Attachment K

Hydrology and Hydraulics Study by Stantec 2022-03-07

HYDROLOGY REPORT

Hydrology and Hydraulics Study for Little Sycamore Creek

Camp Hess Kramer/Gindling Hilltop Camp
Woolsey Fire Rebuild
11495 & 11677 Pacific Coast Highway
Ventura County, CA

Date: March 7, 2022

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No. 37253
CIVIL
STATE OF CALIFORNIA

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Appendix A – Hydrologic Analysis, worksheets, exhibits, input and output

Appendix B – Hydraulic Analysis, worksheets, exhibits, input and output

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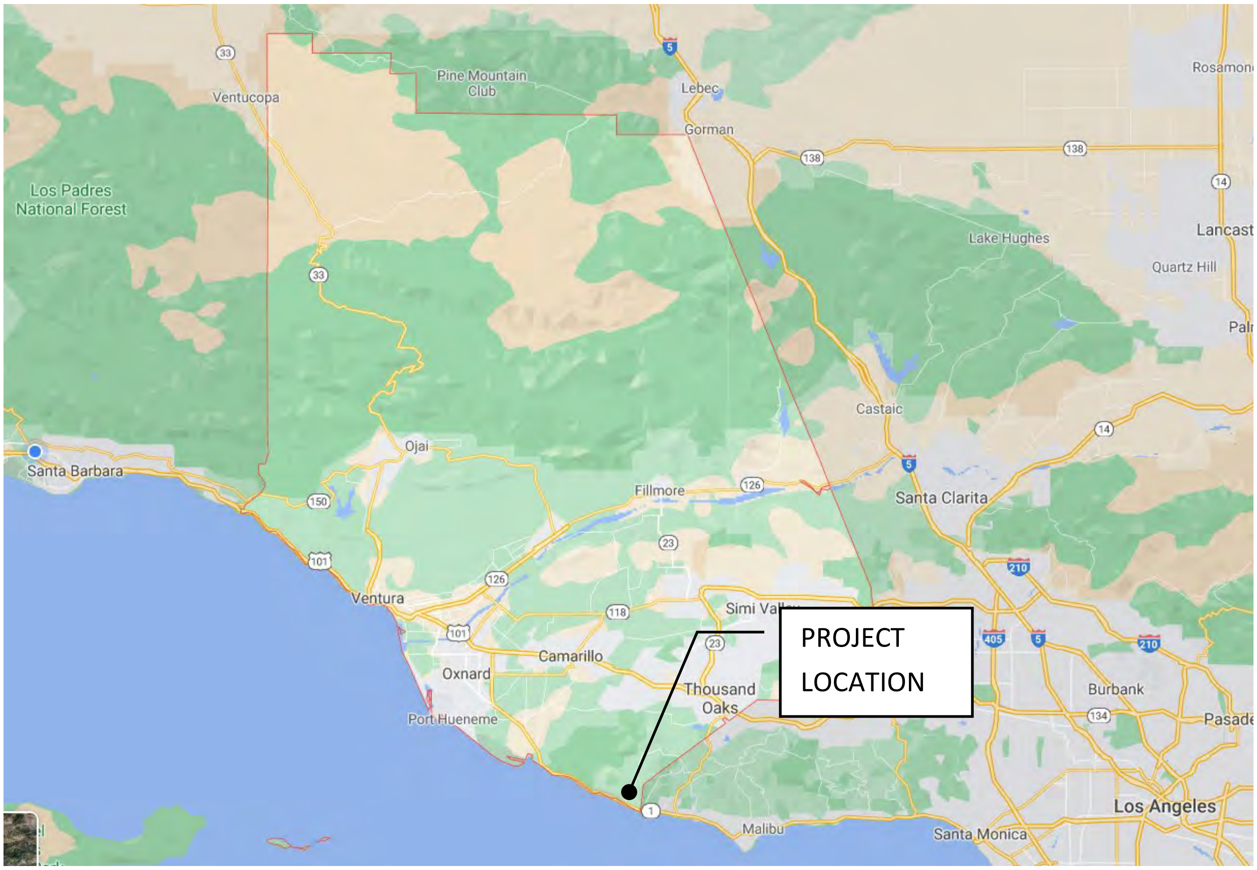
SECTION 1 INTRODUCTION/PROJECT DESCRIPTION

Camp Hess Kramer sits on approximately 187 acres within Little Sycamore Canyon in Malibu, northwesterly of the intersection of Pacific Coast Highway (PCH) and Yerba Buena Road, on the southerly boundary of Ventura County. See Figure A. The purpose of this study is to compare the post-Woolsey Pre-Development Condition water surface elevations to the post-Woolsey Fire Post-Development Condition water surface elevations during a 100-year storm event from the Pacific Ocean within the Camp Hess Kramer property, and upstream of the Camp Hess Kramer property. Results will be presented using NAD83 horizontal datum and NAVD88 vertical datum. The purpose of this initial submittal is to gain approval of the means and methods of the hydrologic and hydraulic analysis in order to properly design proposed Camp Hess Kramer improvement. The proposed project description is as follows:

“Wilshire Boulevard Temple Camp (WBT), a California not-for-profit corporation, is requesting a Major Mod to LU10-0069 to rebuild Camp Hess Kramer (Lower and Middle Camps) and Gindling Hilltop Camp (Upper Camp) which were near-completely destroyed by the Woolsey Fire and subsequent heavy rains between December 2018 and March 2019. Prior to the Fire, Camp had been operating on this site since 1952 and its pre-fire uses and structures are described in a Ventura County-approved CUP (County ref: LU10-0069). The proposed rebuilding effort includes restoration of damaged buildings and construction of new buildings to replace functions of destroyed structures, restoration of outdoor activity areas, landscaping, fuel modification, and restoration of the Little Sycamore Creek corridor. The project will also repair, replace, and or construct necessary infrastructure including access roads, parking, vehicle and pedestrian bridges and walkways, water and wastewater infrastructure, electrical and communication lines, stormwater and drainage facilities and lighting. Please refer to accompanying project description for more details.”


33
Ventucopa
Pine Mountain Club
5
Lebec
Gorman
138
138
Rosamon
14
Los Padres National Forest
Lake Hughes
Lancast
Quartz Hill
Pal
33
Castaic
14
Ojai
Santa Barbara
5
Fillmore
126
Santa Clarita
150
23
210
101
Ventura
126
118
Simi Val
405
5
210
101
23
Camarillo
Oxnard
Thousand Oaks
Burbank
134
Pasade
Port Hueneme
1
Los Angeles
Malibu
Santa Monica

PROJECT LOCATION

Figure A - Location Map

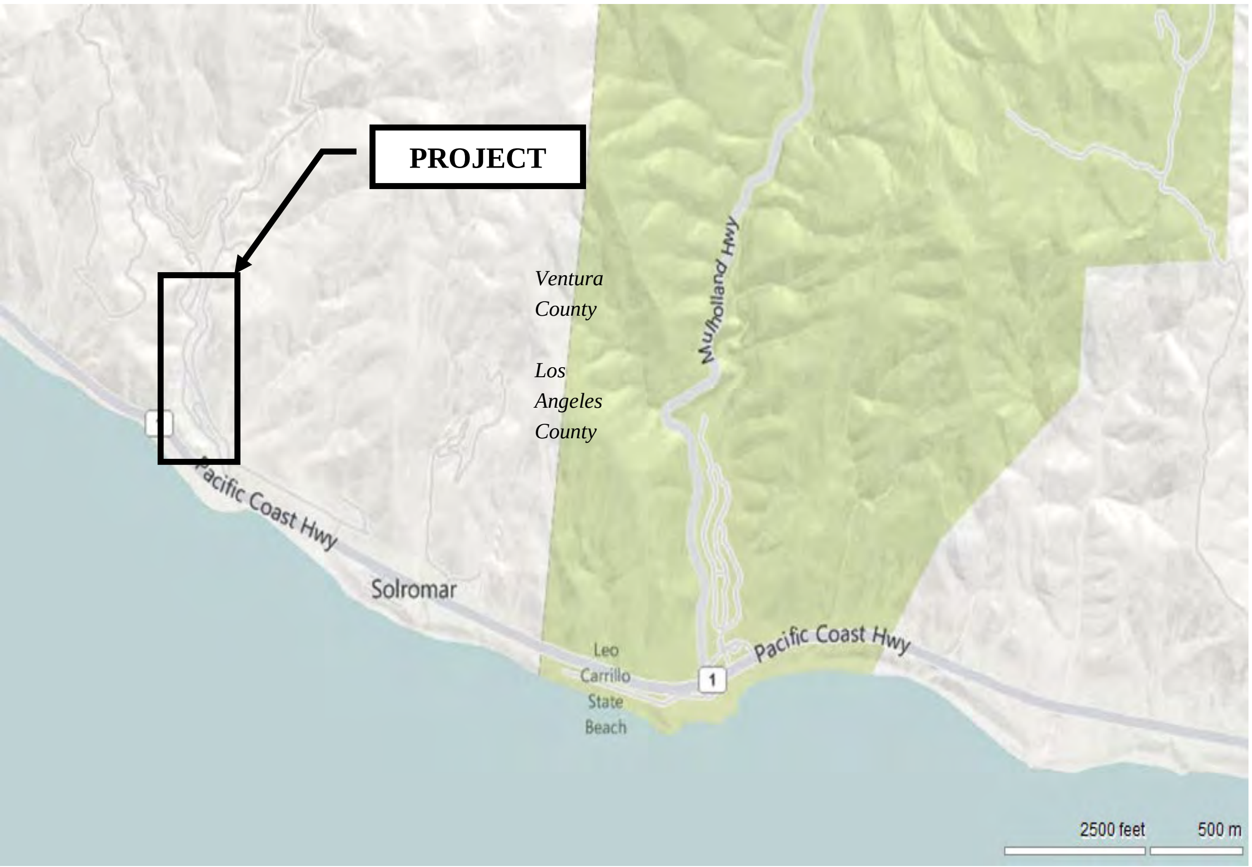

PROJECT
Ventura County
Los Angeles County
Mulholland Hwy
Pacific Coast Hwy
Solromar
Pacific Coast Hwy
Leo Carrillo State Beach
1
2500 feet
500 m

Figure B - Vicinity Map

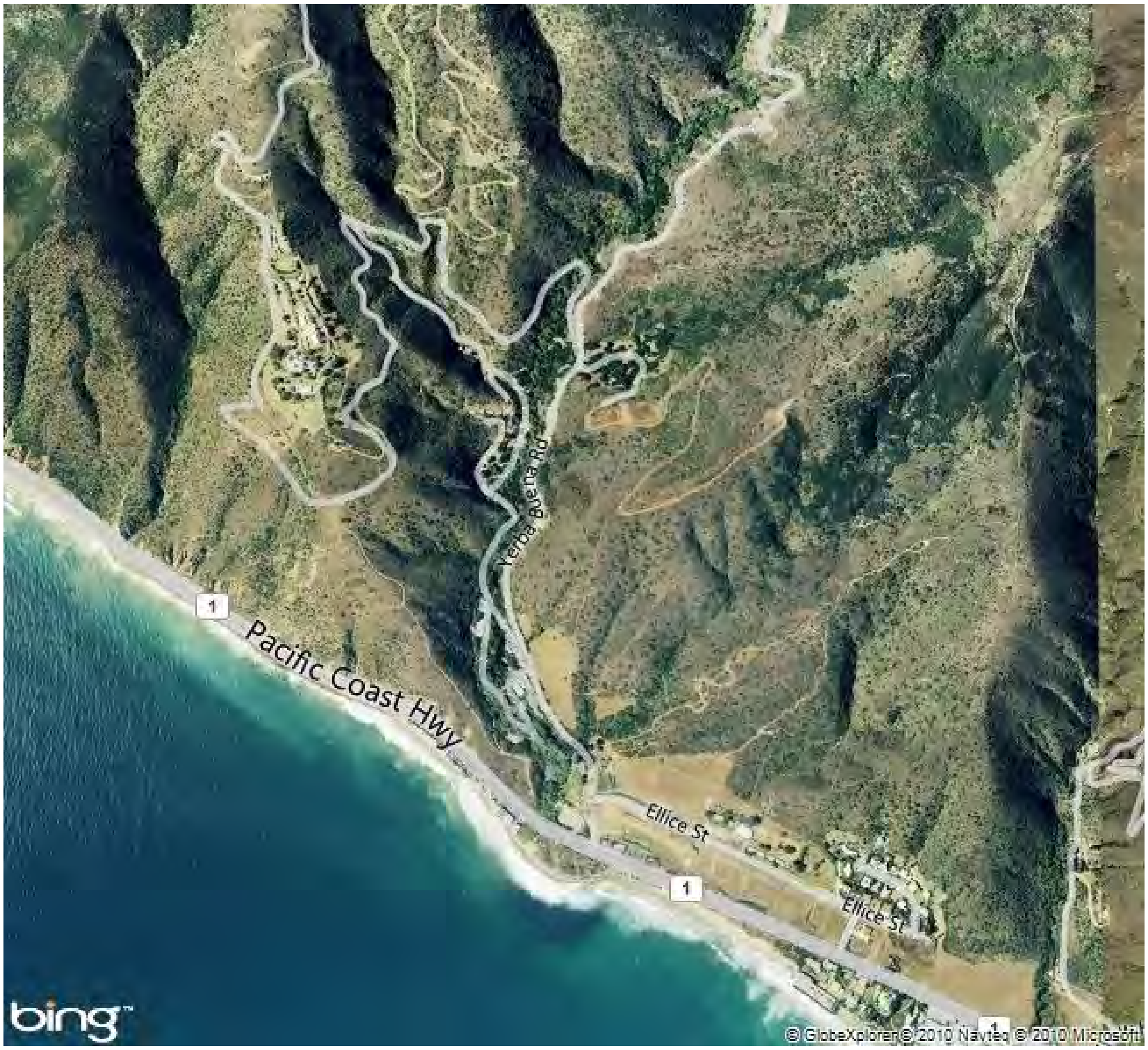


Figure C – Vicinity Photo

The data used for physical definition of the hydraulic input in this report is based on field review with photo documentation and field measurements, augmented with Lidar topographic information and detailed survey of bridges and culverts. The extent of the analyses runs from the Pacific Ocean to the several hundred feet upstream of the northerly project property line.

Hydraulic analysis is being calculated using HEC-RAS v5.0.7. Manning roughness factors have been estimated based on the field review and review of the Ventura County Hydrology Manual. Modifications to the previously submitted model include better detail of location and elevations of bridges from surveyed cross sections, modification of cross sections near bridges to meet modeling standards and extending the model downstream to the Pacific Ocean using publicly available topo-bathymetry from pre-Woolsey Fire time period.

Detailed cross section locations, bridge geometry, and summary analysis tables are found in Appendix B.

1.1.1 Structures

PCH Bridge

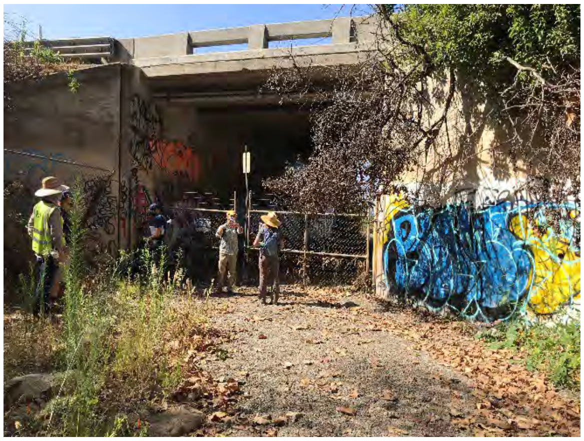


Photo 2 - PCH Bridge Post-Woolsey Fire Upstream Side

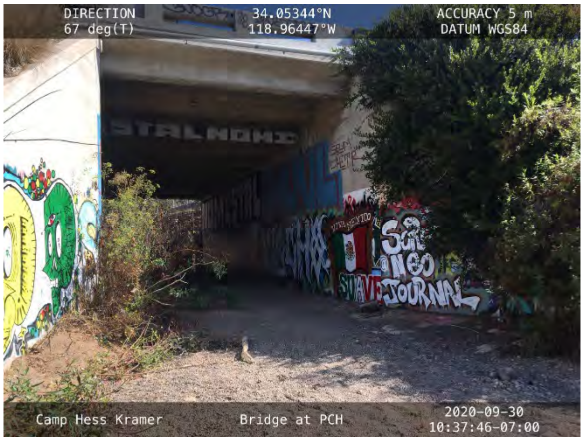
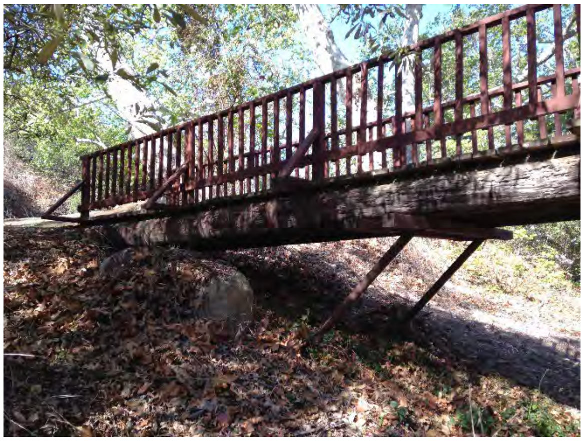

DIRECTION
67 deg(T)
34.05344°N
118.96447°W
ACCURACY 5 m
DATUM WGS84
Camp Hess Kramer
Bridge at PCH
2020-09-30
10:37:46-07:00

Photo 1 - PCH Bridge Post-Woolsey Fire

Downstream side



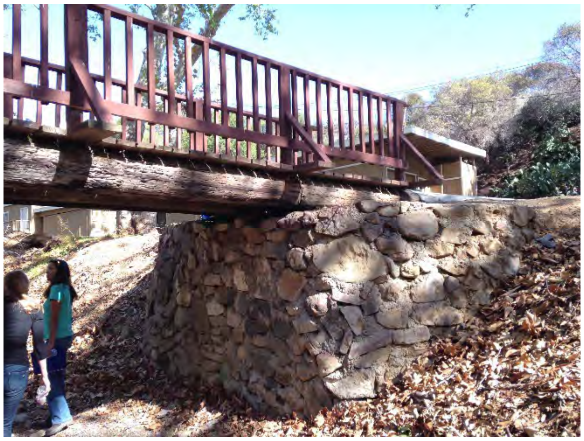


Photo 3 - Bridge 2-V pre-Woolsey Fire

Bridge Brace

Photo 4 - Bridge 2-V Post-Woolsey Fire

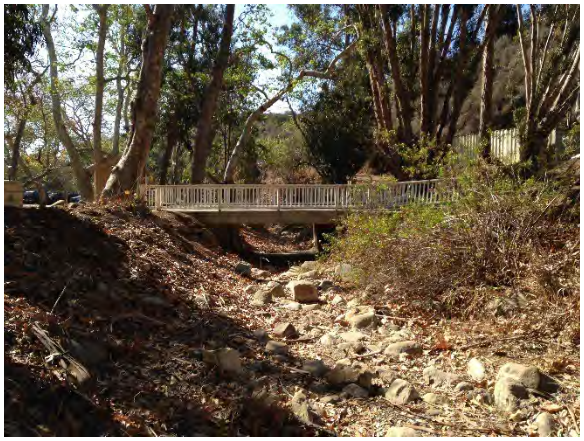


Photo 6 - Bridge 4-V Pre-Woolsey Fire

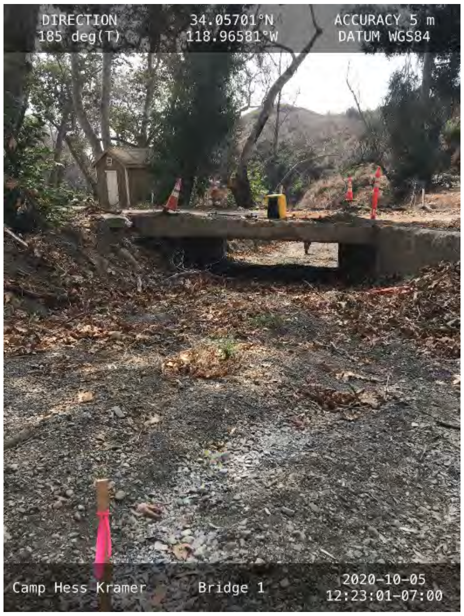

DIRECTION
185 deg(T)
34.05701°N
118.96581°W
ACCURACY 5 m
DATUM WGS84
Camp Hess Kramer
Bridge 1
2020-10-05
12:23:01-07:00

Photo 5 - Bridge 4-V Post-Woolsey Fire

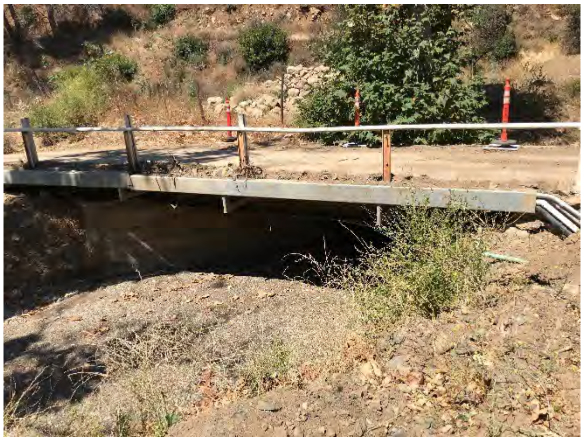


Photo 7 - Bridge 6-V Post-Woolsey Fire

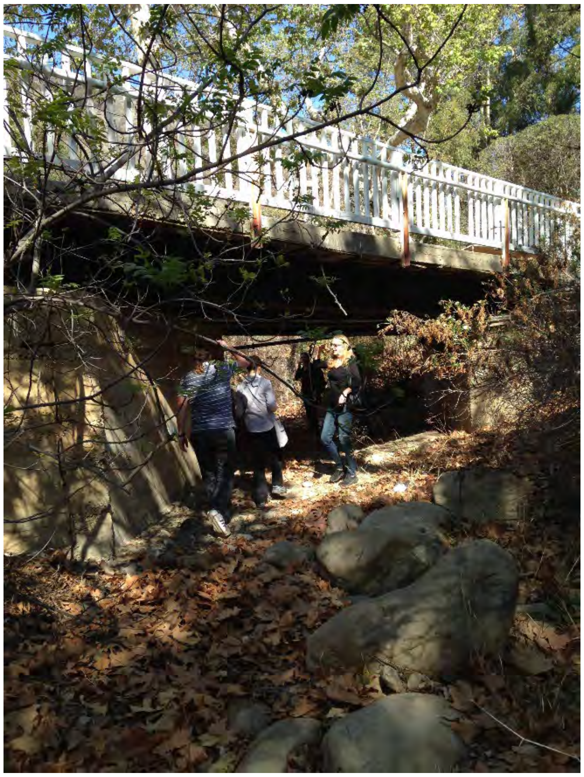


Photo 8 - Bridge 6-V Pre-Woolsey Fire

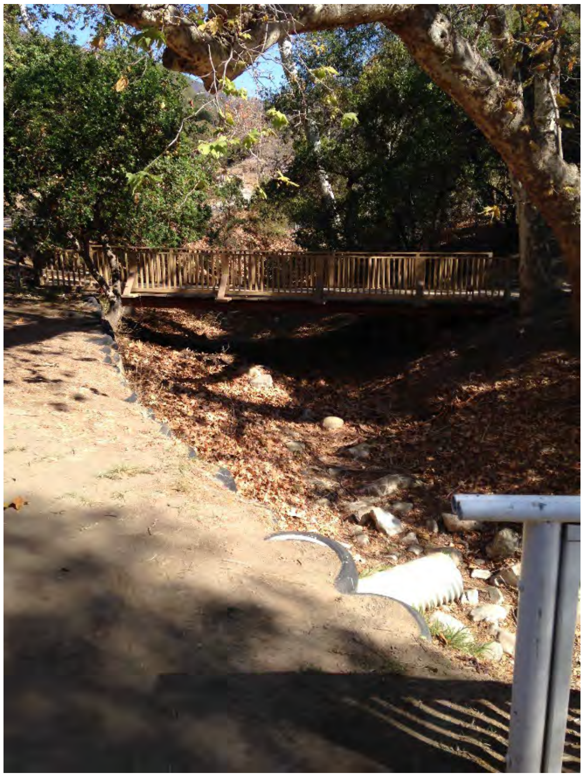


Photo 9 - Bridge 6-V Pre-Woolsey Fire

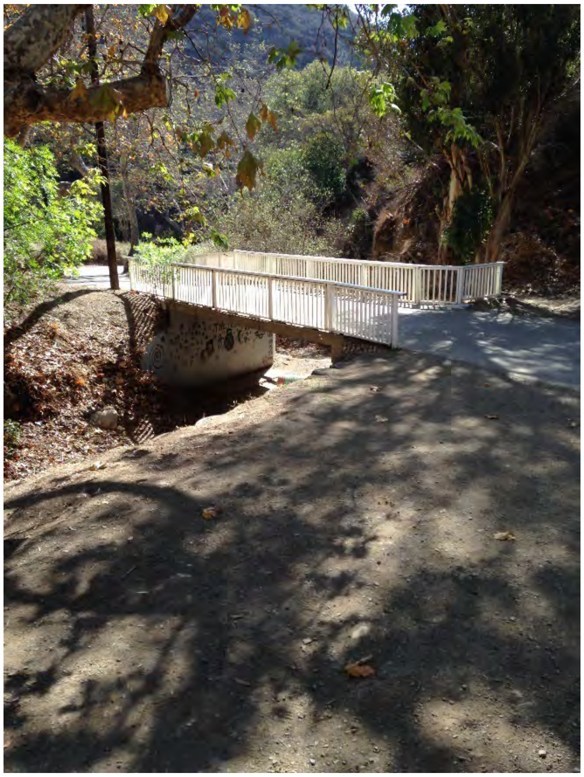


Photo 10 - Bridge 8-V Pre-Woolsey Fire

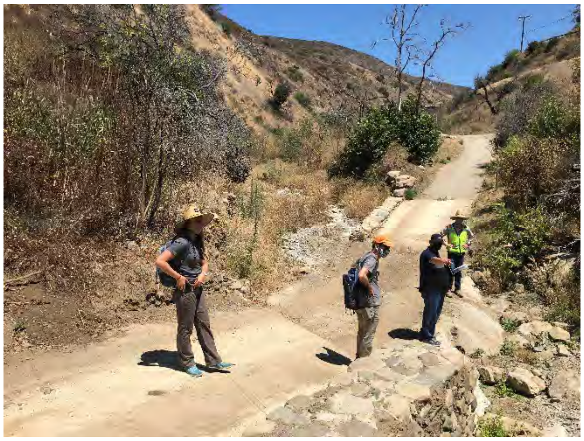


Photo 11 – Arizona Crossing 10-A-V - Post-Woolsey Fire

SECTION 2 MITIGATION CRITERIA

This project will be reviewed by the Ventura County Watershed Protection Agency and the Ventura County Fire Department. Stantec approached Sergio Vargas, Ventura County Watershed Protection Agency to verify what methods and conditions would likely be acceptable for this project site as it was redeveloped. The list below summarizes the points made in the 5/21/2020 email. A subsequent hydraulics and hydrology report identified later modifications to these initial conditions.

- A geomorphic analysis will be helpful in preparing a creek restoration design.
  Comment: ESA was engaged to evaluate the creek geomorphically and to propose channel grading plans that would improve the stability of the channel through the project site.

- A pre-project based on the pre-fire condition and post-project hydraulic analysis providing results of water surface elevations, flow velocities, and floodplain mapping will be required.
  Comment: Based on County comments on an initial submittal, the pre-fire condition will not be used for comparison.

- The pre- and post-project hydraulic analysis results shall be compared to show no adverse hydrologic, hydraulic (H&H), and sediment transport / erosion impacts to the Little Sycamore Canyon Creek.
  Comment: Work of the Stantec/ESA team on this is included in this report.

- The District requires that a H&H and sedimentation analysis be conducted to show that the project will not negatively impact the characteristics of the creek.
  Comment: See the ESA report included in the appendices.

- FEMA requires consideration of bulking factors on sediment prone watersheds or burned watersheds, the District encourages sound engineering analysis based on which infrastructures are built to withstand potential damaging forces either from clear water floods or mudflows. The report should review fire history of the watershed, evaluate the risk of mudflows, and justify whether bulking factors should or should not be used for project design.

- The Pre-Woolsey Fire H&H and topographic conditions shall be regarded as pre-development conditions.
  Comment: Ventura County Fire Department indicated that for the purposes of determining a change in peak flow rates (hydrology) in Little Sycamore Creek due to the proposed development, the Pre-Woolsey Fire Condition should be compared to the Post-Woolsey Fire Post-Project Condition. An analysis of the 1-yr, 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, and 100-yr analysis (Pre- and Post-Project channel flows) would be required.

  For the hydraulic water surface elevations, Ventura County Watershed Protection Agency determined that comparing the Pre-Woolsey Fire hydraulic analysis to the Post-Woolsey Fire hydraulic analysis, particularly in relation to off-site conditions that had been modified by the flooding conditions over which the project applicant has no control, is not consistent nor appropriate.

- In general, changing water surface elevations will result in changes in flow characteristics of the creek flow which may alter sediment delivery to downstream. Stantec should be mindful of the project impact to sediment delivery, particularly when the project is close to the beach.
  Comment: ESA has prepared document that assess general sediment carrying capacity throughout the project reach.

- 1-D and 2-D hydraulic analysis will be acceptable.
  Comment: A 1-D analysis has been used.

- Use the standard report format accepted by Ventura County.

SECTION 3 PEAK RUNOFF ANALYSIS

Detailed hydrologic analysis and exhibits are found in Appendix A of this report.

3.1 EXISTING CONDITION PEAK RUNOFF

It was originally assumed that the VCRAT hydrologic analysis contained in the December 2017 would be sufficiently detailed for this analysis. However, review of the data and comparison to other similar watersheds indicated that the VCRAT analysis was significantly overpredicting the runoff for this watershed.

3.1.1 Watershed Response Evaluation

Stream gauging for a number of similarly sized and shaped coastal watersheds were compared on a unit flow rate basis using the 1% exceedance probability peak flow rate from HEC SSP v2.2 Frequency Analysis based on Bulletin 17C. See Appendix A for detailed calculations. Table 1 presents a summary of the results.

Based on the analysis and after consultation with Mark Bandurraga[1], we prepared a new hydrologic analysis using the U.S. Army Corps of Engineers Hydraulic Engineering Center Hydrologic Modeling System (HEC-HMS v4.6.1), based on the Ventura County Watershed Protection District (VCWPD) Design Hydrology Manual (2017) recommendations for Undeveloped Watersheds. Analysis parameters and assumptions are described in Table 2.

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[1] Email communication dated 9/22/2020, copy attached.

Table 1 - Unit Peak Flow Rate Comparison

Watershed	Watershed Area, sm	Years of Record	Bul 17C Q_{100}, cfs	Unit Q, cfs/sq	Adjusted to Q_{100} at Mouth of Little Sycamore	NOAA 100-yr 24 hr Rainfall at Approx Centroid of Watershed
Carpinteria	13.1	78	10,692	816	4,687	8.2
Little Sycamore	1.4	13	821	586	2,303	11.4
San Jose	5.5	55	4,497	818	4,051	9.3
Topanga	18	49	14,486	805	4,878	11.6
Note: Little Sycamore 100-yr rainfall at centroid of whole watershed = 9.27						

3.1.2 Modeling Parameters

Table 2 - Hydrologic Analysis Parameters

Item	Description	Source
HSG (soil type)	Mostly Type D	VCWPD DHM, Appendix E-10 matching NRCS Soil Mapping
Hypothetical Storm Type	SCS Type I	VCWPD DHM, page 5-1
Subbasin Rainfall Loss	Rainfall Loss per NRCS Curve Numbers Initial Abstraction = 0.2	VCWPD DHM, Table 14a, page A-57
Subbasin Transformation	Ellsworth S-Graph	VCWPD DHM, Appendix C-3
24-hour Rainfall Depths	Extracted from NOAA Atlas No. 14 One rainfall depth per event taken from approximate centroid of entire watershed and applied to all subwatersheds	Precipitation Data Server https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca
Flow Routing	Modified Puls	As recommended by VCWPD
Calibration/Validation	Compared to unit peak 100-year flows in similar gaged watersheds. The data for San Jose Creek validates methodology used in the hydrologic analysis.	VCWPD DHM, Section 5.3, page 5.4

3.1.3 Model Calibration

Hydraulic model calibration is not feasible at this location due to lack of historic flow gaging data at the site. The 2018 debris flow, including a landslide within the project area is an event that cannot be feasibly or accurately modeled and is not typically required by local floodplain ordinances. However, the general magnitude of flooding predicted by the model is similar, showing overtopping of existing and proposed bridges, inundation of some overbank areas.

Hydrologic model calibration strictly speaking, adjusting model parameters to a known (gaged) flowrate on the same watershed is not possible on the Little Sycamore Creek watershed as there are not long-term reliable gaging data on the watershed and applying a bulking factor used in area coastal watersheds. Therefore, the calculated flow rate was validated by comparison to several gaging results on similar coastal watersheds in the region. Figure D illustrates the results.

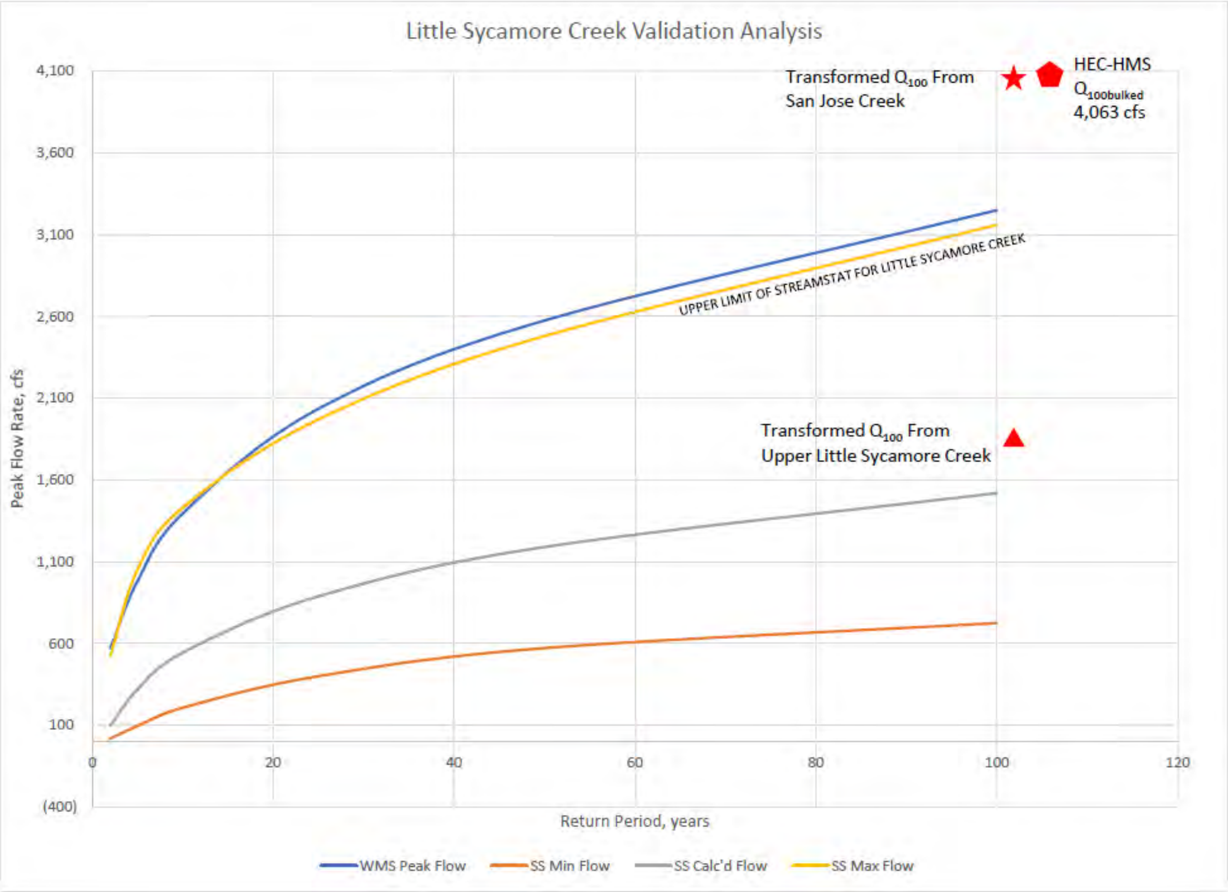


Figure D – Little Sycamore Creek Validation Graph

3.1.4 Bulking Factor Determination

Given the relatively frequent fire history of this watershed, we recommend that a bulking factor be applied to the clear water flow rates. However, methodologies outlined in the current Ventura County Hydrology Manual do not address coastal watersheds and appear to significantly overestimate the bulking factor evident when compared to gaging results for similar coastal watersheds. A detailed review of these gaging results indicates a bulking factor of 1.25 would be appropriate. This factor is consistent with data being developed in the FEMA Montecito Streams Remapping project which is currently underway.

3.1.5 HMS Model Variables and Results

The Little Sycamore Creek was divided into several subbasins within which rainfall runoff processes were assessed in accordance with the parameters identified in Table 4 which are in compliance with the methodology outlined for undeveloped watersheds in Ventura County. Flow was routed using the Modified Puls method. The watershed and subbasins are shown in Figure E. Rainfall depths for storms in addition to the 100-year event are presented in Table 5.

Table 6 includes the results of the HEC-HMS model for clear flow and bulked flow as well as a comparison to the VCRAT 100-year event peak flow rates. Detailed output for the HEC-HMS analysis is contained in Appendix A.

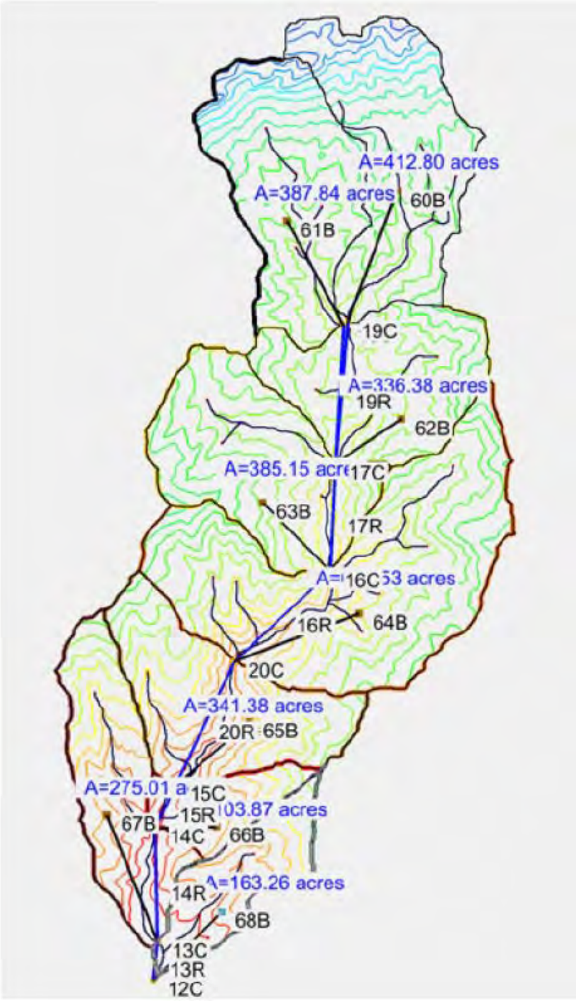

A=412.80 acres
A=387.84 acres
60B
61B
19C
A=336.38 acres
19R
62B
A=385.15 acr
17C
63B
17R
A=
16C
53 acres
16R
64B
20C
A=341.38 acres
20R
65B
A=275.01 a
15C
15R
03.87 acres
67B
14C
66B
14R
A=163.26 acres
68B
13C
13R
12C

Figure E – Watershed Diagram

Table 3 - HEC-HMS Input Parameters

Watershed	Tributary Area	100-yr 24-hr Rain Depth Used	100-yr 24-hr Rain Depth Calculated	Lag	Wt'd CN	Q_{100}
	acres	inches	inches	hours		cfs
60B	412.8	9.27	10.93	0.52	75.0	781
61B	387.8	9.27	9.90	0.37	75.0	897
62B	336.4	9.27	8.80	0.25	73.9	952
63B	385.2	9.27	9.27	0.41	74.6	834
64B	697.6	9.27	9.49	0.42	74.8	1,493
65B	341.4	9.27	8.70	0.24	74.4	996
66B	103.7	9.27	7.96	0.14	73.9	388
67B	275.0	9.27	7.67	0.44	73.7	562
68B	163.3	9.27	7.11	0.28	73.9	435

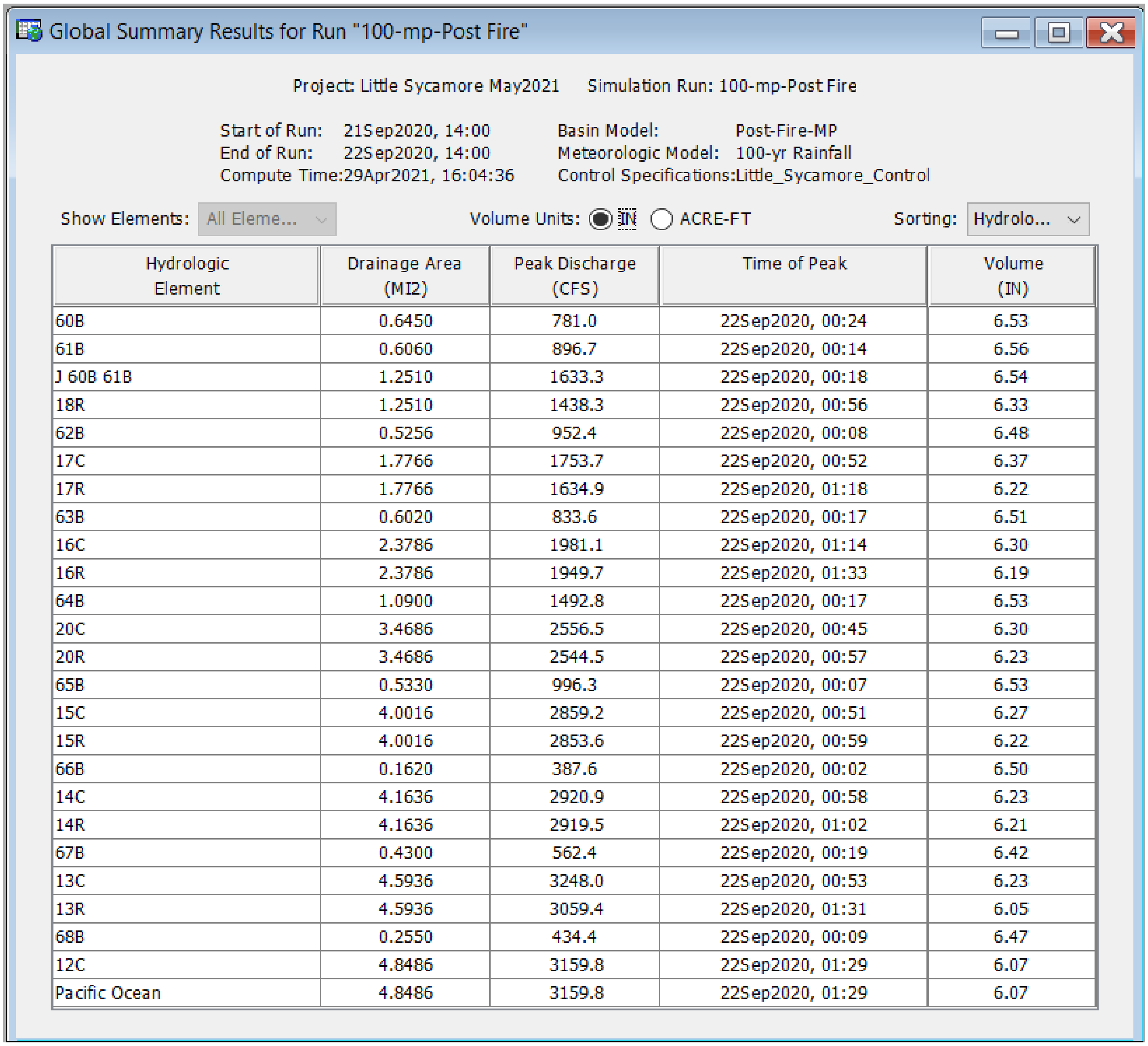
Table 4 - Rainfall Depth at Centroid for 1-yr through 100-year Storm Events

Return Period	Depth inches
1	2.72
2	3.60
5	4.78
10	5.76
25	7.11
50	8.17
100	9.27

Table 5 - Comparison of HMS 100-year Flowrates to VCRAT Flowrates

CP HMS/VCRAT	Q_{100} cfs	$Q_{100\ bulked}$ cfs	$Q_{100\ VCRAT}$ cfs
J 60B 61B	1,635	2,044	
17C	1,755	2,194	
16C	1,985	2,481	
20C	2,560	3,200	
15C/18A	2,860	3,575	5,657
14C	2,925	3,656	
13C/19A*	3,250	4,063	5,875
12C/20A	3,160	3,950	6,018

* Because peak flow rate at CP13C is slightly higher than at the Pacific Ocean, that higher peak flow rate was used in the hydraulic models all the way out to the Pacific Ocean.



Global Summary Results for Run "100-mp-Post Fire"

Project: Little Sycamore May2021 Simulation Run: 100-mp-Post Fire

Start of Run: 21Sep2020, 14:00
End of Run: 22Sep2020, 14:00
Compute Time: 29Apr2021, 16:04:36

Basin Model: Post-Fire-MP
Meteorologic Model: 100-yr Rainfall
Control Specifications: Little_Sycamore_Control

Show Elements: All Eleme...
Volume Units: ● IN ○ ACRE-FT
Sorting: Hydrolo...

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60B	0.6450	781.0	22Sep2020, 00:24	6.53
61B	0.6060	896.7	22Sep2020, 00:14	6.56
J 60B 61B	1.2510	1633.3	22Sep2020, 00:18	6.54
18R	1.2510	1438.3	22Sep2020, 00:56	6.33
62B	0.5256	952.4	22Sep2020, 00:08	6.48
17C	1.7766	1753.7	22Sep2020, 00:52	6.37
17R	1.7766	1634.9	22Sep2020, 01:18	6.22
63B	0.6020	833.6	22Sep2020, 00:17	6.51
16C	2.3786	1981.1	22Sep2020, 01:14	6.30
16R	2.3786	1949.7	22Sep2020, 01:33	6.19
64B	1.0900	1492.8	22Sep2020, 00:17	6.53
20C	3.4686	2556.5	22Sep2020, 00:45	6.30
20R	3.4686	2544.5	22Sep2020, 00:57	6.23
65B	0.5330	996.3	22Sep2020, 00:07	6.53
15C	4.0016	2859.2	22Sep2020, 00:51	6.27
15R	4.0016	2853.6	22Sep2020, 00:59	6.22
66B	0.1620	387.6	22Sep2020, 00:02	6.50
14C	4.1636	2920.9	22Sep2020, 00:58	6.23
14R	4.1636	2919.5	22Sep2020, 01:02	6.21
67B	0.4300	562.4	22Sep2020, 00:19	6.42
13C	4.5936	3248.0	22Sep2020, 00:53	6.23
13R	4.5936	3059.4	22Sep2020, 01:31	6.05
68B	0.2550	434.4	22Sep2020, 00:09	6.47
12C	4.8486	3159.8	22Sep2020, 01:29	6.07
Pacific Ocean	4.8486	3159.8	22Sep2020, 01:29	6.07

Figure F - HEC-HMS Peak Discharge Table for Pre-Project Condition

3.2 PROPOSED CONDITION PEAK RUNOFF

The post-project condition was prepared by modifying the pre-project HEC-HMS model to reflect the post-project increase in impervious area compared to the post-Woolsey Fire imperviousness. The additional impervious area was added directly to the affected watershed as imperviousness without modifying the curve numbers. See Table 6 for a summary of increased impervious area by HEC-HMS subwatershed designation.

Table 6 - Increased Imperviousness in Post-Project Condition

Development Area 1	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	396,500				
2021 Dev Impervious	449,000	738	38,965	12,797	
Increased Impervious	52,500	738	38,965	12,797	52,500

Development Area 2	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	255,800				
2021 Dev Impervious	279,212		9,437		
Increased Impervious	23,412		9,437		9,437
Note: Not all of Development Area 2 drains to the Little Sycamore Creek watersheds.					

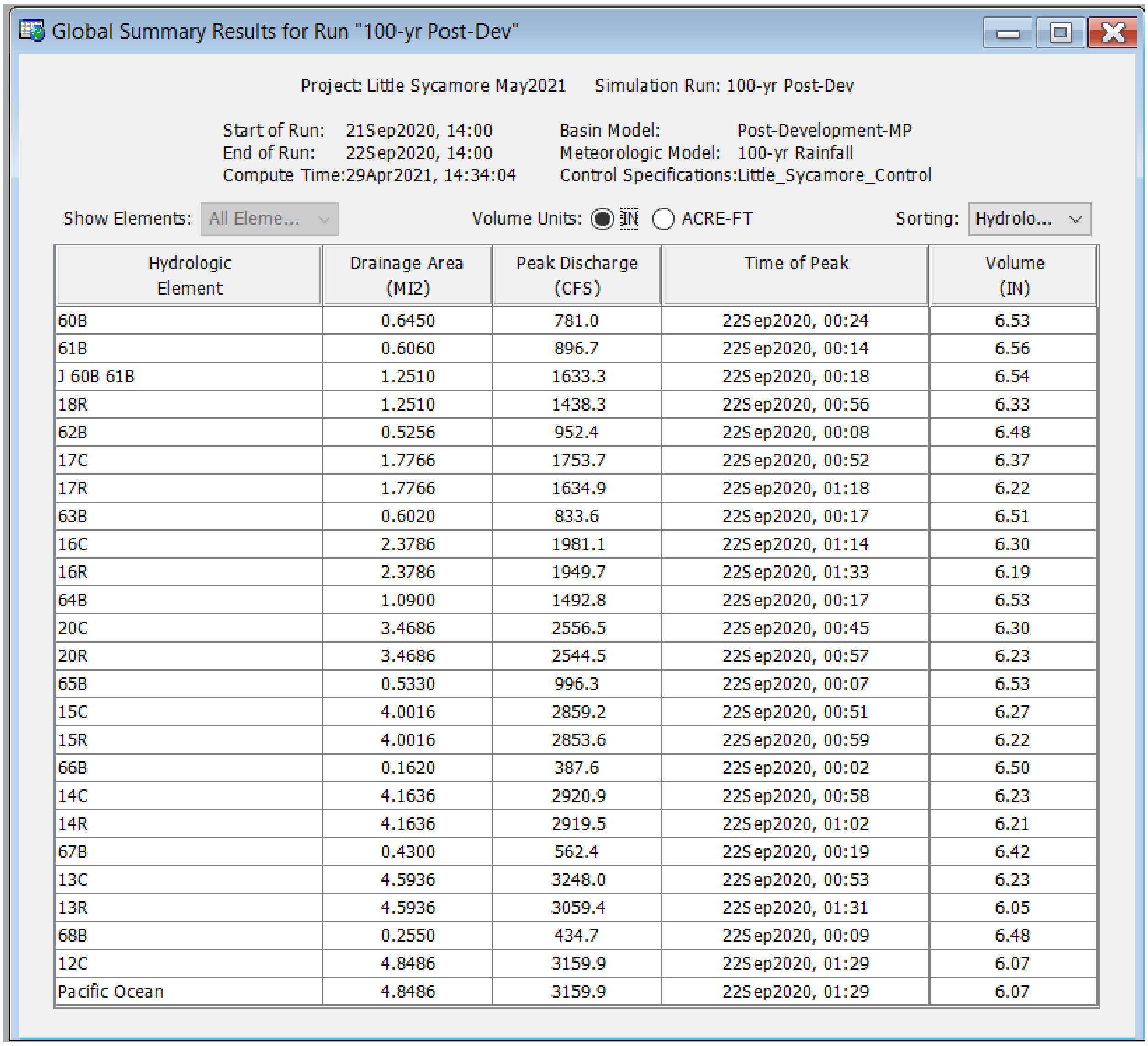
Development Area 3	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	3,600		3,600		
2021 Dev Impervious	3,600		3,600		
Increased Impervious	0		0		0

Development Area 4	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	3,300		3,300		
2021 Dev Impervious	3,300				
Increased Impervious	0		0		0

Project Total New Impervious by Watershed (sf)		738	48,402	12,797	61,937
Project Total New Impervious by Watershed (sm)		0.00003	0.00174	0.00046	0.00222

Watershed Area, sm		0.162	0.43	0.255
Increased Percent Impervious		0.0%	0.4%	0.2%

The post development peak flow rates are shown in Figure G.



