BRIDGE HYDRAULICS REPORT

O.C. PHILLIPS RD. OVER BRUSHY CREEK
BRIDGE NO. 484029

PREPARED FOR:

ESCAMBIA COUNTY
FINANCIAL PROJECT NUMBER 430468-1-38-01

PREPARED BY:

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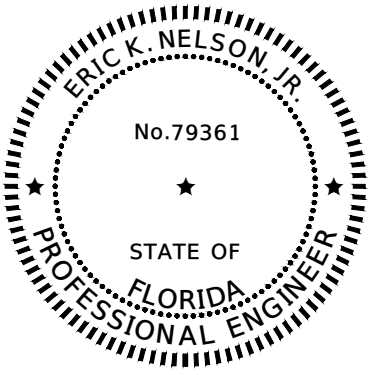

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EXECUTIVE SUMMARY

This Bridge Hydraulics Report (BDR) evaluates the design for the replacement of O.C. Phillips Road over Brushy Creek (Bridge No. 484029) in Escambia County, Florida. The existing bridge is approximately 25'-5" wide and 75'-4" long, carrying two lanes of traffic with bridge-mounted guardrail. The proposed bridge typical section will consist of a 2-lane, local section with 12'-0" travel lanes, 10'-0" shoulders on both sides protected by traffic railing. The alignment will be shifted approximately 8 feet to the south to restore the original alignment of the previously replaced bridge.

The analysis evaluates the 25 year, 100 year and 500 year design stages. The minimum required low member elevation is the 100 year design stage plus two feet for debris clearance (103.5 ft-NAVD). The existing profile grade line (PGL) of the bridge is at approximately 101.3 ft-NAVD.

The following tables summarize the results of the evaluation.

Table 1: Summary Table

SUMMARY OF RESULTS OF RECOMMENDED ALTERNATE	
Name of River	Brushy Creek
Receiving Body	Perdido River
Drainage Area (acres)	43,562
Drainage Area Land Use	Upland Forest, Wetlands
25-YR Design Discharge (cfs)	3967
100-YR Discharge (cfs)	5541
500-YR Discharge (cfs)	7691
Bridge Low Member Elevation (ft)	103.5
Normal Water Level (ft)	92.0
Control Elevation (ft)	N/A
Bank Elevation (ft)	101

Table 2: Peak Stages

Storm Frequency	Existing Bridge (ft-NAVD)	Proposed Bridge (ft-NAVD)
Upstream of Bridge (STA 10+00)		
100yr	102.44	101.28
500yr	103.72	103.41
Downstream of Bridge (STA 9+75)		
100yr	101.02	101.12
500yr	102.58	103.07

Table 3: Scour Estimates

Design Frequency (year)	Local Pier Scour (ft)	Contraction Scour (ft)	Left Abutment Scour (ft)	Right Abutment Scour (ft)	Total Estimated Pier Scour Depth (ft)	Estimated Scour Elev (ft)
100	4.51	1.13	12.92	7.62	5.64	83.74
500	3.60	1.21	14.78	8.90	4.81	84.57

1.0 GENERAL INFORMATION

1.1 Project Location

The proposed project includes the O.C. Phillips Road bridge replacement over Brushy Creek (Bridge No. 484029) in Escambia County Florida and is in Section 29 Township 4N Range 33W (Latitude 30°50'16" N, Longitude 87°33'44" W). See **Figure 1-2** for project location map.

The elevations in the plans and in this report are based on the North American Vertical Datum of 1988 (NAVD88). The conversion factor from the National Geodetic Vertical Datum of 1929 (NGVD 29) to NAVD 88 is 0.029 feet (NGVD 29 + 0.095 ft = NAVD 88).

1.2 Purpose

The purpose of this report is to document a hydraulic evaluation for the replacement of the existing timber bridge at the Brushy Creek crossing.

1.3 Existing Drainage Information

In evaluating the bridge hydraulics, the following reference sources were reviewed: The Flood Insurance Rate Map (FIRM) for Escambia County, Florida and Incorporated Areas, Panel No. 12033C0105G & 12033C0110G, Revised September 29, 2006 FEMA; USGS Quadrangle Mapping; Northwest Florida Water Management District Basin Maps, and survey obtained for this project.

The existing bridge was constructed in 1968 and consists of five spans totaling approximately 75'-4" (±) with a 23'-7" (±) wide asphalt covered deck. It is currently posted with a weight limit of 12 tons. The existing typical section includes two lanes of traffic with bridge mounted guardrail, which is substandard according to current FDOT design criteria and safety standards. The substructure is comprised of round timber piles with timber wrapped abutments. See **Figure 1-1.**

Figure 1-1: Existing Bridge

According to the latest inspection report, the existing bridge is structurally deficient. Based on preliminary survey obtained, the existing low chord elevation is at approximately 98.58 ft-NAVD88 datum.

Field reviews have been conducted for the project. The stream bed and banks were evaluated for determination of channel and overbank Manning's N coefficients. Channel Photographs are provided in **APPENDIX D**

A bridge inspection was completed by Kisinger Campo and Associates on 11/7/2018, both above and under water. The report is provided in **APPENDIX E.** In the report, scour and undermining behind the far backwall and far right wingwall was noted as having been repaired. Scour was categorized as "minimal risk" and additional monitoring was recommended.

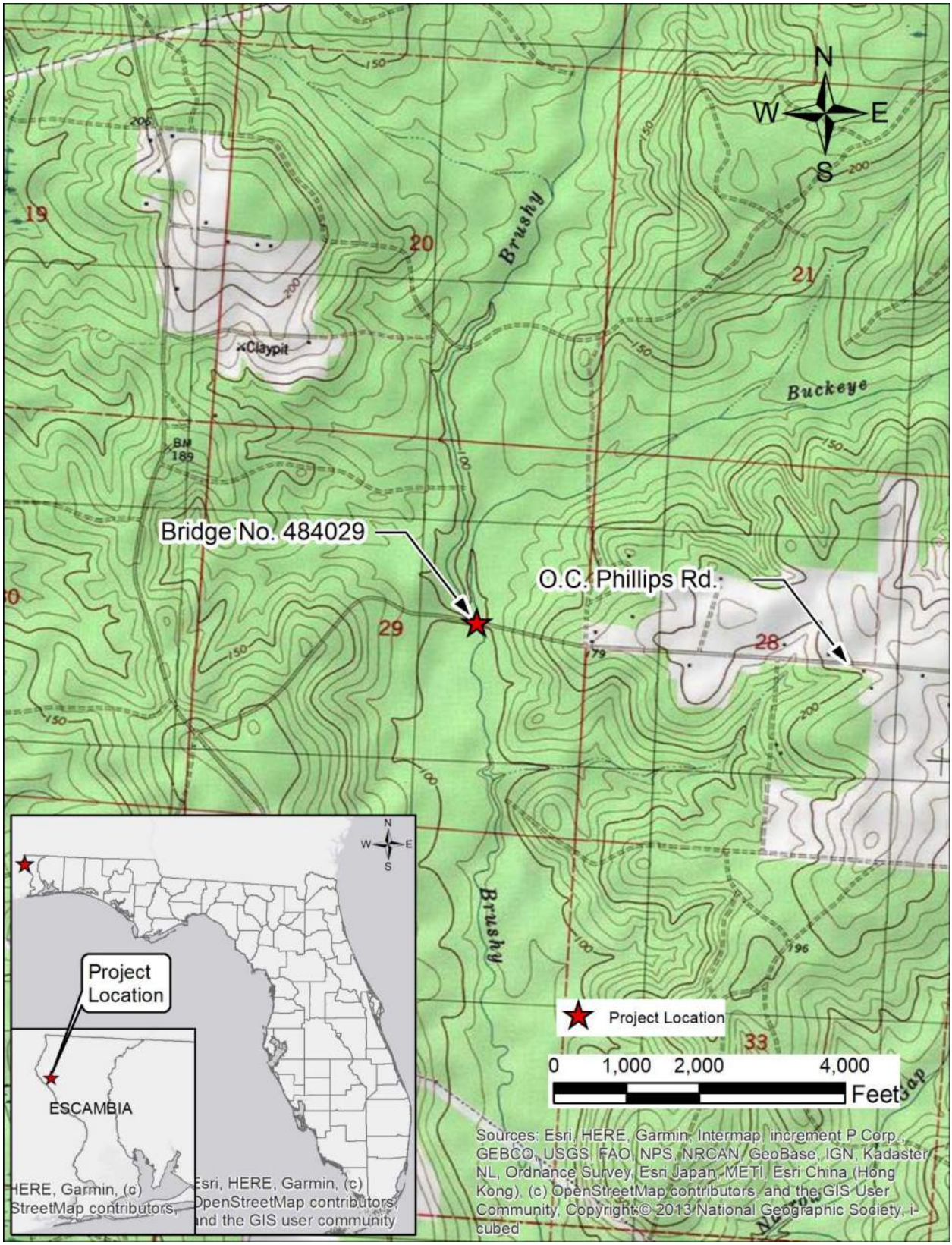


Figure 1-2: Project Location Map

1.4 Tailwater

The FDOT Drainage Manual, Chapter 4.5, defines the selection of the tailwater elevation as the highest elevation which can be reasonably expected to occur coincident with the design storm event. The design tailwaters utilized are based on normal depth of the existing channel. The calculated design tailwater elevations are provided below in **Table 1-1**.

Table 1-1: Estimated Tailwater Elevations

Storm Frequency	Tailwater Elevation (ft NAVD88)
25 year	96.79
100 year	98.22
500 year	99.50

1.5 Floodplain Impacts and Mitigation

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 12033C0105G & 12033C0110G, revised September 29, 2006, identifies that the bridge crossing over Brushy Creek to be within a floodplain designated as Zone A, see **Figure 1-3**. No base flood elevation is determined for this location. See Appendix D for FEMA FIRM. A No-Rise Certification will not be required.

The proposed bridge improvements will include floodplain encroachments associated with roadway widening for the bridge approaches and abutments. The roadway improvements for O.C Phillips Rd. are considered traversing work at this location per NWFWMD Applicant's Handbook Volume II, Section 3.4 therefore no floodplain compensation will be required.

The proposed bridge improvements will result in "no-rise" upstream of the bridge crossing and will not infringe on the rights of others within the floodplain.

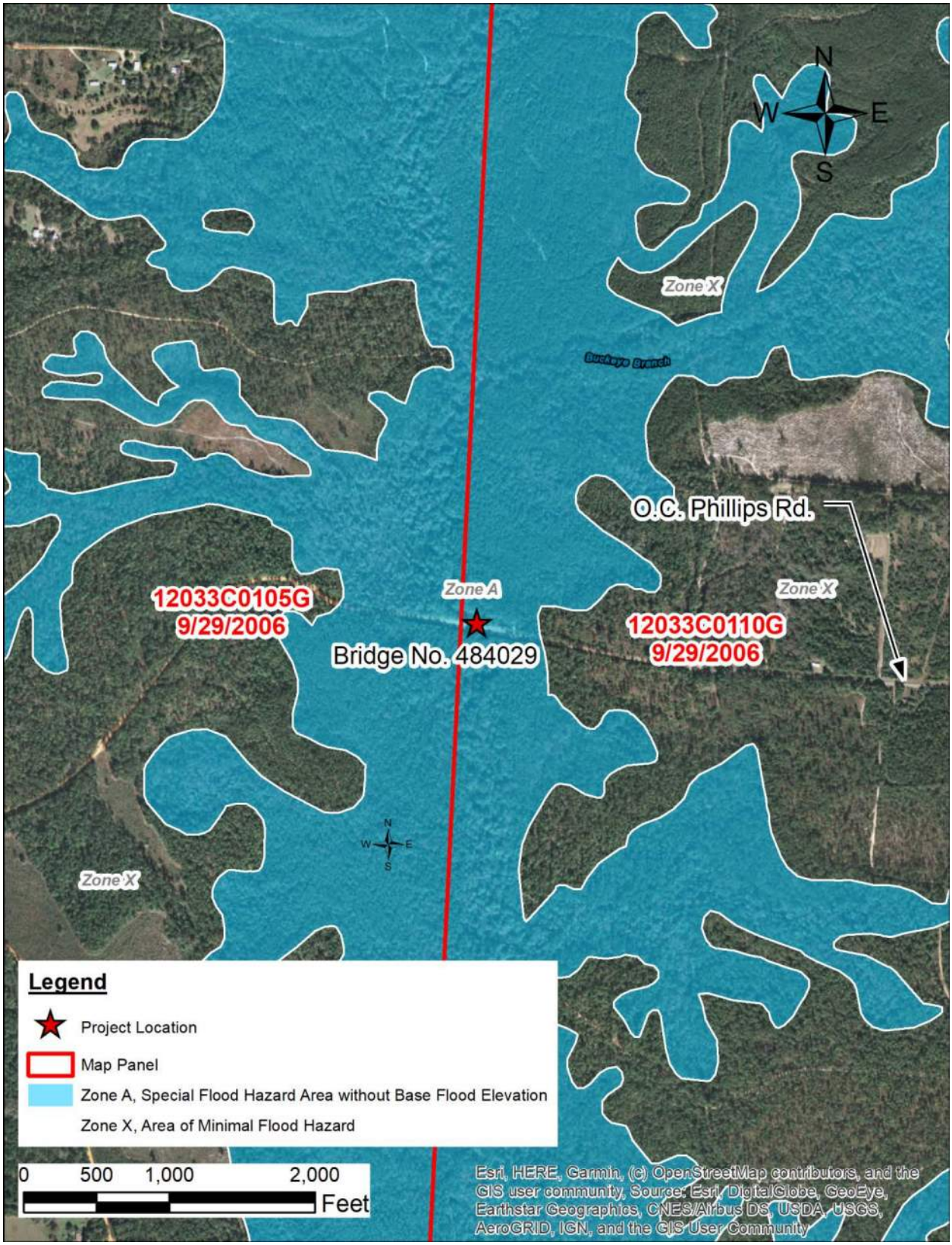


Figure 1-3: FEMA Floodplain Map

1.6 Rules & Regulations/Design Criteria

The Escambia County and FDOT criteria will govern the design of this project. Sources of bridge criteria are identified in:

- Escambia County Design Standards Manual (ECDSM), July 2019, Chapter 1-1.5.c.8
- FDOT Drainage Manual , January 2020 – Chapter 4
- FDOT Design Manual (FDM), January 2020 – Section 260

Hydrology/Hydraulics

- Channels and culverts under all proposed roads, excluding conveyance systems diverting runoff to the ponds, shall be designed to convey the runoff from a 100-year critical duration event without overtopping the road. (ECDSM 1-1.5.c.8)
- Design frequencies – Other projected 20 year AADT < 1500: 25 year (FDM), 100 year (Design Flood- ECDSM), 500 year (Greatest Flood-FDM).
- Backwater – any increase shall not significantly change land use values. No-rise certification is not required. (FDM)
- Tailwater – the highest elevation which can be reasonably expected to occur coincident with the design storm event. (FDM)
- Minimum vertical clearance between Design Flood stage and bridge low member is two feet. *Per County: where the desired freeboard is not achievable, 2ft clearance is an acceptable amount of debris clearance. See* APPENDIX D *for email from the County Project Manager.*
- Minimum horizontal clearance – 10 ft Escambia County
- Hydrologic data based on observed (gage) data and/or Regression equations developed by the USGS. The peak discharges shall be calibrated to the extent practical with available data. (FDM)

Temporary Bridge

Design temporary traversing works accounting for the permitted duration of the work. Temporary traversing work will cause no more than a one-foot increase in the Design Storm Frequency (DSF) flood elevation immediately upstream and no more than one tenth of a foot increase in the DSF flood elevation 500 feet upstream. If the existing structure does not have flooding or scour concerns, a 10-year design storm event is the minimum design frequency for temporary culverts, bridge-culverts, and bridges.

Bridge Scour

Bridge scour estimates shall be developed for each bent following the recommended procedures identified in the FDOT Drainage Manual, January 2019. Per the County criteria, a 100 year design storm frequency is utilized for scour evaluation. Bridge foundations shall be designed with normal safety factors to withstand the scour design 100 year flood condition. The design shall provide a minimum factor of safety of one against failure due to the scour 500 year design check flood condition.

Estimate scour depths using the procedures of FHWA's Hydraulic Engineering Circulars (HEC) 18 and 20, except for the following:

- Follow Section 4.8.2 for tidal hydraulics analysis methodology. NOT APPLICABLE
- Use Sheppard's Pier Scour Equation rather that the CSU Pier Scour Equation when the total scour (general scour, contraction scour, and local scour) is greater than six feet.
- Use the Florida Complex Pier Scour Procedure in lieu of the complex pier scour procedure in HEC 18. NOT APPLICABLE (piers are not complex)

- Use the Florida Rock/Clay Scour Procedure to evaluate scour in scour-resistant soils. NOT APPLICABLE
- Use SED-2D to evaluate contraction scour in the absence of a clearly defined upstream tidal floodplain. NOT APPLICABLE

Minimum Scour Protection

For spill-through abutments, minimum protection consists of one of the following placed on a slope no steeper than 1(vertical) to 2 (horizontal):

- Rubble riprap (bank and shore), bedding stone, and filter fabric: Rubble riprap (bank and shore) as defined in the Standard Specification 530 where (1) design flow velocities do not exceed 7.7 fps, (2) Froude numbers are ≤ 0.80, and (3) wave heights do not exceed 2.4 feet
- Articulated concrete block (cabled and anchored)

Where revetment is deemed necessary to protect piers from scour, and upstream design flow velocities do not exceed 7.2 fps for rectangular piles or bascule piers, and 8.2 fps for round piling or drilled shafts, pier scour protection shall consist of one of the following:

- Rubble riprap (Bank and Shore), bedding stone, and filter fabric: Rubble riprap (Bank and Shore) is defined in the Standard Specifications for Road and Bridge Construction, Section 530.
- Articulated concrete block (cabled).
- Gabions (rock filled baskets)

2.0 HYDRAULIC ANALYSIS OF PROPOSED BRIDGE

2.1 Drainage Basin

The drainage basin is 42,561.5 acres (68.06 square miles), see **Figure A-1: Drainage Map**. The basin acreage was identified from NWFWMD basin and stream shapefiles. The drainage basin land use primarily consists of upland forest, residential, agricultural and wetlands.

2.2 Peak Flow Analysis/Design Frequency

The storm frequencies evaluated for this project are the 25 year, 100 year (Design Flood), and 500 year (Greatest Flood). The design criterion was discussed in Section 1.6 of this report.

The peak discharges for this evaluation were calculated using the USGS Regression equation for Natural Flow Conditions in Florida Region 1 (FDOT Drainage Design Guide – Table B-17). A basin storage percentage of 15.16% was used for the Regression equation calculations; USGS Quadrangle maps identified minimal wetland areas within the drainage basin limits.

An overtopping analysis is provided in **APPENDIX B**, for the existing condition. Overtopping occurs at 4,303.96 cfs, which is less than the 500 yr discharge of 7,691 cfs. The overtopping frequency is 3.1% equating to about a 32 yr storm event. The proposed bridge will not overtop at less than a 500 hr discharge, therefore the overtopping discharge was not calculated.

2.3 Document History of Flooding

This area frequently floods and flood stages have on occation overtopped the existing bridge. Several newspaper articles have documented this. Two articles documenting flooding on January 3, 2017 and October 26, 2017 have been included. See **APPENDIX D.** This documentation further cooborates the overtopping analysis results, discussed in the previous section. There are not any rain gauges or stream gauges in the vicinity of the bridge to properly evaluate the documented flooding events. However, as can be seen in the photographs in **APPENDIX D**, resultant flood stages above the roadway profile are reasonable. It should furthermore be noted that the photographs also show that road overtops just east of the bridge, before the bridge does. This is apparent in the topographic survey as well. The ECDSM requires that channels under all proposed roads, excluding conveyance systems diverting runoff to the ponds, shall be designed to convey the runoff from a 100-year critical duration event without overtopping the road. For this reason, the roadway profile will be raised to be above the 100 year flood stage. This will extend the construction limits to approximately 700 ft west and 400 ft east of the bridge.

2.4 Proposed Bridge

A Bridge Development Report (BDR) was prepared which evaluated the design alternatives for the replacement of O.C. Phillips Road over Brushy Creek (Bridge No. 484029) in Escambia County, Florida. The proposed bridge typical section will consist of a 2-lane, local section with 12'-0" travel lanes, 10'-0" shoulders on both sides protected by traffic railing. The alignment will be shifted approximately 8 feet to the south based on the request from the County. This shift in alignment will allow the road to be straightened back to the original alignment of the previously replaced bridge.

The BDR identifies three short bridge alternatives and three long bridge alternatives consisting of one span to four spans. The development of the alternatives identified in the BDR considered hydraulic requirements, mainly maintaining the existing hydraulic opening and meeting minimum clearances. This report evaluates the proposed bridge which is the preferred alternative identified by the BDR.

This BHR report evaluates the 25 year design stage, along with the 100 year and 500 year stages. The required low member elevation storm event requires an increase of the existing low member elevation of EL. 98.58 ft-NAVD. The existing profile grade line (PGL) of the bridge is at approximately 101.20 ft-NAVD. The profile developed in the roadway plans considers a minimum PGL elevation of 109.00 ft-NAVD, at the end bridge resulting in a proposed low member elevation of approximately 103.5 ft-NAVD, which is about 4.9 ft higher than the existing lowest member. The proposed roadway profile will extend approximately 900 ft west and 630 ft east of the bridge centerline to tie into the existing road.

The minimum recommended bridge length is the creek bank-to-bank width. Sloping 1:2 (vertical:horizontal) from the creek bed results in a 75'-4" bridge length.

The proposed roadway profile will extend approximately 900 ft west and 630 ft east of the bridge centerline to tie into the existing road.

The proposed piles utilize 5 piles at the abutments and 5 to 7 piles, depending on the alternative, at the intermediate bent all spaced at equal intervals. The groups are skewed at a 20° angle with respect to the bridge, making them parallel to the direction of flow in the creek.

For the spill-through abutments; minimum protection shall consist of Rubble Riprap (Bank and Shore) placed on 1(vertical) to 2(horizontal) slope.

The following table summarizes each alternative and includes the costs for the superstructure.

Alternatives One through Six share the same substructure options which consists of concrete prestressed piles supporting a 3'-0" wide x 3'-0" deep cap. The pile sizes will be a 24" as required for the extremely aggressive environment. The bent cap will span the entire 46'-8" width of the bridge.

Table 2-1: Summary of Bridge Alternatives

Alternative	Beam Type	Span Lengths*	Comparative Cost
Spill Thru Bridge Alternatives			
ONE	15½" CIP Flat Slab	4 Spans @ 28'-9"	$1,147,502
TWO	12" FSB with a 6½" CIP Topping	3 Spans @ 38'-4"	$1,143,090
THREE	18" FSB with a 6½" CIP Topping	2 Spans @ 57'-6"	$1,258,126
Wall Bridge Alternatives			
FOUR	15" CIP Flat Slab	3 Spans @ 26'-8"	$1,200,837
FIVE	12" FSB with a 6" CIP Topping	2 Spans @ 40'-0"	$1,193,033
SIX	36" FIB with an 8" CIP Deck	1 Span @ 80'-0"	$1,304,421

** Span lengths measured along the centerline of construction*

Alternative Two using 24" prestressed concrete piles is the most economical option and what is recommended for the replacement of the O.C. Phillips Road over Brushy Creek. Alternative Two proposed bridge consists of three 38'-4" spans and 12" FSB with a 6½" CIP topping. This 115'-0" bridge would feature spill through abutments that would be lined with rip-rap. The bridge deck is crowned with a 2% cross slope. The superstructure consists of a 2-lane undivided roadway with 12'-0" lanes and 10'-0" shoulders on both sides protected by 36" Single-Sloped traffic barriers.

Deck drainage: The bridge deck is crowned with a 2% cross slope and the bridge profile slopes to the west allowing runoff to drain into roadside swales west of the bridge. For a design speed of 35 mph, the allowable spread is half of the 12 foot lane. The bridge deck also has 10 foot shoulders. However, the calculated spread is only 5.90 feet for the span length of the bridge. Calculations are provided in **APPENDIX B.**

2.5 Hydraulic Software

This bridge hydraulic evaluation utilized the U.S. Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS), version 5.0.7, March. 2019, public domain software, to produce water surface profiles and report peak stages and velocities.

2.6 Manning's Roughness Coefficients

A field review was conducted on August 18, 2018 to identify vegetative cover, surface roughness, and channel characteristics for the selection of appropriate Manning's "n" values for the main channel and overbank areas. The following is a description of the field investigation findings and the associated Manning's "n" values chosen, see **APPENDIX D** for field review photographic documentation

The *Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains United States Geological Survey Water-supply Paper 2339* was used for selecting Manning's "n" values. The main channel north and south of the crossing consists of shallow winding flows of water with pools and shoals that contain scattered vegetative debris; the roughness coefficient used for the main channel is 0.04. The channel banks have surface coverage that is densely wooded with small to medium size trees and dense underbrush; the roughness coefficient used for the overbank area is 0.23 for dense brush.

2.7 Tailwater

The design tailwater elevation for bridge hydraulic evaluations shall be the highest elevation which can be reasonably expected to occur coincident with the design storm event. The design tailwaters utilized for this evaluation were discussed in Section 1.4 of this report.

2.8 Model Calibration

No gaged data is available for the bridge crossing. The results of the modeling were evaluated for reasonableness with respect to the drainage area, upstream characteristics (storage potential), FEMA mapping and field surveys. Water elevations derived from the flood history photographs discussed in Section 2.3 were compared to the calculated flood stages. For example, in the October 26, 2017 article (**APPENDIX D**), the roadway appears to have eroded and water may have risen up to the bridge deck. When comparing these erosion lines to the survey, the high water elevation appears to have reached 100.06' on the bridge. Utilizing the Overtopping calculations performed in **APPENDIX B**, this equates to about a 25 year storm event.

2.9 Cross section Development

A river alignment was created and all cross sections reference the river alignment, and are indicated by river alignment stations. Cross sections were produced from survey data points upstream and downstream of the crossing. The cross sections were located to allow for the contraction and expansion of flow that occurs at the inlet and outlet in accordance with recommended procedures identified by the U.S. Army Corps of Engineers HEC-RAS River Analysis System User's Manual.

The model domain extents were determined per recommended procedures identified in the FDOT Drainage Design Guide, January 2019. The downstream cross section was set far enough downstream to establish tailwater conditions for the bridge, and the upstream cross section was set far enough upstream to evaluate the impact the bridge crossing will have on upstream land use values.

The cross sections gradually transition throughout the alignment, therefore the contraction/expansion coeficients were set to 0.1/0.3. To capture the energy loss resulting from increased flow contraction approaching the bridge, and increased flow expansion when leaving the bridge, the contraction/expansion coeficients were increased to 0.3/0.5 at the sections immediately upstream and downstream of the bridge, in both the existing and proposed conditions.

The model "Errors, Warnings and Notes" were reviewed after each model run. No errors were present in the completed models and no warnings occurred at relevant cross sections. The most upstream cross sections (1300-1800) had warnings of "Divided flow computed for this cross-section and "The cross-section end points had to be extended vertically for the computed water surface." Divided flows are expected given the terrain. Where cross sections had to be extended vertically, the model would not be affected since these are ineffective flow areas.

The cross sections are illustrated in **APPENDIX B** for the existing condition and proposed improvements.

3.0 SCOUR ANALYSIS

Scour analysis has been performed per recommended procedures in the FDOT Scour Manual, May 2005, Drainage Manual, January 2019, and Drainage Design Guide 2019.

3.1 Description of Soils

The soil type was determined from the Natural Resources Conservation Service (NRCS) as Bigbee-Garcon-Fluvaquents complex.

A Geotechnical evaluation has been performed for this location, see **APPENDIX D** for the Grainsize Analysis. The geotechnical investigation identified median sediment diameters within the channel utilized for scour prediction calculations as D_{50} = 0.313 mm, D_{90} = 0.80 mm and D_{95} = 1.22 mm.

3.2 Scour Predictions for Design 100YR and 500YR

The FDOT Drainage Manual identifies criteria for calculating scour elevation estimates. For analysis, bridge scour is broken down into the following categories: 1) general scour, 2) long term aggradation/degradation, 3) contraction scour, and 4) local structure-induced pier and abutment scour.

With respect to general and long term aggradation/degradation scour, the location was surveyed, field review performed and the area was compared with previous aerials to identify any changes that have occurred over time. Minor scour holes were apparent from field review and review of survey data. A review of previous aerials found no significant changes in land use since the bridges were constructed. No land use changes are anticipated along the reach within the vicinity of the crossing; therefore, long term aggradation and degradation of the streambed is not a significant concern for the bridges. Based on a comparison of the 1999 versus 2018 river profiles, it appears that long term degradation is not a concern. A profile comparison is located in **Appendix E**

Scour predictions were performed following FDOT methods for all bridge alternatives. Scour prediction estimates for contraction scour, local pier scour and abutment scour were determined with HEC-RAS. The calculations for the scour elevation estimates and plotted scour depth diagrams for each alternative are in **Appendix B**. See **Table 3-1** for predicted scour depths.

Table 3-1: Predicted Scour Depths

Design Frequency (year)	Local Pier Scour (ft)	Contraction Scour (ft)	Left Abutment Scour (ft)	Right Abutment Scour (ft)	Total Estimated Pier Scour Depth (ft)	Estimated Scour Elev (ft)
100	4.51	1.13	12.92	7.62	5.64	83.74
500	3.60	1.21	14.78	8.90	4.81	84.57

3.3 Pier and Abutment Protection

For the spill-through abutments; minimum protection shall consist of Rubble Riprap (Bank and Shore) placed on 1(vertical) to 2(horizontal) slope. The riprap limits have been determined per HEC 23 and the Rubble Riprap Slope Protection Details in the Structures Detailing Manual (SDM). Calculations are provided in **APPENDIX C.** The riprap abutment shall have the following paramters:

Riprap Parameters:

Apron extent from the toe of slope	23 ft
Downstream extent from face	25 ft
Upstream extent from face	15 ft
Riprap D_{50}	0.77 ft
Thickness	2.5 ft

3.4 Tempory Bridge

It is anticipated that the temporary detour bridge will consist of a 50 ft center span, two 30 ft side spans and will be 28.5 ft wide to carry two lanes of traffic. The minimum bridge low member elevation shall be 100.5 ft-NAVD, to be 2 ft above the 10 year design storm. A HEC-RAS model has been developed by placing the temporary bridge immediately upstream of the existing bridge. Input and Results from this model are included in **Appendix B**. **Table 3-2** below summarizes the results from model, and shows that the temporary bridge meets the requirements set forth in the FDOT Drainage Manual.

Table 3-2: Summary Results for the Temporary Bridge

CROSS SECTIONS	EXISTING BRIDGE	PROPOSED BRIDGE	Change	Meets Requirement?
	10 yr	10 yr		
	Stage (ft)	Stage (ft)	ft	
16+00.00	99.86	99.97	0.11 ↑	Yes, ≤ 0.10 ft
15+00.00	99.46	99.60	0.14 ↑	Yes, ≤ 0.10 ft
10+50.00	98.46	98.68	0.22 ↑	Yes, ≤ 1.00 ft
10+00.00	98.24	98.48	0.24 ↑	Yes, ≤ 1.00 ft
9+87.50	Existing Bridge			
975+00	98.00	98.26	0.26 ↑	Yes, ≤ 1.00 ft
960+00	Temporary Bridge			
900+00	97.38	97.38	-	Yes, ≤ 1.00 ft

3.5 Scour Predictions for the Temporary Bridge

Scour predictions were performed following FDOT methods for the temporary bridge. Scour prediction estimates for contraction scour, local pier scour and abutment scour were determined with HEC-RAS. The calculations for the scour elevation estimates for each alternative are in **Appendix B**. See **Table 3-3** for predicted scour depths.

Table 3-3: Predicted Scour Depths for the Temporary Bridge

Design Frequency (year)	Local Pier Scour (ft)	Contraction Scour (ft)	Left Abutment Scour (ft)	Right Abutment Scour (ft)	Total Estimated Pier Scour Depth (ft)	Estimated Scour Elev (ft)
25	2.40	0.00	0.00	11.38	2.40	87.40
50	2.40	0.00	1.29	5.90	2.40	87.40

3.6 Pier and Abutment Protection for the Temporary Bridge

For the spill-through abutments; minimum protection shall consist of Rubble Riprap (Bank and Shore) placed on 1(vertical) to 2(horizontal) slope. The riprap limits have been determined per HEC 23 and the Rubble Riprap Slope Protection Details in the Structures Detailing Manual (SDM). Calculations are provided in **APPENDIX C.** The riprap abutment shall have the following paramters:

Riprap Parameters:

Apron extent from the toe of slope	18 ft
Downstream extent from face	25 ft
Upstream extent from face	15 ft
Riprap D_{50}	0.47 ft
Thickness	2.5 ft

4.0 CONCLUSIONS AND RECOMMENDATIONS

The analysis of the existing bridge crossing indicates that the bridge has sufficient hydraulic capacity to convey the design frequency (100 year) and the 500 year greatest flood without roadway overtopping or creating excessive velocities. The lowest structural member of the proposed bridge will be 103.5 ft-NAVD, which is about 4.9 ft higher than the existing lowest member. Riprap protection at the base of the abutments is recommended due to the predicted scour. **Table 4-1** through **Table 4-4** provide a summary of the results.

Table 4-1: Summary Results For O.C. Phillips Bridge over Brushy Creek (484029)

CROSS SECTIONS	EXISTING BRIDGE				CROSS SECTIONS	PROPOSED BRIDGE			
	CHANNEL	25YR	100YR	500YR		CHANNEL	25YR	100YR	500YR
	LENGTH	Stage (ft)	Stage (ft)	Stage (ft)		LENGTH	Stage (ft)	Stage (ft)	Stage (ft)
19+00.00	100.00	102.45	103.78	105.44	19+00.00	100.00	102.17	103.03	105.09
18+00.00	100.00	101.36	103.75	105.41	18+00.00	100.00	100.96	103.00	105.05
17+00.00	100.00	101.74	103.63	105.29	17+00.00	100.00	101.35	102.83	104.91
16+00.00	100.00	101.43	103.47	105.07	16+00.00	100.00	101.00	102.61	104.67
15+00.00	100.00	101.01	103.37	104.98	15+00.00	100.00	100.52	102.45	104.55
14+00.00	100.00	100.82	103.25	104.83	14+00.00	100.00	100.27	102.28	104.38
13+00.00	100.00	100.76	103.01	104.49	13+00.00	100.00	100.18	101.96	104.00
12+00.00	100.00	100.49	102.72	104.07	12+00.00	100.00	99.93	101.51	103.50
11+00.00	50.00	99.91	102.87	104.31	11+00.00	50.00	100.06	101.71	103.76
10+50.00	50.00	100.16	102.63	103.97	10+50.00	50.00	99.77	101.36	103.36
10+00.00	25.00	99.99	102.44	103.72	10+00.00	25.00	99.66	101.28	103.33
9+87.50	Bridge				9+87.50	Bridge			
9+75.00	25.00	99.28	101.02	102.58	9+75.00	25.00	99.57	101.12	103.07
9+50.00	50.00	99.25	101.00	102.54	9+50.00	50.00	99.26	100.71	102.54
9+00.00	100.00	98.46	100.23	101.46	9+00.00	100.00	98.46	99.80	101.46
8+00.00	100.00	98.16	100.03	101.26	8+00.00	100.00	98.16	99.50	101.26
7+00.00		96.79	98.22	99.50	7+00.00		96.79	98.03	99.50
Total Length	1200.00				Total Length	1200.00			

Table 4-2: Summary for Existing Bridge

FREQUENCY	DISCHARGE	AVERAGE VELOCITY		STAGE		LOW CHORD ELEVATION
		UPSTREAM	DOWNSTREAM	UPSTREAM	DOWNSTREAM	
		10+00	9+75	10+00	9+75	
(years)	(cfs)	(fps)	(fps)	(ft)	(ft)	(ft)
10	3,052	6.18	6.05	98.24	98	98.58
25	3,967	6.34	6.68	99.99	99.28	
100	5,541	6.57	7.57	102.44	101.02	
500	7,691	7.97	8.81	103.72	102.58	

Table 4-3: Summary for Proposed Bridge

FREQUENCY	DISCHARGE	AVERAGE VELOCITY		STAGE		LOW CHORD ELEVATION	LOW CHORD VERTICAL CLEARANCE
		UPSTREAM	DOWNSTREAM	UPSTREAM	DOWNSTREAM		
		10+00	9+75	10+00	9+75		
(years)	(cfs)	(fps)	(fps)	(ft)	(ft)	(ft)	(ft)
100	5,541.00	6.76	6.15	101.28	101.12	103.5	2.22
500	7,691.00	7.36	6.93	103.33	103.07	103.5	0.17

Table 4-4: Scour Estimates

Design Frequency (year)	Local Pier Scour (ft)	Contraction Scour (ft)	Left Abutment Scour (ft)	Right Abutment Scour (ft)	Total Estimated Pier Scour Depth (ft)	Estimated Scour Elev (ft)
100	4.51	1.13	12.92	7.62	5.64	83.74
500	3.60	1.21	14.78	8.90	4.81	84.57

5.0 REFERENCES

- Escambia County Design Standards Manual, July 2019
- FDOT Drainage Manual, January 2020 – Chapter 4
- FDOT Design Manual, January 2020 – Section 260
- FDOT Bridge Scour Manual, May 2005
- US Army Corps of Engineers, HEC-RAS User's Manual, February 2016

FDOT/FHWA Hydraulic Engineering Circular No. 18 (HEC 18), Evaluating Scour at Bridges, May 2001

APPENDIX A: DRAINAGE MAP & USGS REGRESSION FLOW CALCULATIONS

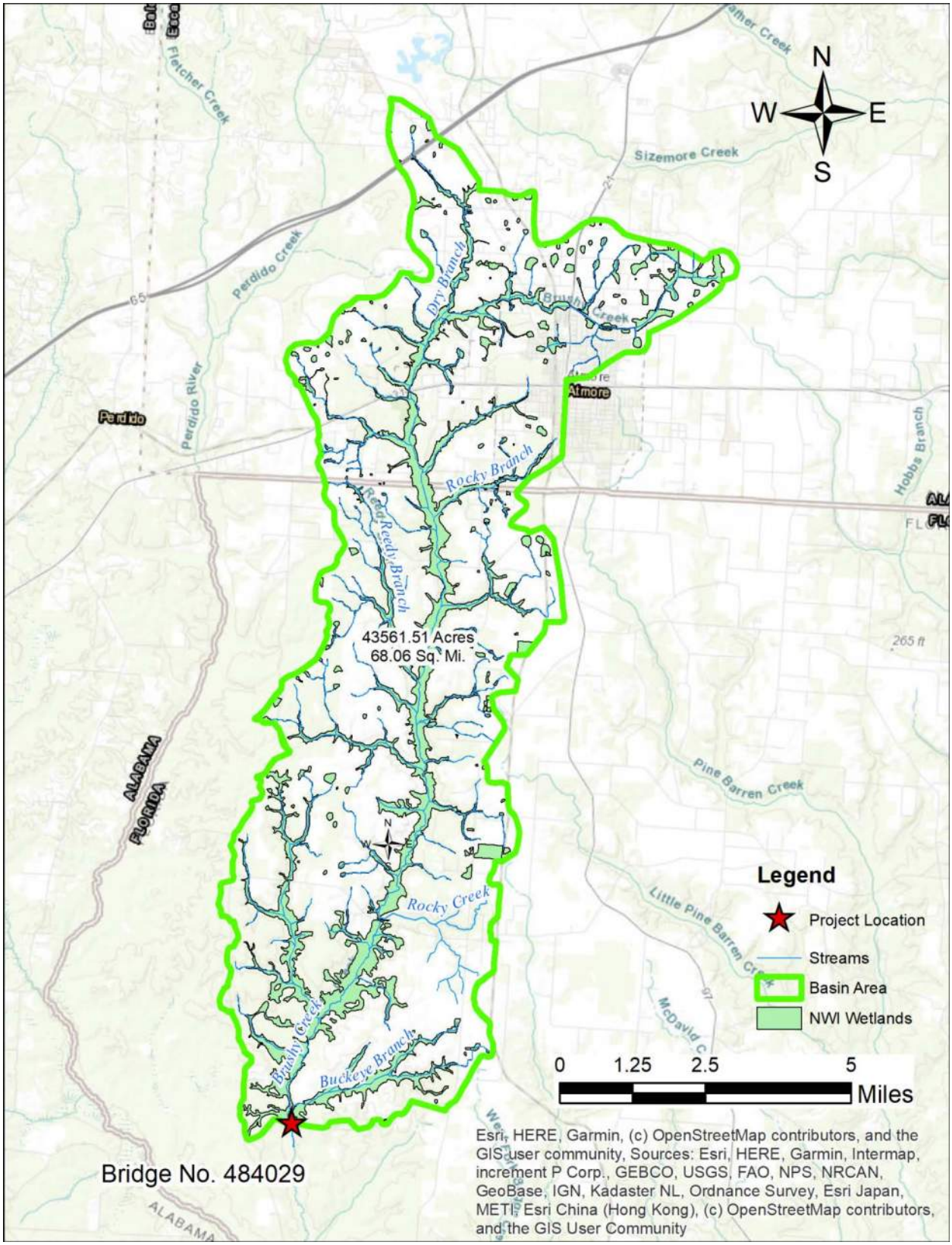


Figure A-1: Drainage Map

FDOT Drainage Design Guide – Figure B-4 indicates that the proposed project is within Region 1. The calculations for regression equations within Region 1 are indicated below.

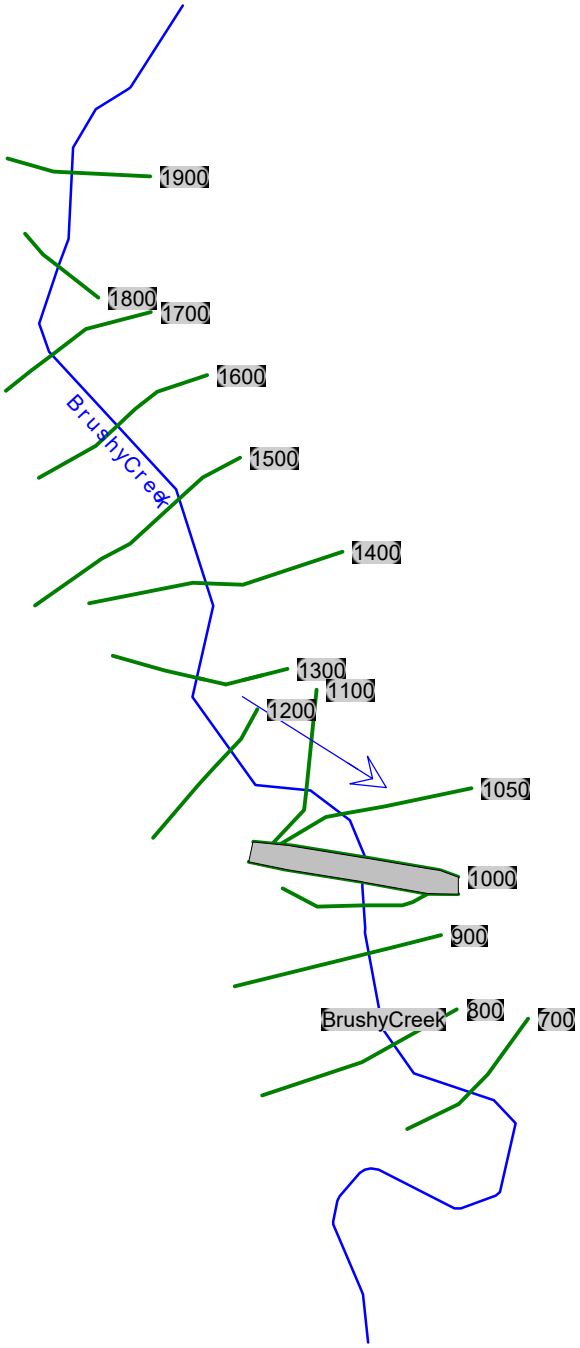
FDOT Drainage Design Guide – Table B-17
USGS Regression Equation for Natural Flow Conditions in Florida -Region 1

O.C. PHILLIPS ROAD over BRUSHY CREEK BRIDGE (484029)

			Range of Applicability
Drainage area (DA)	43562	acres	0.14 mi^2 (89.6 acres) to 4,385 mi^2)
	68.06	mi^2	
Basin Storage (ST) *	15.16	%	(0 to 44.29%) Storage percentage based on GIS wetland boundaries. See **Drainage Map**, **Appendix A**
25 year peak runoff	**3967**	cfs	
100 year peak runoff	**5541**	cfs	
500 year peak runoff	**7691**	cfs	

** Basin storage is the percentage of the drainage basin occupied by lakes, reservoirs, swamps, and wetlands.*

APPENDIX B: HYDRAULIC CALCULATIONS


1900
1800
1700
1600
BrushyCreek
1500
1400
1300
1100
1200
1050
1000
900
BrushyCreek
800
700

HEC-RAS Plan: Existing River: BrushyCreek Reach: BrushyCreek

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BrushyCreek	1900	10 yr	3052.00	89.64	100.81	96.31	101.36	0.001696	5.96	516.64	150.10	0.37
BrushyCreek	1900	25 yr	3967.00	89.64	102.45	97.28	103.10	0.001559	6.46	620.97	150.10	0.36
BrushyCreek	1900	100 yr	5541.00	89.64	103.78	98.73	104.57	0.001731	7.40	1188.18	150.10	0.39
BrushyCreek	1900	500 yr	7691.00	89.64	105.44	100.39	106.55	0.002044	8.82	1437.95	150.10	0.43
BrushyCreek	1800	10 yr	3052.00	89.88	99.89	96.79	101.06	0.003577	8.67	352.37	101.51	0.53
BrushyCreek	1800	25 yr	3967.00	89.88	101.36	97.95	102.79	0.003528	9.59	414.48	101.51	0.54
BrushyCreek	1800	100 yr	5541.00	89.88	103.75	99.65	104.37	0.001182	6.37	1000.06	101.51	0.33
BrushyCreek	1800	500 yr	7691.00	89.88	105.41	101.64	106.32	0.001463	7.73	1167.91	101.51	0.37
BrushyCreek	1700	10 yr	3052.00	88.92	100.12	95.52	100.62	0.001680	5.70	537.61	174.52	0.36
BrushyCreek	1700	25 yr	3967.00	88.92	101.74	96.53	102.32	0.001510	6.13	650.44	174.52	0.35
BrushyCreek	1700	100 yr	5541.00	88.92	103.63	98.00	104.23	0.001342	6.46	1420.30	174.52	0.34
BrushyCreek	1700	500 yr	7691.00	88.92	105.29	99.64	106.13	0.001584	7.71	1709.36	174.52	0.38
BrushyCreek	1600	10 yr	3052.00	89.51	99.86	95.13	100.44	0.001718	6.15	499.30	207.76	0.36
BrushyCreek	1600	25 yr	3967.00	89.51	101.43	96.13	102.15	0.001696	6.81	587.98	207.76	0.37
BrushyCreek	1600	100 yr	5541.00	89.51	103.47	97.60	104.09	0.001358	6.83	1697.82	207.76	0.34
BrushyCreek	1600	500 yr	7691.00	89.51	105.07	99.33	105.96	0.001674	8.22	2031.42	207.76	0.39
BrushyCreek	1500	10 yr	3052.00	89.82	99.46	95.78	100.22	0.002428	7.01	438.77	263.66	0.43
BrushyCreek	1500	25 yr	3967.00	89.82	101.01	96.74	101.93	0.002319	7.68	521.97	263.66	0.43
BrushyCreek	1500	100 yr	5541.00	89.82	103.37	98.18	103.94	0.001380	6.83	2056.39	263.66	0.34
BrushyCreek	1500	500 yr	7691.00	89.82	104.98	99.90	105.76	0.001654	8.12	2480.85	263.66	0.38
BrushyCreek	1400	10 yr	3052.00	87.99	99.25	95.31	99.98	0.002241	6.84	448.34	270.78	0.41
BrushyCreek	1400	25 yr	3967.00	87.99	100.82	96.29	101.69	0.002151	7.51	531.97	270.78	0.42
BrushyCreek	1400	100 yr	5541.00	87.99	103.25	97.79	103.80	0.001281	6.69	2124.74	270.78	0.33
BrushyCreek	1400	500 yr	7691.00	87.99	104.83	99.50	105.59	0.001556	7.99	2553.24	270.78	0.38
BrushyCreek	1300	10 yr	3052.00	90.00	99.13	95.42	99.72	0.002050	6.18	496.33	176.16	0.40
BrushyCreek	1300	25 yr	3967.00	90.00	100.76	96.34	101.44	0.001792	6.60	607.11	187.29	0.39
BrushyCreek	1300	100 yr	5541.00	90.00	103.01	97.67	103.65	0.001417	6.69	1375.24	187.29	0.35
BrushyCreek	1300	500 yr	7691.00	90.00	104.49	99.16	105.41	0.001740	8.06	1652.42	187.29	0.40
BrushyCreek	1200	10 yr	3052.00	87.65	98.82	95.21	99.49	0.002557	6.54	466.66	168.22	0.43
BrushyCreek	1200	25 yr	3967.00	87.65	100.49	96.21	101.23	0.002174	6.92	574.31	172.66	0.41
BrushyCreek	1200	100 yr	5541.00	87.65	102.72	97.67	103.46	0.001746	7.18	1242.28	172.66	0.38
BrushyCreek	1200	500 yr	7691.00	87.65	104.07	99.20	105.16	0.002227	8.75	1475.84	172.66	0.44
BrushyCreek	1100	10 yr	3052.00	89.81	98.28	95.29	99.19	0.003051	7.65	400.93	130.27	0.48
BrushyCreek	1100	25 yr	3967.00	89.81	99.91	96.21	100.96	0.002721	8.20	489.36	172.14	0.47
BrushyCreek	1100	100 yr	5541.00	89.81	102.87	97.64	103.24	0.000781	4.96	1462.26	172.14	0.26
BrushyCreek	1100	500 yr	7691.00	89.81	104.31	99.39	104.85	0.000986	6.05	1710.23	172.14	0.30
BrushyCreek	1050	10 yr	3052.00	86.90	98.46	93.99	98.95	0.001745	5.63	543.18	172.55	0.36
BrushyCreek	1050	25 yr	3967.00	86.90	100.16	94.91	100.71	0.001518	5.96	668.82	208.81	0.35
BrushyCreek	1050	100 yr	5541.00	86.90	102.63	96.31	103.17	0.001164	6.11	1472.57	208.81	0.32
BrushyCreek	1050	500 yr	7691.00	86.90	103.97	97.91	104.77	0.001507	7.48	1752.06	208.81	0.37
BrushyCreek	1000	10 yr	3052.00	89.65	98.24	94.99	98.84	0.002412	6.18	493.52	73.41	0.42
BrushyCreek	1000	25 yr	3967.00	89.65	99.99	95.80	100.62	0.002068	6.34	625.82	138.06	0.40
BrushyCreek	1000	100 yr	5541.00	89.65	102.44	97.05	103.09	0.001609	6.57	1113.77	216.79	0.36
BrushyCreek	1000	500 yr	7691.00	89.65	103.72	98.52	104.67	0.002021	7.97	1391.51	216.79	0.42
BrushyCreek	987.5		Bridge									
BrushyCreek	975	10 yr	3052.00	88.21	98.00	94.05	98.57	0.002170	6.05	504.07	67.78	0.39
BrushyCreek	975	25 yr	3967.00	88.21	99.28	94.92	99.97	0.002338	6.68	593.58	72.06	0.41
BrushyCreek	975	100 yr	5541.00	88.21	101.02	96.24	101.90	0.002596	7.57	834.48	213.00	0.44
BrushyCreek	975	500 yr	7691.00	88.21	102.58	97.92	103.75	0.002854	8.81	1177.18	220.59	0.47
BrushyCreek	950	10 yr	3052.00	89.01	97.95	94.44	98.50	0.002235	5.96	512.15	76.60	0.41
BrushyCreek	950	25 yr	3967.00	89.01	99.25	95.30	99.90	0.002182	6.46	613.81	134.36	0.41
BrushyCreek	950	100 yr	5541.00	89.01	101.00	96.57	101.80	0.002126	7.23	894.66	155.25	0.42
BrushyCreek	950	500 yr	7691.00	89.01	102.54	98.07	103.64	0.002402	8.51	1136.48	157.96	0.46
BrushyCreek	900	10 yr	3052.00	87.52	97.38	93.89	98.32	0.003459	7.80	391.23	127.59	0.49
BrushyCreek	900	25 yr	3967.00	87.52	98.46	95.01	99.69	0.003993	8.91	445.36	211.71	0.53
BrushyCreek	900	100 yr	5541.00	87.52	100.23	96.68	101.59	0.003691	9.66	1010.51	220.64	0.53
BrushyCreek	900	500 yr	7691.00	87.52	101.46	98.63	103.36	0.004618	11.63	1279.95	220.64	0.60
BrushyCreek	800	10 yr	3052.00	88.05	97.00	95.02	97.93	0.004384	7.74	405.62	88.50	0.57
BrushyCreek	800	25 yr	3967.00	88.05	98.16	95.86	99.24	0.004186	8.35	496.14	171.10	0.57
BrushyCreek	800	100 yr	5541.00	88.05	100.03	97.14	101.18	0.003351	8.79	959.95	221.84	0.53
BrushyCreek	800	500 yr	7691.00	88.05	101.26	98.62	102.84	0.003941	10.42	1232.87	221.84	0.59

HEC-RAS Plan: Existing River: BrushyCreek Reach: BrushyCreek (Continued)

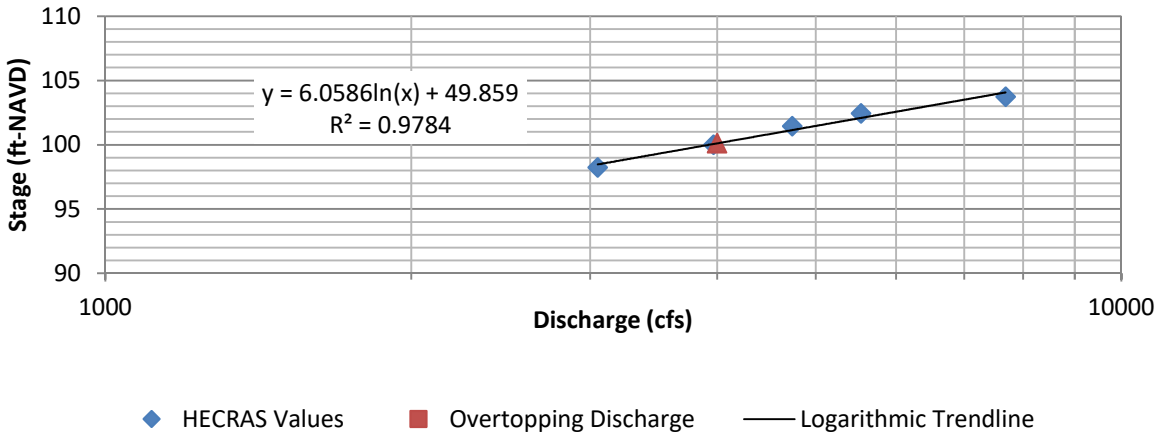
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BrushyCreek	700	10 yr	3052.00	88.75	95.79	94.73	97.30	0.008004	9.84	310.32	100.33	0.74
BrushyCreek	700	25 yr	3967.00	88.75	96.79	95.64	98.60	0.008008	10.80	367.28	131.35	0.76
BrushyCreek	700	100 yr	5541.00	88.75	98.22	97.04	100.57	0.008006	12.29	451.72	172.62	0.78
BrushyCreek	700	500 yr	7691.00	88.75	99.50	98.79	102.18	0.008013	13.58	917.38	174.26	0.80

Date:	**3/5/2020**	**Calc. by:**	**EKN**
Project No.:	**5199627**	**Checked by:**	**WLA**
Subject:	**Overtopping Elevation**		
Project Short Title:	**O.C. Phillips Bridge**	**Datum:**	**NAVD**

Existing Condition (HECRAS)

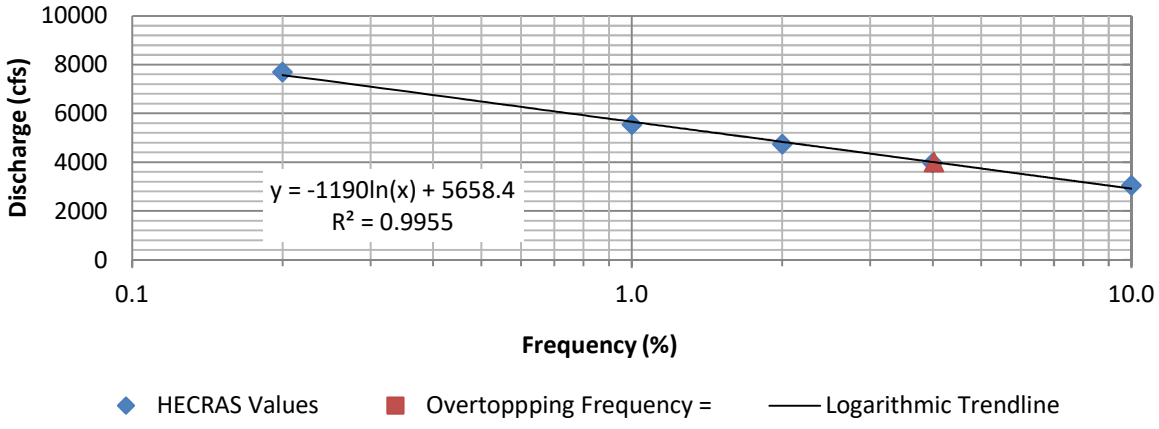
Frequency (YR)	Probablility (%)	Discharge (cfs)	Stage (ft-NAVD)
10	10.0	3052	98.24
25	4.0	3967	99.99
50	2.0	4741	101.43
100	1.0	5541	102.44
500	0.2	7691	103.72

Stage vs. Discharge

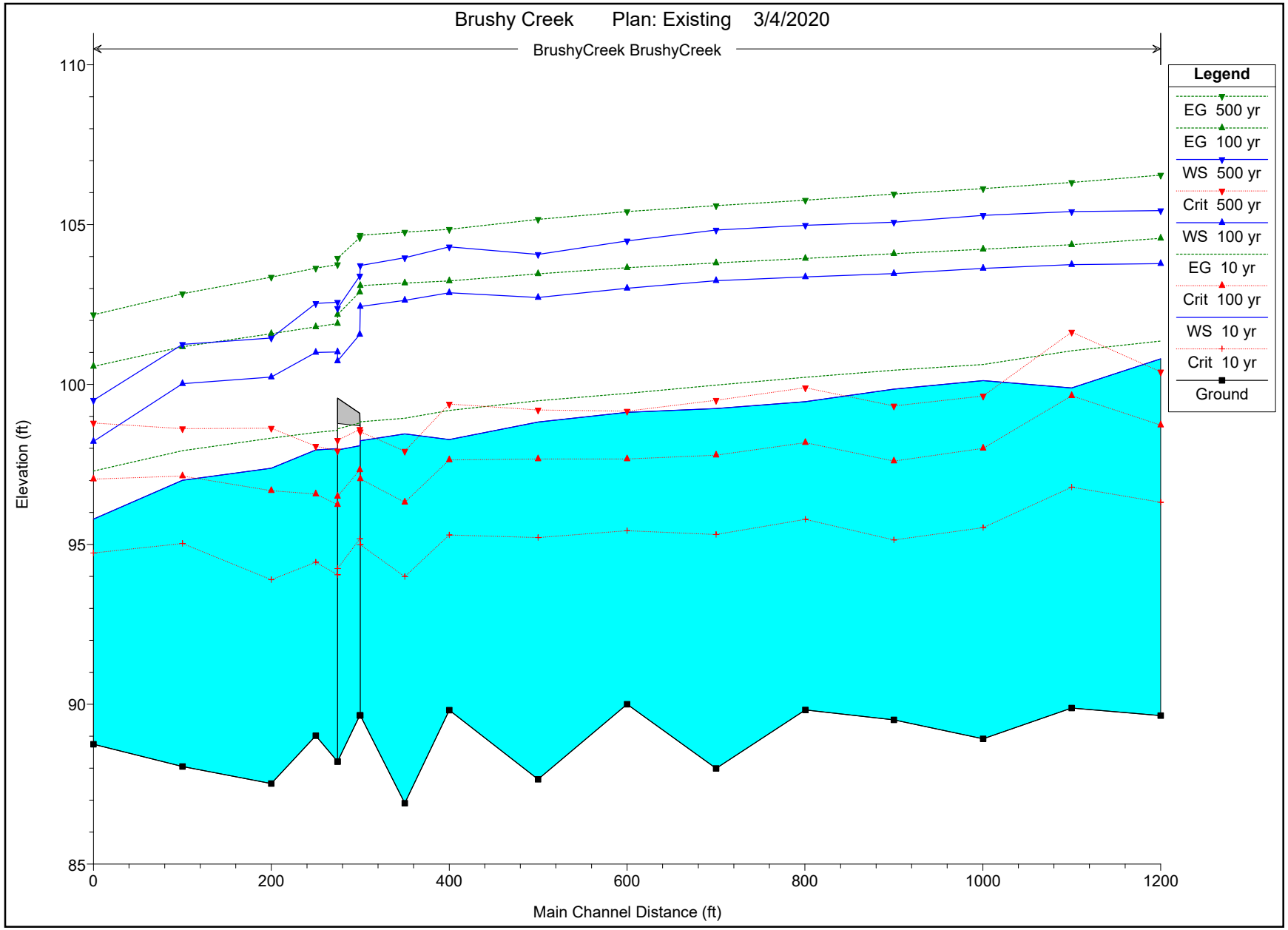


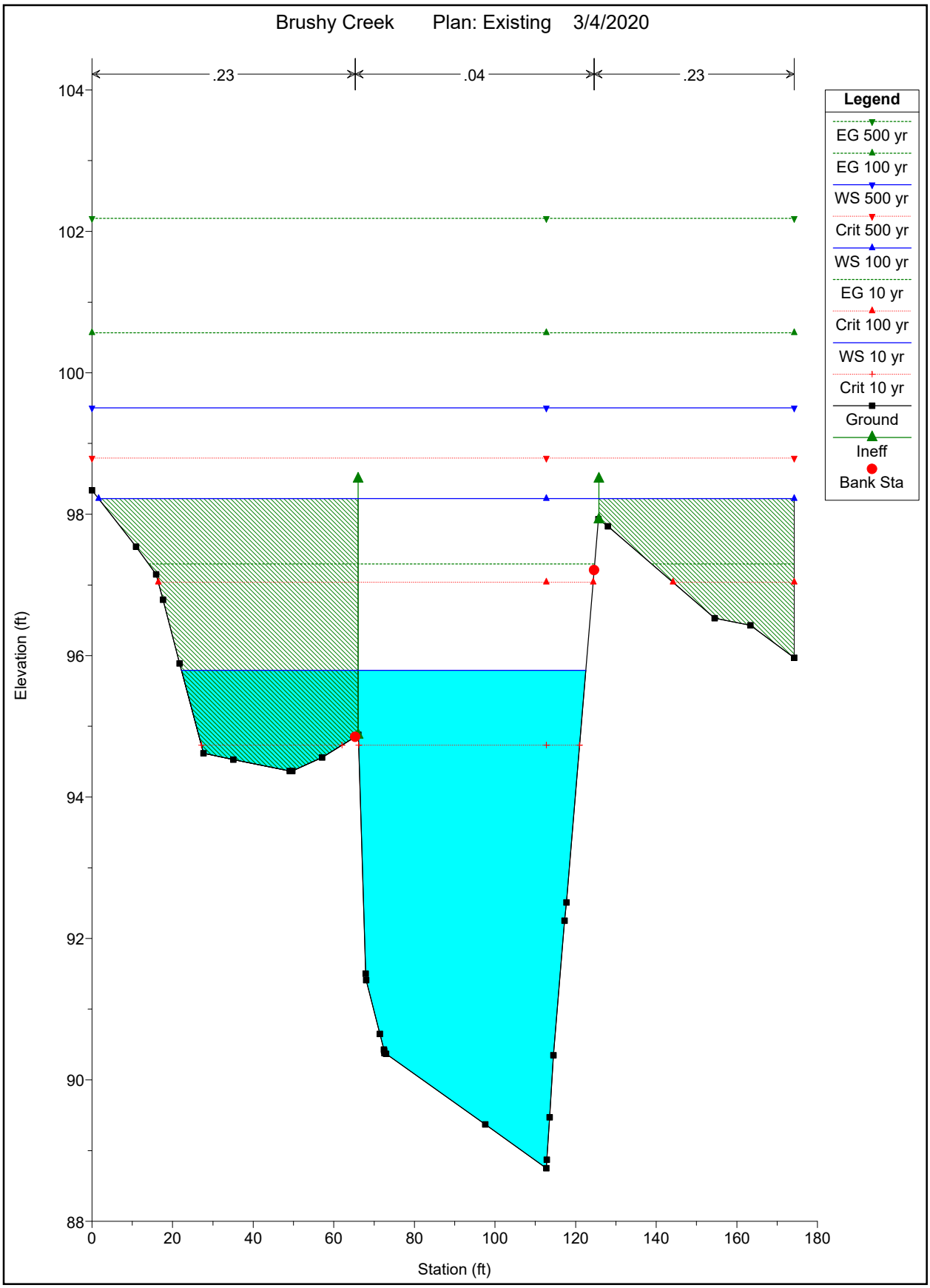
Overtoppping Elevation = 100.11 *ft-NAVD*
Overtopping Discharge = 4,000.44 cfs

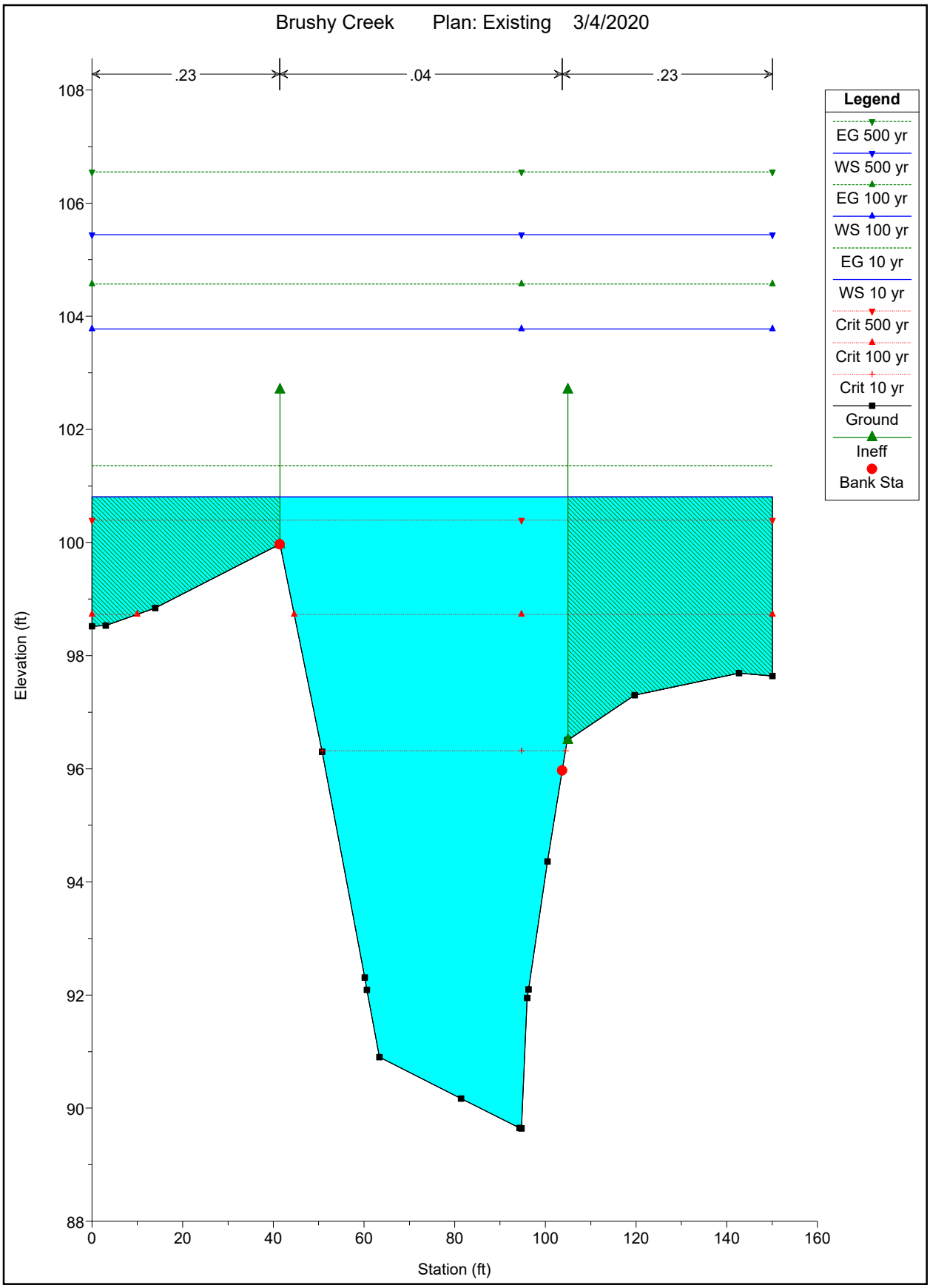
Discharge vs. Frequency



Overtoppping Frequency = 4.0 *%*
Equivelent Storm Event = 24.8


Brushy Creek Plan: Existing 3/4/2020
BrushyCreek BrushyCreek
Legend
EG 500 yr
EG 100 yr
WS 500 yr
Crit 500 yr
WS 100 yr
EG 10 yr
Crit 100 yr
WS 10 yr
Crit 10 yr
Ground
Elevation (ft)
110
105
100
95
90
85
0
200
400
600
800
1000
1200
Main Channel Distance (ft)


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
Legend
EG 500 yr
EG 100 yr
WS 500 yr
Crit 500 yr
WS 100 yr
EG 10 yr
Crit 100 yr
WS 10 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
104
102
100
98
96
94
92
90
88
0
20
40
60
80
100
120
140
160
180