Global Summary Results for Run "100-yr Post-Dev"

Project: Little Sycamore May2021   Simulation Run: 100-yr Post-Dev

Start of Run: 21Sep2020, 14:00   Basin Model: Post-Development-MP
End of Run: 22Sep2020, 14:00   Meteorologic Model: 100-yr Rainfall
Compute Time: 29Apr2021, 14:34:04   Control Specifications: Little_Sycamore_Control

Show Elements: All Eleme...   Volume Units: ● IN ○ ACRE-FT   Sorting: Hydrolo...

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60B	0.6450	781.0	22Sep2020, 00:24	6.53
61B	0.6060	896.7	22Sep2020, 00:14	6.56
J 60B 61B	1.2510	1633.3	22Sep2020, 00:18	6.54
18R	1.2510	1438.3	22Sep2020, 00:56	6.33
62B	0.5256	952.4	22Sep2020, 00:08	6.48
17C	1.7766	1753.7	22Sep2020, 00:52	6.37
17R	1.7766	1634.9	22Sep2020, 01:18	6.22
63B	0.6020	833.6	22Sep2020, 00:17	6.51
16C	2.3786	1981.1	22Sep2020, 01:14	6.30
16R	2.3786	1949.7	22Sep2020, 01:33	6.19
64B	1.0900	1492.8	22Sep2020, 00:17	6.53
20C	3.4686	2556.5	22Sep2020, 00:45	6.30
20R	3.4686	2544.5	22Sep2020, 00:57	6.23
65B	0.5330	996.3	22Sep2020, 00:07	6.53
15C	4.0016	2859.2	22Sep2020, 00:51	6.27
15R	4.0016	2853.6	22Sep2020, 00:59	6.22
66B	0.1620	387.6	22Sep2020, 00:02	6.50
14C	4.1636	2920.9	22Sep2020, 00:58	6.23
14R	4.1636	2919.5	22Sep2020, 01:02	6.21
67B	0.4300	562.4	22Sep2020, 00:19	6.42
13C	4.5936	3248.0	22Sep2020, 00:53	6.23
13R	4.5936	3059.4	22Sep2020, 01:31	6.05
68B	0.2550	434.7	22Sep2020, 00:09	6.48
12C	4.8486	3159.9	22Sep2020, 01:29	6.07
Pacific Ocean	4.8486	3159.9	22Sep2020, 01:29	6.07

Figure G – HEC-HMS Peak Discharge Table for Post-Project Condition

There is an increase in peak flow from subwatershed 68B but not enough to affect the peak flow rate in the channel. See Table 7.

Table 7 - Pre- and Post-Development Peak Flow HEC-HMS Comparison in Little Sycamore Creek

CP	2-yr			5-yr			10-yr		
	Pre-Dev	Post-Dev	ΔQ	Pre-Dev	Post-Dev	ΔQ	Pre-Dev	Post-Dev	ΔQ
	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs
15C	520	520	0	898	898	0	1,275	1,275	0
14C	534	534	0	922	922	0	1,303	1,303	0
13C	595	595	0	1,045	1,045	0	1,446	1,446	0
12C	569	569	0	980	980	0	1,395	1,395	0

CP	25-yr			50-yr			100-yr		
	Pre-Dev	Post-Dev	ΔQ	Pre-Dev	Post-Dev	ΔQ	Pre-Dev	Post-Dev	ΔQ
	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs
15C	1,848	1,848	0	2,344	2,344	0	2,859	2,859	0
14C	1,891	1,891	0	2,394	2,394	0	2,921	2,921	0
13C	2,104	2,104	0	2,655	2,655	0	3,248	3,248	0
12C	2,034	2,034	0	2,573	2,573	0	3,160	3,160	0

SECTION 4 HYDRAULIC MODEL CONFIGURATIONS

Two models have been prepared for this report:

- Post-Woolsey Fire Pre-Development Condition Little Sycamore Creek during a one-hundred-year storm event
- Post-Woolsey Fire Post-Development Little Sycamore Creek during a one-hundred-year storm event. Since current creek elevations were graded during the post-cleanup after the 2018 debris flow, they do not represent the long-term equilibrium channel bottom. ESA has assessed sediments and stream characteristics and determined that a long-term equilibrium channel bottom will reasonably be establish by ongoing scour of smaller debris flow materials to the pre-fire elevation in a relatively short period of time. Channel restoration plans and the hydraulic analysis use the equilibrium channel bottom elevation for the invert.

Post-Woolsey Fire Pre-Development and Post-Development cross sections were placed at the same locations so as to make review of the results easier. Manning's n values used are shown in Table 8.

Table 8 – Manning's Roughness Values

	Post-Woolsey Fire Pre-Development Model	Post-Woolsey Fire Post Development Model
Channel	0.032 – 0.045	0.032 – 0.045
Overbanks	0.045 – 0.080	0.045 – 0.080

Expansion and contraction losses were standardized as shown in Table 9.

Table 9 - Expansion and Contraction Losses

	Expansion Coefficient	Contraction Coefficient
In Channel	0.1	0.3
Upstream and Downstream of Bridges	0.3	0.5

Proposed conditions, including building locations, creek restoration and scour analyses have been added to the Post-Development model based on the proposed preliminary grading and drainage plans.

4.1.1 Model Hydraulic Assumptions

Downstream starting elevation. The VE Zone elevation at the Pacific Ocean is 14 ft NAVD88, which represents a 1% chance tide and swell independent of the riverine flow. Use of the VE elevation for riverine control is not acceptable practice. Usually, downstream control elevations at the ocean are modeled as normal depth, dependent on slope and cross section. That is how Little Sycamore Creek is modeled.

The analysis is assumed to be in the subcritical flow regime, such that the calculated water surface elevations never dip below critical depth at any cross section. This is a typical modeling condition for natural streams.

Peak flow rates for the 100-year event will apply a bulking factor of 1.25 to the WMS peak flow rates.

4.1.2 Information Sources and Accuracy

- Pre-Woolsey Fire Topographic Mapping (used for pre-fire bed elevation determination)
    - Source: LiDAR
    - Date: 2018
    - Contour Interval: 1 ft
    - Horizontal Datum: NAD83
    - Vertical Datum: NAVD88
- Post-Woolsey Fire Topographic Mapping
    - Source: LiDAR prepared for Stantec
    - Date: March 13, 2019
    - Contour Interval: 1 ft
    - Horizontal Datum: NAD83
    - Vertical Datum: NAVD88

- Bridge Detail Topography
    - Source: Stantec Survey Crew
    - Date: October 2020
    - Contour Interval: NA
    - Horizontal Datum: NAD83
    - Vertical Datum: NAVD88

4.1.3 Report Reference Material

- Ventura County Watershed Protection District Design Hydrology Manual, 2017
- United States Department of Agriculture, Natural Resources Conservation Service Web Soil Survey.
- United States Army Corps of Engineers program HEC-HMS v4.6.1 with input through WMS v 10.1
- United States Weather Service National Oceanographic and Atmospheric Agency Atlas 14
- United States Army Corps of Engineers program HEC-SSP v 2.2 Statistical Software Package
- United States Army Corps of Engineers program HEC-RAS v5.0.7 with input through Civil Geo GeoHECRAS 2D v 2.7.0.25377
- AutoCAD 2017

4.2 HYDRAULIC MODEL RESULTS

Detailed results including tabulated hydraulic parameters, profile and cross section are found in Appendix B and summarized in Table 10. Cross section locations are shown as exhibits in the appendices. Based on the analysis, there will be no increase in the 100-year water surface elevation off-site either upstream or downstream of the proposed project. Within the project area, the 100-year water surface elevations are used to safely locate the proposed buildings and elevate them to the required 1foot above the 100-year water surface elevation. It also identifies locations where special design considerations may be required such as non-habitable, open-type structures where utilities may need to be elevated or installed with automatic cut-offs, or perhaps apply floodproofing.

Table 10 - Water Surface Elevation Comparison

		Pre-Project	Post-Project	
River Sta	Q Total	W.S. Elev	W.S. Elev	ΔW.S. Elev
	(cfs)	(ft)	(ft)	
117	4065	15.21	15.21	0.00
195	4065	17.96	16.99	-0.97
276	Bridge			
366	4065	31.44	28.85	-2.59
404	4065	31.44	28.82	-2.62
505	4065	30.79	27.22	-3.57
623	4065	32.24	29.92	-2.32
707	4065	35.25	34.42	-0.83
787	4065	40.18	36.39	-3.79
872	4065	43.55	40.79	-2.76
			41.73	
988	4065	47.49	44.68	-2.81
1065	4065	48.36	48.1	-0.26
1162	4065	51.97	50.31	-1.66
1252	4065	54.5	51.53	-2.97
1303	Proposed Bridge		57.07	
1368	4065	58.98	58.65	-0.33
1470	4065	61.33	60.27	-1.06
1542	4065	65.22	63.19	-2.03
1668	4065	70.91	68.93	-1.98
1762	4065	74.64	73.53	-1.11
1807	Bridge			
1861	4065	77.68	79.78	2.10
1962	4065	82.26	79.06	-3.20
2058	4065	83.85	82.95	-0.90
2163	4065	88.27	86.25	-2.02
2262	4065	93.01	90.46	-2.55
2297	Bridge			
2364	4065	96.32	95.79	-0.53
2463	4065	99.52	96.67	-2.85
2556	4065	102.02	100.28	-1.74
2659	4065	106.58	102.12	-4.46
2761	4065	109.28	104.39	-4.89
2858	4065	112.66	107.73	-4.93
2960	4065	117.38	114.03	-3.35
3051	4065	122.21	119.73	-2.48
3136	4065	126.09	125.92	-0.17
3182	Bridge			
3249	4065	131.2	132.31	1.11
3350	4065	132.86	132.34	-0.52
3444	4065	136.03	131.88	-4.15
3549	4065	140.43	137.12	-3.31
3648	4065	144.1	141.81	-2.29
3745	4065	147.59	145.01	-2.58
3850	4065	150.03	147.45	-2.58
4042	4065	157.82	155.97	-1.85
4143	4065	160.81	158.68	-2.13
4245	3650	165.36	164.16	-1.20
4348	3650	168.22	168.29	0.07
4362	Culvert			
4402	3650	172.37	172.21	-0.16
4445	3650	173.1	172.25	-0.85
4582	3650	179.66	178.17	-1.49
4845	3650	190	189.57	-0.43
5011	3650	198.65	198.65	0.00
5120	Bridge			
5207	3650	215.96	215.96	0.00
5334	3650	218.58	218.58	0.00
5459	3650	224.77	224.77	0.00

SECTION 5 RUNOFF VOLUME INCREASE

Comparison of the Pre-Project HMS runoff volume (Figure G) and Post-Project HMS runoff volume (Figure H) indicate that there is no calculable increase in runoff volume in Little Sycamore Creek.

SECTION 6 MITIGATION

In view that there is no increase in peak flow rate and no increase in runoff volume due to the proposed development, no mitigation is required.

SECTION 7 SUMMARY & CONCLUSIONS

A hydrologic study has been provided which specifically addresses largely undeveloped coastal watersheds. The peak flow rates will be used to:

- Evaluate creek hydraulics for sediment transport, creek restoration design, and inundation limits and water surface elevations for building placement.
- Determine detention requirements for the proposed development

Based on the information developed in this report:

- ESA has developed a creek restoration plan (see project grading and drainage plans), and addressed sediment transport in a geomorphology report. See Appendix C
- Stantec developed a pre-project and post-project hydraulic model that shows that there will be no increase in the 100-year water surface elevations off-site of the project area. See Table 10.
- Stantec has developed a post-project hydraulic model that has been used to set building finish floor elevations to meet Ventura County floodplain ordinance requirement.
- Stantec has developed pre-project and post-project hydrologic models that indicate there will be no increase in peak flow rates or runoff volume due to development. See Table 7.

SECTION 8 APPENDICES

Appendix A – Hydrologic Analysis, worksheets, exhibits, input and output

Appendix B – Hydraulic Analysis, worksheets, exhibits, input and output

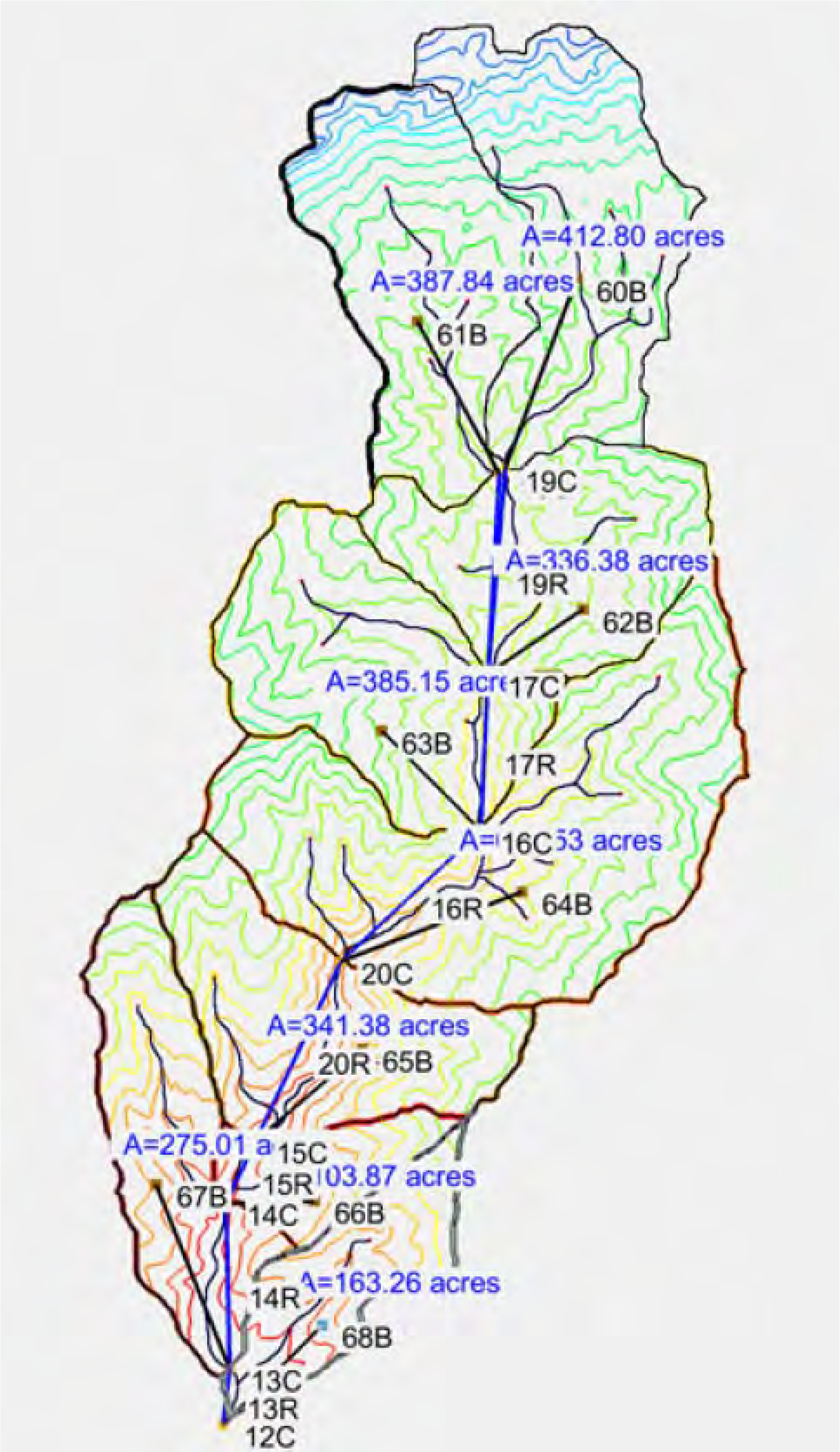
Appendix C – ESA Reports and Recommendations

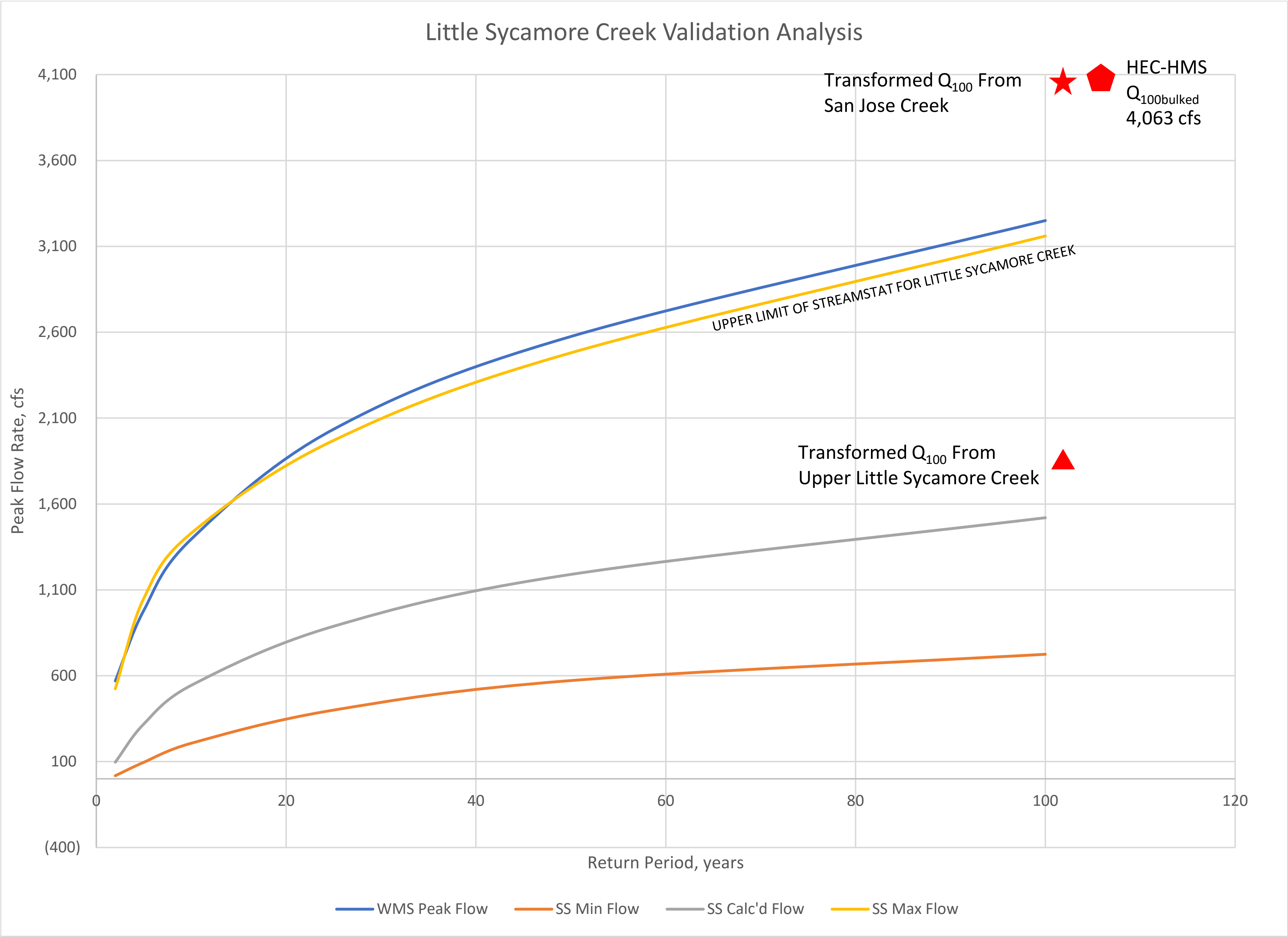
Appendix D – Proposed Grading and Drainage Plans

Electronic Copies of Models Attached

APPENDIX A

HYDROLOGIC ANALYSIS


A=412.80 acres
A=387.84 acres
60B
61B
19C
A=336.38 acres
19R
62B
A=385.15 acr
17C
63B
17R
A=
16C
53 acres
64B
16R
20C
A=341.38 acres
20R
65B
A=275.01 a
15C
15R
03.87 acres
67B
14C
66B
A=163.26 acres
14R
68B
13C
13R
12C



Little Sycamore Creek Validation Analysis

Data Input Summary

				%-24 hr
Designation	**Area, sm**	**Lag, hrs**	**Lag, min**	**Rainfall, in**
60B	0.645	0.772	46.320	9.49
61B	0.606	0.616	36.960	10.93
62B	0.526	0.489	29.340	9.90
63B	0.602	0.780	46.800	8.80
64B	1.090	0.747	44.820	9.27
65B	0.533	0.496	29.760	8.70
66B	0.162	0.464	27.840	7.96
67B	0.430	0.731	43.860	7.67
68B	0.255	0.591	35.460	7.11

Rainfall Depth at Estimated Centroid

Return Period	Depth inches
1	2.72
2	3.60
5	4.78
10	5.76
25	7.11
50	8.17
100	9.27

Ellsorth S-Curve

Total Time = 1440 minutes

%Time, min	% Flow
0.00	0.00
6.41	0.06
12.82	0.26
19.23	0.69
25.64	1.38
32.05	2.37
38.46	3.67
44.87	5.31
51.28	7.30
57.69	9.64
64.10	12.32
70.51	15.29
76.92	18.49
83.33	21.88
89.74	25.42
96.15	29.03
102.56	32.67
108.97	36.24
115.38	39.66
121.79	42.90
128.21	45.96
134.62	48.86
141.03	51.61
147.44	54.21
153.85	56.67
160.26	59.00
166.67	61.21
173.08	63.30
179.49	65.28
185.90	67.15
192.31	68.92
198.72	70.60
205.13	72.19
211.54	73.70
217.95	75.12
224.36	76.47
230.77	77.75
237.18	78.96
243.59	80.10
250.00	81.19
256.41	82.22
262.82	83.19
269.23	84.11

275.64	84.98
282.05	85.81
288.46	86.59
294.87	87.33
301.28	88.03
307.69	88.69
314.10	89.32
320.51	89.91
326.92	90.48
333.33	91.01
339.74	91.51
346.15	91.99
352.56	92.44
358.97	92.87
365.38	93.28
371.79	93.66
378.21	94.02
384.62	94.37
391.03	94.69
397.44	95.00
403.85	95.30
410.26	95.57
416.67	95.83
423.08	96.08
429.49	96.32
435.90	96.54
442.31	96.75
448.72	96.95
455.13	97.14
461.54	97.32
467.95	97.48
474.36	97.65
480.77	97.80
487.18	97.94
493.59	98.08
500.00	98.20
506.41	98.33
512.82	98.44
519.23	98.55
525.64	98.65
532.05	98.75
538.46	98.85
544.00	98.93
551.28	99.02
557.69	99.10
564.10	99.17
570.51	99.24

576.92	99.31
583.33	99.37
589.74	99.43
596.15	99.49
602.56	99.54
608.97	99.59
615.38	99.64
621.79	99.68
628.21	99.73
634.62	99.77
641.03	99.81
647.44	99.84
653.85	99.88
660.26	99.91
666.67	99.94
673.08	99.97
679.49	100.00
685.90	100.00
692.31	100.00

MODEL COMPARISON

Location:	Little Sycamore Creek
Event:	Q_{100}, clear water
Soil type:	HSG D throughout watershed with small amount of HSG Type C in valley bottom

	VCRAT			HEC-HMS Pre-Fire			HEC-HMS Post-Fire	
Location	**CP**	**Q_{100}**	**Q/sm**	**CP**	**Q_{100}**	**Q/sm**	**Q_{100}**	**Q/sm**
Pacific Ocean	20A	6018	1256	12C		0	3356	692
US of Yerba Buena Culvert	19A	5875	1308	13C		0	2855	622
Culvert No. 5 (off-site)	18A	5657	1367	15C		0	2410	603

Notes:

CN75 represents Open Brush (Sagebrush, Flattop Buckwhat (poor cover) or chamise (Narrow Leaf Chaparral (fair cover)

Similar Watershed Evaluation

Compare to:	Little Sycamore Creek at Pacific Ocean	
Watershed Area:	4.85	sm
Coastal Watershed		
VCRat Q100:	6018	cfs
Unit Peak Flow Rate:	1241	cfs/sm

Watershed	**Watershed Area, sm**	**Years of Record**	**Bul 17C Q_{100}, cfs**	**Adjusted to Q_{100} at Mouth of Little Sycamore**	**Unit Q, cfs/sm**	**NOAA 100-yr 24 hr Rainfall at Approx Centroid of Watershed**
Carpinteria	13.1	78	10,692	4,687	816	8.2
Little Sycamore	1.4	13	821	2,303	586	11.4
San Jose	5.5	55	4,497	4,051	818	9.3
Topanga	18.0	49	14,486	4,878	805	11.6

Note: Little Sycamore 100-yr rainfall at centroid of whole watershed = 9.27

Little Sycamore is the closest location but has a short record	586	cfs/sm
All others are grouped closely, the average is	813	cfs/sm
VCRat for Little Sycamore	1241	cfs/sm

	Between Pacific Ocean and Outlet from Yerba Buena Culvert	Btw Outlet from Yerba Buena Rd to Outlet from Upper Canyon	From Outlet Upper Canyon to end of topo
Return Period	**Pacific Ocean Q_{peak}**	**13R Q_{peak}**	**14R Q_{peak}**
1	325	315	310
2	570	550	535
5	980	950	920
10	1,395	1,350	1,300
25	2,035	1,970	1,890
50	2,575	2,490	2,395
100	3,160	3,060	2,920

	Between Pacific Ocean and Outlet from Yerba Buena Culvert*	Btw Outlet from Yerba Buena Rd to Outlet from Upper Canyon	From Outlet Upper Canyon to end of topo
Return Period	**Pacific Ocean Q_{peak}**	**13R Q_{peak}**	**14R Q_{peak}**
1	325	315	310.0
2	570	550	535
5	980	950	920
10	1,395	1,350	1,300
25	2,035	1,970	1,890
50	2,575	2,490	2,395
100	3,160	3,060	2,920

*Peak flow rate from next upstream CP (13C) was used for hydraulic analysis from 13C to Pacific Ocean because flow rate was slightly higher.

VALIDATION

Location: At Pacific Ocean

Return Period, years	WMS Peak Flow	SS Min Flow	SS Calc'd Flow	SS Max Flow
2	570	18	97	524
5	980	96	319	1050
10	1,395	207	544	1430
25	2,035	400	888	1970
50	2,575	572	1190	2480
100	3,250	725	1520	3160

```
-------------------------------
Bulletin 17C (Java) Frequency Analysis
    26 Jan 2021   08:13 AM
-------------------------------


--- Input Data ---

Analysis Name: Carpinteria Creek
Description:

Data Set Name: CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
DSS File Name: C:\Users\csteward\Documents\HEC\Little_Sycamore\Little_Sycamore.dss
DSS Pathname: /CARPINTERIA C/CARPINTERIA CA/FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Carpinteria_Creek\Carpinteria_Creek.rpt
XML File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Carpinteria_Creek\Carpinteria_Creek.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Hirsch-Stedinger

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---



<< EMA Representation of Data >>
CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
---------------------------------------------------------------------------------
|                   |          Value           |        Threshold        |      |
| Year     Peak     |     Low         High     |     Low        High     | Type |
|-------------------|--------------------------|-------------------------|------|
| 1941       803.0  |        803.0       803.0 |       450.0      1.0E99 | Syst |
| 1942        29.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1943     1,450.0  |      1,450.0     1,450.0 |       450.0      1.0E99 | Syst |
| 1944       450.0  |        450.0       450.0 |       450.0      1.0E99 | Syst |
| 1945     1,100.0  |      1,100.0     1,100.0 |       450.0      1.0E99 | Syst |
| 1946       208.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1947       700.0  |        700.0       700.0 |       450.0      1.0E99 | Syst |
| 1948        22.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1949        61.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1950       215.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1951         0.8  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1952     2,440.0  |      2,440.0     2,440.0 |       450.0      1.0E99 | Syst |
| 1953        72.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1954       227.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1955        31.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1956       230.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1957        77.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1958     1,980.0  |      1,980.0     1,980.0 |       450.0      1.0E99 | Syst |
| 1959       149.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1960        44.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1961       146.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1962     1,160.0  |      1,160.0     1,160.0 |       450.0      1.0E99 | Syst |
| 1963       105.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1964        89.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1965       326.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1966     2,300.0  |      2,300.0     2,300.0 |       450.0      1.0E99 | Syst |
| 1967     2,720.0  |      2,720.0     2,720.0 |       450.0      1.0E99 | Syst |
| 1968       120.0  |       1.0E-6       450.0 |       450.0      1.0E99 | Syst |
| 1969     4,560.0  |      4,560.0     4,560.0 |       450.0      1.0E99 | Syst |
| 1970     1,600.0  |      1,600.0     1,600.0 |       450.0      1.0E99 | Syst |
| 1971      215.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1972    8,880.0  |    8,880.0    8,880.0 |       450.0      1.0E99 | Syst |
| 1973    1,800.0  |    1,800.0    1,800.0 |       450.0      1.0E99 | Syst |
| 1974      570.0  |      570.0      570.0 |       450.0      1.0E99 | Syst |
| 1975      569.0  |      569.0      569.0 |       450.0      1.0E99 | Syst |
| 1976      227.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1977      246.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1978        ---  |    8,800.0    8,800.0 |       450.0      1.0E99 | Cens |
| 1979    2,000.0  |    2,000.0    2,000.0 |       450.0      1.0E99 | Syst |
| 1980    2,000.0  |    2,000.0    2,000.0 |       450.0      1.0E99 | Syst |
| 1981      163.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1982      334.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1983    2,750.0  |    2,750.0    2,750.0 |       450.0      1.0E99 | Syst |
| 1984      750.0  |      750.0      750.0 |       450.0      1.0E99 | Syst |
| 1985       73.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1986    1,180.0  |    1,180.0    1,180.0 |       450.0      1.0E99 | Syst |
| 1987      109.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1988      113.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1989       35.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1990       24.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 1991      846.0  |      846.0      846.0 |       450.0      1.0E99 | Syst |
| 1992    1,410.0  |    1,410.0    1,410.0 |       450.0      1.0E99 | Syst |
| 1993      905.0  |      905.0      905.0 |       450.0      1.0E99 | Syst |
| 1994      654.0  |      654.0      654.0 |       450.0      1.0E99 | Syst |
| 1995    7,960.0  |    7,960.0    7,960.0 |       450.0      1.0E99 | Syst |
| 1996    1,060.0  |    1,060.0    1,060.0 |       450.0      1.0E99 | Syst |
| 1997    2,220.0  |    2,220.0    2,220.0 |       450.0      1.0E99 | Syst |
| 1998    5,930.0  |    5,930.0    5,930.0 |       450.0      1.0E99 | Syst |
| 1999       45.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2000      512.0  |      512.0      512.0 |       450.0      1.0E99 | Syst |
| 2001    1,160.0  |    1,160.0    1,160.0 |       450.0      1.0E99 | Syst |
| 2002       13.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2003    1,270.0  |    1,270.0    1,270.0 |       450.0      1.0E99 | Syst |
| 2004        1.7  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2005    4,500.0  |    4,500.0    4,500.0 |       450.0      1.0E99 | Syst |
| 2006      896.0  |      896.0      896.0 |       450.0      1.0E99 | Syst |
| 2007       27.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2008    2,350.0  |    2,350.0    2,350.0 |       450.0      1.0E99 | Syst |
| 2009       22.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2010      520.0  |      520.0      520.0 |       450.0      1.0E99 | Syst |
| 2011    1,110.0  |    1,110.0    1,110.0 |       450.0      1.0E99 | Syst |
| 2012       11.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2013        2.5  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2014       37.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2015        2.6  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2016       17.0  |     1.0E-6      450.0 |       450.0      1.0E99 | Syst |
| 2017    1,970.0  |    1,970.0    1,970.0 |       450.0      1.0E99 | Syst |
| 2018      793.0  |      793.0      793.0 |       450.0      1.0E99 | Syst |
| 2019      972.0  |      972.0      972.0 |       450.0      1.0E99 | Syst |
|------------------|-------------------------|------------------------|------|


-------------------------------------------------------------------------------------------------
  Fitted log10 Moments                                  Mean      Variance    Std Dev       Skew
-------------------------------------------------------------------------------------------------
  EMA at-site data w/o regional info                 2.630136    0.512999    0.716240   -0.502088
  EMA w/ regional info and B17b MSE(G)               2.630136    0.512999    0.716240   -0.502088
  EMA w/ regional info and specified MSE(G)          2.630136    0.512999    0.716240   -0.502088
-------------------------------------------------------------------------------------------------


  EMA Estimate of MSE[G at-site]                     0.096289
  MSE[G at-site systematic]                          0.097287
  Equivalent Record Length [G at-site]              78.808473
  Equivalent Record Length [Syst+Hist-LowOutl]      40.000000
  Grubbs-Beck Critical Value                       450.000000



--- Final Results ---

<< Plotting Positions >>
CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
--------------------------------------------------------------------
```

```
                                         Carpinteria_Creek
|     Events Analyzed       |           Ordered Events              |
|                      FLOW |          Water        FLOW     H-S    |
| Day Mon Year          CFS |  Rank     Year         CFS  Plot Pos |
|---------------------------|---------------------------------------|
|  03 Mar 1941       803.0  |    1      1972     8,880.0    1.24    |
|  29 Dec 1941        29.0  |    2      1995     7,960.0    3.71    |
|  22 Jan 1943     1,450.0  |    3      1998     5,930.0    4.94    |
|  22 Feb 1944       450.0  |    4      1969     4,560.0    6.18    |
|  02 Feb 1945     1,100.0  |    5      2005     4,500.0    7.41    |
|  30 Mar 1946       208.0  |    6      1983     2,750.0    8.65    |
|  20 Nov 1946       700.0  |    7      1967     2,720.0    9.89    |
|  24 Mar 1948        22.0  |    8      1952     2,440.0   11.12    |
|  17 Dec 1948        61.0  |    9      2008     2,350.0   12.36    |
|  06 Feb 1950       215.0  |   10      1966     2,300.0   13.59    |
|  11 Jan 1951         0.8  |   11      1997     2,220.0   14.83    |
|  15 Jan 1952     2,440.0  |   12      1980     2,000.0   16.06    |
|  15 Nov 1952        72.0  |   13      1979     2,000.0   17.30    |
|  24 Jan 1954       227.0  |   14      1958     1,980.0   18.54    |
|  18 Jan 1955        31.0  |   15      2017     1,970.0   19.77    |
|  26 Jan 1956       230.0  |   16      1973     1,800.0   21.01    |
|  28 Feb 1957        77.0  |   17      1970     1,600.0   22.24    |
|  03 Apr 1958     1,980.0  |   18      1943     1,450.0   23.48    |
|  16 Feb 1959       149.0  |   19      1992     1,410.0   24.71    |
|  01 Feb 1960        44.0  |   20      2003     1,270.0   25.95    |
|  05 Nov 1960       146.0  |   21      1986     1,180.0   27.19    |
|  10 Feb 1962     1,160.0  |   22      2001     1,160.0   28.42    |
|  09 Feb 1963       105.0  |   23      1962     1,160.0   29.66    |
|  01 Apr 1964        89.0  |   24      2011     1,110.0   30.89    |
|  09 Apr 1965       326.0  |   25      1945     1,100.0   32.13    |
|  24 Nov 1965     2,300.0  |   26      1996     1,060.0   33.36    |
|  06 Dec 1966     2,720.0  |   27      2019       972.0   34.60    |
|  08 Mar 1968       120.0  |   28      1993       905.0   35.83    |
|  25 Jan 1969     4,560.0  |   29      2006       896.0   37.07    |
|  21 Jan 1970     1,600.0  |   30      1991       846.0   38.31    |
|  29 Nov 1970       215.0  |   31      1941       803.0   39.54    |
|  27 Dec 1971     8,880.0  |   32      2018       793.0   40.78    |
|  11 Feb 1973     1,800.0  |   33      1984       750.0   42.01    |
|  07 Jan 1974       570.0  |   34      1947       700.0   43.25    |
|  04 Dec 1974       569.0  |   35      1994       654.0   44.48    |
|  09 Feb 1976       227.0  |   36      1974       570.0   45.72    |
|  02 Jan 1977       246.0  |   37      1975       569.0   46.96    |
|  01 Jan 1978         ---  |   38      2010       520.0   48.19    |
|  27 Mar 1979     2,000.0  |   39      2000       512.0   49.43    |
|  16 Feb 1980     2,000.0  |   40      1944       450.0   50.66    |
|  05 Mar 1981       163.0  |   41      1982       334.0*  51.91    |
|  01 Apr 1982       334.0  |   42      1965       326.0*  53.19    |
|  24 Jan 1983     2,750.0  |   43      1977       246.0*  54.46    |
|  01 Oct 1983       750.0  |   44      1956       230.0*  55.74    |
|  16 Dec 1984        73.0  |   45      1976       227.0*  57.02    |
|  14 Feb 1986     1,180.0  |   46      1954       227.0*  58.29    |
|  06 Mar 1987       109.0  |   47      1971       215.0*  59.57    |
|  17 Jan 1988       113.0  |   48      1950       215.0*  60.84    |
|  08 Feb 1989        35.0  |   49      1946       208.0*  62.12    |
|  17 Feb 1990        24.0  |   50      1981       163.0*  63.39    |
|  18 Mar 1991       846.0  |   51      1959       149.0*  64.67    |
|  12 Feb 1992     1,410.0  |   52      1961       146.0*  65.94    |
|  17 Jan 1993       905.0  |   53      1968       120.0*  67.22    |
|  20 Feb 1994       654.0  |   54      1988       113.0*  68.49    |
|  10 Jan 1995     7,960.0  |   55      1987       109.0*  69.77    |
|  20 Feb 1996     1,060.0  |   56      1963       105.0*  71.05    |
|  26 Jan 1997     2,220.0  |   57      1964        89.0*  72.32    |
|  23 Feb 1998     5,930.0  |   58      1957        77.0*  73.60    |
|  09 Feb 1999        45.0  |   59      1985        73.0*  74.87    |
|  23 Feb 2000       512.0  |   60      1953        72.0*  76.15    |
|  05 Mar 2001     1,160.0  |   61      1949        61.0*  77.42    |
|  24 Nov 2001        13.0  |   62      1999        45.0*  78.70    |
|  15 Mar 2003     1,270.0  |   63      1960        44.0*  79.97    |
|  25 Feb 2004         1.7  |   64      2014        37.0*  81.25    |
|  10 Jan 2005     4,500.0  |   65      1989        35.0*  82.53    |
|  04 Apr 2006       896.0  |   66      1955        31.0*  83.80    |
|  28 Jan 2007        27.0  |   67      1942        29.0*  85.08    |
|  04 Jan 2008     2,350.0  |   68      2007        27.0*  86.35    |
|  06 Feb 2009        22.0  |   69      1990        24.0*  87.63    |
|  20 Jan 2010       520.0  |   70      2009        22.0*  88.90    |
|  19 Dec 2010     1,110.0  |   71      1948        22.0*  90.18   |
|  13 Apr 2012        11.0  |   72      2016        17.0*  91.45   |
|  24 Dec 2012         2.5  |   73      2002        13.0*  92.73   |
|  01 Mar 2014        37.0  |   74      2012        11.0*  94.01   |
|  12 Dec 2014         2.6  |   75      2015         2.6*  95.28   |
|  06 Mar 2016        17.0  |   76      2013         2.5*  96.56   |
|  17 Feb 2017     1,970.0  |   77      2004         1.7*  97.83   |
|  22 Mar 2018       793.0  |   78      1951         0.8*  99.11   |
|  01 Jan 2019       972.0  |   79      1978         ---    2.47   |
|---------------------------|-------------------------------------|
                                                   * Outlier
* Low outlier plotting positions are computed using Median parameters.
```

```
<< Frequency Curve >>
CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
----------------------------------------------------------------------------
|   Computed      Variance      |  Percent    |      Confidence Limits      |
|     Curve       Log(EMA)      |  Chance     |        0.05          0.95 |
|          FLOW, CFS            | Exceedance  |          FLOW, CFS          |
|-------------------------------|-------------|-----------------------------|
|      18,351.3       0.03730  |    0.200    |      67,289.3      10,311.1 |
|      13,764.6       0.02912  |    0.500    |      43,311.1       8,211.6 |
|      10,692.3       0.02359  |    1.000    |      29,145.6       6,675.5 |
|       7,982.9       0.01859  |    2.000    |      18,599.4       5,199.5 |
|       4,983.8       0.01275  |    5.000    |       9,109.2       3,445.8 |
|       3,169.4       0.00901  |   10.000    |       4,945.0       2,290.6 |
|       1,752.4       0.00655  |   20.000    |       2,469.2       1,294.9 |
|         489.6       0.01329  |   50.000    |         655.1         188.7 |
|         112.5       0.05552  |   80.000    |         193.1          18.8 |
|          48.1       0.10581  |   90.000    |         104.0           4.1 |
|          22.9       0.17031  |   95.000    |          62.5           1.0 |
|           5.1       0.37201  |   99.000    |          24.1           0.1 |
|-------------------------------|-------------|-----------------------------|
```

```
<< Multiple Grubbs-Beck Test P-Values >>
CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
--------------------------------
|    Number Of   |  P-Values    |
|  Low Outliers  |              |
|----------------|-------------|
|              1 |    1.302E-1 |
|              2 |    5.151E-2 |
|              3 |    1.664E-2 |
|              4 |    1.351E-3 |
|              5 |    1.655E-1 |
|              6 |    1.211E-1 |
|              7 |    1.570E-1 |
|              8 |    2.251E-1 |
|              9 |    1.004E-1 |
|             10 |    6.424E-2 |
|             11 |    5.013E-2 |
|             12 |    2.833E-2 |
|             13 |    1.464E-2 |
|             14 |    1.186E-2 |
|             15 |    5.268E-3 |
|             16 |    7.400E-3 |
|             17 |    2.327E-3 |
|             18 |    1.479E-2 |
|             19 |    2.611E-2 |
|             20 |    1.027E-2 |
|             21 |    5.585E-3 |
|             22 |    8.674E-3 |
|             23 |    1.851E-2 |
|             24 |    9.823E-3 |
|             25 |    4.762E-3 |
|             26 |    2.927E-3 |
|             27 |    1.054E-2 |
|             28 |    4.430E-3 |
|             29 |    4.366E-3 |
|             30 |    3.362E-2 |
|             31 |    2.060E-2 |
|             32 |    7.562E-3 |
|             33 |    5.213E-3 |
|             34 |    1.580E-3 |
|             35 |    5.026E-4 |
|             36 |    3.131E-4 |
|             37 |    4.833E-3 |
|             38 |    2.161E-3 |
|             39 |    5.629E-2 |
|----------------|-------------|
* = p-value corresponds to a zero flow value.


<< Systematic Statistics >>
CARPINTERIA C-CARPINTERIA CA-FLOW-ANNUAL PEAK
----------------------------------------------------------------
|        Log Transform:        |                               |
|          FLOW, CFS           |       Number of Events        |
|------------------------------|-------------------------------|
|  Mean                  2.630  |  Historic Events           0  |
|  Standard Dev          0.716  |  High Outliers          0     |
|  Station Skew         -0.502  |  Low Outliers          38     |
|  Regional Skew           ---  |  Zero Events            0     |
|  Weighted Skew           ---  |  Missing Events         1     |
|  Adopted Skew         -0.502  |  Systematic Events        78  |
|                              |  Historic Period          79  |
|------------------------------|-------------------------------|

--- End of Analytical Frequency Curve ---
```

```
-------------------------------
Bulletin 17C (Java) Frequency Analysis
    26 Jan 2021   03:14 PM
-------------------------------


--- Input Data ---

Analysis Name: Little Sycamore
Description:

Data Set Name: LITTLE SYCAMORE C-NEWBERRY PAR
DSS File Name: C:\Users\csteward\Documents\HEC\Little_Sycamore\Little_Sycamore.dss
DSS Pathname: /LITTLE SYCAMORE C/NEWBERRY PARK CA/FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Little_Sycamore\Little_Sycamore.rpt
XML File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Little_Sycamore\Little_Sycamore.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Hirsch-Stedinger

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---



<< EMA Representation of Data >>
LITTLE SYCAMORE C-NEWBERRY PAR
---------------------------------------------------------------------------------
|                   |           Value            |         Threshold         |      |
| Year     Peak     |      Low         High      |     Low         High      | Type |
|-------------------|----------------------------|---------------------------|------|
| 1961        1.0   |     1.0E-6        54.0     |       54.0      1.0E99    | Syst |
| 1962      206.0   |      206.0       206.0     |       54.0      1.0E99    | Syst |
| 1963        0.2   |     1.0E-6        54.0     |       54.0      1.0E99    | Syst |
| 1964        0.1   |     1.0E-6        54.0     |       54.0      1.0E99    | Syst |
| 1965        7.0   |     1.0E-6        54.0     |       54.0      1.0E99    | Syst |
| 1966      377.0   |      377.0       377.0     |       54.0      1.0E99    | Syst |
| 1967      215.0   |      215.0       215.0     |       54.0      1.0E99    | Syst |
| 1968      212.0   |      212.0       212.0     |       54.0      1.0E99    | Syst |
| 1969      240.0   |      240.0       240.0     |       54.0      1.0E99    | Syst |
| 1970       55.0   |       55.0        55.0     |       54.0      1.0E99    | Syst |
| 1971       78.0   |       78.0        78.0     |       54.0      1.0E99    | Syst |
| 1972       54.0   |       54.0        54.0     |       54.0      1.0E99    | Syst |
| 1973      117.0   |      117.0       117.0     |       54.0      1.0E99    | Syst |
|-------------------|----------------------------|---------------------------|------|


-------------------------------------------------------------------------------------------------
  Fitted log10 Moments                                 Mean      Variance    Std Dev       Skew
-------------------------------------------------------------------------------------------------
  EMA at-site data w/o regional info                 1.927199    0.201543    0.448936   -0.172389
  EMA w/ regional info and B17b MSE(G)               1.927199    0.201543    0.448936   -0.172389
  EMA w/ regional info and specified MSE(G)          1.927199    0.201543    0.448936   -0.172389
-------------------------------------------------------------------------------------------------


  EMA Estimate of MSE[G at-site]                     0.381761
  MSE[G at-site systematic]                          0.381761
  Equivalent Record Length [G at-site]              13.000000
  Equivalent Record Length [Syst+Hist-LowOutl]       9.000000
  Grubbs-Beck Critical Value                        54.000000
```

```
--- Final Results ---

<< Plotting Positions >>
LITTLE SYCAMORE C-NEWBERRY PAR
--------------------------------------------------------------------
|     Events Analyzed       |          Ordered Events             |
|                     FLOW  |          Water        FLOW    H-S   |
| Day Mon Year         CFS  |  Rank     Year         CFS  Plot Pos |
|---------------------------|--------------------------------------|
|  01 Jan 1961         1.0  |    1      1966       377.0    6.92   |
|  10 Feb 1962       206.0  |    2      1969       240.0   13.85   |
|  18 Sep 1963         0.2  |    3      1967       215.0   20.77   |
|  21 Jan 1964         0.1  |    4      1968       212.0   27.69   |
|  09 Apr 1965         7.0  |    5      1962       206.0   34.62   |
|  29 Dec 1965       377.0  |    6      1973       117.0   41.54   |
|  24 Jan 1967       215.0  |    7      1971        78.0   48.46   |
|  21 Nov 1967       212.0  |    8      1970        55.0   55.38   |
|  25 Jan 1969       240.0  |    9      1972        54.0   62.31   |
|  01 Mar 1970        55.0  |   10      1965         7.0*  72.39   |
|  29 Nov 1970        78.0  |   11      1961         1.0*  79.85   |
|  24 Dec 1971        54.0  |   12      1963         0.2*  87.31   |
|  01 Jan 1973       117.0  |   13      1964         0.1*  94.78   |
|---------------------------|--------------------------------------|
                                                        * Outlier
* Low outlier plotting positions are computed using Median parameters.



<< Frequency Curve >>
LITTLE SYCAMORE C-NEWBERRY PAR
----------------------------------------------------------------------------
|   Computed      Variance     |   Percent   |      Confidence Limits      |
|     Curve       Log(EMA)     |   Chance    |          0.05          0.95 |
|          FLOW, CFS            | Exceedance  |          FLOW, CFS          |
|------------------------------|-------------|-----------------------------|
|       1,336.0       0.11101  |    0.200    |       15,148.8         429.9 |
|       1,025.4       0.08555  |    0.500    |        8,148.8         373.9 |
|         821.1       0.06821  |    1.000    |        5,009.7         330.1 |
|         641.5       0.05261  |    2.000    |        3,023.3         285.3 |
|         439.5       0.03497  |    5.000    |        1,504.6         224.9 |
|         311.6       0.02436  |   10.000    |          875.6         178.4 |
|         203.4       0.01722  |   20.000    |          517.1         129.4 |
|          87.1       0.02055  |   50.000    |          199.3          50.0 |
|          35.8       0.05122  |   80.000    |           99.0          12.1 |
|          22.1       0.08272  |   90.000    |           80.2           5.5 |
|          14.7       0.11967  |   95.000    |           72.0           2.9 |
|           6.7       0.22459  |   99.000    |           68.0           0.8 |
|------------------------------|-------------|-----------------------------|


<< Multiple Grubbs-Beck Test P-Values >>
LITTLE SYCAMORE C-NEWBERRY PAR
--------------------------------
|    Number Of   |  P-Values   |
|  Low Outliers  |             |
|----------------|-------------|
|              1 |    2.185E-1 |
|              2 |    1.452E-2 |
|              3 |    1.496E-3 |
|              4 |    9.555E-4 |
|              5 |    3.246E-1 |
|              6 |    6.643E-2 |
|----------------|-------------|
* = p-value corresponds to a zero flow value.


<< Systematic Statistics >>
LITTLE SYCAMORE C-NEWBERRY PAR
----------------------------------------------------------------
|        Log Transform:        |                               |
|          FLOW, CFS           |       Number of Events        |
                                              Little_Sycamore
|------------------------------|-------------------------------|
|  Mean                 1.927  |  Historic Events           0  |
|  Standard Dev         0.449  |  High Outliers          0     |
|  Station Skew        -0.172  |  Low Outliers           4     |
|  Regional Skew          ---  |  Zero Events            0     |
|  Weighted Skew          ---  |  Missing Events         0     |
|  Adopted Skew        -0.172  |  Systematic Events        13  |
|------------------------------|-------------------------------|

--- End of Analytical Frequency Curve ---
```

```
-------------------------------
Bulletin 17C (Java) Frequency Analysis
    26 Jan 2021   08:25 AM
-------------------------------


--- Input Data ---

Analysis Name: San Jose Creek
Description:

Data Set Name: SAN JOSE C-GOLETA CA-FLOW-ANNU
DSS File Name: C:\Users\csteward\Documents\HEC\Little_Sycamore\Little_Sycamore.dss
DSS Pathname: /SAN JOSE C/GOLETA CA/FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\San_Jose_Creek\San_Jose_Creek.rpt
XML File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\San_Jose_Creek\San_Jose_Creek.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Hirsch-Stedinger

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---



<< EMA Representation of Data >>
SAN JOSE C-GOLETA CA-FLOW-ANNU
---------------------------------------------------------------------------------
|                   |          Value            |        Threshold        |      |
| Year     Peak     |     Low         High      |     Low        High     | Type |
|-------------------|---------------------------|-------------------------|------|
| 1941     1,960.0  |      1,960.0     1,960.0 |        87.0      1.0E99 | Syst |
| 1942       210.0  |        210.0       210.0 |        87.0      1.0E99 | Syst |
| 1943     1,780.0  |      1,780.0     1,780.0 |        87.0      1.0E99 | Syst |
| 1944       200.0  |        200.0       200.0 |        87.0      1.0E99 | Syst |
| 1945       500.0  |        500.0       500.0 |        87.0      1.0E99 | Syst |
| 1946       390.0  |        390.0       390.0 |        87.0      1.0E99 | Syst |
| 1947       500.0  |        500.0       500.0 |        87.0      1.0E99 | Syst |
| 1948        23.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 1949       150.0  |        150.0       150.0 |        87.0      1.0E99 | Syst |
| 1950       230.0  |        230.0       230.0 |        87.0      1.0E99 | Syst |
| 1951         5.2  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 1952     1,340.0  |      1,340.0     1,340.0 |        87.0      1.0E99 | Syst |
| 1953       120.0  |        120.0       120.0 |        87.0      1.0E99 | Syst |
| 1954       162.0  |        162.0       162.0 |        87.0      1.0E99 | Syst |
| 1955       119.0  |        119.0       119.0 |        87.0      1.0E99 | Syst |
| 1956       978.0  |        978.0       978.0 |        87.0      1.0E99 | Syst |
| 1957       286.0  |        286.0       286.0 |        87.0      1.0E99 | Syst |
| 1958       790.0  |        790.0       790.0 |        87.0      1.0E99 | Syst |
| 1959       254.0  |        254.0       254.0 |        87.0      1.0E99 | Syst |
| 1960        51.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 1961       102.0  |        102.0       102.0 |        87.0      1.0E99 | Syst |
| 1962     1,150.0  |      1,150.0     1,150.0 |        87.0      1.0E99 | Syst |
| 1963       258.0  |        258.0       258.0 |        87.0      1.0E99 | Syst |
| 1964       148.0  |        148.0       148.0 |        87.0      1.0E99 | Syst |
| 1965       360.0  |        360.0       360.0 |        87.0      1.0E99 | Syst |
| 1966     1,700.0  |      1,700.0     1,700.0 |        87.0      1.0E99 | Syst |
| 1967     1,620.0  |      1,620.0     1,620.0 |        87.0      1.0E99 | Syst |
| 1968       121.0  |        121.0       121.0 |        87.0      1.0E99 | Syst |
| 1969     2,000.0  |      2,000.0     2,000.0 |        87.0      1.0E99 | Syst |
| 1970       340.0  |        340.0       340.0 |        87.0      1.0E99 | Syst |
| 1971       257.0  |        257.0       257.0 |        87.0      1.0E99 | Syst |
| 1972       428.0  |        428.0       428.0 |        87.0      1.0E99 | Syst |
| 1973     1,220.0  |      1,220.0     1,220.0 |        87.0      1.0E99 | Syst |
| 1974       243.0  |        243.0       243.0 |        87.0      1.0E99 | Syst |
| 1975       902.0  |        902.0       902.0 |        87.0      1.0E99 | Syst |
| 1976       192.0  |        192.0       192.0 |        87.0      1.0E99 | Syst |
| 1977       285.0  |        285.0       285.0 |        87.0      1.0E99 | Syst |
| 1978     1,770.0  |      1,770.0     1,770.0 |        87.0      1.0E99 | Syst |
| 1979       163.0  |        163.0       163.0 |        87.0      1.0E99 | Syst |
| 1980     1,370.0  |      1,370.0     1,370.0 |        87.0      1.0E99 | Syst |
| 1981       267.0  |        267.0       267.0 |        87.0      1.0E99 | Syst |
| 1982       267.0  |        267.0       267.0 |        87.0      1.0E99 | Syst |
| 1983     1,440.0  |      1,440.0     1,440.0 |        87.0      1.0E99 | Syst |
| 1984       698.0  |        698.0       698.0 |        87.0      1.0E99 | Syst |
| 1985       146.0  |        146.0       146.0 |        87.0      1.0E99 | Syst |
| 1986       570.0  |        570.0       570.0 |        87.0      1.0E99 | Syst |
| 1987        87.0  |         87.0        87.0 |        87.0      1.0E99 | Syst |
| 1988       159.0  |        159.0       159.0 |        87.0      1.0E99 | Syst |
| 1989        26.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 1990       212.0  |        212.0       212.0 |        87.0      1.0E99 | Syst |
| 1991       830.0  |        830.0       830.0 |        87.0      1.0E99 | Syst |
| 1992     1,480.0  |      1,480.0     1,480.0 |        87.0      1.0E99 | Syst |
| 1993       531.0  |        531.0       531.0 |        87.0      1.0E99 | Syst |
| 1994       277.0  |        277.0       277.0 |        87.0      1.0E99 | Syst |
| 1995     1,470.0  |      1,470.0     1,470.0 |        87.0      1.0E99 | Syst |
| 1996       368.0  |        368.0       368.0 |        87.0      1.0E99 | Syst |
| 1997       400.0  |        400.0       400.0 |        87.0      1.0E99 | Syst |
| 1998     1,540.0  |      1,540.0     1,540.0 |        87.0      1.0E99 | Syst |
| 1999     2,500.0  |      1.0E-99     2,500.0 |        87.0      1.0E99 | Syst |
| 2000       321.0  |        321.0       321.0 |        87.0      1.0E99 | Syst |
| 2001     2,520.0  |      2,520.0     2,520.0 |        87.0      1.0E99 | Syst |
| 2002        13.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 2003       717.0  |        717.0       717.0 |        87.0      1.0E99 | Syst |
| 2004       654.0  |        654.0       654.0 |        87.0      1.0E99 | Syst |
| 2005     2,080.0  |      2,080.0     2,080.0 |        87.0      1.0E99 | Syst |
| 2006       543.0  |        543.0       543.0 |        87.0      1.0E99 | Syst |
| 2007        10.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 2008     1,380.0  |      1,380.0     1,380.0 |        87.0      1.0E99 | Syst |
| 2009       107.0  |        107.0       107.0 |        87.0      1.0E99 | Syst |
| 2010       455.0  |        455.0       455.0 |        87.0      1.0E99 | Syst |
| 2011     2,130.0  |      2,130.0     2,130.0 |        87.0      1.0E99 | Syst |
| 2012        50.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 2013        25.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 2014        50.0  |       1.0E-6        87.0 |        87.0      1.0E99 | Syst |
| 2015       221.0  |        221.0       221.0 |        87.0      1.0E99 | Syst |
| 2016       179.0  |        179.0       179.0 |        87.0      1.0E99 | Syst |
| 2017     1,500.0  |      1,500.0     1,500.0 |        87.0      1.0E99 | Syst |
| 2018       113.0  |        113.0       113.0 |        87.0      1.0E99 | Syst |
| 2019     2,290.0  |      2,290.0     2,290.0 |        87.0      1.0E99 | Syst |
|-------------------|--------------------------|-------------------------|------|


-------------------------------------------------------------------------------------------------
  Fitted log10 Moments                              Mean      Variance    Std Dev       Skew
-------------------------------------------------------------------------------------------------
  EMA at-site data w/o regional info               2.550648    0.278048    0.527302   -0.318120
  EMA w/ regional info and B17b MSE(G)             2.550648    0.278048    0.527302   -0.318120
  EMA w/ regional info and specified MSE(G)        2.550648    0.278048    0.527302   -0.318120
-------------------------------------------------------------------------------------------------


  EMA Estimate of MSE[G at-site]                   0.084319
  MSE[G at-site systematic]                        0.085245
  Equivalent Record Length [G at-site]            78.856508
  Equivalent Record Length [Syst+Hist-LowOutl]    70.000000
  Grubbs-Beck Critical Value                      87.000000



--- Final Results ---

<< Plotting Positions >>
SAN JOSE C-GOLETA CA-FLOW-ANNU
--------------------------------------------------------------------
```

```
                                             San_Jose_Creek
|     Events Analyzed       |            Ordered Events            |
|                     FLOW  |          Water        FLOW    H-S    |
| Day Mon Year         CFS  |  Rank     Year         CFS  Plot Pos |
|---------------------------|--------------------------------------|
|  04 Apr 1941     1,960.0  |    1      2001     2,520.0    1.25   |
|  14 Apr 1942       210.0  |    2      1999     2,500.0    2.14   |
|  21 Jan 1943     1,780.0  |    3      2019     2,290.0    2.50   |
|  22 Feb 1944       200.0  |    4      2011     2,130.0    3.74   |
|  02 Feb 1945       500.0  |    5      2005     2,080.0    4.99   |
|  29 Mar 1946       390.0  |    6      1969     2,000.0    6.24   |
|  20 Nov 1946       500.0  |    7      1941     1,960.0    7.49   |
|  24 Mar 1948        23.0  |    8      1943     1,780.0    8.73   |
|  04 Mar 1949       150.0  |    9      1978     1,770.0    9.98   |
|  06 Feb 1950       230.0  |   10      1966     1,700.0   11.23   |
|  11 Jan 1951         5.2  |   11      1967     1,620.0   12.48   |
|  15 Jan 1952     1,340.0  |   12      1998     1,540.0   13.73   |
|  20 Dec 1952       120.0  |   13      2017     1,500.0   14.97   |
|  24 Jan 1954       162.0  |   14      1992     1,480.0   16.22   |
|  18 Jan 1955       119.0  |   15      1995     1,470.0   17.47   |
|  24 Dec 1955       978.0  |   16      1983     1,440.0   18.72   |
|  17 Apr 1957       286.0  |   17      2008     1,380.0   19.96   |
|  03 Apr 1958       790.0  |   18      1980     1,370.0   21.21   |
|  05 Jan 1959       254.0  |   19      1952     1,340.0   22.46   |
|  27 Apr 1960        51.0  |   20      1973     1,220.0   23.71   |
|  12 Nov 1960       102.0  |   21      1962     1,150.0   24.95   |
|  09 Feb 1962     1,150.0  |   22      1956       978.0   26.20   |
|  09 Feb 1963       258.0  |   23      1975       902.0   27.45   |
|  20 Nov 1963       148.0  |   24      1991       830.0   28.70   |
|  09 Apr 1965       360.0  |   25      1958       790.0   29.95   |
|  16 Nov 1965     1,700.0  |   26      2003       717.0   31.19   |
|  24 Jan 1967     1,620.0  |   27      1984       698.0   32.44   |
|  08 Mar 1968       121.0  |   28      2004       654.0   33.69   |
|  25 Jan 1969     2,000.0  |   29      1986       570.0   34.94   |
|  28 Feb 1970       340.0  |   30      2006       543.0   36.18   |
|  29 Nov 1970       257.0  |   31      1993       531.0   37.43   |
|  27 Dec 1971       428.0  |   32      1947       500.0   38.68   |
|  18 Jan 1973     1,220.0  |   33      1945       500.0   39.93   |
|  06 Jan 1974       243.0  |   34      2010       455.0   41.18   |
|  03 Dec 1974       902.0  |   35      1972       428.0   42.42   |
|  09 Feb 1976       192.0  |   36      1997       400.0   43.67   |
|  02 Jan 1977       285.0  |   37      1946       390.0   44.92   |
|  16 Jan 1978     1,770.0  |   38      1996       368.0   46.17   |
|  27 Mar 1979       163.0  |   39      1965       360.0   47.41   |
|  16 Feb 1980     1,370.0  |   40      1970       340.0   48.66   |
|  01 Mar 1981       267.0  |   41      2000       321.0   49.91   |
|  01 Apr 1982       267.0  |   42      1957       286.0   51.16   |
|  24 Jan 1983     1,440.0  |   43      1977       285.0   52.41   |
|  01 Oct 1983       698.0  |   44      1994       277.0   53.65   |
|  19 Dec 1984       146.0  |   45      1982       267.0   54.90   |
|  14 Feb 1986       570.0  |   46      1981       267.0   56.15   |
|  06 Mar 1987        87.0  |   47      1963       258.0   57.40   |
|  29 Feb 1988       159.0  |   48      1971       257.0   58.64   |
|  09 Feb 1989        26.0  |   49      1959       254.0   59.89   |
|  17 Feb 1990       212.0  |   50      1974       243.0   61.14   |
|  18 Mar 1991       830.0  |   51      1950       230.0   62.39   |
|  12 Feb 1992     1,480.0  |   52      2015       221.0   63.63   |
|  25 Mar 1993       531.0  |   53      1990       212.0   64.88   |
|  20 Feb 1994       277.0  |   54      1942       210.0   66.13   |
|  10 Jan 1995     1,470.0  |   55      1944       200.0   67.38   |
|  04 Feb 1996       368.0  |   56      1976       192.0   68.63   |
|  26 Jan 1997       400.0  |   57      2016       179.0   69.87   |
|  03 Feb 1998     1,540.0  |   58      1979       163.0   71.12   |
|  01 Jan 1999     2,500.0  |   59      1954       162.0   72.37   |
|  23 Feb 2000       321.0  |   60      1988       159.0   73.62   |
|  04 Mar 2001     2,520.0  |   61      1949       150.0   74.86   |
|  12 Nov 2001        13.0  |   62      1964       148.0   76.11   |
|  15 Mar 2003       717.0  |   63      1985       146.0   77.36   |
|  25 Feb 2004       654.0  |   64      1968       121.0   78.61   |
|  10 Jan 2005     2,080.0  |   65      1953       120.0   79.86   |
|  02 Jan 2006       543.0  |   66      1955       119.0   81.10   |
|  28 Jan 2007        10.0  |   67      2018       113.0   82.35   |
|  27 Jan 2008     1,380.0  |   68      2009       107.0   83.60   |
|  15 Dec 2008       107.0  |   69      1961       102.0   84.85   |
|  14 Oct 2009       455.0  |   70      1987        87.0   86.09   |
|  20 Mar 2011     2,130.0  |   71      1960        51.0*  89.04   |
|  17 Mar 2012        50.0  |   72      2014        50.0*  90.30   |
|  24 Jan 2013        25.0  |   73      2012        50.0*  91.56   |
|  01 Mar 2014        50.0  |   74      1989        26.0*  92.82   |
|  12 Dec 2014       221.0  |   75      2013        25.0*  94.08   |
|  31 Jan 2016       179.0  |   76      1948        23.0*  95.34   |
|  17 Feb 2017     1,500.0  |   77      2002        13.0*  96.60   |
|  22 Mar 2018       113.0  |   78      2007        10.0*  97.86   |
|  01 Jan 2019     2,290.0  |   79      1951         5.2*  99.12   |
|---------------------------|--------------------------------------|
                                                     * Outlier
* Low outlier plotting positions are computed using Median parameters.


<< Frequency Curve >>
SAN JOSE C-GOLETA CA-FLOW-ANNU
----------------------------------------------------------------------------
|   Computed      Variance     |   Percent    |      Confidence Limits      |
|     Curve       Log(EMA)     |   Chance     |        0.05          0.95 |
|         FLOW, CFS            |  Exceedance  |         FLOW, CFS           |
|------------------------------|--------------|-----------------------------|
|       7,357.9       0.03300  |     0.200    |      20,099.7       4,328.2 |
|       5,642.5       0.02228  |     0.500    |      12,677.7       3,620.0 |
|       4,497.1       0.01591  |     1.000    |       8,789.0       3,066.7 |
|       3,481.0       0.01102  |     2.000    |       5,968.9       2,504.0 |
|       2,332.1       0.00672  |     5.000    |       3,428.8       1,767.8 |
|       1,606.6       0.00494  |    10.000    |       2,167.2       1,246.4 |
|       1,001.4       0.00416  |    20.000    |       1,293.0         785.8 |
|         378.9       0.00405  |    50.000    |         483.5         296.0 |
|         130.9       0.00670  |    80.000    |         170.7          86.8 |
|          72.4       0.01239  |    90.000    |          99.9          37.6 |
|          43.5       0.02185  |    95.000    |          65.4          17.3 |
|          15.9       0.05976  |    99.000    |          30.8           3.4 |
|------------------------------|--------------|-----------------------------|


<< Multiple Grubbs-Beck Test P-Values >>
SAN JOSE C-GOLETA CA-FLOW-ANNU
--------------------------------
|    Number Of   |  P-Values    |
|  Low Outliers  |              |
|----------------|--------------|
|              1 |    7.017E-2 |
|              2 |    3.068E-2 |
|              3 |    7.728E-3 |
|              4 |    2.836E-2 |
|              5 |    7.346E-3 |
|              6 |    1.057E-3 |
|              7 |    7.739E-2 |
|              8 |    2.227E-2 |
|              9 |    6.000E-3 |
|             10 |    3.414E-1 |
|             11 |    5.517E-1 |
|             12 |    5.063E-1 |
|             13 |    4.847E-1 |
|             14 |    4.618E-1 |
|             15 |    3.265E-1 |
|             16 |    2.096E-1 |
|             17 |    5.539E-1 |
|             18 |    4.430E-1 |
|             19 |    3.344E-1 |
|             20 |    3.544E-1 |
|             21 |    2.698E-1 |
|             22 |    1.704E-1 |
|             23 |    2.631E-1 |
|             24 |    3.243E-1 |
|             25 |    3.103E-1 |
|             26 |    3.214E-1 |
|             27 |    2.259E-1 |
|             28 |    2.153E-1 |
|             29 |    2.018E-1 |
|             30 |    2.252E-1 |
|             31 |    2.257E-1 |
|             32 |    1.537E-1 |
|             33 |    8.712E-2 |
|             34 |    7.047E-2 |
|             35 |    3.240E-2 |
|             36 |    2.441E-2 |
|             37 |    1.549E-2 |
|             38 |    5.948E-3 |
|             39 |    1.533E-2 |
|----------------|-------------|
* = p-value corresponds to a zero flow value.


<< Systematic Statistics >>
SAN JOSE C-GOLETA CA-FLOW-ANNU
----------------------------------------------------------------
|        Log Transform:         |                               |
|          FLOW, CFS            |       Number of Events        |
|------------------------------|-------------------------------|
|  Mean                 2.551  |  Historic Events           0  |
|  Standard Dev         0.527  |  High Outliers          0     |
|  Station Skew        -0.318  |  Low Outliers           9     |
|  Regional Skew          ---  |  Zero Events            0     |
|  Weighted Skew          ---  |  Missing Events         0     |
|  Adopted Skew        -0.318  |  Systematic Events        79  |
|------------------------------|-------------------------------|

--- End of Analytical Frequency Curve ---
```

```
-------------------------------
Bulletin 17C (Java) Frequency Analysis
    26 Jan 2021   08:26 AM
-------------------------------


--- Input Data ---

Analysis Name: Topanga Creek
Description:

Data Set Name: TOPANGA C-TOPANGA BCH CA-FLOW-
DSS File Name: C:\Users\csteward\Documents\HEC\Little_Sycamore\Little_Sycamore.dss
DSS Pathname: /TOPANGA C/TOPANGA BCH CA/FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Topanga_Creek\Topanga_Creek.rpt
XML File Name:
C:\Users\csteward\Documents\HEC\Little_Sycamore\Bulletin17Results\Topanga_Creek\Topanga_Creek.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Hirsch-Stedinger

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---



<< EMA Representation of Data >>
TOPANGA C-TOPANGA BCH CA-FLOW-
---------------------------------------------------------------------------------
|                   |           Value           |        Threshold         |      |
| Year     Peak     |     Low         High      |     Low         High     | Type |
|-------------------|---------------------------|--------------------------|------|
| 1930      340.0   |        340.0       340.0  |     1.0E-99      1.0E99  | Syst |
| 1931    1,370.0   |      1,370.0     1,370.0  |     1.0E-99      1.0E99  | Syst |
| 1932    1,250.0   |      1,250.0     1,250.0  |     1.0E-99      1.0E99  | Syst |
| 1933    1,430.0   |      1,430.0     1,430.0  |     1.0E-99      1.0E99  | Syst |
| 1934    4,510.0   |      4,510.0     4,510.0  |     1.0E-99      1.0E99  | Syst |
| 1935    1,200.0   |      1,200.0     1,200.0  |     1.0E-99      1.0E99  | Syst |
| 1936      528.0   |        528.0       528.0  |     1.0E-99      1.0E99  | Syst |
| 1937    1,130.0   |      1,130.0     1,130.0  |     1.0E-99      1.0E99  | Syst |
| 1938    7,960.0   |      7,960.0     7,960.0  |     1.0E-99      1.0E99  | Syst |
| 1939        ---   |     12,200.0    12,200.0  |     1.0E-99      1.0E99  | Cens |
| 1940    1,280.0   |      1,280.0     1,280.0  |     1.0E-99      1.0E99  | Syst |
| 1941    1,100.0   |      1,100.0     1,100.0  |     1.0E-99      1.0E99  | Syst |
| 1942      385.0   |        385.0       385.0  |     1.0E-99      1.0E99  | Syst |
| 1943    2,200.0   |      2,200.0     2,200.0  |     1.0E-99      1.0E99  | Syst |
| 1944    5,070.0   |      5,070.0     5,070.0  |     1.0E-99      1.0E99  | Syst |
| 1945      964.0   |        964.0       964.0  |     1.0E-99      1.0E99  | Syst |
| 1946      905.0   |        905.0       905.0  |     1.0E-99      1.0E99  | Syst |
| 1947      567.0   |        567.0       567.0  |     1.0E-99      1.0E99  | Syst |
| 1948      276.0   |        276.0       276.0  |     1.0E-99      1.0E99  | Syst |
| 1949       63.0   |         63.0        63.0  |     1.0E-99      1.0E99  | Syst |
| 1950      275.0   |        275.0       275.0  |     1.0E-99      1.0E99  | Syst |
| 1951       21.0   |         21.0        21.0  |     1.0E-99      1.0E99  | Syst |
| 1952    6,050.0   |      6,050.0     6,050.0  |     1.0E-99      1.0E99  | Syst |
| 1953      702.0   |        702.0       702.0  |     1.0E-99      1.0E99  | Syst |
| 1954    2,090.0   |      2,090.0     2,090.0  |     1.0E-99      1.0E99  | Syst |
| 1955      151.0   |        151.0       151.0  |     1.0E-99      1.0E99  | Syst |
| 1956    1,540.0   |      1,540.0     1,540.0  |     1.0E-99      1.0E99  | Syst |
| 1957      655.0   |        655.0       655.0  |     1.0E-99      1.0E99  | Syst |
| 1958    3,950.0   |      3,950.0     3,950.0  |     1.0E-99      1.0E99  | Syst |
| 1959    1,510.0   |      1,510.0     1,510.0  |     1.0E-99      1.0E99  | Syst |
| 1960       539.0  |         539.0       539.0 |     1.0E-99      1.0E99 | Syst |
| 1961        28.0  |          28.0        28.0 |     1.0E-99      1.0E99 | Syst |
| 1962     2,790.0  |       2,790.0     2,790.0 |     1.0E-99      1.0E99 | Syst |
| 1963       569.0  |         569.0       569.0 |     1.0E-99      1.0E99 | Syst |
| 1964       196.0  |         196.0       196.0 |     1.0E-99      1.0E99 | Syst |
| 1965       716.0  |         716.0       716.0 |     1.0E-99      1.0E99 | Syst |
| 1966     3,500.0  |       3,500.0     3,500.0 |     1.0E-99      1.0E99 | Syst |
| 1967     2,280.0  |       2,280.0     2,280.0 |     1.0E-99      1.0E99 | Syst |
| 1968       567.0  |         567.0       567.0 |     1.0E-99      1.0E99 | Syst |
| 1969    12,200.0  |      12,200.0    12,200.0 |     1.0E-99      1.0E99 | Syst |
| 1970       844.0  |         844.0       844.0 |     1.0E-99      1.0E99 | Syst |
| 1971     3,020.0  |       3,020.0     3,020.0 |     1.0E-99      1.0E99 | Syst |
| 1972       588.0  |         588.0       588.0 |     1.0E-99      1.0E99 | Syst |
| 1973     3,840.0  |       3,840.0     3,840.0 |     1.0E-99      1.0E99 | Syst |
| 1974     2,060.0  |       2,060.0     2,060.0 |     1.0E-99      1.0E99 | Syst |
| 1975     1,670.0  |       1,670.0     1,670.0 |     1.0E-99      1.0E99 | Syst |
| 1976        72.0  |          72.0        72.0 |     1.0E-99      1.0E99 | Syst |
| 1977       219.0  |         219.0       219.0 |     1.0E-99      1.0E99 | Syst |
| 1978    10,100.0  |      10,100.0    10,100.0 |     1.0E-99      1.0E99 | Syst |
| 1979     2,490.0  |       2,490.0     2,490.0 |     1.0E-99      1.0E99 | Syst |
|-------------------|--------------------------|-------------------------|------|


-------------------------------------------------------------------------------------------------
  Fitted log10 Moments                                  Mean      Variance    Std Dev       Skew
-------------------------------------------------------------------------------------------------
  EMA at-site data w/o regional info                 2.999289    0.387860    0.622784   -0.620225
  EMA w/ regional info and B17b MSE(G)               2.999289    0.387860    0.622784   -0.620225
  EMA w/ regional info and specified MSE(G)          2.999289    0.387860    0.622784   -0.620225
-------------------------------------------------------------------------------------------------


  EMA Estimate of MSE[G at-site]                     0.149727
  MSE[G at-site systematic]                          0.152102
  Equivalent Record Length [G at-site]              49.776998
  Equivalent Record Length [Syst+Hist-LowOutl]      49.000000
  Grubbs-Beck Critical Value                         0.000000



--- Final Results ---

<< Plotting Positions >>
TOPANGA C-TOPANGA BCH CA-FLOW-
--------------------------------------------------------------------
|     Events Analyzed       |           Ordered Events             |
|                    FLOW   |          Water        FLOW    H-S    |
| Day Mon Year        CFS   |  Rank     Year         CFS  Plot Pos |
|---------------------------|--------------------------------------|
|  15 Mar 1930       340.0  |    1      1969    12,200.0    1.96   |
|  04 Feb 1931     1,370.0  |    2      1978    10,100.0    5.88   |
|  08 Feb 1932     1,250.0  |    3      1938     7,960.0    7.84   |
|  19 Jan 1933     1,430.0  |    4      1952     6,050.0    9.80   |
|  31 Dec 1933     4,510.0  |    5      1944     5,070.0   11.76   |
|  05 Jan 1935     1,200.0  |    6      1934     4,510.0   13.73   |
|  22 Feb 1936       528.0  |    7      1958     3,950.0   15.69   |
|  15 Mar 1937     1,130.0  |    8      1973     3,840.0   17.65   |
|  02 Mar 1938     7,960.0  |    9      1966     3,500.0   19.61   |
|  01 Jan 1939         ---  |   10      1971     3,020.0   21.57   |
|  01 Feb 1940     1,280.0  |   11      1962     2,790.0   23.53   |
|  20 Feb 1941     1,100.0  |   12      1979     2,490.0   25.49   |
|  28 Dec 1941       385.0  |   13      1967     2,280.0   27.45   |
|  22 Jan 1943     2,200.0  |   14      1943     2,200.0   29.41   |
|  22 Feb 1944     5,070.0  |   15      1954     2,090.0   31.37   |
|  02 Feb 1945       964.0  |   16      1974     2,060.0   33.33   |
|  23 Dec 1945       905.0  |   17      1975     1,670.0   35.29   |
|  20 Nov 1946       567.0  |   18      1956     1,540.0   37.25   |
|  24 Mar 1948       276.0  |   19      1959     1,510.0   39.22   |
|  26 Dec 1948        63.0  |   20      1933     1,430.0   41.18   |
|  18 Dec 1949       275.0  |   21      1931     1,370.0   43.14   |
|  11 Jan 1951        21.0  |   22      1940     1,280.0   45.10   |
|  15 Jan 1952     6,050.0  |   23      1932     1,250.0   47.06   |
|  01 Dec 1952       702.0  |   24      1935     1,200.0   49.02   |
|  13 Feb 1954     2,090.0  |   25      1937     1,130.0   50.98   |
|  18 Jan 1955       151.0  |   26      1941     1,100.0   52.94   |
|  26 Jan 1956     1,540.0  |   27      1945       964.0   54.90   |
|  23 Feb 1957       655.0  |   28      1946       905.0   56.86   |
|  03 Apr 1958     3,950.0  |   29      1970       844.0   58.82   |
|  06 Jan 1959     1,510.0  |   30      1965       716.0   60.78   |
|  27 Apr 1960       539.0  |   31      1953       702.0   62.75   |
|  26 Jan 1961        28.0  |   32      1957       655.0   64.71   |
|  10 Feb 1962     2,790.0  |   33      1972       588.0   66.67   |
|  09 Feb 1963       569.0  |   34      1963       569.0   68.63   |
|  21 Jan 1964       196.0  |   35      1968       567.0   70.59   |
|  09 Apr 1965       716.0  |   36      1947       567.0   72.55   |
|  29 Dec 1965     3,500.0  |   37      1960       539.0   74.51   |
|  24 Jan 1967     2,280.0  |   38      1936       528.0   76.47   |
|  08 Mar 1968       567.0  |   39      1942       385.0   78.43   |
|  25 Jan 1969    12,200.0  |   40      1930       340.0   80.39   |
|  04 Mar 1970       844.0  |   41      1948       276.0   82.35   |
|  29 Nov 1970     3,020.0  |   42      1950       275.0   84.31   |
|  27 Dec 1971       588.0  |   43      1977       219.0   86.27   |
|  11 Feb 1973     3,840.0  |   44      1964       196.0   88.24   |
|  07 Jan 1974     2,060.0  |   45      1955       151.0   90.20   |
|  06 Mar 1975     1,670.0  |   46      1976        72.0   92.16   |
|  09 Feb 1976        72.0  |   47      1949        63.0   94.12   |
|  03 Jan 1977       219.0  |   48      1961        28.0   96.08   |
|  04 Mar 1978    10,100.0  |   49      1951        21.0   98.04   |
|  01 Jan 1979     2,490.0  |   50      1939         ---    3.92   |
|---------------------------|---------------------------------------|
* Low outlier plotting positions are computed using Median parameters.


<< Frequency Curve >>
TOPANGA C-TOPANGA BCH CA-FLOW-
----------------------------------------------------------------------------
|   Computed      Variance      |   Percent    |      Confidence Limits      |
|    Curve       Log(EMA)       |   Chance     |        0.05          0.95 |
|         FLOW, CFS              | Exceedance   |          FLOW, CFS          |
|-------------------------------|--------------|-----------------------------|
|      21,666.7       0.06504  |    0.200     |      61,729.3       8,567.8 |
|      17,523.4       0.04431  |    0.500     |      41,565.1       8,115.6 |
|      14,486.0       0.03136  |    1.000     |      30,231.5       7,626.4 |
|      11,574.6       0.02100  |    2.000     |      21,517.3       6,939.3 |
|       7,994.8       0.01164  |    5.000     |      13,042.0       5,548.2 |
|       5,555.7       0.00799  |   10.000     |       8,286.3       4,037.3 |
|       3,413.1       0.00718  |   20.000     |       4,750.1       2,433.2 |
|       1,156.9       0.00945  |   50.000     |       1,694.0         792.3 |
|         318.1       0.01430  |   80.000     |         486.1         186.0 |
|         148.4       0.02297  |   90.000     |         242.7          69.0 |
|          75.4       0.03840  |   95.000     |         136.3          24.6 |
|          18.8       0.10629  |   99.000     |          45.3           1.8 |
|-------------------------------|--------------|-----------------------------|


<< Multiple Grubbs-Beck Test P-Values >>
TOPANGA C-TOPANGA BCH CA-FLOW-
--------------------------------
|    Number Of    |  P-Values    |
|  Low Outliers   |              |
|-----------------|--------------|
|               1 |    1.158E-1 |
|               2 |    1.178E-2 |
|               3 |    2.995E-2 |
|               4 |    5.596E-3 |
|               5 |    1.044E-1 |
|               6 |    1.671E-1 |
|               7 |    1.254E-1 |
|               8 |    2.323E-1 |
|               9 |    9.827E-2 |
|              10 |    1.998E-1 |
|              11 |    2.385E-1 |
|              12 |    7.769E-1 |
|              13 |    6.773E-1 |
|              14 |    6.418E-1 |
|              15 |    4.656E-1 |
|              16 |    2.995E-1 |
|             17 |    2.134E-1 |
|             18 |    2.768E-1 |
|             19 |    2.716E-1 |
|             20 |    1.713E-1 |
|             21 |    3.715E-1 |
|             22 |    3.907E-1 |
|             23 |    3.948E-1 |
|             24 |    6.194E-1 |
|----------------|-------------|
* = p-value corresponds to a zero flow value.


<< Systematic Statistics >>
TOPANGA C-TOPANGA BCH CA-FLOW-
----------------------------------------------------------------
|        Log Transform:        |                               |
|          FLOW, CFS           |       Number of Events        |
|------------------------------|-------------------------------|
|  Mean                 2.999  |  Historic Events           0  |
|  Standard Dev         0.623  |  High Outliers          0     |
|  Station Skew        -0.620  |  Low Outliers           0     |
|  Regional Skew          ---  |  Zero Events            0     |
|  Weighted Skew          ---  |  Missing Events         1     |
|  Adopted Skew        -0.620  |  Systematic Events        49  |
|                              |  Historic Period          50  |
|------------------------------|-------------------------------|

--- End of Analytical Frequency Curve ---
```

KEY TO REACHES

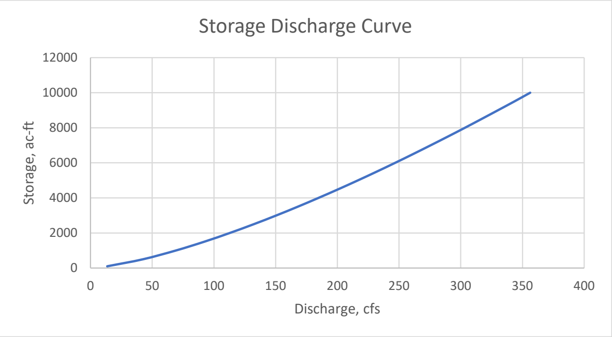
See attached diagram

Reach	US Section	DS Section	Add
18R	18569	15587	60B+61B
17R	14716	12771	62B
16R	12086	9189	63B
20R	8575	5707	64B
15R	5292	4538	65B
14R	4115	1652	66B
13R	1374	1000	67B

Reach: 18R

18569 To 15587

18569		18229		17736		17072		16221		15587		Vol$_{avg}$	Discharge
Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Vol$_{avg}$	Discharge
Discharge	Storage	x	y	x	y	x	y	x	y	x	y	ac-ft	cfs
0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	14.95362	100	14.47416	100	13.97193	100	13.26665	100	12.50999	100	12.05755	13.53898	100
500	46.9352	500	45.52383	500	43.8876	500	41.58016	500	39.25874	500	37.82053	42.50101	500
1000	76.34855	1000	74.1525	1000	71.46744	1000	67.6274	1000	63.86243	1000	61.53265	69.16516	1000
1500	101.5439	1500	98.71225	1500	95.22033	1500	90.13931	1500	85.10914	1500	81.99706	92.12033	1500
2000	124.3482	2000	120.949	2000	116.7208	2000	110.49	2000	104.2625	2000	100.4053	112.8626	2000
2500	145.6423	2500	141.7277	2500	136.8126	2500	129.5129	2500	122.1907	2500	117.6511	132.2562	2500
3000	165.7014	3000	161.324	3000	155.7607	3000	147.4408	3000	139.1	3000	133.924	150.5418	3000
3500	184.8453	3500	180.0214	3500	173.843	3500	164.5467	3500	155.2355	3500	149.4514	167.9906	3500
4000	203.1947	4000	197.9462	4000	191.1901	4000	180.9332	4000	170.6874	4000	164.3132	184.7108	4000
4500	221.0421	4500	215.3752	4500	208.0376	4500	196.8377	4500	185.6714	4500	178.7178	200.947	4500
5000	238.3671	5000	232.2825	5000	224.3365	5000	212.2148	5000	200.1501	5000	192.6292	216.6633	5000
5500	255.208	5500	248.7239	5500	240.1781	5500	227.1511	5500	214.214	5500	206.139	231.9357	5500
6000	271.6356	6000	264.7646	6000	255.6263	6000	241.705	6000	227.91	6000	219.2881	246.8216	6000
6500	287.6871	6500	280.4381	6500	270.7106	6500	255.9012	6500	241.2665	6500	232.1084	261.352	6500
7000	303.3961	7000	295.7754	7000	285.4677	7000	269.7866	7000	254.3333	7000	244.6507	275.5683	7000
7500	318.868	7500	310.8907	7500	300.0162	7500	283.47	7500	267.2178	7500	257.0225	289.5809	7500
8000	334.0945	8000	325.7623	8000	314.3138	8000	296.9062	8000	279.8666	8000	269.1641	303.3513	8000
8500	348.988	8500	340.3067	8500	328.2932	8500	310.0367	8500	292.2216	8500	281.0208	316.8112	8500
9000	363.7383	9000	354.7132	9000	342.1356	9000	323.038	9000	304.4553	9000	292.7549	330.1392	9000
9500	378.3833	9500	369.0197	9500	355.8823	9500	335.944	9500	316.5995	9500	304.4095	343.373	9500
10000	392.6612	10000	382.9639	10000	369.2565	10000	348.4747	10000	328.4098	10000	315.7499	356.2527	10000



Calc Initial Step

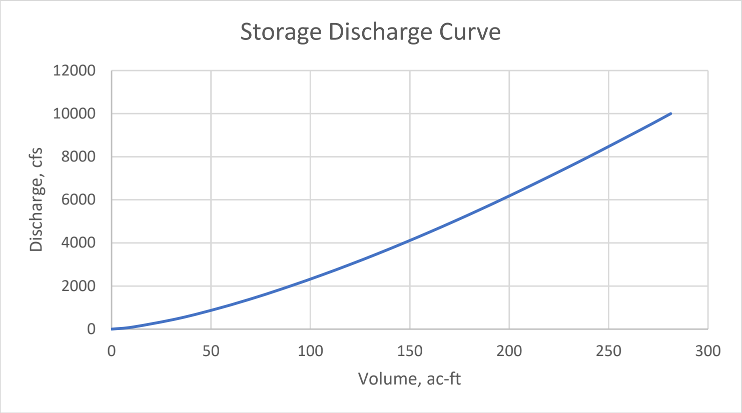
L_{Reach} = 4140 ft
$V_{assumed}$ = 6 fps
C = Vx1.5 = 9 fps
T_{step} = 1 minutes
Subreaches = 7.666667

Reach: 17R

14716 To 12771

14716 14188 13604 12771

Label	Volume	Label	Volume	Label	Volume	Label	Volume	Vol_{avg}	Discharge
x	y	x	y	x	y	x	y	ac-ft	cfs
0	0	0	0	0	0	0	0	0	0
100	11.53609	100	11.22517	100	10.74099	100	10.02984	10.88302	100
500	36.0605	500	34.9791	500	33.35999	500	31.08826	33.87196	500
1000	58.69035	1000	56.9	1000	54.28233	1000	50.60588	55.11964	1000
1500	78.21842	1500	75.80234	1500	72.31381	1500	67.48286	73.45436	1500
2000	95.78841	2000	92.80708	2000	88.52232	2000	82.64648	89.94107	2000
2500	112.2606	2500	108.7209	2500	103.6861	2500	96.83744	105.3763	2500
3000	127.8013	3000	123.7337	3000	117.9871	3000	110.2331	119.9388	3000
3500	142.6291	3500	138.0533	3500	131.6209	3500	123.0001	133.8259	3500
4000	156.7761	4000	151.7044	4000	144.6148	4000	135.1644	147.065	4000
4500	170.4728	4500	164.9075	4500	157.1796	4500	146.9156	159.8689	4500
5000	183.7022	5000	177.6607	5000	169.3165	5000	158.2676	172.2367	5000
5500	196.5347	5500	190.0244	5500	181.079	5500	169.2644	184.2256	5500
6000	209.0158	6000	202.0464	6000	192.5148	6000	179.953	195.8825	6000
6500	221.1771	6500	213.7593	6500	203.6596	6500	190.3704	207.2416	6500
7000	233.072	7000	225.2148	7000	214.5587	7000	200.5569	218.3506	7000
7500	244.8063	7500	236.5156	7500	225.3144	7500	210.6179	229.3136	7500
8000	256.3101	8000	247.5839	8000	235.8447	8000	220.4675	240.0516	8000
8500	267.5452	8500	258.3944	8500	246.126	8500	230.0782	250.536	8500
9000	278.6649	9000	269.0953	9000	256.3044	9000	239.5922	260.9142	9000
9500	289.7115	9500	279.7277	9500	266.422	9500	249.0553	271.2291	9500
10000	300.4502	10000	290.0544	10000	276.2367	10000	258.222	281.2408	10000



Calc Initial Step

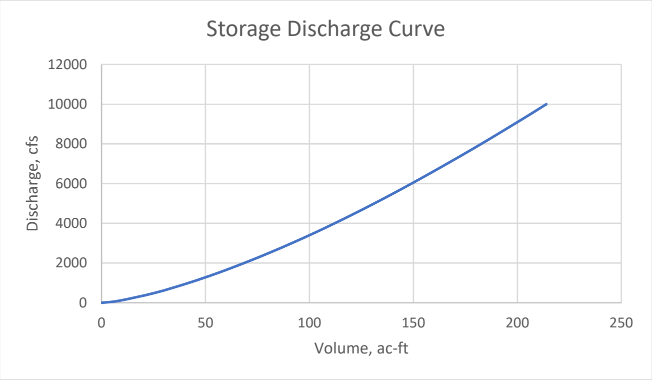
L_{Reach} = 2750 ft
$V_{assumed}$ = 8 fps
C = Vx1.5 = 12 fps
T_{step} = 1 minutes
Subreaches = 3.819444

Reach: 16R

12086 To 9189

12086 11074 10158 9638 9189

Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Vol$_{avg}$	Discharge
x	y	x	y	x	y	x	y	x	y	ac-ft	cfs
0	0	0	0	0	0	0	0	0	0	0	0
100	9.522757	100	8.753694	100	8.146609	100	7.749135	100	7.40942	8.316323	100
500	29.51237	500	27.05979	500	25.10391	500	23.90354	500	22.84316	25.68455	500
1000	48.01729	1000	44.08451	1000	40.92915	1000	38.9773	1000	37.24634	41.85092	1000
1500	64.05737	1500	58.87098	1500	54.68544	1500	52.09768	1500	49.79403	55.9011	1500
2000	78.46358	2000	72.14585	2000	67.05812	2000	63.91923	2000	61.10815	68.53899	2000
2500	91.93585	2500	84.55141	2500	78.59441	2500	74.92781	2500	71.64383	80.33066	2500
3000	104.6482	3000	96.2394	3000	89.45043	3000	85.28299	3000	81.55858	91.43592	3000
3500	116.762	3500	107.3738	3500	99.7892	3500	95.1506	3500	91.00394	102.0159	3500
4000	128.2909	4000	117.9637	4000	109.6128	4000	104.5223	4000	99.96965	112.0718	4000
4500	139.4058	4500	128.1713	4500	119.0809	4500	113.5567	4500	108.6212	121.7672	4500
5000	150.1344	5000	138.0258	5000	128.2296	5000	122.2837	5000	116.9767	131.13	5000
5500	160.5322	5500	147.5847	5500	137.103	5500	130.7491	5500	125.0792	140.2096	5500
6000	170.6463	6000	156.8965	6000	145.7319	6000	138.9858	6000	132.9614	149.0444	6000
6500	180.5352	6500	166.0075	6500	154.1445	6500	147.0116	6500	140.6406	157.6679	6500
7000	190.2073	7000	174.9213	7000	162.39	7000	154.8964	7000	148.1901	166.121	7000
7500	199.7649	7500	183.7361	7500	170.5271	7500	162.6624	7500	155.6255	174.4632	7500
8000	209.1205	8000	192.3625	8000	178.4849	8000	170.262	8000	162.9029	182.6266	8000
8500	218.247	8500	200.7742	8500	186.2806	8500	177.7311	8500	170.0531	190.6172	8500
9000	227.2807	9000	209.1019	9000	193.9608	9000	185.0673	9000	177.0792	198.498	9000
9500	236.2683	9500	217.394	9500	201.5675	9500	192.3072	9500	184.0123	206.3099	9500
10000	244.9668	10000	225.4072	10000	208.9962	10000	199.4298	10000	190.8344	213.9269	10000



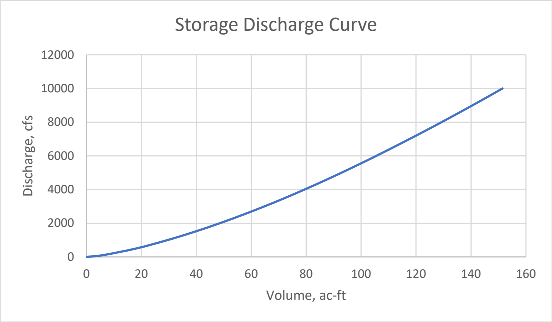
Calc Initial Step

L_{Reach} = 3720 ft
$V_{assumed}$ = 7 fps
C = Vx1.5 = 10.5 fps
T_{step} = 1 minutes
Subreache 5.904762

Reach: 20R

8575 To 5707

8575		8062		7694		7388		6663		6253		5707			
Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Vol$_{avg}$	Discharge
x	y	x	y	x	y	x	y	x	y	x	y	x	y	ac-ft	cfs
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	6.974456	100	6.606723	100	6.307813	100	6.034013	100	5.514512	100	5.136162	100	4.677819	5.893071	100
500	21.44832	500	20.30453	500	19.36736	500	18.57898	500	16.98177	500	15.78214	500	14.35165	18.11639	500
1000	34.96956	1000	33.1024	1000	31.56484	1000	30.31195	1000	27.70495	1000	25.75412	1000	23.44359	29.5502	1000
1500	46.76788	1500	44.31171	1500	42.2808	1500	40.60756	1500	37.01814	1500	34.40622	1500	31.31065	39.52899	1500
2000	57.40552	2000	54.41803	2000	51.95304	2000	49.91173	2000	45.45108	2000	42.2491	2000	38.44881	48.54819	2000
2500	67.30843	2500	63.80966	2500	60.93111	2500	58.55222	2500	53.27703	2500	49.53296	2500	45.08887	56.92861	2500
3000	76.62228	3000	72.63993	3000	69.37865	3000	66.67809	3000	60.62262	3000	56.36491	3000	51.31615	64.80323	3000
3500	85.49158	3500	81.04611	3500	77.42113	3500	74.41219	3500	67.59609	3500	62.8554	3500	57.23346	72.29371	3500
4000	93.90177	4000	89.01024	4000	85.02969	4000	81.73524	4000	74.22085	4000	69.02101	4000	62.85361	79.39606	4000
4500	102.0268	4500	96.70348	4500	92.38212	4500	88.81228	4500	80.61693	4500	74.97427	4500	68.28011	86.25658	4500
5000	109.8673	5000	104.1263	5000	99.47861	5000	95.6413	5000	86.78333	5000	80.7121	5000	73.50751	92.87377	5000
5500	117.476	5500	111.338	5500	106.3764	5500	102.2817	5500	92.77844	5500	86.29377	5500	78.59548	99.30567	5500
6000	124.8771	6000	118.3525	6000	113.0745	6000	108.7282	6000	98.59371	6000	91.70631	6000	83.52651	105.5513	6000
6500	132.0866	6500	125.1866	6500	119.6076	6500	115.0156	6500	104.2663	6500	96.98668	6500	88.3351	111.6407	6500
7000	139.1756	7000	131.9077	7000	126.0318	7000	121.1993	7000	109.8466	7000	102.184	7000	93.073	117.6311	7000
7500	146.1565	7500	138.5168	7500	132.347	7500	127.2792	7500	115.3338	7500	107.2962	7500	97.73542	123.5235	7500
8000	152.9862	8000	144.9894	8000	138.5359	8000	133.238	8000	120.7104	8000	112.3052	8000	102.303	129.2954	8000
8500	159.6972	8500	151.3554	8500	144.6182	8500	139.0949	8500	126.0094	8500	117.2439	8500	106.8084	134.9753	8500
9000	166.2946	9000	157.6134	9000	150.6026	9000	144.8549	9000	131.209	9000	122.0921	9000	111.2303	140.5567	9000
9500	172.8041	9500	163.7889	9500	156.5091	9500	150.5406	9500	136.3293	9500	126.8584	9500	115.5751	146.0579	9500
10000	179.2086	10000	169.8642	10000	162.3196	10000	156.1334	10000	141.3615	10000	131.5455	10000	119.8527	151.4694	10000



Calc Initial Step

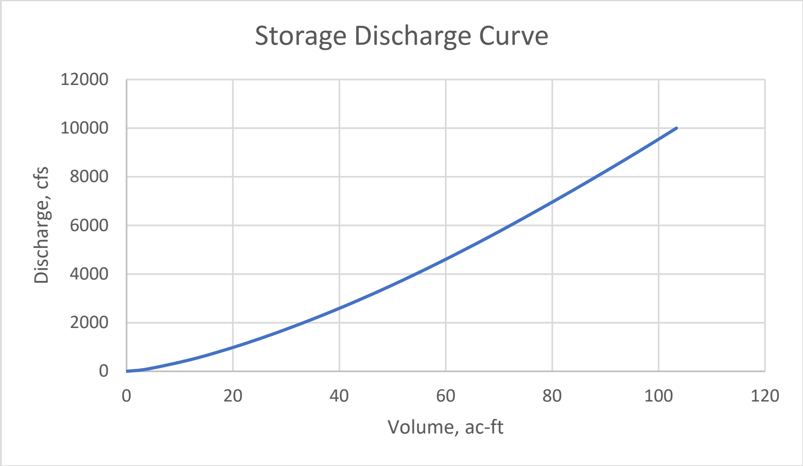
L_{Reach} = 3830 ft
$V_{assumed}$ = 7 fps
C = Vx1.5 = 10.5 fps
T_{step} = 1 minutes
Subreache 6.079365

Reach: 15R

5292 To 4538

5292 4965 4538

Label x	Volume y	Label x	Volume y	Label x	Volume y	Vol$_{avg}$ ac-ft	Discharge cfs
0	0	0	0	0	0	0	0
100	4.346347	100	4.081542	100	3.706017	4.044635	100
500	13.31768	500	12.50539	500	11.36872	12.39726	500
1000	21.76948	1000	20.46065	1000	18.5986	20.27624	1000
1500	29.06377	1500	27.33111	1500	24.87096	27.08861	1500
2000	35.67743	2000	33.55578	2000	30.55284	33.26202	2000
2500	41.83639	2500	39.34812	2500	35.82261	39.00237	2500
3000	47.60427	3000	44.77345	3000	40.7693	44.38234	3000
3500	53.09058	3500	49.93184	3500	45.4596	49.49401	3500
4000	58.29745	4000	54.82566	4000	49.90765	54.34359	4000
4500	63.32299	4500	59.54735	4500	54.19974	59.02336	4500
5000	68.15981	5000	64.08811	5000	58.32293	63.52362	5000
5500	72.86595	5500	68.50496	5500	62.33686	67.90259	5500
6000	77.42548	6000	72.78449	6000	66.2275	72.14583	6000
6500	81.87125	6500	76.95238	6500	70.00616	76.2766	6500
7000	86.25743	7000	81.06553	7000	73.7301	80.35102	7000
7500	90.56889	7500	85.10426	7500	77.3912	84.35478	7500
8000	94.7952	8000	89.06458	8000	80.97937	88.27972	8000
8500	98.9651	8500	92.97242	8500	84.52004	92.15252	8500
9000	103.0548	9000	96.80447	9000	87.99239	95.95056	9000
9500	107.073	9500	100.5703	9500	91.40456	99.68263	9500
10000	111.0298	10000	104.278	10000	94.76153	103.3564	10000



Calc Initial Step

L_{Reach} = 1200 ft

$V_{assumed}$ = 7 fps

C = Vx1.5 = 10.5 fps

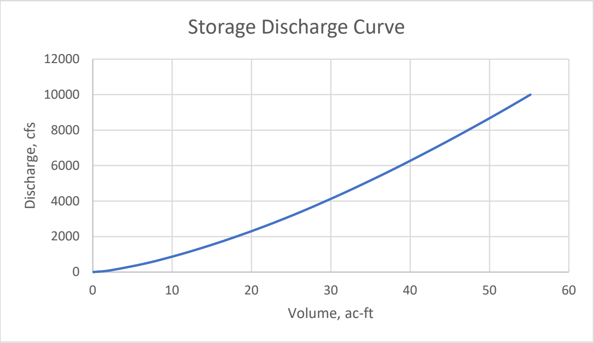
T_{step} = 1 minutes

Subreache: 1.904762

Reach: 14R

4115 To 1652

4115		3734		3238		2826		2282		1652			
Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Label	Volume	Vol_{avg}	Discharge
x	y	x	y	x	y	x	y	x	y	x	y	ac-ft	cfs
0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	3.336654	100	2.981853	100	2.439851	100	2.074486	100	1.582403	100	0.88081	2.216009	100
500	10.25616	500	9.084222	500	7.431323	500	6.290284	500	4.856002	500	2.691679	6.768279	500
1000	16.76424	1000	14.83334	1000	12.11669	1000	10.24733	1000	7.953219	1000	4.33441	11.04154	1000
1500	22.4261	1500	19.82499	1500	16.15012	1500	13.66122	1500	10.63221	1500	5.716604	14.73521	1500
2000	27.5436	2000	24.33718	2000	19.80635	2000	16.75749	2000	13.06107	2000	6.958278	18.07733	2000
2500	32.29486	2500	28.53351	2500	23.20018	2500	19.63132	2500	15.30829	2500	8.094178	21.17706	2500
3000	36.74784	3000	32.45527	3000	26.35797	3000	22.29742	3000	17.39356	3000	9.148825	24.06681	3000
3500	40.9634	3500	36.15918	3500	29.32754	3500	24.79994	3500	19.34622	3500	10.1257	26.787	3500
4000	44.95672	4000	39.66471	4000	32.1324	4000	27.15557	4000	21.17349	4000	11.04131	29.35403	4000
4500	48.81024	4500	43.05856	4500	34.86478	4500	29.45326	4500	22.9596	4500	11.93437	31.8468	4500
5000	52.50686	5000	46.31255	5000	37.479	5000	31.64537	5000	24.65749	5000	12.78197	34.23054	5000
5500	56.10786	5500	49.48209	5500	40.02497	5500	33.78216	5500	26.31656	5500	13.60582	36.55324	5500
6000	59.59938	6000	52.5508	6000	42.4889	6000	35.85388	6000	27.92258	6000	14.4033	38.80314	6000
6500	62.98628	6500	55.52686	6500	44.88421	6500	37.87408	6500	29.48793	6500	15.17921	40.98976	6500
7000	66.32246	7000	58.45459	7000	47.23115	7000	39.84919	7000	31.01705	7000	15.93579	43.13504	7000
7500	69.60753	7500	61.33405	7500	49.52612	7500	41.77473	7500	32.50747	7500	16.67294	45.23714	7500
8000	72.82593	8000	64.15129	8000	51.76963	8000	43.65931	8000	33.96524	8000	17.39302	47.29407	8000
8500	76.0022	8500	66.93295	8500	53.98194	8500	45.51487	8500	35.40143	8500	18.09907	49.32208	8500
9000	79.11517	9000	69.65643	9000	56.14417	9000	47.32829	9000	36.80474	9000	18.78625	51.30584	9000
9500	82.17258	9500	72.32976	9500	58.26046	9500	49.09848	9500	38.1721	9500	19.45461	53.248	9500
10000	85.17916	10000	74.95676	10000	60.33679	10000	50.83484	10000	39.51356	10000	20.10985	55.15516	10000