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
108
106
104
102
100
98
96
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92
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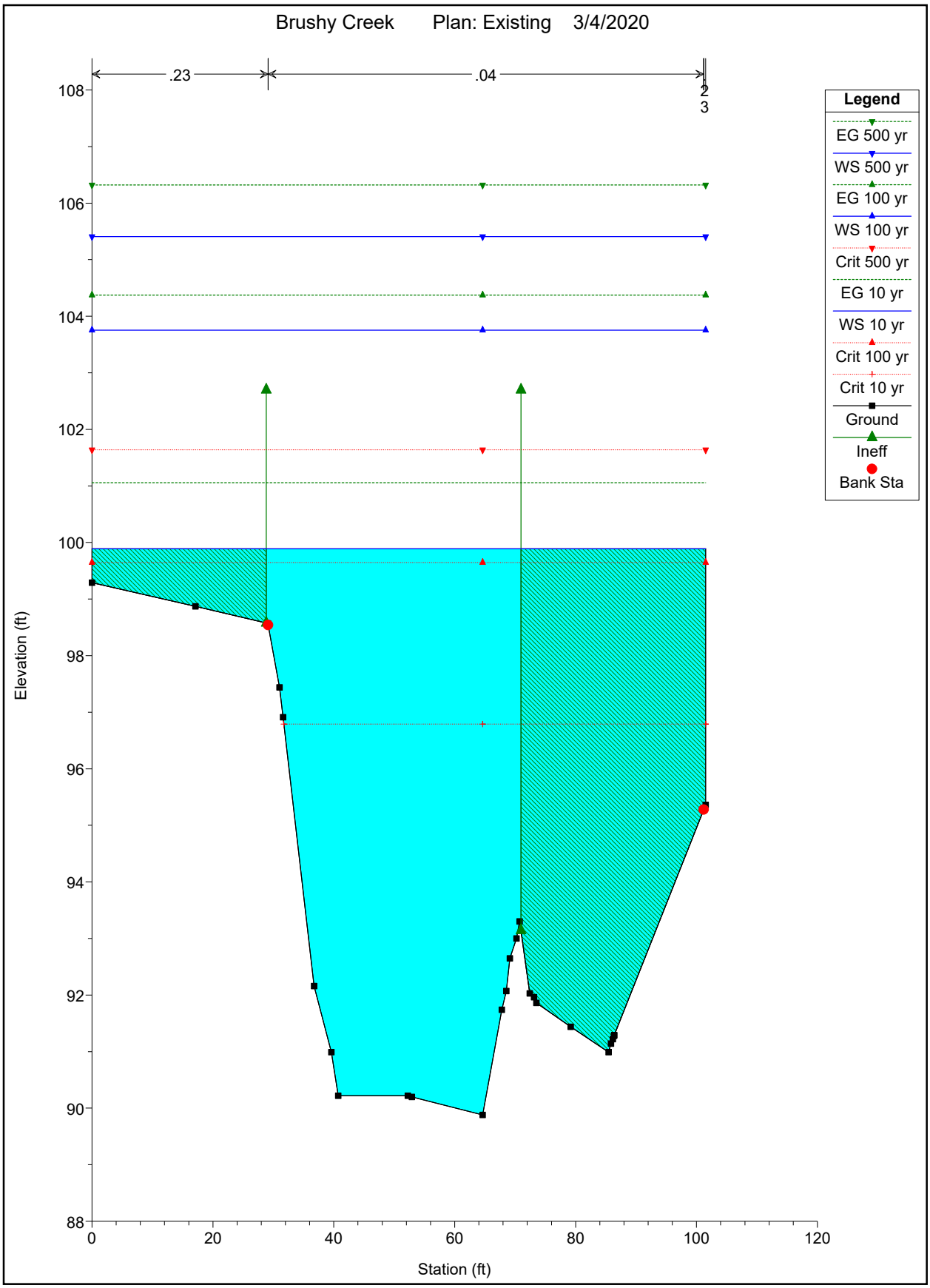
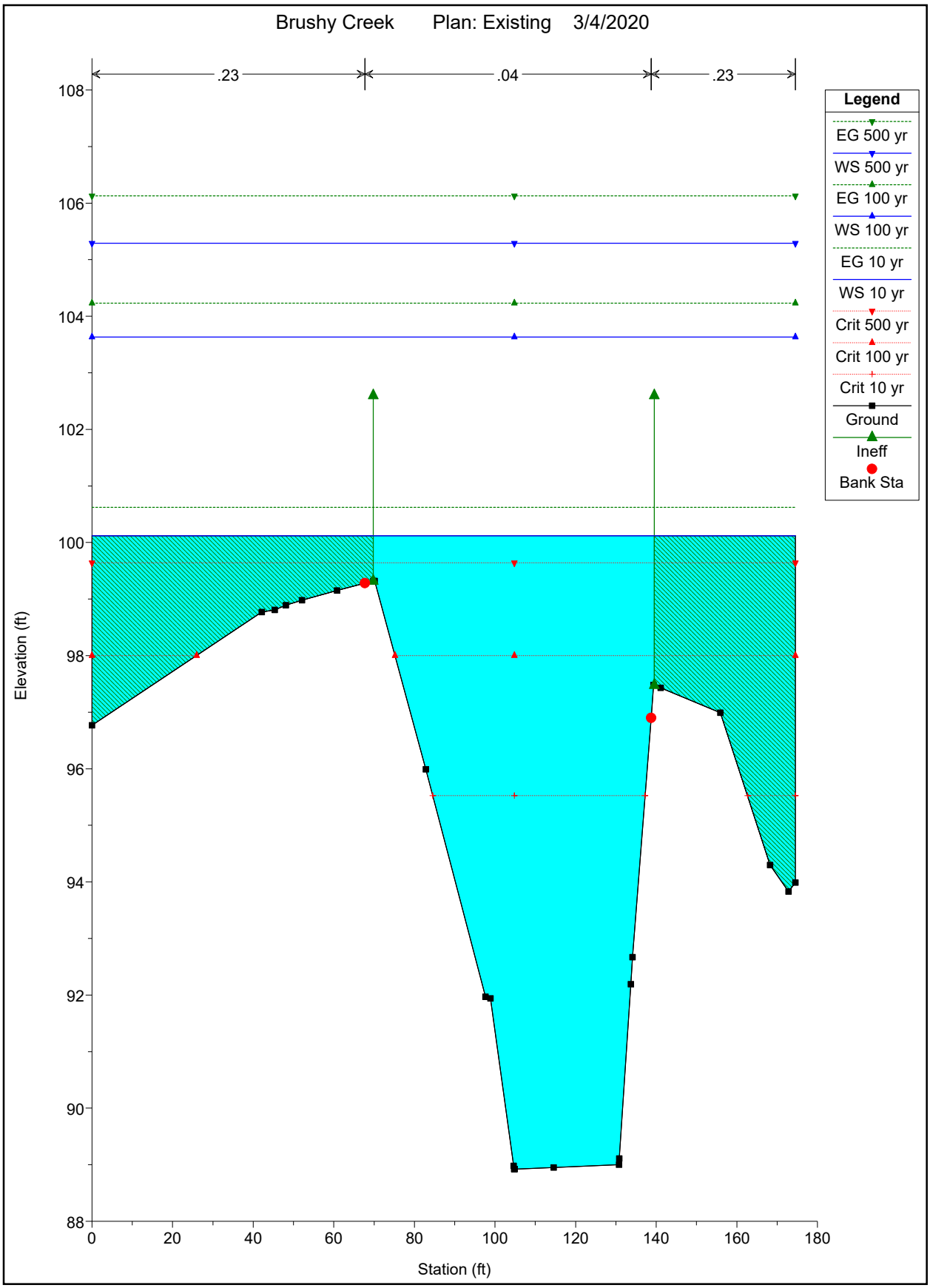
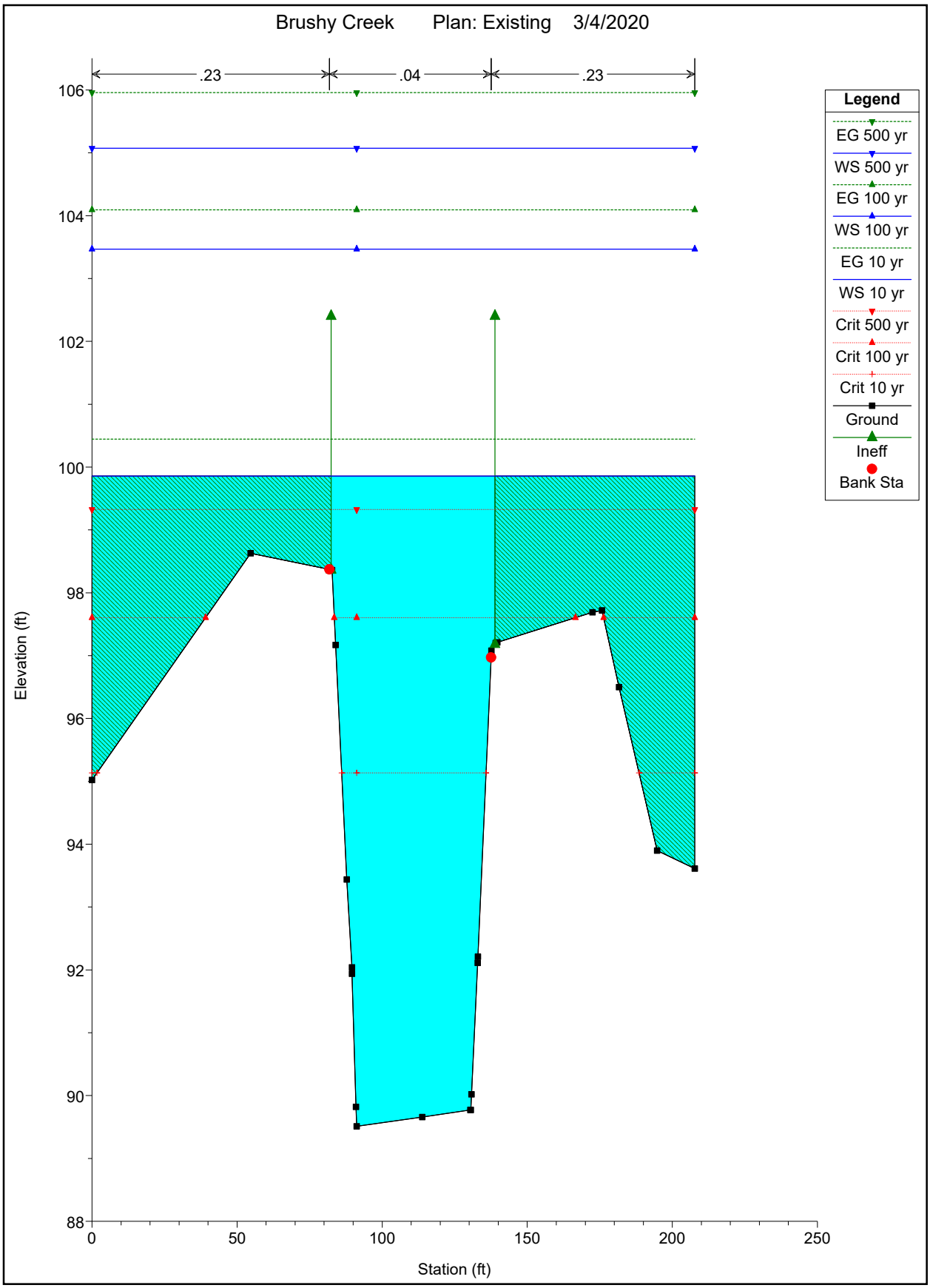
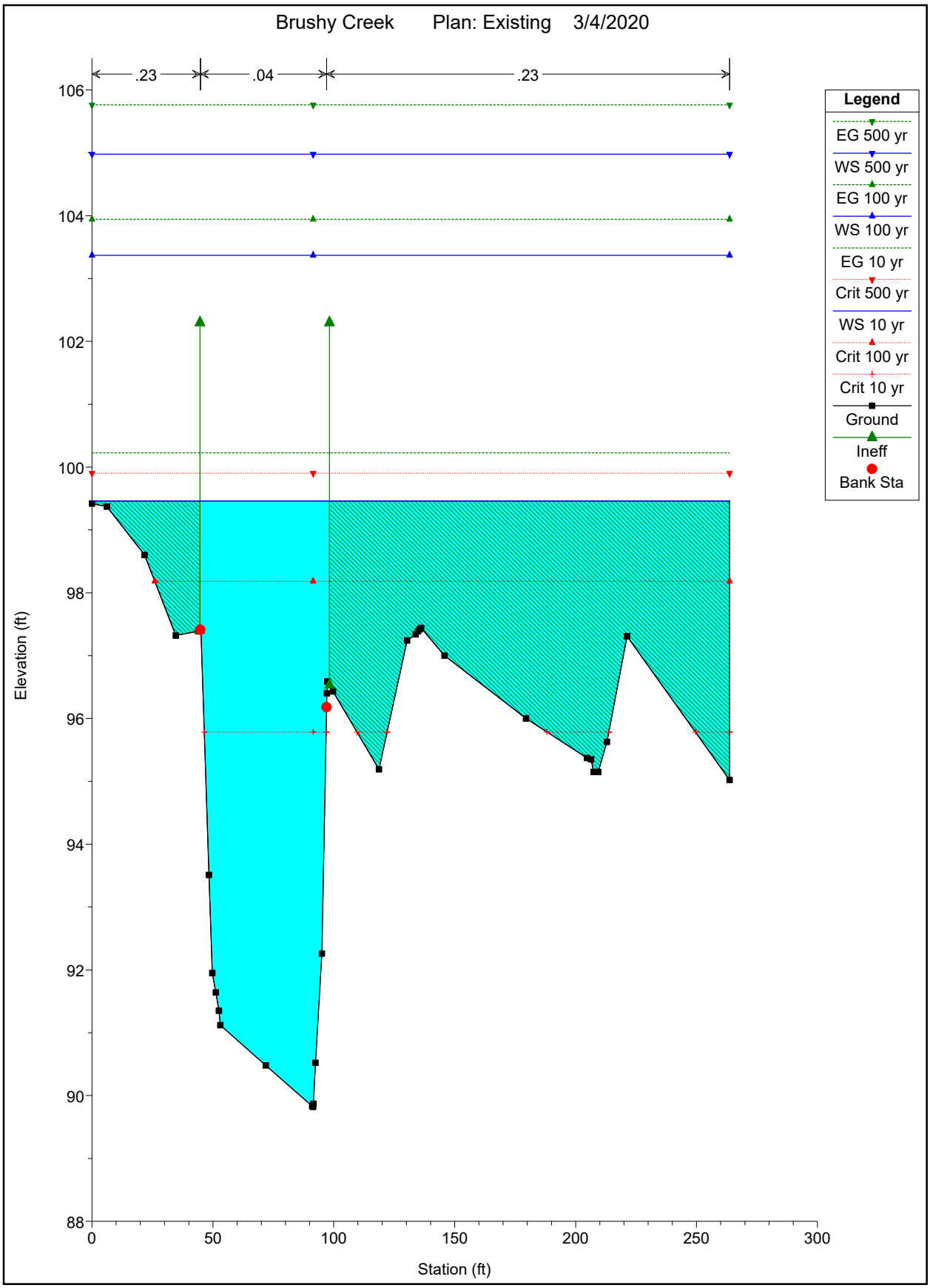
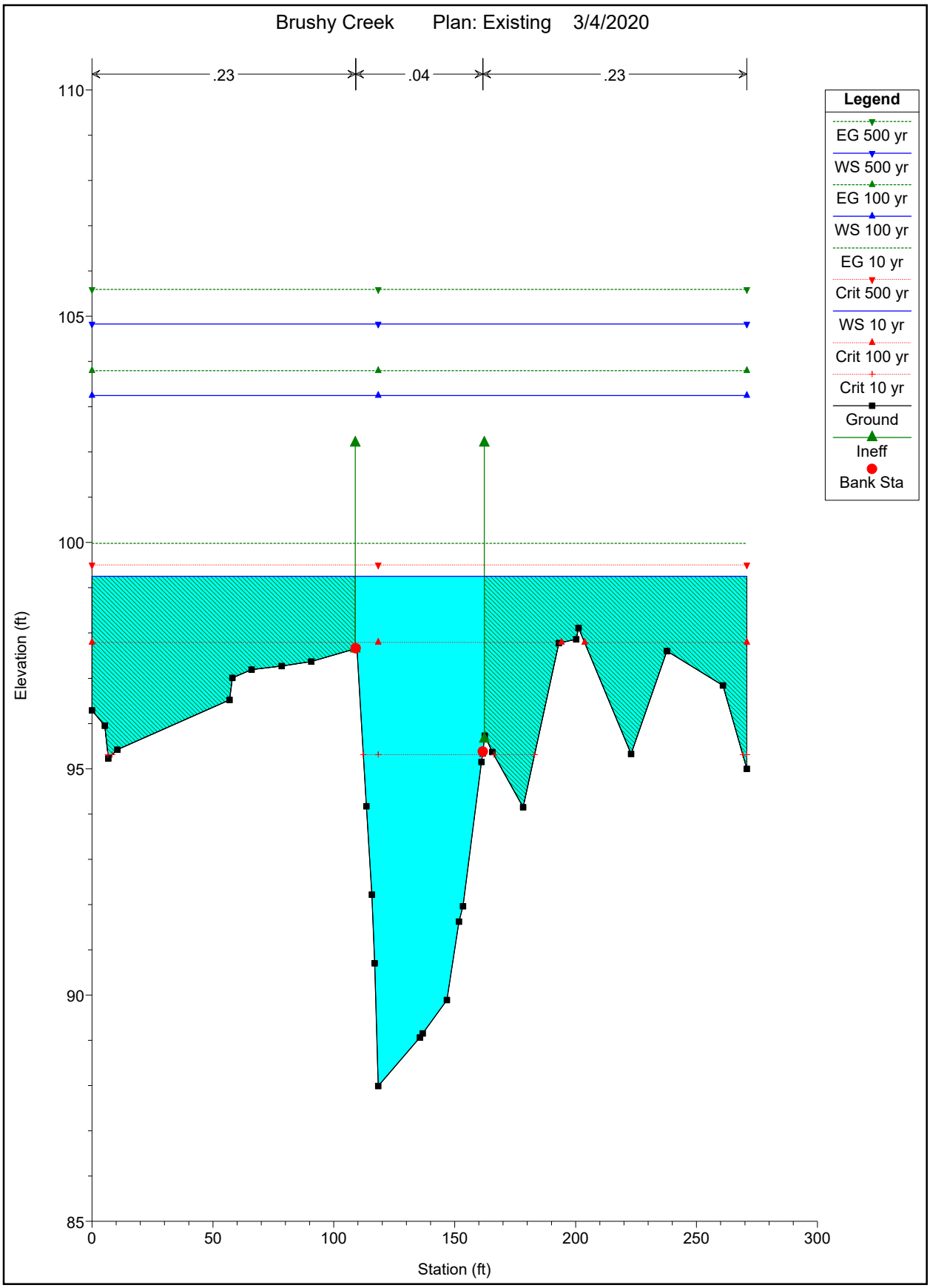
88
0
20
40
60
80
100
120
140
160

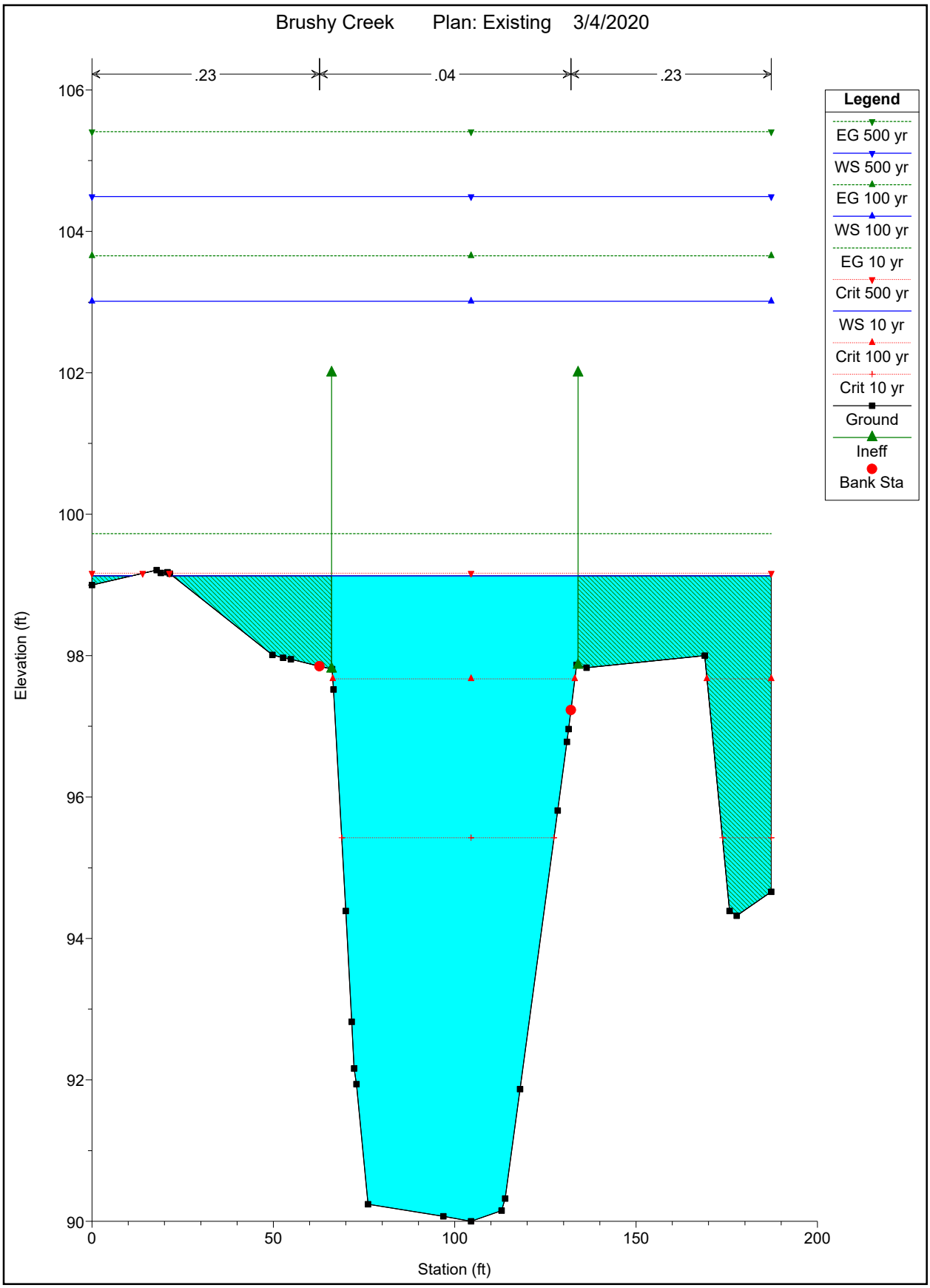

Brushy Creek Plan: Existing 3/4/2020
.23
.04
1
2
3
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
Crit 500 yr
EG 10 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
88
90
92
94
96
98
100
102
104
106
108
0
20
40
60
80
100
120


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
108
106
104
102
100
98
96
94
92
90
88
0
20
40
60
80
100
120
140
160
180


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
106
104
102
100
98
96
94
92
90
88
0
50
100
150
200
250


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
106
104
102
100
98
96
94
92
90
88
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
Crit 500 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta


Brushy Creek Plan: Existing 3/4/2020
.23
.04
.23
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
Crit 500 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
110
105
100
95
90
85
0
50
100
150
200
250
300
Station (ft)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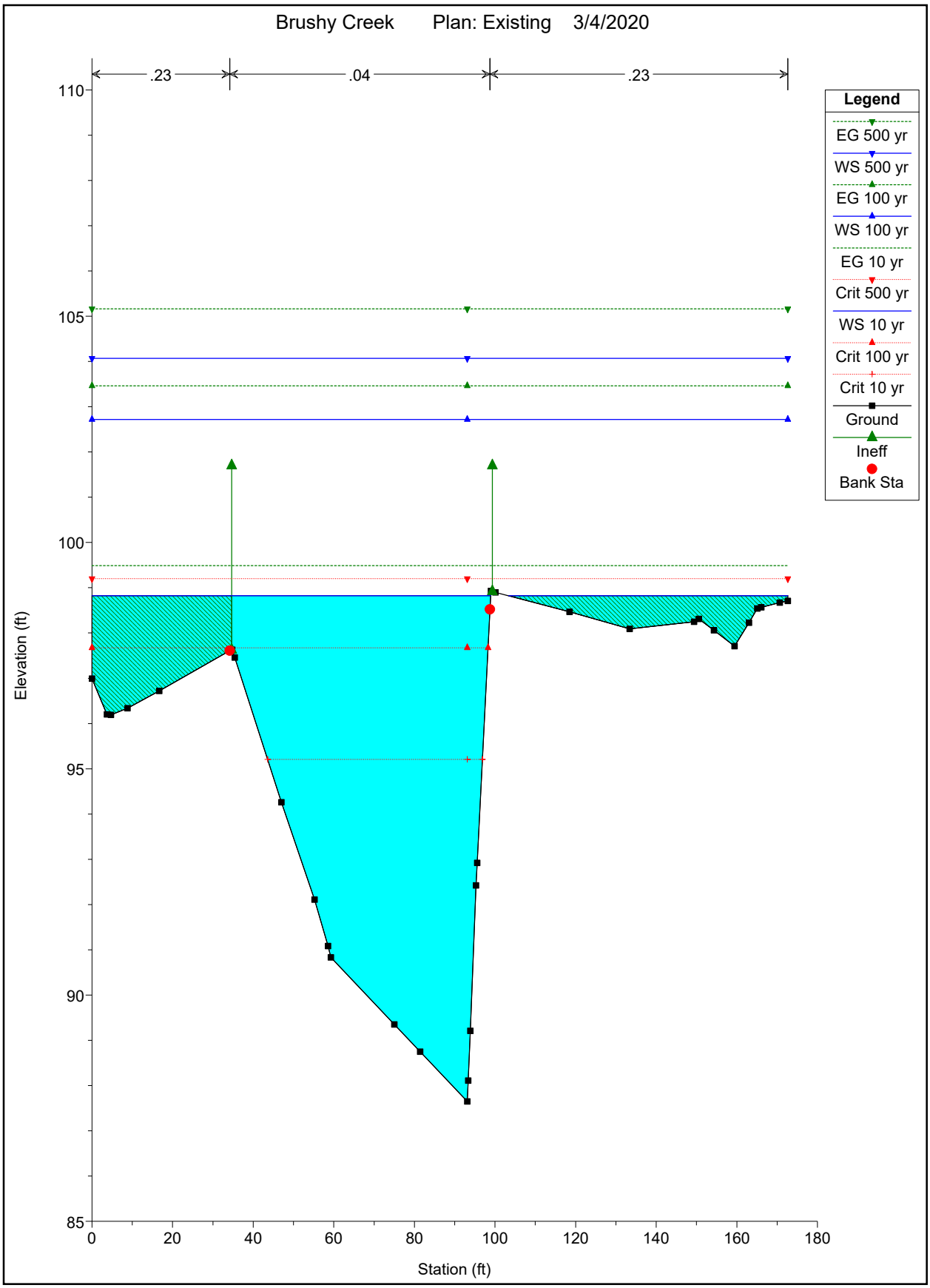
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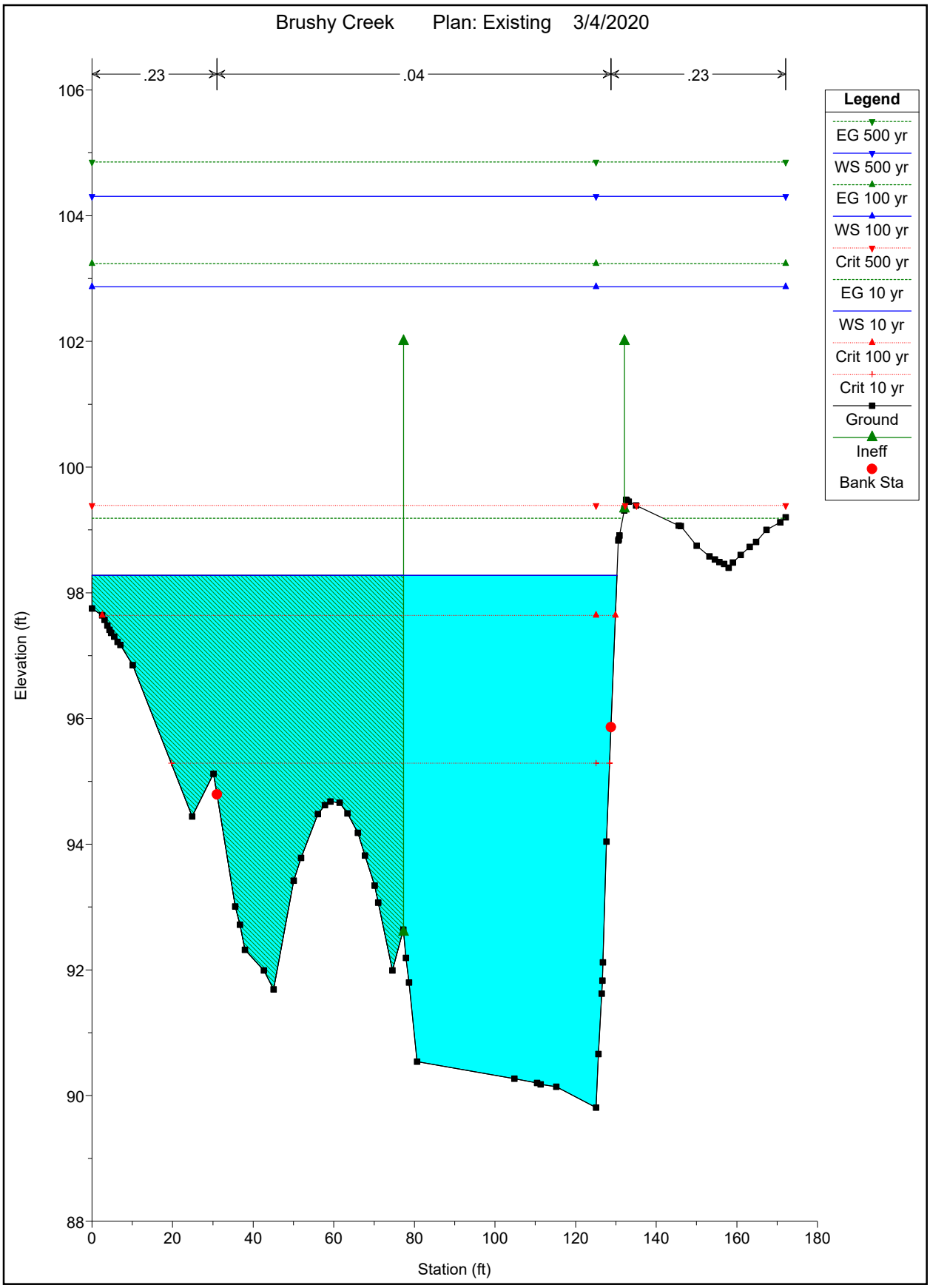
Station (ft)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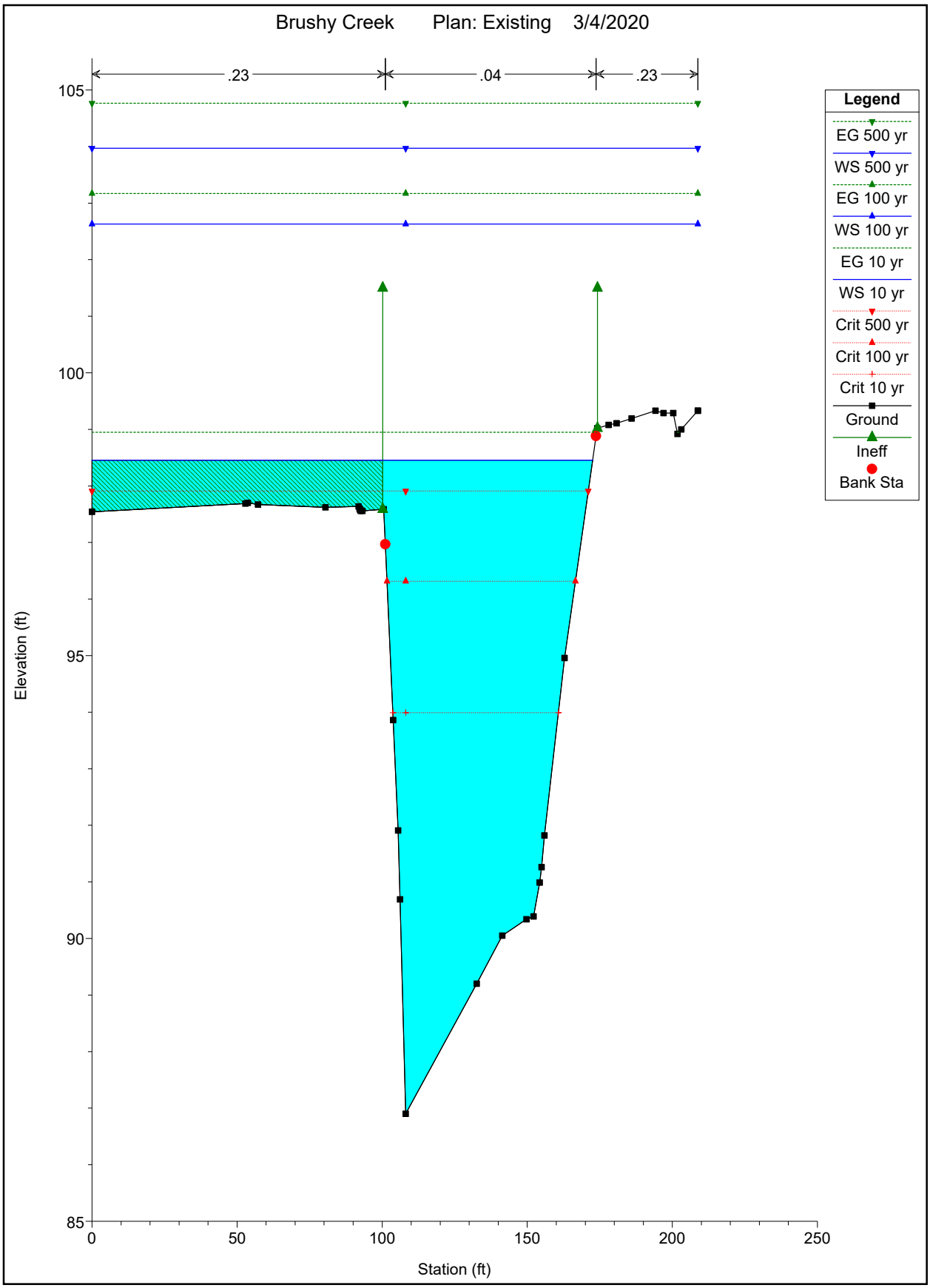
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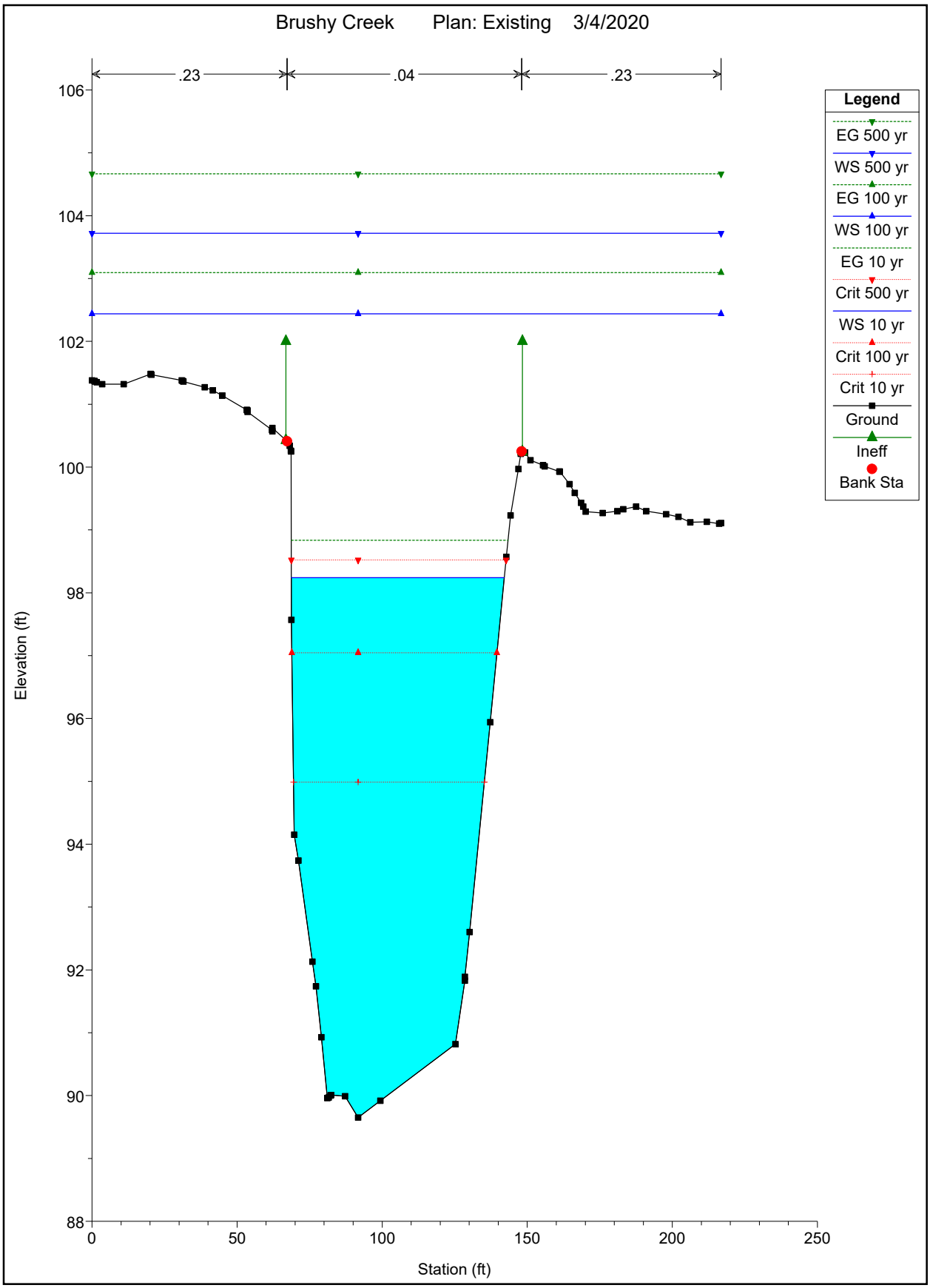
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta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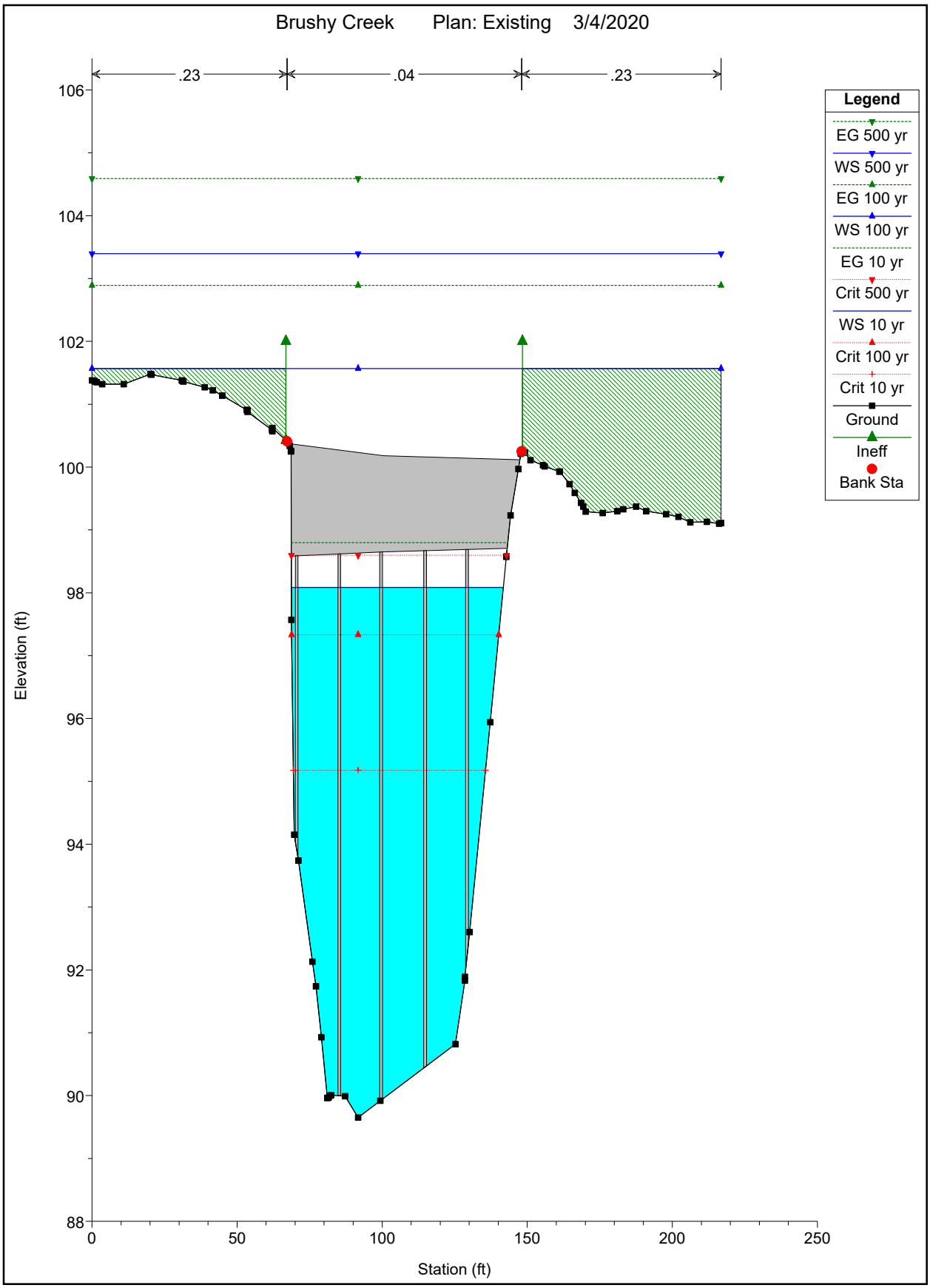
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Crit 10 yr
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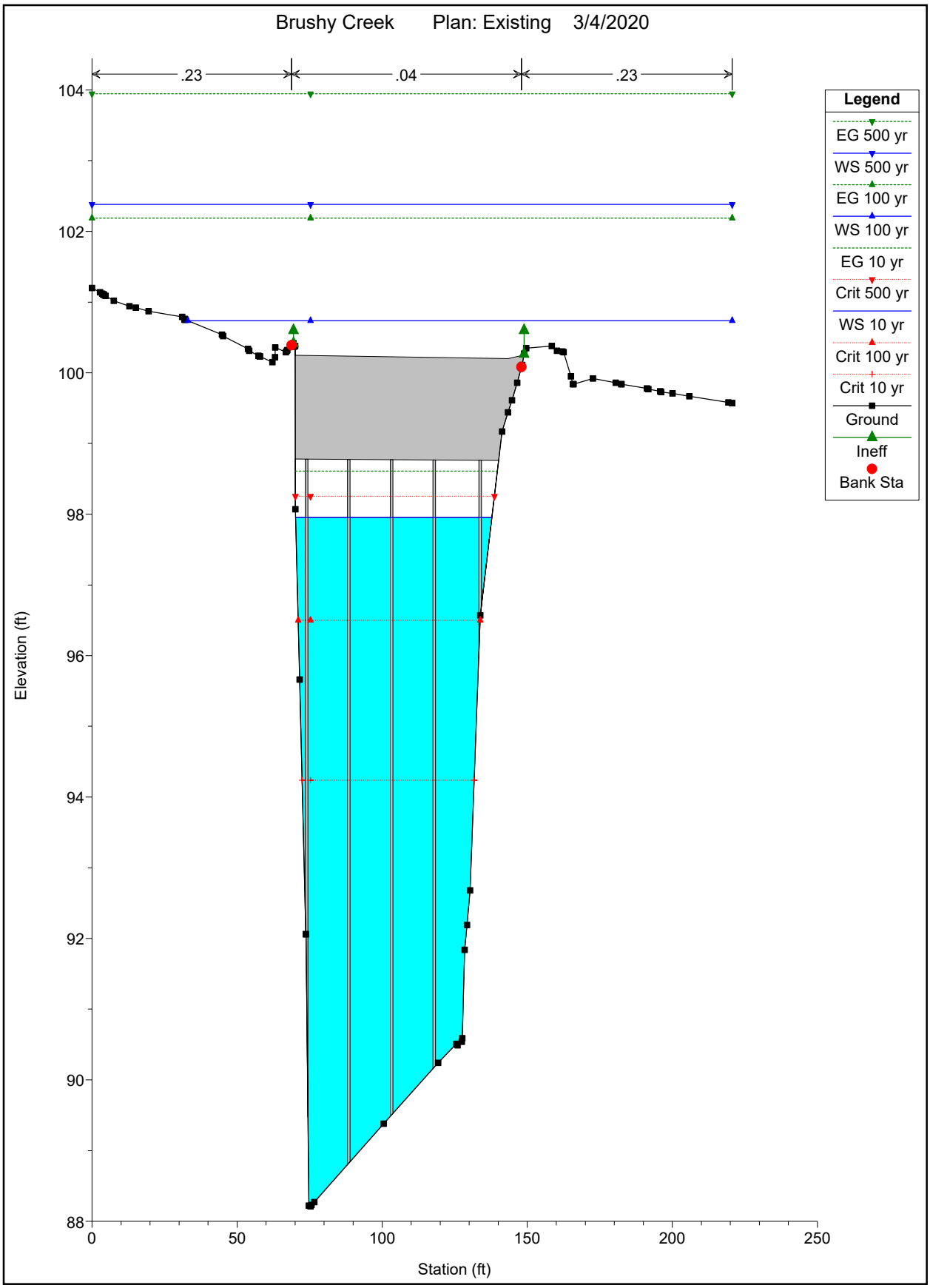
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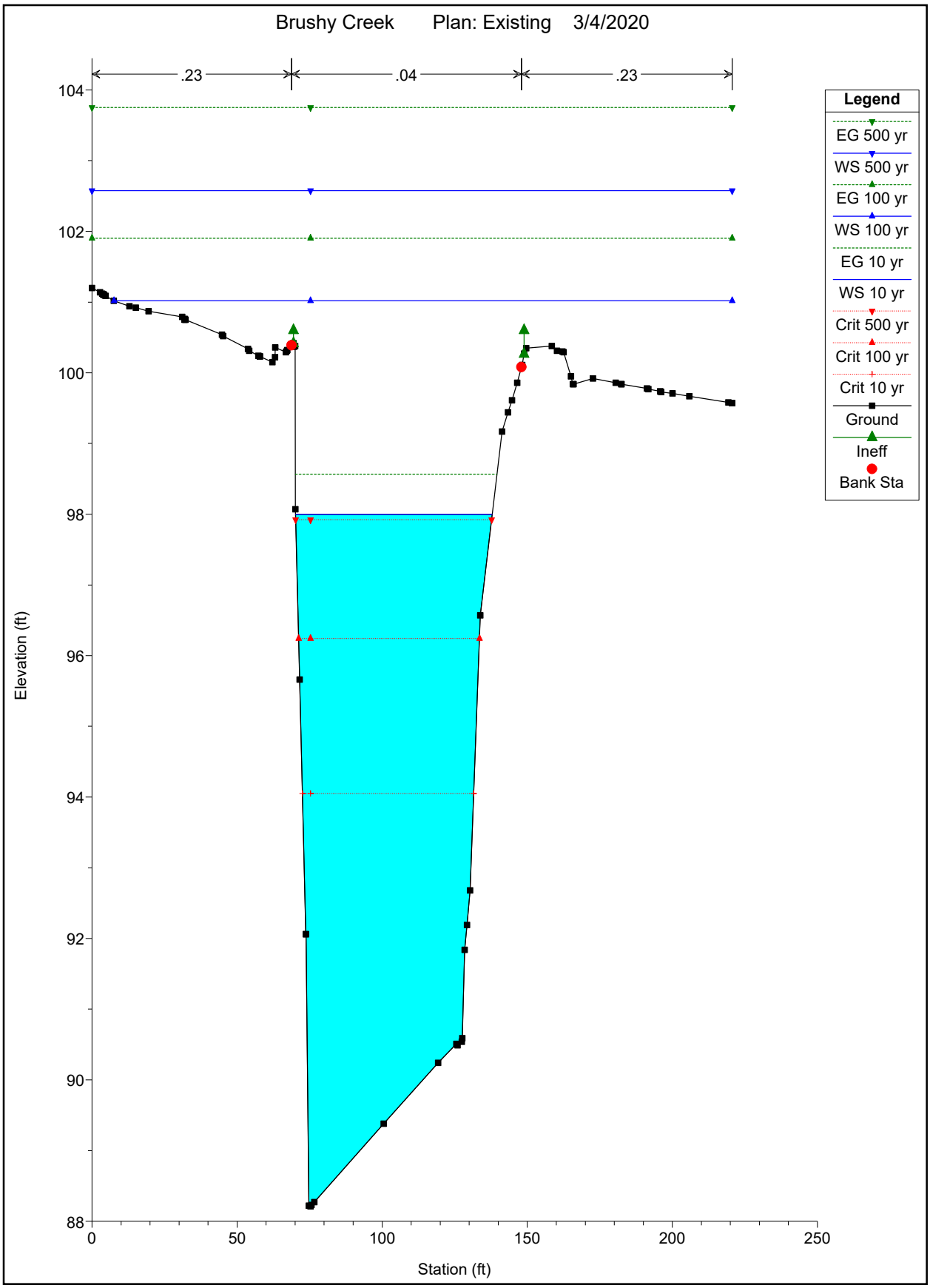
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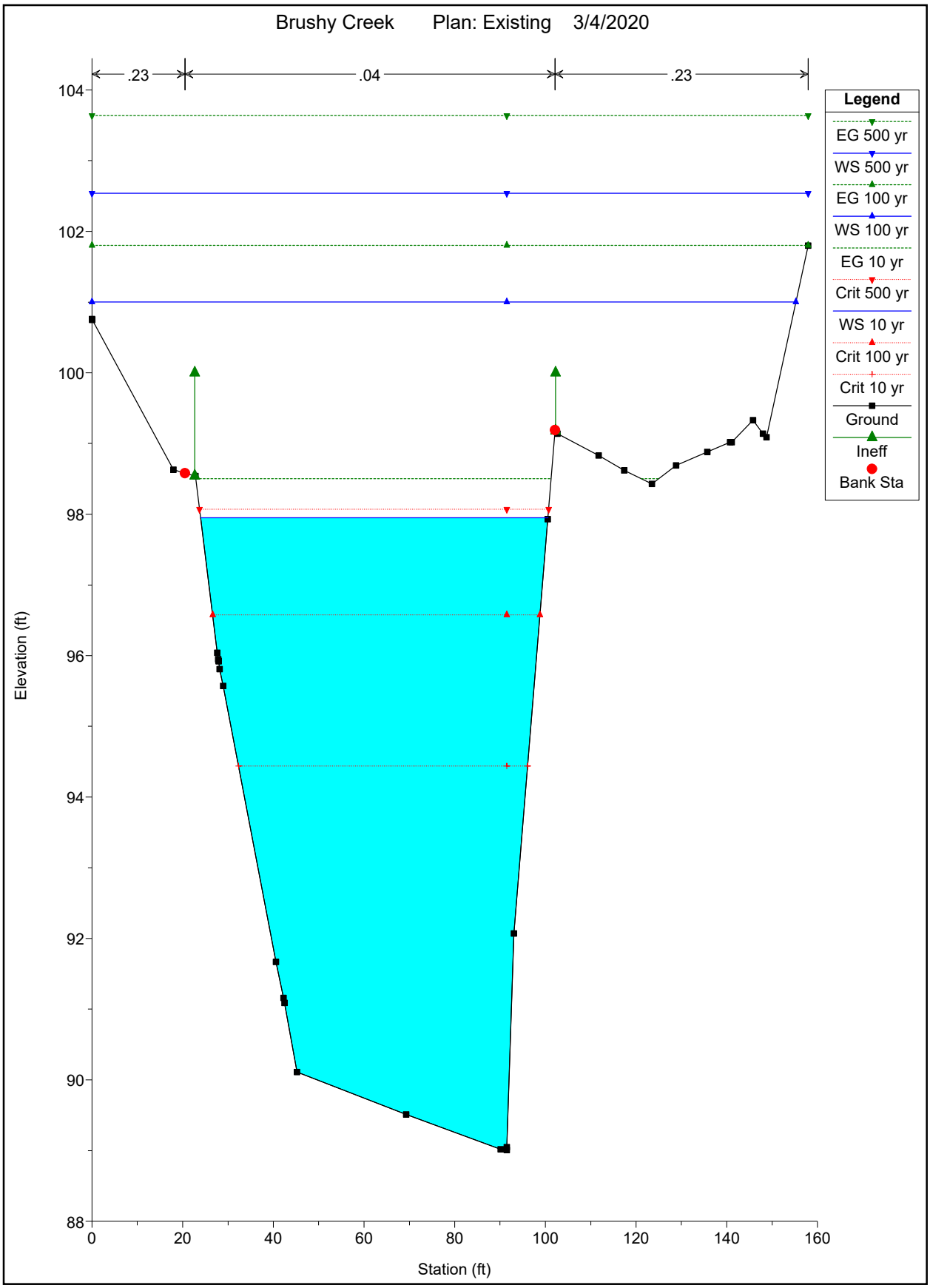
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Crit 10 yr
Ground
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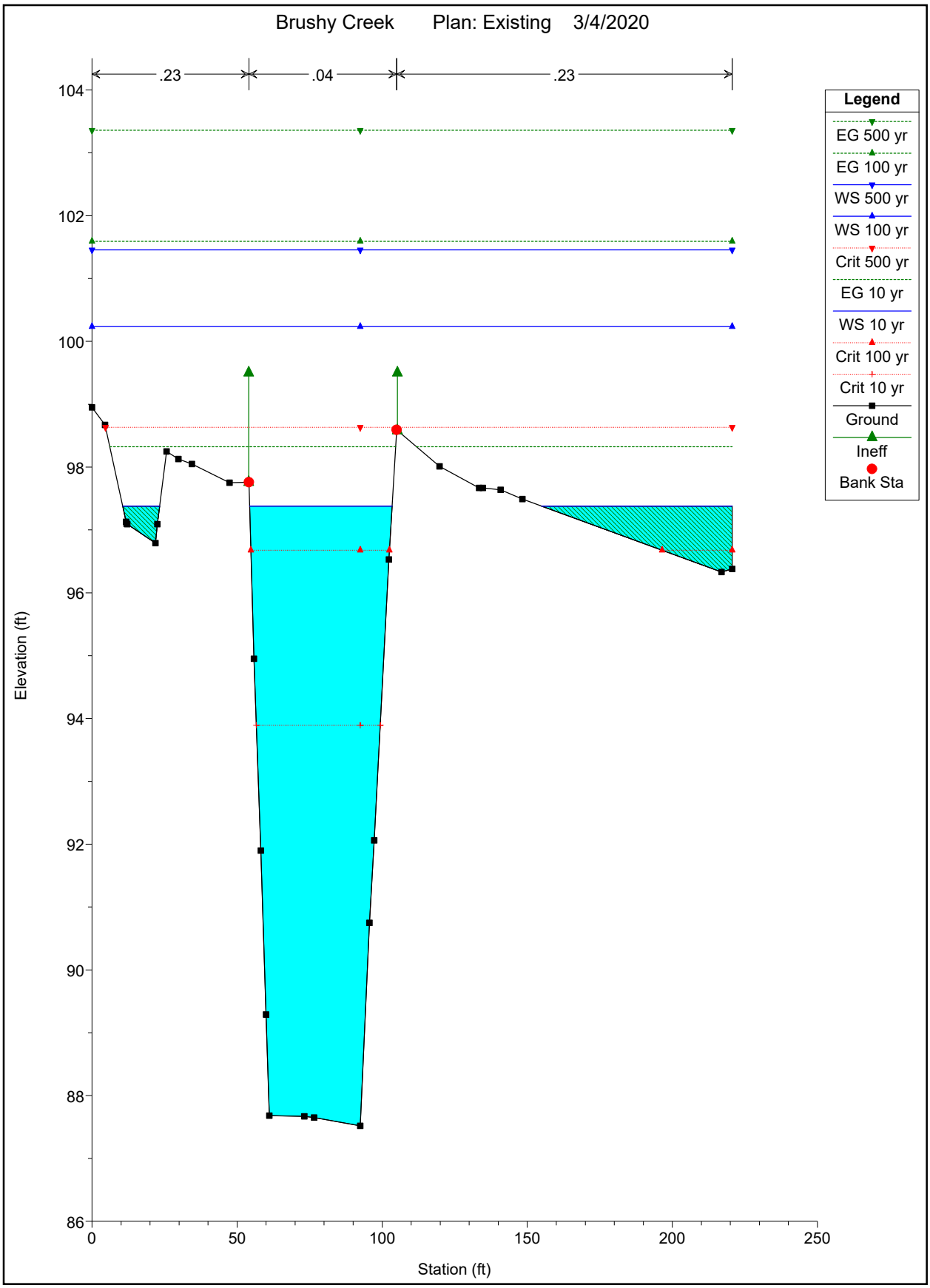
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Crit 10 yr
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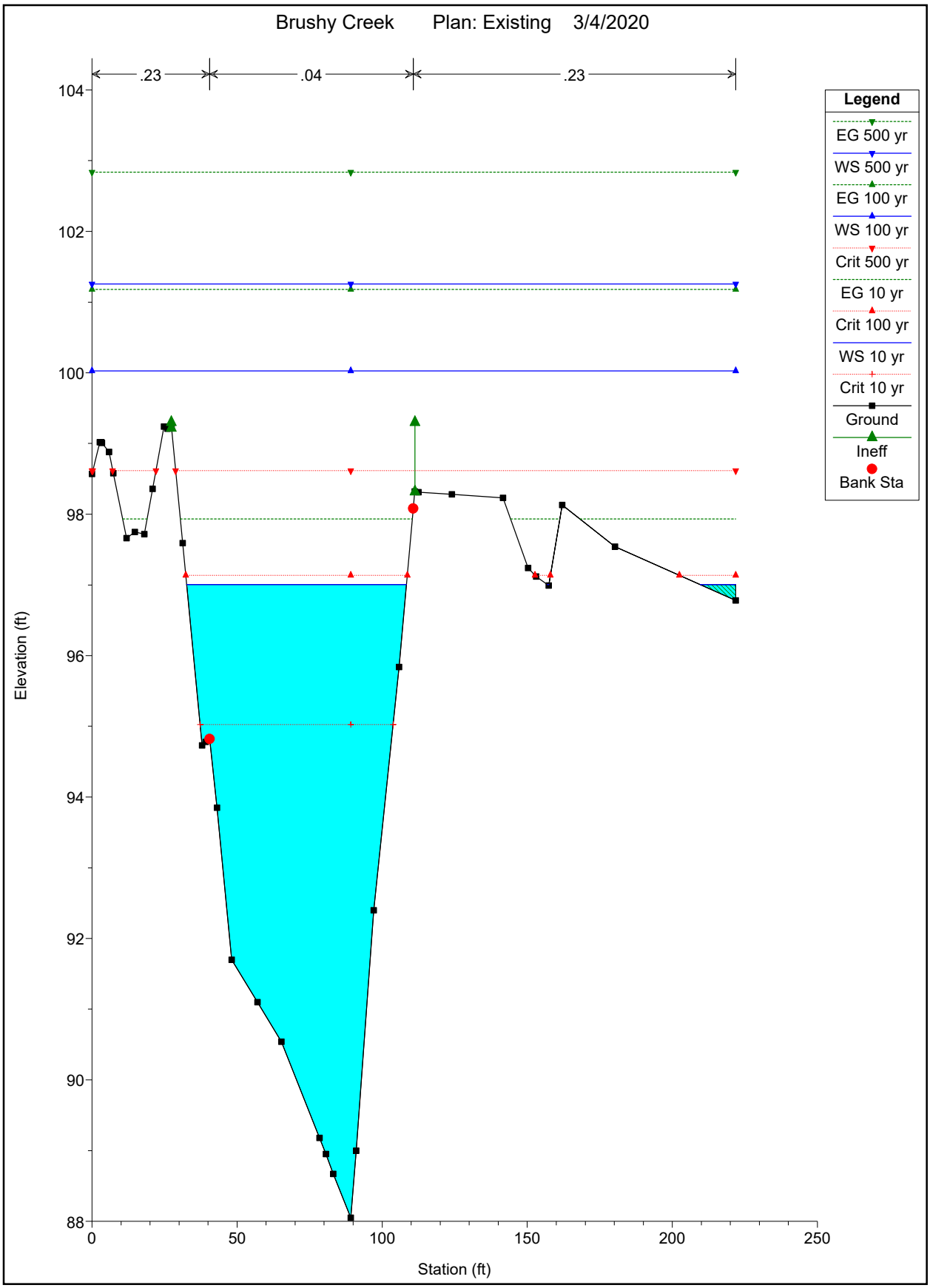
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WS 500 yr
EG 100 yr
WS 100 yr
Crit 500 yr
EG 10 yr
Crit 100 yr
WS 10 yr
Crit 10 yr
Ground
Ineff
Bank Sta

HEC-RAS HEC-RAS 5.0.7 March 2019
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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PROJECT DATA
Project Title: Brushy Creek
Project File : BrushyCreek.prj
Run Date and Time: 3/5/2020 9:01:41 PM

Project in English units

Project Description:
O.C Phillips Bridge

PLAN DATA

Plan Title: Proposed (24" Conc)
Plan File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.p18

Geometry Title: Proposed (24" Conc)
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g07

Flow Title : USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

Plan Summary Information:
Number of: Cross Sections = 16 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

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

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

FLOW DATA

Flow Title: USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

Flow Data (cfs)

River	Reach	RS	2 yr	10 yr	25 yr	50 yr	100 yr	500 yr
BrushyCreek	BrushyCreek	1900	1541	3052	3967	4741	5541	7691

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
BrushyCreek	BrushyCreek	2 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	10 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	25 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	50 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	100 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	500 yr		Normal S = 0.008

GEOMETRY DATA

Geometry Title: Proposed (24" Conc)
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g07

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1900

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.52	3.020004	98.53	13.95001	98.84	41.43001	99.97	41.46001	99.97
50.78001	96.36	0.15001	92.31	60.61001	92.09	63.39001	90.9	81.41	90.17
94.33	89.65	94.7	89.64	96.00001	91.95	96.28001	92.1	100.45	94.36
103.72	95.97	104.79	96.5	105.03	96.51	119.69	97.3	142.69	97.69
150.1	97.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	41.43001	.04	103.72	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
41.43001 103.72 105.8 100 118.29 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	41.48	102.9	F
104.94	150.1	102.9	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.35	Element			
Vel Head (ft)	0.55	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.80	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	96.31	Flow Area (sq ft)		510.70	5.53
E.G. Slope (ft/ft)	0.001701	Area (sq ft)	68.28	510.74	162.21
Q Total (cfs)	3052.00	Flow (cfs)		3048.22	3.78
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)		5.97	0.68
Max Chl Dpth (ft)	11.16	Hydr. Depth (ft)		8.21	4.53
Conv. Total (cfs)	74008.2	Conv. (cfs)		73916.6	91.7
Length Wtd. (ft)	100.01	Wetted Per. (ft)		66.40	1.34
Min Ch El (ft)	89.64	Shear (lb/sq ft)		0.82	0.44
Alpha	1.02	Stream Power (lb/ft s)		4.87	0.30
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.37	13.37	3.59
C & E Loss (ft)	0.06	Cum SA (acres)	2.21	1.82	1.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	102.17	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	97.28	Flow Area (sq ft)		595.74	7.19
E.G. Slope (ft/ft)	0.001719	Area (sq ft)	124.89	595.85	225.59
Q Total (cfs)	3967.00	Flow (cfs)		3961.10	5.90
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		6.65	0.82
Max Chl Dpth (ft)	12.53	Hydr. Depth (ft)		9.57	5.90
Conv. Total (cfs)	95693.3	Conv. (cfs)		95551.0	142.2
Length Wtd. (ft)	100.01	Wetted Per. (ft)		66.40	1.34
Min Ch El (ft)	89.64	Shear (lb/sq ft)		0.96	0.57
Alpha	1.02	Stream Power (lb/ft s)		6.40	0.47
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	6.27	15.61	5.60
C & E Loss (ft)	0.09	Cum SA (acres)	2.84	1.85	2.03

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.03	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	98.73	Flow Area (sq ft)	160.73	649.74	265.71
E.G. Slope (ft/ft)	0.002211	Area (sq ft)	160.73	649.74	265.71
Q Total (cfs)	5541.00	Flow (cfs)	112.47	5188.83	239.69
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.15	Avg. Vel. (ft/s)	0.70	7.99	0.90
Max Chl Dpth (ft)	13.39	Hydr. Depth (ft)	3.88	10.43	5.73
Conv. Total (cfs)	117849.7	Conv. (cfs)	2392.2	110359.6	5097.9
Length Wtd. (ft)	100.49	Wetted Per. (ft)	45.97	66.46	51.92
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.48	1.35	0.71
Alpha	2.25	Stream Power (lb/ft s)	0.34	10.78	0.64
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	11.21	18.59	9.13
C & E Loss (ft)	0.06	Cum SA (acres)	3.53	1.85	2.16

Warning: Multiple water surfaces were found that could balance the energy equation. The program selected the water
surface whose main channel velocity head was the closest to the previously computed cross section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.230	0.040	0.230

W.S. Elev (ft)	105.09	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	100.39	Flow Area (sq ft)	245.90	777.79	361.05
E.G. Slope (ft/ft)	0.002256	Area (sq ft)	245.90	777.79	361.05
Q Total (cfs)	7691.00	Flow (cfs)	224.14	7073.57	393.29
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.55	Avg. Vel. (ft/s)	0.91	9.09	1.09
Max Chl Dpth (ft)	15.45	Hydr. Depth (ft)	5.94	12.49	7.78
Conv. Total (cfs)	161941.2	Conv. (cfs)	4719.4	148940.6	8281.1
Length Wtd. (ft)	100.60	Wetted Per. (ft)	48.02	66.46	53.98
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.72	1.65	0.94
Alpha	2.47	Stream Power (lb/ft s)	0.66	14.99	1.03
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	18.15	22.24	13.41
C & E Loss (ft)	0.07	Cum SA (acres)	3.58	1.85	2.17

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1800

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.29	17.11	98.87	29.08	98.57	29.13	98.54	31.01	97.44
31.59	96.91	36.72	92.16	39.6	90.99	40.75	90.22	52.24	90.22
52.92	90.2	64.62	89.88	67.8	91.74	68.54	92.07	69.11	92.65
70.21001	9370.74001		93.3	72.43	92.03	73.12	91.96	73.5	91.86
79.21001	91.4485.46001		90.99	85.84	91.14	86.16	91.22	86.36	91.28
86.4	91.29	101.21	95.28	101.51	95.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	29.13	.04	101.21	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.13	101.21	439.95	99.76	53.66	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	28.83	102.5	F
70.95	101.51	102.5	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	101.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	99.88	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	96.79	Flow Area (sq ft)	0.39	351.59	
E.G. Slope (ft/ft)	0.003590	Area (sq ft)	27.65	577.89	1.37
Q Total (cfs)	3052.00	Flow (cfs)	0.18	3051.82	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	8.67	Avg. Vel. (ft/s)	0.46	8.68	
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)	1.31	8.41	
Conv. Total (cfs)	50936.3	Conv. (cfs)	3.0	50933.3	
Length Wtd. (ft)	99.76	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.29	1.73	
Alpha	1.00	Stream Power (lb/ft s)	0.13	14.98	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.26	12.13	3.37
C & E Loss (ft)	0.20	Cum SA (acres)	2.12	1.67	1.33

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	100.96	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	97.95	Flow Area (sq ft)	0.72	396.65	
E.G. Slope (ft/ft)	0.004057	Area (sq ft)	59.03	655.54	1.69
Q Total (cfs)	3967.00	Flow (cfs)	0.52	3966.48	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	9.98	Avg. Vel. (ft/s)	0.72	10.00	
Max Chl Dpth (ft)	11.08	Hydr. Depth (ft)	2.39	9.48	
Conv. Total (cfs)	62277.8	Conv. (cfs)	8.1	62269.7	
Length Wtd. (ft)	99.77	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.59	2.20	
Alpha	1.00	Stream Power (lb/ft s)	0.42	22.01	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	6.04	14.17	5.29
C & E Loss (ft)	0.28	Cum SA (acres)	2.76	1.69	1.97

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.00	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	99.63	Flow Area (sq ft)	118.59	802.91	2.30
E.G. Slope (ft/ft)	0.001475	Area (sq ft)	118.59	802.91	2.30
Q Total (cfs)	5541.00	Flow (cfs)	69.23	5471.52	0.25
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)	0.58	6.81	0.11
Max Chl Dpth (ft)	13.12	Hydr. Depth (ft)	4.07	11.14	7.68
Conv. Total (cfs)	144277.9	Conv. (cfs)	1802.6	142468.8	6.5
Length Wtd. (ft)	107.78	Wetted Per. (ft)	32.86	76.91	7.95
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.33	0.96	0.03
Alpha	1.27	Stream Power (lb/ft s)	0.19	6.55	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	10.88	16.92	8.76
C & E Loss (ft)	0.00	Cum SA (acres)	3.44	1.70	2.10

Warning: Multiple water surfaces were found that could balance the energy equation. The program selected the water
surface whose main channel velocity head was the closest to the previously computed cross section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.05	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	101.65	Flow Area (sq ft)	178.24	950.51	2.92
E.G. Slope (ft/ft)	0.001602	Area (sq ft)	178.24	950.51	2.92
Q Total (cfs)	7691.00	Flow (cfs)	136.66	7554.01	0.33
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30

Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)	0.77	7.95	0.11
Max Chl Dpth (ft)	15.17	Hydr. Depth (ft)	6.12	13.19	9.73
Conv. Total (cfs)	192163.3	Conv. (cfs)	3414.4	188740.6	8.3
Length Wtd. (ft)	110.76	Wetted Per. (ft)	34.91	76.91	10.00
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.51	1.24	0.03
Alpha	1.34	Stream Power (lb/ft s)	0.39	9.82	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	17.64	20.26	12.91
C & E Loss (ft)	0.02	Cum SA (acres)	3.50	1.70	2.11

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1700

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.77	42.14	98.77	45.34001	98.81	48.09	98.89	52.11	98.98
60.78001	99.15	67.71001	99.28	69.79	99.32	70.16	99.32	82.83	95.99
97.66	91.97	98.88	91.94	104.61	88.98	104.73	88.92	104.86	88.92
114.54	88.95	130.75	89	130.82	89.11	133.68	92.19	134.1	92.67
138.74	96.9	139.37	97.48	141.1	97.43	155.94	96.99	168.27	94.3
172.84	93.83	174.52	93.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	67.71001	.04	138.74	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67.71001	138.74	102.93	100.24	97.47	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	69.77	102	F
139.53	174.52	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.11	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	95.51	Flow Area (sq ft)		534.71	2.26
E.G. Slope (ft/ft)	0.001687	Area (sq ft)	126.20	536.38	142.52
Q Total (cfs)	3052.00	Flow (cfs)		3050.98	1.02
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	5.68	Avg. Vel. (ft/s)		5.71	0.45
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)		7.75	2.86
Conv. Total (cfs)	74313.8	Conv. (cfs)		74289.0	24.9
Length Wtd. (ft)	100.24	Wetted Per. (ft)		73.93	1.02
Min Ch El (ft)	88.92	Shear (lb/sq ft)		0.76	0.23
Alpha	1.01	Stream Power (lb/ft s)		4.35	0.11
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	2.48	10.85	3.28
C & E Loss (ft)	0.01	Cum SA (acres)	1.63	1.50	1.31

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	101.35	Reach Len. (ft)	102.93	100.24	97.47

Crit W.S. (ft)	96.54	Flow Area (sq ft)		620.13	3.24
E.G. Slope (ft/ft)	0.001738	Area (sq ft)	210.06	624.35	186.84
Q Total (cfs)	3967.00	Flow (cfs)		3965.11	1.89
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	6.36	Avg. Vel. (ft/s)		6.39	0.58
Max Chl Dpth (ft)	12.43	Hydr. Depth (ft)		8.99	4.10
Conv. Total (cfs)	95148.8	Conv. (cfs)		95103.5	45.3
Length Wtd. (ft)	100.24	Wetted Per. (ft)		73.93	1.02
Min Ch El (ft)	88.92	Shear (lb/sq ft)		0.91	0.35
Alpha	1.01	Stream Power (lb/ft s)		5.82	0.20
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	4.68	12.70	5.18
C & E Loss (ft)	0.01	Cum SA (acres)	2.27	1.53	1.95

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.83	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	98.00	Flow Area (sq ft)	310.54	729.76	239.93
E.G. Slope (ft/ft)	0.001751	Area (sq ft)	310.54	729.76	239.93
Q Total (cfs)	5541.00	Flow (cfs)	218.75	5124.81	197.43
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	4.33	Avg. Vel. (ft/s)	0.70	7.02	0.82
Max Chl Dpth (ft)	13.91	Hydr. Depth (ft)	4.59	10.27	6.71
Conv. Total (cfs)	132425.6	Conv. (cfs)	5228.0	122479.1	4718.5
Length Wtd. (ft)	100.23	Wetted Per. (ft)	73.82	75.99	45.18
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.46	1.05	0.58
Alpha	2.44	Stream Power (lb/ft s)	0.32	7.37	0.48
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	8.71	15.17	8.61
C & E Loss (ft)	0.00	Cum SA (acres)	2.95	1.53	2.08

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.91	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	99.64	Flow Area (sq ft)	451.43	877.55	314.38
E.G. Slope (ft/ft)	0.001760	Area (sq ft)	451.43	877.55	314.38
Q Total (cfs)	7691.00	Flow (cfs)	401.66	6987.91	301.42
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)	0.89	7.96	0.96
Max Chl Dpth (ft)	15.99	Hydr. Depth (ft)	6.67	12.35	8.79
Conv. Total (cfs)	183309.8	Conv. (cfs)	9573.4	166552.2	7184.2
Length Wtd. (ft)	100.25	Wetted Per. (ft)	75.90	75.99	47.26
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.65	1.27	0.73
Alpha	2.63	Stream Power (lb/ft s)	0.58	10.11	0.70
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	14.46	18.17	12.72
C & E Loss (ft)	0.01	Cum SA (acres)	3.01	1.53	2.08

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1600

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	95.02	54.64999	98.63	81.85999	98.37	82.73	98.36	83.95	97.17
87.81999	93.44	89.56	92.04	89.62	91.94	90.95	89.82	91.23	89.51
113.8	89.66	130.42	89.77	130.57	89.77	130.82	90.02	132.88	92.11
133.02	92.21	137.54	96.97	137.64	97.08	139.1	97.2	139.69	97.21
172.46	97.69	175.77	97.72	181.65	96.5	194.73	93.9	207.76	93.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.238	1.85999	.04	137.54	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
81.85999	137.54	100.17	99.43	99.79	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	82.41	101.6	F
138.89	207.76	101.6	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.85	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	95.13	Flow Area (sq ft)		495.07	3.68
E.G. Slope (ft/ft)	0.001725	Area (sq ft)	201.70	495.89	247.60
Q Total (cfs)	3052.00	Flow (cfs)		3050.13	1.87
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	6.12	Avg. Vel. (ft/s)		6.16	0.51
Max Chl Dpth (ft)	10.34	Hydr. Depth (ft)		8.98	2.72
Conv. Total (cfs)	73490.2	Conv. (cfs)		73445.0	45.1
Length Wtd. (ft)	99.43	Wetted Per. (ft)		62.03	1.40
Min Ch El (ft)	89.51	Shear (lb/sq ft)		0.86	0.28
Alpha	1.01	Stream Power (lb/ft s)		5.29	0.14
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	2.09	9.66	2.84
C & E Loss (ft)	0.02	Cum SA (acres)	1.46	1.36	1.19

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	101.00	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	96.12	Flow Area (sq ft)		558.86	5.24
E.G. Slope (ft/ft)	0.001944	Area (sq ft)	296.41	560.31	328.84
Q Total (cfs)	3967.00	Flow (cfs)		3963.41	3.59
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	7.03	Avg. Vel. (ft/s)		7.09	0.69
Max Chl Dpth (ft)	11.49	Hydr. Depth (ft)		10.14	3.88
Conv. Total (cfs)	89964.8	Conv. (cfs)		89883.4	81.4
Length Wtd. (ft)	99.43	Wetted Per. (ft)		62.03	1.40
Min Ch El (ft)	89.51	Shear (lb/sq ft)		1.09	0.45
Alpha	1.02	Stream Power (lb/ft s)		7.76	0.31
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	4.08	11.34	4.60
C & E Loss (ft)	0.02	Cum SA (acres)	2.09	1.38	1.83

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.230	0.040	0.230

W.S. Elev (ft)	102.61	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	97.62	Flow Area (sq ft)	427.79	649.67	441.54
E.G. Slope (ft/ft)	0.001772	Area (sq ft)	427.79	649.67	441.54
Q Total (cfs)	5541.00	Flow (cfs)	329.99	4834.89	376.13
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)	0.77	7.44	0.85
Max Chl Dpth (ft)	13.10	Hydr. Depth (ft)	5.23	11.67	6.29
Conv. Total (cfs)	131617.8	Conv. (cfs)	7838.3	114845.2	8934.4
Length Wtd. (ft)	99.50	Wetted Per. (ft)	89.57	62.58	79.66
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.53	1.15	0.61
Alpha	3.64	Stream Power (lb/ft s)	0.41	8.55	0.52
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	7.84	13.58	7.85
C & E Loss (ft)	0.01	Cum SA (acres)	2.78	1.39	1.96

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.67	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	99.33	Flow Area (sq ft)	596.45	764.39	586.21
E.G. Slope (ft/ft)	0.001864	Area (sq ft)	596.45	764.39	586.21
Q Total (cfs)	7691.00	Flow (cfs)	580.07	6502.67	608.26
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	3.95	Avg. Vel. (ft/s)	0.97	8.51	1.04
Max Chl Dpth (ft)	15.16	Hydr. Depth (ft)	7.29	13.73	8.35
Conv. Total (cfs)	178116.2	Conv. (cfs)	13433.9	150595.6	14086.8
Length Wtd. (ft)	99.52	Wetted Per. (ft)	91.63	62.58	81.72
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.76	1.42	0.83
Alpha	3.93	Stream Power (lb/ft s)	0.74	12.09	0.87
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	13.22	16.28	11.71
C & E Loss (ft)	0.03	Cum SA (acres)	2.83	1.39	1.97

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1500

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.426.160004	99.3721.74001	98.634.68001	97.3243.85001	97.39				
44.82001	97.4145.04001	97.41	48.39	93.51	49.72	91.95	51.17	91.64	
52.52	91.35	53.09	91.12	71.91	90.48	91.09	89.83	91.45	89.82
91.52	89.87	92.47	90.52	95.03	92.26	97.02	96.18	97.14	96.4
97.35001	96.5999.71001	96.43	118.64	95.19	130.28	97.24	133.89	97.34	
134.79	97.39	135.48	97.42	136.11	97.44	145.8	97	179.45	96
204.77	95.37	206.35	95.35	207.43	95.15	209.36	95.15	212.96	95.63
221.32	97.31	263.66	95.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2344.82001	.04	97.02	.23	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
44.82001 97.02 79.93 100.57 123.17 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
044.62001	101.1	F	

98.2 263.66 101.1 F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.45	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	95.78	Flow Area (sq ft)	0.41	434.28	3.45
E.G. Slope (ft/ft)	0.002440	Area (sq ft)	48.03	434.28	540.87
Q Total (cfs)	3052.00	Flow (cfs)	0.21	3049.76	2.03
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	6.97	Avg. Vel. (ft/s)	0.51	7.02	0.59
Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)	2.04	8.32	2.93
Conv. Total (cfs)	61790.3	Conv. (cfs)	4.2	61745.1	41.0
Length Wtd. (ft)	100.58	Wetted Per. (ft)	0.20	58.00	1.39
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.31	1.14	0.38
Alpha	1.02	Stream Power (lb/ft s)	0.16	8.01	0.22
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	1.81	8.60	1.94
C & E Loss (ft)	0.01	Cum SA (acres)	1.31	1.23	0.92

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.52	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	96.73	Flow Area (sq ft)	0.62	489.97	4.71
E.G. Slope (ft/ft)	0.002755	Area (sq ft)	95.85	489.97	718.63
Q Total (cfs)	3967.00	Flow (cfs)	0.45	3962.94	3.61
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	8.01	Avg. Vel. (ft/s)	0.72	8.09	0.77
Max Chl Dpth (ft)	10.70	Hydr. Depth (ft)	3.11	9.39	3.99
Conv. Total (cfs)	75573.8	Conv. (cfs)	8.6	75496.4	68.9
Length Wtd. (ft)	100.59	Wetted Per. (ft)	0.20	58.00	1.39
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.53	1.45	0.59
Alpha	1.02	Stream Power (lb/ft s)	0.39	11.75	0.45
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	3.63	10.14	3.40
C & E Loss (ft)	0.01	Cum SA (acres)	1.94	1.26	1.56

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.45	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	98.17	Flow Area (sq ft)	182.60	591.01	1041.20
E.G. Slope (ft/ft)	0.001869	Area (sq ft)	182.60	591.01	1041.20
Q Total (cfs)	5541.00	Flow (cfs)	124.40	4461.09	955.51
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	3.05	Avg. Vel. (ft/s)	0.68	7.55	0.92
Max Chl Dpth (ft)	12.63	Hydr. Depth (ft)	4.07	11.32	6.25
Conv. Total (cfs)	128170.4	Conv. (cfs)	2877.5	103190.8	22102.1
Length Wtd. (ft)	102.42	Wetted Per. (ft)	47.93	58.00	174.82
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.44	1.19	0.69
Alpha	4.94	Stream Power (lb/ft s)	0.30	8.97	0.64
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	7.13	12.16	6.15
C & E Loss (ft)	0.01	Cum SA (acres)	2.63	1.27	1.69

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.55	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	99.90	Flow Area (sq ft)	276.65	700.55	1390.87
E.G. Slope (ft/ft)	0.001865	Area (sq ft)	276.65	700.55	1390.87
Q Total (cfs)	7691.00	Flow (cfs)	241.33	5915.57	1534.11
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)	0.87	8.44	1.10
Max Chl Dpth (ft)	14.73	Hydr. Depth (ft)	6.17	13.42	8.35
Conv. Total (cfs)	178113.7	Conv. (cfs)	5588.9	136996.9	35527.9
Length Wtd. (ft)	102.64	Wetted Per. (ft)	50.03	58.00	176.91
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.64	1.41	0.92
Alpha	5.22	Stream Power (lb/ft s)	0.56	11.87	1.01
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	12.21	14.61	9.45
C & E Loss (ft)	0.01	Cum SA (acres)	2.69	1.26	1.69

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1400

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.29	5.290009	95.95	6.709991	95.23	10.51001	95.42	56.84	96.52
58.08	97.01	65.95	97.19	78.45999	97.27	90.67	97.37	108.91	97.65
109.12	97.66	109.55	97.67	113.48	94.17	115.77	92.22	116.89	90.7
118.38	87.99	135.56	89.06	136.77	89.15	146.76	89.89	151.74	91.62
153.39	91.96	161.09	95.15	161.56	95.34	161.66	95.38	162.43	95.73
165.58	95.37	178.29	94.15	193.12	97.78	200.23	97.86	201.25	98.11
222.92	95.33	237.71	97.6	237.78	97.6	260.9	96.84	270.78	95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	109.12	.04	161.66	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
109.12 161.66 98.46 100 105.25 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.86	100.7	F
162.27	270.78	100.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.24	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	95.31	Flow Area (sq ft)	0.41	444.97	2.27
E.G. Slope (ft/ft)	0.002252	Area (sq ft)	288.26	444.97	306.42
Q Total (cfs)	3052.00	Flow (cfs)	0.17	3050.26	1.57
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	6.82	Avg. Vel. (ft/s)	0.42	6.85	0.69
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)	1.58	8.47	3.72
Conv. Total (cfs)	64312.5	Conv. (cfs)	3.6	64275.8	33.1
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.03	0.67
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.22	1.08	0.48
Alpha	1.01	Stream Power (lb/ft s)	0.09	7.39	0.33
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	1.50	7.58	0.74
C & E Loss (ft)	0.04	Cum SA (acres)	1.17	1.11	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.98	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.27	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	96.29	Flow Area (sq ft)	0.68	499.36	2.90
E.G. Slope (ft/ft)	0.002590	Area (sq ft)	401.22	499.36	419.39
Q Total (cfs)	3967.00	Flow (cfs)	0.43	3964.04	2.53
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	7.89	Avg. Vel. (ft/s)	0.62	7.94	0.87
Max Chl Dpth (ft)	12.28	Hydr. Depth (ft)	2.62	9.50	4.75
Conv. Total (cfs)	77954.8	Conv. (cfs)	8.4	77896.7	49.8
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.03	0.67
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.42	1.39	0.70
Alpha	1.01	Stream Power (lb/ft s)	0.26	11.04	0.61
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.18	9.00	1.79
C & E Loss (ft)	0.06	Cum SA (acres)	1.80	1.14	1.17

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.28	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	97.79	Flow Area (sq ft)	620.07	604.73	638.23
E.G. Slope (ft/ft)	0.001757	Area (sq ft)	620.07	604.73	638.23
Q Total (cfs)	5541.00	Flow (cfs)	515.06	4492.09	533.85
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)	0.83	7.43	0.84
Max Chl Dpth (ft)	14.29	Hydr. Depth (ft)	5.68	11.51	5.85
Conv. Total (cfs)	132202.4	Conv. (cfs)	12288.7	107176.6	12737.1
Length Wtd. (ft)	100.26	Wetted Per. (ft)	115.41	58.03	117.56
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.59	1.14	0.60
Alpha	5.07	Stream Power (lb/ft s)	0.49	8.49	0.50
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	6.40	10.78	3.78
C & E Loss (ft)	0.01	Cum SA (acres)	2.49	1.14	1.30

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.38	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	99.50	Flow Area (sq ft)	849.20	715.06	867.36
E.G. Slope (ft/ft)	0.001762	Area (sq ft)	849.20	715.06	867.36
Q Total (cfs)	7691.00	Flow (cfs)	860.90	5948.99	881.11
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)	1.01	8.32	1.02
Max Chl Dpth (ft)	16.39	Hydr. Depth (ft)	7.78	13.61	7.95
Conv. Total (cfs)	183203.6	Conv. (cfs)	20507.1	141708.1	20988.5
Length Wtd. (ft)	100.31	Wetted Per. (ft)	117.51	58.03	119.66
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.80	1.36	0.80
Alpha	5.38	Stream Power (lb/ft s)	0.81	11.28	0.81
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	11.18	12.97	6.25
C & E Loss (ft)	0.02	Cum SA (acres)	2.54	1.14	1.30

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1300

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	9917.81999	99.2119.01999	99.17	20.84	99.1821.45999	99.16			
49.70999	98.0152.68999	97.97	54.86	97.9562.73999	97.8566.21999	97.81			
66.59	97.5269.99999	94.3971.57999	92.8272.24999	92.16	72.91	91.94			
76.07999	90.24	96.87	90.07	104.48	90	112.91	90.15	113.93	90.32
118	91.87	128.38	95.81	130.94	96.78	131.37	96.96	132.04	97.23
133.61	97.87	136.37	97.83	168.9	98	175.78	94.39	177.76	94.32
187.29	94.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2362.73999	.04	132.04	.23	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
62.73999 132.04 664.31 100 63.68 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.05	100.2	F
133.99	187.29	100.2	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	99.71	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.12	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	95.43	Flow Area (sq ft)		492.44	2.93
E.G. Slope (ft/ft)	0.002063	Area (sq ft)	31.06	496.70	118.65
Q Total (cfs)	3052.00	Flow (cfs)		3050.92	1.08
Top Width (ft)	174.62	Top Width (ft)	50.07	69.30	55.25
Vel Total (ft/s)	6.16	Avg. Vel. (ft/s)		6.20	0.37
Max Chl Dpth (ft)	9.12	Hydr. Depth (ft)		7.46	1.50
Conv. Total (cfs)	67199.4	Conv. (cfs)		67175.6	23.9
Length Wtd. (ft)	99.99	Wetted Per. (ft)		69.98	2.08
Min Ch El (ft)	90.00	Shear (lb/sq ft)		0.91	0.18
Alpha	1.01	Stream Power (lb/ft s)		5.61	0.07
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	1.14	6.50	0.23
C & E Loss (ft)	0.01	Cum SA (acres)	0.99	0.97	0.33

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	100.95	Element			
Vel Head (ft)	0.77	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.18	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	96.34	Flow Area (sq ft)		562.52	5.00
E.G. Slope (ft/ft)	0.002235	Area (sq ft)	97.06	570.29	177.32
Q Total (cfs)	3967.00	Flow (cfs)		3964.25	2.75
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	6.99	Avg. Vel. (ft/s)		7.05	0.55
Max Chl Dpth (ft)	10.18	Hydr. Depth (ft)		8.52	2.57
Conv. Total (cfs)	83911.3	Conv. (cfs)		83853.2	58.1

Length Wtd. (ft)	104.71	Wetted Per. (ft)		69.98	2.08
Min Ch El (ft)	90.00	Shear (lb/sq ft)		1.12	0.34
Alpha	1.02	Stream Power (lb/ft s)		7.90	0.18
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	2.61	7.77	1.07
C & E Loss (ft)	0.00	Cum SA (acres)	1.61	1.00	0.97

Warning: Multiple water surfaces were found that could balance the energy equation. The program selected the water
surface whose main channel velocity head was the closest to the previously computed cross section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.96	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	97.67	Flow Area (sq ft)	208.60	693.49	275.54
E.G. Slope (ft/ft)	0.002033	Area (sq ft)	208.60	693.49	275.54
Q Total (cfs)	5541.00	Flow (cfs)	131.23	5196.39	213.38
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	0.63	7.49	0.77
Max Chl Dpth (ft)	11.96	Hydr. Depth (ft)	3.32	10.01	4.99
Conv. Total (cfs)	122892.7	Conv. (cfs)	2910.5	115249.7	4732.4
Length Wtd. (ft)	112.44	Wetted Per. (ft)	65.72	73.29	63.57
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.40	1.20	0.55
Alpha	2.38	Stream Power (lb/ft s)	0.25	9.00	0.43
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	5.46	9.29	2.67
C & E Loss (ft)	0.02	Cum SA (acres)	2.29	1.00	1.10

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.00	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	99.16	Flow Area (sq ft)	336.57	834.85	388.24
E.G. Slope (ft/ft)	0.002010	Area (sq ft)	336.57	834.85	388.24
Q Total (cfs)	7691.00	Flow (cfs)	283.80	7039.29	367.91
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	4.93	Avg. Vel. (ft/s)	0.84	8.43	0.95
Max Chl Dpth (ft)	14.00	Hydr. Depth (ft)	5.36	12.05	7.03
Conv. Total (cfs)	171542.5	Conv. (cfs)	6330.1	157006.5	8205.9
Length Wtd. (ft)	117.45	Wetted Per. (ft)	67.76	73.29	65.61
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.62	1.43	0.74
Alpha	2.68	Stream Power (lb/ft s)	0.53	12.05	0.70
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	9.84	11.19	4.74
C & E Loss (ft)	0.02	Cum SA (acres)	2.35	1.00	1.11

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1200

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.993.680008		96.24.720001		96.198.790009		96.3416.71001		96.72
34.19	97.61	34.77	97.6335.40001		97.46	47	94.26	55.25	92.11
58.57001	91.08	59.25	90.8375.03001		89.35	81.43	88.7593.14001		87.65
93.36	88.11	93.86	89.21	95.3	92.42	95.58	92.92	98.76	98.52
98.99001	98.93	100.13	98.9	118.49	98.47	133.43	98.09	149.42	98.25
150.55	98.31	154.31	98.06	159.45	97.71	163	98.23	165.09	98.54
166.06	98.57	170.66	98.67	172.66	98.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	34.19	.04	98.76	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
34.19	98.76	114.91	100 120.57	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	34.64	99.8	F
99.34	172.66	99.8	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	98.81	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	95.21	Flow Area (sq ft)		465.57	0.02
E.G. Slope (ft/ft)	0.002577	Area (sq ft)	67.96	466.11	33.42
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	0.00
Top Width (ft)	167.51	Top Width (ft)	34.19	64.57	68.75
Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)		6.56	0.06
Max Chl Dpth (ft)	11.16	Hydr. Depth (ft)		7.26	0.14
Conv. Total (cfs)	60123.5	Conv. (cfs)		60123.5	0.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)		71.83	0.33
Min Ch El (ft)	87.65	Shear (lb/sq ft)		1.04	0.01
Alpha	1.00	Stream Power (lb/ft s)		6.84	0.00
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.38	5.40	0.12
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.82	0.24

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.93	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	96.21	Flow Area (sq ft)	106.36	538.62	116.11
E.G. Slope (ft/ft)	0.002540	Area (sq ft)	106.36	538.62	116.11
Q Total (cfs)	3967.00	Flow (cfs)	69.70	3846.92	50.38
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	0.66	7.14	0.43
Max Chl Dpth (ft)	12.28	Hydr. Depth (ft)	3.11	8.34	1.57
Conv. Total (cfs)	78718.6	Conv. (cfs)	1383.0	76335.8	999.8
Length Wtd. (ft)	100.41	Wetted Per. (ft)	37.25	72.28	75.46
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.45	1.18	0.24
Alpha	1.82	Stream Power (lb/ft s)	0.30	8.44	0.11
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	1.06	6.50	0.86
C & E Loss (ft)	0.12	Cum SA (acres)	0.87	0.84	0.88

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.98	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.51	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	97.68	Flow Area (sq ft)	160.52	640.91	233.17
E.G. Slope (ft/ft)	0.002641	Area (sq ft)	160.52	640.91	233.17
Q Total (cfs)	5541.00	Flow (cfs)	137.27	5241.74	161.99
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	0.86	8.18	0.69
Max Chl Dpth (ft)	13.86	Hydr. Depth (ft)	4.69	9.93	3.16
Conv. Total (cfs)	107819.2	Conv. (cfs)	2671.1	101996.1	3152.0
Length Wtd. (ft)	100.73	Wetted Per. (ft)	38.83	72.28	77.04
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.68	1.46	0.50
Alpha	2.21	Stream Power (lb/ft s)	0.58	11.96	0.35
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	2.65	7.76	2.30
C & E Loss (ft)	0.15	Cum SA (acres)	1.56	0.85	1.00

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.50	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	99.20	Flow Area (sq ft)	228.28	768.87	379.63
E.G. Slope (ft/ft)	0.002637	Area (sq ft)	228.28	768.87	379.63
Q Total (cfs)	7691.00	Flow (cfs)	238.61	7093.83	358.56
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	5.59	Avg. Vel. (ft/s)	1.05	9.23	0.94
Max Chl Dpth (ft)	15.85	Hydr. Depth (ft)	6.68	11.91	5.14
Conv. Total (cfs)	149777.6	Conv. (cfs)	4646.9	138148.0	6982.7
Length Wtd. (ft)	101.05	Wetted Per. (ft)	40.82	72.28	79.02
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.92	1.75	0.79
Alpha	2.52	Stream Power (lb/ft s)	0.96	16.16	0.75
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	5.53	9.35	4.18
C & E Loss (ft)	0.19	Cum SA (acres)	1.61	0.85	1.01

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1100

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.752.529999	97.643.139999	97.573.809998	97.484.330002	97.41				
4.779999	97.36	5.5	97.36.350006	97.227.069992	97.17	10.11	96.85		

24.85001	94.44	30.14	95.12	30.99001	94.79	35.53999	93.01	36.71001	92.72	
37.96001	92.32	42.64999	91.99	45.03	91.69	50.06	93.42	51.88	93.78	
56.04	94.48	57.81	94.62	59.17	94.68	61.47	94.66	63.4	94.49	
66	94.18	67.73	93.82	70.15	93.34	71.03	93.07	74.56	91.99	
77.27	92.64	77.87	92.19	78.67	91.8	80.64	90.54	104.79	90.27	
110.47	90.2	111.35	90.18	115.19	90.14	125.07	89.81	125.65	90.66	
126.49	91.62	126.67	91.83	126.8	92.12	127.63	94.04	128.76	95.86	
130.62	98.83	130.69	98.85	130.86	98.91	132.04	99.31	132.15	99.34	
132.55	99.48	132.7	99.47	133.17	99.45	135.01	99.39	145.57	99.07	
146.1	99.06	150.05	98.75	153.21	98.58	154.58	98.53	155.66	98.49	
156.86	98.46	157.98	98.4	159.05	98.48	160.98	98.6	163.22	98.73	
164.77	98.81	167.38	99	170.75	99.12	172.14	99.2			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	30.99001	.04	128.76	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30.99001	128.76	20.56	50	255.03	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	77.32	99.3	F
132.14	172.14	99.3	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	98.26	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	95.29	Flow Area (sq ft)		398.03	1.80
E.G. Slope (ft/ft)	0.003079	Area (sq ft)	68.88	626.27	1.80
Q Total (cfs)	3052.00	Flow (cfs)		3051.52	0.48
Top Width (ft)	130.26	Top Width (ft)	30.99	97.77	1.50
Vel Total (ft/s)	7.63	Avg. Vel. (ft/s)		7.67	0.27
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		7.74	1.20
Conv. Total (cfs)	55005.1	Conv. (cfs)		54996.5	8.6
Length Wtd. (ft)	50.01	Wetted Per. (ft)		55.49	2.83
Min Ch El (ft)	89.81	Shear (lb/sq ft)		1.38	0.12
Alpha	1.01	Stream Power (lb/ft s)		10.57	0.03
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.20	4.14	0.07
C & E Loss (ft)	0.13	Cum SA (acres)	0.26	0.63	0.14

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.06	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	96.21	Flow Area (sq ft)	124.67	802.29	51.36
E.G. Slope (ft/ft)	0.001105	Area (sq ft)	124.67	802.29	51.36
Q Total (cfs)	3967.00	Flow (cfs)	64.11	3891.02	11.86
Top Width (ft)	172.14	Top Width (ft)	30.99	97.77	43.38
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)	0.51	4.85	0.23
Max Chl Dpth (ft)	10.25	Hydr. Depth (ft)	4.02	8.21	1.18
Conv. Total (cfs)	119341.5	Conv. (cfs)	1928.8	117055.8	356.9
Length Wtd. (ft)	49.82	Wetted Per. (ft)	33.64	103.07	46.04
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.26	0.54	0.08
Alpha	1.40	Stream Power (lb/ft s)	0.13	2.60	0.02
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.76	4.96	0.62
C & E Loss (ft)	0.02	Cum SA (acres)	0.78	0.66	0.71

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.71	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	97.64	Flow Area (sq ft)	175.80	963.59	122.92
E.G. Slope (ft/ft)	0.001146	Area (sq ft)	175.80	963.59	122.92
Q Total (cfs)	5541.00	Flow (cfs)	112.15	5378.30	50.55
Top Width (ft)	172.14	Top Width (ft)	30.99	97.77	43.38
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	0.64	5.58	0.41
Max Chl Dpth (ft)	11.90	Hydr. Depth (ft)	5.67	9.86	2.83
Conv. Total (cfs)	163658.6	Conv. (cfs)	3312.6	158853.1	1493.0
Length Wtd. (ft)	50.62	Wetted Per. (ft)	35.29	103.07	47.69
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.36	0.67	0.18
Alpha	1.57	Stream Power (lb/ft s)	0.23	3.73	0.08
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	2.20	5.92	1.81
C & E Loss (ft)	0.03	Cum SA (acres)	1.47	0.66	0.84

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.76	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	99.30	Flow Area (sq ft)	239.50	1164.56	212.09
E.G. Slope (ft/ft)	0.001150	Area (sq ft)	239.50	1164.56	212.09
Q Total (cfs)	7691.00	Flow (cfs)	181.13	7387.68	122.19
Top Width (ft)	172.14	Top Width (ft)	30.99	97.77	43.38
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)	0.76	6.34	0.58
Max Chl Dpth (ft)	13.95	Hydr. Depth (ft)	7.73	11.91	4.89
Conv. Total (cfs)	226768.5	Conv. (cfs)	5340.6	217825.1	3602.8
Length Wtd. (ft)	51.64	Wetted Per. (ft)	37.35	103.07	49.74
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.46	0.81	0.31
Alpha	1.71	Stream Power (lb/ft s)	0.35	5.15	0.18
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	4.92	7.13	3.36
C & E Loss (ft)	0.03	Cum SA (acres)	1.52	0.66	0.85

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1050

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.54	52.84	97.69	53.67999	97.7	57.2	97.678	0.48999	97.62
91.89	97.649	2.18999	97.6	92.36	97.58	92.57	97.56	93.2	97.56
100.52	97.59	101.06	96.97	103.8	93.86	105.52	91.91	106.17	90.69
108.15	86.9	132.55	89.2	141.44	90.05	149.74	90.34	152.2	90.39
154.26	90.99	154.95	91.26	155.92	91.82	162.83	94.96	173.73	98.88
174.12	99.02	178.03	99.08	180.81	99.11	185.92	99.19	194.16	99.33
196.93	99.29	200.31	99.29	201.78	98.92	203.12	99	208.79	99.33
208.81	99.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	101.06	.04	173.73	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
101.06	173.73	25.83	50	71.25	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
	099.64999	99.1	F
173.14	208.81	99.1	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	98.43	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	94.00	Flow Area (sq ft)	1.36	540.84	
E.G. Slope (ft/ft)	0.001759	Area (sq ft)	82.20	540.84	
Q Total (cfs)	3052.00	Flow (cfs)	0.32	3051.68	
Top Width (ft)	172.49	Top Width (ft)	101.06	71.43	
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)	0.23	5.64	
Max Chl Dpth (ft)	11.53	Hydr. Depth (ft)	0.96	7.57	
Conv. Total (cfs)	72769.5	Conv. (cfs)	7.6	72761.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)	1.69	78.47	
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.09	0.76	
Alpha	1.00	Stream Power (lb/ft s)	0.02	4.27	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.17	3.48	0.06
C & E Loss (ft)	0.00	Cum SA (acres)	0.23	0.54	0.13

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.77	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	94.91	Flow Area (sq ft)	217.13	637.59	20.78
E.G. Slope (ft/ft)	0.001670	Area (sq ft)	217.13	637.59	20.78
Q Total (cfs)	3967.00	Flow (cfs)	93.91	3869.26	3.83
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	4.53	Avg. Vel. (ft/s)	0.43	6.07	0.18
Max Chl Dpth (ft)	12.87	Hydr. Depth (ft)	2.15	8.77	0.59
Conv. Total (cfs)	97060.9	Conv. (cfs)	2297.7	94669.5	93.8
Length Wtd. (ft)	49.73	Wetted Per. (ft)	103.58	79.79	35.61
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.22	0.83	0.06
Alpha	1.75	Stream Power (lb/ft s)	0.09	5.06	0.01
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.68	4.13	0.41
C & E Loss (ft)	0.00	Cum SA (acres)	0.75	0.56	0.48

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.36	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	96.31	Flow Area (sq ft)	377.50	752.91	76.45
E.G. Slope (ft/ft)	0.001778	Area (sq ft)	377.50	752.91	76.45
Q Total (cfs)	5541.00	Flow (cfs)	241.09	5266.24	33.67
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)	0.64	6.99	0.44
Max Chl Dpth (ft)	14.46	Hydr. Depth (ft)	3.74	10.36	2.18
Conv. Total (cfs)	131412.3	Conv. (cfs)	5717.8	124896.0	798.5
Length Wtd. (ft)	49.64	Wetted Per. (ft)	105.16	79.79	37.19
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.40	1.05	0.23
Alpha	2.21	Stream Power (lb/ft s)	0.25	7.33	0.10
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	2.07	4.94	1.22
C & E Loss (ft)	0.01	Cum SA (acres)	1.44	0.57	0.61

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.36	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	97.93	Flow Area (sq ft)	580.11	898.60	146.78
E.G. Slope (ft/ft)	0.001794	Area (sq ft)	580.11	898.60	146.78
Q Total (cfs)	7691.00	Flow (cfs)	489.44	7104.69	96.87
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	4.73	Avg. Vel. (ft/s)	0.84	7.91	0.66
Max Chl Dpth (ft)	16.46	Hydr. Depth (ft)	5.74	12.37	4.18
Conv. Total (cfs)	181562.2	Conv. (cfs)	11554.2	167721.2	2286.8
Length Wtd. (ft)	49.51	Wetted Per. (ft)	107.17	79.79	39.20
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.61	1.26	0.42
Alpha	2.58	Stream Power (lb/ft s)	0.51	9.98	0.28
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	4.72	5.95	2.31
C & E Loss (ft)	0.02	Cum SA (acres)	1.49	0.57	0.62

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1000

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38.8499908		101.37.9599915		101.361.669998		101.353.539993		101.32
10.96999	101.32	20.2	101.4820.20999		101.4820.46999		101.4730.93999		101.38
31.14999	101.3731.50999		101.3638.79999		101.2741.59999		101.2244.84999		101.14
44.86	101.14	56.31	100.81	81.11	89.9681.56999		89.97	82.28	90
82.37999	90.0187.21999		89.9991.73999		89.65	99.34	89.92	125.26	90.82
128.49	91.83	128.52	91.89	155.45	100.03	156	100.01	161.06	99.93
161.24	99.93	164.58	99.73	166.33	99.59	168.59	99.43	169.31	99.37
170.14	99.29	175.97	99.27	181.09	99.3	183.09	99.33	187.53	99.37
190.98	99.3	197.9	99.25	202.14	99.21	206.21	99.12	211.91	99.13
216.15	99.1	216.79	99.11						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	56.31	.04	155.45	.23

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

	56.31	155.45	25.88	25.66	27.03	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	56.26999	98.9	F
156.52	216.79	98.9	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.31	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	95.01	Flow Area (sq ft)		530.78	
E.G. Slope (ft/ft)	0.002271	Area (sq ft)		530.78	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	87.76	Top Width (ft)		87.76	
Vel Total (ft/s)	5.75	Avg. Vel. (ft/s)		5.75	
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	64037.8	Conv. (cfs)		64037.8	

Length Wtd. (ft)	0.50	Wetted Per. (ft)		90.68	
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		4.77	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.14	2.86	0.06
C & E Loss (ft)	0.03	Cum SA (acres)	0.20	0.44	0.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.66	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	95.84	Flow Area (sq ft)		654.29	20.56
E.G. Slope (ft/ft)	0.002136	Area (sq ft)		654.29	20.56
Q Total (cfs)	3967.00	Flow (cfs)		3963.69	3.31
Top Width (ft)	146.69	Top Width (ft)		95.31	51.38
Vel Total (ft/s)	5.88	Avg. Vel. (ft/s)		6.06	0.16
Max Chl Dpth (ft)	10.01	Hydr. Depth (ft)		6.86	0.40
Conv. Total (cfs)	85834.2	Conv. (cfs)		85762.5	71.6
Length Wtd. (ft)	0.50	Wetted Per. (ft)		98.71	51.95
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.88	0.05
Alpha	1.06	Stream Power (lb/ft s)		5.35	0.01
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.61	3.39	0.38
C & E Loss (ft)	0.03	Cum SA (acres)	0.72	0.46	0.41

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.28	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	97.07	Flow Area (sq ft)	3.84	812.33	117.04
E.G. Slope (ft/ft)	0.002103	Area (sq ft)	3.84	812.33	117.04
Q Total (cfs)	5541.00	Flow (cfs)	0.41	5488.49	52.11
Top Width (ft)	178.42	Top Width (ft)	17.94	99.14	61.34
Vel Total (ft/s)	5.94	Avg. Vel. (ft/s)	0.11	6.76	0.45
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)	0.21	8.19	1.91
Conv. Total (cfs)	120834.0	Conv. (cfs)	8.9	119688.8	1136.3
Length Wtd. (ft)	0.50	Wetted Per. (ft)	17.95	102.84	63.53
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.03	1.04	0.24
Alpha	1.28	Stream Power (lb/ft s)	0.00	7.01	0.11
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.96	4.04	1.07
C & E Loss (ft)	0.05	Cum SA (acres)	1.40	0.47	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.33	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	98.48	Flow Area (sq ft)	115.64	1015.71	242.87
E.G. Slope (ft/ft)	0.001854	Area (sq ft)	115.64	1015.71	242.87
Q Total (cfs)	7691.00	Flow (cfs)	50.80	7478.49	161.71
Top Width (ft)	216.79	Top Width (ft)	56.31	99.14	61.34
Vel Total (ft/s)	5.60	Avg. Vel. (ft/s)	0.44	7.36	0.67
Max Chl Dpth (ft)	13.68	Hydr. Depth (ft)	2.05	10.25	3.96

Conv. Total (cfs)	178627.3	Conv. (cfs)	1179.9	173691.6	3755.8
Length Wtd. (ft)	0.50	Wetted Per. (ft)	58.27	102.84	65.58
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.23	1.14	0.43
Alpha	1.68	Stream Power (lb/ft s)	0.10	8.42	0.29
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	4.52	4.85	1.99
C & E Loss (ft)	0.08	Cum SA (acres)	1.45	0.47	0.54

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: BrushyCreek
REACH: BrushyCreek RS: 987.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 25
Weir Coefficient = .3
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	104.37	100.4	48	104.24	100.4	48	104.24	103.5
162.79	104	103.5	162.79	104	99.1	216.79	103.82	99.1

Upstream Bridge Cross Section Data
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38.8499908	101.37.9599915		101.361.669998		101.353.539993		101.32	
10.96999	101.32	20.2	101.4820.20999		101.4820.46999		101.4730.93999		101.38
31.14999	101.3731.50999		101.3638.79999		101.2741.59999		101.2244.84999		101.14
44.86	101.14	56.31	100.81	81.11	89.9681.56999		89.97	82.28	90
82.37999	90.0187.21999		89.9991.73999		89.65	99.34	89.92	125.26	90.82
128.49	91.83	128.52	91.89	155.45	100.03	156	100.01	161.06	99.93
161.24	99.93	164.58	99.73	166.33	99.59	168.59	99.43	169.31	99.37
170.14	99.29	175.97	99.27	181.09	99.3	183.09	99.33	187.53	99.37
190.98	99.3	197.9	99.25	202.14	99.21	206.21	99.12	211.91	99.13
216.15	99.1	216.79	99.11						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	56.31	.04	155.45	.23

Bank Sta: Left Right Coeff Contr. Expan.
56.31 155.45 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	56.26999	98.9	F
156.52	216.79	98.9	F

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	104.37	100	41.5	104.24	100	41.5	104.24	103.5
156.49	104	103.5	156.49	104	99.1	220.6	103.82	99.5