Calc Initial Step

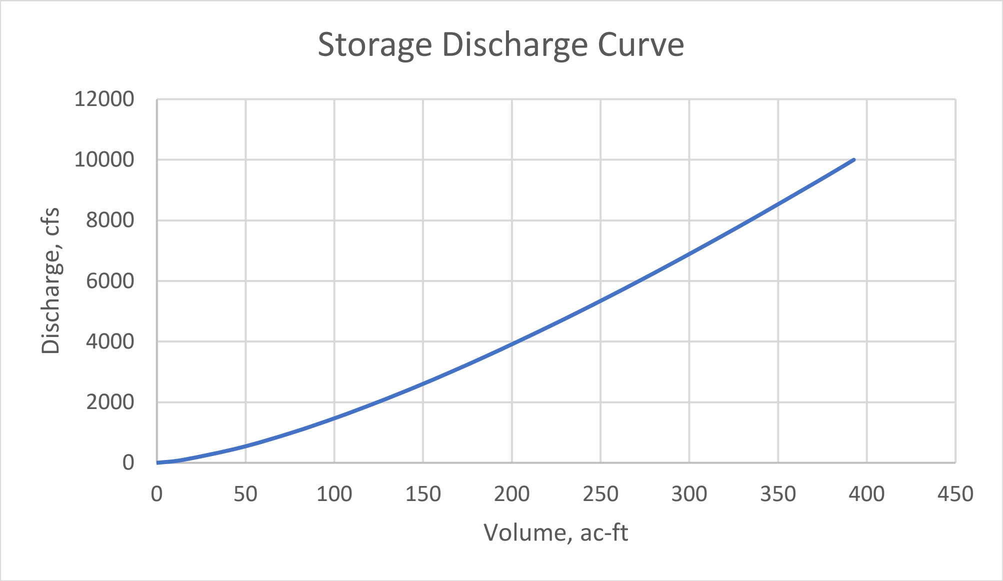
L_{Reach} = 3070 ft
$V_{assumed}$ = 9 fps
C = Vx1.5 = 13.5 fps
T_{step} = 1 minutes
Subreache 3.790123

Reach: 13R

1374

1374

Label x	Volume y	Vol_{avg} ac-ft	Discharge cfs
0	0	0	0
100	14.95362	14.95362	100
500	46.9352	46.9352	500
1000	76.34855	76.34855	1000
1500	101.5439	101.5439	1500
2000	124.3482	124.3482	2000
2500	145.6423	145.6423	2500
3000	165.7014	165.7014	3000
3500	184.8453	184.8453	3500
4000	203.1947	203.1947	4000
4500	221.0421	221.0421	4500
5000	238.3671	238.3671	5000
5500	255.208	255.208	5500
6000	271.6356	271.6356	6000
6500	287.6871	287.6871	6500
7000	303.3961	303.3961	7000
7500	318.868	318.868	7500
8000	334.0945	334.0945	8000
8500	348.988	348.988	8500
9000	363.7383	363.7383	9000
9500	378.3833	378.3833	9500
10000	392.6612	392.6612	10000



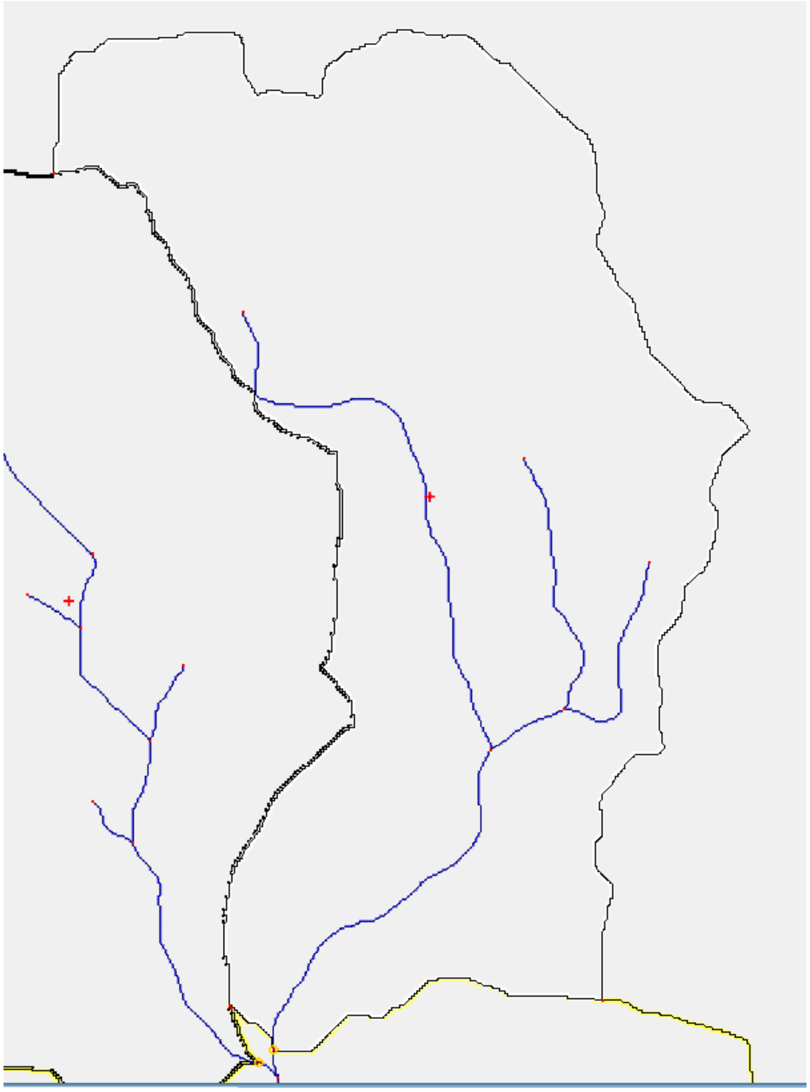
Calc Initial Step

L_{Reach} = 1090 ft
$V_{assumed}$ = 7 fps
C = Vx1.5 = 10.50 fps
T_{step} = 1 minutes
Subreache 1.730159

SUMMARY

Watershed	Tributary Area	100-yr 24-hr Rain Depth Used	100-yr 24-hr Rain Depth Calculated	Lag	Wt'd CN	Q_{100}
	acres	inches	inches	hours		cfs
60B	412.8	9.27	10.93	0.52	75.0	781
61B	387.8	9.27	9.90	0.37	75.0	897
62B	336.4	9.27	8.80	0.25	73.9	952
63B	385.2	9.27	9.27	0.41	74.6	834
64B	697.6	9.27	9.49	0.42	74.8	1,493
65B	341.4	9.27	8.70	0.24	74.4	996
66B	103.7	9.27	7.96	0.14	73.9	388
67B	275.0	9.27	7.67	0.44	73.7	562
68B	163.3	9.27	7.11	0.28	73.9	435

60B



A = 0.645 sm

L = 1.367 mi (max stream length)

Lc = 1.729 mi

S1 = 960 ft/mi (CP to Ridge)

S3 = 789 ft/mi (see calcs below)

ER = 0.453

ER x S3 / (Lc/L) = 283

Basin N = 0.055

Selected Slope for Lag = 789 ft/mi

T_{60B} = 0.52 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/mi	L/S$^{0.5}$
2026	0.1499	0.3837	791	0.014
619	0.1481	0.1172	782	0.004
		0.5009		0.0178

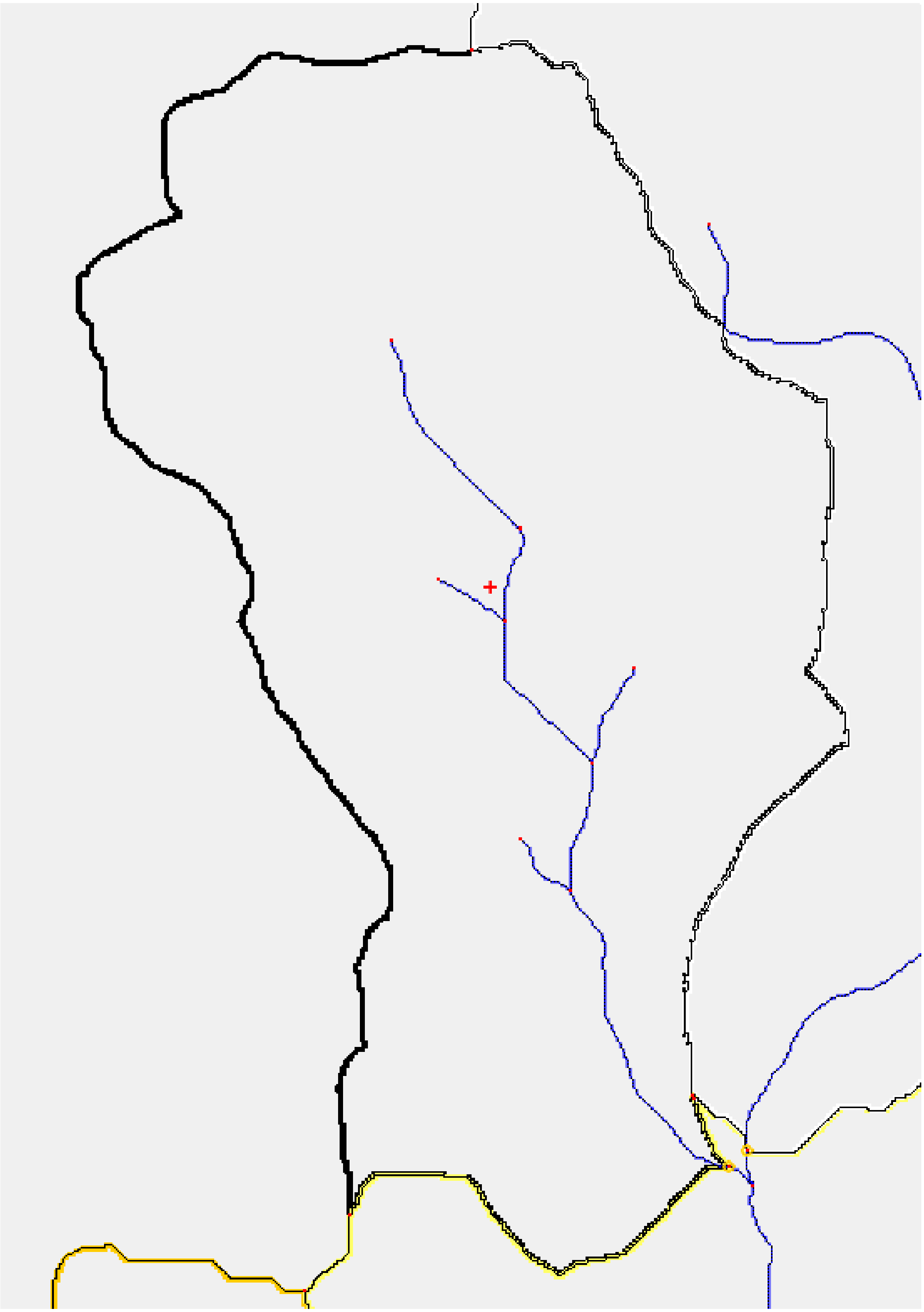
S3 = 789 ft/mi

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.645	75	48.375
Type C	0	68	0
Type B	0	55	0
Total	0.645		48.375
Wt'd CN		75	

61B



A = 0.606 sm
L = 1.069 mi (max stream length)
Lc = 0.732 mi
S1 = 1170 ft/mi (CP to Ridge)
S3 = 498 ft/mi (see calcs below)
ER = 0.439
ER x S3 / (Lc/L) = 319
Basin N = 0.055

Selected Slope for Lag = 498 ft/mi
T_{61B} = 0.37 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/mi	$L/S^{0.5}$
1362	0.2222	0.2580	1173	0.0075
568	0.1497	0.1076	790	0.0038
1012	0.137	0.1917	723	0.0071
771	0.1049	0.1460	554	0.0062
1975	0.0476	0.3741	251	0.0236
		1.0773		0.0483

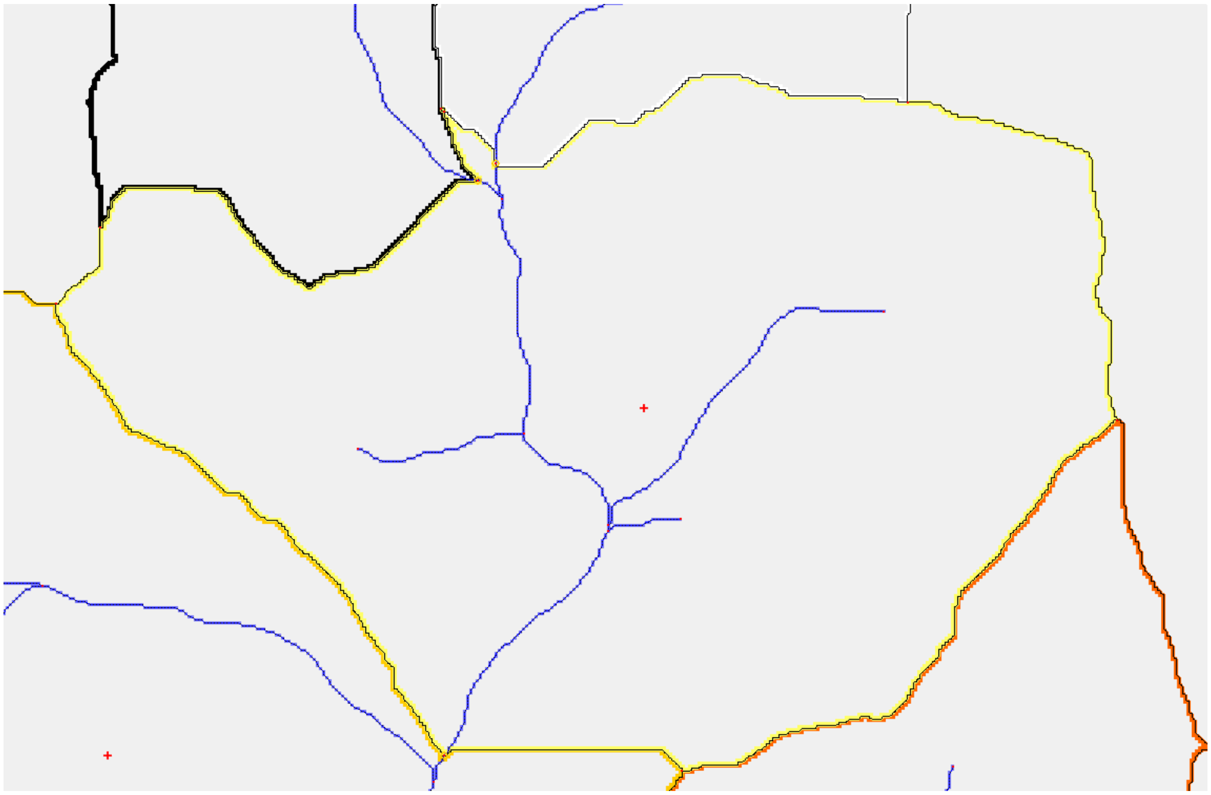
S3 = 498

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.606	75	45.45
Type C	0	68	0
Type B	0	55	0
Total	0.606		45.45
Wt'd CN		75	

62B



A = 0.525 sm
L = 0.760 mi (max stream length)
Lc = 0.476 mi
S1 = 887 ft/mi (CP to Ridge)
S3 = 224 ft/mi (see calcs below)
ER = 0.409
ER x S3 / (Lc/L) = 146
Basin N = 0.055

Selected Slope for Lag = 887 ft/mi
T_{62B} = 0.25 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/mi	$L/S^{0.5}$
1420	0.0253	0.2689	134	0.023
791	0.0519	0.1498	274	0.009
1666	0.0674	0.3155	356	0.017
		0.7343		0.0490

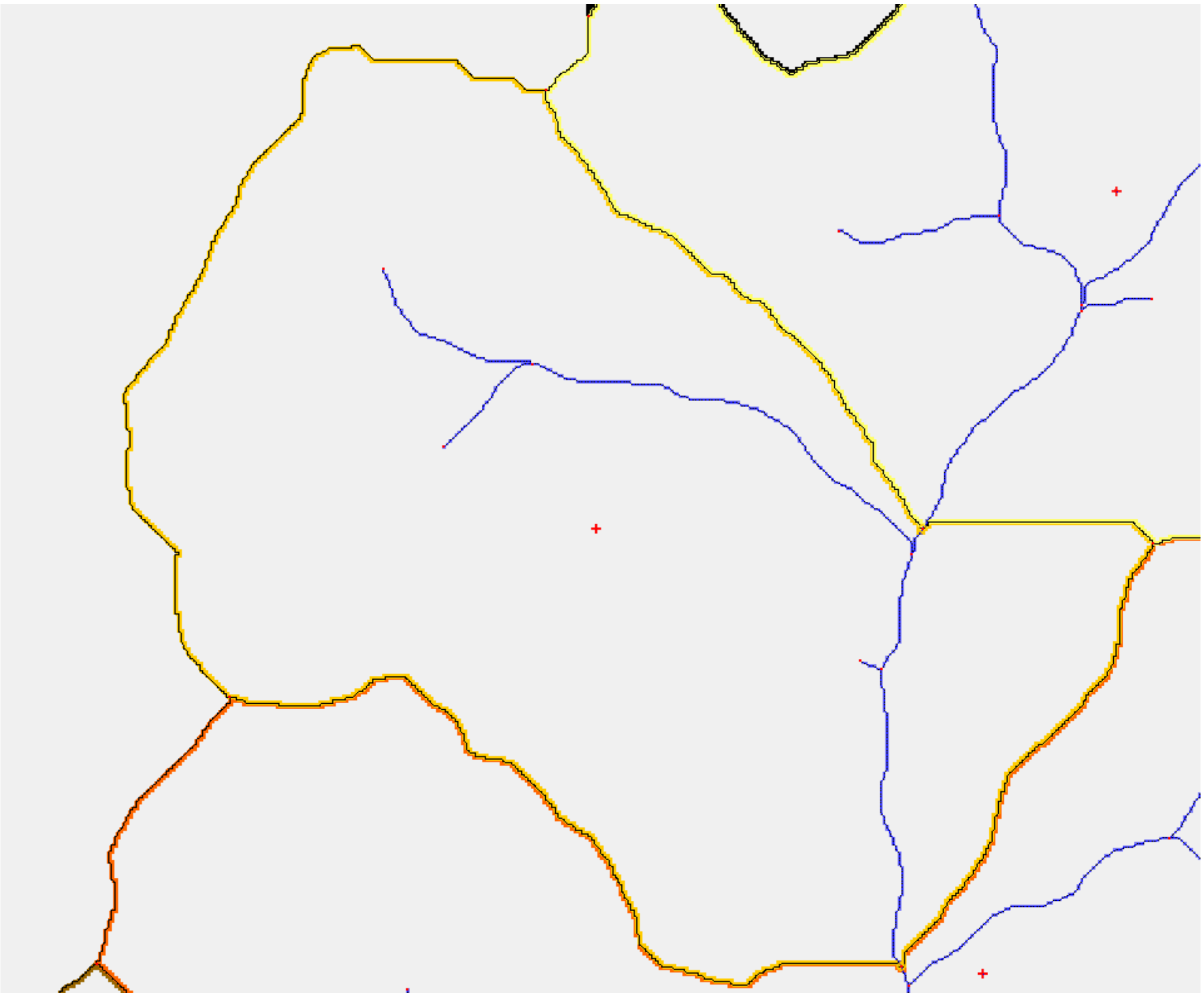
S3 = 224.14849

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.487	75	36.538
Type C	0.013	68	0.867
Type B	0.025	55	1.379
Total	0.525		38.784
Wt'd CN		73.9	

63B



A = 0.602 sm
L = 1.205 mi (max stream length)
Lc = 0.987 mi
S1 = 687 ft/mi (CP to Ridge)
S3 = 328 ft/mi (see calcs below)
ER = 0.438
ER x S3 / (Lc/L) = 175
Basin N = 0.055

Selected Slope for Lag = 687 ft/mi
T_{63B} = 0.41 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/mi	$L/S^{0.5}$
171	0.1874	0.0324	989	0.001
740	0.0945	0.1402	499	0.006

1836	0.0499	0.3477	263	0.021
		0.5203		0.0287

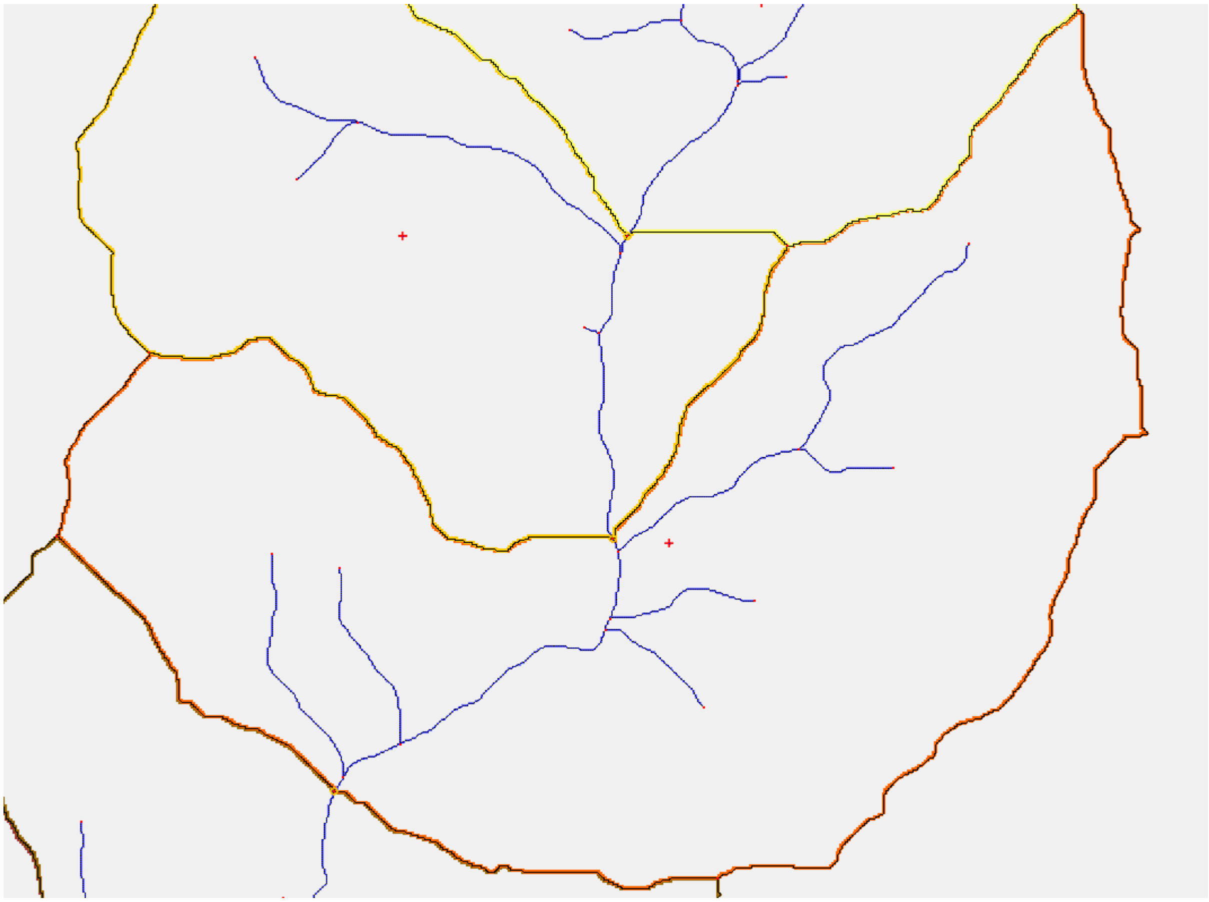
S3 = 328.01

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.590	75	44.219
Type C	0.000	68	0.000
Type B	0.012	55	0.659
Total	0.602		44.878
Wt'd CN		74.6	

64B



A = 1.091 sm

L = 1.502 mi (max stream length)

Lc = 0.739 mi

S1 = 782 ft/mi (CP to Ridge)

S3 = 520 ft/mi (see calcs below)

ER = 0.589

ER x S3 / (Lc/L) = 622

Basin N = 0.055

Selected Slope for Lag = 520 ft/mi

T_{64B} = 0.42 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/mi	$L/S^{0.5}$
2555	0.1387	0.484	732	0.018
1844	0.1125	0.349	594	0.014
606	0.0451	0.115	238	0.007
2146	0.091	0.406	480	0.019
592	0.0657	0.112	347	0.006

152	0.0812	0.029	429	0.001
		1.4953		0.0656

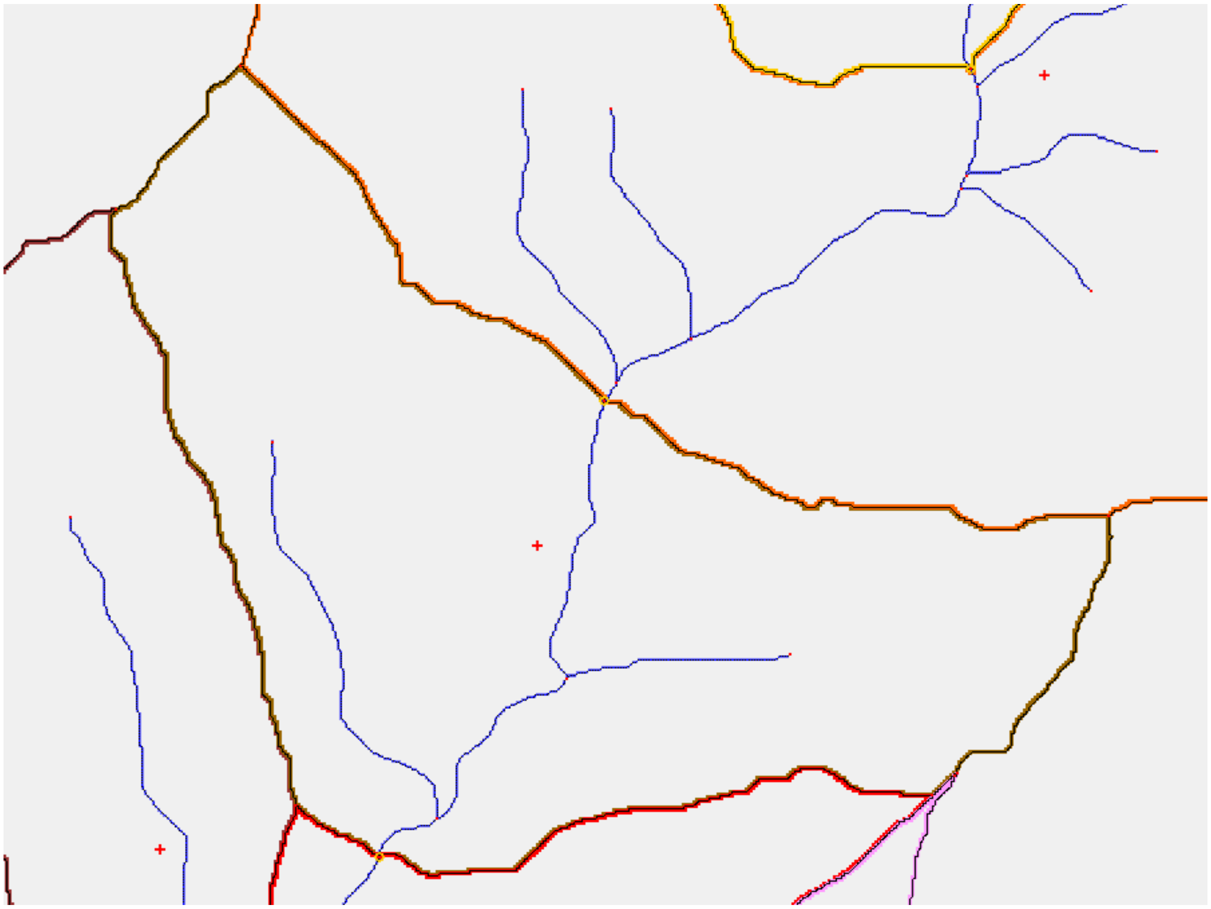
S3 = 519.54

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	1.079	75	80.917
Type C	0.000	68	0.000
Type B	0.012	55	0.645
Total	1.091		81.562
Wt'd CN		74.8	

65B



A = 0.533 sm
L = 0.723 mi (max stream length)
Lc = 0.527 mi
S1 = 1191 ft/mi (CP to Ridge)
S3 = 308 ft/mi (see calcs below)
ER = 0.412
ER x S3 / (Lc/L) = 174
Basin N = 0.055

Selected Slope for Lag = 1191 ft/mi
T_{65B} = 0.24 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/m	$L/S^{0.5}$
1972	0.0642	0.3735	339	0.020
1367	0.0503	0.2589	266	0.016
494	0.0615	0.0936	325	0.005

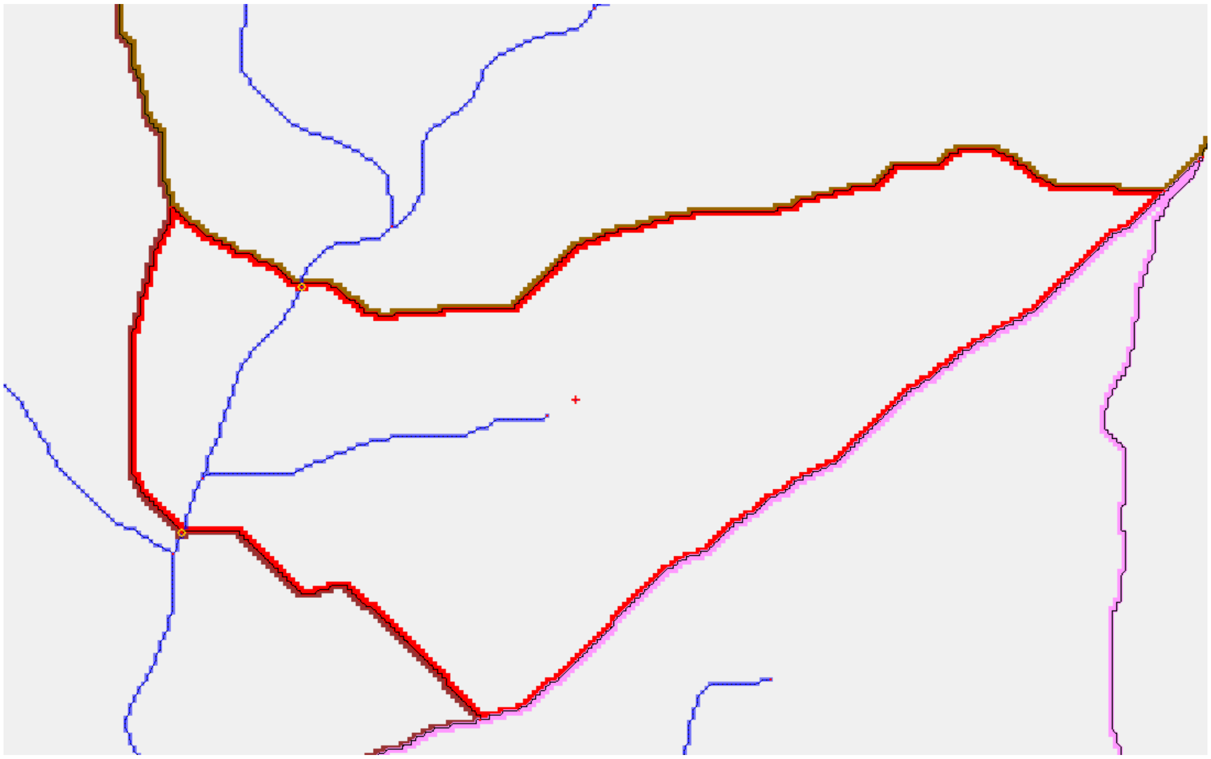
		0.7259		0.0414
S3 =	308.0044			

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	CN	CN x Area
Type D	0.518	75	38.821
Type C	0.000	68	0.000
Type B	0.016	55	0.869
Total	0.533		39.690
Wt'd CN		74.4	

66B



A = 0.162 sm

L = 0.325 mi (max stream length)

Lc = 0.344 mi

S1 = 1403 ft/mi (CP to Ridge)

S3 = 820 ft/mi (see calcs below)

ER = 0.227

ER x S3 / (Lc/L) = 176

Basin N = 0.055

Selected Slope for Lag = 1403 ft/mi

T_{66B} = 0.14 hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/m	$L/S^{0.5}$
679	0.1906	0.1286	1006	0.004
644	0.1882	0.1220	994	0.004
258	0.0703	0.0489	371	0.003

0.2994 0.0105

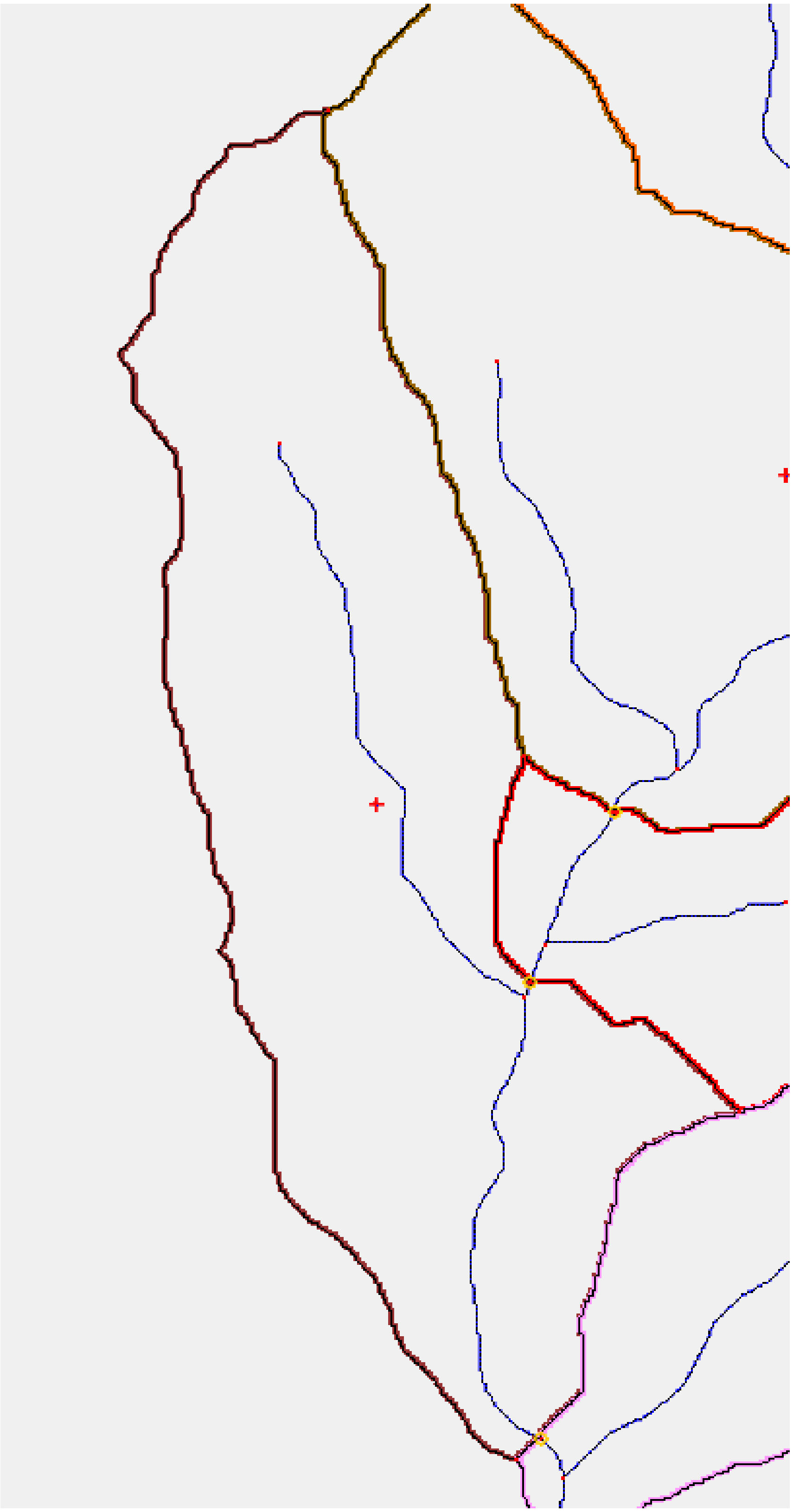
S3 = 819.5889

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.153	75	11.495
Type C	0.000	68	0.000
Type B	0.009	55	0.497
Total	0.162		11.992
Wt'd CN		73.9	

67B



A = 0.430 sm

L =	1.260	mi (max stream length)
Lc =	0.843	mi
S1 =	861	ft/mi (CP to Ridge)
S3 =	381	ft/mi (see calcs below)
ER =	0.370	
ER x S3 / (Lc/L) =	211	
Basin N =	0.055	

Selected Slope for Lag =	381	ft/mi
T_{67B} =	0.44	hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/m	$L/S^{0.5}$
1831	0.1557	0.3468	822	0.012
1895	0.1583	0.3589	836	0.012
2970	0.0366	0.5625	193	0.040
		1.2682		0.0650

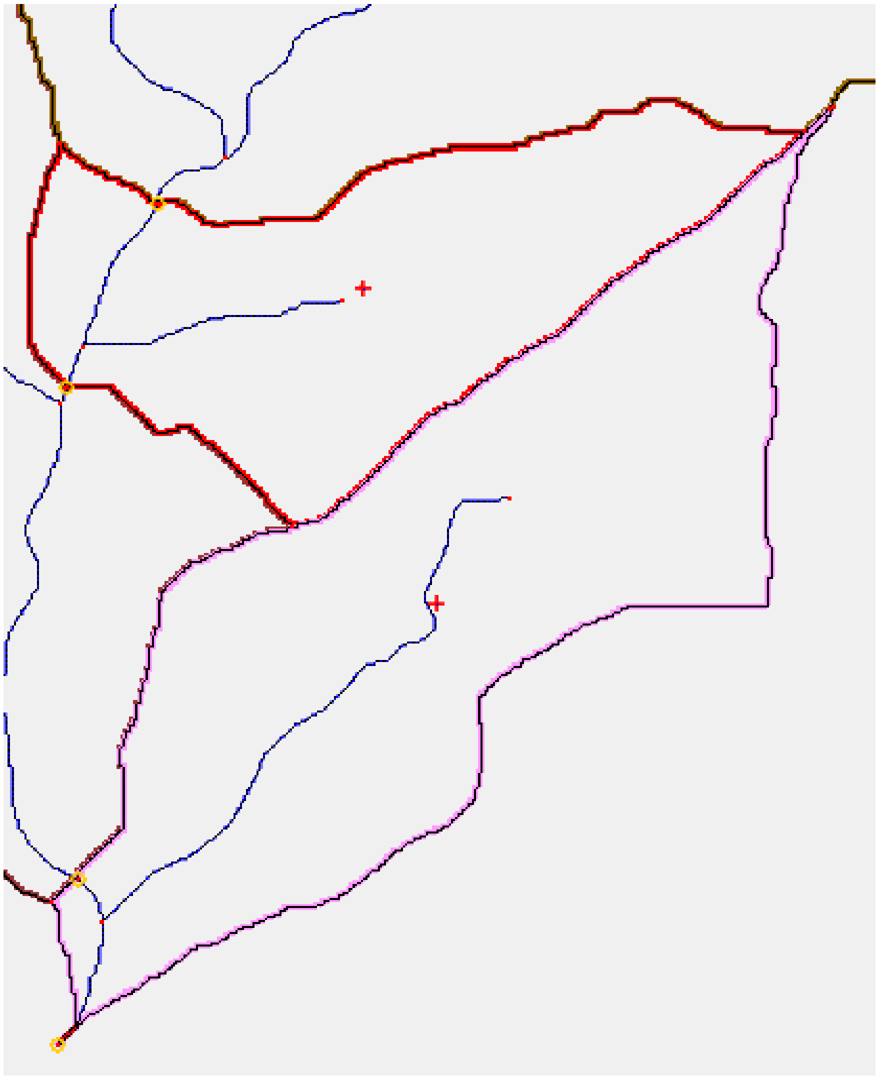
S3 = 380.9819

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.402	75	30.145
Type C	0.000	68	0.000
Type B	0.028	55	1.526
Total	0.430		31.672
Wt'd CN		73.7	

68B



A =	0.253	sm
L =	0.821	mi (max stream length)
Lc =	0.636	mi
S1 =	972	ft/mi (CP to Ridge)
S3 =	520	ft/mi (see calcs below)
ER =	0.284	
ER x S3 / (Lc/L) =	191	
Basin N =	0.055	

Selected Slope for Lag =	972	ft/mi
T_{61B} =	0.28	hours

S3 Calculation

Length, ft	Slope ft/ft	Length, mi	Slope, ft/m	$L/S^{0.5}$

1122	0.1869	0.2125	986.8	0.007
2248	0.127	0.4258	670.6	0.016
764	0.032	0.1447	169.0	0.011
		0.7830		0.0343

S3 = 519.9052

Curve Numbers Determination

Post-Fire Condition, Recovered

	Area, sf	**CN**	**CN x Area**
Type D	0.232	75	17.383
Type C	0.013	68	0.876
Type B	0.009	55	0.486
Total	0.253		18.745
Wt'd CN		73.9	

CONCENTRATION POINTS

CP HMS/VCRAT	**Q_{100}** cfs	**$Q_{100\ VCRAT}$** cfs
J60B 61B	1,633	
17C	1,754	
16C	1,981	
20C	2,557	
15C/18A	2,859	5,657
14C	2,921	
13C/19A	3,248	5,875
12C/20A	3,160	6,018

Project: Little_Sycamore_May2021
Simulation Run: 002-mp-Post-Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:20

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	188.07	22Sep2020, 00:25	1.68
61b	0.61	216.56	22Sep2020, 00:15	1.69
J 60b 61b	1.25	393.35	22Sep2020, 00:19	1.69
18r	1.25	314.24	22Sep2020, 01:20	1.62
62b	0.53	227.32	22Sep2020, 00:08	1.65
17c	1.78	373.3	22Sep2020, 01:17	1.63
17r	1.78	333.71	22Sep2020, 02:01	1.56
63b	0.6	199.83	22Sep2020, 00:18	1.67
16c	2.38	395.47	22Sep2020, 01:58	1.59
16r	2.38	386.19	22Sep2020, 02:30	1.54
64b	1.09	358.99	22Sep2020, 00:18	1.68
20c	3.47	483.09	22Sep2020, 02:25	1.58
20r	3.47	479.54	22Sep2020, 02:46	1.55
65b	0.53	239.37	22Sep2020, 00:07	1.68
15c	4	519.57	22Sep2020, 01:08	1.57
15r	4	518.2	22Sep2020, 01:19	1.55
66b	0.16	93.22	22Sep2020, 00:02	1.66
14c	4.16	533.79	22Sep2020, 01:19	1.55
14r	4.16	533.43	22Sep2020, 01:25	1.54
67b	0.43	132.97	22Sep2020, 00:20	1.63
13c	4.59	595.2	22Sep2020, 01:16	1.55
13r	4.59	552.12	22Sep2020, 03:24	1.47
68b	0.26	103.44	22Sep2020, 00:10	1.65

12c	4.85	568.97	22Sep2020, 03:22	1.48
Pacific Ocean	4.85	568.97	22Sep2020, 03:22	1.48

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

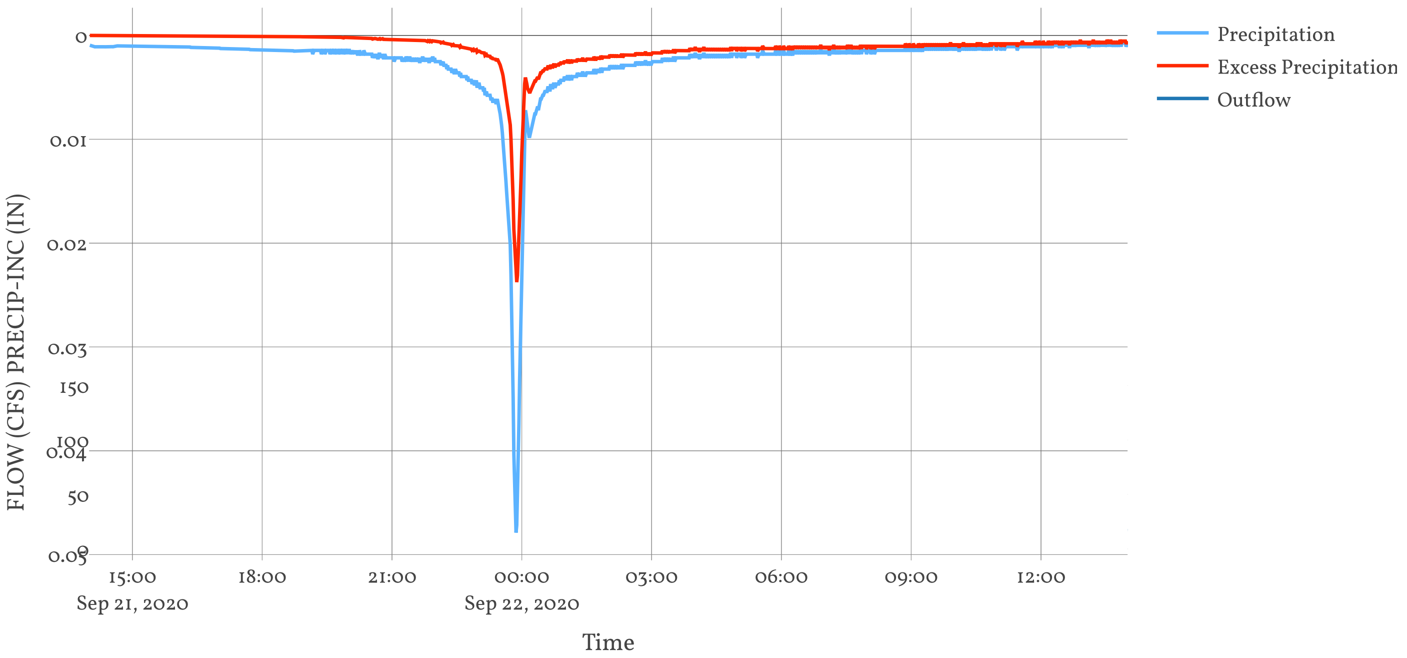
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	188.07
Time of Peak Discharge	22Sep2020, 00:25
Volume (IN)	1.68
Precipitation Volume (AC - FT)	123.84
Loss Volume (AC - FT)	64.78
Excess Volume (AC - FT)	59.06
Direct Runoff Volume (AC - FT)	57.9
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

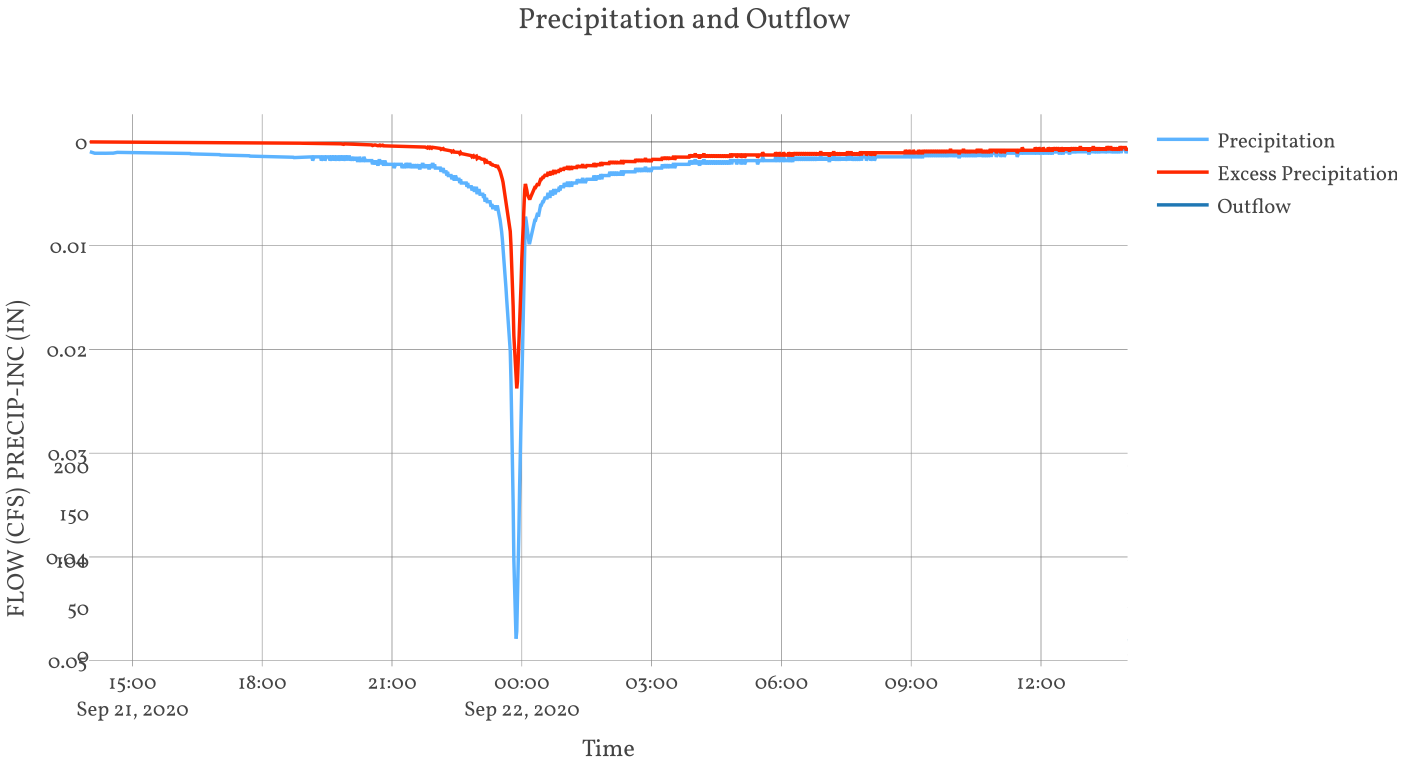
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	216.56
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	1.69
Precipitation Volume (AC - FT)	116.35
Loss Volume (AC - FT)	60.86
Excess Volume (AC - FT)	55.49
Direct Runoff Volume (AC - FT)	54.73
Baseflow Volume (AC - FT)	0