Downstream Bridge Cross Section Data
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.22.800003	101.143.539993		101.123.819992		101.113.959991		101.11	
4.12999	101.14.679993	101.09	7.5	101.02	12.86	100.94	15.12	100.92	
19.53999	100.87	31.05	100.79	31.91	100.7531.92999		100.7631.95999		100.76
32.2	100.75	44.8	100.5451.45999		100.3	74.73	88.2275.34999		88.21

```
   75.66   88.23   76.58   88.27  100.53   89.38  119.27   90.24  125.57   90.51
  125.79    90.5  125.99   90.49  127.48   90.54  127.62   90.59  148.02  100.08
  148.24  100.11  148.92  100.27  149.68  100.35  158.44  100.38  160.23  100.31
  162.09   100.3  162.54  100.29  165.05   99.95  165.68   99.84  165.95   99.84
  172.61   99.92  180.48   99.86  182.44   99.84  182.45   99.84  191.25   99.78
  191.78   99.77  195.83   99.74  196.17   99.73  200.09   99.71  205.85   99.67
  219.32   99.58  220.57   99.57  220.59   99.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .2351.45999     .04  148.02     .23

Bank Sta: Left   Right    Coeff Contr.   Expan.
      51.45999  148.02            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       050.84999    98.8       F
  149.25  220.59    98.8       F

Upstream Embankment side slope              =       1 horiz. to 1.0 vertical
Downstream Embankment side slope            =       1 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Abutments =  2

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   102.6      54   102.6   79.28   89.96   89.28   89.96
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   102.6    47.5   102.6   76.16   88.27   86.16   88.27

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  126.23   90.82  136.23   90.82  159.79   102.6  216.79   102.6
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  119.47   90.24  129.47   90.59  153.49   102.6   220.6   102.6

Number of Piers =  2

Pier Data
Pier Station     Upstream=   81.45    Downstream=   87.79
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2      85       2   101.6       3   101.6       3     104
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2      85       2   101.6       3   101.6       3     104

Pier Data
Pier Station     Upstream=  119.78    Downstream=  126.04
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2      85       2   101.6       3   101.6       3     104
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       2      85       2   101.6       3   101.6       3     104

Number of Bridge Coefficient Sets =  1

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

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #10 yr

E.G. US. (ft)	98.83	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	98.31	E.G. Elev (ft)	98.80	98.63
Q Total (cfs)	3052.00	W.S. Elev (ft)	98.19	98.20
Q Bridge (cfs)	3052.00	Crit W.S. (ft)	95.25	94.08
Q Weir (cfs)		Max Chl Dpth (ft)	8.54	9.93
Weir Sta Lft (ft)		Vel Total (ft/s)	6.26	5.29
Weir Sta Rgt (ft)		Flow Area (sq ft)	487.88	577.39
Weir Submerg		Froude # Chl	0.45	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	2320.93	2824.35
Min El Weir Flow (ft)	103.83	Hydr Depth (ft)	5.91	6.90
Min El Prs (ft)	103.50	W.P. Total (ft)	116.77	121.95
Delta EG (ft)	0.23	Conv. Total (cfs)	47014.6	60478.8
Delta WS (ft)	0.08	Top Width (ft)	82.54	83.67
BR Open Area (sq ft)	992.78	Frctn Loss (ft)	0.08	0.00
BR Open Vel (ft/s)	6.26	C & E Loss (ft)	0.09	0.03
BR Sluice Coef		Shear Total (lb/sq ft)	1.10	0.75
BR Sel Method	Energy only	Power Total (lb/ft s)	6.88	3.98

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #25 yr

E.G. US. (ft)	100.23	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	99.66	E.G. Elev (ft)	100.20	100.04
Q Total (cfs)	3967.00	W.S. Elev (ft)	99.53	99.53
Q Bridge (cfs)	3967.00	Crit W.S. (ft)	96.09	94.91
Q Weir (cfs)		Max Chl Dpth (ft)	9.88	11.26
Weir Sta Lft (ft)		Vel Total (ft/s)	6.58	5.73
Weir Sta Rgt (ft)		Flow Area (sq ft)	603.15	692.54
Weir Submerg		Froude # Chl	0.45	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	3267.81	3874.31
Min El Weir Flow (ft)	103.83	Hydr Depth (ft)	6.74	7.76
Min El Prs (ft)	103.50	W.P. Total (ft)	129.61	133.42
Delta EG (ft)	0.23	Conv. Total (cfs)	62451.3	77126.8
Delta WS (ft)	0.10	Top Width (ft)	89.51	89.20
BR Open Area (sq ft)	992.78	Frctn Loss (ft)	0.08	0.00
BR Open Vel (ft/s)	6.58	C & E Loss (ft)	0.08	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	1.17	0.86
BR Sel Method	Energy only	Power Total (lb/ft s)	7.71	4.91

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #100 yr

E.G. US. (ft)	101.98	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	101.28	E.G. Elev (ft)	101.93	101.75
Q Total (cfs)	5541.00	W.S. Elev (ft)	101.07	101.07
Q Bridge (cfs)	5541.00	Crit W.S. (ft)	97.36	96.16
Q Weir (cfs)		Max Chl Dpth (ft)	11.42	12.80
Weir Sta Lft (ft)		Vel Total (ft/s)	7.43	6.64
Weir Sta Rgt (ft)		Flow Area (sq ft)	745.93	834.84

Weir Submerg		Froude # Chl	0.47	0.39
Weir Max Depth (ft)		Specif Force (cu ft)	4775.81	5485.38
Min El Weir Flow (ft)	103.83	Hydr Depth (ft)	7.80	8.71
Min El Prs (ft)	103.50	W.P. Total (ft)	142.68	146.92
Delta EG (ft)	0.28	Conv. Total (cfs)	83957.6	100098.3
Delta WS (ft)	0.16	Top Width (ft)	95.67	95.86
BR Open Area (sq ft)	992.78	Frctn Loss (ft)	0.09	0.00
BR Open Vel (ft/s)	7.43	C & E Loss (ft)	0.09	0.05
BR Sluice Coef		Shear Total (lb/sq ft)	1.42	1.09
BR Sel Method	Energy only	Power Total (lb/ft s)	10.56	7.21

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #500 yr

E.G. US. (ft)	104.15	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	103.33	E.G. Elev (ft)	104.07	103.89
Q Total (cfs)	7691.00	W.S. Elev (ft)	103.00	102.99
Q Bridge (cfs)	7691.00	Crit W.S. (ft)	98.81	97.63
Q Weir (cfs)		Max Chl Dpth (ft)	13.35	14.72
Weir Sta Lft (ft)		Vel Total (ft/s)	8.20	7.49
Weir Sta Rgt (ft)		Flow Area (sq ft)	938.25	1026.56
Weir Submerg		Froude # Chl	0.40	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	7098.05	7942.86
Min El Weir Flow (ft)	103.83	Hydr Depth (ft)	8.62	9.42
Min El Prs (ft)	103.50	W.P. Total (ft)	168.62	172.84
Delta EG (ft)	0.35	Conv. Total (cfs)	114909.2	131750.6
Delta WS (ft)	0.26	Top Width (ft)	108.79	108.99
BR Open Area (sq ft)	992.78	Frctn Loss (ft)	0.10	0.00
BR Open Vel (ft/s)	8.20	C & E Loss (ft)	0.08	0.09
BR Sluice Coef		Shear Total (lb/sq ft)	1.56	1.26
BR Sel Method	Energy only	Power Total (lb/ft s)	12.76	9.47

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 975

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.22.800003	101.143.539993		101.123.819992		101.113.959991		101.11	
4.12999	101.14.679993	101.09	7.5	101.02	12.86	100.94	15.12	100.92	
19.53999	100.87	31.05	100.79	31.91	100.7531.92999		100.7631.95999		100.76
32.2	100.75	44.8	100.5451.45999		100.3	74.73	88.2275.34999		88.21
75.66	88.23	76.58	88.27	100.53	89.38	119.27	90.24	125.57	90.51
125.79	90.5	125.99	90.49	127.48	90.54	127.62	90.59	148.02	100.08
148.24	100.11	148.92	100.27	149.68	100.35	158.44	100.38	160.23	100.31
162.09	100.3	162.54	100.29	165.05	99.95	165.68	99.84	165.95	99.84
172.61	99.92	180.48	99.86	182.44	99.84	182.45	99.84	191.25	99.78
191.78	99.77	195.83	99.74	196.17	99.73	200.09	99.71	205.85	99.67
219.32	99.58	220.57	99.57	220.59	99.57				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.235	1.45999	.04	148.02	.23

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

51.45999	148.02		658.96	24.34	24.13	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	50.84999	98.8	F
149.25	220.59	98.8	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.23	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	93.80	Flow Area (sq ft)		626.03	
E.G. Slope (ft/ft)	0.001351	Area (sq ft)		626.03	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	88.59	Top Width (ft)		88.59	
Vel Total (ft/s)	4.88	Avg. Vel. (ft/s)		4.88	
Max Chl Dpth (ft)	10.02	Hydr. Depth (ft)		7.07	
Conv. Total (cfs)	83035.6	Conv. (cfs)		83035.6	
Length Wtd. (ft)	24.34	Wetted Per. (ft)		92.79	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		0.57	
Alpha	1.00	Stream Power (lb/ft s)		2.77	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.14	2.55	0.06
C & E Loss (ft)	0.05	Cum SA (acres)	0.20	0.40	0.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.040	
W.S. Elev (ft)	99.57	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	94.59	Flow Area (sq ft)		748.05	
E.G. Slope (ft/ft)	0.001372	Area (sq ft)		748.05	
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	94.04	Top Width (ft)		94.04	
Vel Total (ft/s)	5.30	Avg. Vel. (ft/s)		5.30	
Max Chl Dpth (ft)	11.36	Hydr. Depth (ft)		7.95	
Conv. Total (cfs)	107106.4	Conv. (cfs)		107106.4	
Length Wtd. (ft)	24.39	Wetted Per. (ft)		98.86	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		3.44	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.61	3.01	0.38
C & E Loss (ft)	0.06	Cum SA (acres)	0.72	0.41	0.41

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.12	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	95.79	Flow Area (sq ft)	16.64	897.09	89.31
E.G. Slope (ft/ft)	0.001501	Area (sq ft)	16.64	897.09	89.31
Q Total (cfs)	5541.00	Flow (cfs)	2.06	5513.64	25.30
Top Width (ft)	216.98	Top Width (ft)	47.85	96.56	72.57
Vel Total (ft/s)	5.52	Avg. Vel. (ft/s)	0.12	6.15	0.28
Max Chl Dpth (ft)	12.91	Hydr. Depth (ft)	0.35	9.29	1.23
Conv. Total (cfs)	143002.5	Conv. (cfs)	53.2	142296.4	653.0
Length Wtd. (ft)	24.93	Wetted Per. (ft)	47.86	101.67	74.18
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.03	0.83	0.11
Alpha	1.23	Stream Power (lb/ft s)	0.00	5.08	0.03
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.96	3.57	1.07

C & E Loss (ft)	0.08	Cum SA (acres)	1.40	0.41	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.07	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	97.21	Flow Area (sq ft)	117.04	1085.76	231.10
E.G. Slope (ft/ft)	0.001479	Area (sq ft)	117.04	1085.76	231.10
Q Total (cfs)	7691.00	Flow (cfs)	49.09	7521.54	120.37
Top Width (ft)	220.59	Top Width (ft)	51.46	96.56	72.57
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	0.42	6.93	0.52
Max Chl Dpth (ft)	14.86	Hydr. Depth (ft)	2.27	11.24	3.18
Conv. Total (cfs)	200002.3	Conv. (cfs)	1276.7	195595.5	3130.2
Length Wtd. (ft)	27.92	Wetted Per. (ft)	53.34	101.67	76.13
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.20	0.99	0.28
Alpha	1.63	Stream Power (lb/ft s)	0.08	6.83	0.15
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	4.51	4.28	1.98
C & E Loss (ft)	0.11	Cum SA (acres)	1.44	0.41	0.54

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 950

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.76	0	100.75	.04	100.75	17.97	98.63	20.53001	98.58
22.82001	98.54	27.64	96.04	27.84001	95.95	27.90001	95.93	27.93001	95.92
28.13	95.81	28.95001	95.57	40.59	91.67	42.22001	91.16	42.43001	91.09
45.22001	90.11	69.32001	89.51	90.15001	89.02	91.47001	89.01	91.49001	89.05
93.07001	92.07	100.53	97.93	102.14	99.19	102.65	99.14	111.74	98.83
117.38	98.62	123.5	98.43	128.82	98.69	135.73	98.88	140.72	99.02
141.1	99.02	145.82	99.33	148	99.14	148.78	99.09	157.96	101.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.232	0.53001	.04	102.14	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20.53001 102.14 756.2 50 53.58 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	20.20001	98.8	F
102.66	157.96	98.8	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.		0.040	
W.S. Elev (ft)	97.95	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	94.45	Flow Area (sq ft)		512.12	
E.G. Slope (ft/ft)	0.002236	Area (sq ft)		512.12	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	76.60	Top Width (ft)		76.60	
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)		5.96	
Max Chl Dpth (ft)	8.94	Hydr. Depth (ft)		6.69	
Conv. Total (cfs)	64547.2	Conv. (cfs)		64547.2	

Length Wtd. (ft)	50.00	Wetted Per. (ft)		81.94	
Min Ch El (ft)	89.01	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)		5.20	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.14	2.23	0.06
C & E Loss (ft)	0.04	Cum SA (acres)	0.20	0.35	0.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.26	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	95.30	Flow Area (sq ft)	3.33	615.99	19.23
E.G. Slope (ft/ft)	0.002224	Area (sq ft)	3.33	615.99	19.23
Q Total (cfs)	3967.00	Flow (cfs)	0.57	3963.04	3.39
Top Width (ft)	134.71	Top Width (ft)	7.86	81.61	45.24
Vel Total (ft/s)	6.21	Avg. Vel. (ft/s)	0.17	6.43	0.18
Max Chl Dpth (ft)	10.25	Hydr. Depth (ft)	0.42	7.55	0.43
Conv. Total (cfs)	84120.3	Conv. (cfs)	12.1	84036.3	71.9
Length Wtd. (ft)	50.07	Wetted Per. (ft)	7.90	87.53	45.30
Min Ch El (ft)	89.01	Shear (lb/sq ft)	0.06	0.98	0.06
Alpha	1.07	Stream Power (lb/ft s)	0.01	6.29	0.01
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.59	2.63	0.37
C & E Loss (ft)	0.06	Cum SA (acres)	0.66	0.36	0.40

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.71	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	96.57	Flow Area (sq ft)	23.73	734.80	91.46
E.G. Slope (ft/ft)	0.002372	Area (sq ft)	23.73	734.80	91.46
Q Total (cfs)	5541.00	Flow (cfs)	8.29	5491.01	41.71
Top Width (ft)	153.91	Top Width (ft)	20.17	81.61	52.13
Vel Total (ft/s)	6.52	Avg. Vel. (ft/s)	0.35	7.47	0.46
Max Chl Dpth (ft)	11.70	Hydr. Depth (ft)	1.18	9.00	1.75
Conv. Total (cfs)	113777.6	Conv. (cfs)	170.1	112751.0	856.5
Length Wtd. (ft)	55.23	Wetted Per. (ft)	20.29	87.53	52.41
Min Ch El (ft)	89.01	Shear (lb/sq ft)	0.17	1.24	0.26
Alpha	1.30	Stream Power (lb/ft s)	0.06	9.29	0.12
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	1.65	3.12	1.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.89	0.36	0.50

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.54	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	98.07	Flow Area (sq ft)	61.22	883.86	191.41
E.G. Slope (ft/ft)	0.002402	Area (sq ft)	61.22	883.86	191.41
Q Total (cfs)	7691.00	Flow (cfs)	37.84	7517.26	135.91
Top Width (ft)	157.96	Top Width (ft)	20.53	81.61	55.82
Vel Total (ft/s)	6.77	Avg. Vel. (ft/s)	0.62	8.51	0.71

Max Chl Dpth (ft)	13.53	Hydr. Depth (ft)	2.98	10.83	3.43
Conv. Total (cfs)	156940.9	Conv. (cfs)	772.1	153395.5	2773.3
Length Wtd. (ft)	61.05	Wetted Per. (ft)	22.44	87.53	57.00
Min Ch El (ft)	89.01	Shear (lb/sq ft)	0.41	1.51	0.50
Alpha	1.54	Stream Power (lb/ft s)	0.25	12.88	0.36
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.16	3.73	1.86
C & E Loss (ft)	0.08	Cum SA (acres)	0.90	0.36	0.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 900

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.954.449997		98.67	11.78	97.13	11.92	97.1	12.17	97.09
21.89	96.7922.53999		97.09	25.72	98.2529.81999		98.13	34.42	98.05
47.41	97.75	54.03	97.76	54.06	97.76	54.08	97.76	55.8	94.95
58.2	91.9	59.95	89.29	61.08	87.6873.21001		87.67	76.52	87.65
92.47	87.52	95.62	90.75	97.29	92.06	102.32	96.53	105.02	98.59
119.8	98.01	133.37	97.67	134.69	97.67	140.79	97.64	148.33	97.49
216.93	96.33	220.64	96.38						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	54.06	.04	105.02	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54.06	105.02	108.83	100	90.91	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	53.36	98.7	F
105.94	220.64	98.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.		0.040	
W.S. Elev (ft)	97.38	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	93.90	Flow Area (sq ft)		391.23	
E.G. Slope (ft/ft)	0.003459	Area (sq ft)	4.92	391.23	36.32
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	127.59	Top Width (ft)	12.74	49.12	65.73
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)		7.80	
Max Chl Dpth (ft)	9.86	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	51890.1	Conv. (cfs)		51890.1	
Length Wtd. (ft)	100.01	Wetted Per. (ft)		57.99	
Min Ch El (ft)	87.52	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		11.37	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.10	1.71	0.04
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	0.28	0.09

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	98.46	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	95.01	Flow Area (sq ft)	0.49	445.34	
E.G. Slope (ft/ft)	0.003993	Area (sq ft)	37.79	445.34	137.86
Q Total (cfs)	3967.00	Flow (cfs)	0.16	3966.84	
Top Width (ft)	211.71	Top Width (ft)	48.61	50.79	112.31
Vel Total (ft/s)	8.90	Avg. Vel. (ft/s)	0.32	8.91	
Max Chl Dpth (ft)	10.94	Hydr. Depth (ft)	0.70	8.77	
Conv. Total (cfs)	62782.4	Conv. (cfs)	2.5	62779.9	
Length Wtd. (ft)	100.02	Wetted Per. (ft)	0.70	60.24	
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.17	1.84	
Alpha	1.00	Stream Power (lb/ft s)	0.06	16.41	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.23	2.02	0.28
C & E Loss (ft)	0.05	Cum SA (acres)	0.17	0.29	0.30

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.53	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.80	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	96.69	Flow Area (sq ft)	108.49	513.53	292.40
E.G. Slope (ft/ft)	0.004356	Area (sq ft)	108.49	513.53	292.40
Q Total (cfs)	5541.00	Flow (cfs)	72.44	5241.63	226.93
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	0.67	10.21	0.78
Max Chl Dpth (ft)	12.28	Hydr. Depth (ft)	2.01	10.08	2.53
Conv. Total (cfs)	83956.0	Conv. (cfs)	1097.6	79419.9	3438.4
Length Wtd. (ft)	99.80	Wetted Per. (ft)	55.36	60.46	119.07
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.53	2.31	0.67
Alpha	2.68	Stream Power (lb/ft s)	0.36	23.58	0.52
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.51	2.40	0.78
C & E Loss (ft)	0.05	Cum SA (acres)	0.24	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.90	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.46	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	99.30	Flow Area (sq ft)	198.06	597.96	483.95
E.G. Slope (ft/ft)	0.004618	Area (sq ft)	198.06	597.96	483.95
Q Total (cfs)	7691.00	Flow (cfs)	199.43	6955.41	536.16
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	1.01	11.63	1.11
Max Chl Dpth (ft)	13.94	Hydr. Depth (ft)	3.66	11.73	4.19
Conv. Total (cfs)	113178.5	Conv. (cfs)	2934.7	102353.8	7890.0
Length Wtd. (ft)	99.65	Wetted Per. (ft)	57.02	60.46	120.72
Min Ch El (ft)	87.52	Shear (lb/sq ft)	1.00	2.85	1.16
Alpha	3.39	Stream Power (lb/ft s)	1.01	33.17	1.28
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	0.91	2.88	1.45
C & E Loss (ft)	0.10	Cum SA (acres)	0.25	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 800

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.57	2.709991	99.02	3.190002	99.02	3.459991	99.01	5.839996	98.88
7.309998	98.58	11.94	97.66	14.73999	97.75	18.06999	97.72	20.87999	98.36
24.78	99.24	26.01999	99.21	27.41	99.22	31.26999	97.59	37.95999	94.73
39.16	94.78	40.56	94.83	40.59	94.82	43.09999	93.85	48.16	91.7
57.03999	91.16	5.23999	90.54	78.45	89.18	80.59	88.95	83.16	88.67
89.17999	88.05	91.03	89	97.10999	92.4	105.86	95.84	110.7	98.08
111.2	98.32	112.54	98.31	124.01	98.28	141.64	98.23	150.31	97.24
153.04	97.12	157.4	96.99	162.01	98.13	180.27	97.54	221.84	96.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	40.59	.04	110.7	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40.59	110.7	107.86	100	85.5	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	27.5	98.4	F
112.98	221.84	98.4	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	97.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	97.00	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	95.02	Flow Area (sq ft)	11.89	393.73	
E.G. Slope (ft/ft)	0.004384	Area (sq ft)	11.89	393.73	1.37
Q Total (cfs)	3052.00	Flow (cfs)	6.40	3045.60	
Top Width (ft)	88.50	Top Width (ft)	7.95	67.78	12.77
Vel Total (ft/s)	7.52	Avg. Vel. (ft/s)	0.54	7.74	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)	1.50	5.81	
Conv. Total (cfs)	46095.7	Conv. (cfs)	96.7	45999.0	
Length Wtd. (ft)	100.01	Wetted Per. (ft)	8.42	70.60	
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.39	1.53	
Alpha	1.05	Stream Power (lb/ft s)	0.21	11.81	
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	0.08	0.81	0.00
C & E Loss (ft)	0.06	Cum SA (acres)	0.06	0.14	0.01

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.	0.230	0.040	0.001
W.S. Elev (ft)	98.16	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	95.86	Flow Area (sq ft)	22.64	473.49	0.01
E.G. Slope (ft/ft)	0.004186	Area (sq ft)	26.38	473.49	61.42
Q Total (cfs)	3967.00	Flow (cfs)	14.98	3952.02	0.00
Top Width (ft)	171.10	Top Width (ft)	21.24	70.11	79.75
Vel Total (ft/s)	8.00	Avg. Vel. (ft/s)	0.66	8.35	0.05
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)	2.12	6.75	0.04
Conv. Total (cfs)	61317.9	Conv. (cfs)	231.5	61086.4	0.0
Length Wtd. (ft)	100.01	Wetted Per. (ft)	11.37	73.16	0.18
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.52	1.69	
Alpha	1.09	Stream Power (lb/ft s)	0.34	14.12	
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.15	0.97	0.07
C & E Loss (ft)	0.07	Cum SA (acres)	0.09	0.15	0.10

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	100.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.50	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	97.13	Flow Area (sq ft)	68.37	567.15	206.40
E.G. Slope (ft/ft)	0.004239	Area (sq ft)	68.37	567.15	206.40
Q Total (cfs)	5541.00	Flow (cfs)	39.32	5372.82	128.86
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)	0.58	9.47	0.62
Max Chl Dpth (ft)	11.45	Hydr. Depth (ft)	1.68	8.09	1.86
Conv. Total (cfs)	85109.1	Conv. (cfs)	603.9	82525.9	1979.3
Length Wtd. (ft)	99.94	Wetted Per. (ft)	42.77	73.16	114.13
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.42	2.05	0.48
Alpha	2.01	Stream Power (lb/ft s)	0.24	19.43	0.30
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	0.29	1.16	0.26
C & E Loss (ft)	0.08	Cum SA (acres)	0.13	0.15	0.16

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	102.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.26	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	98.92	Flow Area (sq ft)	139.91	690.71	402.27
E.G. Slope (ft/ft)	0.003941	Area (sq ft)	139.91	690.71	402.27
Q Total (cfs)	7691.00	Flow (cfs)	121.72	7195.26	374.02
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	6.24	Avg. Vel. (ft/s)	0.87	10.42	0.93
Max Chl Dpth (ft)	13.21	Hydr. Depth (ft)	3.45	9.85	3.62
Conv. Total (cfs)	122516.2	Conv. (cfs)	1939.0	114619.2	5958.1
Length Wtd. (ft)	99.77	Wetted Per. (ft)	44.53	73.16	115.89
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.77	2.32	0.85
Alpha	2.61	Stream Power (lb/ft s)	0.67	24.20	0.79
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	0.49	1.40	0.52
C & E Loss (ft)	0.11	Cum SA (acres)	0.13	0.15	0.16

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.34	10.95	97.54	15.92999	97.15	17.62	96.79	21.73999	95.89
27.65999	94.62	35.09999	94.53	49.06999	94.37	49.70999	94.37	57.13	94.56
65.34999	94.85	66.09	94.88	67.92999	91.5	68.02	91.41	71.41	90.65
72.42	90.43	72.50999	90.41	72.57999	90.38	72.95	90.37	97.56	89.37
112.72	88.75	112.85	88.87	113.53	89.47	114.5	90.35	117.24	92.25
117.74	92.51	124.6	97.21	125.66	97.93	128.02	97.83	154.53	96.53
163.35	96.43	174.26	95.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.236	5.34999	.04	124.6	.23

Bank Sta: Left Right Coeff Contr. Expan.
65.34999 124.6 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.06	98	F
125.79	174.26	98	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	97.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	95.79	Reach Len. (ft)			
Crit W.S. (ft)	94.73	Flow Area (sq ft)		310.32	
E.G. Slope (ft/ft)	0.008004	Area (sq ft)	50.70	310.97	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	100.33	Top Width (ft)	43.15	57.18	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		5.50	
Conv. Total (cfs)	34114.8	Conv. (cfs)		34114.8	
Length Wtd. (ft)		Wetted Per. (ft)		60.95	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.54	
Alpha	1.00	Stream Power (lb/ft s)		25.02	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	98.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.040	
W.S. Elev (ft)	96.79	Reach Len. (ft)			
Crit W.S. (ft)	95.64	Flow Area (sq ft)		367.28	
E.G. Slope (ft/ft)	0.008009	Area (sq ft)	95.96	368.65	9.81
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	131.35	Top Width (ft)	47.72	58.63	24.99
Vel Total (ft/s)	10.80	Avg. Vel. (ft/s)		10.80	
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	44328.6	Conv. (cfs)		44328.6	
Length Wtd. (ft)		Wetted Per. (ft)		62.72	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.93	
Alpha	1.00	Stream Power (lb/ft s)		31.63	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	100.20	Element	Left OB	Channel	Right OB

Vel Head (ft)	2.17	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	98.03	Reach Len. (ft)			
Crit W.S. (ft)	97.03	Flow Area (sq ft)	162.32	442.33	57.21
E.G. Slope (ft/ft)	0.008010	Area (sq ft)	162.32	442.33	57.21
Q Total (cfs)	5541.00	Flow (cfs)	179.30	5326.44	35.25
Top Width (ft)	170.07	Top Width (ft)	61.16	59.25	49.66
Vel Total (ft/s)	8.37	Avg. Vel. (ft/s)	1.10	12.04	0.62
Max Chl Dpth (ft)	9.28	Hydr. Depth (ft)	2.65	7.47	1.15
Conv. Total (cfs)	61911.0	Conv. (cfs)	2003.4	59513.7	393.9
Length Wtd. (ft)		Wetted Per. (ft)	61.47	64.17	51.99
Min Ch El (ft)	88.75	Shear (lb/sq ft)	1.32	3.45	0.55
Alpha	1.99	Stream Power (lb/ft s)	1.46	41.51	0.34
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	102.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.50	Reach Len. (ft)			
Crit W.S. (ft)	98.79	Flow Area (sq ft)	257.74	529.43	130.21
E.G. Slope (ft/ft)	0.008013	Area (sq ft)	257.74	529.43	130.21
Q Total (cfs)	7691.00	Flow (cfs)	366.55	7188.14	136.31
Top Width (ft)	174.26	Top Width (ft)	65.35	59.25	49.66
Vel Total (ft/s)	8.38	Avg. Vel. (ft/s)	1.42	13.58	1.05
Max Chl Dpth (ft)	10.75	Hydr. Depth (ft)	3.94	8.94	2.62
Conv. Total (cfs)	85917.8	Conv. (cfs)	4094.8	80300.2	1522.8
Length Wtd. (ft)		Wetted Per. (ft)	66.84	64.17	53.46
Min Ch El (ft)	88.75	Shear (lb/sq ft)	1.93	4.13	1.22
Alpha	2.45	Stream Power (lb/ft s)	2.74	56.04	1.28
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.

SUMMARY OF MANNING'S N VALUES

River:BrushyCreek

Reach	River Sta.	n1	n2	n3
BrushyCreek	1900	.23	.04	.23
BrushyCreek	1800	.23	.04	.23
BrushyCreek	1700	.23	.04	.23
BrushyCreek	1600	.23	.04	.23
BrushyCreek	1500	.23	.04	.23
BrushyCreek	1400	.23	.04	.23
BrushyCreek	1300	.23	.04	.23
BrushyCreek	1200	.23	.04	.23
BrushyCreek	1100	.23	.04	.23
BrushyCreek	1050	.23	.04	.23
BrushyCreek	1000	.23	.04	.23
BrushyCreek	987.5	Bridge		
BrushyCreek	975	.23	.04	.23
BrushyCreek	950	.23	.04	.23
BrushyCreek	900	.23	.04	.23
BrushyCreek	800	.23	.04	.23
BrushyCreek	700	.23	.04	.23

SUMMARY OF REACH LENGTHS

River: BrushyCreek

Reach	River Sta.	Left	Channel	Right
BrushyCreek	1900	105.8	100	118.29
BrushyCreek	1800	439.95	99.76	53.66
BrushyCreek	1700	102.93	100.24	97.47
BrushyCreek	1600	100.17	99.43	99.79
BrushyCreek	1500	79.93	100.57	123.17
BrushyCreek	1400	98.46	100	105.25
BrushyCreek	1300	664.31	100	63.68
BrushyCreek	1200	114.91	100	120.57
BrushyCreek	1100	20.56	50	255.03
BrushyCreek	1050	25.83	50	71.25
BrushyCreek	1000	25.88	25.66	27.03
BrushyCreek	987.5	Bridge		
BrushyCreek	975	658.96	24.34	24.13
BrushyCreek	950	756.2	50	53.58
BrushyCreek	900	108.83	100	90.91
BrushyCreek	800	107.86	100	85.5
BrushyCreek	700			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: BrushyCreek

Reach	River Sta.	Contr.	Expan.
BrushyCreek	1900	.1	.3
BrushyCreek	1800	.1	.3
BrushyCreek	1700	.1	.3
BrushyCreek	1600	.1	.3
BrushyCreek	1500	.1	.3
BrushyCreek	1400	.1	.3
BrushyCreek	1300	.1	.3
BrushyCreek	1200	.1	.3
BrushyCreek	1100	.1	.3
BrushyCreek	1050	.1	.3
BrushyCreek	1000	.3	.5
BrushyCreek	987.5	Bridge	
BrushyCreek	975	.3	.5
BrushyCreek	950	.1	.3
BrushyCreek	900	.1	.3
BrushyCreek	800	.1	.3
BrushyCreek	700	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : PR24Conc

River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 10 yr
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 25 yr
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

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          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1900     Profile: 100 yr
     Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the
water surface
          whose main channel velocity head was the closest to the previously computed cross section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1900     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 100 yr
     Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the
water surface
          whose main channel velocity head was the closest to the previously computed cross section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
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River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1400   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1400   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1400   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1400   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1300   Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1300   Profile: 25 yr
     Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
             whose main channel velocity head was the closest to the previously computed cross section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1300   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1300   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1200   Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.

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     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
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     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Downstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Downstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 25 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
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River: BrushyCreek Reach: BrushyCreek RS: 975 Profile: 500 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
  used.
River: BrushyCreek Reach: BrushyCreek RS: 950 Profile: 10 yr
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 950 Profile: 25 yr
  Warning:Divided flow computed for this cross-section.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 950 Profile: 100 yr
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 950 Profile: 500 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 900 Profile: 10 yr
  Warning:Divided flow computed for this cross-section.
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 900 Profile: 25 yr
  Warning:Divided flow computed for this cross-section.
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 900 Profile: 100 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The cross section had to be extended vertically during the critical depth calculations.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 900 Profile: 500 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The cross section had to be extended vertically during the critical depth calculations.
River: BrushyCreek Reach: BrushyCreek RS: 800 Profile: 10 yr
  Warning:Divided flow computed for this cross-section.
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 800 Profile: 25 yr
  Warning:Divided flow computed for this cross-section.
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 800 Profile: 100 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The cross section had to be extended vertically during the critical depth calculations.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 800 Profile: 500 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
  This may indicate the need for additional cross sections.

Warning:The cross section had to be extended vertically during the critical depth calculations.

River: BrushyCreek Reach: BrushyCreek RS: 700 Profile: 10 yr

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: BrushyCreek Reach: BrushyCreek RS: 700 Profile: 25 yr

Warning:Divided flow computed for this cross-section.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: BrushyCreek Reach: BrushyCreek RS: 700 Profile: 100 yr

Warning:The cross section had to be extended vertically during the critical depth calculations.

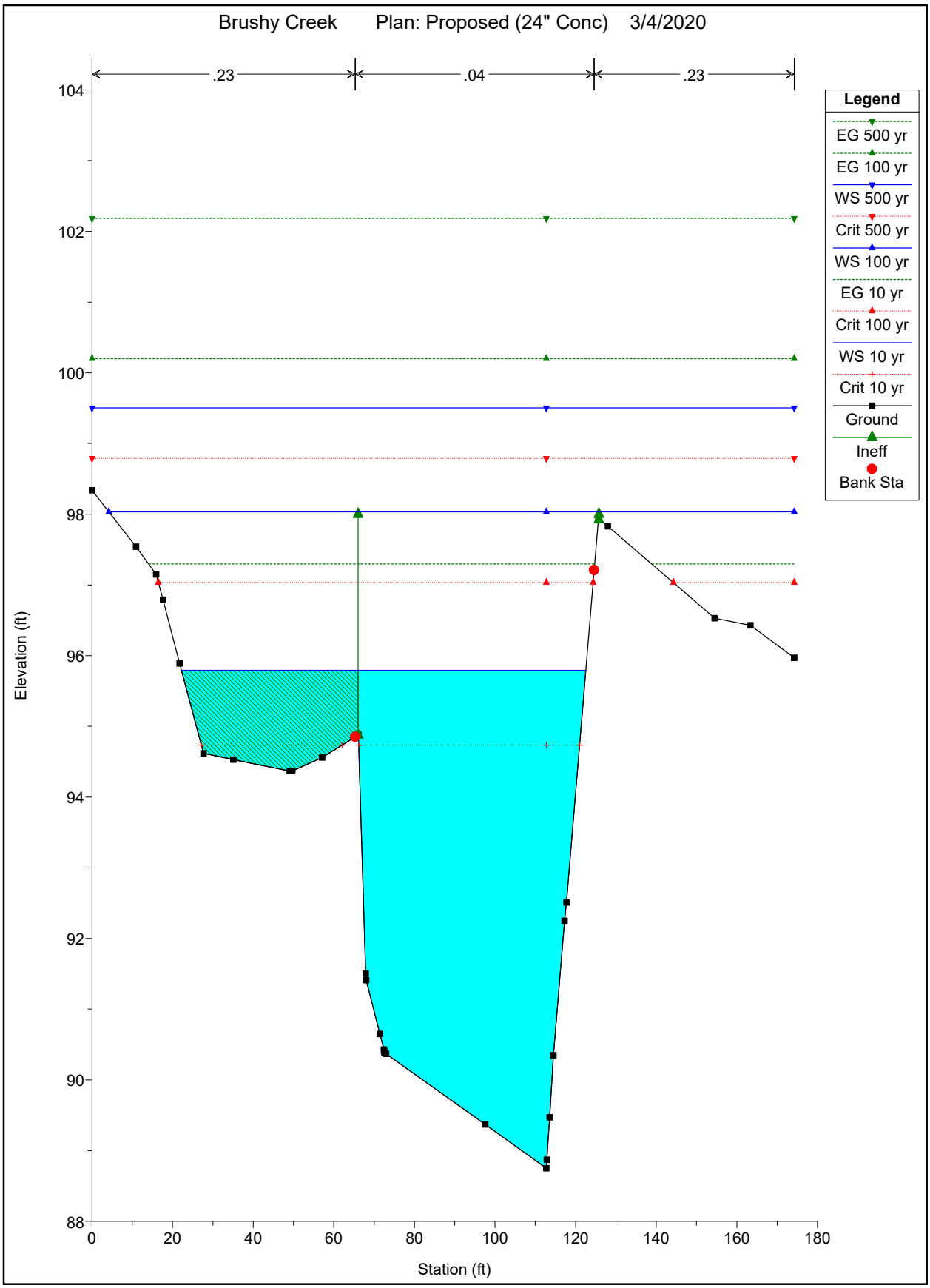
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: BrushyCreek Reach: BrushyCreek RS: 700 Profile: 500 yr

Warning:The cross section had to be extended vertically during the critical depth calculations.

HEC-RAS Plan: PR24Conc River: BrushyCreek Reach: BrushyCreek

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BrushyCreek	1900	25 yr	3967.00	89.64	102.17	97.28	102.85	0.001719	6.65	602.94	150.10	0.38
BrushyCreek	1900	100 yr	5541.00	89.64	103.03	98.73	103.96	0.002211	7.99	1076.18	150.10	0.44
BrushyCreek	1900	500 yr	7691.00	89.64	105.09	100.39	106.27	0.002256	9.09	1384.74	150.10	0.45
BrushyCreek	1800	25 yr	3967.00	89.88	100.96	97.95	102.51	0.004057	10.00	397.36	101.51	0.57
BrushyCreek	1800	100 yr	5541.00	89.88	103.00	99.63	103.71	0.001475	6.81	923.80	101.51	0.36
BrushyCreek	1800	500 yr	7691.00	89.88	105.05	101.65	106.01	0.001602	7.95	1131.66	101.51	0.39
BrushyCreek	1700	25 yr	3967.00	88.92	101.35	96.54	101.98	0.001738	6.39	623.37	174.52	0.38
BrushyCreek	1700	100 yr	5541.00	88.92	102.83	98.00	103.54	0.001751	7.02	1280.23	174.52	0.39
BrushyCreek	1700	500 yr	7691.00	88.92	104.91	99.64	105.81	0.001760	7.96	1643.36	174.52	0.40
BrushyCreek	1600	25 yr	3967.00	89.51	101.00	96.12	101.78	0.001944	7.09	564.09	207.76	0.39
BrushyCreek	1600	100 yr	5541.00	89.51	102.61	97.62	103.36	0.001772	7.44	1519.01	207.76	0.38
BrushyCreek	1600	500 yr	7691.00	89.51	104.67	99.33	105.62	0.001864	8.51	1947.05	207.76	0.40
BrushyCreek	1500	25 yr	3967.00	89.82	100.52	96.73	101.53	0.002755	8.09	495.30	263.66	0.47
BrushyCreek	1500	100 yr	5541.00	89.82	102.45	98.17	103.17	0.001869	7.55	1814.81	263.66	0.40
BrushyCreek	1500	500 yr	7691.00	89.82	104.55	99.90	105.41	0.001865	8.44	2368.07	263.66	0.41
BrushyCreek	1400	25 yr	3967.00	87.99	100.27	96.29	101.25	0.002590	7.94	502.94	270.78	0.45
BrushyCreek	1400	100 yr	5541.00	87.99	102.28	97.79	102.98	0.001757	7.43	1863.03	270.78	0.39
BrushyCreek	1400	500 yr	7691.00	87.99	104.38	99.50	105.21	0.001762	8.32	2431.61	270.78	0.40
BrushyCreek	1300	25 yr	3967.00	90.00	100.18	96.34	100.95	0.002235	7.05	567.53	187.29	0.43
BrushyCreek	1300	100 yr	5541.00	90.00	101.96	97.67	102.77	0.002033	7.49	1177.63	187.29	0.42
BrushyCreek	1300	500 yr	7691.00	90.00	104.00	99.16	105.01	0.002010	8.43	1559.66	187.29	0.43
BrushyCreek	1200	25 yr	3967.00	87.65	99.93	96.21	100.70	0.002540	7.14	761.09	172.66	0.44
BrushyCreek	1200	100 yr	5541.00	87.65	101.51	97.68	102.50	0.002641	8.18	1034.61	172.66	0.46
BrushyCreek	1200	500 yr	7691.00	87.65	103.50	99.20	104.72	0.002637	9.23	1376.78	172.66	0.47
BrushyCreek	1100	25 yr	3967.00	89.81	100.06	96.21	100.42	0.001105	4.85	978.32	172.14	0.30
BrushyCreek	1100	100 yr	5541.00	89.81	101.71	97.64	102.18	0.001146	5.58	1262.31	172.14	0.31
BrushyCreek	1100	500 yr	7691.00	89.81	103.76	99.30	104.36	0.001150	6.34	1616.14	172.14	0.32
BrushyCreek	1050	25 yr	3967.00	86.90	99.77	94.91	100.33	0.001670	6.07	875.50	208.81	0.36
BrushyCreek	1050	100 yr	5541.00	86.90	101.36	96.31	102.08	0.001778	6.99	1206.87	208.81	0.38
BrushyCreek	1050	500 yr	7691.00	86.90	103.36	97.93	104.26	0.001794	7.91	1625.49	208.81	0.40
BrushyCreek	1000	25 yr	3967.00	89.65	99.66	95.84	100.23	0.002136	6.06	674.85	146.69	0.41
BrushyCreek	1000	100 yr	5541.00	89.65	101.28	97.07	101.98	0.002103	6.76	933.21	178.42	0.42
BrushyCreek	1000	500 yr	7691.00	89.65	103.33	98.48	104.15	0.001854	7.36	1374.22	216.79	0.41
BrushyCreek	987.5		Bridge									
BrushyCreek	975	25 yr	3967.00	88.21	99.57	94.59	100.00	0.001372	5.30	748.05	94.04	0.33
BrushyCreek	975	100 yr	5541.00	88.21	101.12	95.79	101.70	0.001501	6.15	1003.04	216.98	0.36
BrushyCreek	975	500 yr	7691.00	88.21	103.07	97.21	103.80	0.001479	6.93	1433.90	220.59	0.36
BrushyCreek	950	25 yr	3967.00	89.01	99.26	95.30	99.90	0.002224	6.43	638.55	134.71	0.41
BrushyCreek	950	100 yr	5541.00	89.01	100.71	96.57	101.57	0.002372	7.47	849.99	153.91	0.44
BrushyCreek	950	500 yr	7691.00	89.01	102.54	98.07	103.64	0.002402	8.51	1136.49	157.96	0.46
BrushyCreek	900	25 yr	3967.00	87.52	98.46	95.01	99.69	0.003993	8.91	445.83	211.71	0.53
BrushyCreek	900	100 yr	5541.00	87.52	99.80	96.69	101.33	0.004356	10.21	914.42	220.64	0.57
BrushyCreek	900	500 yr	7691.00	87.52	101.46	99.30	103.36	0.004618	11.63	1279.97	220.64	0.60
BrushyCreek	800	25 yr	3967.00	88.05	98.16	95.86	99.24	0.004186	8.35	496.14	171.10	0.57
BrushyCreek	800	100 yr	5541.00	88.05	99.50	97.13	100.85	0.004239	9.47	841.92	221.84	0.59
BrushyCreek	800	500 yr	7691.00	88.05	101.26	98.92	102.84	0.003941	10.42	1232.90	221.84	0.59
BrushyCreek	700	25 yr	3967.00	88.75	96.79	95.64	98.60	0.008009	10.80	367.28	131.35	0.76
BrushyCreek	700	100 yr	5541.00	88.75	98.03	97.03	100.20	0.008010	12.04	661.86	170.07	0.78
BrushyCreek	700	500 yr	7691.00	88.75	99.50	98.79	102.18	0.008013	13.58	917.38	174.26	0.80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.23
.04
.23
Legend
EG 500 yr
EG 100 yr
WS 500 yr
Crit 500 yr
WS 100 yr
EG 10 yr
Crit 100 yr
WS 10 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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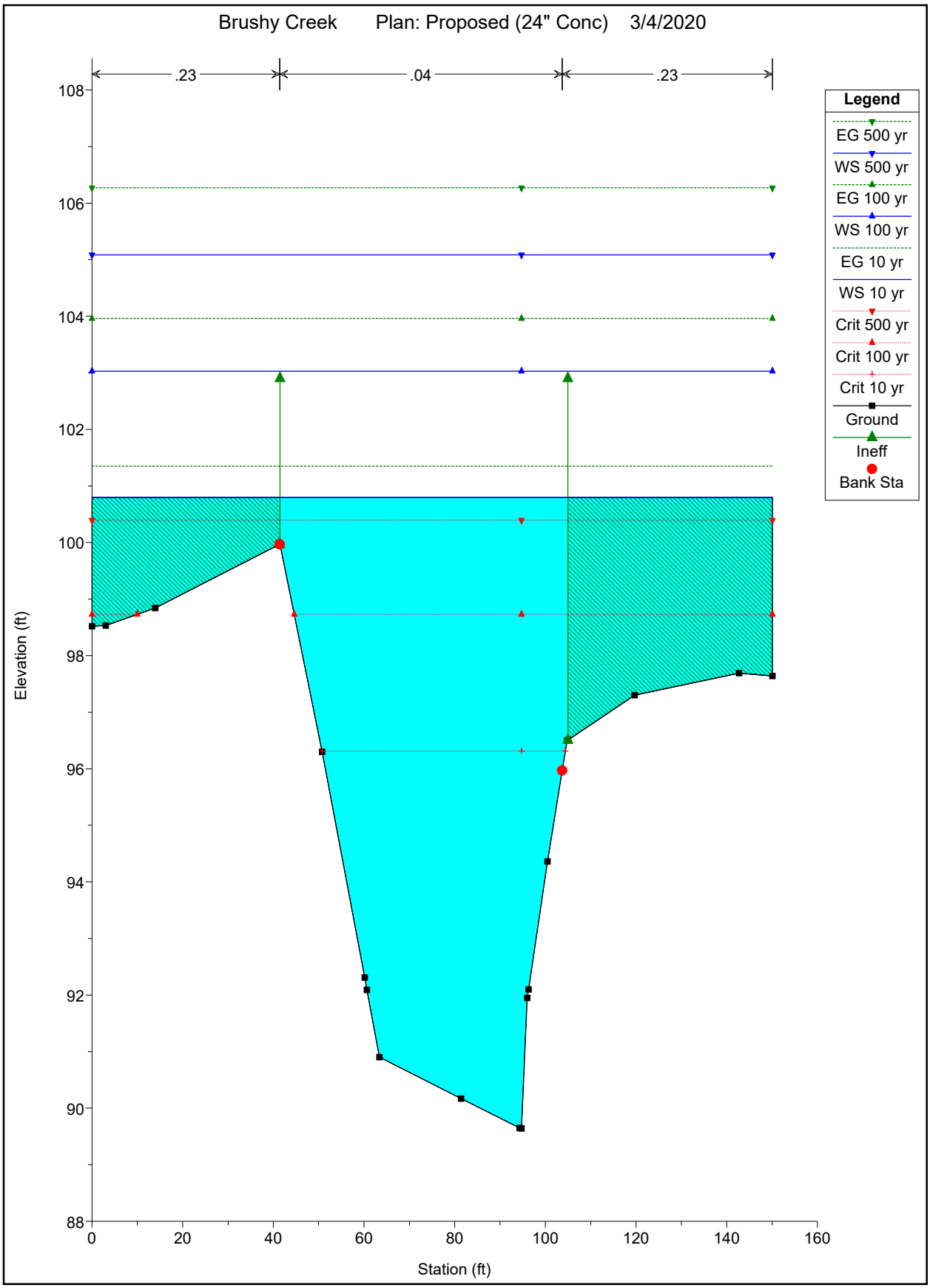
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Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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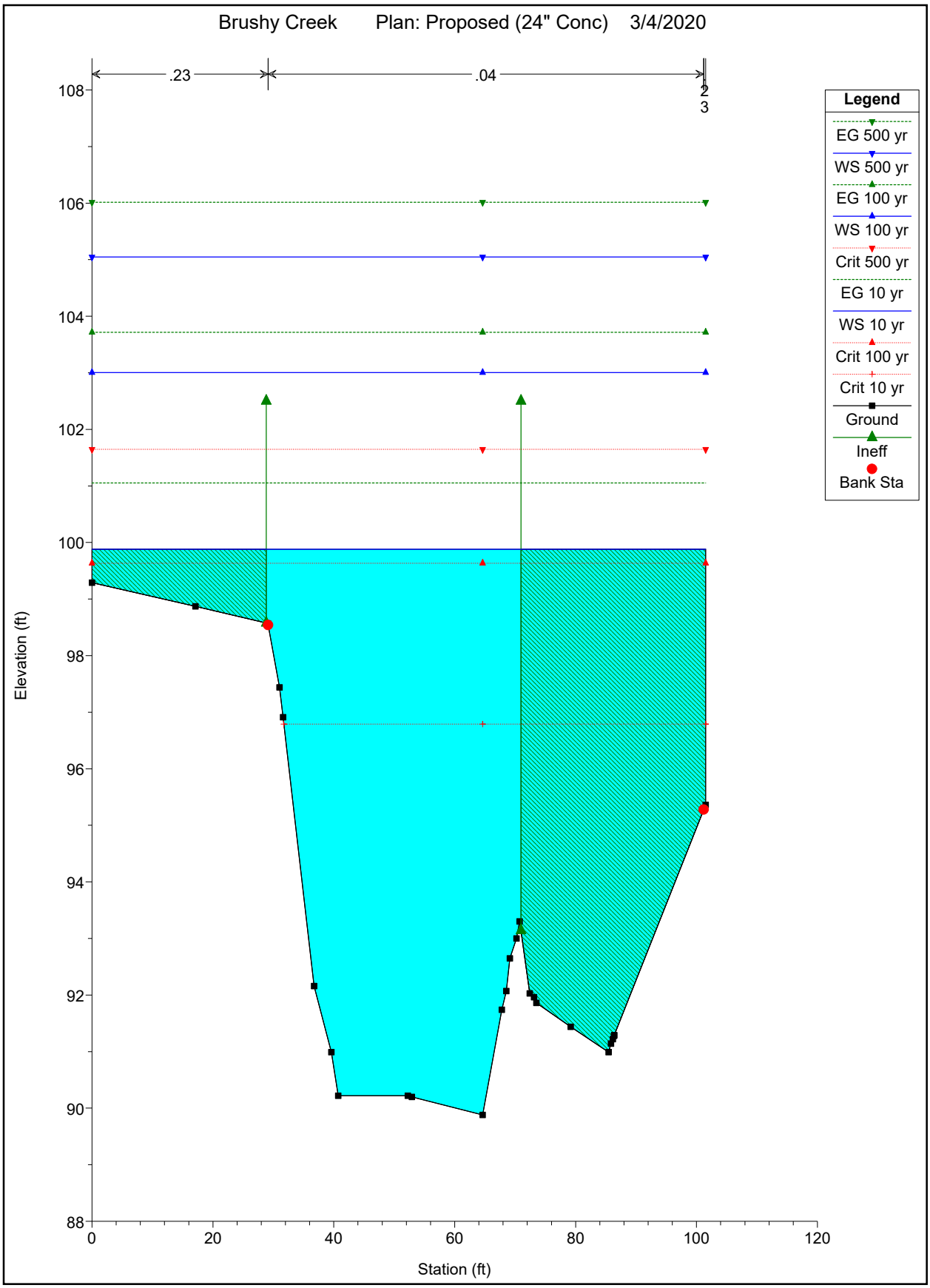
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.04
1
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3
Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
Crit 500 yr
EG 10 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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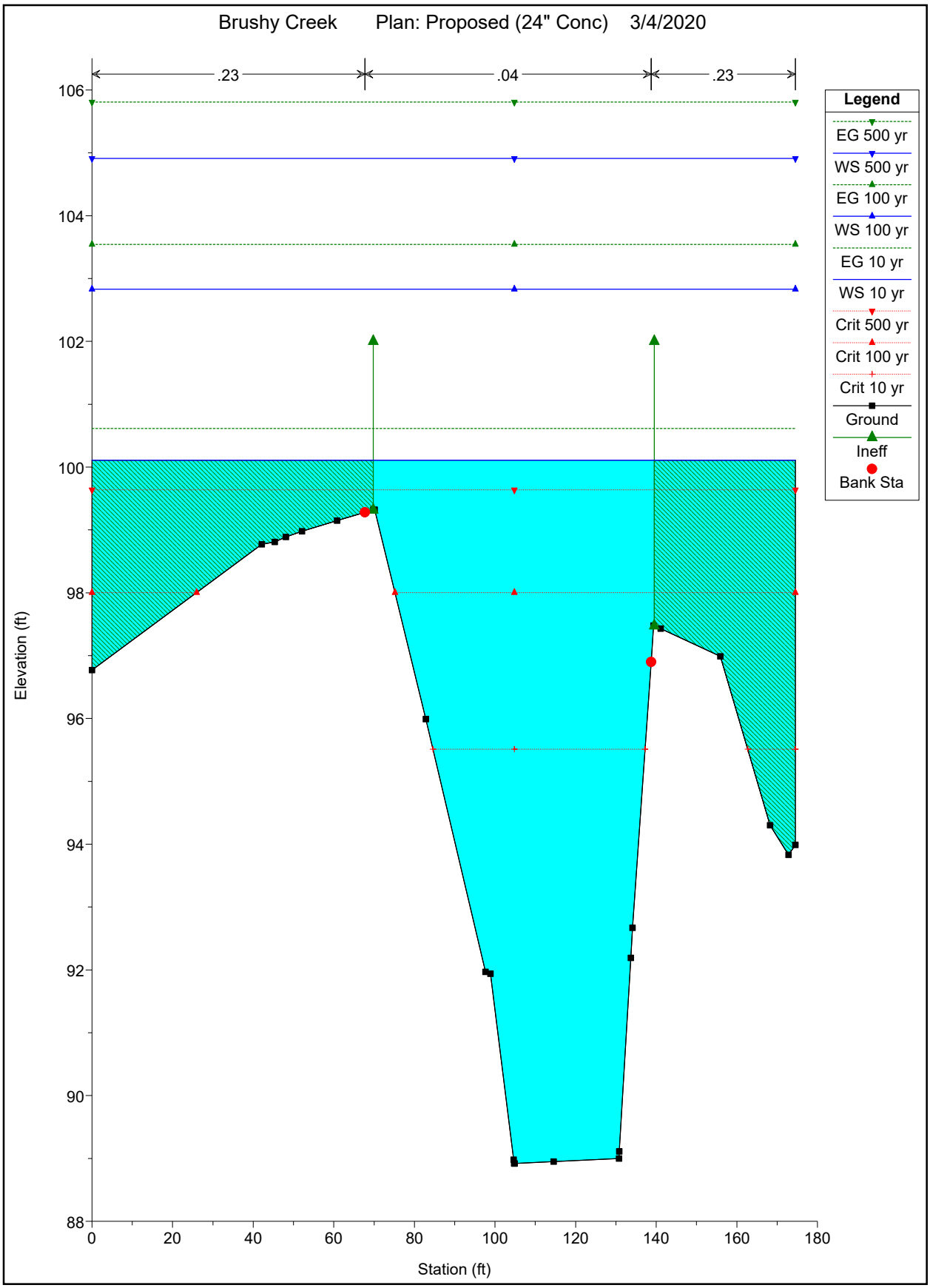
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Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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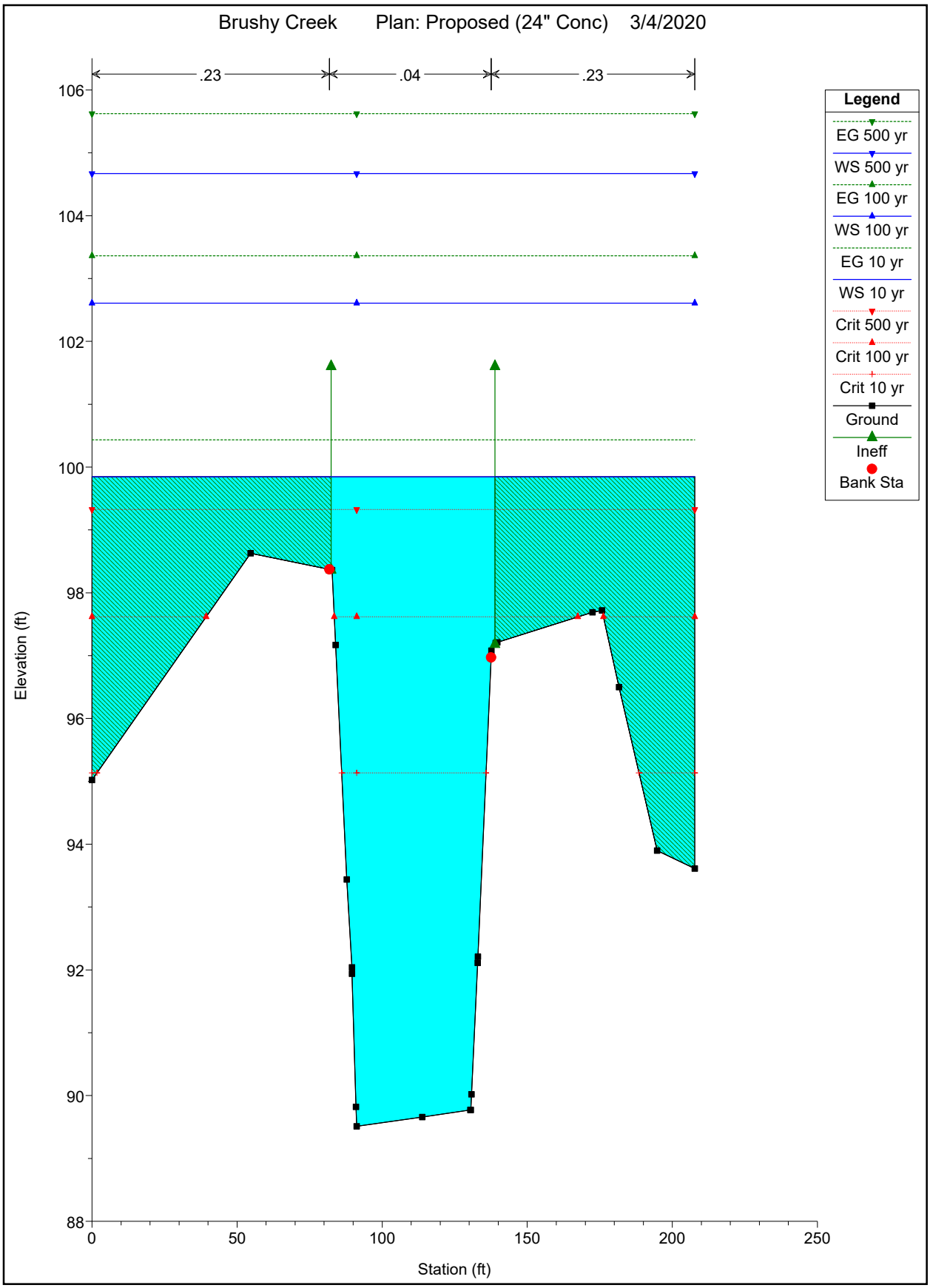
Brushy Creek Plan: Proposed (24" Conc) 3/4/2020
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Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
WS 10 yr
Crit 500 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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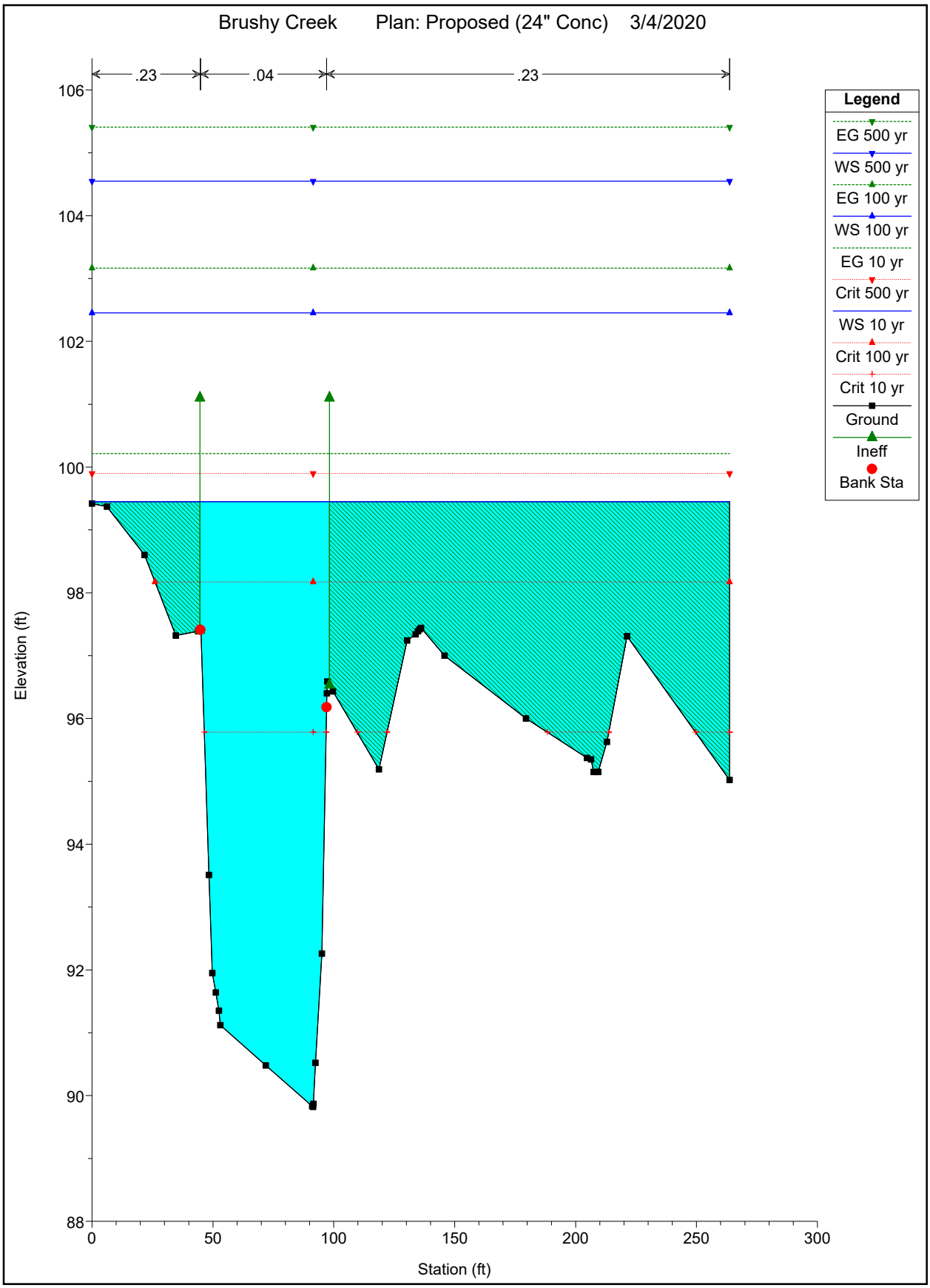
Brushy Creek Plan: Proposed (24" Conc) 3/4/2020
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Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
Crit 500 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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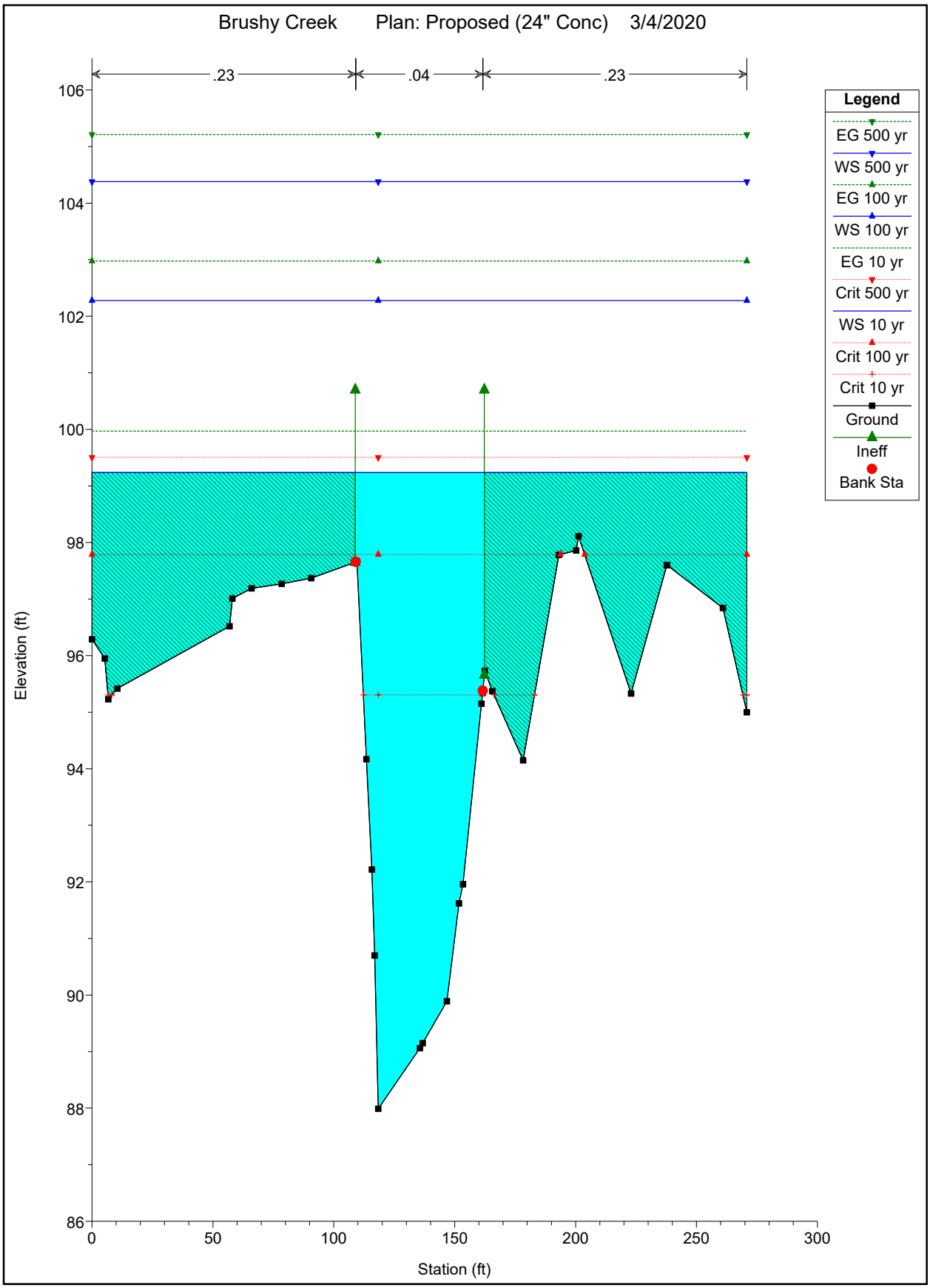
Brushy Creek Plan: Proposed (24" Conc) 3/4/2020
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Legend
EG 500 yr
WS 500 yr
EG 100 yr
WS 100 yr
EG 10 yr
Crit 500 yr
WS 10 yr
Crit 100 yr
Crit 10 yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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86
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150
200
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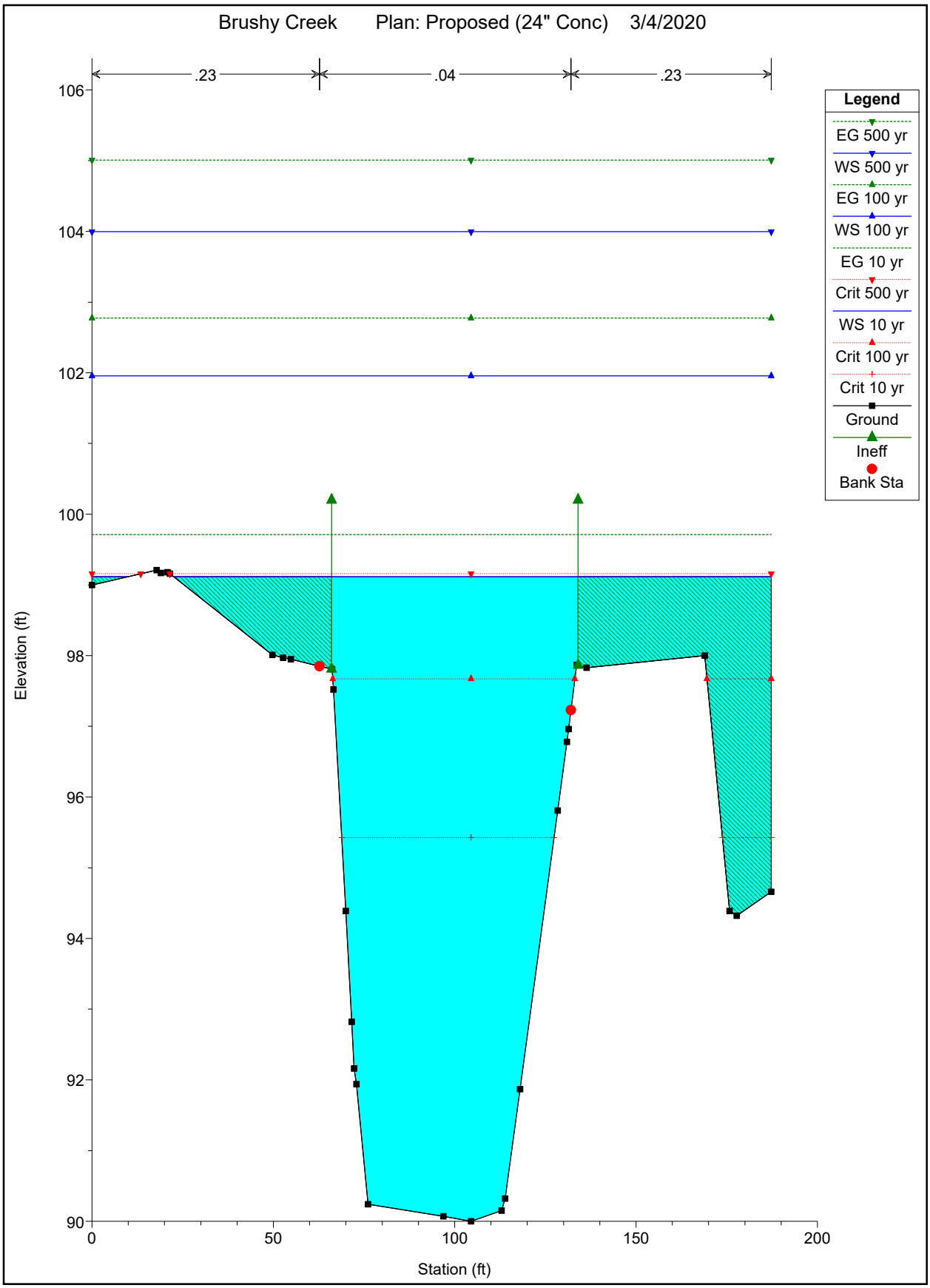
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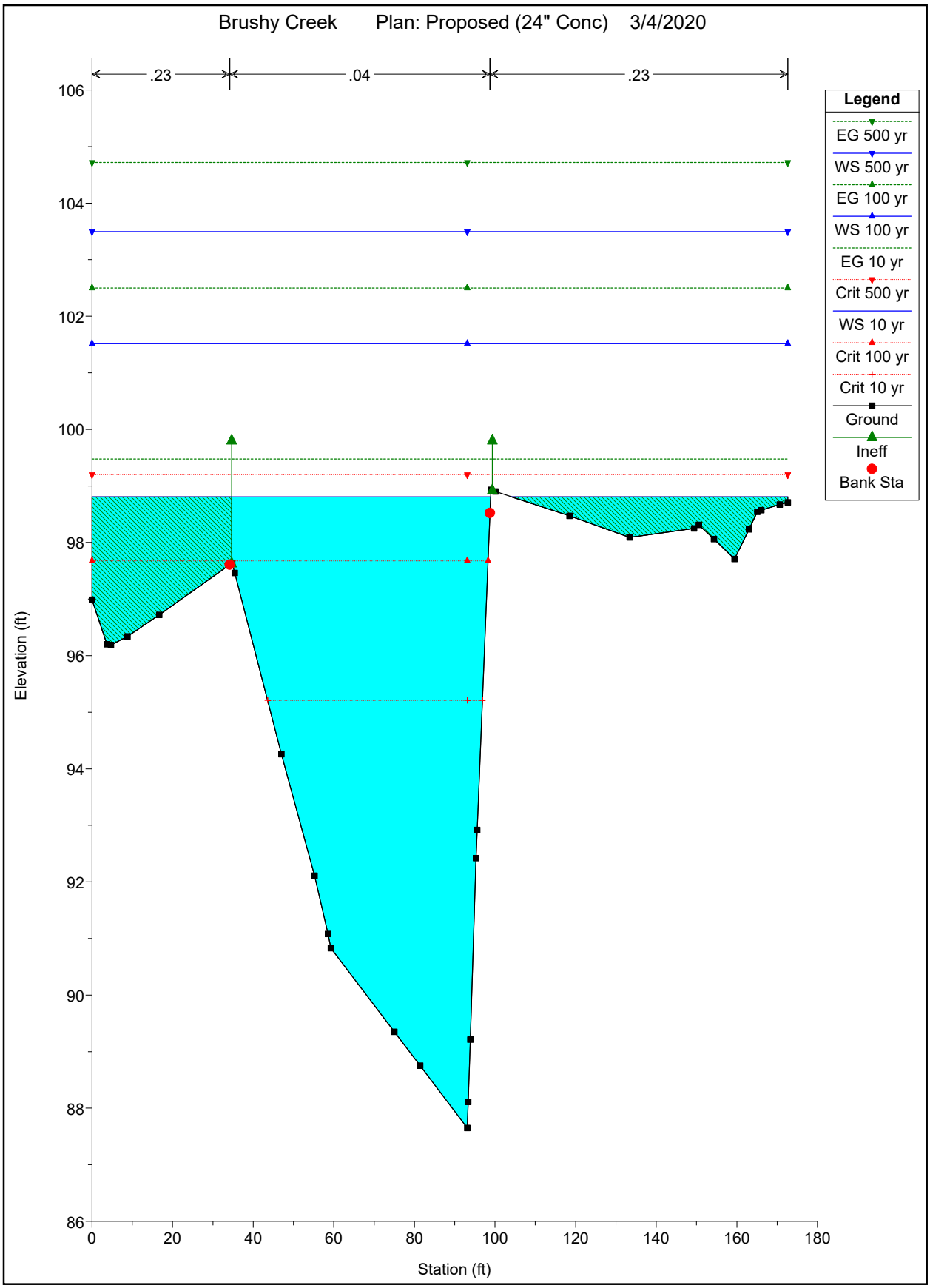
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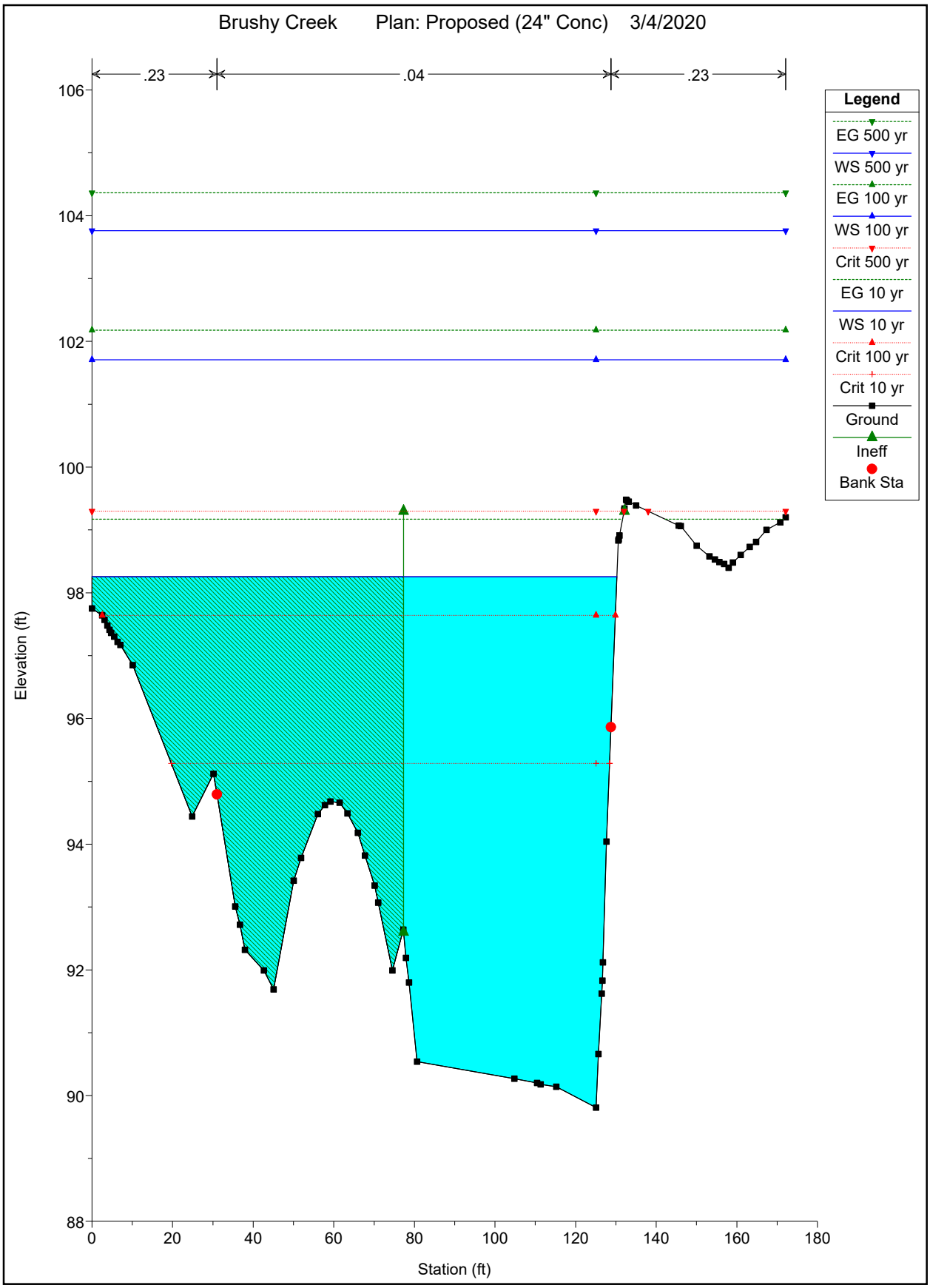
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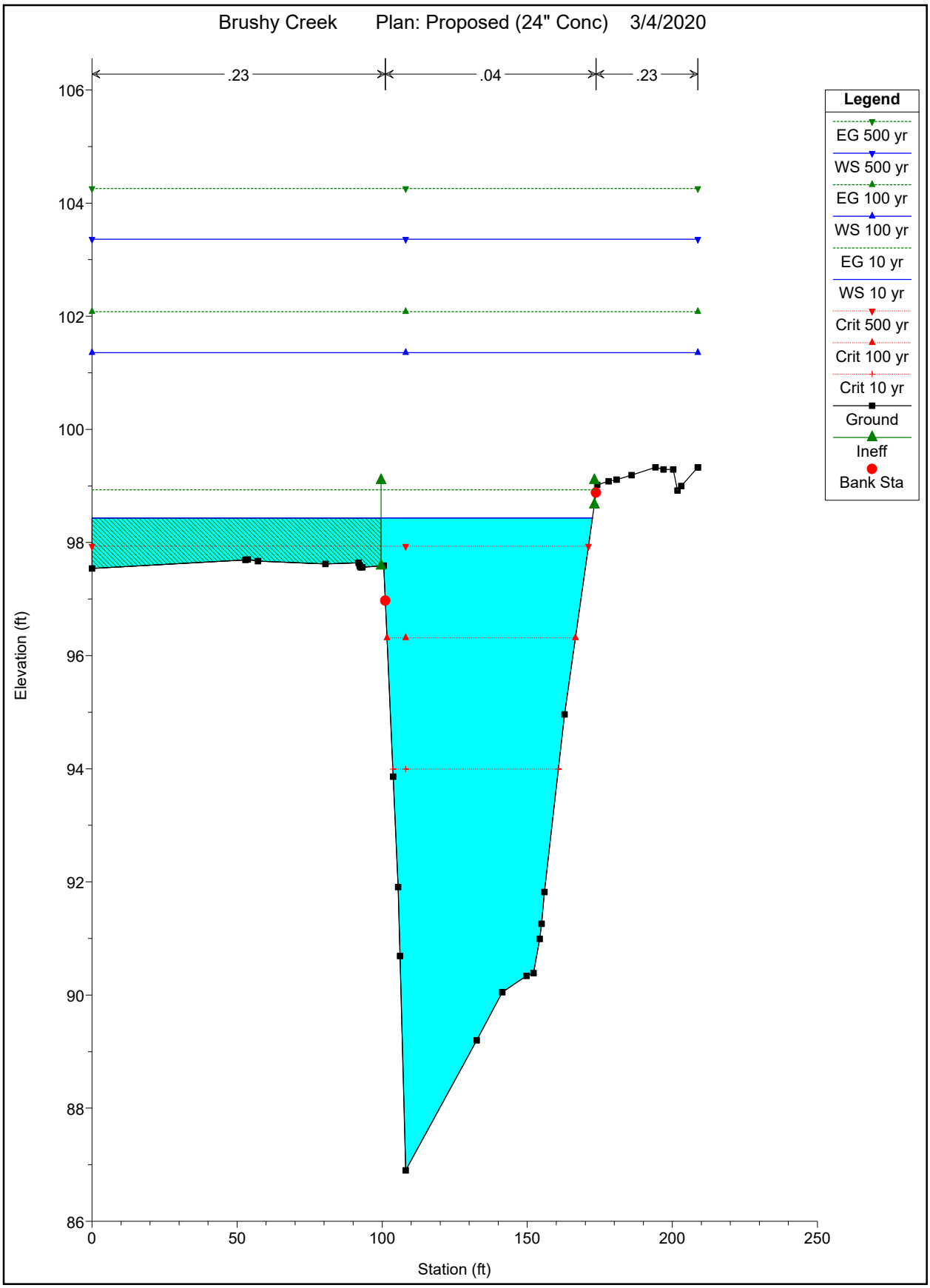
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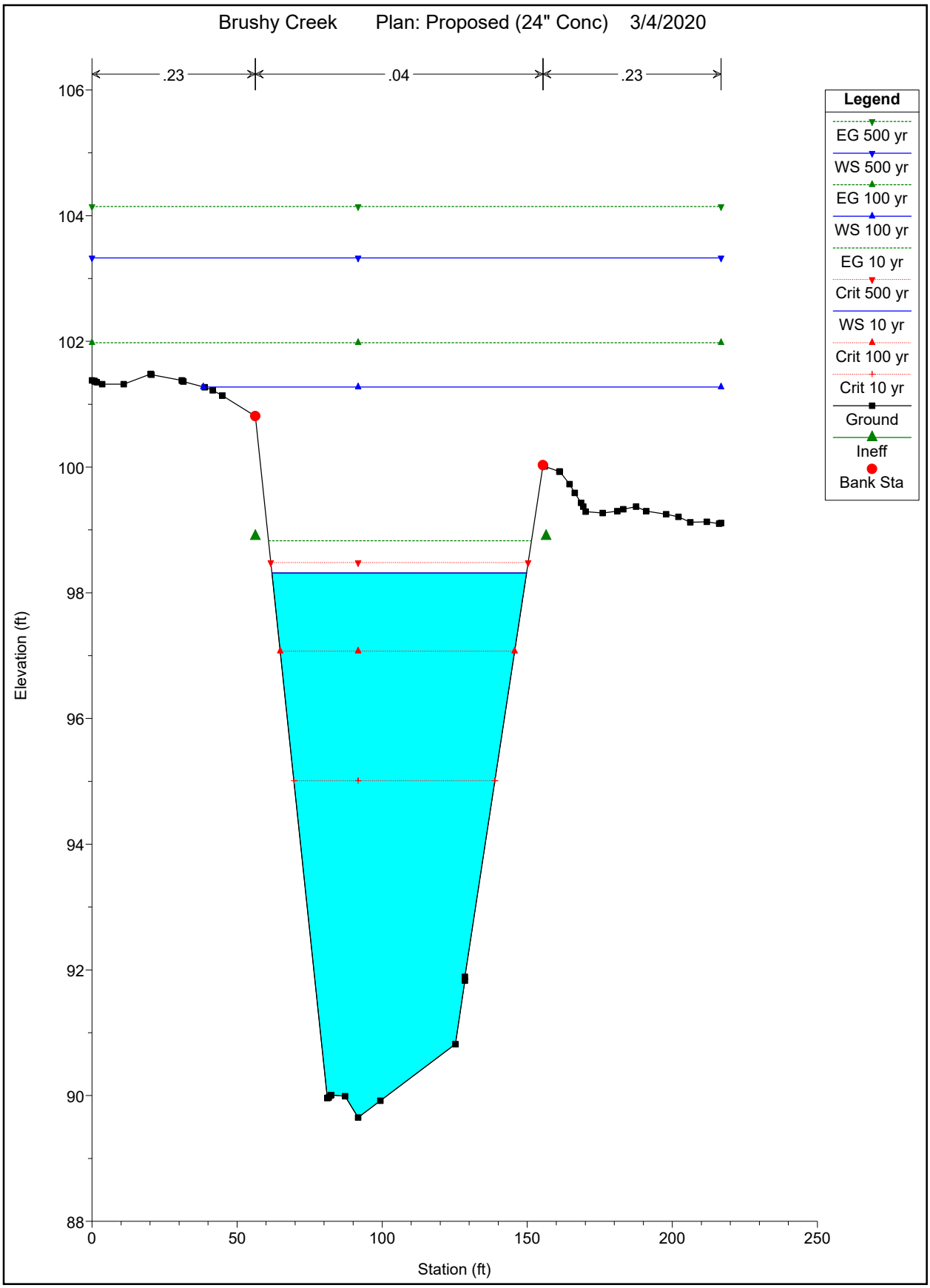
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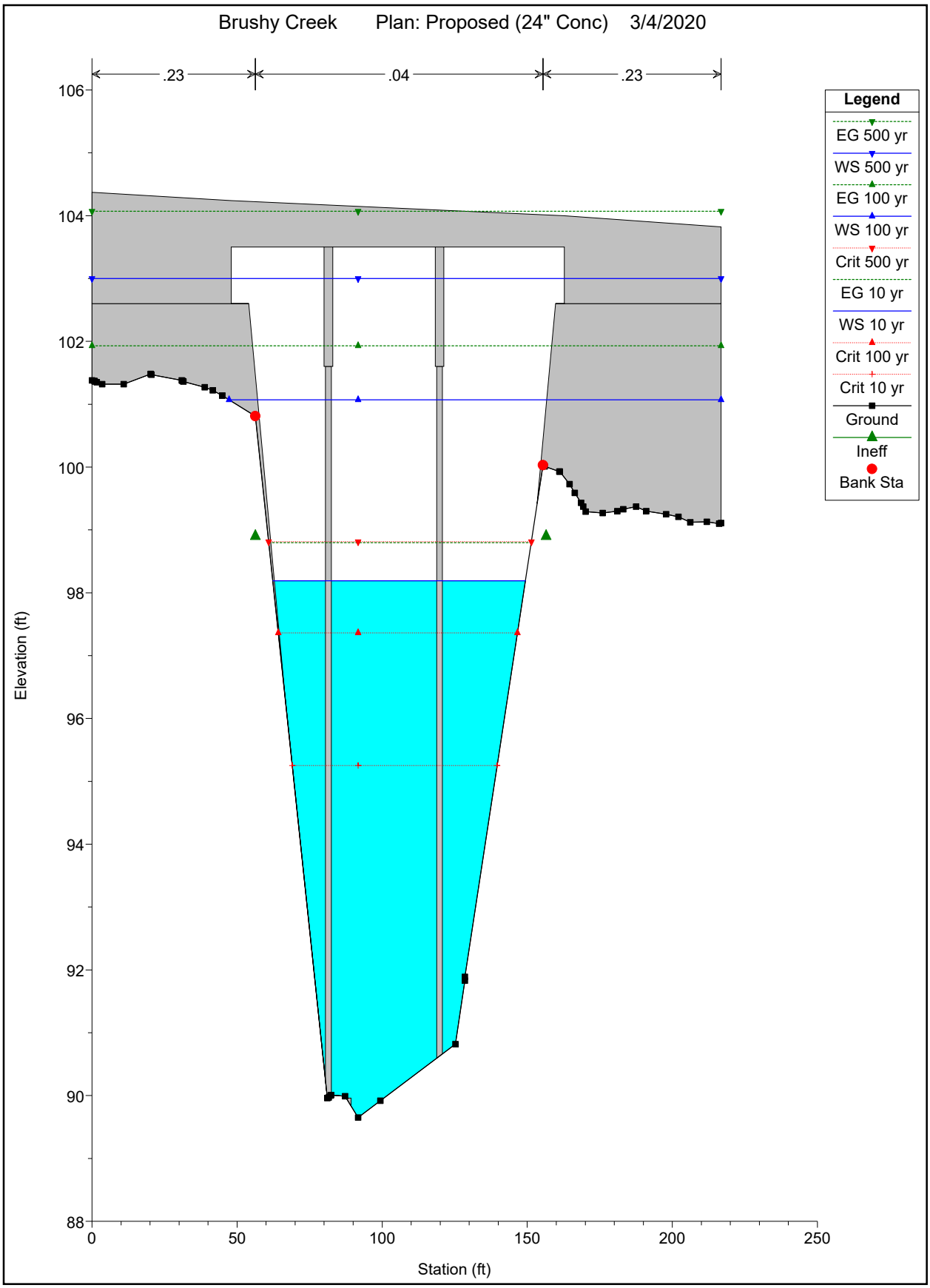
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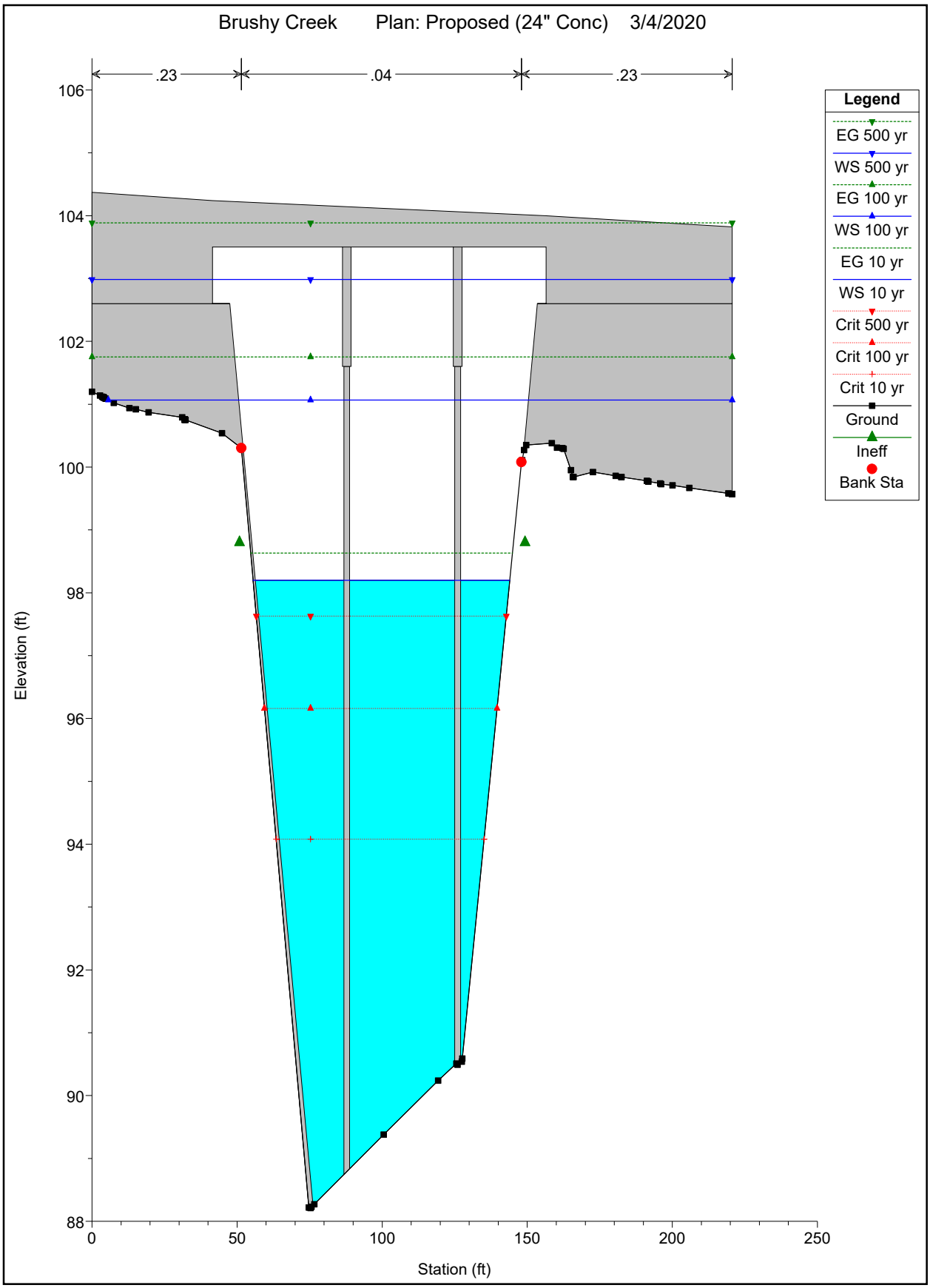
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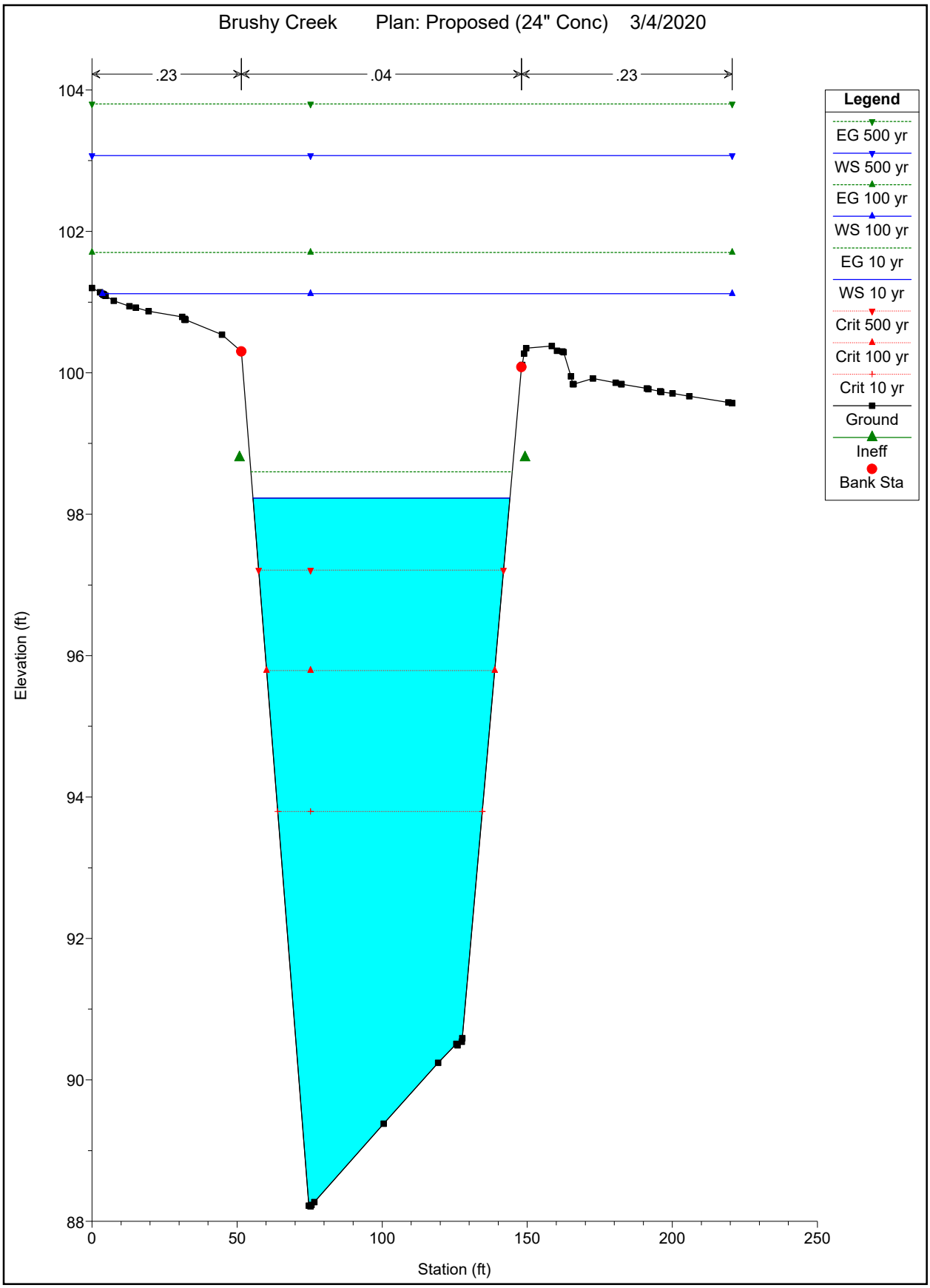
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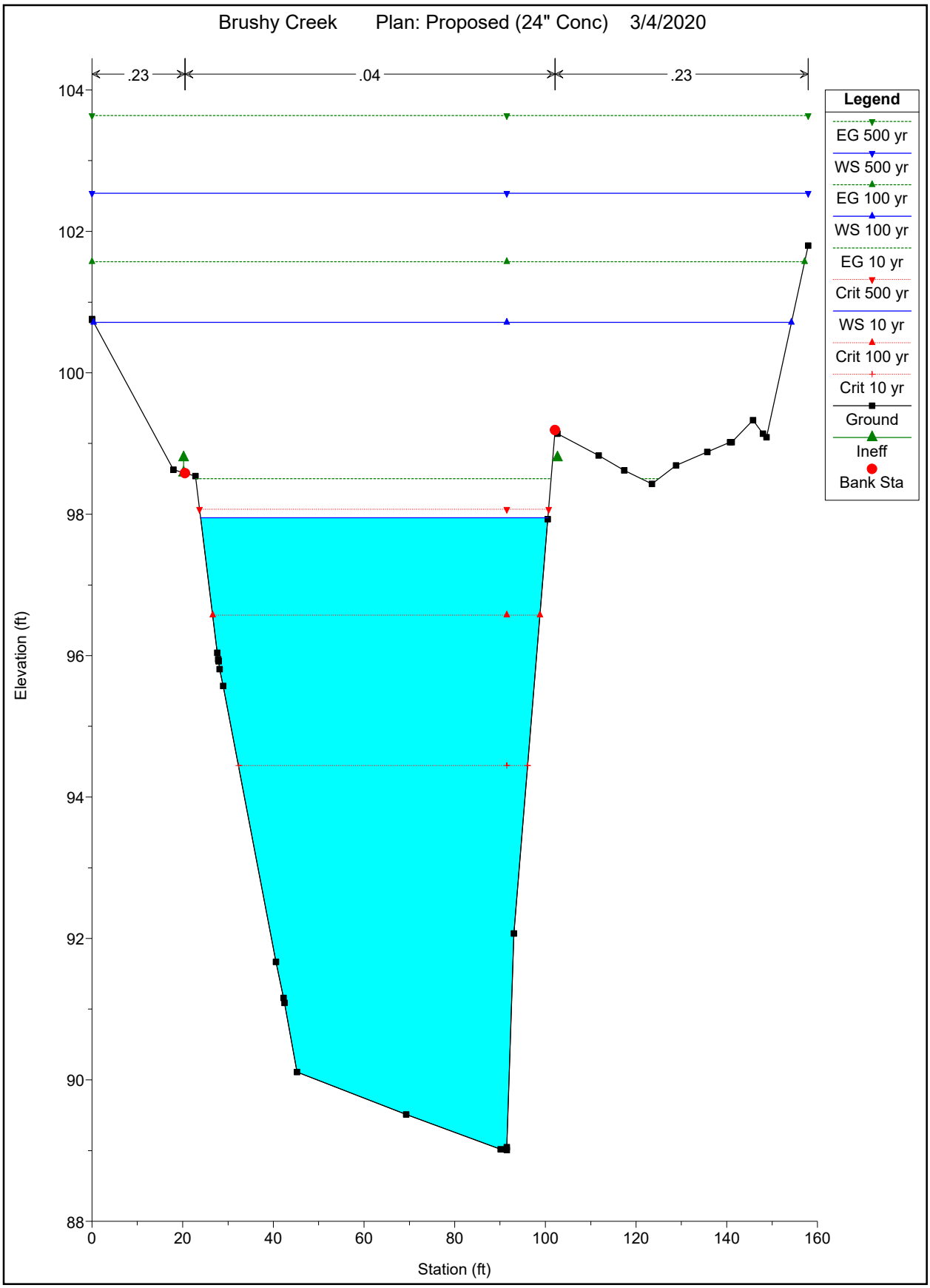
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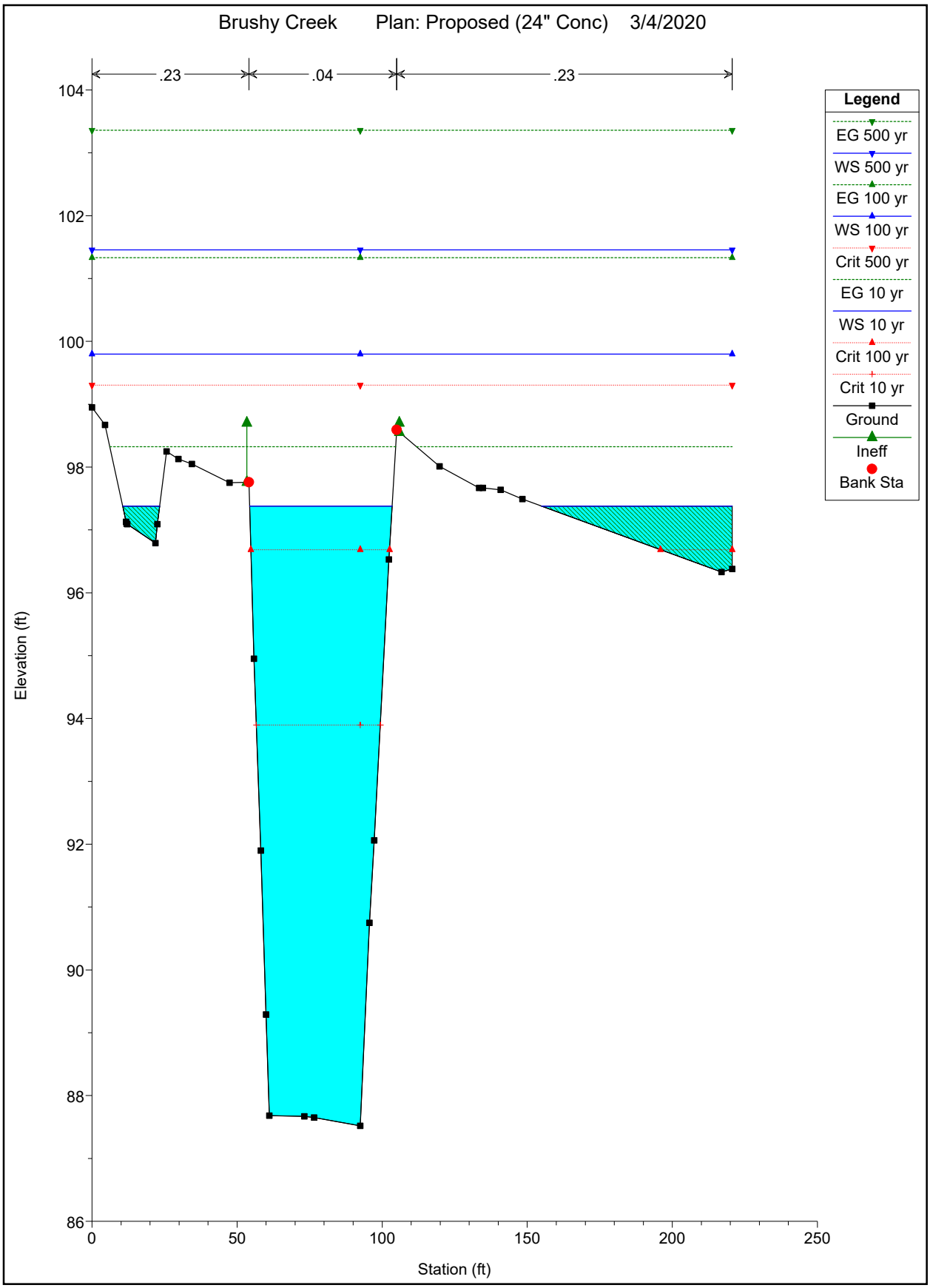
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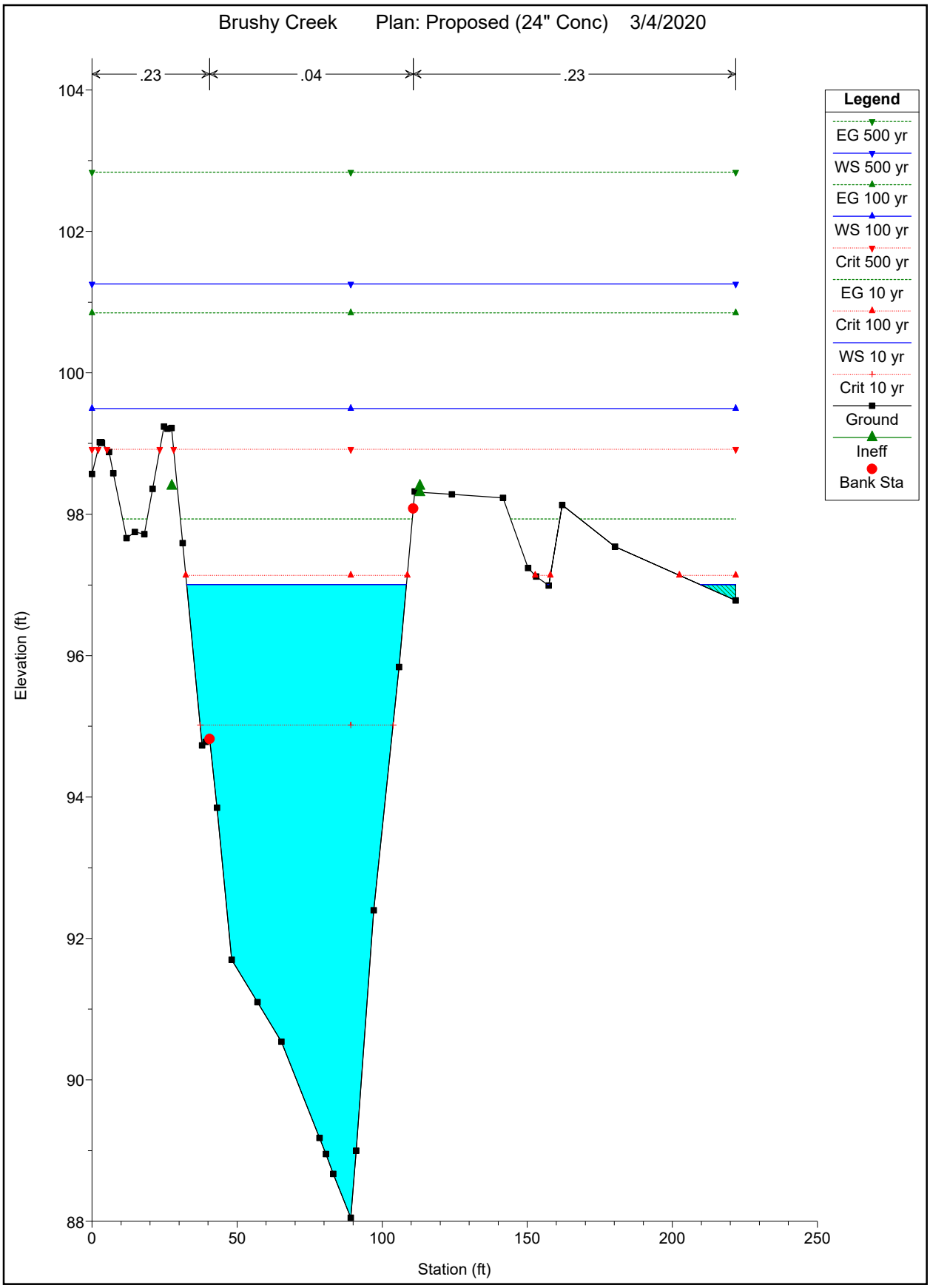
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HEC-RAS HEC-RAS 5.0.7 March 2019
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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PROJECT DATA
Project Title: Brushy Creek
Project File : BrushyCreek.prj
Run Date and Time: 3/5/2020 9:40:49 PM

Project in English units

Project Description:
O.C Phillips Bridge

PLAN DATA

Plan Title: Temp Bridge (30-50-30)
Plan File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.p19

Geometry Title: Temp Bridge (30-50-30)
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g08

Flow Title : USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

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

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

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

FLOW DATA

Flow Title: USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

Flow Data (cfs)

River	Reach	RS	2 yr	10 yr	25 yr	50 yr	100 yr	500 yr
BrushyCreek	BrushyCreek	1900	1541	3052	3967	4741	5541	7691

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
BrushyCreek	BrushyCreek	2 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	10 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	25 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	50 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	100 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	500 yr		Normal S = 0.008

GEOMETRY DATA

Geometry Title: Temp Bridge (30-50-30)
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g08

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1900

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.52	3.02	98.53	13.95	98.84	41.43	99.97	41.46	99.97
50.78	96.3	60.15	92.31	60.61	92.09	63.39	90.9	81.41	90.17
94.33	89.65	94.7	89.64	96	91.95	96.28	92.1	100.45	94.36
103.72	95.97	104.79	96.5	105.03	96.51	119.69	97.3	142.69	97.69
150.1	97.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	41.43	.04	103.72	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
41.43 103.72 105.8 100 118.29 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	41.48	102.7	F
104.94	150.1	102.7	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.49	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.96	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	96.31	Flow Area (sq ft)		520.78	5.73
E.G. Slope (ft/ft)	0.001593	Area (sq ft)	74.99	520.83	169.72
Q Total (cfs)	3052.00	Flow (cfs)		3048.12	3.88
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)		5.85	0.68
Max Chl Dpth (ft)	11.32	Hydr. Depth (ft)		8.37	4.69
Conv. Total (cfs)	76461.1	Conv. (cfs)		76363.9	97.2
Length Wtd. (ft)	100.01	Wetted Per. (ft)		66.40	1.34
Min Ch El (ft)	89.64	Shear (lb/sq ft)		0.78	0.42
Alpha	1.02	Stream Power (lb/ft s)		4.57	0.29
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	4.41	13.87	3.99
C & E Loss (ft)	0.06	Cum SA (acres)	2.36	1.79	1.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	103.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.84	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	97.28	Flow Area (sq ft)	152.75	637.74	256.77
E.G. Slope (ft/ft)	0.001211	Area (sq ft)	152.75	637.74	256.77
Q Total (cfs)	3967.00	Flow (cfs)	76.67	3722.37	167.96
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	0.50	5.84	0.65
Max Chl Dpth (ft)	13.20	Hydr. Depth (ft)	3.69	10.24	5.54
Conv. Total (cfs)	114013.3	Conv. (cfs)	2203.6	106982.4	4827.3
Length Wtd. (ft)	100.44	Wetted Per. (ft)	45.78	66.46	51.73
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.25	0.73	0.38
Alpha	2.23	Stream Power (lb/ft s)	0.13	4.23	0.25
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	8.65	16.74	7.24
C & E Loss (ft)	0.08	Cum SA (acres)	2.54	1.78	2.16

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.03	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	98.73	Flow Area (sq ft)	202.24	712.14	312.17
E.G. Slope (ft/ft)	0.001598	Area (sq ft)	202.24	712.14	312.17
Q Total (cfs)	5541.00	Flow (cfs)	138.22	5139.61	263.18
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)	0.68	7.22	0.84
Max Chl Dpth (ft)	14.39	Hydr. Depth (ft)	4.88	11.43	6.73
Conv. Total (cfs)	138626.7	Conv. (cfs)	3457.9	128584.5	6584.3
Length Wtd. (ft)	100.55	Wetted Per. (ft)	46.97	66.46	52.92
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.43	1.07	0.59
Alpha	2.37	Stream Power (lb/ft s)	0.29	7.71	0.50
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	13.99	20.31	11.89
C & E Loss (ft)	0.05	Cum SA (acres)	2.72	1.77	2.29

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	107.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.54	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	100.40	Flow Area (sq ft)	306.24	868.52	428.61
E.G. Slope (ft/ft)	0.001532	Area (sq ft)	306.24	868.52	428.61
Q Total (cfs)	7691.00	Flow (cfs)	261.03	7006.19	423.78

Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)	0.85	8.07	0.99
Max Chl Dpth (ft)	16.90	Hydr. Depth (ft)	7.39	13.94	9.24
Conv. Total (cfs)	196507.2	Conv. (cfs)	6669.5	179010.1	10827.6
Length Wtd. (ft)	100.66	Wetted Per. (ft)	49.48	66.46	55.43
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.59	1.25	0.74
Alpha	2.58	Stream Power (lb/ft s)	0.50	10.08	0.73
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	20.43	24.33	16.98
C & E Loss (ft)	0.04	Cum SA (acres)	2.73	1.77	2.29

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1800

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.29	17.11	98.87	29.08	98.57	29.13	98.54	31.01	97.44
31.59	96.91	36.72	92.16	39.6	90.99	40.75	90.22	52.24	90.22
52.92	90.2	64.62	89.88	67.8	91.74	68.54	92.07	69.11	92.65
70.21	93	70.74	93.3	72.43	92.03	73.12	91.96	73.5	91.86
79.21	91.44	85.46	90.99	85.84	91.14	86.16	91.22	86.36	91.28
86.4	91.29	101.21	95.28	101.51	95.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	29.13	.04	101.21	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.13	101.21	439.95	99.76	53.66	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	28.83	102.7	F
70.95	101.51	102.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	101.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	100.10	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	96.79	Flow Area (sq ft)	0.46	360.82	
E.G. Slope (ft/ft)	0.003293	Area (sq ft)	34.08	593.80	1.43
Q Total (cfs)	3052.00	Flow (cfs)	0.22	3051.78	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	8.45	Avg. Vel. (ft/s)	0.48	8.46	
Max Chl Dpth (ft)	10.22	Hydr. Depth (ft)	1.53	8.63	
Conv. Total (cfs)	53185.7	Conv. (cfs)	3.9	53181.8	
Length Wtd. (ft)	99.77	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.31	1.62	
Alpha	1.00	Stream Power (lb/ft s)	0.15	13.74	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	4.28	12.59	3.75
C & E Loss (ft)	0.19	Cum SA (acres)	2.28	1.64	1.47

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	103.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	101.74	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	97.95	Flow Area (sq ft)	0.95	429.43	
E.G. Slope (ft/ft)	0.003113	Area (sq ft)	81.87	712.05	1.93
Q Total (cfs)	3967.00	Flow (cfs)	0.73	3966.27	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	9.22	Avg. Vel. (ft/s)	0.76	9.24	
Max Chl Dpth (ft)	11.86	Hydr. Depth (ft)	3.17	10.27	
Conv. Total (cfs)	71095.2	Conv. (cfs)	13.0	71082.2	
Length Wtd. (ft)	99.79	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.60	1.83	
Alpha	1.00	Stream Power (lb/ft s)	0.46	16.89	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	8.37	15.19	6.88
C & E Loss (ft)	0.24	Cum SA (acres)	2.46	1.62	2.10

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.01	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	99.65	Flow Area (sq ft)	147.95	875.58	2.61
E.G. Slope (ft/ft)	0.001099	Area (sq ft)	147.95	875.58	2.61
Q Total (cfs)	5541.00	Flow (cfs)	84.67	5456.08	0.25
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	0.57	6.23	0.09
Max Chl Dpth (ft)	14.13	Hydr. Depth (ft)	5.08	12.15	8.69
Conv. Total (cfs)	167163.0	Conv. (cfs)	2554.4	164601.2	7.4
Length Wtd. (ft)	109.60	Wetted Per. (ft)	33.87	76.91	8.96
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.30	0.78	0.02
Alpha	1.31	Stream Power (lb/ft s)	0.17	4.87	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	13.56	18.49	11.46
C & E Loss (ft)	0.01	Cum SA (acres)	2.64	1.62	2.23

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	107.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.52	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	101.64	Flow Area (sq ft)	220.93	1056.16	3.36
E.G. Slope (ft/ft)	0.001121	Area (sq ft)	220.93	1056.16	3.36
Q Total (cfs)	7691.00	Flow (cfs)	159.07	7531.61	0.32
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	0.72	7.13	0.10
Max Chl Dpth (ft)	16.64	Hydr. Depth (ft)	7.58	14.65	11.20
Conv. Total (cfs)	229747.0	Conv. (cfs)	4751.7	224985.7	9.6
Length Wtd. (ft)	112.73	Wetted Per. (ft)	36.37	76.91	11.47
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.42	0.96	0.02
Alpha	1.38	Stream Power (lb/ft s)	0.31	6.85	0.00

Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	19.79	22.12	16.39
C & E Loss (ft)	0.02	Cum SA (acres)	2.64	1.62	2.23

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1700

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.77	42.14	98.77	45.34	98.81	48.09	98.89	52.11	98.98
60.78	99.15	67.71	99.28	69.79	99.32	70.16	99.32	82.83	95.99
97.66	91.97	98.88	91.94	104.61	88.98	104.73	88.92	104.86	88.92
114.54	88.95	130.75	89	130.82	89.11	133.68	92.19	134.1	92.67
138.74	96.9	139.37	97.48	141.1	97.43	155.94	96.99	168.27	94.3
172.84	93.83	174.52	93.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	69.79	.04	139.37	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69.79	139.37	102.93	100.24	97.47	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	69.77	102.6	F
139.53	174.52	102.6	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	100.80	Element			
Vel Head (ft)	0.48	Wt. n-Val.	0.000	0.040	0.230
W.S. Elev (ft)	100.33	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	95.52	Flow Area (sq ft)	0.02	551.90	0.46
E.G. Slope (ft/ft)	0.001542	Area (sq ft)	143.30	551.90	148.45
Q Total (cfs)	3052.00	Flow (cfs)	0.01	3051.76	0.23
Top Width (ft)	174.52	Top Width (ft)	69.79	69.58	35.15
Vel Total (ft/s)	5.53	Avg. Vel. (ft/s)	0.26	5.53	0.51
Max Chl Dpth (ft)	11.41	Hydr. Depth (ft)	1.01	7.93	2.85
Conv. Total (cfs)	77732.9	Conv. (cfs)	0.1	77726.9	5.9
Length Wtd. (ft)	100.24	Wetted Per. (ft)	0.02	74.77	0.16
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.10	0.71	0.27
Alpha	1.00	Stream Power (lb/ft s)	0.02	3.93	0.14
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	3.38	11.28	3.66
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	1.48	1.45

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	102.64	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.000	0.040	0.230
W.S. Elev (ft)	102.10	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	96.53	Flow Area (sq ft)	0.06	675.06	0.74
E.G. Slope (ft/ft)	0.001331	Area (sq ft)	266.83	675.06	210.66
Q Total (cfs)	3967.00	Flow (cfs)	0.03	3966.49	0.48
Top Width (ft)	174.52	Top Width (ft)	69.79	69.58	35.15
Vel Total (ft/s)	5.87	Avg. Vel. (ft/s)	0.47	5.88	0.65
Max Chl Dpth (ft)	13.18	Hydr. Depth (ft)	2.78	9.70	4.62

Conv. Total (cfs)	108748.5	Conv. (cfs)	0.7	108734.5	13.3
Length Wtd. (ft)	100.24	Wetted Per. (ft)	0.02	74.77	0.16
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.23	0.75	0.38
Alpha	1.00	Stream Power (lb/ft s)	0.11	4.41	0.25
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	6.61	13.60	6.75
C & E Loss (ft)	0.01	Cum SA (acres)	1.96	1.46	2.08

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.90	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	98.01	Flow Area (sq ft)	392.39	800.24	273.90
E.G. Slope (ft/ft)	0.001234	Area (sq ft)	392.39	800.24	273.90
Q Total (cfs)	5541.00	Flow (cfs)	263.75	5071.23	206.02
Top Width (ft)	174.52	Top Width (ft)	69.79	69.58	35.15
Vel Total (ft/s)	3.78	Avg. Vel. (ft/s)	0.67	6.34	0.75
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	5.62	11.50	7.79
Conv. Total (cfs)	157753.3	Conv. (cfs)	7508.9	144379.0	5865.4
Length Wtd. (ft)	100.24	Wetted Per. (ft)	76.97	74.77	45.39
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.39	0.82	0.46
Alpha	2.58	Stream Power (lb/ft s)	0.26	5.22	0.35
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	10.83	16.57	11.29
C & E Loss (ft)	0.00	Cum SA (acres)	2.14	1.46	2.21

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	107.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.44	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	99.64	Flow Area (sq ft)	569.60	976.92	363.15
E.G. Slope (ft/ft)	0.001178	Area (sq ft)	569.60	976.92	363.15
Q Total (cfs)	7691.00	Flow (cfs)	469.42	6910.88	310.69
Top Width (ft)	174.52	Top Width (ft)	69.79	69.58	35.15
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	0.82	7.07	0.86
Max Chl Dpth (ft)	17.52	Hydr. Depth (ft)	8.16	14.04	10.33
Conv. Total (cfs)	224051.4	Conv. (cfs)	13675.1	201325.2	9051.0
Length Wtd. (ft)	100.26	Wetted Per. (ft)	79.51	74.77	47.93
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.53	0.96	0.56
Alpha	2.78	Stream Power (lb/ft s)	0.43	6.80	0.48
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	15.80	19.79	16.17
C & E Loss (ft)	0.00	Cum SA (acres)	2.14	1.46	2.21

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1600

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	95.02	54.65	98.63	81.86	98.37	82.73	98.36	83.95	97.17
87.82	93.44	89.56	92.04	89.62	91.94	90.95	89.82	91.23	89.51

113.8	89.66	130.42	89.77	130.57	89.77	130.82	90.02	132.88	92.11
133.02	92.21	137.54	96.97	137.64	97.08	139.1	97.2	139.69	97.21
172.46	97.69	175.77	97.72	181.65	96.5	194.73	93.9	207.76	93.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	82.73	.04	137.64	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
82.73	137.64	100.17	99.43	99.79	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	82.41	102.4	F
138.89	207.76	102.4	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	100.64	Element			
Vel Head (ft)	0.56	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.08	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	95.14	Flow Area (sq ft)	0.55	507.72	3.69
E.G. Slope (ft/ft)	0.001580	Area (sq ft)	222.33	507.72	263.71
Q Total (cfs)	3052.00	Flow (cfs)	0.20	3049.86	1.94
Top Width (ft)	207.76	Top Width (ft)	82.73	54.91	70.12
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)	0.37	6.01	0.53
Max Chl Dpth (ft)	10.57	Hydr. Depth (ft)	1.72	9.25	2.95
Conv. Total (cfs)	76792.8	Conv. (cfs)	5.1	76738.8	48.8
Length Wtd. (ft)	99.43	Wetted Per. (ft)	0.32	61.86	1.25
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.17	0.81	0.29
Alpha	1.01	Stream Power (lb/ft s)	0.06	4.86	0.15
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	2.95	10.06	3.20
C & E Loss (ft)	0.02	Cum SA (acres)	1.60	1.33	1.33

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	102.48	Element			
Vel Head (ft)	0.67	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.81	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	96.13	Flow Area (sq ft)	1.10	602.75	5.85
E.G. Slope (ft/ft)	0.001505	Area (sq ft)	365.51	602.75	385.07
Q Total (cfs)	3967.00	Flow (cfs)	0.63	3962.28	4.09
Top Width (ft)	207.76	Top Width (ft)	82.73	54.91	70.12
Vel Total (ft/s)	6.51	Avg. Vel. (ft/s)	0.57	6.57	0.70
Max Chl Dpth (ft)	12.30	Hydr. Depth (ft)	3.45	10.98	4.68
Conv. Total (cfs)	102264.6	Conv. (cfs)	16.3	102142.8	105.5
Length Wtd. (ft)	99.43	Wetted Per. (ft)	0.32	61.86	1.25
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.32	0.92	0.44
Alpha	1.02	Stream Power (lb/ft s)	0.19	6.02	0.31
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	5.86	12.13	6.09
C & E Loss (ft)	0.02	Cum SA (acres)	1.78	1.32	1.96

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	104.34	Element			
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.75	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	97.61	Flow Area (sq ft)	525.87	709.19	520.99
E.G. Slope (ft/ft)	0.001253	Area (sq ft)	525.87	709.19	520.99
Q Total (cfs)	5541.00	Flow (cfs)	385.70	4741.99	413.31
Top Width (ft)	207.76	Top Width (ft)	82.73	54.91	70.12
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)	0.73	6.69	0.79

Max Chl Dpth (ft)	14.24	Hydr. Depth (ft)	6.36	12.92	7.43
Conv. Total (cfs)	156509.8	Conv. (cfs)	10894.4	133941.0	11674.4
Length Wtd. (ft)	99.51	Wetted Per. (ft)	91.58	61.86	80.65
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.45	0.90	0.51
Alpha	3.85	Stream Power (lb/ft s)	0.33	6.00	0.40
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	9.75	14.83	10.40
C & E Loss (ft)	0.02	Cum SA (acres)	1.96	1.31	2.09

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	107.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.29	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	99.32	Flow Area (sq ft)	735.73	848.47	698.85
E.G. Slope (ft/ft)	0.001245	Area (sq ft)	735.73	848.47	698.85
Q Total (cfs)	7691.00	Flow (cfs)	660.58	6372.09	658.33
Top Width (ft)	207.76	Top Width (ft)	82.73	54.91	70.12
Vel Total (ft/s)	3.37	Avg. Vel. (ft/s)	0.90	7.51	0.94
Max Chl Dpth (ft)	16.78	Hydr. Depth (ft)	8.89	15.45	9.97
Conv. Total (cfs)	217976.7	Conv. (cfs)	18722.1	180596.4	18658.2
Length Wtd. (ft)	99.53	Wetted Per. (ft)	94.12	61.86	83.19
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.61	1.07	0.65
Alpha	4.13	Stream Power (lb/ft s)	0.55	8.01	0.62
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	14.25	17.69	14.98
C & E Loss (ft)	0.03	Cum SA (acres)	1.96	1.31	2.09

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1500

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.42	6.16	99.37	21.74	98.6	34.68	97.32	43.85	97.39
44.82	97.41	45.04	97.41	48.39	93.51	49.72	91.95	51.17	91.64
52.52	91.35	53.09	91.12	71.91	90.48	91.09	89.83	91.45	89.82
91.52	89.87	92.47	90.52	95.03	92.26	97.02	96.18	97.14	96.4
97.35	96.59	99.71	96.43	118.64	95.19	130.28	97.24	133.89	97.34
134.79	97.39	135.48	97.42	136.11	97.44	145.8	97	179.45	96
204.77	95.37	206.35	95.35	207.43	95.15	209.36	95.15	212.96	95.63
221.32	97.31	263.66	95.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	45.04	.04	97.35	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45.04	97.35	79.93	100.57	123.17	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
044.62001		102.3	F
98.2	263.66	102.3	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.230	0.040	0.230

W.S. Elev (ft)	99.72	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	95.78	Flow Area (sq ft)	0.97	449.24	2.69
E.G. Slope (ft/ft)	0.002195	Area (sq ft)	60.89	449.24	585.67
Q Total (cfs)	3052.00	Flow (cfs)	0.52	3049.73	1.75
Top Width (ft)	263.66	Top Width (ft)	45.04	52.31	166.31
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)	0.53	6.79	0.65
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)	2.32	8.59	3.16
Conv. Total (cfs)	65144.0	Conv. (cfs)	11.0	65095.7	37.4
Length Wtd. (ft)	100.57	Wetted Per. (ft)	0.42	58.31	0.85
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.32	1.06	0.43
Alpha	1.01	Stream Power (lb/ft s)	0.17	7.17	0.28
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	2.62	8.97	2.23
C & E Loss (ft)	0.01	Cum SA (acres)	1.45	1.21	1.06

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.46	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	96.75	Flow Area (sq ft)	1.70	539.81	4.16
E.G. Slope (ft/ft)	0.002009	Area (sq ft)	138.87	539.81	873.61
Q Total (cfs)	3967.00	Flow (cfs)	1.25	3962.28	3.47
Top Width (ft)	263.66	Top Width (ft)	45.04	52.31	166.31
Vel Total (ft/s)	7.27	Avg. Vel. (ft/s)	0.74	7.34	0.83
Max Chl Dpth (ft)	11.64	Hydr. Depth (ft)	4.05	10.32	4.89
Conv. Total (cfs)	88511.9	Conv. (cfs)	27.9	88406.6	77.4
Length Wtd. (ft)	100.58	Wetted Per. (ft)	0.42	58.31	0.85
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.51	1.16	0.61
Alpha	1.02	Stream Power (lb/ft s)	0.37	8.52	0.51
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	5.28	10.83	4.65
C & E Loss (ft)	0.01	Cum SA (acres)	1.63	1.20	1.69

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.67	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	98.18	Flow Area (sq ft)	238.42	655.43	1241.22
E.G. Slope (ft/ft)	0.001260	Area (sq ft)	238.42	655.43	1241.22
Q Total (cfs)	5541.00	Flow (cfs)	156.20	4336.13	1048.67
Top Width (ft)	263.66	Top Width (ft)	45.04	52.31	166.31
Vel Total (ft/s)	2.60	Avg. Vel. (ft/s)	0.66	6.62	0.84
Max Chl Dpth (ft)	13.85	Hydr. Depth (ft)	5.29	12.53	7.46
Conv. Total (cfs)	156118.0	Conv. (cfs)	4400.9	122170.7	29546.3
Length Wtd. (ft)	102.54	Wetted Per. (ft)	49.37	58.31	175.50
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.38	0.88	0.56
Alpha	5.11	Stream Power (lb/ft s)	0.25	5.85	0.47
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	8.87	13.28	8.38
C & E Loss (ft)	0.01	Cum SA (acres)	1.81	1.19	1.82

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.24	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	99.89	Flow Area (sq ft)	354.33	790.05	1669.21

E.G. Slope (ft/ft)	0.001190	Area (sq ft)	354.33	790.05	1669.21
Q Total (cfs)	7691.00	Flow (cfs)	284.01	5753.27	1653.72
Top Width (ft)	263.66	Top Width (ft)	45.04	52.31	166.31
Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)	0.80	7.28	0.99
Max Chl Dpth (ft)	16.42	Hydr. Depth (ft)	7.87	15.10	10.04
Conv. Total (cfs)	222968.7	Conv. (cfs)	8233.8	166792.3	47942.7
Length Wtd. (ft)	102.75	Wetted Per. (ft)	51.94	58.31	178.07
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.51	1.01	0.70
Alpha	5.34	Stream Power (lb/ft s)	0.41	7.33	0.69
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	13.00	15.82	12.27
C & E Loss (ft)	0.01	Cum SA (acres)	1.81	1.19	1.82

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1400

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.29	5.29	95.95	6.71	95.23	10.51	95.42	56.84	96.52
58.08	97.01	65.95	97.19	78.46	97.27	90.67	97.37	108.91	97.65
109.12	97.66	109.55	97.67	113.48	94.17	115.77	92.22	116.89	90.7
118.38	87.99	135.56	89.06	136.77	89.15	146.76	89.89	151.74	91.62
153.39	91.96	161.09	95.15	161.56	95.34	161.66	95.38	162.43	95.73
165.58	95.37	178.29	94.15	193.12	97.78	200.23	97.86	201.25	98.11
222.92	95.33	237.71	97.6	237.78	97.6	260.9	96.84	270.78	95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	109.12	.04	162.43	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
109.12	162.43	98.46	100	105.25	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.86	102.2	F
162.27	270.78	102.2	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	99.54	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	95.31	Flow Area (sq ft)	0.49	463.45	
E.G. Slope (ft/ft)	0.001999	Area (sq ft)	321.55	464.07	336.64
Q Total (cfs)	3052.00	Flow (cfs)	0.22	3051.78	
Top Width (ft)	270.78	Top Width (ft)	109.12	53.31	108.35
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)	0.44	6.58	
Max Chl Dpth (ft)	11.55	Hydr. Depth (ft)	1.89	8.72	
Conv. Total (cfs)	68267.3	Conv. (cfs)	4.8	68262.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.70	
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.24	0.99	
Alpha	1.00	Stream Power (lb/ft s)	0.10	6.49	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	2.27	7.92	0.92
C & E Loss (ft)	0.04	Cum SA (acres)	1.31	1.09	0.67

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	101.30	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	96.29	Flow Area (sq ft)	0.95	556.63	
E.G. Slope (ft/ft)	0.001833	Area (sq ft)	512.85	557.53	526.59
Q Total (cfs)	3967.00	Flow (cfs)	0.62	3966.38	
Top Width (ft)	270.78	Top Width (ft)	109.12	53.31	108.35
Vel Total (ft/s)	7.11	Avg. Vel. (ft/s)	0.65	7.13	
Max Chl Dpth (ft)	13.31	Hydr. Depth (ft)	3.64	10.47	
Conv. Total (cfs)	92651.7	Conv. (cfs)	14.5	92637.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.70	
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.42	1.09	
Alpha	1.00	Stream Power (lb/ft s)	0.27	7.73	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	4.68	9.56	2.67
C & E Loss (ft)	0.06	Cum SA (acres)	1.49	1.07	1.30

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.56	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	97.79	Flow Area (sq ft)	759.85	678.20	771.85
E.G. Slope (ft/ft)	0.001155	Area (sq ft)	759.85	678.20	771.85
Q Total (cfs)	5541.00	Flow (cfs)	581.70	4366.60	592.70
Top Width (ft)	270.78	Top Width (ft)	109.12	53.31	108.35
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	0.77	6.44	0.77
Max Chl Dpth (ft)	15.57	Hydr. Depth (ft)	6.96	12.72	7.12
Conv. Total (cfs)	163059.7	Conv. (cfs)	17118.3	128499.6	17441.8
Length Wtd. (ft)	100.29	Wetted Per. (ft)	116.69	58.88	117.99
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.47	0.83	0.47
Alpha	5.22	Stream Power (lb/ft s)	0.36	5.35	0.36
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	7.95	11.74	5.53
C & E Loss (ft)	0.01	Cum SA (acres)	1.67	1.07	1.43

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	106.14	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	99.49	Flow Area (sq ft)	1041.53	815.81	1051.54
E.G. Slope (ft/ft)	0.001098	Area (sq ft)	1041.53	815.81	1051.54
Q Total (cfs)	7691.00	Flow (cfs)	945.32	5792.10	953.59
Top Width (ft)	270.78	Top Width (ft)	109.12	53.31	108.35
Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)	0.91	7.10	0.91
Max Chl Dpth (ft)	18.15	Hydr. Depth (ft)	9.54	15.30	9.71
Conv. Total (cfs)	232151.2	Conv. (cfs)	28534.2	174833.1	28783.9
Length Wtd. (ft)	100.33	Wetted Per. (ft)	119.27	58.88	120.57
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.60	0.95	0.60
Alpha	5.46	Stream Power (lb/ft s)	0.54	6.74	0.54
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	11.72	13.96	8.42
C & E Loss (ft)	0.01	Cum SA (acres)	1.67	1.07	1.43

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1300

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99	17.82	99.21	19.02	99.17	20.84	99.18	21.46	99.16
49.71	98.01	52.69	97.97	54.86	97.95	62.74	97.85	66.22	97.81
66.59	97.52	70	94.39	71.58	92.82	72.25	92.16	72.91	91.94
76.08	90.24	96.87	90.07	104.48	90	112.91	90.15	113.93	90.32
118	91.87	128.38	95.81	130.94	96.78	131.37	96.96	132.04	97.23
133.61	97.87	136.37	97.83	168.9	98	175.78	94.39	177.76	94.32
187.29	94.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	66.22	.04	133.61	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66.22	133.61	664.31	100	63.68	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.05	102	F
133.99	187.29	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.45	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	95.42	Flow Area (sq ft)	0.28	516.89	0.60
E.G. Slope (ft/ft)	0.001807	Area (sq ft)	56.73	516.89	133.88
Q Total (cfs)	3052.00	Flow (cfs)	0.11	3051.67	0.22
Top Width (ft)	187.29	Top Width (ft)	66.22	67.39	53.68
Vel Total (ft/s)	5.89	Avg. Vel. (ft/s)	0.38	5.90	0.37
Max Chl Dpth (ft)	9.45	Hydr. Depth (ft)	1.63	7.67	1.58
Conv. Total (cfs)	71794.1	Conv. (cfs)	2.5	71786.4	5.3
Length Wtd. (ft)	100.01	Wetted Per. (ft)	0.17	71.51	0.38
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.18	0.82	0.18
Alpha	1.00	Stream Power (lb/ft s)	0.07	4.81	0.07
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	1.85	6.79	0.35
C & E Loss (ft)	0.01	Cum SA (acres)	1.11	0.95	0.48

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.26	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	96.34	Flow Area (sq ft)	0.59	639.47	1.29
E.G. Slope (ft/ft)	0.001502	Area (sq ft)	177.19	639.47	231.52
Q Total (cfs)	3967.00	Flow (cfs)	0.34	3965.93	0.73
Top Width (ft)	187.29	Top Width (ft)	66.22	67.39	53.68
Vel Total (ft/s)	6.19	Avg. Vel. (ft/s)	0.57	6.20	0.57
Max Chl Dpth (ft)	11.26	Hydr. Depth (ft)	3.45	9.49	3.40
Conv. Total (cfs)	102375.8	Conv. (cfs)	8.7	102348.3	18.9
Length Wtd. (ft)	100.02	Wetted Per. (ft)	0.17	71.51	0.38
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.32	0.84	0.32
Alpha	1.01	Stream Power (lb/ft s)	0.19	5.20	0.18
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	3.90	8.19	1.75
C & E Loss (ft)	0.01	Cum SA (acres)	1.29	0.94	1.10

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	103.94	Element			
Vel Head (ft)	0.62	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.32	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	97.71	Flow Area (sq ft)	313.39	778.08	341.93
E.G. Slope (ft/ft)	0.001291	Area (sq ft)	313.39	778.08	341.93
Q Total (cfs)	5541.00	Flow (cfs)	196.55	5099.93	244.52
Top Width (ft)	187.29	Top Width (ft)	66.22	67.39	53.68
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)	0.63	6.55	0.72
Max Chl Dpth (ft)	13.32	Hydr. Depth (ft)	4.73	11.55	6.37
Conv. Total (cfs)	154207.8	Conv. (cfs)	5470.1	141932.5	6805.2
Length Wtd. (ft)	116.86	Wetted Per. (ft)	70.57	71.51	63.24
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.36	0.88	0.44
Alpha	2.65	Stream Power (lb/ft s)	0.22	5.75	0.31
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	6.74	10.07	4.19
C & E Loss (ft)	0.01	Cum SA (acres)	1.47	0.93	1.23

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	106.60	Element			
Vel Head (ft)	0.74	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.87	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	99.17	Flow Area (sq ft)	481.83	949.50	478.48
E.G. Slope (ft/ft)	0.001218	Area (sq ft)	481.83	949.50	478.48
Q Total (cfs)	7691.00	Flow (cfs)	381.94	6903.99	405.07
Top Width (ft)	187.29	Top Width (ft)	66.22	67.39	53.68
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	0.79	7.27	0.85
Max Chl Dpth (ft)	15.87	Hydr. Depth (ft)	7.28	14.09	8.91
Conv. Total (cfs)	220334.9	Conv. (cfs)	10942.0	197788.3	11604.5
Length Wtd. (ft)	121.94	Wetted Per. (ft)	73.11	71.51	65.78
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.50	1.01	0.55
Alpha	2.93	Stream Power (lb/ft s)	0.40	7.34	0.47
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	10.00	11.94	6.57
C & E Loss (ft)	0.01	Cum SA (acres)	1.48	0.93	1.23

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1200

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.99	3.68	96.2	4.72	96.19	8.79	96.34	16.71	96.72
34.19	97.61	34.77	97.63	35.4	97.46	47	94.26	55.25	92.11
58.57	91.08	59.25	90.83	75.03	89.35	81.43	88.75	93.14	87.65
93.36	88.11	93.86	89.21	95.3	92.42	95.58	92.92	98.76	98.52
98.99	98.93	100.13	98.9	118.49	98.47	133.43	98.09	149.42	98.25
150.55	98.31	154.31	98.06	159.45	97.71	163	98.23	165.09	98.54
166.06	98.57	170.66	98.67	172.66	98.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	34.19	.04	98.76	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
34.19 98.76 114.91 100 120.57 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	34.64	101.7	F
99.34	172.66	101.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.18	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	95.21	Flow Area (sq ft)		489.35	0.19
E.G. Slope (ft/ft)	0.002183	Area (sq ft)	80.64	490.05	60.52
Q Total (cfs)	3052.00	Flow (cfs)		3051.98	0.02
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	6.23	Avg. Vel. (ft/s)		6.24	0.11
Max Chl Dpth (ft)	11.53	Hydr. Depth (ft)		7.63	0.33
Conv. Total (cfs)	65327.7	Conv. (cfs)		65327.3	0.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)		71.83	0.82
Min Ch El (ft)	87.65	Shear (lb/sq ft)		0.93	0.03
Alpha	1.00	Stream Power (lb/ft s)		5.79	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.80	5.63	0.21
C & E Loss (ft)	0.02	Cum SA (acres)	0.34	0.80	0.38

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	101.03	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	96.21	Flow Area (sq ft)		608.17	1.27
E.G. Slope (ft/ft)	0.001786	Area (sq ft)	144.00	609.71	197.46
Q Total (cfs)	3967.00	Flow (cfs)		3966.54	0.46
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	6.51	Avg. Vel. (ft/s)		6.52	0.37
Max Chl Dpth (ft)	13.38	Hydr. Depth (ft)		9.48	2.19
Conv. Total (cfs)	93861.8	Conv. (cfs)		93850.8	10.9
Length Wtd. (ft)	100.00	Wetted Per. (ft)		71.83	0.82
Min Ch El (ft)	87.65	Shear (lb/sq ft)		0.94	0.17
Alpha	1.00	Stream Power (lb/ft s)		6.16	0.06
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	1.45	6.76	1.44
C & E Loss (ft)	0.02	Cum SA (acres)	0.52	0.78	1.01

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.07	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	97.67	Flow Area (sq ft)	213.76	741.45	348.24
E.G. Slope (ft/ft)	0.001560	Area (sq ft)	213.76	741.45	348.24
Q Total (cfs)	5541.00	Flow (cfs)	165.64	5135.67	239.70
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.77	6.93	0.69
Max Chl Dpth (ft)	15.42	Hydr. Depth (ft)	6.25	11.48	4.71
Conv. Total (cfs)	140296.2	Conv. (cfs)	4193.9	130033.3	6069.0
Length Wtd. (ft)	101.75	Wetted Per. (ft)	40.39	72.28	78.60
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.52	1.00	0.43
Alpha	2.46	Stream Power (lb/ft s)	0.40	6.92	0.30
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	2.72	8.32	3.68
C & E Loss (ft)	0.00	Cum SA (acres)	0.71	0.78	1.14

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.43	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.83	Wt. n-Val.	0.230	0.040	0.230	
W.S. Elev (ft)	105.60	Reach Len. (ft)	114.91	100.00	120.57	
Crit W.S. (ft)	99.20	Flow Area (sq ft)	300.23	904.76	535.15	
E.G. Slope (ft/ft)	0.001472	Area (sq ft)	300.23	904.76	535.15	
Q Total (cfs)	7691.00	Flow (cfs)	272.21	6952.21	466.58	
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	0.91	7.68	0.87	
Max Chl Dpth (ft)	17.95	Hydr. Depth (ft)	8.78	14.01	7.24	
Conv. Total (cfs)	200450.4	Conv. (cfs)	7094.6	181195.3	12160.6	
Length Wtd. (ft)	102.14	Wetted Per. (ft)	42.92	72.28	81.13	
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.64	1.15	0.61	
Alpha	2.74	Stream Power (lb/ft s)	0.58	8.84	0.53	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	4.03	9.81	5.83	
C & E Loss (ft)	0.01	Cum SA (acres)	0.71	0.78	1.14	

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1100

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.75	2.53	97.64	3.14	97.57	3.81	97.48	4.33	97.41
4.78	97.36	5.5	97.3	6.35	97.22	7.07	97.17	10.11	96.85
24.85	94.44	30.14	95.12	30.99	94.79	35.54	93.01	36.71	92.72
37.96	92.32	42.65	91.99	45.03	91.69	50.06	93.42	51.88	93.78
56.04	94.48	57.81	94.62	59.17	94.68	61.47	94.66	63.4	94.49
66	94.18	67.73	93.82	70.15	93.34	71.03	93.07	74.56	91.99
77.27	92.64	77.87	92.19	78.67	91.8	80.64	90.54	104.79	90.27
110.47	90.2	111.35	90.18	115.19	90.14	125.07	89.81	125.65	90.66
126.49	91.62	126.67	91.83	126.8	92.12	127.63	94.04	128.76	95.86
130.62	98.83	130.69	98.85	130.86	98.91	132.04	99.31	132.15	99.34
132.55	99.48	132.7	99.47	133.17	99.45	135.01	99.39	145.57	99.07
146.1	99.06	150.05	98.75	153.21	98.58	154.58	98.53	155.66	98.49
156.86	98.46	157.98	98.4	159.05	98.48	160.98	98.6	163.22	98.73
164.77	98.81	167.38	99	170.75	99.12	172.14	99.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	77.27	.04	132.04	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77.27	132.04	20.56	50	255.03	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	77.32	102	F
132.14	172.14	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.52	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.80	Wt. n-Val.		0.040		
W.S. Elev (ft)	98.72	Reach Len. (ft)	20.56	50.00	255.03	

Crit W.S. (ft)	95.29	Flow Area (sq ft)		424.28	
E.G. Slope (ft/ft)	0.002693	Area (sq ft)	332.43	424.59	1.99
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	142.88	Top Width (ft)	77.27	53.28	12.33
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)		7.19	
Max Chl Dpth (ft)	8.91	Hydr. Depth (ft)		7.97	
Conv. Total (cfs)	58815.1	Conv. (cfs)		58815.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		58.86	
Min Ch El (ft)	89.81	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)		8.72	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.25	4.58	0.13
C & E Loss (ft)	0.11	Cum SA (acres)	0.20	0.66	0.26

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.58	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	96.23	Flow Area (sq ft)		525.93	0.13
E.G. Slope (ft/ft)	0.002306	Area (sq ft)	476.69	526.33	66.05
Q Total (cfs)	3967.00	Flow (cfs)		3966.96	0.04
Top Width (ft)	172.14	Top Width (ft)	77.27	54.77	40.10
Vel Total (ft/s)	7.54	Avg. Vel. (ft/s)		7.54	0.35
Max Chl Dpth (ft)	10.77	Hydr. Depth (ft)		9.61	1.26
Conv. Total (cfs)	82610.7	Conv. (cfs)		82609.8	0.9
Length Wtd. (ft)	50.01	Wetted Per. (ft)		60.49	0.10
Min Ch El (ft)	89.81	Shear (lb/sq ft)		1.25	0.18
Alpha	1.00	Stream Power (lb/ft s)		9.44	0.06
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.63	5.45	1.07
C & E Loss (ft)	0.12	Cum SA (acres)	0.38	0.65	0.85

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.88	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	97.67	Flow Area (sq ft)	654.02	652.03	158.08
E.G. Slope (ft/ft)	0.001633	Area (sq ft)	654.02	652.03	158.08
Q Total (cfs)	5541.00	Flow (cfs)	670.85	4773.13	97.02
Top Width (ft)	172.14	Top Width (ft)	77.27	54.77	40.10
Vel Total (ft/s)	3.78	Avg. Vel. (ft/s)	1.03	7.32	0.61
Max Chl Dpth (ft)	13.07	Hydr. Depth (ft)	8.46	11.90	3.94
Conv. Total (cfs)	137111.6	Conv. (cfs)	16600.1	118110.7	2400.8
Length Wtd. (ft)	50.30	Wetted Per. (ft)	83.99	60.55	43.86
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.79	1.10	0.37
Alpha	3.23	Stream Power (lb/ft s)	0.81	8.04	0.23
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	1.58	6.72	2.98
C & E Loss (ft)	0.07	Cum SA (acres)	0.56	0.64	0.98

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.38	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	99.48	Flow Area (sq ft)	847.58	789.23	258.53

E.G. Slope (ft/ft)	0.001593	Area (sq ft)	847.58	789.23	258.53
Q Total (cfs)	7691.00	Flow (cfs)	1000.80	6480.57	209.62
Top Width (ft)	172.14	Top Width (ft)	77.27	54.77	40.10
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)	1.18	8.21	0.81
Max Chl Dpth (ft)	15.57	Hydr. Depth (ft)	10.97	14.41	6.45
Conv. Total (cfs)	192701.0	Conv. (cfs)	25075.5	162373.3	5252.2
Length Wtd. (ft)	51.57	Wetted Per. (ft)	86.49	60.55	46.36
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.97	1.30	0.55
Alpha	3.46	Stream Power (lb/ft s)	1.15	10.64	0.45
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	2.52	7.86	4.73
C & E Loss (ft)	0.09	Cum SA (acres)	0.56	0.64	0.98

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1050

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.54	52.84	97.69	53.68	97.7	57.2	97.67	80.49	97.62
91.89	97.64	92.19	97.6	92.36	97.58	92.57	97.56	93.2	97.56
100.52	97.59	101.06	96.97	103.8	93.86	105.52	91.91	106.17	90.69
108.15	86.9	132.55	89.2	141.44	90.05	149.74	90.34	152.2	90.39
154.26	90.99	154.95	91.26	155.92	91.82	162.83	94.96	173.73	98.88
174.12	99.02	178.03	99.08	180.81	99.11	185.92	99.19	194.16	99.33
196.93	99.29	200.31	99.29	201.78	98.92	203.12	99	208.79	99.33
208.81	99.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	100.52	.04	173.73	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
100.52 173.73 25.83 50 71.25 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	100.22	101.5	F
174.16	208.81	101.5	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	98.87	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	93.99	Flow Area (sq ft)	0.39	573.26	
E.G. Slope (ft/ft)	0.001501	Area (sq ft)	125.62	573.26	
Q Total (cfs)	3052.00	Flow (cfs)	0.11	3051.89	
Top Width (ft)	173.71	Top Width (ft)	100.52	73.19	
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	0.30	5.32	
Max Chl Dpth (ft)	11.97	Hydr. Depth (ft)	1.28	7.83	
Conv. Total (cfs)	78768.7	Conv. (cfs)	2.9	78765.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)	0.30	80.59	
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.12	0.67	
Alpha	1.00	Stream Power (lb/ft s)	0.04	3.55	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.15	4.01	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	0.15	0.59	0.23

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.78	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	94.91	Flow Area (sq ft)	0.96	713.19	0.79
E.G. Slope (ft/ft)	0.001225	Area (sq ft)	317.74	713.19	56.37
Q Total (cfs)	3967.00	Flow (cfs)	0.47	3966.27	0.26
Top Width (ft)	208.81	Top Width (ft)	100.52	73.21	35.08
Vel Total (ft/s)	5.55	Avg. Vel. (ft/s)	0.49	5.56	0.33
Max Chl Dpth (ft)	13.88	Hydr. Depth (ft)	3.20	9.74	1.83
Conv. Total (cfs)	113352.5	Conv. (cfs)	13.4	113331.7	7.3
Length Wtd. (ft)	50.00	Wetted Per. (ft)	0.30	80.61	0.45
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.24	0.68	0.13
Alpha	1.00	Stream Power (lb/ft s)	0.12	3.76	0.04
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.45	4.74	0.71
C & E Loss (ft)	0.00	Cum SA (acres)	0.34	0.57	0.63

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.97	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	96.31	Flow Area (sq ft)	537.05	872.91	132.90
E.G. Slope (ft/ft)	0.001051	Area (sq ft)	537.05	872.91	132.90
Q Total (cfs)	5541.00	Flow (cfs)	331.93	5145.82	63.25
Top Width (ft)	208.81	Top Width (ft)	100.52	73.21	35.08
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)	0.62	5.90	0.48
Max Chl Dpth (ft)	16.07	Hydr. Depth (ft)	5.34	11.92	3.79
Conv. Total (cfs)	170906.7	Conv. (cfs)	10238.0	158717.7	1950.9
Length Wtd. (ft)	49.55	Wetted Per. (ft)	105.95	80.61	38.80
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.33	0.71	0.22
Alpha	2.50	Stream Power (lb/ft s)	0.21	4.19	0.11
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.29	5.85	2.13
C & E Loss (ft)	0.01	Cum SA (acres)	0.52	0.57	0.76

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.52	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	97.94	Flow Area (sq ft)	793.59	1059.76	222.43
E.G. Slope (ft/ft)	0.001002	Area (sq ft)	793.59	1059.76	222.43
Q Total (cfs)	7691.00	Flow (cfs)	611.38	6940.01	139.61
Top Width (ft)	208.81	Top Width (ft)	100.52	73.21	35.08
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)	0.77	6.55	0.63
Max Chl Dpth (ft)	18.62	Hydr. Depth (ft)	7.89	14.48	6.34
Conv. Total (cfs)	243020.3	Conv. (cfs)	19318.3	219290.5	4411.5
Length Wtd. (ft)	49.37	Wetted Per. (ft)	108.50	80.61	41.35
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.46	0.82	0.34
Alpha	2.82	Stream Power (lb/ft s)	0.35	5.38	0.21
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.13	6.80	3.32
C & E Loss (ft)	0.01	Cum SA (acres)	0.52	0.57	0.76

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1001

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38.8499908	101.37.9599915	101.361.669998	101.353.539993	101.32				
10.96999	101.32	20.2	101.4820.20999	101.4820.46999	101.4730.93999	101.38			
31.14999	101.3731.50999	101.3638.79999	101.2741.59999	101.2244.84999	101.14				
44.86	101.14	53.36	100.9153.39999	100.9153.56999	100.9	53.61	100.88		
61.98	100.59	62.14	100.5762.14999	100.6267.20999	100.4167.71999	100.39			
68.12999	100.34	68.5	100.26	68.62	100.25	68.7	97.5769.64999	94.15	
71.17999	93.74	75.98	92.1377.20999	91.74	79.03	90.93	81.11	89.96	
81.56999	89.97	82.28	9082.37999	90.0187.21999	89.9991.73999	89.65			
99.34	89.92	125.26	90.82	128.49	91.83	128.52	91.89	130.13	92.6
137.2	95.94	142.79	98.57	144.27	99.23	146.98	99.97	147.74	100.21
148.07	100.25	148.54	100.24	149.27	100.23	151.09	100.11	155.45	100.03
156	100.01	161.06	99.93	161.24	99.93	164.58	99.73	166.33	99.59
168.59	99.43	169.31	99.37	170.14	99.29	175.97	99.27	181.09	99.3
183.09	99.33	187.53	99.37	190.98	99.3	197.9	99.25	202.14	99.21
206.21	99.12	211.91	99.13	216.15	99.1	216.79	99.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2367.20999	.04	148.07	.23	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
67.20999 148.07 1 1 1 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
066.78999		102	F
148.34	216.79	102	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	99.22	Element			
Vel Head (ft)	0.52	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.70	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	94.99	Flow Area (sq ft)		527.31	
E.G. Slope (ft/ft)	0.001984	Area (sq ft)		527.31	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	74.41	Top Width (ft)		74.41	
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)		5.79	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		7.09	
Conv. Total (cfs)	68513.7	Conv. (cfs)		68513.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		80.61	
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		4.69	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.11	3.38	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	0.12	0.51	0.23

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.19	Element			
Vel Head (ft)	0.53	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.66	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	95.80	Flow Area (sq ft)	0.10	679.13	0.11
E.G. Slope (ft/ft)	0.001642	Area (sq ft)	0.81	679.13	83.21
Q Total (cfs)	3967.00	Flow (cfs)	0.01	3966.97	0.02
Top Width (ft)	156.81	Top Width (ft)	7.23	80.86	68.72
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)	0.10	5.84	0.14
Max Chl Dpth (ft)	11.01	Hydr. Depth (ft)	0.24	8.40	0.41
Conv. Total (cfs)	97908.3	Conv. (cfs)	0.3	97907.7	0.4
Length Wtd. (ft)	1.00	Wetted Per. (ft)	0.42	88.83	0.27
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.02	0.78	0.04

Alpha	1.00	Stream Power (lb/ft s)	0.00	4.58	0.01
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.35	3.94	0.60
C & E Loss (ft)	0.00	Cum SA (acres)	0.30	0.48	0.55

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.79	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	97.05	Flow Area (sq ft)	109.49	851.77	229.94
E.G. Slope (ft/ft)	0.001421	Area (sq ft)	109.49	851.77	229.94
Q Total (cfs)	5541.00	Flow (cfs)	36.39	5383.66	120.95
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	0.33	6.32	0.53
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)	1.63	10.53	3.35
Conv. Total (cfs)	146988.1	Conv. (cfs)	965.2	142814.3	3208.6
Length Wtd. (ft)	1.00	Wetted Per. (ft)	68.69	88.83	72.44
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.14	0.85	0.28
Alpha	1.79	Stream Power (lb/ft s)	0.05	5.38	0.15
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.10	4.86	1.84
C & E Loss (ft)	0.00	Cum SA (acres)	0.47	0.48	0.68

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.37	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	98.52	Flow Area (sq ft)	282.88	1060.37	407.22
E.G. Slope (ft/ft)	0.001240	Area (sq ft)	282.88	1060.37	407.22
Q Total (cfs)	7691.00	Flow (cfs)	161.29	7243.61	286.09
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	0.57	6.83	0.70
Max Chl Dpth (ft)	15.72	Hydr. Depth (ft)	4.21	13.11	5.93
Conv. Total (cfs)	218453.2	Conv. (cfs)	4581.4	205745.8	8126.1
Length Wtd. (ft)	1.00	Wetted Per. (ft)	71.27	88.83	75.02
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.31	0.92	0.42
Alpha	2.28	Stream Power (lb/ft s)	0.18	6.31	0.30
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.81	5.59	2.81
C & E Loss (ft)	0.00	Cum SA (acres)	0.47	0.48	0.68

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1000

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38	.85	101.37	.96	101.36	1.67	101.35	3.54	101.32
10.97	101.32	20.2	101.48	20.21	101.48	20.47	101.47	30.94	101.38
31.15	101.37	31.51	101.36	38.8	101.27	41.6	101.22	44.85	101.14
44.86	101.14	53.36	100.91	53.4	100.91	53.57	100.9	53.61	100.88
61.98	100.59	62.14	100.57	62.15	100.62	67.21	100.41	67.72	100.39
68.13	100.34	68.5	100.26	68.62	100.25	68.7	97.57	69.65	94.15

71.18	93.74	75.98	92.13	77.21	91.74	79.03	90.93	81.11	89.96
81.57	89.97	82.28	90	82.38	90.01	87.22	89.99	91.74	89.65
99.34	89.92	125.26	90.82	128.49	91.83	128.52	91.89	130.13	92.6
137.2	95.94	142.79	98.57	144.27	99.23	146.98	99.97	147.74	100.21
148.07	100.25	148.54	100.24	149.27	100.23	151.09	100.11	155.45	100.03
156	100.01	161.06	99.93	161.24	99.93	164.58	99.73	166.33	99.59
168.59	99.43	169.31	99.37	170.14	99.29	175.97	99.27	181.09	99.3
183.09	99.33	187.53	99.37	190.98	99.3	197.9	99.25	202.14	99.21
206.21	99.12	211.91	99.13	216.15	99.1	216.79	99.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	67.21	.04	148.07	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67.21	148.07	25.88	25.66	27.03	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
066.78999		102	F
148.34	216.79	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.70	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	94.99	Flow Area (sq ft)		527.12	
E.G. Slope (ft/ft)	0.001986	Area (sq ft)		527.12	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	74.41	Top Width (ft)		74.41	
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)		5.79	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		7.08	
Conv. Total (cfs)	68476.9	Conv. (cfs)		68476.9	
Length Wtd. (ft)	0.50	Wetted Per. (ft)		80.60	
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		4.70	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.11	3.37	0.12
C & E Loss (ft)	0.03	Cum SA (acres)	0.12	0.51	0.23

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.66	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	95.80	Flow Area (sq ft)	0.10	678.94	0.11
E.G. Slope (ft/ft)	0.001643	Area (sq ft)	0.80	678.94	83.06
Q Total (cfs)	3967.00	Flow (cfs)	0.01	3966.97	0.02
Top Width (ft)	156.74	Top Width (ft)	7.16	80.86	68.72
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)	0.10	5.84	0.14
Max Chl Dpth (ft)	11.01	Hydr. Depth (ft)	0.24	8.40	0.41
Conv. Total (cfs)	97864.4	Conv. (cfs)	0.2	97863.8	0.4
Length Wtd. (ft)	0.50	Wetted Per. (ft)	0.42	88.83	0.27
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.02	0.78	0.04
Alpha	1.00	Stream Power (lb/ft s)	0.00	4.58	0.01
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.35	3.93	0.60
C & E Loss (ft)	0.15	Cum SA (acres)	0.30	0.48	0.55

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.79	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	97.05	Flow Area (sq ft)	109.35	851.61	229.80
E.G. Slope (ft/ft)	0.001422	Area (sq ft)	109.35	851.61	229.80
Q Total (cfs)	5541.00	Flow (cfs)	36.32	5383.80	120.88
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	0.33	6.32	0.53
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)	1.63	10.53	3.34
Conv. Total (cfs)	146937.7	Conv. (cfs)	963.2	142769.0	3205.5
Length Wtd. (ft)	0.50	Wetted Per. (ft)	68.69	88.83	72.43
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.14	0.85	0.28
Alpha	1.79	Stream Power (lb/ft s)	0.05	5.38	0.15
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.10	4.84	1.83
C & E Loss (ft)	0.07	Cum SA (acres)	0.47	0.48	0.68

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.37	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	98.52	Flow Area (sq ft)	282.76	1060.24	407.11
E.G. Slope (ft/ft)	0.001240	Area (sq ft)	282.76	1060.24	407.11
Q Total (cfs)	7691.00	Flow (cfs)	161.23	7243.75	286.03
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	0.57	6.83	0.70
Max Chl Dpth (ft)	15.72	Hydr. Depth (ft)	4.21	13.11	5.92
Conv. Total (cfs)	218403.2	Conv. (cfs)	4578.4	205702.4	8122.4
Length Wtd. (ft)	0.50	Wetted Per. (ft)	71.27	88.83	75.01
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.31	0.92	0.42
Alpha	2.28	Stream Power (lb/ft s)	0.18	6.31	0.30
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.81	5.56	2.80
C & E Loss (ft)	0.00	Cum SA (acres)	0.47	0.48	0.68

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: BrushyCreek
REACH: BrushyCreek RS: 987.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 25
Weir Coefficient = .3
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
66.78999	100.38	98.58	100.56	100.18	98.65	151.79	100.11	98.72

Upstream Bridge Cross Section Data
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38	.85	101.37	.96	101.36	1.67	101.35	3.54	101.32
10.97	101.32	20.2	101.48	20.21	101.48	20.47	101.47	30.94	101.38
31.15	101.37	31.51	101.36	38.8	101.27	41.6	101.22	44.85	101.14
44.86	101.14	53.36	100.91	53.4	100.91	53.57	100.9	53.61	100.88
61.98	100.59	62.14	100.57	62.15	100.62	67.21	100.41	67.72	100.39
68.13	100.34	68.5	100.26	68.62	100.25	68.7	97.57	69.65	94.15
71.18	93.74	75.98	92.13	77.21	91.74	79.03	90.93	81.11	89.96
81.57	89.97	82.28	90	82.38	90.01	87.22	89.99	91.74	89.65
99.34	89.92	125.26	90.82	128.49	91.83	128.52	91.89	130.13	92.6
137.2	95.94	142.79	98.57	144.27	99.23	146.98	99.97	147.74	100.21
148.07	100.25	148.54	100.24	149.27	100.23	151.09	100.11	155.45	100.03
156	100.01	161.06	99.93	161.24	99.93	164.58	99.73	166.33	99.59
168.59	99.43	169.31	99.37	170.14	99.29	175.97	99.27	181.09	99.3
183.09	99.33	187.53	99.37	190.98	99.3	197.9	99.25	202.14	99.21
206.21	99.12	211.91	99.13	216.15	99.1	216.79	99.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	67.21	.04	148.07	.23

Bank Sta: Left Right Coeff Contr. Expan.
67.21 148.07 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.78999	102	F
148.34	216.79	102	F

Downstream Deck/Roadway Coordinates
num= 4

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
68.37	100.39	98.78	69.26999	100.25	98.78	143.44	100.2	98.76
148.72	100.25	98.76						

Downstream Bridge Cross Section Data
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.2	2.8	101.14	3.54	101.12	3.82	101.11	3.96	101.11
4.13	101.1	4.68	101.09	7.5	101.02	12.86	100.94	15.12	100.92
19.54	100.87	31.05	100.79	31.91	100.75	31.93	100.76	31.96	100.76
32.2	100.75	44.8	100.54	45.19	100.52	53.73	100.34	54.14	100.31
57.36	100.24	57.81	100.23	57.83	100.23	62.16	100.15	63.08	100.22
63.19	100.36	66.86	100.29	67.11	100.31	67.32	100.32	68.82	100.39
69.45	100.42	69.59	100.37	70.03	100.38	70.1	98.07	71.54	95.66
73.71	92.06	73.75	92.06	74.73	88.22	75.35	88.21	75.66	88.23
76.58	88.27	100.53	89.38	119.27	90.24	125.57	90.51	125.79	90.5
125.99	90.49	127.48	90.54	127.62	90.59	128.42	91.84	129.21	92.19
130.31	92.68	133.84	96.57	141.29	99.17	143.33	99.44	144.75	99.61
146.56	99.86	148.02	100.08	148.24	100.11	148.92	100.27	149.68	100.35
158.44	100.38	160.23	100.31	162.09	100.3	162.54	100.29	165.05	99.95
165.68	99.84	165.95	99.84	172.61	99.92	180.48	99.86	182.44	99.84
182.45	99.84	191.25	99.78	191.78	99.77	195.83	99.74	196.17	99.73
200.09	99.71	205.85	99.67	219.32	99.58	220.57	99.57	220.59	99.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	68.82	.04	148.02	.23

Bank Sta: Left Right Coeff Contr. Expan.
68.82 148.02 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	69.45999	100.6	F
148.9	220.59	100.6	F

Upstream Embankment side slope = 1 horiz. to 1.0 vertical
Downstream Embankment side slope = 1 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =