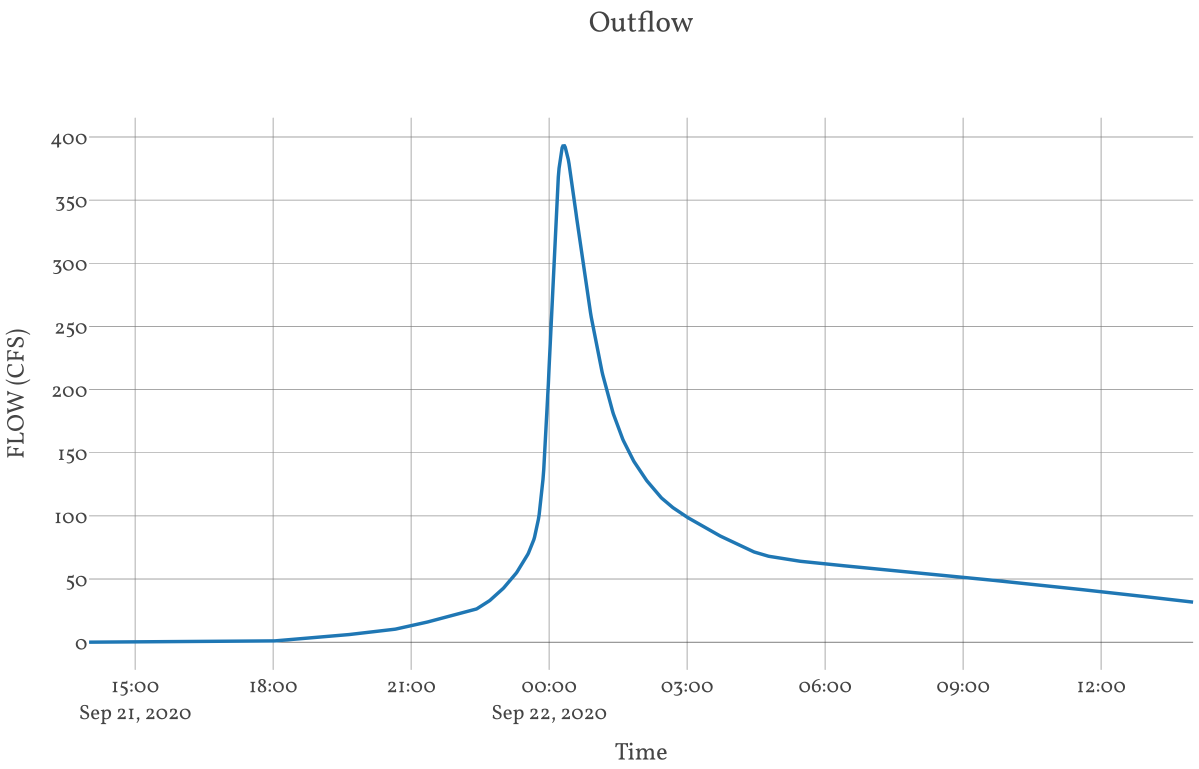

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
200
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	393.35
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	1.69



Reach: 18R

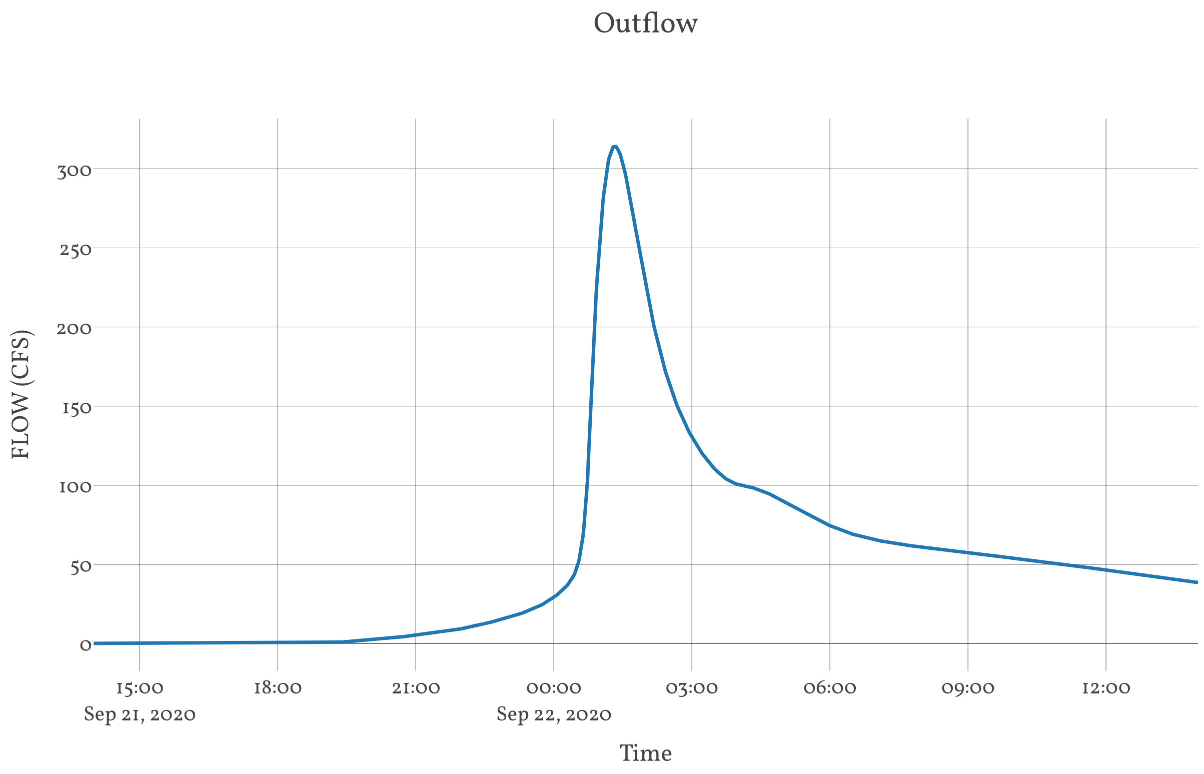
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	314.24
Time of Peak Discharge	22Sep2020, 01:20
Volume (IN)	1.62
Peak Inflow (CFS)	393.35
Inflow Volume (AC - FT)	112.63



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

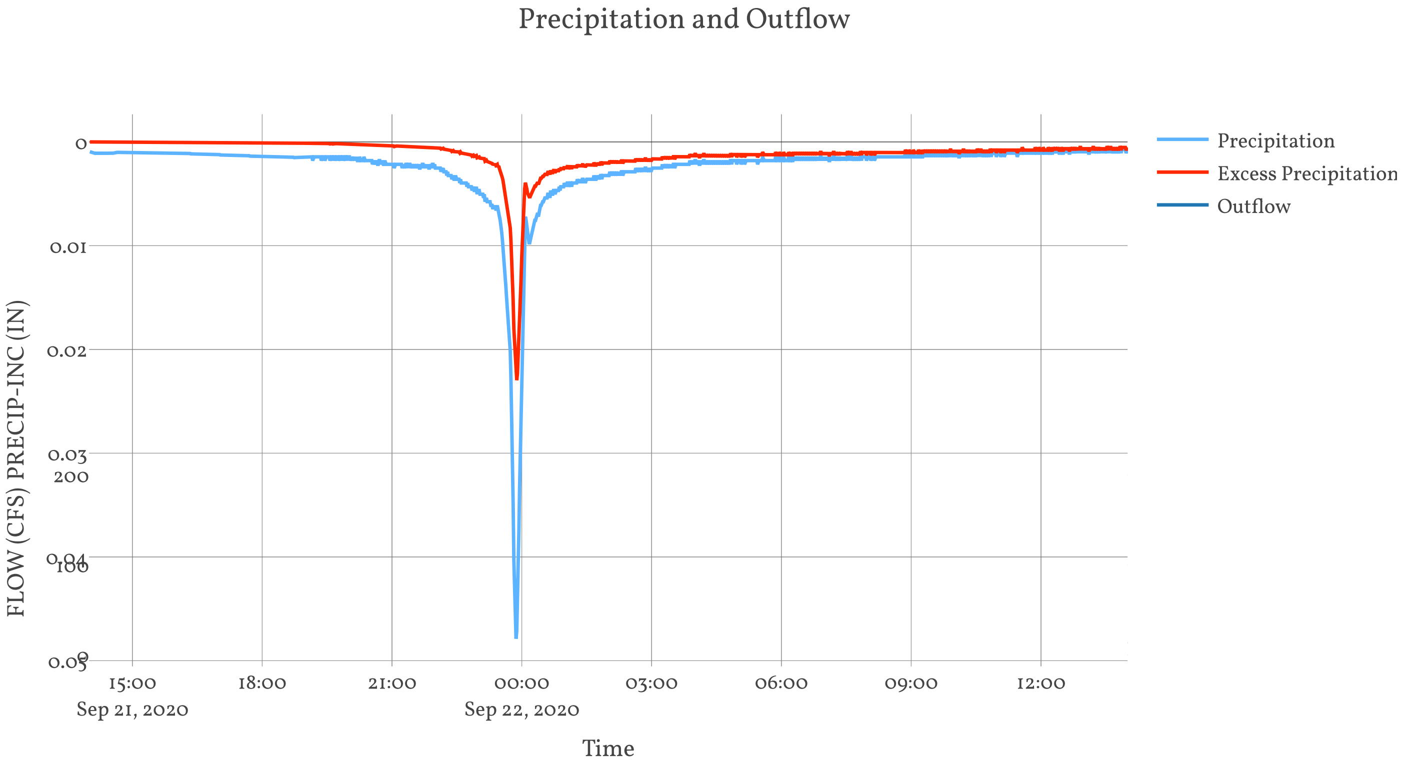
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	227.32
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	1.65
Precipitation Volume (AC - FT)	100.92
Loss Volume (AC - FT)	54.17
Excess Volume (AC - FT)	46.75
Direct Runoff Volume (AC - FT)	46.32
Baseflow Volume (AC - FT)	0

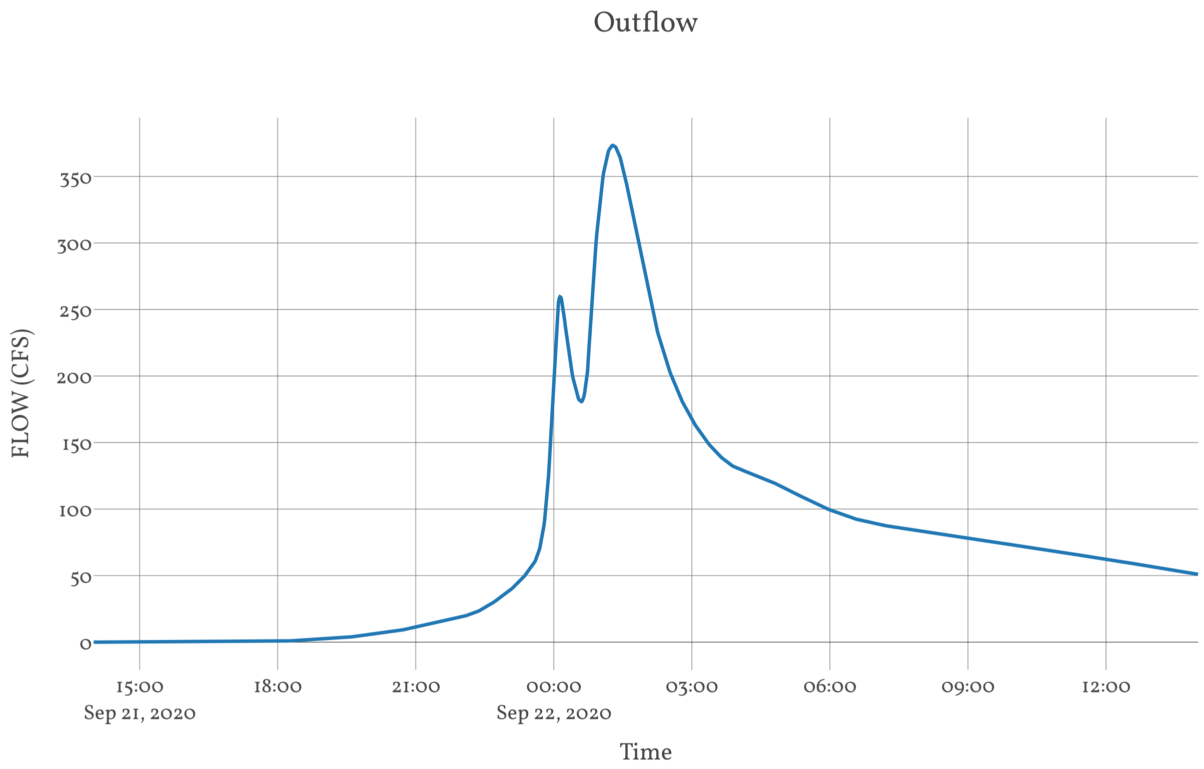

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
200
0.04
100
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	373.3
Time of Peak Discharge	22Sep2020, 01:17
Volume (IN)	1.63



Reach: 17R

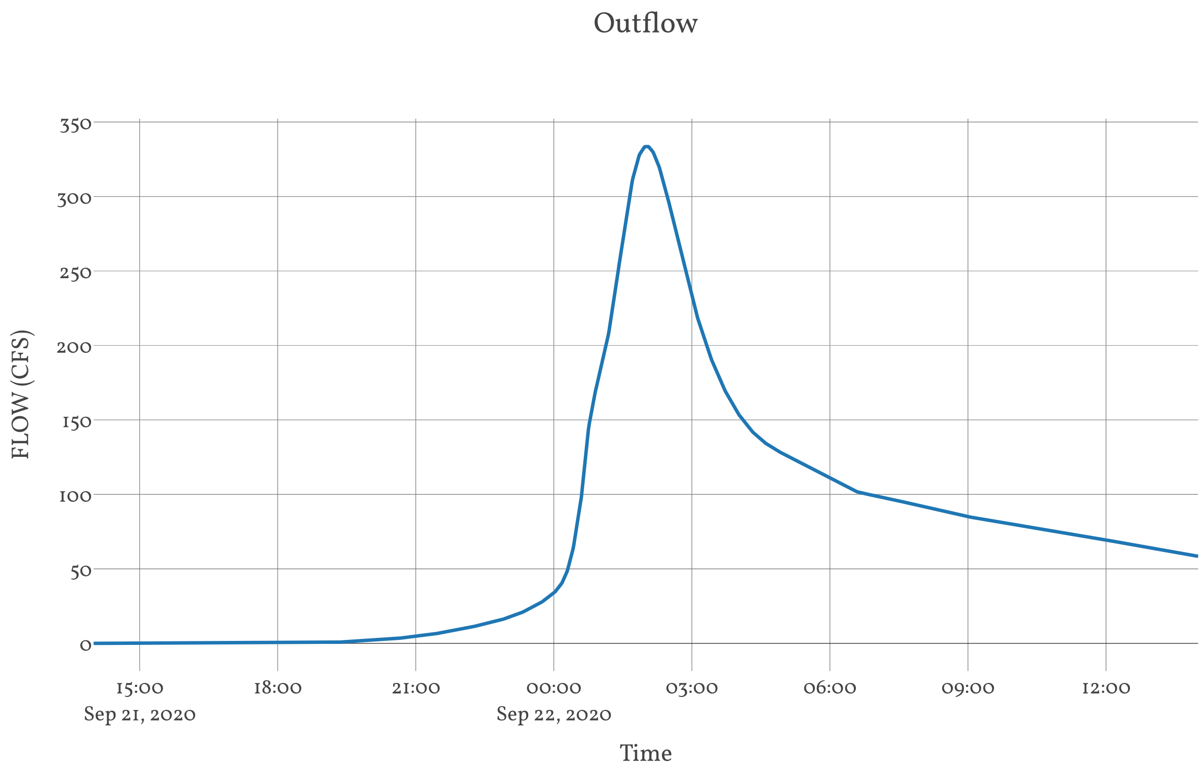
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	333.71
Time of Peak Discharge	22Sep2020, 02:01
Volume (IN)	1.56
Peak Inflow (CFS)	373.3
Inflow Volume (AC - FT)	154.15



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

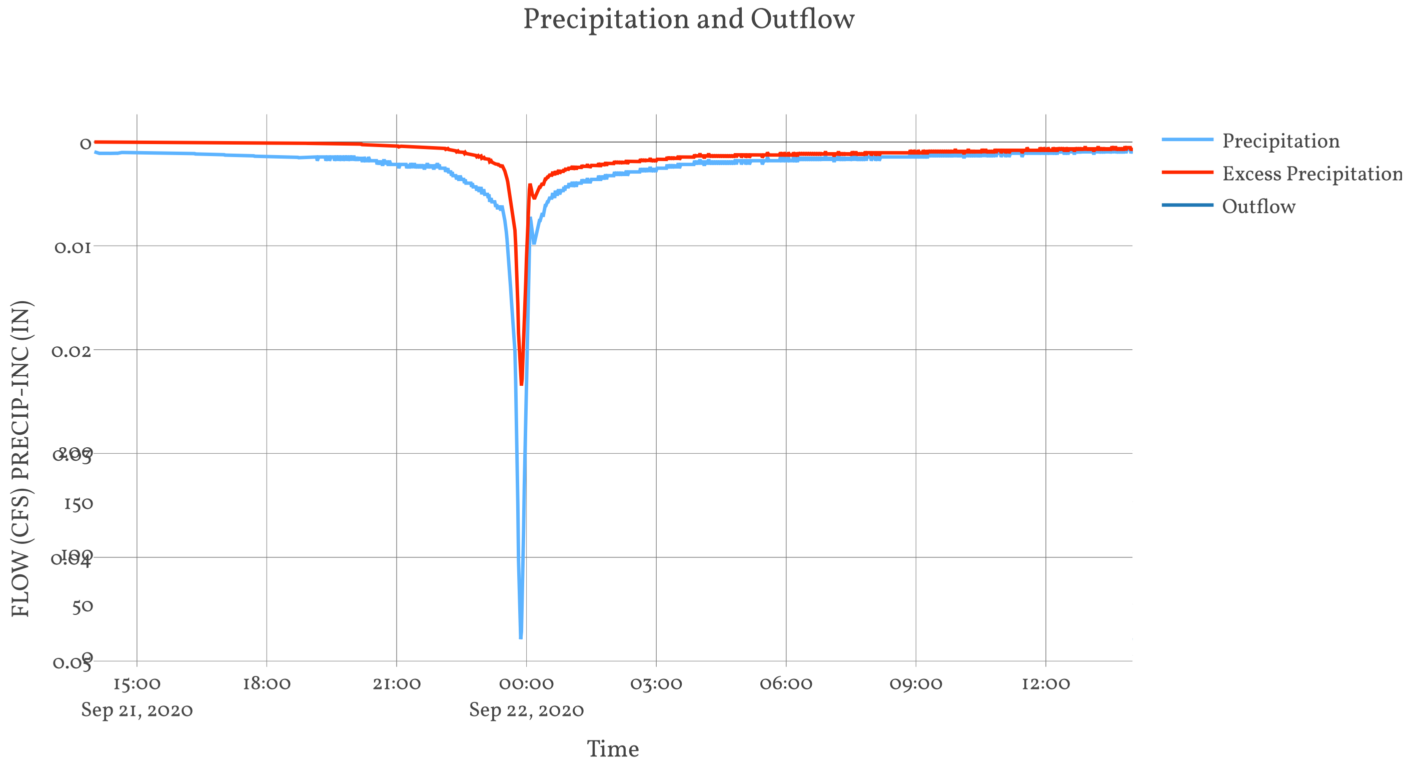
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	199.83
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	1.67
Precipitation Volume (AC - FT)	115.58
Loss Volume (AC - FT)	61.04
Excess Volume (AC - FT)	54.54
Direct Runoff Volume (AC - FT)	53.71
Baseflow Volume (AC - FT)	0

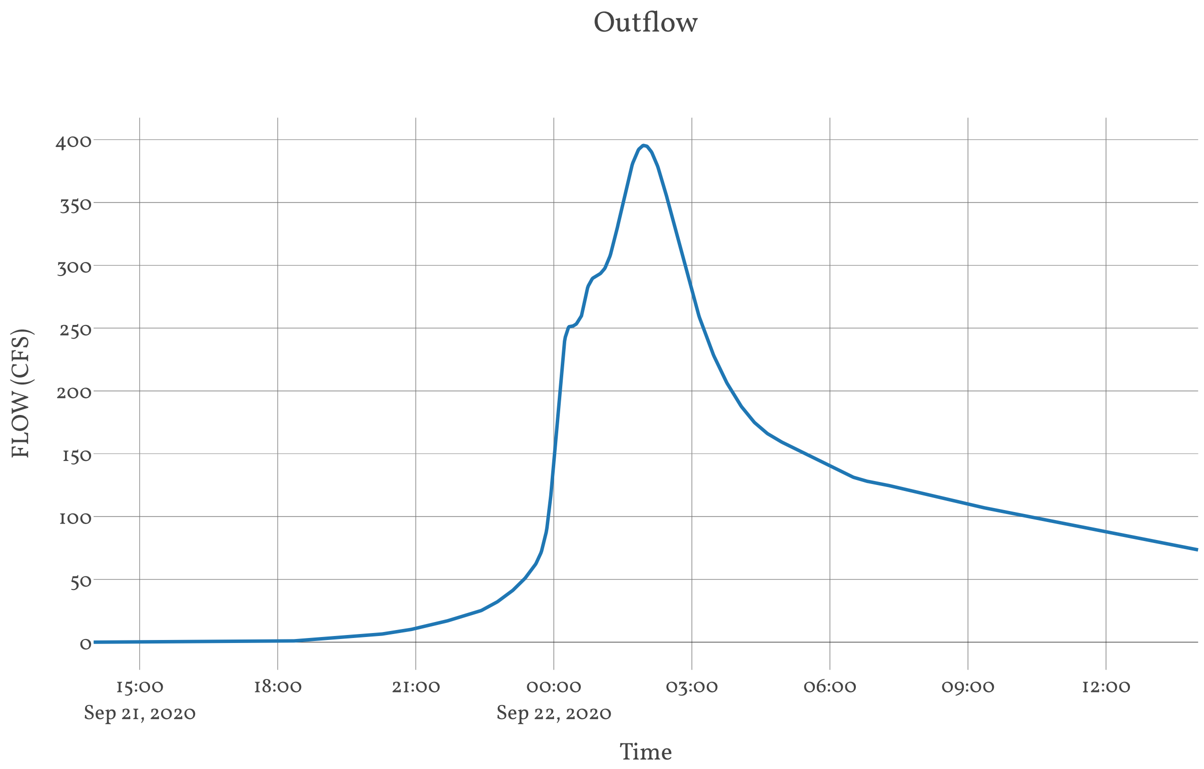

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
200
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	395.47
Time of Peak Discharge	22Sep2020, 01:58
Volume (IN)	1.59



Reach: 16R

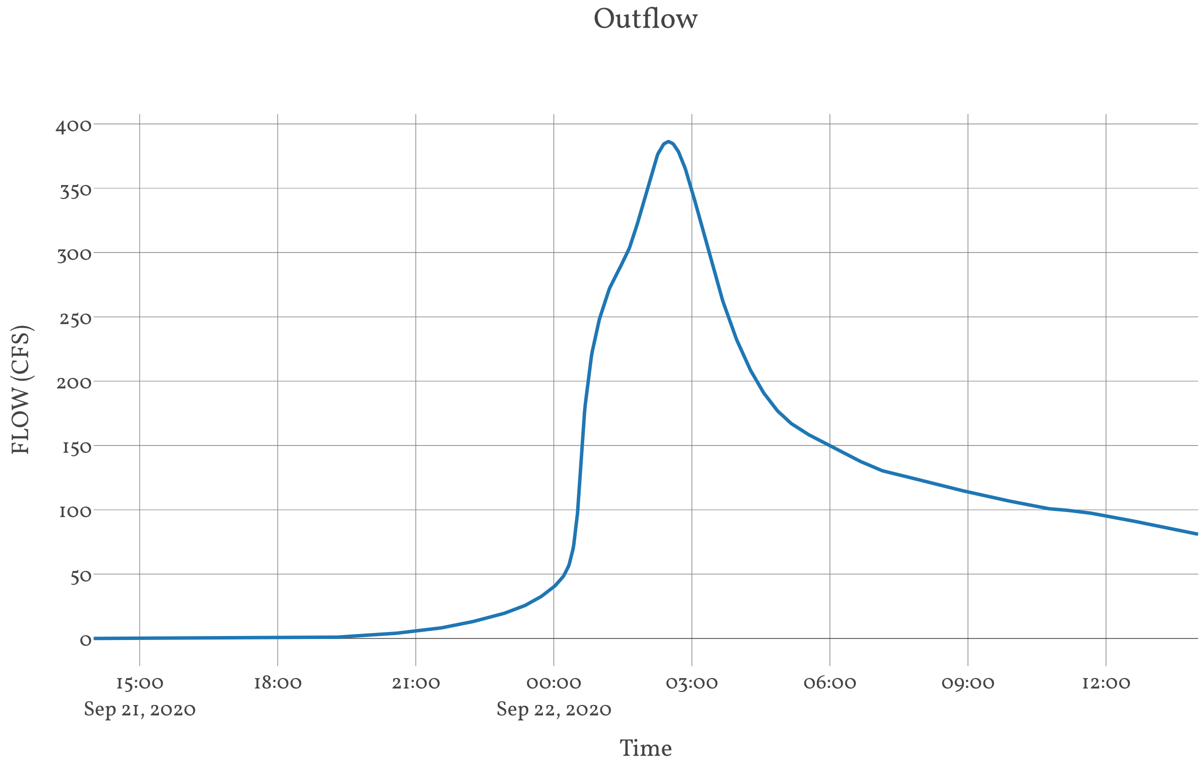
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	386.19
Time of Peak Discharge	22Sep2020, 02:30
Volume (IN)	1.54
Peak Inflow (CFS)	395.47
Inflow Volume (AC - FT)	201.8



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

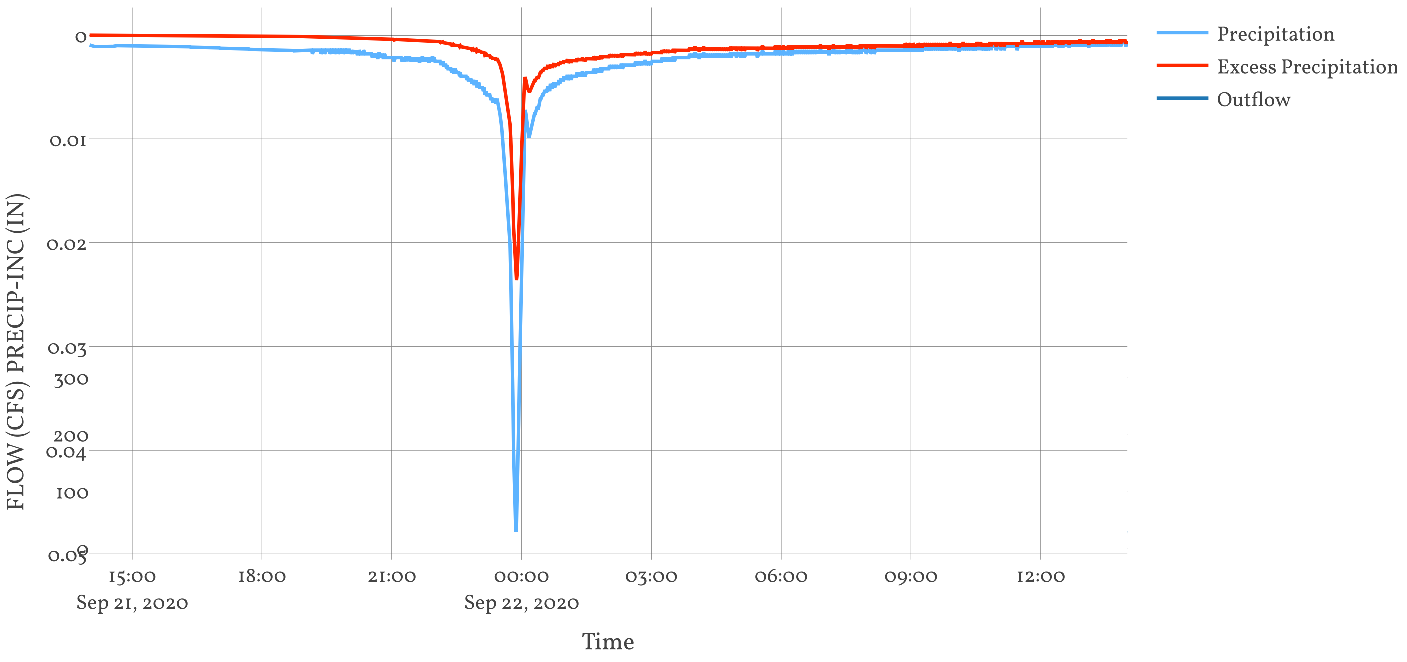
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	358.99
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	1.68
Precipitation Volume (AC - FT)	209.28
Loss Volume (AC - FT)	110
Excess Volume (AC - FT)	99.28
Direct Runoff Volume (AC - FT)	97.73
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

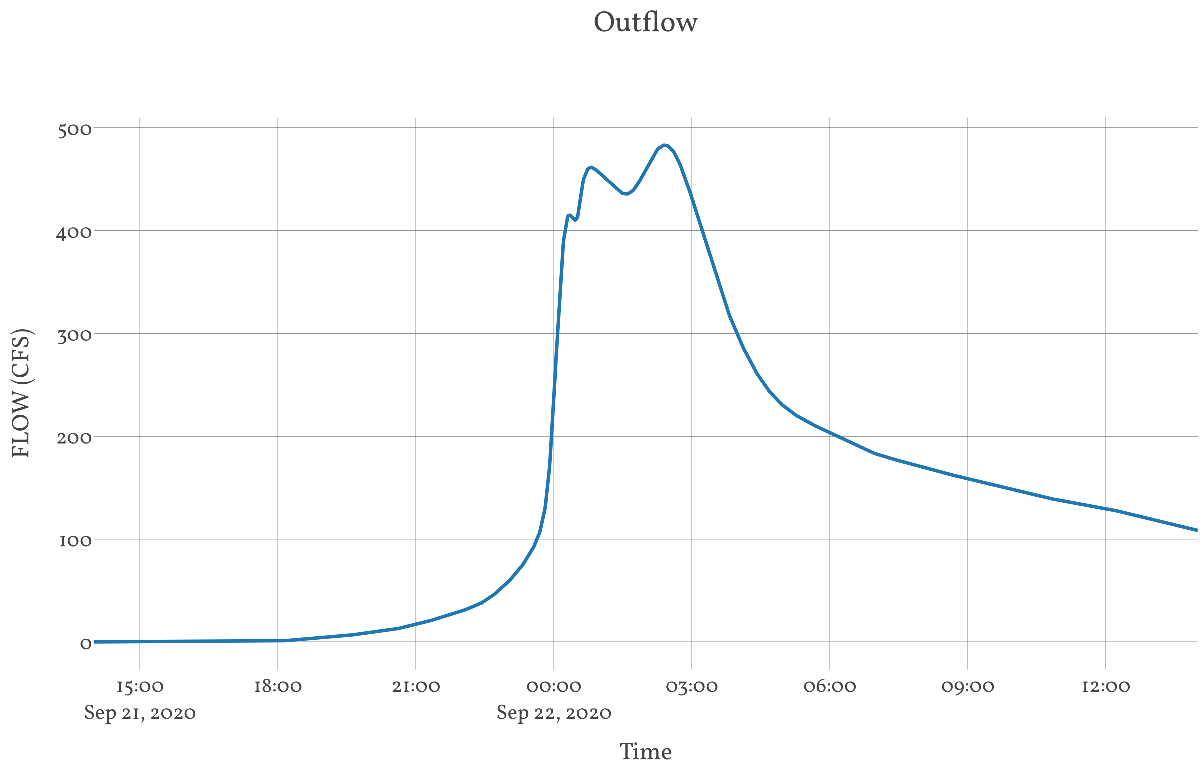


Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	483.09
Time of Peak Discharge	22Sep2020, 02:25
Volume (IN)	1.58



Reach: 20R

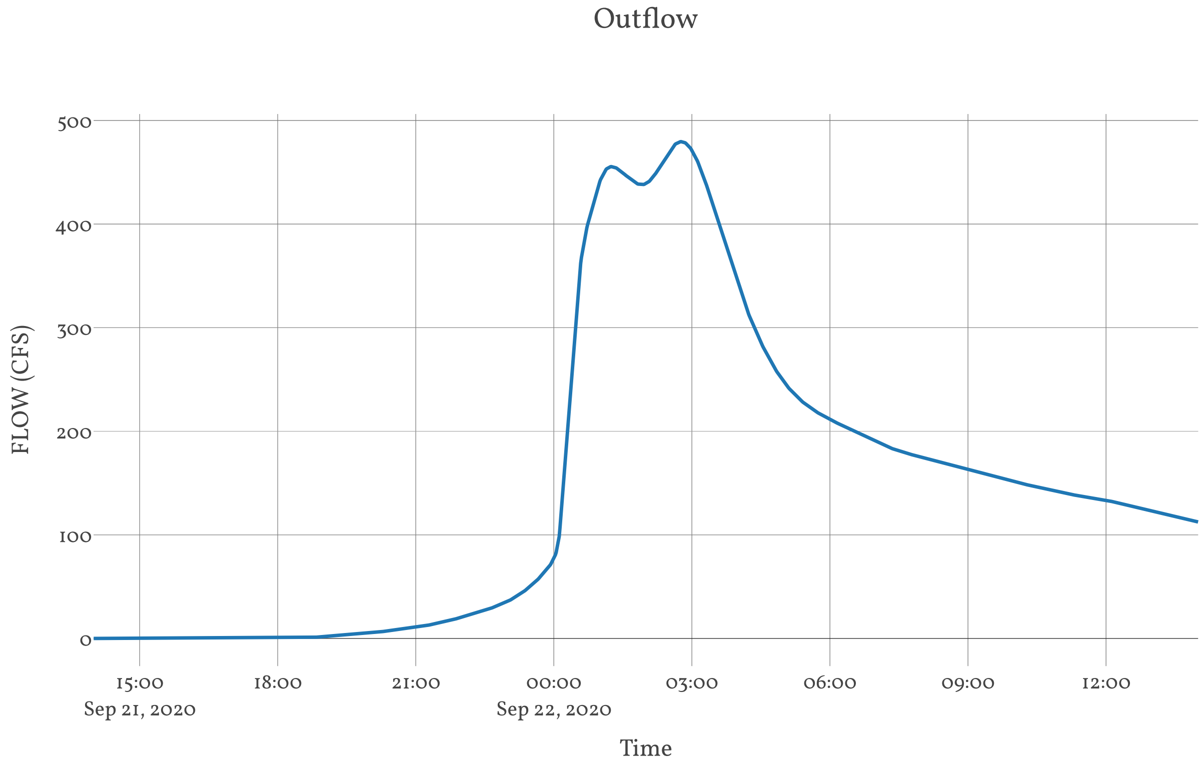
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	479.54
Time of Peak Discharge	22Sep2020, 02:46
Volume (IN)	1.55
Peak Inflow (CFS)	483.09
Inflow Volume (AC - FT)	293.05



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

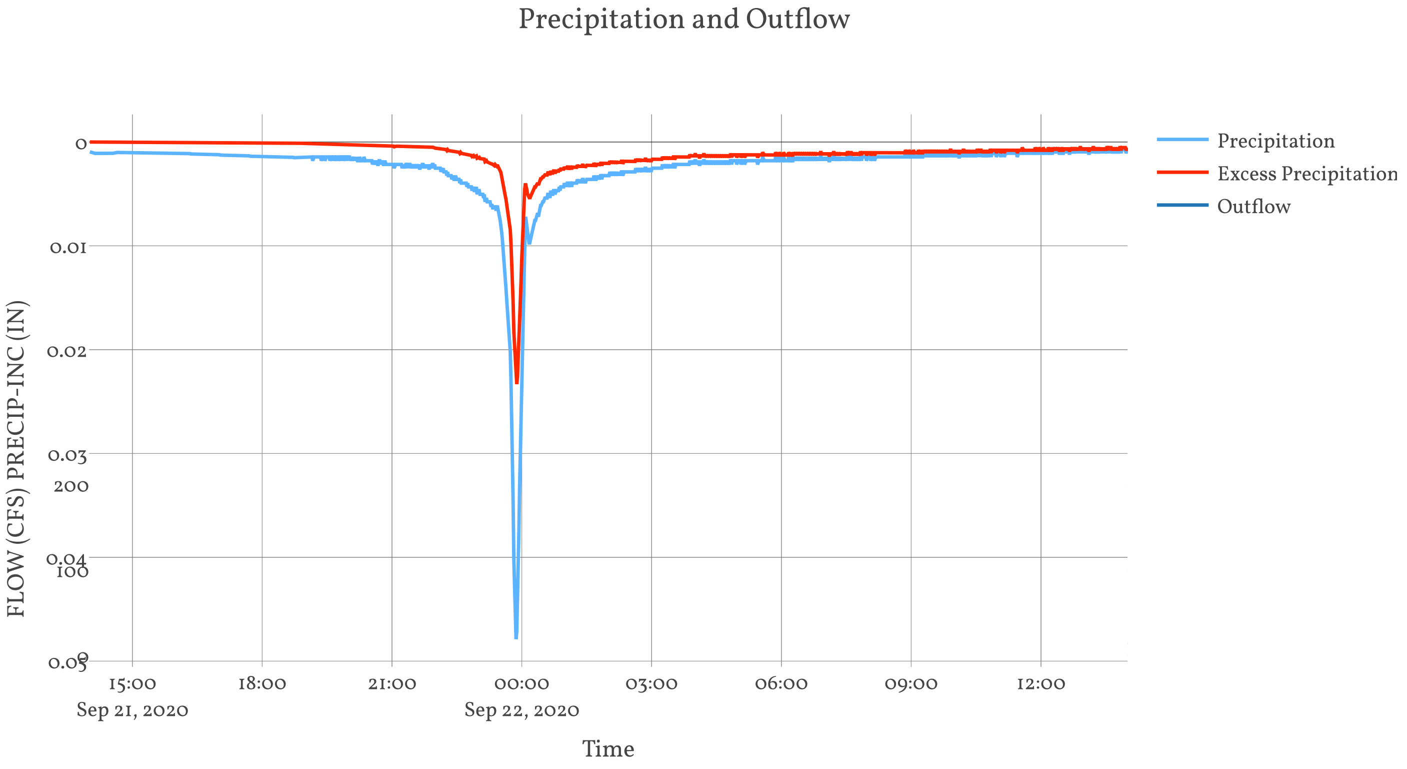
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	239.37
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	1.68
Precipitation Volume (AC - FT)	102.34
Loss Volume (AC - FT)	54.3
Excess Volume (AC - FT)	48.04
Direct Runoff Volume (AC - FT)	47.62
Baseflow Volume (AC - FT)	0

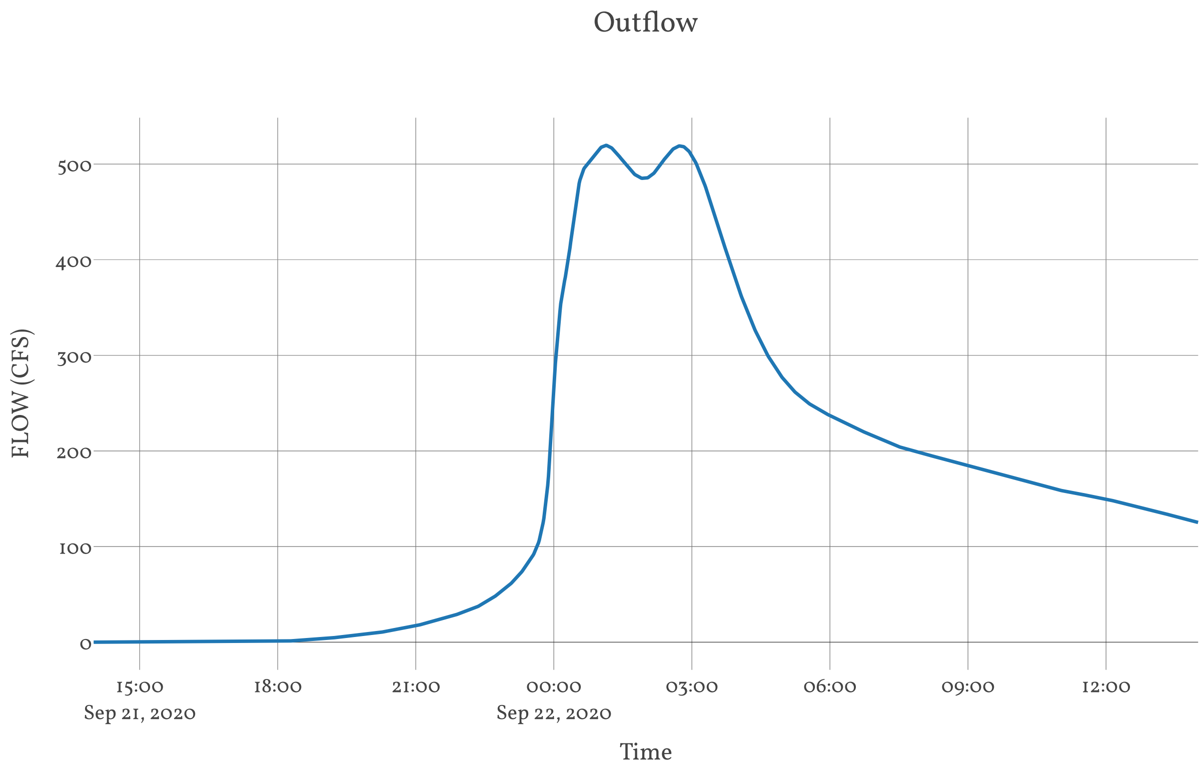

Precipitation and Outflow
0
0.01
0.02
0.03
200
0.04
100
0
0.05
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	519.57
Time of Peak Discharge	22Sep2020, 01:08
Volume (IN)	1.57



Reach: 15R

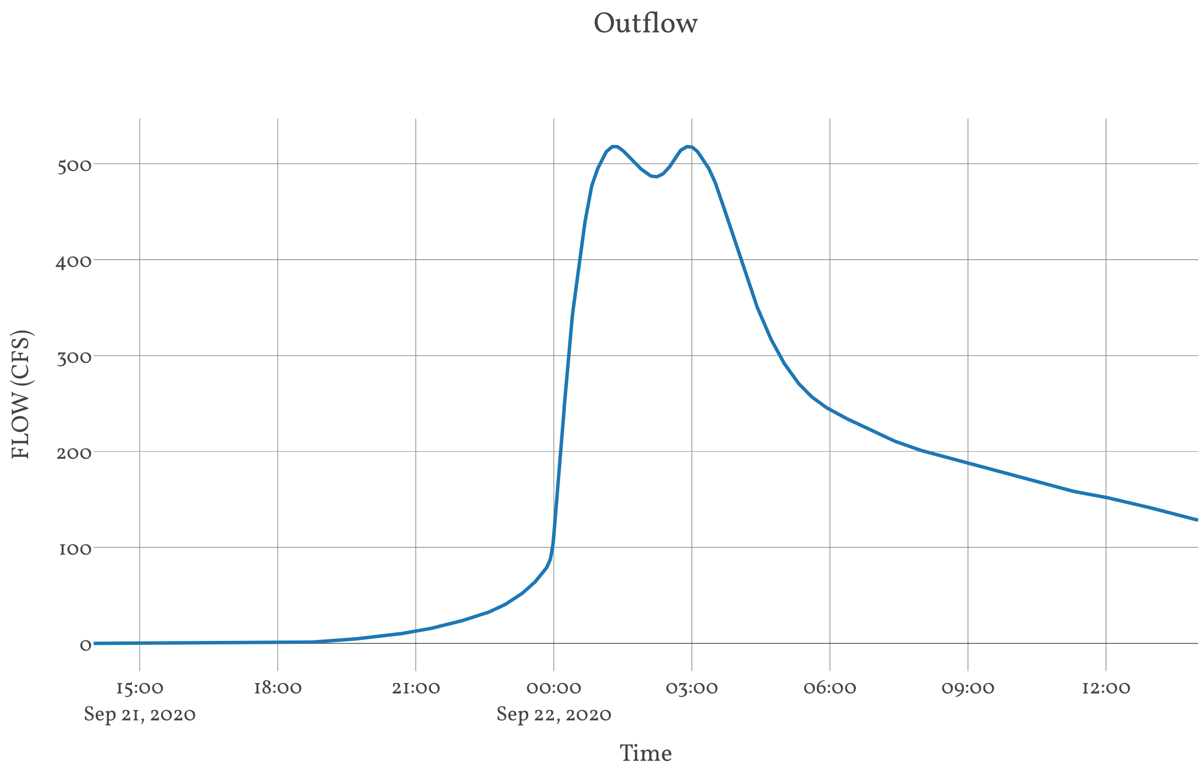
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	518.2
Time of Peak Discharge	22Sep2020, 01:19
Volume (IN)	1.55
Peak Inflow (CFS)	519.57
Inflow Volume (AC - FT)	334.44



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

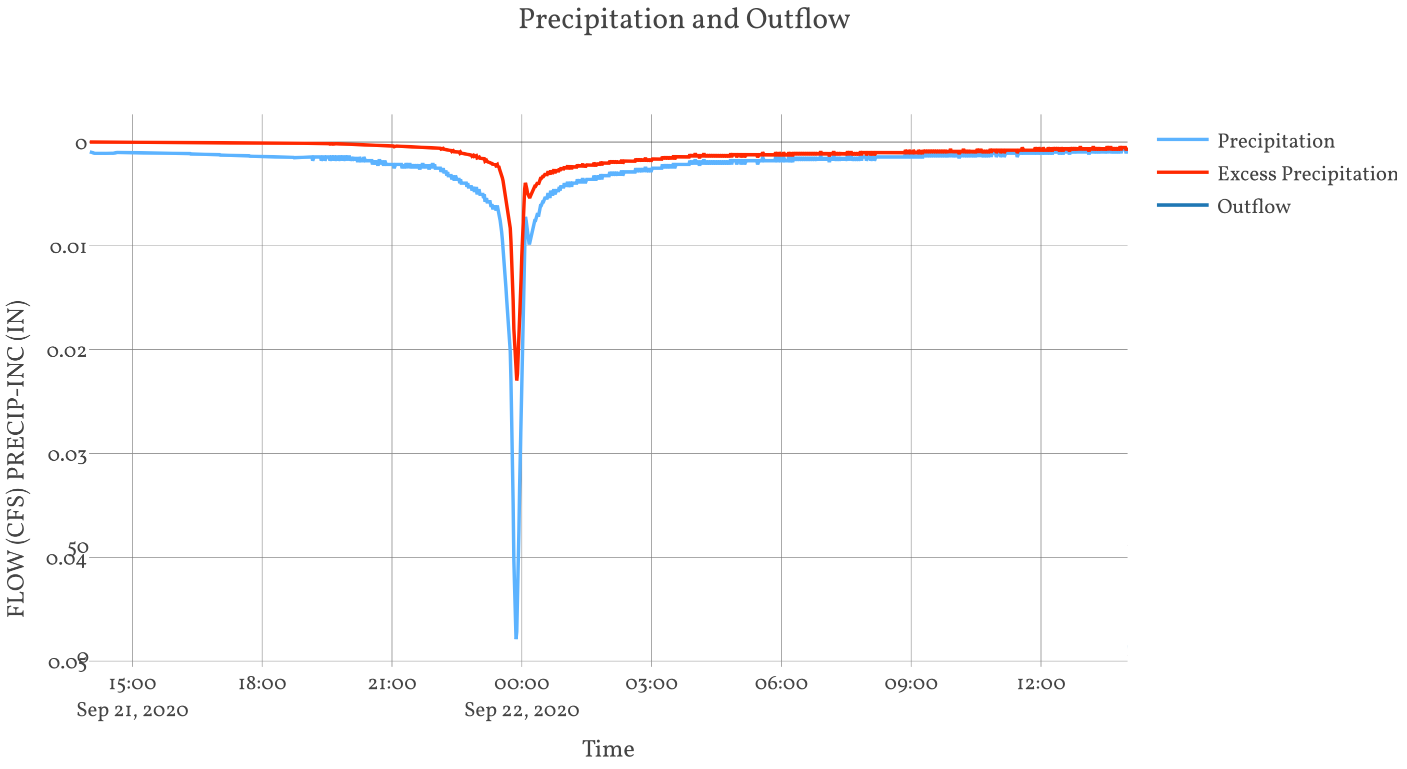
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	93.22
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	1.66
Precipitation Volume (AC - FT)	31.1
Loss Volume (AC - FT)	16.7
Excess Volume (AC - FT)	14.41
Direct Runoff Volume (AC - FT)	14.34
Baseflow Volume (AC - FT)	0

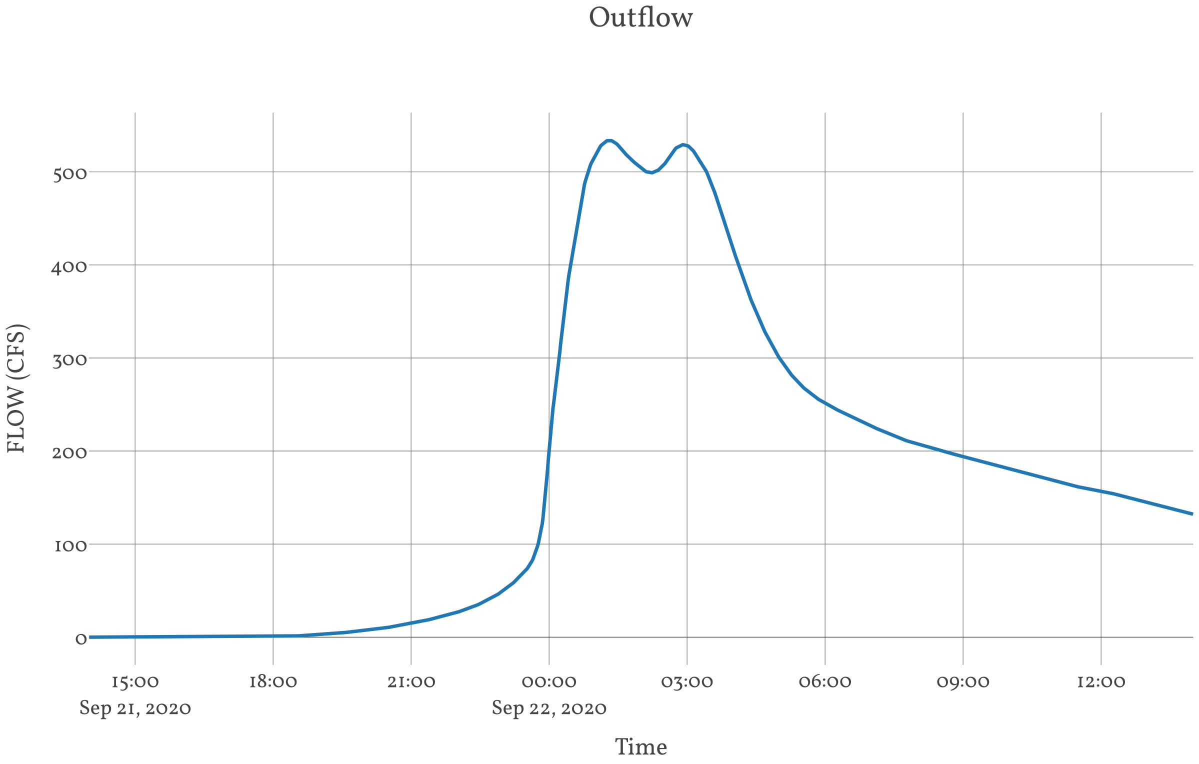

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	533.79
Time of Peak Discharge	22Sep2020, 01:19
Volume (IN)	1.55