```
Weir crest shape                          = Broad Crested

Number of Piers =  5

Pier Data
Pier Station     Upstream=   70.53    Downstream=   73.95
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=85.23999    Downstream=88.48999
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=   99.62    Downstream=  103.25
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=  114.79    Downstream=  117.97
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=  129.25    Downstream=  133.75
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Energy Only

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

BRIDGE OUTPUT  Profile #10 yr

  E.G. US. (ft)                99.22    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)                98.70    E.G. Elev (ft)               99.19         99.03
  Q Total (cfs)              3052.00    W.S. Elev (ft)               98.57         98.45
  Q Bridge (cfs)             3052.00    Crit W.S. (ft)               95.18         94.24
```

Q Weir (cfs)		Max Chl Dpth (ft)	8.92	10.24
Weir Sta Lft (ft)		Vel Total (ft/s)	6.30	6.08
Weir Sta Rgt (ft)		Flow Area (sq ft)	484.27	502.14
Weir Submerg		Froude # Chl	0.42	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	2467.37	2767.86
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)	6.97	7.78
Min El Prs (ft)	98.71	W.P. Total (ft)	148.12	144.72
Delta EG (ft)	0.23	Conv. Total (cfs)	39628.0	42751.5
Delta WS (ft)	0.21	Top Width (ft)	69.52	64.55
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.14	0.00
BR Open Vel (ft/s)	6.30	C & E Loss (ft)	0.02	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	1.21	1.10
BR Sel Method	Energy only	Power Total (lb/ft s)	7.63	6.71

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #25 yr

E.G. US. (ft)	101.19	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	100.66	E.G. Elev (ft)	101.04	100.62
Q Total (cfs)	3967.00	W.S. Elev (ft)	100.02	99.72
Q Bridge (cfs)	3967.00	Crit W.S. (ft)	96.03	95.14
Q Weir (cfs)		Max Chl Dpth (ft)	10.37	11.51
Weir Sta Lft (ft)		Vel Total (ft/s)	8.09	7.59
Weir Sta Rgt (ft)		Flow Area (sq ft)	490.08	522.73
Weir Submerg		Froude # Chl	0.44	0.39
Weir Max Depth (ft)		Specif Force (cu ft)	3578.22	3787.75
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)		
Min El Prs (ft)	98.71	W.P. Total (ft)	219.04	214.59
Delta EG (ft)	0.72	Conv. Total (cfs)	31143.6	35155.0
Delta WS (ft)	0.79	Top Width (ft)		
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.36	0.00
BR Open Vel (ft/s)	8.09	C & E Loss (ft)	0.06	0.15
BR Sluice Coef		Shear Total (lb/sq ft)	2.27	1.94
BR Sel Method	Energy only	Power Total (lb/ft s)	18.35	14.70

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #100 yr

E.G. US. (ft)	103.40	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	102.79	E.G. Elev (ft)	103.32	102.93
Q Total (cfs)	5541.00	W.S. Elev (ft)	102.49	102.00
Q Bridge (cfs)	3710.48	Crit W.S. (ft)	97.32	96.50
Q Weir (cfs)		Max Chl Dpth (ft)	12.84	13.79
Weir Sta Lft (ft)		Vel Total (ft/s)	5.69	6.10
Weir Sta Rgt (ft)		Flow Area (sq ft)	973.23	908.26
Weir Submerg		Froude # Chl	0.36	0.37
Weir Max Depth (ft)		Specif Force (cu ft)	5617.51	5700.36
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)	4.49	4.12
Min El Prs (ft)	98.71	W.P. Total (ft)	440.45	438.74
Delta EG (ft)	0.59	Conv. Total (cfs)	46505.6	44693.2
Delta WS (ft)	0.67	Top Width (ft)	216.79	220.59
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.37	0.00
BR Open Vel (ft/s)	7.57	C & E Loss (ft)	0.03	0.12
BR Sluice Coef		Shear Total (lb/sq ft)	1.96	1.99
BR Sel Method	Energy only	Power Total (lb/ft s)	11.15	12.12

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #500 yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	106.06	Element		
W.S. US. (ft)	105.37	E.G. Elev (ft)	106.05	105.84
Q Total (cfs)	7691.00	W.S. Elev (ft)	105.37	105.15
Q Bridge (cfs)	2656.26	Crit W.S. (ft)	98.60	98.26
Q Weir (cfs)		Max Chl Dpth (ft)	15.72	16.94
Weir Sta Lft (ft)		Vel Total (ft/s)	4.82	4.80
Weir Sta Rgt (ft)		Flow Area (sq ft)	1596.91	1602.00
Weir Submerg		Froude # Chl	0.30	0.29
Weir Max Depth (ft)		Specif Force (cu ft)	9601.48	9870.50
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)	7.37	7.26
Min El Prs (ft)	98.71	W.P. Total (ft)	446.20	445.03
Delta EG (ft)	0.22	Conv. Total (cfs)	83234.6	84410.3
Delta WS (ft)	0.23	Top Width (ft)	216.79	220.59
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.21	0.00
BR Open Vel (ft/s)	5.42	C & E Loss (ft)	0.00	0.00
BR Sluice Coef		Shear Total (lb/sq ft)	1.91	1.87
BR Sel Method	Energy only	Power Total (lb/ft s)	9.19	8.96

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 975

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.2	2.8	101.14	3.54	101.12	3.82	101.11	3.96	101.11
4.13	101.1	4.68	101.09	7.5	101.02	12.86	100.94	15.12	100.92
19.54	100.87	31.05	100.79	31.91	100.75	31.93	100.76	31.96	100.76
32.2	100.75	44.8	100.54	45.19	100.52	53.73	100.34	54.14	100.31
57.36	100.24	57.81	100.23	57.83	100.23	62.16	100.15	63.08	100.22
63.19	100.36	66.86	100.29	67.11	100.31	67.32	100.32	68.82	100.39
69.45	100.42	69.59	100.37	70.03	100.38	70.1	98.07	71.54	95.66
73.71	92.06	73.75	92.06	74.73	88.22	75.35	88.21	75.66	88.23
76.58	88.27	100.53	89.38	119.27	90.24	125.57	90.51	125.79	90.5
125.99	90.49	127.48	90.54	127.62	90.59	128.42	91.84	129.21	92.19
130.31	92.68	133.84	96.57	141.29	99.17	143.33	99.44	144.75	99.61
146.56	99.86	148.02	100.08	148.24	100.11	148.92	100.27	149.68	100.35
158.44	100.38	160.23	100.31	162.09	100.3	162.54	100.29	165.05	99.95
165.68	99.84	165.95	99.84	172.61	99.92	180.48	99.86	182.44	99.84
182.45	99.84	191.25	99.78	191.78	99.77	195.83	99.74	196.17	99.73
200.09	99.71	205.85	99.67	219.32	99.58	220.57	99.57	220.59	99.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	68.82	.04	148.02	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
68.82 148.02 5 5 5 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
069.45999 100.6 F
148.9 220.59 100.6 F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.49	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	94.06	Flow Area (sq ft)		537.94	
E.G. Slope (ft/ft)	0.001808	Area (sq ft)		537.94	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	69.25	Top Width (ft)		69.25	
Vel Total (ft/s)	5.67	Avg. Vel. (ft/s)		5.67	
Max Chl Dpth (ft)	10.28	Hydr. Depth (ft)		7.77	
Conv. Total (cfs)	71780.1	Conv. (cfs)		71780.1	
Length Wtd. (ft)	5.00	Wetted Per. (ft)		79.02	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		4.36	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.11	3.08	0.12
C & E Loss (ft)	0.03	Cum SA (acres)	0.12	0.47	0.23

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.		0.040	
W.S. Elev (ft)	99.87	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	94.92	Flow Area (sq ft)		637.43	
E.G. Slope (ft/ft)	0.001998	Area (sq ft)		637.43	6.47
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	120.88	Top Width (ft)		76.58	44.30
Vel Total (ft/s)	6.22	Avg. Vel. (ft/s)		6.22	
Max Chl Dpth (ft)	11.66	Hydr. Depth (ft)		8.32	
Conv. Total (cfs)	88753.1	Conv. (cfs)		88753.1	
Length Wtd. (ft)	5.00	Wetted Per. (ft)		87.84	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		0.91	
Alpha	1.00	Stream Power (lb/ft s)		5.63	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.35	3.63	0.60
C & E Loss (ft)	0.05	Cum SA (acres)	0.30	0.48	0.54

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.13	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	96.24	Flow Area (sq ft)	100.16	815.30	162.46
E.G. Slope (ft/ft)	0.001729	Area (sq ft)	100.16	815.30	162.46
Q Total (cfs)	5541.00	Flow (cfs)	34.22	5433.82	72.95
Top Width (ft)	220.59	Top Width (ft)	68.82	79.20	72.57
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)	0.34	6.66	0.45
Max Chl Dpth (ft)	13.92	Hydr. Depth (ft)	1.46	10.29	2.24
Conv. Total (cfs)	133240.5	Conv. (cfs)	823.0	130663.3	1754.3
Length Wtd. (ft)	5.00	Wetted Per. (ft)	69.83	90.98	75.19
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.15	0.97	0.23
Alpha	1.65	Stream Power (lb/ft s)	0.05	6.45	0.10
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.05	4.44	1.72
C & E Loss (ft)	0.06	Cum SA (acres)	0.43	0.43	0.63

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	105.84	Element			
Vel Head (ft)	0.69	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.15	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	97.92	Flow Area (sq ft)	308.12	1054.63	381.76
E.G. Slope (ft/ft)	0.001304	Area (sq ft)	308.12	1054.63	381.76
Q Total (cfs)	7691.00	Flow (cfs)	188.01	7246.69	256.31
Top Width (ft)	220.59	Top Width (ft)	68.82	79.20	72.57
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)	0.61	6.87	0.67
Max Chl Dpth (ft)	16.94	Hydr. Depth (ft)	4.48	13.32	5.26
Conv. Total (cfs)	212961.1	Conv. (cfs)	5205.9	200658.2	7097.0
Length Wtd. (ft)	5.00	Wetted Per. (ft)	72.86	90.98	78.21
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.34	0.94	0.40
Alpha	2.29	Stream Power (lb/ft s)	0.21	6.49	0.27
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.63	5.03	2.57
C & E Loss (ft)	0.06	Cum SA (acres)	0.43	0.43	0.63

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 970

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.916	8.94	100.743	13.44	100.628	17.94	100.457	22.44	100.344
26.94	100.176	40.577	99.83	45.149	99.758	49.721	99.609	54.911	99.394
57.738	99.167	58.865	99.122	60.487	98.513	61.612	97.984	63.437	97.376
65.487	95.467	66.063	94.825	68.009	92.905	68.82	92.471	69.361	92.181
71.639	90.878	72.581	90.364	73.236	90.238	77.153	89.217	81.725	88.765
84.859	88.77	90.869	88.855	96.482	89.008	100.528	89.141	104.573	89.3
110.414	89.579	118.247	89.921	119.978	90.019	122.805	90.153	123.903	90.429
126.718	91.024	127.362	91.178	127.828	91.624	130.714	94.511	131.753	95.523
131.92	95.659	136.478	98.131	137.587	98.369	139.602	98.488	141.036	98.881
143.527	99.091	145.594	99.293	148.02	99.553	150.152	99.781	151.376	99.837
154.71	99.943	163.825	99.705	168.383	99.719	172.941	99.781	177.499	99.864
182.448	99.875	200.441	99.634	209.381	99.422	213.183	99.36	218.829	99.293
220.59	99.315								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	57.738	.04	148.02	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57.738	148.02	40	33	29	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	58.75	100.23	F
148.9	220.59	100.6	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	98.95	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.51	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	93.97	Flow Area (sq ft)		577.31	

E.G. Slope (ft/ft)	0.001568	Area (sq ft)		577.31	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	79.22	Top Width (ft)		79.22	
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.29	
Max Chl Dpth (ft)	9.75	Hydr. Depth (ft)		7.29	
Conv. Total (cfs)	77083.9	Conv. (cfs)		77083.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		84.72	
Min Ch El (ft)	88.77	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		3.53	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.11	3.01	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	0.12	0.46	0.23

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.91	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	94.79	Flow Area (sq ft)		696.24	0.27
E.G. Slope (ft/ft)	0.001652	Area (sq ft)	5.58	697.01	16.26
Q Total (cfs)	3967.00	Flow (cfs)		3966.97	0.03
Top Width (ft)	180.79	Top Width (ft)	20.29	90.28	70.22
Vel Total (ft/s)	5.70	Avg. Vel. (ft/s)		5.70	0.12
Max Chl Dpth (ft)	11.14	Hydr. Depth (ft)		7.80	0.31
Conv. Total (cfs)	97609.3	Conv. (cfs)		97608.5	0.8
Length Wtd. (ft)	1.00	Wetted Per. (ft)		94.97	0.89
Min Ch El (ft)	88.77	Shear (lb/sq ft)		0.76	0.03
Alpha	1.00	Stream Power (lb/ft s)		4.31	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.35	3.55	0.60
C & E Loss (ft)	0.01	Cum SA (acres)	0.30	0.47	0.54

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.18	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	96.08	Flow Area (sq ft)	117.03	902.18	181.14
E.G. Slope (ft/ft)	0.001319	Area (sq ft)	117.03	902.18	181.14
Q Total (cfs)	5541.00	Flow (cfs)	43.34	5421.46	76.20
Top Width (ft)	220.59	Top Width (ft)	57.74	90.28	72.57
Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)	0.37	6.01	0.42
Max Chl Dpth (ft)	13.42	Hydr. Depth (ft)	2.03	9.99	2.50
Conv. Total (cfs)	152561.6	Conv. (cfs)	1193.2	149270.4	2098.0
Length Wtd. (ft)	1.00	Wetted Per. (ft)	59.04	95.98	75.46
Min Ch El (ft)	88.77	Shear (lb/sq ft)	0.16	0.77	0.20
Alpha	1.66	Stream Power (lb/ft s)	0.06	4.65	0.08
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.03	4.34	1.70
C & E Loss (ft)	0.10	Cum SA (acres)	0.42	0.42	0.63

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.20	Reach Len. (ft)	1.00	1.00	1.00

Crit W.S. (ft)	97.65	Flow Area (sq ft)	291.56	1175.08	400.50
E.G. Slope (ft/ft)	0.000987	Area (sq ft)	291.56	1175.08	400.50
Q Total (cfs)	7691.00	Flow (cfs)	165.98	7284.10	240.92
Top Width (ft)	220.59	Top Width (ft)	57.74	90.28	72.57
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)	0.57	6.20	0.60
Max Chl Dpth (ft)	16.44	Hydr. Depth (ft)	5.05	13.02	5.52
Conv. Total (cfs)	244832.2	Conv. (cfs)	5283.8	231879.3	7669.2
Length Wtd. (ft)	1.00	Wetted Per. (ft)	62.06	95.98	78.48
Min Ch El (ft)	88.77	Shear (lb/sq ft)	0.29	0.75	0.31
Alpha	2.15	Stream Power (lb/ft s)	0.16	4.68	0.19
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.60	4.90	2.52
C & E Loss (ft)	0.35	Cum SA (acres)	0.42	0.42	0.63

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: BrushyCreek
REACH: BrushyCreek RS: 960

INPUT
Description:
Distance from Upstream XS = 1
Deck/Roadway Width = 28.5
Weir Coefficient = .3
Upstream Deck/Roadway Coordinates
num= 4

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	105.1	100.5	15	105.1	100.5	125	105.1	100.5
250	105.1	100.5						

Upstream Bridge Cross Section Data
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.916	8.94	100.743	13.44	100.628	17.94	100.457	22.44	100.344
26.94	100.176	40.577	99.83	45.149	99.758	49.721	99.609	54.911	99.394
57.738	99.167	58.865	99.122	60.487	98.513	61.612	97.984	63.437	97.376
65.487	95.467	66.063	94.825	68.009	92.905	68.82	92.471	69.361	92.181
71.639	90.878	72.581	90.364	73.236	90.238	77.153	89.217	81.725	88.765
84.859	88.77	90.869	88.855	96.482	89.008	100.528	89.141	104.573	89.3
110.414	89.579	118.247	89.921	119.978	90.019	122.805	90.153	123.903	90.429
126.718	91.024	127.362	91.178	127.828	91.624	130.714	94.511	131.753	95.523
131.92	95.659	136.478	98.131	137.587	98.369	139.602	98.488	141.036	98.881
143.527	99.091	145.594	99.293	148.02	99.553	150.152	99.781	151.376	99.837
154.71	99.943	163.825	99.705	168.383	99.719	172.941	99.781	177.499	99.864
182.448	99.875	200.441	99.634	209.381	99.422	213.183	99.36	218.829	99.293
220.59	99.315								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	57.738	.04	148.02	.23

Bank Sta: Left Right Coeff Contr. Expan.
57.738 148.02 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	58.75	100.23	F
148.9	220.59	100.6	F

Downstream Deck/Roadway Coordinates

```
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0   105.1   100.5      45   105.1   100.5     155   105.1   100.5
     250   105.1   100.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 100.025   7.563  99.763  12.069  99.579  16.576   99.43  25.589  99.203
  34.928  99.177  38.581  99.237  39.109  99.226  42.851  98.772  43.616  98.665
  48.122  97.824  49.241  97.794  52.629  97.709  57.135  97.653  58.783  97.824
  59.931  97.887  61.642  98.075  70.655   98.14  75.162  98.072   77.01   97.98
  77.868  97.975  79.668  97.894   81.28  97.296  82.639  96.901  83.195    96.7
  84.175  96.344   85.55  95.341   87.41  93.915  88.682  92.981   89.79  92.455
  92.323  91.033    93.2  90.605  93.929  90.503  97.718   89.87 107.247  89.397
  124.83  88.448 127.042   88.45 129.348  88.479 131.181  89.222 132.121  89.723
 133.867  90.467 134.155  90.787  135.32  92.082 137.095  94.001 138.386  95.428
 139.459   96.14 141.942  97.624 142.894  98.242 143.772  98.329 146.635  98.393
 147.397  98.463 151.901  98.449 165.411  98.156 169.743  98.093 174.417  98.118
 183.424  97.985 214.948  97.302 241.968  96.789 246.471  96.776 249.775  96.796