Reach: 14R

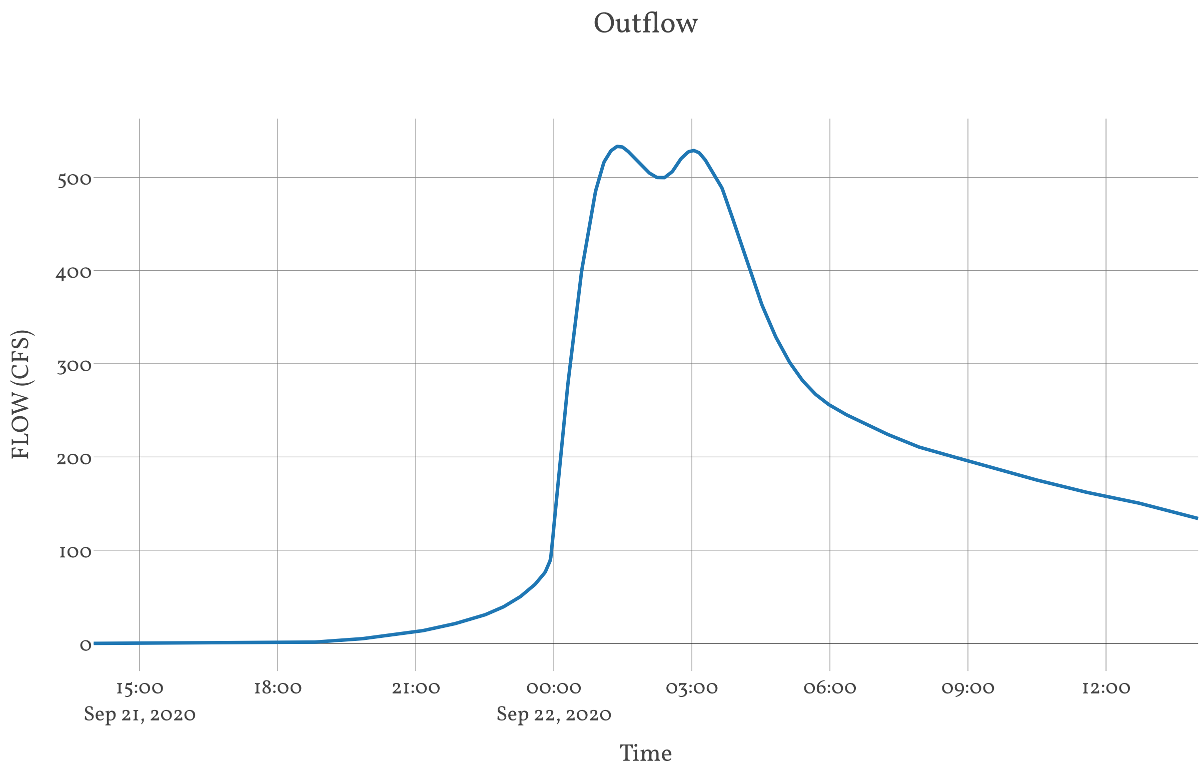
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	533.43
Time of Peak Discharge	22Sep2020, 01:25
Volume (IN)	1.54
Peak Inflow (CFS)	533.79
Inflow Volume (AC - FT)	344.17



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

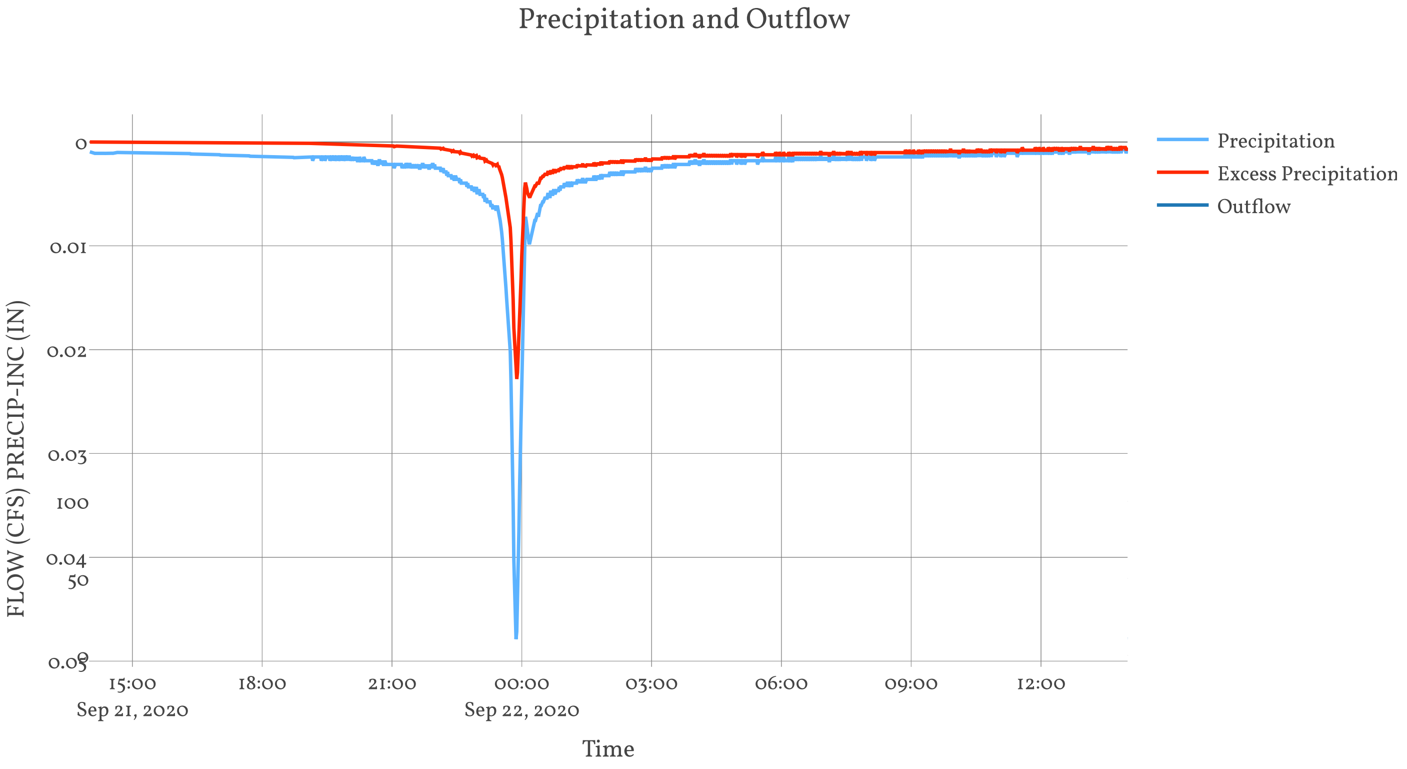
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	132.97
Time of Peak Discharge	22Sep2020, 00:20
Volume (IN)	1.63
Precipitation Volume (AC - FT)	82.56
Loss Volume (AC - FT)	44.52
Excess Volume (AC - FT)	38.04
Direct Runoff Volume (AC - FT)	37.41
Baseflow Volume (AC - FT)	0

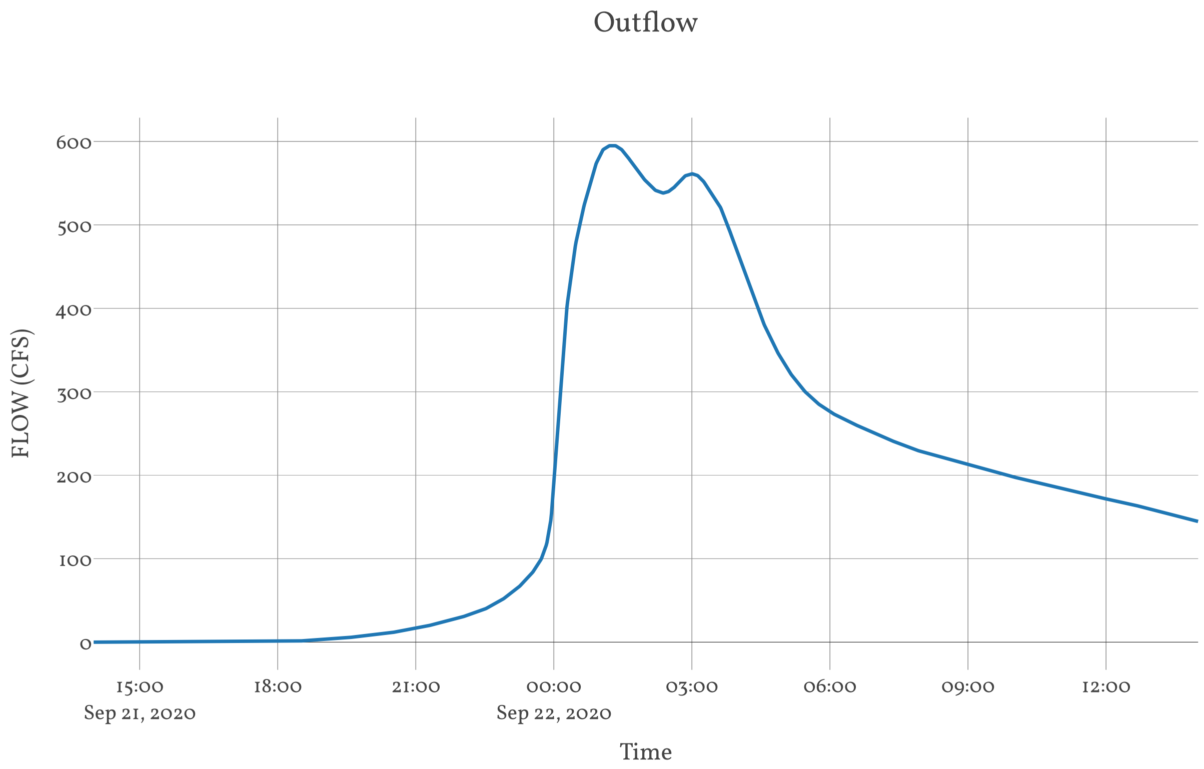

Precipitation and Outflow
0
0.01
0.02
0.03
100
0.04
50
0.05
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	595.2
Time of Peak Discharge	22Sep2020, 01:16
Volume (IN)	1.55



Reach: 13R

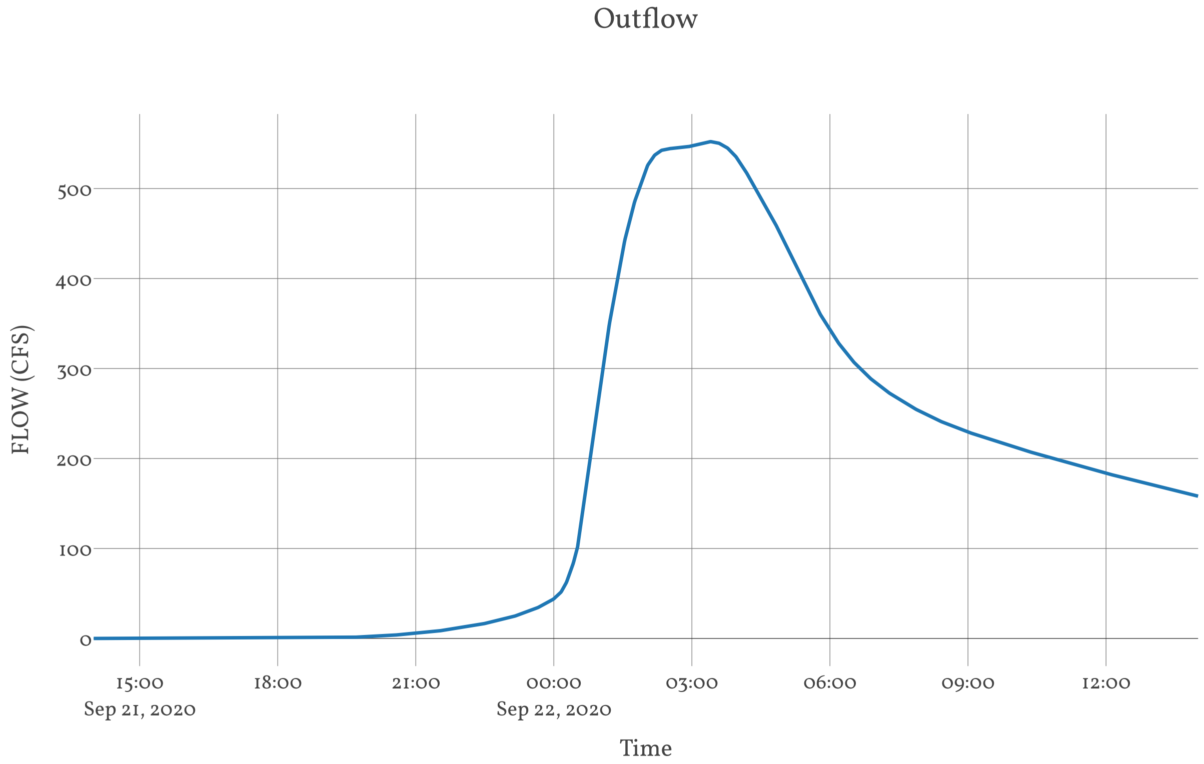
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	552.12
Time of Peak Discharge	22Sep2020, 03:24
Volume (IN)	1.47
Peak Inflow (CFS)	595.2
Inflow Volume (AC - FT)	378.99



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

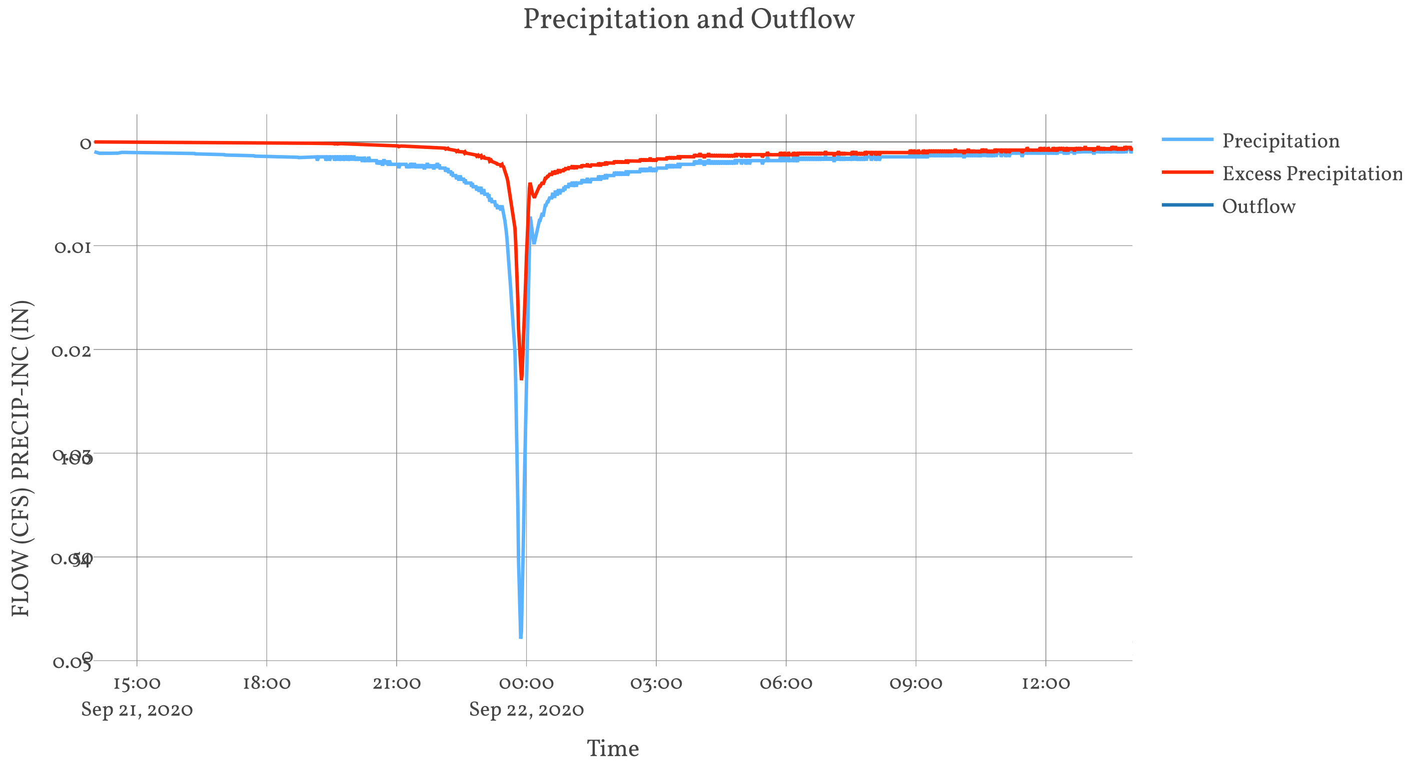
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	103.44
Time of Peak Discharge	22Sep2020, 00:10
Volume (IN)	1.65
Precipitation Volume (AC - FT)	48.96
Loss Volume (AC - FT)	26.28
Excess Volume (AC - FT)	22.68
Direct Runoff Volume (AC - FT)	22.45
Baseflow Volume (AC - FT)	0

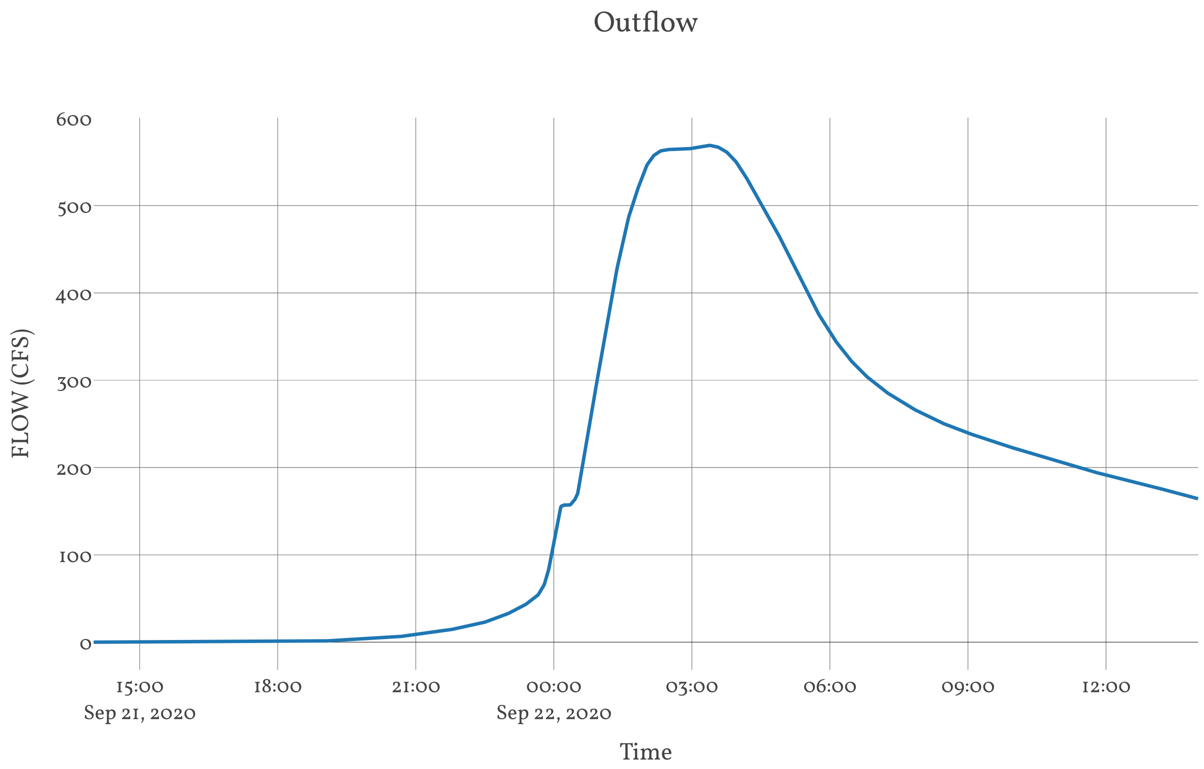

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
100
0.04
50
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

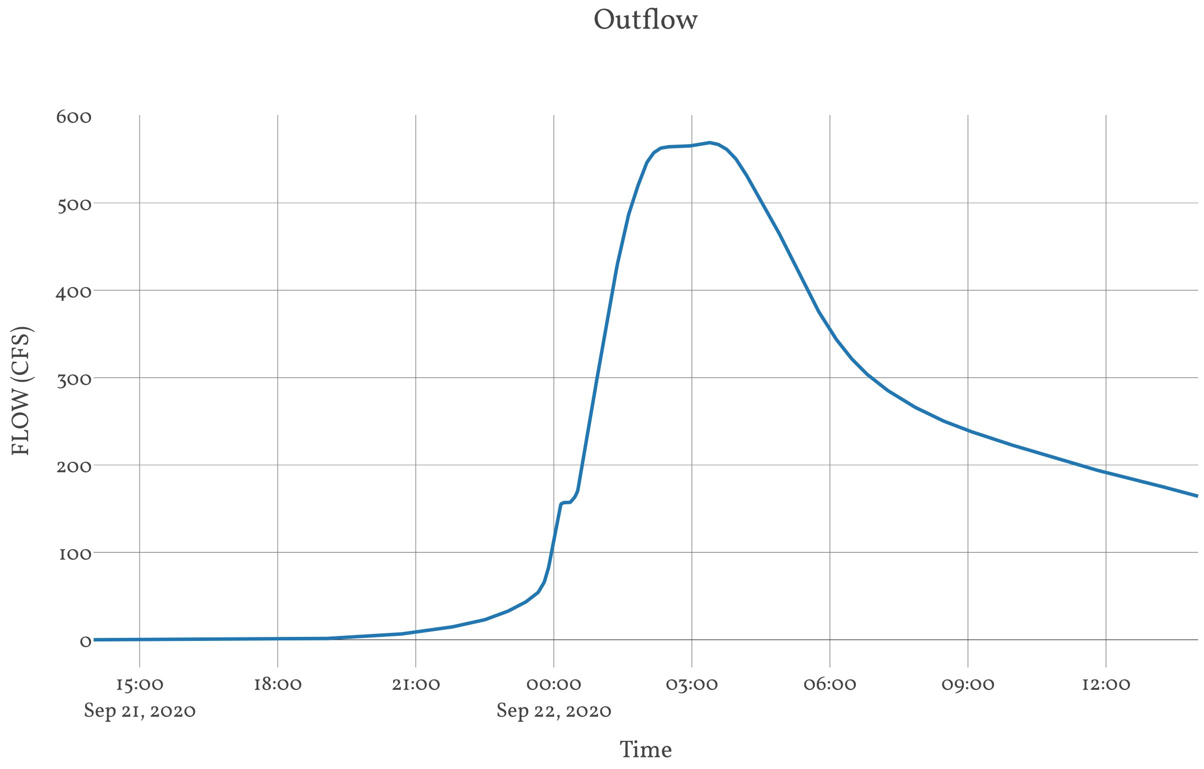
Peak Discharge (CFS)	568.97
Time of Peak Discharge	22Sep2020, 03:22
Volume (IN)	1.48



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	568.97
Time of Peak Discharge	22Sep2020, 03:22
Volume (IN)	1.48
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 005-mp-Post-Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:26

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	299.05	22Sep2020, 00:24	2.6
61b	0.61	344.07	22Sep2020, 00:15	2.62
J 60b 61b	1.25	625.34	22Sep2020, 00:19	2.61
18r	1.25	502.51	22Sep2020, 01:13	2.5
62b	0.53	362.49	22Sep2020, 00:08	2.56
17c	1.78	599.85	22Sep2020, 01:11	2.52
17r	1.78	552.97	22Sep2020, 01:47	2.43
63b	0.6	318.15	22Sep2020, 00:17	2.59
16c	2.38	656.9	22Sep2020, 01:44	2.47
16r	2.38	644.4	22Sep2020, 02:08	2.4
64b	1.09	571.11	22Sep2020, 00:18	2.6
20c	3.47	809.6	22Sep2020, 02:04	2.46
20r	3.47	805.05	22Sep2020, 02:20	2.42
65b	0.53	380.96	22Sep2020, 00:07	2.59
15c	4	897.56	22Sep2020, 00:44	2.45
15r	4	894.79	22Sep2020, 01:00	2.42
66b	0.16	148.29	22Sep2020, 00:02	2.57
14c	4.16	922.42	22Sep2020, 00:58	2.42
14r	4.16	921.68	22Sep2020, 01:05	2.41
67b	0.43	212.62	22Sep2020, 00:19	2.53
13c	4.59	1044.93	22Sep2020, 00:59	2.42
13r	4.59	947.29	22Sep2020, 02:07	2.32
68b	0.26	164.98	22Sep2020, 00:10	2.56

12c	4.85	980.2	22Sep2020, 02:04	2.33
Pacific Ocean	4.85	980.2	22Sep2020, 02:04	2.33

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

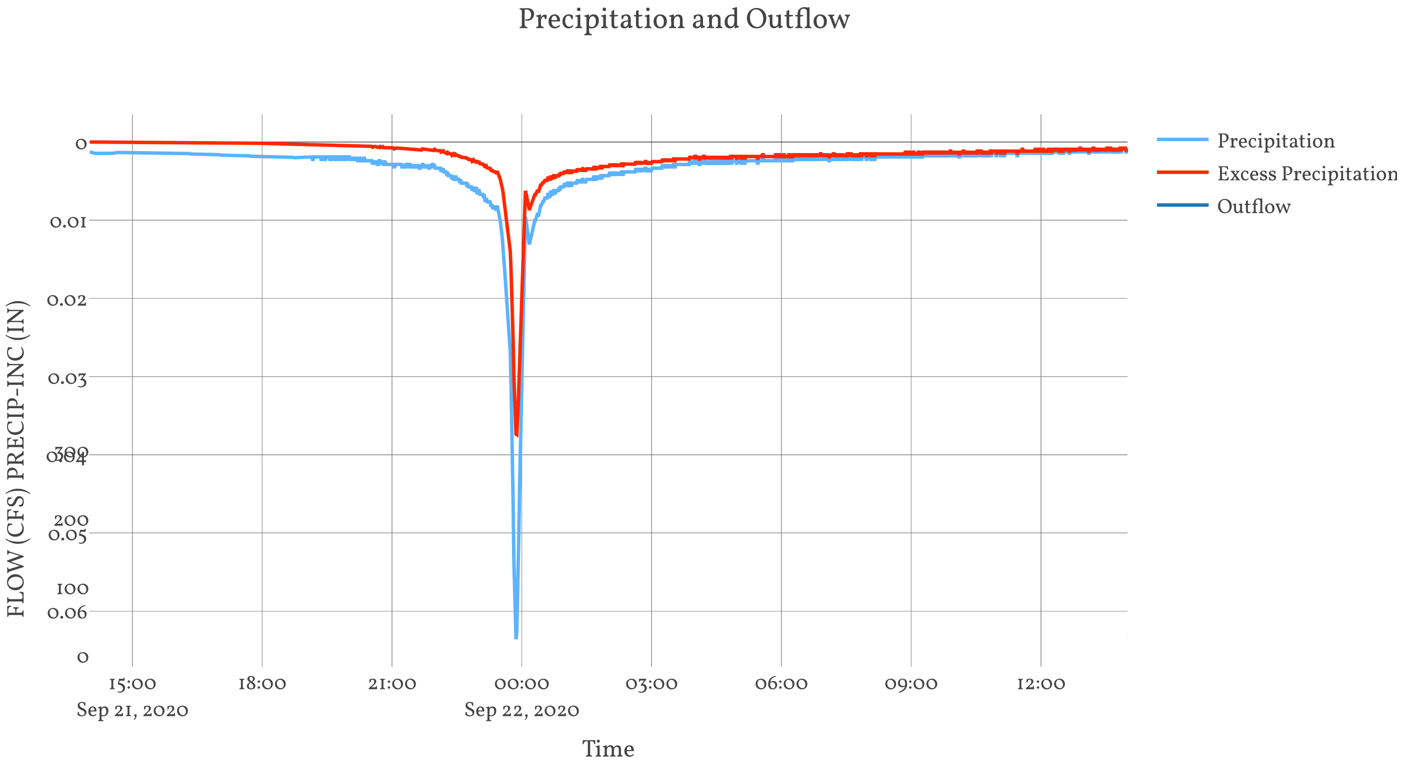
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	299.05
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	2.6
Precipitation Volume (AC - FT)	164.43
Loss Volume (AC - FT)	73.25
Excess Volume (AC - FT)	91.19
Direct Runoff Volume (AC - FT)	89.51
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

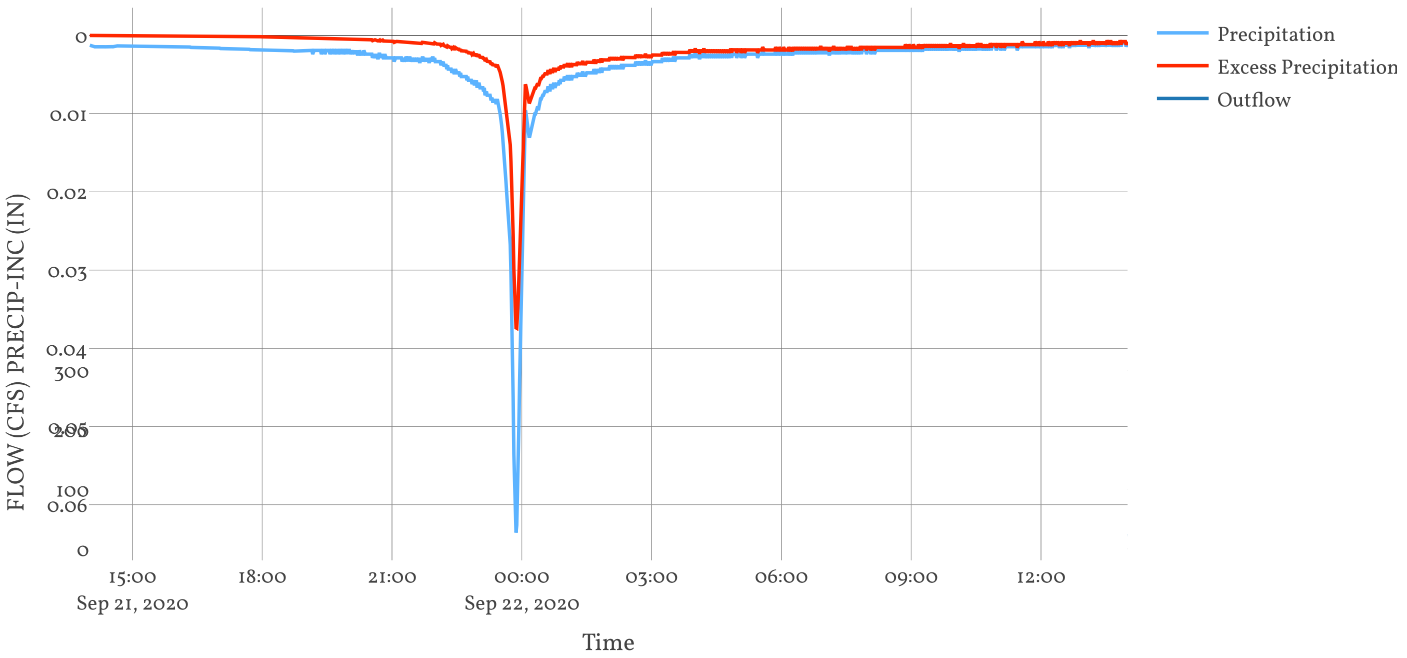
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	344.07
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	2.62
Precipitation Volume (AC - FT)	154.49
Loss Volume (AC - FT)	68.82
Excess Volume (AC - FT)	85.67
Direct Runoff Volume (AC - FT)	84.58
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

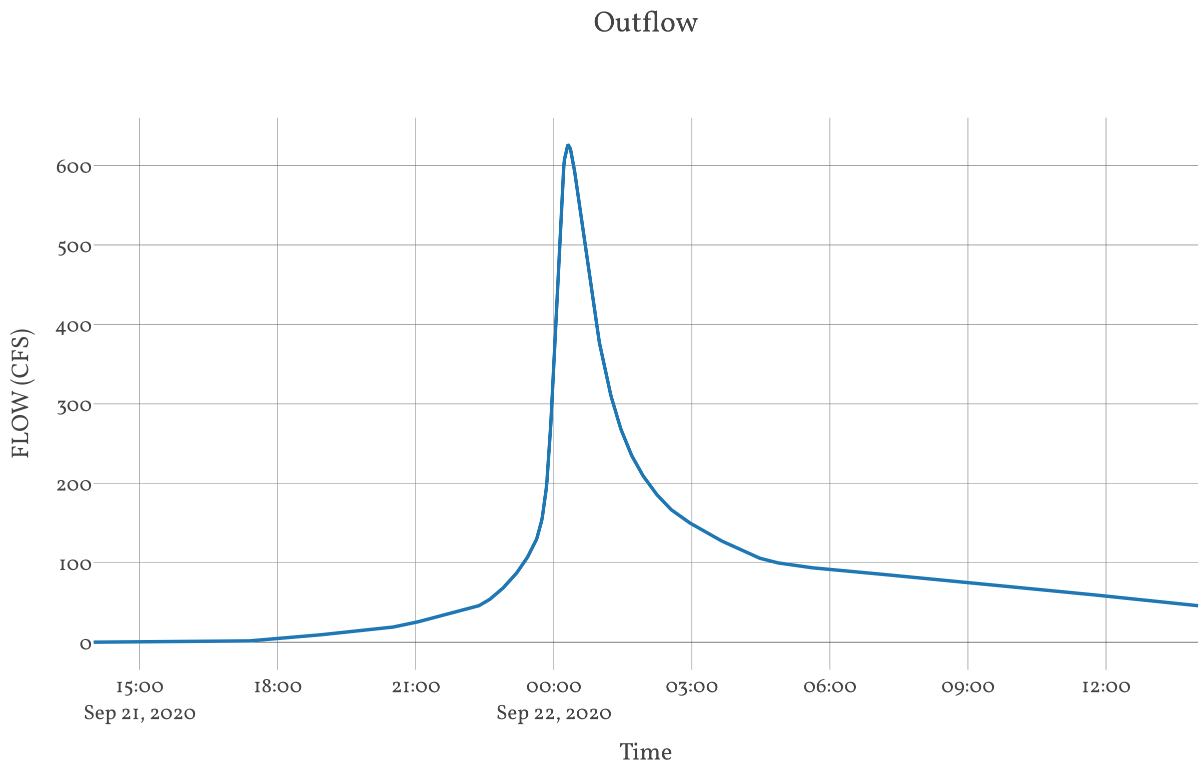


Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	625.34
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	2.61



Reach: 18R

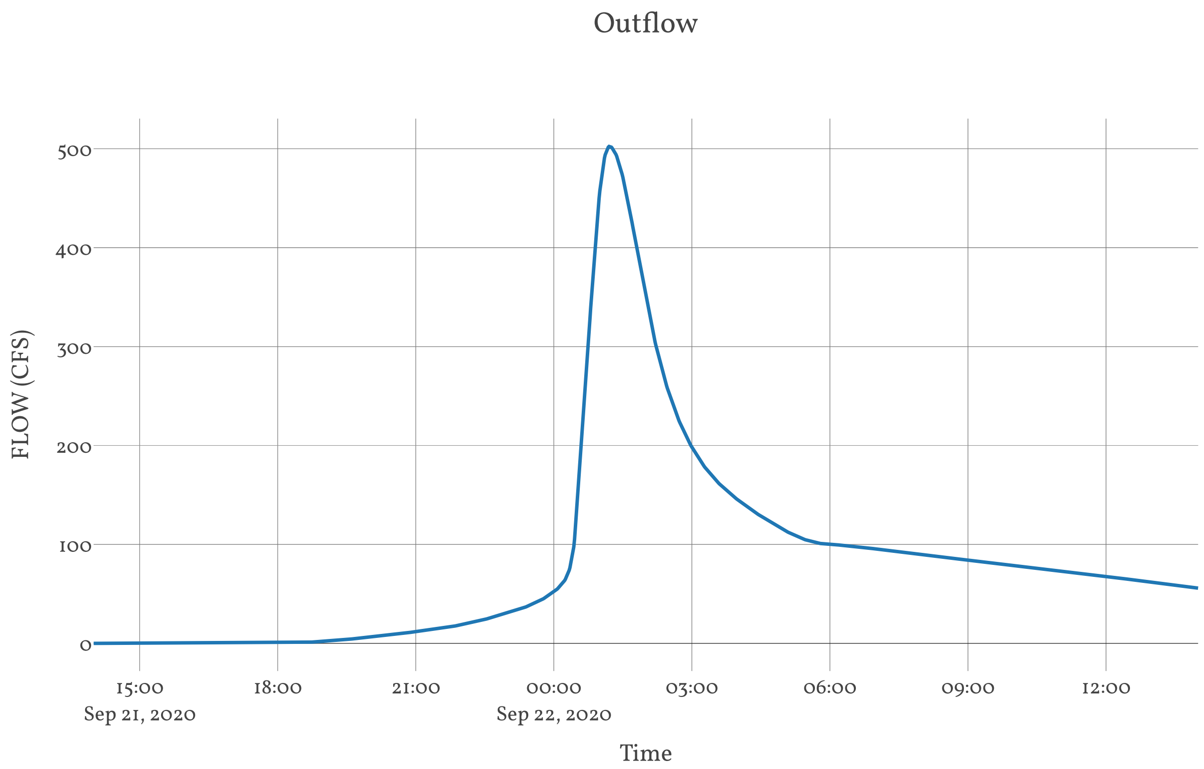
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	502.51
Time of Peak Discharge	22Sep2020, 01:13
Volume (IN)	2.5
Peak Inflow (CFS)	625.34
Inflow Volume (AC - FT)	174.09



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

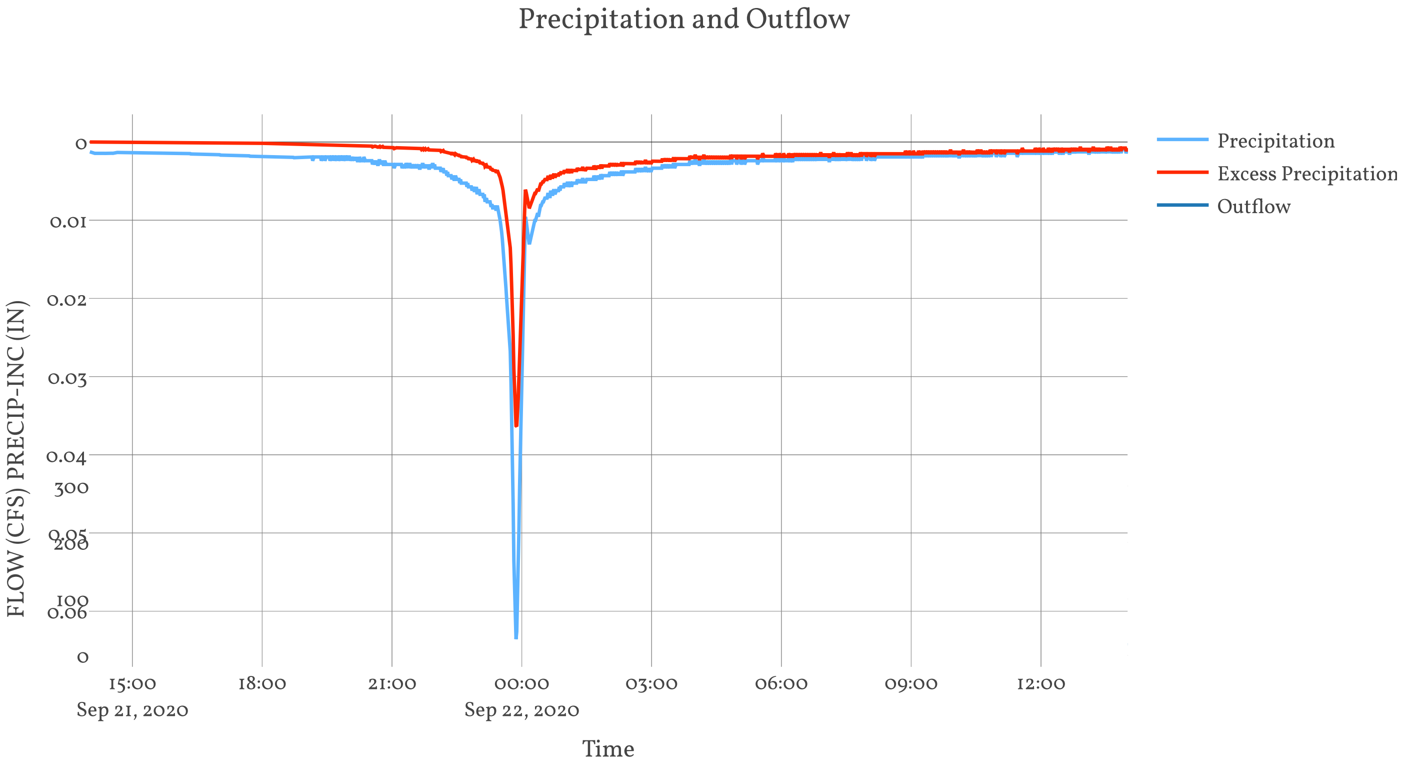
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	362.49
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	2.56
Precipitation Volume (AC - FT)	133.99
Loss Volume (AC - FT)	61.5
Excess Volume (AC - FT)	72.49
Direct Runoff Volume (AC - FT)	71.87
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

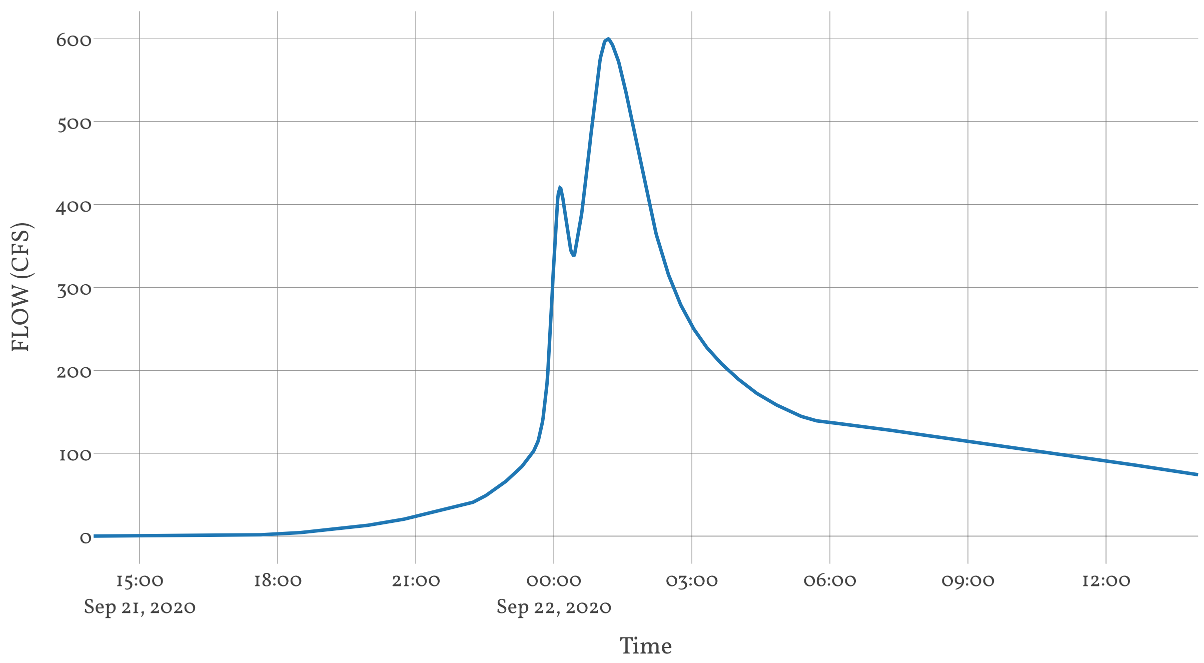
Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	599.85
Time of Peak Discharge	22Sep2020, 01:11
Volume (IN)	2.52

Outflow



Reach: 17R

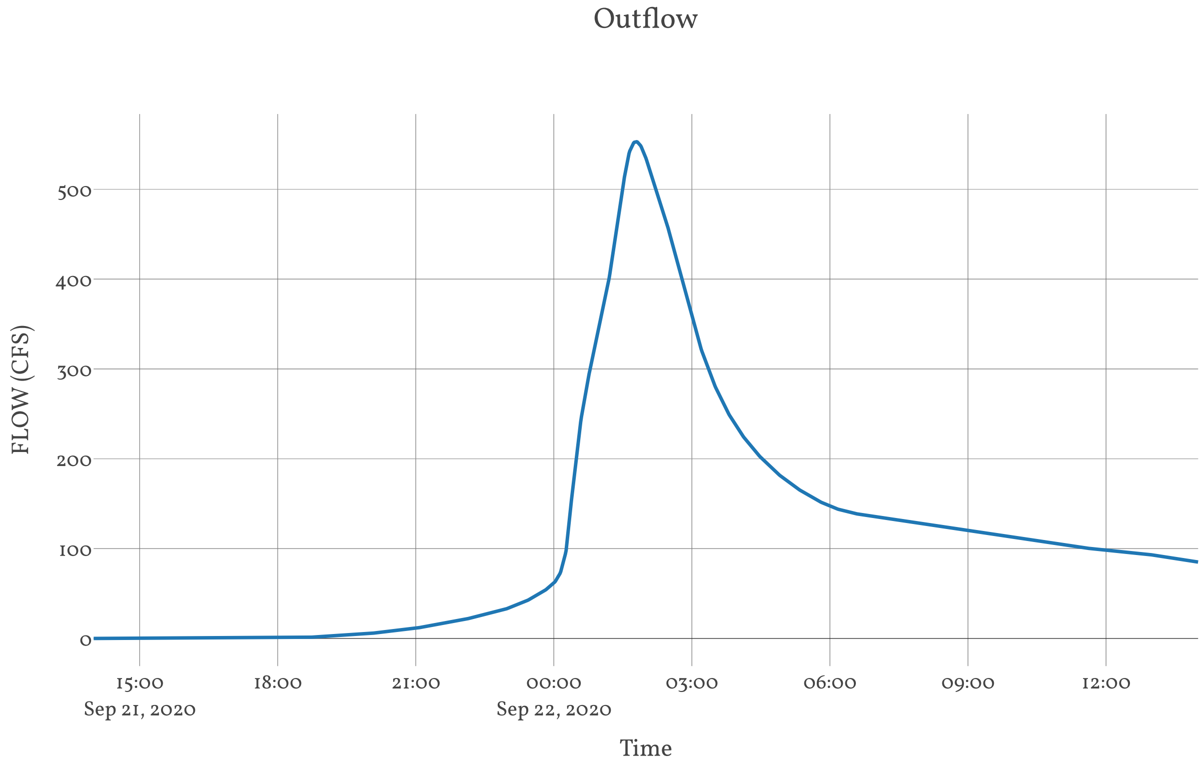
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	552.97
Time of Peak Discharge	22Sep2020, 01:47
Volume (IN)	2.43
Peak Inflow (CFS)	599.85
Inflow Volume (AC - FT)	238.98



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

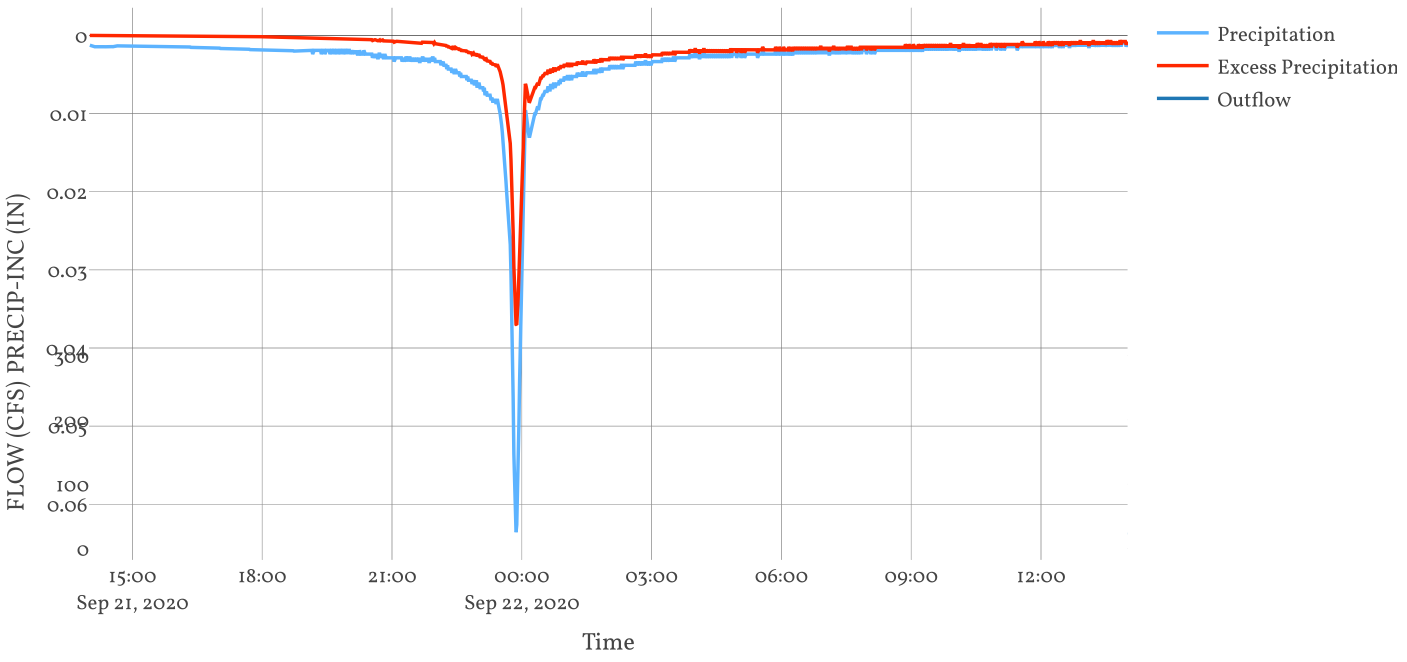
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	318.15
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	2.59
Precipitation Volume (AC - FT)	153.47
Loss Volume (AC - FT)	69.12
Excess Volume (AC - FT)	84.35
Direct Runoff Volume (AC - FT)	83.14
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

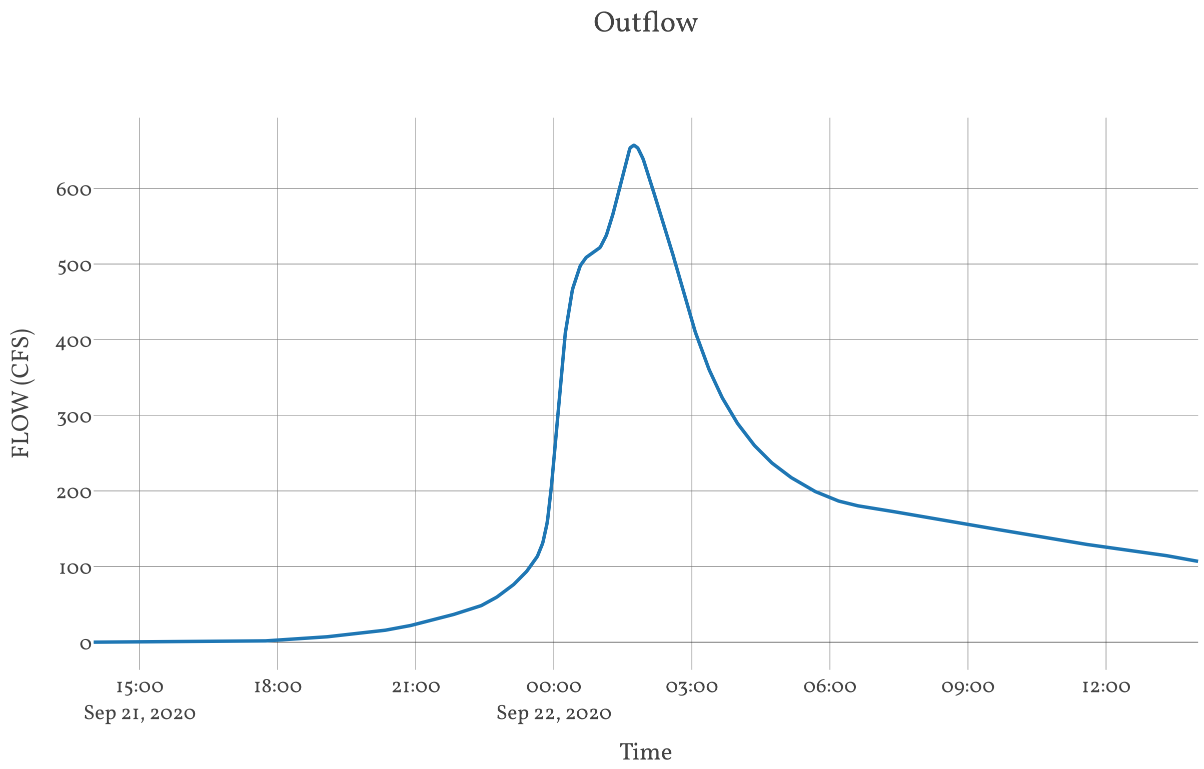


Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	656.9
Time of Peak Discharge	22Sep2020, 01:44
Volume (IN)	2.47



Reach: 16R

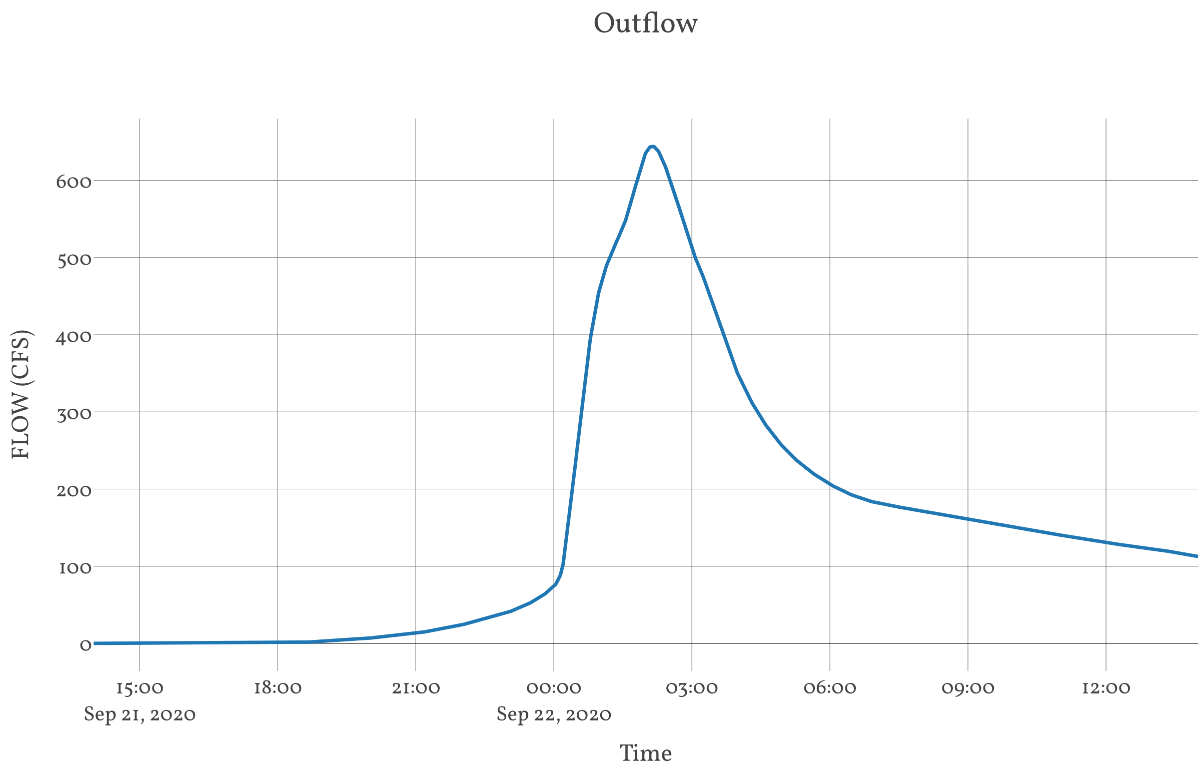
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	644.4
Time of Peak Discharge	22Sep2020, 02:08
Volume (IN)	2.4
Peak Inflow (CFS)	656.9
Inflow Volume (AC - FT)	313.31



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

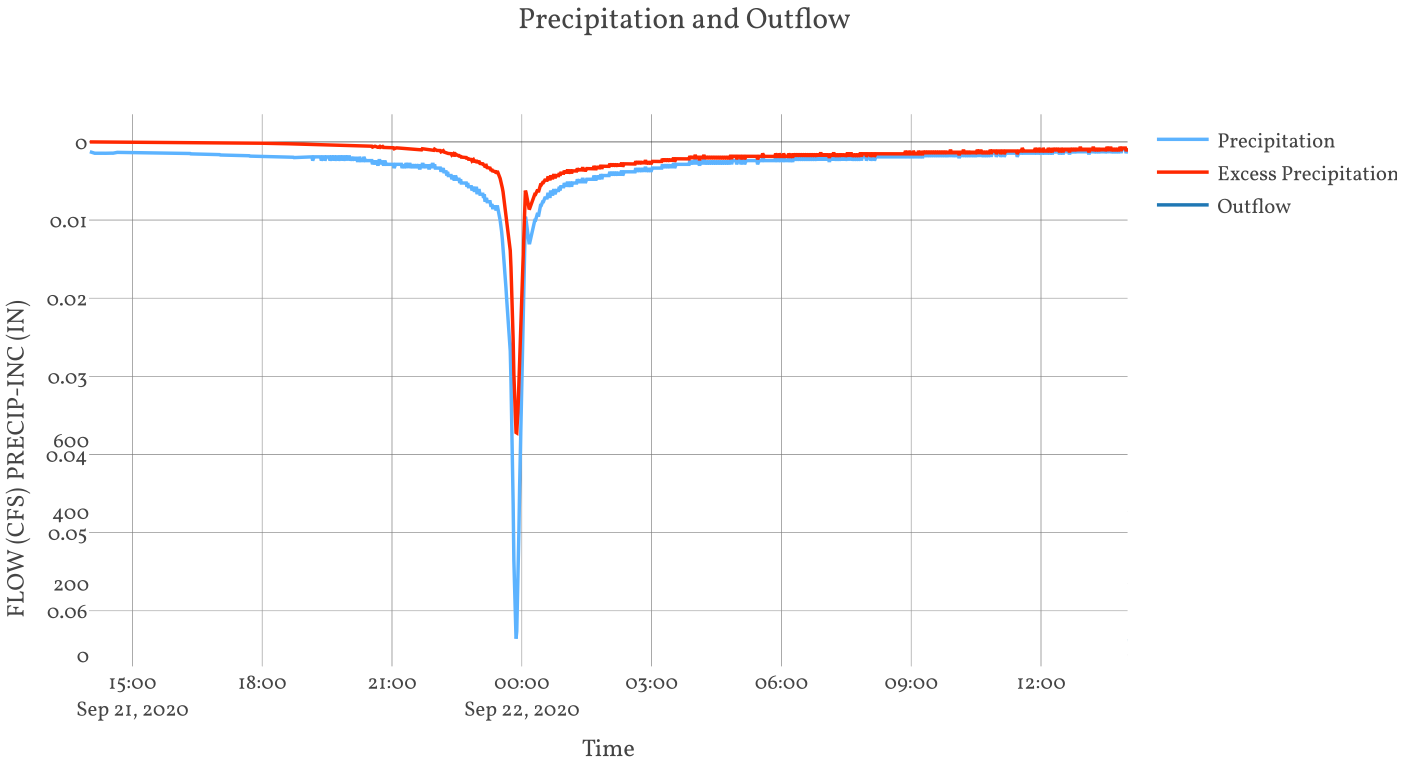
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	571.11
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	2.6
Precipitation Volume (AC - FT)	277.88
Loss Volume (AC - FT)	124.47
Excess Volume (AC - FT)	153.41
Direct Runoff Volume (AC - FT)	151.16
Baseflow Volume (AC - FT)	0

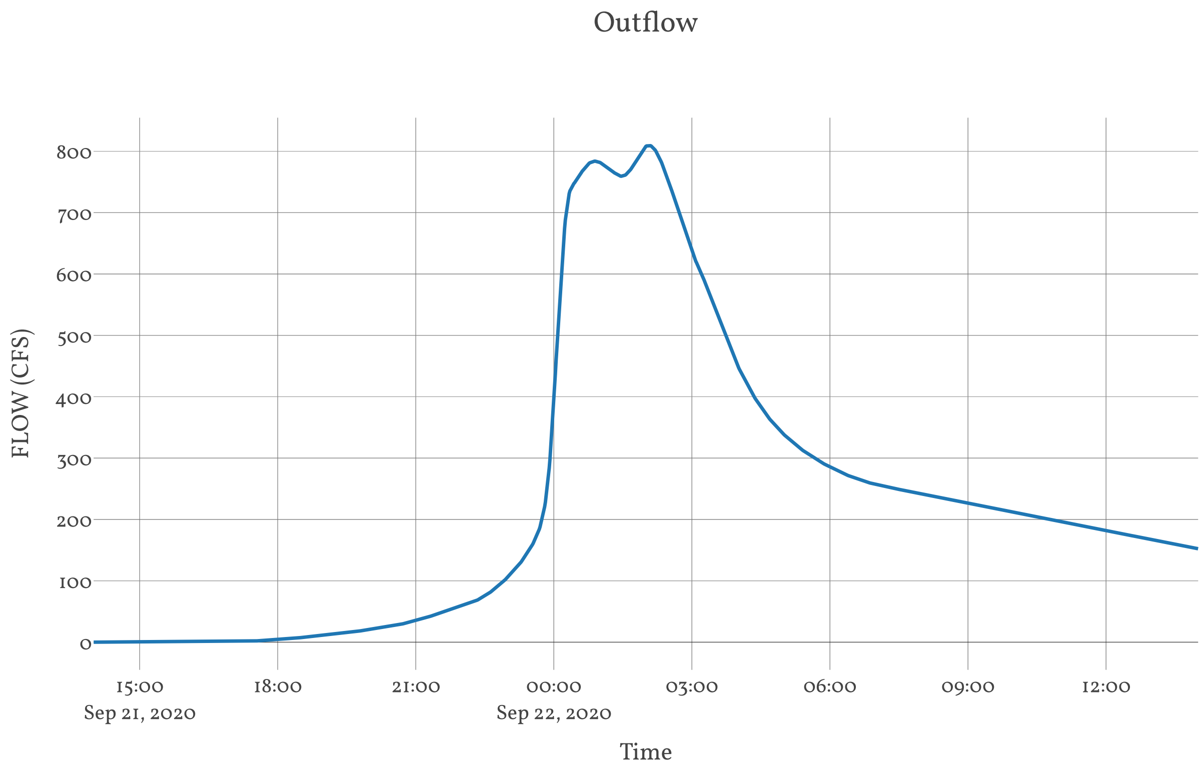

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	809.6
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.46



Reach: 20R

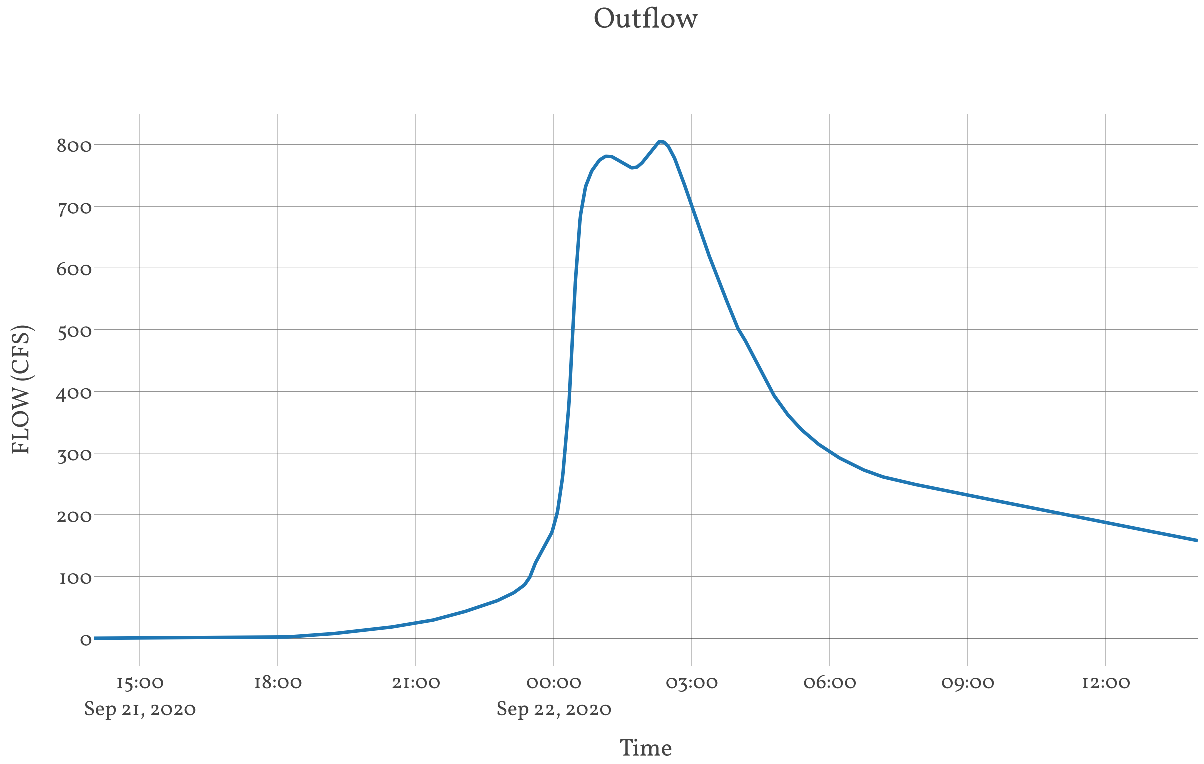
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	805.05
Time of Peak Discharge	22Sep2020, 02:20
Volume (IN)	2.42
Peak Inflow (CFS)	809.6
Inflow Volume (AC - FT)	455.71



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

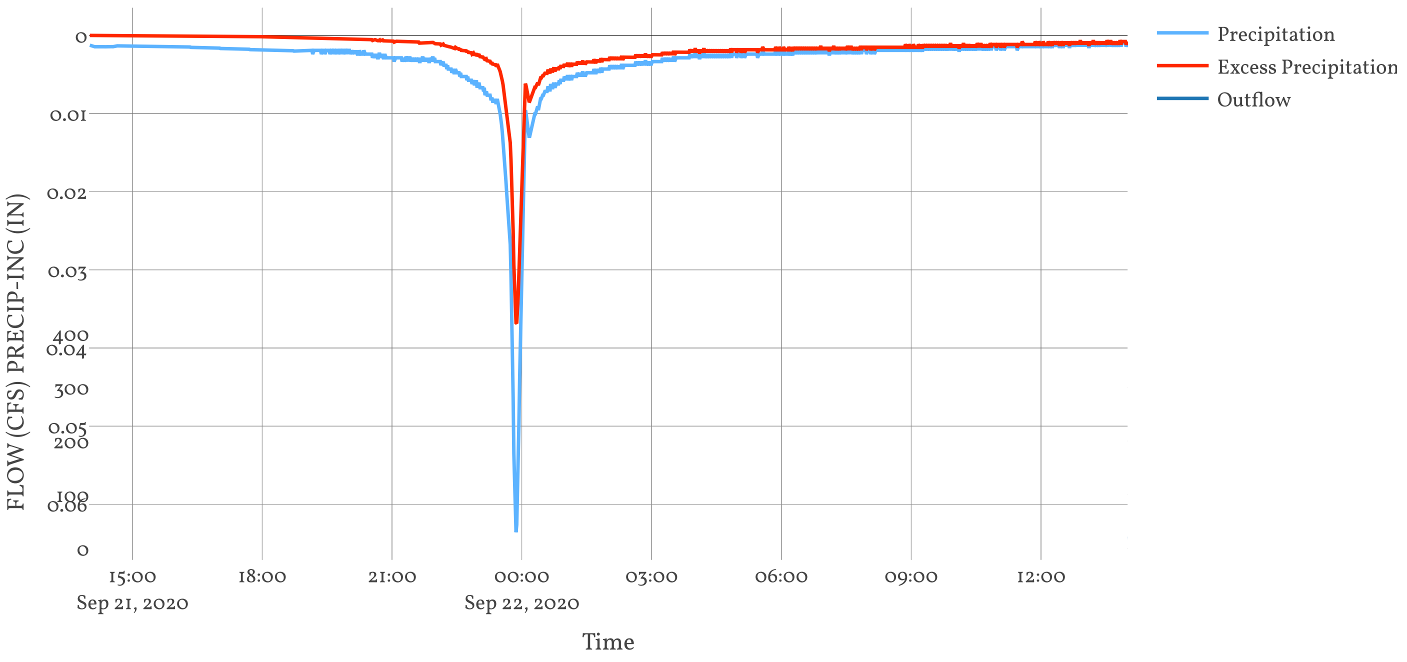
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	380.96
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	2.59
Precipitation Volume (AC - FT)	135.88
Loss Volume (AC - FT)	61.54
Excess Volume (AC - FT)	74.34
Direct Runoff Volume (AC - FT)	73.74
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

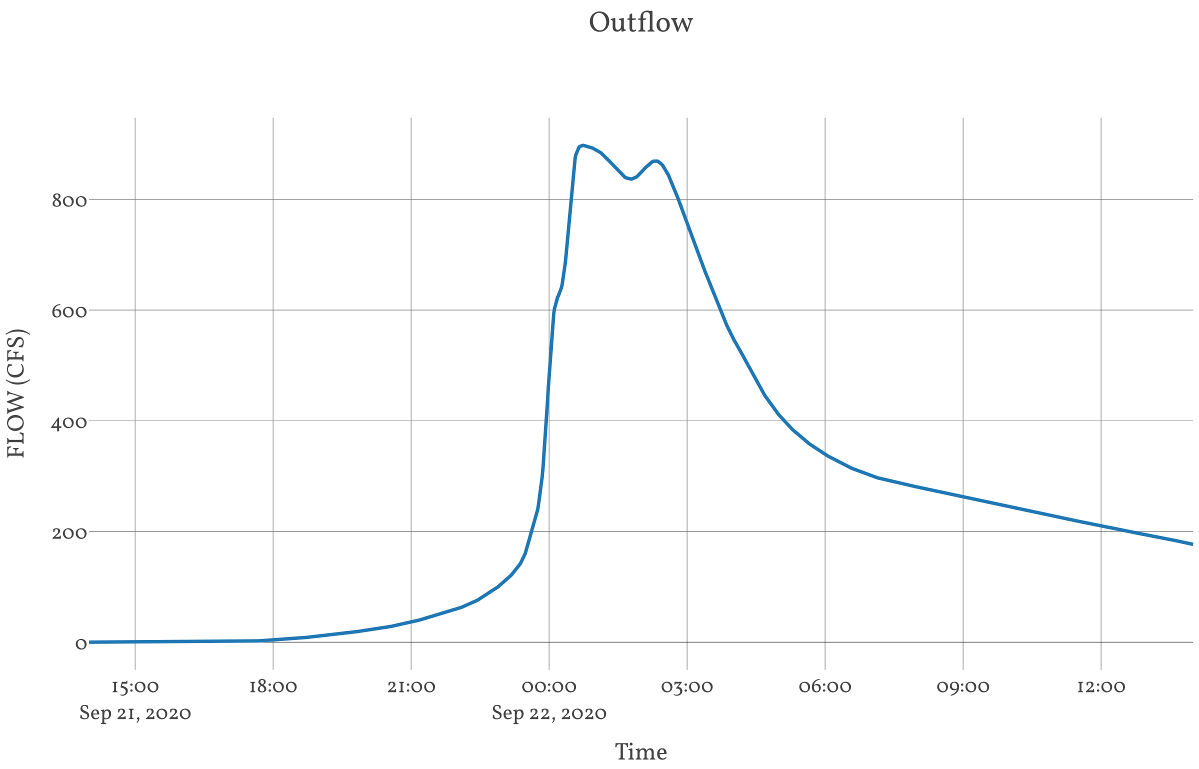


Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	897.56
Time of Peak Discharge	22Sep2020, 00:44
Volume (IN)	2.45



Reach: 15R

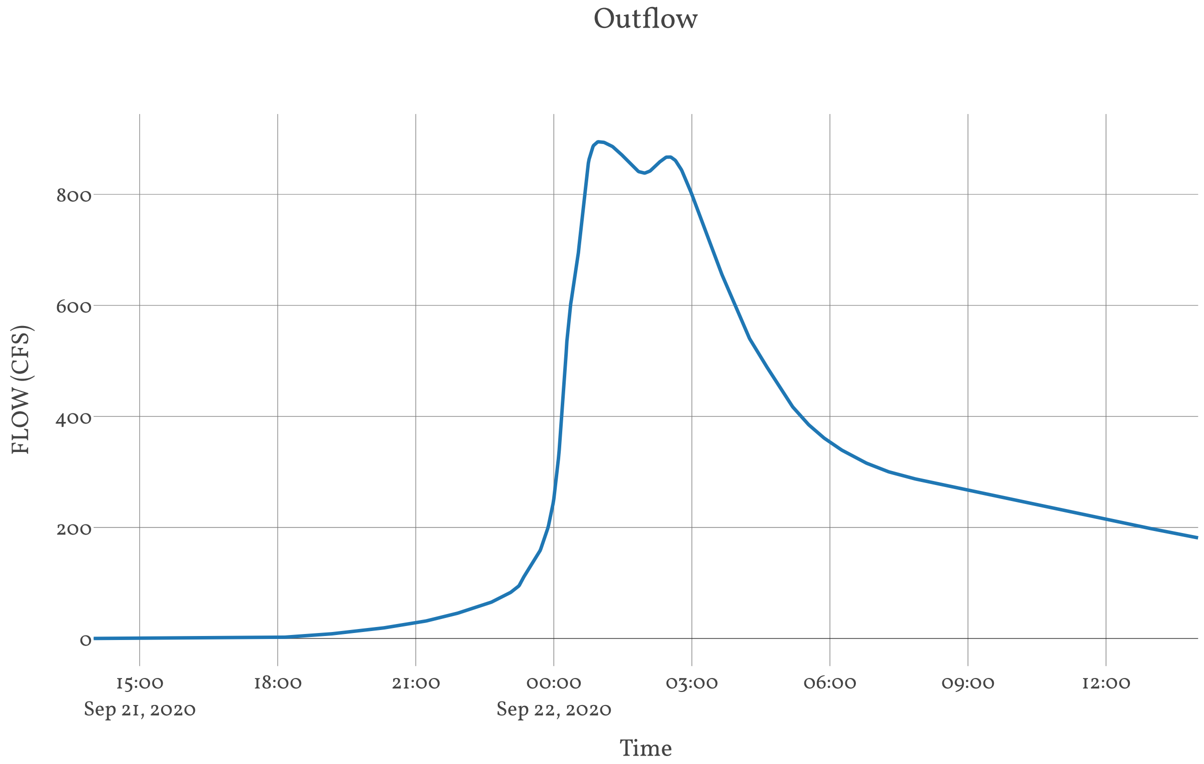
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	894.79
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	2.42
Peak Inflow (CFS)	897.56
Inflow Volume (AC - FT)	521.85



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

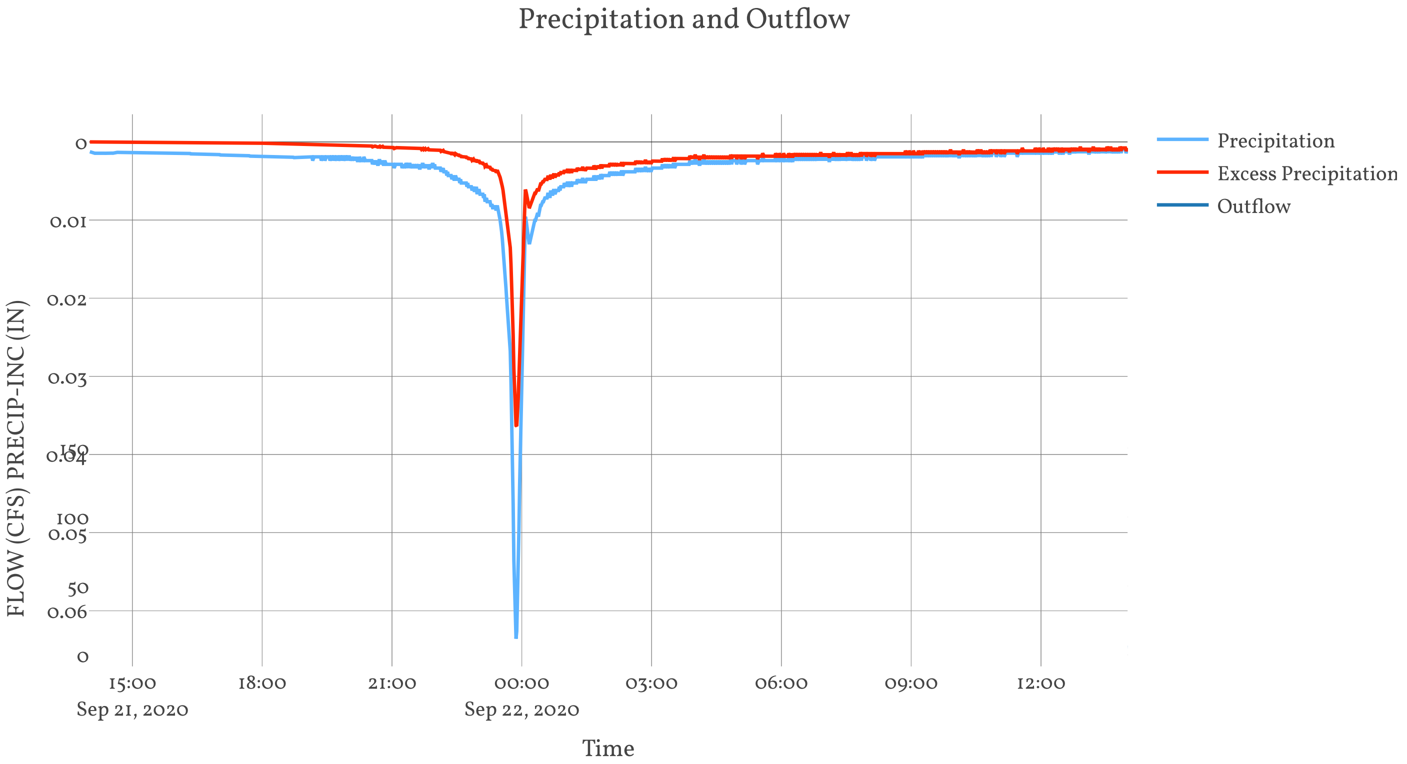
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	148.29
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	2.57
Precipitation Volume (AC - FT)	41.3
Loss Volume (AC - FT)	18.96
Excess Volume (AC - FT)	22.34
Direct Runoff Volume (AC - FT)	22.24
Baseflow Volume (AC - FT)	0

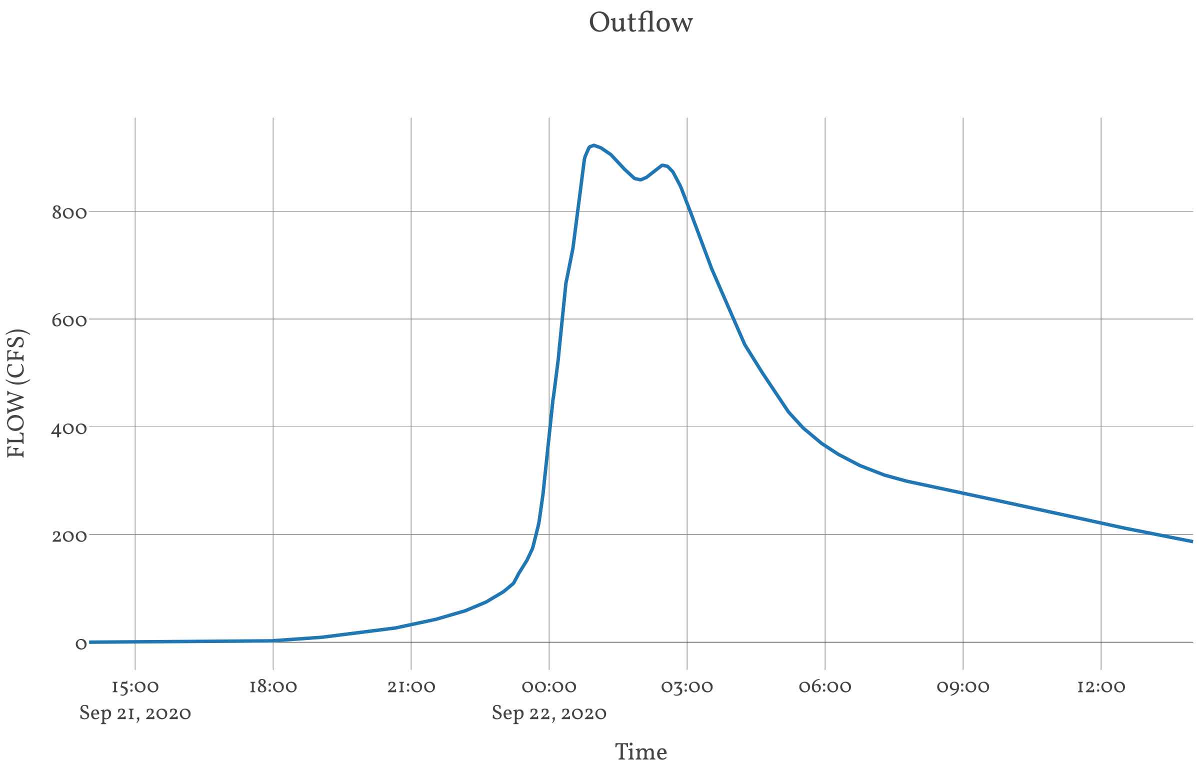

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	922.42
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	2.42



Reach: 14R

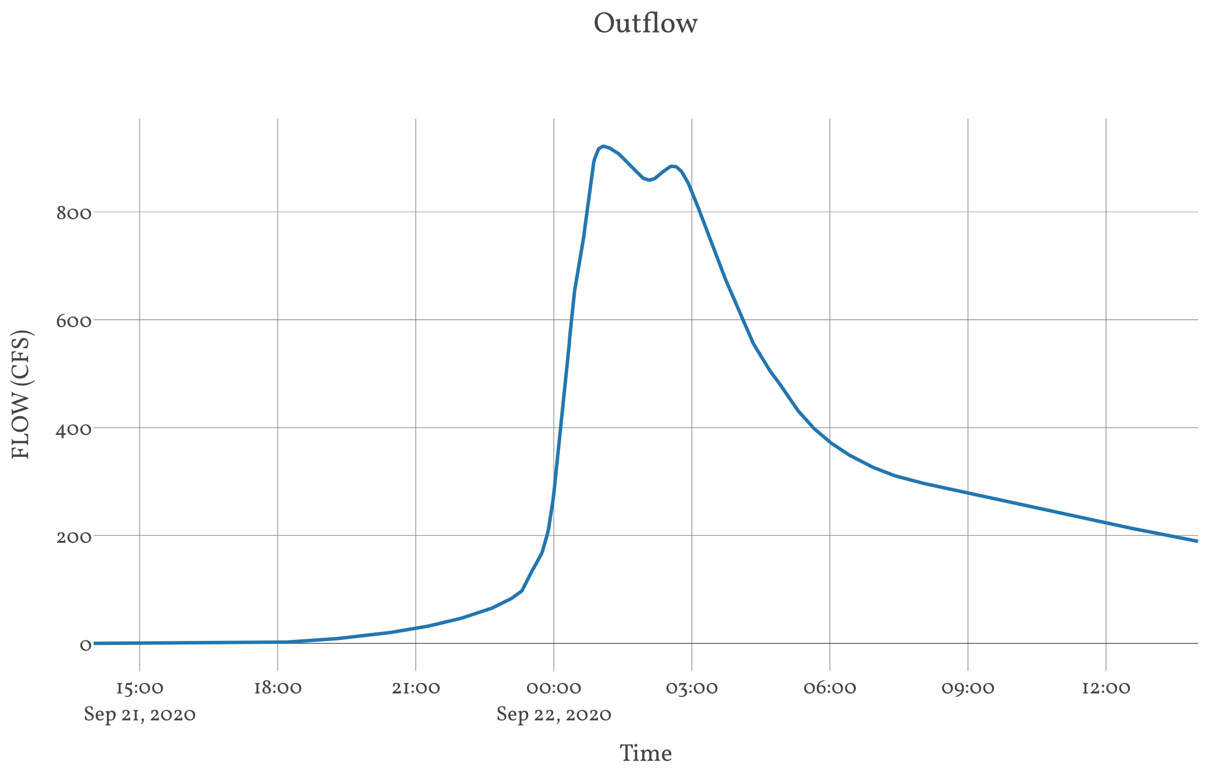
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	921.68
Time of Peak Discharge	22Sep2020, 01:05
Volume (IN)	2.41
Peak Inflow (CFS)	922.42
Inflow Volume (AC - FT)	538.39



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

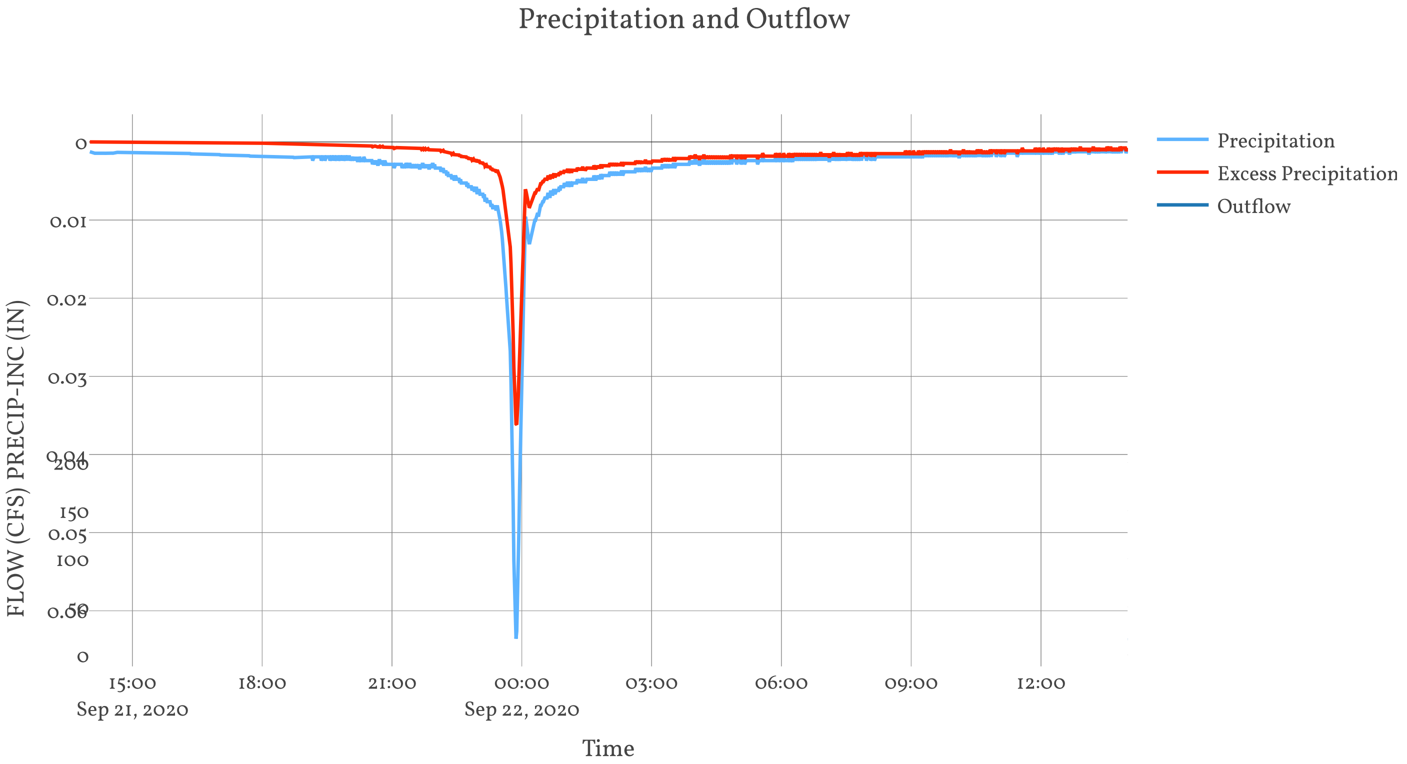
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	212.62
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	2.53
Precipitation Volume (AC - FT)	109.62
Loss Volume (AC - FT)	50.59
Excess Volume (AC - FT)	59.04
Direct Runoff Volume (AC - FT)	58.12
Baseflow Volume (AC - FT)	0

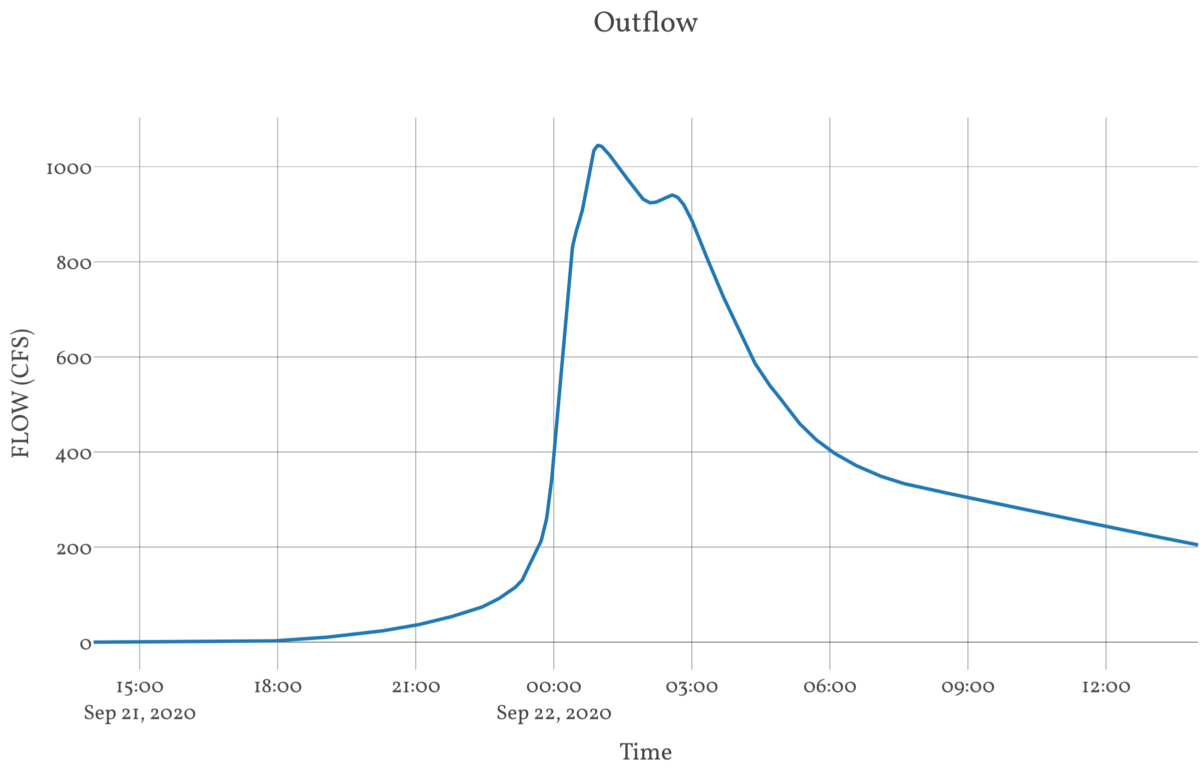

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
0.06
200
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	1044.93
Time of Peak Discharge	22Sep2020, 00:59
Volume (IN)	2.42



Reach: 13R

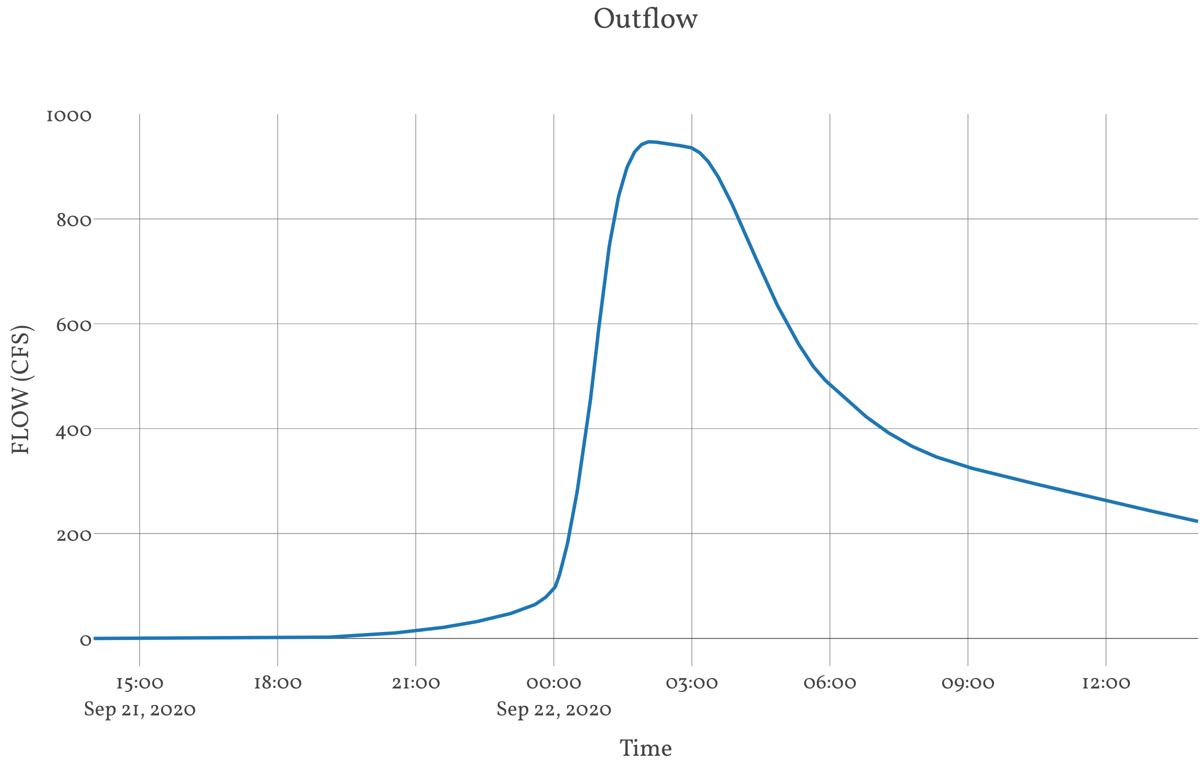
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	947.29
Time of Peak Discharge	22Sep2020, 02:07
Volume (IN)	2.32
Peak Inflow (CFS)	1044.93
Inflow Volume (AC - FT)	593.29



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

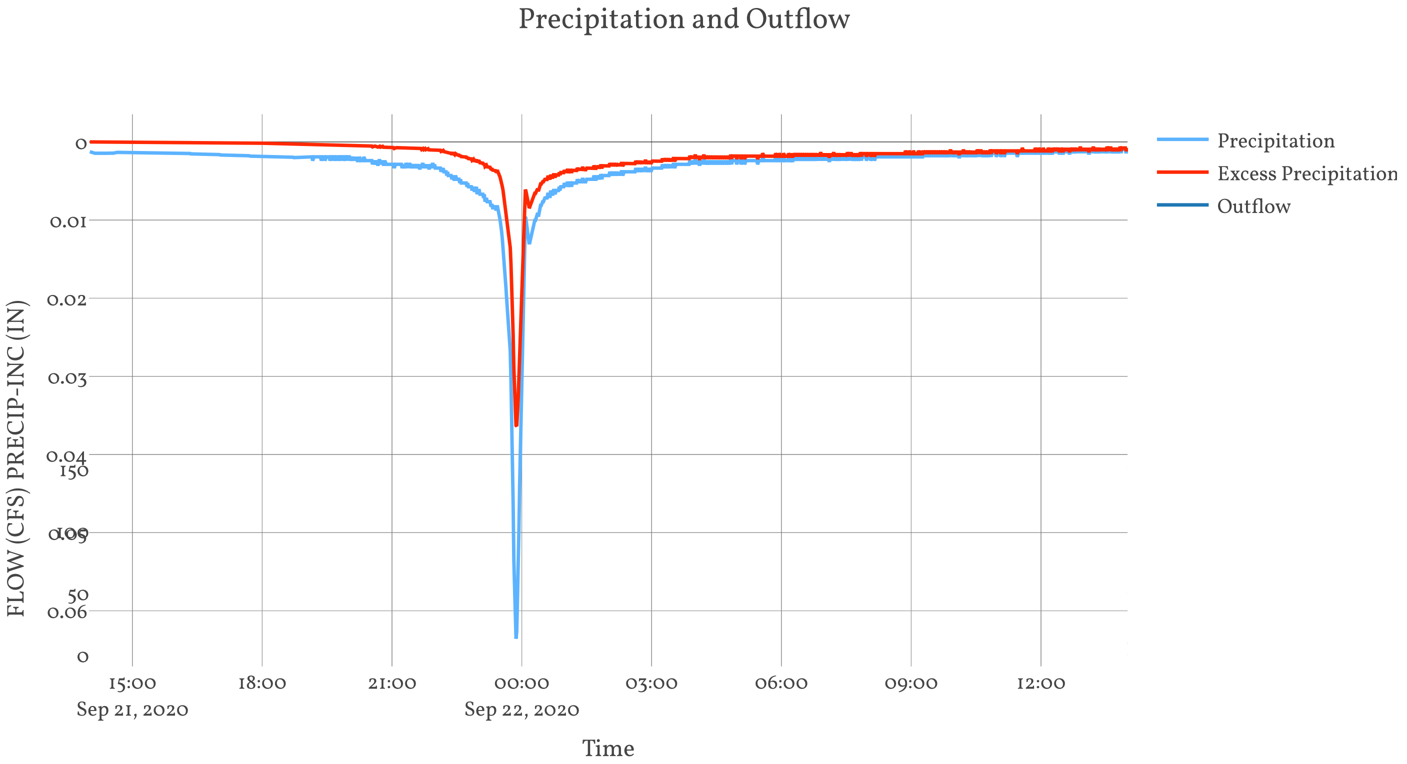
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	164.98
Time of Peak Discharge	22Sep2020, 00:10
Volume (IN)	2.56
Precipitation Volume (AC - FT)	65.01
Loss Volume (AC - FT)	29.84
Excess Volume (AC - FT)	35.17
Direct Runoff Volume (AC - FT)	34.83
Baseflow Volume (AC - FT)	0

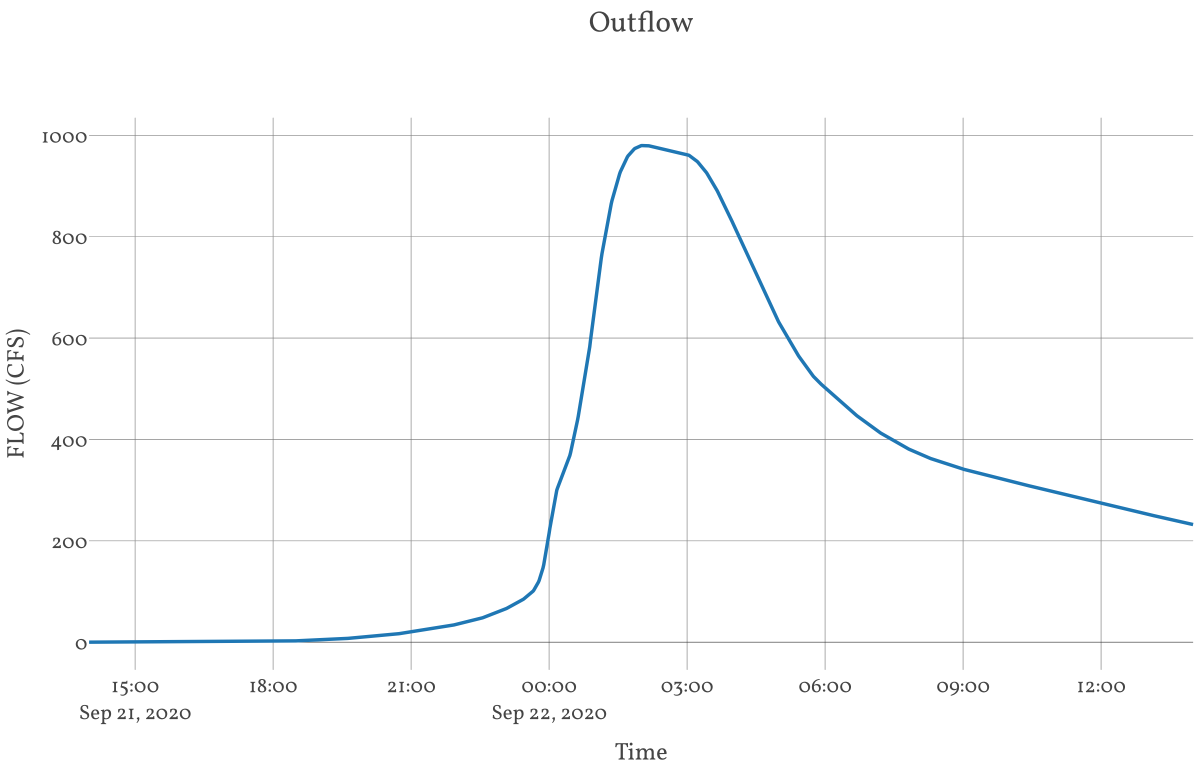

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

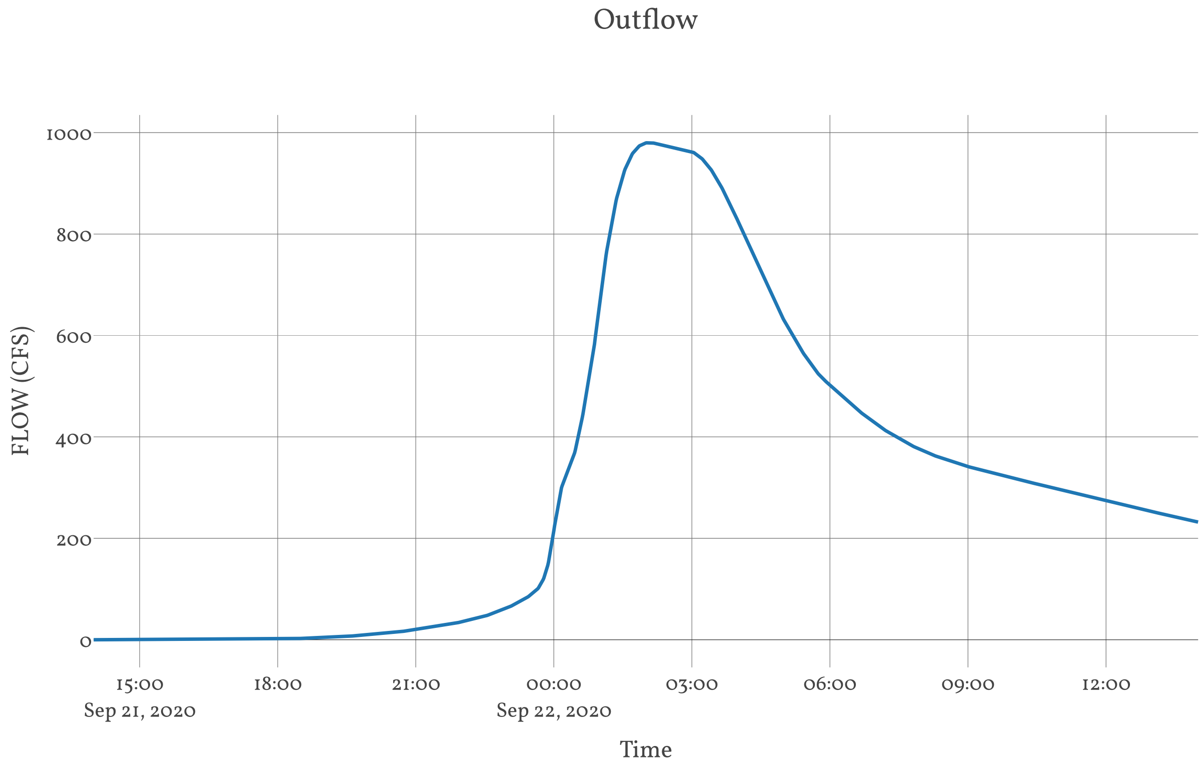
Peak Discharge (CFS)	980.2
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.33



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	980.2
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.33
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 010-mp-Post-Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:32

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	398.39	22Sep2020, 00:24	3.41
61b	0.61	458.08	22Sep2020, 00:15	3.43
J 60b 61b	1.25	832.88	22Sep2020, 00:19	3.42
18r	1.25	702.52	22Sep2020, 01:04	3.29
62b	0.53	483.79	22Sep2020, 00:08	3.37
17c	1.78	845.88	22Sep2020, 01:02	3.32
17r	1.78	769.61	22Sep2020, 01:34	3.2
63b	0.6	424.27	22Sep2020, 00:17	3.4
16c	2.38	922.1	22Sep2020, 01:31	3.25
16r	2.38	904.53	22Sep2020, 01:54	3.18
64b	1.09	761.01	22Sep2020, 00:18	3.41
20c	3.47	1142.12	22Sep2020, 01:48	3.25
20r	3.47	1137.47	22Sep2020, 02:02	3.2
65b	0.53	507.77	22Sep2020, 00:07	3.41
15c	4	1274.95	22Sep2020, 01:00	3.23
15r	4	1270.86	22Sep2020, 01:10	3.2
66b	0.16	197.61	22Sep2020, 00:02	3.38
14c	4.16	1303.35	22Sep2020, 01:09	3.21
14r	4.16	1302.34	22Sep2020, 01:14	3.19
67b	0.43	284.32	22Sep2020, 00:19	3.34
13c	4.59	1446.43	22Sep2020, 00:55	3.2
13r	4.59	1349.74	22Sep2020, 01:54	3.09
68b	0.26	220.26	22Sep2020, 00:09	3.37

12c	4.85	1395.18	22Sep2020, 01:51	3.1
Pacific Ocean	4.85	1395.18	22Sep2020, 01:51	3.1