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .23  79.668     .04 142.894     .23

Bank Sta: Left   Right    Coeff Contr.   Expan.
        79.668 142.894             .3      .35
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   76.83   99.65       F
  146.53 249.775   99.69       F

Upstream Embankment side slope              =       1 horiz. to 1.0 vertical
Downstream Embankment side slope            =       1 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Abutments =  2

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   100.5      36   100.5      36      98      51      88
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   100.5      54   100.5      54      98      69      88

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     131      88     146      98     146   100.5     250   100.5
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     149      88     164      98     164   100.5     250   100.5

Number of Piers =  2

Pier Data
Pier Station     Upstream=      75    Downstream=      87
Upstream     num=       2
    Width   Elev    Width   Elev
       1      88       1   100.5
Downstream     num=       2
    Width   Elev    Width   Elev
       1      88       1   100.5

Pier Data
Pier Station     Upstream=     125    Downstream=     137
```

Upstream num= 2

Width	Elev	Width	Elev
1	88	1	100.5

Downstream num= 2

Width	Elev	Width	Elev
1	88	1	100.5

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #10 yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	98.95	Element		
W.S. US. (ft)	98.51	E.G. Elev (ft)	98.94	98.73
Q Total (cfs)	3052.00	W.S. Elev (ft)	98.47	97.90
Q Bridge (cfs)	3052.00	Crit W.S. (ft)	94.04	94.67
Q Weir (cfs)		Max Chl Dpth (ft)	9.71	9.45
Weir Sta Lft (ft)		Vel Total (ft/s)	5.48	7.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	557.41	417.31
Weir Submerg		Froude # Chl	0.36	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	2906.20	2386.54
Min El Weir Flow (ft)	105.11	Hydr Depth (ft)	7.26	6.86
Min El Prs (ft)	100.50	W.P. Total (ft)	115.19	80.85
Delta EG (ft)	0.24	Conv. Total (cfs)	59239.2	46361.9
Delta WS (ft)	0.61	Top Width (ft)	76.75	66.78
BR Open Area (sq ft)	685.97	Frctn Loss (ft)	0.10	0.01
BR Open Vel (ft/s)	7.31	C & E Loss (ft)	0.11	0.02
BR Sluice Coef		Shear Total (lb/sq ft)	0.80	1.40
BR Sel Method	Energy only	Power Total (lb/ft s)	4.39	10.21

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #25 yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	100.41	Element		
W.S. US. (ft)	99.91	E.G. Elev (ft)	100.40	100.16
Q Total (cfs)	3967.00	W.S. Elev (ft)	99.86	99.17
Q Bridge (cfs)	3967.00	Crit W.S. (ft)	94.89	95.69
Q Weir (cfs)		Max Chl Dpth (ft)	11.09	10.72
Weir Sta Lft (ft)		Vel Total (ft/s)	5.91	7.92
Weir Sta Rgt (ft)		Flow Area (sq ft)	671.55	501.02
Weir Submerg		Froude # Chl	0.37	0.50
Weir Max Depth (ft)		Specif Force (cu ft)	3965.58	3259.79
Min El Weir Flow (ft)	105.11	Hydr Depth (ft)	7.88	7.40
Min El Prs (ft)	100.50	W.P. Total (ft)	129.95	92.85
Delta EG (ft)	0.29	Conv. Total (cfs)	74565.9	58850.9
Delta WS (ft)	0.74	Top Width (ft)	104.53	108.00
BR Open Area (sq ft)	685.97	Frctn Loss (ft)	0.10	0.01
BR Open Vel (ft/s)	7.92	C & E Loss (ft)	0.14	0.02
BR Sluice Coef		Shear Total (lb/sq ft)	0.91	1.53
BR Sel Method	Energy only	Power Total (lb/ft s)	5.39	12.12

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #100 yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	102.73	Element		
W.S. US. (ft)	102.18	E.G. Elev (ft)	102.62	102.20
Q Total (cfs)	5541.00	W.S. Elev (ft)	101.73	100.83
Q Bridge (cfs)	5541.00	Crit W.S. (ft)	96.20	97.29
Q Weir (cfs)		Max Chl Dpth (ft)	12.96	12.38
Weir Sta Lft (ft)		Vel Total (ft/s)	7.43	8.08
Weir Sta Rgt (ft)		Flow Area (sq ft)	746.03	685.97
Weir Submerg		Froude # Chl	0.37	0.47
Weir Max Depth (ft)		Specif Force (cu ft)	5917.52	4949.01
Min El Weir Flow (ft)	105.11	Hydr Depth (ft)		
Min El Prs (ft)	100.50	W.P. Total (ft)	264.49	251.42
Delta EG (ft)	0.72	Conv. Total (cfs)	59991.3	52608.8
Delta WS (ft)	1.19	Top Width (ft)		
BR Open Area (sq ft)	685.97	Frctn Loss (ft)	0.28	0.02
BR Open Vel (ft/s)	8.08	C & E Loss (ft)	0.14	0.18
BR Sluice Coef		Shear Total (lb/sq ft)	1.50	1.89
BR Sel Method	Energy only	Power Total (lb/ft s)	11.16	15.26

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #500 yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	105.77	Element		
W.S. US. (ft)	105.20	E.G. Elev (ft)	105.42	104.61
Q Total (cfs)	7691.00	W.S. Elev (ft)	103.69	101.96
Q Bridge (cfs)	7691.00	Crit W.S. (ft)	97.81	99.00
Q Weir (cfs)		Max Chl Dpth (ft)	14.92	13.51
Weir Sta Lft (ft)		Vel Total (ft/s)	10.31	11.21
Weir Sta Rgt (ft)		Flow Area (sq ft)	746.03	685.97
Weir Submerg		Froude # Chl	0.48	0.63
Weir Max Depth (ft)		Specif Force (cu ft)	8594.64	7217.94
Min El Weir Flow (ft)	105.11	Hydr Depth (ft)		
Min El Prs (ft)	100.50	W.P. Total (ft)	264.49	251.42
Delta EG (ft)	1.87	Conv. Total (cfs)	59991.3	52608.8
Delta WS (ft)	2.58	Top Width (ft)		
BR Open Area (sq ft)	685.97	Frctn Loss (ft)	0.53	0.02
BR Open Vel (ft/s)	11.21	C & E Loss (ft)	0.28	0.69
BR Sluice Coef		Shear Total (lb/sq ft)	2.89	3.64
BR Sel Method	Energy only	Power Total (lb/ft s)	29.84	40.81

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 933

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.025	7.563	99.763	12.069	99.579	16.576	99.43	25.589	99.203
34.928	99.177	38.581	99.237	39.109	99.226	42.851	98.772	43.616	98.665
48.122	97.824	49.241	97.794	52.629	97.709	57.135	97.653	58.783	97.824
59.931	97.887	61.642	98.075	70.655	98.14	75.162	98.072	77.01	97.98
77.868	97.975	79.668	97.894	81.28	97.296	82.639	96.901	83.195	96.7
84.175	96.344	85.55	95.341	87.41	93.915	88.682	92.981	89.79	92.455
92.323	91.033	93.2	90.605	93.929	90.503	97.718	89.87	107.247	89.397
124.83	88.448	127.042	88.45	129.348	88.479	131.181	89.222	132.121	89.723
133.867	90.467	134.155	90.787	135.32	92.082	137.095	94.001	138.386	95.428
139.459	96.14	141.942	97.624	142.894	98.242	143.772	98.329	146.635	98.393
147.397	98.463	151.901	98.449	165.411	98.156	169.743	98.093	174.417	98.118
183.424	97.985	214.948	97.302	241.968	96.789	246.471	96.776	249.775	96.796

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	79.668	.04	142.894	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
79.668	142.894	108.83	100	90.91	.3	.35

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	76.83	99.65	F
146.53	249.775	99.69	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	98.70	Element			
Vel Head (ft)	0.80	Wt. n-Val.	0.000	0.040	
W.S. Elev (ft)	97.90	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	94.72	Flow Area (sq ft)	0.00	425.07	
E.G. Slope (ft/ft)	0.003250	Area (sq ft)	1.96	425.07	40.23
Q Total (cfs)	3052.00	Flow (cfs)	0.00	3052.00	
Top Width (ft)	137.83	Top Width (ft)	12.57	62.70	62.56
Vel Total (ft/s)	7.18	Avg. Vel. (ft/s)	0.01	7.18	
Max Chl Dpth (ft)	9.45	Hydr. Depth (ft)	0.00	6.78	
Conv. Total (cfs)	53536.3	Conv. (cfs)	0.0	53536.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.20	68.09	
Min Ch El (ft)	88.45	Shear (lb/sq ft)		1.27	
Alpha	1.00	Stream Power (lb/ft s)		9.09	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.11	2.65	0.12
C & E Loss (ft)	0.04	Cum SA (acres)	0.12	0.41	0.22

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	100.13	Element			
Vel Head (ft)	0.96	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.17	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	95.69	Flow Area (sq ft)	3.47	505.21	3.02
E.G. Slope (ft/ft)	0.003121	Area (sq ft)	43.91	505.21	162.51
Q Total (cfs)	3967.00	Flow (cfs)	1.43	3964.61	0.96
Top Width (ft)	210.22	Top Width (ft)	40.11	63.23	106.88
Vel Total (ft/s)	7.75	Avg. Vel. (ft/s)	0.41	7.85	0.32
Max Chl Dpth (ft)	10.72	Hydr. Depth (ft)	1.22	7.99	0.83
Conv. Total (cfs)	71005.5	Conv. (cfs)	25.6	70962.7	17.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	2.84	68.71	3.64
Min Ch El (ft)	88.45	Shear (lb/sq ft)	0.24	1.43	0.16
Alpha	1.02	Stream Power (lb/ft s)	0.10	11.24	0.05

Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.34	3.11	0.58
C & E Loss (ft)	0.08	Cum SA (acres)	0.28	0.42	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	102.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.99	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	97.25	Flow Area (sq ft)	178.16	620.37	357.19
E.G. Slope (ft/ft)	0.002687	Area (sq ft)	178.16	620.37	357.19
Q Total (cfs)	5541.00	Flow (cfs)	101.08	5179.37	260.55
Top Width (ft)	249.78	Top Width (ft)	79.67	63.23	106.88
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	0.57	8.35	0.73
Max Chl Dpth (ft)	12.55	Hydr. Depth (ft)	2.24	9.81	3.34
Conv. Total (cfs)	106899.6	Conv. (cfs)	1950.1	99922.9	5026.6
Length Wtd. (ft)	99.72	Wetted Per. (ft)	80.79	68.71	111.10
Min Ch El (ft)	88.45	Shear (lb/sq ft)	0.37	1.51	0.54
Alpha	2.84	Stream Power (lb/ft s)	0.21	12.64	0.39
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	1.00	3.85	1.67
C & E Loss (ft)	0.10	Cum SA (acres)	0.42	0.42	0.62

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.63	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	98.92	Flow Area (sq ft)	308.24	723.60	531.70
E.G. Slope (ft/ft)	0.002868	Area (sq ft)	308.24	723.60	531.70
Q Total (cfs)	7691.00	Flow (cfs)	256.96	6916.66	517.39
Top Width (ft)	249.78	Top Width (ft)	79.67	63.23	106.88
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)	0.83	9.56	0.97
Max Chl Dpth (ft)	14.18	Hydr. Depth (ft)	3.87	11.44	4.97
Conv. Total (cfs)	143604.3	Conv. (cfs)	4797.9	129146.0	9660.5
Length Wtd. (ft)	99.64	Wetted Per. (ft)	82.42	68.71	112.74
Min Ch El (ft)	88.45	Shear (lb/sq ft)	0.67	1.89	0.84
Alpha	3.40	Stream Power (lb/ft s)	0.56	18.03	0.82
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	1.55	4.40	2.48
C & E Loss (ft)	0.19	Cum SA (acres)	0.42	0.42	0.62

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 900

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.95	4.45	98.67	11.78	97.13	11.92	97.1	12.17	97.09
21.89	96.79	22.54	97.09	25.72	98.25	29.82	98.13	34.42	98.05

47.41	97.75	54.03	97.76	54.06	97.76	54.08	97.76	55.8	94.95
58.2	91.9	59.95	89.29	61.08	87.68	73.21	87.67	76.52	87.65
92.47	87.52	95.62	90.75	97.29	92.06	102.32	96.53	105.02	98.59
119.8	98.01	133.37	97.67	134.69	97.67	140.79	97.64	148.33	97.49
216.93	96.33	220.64	96.38						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	54.06	.04	105.02	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54.06	105.02	107.86	100	85.5	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	54.02	99.5	F
105.29	220.64	99.5	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.		0.040	
W.S. Elev (ft)	97.38	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	93.89	Flow Area (sq ft)		391.23	
E.G. Slope (ft/ft)	0.003459	Area (sq ft)	4.92	391.23	36.33
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	127.59	Top Width (ft)	12.74	49.12	65.74
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)		7.80	
Max Chl Dpth (ft)	9.86	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	51890.1	Conv. (cfs)		51890.1	
Length Wtd. (ft)	100.01	Wetted Per. (ft)		57.99	
Min Ch El (ft)	87.52	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		11.37	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.10	1.71	0.04
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	0.28	0.09

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.	0.000	0.040	
W.S. Elev (ft)	98.46	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	95.01	Flow Area (sq ft)	0.03	445.33	
E.G. Slope (ft/ft)	0.003993	Area (sq ft)	37.79	445.33	137.84
Q Total (cfs)	3967.00	Flow (cfs)	0.01	3966.99	
Top Width (ft)	211.71	Top Width (ft)	48.61	50.79	112.31
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)	0.32	8.91	
Max Chl Dpth (ft)	10.94	Hydr. Depth (ft)	0.70	8.77	
Conv. Total (cfs)	62778.9	Conv. (cfs)	0.1	62778.7	
Length Wtd. (ft)	100.01	Wetted Per. (ft)	0.04	60.24	
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.17	1.84	
Alpha	1.00	Stream Power (lb/ft s)	0.06	16.42	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.23	2.02	0.27
C & E Loss (ft)	0.05	Cum SA (acres)	0.17	0.29	0.30

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.23	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	96.68	Flow Area (sq ft)	132.00	535.70	342.69

E.G. Slope (ft/ft)	0.003692	Area (sq ft)	132.00	535.70	342.69
Q Total (cfs)	5541.00	Flow (cfs)	92.00	5177.49	271.51
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	0.70	9.66	0.79
Max Chl Dpth (ft)	12.71	Hydr. Depth (ft)	2.44	10.51	2.96
Conv. Total (cfs)	91197.8	Conv. (cfs)	1514.2	85214.9	4468.7
Length Wtd. (ft)	99.52	Wetted Per. (ft)	55.80	60.46	119.50
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.55	2.04	0.66
Alpha	2.90	Stream Power (lb/ft s)	0.38	19.74	0.52
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.61	2.52	0.94
C & E Loss (ft)	0.06	Cum SA (acres)	0.25	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.90	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.45	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	98.63	Flow Area (sq ft)	198.02	597.93	483.88
E.G. Slope (ft/ft)	0.004619	Area (sq ft)	198.02	597.93	483.88
Q Total (cfs)	7691.00	Flow (cfs)	199.40	6955.51	536.09
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	1.01	11.63	1.11
Max Chl Dpth (ft)	13.93	Hydr. Depth (ft)	3.66	11.73	4.19
Conv. Total (cfs)	113167.7	Conv. (cfs)	2934.0	102345.5	7888.2
Length Wtd. (ft)	99.31	Wetted Per. (ft)	57.02	60.46	120.72
Min Ch El (ft)	87.52	Shear (lb/sq ft)	1.00	2.85	1.16
Alpha	3.39	Stream Power (lb/ft s)	1.01	33.17	1.28
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	0.92	2.88	1.42
C & E Loss (ft)	0.10	Cum SA (acres)	0.25	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 800

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.57	2.71	99.02	3.19	99.02	3.46	99.01	5.84	98.88
7.31	98.58	11.94	97.66	14.74	97.75	18.07	97.72	20.88	98.36
24.78	99.24	26.02	99.21	27.41	99.22	31.27	97.59	37.96	94.73
39.16	94.78	40.56	94.83	40.59	94.82	43.1	93.85	48.16	91.7
57.04	91.1	65.24	90.54	78.45	89.18	80.59	88.95	83.16	88.67
89.18	88.05	91.03	89	97.11	92.4	105.86	95.84	110.7	98.08
111.2	98.32	112.54	98.31	124.01	98.28	141.64	98.23	150.31	97.24
153.04	97.12	157.4	96.99	162.01	98.13	180.27	97.54	221.84	96.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	40.59	.04	110.7	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40.59	110.7	110	100	90	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	27.33	99.3	F
111.28	221.84	99.3	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	97.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	97.00	Reach Len. (ft)	110.00	100.00	90.00
Crit W.S. (ft)	95.02	Flow Area (sq ft)	11.89	393.73	
E.G. Slope (ft/ft)	0.004384	Area (sq ft)	11.89	393.73	1.37
Q Total (cfs)	3052.00	Flow (cfs)	6.40	3045.60	
Top Width (ft)	88.50	Top Width (ft)	7.95	67.78	12.77
Vel Total (ft/s)	7.52	Avg. Vel. (ft/s)	0.54	7.74	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)	1.50	5.81	
Conv. Total (cfs)	46095.9	Conv. (cfs)	96.7	45999.2	
Length Wtd. (ft)	100.01	Wetted Per. (ft)	8.42	70.60	
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.39	1.53	
Alpha	1.05	Stream Power (lb/ft s)	0.21	11.81	
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	0.08	0.81	0.00
C & E Loss (ft)	0.06	Cum SA (acres)	0.06	0.14	0.01

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.	0.230	0.040	0.001
W.S. Elev (ft)	98.16	Reach Len. (ft)	110.00	100.00	90.00
Crit W.S. (ft)	95.86	Flow Area (sq ft)	22.64	473.49	0.01
E.G. Slope (ft/ft)	0.004186	Area (sq ft)	26.38	473.49	61.42
Q Total (cfs)	3967.00	Flow (cfs)	14.98	3952.02	0.00
Top Width (ft)	171.10	Top Width (ft)	21.24	70.11	79.75
Vel Total (ft/s)	8.00	Avg. Vel. (ft/s)	0.66	8.35	0.05
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)	2.12	6.75	0.04
Conv. Total (cfs)	61317.7	Conv. (cfs)	231.5	61086.3	0.0
Length Wtd. (ft)	100.02	Wetted Per. (ft)	11.37	73.16	0.18
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.52	1.69	
Alpha	1.09	Stream Power (lb/ft s)	0.34	14.12	
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.15	0.97	0.07
C & E Loss (ft)	0.07	Cum SA (acres)	0.09	0.15	0.11

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.03	Reach Len. (ft)	110.00	100.00	90.00
Crit W.S. (ft)	97.14	Flow Area (sq ft)	89.99	604.49	265.59
E.G. Slope (ft/ft)	0.003350	Area (sq ft)	89.99	604.49	265.59
Q Total (cfs)	5541.00	Flow (cfs)	54.80	5312.33	173.87
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	0.61	8.79	0.65
Max Chl Dpth (ft)	11.98	Hydr. Depth (ft)	2.22	8.62	2.39
Conv. Total (cfs)	95729.4	Conv. (cfs)	946.8	91778.8	3003.8
Length Wtd. (ft)	99.89	Wetted Per. (ft)	43.30	73.16	114.66
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.43	1.73	0.48
Alpha	2.22	Stream Power (lb/ft s)	0.26	15.19	0.32
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	0.33	1.21	0.34

C & E Loss (ft)	0.12	Cum SA (acres)	0.13	0.15	0.17

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	102.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.26	Reach Len. (ft)	110.00	100.00	90.00
Crit W.S. (ft)	98.62	Flow Area (sq ft)	139.97	690.83	402.45
E.G. Slope (ft/ft)	0.003938	Area (sq ft)	139.97	690.83	402.45
Q Total (cfs)	7691.00	Flow (cfs)	121.78	7195.04	374.18
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	6.24	Avg. Vel. (ft/s)	0.87	10.42	0.93
Max Chl Dpth (ft)	13.21	Hydr. Depth (ft)	3.45	9.85	3.62
Conv. Total (cfs)	122553.5	Conv. (cfs)	1940.4	114650.6	5962.5
Length Wtd. (ft)	99.99	Wetted Per. (ft)	44.53	73.16	115.89
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.77	2.32	0.85
Alpha	2.61	Stream Power (lb/ft s)	0.67	24.18	0.79
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	0.50	1.40	0.55
C & E Loss (ft)	0.11	Cum SA (acres)	0.13	0.15	0.17

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.34	10.95	97.54	15.93	97.15	17.62	96.79	21.74	95.89
27.66	94.62	35.1	94.53	49.07	94.37	49.71	94.37	57.13	94.56
65.35	94.85	66.09	94.88	67.93	91.5	68.02	91.41	71.41	90.65
72.42	90.43	72.51	90.41	72.58	90.38	72.95	90.37	97.56	89.37
112.72	88.75	112.85	88.87	113.53	89.47	114.5	90.35	117.24	92.25
117.74	92.51	124.6	97.21	125.66	97.93	128.02	97.83	154.53	96.53
163.35	96.43	174.26	95.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	65.35	.04	124.6	.23

Bank Sta: Left Right Coeff Contr. Expan.
65.35 124.6 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.06	98.5	F

125.79 174.26 98.5 F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	97.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	95.79	Reach Len. (ft)			
Crit W.S. (ft)	94.73	Flow Area (sq ft)		310.32	
E.G. Slope (ft/ft)	0.008004	Area (sq ft)	50.70	310.97	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	100.33	Top Width (ft)	43.15	57.18	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		5.50	
Conv. Total (cfs)	34114.9	Conv. (cfs)		34114.9	
Length Wtd. (ft)		Wetted Per. (ft)		60.95	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.54	
Alpha	1.00	Stream Power (lb/ft s)		25.02	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	98.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.040	
W.S. Elev (ft)	96.79	Reach Len. (ft)			
Crit W.S. (ft)	95.64	Flow Area (sq ft)		367.28	
E.G. Slope (ft/ft)	0.008008	Area (sq ft)	95.96	368.65	9.81
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	131.35	Top Width (ft)	47.72	58.63	24.99
Vel Total (ft/s)	10.80	Avg. Vel. (ft/s)		10.80	
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	44329.0	Conv. (cfs)		44329.0	
Length Wtd. (ft)		Wetted Per. (ft)		62.72	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.93	
Alpha	1.00	Stream Power (lb/ft s)		31.62	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	100.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.35	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	98.22	Reach Len. (ft)			
Crit W.S. (ft)	97.04	Flow Area (sq ft)		450.99	0.73
E.G. Slope (ft/ft)	0.008006	Area (sq ft)	173.95	453.37	66.46
Q Total (cfs)	5541.00	Flow (cfs)		5540.73	0.27
Top Width (ft)	172.62	Top Width (ft)	63.71	59.25	49.66
Vel Total (ft/s)	12.27	Avg. Vel. (ft/s)		12.29	0.37
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)		7.70	0.61
Conv. Total (cfs)	61928.9	Conv. (cfs)		61925.8	3.0
Length Wtd. (ft)		Wetted Per. (ft)		63.46	1.41
Min Ch El (ft)	88.75	Shear (lb/sq ft)		3.55	0.26
Alpha	1.00	Stream Power (lb/ft s)		43.64	0.10
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	102.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.50	Reach Len. (ft)			
Crit W.S. (ft)	98.79	Flow Area (sq ft)	257.74	529.43	130.21
E.G. Slope (ft/ft)	0.008013	Area (sq ft)	257.74	529.43	130.21
Q Total (cfs)	7691.00	Flow (cfs)	366.55	7188.13	136.31
Top Width (ft)	174.26	Top Width (ft)	65.35	59.25	49.66
Vel Total (ft/s)	8.38	Avg. Vel. (ft/s)	1.42	13.58	1.05
Max Chl Dpth (ft)	10.75	Hydr. Depth (ft)	3.94	8.94	2.62
Conv. Total (cfs)	85918.0	Conv. (cfs)	4094.8	80300.3	1522.8
Length Wtd. (ft)		Wetted Per. (ft)	66.84	64.17	53.46
Min Ch El (ft)	88.75	Shear (lb/sq ft)	1.93	4.13	1.22
Alpha	2.45	Stream Power (lb/ft s)	2.74	56.03	1.28
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.

SUMMARY OF MANNING'S N VALUES

River:BrushyCreek

Reach	River Sta.	n1	n2	n3
BrushyCreek	1900	.23	.04	.23
BrushyCreek	1800	.23	.04	.23
BrushyCreek	1700	.23	.04	.23
BrushyCreek	1600	.23	.04	.23
BrushyCreek	1500	.23	.04	.23
BrushyCreek	1400	.23	.04	.23
BrushyCreek	1300	.23	.04	.23
BrushyCreek	1200	.23	.04	.23
BrushyCreek	1100	.23	.04	.23
BrushyCreek	1050	.23	.04	.23
BrushyCreek	1001	.23	.04	.23
BrushyCreek	1000	.23	.04	.23
BrushyCreek	987.5	Bridge		
BrushyCreek	975	.23	.04	.23
BrushyCreek	970	.23	.04	.23
BrushyCreek	960	Bridge		
BrushyCreek	933	.23	.04	.23
BrushyCreek	900	.23	.04	.23
BrushyCreek	800	.23	.04	.23
BrushyCreek	700	.23	.04	.23

SUMMARY OF REACH LENGTHS

River: BrushyCreek

Reach	River Sta.	Left	Channel	Right
BrushyCreek	1900	105.8	100	118.29
BrushyCreek	1800	439.95	99.76	53.66
BrushyCreek	1700	102.93	100.24	97.47
BrushyCreek	1600	100.17	99.43	99.79
BrushyCreek	1500	79.93	100.57	123.17
BrushyCreek	1400	98.46	100	105.25
BrushyCreek	1300	664.31	100	63.68
BrushyCreek	1200	114.91	100	120.57
BrushyCreek	1100	20.56	50	255.03
BrushyCreek	1050	25.83	50	71.25
BrushyCreek	1001	1	1	1
BrushyCreek	1000	25.88	25.66	27.03
BrushyCreek	987.5	Bridge		

BrushyCreek	975		5	5	5
BrushyCreek	970		40	33	29
BrushyCreek	960	Bridge			
BrushyCreek	933		108.83	100	90.91
BrushyCreek	900		107.86	100	85.5
BrushyCreek	800		110	100	90
BrushyCreek	700				

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: BrushyCreek

Reach	River Sta.	Contr.	Expan.
BrushyCreek	1900	.1	.3
BrushyCreek	1800	.1	.3
BrushyCreek	1700	.1	.3
BrushyCreek	1600	.1	.3
BrushyCreek	1500	.1	.3
BrushyCreek	1400	.1	.3
BrushyCreek	1300	.1	.3
BrushyCreek	1200	.1	.3
BrushyCreek	1100	.1	.3
BrushyCreek	1050	.1	.3
BrushyCreek	1001	.3	.5
BrushyCreek	1000	.3	.5
BrushyCreek	987.5	Bridge	
BrushyCreek	975	.3	.5
BrushyCreek	970	.3	.5
BrushyCreek	960	Bridge	
BrushyCreek	933	.3	.35
BrushyCreek	900	.1	.3
BrushyCreek	800	.1	.3
BrushyCreek	700	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan p19

River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 10 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
  This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 25 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
  This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 100 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 500 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The cross section had to be extended vertically during the critical depth calculations.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: BrushyCreek Reach: BrushyCreek   RS: 1800   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1800   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1800   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1800   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1700   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1700   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1700   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1700   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1600   Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek   RS: 1500   Profile: 100 yr

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     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1500     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
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     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1001     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1001     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1001     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1001     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 10 yr
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Upstream
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     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Upstream
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 970     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 970     Profile: 25 yr
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     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 970     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 970     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 10 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 10 yr Downstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 25 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 25 yr Downstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 100 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 100 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 500 yr Upstream
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 960     Profile: 500 yr Downstream
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 933     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
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            used.
River: BrushyCreek  Reach: BrushyCreek     RS: 933     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
            used.
River: BrushyCreek  Reach: BrushyCreek     RS: 933     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
            used.
River: BrushyCreek  Reach: BrushyCreek     RS: 933     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
            used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
            This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
            This may indicate the need for additional cross sections.
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     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 100 yr
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 500 yr
     Warning:The cross section had to be extended vertically during the critical depth calculations.
```

HEC-RAS Plan: Plan p19 River: BrushyCreek Reach: BrushyCreek

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BrushyCreek	1900	10 yr	3052.00	89.64	100.96	96.31	101.49	0.001593	5.85	526.50	150.10	0.36
BrushyCreek	1900	25 yr	3967.00	89.64	102.84	97.28	103.33	0.001211	5.84	1047.25	150.10	0.32
BrushyCreek	1900	100 yr	5541.00	89.64	104.03	98.73	104.78	0.001598	7.22	1226.55	150.10	0.38
BrushyCreek	1900	500 yr	7691.00	89.64	106.54	100.40	107.47	0.001532	8.07	1603.37	150.10	0.38
BrushyCreek	1800	10 yr	3052.00	89.88	100.10	96.79	101.21	0.003293	8.46	361.28	101.51	0.51
BrushyCreek	1800	25 yr	3967.00	89.88	101.74	97.95	103.07	0.003113	9.24	430.38	101.51	0.51
BrushyCreek	1800	100 yr	5541.00	89.88	104.01	99.65	104.60	0.001099	6.23	1026.14	101.51	0.32
BrushyCreek	1800	500 yr	7691.00	89.88	106.52	101.64	107.29	0.001121	7.13	1280.45	101.51	0.33
BrushyCreek	1700	10 yr	3052.00	88.92	100.33	95.52	100.80	0.001542	5.53	552.38	174.52	0.35
BrushyCreek	1700	25 yr	3967.00	88.92	102.10	96.53	102.64	0.001331	5.88	675.85	174.52	0.33
BrushyCreek	1700	100 yr	5541.00	88.92	103.90	98.01	104.47	0.001234	6.34	1466.54	174.52	0.33
BrushyCreek	1700	500 yr	7691.00	88.92	106.44	99.64	107.14	0.001178	7.07	1909.67	174.52	0.33
BrushyCreek	1600	10 yr	3052.00	89.51	100.08	95.14	100.64	0.001580	6.01	511.95	207.76	0.35
BrushyCreek	1600	25 yr	3967.00	89.51	101.81	96.13	102.48	0.001505	6.57	609.70	207.76	0.35
BrushyCreek	1600	100 yr	5541.00	89.51	103.75	97.61	104.34	0.001253	6.69	1756.04	207.76	0.33
BrushyCreek	1600	500 yr	7691.00	89.51	106.29	99.32	107.01	0.001245	7.51	2283.05	207.76	0.34
BrushyCreek	1500	10 yr	3052.00	89.82	99.72	95.78	100.44	0.002195	6.79	452.90	263.66	0.41
BrushyCreek	1500	25 yr	3967.00	89.82	101.46	96.75	102.29	0.002009	7.34	545.67	263.66	0.40
BrushyCreek	1500	100 yr	5541.00	89.82	103.67	98.18	104.20	0.001260	6.62	2135.08	263.66	0.33
BrushyCreek	1500	500 yr	7691.00	89.82	106.24	99.89	106.86	0.001190	7.28	2813.58	263.66	0.33
BrushyCreek	1400	10 yr	3052.00	87.99	99.54	95.31	100.22	0.001999	6.58	463.94	270.78	0.39
BrushyCreek	1400	25 yr	3967.00	87.99	101.30	96.29	102.09	0.001833	7.13	557.58	270.78	0.39
BrushyCreek	1400	100 yr	5541.00	87.99	103.56	97.79	104.07	0.001155	6.44	2209.90	270.78	0.32
BrushyCreek	1400	500 yr	7691.00	87.99	106.14	99.49	106.73	0.001098	7.10	2908.89	270.78	0.32
BrushyCreek	1300	10 yr	3052.00	90.00	99.45	95.42	99.99	0.001807	5.90	517.77	187.29	0.38
BrushyCreek	1300	25 yr	3967.00	90.00	101.26	96.34	101.86	0.001502	6.20	641.35	187.29	0.35
BrushyCreek	1300	100 yr	5541.00	90.00	103.32	97.71	103.94	0.001291	6.55	1433.40	187.29	0.34
BrushyCreek	1300	500 yr	7691.00	90.00	105.87	99.17	106.60	0.001218	7.27	1909.81	187.29	0.34
BrushyCreek	1200	10 yr	3052.00	87.65	99.18	95.21	99.78	0.002183	6.24	489.54	172.66	0.40
BrushyCreek	1200	25 yr	3967.00	87.65	101.03	96.21	101.69	0.001786	6.52	609.44	172.66	0.37
BrushyCreek	1200	100 yr	5541.00	87.65	103.07	97.67	103.76	0.001560	6.93	1303.44	172.66	0.36
BrushyCreek	1200	500 yr	7691.00	87.65	105.60	99.20	106.43	0.001472	7.68	1740.15	172.66	0.36
BrushyCreek	1100	10 yr	3052.00	89.81	98.72	95.29	99.52	0.002693	7.19	424.28	142.88	0.45
BrushyCreek	1100	25 yr	3967.00	89.81	100.58	96.23	101.47	0.002306	7.54	526.06	172.14	0.43
BrushyCreek	1100	100 yr	5541.00	89.81	102.88	97.67	103.60	0.001633	7.32	1464.13	172.14	0.37
BrushyCreek	1100	500 yr	7691.00	89.81	105.38	99.48	106.27	0.001593	8.21	1895.34	172.14	0.38
BrushyCreek	1050	10 yr	3052.00	86.90	98.87	93.99	99.31	0.001501	5.32	573.65	173.71	0.34
BrushyCreek	1050	25 yr	3967.00	86.90	100.78	94.91	101.27	0.001225	5.56	714.93	208.81	0.31
BrushyCreek	1050	100 yr	5541.00	86.90	102.97	96.31	103.47	0.001051	5.90	1542.85	208.81	0.30
BrushyCreek	1050	500 yr	7691.00	86.90	105.52	97.94	106.12	0.001002	6.55	2075.78	208.81	0.30
BrushyCreek	1001	10 yr	3052.00	89.65	98.70	94.99	99.22	0.001984	5.79	527.31	74.41	0.38
BrushyCreek	1001	25 yr	3967.00	89.65	100.66	95.80	101.19	0.001642	5.84	679.34	156.81	0.36
BrushyCreek	1001	100 yr	5541.00	89.65	102.79	97.05	103.40	0.001421	6.32	1191.20	216.79	0.34
BrushyCreek	1001	500 yr	7691.00	89.65	105.37	98.52	106.06	0.001240	6.83	1750.47	216.79	0.33
BrushyCreek	1000	10 yr	3052.00	89.65	98.70	94.99	99.22	0.001986	5.79	527.12	74.41	0.38
BrushyCreek	1000	25 yr	3967.00	89.65	100.66	95.80	101.19	0.001643	5.84	679.15	156.74	0.36
BrushyCreek	1000	100 yr	5541.00	89.65	102.79	97.05	103.40	0.001422	6.32	1190.76	216.79	0.34
BrushyCreek	1000	500 yr	7691.00	89.65	105.37	98.52	106.06	0.001240	6.83	1750.11	216.79	0.33
BrushyCreek	987.5		Bridge									
BrushyCreek	975	10 yr	3052.00	88.21	98.49	94.06	98.99	0.001808	5.67	537.94	69.25	0.36
BrushyCreek	975	25 yr	3967.00	88.21	99.87	94.92	100.47	0.001998	6.22	637.43	120.88	0.38
BrushyCreek	975	100 yr	5541.00	88.21	102.13	96.24	102.80	0.001729	6.66	1077.92	220.59	0.37
BrushyCreek	975	500 yr	7691.00	88.21	105.15	97.92	105.84	0.001304	6.87	1744.51	220.59	0.33
BrushyCreek	970	10 yr	3052.00	88.77	98.51	93.97	98.95	0.001568	5.29	577.31	79.22	0.35
BrushyCreek	970	25 yr	3967.00	88.77	99.91	94.79	100.41	0.001652	5.70	696.51	180.79	0.36
BrushyCreek	970	100 yr	5541.00	88.77	102.18	96.08	102.73	0.001319	6.01	1200.36	220.59	0.34
BrushyCreek	970	500 yr	7691.00	88.77	105.20	97.65	105.77	0.000987	6.20	1867.14	220.59	0.30
BrushyCreek	960		Bridge									
BrushyCreek	933	10 yr	3052.00	88.45	97.90	94.72	98.70	0.003250	7.18	425.07	137.83	0.49
BrushyCreek	933	25 yr	3967.00	88.45	99.17	95.69	100.13	0.003121	7.85	511.69	210.22	0.49

HEC-RAS Plan: Plan p19 River: BrushyCreek Reach: BrushyCreek (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BrushyCreek	933	100 yr	5541.00	88.45	100.99	97.25	102.01	0.002687	8.35	1155.72	249.78	0.47
BrushyCreek	933	500 yr	7691.00	88.45	102.63	98.92	103.90	0.002868	9.56	1563.54	249.78	0.50
BrushyCreek	900	10 yr	3052.00	87.52	97.38	93.89	98.32	0.003459	7.80	391.23	127.59	0.49
BrushyCreek	900	25 yr	3967.00	87.52	98.46	95.01	99.69	0.003993	8.91	445.36	211.71	0.53
BrushyCreek	900	100 yr	5541.00	87.52	100.23	96.68	101.59	0.003692	9.66	1010.39	220.64	0.53
BrushyCreek	900	500 yr	7691.00	87.52	101.45	98.63	103.36	0.004619	11.63	1279.84	220.64	0.60
BrushyCreek	800	10 yr	3052.00	88.05	97.00	95.02	97.93	0.004384	7.74	405.62	88.50	0.57
BrushyCreek	800	25 yr	3967.00	88.05	98.16	95.86	99.24	0.004186	8.35	496.14	171.10	0.57
BrushyCreek	800	100 yr	5541.00	88.05	100.03	97.14	101.18	0.003350	8.79	960.07	221.84	0.53
BrushyCreek	800	500 yr	7691.00	88.05	101.26	98.62	102.84	0.003938	10.42	1233.25	221.84	0.58
BrushyCreek	700	10 yr	3052.00	88.75	95.79	94.73	97.30	0.008004	9.84	310.32	100.33	0.74
BrushyCreek	700	25 yr	3967.00	88.75	96.79	95.64	98.60	0.008008	10.80	367.28	131.35	0.76
BrushyCreek	700	100 yr	5541.00	88.75	98.22	97.04	100.57	0.008006	12.29	451.72	172.62	0.78
BrushyCreek	700	500 yr	7691.00	88.75	99.50	98.79	102.18	0.008013	13.58	917.38	174.26	0.80

FLORIDA DEPARTMENT OF TRANSPORTATION
SPREAD CALCULATIONS

Project: O.C. PHILLIPS RD. OVER BRUSHY CREEK BRIDGE NO. 484029
County: Escambia
Financial Project ID: 430468-1-38-01
Alignment: O.C. PHILLIPS RD.
Design Speed: 35 mph
Requirement: Design speed ≤ 45; Keep ½ of lane clear

Prepared by: EKN Date 3/4/20
Checked by: WLA Date 3/5/20

Intensity (in/hr) = 4.00
Manning's n = 0.016

Str. No.	Station	Offset	Direction	Structure Type	C · A	Overland Runoff (cfs)	Previous bypass flow (cfs)	Total Flow (cfs)	Cross Slope (ft/ft)	Long. Slope	Spread (ft)	Allowable Spread (ft)	Intercepted flow (cfs)	Bypass to Str. No.	Bypass flow (cfs)
Swale Lt.	20+87	23.33 Lt.	AH	Open Channel	0.08	0.32	0.00	0.32	2.00%	0.30%	5.90	16.00	0.32	N/A	0.00
Swale Rt.	21+02	23.33 Rt.	AH	Open Channel	0.08	0.32	0.00	0.32	2.00%	0.30%	5.90	16.00	0.32	N/A	0.00

Station References: All station refer to CL Const. SR 64

HEC-RAS HEC-RAS 5.0.7 March 2019
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Brushy Creek
Project File : BrushyCreek.prj
Run Date and Time: 3/5/2020 9:12:10 PM

Project in English units

Project Description:
O.C Phillips Bridge

PLAN DATA

Plan Title: Existing
Plan File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.p05

Geometry Title: Existing
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g03

Flow Title : USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

Plan Summary Information:
Number of: Cross Sections = 16 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

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

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

FLOW DATA

Flow Title: USGS Regression Flows
Flow File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.F01

Flow Data (cfs)

River	Reach	RS	2 yr	10 yr	25 yr	50 yr	100 yr	500 yr
BrushyCreek	BrushyCreek	1900	1541	3052	3967	4741	5541	7691

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
BrushyCreek	BrushyCreek	2 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	10 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	25 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	50 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	100 yr		Normal S = 0.008
BrushyCreek	BrushyCreek	500 yr		Normal S = 0.008

GEOMETRY DATA

Geometry Title: Existing
Geometry File : f:\PROJECT\5199627\FileCabinet\C. Design Documentation\C.09 Drainage\HECRAS\BrushyCreek.g03

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1900

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.523.020004	98.5313.95001	98.8441.43001	99.9741.46001	99.97				
50.78001	96.360.15001	92.3160.61001	92.0963.39001	90.9	81.41	90.17			
94.33	89.65	94.7	89.6496.00001	91.9596.28001	92.1	100.45	94.36		
103.72	95.97	104.79	96.5	105.03	96.51	119.69	97.3	142.69	97.69
150.1	97.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2341.43001	.04	103.72	.23	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
41.43001 103.72 105.8 100 118.29 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	41.48	102.7	F
104.94	150.1	102.7	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.36	Element			
Vel Head (ft)	0.55	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.81	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	96.31	Flow Area (sq ft)		511.11	5.54
E.G. Slope (ft/ft)	0.001696	Area (sq ft)	68.55	511.15	162.52
Q Total (cfs)	3052.00	Flow (cfs)		3048.22	3.78
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)		5.96	0.68
Max Chl Dpth (ft)	11.17	Hydr. Depth (ft)		8.21	4.54
Conv. Total (cfs)	74107.1	Conv. (cfs)		74015.2	91.9
Length Wtd. (ft)	100.01	Wetted Per. (ft)		66.40	1.34
Min Ch El (ft)	89.64	Shear (lb/sq ft)		0.81	0.44
Alpha	1.02	Stream Power (lb/ft s)		4.86	0.30

Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.40	13.29	3.61
C & E Loss (ft)	0.06	Cum SA (acres)	2.22	1.80	1.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	103.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	102.45	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	97.28	Flow Area (sq ft)		613.43	7.54
E.G. Slope (ft/ft)	0.001559	Area (sq ft)	136.66	613.55	238.76
Q Total (cfs)	3967.00	Flow (cfs)		3960.93	6.07
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)		6.46	0.81
Max Chl Dpth (ft)	12.81	Hydr. Depth (ft)		9.86	6.18
Conv. Total (cfs)	100478.1	Conv. (cfs)		100324.2	153.8
Length Wtd. (ft)	100.01	Wetted Per. (ft)		66.40	1.34
Min Ch El (ft)	89.64	Shear (lb/sq ft)		0.90	0.55
Alpha	1.02	Stream Power (lb/ft s)		5.80	0.44
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	7.27	15.98	6.27
C & E Loss (ft)	0.08	Cum SA (acres)	2.84	1.78	2.04

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.78	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	98.73	Flow Area (sq ft)	191.65	696.22	300.32
E.G. Slope (ft/ft)	0.001731	Area (sq ft)	191.65	696.22	300.32
Q Total (cfs)	5541.00	Flow (cfs)	132.00	5151.38	257.63
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	4.66	Avg. Vel. (ft/s)	0.69	7.40	0.86
Max Chl Dpth (ft)	14.14	Hydr. Depth (ft)	4.63	11.18	6.48
Conv. Total (cfs)	133194.6	Conv. (cfs)	3173.0	123828.9	6192.8
Length Wtd. (ft)	100.54	Wetted Per. (ft)	46.71	66.46	52.67
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.44	1.13	0.62
Alpha	2.34	Stream Power (lb/ft s)	0.31	8.37	0.53
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	13.76	19.88	11.07
C & E Loss (ft)	0.05	Cum SA (acres)	3.68	1.83	2.21

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.	0.230	0.040	0.230

W.S. Elev (ft)	105.44	Reach Len. (ft)	105.80	100.00	118.29
Crit W.S. (ft)	100.39	Flow Area (sq ft)	260.58	799.87	377.49
E.G. Slope (ft/ft)	0.002044	Area (sq ft)	260.58	799.87	377.49
Q Total (cfs)	7691.00	Flow (cfs)	233.89	7055.61	401.50
Top Width (ft)	150.10	Top Width (ft)	41.43	62.29	46.38
Vel Total (ft/s)	5.35	Avg. Vel. (ft/s)	0.90	8.82	1.06
Max Chl Dpth (ft)	15.80	Hydr. Depth (ft)	6.29	12.84	8.14
Conv. Total (cfs)	170107.6	Conv. (cfs)	5173.0	156054.3	8880.3
Length Wtd. (ft)	100.62	Wetted Per. (ft)	48.38	66.46	54.33
Min Ch El (ft)	89.64	Shear (lb/sq ft)	0.69	1.54	0.89
Alpha	2.50	Stream Power (lb/ft s)	0.62	13.55	0.94
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	19.32	22.59	14.31
C & E Loss (ft)	0.06	Cum SA (acres)	3.75	1.83	2.21

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1800

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.29	17.11	98.87	29.08	98.57	29.13	98.54	31.01	97.44
31.59	96.91	36.72	92.16	39.6	90.99	40.75	90.22	52.24	90.22
52.92	90.2	64.62	89.88	67.8	91.74	68.54	92.07	69.11	92.65
70.21001	9370.74001		93.3	72.43	92.03	73.12	91.96	73.5	91.86
79.21001	91.4485.46001		90.99	85.84	91.14	86.16	91.22	86.36	91.28
86.4	91.29	101.21	95.28	101.51	95.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	29.13	.04	101.21	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.13	101.21	439.95	99.76	53.66	.1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	28.83	102.7	F
70.95	101.51	102.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	101.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	99.89	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	96.79	Flow Area (sq ft)	0.40	351.97	
E.G. Slope (ft/ft)	0.003577	Area (sq ft)	27.91	578.55	1.37
Q Total (cfs)	3052.00	Flow (cfs)	0.18	3051.82	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	8.66	Avg. Vel. (ft/s)	0.46	8.67	
Max Chl Dpth (ft)	10.01	Hydr. Depth (ft)	1.32	8.42	
Conv. Total (cfs)	51028.5	Conv. (cfs)	3.0	51025.5	
Length Wtd. (ft)	99.76	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.29	1.72	
Alpha	1.00	Stream Power (lb/ft s)	0.13	14.93	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.28	12.04	3.38
C & E Loss (ft)	0.20	Cum SA (acres)	2.14	1.64	1.33

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross

sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	101.36	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	97.95	Flow Area (sq ft)	0.84	413.64	
E.G. Slope (ft/ft)	0.003528	Area (sq ft)	70.87	684.84	1.81
Q Total (cfs)	3967.00	Flow (cfs)	0.63	3966.37	
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	9.57	Avg. Vel. (ft/s)	0.75	9.59	
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)	2.79	9.89	
Conv. Total (cfs)	66789.8	Conv. (cfs)	10.5	66779.3	
Length Wtd. (ft)	99.77	Wetted Per. (ft)	0.31	45.66	
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.60	2.00	
Alpha	1.00	Stream Power (lb/ft s)	0.45	19.13	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	7.02	14.49	5.94
C & E Loss (ft)	0.25	Cum SA (acres)	2.75	1.62	1.98

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.75	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	99.65	Flow Area (sq ft)	140.47	857.06	2.53
E.G. Slope (ft/ft)	0.001182	Area (sq ft)	140.47	857.06	2.53
Q Total (cfs)	5541.00	Flow (cfs)	80.94	5459.82	0.25
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	5.54	Avg. Vel. (ft/s)	0.58	6.37	0.10
Max Chl Dpth (ft)	13.87	Hydr. Depth (ft)	4.82	11.89	8.43
Conv. Total (cfs)	161200.5	Conv. (cfs)	2354.6	158838.7	7.2
Length Wtd. (ft)	109.02	Wetted Per. (ft)	33.61	76.91	8.70
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.31	0.82	0.02
Alpha	1.30	Stream Power (lb/ft s)	0.18	5.24	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	13.36	18.09	10.66
C & E Loss (ft)	0.01	Cum SA (acres)	3.60	1.68	2.15

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.41	Reach Len. (ft)	439.95	99.76	53.66
Crit W.S. (ft)	101.64	Flow Area (sq ft)	188.64	976.25	3.03
E.G. Slope (ft/ft)	0.001463	Area (sq ft)	188.64	976.25	3.03
Q Total (cfs)	7691.00	Flow (cfs)	142.58	7548.09	0.33
Top Width (ft)	101.51	Top Width (ft)	29.13	72.08	0.30
Vel Total (ft/s)	6.59	Avg. Vel. (ft/s)	0.76	7.73	0.11

Max Chl Dpth (ft)	15.53	Hydr. Depth (ft)	6.48	13.54	10.09
Conv. Total (cfs)	201072.8	Conv. (cfs)	3727.6	197336.6	8.6
Length Wtd. (ft)	111.20	Wetted Per. (ft)	35.26	76.91	10.36
Min Ch El (ft)	89.88	Shear (lb/sq ft)	0.49	1.16	0.03
Alpha	1.35	Stream Power (lb/ft s)	0.37	8.96	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	18.77	20.56	13.80
C & E Loss (ft)	0.02	Cum SA (acres)	3.67	1.68	2.15

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1700

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.77	42.14	98.77	45.34001	98.81	48.09	98.89	52.11	98.98
60.78001	99.15	67.71001	99.28	69.79	99.32	70.16	99.32	82.83	95.99
97.66	91.97	98.88	91.94	104.61	88.98	104.73	88.92	104.86	88.92
114.54	88.95	130.75	89	130.82	89.11	133.68	92.19	134.1	92.67
138.74	96.9	139.37	97.48	141.1	97.43	155.94	96.99	168.27	94.3
172.84	93.83	174.52	93.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.236	7.71001	.04	138.74	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
67.71001 138.74 102.93 100.24 97.47 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	69.77	102.6	F
139.53	174.52	102.6	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.12	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	95.52	Flow Area (sq ft)		535.34	2.27
E.G. Slope (ft/ft)	0.001680	Area (sq ft)	126.82	537.02	142.85
Q Total (cfs)	3052.00	Flow (cfs)		3050.98	1.02
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	5.68	Avg. Vel. (ft/s)		5.70	0.45
Max Chl Dpth (ft)	11.20	Hydr. Depth (ft)		7.76	2.87
Conv. Total (cfs)	74458.9	Conv. (cfs)		74433.9	25.0
Length Wtd. (ft)	100.24	Wetted Per. (ft)		73.93	1.02
Min Ch El (ft)	88.92	Shear (lb/sq ft)		0.76	0.23
Alpha	1.01	Stream Power (lb/ft s)		4.33	0.11
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	2.50	10.77	3.29
C & E Loss (ft)	0.01	Cum SA (acres)	1.65	1.48	1.31

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	102.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	101.74	Reach Len. (ft)	102.93	100.24	97.47

Crit W.S. (ft)	96.53	Flow Area (sq ft)		646.90	3.54
E.G. Slope (ft/ft)	0.001510	Area (sq ft)	236.34	651.91	200.72
Q Total (cfs)	3967.00	Flow (cfs)		3964.95	2.05
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	6.10	Avg. Vel. (ft/s)		6.13	0.58
Max Chl Dpth (ft)	12.82	Hydr. Depth (ft)		9.38	4.49
Conv. Total (cfs)	102094.9	Conv. (cfs)		102042.3	52.7
Length Wtd. (ft)	100.24	Wetted Per. (ft)		73.93	1.02
Min Ch El (ft)	88.92	Shear (lb/sq ft)		0.82	0.33
Alpha	1.01	Stream Power (lb/ft s)		5.06	0.19
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	5.47	12.96	5.82
C & E Loss (ft)	0.01	Cum SA (acres)	2.27	1.46	1.95

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	104.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.63	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	98.00	Flow Area (sq ft)	364.89	786.76	268.65
E.G. Slope (ft/ft)	0.001342	Area (sq ft)	364.89	786.76	268.65
Q Total (cfs)	5541.00	Flow (cfs)	248.77	5085.98	206.25
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	0.68	6.46	0.77
Max Chl Dpth (ft)	14.71	Hydr. Depth (ft)	5.39	11.08	7.51
Conv. Total (cfs)	151258.6	Conv. (cfs)	6791.0	138837.3	5630.3
Length Wtd. (ft)	100.24	Wetted Per. (ft)	74.63	75.99	45.98
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.41	0.87	0.49
Alpha	2.52	Stream Power (lb/ft s)	0.28	5.61	0.38
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	10.80	16.21	10.49
C & E Loss (ft)	0.00	Cum SA (acres)	3.11	1.51	2.12

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	106.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.29	Reach Len. (ft)	102.93	100.24	97.47
Crit W.S. (ft)	99.64	Flow Area (sq ft)	477.03	904.41	327.91
E.G. Slope (ft/ft)	0.001584	Area (sq ft)	477.03	904.41	327.91
Q Total (cfs)	7691.00	Flow (cfs)	416.29	6969.63	305.08
Top Width (ft)	174.52	Top Width (ft)	67.71	71.03	35.78
Vel Total (ft/s)	4.50	Avg. Vel. (ft/s)	0.87	7.71	0.93
Max Chl Dpth (ft)	16.37	Hydr. Depth (ft)	7.05	12.73	9.16
Conv. Total (cfs)	193263.0	Conv. (cfs)	10460.8	175136.1	7666.1
Length Wtd. (ft)	100.25	Wetted Per. (ft)	76.28	75.99	47.64
Min Ch El (ft)	88.92	Shear (lb/sq ft)	0.62	1.18	0.68
Alpha	2.66	Stream Power (lb/ft s)	0.54	9.07	0.63
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	15.41	18.40	13.59
C & E Loss (ft)	0.00	Cum SA (acres)	3.18	1.51	2.13

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1600

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INPUT
Description:
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   95.025 4.64999   98.63 81.85999   98.37   82.73   98.36   83.95   97.17
87.81999   93.44   89.56   92.04   89.62   91.94   90.95   89.82   91.23   89.51
   113.8   89.66  130.42   89.77  130.57   89.77  130.82   90.02  132.88   92.11
  133.02   92.21  137.54   96.97  137.64   97.08   139.1    97.2  139.69   97.21
  172.46   97.69  175.77   97.72  181.65    96.5  194.73    93.9  207.76   93.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .238 81.85999     .04  137.54     .23

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      81.85999  137.54           100.17   99.43   99.79             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   82.41   102.4       F
  138.89  207.76   102.4       F

CROSS SECTION OUTPUT  Profile #10 yr

  E.G. Elev (ft)            100.44    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.59    Wt. n-Val.                          0.040     0.230
  W.S. Elev (ft)             99.86    Reach Len. (ft)          100.17     99.43     99.79
  Crit W.S. (ft)             95.13    Flow Area (sq ft)                  495.62      3.69
  E.G. Slope (ft/ft)      0.001718    Area (sq ft)             202.51    496.44    248.29
  Q Total (cfs)            3052.00    Flow (cfs)                        3050.12      1.88
  Top Width (ft)            207.76    Top Width (ft)            81.86     55.68     70.22
  Vel Total (ft/s)            6.11    Avg. Vel. (ft/s)                    6.15      0.51
  Max Chl Dpth (ft)          10.35    Hydr. Depth (ft)                    8.99      2.73
  Conv. Total (cfs)         73624.7    Conv. (cfs)                       73579.3      45.4
  Length Wtd. (ft)            99.43    Wetted Per. (ft)                    62.03      1.40
  Min Ch El (ft)              89.51    Shear (lb/sq ft)                    0.86      0.28
  Alpha                        1.01    Stream Power (lb/ft s)              5.27      0.14
  Frctn Loss (ft)             0.20    Cum Volume (acre-ft)        2.11      9.58      2.86
  C & E Loss (ft)             0.02    Cum SA (acres)              1.47      1.33      1.19


Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

CROSS SECTION OUTPUT  Profile #25 yr

  E.G. Elev (ft)            102.15    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.72    Wt. n-Val.                          0.040     0.230
  W.S. Elev (ft)            101.43    Reach Len. (ft)          100.17     99.43     99.79
  Crit W.S. (ft)             96.13    Flow Area (sq ft)                  582.17      5.81
  E.G. Slope (ft/ft)      0.001696    Area (sq ft)             331.03    583.85    358.54
  Q Total (cfs)            3967.00    Flow (cfs)                        3963.02      3.98
  Top Width (ft)            207.76    Top Width (ft)            81.86     55.68     70.22
  Vel Total (ft/s)            6.75    Avg. Vel. (ft/s)                    6.81      0.69
  Max Chl Dpth (ft)          11.92    Hydr. Depth (ft)                   10.56      4.30
  Conv. Total (cfs)         96316.0    Conv. (cfs)                       96219.2      96.7
  Length Wtd. (ft)            99.43    Wetted Per. (ft)                    62.03      1.40
  Min Ch El (ft)              89.51    Shear (lb/sq ft)                    0.99      0.44
  Alpha                        1.02    Stream Power (lb/ft s)              6.77      0.30
  Frctn Loss (ft)             0.20    Cum Volume (acre-ft)        4.80     11.54      5.19
  C & E Loss (ft)             0.02    Cum SA (acres)              2.09      1.31      1.84


Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

CROSS SECTION OUTPUT  Profile #100 yr
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E.G. Elev (ft)	104.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.47	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	97.60	Flow Area (sq ft)	498.25	697.59	501.98
E.G. Slope (ft/ft)	0.001358	Area (sq ft)	498.25	697.59	501.98
Q Total (cfs)	5541.00	Flow (cfs)	370.11	4766.00	404.89
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)	0.74	6.83	0.81
Max Chl Dpth (ft)	13.96	Hydr. Depth (ft)	6.09	12.53	7.15
Conv. Total (cfs)	150335.6	Conv. (cfs)	10041.7	129308.7	10985.2
Length Wtd. (ft)	99.51	Wetted Per. (ft)	90.43	62.58	80.52
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.47	0.95	0.53
Alpha	3.78	Stream Power (lb/ft s)	0.35	6.46	0.43
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	9.78	14.50	9.63
C & E Loss (ft)	0.02	Cum SA (acres)	2.93	1.37	2.01

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	105.07	Reach Len. (ft)	100.17	99.43	99.79
Crit W.S. (ft)	99.33	Flow Area (sq ft)	629.69	787.00	614.73
E.G. Slope (ft/ft)	0.001674	Area (sq ft)	629.69	787.00	614.73
Q Total (cfs)	7691.00	Flow (cfs)	599.95	6469.19	621.86
Top Width (ft)	207.76	Top Width (ft)	81.86	55.68	70.22
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	0.95	8.22	1.01
Max Chl Dpth (ft)	15.56	Hydr. Depth (ft)	7.69	14.13	8.75
Conv. Total (cfs)	187951.2	Conv. (cfs)	14661.5	158092.8	15196.9
Length Wtd. (ft)	99.52	Wetted Per. (ft)	92.03	62.58	82.13
Min Ch El (ft)	89.51	Shear (lb/sq ft)	0.72	1.31	0.78
Alpha	3.98	Stream Power (lb/ft s)	0.68	10.81	0.79
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	14.10	16.46	12.54
C & E Loss (ft)	0.03	Cum SA (acres)	3.00	1.37	2.01

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1500

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.42	6.160004	99.37	21.74001	98.63	4.68001	97.32	43.85001	97.39
44.82001	97.41	45.04001	97.41	48.39	93.51	49.72	91.95	51.17	91.64
52.52	91.35	53.09	91.12	71.91	90.48	91.09	89.83	91.45	89.82
91.52	89.87	92.47	90.52	95.03	92.26	97.02	96.18	97.14	96.4
97.35001	96.59	99.71001	96.43	118.64	95.19	130.28	97.24	133.89	97.34
134.79	97.39	135.48	97.42	136.11	97.44	145.8	97	179.45	96
204.77	95.37	206.35	95.35	207.43	95.15	209.36	95.15	212.96	95.63
221.32	97.31	263.66	95.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	44.82001	.04	97.02	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44.82001	97.02	79.93	100.57	123.17	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
044.62001		102.3	F
98.2	263.66	102.3	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	100.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.46	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	95.78	Flow Area (sq ft)	0.41	434.89	3.47
E.G. Slope (ft/ft)	0.002428	Area (sq ft)	48.55	434.89	542.80
Q Total (cfs)	3052.00	Flow (cfs)	0.21	3049.75	2.04
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	6.96	Avg. Vel. (ft/s)	0.51	7.01	0.59
Max Chl Dpth (ft)	9.64	Hydr. Depth (ft)	2.05	8.33	2.94
Conv. Total (cfs)	61934.2	Conv. (cfs)	4.3	61888.6	41.3
Length Wtd. (ft)	100.58	Wetted Per. (ft)	0.20	58.00	1.39
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.31	1.14	0.38
Alpha	1.02	Stream Power (lb/ft s)	0.16	7.97	0.22
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	1.82	8.51	1.95
C & E Loss (ft)	0.01	Cum SA (acres)	1.32	1.21	0.92

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.01	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	96.74	Flow Area (sq ft)	0.72	515.95	5.30
E.G. Slope (ft/ft)	0.002319	Area (sq ft)	118.15	515.95	801.57
Q Total (cfs)	3967.00	Flow (cfs)	0.53	3962.44	4.03
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	7.60	Avg. Vel. (ft/s)	0.73	7.68	0.76
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)	3.61	9.88	4.49
Conv. Total (cfs)	82380.3	Conv. (cfs)	11.0	82285.6	83.8
Length Wtd. (ft)	100.59	Wetted Per. (ft)	0.20	58.00	1.39
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.52	1.29	0.55
Alpha	1.02	Stream Power (lb/ft s)	0.38	9.89	0.42
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	4.28	10.28	3.86
C & E Loss (ft)	0.01	Cum SA (acres)	1.94	1.19	1.57

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.37	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	98.18	Flow Area (sq ft)	223.67	638.84	1193.88
E.G. Slope (ft/ft)	0.001380	Area (sq ft)	223.67	638.84	1193.88
Q Total (cfs)	5541.00	Flow (cfs)	148.04	4364.99	1027.97
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	2.69	Avg. Vel. (ft/s)	0.66	6.83	0.86
Max Chl Dpth (ft)	13.55	Hydr. Depth (ft)	4.99	12.24	7.16
Conv. Total (cfs)	149132.7	Conv. (cfs)	3984.4	117481.0	27667.3
Length Wtd. (ft)	102.53	Wetted Per. (ft)	48.85	58.00	175.73
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.39	0.95	0.59
Alpha	5.09	Stream Power (lb/ft s)	0.26	6.49	0.50
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	8.95	12.98	7.69
C & E Loss (ft)	0.01	Cum SA (acres)	2.79	1.24	1.73

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.98	Reach Len. (ft)	79.93	100.57	123.17
Crit W.S. (ft)	99.90	Flow Area (sq ft)	295.83	722.87	1462.15
E.G. Slope (ft/ft)	0.001654	Area (sq ft)	295.83	722.87	1462.15
Q Total (cfs)	7691.00	Flow (cfs)	252.70	5870.47	1567.83
Top Width (ft)	263.66	Top Width (ft)	44.82	52.20	166.64
Vel Total (ft/s)	3.10	Avg. Vel. (ft/s)	0.85	8.12	1.07
Max Chl Dpth (ft)	15.16	Hydr. Depth (ft)	6.60	13.85	8.77
Conv. Total (cfs)	189116.7	Conv. (cfs)	6213.8	144351.1	38551.8
Length Wtd. (ft)	102.68	Wetted Per. (ft)	50.46	58.00	177.34
Min Ch El (ft)	89.82	Shear (lb/sq ft)	0.61	1.29	0.85
Alpha	5.26	Stream Power (lb/ft s)	0.52	10.45	0.91
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	13.04	14.73	10.16
C & E Loss (ft)	0.01	Cum SA (acres)	2.85	1.24	1.74

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1400

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.29	5.290009	95.95	6.709991	95.23	10.51001	95.42	56.84	96.52
58.08	97.01	65.95	97.19	78.45999	97.27	90.67	97.37	108.91	97.65
109.12	97.66	109.55	97.67	113.48	94.17	115.77	92.22	116.89	90.7
118.38	87.99	135.56	89.06	136.77	89.15	146.76	89.89	151.74	91.62
153.39	91.96	161.09	95.15	161.56	95.34	161.66	95.38	162.43	95.73
165.58	95.37	178.29	94.15	193.12	97.78	200.23	97.86	201.25	98.11
222.92	95.33	237.71	97.6	237.78	97.6	260.9	96.84	270.78	95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	109.12	.04	161.66	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
109.12 161.66 98.46 100 105.25 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	108.86	102.2	F
162.27	270.78	102.2	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.25	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	95.31	Flow Area (sq ft)	0.42	445.64	2.28
E.G. Slope (ft/ft)	0.002241	Area (sq ft)	289.66	445.64	307.82
Q Total (cfs)	3052.00	Flow (cfs)	0.17	3050.25	1.57
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	6.81	Avg. Vel. (ft/s)	0.42	6.84	0.69
Max Chl Dpth (ft)	11.26	Hydr. Depth (ft)	1.60	8.48	3.73
Conv. Total (cfs)	64474.7	Conv. (cfs)	3.7	64437.8	33.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.03	0.67

Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.22	1.07	0.48
Alpha	1.01	Stream Power (lb/ft s)	0.09	7.35	0.33
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	1.51	7.50	0.75
C & E Loss (ft)	0.04	Cum SA (acres)	1.18	1.09	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.69	Element			
Vel Head (ft)	0.88	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.82	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	96.29	Flow Area (sq ft)	0.82	527.91	3.23
E.G. Slope (ft/ft)	0.002151	Area (sq ft)	460.52	527.91	478.69
Q Total (cfs)	3967.00	Flow (cfs)	0.53	3963.71	2.76
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	7.46	Avg. Vel. (ft/s)	0.65	7.51	0.86
Max Chl Dpth (ft)	12.83	Hydr. Depth (ft)	3.16	10.05	5.30
Conv. Total (cfs)	85531.6	Conv. (cfs)	11.4	85460.6	59.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	0.26	58.03	0.67
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.42	1.22	0.65
Alpha	1.01	Stream Power (lb/ft s)	0.27	9.17	0.55
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.75	9.07	2.05
C & E Loss (ft)	0.06	Cum SA (acres)	1.80	1.07	1.18

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	103.80	Element			
Vel Head (ft)	0.55	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.25	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	97.79	Flow Area (sq ft)	725.53	655.51	743.69
E.G. Slope (ft/ft)	0.001281	Area (sq ft)	725.53	655.51	743.69
Q Total (cfs)	5541.00	Flow (cfs)	568.28	4387.70	585.02
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)	0.78	6.69	0.79
Max Chl Dpth (ft)	15.26	Hydr. Depth (ft)	6.65	12.48	6.82
Conv. Total (cfs)	154814.9	Conv. (cfs)	15877.7	122592.0	16345.3
Length Wtd. (ft)	100.29	Wetted Per. (ft)	116.37	58.03	118.52
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.50	0.90	0.50
Alpha	5.24	Stream Power (lb/ft s)	0.39	6.05	0.39
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	8.08	11.48	4.95
C & E Loss (ft)	0.01	Cum SA (acres)	2.64	1.12	1.34

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	105.59	Element			
Vel Head (ft)	0.76	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.83	Reach Len. (ft)	98.46	100.00	105.25
Crit W.S. (ft)	99.50	Flow Area (sq ft)	898.21	738.65	916.37
E.G. Slope (ft/ft)	0.001556	Area (sq ft)	898.21	738.65	916.37
Q Total (cfs)	7691.00	Flow (cfs)	885.88	5900.12	905.00
Top Width (ft)	270.78	Top Width (ft)	109.12	52.54	109.12
Vel Total (ft/s)	3.01	Avg. Vel. (ft/s)	0.99	7.99	0.99
Max Chl Dpth (ft)	16.84	Hydr. Depth (ft)	8.23	14.06	8.40
Conv. Total (cfs)	194993.1	Conv. (cfs)	22460.2	149588.2	22944.7
Length Wtd. (ft)	100.32	Wetted Per. (ft)	117.96	58.03	120.10
Min Ch El (ft)	87.99	Shear (lb/sq ft)	0.74	1.24	0.74

Alpha	5.42	Stream Power (lb/ft s)	0.73	9.87	0.73
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	11.94	13.05	6.79
C & E Loss (ft)	0.02	Cum SA (acres)	2.71	1.12	1.35

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1300

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	9917.81999	99.2119.01999	99.17	20.84	99.1821.45999	99.16			
49.70999	98.0152.68999	97.97	54.86	97.9562.73999	97.8566.21999	97.81			
66.59	97.5269.99999	94.3971.57999	92.8272.24999	92.16	72.91	91.94			
76.07999	90.24	96.87	90.07	104.48	90	112.91	90.15	113.93	90.32
118	91.87	128.38	95.81	130.94	96.78	131.37	96.96	132.04	97.23
133.61	97.87	136.37	97.83	168.9	98	175.78	94.39	177.76	94.32
187.29	94.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2362.73999	.04	132.04	.23	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62.73999	132.04	664.31	100	63.68	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.05	102	F
133.99	187.29	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	99.13	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	95.42	Flow Area (sq ft)		493.37	2.96
E.G. Slope (ft/ft)	0.002050	Area (sq ft)	31.77	497.67	119.42
Q Total (cfs)	3052.00	Flow (cfs)		3050.90	1.10
Top Width (ft)	176.16	Top Width (ft)	51.61	69.30	55.25
Vel Total (ft/s)	6.15	Avg. Vel. (ft/s)		6.18	0.37
Max Chl Dpth (ft)	9.13	Hydr. Depth (ft)		7.48	1.52
Conv. Total (cfs)	67410.8	Conv. (cfs)		67386.5	24.2
Length Wtd. (ft)	99.99	Wetted Per. (ft)		69.98	2.08
Min Ch El (ft)	90.00	Shear (lb/sq ft)		0.90	0.18
Alpha	1.01	Stream Power (lb/ft s)		5.58	0.07
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	1.15	6.42	0.23
C & E Loss (ft)	0.01	Cum SA (acres)	1.00	0.95	0.33

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.76	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	96.34	Flow Area (sq ft)		600.97	6.14
E.G. Slope (ft/ft)	0.001792	Area (sq ft)	133.62	610.67	209.51

Q Total (cfs)	3967.00	Flow (cfs)		3963.54	3.46
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	6.53	Avg. Vel. (ft/s)		6.60	0.56
Max Chl Dpth (ft)	10.76	Hydr. Depth (ft)		9.11	3.15
Conv. Total (cfs)	93703.4	Conv. (cfs)		93621.7	81.8
Length Wtd. (ft)	99.98	Wetted Per. (ft)		69.98	2.08
Min Ch El (ft)	90.00	Shear (lb/sq ft)		0.96	0.33
Alpha	1.02	Stream Power (lb/ft s)		6.34	0.19
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.08	7.77	1.22
C & E Loss (ft)	0.01	Cum SA (acres)	1.61	0.93	0.98

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.01	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	97.67	Flow Area (sq ft)	274.79	766.61	333.84
E.G. Slope (ft/ft)	0.001417	Area (sq ft)	274.79	766.61	333.84
Q Total (cfs)	5541.00	Flow (cfs)	171.60	5126.81	242.59
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	0.62	6.69	0.73
Max Chl Dpth (ft)	13.01	Hydr. Depth (ft)	4.38	11.06	6.04
Conv. Total (cfs)	147209.5	Conv. (cfs)	4558.9	136205.6	6445.1
Length Wtd. (ft)	115.36	Wetted Per. (ft)	66.78	73.29	64.62
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.36	0.93	0.46
Alpha	2.55	Stream Power (lb/ft s)	0.23	6.19	0.33
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	6.95	9.85	3.64
C & E Loss (ft)	0.01	Cum SA (acres)	2.45	0.98	1.15

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.49	Reach Len. (ft)	664.31	100.00	63.68
Crit W.S. (ft)	99.16	Flow Area (sq ft)	367.65	869.17	415.60
E.G. Slope (ft/ft)	0.001740	Area (sq ft)	367.65	869.17	415.60
Q Total (cfs)	7691.00	Flow (cfs)	304.47	7004.96	381.57
Top Width (ft)	187.29	Top Width (ft)	62.74	69.30	55.25
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	0.83	8.06	0.92
Max Chl Dpth (ft)	14.49	Hydr. Depth (ft)	5.86	12.54	7.52
Conv. Total (cfs)	184355.8	Conv. (cfs)	7298.2	167911.3	9146.4
Length Wtd. (ft)	118.49	Wetted Per. (ft)	68.26	73.29	66.10
Min Ch El (ft)	90.00	Shear (lb/sq ft)	0.59	1.29	0.68
Alpha	2.73	Stream Power (lb/ft s)	0.48	10.38	0.63
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	10.51	11.20	5.19
C & E Loss (ft)	0.02	Cum SA (acres)	2.52	0.98	1.15

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1200

INPUT

Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.99	3.680008	96.2	4.720001	96.19	8.790009	96.34	16.71001	96.72
34.19	97.61	34.77	97.63	35.40001	97.46	47	94.26	55.25	92.11
58.57001	91.08	59.25	90.83	75.03001	89.35	81.43	88.75	93.14001	87.65
93.36	88.11	93.86	89.21	95.3	92.42	95.58	92.92	98.76	98.52
98.99001	98.93	100.13	98.9	118.49	98.47	133.43	98.09	149.42	98.25
150.55	98.31	154.31	98.06	159.45	97.71	163	98.23	165.09	98.54
166.06	98.57	170.66	98.67	172.66	98.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	34.19	.04	98.76	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
34.19	98.76	114.91	100	120.57	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	34.64	101.7	F
99.34	172.66	101.7	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	99.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	98.82	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	95.21	Flow Area (sq ft)		466.63	0.03
E.G. Slope (ft/ft)	0.002557	Area (sq ft)	68.53	467.17	34.56
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	0.00
Top Width (ft)	168.22	Top Width (ft)	34.19	64.57	69.46
Vel Total (ft/s)	6.54	Avg. Vel. (ft/s)		6.54	0.06
Max Chl Dpth (ft)	11.17	Hydr. Depth (ft)		7.28	0.15
Conv. Total (cfs)	60351.1	Conv. (cfs)		60351.1	0.0
Length Wtd. (ft)	100.00	Wetted Per. (ft)		71.83	0.35
Min Ch El (ft)	87.65	Shear (lb/sq ft)		1.04	0.01
Alpha	1.00	Stream Power (lb/ft s)		6.78	0.00
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.38	5.31	0.12
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.80	0.24

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	101.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	100.49	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	96.21	Flow Area (sq ft)		573.36	0.95
E.G. Slope (ft/ft)	0.002174	Area (sq ft)	125.44	574.65	157.34
Q Total (cfs)	3967.00	Flow (cfs)		3966.68	0.32
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	6.91	Avg. Vel. (ft/s)		6.92	0.33
Max Chl Dpth (ft)	12.84	Hydr. Depth (ft)		8.94	1.64
Conv. Total (cfs)	85076.7	Conv. (cfs)		85069.9	6.8
Length Wtd. (ft)	100.01	Wetted Per. (ft)		71.83	0.82
Min Ch El (ft)	87.65	Shear (lb/sq ft)		1.08	0.16
Alpha	1.00	Stream Power (lb/ft s)		7.50	0.05
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	1.10	6.41	0.95
C & E Loss (ft)	0.03	Cum SA (acres)	0.87	0.78	0.88

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.72	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	97.67	Flow Area (sq ft)	201.65	718.58	322.06
E.G. Slope (ft/ft)	0.001746	Area (sq ft)	201.65	718.58	322.06
Q Total (cfs)	5541.00	Flow (cfs)	159.97	5157.70	223.33
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)	0.79	7.18	0.69
Max Chl Dpth (ft)	15.07	Hydr. Depth (ft)	5.90	11.13	4.36
Conv. Total (cfs)	132588.8	Conv. (cfs)	3827.8	123417.1	5344.0
Length Wtd. (ft)	100.93	Wetted Per. (ft)	40.04	72.28	78.24
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.55	1.08	0.45
Alpha	2.41	Stream Power (lb/ft s)	0.44	7.78	0.31
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	3.32	8.15	3.17
C & E Loss (ft)	0.11	Cum SA (acres)	1.71	0.83	1.05

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	105.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.07	Reach Len. (ft)	114.91	100.00	120.57
Crit W.S. (ft)	99.20	Flow Area (sq ft)	247.90	805.92	422.03
E.G. Slope (ft/ft)	0.002227	Area (sq ft)	247.90	805.92	422.03
Q Total (cfs)	7691.00	Flow (cfs)	249.23	7050.57	391.19
Top Width (ft)	172.66	Top Width (ft)	34.19	64.57	73.90
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	1.01	8.75	0.93
Max Chl Dpth (ft)	16.42	Hydr. Depth (ft)	7.25	12.48	5.71
Conv. Total (cfs)	162992.2	Conv. (cfs)	5281.9	149419.9	8290.4
Length Wtd. (ft)	101.12	Wetted Per. (ft)	41.39	72.28	79.60
Min Ch El (ft)	87.65	Shear (lb/sq ft)	0.83	1.55	0.74
Alpha	2.59	Stream Power (lb/ft s)	0.84	13.56	0.68
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	5.82	9.28	4.57
C & E Loss (ft)	0.16	Cum SA (acres)	1.78	0.83	1.05

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1100

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.75	2.529999	97.64	3.139999	97.57	3.809998	97.48	4.330002	97.41
4.779999	97.36	5.5	97.36	350006	97.22	7.069992	97.17	10.11	96.85
24.85001	94.44	30.14	95.12	30.99001	94.79	35.53999	93.01	36.71001	92.72
37.96001	92.32	42.64999	91.99	45.03	91.69	50.06	93.42	51.88	93.78
56.04	94.48	57.81	94.62	59.17	94.68	61.47	94.66	63.4	94.49

```
      66   94.18   67.73   93.82   70.15   93.34   71.03   93.07   74.56   91.99
   77.27   92.64   77.87   92.19   78.67    91.8   80.64   90.54  104.79   90.27
  110.47    90.2  111.35   90.18  115.19   90.14  125.07   89.81  125.65   90.66
  126.49   91.62  126.67   91.83   126.8   92.12  127.63   94.04  128.76   95.86
  130.62   98.83  130.69   98.85  130.86   98.91  132.04   99.31  132.15   99.34
  132.55   99.48   132.7   99.47  133.17   99.45  135.01   99.39  145.57   99.07
   146.1   99.06  150.05   98.75  153.21   98.58  154.58   98.53  155.66   98.49
  156.86   98.46  157.98    98.4  159.05   98.48  160.98    98.6  163.22   98.73
  164.77   98.81  167.38      99  170.75   99.12  172.14    99.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .233 0.99001     .04  128.76     .23

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      30.99001  128.76            20.56      50  255.03             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   77.32     102       F
  132.14  172.14     102       F

CROSS SECTION OUTPUT  Profile #10 yr

  E.G. Elev (ft)             99.19    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.91    Wt. n-Val.                            0.040     0.230
  W.S. Elev (ft)             98.28    Reach Len. (ft)           20.56      50.00    255.03
  Crit W.S. (ft)             95.29    Flow Area (sq ft)                   399.10      1.83
  E.G. Slope (ft/ft)      0.003051    Area (sq ft)              69.53     628.32      1.83
  Q Total (cfs)            3052.00    Flow (cfs)                        3051.51      0.49
  Top Width (ft)            130.27    Top Width (ft)            30.99      97.77      1.51
  Vel Total (ft/s)            7.61    Avg. Vel. (ft/s)                      7.65      0.27
  Max Chl Dpth (ft)           8.47    Hydr. Depth (ft)                      7.76      1.21
  Conv. Total (cfs)        55253.0    Conv. (cfs)                       55244.2       8.8
  Length Wtd. (ft)            50.02    Wetted Per. (ft)                     55.49      2.85
  Min Ch El (ft)              89.81    Shear (lb/sq ft)                      1.37      0.12
  Alpha                       1.01    Stream Power (lb/ft s)               10.48      0.03
  Frctn Loss (ft)             0.11    Cum Volume (acre-ft)       0.20       4.05      0.07
  C & E Loss (ft)             0.12    Cum SA (acres)             0.26       0.61      0.14


Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

CROSS SECTION OUTPUT  Profile #25 yr

  E.G. Elev (ft)            100.96    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.05    Wt. n-Val.                            0.040     0.230
  W.S. Elev (ft)             99.91    Reach Len. (ft)           20.56      50.00    255.03
  Crit W.S. (ft)             96.21    Flow Area (sq ft)                   483.33      6.04
  E.G. Slope (ft/ft)      0.002721    Area (sq ft)             120.26     788.39     45.19
  Q Total (cfs)            3967.00    Flow (cfs)                        3964.73      2.28
  Top Width (ft)            172.14    Top Width (ft)            30.99      97.77     43.38
  Vel Total (ft/s)            8.11    Avg. Vel. (ft/s)                      8.20      0.38
  Max Chl Dpth (ft)          10.10    Hydr. Depth (ft)                      9.40      1.79
  Conv. Total (cfs)        76054.4    Conv. (cfs)                       76010.7       43.6
  Length Wtd. (ft)            50.06    Wetted Per. (ft)                     55.49      5.11
  Min Ch El (ft)              89.81    Shear (lb/sq ft)                      1.48      0.20
  Alpha                       1.02    Stream Power (lb/ft s)               12.14      0.08
  Frctn Loss (ft)             0.10    Cum Volume (acre-ft)       0.78       4.84      0.67
  C & E Loss (ft)             0.15    Cum SA (acres)             0.78       0.59      0.72


Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

CROSS SECTION OUTPUT  Profile #100 yr

  E.G. Elev (ft)            103.24    Element                  Left OB    Channel   Right OB
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Vel Head (ft)	0.37	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.87	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	97.64	Flow Area (sq ft)	211.79	1077.16	173.31
E.G. Slope (ft/ft)	0.000781	Area (sq ft)	211.79	1077.16	173.31
Q Total (cfs)	5541.00	Flow (cfs)	123.57	5344.65	72.78
Top Width (ft)	172.14	Top Width (ft)	30.99	97.77	43.38
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	0.58	4.96	0.42
Max Chl Dpth (ft)	13.06	Hydr. Depth (ft)	6.83	11.02	4.00
Conv. Total (cfs)	198293.3	Conv. (cfs)	4422.1	191266.6	2604.6
Length Wtd. (ft)	51.24	Wetted Per. (ft)	36.45	103.07	48.85
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.28	0.51	0.17
Alpha	1.65	Stream Power (lb/ft s)	0.17	2.53	0.07
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.77	6.09	2.48
C & E Loss (ft)	0.02	Cum SA (acres)	1.62	0.64	0.89

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	104.31	Reach Len. (ft)	20.56	50.00	255.03
Crit W.S. (ft)	99.39	Flow Area (sq ft)	256.43	1218.00	235.80
E.G. Slope (ft/ft)	0.000986	Area (sq ft)	256.43	1218.00	235.80
Q Total (cfs)	7691.00	Flow (cfs)	186.12	7370.88	134.01
Top Width (ft)	172.14	Top Width (ft)	30.99	97.77	43.38
Vel Total (ft/s)	4.50	Avg. Vel. (ft/s)	0.73	6.05	0.57
Max Chl Dpth (ft)	14.50	Hydr. Depth (ft)	8.27	12.46	5.44
Conv. Total (cfs)	244932.6	Conv. (cfs)	5927.2	234737.8	4267.6
Length Wtd. (ft)	51.89	Wetted Per. (ft)	37.89	103.07	50.29
Min Ch El (ft)	89.81	Shear (lb/sq ft)	0.42	0.73	0.29
Alpha	1.74	Stream Power (lb/ft s)	0.30	4.40	0.16
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	5.15	6.95	3.66
C & E Loss (ft)	0.03	Cum SA (acres)	1.69	0.64	0.89

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1050

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.54	52.84	97.69	53.67999	97.7	57.2	97.67	80.48999	97.62
91.89	97.64	92.18999	97.6	92.36	97.58	92.57	97.56	93.2	97.56
100.52	97.59	101.06	96.97	103.8	93.86	105.52	91.91	106.17	90.69
108.15	86.9	132.55	89.2	141.44	90.05	149.74	90.34	152.2	90.39
154.26	90.99	154.95	91.26	155.92	91.82	162.83	94.96	173.73	98.88
174.12	99.02	178.03	99.08	180.81	99.11	185.92	99.19	194.16	99.33
196.93	99.29	200.31	99.29	201.78	98.92	203.12	99	208.79	99.33
208.81	99.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	101.06	.04	173.73	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
101.06	173.73	25.83	50	71.25	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	100.22	101.5	F
174.16	208.81	101.5	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.230	0.040	
W.S. Elev (ft)	98.46	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	93.99	Flow Area (sq ft)	0.89	542.28	
E.G. Slope (ft/ft)	0.001745	Area (sq ft)	84.24	542.28	
Q Total (cfs)	3052.00	Flow (cfs)	0.21	3051.79	
Top Width (ft)	172.55	Top Width (ft)	101.06	71.49	
Vel Total (ft/s)	5.62	Avg. Vel. (ft/s)	0.23	5.63	
Max Chl Dpth (ft)	11.56	Hydr. Depth (ft)	1.06	7.59	
Conv. Total (cfs)	73053.7	Conv. (cfs)	5.0	73048.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)	1.12	78.53	
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.09	0.75	
Alpha	1.00	Stream Power (lb/ft s)	0.02	4.23	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.17	3.38	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.23	0.51	0.13

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	100.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.16	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	94.91	Flow Area (sq ft)	2.33	665.97	0.52
E.G. Slope (ft/ft)	0.001518	Area (sq ft)	256.60	665.97	34.49
Q Total (cfs)	3967.00	Flow (cfs)	0.95	3965.91	0.14
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)	0.41	5.96	0.27
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)	2.77	9.16	1.20
Conv. Total (cfs)	101825.7	Conv. (cfs)	24.4	101797.6	3.6
Length Wtd. (ft)	50.00	Wetted Per. (ft)	1.12	79.79	0.45
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.20	0.79	0.11
Alpha	1.01	Stream Power (lb/ft s)	0.08	4.71	0.03
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.69	4.01	0.44
C & E Loss (ft)	0.01	Cum SA (acres)	0.75	0.49	0.49

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	103.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.63	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	96.31	Flow Area (sq ft)	506.10	845.38	121.09
E.G. Slope (ft/ft)	0.001164	Area (sq ft)	506.10	845.38	121.09
Q Total (cfs)	5541.00	Flow (cfs)	315.41	5168.26	57.33
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	3.76	Avg. Vel. (ft/s)	0.62	6.11	0.47
Max Chl Dpth (ft)	15.73	Hydr. Depth (ft)	5.01	11.63	3.45
Conv. Total (cfs)	162420.8	Conv. (cfs)	9245.6	151494.8	1680.4
Length Wtd. (ft)	49.57	Wetted Per. (ft)	106.44	79.79	38.46
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.35	0.77	0.23
Alpha	2.46	Stream Power (lb/ft s)	0.22	4.71	0.11
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	2.61	4.98	1.62
C & E Loss (ft)	0.01	Cum SA (acres)	1.59	0.54	0.66

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	104.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.97	Reach Len. (ft)	25.83	50.00	71.25
Crit W.S. (ft)	97.91	Flow Area (sq ft)	641.37	942.65	168.05
E.G. Slope (ft/ft)	0.001507	Area (sq ft)	641.37	942.65	168.05
Q Total (cfs)	7691.00	Flow (cfs)	528.31	7052.58	110.11
Top Width (ft)	208.81	Top Width (ft)	101.06	72.67	35.08
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	0.82	7.48	0.66
Max Chl Dpth (ft)	17.07	Hydr. Depth (ft)	6.35	12.97	4.79
Conv. Total (cfs)	198089.5	Conv. (cfs)	13607.1	181646.4	2836.0
Length Wtd. (ft)	49.48	Wetted Per. (ft)	107.78	79.79	39.80
Min Ch El (ft)	86.90	Shear (lb/sq ft)	0.56	1.11	0.40
Alpha	2.67	Stream Power (lb/ft s)	0.46	8.32	0.26
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	4.94	5.71	2.48
C & E Loss (ft)	0.02	Cum SA (acres)	1.66	0.54	0.66

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 1000

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38.8499908	101.37.9599915	101.361.669998	101.353.539993	101.32				
10.96999	101.32	20.2	101.4820.20999	101.4820.46999	101.4730.93999	101.38			
31.14999	101.3731.50999	101.3638.79999	101.2741.59999	101.2244.84999	101.14				
44.86	101.14	53.36	100.9153.39999	100.9153.56999	100.9	53.61	100.88		
61.98	100.59	62.14	100.5762.14999	100.6267.20999	100.4167.71999	100.39			
68.12999	100.34	68.5	100.26	68.62	100.25	68.7	97.5769.64999	94.15	
71.17999	93.74	75.98	92.1377.20999	91.74	79.03	90.93	81.11	89.96	
81.56999	89.97	82.28	9082.37999	90.0187.21999	89.9991.73999	89.65			
99.34	89.92	125.26	90.82	128.49	91.83	128.52	91.89	130.13	92.6
137.2	95.94	142.79	98.57	144.27	99.23	146.98	99.97	147.74	100.21
148.07	100.25	148.54	100.24	149.27	100.23	151.09	100.11	155.45	100.03
156	100.01	161.06	99.93	161.24	99.93	164.58	99.73	166.33	99.59
168.59	99.43	169.31	99.37	170.14	99.29	175.97	99.27	181.09	99.3
183.09	99.33	187.53	99.37	190.98	99.3	197.9	99.25	202.14	99.21
206.21	99.12	211.91	99.13	216.15	99.1	216.79	99.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2367.20999	.04	148.07	.23	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
67.20999 148.07 25.88 25.66 27.03 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
066.78999		102	F
148.34	216.79	102	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.040	
W.S. Elev (ft)	98.24	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	94.99	Flow Area (sq ft)		493.52	
E.G. Slope (ft/ft)	0.002412	Area (sq ft)		493.52	

Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	73.41	Top Width (ft)		73.41	
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)		6.18	
Max Chl Dpth (ft)	8.59	Hydr. Depth (ft)		6.72	
Conv. Total (cfs)	62150.0	Conv. (cfs)		62150.0	
Length Wtd. (ft)	0.50	Wetted Per. (ft)		79.07	
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)		5.81	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.14	2.78	0.06
C & E Loss (ft)	0.04	Cum SA (acres)	0.20	0.43	0.13

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	100.62	Element			
Vel Head (ft)	0.62	Wt. n-Val.		0.040	
W.S. Elev (ft)	99.99	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	95.80	Flow Area (sq ft)		625.82	
E.G. Slope (ft/ft)	0.002068	Area (sq ft)		625.82	38.34
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	138.06	Top Width (ft)		78.42	59.64
Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)		6.34	
Max Chl Dpth (ft)	10.34	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	87239.8	Conv. (cfs)		87239.8	
Length Wtd. (ft)	0.50	Wetted Per. (ft)		86.09	
Min Ch El (ft)	89.65	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)		5.95	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.61	3.27	0.38
C & E Loss (ft)	0.12	Cum SA (acres)	0.72	0.41	0.41

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	103.09	Element			
Vel Head (ft)	0.66	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.44	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	97.05	Flow Area (sq ft)	85.48	822.89	205.39
E.G. Slope (ft/ft)	0.001609	Area (sq ft)	85.48	822.89	205.39
Q Total (cfs)	5541.00	Flow (cfs)	25.72	5408.30	106.98
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	0.30	6.57	0.52
Max Chl Dpth (ft)	12.79	Hydr. Depth (ft)	1.27	10.18	2.99
Conv. Total (cfs)	138143.5	Conv. (cfs)	641.2	134835.3	2667.1
Length Wtd. (ft)	0.50	Wetted Per. (ft)	68.33	88.83	72.08
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.13	0.93	0.29
Alpha	1.70	Stream Power (lb/ft s)	0.04	6.12	0.15
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.43	4.03	1.35
C & E Loss (ft)	0.20	Cum SA (acres)	1.54	0.46	0.57

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than

1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	104.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	103.72	Reach Len. (ft)	0.50	0.50	0.50
Crit W.S. (ft)	98.52	Flow Area (sq ft)	171.59	926.49	293.43
E.G. Slope (ft/ft)	0.002021	Area (sq ft)	171.59	926.49	293.43
Q Total (cfs)	7691.00	Flow (cfs)	90.93	7385.35	214.73
Top Width (ft)	216.79	Top Width (ft)	67.21	80.86	68.72
Vel Total (ft/s)	5.53	Avg. Vel. (ft/s)	0.53	7.97	0.73
Max Chl Dpth (ft)	14.07	Hydr. Depth (ft)	2.55	11.46	4.27
Conv. Total (cfs)	171096.7	Conv. (cfs)	2022.8	164297.0	4776.9
Length Wtd. (ft)	0.50	Wetted Per. (ft)	69.61	88.83	73.36
Min Ch El (ft)	89.65	Shear (lb/sq ft)	0.31	1.32	0.50
Alpha	2.00	Stream Power (lb/ft s)	0.16	10.49	0.37
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	4.70	4.64	2.10
C & E Loss (ft)	0.07	Cum SA (acres)	1.61	0.46	0.58

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: BrushyCreek
REACH: BrushyCreek RS: 987.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 25
Weir Coefficient = .3
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
66.78999	100.38	98.58	100.56	100.18	98.65	151.79	100.11	98.72

Upstream Bridge Cross Section Data
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.38.8499908	101.37.9599915		101.361.669998		101.353.539993		101.32	
10.96999	101.32	20.2	101.4820.20999		101.4820.46999		101.4730.93999		101.38
31.14999	101.3731.50999		101.3638.79999		101.2741.59999		101.2244.84999		101.14
44.86	101.14	53.36	100.9153.39999		100.9153.56999		100.9	53.61	100.88
61.98	100.59	62.14	100.5762.14999		100.6267.20999		100.4167.71999		100.39
68.12999	100.34	68.5	100.26	68.62	100.25	68.7	97.5769.64999		94.15
71.17999	93.74	75.98	92.1377.20999		91.74	79.03	90.93	81.11	89.96
81.56999	89.97	82.28	9082.37999		90.0187.21999		89.9991.73999		89.65
99.34	89.92	125.26	90.82	128.49	91.83	128.52	91.89	130.13	92.6
137.2	95.94	142.79	98.57	144.27	99.23	146.98	99.97	147.74	100.21
148.07	100.25	148.54	100.24	149.27	100.23	151.09	100.11	155.45	100.03
156	100.01	161.06	99.93	161.24	99.93	164.58	99.73	166.33	99.59
168.59	99.43	169.31	99.37	170.14	99.29	175.97	99.27	181.09	99.3
183.09	99.33	187.53	99.37	190.98	99.3	197.9	99.25	202.14	99.21
206.21	99.12	211.91	99.13	216.15	99.1	216.79	99.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2367.20999		.04	148.07	.23

Bank Sta: Left Right Coeff Contr. Expan.

```
      67.20999  148.07             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       066.78999     102       F
  148.34  216.79     102       F

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   68.37  100.39   98.7869.26999  100.25   98.78  143.44   100.2   98.76
  148.72  100.25   98.76

Downstream Bridge Cross Section Data
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   101.22.800003  101.143.539993  101.123.819992  101.113.959991  101.11
 4.12999   101.14.679993  101.09     7.5  101.02   12.86  100.94   15.12  100.92
19.53999  100.87   31.05  100.79   31.91  100.7531.92999  100.7631.95999  100.76
    32.2  100.75    44.8  100.54   45.19  100.52   53.73  100.34   54.14  100.31
   57.36  100.24   57.81  100.23   57.83  100.23   62.16  100.15   63.08  100.22
   63.19  100.36   66.86  100.29   67.11  100.3167.31999  100.3268.81999  100.39
   69.45  100.42   69.59  100.37   70.03  100.3870.09999   98.0771.53999   95.66
73.70999   92.06   73.75   92.06   74.73   88.2275.34999   88.21   75.66   88.23
   76.58   88.27  100.53   89.38  119.27   90.24  125.57   90.51  125.79    90.5
  125.99   90.49  127.48   90.54  127.62   90.59  128.42   91.84  129.21   92.19
  130.31   92.68  133.84   96.57  141.29   99.17  143.33   99.44  144.75   99.61
  146.56   99.86  148.02  100.08  148.24  100.11  148.92  100.27  149.68  100.35
  158.44  100.38  160.23  100.31  162.09   100.3  162.54  100.29  165.05   99.95
  165.68   99.84  165.95   99.84  172.61   99.92  180.48   99.86  182.44   99.84
  182.45   99.84  191.25   99.78  191.78   99.77  195.83   99.74  196.17   99.73
  200.09   99.71  205.85   99.67  219.32   99.58  220.57   99.57  220.59   99.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .2368.81999     .04  148.02     .23

Bank Sta: Left   Right    Coeff Contr.   Expan.
      68.81999  148.02             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       069.45999   100.6       F
   148.9  220.59   100.6       F

Upstream Embankment side slope              =       1 horiz. to 1.0 vertical
Downstream Embankment side slope            =       1 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  5

Pier Data
Pier Station     Upstream=   70.53    Downstream=   73.95
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=85.23999    Downstream=88.48999
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
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Pier Data
Pier Station     Upstream=   99.62    Downstream=  103.25
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=  114.79    Downstream=  117.97
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Pier Data
Pier Station     Upstream=  129.25    Downstream=  133.75
Upstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99
Downstream     num=       2
    Width   Elev    Width   Elev
     .92      88     .92      99

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Energy Only

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

BRIDGE OUTPUT  Profile #10 yr

  E.G. US. (ft)                 98.84    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)                 98.24    E.G. Elev (ft)               98.80         98.61
  Q Total (cfs)               3052.00    W.S. Elev (ft)               98.09         97.95
  Q Bridge (cfs)              3052.00    Crit W.S. (ft)               95.18         94.24
  Q Weir (cfs)                           Max Chl Dpth (ft)             8.44          9.74
  Weir Sta Lft (ft)                      Vel Total (ft/s)              6.77          6.49
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           450.98        470.26
  Weir Submerg                           Froude # Chl                  0.46          0.42
  Weir Max Depth (ft)                    Specif Force (cu ft)        2285.88       2564.08
  Min El Weir Flow (ft)         100.21   Hydr Depth (ft)               6.59          7.46
  Min El Prs (ft)                98.71   W.P. Total (ft)             141.68        137.69
  Delta EG (ft)                   0.27   Conv. Total (cfs)           36250.8       39617.7
  Delta WS (ft)                   0.25   Top Width (ft)                68.48         63.04
  BR Open Area (sq ft)          490.08   Frctn Loss (ft)               0.16          0.00
  BR Open Vel (ft/s)              6.77   C & E Loss (ft)               0.03          0.04
  BR Sluice Coef                         Shear Total (lb/sq ft)        1.41          1.27
  BR Sel Method           Energy only    Power Total (lb/ft s)         9.53          8.21


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water
surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater
than
         1.4.  This may indicate the need for additional cross sections.
```

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #25 yr

E.G. US. (ft)	100.62	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	99.99	E.G. Elev (ft)	100.49	100.08
Q Total (cfs)	3967.00	W.S. Elev (ft)	99.48	99.18
Q Bridge (cfs)	3967.00	Crit W.S. (ft)	96.03	95.14
Q Weir (cfs)		Max Chl Dpth (ft)	9.83	10.97
Weir Sta Lft (ft)		Vel Total (ft/s)	8.09	7.59
Weir Sta Rgt (ft)		Flow Area (sq ft)	490.08	522.73
Weir Submerg		Froude # Chl	0.46	0.40
Weir Max Depth (ft)		Specif Force (cu ft)	3311.85	3503.63
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)		
Min El Prs (ft)	98.71	W.P. Total (ft)	219.04	214.59
Delta EG (ft)	0.64	Conv. Total (cfs)	31143.6	35155.0
Delta WS (ft)	0.71	Top Width (ft)		
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.36	0.00
BR Open Vel (ft/s)	8.09	C & E Loss (ft)	0.06	0.10
BR Sluice Coef		Shear Total (lb/sq ft)	2.27	1.94
BR Sel Method	Energy only	Power Total (lb/ft s)	18.35	14.70

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #100 yr

E.G. US. (ft)	103.09	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	102.44	E.G. Elev (ft)	102.89	102.19
Q Total (cfs)	5541.00	W.S. Elev (ft)	101.57	100.74
Q Bridge (cfs)	4767.65	Crit W.S. (ft)	97.33	96.50
Q Weir (cfs)		Max Chl Dpth (ft)	11.92	12.53
Weir Sta Lft (ft)		Vel Total (ft/s)	9.21	8.72
Weir Sta Rgt (ft)		Flow Area (sq ft)	601.31	635.53
Weir Submerg		Froude # Chl	0.47	0.48
Weir Max Depth (ft)		Specif Force (cu ft)	5003.30	5079.20
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)	7.37	3.39
Min El Prs (ft)	98.71	W.P. Total (ft)	300.60	403.63
Delta EG (ft)	1.19	Conv. Total (cfs)	35440.0	32644.8
Delta WS (ft)	1.42	Top Width (ft)	216.79	187.56
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.66	0.00
BR Open Vel (ft/s)	9.73	C & E Loss (ft)	0.04	0.28
BR Sluice Coef		Shear Total (lb/sq ft)	3.05	2.83
BR Sel Method	Energy only	Power Total (lb/ft s)	28.13	24.69

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE OUTPUT Profile #500 yr

E.G. US. (ft)	104.67	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	103.72	E.G. Elev (ft)	104.59	103.95
Q Total (cfs)	7691.00	W.S. Elev (ft)	103.40	102.38
Q Bridge (cfs)	4145.17	Crit W.S. (ft)	98.60	98.26

Q Weir (cfs)		Max Chl Dpth (ft)	13.75	14.17
Weir Sta Lft (ft)		Vel Total (ft/s)	6.57	7.75
Weir Sta Rgt (ft)		Flow Area (sq ft)	1169.79	992.05
Weir Submerg		Froude # Chl	0.42	0.47
Weir Max Depth (ft)		Specif Force (cu ft)	7384.77	7101.29
Min El Weir Flow (ft)	100.21	Hydr Depth (ft)	5.40	4.50
Min El Prs (ft)	98.71	W.P. Total (ft)	442.26	439.50
Delta EG (ft)	0.92	Conv. Total (cfs)	56976.3	48809.5
Delta WS (ft)	1.14	Top Width (ft)	216.79	220.59
BR Open Area (sq ft)	490.08	Frctn Loss (ft)	0.53	0.00
BR Open Vel (ft/s)	8.46	C & E Loss (ft)	0.11	0.20
BR Sluice Coef		Shear Total (lb/sq ft)	3.01	3.50
BR Sel Method	Energy only	Power Total (lb/ft s)	19.78	27.13

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 975

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.22.800003	101.143.539993		101.123.819992		101.113.959991		101.11	
4.12999	101.14.679993	101.09	7.5	101.02	12.86	100.94	15.12	100.92	
19.53999	100.87	31.05	100.79	31.91	100.7531.92999		100.7631.95999		100.76
32.2	100.75	44.8	100.54	45.19	100.52	53.73	100.34	54.14	100.31
57.36	100.24	57.81	100.23	57.83	100.23	62.16	100.15	63.08	100.22
63.19	100.36	66.86	100.29	67.11	100.3167.31999		100.3268.81999		100.39
69.45	100.42	69.59	100.37	70.03	100.3870.09999		98.0771.53999		95.66
73.70999	92.06	73.75	92.06	74.73	88.2275.34999		88.21	75.66	88.23
76.58	88.27	100.53	89.38	119.27	90.24	125.57	90.51	125.79	90.5
125.99	90.49	127.48	90.54	127.62	90.59	128.42	91.84	129.21	92.19
130.31	92.68	133.84	96.57	141.29	99.17	143.33	99.44	144.75	99.61
146.56	99.86	148.02	100.08	148.24	100.11	148.92	100.27	149.68	100.35
158.44	100.38	160.23	100.31	162.09	100.3	162.54	100.29	165.05	99.95
165.68	99.84	165.95	99.84	172.61	99.92	180.48	99.86	182.44	99.84
182.45	99.84	191.25	99.78	191.78	99.77	195.83	99.74	196.17	99.73
200.09	99.71	205.85	99.67	219.32	99.58	220.57	99.57	220.59	99.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.2368.81999		.04	148.02	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
68.81999 148.02 25 24.34 24.13 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
069.45999		100.6	F
148.9	220.59	100.6	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.57	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.57	Wt. n-Val.		0.040		
W.S. Elev (ft)	98.00	Reach Len. (ft)	658.96	24.34	24.13	
Crit W.S. (ft)	94.05	Flow Area (sq ft)		504.07		
E.G. Slope (ft/ft)	0.002170	Area (sq ft)		504.07		

Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	67.78	Top Width (ft)		67.78	
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)		6.05	
Max Chl Dpth (ft)	9.79	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	65521.3	Conv. (cfs)		65521.3	
Length Wtd. (ft)	24.34	Wetted Per. (ft)		77.01	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)		5.37	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.14	2.51	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.20	0.39	0.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.040	
W.S. Elev (ft)	99.28	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	94.92	Flow Area (sq ft)		593.58	
E.G. Slope (ft/ft)	0.002338	Area (sq ft)		593.58	
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	72.06	Top Width (ft)		72.06	
Vel Total (ft/s)	6.68	Avg. Vel. (ft/s)		6.68	
Max Chl Dpth (ft)	11.07	Hydr. Depth (ft)		8.24	
Conv. Total (cfs)	82040.0	Conv. (cfs)		82040.0	
Length Wtd. (ft)	24.34	Wetted Per. (ft)		82.71	
Min Ch El (ft)	88.21	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		7.00	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.61	2.97	0.38
C & E Loss (ft)	0.02	Cum SA (acres)	0.72	0.41	0.41

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.02	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	96.24	Flow Area (sq ft)	24.69	727.64	82.14
E.G. Slope (ft/ft)	0.002596	Area (sq ft)	24.69	727.64	82.14
Q Total (cfs)	5541.00	Flow (cfs)	4.43	5507.60	28.97
Top Width (ft)	213.00	Top Width (ft)	61.23	79.20	72.57
Vel Total (ft/s)	6.64	Avg. Vel. (ft/s)	0.18	7.57	0.35
Max Chl Dpth (ft)	12.81	Hydr. Depth (ft)	0.40	9.19	1.13
Conv. Total (cfs)	108754.5	Conv. (cfs)	87.0	108098.9	568.5
Length Wtd. (ft)	25.23	Wetted Per. (ft)	61.32	90.98	74.08
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.07	1.30	0.18
Alpha	1.29	Stream Power (lb/ft s)	0.01	9.81	0.06
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	2.42	3.68	1.29
C & E Loss (ft)	0.04	Cum SA (acres)	1.51	0.41	0.53

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.58	Reach Len. (ft)	658.96	24.34	24.13
Crit W.S. (ft)	97.92	Flow Area (sq ft)	131.12	850.94	195.12
E.G. Slope (ft/ft)	0.002854	Area (sq ft)	131.12	850.94	195.12
Q Total (cfs)	7691.00	Flow (cfs)	68.58	7495.76	126.66
Top Width (ft)	220.59	Top Width (ft)	68.82	79.20	72.57
Vel Total (ft/s)	6.53	Avg. Vel. (ft/s)	0.52	8.81	0.65

Max Chl Dpth (ft)	14.37	Hydr. Depth (ft)	1.91	10.74	2.69
Conv. Total (cfs)	143975.0	Conv. (cfs)	1283.8	140320.2	2371.0
Length Wtd. (ft)	28.73	Wetted Per. (ft)	70.28	90.98	75.64
Min Ch El (ft)	88.21	Shear (lb/sq ft)	0.33	1.67	0.46
Alpha	1.77	Stream Power (lb/ft s)	0.17	14.68	0.30
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	4.62	4.21	1.97
C & E Loss (ft)	0.04	Cum SA (acres)	1.57	0.41	0.54

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 950

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.76	0	100.75	.04	100.75	17.97	98.63	20.53001	98.58
22.82001	98.54	27.64	96.04	27.84001	95.95	27.90001	95.93	27.93001	95.92
28.13	95.81	28.95001	95.57	40.59	91.67	42.22001	91.16	42.43001	91.09
45.22001	90.11	69.32001	89.51	90.15001	89.02	91.47001	89.01	91.49001	89.05
93.07001	92.07	100.53	97.93	102.14	99.19	102.65	99.14	111.74	98.83
117.38	98.62	123.5	98.43	128.82	98.69	135.73	98.88	140.72	99.02
141.1	99.02	145.82	99.33	148	99.14	148.78	99.09	157.96	101.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.232	20.53001	.04	102.14	.23

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
20.53001 102.14 756.2 50 53.58 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	22.66	100	F
102.25	157.96	100	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	98.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.		0.040	
W.S. Elev (ft)	97.95	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	94.44	Flow Area (sq ft)		512.15	
E.G. Slope (ft/ft)	0.002235	Area (sq ft)		512.15	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	76.60	Top Width (ft)		76.60	
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)		5.96	
Max Chl Dpth (ft)	8.94	Hydr. Depth (ft)		6.69	
Conv. Total (cfs)	64551.7	Conv. (cfs)		64551.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		81.95	
Min Ch El (ft)	89.01	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)		5.20	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.14	2.23	0.06
C & E Loss (ft)	0.04	Cum SA (acres)	0.20	0.35	0.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	99.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.040	0.002
W.S. Elev (ft)	99.25	Reach Len. (ft)	756.20	50.00	53.58

Crit W.S. (ft)	95.30	Flow Area (sq ft)		613.81	0.01
E.G. Slope (ft/ft)	0.002182	Area (sq ft)	3.26	615.27	18.83
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	0.00
Top Width (ft)	134.36	Top Width (ft)	7.78	81.61	44.97
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46	0.05
Max Chl Dpth (ft)	10.24	Hydr. Depth (ft)		7.72	0.06
Conv. Total (cfs)	84923.7	Conv. (cfs)		84923.7	0.0
Length Wtd. (ft)	50.00	Wetted Per. (ft)		85.40	0.11
Min Ch El (ft)	89.01	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		6.33	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.59	2.63	0.37
C & E Loss (ft)	0.06	Cum SA (acres)	0.66	0.36	0.40

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	101.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.00	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	96.57	Flow Area (sq ft)	29.65	758.36	106.66
E.G. Slope (ft/ft)	0.002126	Area (sq ft)	29.65	758.36	106.66
Q Total (cfs)	5541.00	Flow (cfs)	11.15	5479.49	50.37
Top Width (ft)	155.25	Top Width (ft)	20.53	81.61	53.11
Vel Total (ft/s)	6.19	Avg. Vel. (ft/s)	0.38	7.23	0.47
Max Chl Dpth (ft)	11.99	Hydr. Depth (ft)	1.44	9.29	2.01
Conv. Total (cfs)	120174.8	Conv. (cfs)	241.8	118840.7	1092.3
Length Wtd. (ft)	56.68	Wetted Per. (ft)	20.91	87.53	53.43
Min Ch El (ft)	89.01	Shear (lb/sq ft)	0.19	1.15	0.26
Alpha	1.35	Stream Power (lb/ft s)	0.07	8.31	0.13
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	2.01	3.27	1.24
C & E Loss (ft)	0.06	Cum SA (acres)	0.89	0.36	0.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	103.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	102.54	Reach Len. (ft)	756.20	50.00	53.58
Crit W.S. (ft)	98.07	Flow Area (sq ft)	61.22	883.85	191.41
E.G. Slope (ft/ft)	0.002402	Area (sq ft)	61.22	883.85	191.41
Q Total (cfs)	7691.00	Flow (cfs)	37.84	7517.26	135.90
Top Width (ft)	157.96	Top Width (ft)	20.53	81.61	55.82
Vel Total (ft/s)	6.77	Avg. Vel. (ft/s)	0.62	8.51	0.71
Max Chl Dpth (ft)	13.53	Hydr. Depth (ft)	2.98	10.83	3.43
Conv. Total (cfs)	156939.3	Conv. (cfs)	772.1	153394.0	2773.2
Length Wtd. (ft)	61.05	Wetted Per. (ft)	22.44	87.53	57.00
Min Ch El (ft)	89.01	Shear (lb/sq ft)	0.41	1.51	0.50
Alpha	1.54	Stream Power (lb/ft s)	0.25	12.88	0.36
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.16	3.73	1.86
C & E Loss (ft)	0.08	Cum SA (acres)	0.90	0.36	0.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 900

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.95	4.44999	7	98.67	11.78	97.13	11.92	97.1	12.17	97.09
21.89	96.79	22.5399	9	97.09	25.72	98.25	29.8199	9	98.13	34.42	98.05
47.41	97.75	54.03	97.76	54.06	97.76	54.08	97.76	55.8	94.95
58.2	91.9	59.95	89.29	61.08	87.68	73.2100	1	87.67	76.52	87.65
92.47	87.52	95.62	90.75	97.29	92.06	102.32	96.53	105.02	98.59
119.8	98.01	133.37	97.67	134.69	97.67	140.79	97.64	148.33	97.49
216.93	96.33	220.64	96.38						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	54.06	.04	105.02	.23

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54.06	105.02	108.83	100	90.91	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	54.02	99.5	F
105.29	220.64	99.5	F

CROSS SECTION OUTPUT Profile #10 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	98.32	Element			
Vel Head (ft)	0.95	Wt. n-Val.		0.040	
W.S. Elev (ft)	97.38	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	93.89	Flow Area (sq ft)		391.23	
E.G. Slope (ft/ft)	0.003459	Area (sq ft)	4.92	391.23	36.32
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	127.59	Top Width (ft)	12.74	49.12	65.73
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)		7.80	
Max Chl Dpth (ft)	9.86	Hydr. Depth (ft)		7.96	
Conv. Total (cfs)	51890.1	Conv. (cfs)		51890.1	
Length Wtd. (ft)	100.01	Wetted Per. (ft)		57.99	
Min Ch El (ft)	87.52	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		11.37	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.10	1.71	0.04
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	0.28	0.09

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	99.69	Element			
Vel Head (ft)	1.23	Wt. n-Val.	0.000	0.040	
W.S. Elev (ft)	98.46	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	95.01	Flow Area (sq ft)	0.03	445.33	
E.G. Slope (ft/ft)	0.003993	Area (sq ft)	37.79	445.33	137.85
Q Total (cfs)	3967.00	Flow (cfs)	0.01	3966.99	
Top Width (ft)	211.71	Top Width (ft)	48.61	50.79	112.31
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)	0.32	8.91	
Max Chl Dpth (ft)	10.94	Hydr. Depth (ft)	0.70	8.77	
Conv. Total (cfs)	62779.2	Conv. (cfs)	0.1	62779.1	
Length Wtd. (ft)	100.02	Wetted Per. (ft)	0.04	60.24	
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.17	1.84	

Alpha	1.00	Stream Power (lb/ft s)	0.06	16.42	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.23	2.02	0.28
C & E Loss (ft)	0.05	Cum SA (acres)	0.17	0.29	0.30

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.23	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	96.68	Flow Area (sq ft)	132.04	535.73	342.75
E.G. Slope (ft/ft)	0.003691	Area (sq ft)	132.04	535.73	342.75
Q Total (cfs)	5541.00	Flow (cfs)	92.02	5177.41	271.56
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	0.70	9.66	0.79
Max Chl Dpth (ft)	12.71	Hydr. Depth (ft)	2.44	10.51	2.96
Conv. Total (cfs)	91207.3	Conv. (cfs)	1514.7	85222.5	4470.1
Length Wtd. (ft)	99.75	Wetted Per. (ft)	55.80	60.46	119.50
Min Ch El (ft)	87.52	Shear (lb/sq ft)	0.55	2.04	0.66
Alpha	2.90	Stream Power (lb/ft s)	0.38	19.73	0.52
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.60	2.52	0.96
C & E Loss (ft)	0.06	Cum SA (acres)	0.25	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	103.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.90	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.46	Reach Len. (ft)	108.83	100.00	90.91
Crit W.S. (ft)	98.63	Flow Area (sq ft)	198.05	597.96	483.94
E.G. Slope (ft/ft)	0.004618	Area (sq ft)	198.05	597.96	483.94
Q Total (cfs)	7691.00	Flow (cfs)	199.42	6955.43	536.15
Top Width (ft)	220.64	Top Width (ft)	54.06	50.96	115.62
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	1.01	11.63	1.11
Max Chl Dpth (ft)	13.94	Hydr. Depth (ft)	3.66	11.73	4.19
Conv. Total (cfs)	113176.7	Conv. (cfs)	2934.6	102352.4	7889.7
Length Wtd. (ft)	99.65	Wetted Per. (ft)	57.02	60.46	120.72
Min Ch El (ft)	87.52	Shear (lb/sq ft)	1.00	2.85	1.16
Alpha	3.39	Stream Power (lb/ft s)	1.01	33.17	1.28
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	0.91	2.88	1.45
C & E Loss (ft)	0.10	Cum SA (acres)	0.25	0.29	0.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 800

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.57	2.709991	99.02	3.190002	99.02	3.459991	99.01	5.839996	98.88
7.309998	98.58	11.94	97.6614.73999		97.7518.06999		97.7220.87999		98.36

```
   24.78   99.2426.01999   99.21   27.41   99.2231.26999   97.5937.95999   94.73
   39.16   94.78   40.56   94.83   40.59   94.8243.09999   93.85   48.16    91.7
57.03999    91.165.23999   90.54   78.45   89.18   80.59   88.95   83.16   88.67
89.17999   88.05   91.03      8997.10999    92.4  105.86   95.84   110.7   98.08
   111.2   98.32  112.54   98.31  124.01   98.28  141.64   98.23  150.31   97.24
  153.04   97.12   157.4   96.99  162.01   98.13  180.27   97.54  221.84   96.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .23   40.59     .04   110.7     .23

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         40.59   110.7          107.86     100    85.5             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   27.33    99.3       F
  111.28  221.84    99.3       F

CROSS SECTION OUTPUT  Profile #10 yr

  E.G. Elev (ft)             97.93    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               0.93    Wt. n-Val.               0.230      0.040
  W.S. Elev (ft)             97.00    Reach Len. (ft)         107.86     100.00      85.50
  Crit W.S. (ft)             95.02    Flow Area (sq ft)        11.89     393.73
  E.G. Slope (ft/ft)      0.004384    Area (sq ft)             11.89     393.73       1.37
  Q Total (cfs)            3052.00    Flow (cfs)                6.40    3045.60
  Top Width (ft)             88.50    Top Width (ft)            7.95      67.78      12.77
  Vel Total (ft/s)            7.52    Avg. Vel. (ft/s)          0.54       7.74
  Max Chl Dpth (ft)           8.95    Hydr. Depth (ft)          1.50       5.81
  Conv. Total (cfs)        46095.7    Conv. (cfs)              96.7    45999.0
  Length Wtd. (ft)           100.01    Wetted Per. (ft)          8.42      70.60
  Min Ch El (ft)              88.05    Shear (lb/sq ft)          0.39       1.53
  Alpha                        1.05    Stream Power (lb/ft s)    0.21      11.81
  Frctn Loss (ft)             0.58    Cum Volume (acre-ft)      0.08       0.81       0.00
  C & E Loss (ft)             0.06    Cum SA (acres)            0.06       0.14       0.01


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional
cross
         sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

CROSS SECTION OUTPUT  Profile #25 yr

  E.G. Elev (ft)             99.24    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               1.08    Wt. n-Val.               0.230      0.040      0.001
  W.S. Elev (ft)             98.16    Reach Len. (ft)         107.86     100.00      85.50
  Crit W.S. (ft)             95.86    Flow Area (sq ft)        22.64     473.49       0.01
  E.G. Slope (ft/ft)      0.004186    Area (sq ft)             26.38     473.49      61.42
  Q Total (cfs)            3967.00    Flow (cfs)               14.98    3952.02       0.00
  Top Width (ft)             171.10    Top Width (ft)           21.24      70.11      79.75
  Vel Total (ft/s)            8.00    Avg. Vel. (ft/s)          0.66       8.35       0.05
  Max Chl Dpth (ft)          10.11    Hydr. Depth (ft)          2.12       6.75       0.04
  Conv. Total (cfs)        61318.0    Conv. (cfs)             231.5    61086.5        0.0
  Length Wtd. (ft)           100.01    Wetted Per. (ft)         11.37      73.16       0.18
  Min Ch El (ft)              88.05    Shear (lb/sq ft)          0.52       1.69
  Alpha                        1.09    Stream Power (lb/ft s)    0.34      14.12
  Frctn Loss (ft)             0.56    Cum Volume (acre-ft)      0.15       0.97       0.07
  C & E Loss (ft)             0.07    Cum SA (acres)            0.09       0.15       0.10


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional
cross
         sections.
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Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	101.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	100.03	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	97.14	Flow Area (sq ft)	89.97	604.45	265.53
E.G. Slope (ft/ft)	0.003351	Area (sq ft)	89.97	604.45	265.53
Q Total (cfs)	5541.00	Flow (cfs)	54.79	5312.39	173.82
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	0.61	8.79	0.65
Max Chl Dpth (ft)	11.98	Hydr. Depth (ft)	2.22	8.62	2.39
Conv. Total (cfs)	95718.5	Conv. (cfs)	946.4	91769.3	3002.7
Length Wtd. (ft)	99.81	Wetted Per. (ft)	43.30	73.16	114.66
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.43	1.73	0.48
Alpha	2.22	Stream Power (lb/ft s)	0.26	15.19	0.32
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	0.33	1.21	0.33
C & E Loss (ft)	0.12	Cum SA (acres)	0.13	0.15	0.16

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	102.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	101.26	Reach Len. (ft)	107.86	100.00	85.50
Crit W.S. (ft)	98.62	Flow Area (sq ft)	139.90	690.71	402.26
E.G. Slope (ft/ft)	0.003941	Area (sq ft)	139.90	690.71	402.26
Q Total (cfs)	7691.00	Flow (cfs)	121.72	7195.28	374.01
Top Width (ft)	221.84	Top Width (ft)	40.59	70.11	111.14
Vel Total (ft/s)	6.24	Avg. Vel. (ft/s)	0.87	10.42	0.93
Max Chl Dpth (ft)	13.21	Hydr. Depth (ft)	3.45	9.85	3.62
Conv. Total (cfs)	122513.6	Conv. (cfs)	1938.9	114617.0	5957.8
Length Wtd. (ft)	99.77	Wetted Per. (ft)	44.53	73.16	115.89
Min Ch El (ft)	88.05	Shear (lb/sq ft)	0.77	2.32	0.85
Alpha	2.61	Stream Power (lb/ft s)	0.67	24.20	0.79
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	0.49	1.40	0.52
C & E Loss (ft)	0.11	Cum SA (acres)	0.13	0.15	0.16

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: BrushyCreek
REACH: BrushyCreek RS: 700

INPUT

Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.34	10.95	97.54	15.92999	97.15	17.62	96.79	21.73999	95.89
27.65999	94.62	35.09999	94.53	49.06999	94.37	49.70999	94.37	57.13	94.56
65.34999	94.85	66.09	94.88	67.92999	91.5	68.02	91.41	71.41	90.65
72.42	90.43	72.50999	90.41	72.57999	90.38	72.95	90.37	97.56	89.37
112.72	88.75	112.85	88.87	113.53	89.47	114.5	90.35	117.24	92.25
117.74	92.51	124.6	97.21	125.66	97.93	128.02	97.83	154.53	96.53
163.35	96.43	174.26	95.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.23	65.34999	.04	124.6	.23

Bank Sta: Left Right Coeff Contr. Expan.
65.34999 124.6 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	66.06	98.5	F
125.79	174.26	98.5	F

CROSS SECTION OUTPUT Profile #10 yr

E.G. Elev (ft)	97.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	95.79	Reach Len. (ft)			
Crit W.S. (ft)	94.73	Flow Area (sq ft)		310.32	
E.G. Slope (ft/ft)	0.008004	Area (sq ft)	50.70	310.97	
Q Total (cfs)	3052.00	Flow (cfs)		3052.00	
Top Width (ft)	100.33	Top Width (ft)	43.15	57.18	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		5.50	
Conv. Total (cfs)	34114.8	Conv. (cfs)		34114.8	
Length Wtd. (ft)		Wetted Per. (ft)		60.95	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.54	
Alpha	1.00	Stream Power (lb/ft s)		25.02	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25 yr

E.G. Elev (ft)	98.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.040	
W.S. Elev (ft)	96.79	Reach Len. (ft)			
Crit W.S. (ft)	95.64	Flow Area (sq ft)		367.28	
E.G. Slope (ft/ft)	0.008008	Area (sq ft)	95.96	368.65	9.81
Q Total (cfs)	3967.00	Flow (cfs)		3967.00	
Top Width (ft)	131.35	Top Width (ft)	47.72	58.63	24.99
Vel Total (ft/s)	10.80	Avg. Vel. (ft/s)		10.80	
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	44329.0	Conv. (cfs)		44329.0	
Length Wtd. (ft)		Wetted Per. (ft)		62.72	
Min Ch El (ft)	88.75	Shear (lb/sq ft)		2.93	
Alpha	1.00	Stream Power (lb/ft s)		31.62	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #100 yr

E.G. Elev (ft)	100.57	Element	Left OB	Channel	Right OB

Vel Head (ft)	2.35	Wt. n-Val.		0.040	0.230
W.S. Elev (ft)	98.22	Reach Len. (ft)			
Crit W.S. (ft)	97.04	Flow Area (sq ft)		450.99	0.73
E.G. Slope (ft/ft)	0.008006	Area (sq ft)	173.96	453.37	66.46
Q Total (cfs)	5541.00	Flow (cfs)		5540.73	0.27
Top Width (ft)	172.62	Top Width (ft)	63.71	59.25	49.66
Vel Total (ft/s)	12.27	Avg. Vel. (ft/s)		12.29	0.37
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)		7.70	0.61
Conv. Total (cfs)	61929.0	Conv. (cfs)		61925.9	3.0
Length Wtd. (ft)		Wetted Per. (ft)		63.46	1.41
Min Ch El (ft)	88.75	Shear (lb/sq ft)		3.55	0.26
Alpha	1.00	Stream Power (lb/ft s)		43.64	0.10
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #500 yr

E.G. Elev (ft)	102.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.68	Wt. n-Val.	0.230	0.040	0.230
W.S. Elev (ft)	99.50	Reach Len. (ft)			
Crit W.S. (ft)	98.79	Flow Area (sq ft)	257.74	529.43	130.21
E.G. Slope (ft/ft)	0.008013	Area (sq ft)	257.74	529.43	130.21
Q Total (cfs)	7691.00	Flow (cfs)	366.55	7188.13	136.31
Top Width (ft)	174.26	Top Width (ft)	65.35	59.25	49.66
Vel Total (ft/s)	8.38	Avg. Vel. (ft/s)	1.42	13.58	1.05
Max Chl Dpth (ft)	10.75	Hydr. Depth (ft)	3.94	8.94	2.62
Conv. Total (cfs)	85918.0	Conv. (cfs)	4094.8	80300.3	1522.8
Length Wtd. (ft)		Wetted Per. (ft)	66.84	64.17	53.46
Min Ch El (ft)	88.75	Shear (lb/sq ft)	1.93	4.13	1.22
Alpha	2.45	Stream Power (lb/ft s)	2.74	56.03	1.28
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.

SUMMARY OF MANNING'S N VALUES

River:BrushyCreek

Reach	River Sta.	n1	n2	n3
BrushyCreek	1900	.23	.04	.23
BrushyCreek	1800	.23	.04	.23
BrushyCreek	1700	.23	.04	.23
BrushyCreek	1600	.23	.04	.23
BrushyCreek	1500	.23	.04	.23
BrushyCreek	1400	.23	.04	.23
BrushyCreek	1300	.23	.04	.23
BrushyCreek	1200	.23	.04	.23
BrushyCreek	1100	.23	.04	.23
BrushyCreek	1050	.23	.04	.23
BrushyCreek	1000	.23	.04	.23
BrushyCreek	987.5	Bridge		
BrushyCreek	975	.23	.04	.23
BrushyCreek	950	.23	.04	.23
BrushyCreek	900	.23	.04	.23
BrushyCreek	800	.23	.04	.23
BrushyCreek	700	.23	.04	.23

SUMMARY OF REACH LENGTHS

River: BrushyCreek

Reach	River Sta.	Left	Channel	Right
BrushyCreek	1900	105.8	100	118.29
BrushyCreek	1800	439.95	99.76	53.66
BrushyCreek	1700	102.93	100.24	97.47
BrushyCreek	1600	100.17	99.43	99.79
BrushyCreek	1500	79.93	100.57	123.17
BrushyCreek	1400	98.46	100	105.25
BrushyCreek	1300	664.31	100	63.68
BrushyCreek	1200	114.91	100	120.57
BrushyCreek	1100	20.56	50	255.03
BrushyCreek	1050	25.83	50	71.25
BrushyCreek	1000	25.88	25.66	27.03
BrushyCreek	987.5	Bridge		
BrushyCreek	975	25	24.34	24.13
BrushyCreek	950	756.2	50	53.58
BrushyCreek	900	108.83	100	90.91
BrushyCreek	800	107.86	100	85.5
BrushyCreek	700			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: BrushyCreek

Reach	River Sta.	Contr.	Expan.
BrushyCreek	1900	.1	.3
BrushyCreek	1800	.1	.3
BrushyCreek	1700	.1	.3
BrushyCreek	1600	.1	.3
BrushyCreek	1500	.1	.3
BrushyCreek	1400	.1	.3
BrushyCreek	1300	.1	.3
BrushyCreek	1200	.1	.3
BrushyCreek	1100	.1	.3
BrushyCreek	1050	.1	.3
BrushyCreek	1000	.3	.5
BrushyCreek	987.5	Bridge	
BrushyCreek	975	.3	.5
BrushyCreek	950	.1	.3
BrushyCreek	900	.1	.3
BrushyCreek	800	.1	.3
BrushyCreek	700	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Existing

River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 10 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
  This may indicate the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: BrushyCreek Reach: BrushyCreek RS: 1900 Profile: 25 yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1900     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1900     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1800     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1700     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
```

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     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1600     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1500     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1500     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1500     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1500     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1400     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1300     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
```

```
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1200     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1100     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 10 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 25 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1050     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 10 yr
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
```

```
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 1000     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 10 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 25 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 100 yr Downstream
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Upstream
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 987.5     Profile: 500 yr Downstream
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
          This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 25 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
          used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
```

```
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 975     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
water surface was
             used.
River: BrushyCreek  Reach: BrushyCreek     RS: 950     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 950     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 950     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 950     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 900     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 10 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 100 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
```

```
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 800     Profile: 500 yr
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 10 yr
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 25 yr
     Warning:Divided flow computed for this cross-section.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 100 yr
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.
River: BrushyCreek  Reach: BrushyCreek     RS: 700     Profile: 500 yr
     Warning:The cross section had to be extended vertically during the critical depth calculations.
```

APPENDIX C: SCOUR CALCULATIONS

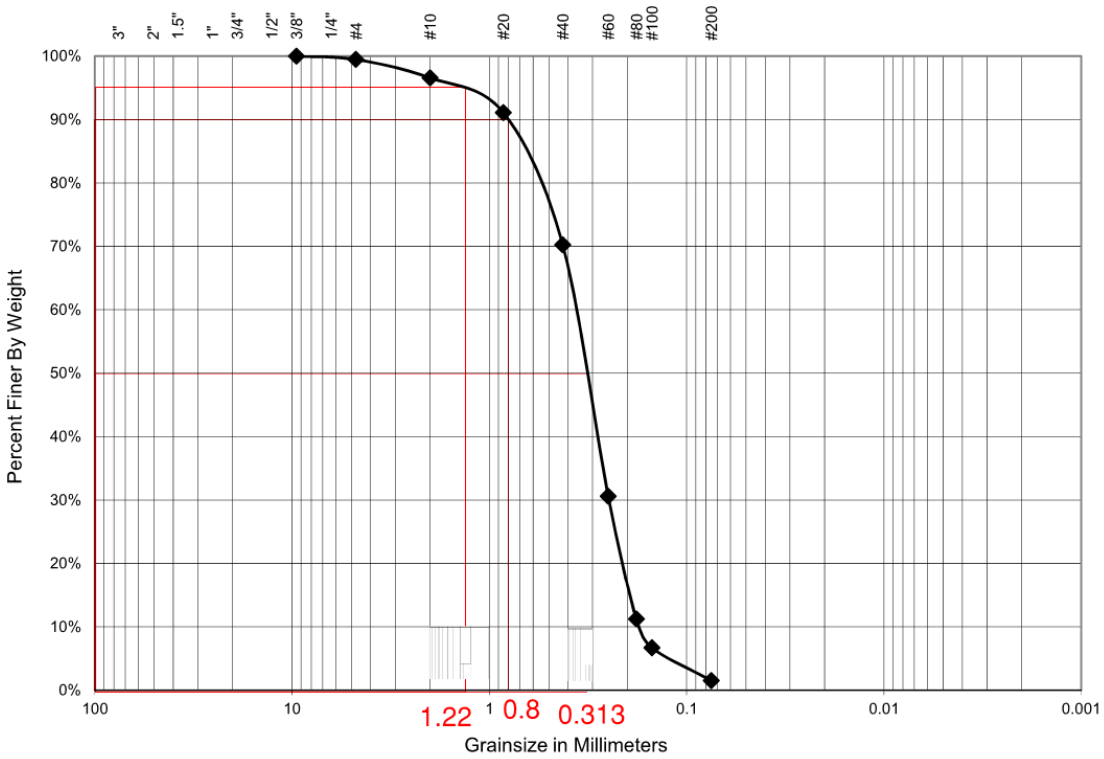


Figure C-2: Grain Size Distribution
(See Geotech Report for complete analysis)

Proposed Bridge
100 year Scour

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	3.74	10.36	2.18
	Approach Velocity (ft/s):	0.64	6.99	0.44
	Br Average Depth (ft):		7.90	0.32
	BR Opening Flow (cfs):		5540.92	0.08
	BR Top WD (ft):		94.39	1.28
	Grain Size D50 (mm):	0.31	0.31	0.31
	Approach Flow (cfs):	241.09	5266.24	33.67
	Approach Top WD (ft):	101.06	72.67	35.08
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):		1.13	0.00
	Critical Velocity (ft/s):		1.66	1.28
	Equation:		Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	1.50
	Grain Size D50 (mm):	0.31000
	Depth Upstream (ft):	8.19
	Velocity Upstream (ft/s):	6.76
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	25.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	1.22000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	4.51
	Froude #:	0.42
	Equation:	CSU equation

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	66.47	153.43
	Toe Sta at appr (ft):	111.22	171.71
	Abutment Length (ft):	111.22	37.10
	Depth at Toe (ft):	4.91	1.86
	K1 Shape Coef:	0.55 - Spill-through abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	111.22	37.10
	Avg Depth Obstructed Ya (ft):	4.34	2.63
	Flow Obstructed Qe (cfs):	977.36	180.27
	Area Obstructed Ae (sq ft):	482.77	97.41
Results			
	Scour Depth Ys (ft):	11.79	6.48
	Qe/Ae = Ve:	2.02	1.85

Proposed Bridge
100 year Scour

Froude #:	0.17	0.20
Equation:	Froehlich	Froehlich

Combined Scour Depths

Pier Scour + Contraction Scour (ft):		
	Channel:	5.64
Left abutment scour + contraction scour (ft):	12.92	
Right abutment scour + contraction scour (ft):	7.62	

Proposed Bridge
500 year Scour

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	5.74	12.37	4.18
	Approach Velocity (ft/s):	0.84	7.91	0.66
	Br Average Depth (ft):	0.56	9.94	1.04
	BR Opening Flow (cfs):	1.30	7686.46	3.24
	BR Top WD (ft):	8.31	93.14	7.34
	Grain Size D50 (mm):	0.31	0.31	0.31
	Approach Flow (cfs):	489.44	7104.69	96.87
	Approach Top WD (ft):	101.06	72.67	35.08
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	1.21	0.00
	Critical Velocity (ft/s):	1.51	1.71	1.43
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	1.50
	Grain Size D50 (mm):	0.31000
	Depth Upstream (ft):	10.25
	Velocity Upstream (ft/s):	7.36
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	25.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	1.22000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	3.60
	Froude #:	0.41
	Equation:	CSU equation
	Pier Scour Limited to Maximum of Ys = 2.4 * a	

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	66.47	153.43
	Toe Sta at appr (ft):	111.22	171.71
	Abutment Length (ft):	111.22	37.10
	Depth at Toe (ft):	6.96	3.91
	K1 Shape Coef:	0.55 - Spill-through abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	111.22	37.10
	Avg Depth Obstructed Ya (ft):	6.35	4.63
	Flow Obstructed Qe (cfs):	1482.75	294.64
	Area Obstructed Ae (sq ft):	705.75	171.80
Results			
	Scour Depth Ys (ft):	14.78	8.90

Proposed Bridge
500 year Scour

Qe/Ae = Ve:	2.10	1.72
Froude #:	0.15	0.14
Equation:	Froehlich	Froehlich

Combined Scour Depths

Pier Scour + Contraction Scour (ft):		
	Channel:	4.81
Left abutment scour + contraction scour (ft):	15.99	
Right abutment scour + contraction scour (ft):	10.11	

Temporary Bridge
25 year Scour

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):		8.27	
	Approach Velocity (ft/s):		6.41	
	Br Average Depth (ft):		7.64	
	BR Opening Flow (cfs):		3967.00	
	BR Top WD (ft):		85.25	
	Grain Size D50 (mm):	0.31	0.31	0.31
	Approach Flow (cfs):		3967.00	
	Approach Top WD (ft):		74.85	
	K1 Coefficient:		0.690	
Results				
	Scour Depth Ys (ft):		0.00	
	Critical Velocity (ft/s):		1.60	
	Equation:		Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	1.00
	Grain Size D50 (mm):	0.31000
	Depth Upstream (ft):	7.56
	Velocity Upstream (ft/s):	5.88
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	28.50
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	1.22000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	2.40
	Froude #:	0.38
	Equation:	CSU equation
	Pier Scour Limited to Maximum of Ys = 2.4 * a	

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	36.00	146.00
	Toe Sta at appr (ft):	47.08	146.00
	Abutment Length (ft):	0.00	1.91
	Depth at Toe (ft):	-0.27	0.33
	K1 Shape Coef:	0.55 - Spill-through abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	0.00	1.91
	Avg Depth Obstructed Ya (ft):		8.27
	Flow Obstructed Qe (cfs):		101.18
	Area Obstructed Ae (sq ft):		15.80
Results			
	Scour Depth Ys (ft):		11.38

Qe/Ae = Ve:		6.40
Froude #:		0.39
Equation:	Default	Froehlich

Temporary Bridge
50 year Scour

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Round nose
Pier Width (ft):	1.00
Grain Size D50 (mm):	0.31000
Depth Upstream (ft):	8.71
Velocity Upstream (ft/s):	5.98
K1 Nose Shape:	1.00
Pier Angle:	0.00
Pier Length (ft):	28.50
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	1.22000
K4 Armouring Coef:	1.00

Results

Scour Depth Ys (ft):	2.40
Froude #:	0.36
Equation:	CSU equation

Pier Scour Limited to Maximum of Ys = 2.4 * a

Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	36.00	146.00
Toe Sta at appr (ft):	36.00	146.00
Abutment Length (ft):	46.10	74.59
Depth at Toe (ft):	0.95	1.56
K1 Shape Coef:	0.55 - Spill-through abutment	
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	46.10	74.59
Avg Depth Obstructed Ya (ft):	0.33	1.18
Flow Obstructed Qe (cfs):	2.15	139.89
Area Obstructed Ae (sq ft):	15.36	87.96
Results		
Scour Depth Ys (ft):	1.29	5.90
Froude #:	0.04	0.84
Equation:	HIRE	HIRE

BRIDGE ABUTMENT RIPRAP CALCULATIONS

Design By:	EKN	3/5/2020
Check By:	WLA	3/6/2020

Design Storm	100	yr
DHW Elev.	101.28	ft-NAVD
Average Stream Bed Elev.	90.00	ft-NAVD
Flow Depth	11.28	ft

Riprap Extents (See Figure 14.7 below)

2 X Flow Depth	22.56	ft
(a) Extent from Toe	**23.00**	ft
Min. 10 ft per SDM		
(b) Extent from Abutment Face DS	**25.00**	ft
Min. 15 ft per SDM		
(c) Extent from Abutment Face US	**15.00**	ft
Min. 15 ft per SDM		

Riprap Size (See Equation 14.1/14.2 Below)

V	6.76	ft/s
y	11.28	ft
Froude No. (V/(gy)^0.5)	0.35	
K	0.89	
S_S	2.65	
D_{50}	**0.77**	ft

Riprap Thickness

D_{50} x 1.5	1.15	ft
Min. Thickness per SDM	2.50	ft
Design Thickness	**2.50**	ft

Note: Thickness should not be less than D_{100}.

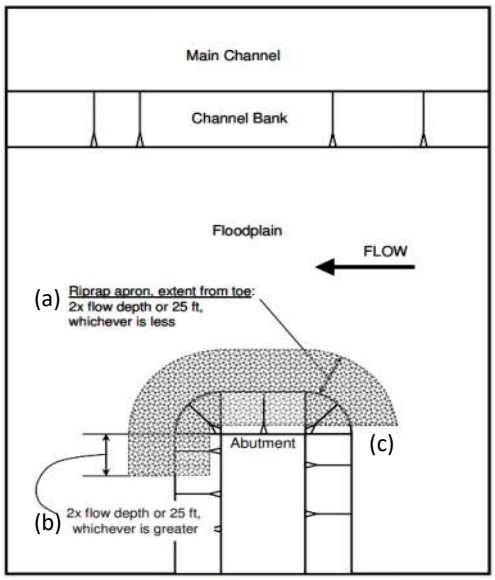


Figure 14.7. Plan view of the extent of rock riprap apron (Lagasse et al. 2006).

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

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)}\left[\frac{V^2}{gy}\right] \quad (14.1)$$

where:

- D_{50} = median stone diameter, ft (m)
- V = characteristic average velocity in the contracted section (explained below), ft/s (m/s)
- S_s = specific gravity of rock riprap
- g = gravitational acceleration, 32.2 ft/s^2 (9.81 m/s^2)
- y = depth of flow in the contracted bridge opening, ft (m)
- K = 0.89 for a spill-through abutment
  1.02 for a vertical wall abutment

For Froude Numbers >0.80, Equation 14.2 is recommended:

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)}\left[\frac{V^2}{gy}\right]^{0.14} \quad (14.2)$$

where:

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

BRIDGE ABUTMENT RIPRAP CALCULATIONS
Temporary Bridge

Design By:	EKN	3/5/2020
Check By:	WLA	3/6/2020

Design Storm	10	yr
DHW Elev.	98.51	ft-NAVD
Average Stream Bed Elev.	90.00	ft-NAVD
Flow Depth	8.51	ft

Riprap Extents (See Figure 14.7 below)

2 X Flow Depth	17.02	ft
(a) Extent from Toe	**18.00**	ft
Min. 10 ft per SDM		
(b) Extent from Abutment Face DS	**25.00**	ft
(c) Extent from Abutment Face US	**15.00**	ft
Min. 15 ft per SDM		

Riprap Size (See Equation 14.1/14.2 Below)

V	5.29	ft/s
y	8.51	ft
Froude No. (V/(gy)^0.5)	0.32	
K	0.89	
S_S	2.65	
D_{50}	**0.47**	ft

Riprap Thickness

D_{50} x 1.5	0.70	ft
Min. Thickness per SDM	2.50	ft
Design Thickness	**2.50**	ft

Note: Thickness should not be less than D_{100}.

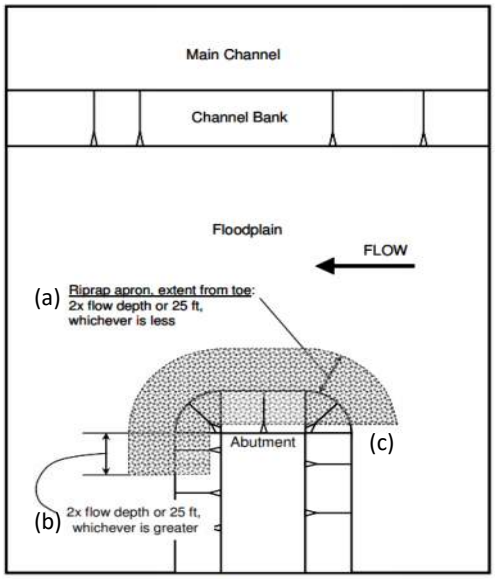


Figure 14.7. Plan view of the extent of rock riprap apron (Lagasse et al. 2006).

For Froude Numbers ($V/(gy)^{1/2}$) ≤ 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:

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)}\left[\frac{V^2}{gy}\right] \qquad (14.1)$$

where:

D_{50} = median stone diameter, ft (m)
V = characteristic average velocity in the contracted section (explained below), ft/s (m/s)
S_s = specific gravity of rock riprap
g = gravitational acceleration, 32.2 ft/s² (9.81 m/s²)
y = depth of flow in the contracted bridge opening, ft (m)
K = 0.89 for a spill-through abutment
1.02 for a vertical wall abutment

For Froude Numbers >0.80, Equation 14.2 is recommended:

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)}\left[\frac{V^2}{gy}\right]^{0.14} \qquad (14.2)$$

where:

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

APPENDIX D: SUPPORTING DOCUMENTATION

http://www.northescambia.com/2017/10/north-escambia-roads-bridges-reopen-after-flooding

North Escambia Roads, Bridges Reopen After Flooding

October 26, 2017

Three North Escambia roads and bridges closed Monday due to flooding have reopened.
The Barrineau Park Road bridge over the Perdido River at the state line, O.C. Phillips Road at Brushy Creek and North Pineville Road near Tullis Road are now all open, according to Escambia County.
Pictured top: A truck was partially submerged Monday in floodwaters on O.C. Phillips Road. Pictured below: Another view of the flooding (after the truck was removed). NorthEscambia.com reader submitted photos, click to enlarge.

NorthEscambia.com

News for Molino, Bratt, Walnut Hill
McDavid, Century & Cantonment

http://www.northescambia.com/2017/01/road-and-bridge-closures-due-to-flooding

Road And Bridge Closures Due To Flooding

January 3, 2017

The following roads in Escambia County were closed, or not safely passable, due to flooding as of Tuesday morning:

- South Pineville Road at Brushy Creek Bridge
- Occie Phillips Road at Brushy Creek Bridge
- Mobile Highway at Fairfield Drive
- Woodrun Road from Woodrun Lane To Woodrun Road
- Barrineau Park Road at the Pedido River bridge
- University Parkway at Hillview Drive
- North Navy Boulevard at New Warrington Road

This report was compiled with information from Escambia County, the Florida Highway Patrol and verified NorthEscambia.com reader reports.

Pictured top: Gibson Road in Molino. Pictured below, in top to bottom order: South Pineville Road at Brushy Creek, Occie Phillips Road at Brushy Creek, Highway 196/Barrineau Park Road at the Perdido River into Alabama. NorthEscambia.com photos, click to enlarge.

NorthEscambia.com

News for Molino, Bratt, Walnut Hill
McDavid, Century & Cantonment

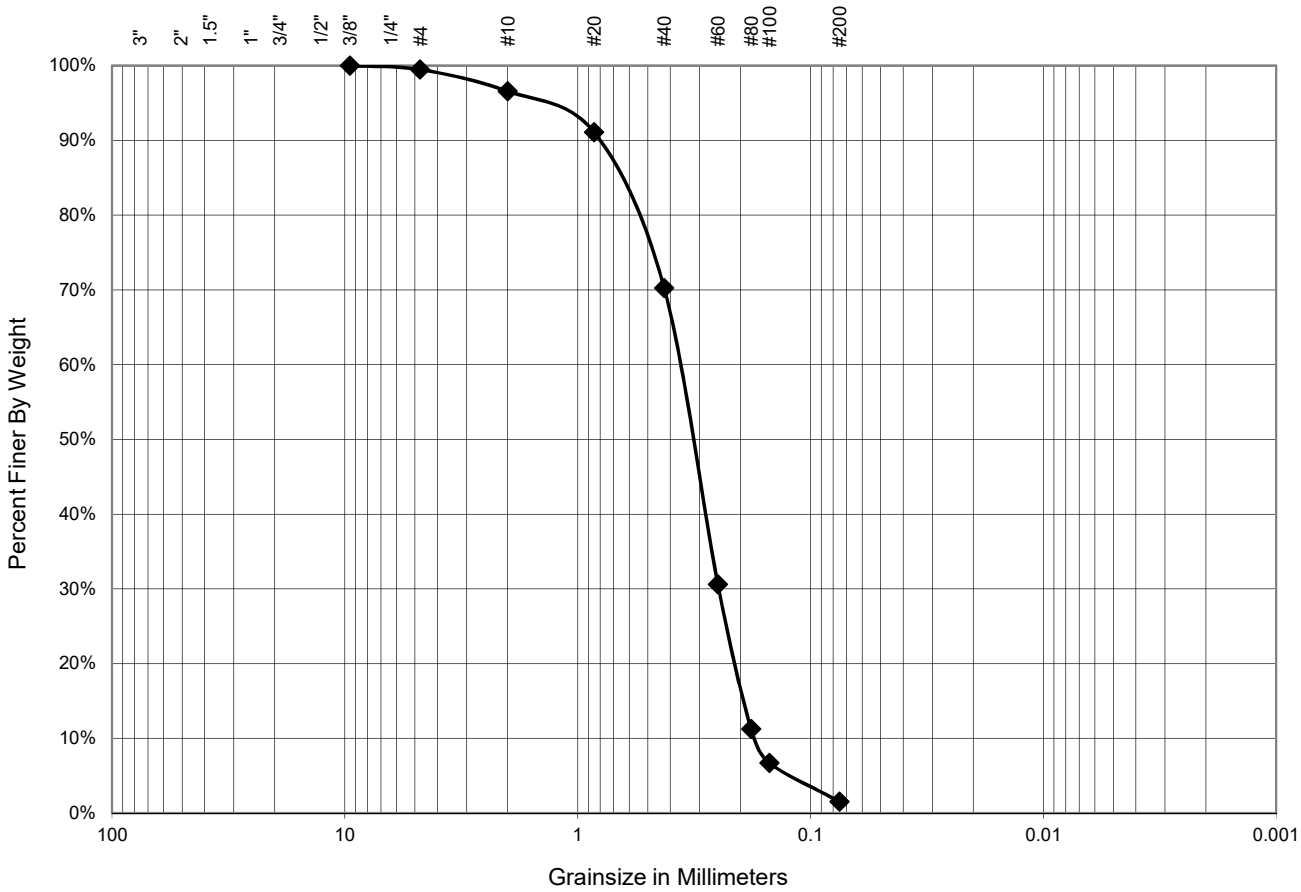
Should be included in the report

Client: American Consulting Professionals
Project: Occie Philips Road Over Bushy Creek
Location: Escambia County, FL

Grainsize Analysis - ASTM C136/AASHTO T27

Figure #:
Project #: 19-233
Date: 7/18/2019
Engineer: DLL

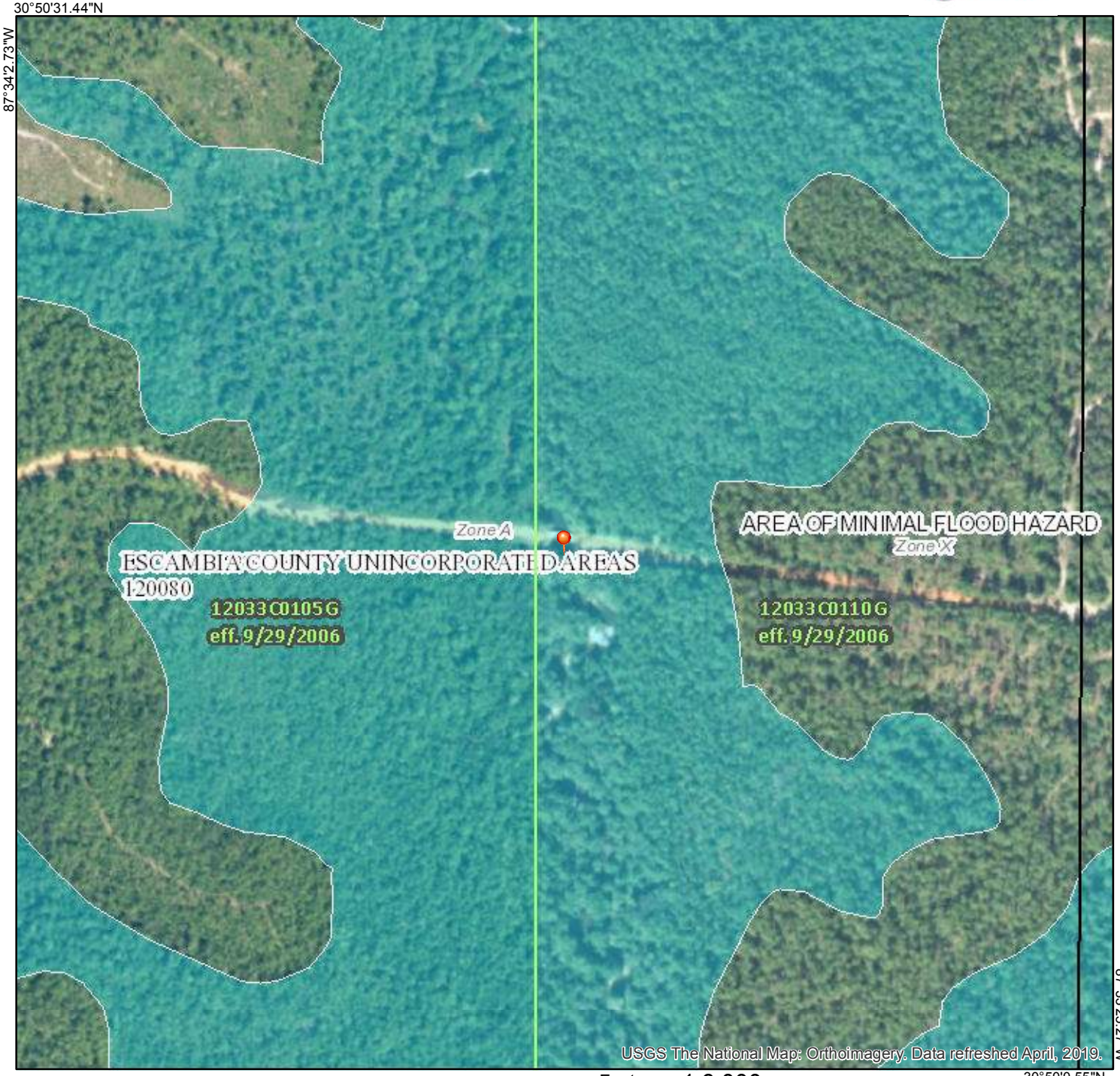
Sample #	Depth (ft)	Soil Description
◆ Creek Bottom	ni	Orange/Brown Sand



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

National Flood Hazard Layer FIRMette

FEMA



Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/18/2019 at 10:54:46 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

From: Powell, Leahann E.
To: Derek Fox
Cc: JLashley@sigmacg.com; Nelson, Eric K.; Barrett, Cody A.; Chris A. Curb
Subject: Re: OC Phillips - Debris Clearance Recommendation
Date: Wednesday, August 21, 2019 8:20:16 PM

Thank you Derek. We will proceed accordingly.

Leahann Powell, PE
Project Manager/Principal

American Consulting Professionals, LLC
4489 Woodbine Road | Pace, FL 32571
850.289.1005 (D) | 813.434.3221 (M) | lpowell@acp-fl.com | acp-americas.com

On Aug 21, 2019, at 5:18 PM, Derek Fox <dfox@myescambia.com> wrote:

> Leahann
> Per our previous conversation on this matter, after consulting with Chris Curb who was in dept when that standard was developed, and based on previous precedent in recent County bridge designs, where the desired freeboard in the memo was not achievable, 2ft clearance is an acceptable amount of debris clearance.
>
> If you have any questions on this please call and discuss.
>
> <image002.jpg>
>
> Derek M. Fox
> Senior Project Coordinator
> Bridge Program Program
> Engineer Department
> Escambia County, FL
> Office: (850) 595-2413
> Cell: (850) 384-3760
>
>
>
>
> ---
>
> **From:** Powell, Leahann E. <LPowell@acp-fl.com>
> **Sent:** Tuesday, August 20, 2019 11:46 AM
> **To:** Derek Fox <dfox@myescambia.com>
> **Cc:** JLashley@sigmacg.com; Nelson, Eric K. <ENelson@acp-fl.com>; Barrett, Cody A. <CBarrett@acp-fl.com>
> **Subject:** RE: OC Phillips - Debris Clearance Recommendation

Derek,

Could you please provide an update on this?

Thanks,

Leahann Powell, PE
American Consulting Professionals, LLC
4489 Woodbine Road | Pace, FL 32571
850.289.1005 (D) | 813.434.3221 (M) | lpowell@acp-fl.com | acp-americas.com

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From: Powell, Leahann E.
Sent: Friday, August 16, 2019 9:22 AM
To: dfox@myescambia.com
Cc: JLashley@sigmacg.com; Nelson, Eric K.; Barrett, Cody A.
Subject: OC Phillips - Debris Clearance Recommendation
Importance: High

Derek,

The attached memo would require a minimum of 6'-0" of debris clearance above the 100-year storm. Understanding that the County has different requirements, this is significantly greater than what FDOT would require (for both storm event and debris clearance) and does not seem warranted on this project. In addition, the 6 feet of debris clearance will increase the project limits and R/W requirements tremendously, ultimately increasing construction costs.

FDOT requires a minimum of 1 foot of debris clearance above the 25 year storm event.

We recommend providing 2 feet of clearance (understanding that is what the County has done on past projects, and considers that the minimum) above the 100-year storm event. Please confirm that this is acceptable by the County.

Also, please confirm approval of the horizontal alignment with the 8ft to 10ft offset we presented on 7/16 is acceptable by the County.

Thank you,

<image003.png>

Leahann Powell, PE
Project Manager/Principal
American Consulting Professionals, LLC
4489 Woodbine Road | Pace, FL 32571
850.289.1005 (D) | 813.434.3221 (M) | lpowell@acp-fl.com | acp-americas.com

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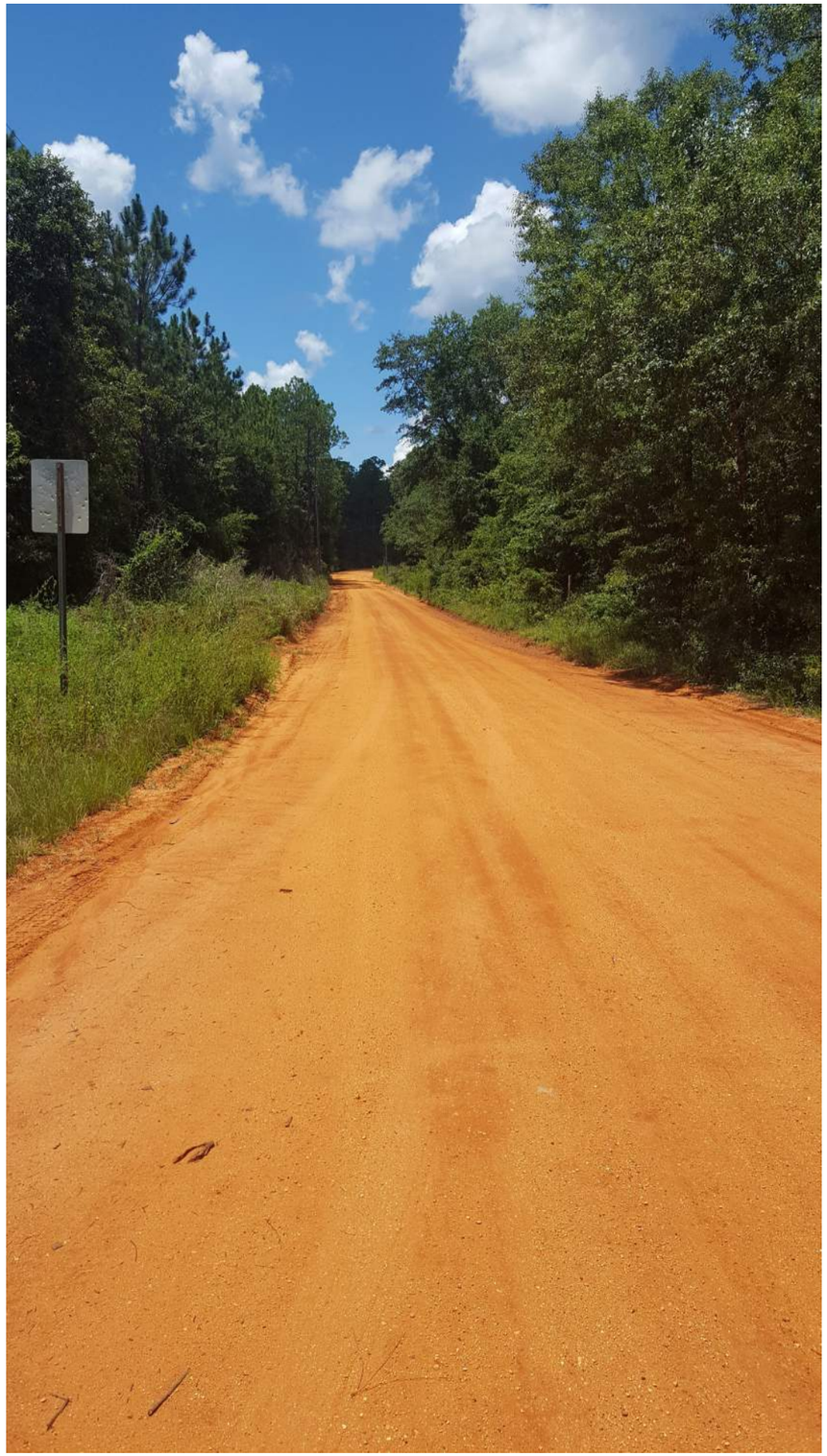
484029
484029



APPENDIX E: EXISTING BRIDGE INSPECTION REPORT

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

BY:	Kisinger Campo and Associates	STRUCTURE NAME:	Not recorded
OWNER:	2 County Hwy Agency	YEAR BUILT:	1968
MAINTAINED BY:	2 County Hwy Agency	SECTION NO.:	48 000 079
STRUCTURE TYPE:	7 Wood or Timber - 02 Stringer/Girder	MP:	0.862
LOCATION:	3.0 Mi W of HWY 97A	ROUTE:	00000
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	O.C. Phillips Road
SERV. TYPE UNDER:	5 Waterway	FEATURE INTERSECTED:	Brushy Creek

☐ FUNCTIONALLY OBSOLETE ☒ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 11/7/2018 UNDERWATER: 11/7/2018

SUFFICIENCY RATING: 39.9
HEALTH INDEX: 77.39

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

BY:	Kisinger Campo and Associates	STRUCTURE NAME:	Not recorded
OWNER:	2 County Hwy Agency	YEAR BUILT:	1968
MAINTAINED BY:	2 County Hwy Agency	SECTION NO.:	48 000 079
STRUCTURE TYPE:	7 Wood or Timber - 02 Stringer/Girder	MP:	0.862
LOCATION:	3.0 Mi W of HWY 97A	ROUTE:	00000
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	O.C. Phillips Road
SERV. TYPE UNDER:	5 Waterway	FEATURE INTERSECTED:	Brushy Creek

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS

☐ THIS BRIDGE IS SCOUR CRITICAL

☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION

☐ FUNCTIONALLY OBSOLETE ☒ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 11/7/2018 UNDERWATER: 11/7/2018

OVERALL NBI RATINGS:

DECK:	6 Satisfactory	CHANNEL:	6 Bank Slumping
SUPERSTRUCTURE:	5 Fair	CULVERT:	N N/A (NBI)
SUBSTRUCTURE:	4 Poor	SUFF. RATING:	39.9
PERF. RATING:	Poor	HEALTH INDEX:	77.39

FIELD PERSONNEL / TITLE / NUMBER: **INITIALS**

Everidge, Dillon - CBI #00565/Lead Inspector (lead) _____

Pieczynski, Patrick - CBI #00582/ Inspector _____

Hoogland, Keith - Bridge Inspector (CBI #00341) - Lead Diver _____

DeReus, Scott - Professional Engineer (#51907) - Tender _____

Tulalian, Jose - Assistant Bridge Inspector - Diver _____

REVIEWING BRIDGE INSPECTION SUPERVISOR:

Rothman, David - Bridge Inspector (CBI #00056) _____

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

Betz, Scott - PE #81282 Kisinger Campo & Associates
4524 Oak Fair Blvd.
Certificate of Authorization #2317
Tampa FL 33610

SIGNATURE: _____

DATE: _____

The official record of this package has been electronically signed and sealed using a Digital Signature as required by 61G15-23.004 F.A.C. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 2	Re Concrete Deck	0	.	1890	98.8	23	1.2	0	.	1913 sq.ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	0	.	23	100	0	.	23 sq.ft
0	1130 / 2	Cracking (RC and Other)	0	.	383	100	0	.	0	.	383 sq.ft
0	1190 / 2	Abrasion(PSC/RC)	0	.	1507	100	0	.	0	.	1507 sq.ft

Element Inspection Notes:

12/2 CS3 1080 = There are numerous spalls, up to 0.5ft. diameter x 0.17ft. deep, in the deck underside with exposed steel - NO CHANGE. (See Photo 1) (22SF)

CS2 1130 = The deck has longitudinal and transverse cracks, up to 0.06in. wide x full length - NO CHANGE. (383SF)

CS2 1190 = Abrasion of the deck has exposed concrete aggregate - NO CHANGE. (1507SF)

CS3 1080 = There is a spall, 0.42ft. diameter x 0.125ft. deep, at the far right end of bridge deck 3.5ft. from the right curb - NO CHANGE. (1SF)

Notes:
The curbs have random cracks, up to 0.06in. wide - NO CHANGE.

Object markers are not provided at the bridge corners - NO CHANGE. (See Photo 2)

Approach guardrails are not provided - NO CHANGE. (See Photo 2)

Dirt and debris has collected on the deck top - NO CHANGE.

The near and far posting signs have gunshot damage; however, both signs are still legible - NO CHANGE. (See Near Posting Sign Photo)

Steel channels have been anchored to the bottom of the deck in Span 5 in an attempt to secure the far backwall - NO CHANGE.

1080/2 Refer to Parent Element

1130/2 Refer to Parent Element

1190/2 Refer to Parent Element

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 2	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9140 / 2	Debris	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8290/2 CS2 9140 = Moderate amounts of debris and drift are lodged on the upstream piles, tops of the caps and cross bracing of the bridge - NO CHANGE. (See Photo 3) (1EA)

9140/2 Refer to Parent Element

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8476 / 2	Timber Walls	42	60	13	18.57	2	2.86	13	18.57	70 ft
0	1140 / 2	Decay/Section Loss	0	.	13	46.43	2	7.14	13	46.43	28 ft

Element Inspection Notes:

8476/2 CORRECTIVE ACTION:
The scour and undermining behind the far backwall and far right wingwall has been repaired.

CS2 1140 = The near backwall has boards with moderate decay - NO CHANGE. (13FT)

CS4 1140 = The exposed near backwall boards between Piles 1-1 and 1-4 have advanced decay, full board depth, with an area at the near left corner that has complete loss of section and backfill loss - NO CHANGE. (See Photo 4) (13FT)

CS3 1140 = There is an area of decay in the seventh board from the top of the far backwall 1.0ft. L x 0.42ft. H x 0.17ft. D, in the left end - NEW. (See Photo 5) (1FT)

CS3 1140 = The far right center wingwall pile has advanced decay in the top 1.0ft. - NO CHANGE. (See Photo 6) (1FT)

1140/2 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	216 / 2	Timber Abutment	24	50	12	25	12	25	0	.	48 ft
0	1140 / 2	Decay/Section Loss	0	.	0	.	12	100	0	.	12 ft
0	4000 / 2	Settlement	0	.	12	100	0	.	0	.	12 ft

Element Inspection Notes:

216/2 CS3 1140 = Abutment Cap 6 has severe decay starting at the right end and extending 12.0ft. to the center. The cap has been filled with epoxy to prevent further crushing and a steel crutch cap has been installed - NO CHANGE. (See Photo 7 and See Sketch 1) (12FT)

CS2 4000 = Abutment Cap 6 has rotated 5 degrees toward the far backwall and is 1.5 degrees out of plumb at the left end and 2.8 degrees out of plumb at the right end - NO CHANGE. (12FT)

Note:
A steel crutch cap has been installed along the right side of Abutment Cap 6. This cap as of the 07/25/2018 inspection carries only a partial load from the superstructure and appears to have been installed as a crutch in the event of further distress of Abutment Cap 6. Abutment Cap 6 should continue to be monitored for crushing and deformation - NO CHANGE.

1140/2 Refer to Parent Element

4000/2 Refer to Parent Element

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SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	228 / 2	Timber Pile	0	.	26	81.25	6	18.75	0	.	32 (EA)
0	1140 / 2	Decay/Section Loss	0	.	0	.	3	100	0	.	3 (EA)
0	1150 / 2	Check/Shake	0	.	26	100	0	.	0	.	26 (EA)
0	1170 / 2	Split/Delamination (Timber)	0	.	0	.	2	100	0	.	2 (EA)
0	4000 / 2	Settlement	0	.	0	.	1	100	0	.	1 (EA)

Element Inspection Notes:

228/2

CORRECTIVE ACTION:
Pile 2-2 has been repaired.
Previously reported Piles 5-1, 5-5, 6-1 and 6-4 have been discounted due to installation of adjacent helper piles.
The top bolt at the near left repair collar at Pile 5-6 has been tightened.
The top bolt at the left vertical steel support for Pile 5-6 has been tightened.

CS2 1150 = All piles have checks, up to 0.13in. W x 0.08ft. D - NO CHANGE. (25EA)

CS3 1170 = Pile 1-4, far face, is splitting away, 0.83ft. H x 0.5in. W x 0.5ft. D - NO CHANGE. (See Photo 8) (1EA)

(UW) Pile 3-4 has an area of decay. 0.4ft. H x 0.2ft. W x 0.5in. D in the right face, beginning 6.0ft. below the cap - NEW.

CS3 1140 = Pile 3-5 has an area of exterior decay, 1.0ft. H x 0.5ft. W x 0.17ft. D, in the far face, beginning 4.0ft. below the cap extending down 1.0ft. - NO CHANGE. (1EA)

Pile 4-1 has decay, up to 0.80ft. x 0.25ft. x 0.08ft. deep, in the near and far faces starting 5.0ft. below the cap - NEW.

Pile 4-3 has a hollow area in the right face starting at the cap and extending down 4.0ft. - NO CHANGE.

CS3 1140 = (UW) Pile 4-4 has rot around the entire perimeter from cap down 7.0ft., up to 0.30ft. deep – NEW. (1EA)

CS3 1140 = Pile 5-2 (previously 5-3) has exterior decay, up to 0.08ft. deep, in the near face, starting 2.8ft. below the cap, and an area of exterior decay, 2.5ft. H x 0.67ft. W x 0.17ft. D, in the far face, 4.0ft. below the cap and a split, 5.0ft. H x 0.19in. W x 0.42ft. D, in the far face - NO CHANGE. (See Photo 9) (1EA)

CS3 1140 = (UW) Pile 5-3 (previously 5-5) has an area of decay, 1.7ft. H x 0.25ft. W x 0.17ft. D in the near face, beginning 5.0ft. below the cap - NEW. (1EA)

CS3 1170 = Pile 6-2 (previously 6-3), far face, is splitting away, 1.16ft. H x 0.83ft. W x 0.42ft. D - NO CHANGE. (See Photo 10) (1EA)

CS3 4000 = Pile 6-4 (previously 6-6) is out of alignment due to rotation of Abutment Cap 6, resulting in 0.15ft. of remaining bearing - NO CHANGE. (See Photo 11) (1EA)

Notes:
Steel channels have been attached to Piles 6-3, 6-5 and 6-6 to provide support for the crutch cap - NO CHANGE.

Pile 6-3 has been stubbed to repair the split - NO CHANGE.

The following bents have discounted Piles:

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Bent 3 has 1 discounted Pile.
Bent 4 has 1 discounted Pile.
Bent 5 has 2 discounted Piles.
Bent 6 has 2 discounted Piles.

1140/2 Refer to Parent Element

1150/2 Refer to Parent Element

1170/2 Refer to Parent Element

4000/2 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	231 / 2	Steel Pier Cap	12	100	0	.	0	.	0	.	12 ft
0	8516 / 2	Painted Steel	56	100	0	.	0	.	0	.	56 sq.ft

Element Inspection Notes:

231/2 Note:
This element represents the steel crutch cap installed at Abutment 6.

8516/2 No Notes

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	235 / 2	Timber Pier Cap	96	100	0	.	0	.	0	.	96 ft

Element Inspection Notes:

235/2 CORRECTIVE ACTION:
Bent Cap 3 has been replaced.

Note:
The pile spacing at Bent Cap 2 between Piles 2-2 and 2-3 is excessive; 8.6ft. - NO CHANGE.
(See Photo 12)

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 2	Steel Opn Girder/Beam	15	100	0	.	0	.	0	.	15 ft
0	8516 / 2	Painted Steel	33	100	0	.	0	.	0	.	33 sq.ft

Element Inspection Notes:

107/2 Note:
This element represents the steel channel attached to Beam 4-19.

8516/2 No Notes

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	111 / 2	Timber Open Girder	1260	88.11	169	11.82	1	0.07	0	.	1430 ft
0	1140 / 2	Decay/Section Loss	0	.	10	90.91	1	9.09	0	.	11 ft
0	1150 / 2	Check/Shake	0	.	143	100	0	.	0	.	143 ft
0	1160 / 2	Crack (Timber)	0	.	1	100	0	.	0	.	1 ft

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0	1170 / 2	Split/Delamination (Timber)	0	.	15	100	0	.	0	.	15 ft

Element Inspection Notes:

111/2 CS2 1150 = Several beams have shakes, 1.17ft. L x 0.25ft. W x 0.5in. D, in the bottom left corner near midspan - NO CHANGE. (143FT)

CS2 1170 = The beam ends have random splits, up to 0.5ft. L x full height x 0.25in. wide, in the bearing areas - NO CHANGE. (15FT)

CS2 1140 = The exterior beams have light decay under the scuppers - NO CHANGE. (10FT)

CS2 1140 = Beam 1-12 is crushing up to 0.25in. H, and has a split in the bottom over the bearing area at Bent 2 - NO CHANGE. (See Photo 13) (1FT)

CS3 1160 = Beam 2-11 has a crack, 0.42ft. L x 0.03in. W, in the bottom face near midspan. The crack has been epoxy sealed - NO CHANGE. (See Photo 14) (1FT)

Notes:
(NBI) Beam 4-19 has advanced decay, 2.4ft. L x 0.75ft. H x 0.375ft. D, in the right face at midspan. A steel channel has been retrofitted to the left face of the beam, effectively mitigating the decay - NO CHANGE.

The left exterior beams have debris lodged against them - NO CHANGE.

1140/2 Refer to Parent Element

1150/2 Refer to Parent Element

1160/2 Refer to Parent Element

1170/2 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	330 / 2	Metal Bridge Railing	0	.	140	92.72	11	7.28	0	.	151 ft
0	1000 / 2	Corrosion	0	.	140	100	0	.	0	.	140 ft
0	1020 / 2	Connection	0	.	0	.	8	100	0	.	8 ft
0	1900 / 2	Distortion	0	.	0	.	3	100	0	.	3 ft
0	7000 / 2	Damage	0	.	0	.	3	100	0	.	3 ft
0	8518 / 2	Galvanized Steel	0	.	0	.	0	.	453	100	453 sq.ft
0	3440 / 2	Eff (Stl Protect Coat)	0	.	0	.	0	.	453	100	453 sq.ft

Element Inspection Notes:

330/2 CS3 1020 = The bridge rails have missing or loose rail-to-rail connection bolts throughout - NO CHANGE. (See Photo 15) (5FT)

CS2 1000 = The bridge rails have minor surface corrosion - NO CHANGE. (140FT)

CS3 1900/7000 = The right bridge rail in Span 1 has an area of impact damage 3.0ft. long - NEW. (See Photo 16) (3FT)

CS3 1020 = The right bridge rail has two rail sections not attached to the post and the left bridge rail has one rail section not attached to the post - NO CHANGE. (See Photo 17) (3FT)

Notes:

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	Both bridge rails are missing reflectors - NO CHANGE. (See Photo 18) The last post of the far left bridge rail extension is spalled, 5in. H x 3in. W x 1in. D - NO CHANGE. (See Photo 19) The far right and far left bridge rail end terminals are damaged - NO CHANGE. (See Photo 20)
1000/2	Refer to Parent Element
1020/2	Refer to Parent Element
1900/2	Refer to Parent Element
7000/2	Refer to Parent Element
8518/2	CS4 3440 = The bridge rails have galvanizing failure, allowing for corrosion to form as noted within - NO CHANGE. (See Photo 21) (453SF)
3440/2	Refer to Parent Element

Total Number of Elements*: 10
*excluding defects/protective systems

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Inspector Recommendations

UNIT: 0 **DECKS**

ELEMENT/ENV: 12 / 2 Re Concrete Deck **ELEM CATEGORY: Decks/Slabs**

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 4 sf	Element Estimated Quantity: 1913 sq.ft	3

WORK ORDER RECOMMENDATION:
Object markers; install at all four corners of the bridge.

2 , 3	MMS Quantity: 22 sf	Element Estimated Quantity: 1913 sq.ft	3

WORK ORDER RECOMMENDATION:
Deck underside; clean and patch spalls with exposed steel.

2 , 3	MMS Quantity: 250 sf	Element Estimated Quantity: 1913 sq.ft	3

WORK ORDER RECOMMENDATION:
Approach guardrails; install at all four corners of the bridge.

UNIT: 0 **MISCELLANEOUS**

ELEMENT/ENV: 8290 / 2 Channel **ELEM CATEGORY: Channel**

CONDITION STATE			PRIORITY
2	MMS Quantity: 40 mh	Element Estimated Quantity: 1 (EA)	3

WORK ORDER RECOMMENDATION:
Channel; remove debris.

ELEMENT/ENV: 8476 / 2 Timber Walls **ELEM CATEGORY: Other Elements**

CONDITION STATE			PRIORITY
1 , 2 , 3 , 4	MMS Quantity: 20 mh	Element Estimated Quantity: 70 ft	3

WORK ORDER RECOMMENDATION:
Far right wingwall pile; repair.

1 , 2 , 3 , 4	MMS Quantity: 40 mh	Element Estimated Quantity: 70 ft	3

WORK ORDER RECOMMENDATION:
Backwalls; replace boards with advanced decay.

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Inspector Recommendations

UNIT: 0 **SUBSTRUCTURE**

ELEMENT/ENV: 228 / 2 Timber Pile **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 60 mh	Element Estimated Quantity: 32 (EA)	3

WORK ORDER RECOMMENDATION:

Piles 1-4, 5-2 and 6-2; repair split piles.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 10 mh	Element Estimated Quantity: 32 (EA)	3

WORK ORDER RECOMMENDATION:

Pile 6-4; repair.

ELEMENT/ENV: 235 / 2 Timber Pier Cap **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
1	MMS Quantity: 40 mh	Element Estimated Quantity: 32 ft	3

WORK ORDER RECOMMENDATION:

Piles at Bent 2; reduce pile spacing.

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Inspector Recommendations

UNIT: 0 **SUPERSTRUCTURE**

ELEMENT/ENV: 111 / 2 Timber Open Girder **ELEM CATEGORY: Superstructure**

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 20 mh	Element Estimated Quantity: 1430 ft	3

WORK ORDER RECOMMENDATION:
Beam 2-11; replace.

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 20 mh	Element Estimated Quantity: 1430 ft	3

WORK ORDER RECOMMENDATION:
Beam 1-12; repair.

ELEMENT/ENV: 330 / 2 Metal Bridge Railing **ELEM CATEGORY: Superstructure**

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 2 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Far left and right bridge rail end terminals; replace.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 3 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Left and right bridge rails; attach loose sections to the bridge rail posts.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 5 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Bridge rails; install missing rail to rail connection bolts.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 3 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Right bridge rail; replace damaged section.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 151 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Bridge rails; clean and paint.

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 10 lf	Element Estimated Quantity: 151 ft	3

WORK ORDER RECOMMENDATION:
Bridge rails; install missing reflectors.

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Structure Notes

The Scour POA is to be reviewed and updated as necessary during the routine inspection.

This structure is on a 12 month inspection cycle due to the load capacity analysis of Element 235 Timber Pier Cap.

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INSPECTION NOTES: PDOR 11/7/2018

Sufficiency Rating Calculation Accepted by KNKCAPP at 12/19/2018 08:16:23 AM
UW TANK - 11/28/18
Sufficiency Rating Calculation Accepted by KNIEISB at 8/28/2018 12:47:19 PM
UW TANK - 7/25/18
Sufficiency Rating Calculation Accepted by KNIEIZS at 6/6/2018 11:27:10 AM
Sufficiency Rating Calculation Accepted by KNIEISB at 12/26/2017 2:17:20 PM
UW TANK = 11/12/17
Sufficiency Rating Calculation Accepted by KNIEISB-P at 2016-11-29 08:57:48
UW TANK = 11/3/16
Sufficiency Rating Calculation Accepted by KNIEISB-P at 2015-12-01 15:30:32
UW TANK = 11/4/15
Sufficiency Rating Calculation Accepted by KNIEIVD-P at 2014-12-26 13:33:09
UW SNORKEL = 11/20/14
Sufficiency Rating Calculation Accepted by knvolss-P at 2013-11-26 15:04:32
UW TANK = 11/12/13
Sufficiency Rating Calculation Accepted by knvolss-P at 2012-12-11 12:01:24
UW TANK = 12/11/12
Sufficiency Rating Calculation Accepted by knvolwc-P at 2011-11-29 15:59:20
UW TANK = 11/28/11
Sufficiency Rating Calculation Accepted by knvolwc-P at 2010-12-20 15:38:20
UW SNORKEL = 12/22/10
Sufficiency Rating Calculation Accepted by KN338CD-P at 2010-01-11 15:36:38
UW TANK = 1/19/10
Sufficiency Rating Calculation Accepted by KN338CD-P at 2009-02-16 11:12:31
UW SNORKEL = 2/12/09
Sufficiency Rating Calculation Accepted by KN338CD-P at 2008-03-25 16:34:04
UW SNORKEL = 3/27/08
Sufficiency Rating Calculation Accepted by kn338cd-P at 2007-04-25 11:58:01
UW SNORKEL = 5/2/07
Sufficiency Rating Calculation Accepted by kn338cd-P at 2006-06-05 17:25:29
UW SNORKEL = 6/14/06
Sufficiency Rating Calculation Accepted by kn338cd-P at 2005-07-06 16:46:58
UNDERWATER NOT REQUIRED ON INTERIM - NO DEFICIENCIES UNDERWATER
Sufficiency Rating Calculation Accepted by KNVOLTL-P at 2004-08-24 11:52:21
LOW WATER - DIVE NOT NEEDED
Sufficiency Rating Calculation Accepted by kn338mv-P at 2003-08-05 12:36:47

TRAFFIC RESTRICTIONS: The bridge is posted 12 U.S. tons. Based on our recent (2018) field inspection and the 2013 load capacity analysis, the bridge should be posted 12 U.S. tons for single unit vehicles, 12 U.S. tons for combination unit vehicles and 12 U.S tons for tandem trailer vehicles.

The load rating currently filed in the Department's Electronic Document Management System, sealed on 09/30/2013 by Aaron D. Immel, P.E., was reviewed by Scott Betz, P.E. The document were found to be complete, with a minimum load summary sheet and calculations, and applicable based on current observations made in the field. The rating information in the FDOT bridge management system matches the summary sheet and calculations on file. The reviewing engineer did not perform a detailed technical review and does not assume any responsibility for the accuracy of the load rating calculations performed by others.

During this inspection, Element 8395 Timber Abutment Slope Protection was deleted and replaced with Element 8476 Timber Walls.

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Photo 1 - Element 12 Re Concrete Deck

Typical spalls with exposed steel in the deck underside

REPAIR RECOMMENDATION:
Deck underside; clean and patch spalls with exposed steel.

Photo 2 - Element 12 Re Concrete Deck

Object markers and approach guardrails are not provided

REPAIR RECOMMENDATIONS:
1) Object markers; install at all four corners of the bridge.
2) Approach guardrails; install at all four corners of the bridge.

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Photo 3 - Element 8290 Channel

Drift and debris lodged against the upstream piles

REPAIR RECOMMENDATION:
Channel; remove debris.

Photo 4 - Element 8476 Timber Walls

Decay in the near backwall boards between Piles 1-1 and 1-4 with active backfill loss

REPAIR RECOMMENDATION:
Backwalls; replace boards with advanced decay.

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Photo 5 - Element 8476 Timber Walls

Decay in the seventh board from the top of the far backwall

REPAIR RECOMMENDATION:
See Photo 4.

Photo 6 - Element 8476 Timber Walls

Decay in the far right center wingwall pile

REPAIR RECOMMENDATION:
Far right wingwall pile; repair.

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Photo 7 - Element 216 Timber Abutment

A steel crutch cap has been installed at Abutment cap 6

REPAIR RECOMMENDATION:
None

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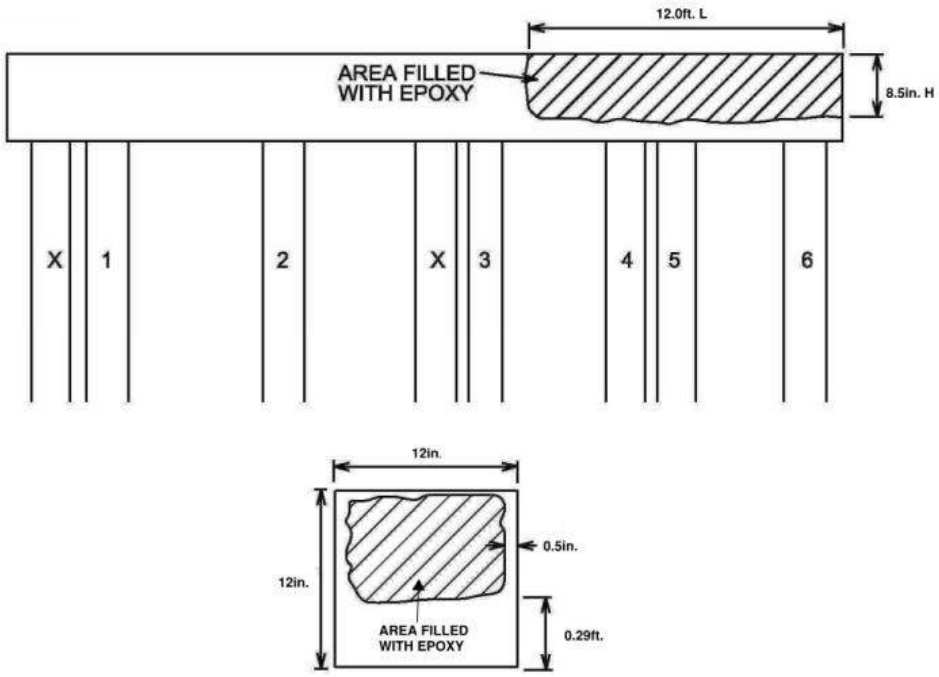
Bridge NO. 484029

ABUTMENT CAP 6



216 - Timber Abutment

Sketch 2

REPAIR RECOMMENDATION:
None

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Photo 8 - Element 228 Timber Pile

Split in Pile 1-4

REPAIR RECOMMENDATION:
Piles 1-4 5-2 and 6-2; repair split piles.

Photo 9 - Element 228 Timber Pile

Split in Pile 5-2

REPAIR RECOMMENDATION:
See to Photo 8.

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Photo 10 - Element 228 Timber Pile

Split in Pile 6-2

REPAIR RECOMMENDATION:
See to Photo 8.

Photo 11 - Element 228 Timber Pile

Loss of bearing at Pile 6-4

REPAIR RECOMMENDATION:
Pile 6-4; repair.

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Photo 12 - Element 235 Timber Pier Cap

Excessive pile spacing between Piles 2-2 and 2-3

REPAIR RECOMMENDATION:
Piles at Bent 2; reduce pile spacing.

Photo 13 - Element 111 Timber Open Girder

Crushing at the far end of Beam 1-12

REPAIR RECOMMENDATION:
Beam 1-12; repair.

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Photo 14 - Element 111 Timber Open Girder

Crack in Beam 2-11

REPAIR RECOMMENDATION:
Beam 2-11; replace.

Photo 15 - Element 330 Metal Bridge Railing

Missing rail to rail connection bolts

REPAIR RECOMMENDATION:
Bridge rails; install missing rail to rail connection bolts.

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Photo 16 - Element 330 Metal Bridge Railing

Damaged area along the right bridge rail in Span 1

REPAIR RECOMMENDATION:
Right bridge rail; replace damaged section.

Photo 17 - Element 330 Metal Bridge Railing

Rail section not attached to the post

REPAIR RECOMMENDATION:
Left and right bridge rails; attach loose sections to the bridge rail posts.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

Photo 18 - Element 330 Metal Bridge Railing

Missing reflectors along the bridge rails

REPAIR RECOMMENDATION:
Bridge rails; install missing reflectors.

Photo 19 - Element 330 Metal Bridge Railing

Spall in the last post of the far left bridge rail extension

REPAIR RECOMMENDATION:
None

FLORIDA DEPARTMENT OF TRANSPORTATION
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DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

Photo 20 - Element 330 Metal Bridge Railing

Damaged far right bridge rail end terminal

REPAIR RECOMMENDATION:
Far left and right bridge rail end terminals; replace.

Photo 21 - Element 330 Metal Bridge Railing (8518 Galvanized Steel)

Galvanizing failure on the bridge rails

REPAIR RECOMMENDATION:
Bridge rails; clean and paint.

FLORIDA DEPARTMENT OF TRANSPORTATION
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DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

Near Looking Far

Near Posting Sign

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Inspection

Structure ID: 484029

DISTRICT: D3 - Chipley **INSPECTION DATE: 11/7/2018 PDOR**

Far Posting Sign

Form Revision: 15-Aug-07

BRIDGE LOAD RATING SUMMARY FORM

BRIDGE DATA	
Bridge Number:	484029
Struct. Type Main [Item 43] @:	7 02
Struct. Type Appr. [Item 44] @:	0 00
Select Construction Cont.	

POSTING DATA

Current Restrictions	
Item 41 @:	Posted for Load
Is Posting Needed:	Yes
Proposed Restrictions	
Item 70 @:	> 39.9% BELOW

PROGRAM USED

Hand Calculations

BASIS FOR ANALYSIS	
Design Drawings:	No
As-Built Drawings:	No
Shop Drawings:	No
Field Measurements:	Yes
Coupon Testing:	No
Other:	

LIVE LOAD DISTRIBUTION	
AASHTO LFD:	X
AASHTO LRFD:	
SALOD:	
BRUFEM:	
Finite Element on Grillage:	

LONGITUDINAL GOVERNING COMPONENT	
Main/Approach Span:	Main
Description:	Multi-Beam
Material:	Timber
Simple/Continuous Span:	Simple
Span Length:	15.50
Flexure, Shear or Principal Tension:	Flexure

TRANSVERSE GOVERNING COMPONENT	
Main/Approach Span:	
Description:	
Material:	
Deck, Box or Substructure:	
Flexure, Shear or Principal Tension:	

OTHER SPAN OF INTEREST
(If Applicable)

OTHER SPAN OF INTEREST
(If Applicable)

PONTIS DATABASE INPUT

PONTIS APPRAISAL TAB

Description (NBIS Code)	Value	
Design Load (31) @	Other or Unknown	
HL93, M9 (H10), M13.5 ((H15), M13.5 (HS15), M18 (H20), MS18 (HS20), MS18 (HS20)+Mod, Pedestrian, Railroad, MS22.5 (HS25), Unknown (NBI), Unknown (P), Not Applicable (P)		
Operating Type (63) @	Allowable Stress	
Unknown, Load Factor, Allowable Stress, Load & Resistance Factor, Load Test, No Rating, Unknown (NBI), Not Applicable (P)		
Operating Rating (64)* @ ( )	12.0	Tons
Inventory Type (65) @	Allowable Stress	
Unknown, Load Factor, Allowable Stress, Load & Resistance Factor, Load Test, No Rating, Unknown (NBI), Not Applicable (P)		
Inventory Rating (66)* @ ( )	8.0	Tons

PONTIS LOAD RATING 1 TAB

Description (NBIS Code)	Value	
HS 20/HL 93 Governing Span Length	15.50	FT
Load Rating Origination	Field Measurements	
Unknown, Design Plans, As-Built Plans, Field Measurements		
Load Rating Date	28-Sep-13	
Method Calculation	AASHTO Formula	
Unknown, AASHTO Formula, SALOD, BRUFEM, Other		
Load Distribution Factor	0.2500	
Impact Factor	0.00	
Design Method	Unknown	
Unknown, Working Stress, Load Factor, LRFD, Others		
Design Measure	English	
Unknown, English, Systeme International		

TRUCK OPERATING RATINGS

SU 2**	Bent Cap 2	M	12.0	Tons
SU 3**	Bent Cap 2	M	12.0	Tons
SU 4**	Bent Cap 2	M	12.0	Tons
C 3**	Bent Cap 2	M	12.0	Tons
C 4**	Bent Cap 2	M	12.0	Tons
C 5**	Bent Cap 2	M	12.0	Tons
ST 5**	Bent Cap 2	M	12.0	Tons
Recommended SU Posting ##			12	Tons
Recommended C Posting ##			12	Tons
Recommended ST Posting ##			12	Tons

PONTIS LOAD RATING 2 TAB

Description (NBIS Code)	Value	
FL 120 Longitudinal Governing Span Rating	-1.0	Tons
SEGMENTAL		
FL 120 Transverse Rating (Segmental)**	-1.0	Tons
Single Axle Transverse Rating**	-1.0	Tons
Tandem Axle Transverse Rating**	-1.0	Tons
Wing Span**	-1.00	FT
Web-to-Web Span**	-1.00	FT
MAXIMUM SPAN		
HS 20 Operating Rating Maximum Span**	-1.0	Tons
FL 120 Longitudinal Maximum Span #	-1.0	Tons
FLOOR BEAM		
Floor Beam Present	No = Stop / Yes = Continue	
Governing Floor Beam Span**	0.00	FT
Governing Floor Beam Spacing**	0.00	FT
Floor Beam HS 20 Rating**	0.0	Tons
Floor Beam SU 4 Rating**	0.0	Tons
Floor Beam Inventory Rating Factor** #	0.0000	
Floor Beam Operating Rating Factor **#	0.0000	
Floor Beam FL 120 Rating #	0.0	Tons

LEGEND

* If rating is provided as a factor from an LRFR analysis, multiply the rating factor by 36 tons

** If not calculated, enter "-1"

LRFR Rating Only

If Posting is not required, enter "99"

@ BMS Coding Manual available on the FDOT Office of Maintenance website

COMMENTS BY ENGINEER

Recommended posting of 12 tons is based on excessive pile spacing between Piles 2-2 and 2-3 per the bridge inspection conducted on 3/25/2008. Upon completion of the repairs, refer to the load rating performed on 6/19/1984 for posting recommendations.

COMPUTATIONS			
Performed By:	Richard Parker, P.E.	Date:	28-Sep-13
Checked By:	Matt Burnett, EI	Date:	28-Sep-13
Reviewed By:	Aaron Immel, PE	Date:	30-Sep-13

Responsible Engineer:	Aaron Immel
FL P.E. #:	55026
Date:	30-Sep-13
Address:	3809 Moffett Road Mobile, AL 36618

Seal

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 — **CIDR** — **DATE PRINTED: 1/4/2019**

Description

Structure Unit Identification

Bridge/Unit Key: 484029 0
Structure Name:
Description: MAIN SPAN 1
Type: M - Main

Roadway Identification

NBI Structure No (8): 484029
Position/Prefix (5): 1 - Route On Structure
Kind Hwy (Rte Prefix): 4 County Hwy
Design Level of Service: 1 Mainline
Route Number/Suffix: 00000 / 0 N/A (NBI)
Feature Intersect (6): Brushy Creek
Critical Facility: Not Defense-crit
Facility Carried (7): O.C. Phillips Road
Mile Point (11): 0.862
Latitude (16): 030d50'16.2" Long (17): 087d33'44.1"

Roadway Traffic and Accidents

Lanes (28): 2 Medians: 0 Speed: 35 mph
ADT Class: 1 ADT Class 1
Recent ADT (29): 50 Year (30): 2018
Future ADT (114): 87 Year (115): 2040
Truck % ADT (109): 0
Detour Length (19): 11.7 mi
Detour Speed: 35 mph
Accident Count: -1 Rate:

Roadway Classification

Nat. Hwy Sys (104): 0 Not on NHS
National base Net (12): 0 - Not on Base Network
LRS Inventory Rte (13a): 48 000 079 Sub Rte (13b): 00
Functional Class (26): 09 Rural Local
On Federal Aid System: No
Defense Hwy (100): 0 Not a STRAHNET hwy
Direction of Traffic (102): 2 2-way traffic
Emergency: ☐

Roadway Clearances

Vertical (10): 99.99 ft Appr. Road (32): 18 ft
Horiz. (47): 23.6 ft Roadway (51): 23.6 ft
Truck Network (110): 0 Not part of natl netwo
Toll Facility (20): 3 On free road
Fed. Lands Hwy (105): 0 N/A (NBI)
School Bus Route: ☐
Transit Route: ☐

NBI Project Data

Proposed Work (075A): 31 Repl-Load Capacity
Work To Be Done By (075B): 1 Contract
Improvement Length (076): 102 ft

Improvement Cost (094): $ 0.00
Roadway Improvement Cost (095): $ 0.00
Total Cost (096): $ 1,565,206.00
Year of Estimate (097): 2011

NBI Rating

Channel (61): 6 Bank Slumping
Deck (58): 6 Satisfactory
Superstructure (59): 5 Fair
Substructure (60): 4 Poor

Culvert (62): N N/A (NBI)
Waterway (71): 7 Above Minimum
Unrepaired Spalls: -1 sq.ft.
Review Required: ☒

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 — **CIDR** — **DATE PRINTED: 1/4/2019**

Structure Identification

Admin Area: Not located in area
District (2): D3 - Chipley
County (3): (48)Escambia
Place Code (4): No city involved
Location (9): 3.0 Mi W of HWY 97A
Border Br St/Reg (98): Not Applicable (P) Share: 0 %
Border Struct No (99):
FIPS State/Region (1): 12 Florida Region 4-Atlanta
NBIS Bridge Len (112): Y - Meets NBI Length

Parallel Structure (101): No || bridge exists
Temp. Structure (103): Not Applicable (P)
Maint. Resp. (21): 2 County Hwy Agency
Owner (22): 2 County Hwy Agency
Historic Signif. (37): 5 Not eligible for NRHP

Geometrics

Spans in Main Unit (45): 5
Approach Spans (46): 0
Length of Max Span (48): 16.1 ft
Structure Length (49): 75.3 ft
Total Length: 75.3 ft
Deck Area: 1913 sqft
Structure Flared (35): 0 No flare

Age and Service

Year Built (27): 1968
Year Reconstructed (106): 0
Type of Service On (42a): 1 Highway
Under (42b): 5 Waterway
Fracture Critical Details: Not Applicable

Structure Type and Material

Curb/Sidewalk (50): Left: 0.6 ft Right: 0.6 ft
Bridge Median (33): 0 No median
Main Span Material (43A): 7 Wood or Timber
Appr Span Material (44A): Not Applicable (P)
Main Span Design (43B): 02 Stringer/Girder
Appr Span Design (44B): Not Applicable (P)

Deck Type and Material

Deck Width (52): 25.4 ft
Skew (34): 0 deg
Deck Type (107): 1 Concrete-Cast-in-Place
Surface (108): 0 None
Membrane: 0 None
Deck Protection: None

Appraisal

Structure Appraisal

Open/Posted/Closed (41): P Posted for load
Deck Geometry (68): 5 Above Tolerable
Underclearances (69): N Not applicable (NBI)
Approach Alignment (72): 8-No Speed Red thru Curv
Bridge Railings (36a): 0 Substandard
Transitions (36b): 0 Substandard

Approach Guardrail (36c): 0 Substandard
Approach Guardrail Ends (36d): 0 Substandard
Scour Critical (113): U Unknown Foundation

Navigation Data

Navigation Control (38): Permit Not Required
Nav Vertical Clr (39): 0 ft
Nav Horizontal Clr (40): 0 ft
Min Vert Lift Clr (116): 0 ft
Pier Protection (111): Not Applicable (P)

NBI Condition Rating

Sufficiency Rating: 39.9
Health Index: 77.39
Structural Eval (67): 2 Intolerable - Replace
Deficiency: Structurally Deficient

Minimum Vertical Clearance

Over Structure (53): 99.99 ft
Under (reference) (54a): N Feature not hwy or RR
Under (54b): 0 ft

Minimum Lateral Underclearance

Reference (55a): N Feature not hwy or RR
Right Side (55b): 0 ft
Left Side (56): 0 ft

Schedule

Current Inspection

Inspection Date: 11/07/2018
Inspector: KNKCADE - Dillon Everidge
Bridge Group: CA032
Alt. Bridge Group:
Primary Type: Regular NBI
Review Required: [X]

Next Inspection Date Scheduled

NBI: 11/07/2020
Element: 11/07/2019
Fracture Critical:
Underwater: 11/07/2019
Other/Special: 11/07/2019

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 — **CIDR** — **DATE PRINTED: 1/4/2019**

Schedule Cont.

Inspection Types Performed NBI [X] Element [X] Fracture Critical [ ] Underwater [X] Other Special [X]

Inspection Intervals	Required (92)	Frequency (92)		Last Date (93)	
Fracture Critical	[ ]		mos		
Underwater	[X]	12	mos	11/07/2018	
Other Special	[X]	12	mos	11/07/2018	
NBI		24	mos (91)	11/07/2018	(90)

Inspection Resources

Crew Hours:	8
Flagger Hours:	0
Helper Hours:	0
Snooper Hours:	0
Special Crew Hours:	3
Special Equip Hours:	0

Bridge Related

General Bridge Information

Parallel Bridge Seq:
Channel Depth: 6.1 ft
Radio Frequency: -1
Phone Number:
Exception Date:
Exception Type: Unknown
Accepted By Maint: 01/01/1968
Warranty Expiration: 00/00/0000
Performance Rating: Poor

Bridge Rail 1: Steel guard/concret post
Bridge Rail 2: Not applicable-No rail
Electrical Devices: No electric service
Culvert Type: Not applicable
Maintenance Yard: Not FDOT Maintained
FIHS ON / OFF: No Routes on FIHS
Previous Structure:
2nd Previous Structure:
Replacement Structure:

Permitted Utilities: Power [ ] Water [ ] Gas [ ] Fiber Optic [ ] Sewage [ ] Other [ ]

Bridge Load Rating Information

Inventory Type (065): 2 AS Allowable Stress
Operating Type (063): 2 AS Allowable Stress
Original Design Load (031): 0 Unknown
Date: 09/30/2013
Initials: JAD
Load Rating Rev. Recom.: No
Load Rating Plans Status: Field Measurements

Inventory Rating (066): 8.0 tons
Operating Rating (064): 12.0 tons
FL120 Permit Rating: -1.0 tons
HS20/FL120 Max Span Rating: 12.0 tons
Dynamic Impact in Percent: 0 %
Governing Span Length: 15.5 ft
Minimum Span Length:
Distribution Method: AASHTO formula

Load Rating Notes:

LEGAL LOADS

SU2: 12.0 tons
SU3: 12.0 tons
SU4: 12.0 tons
C3: 12.0 tons
C4: 12.0 tons
C5: 12.0 tons
ST5: 12.0 tons
Posting (070): 0 >39.9% below
Open/Posted/Closed (041): P Posted for load

POSTING

Recom. SU Posting: 12 tons
Recom. C Posting: 12 tons
Recom. ST5 Posting: 12 tons
Actual SU Posting: 99 tons
Actual C Posting: 99 tons
Actual ST5 Posting: 99 tons
Actual Blanket Posting: 12 tons
Emergency Vehicle: 1 EV inapplicable

FLOOR BEAM (FB) FB Present: No

FB Span Length, Gov: 0.0 ft
FB Spacing, Gov: 0.0 ft
FB OPR Rating: 0.0 tons
FB SU4 OPR Rating: 0.0 tons
FB FL120 Rating: 0.0 tons

SEGMENTAL (SEG)

SEG Wing-Span: -1.0 ft
SEG Web-to-Web Span: -1.0 ft
SEG Transverse HL93 Operating: -1.00 RF

Bridge Scour and Storm Information

Pile Driving Record: No pile driving records
Foundation Type: Foundation details
Mode of Flow: Riverine
Rating Scour Eval: Minimal Risk
Highest Scour Eval: Phase I completed
Scour Evaluation Method: Unk Foundation Stat Eval

Scour Recommended I: Perform add'l monitoring
Scour Recommended II: Stop scour evaluations
Scour Recommended III: Stop scour evaluations
Scour Elevation: 999 ft
Action Elevation: 999 ft
Storm Frequency: 999

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 **CIDR** **DATE PRINTED: 1/4/2019**

Elements

Inspection Date: 11/07/2018 **PDOR**

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 2	Re Concrete Deck	0	.	1890	98.8	23	1.2	0	.	1913 sq.ft
0	1080 / 2	Delamination/Spall/Patched Area	0	.	0	.	23	100	0	.	23 sq.ft
0	1130 / 2	Cracking (RC and Other)	0	.	383	100	0	.	0	.	383 sq.ft
0	1190 / 2	Abrasion(PSC/RC)	0	.	1507	100	0	.	0	.	1507 sq.ft

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 2	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9140 / 2	Debris	0	.	1	100	0	.	0	.	1 (EA)

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8476 / 2	Timber Walls	42	60	13	18.57	2	2.86	13	18.57	70 ft
0	1140 / 2	Decay/Section Loss	0	.	13	46.43	2	7.14	13	46.43	28 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	216 / 2	Timber Abutment	24	50	12	25	12	25	0	.	48 ft
0	1140 / 2	Decay/Section Loss	0	.	0	.	12	100	0	.	12 ft
0	4000 / 2	Settlement	0	.	12	100	0	.	0	.	12 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	228 / 2	Timber Pile	0	.	26	81.25	6	18.75	0	.	32 (EA)
0	1140 / 2	Decay/Section Loss	0	.	0	.	3	100	0	.	3 (EA)
0	1150 / 2	Check/Shake	0	.	26	100	0	.	0	.	26 (EA)
0	1170 / 2	Split/Delamination (Timber)	0	.	0	.	2	100	0	.	2 (EA)
0	4000 / 2	Settlement	0	.	0	.	1	100	0	.	1 (EA)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	231 / 2	Steel Pier Cap	12	100	0	.	0	.	0	.	12 ft
0	8516 / 2	Painted Steel	56	100	0	.	0	.	0	.	56 sq.ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	235 / 2	Timber Pier Cap	96	100	0	.	0	.	0	.	96 ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 2	Steel Opn Girder/Beam	15	100	0	.	0	.	0	.	15 ft
0	8516 / 2	Painted Steel	33	100	0	.	0	.	0	.	33 sq.ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	111 / 2	Timber Open Girder	1260	88.11	169	11.82	1	0.07	0	.	1430 ft
0	1140 / 2	Decay/Section Loss	0	.	10	90.91	1	9.09	0	.	11 ft

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 **CIDR** **DATE PRINTED: 1/4/2019**

0	1150 / 2	Check/Shake	0	.	143	100	0	.	0	.	143 ft
0	1160 / 2	Crack (Timber)	0	.	1	100	0	.	0	.	1 ft
0	1170 / 2	Split/Delamination (Timber)	0	.	15	100	0	.	0	.	15 ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	330 / 2	Metal Bridge Railing	0	.	140	92.72	11	7.28	0	.	151 ft
0	1000 / 2	Corrosion	0	.	140	100	0	.	0	.	140 ft
0	1020 / 2	Connection	0	.	0	.	8	100	0	.	8 ft
0	1900 / 2	Distortion	0	.	0	.	3	100	0	.	3 ft
0	7000 / 2	Damage	0	.	0	.	3	100	0	.	3 ft
0	8518 / 2	Galvanized Steel	0	.	0	.	0	.	453	100	453 sq.ft
0	3440 / 2	Eff (Stl Protect Coat)	0	.	0	.	0	.	453	100	453 sq.ft

Total Number of Elements*: 10
*excluding defects/protective systems

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 **Inspection/CIDR/Bridge Profile Report with PDF attachment(s)**

Structure ID: 484029 **CIDR** **DATE PRINTED: 1/4/2019**

Inspection Information

Inspection Date: 11/07/2018 **Type:** Regular NBI

Inspector: KNKCADE - Dillon Everidge

Inspection Notes:

Sufficiency Rating Calculation Accepted by KNKCAPP at 12/19/2018 08:16:23 AM
UW TANK - 11/28/18
Sufficiency Rating Calculation Accepted by KNIEISB at 8/28/2018 12:47:19 PM
UW TANK - 7/25/18
Sufficiency Rating Calculation Accepted by KNIEIZS at 6/6/2018 11:27:10 AM
Sufficiency Rating Calculation Accepted by KNIEISB at 12/26/2017 2:17:20 PM
UW TANK = 11/12/17
Sufficiency Rating Calculation Accepted by KNIEISB-P at 2016-11-29 08:57:48
UW TANK = 11/3/16
Sufficiency Rating Calculation Accepted by KNIEISB-P at 2015-12-01 15:30:32
UW TANK = 11/4/15
Sufficiency Rating Calculation Accepted by KNIEIVD-P at 2014-12-26 13:33:09
UW SNORKEL = 11/20/14
Sufficiency Rating Calculation Accepted by knvolss-P at 2013-11-26 15:04:32
UW TANK = 11/12/13
Sufficiency Rating Calculation Accepted by knvolss-P at 2012-12-11 12:01:24
UW TANK = 12/11/12
Sufficiency Rating Calculation Accepted by knvolwc-P at 2011-11-29 15:59:20
UW TANK = 11/28/11
Sufficiency Rating Calculation Accepted by knvolwc-P at 2010-12-20 15:38:20
UW SNORKEL = 12/22/10
Sufficiency Rating Calculation Accepted by KN338CD-P at 2010-01-11 15:36:38
UW TANK = 1/19/10
Sufficiency Rating Calculation Accepted by KN338CD-P at 2009-02-16 11:12:31
UW SNORKEL = 2/12/09
Sufficiency Rating Calculation Accepted by KN338CD-P at 2008-03-25 16:34:04
UW SNORKEL = 3/27/08
Sufficiency Rating Calculation Accepted by kn338cd-P at 2007-04-25 11:58:01
UW SNORKEL = 5/2/07
Sufficiency Rating Calculation Accepted by kn338cd-P at 2006-06-05 17:25:29
UW SNORKEL = 6/14/06
Sufficiency Rating Calculation Accepted by kn338cd-P at 2005-07-06 16:46:58
UNDERWATER NOT REQUIRED ON INTERIM - NO DEFICIENCIES UNDERWATER
Sufficiency Rating Calculation Accepted by KNVOLTL-P at 2004-08-24 11:52:21
LOW WATER - DIVE NOT NEEDED
Sufficiency Rating Calculation Accepted by kn338mv-P at 2003-08-05 12:36:47

TRAFFIC RESTRICTIONS: The bridge is posted 12 U.S. tons. Based on our recent (2018) field inspection and the 2013 load capacity analysis, the bridge should be posted 12 U.S. tons for single unit vehicles, 12 U.S. tons for combination unit vehicles and 12 U.S tons for tandem trailer vehicles.

The load rating currently filed in the Department's Electronic Document Management System, sealed on 09/30/2013 by Aaron D. Immel, P.E., was reviewed by Scott Betz, P.E. The document were found to be complete, with a minimum load summary sheet and calculations, and applicable based on current observations made in the field. The rating information in the FDOT bridge management system matches the summary sheet and calculations on file. The reviewing engineer did not perform a detailed technical review and does not assume any responsibility for the accuracy of the load rating calculations performed by others.

During this inspection, Element 8395 Timber Abutment Slope Protection was deleted and replaced with Element 8476 Timber Walls.

Structure Notes

The Scour POA is to be reviewed and updated as necessary during the routine inspection.

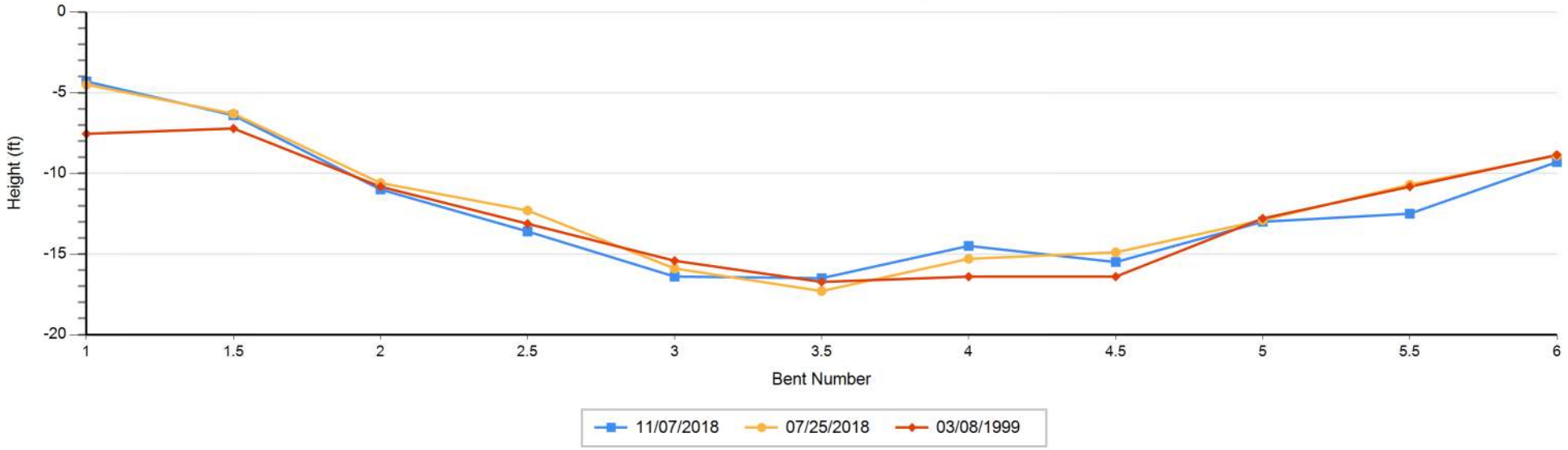
This structure is on a 12 month inspection cycle due to the load capacity analysis of Element 235 Timber Pier Cap.

Schedule Notes

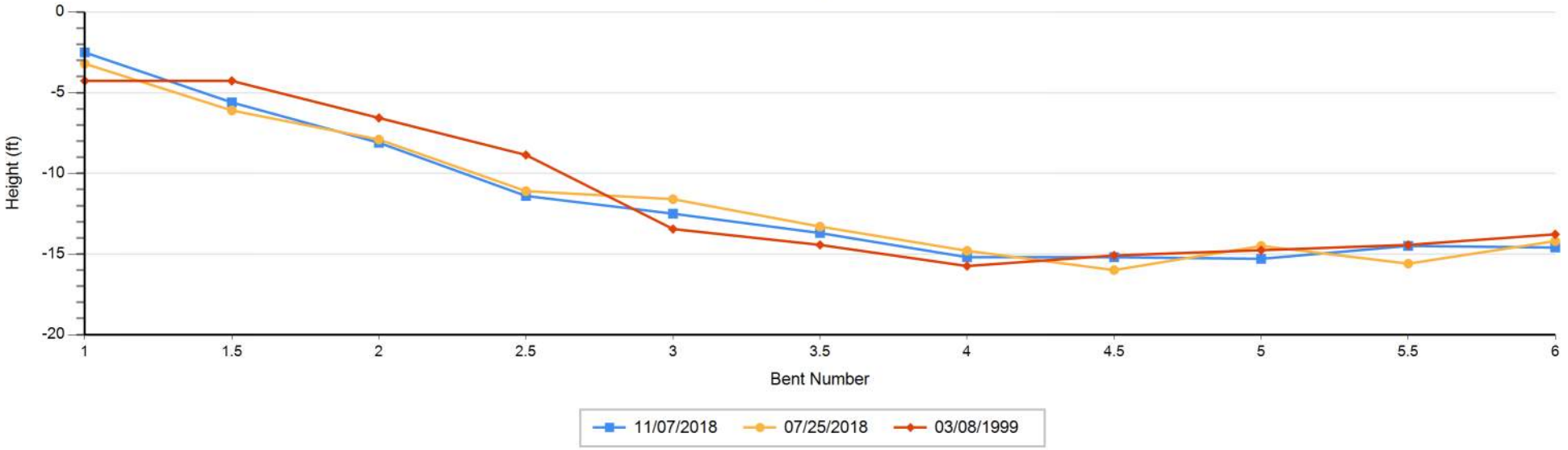
FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Bridge Profile

DATE PRINTED: 1/4/2019 4:59:24 PM

Left Profile by Inspection



Right Profile by Inspection



FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Bridge Profile

DATE PRINTED: 1/4/2019 4:59:24 PM

Profile Data - Numerical Summary

Inspection Date and Key: 11/7/2018 PDOR

(All Heights are in Feet)

Bent #	Left Height	Right Height
1	4.30	2.50
1.5	6.40	5.60
2	11.00	8.10
2.5	13.60	11.40
3	16.40	12.50
3.5	16.50	13.70
4	14.50	15.20
4.5	15.50	15.20
5	13.00	15.30
5.5	12.50	14.50
6	9.30	14.60

Air Temp: 70

Profile Notes:

Groundline Measurements taken from top of rail.
Waterway Measurements: Top of rail to waterline at Bent 4 = 10.4ft. Left and Right.

Inspection Date and Key: 7/25/2018 ZAAS

Bent #	Left Height	Right Height
1	4.50	3.20
1.5	6.30	6.10
2	10.60	7.90
2.5	12.30	11.10
3	15.90	11.60
3.5	17.30	13.30
4	15.30	14.80
4.5	14.90	16.00

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report with PDF attachment(s)
Bridge Profile

DATE PRINTED: 1/4/2019 4:59:24 PM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height	(All Heights are in Feet)
5	12.90	14.50	
5.5	10.70	15.60	
6	8.90	14.20	

Air Temp: 80

Profile Notes:

Waterway Measurements: Top of rail to waterline at Bent 4 = 11.0 ft left and right.
Groundline Measurements from top of rail.

Inspection Date and Key: 3/8/1999 YJDW

1	7.55	4.27
1.5	7.22	4.27
2	10.83	6.56
2.5	13.12	8.86
3	15.42	13.45
3.5	16.73	14.44
4	16.40	15.75
4.5	16.40	15.09
5	12.80	14.76
5.5	10.83	14.44
6	8.86	13.78

Air Temp:

Profile Notes:

Waterway Measurements: Top of rail to waterline at Bent 4; 2.8 m left and right.
Groundline Measurements from top of rail.