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

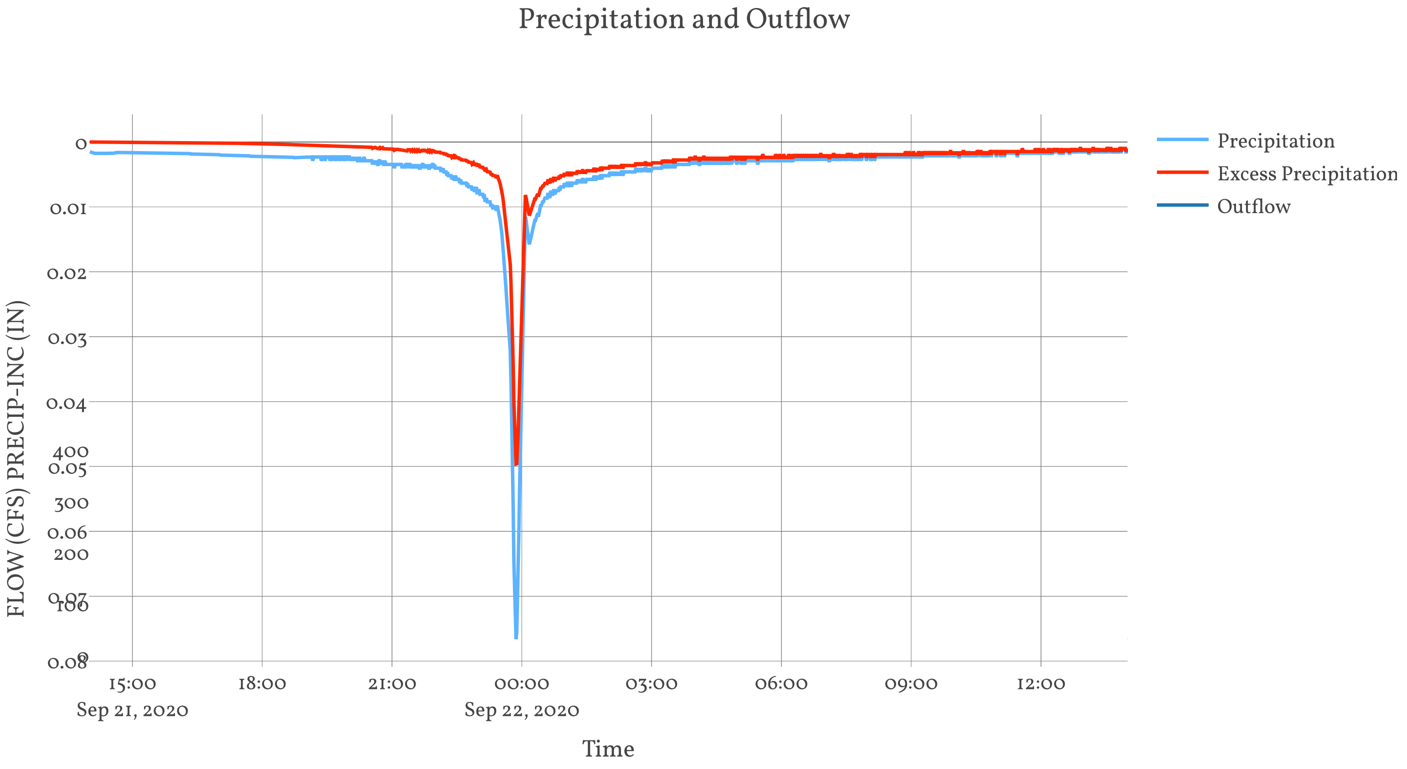
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	398.39
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	3.41
Precipitation Volume (AC - FT)	198.14
Loss Volume (AC - FT)	78.57
Excess Volume (AC - FT)	119.58
Direct Runoff Volume (AC - FT)	117.46
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

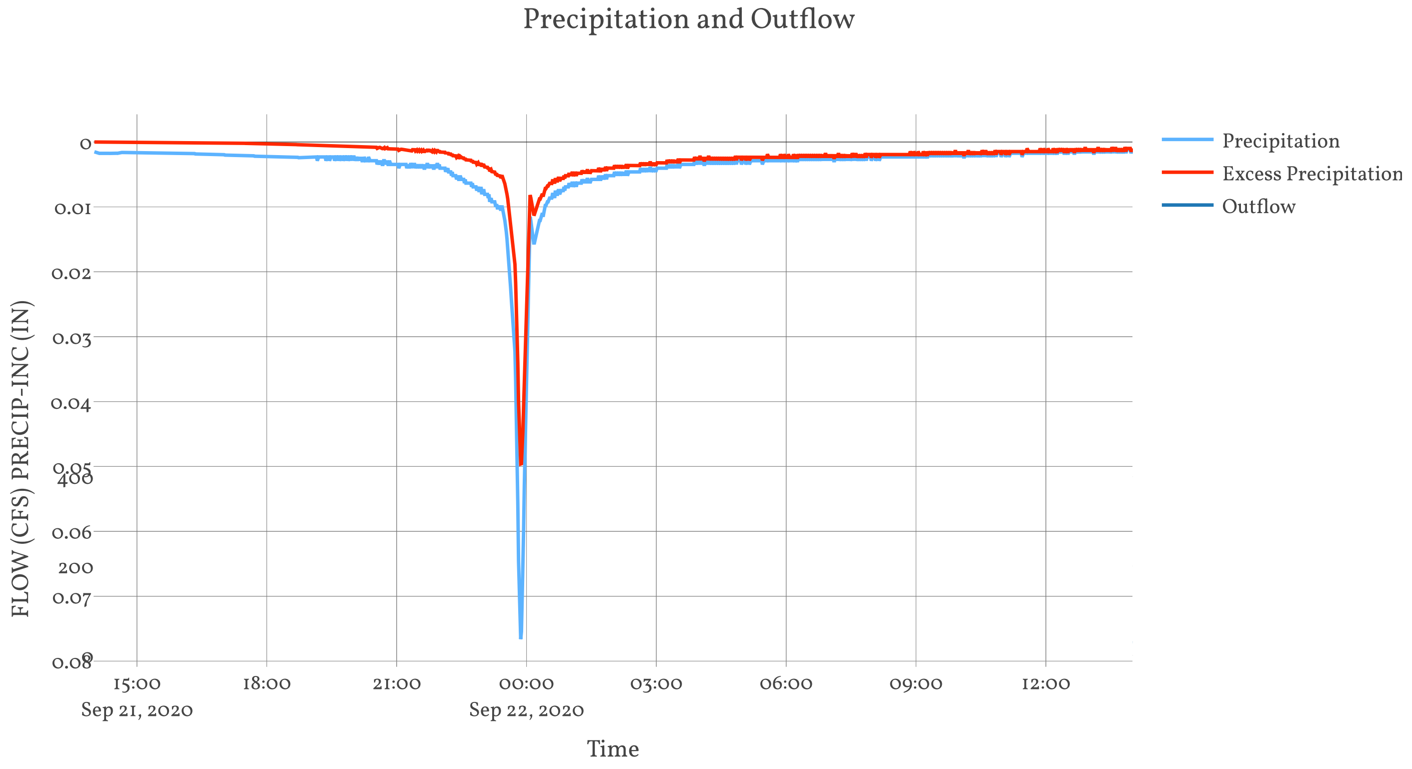
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	458.08
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	3.43
Precipitation Volume (AC - FT)	186.16
Loss Volume (AC - FT)	73.82
Excess Volume (AC - FT)	112.35
Direct Runoff Volume (AC - FT)	110.97
Baseflow Volume (AC - FT)	0

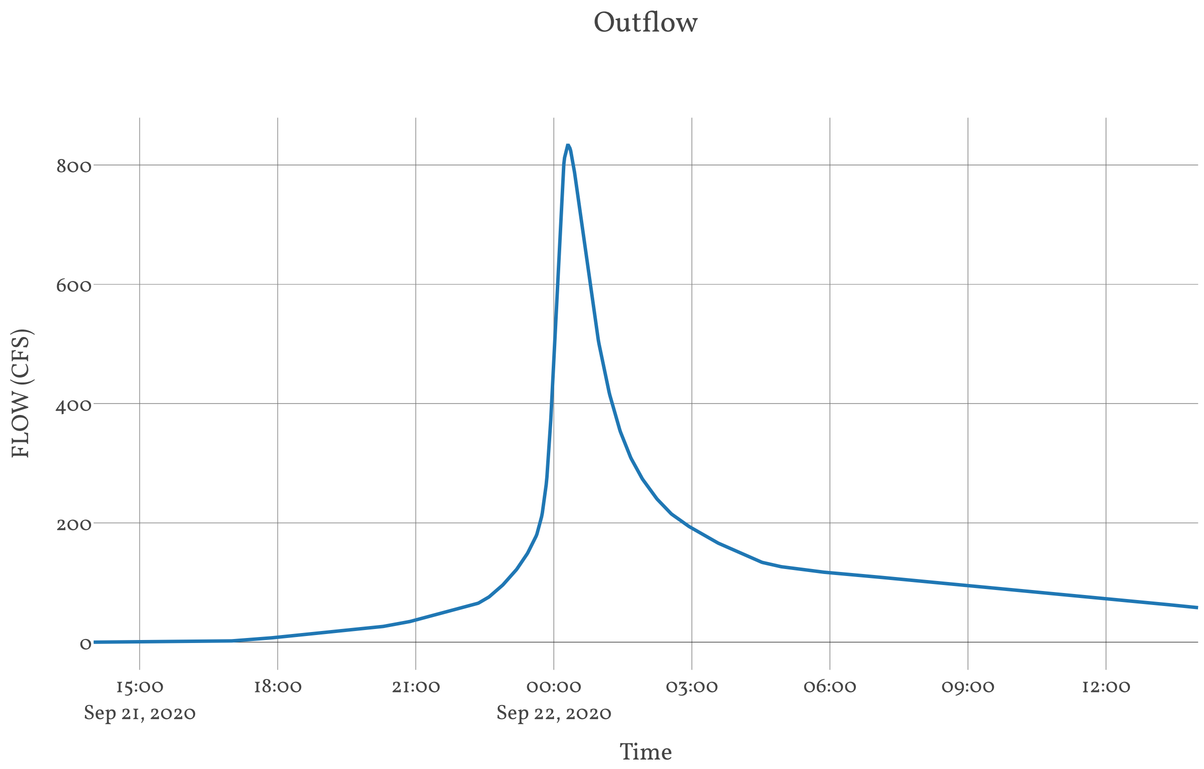

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
400
0.06
200
0.07
0.08
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	832.88
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	3.42



Reach: 18R

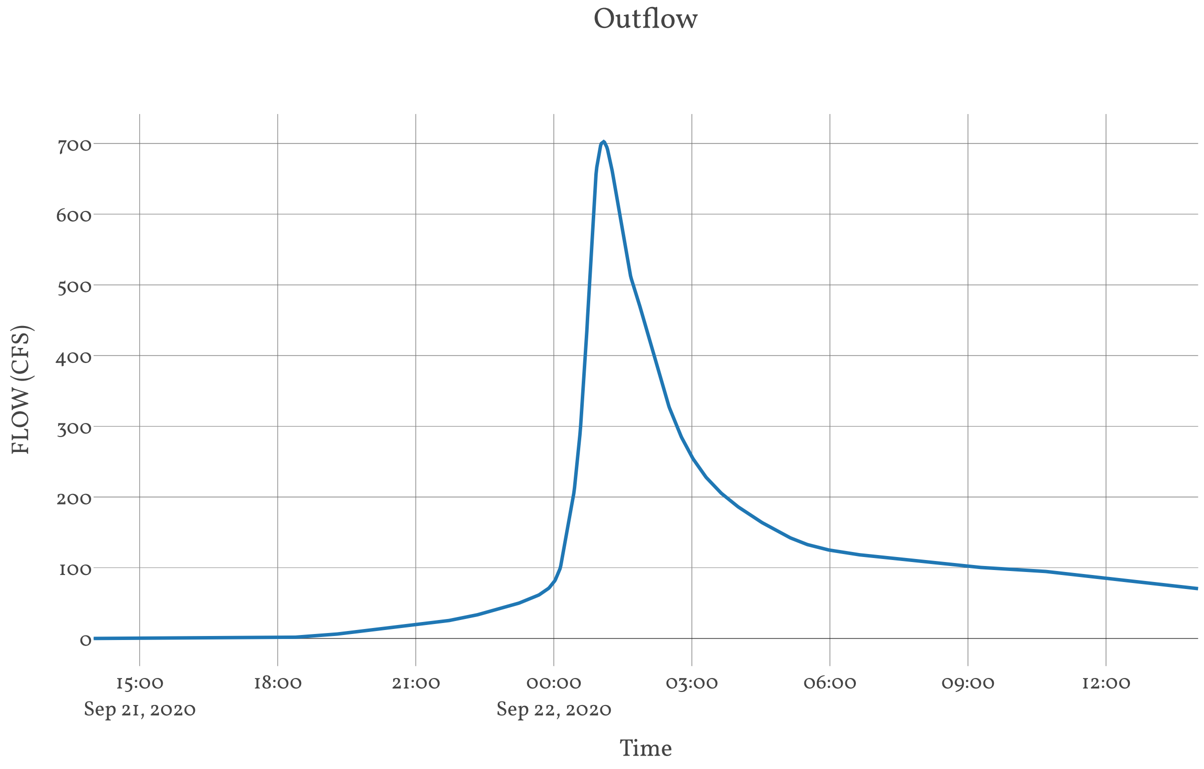
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	702.52
Time of Peak Discharge	22Sep2020, 01:04
Volume (IN)	3.29
Peak Inflow (CFS)	832.88
Inflow Volume (AC - FT)	228.43



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

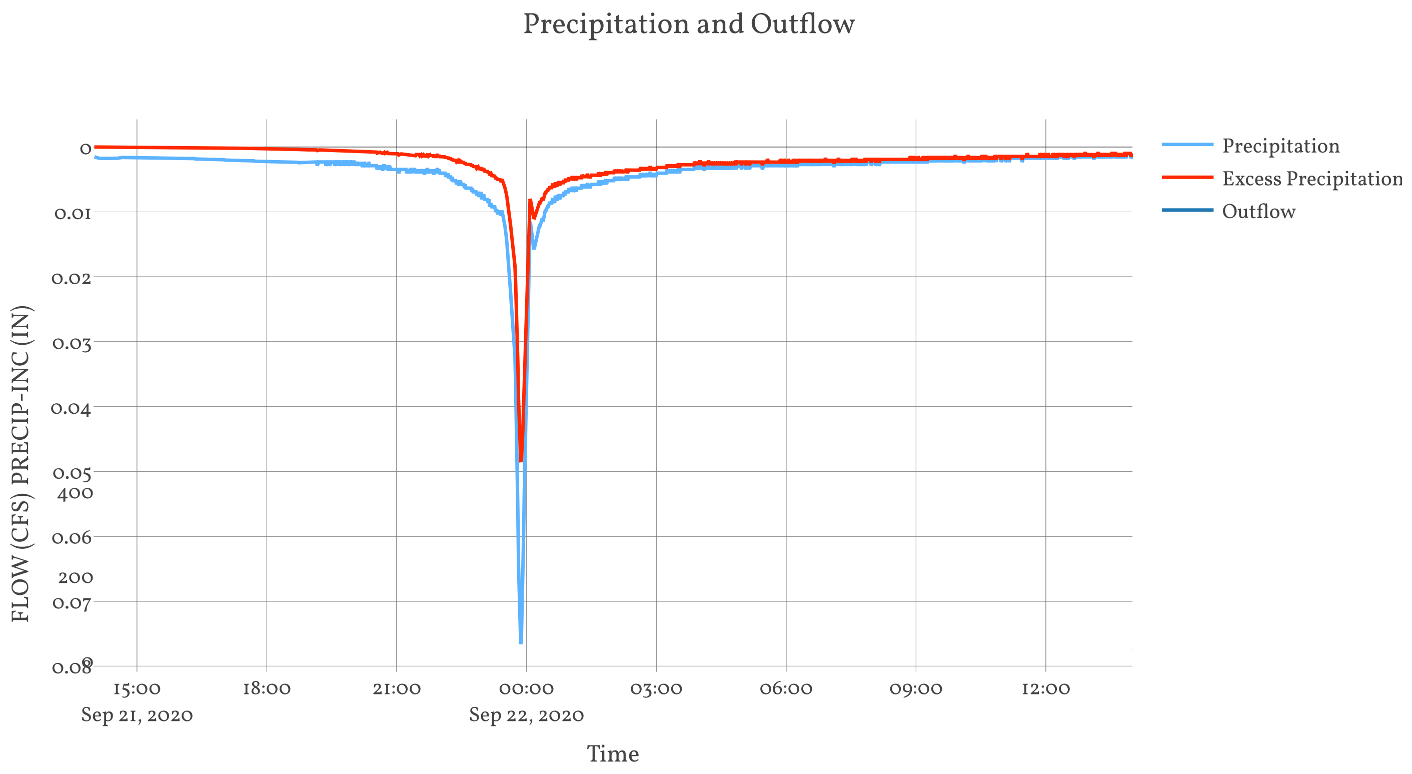
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	483.79
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	3.37
Precipitation Volume (AC - FT)	161.46
Loss Volume (AC - FT)	66.15
Excess Volume (AC - FT)	95.31
Direct Runoff Volume (AC - FT)	94.53
Baseflow Volume (AC - FT)	0

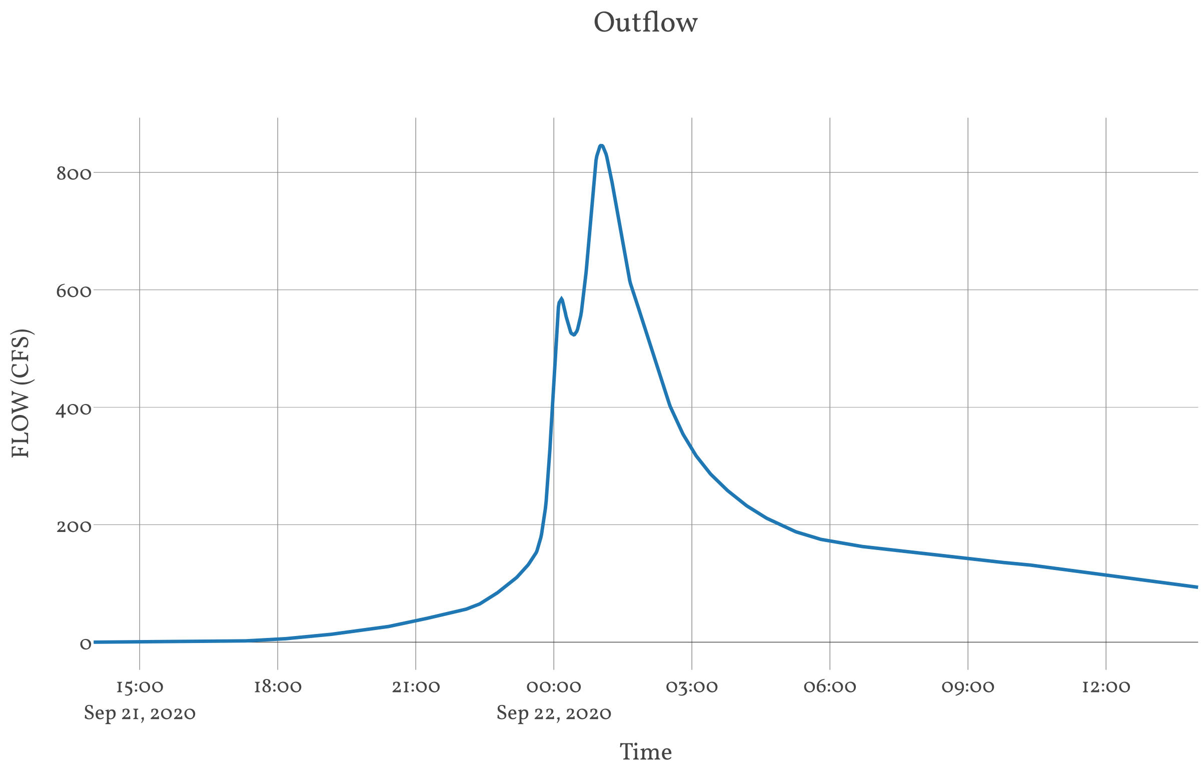

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
400
0.06
200
0.07
0.08
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	845.88
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	3.32



Reach: 17R

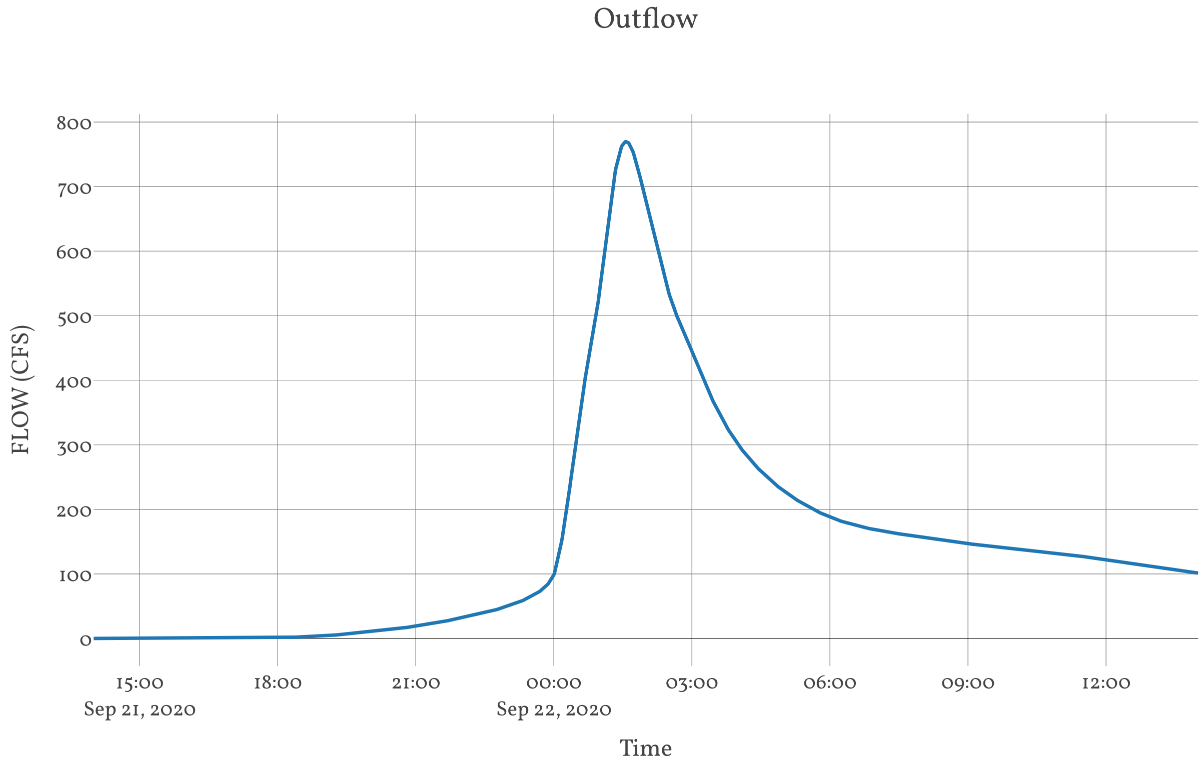
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	769.61
Time of Peak Discharge	22Sep2020, 01:34
Volume (IN)	3.2
Peak Inflow (CFS)	845.88
Inflow Volume (AC - FT)	314.17



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

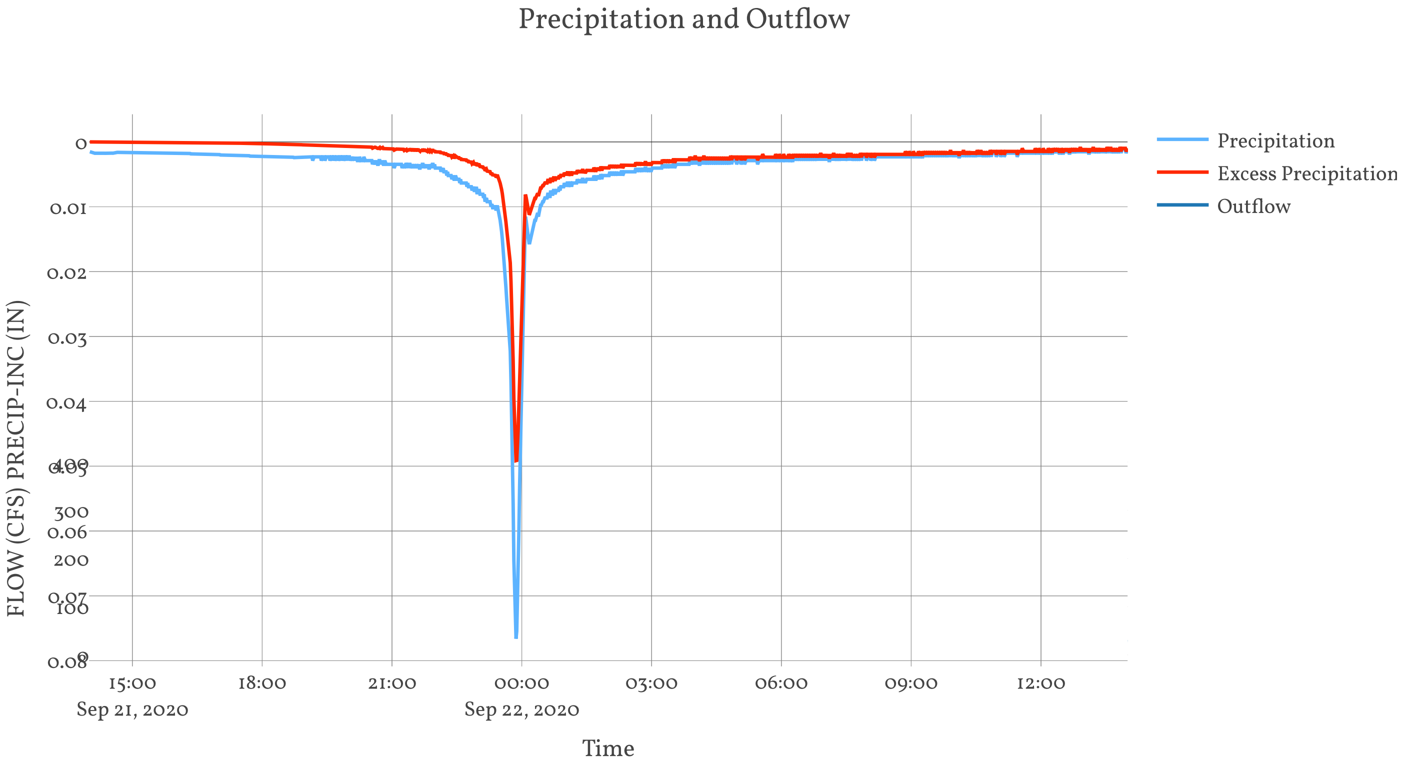
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	424.27
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	3.4
Precipitation Volume (AC - FT)	184.93
Loss Volume (AC - FT)	74.22
Excess Volume (AC - FT)	110.71
Direct Runoff Volume (AC - FT)	109.19
Baseflow Volume (AC - FT)	0

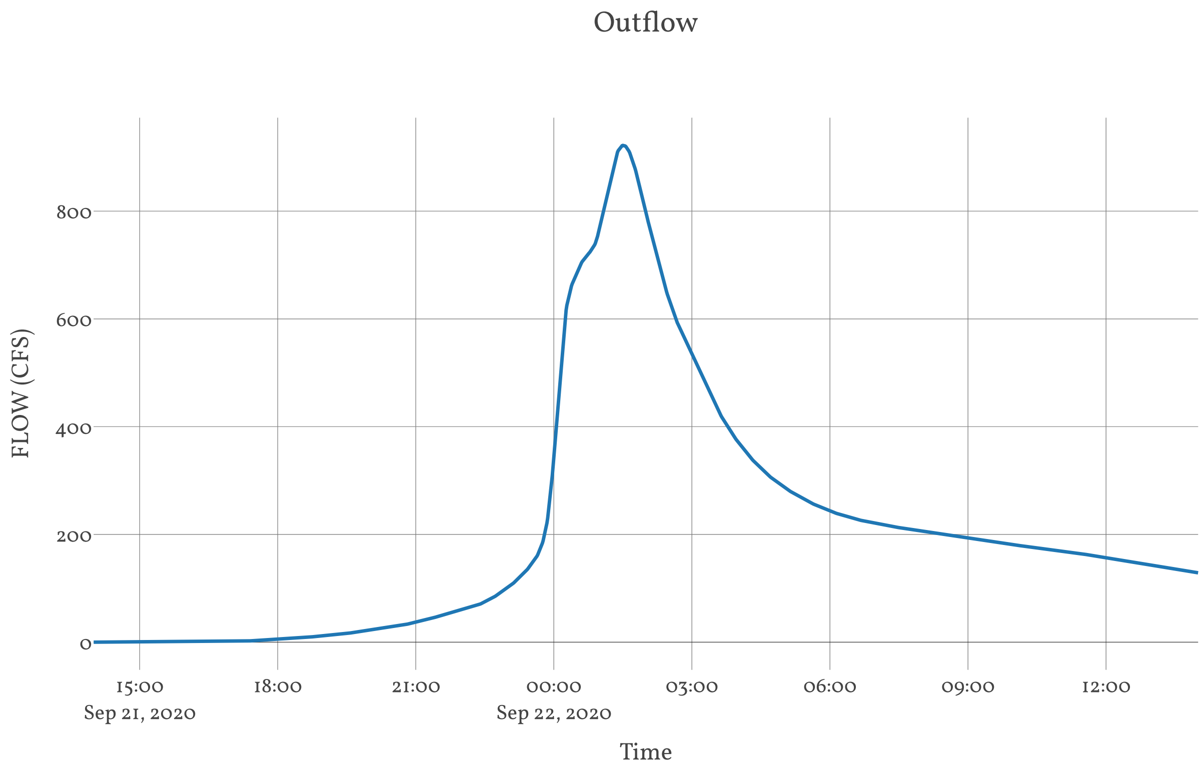

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	922.1
Time of Peak Discharge	22Sep2020, 01:31
Volume (IN)	3.25



Reach: 16R

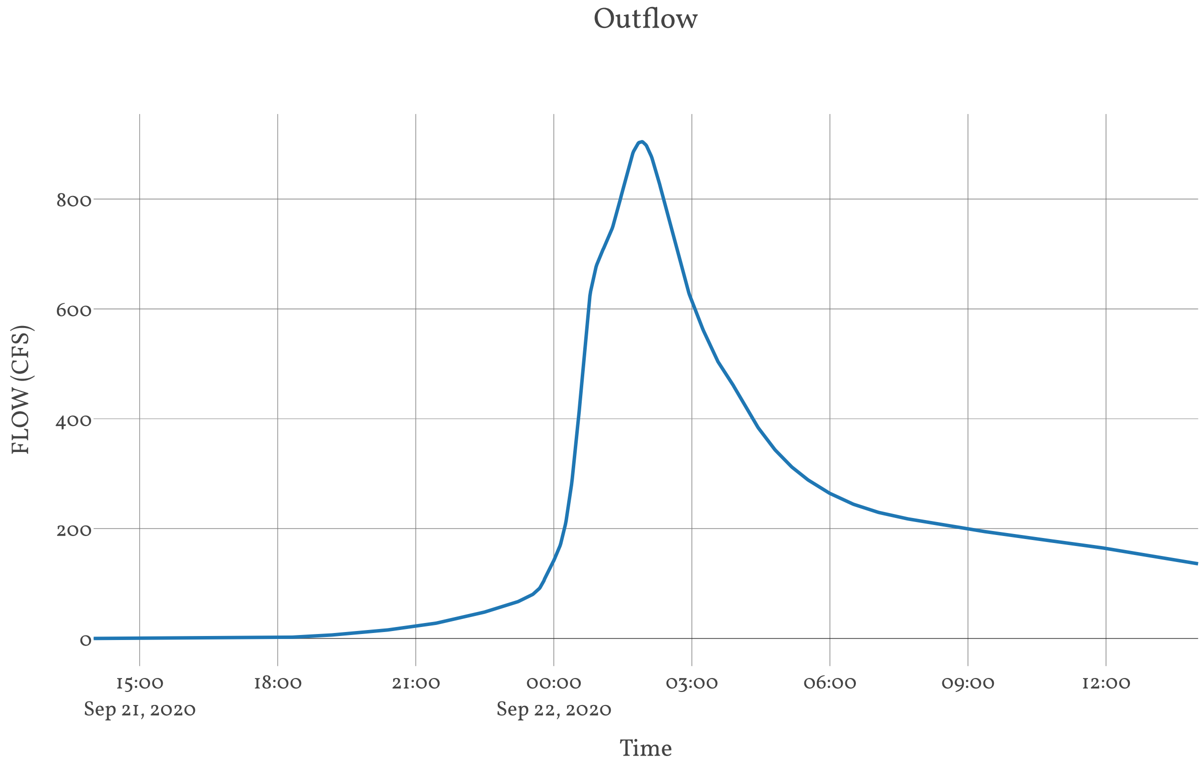
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	904.53
Time of Peak Discharge	22Sep2020, 01:54
Volume (IN)	3.18
Peak Inflow (CFS)	922.1
Inflow Volume (AC - FT)	412.59



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

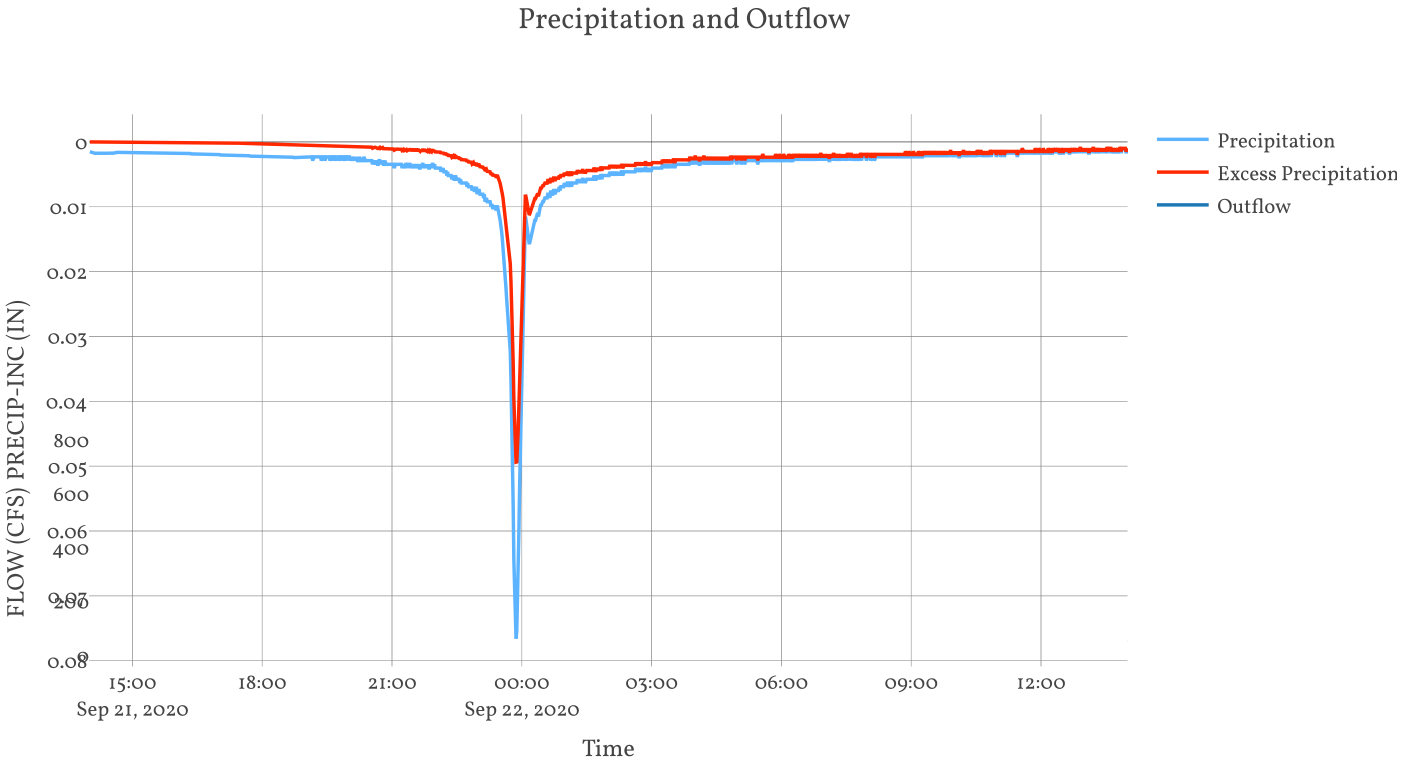
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	761.01
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	3.41
Precipitation Volume (AC - FT)	334.85
Loss Volume (AC - FT)	133.58
Excess Volume (AC - FT)	201.27
Direct Runoff Volume (AC - FT)	198.44
Baseflow Volume (AC - FT)	0

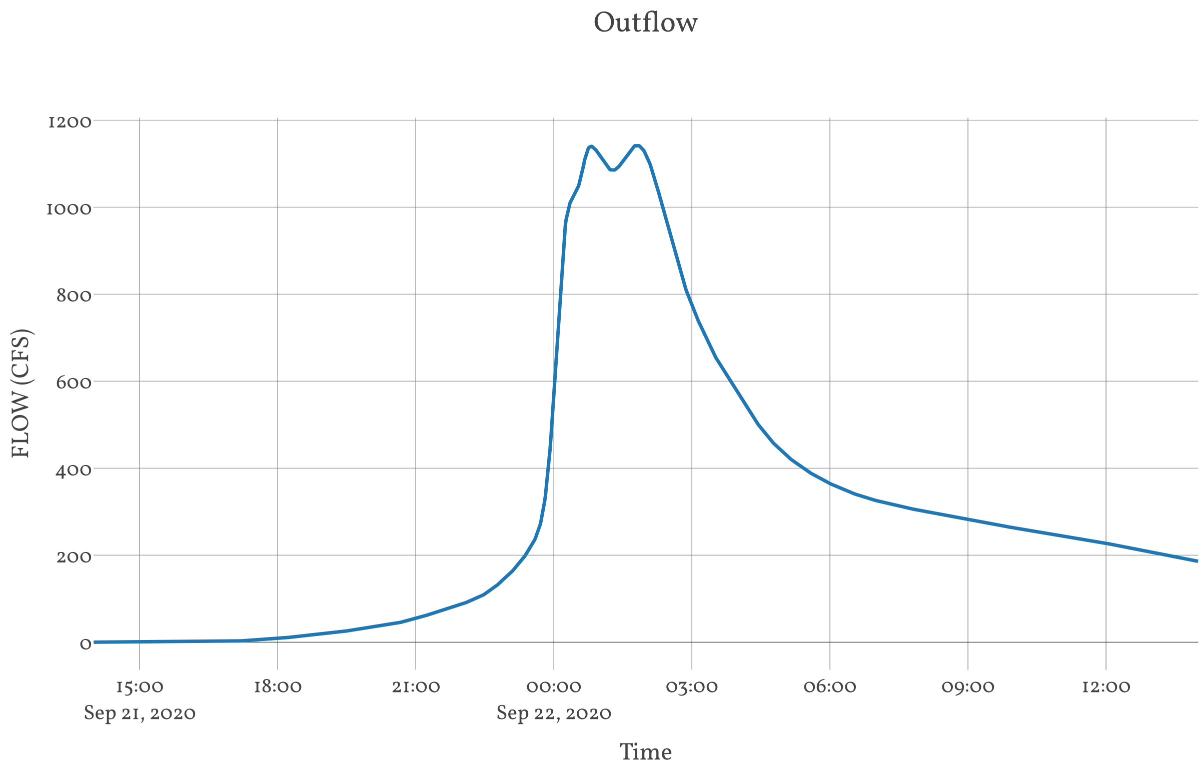

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	1142.12
Time of Peak Discharge	22Sep2020, 01:48
Volume (IN)	3.25



Reach: 20R

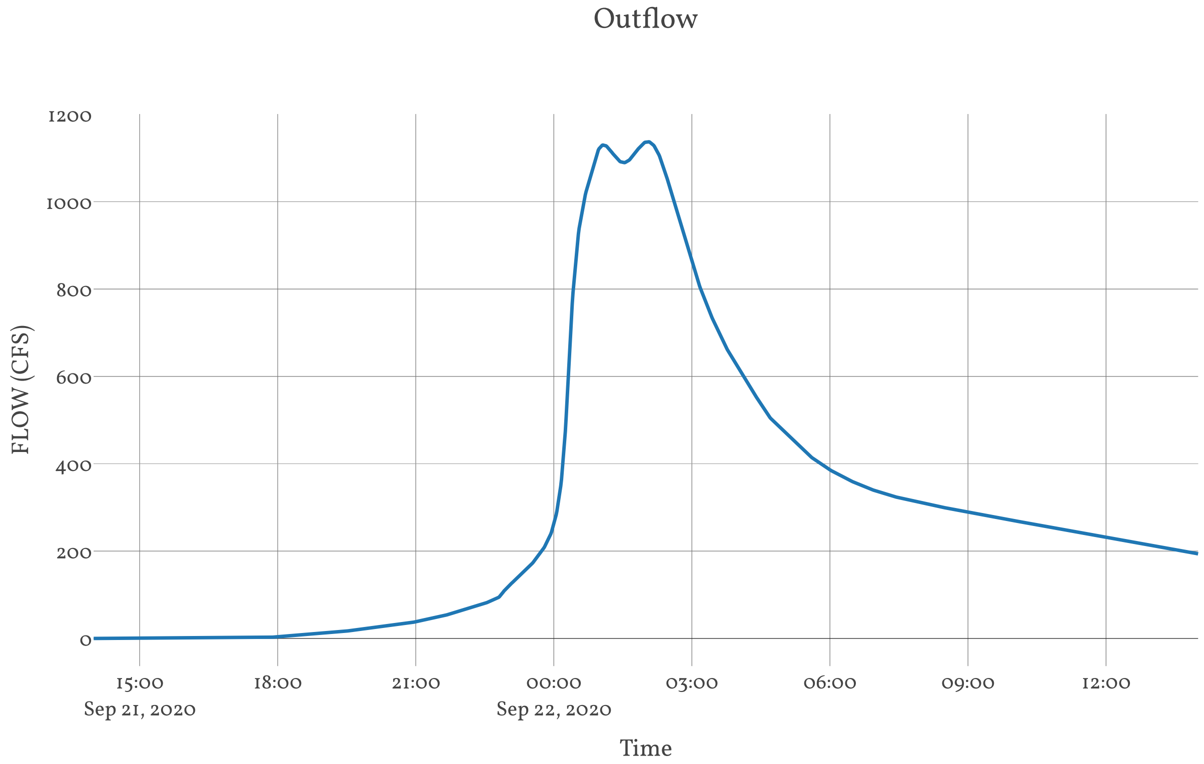
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	1137.47
Time of Peak Discharge	22Sep2020, 02:02
Volume (IN)	3.2
Peak Inflow (CFS)	1142.12
Inflow Volume (AC - FT)	601.28



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

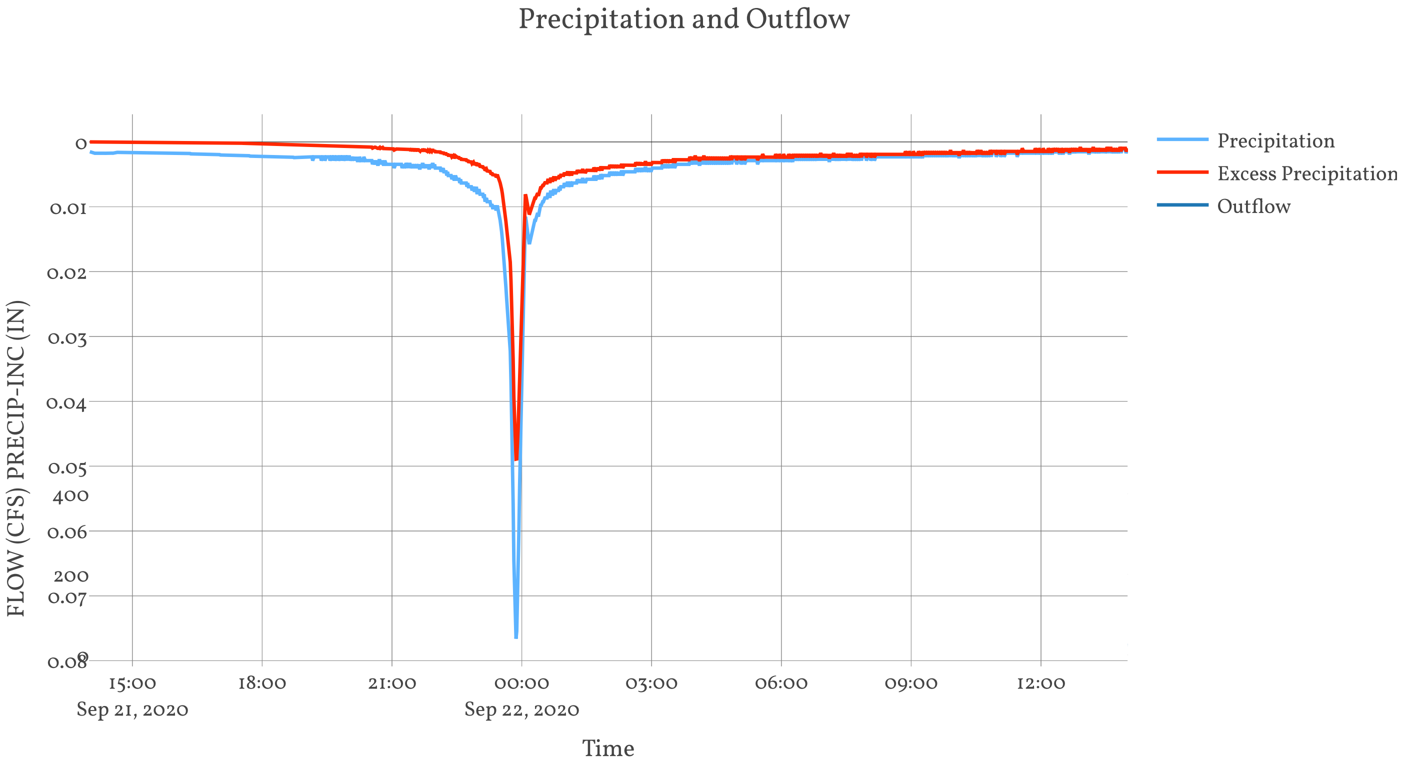
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	507.77
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	3.41
Precipitation Volume (AC - FT)	163.74
Loss Volume (AC - FT)	66.11
Excess Volume (AC - FT)	97.63
Direct Runoff Volume (AC - FT)	96.87
Baseflow Volume (AC - FT)	0

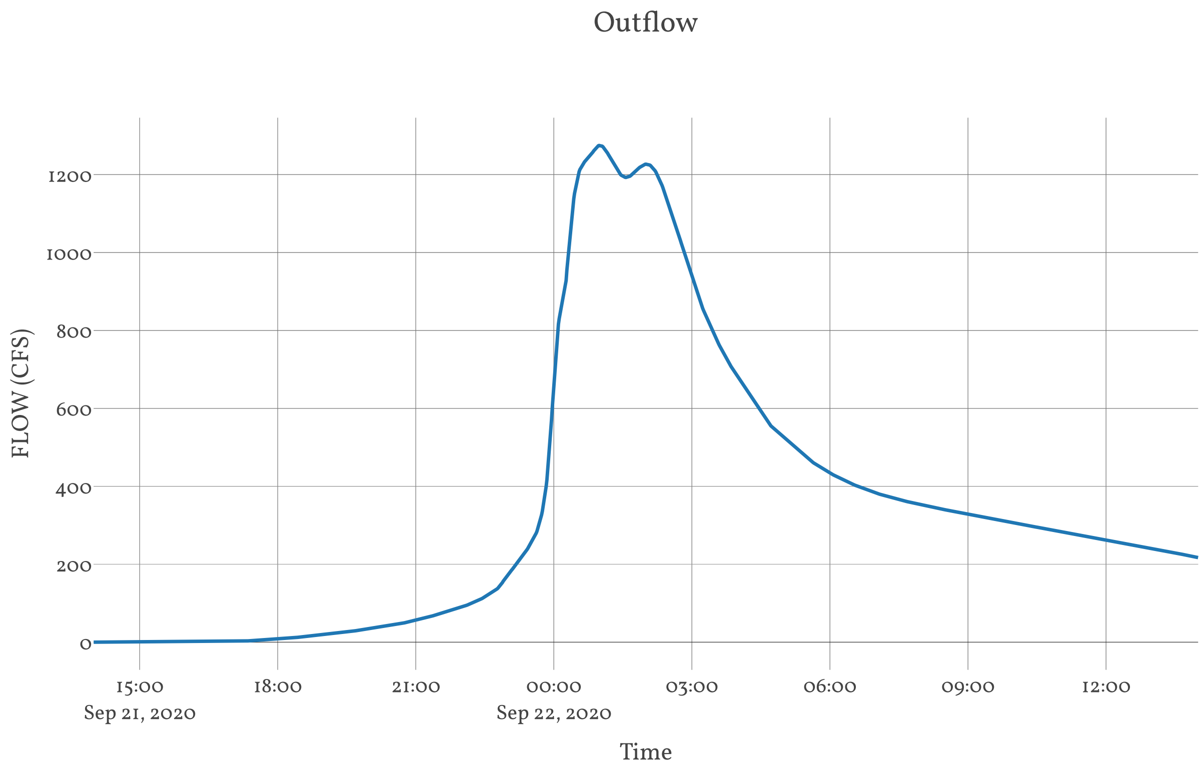

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
400
0.06
200
0.07
0.08
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	1274.95
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	3.23



Reach: 15R

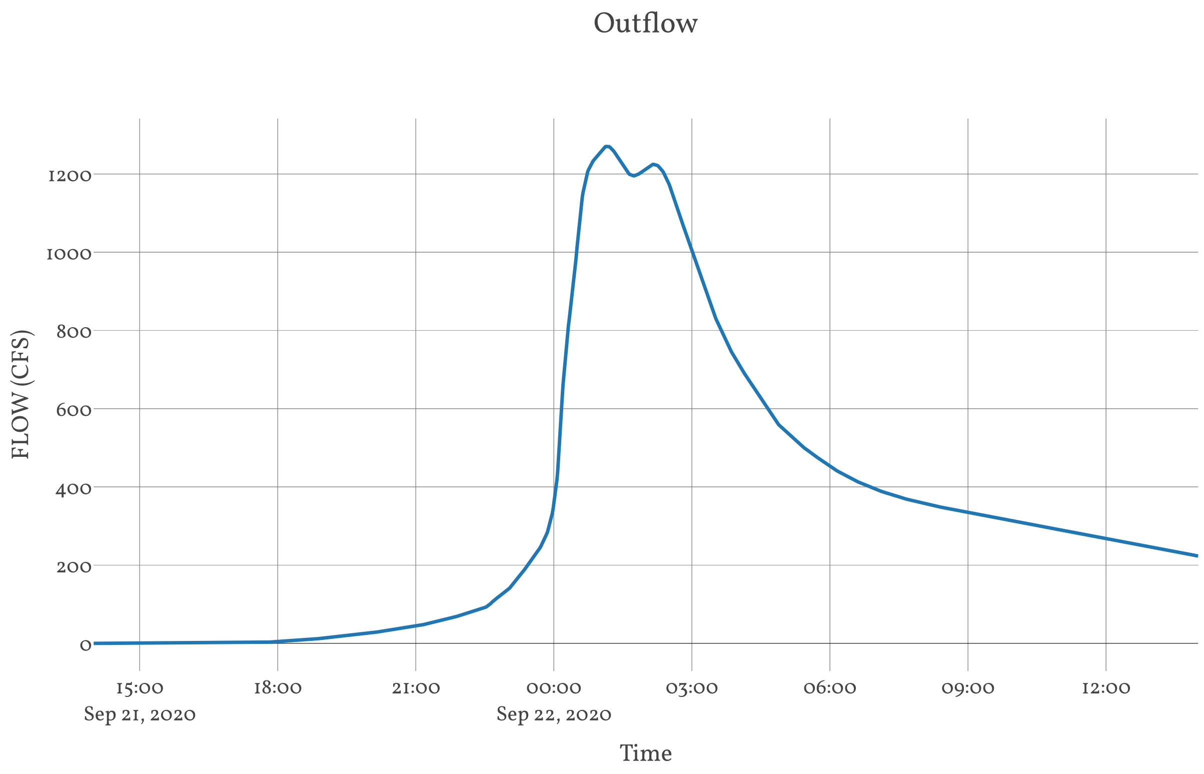
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	1270.86
Time of Peak Discharge	22Sep2020, 01:10
Volume (IN)	3.2
Peak Inflow (CFS)	1274.95
Inflow Volume (AC - FT)	689.49



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

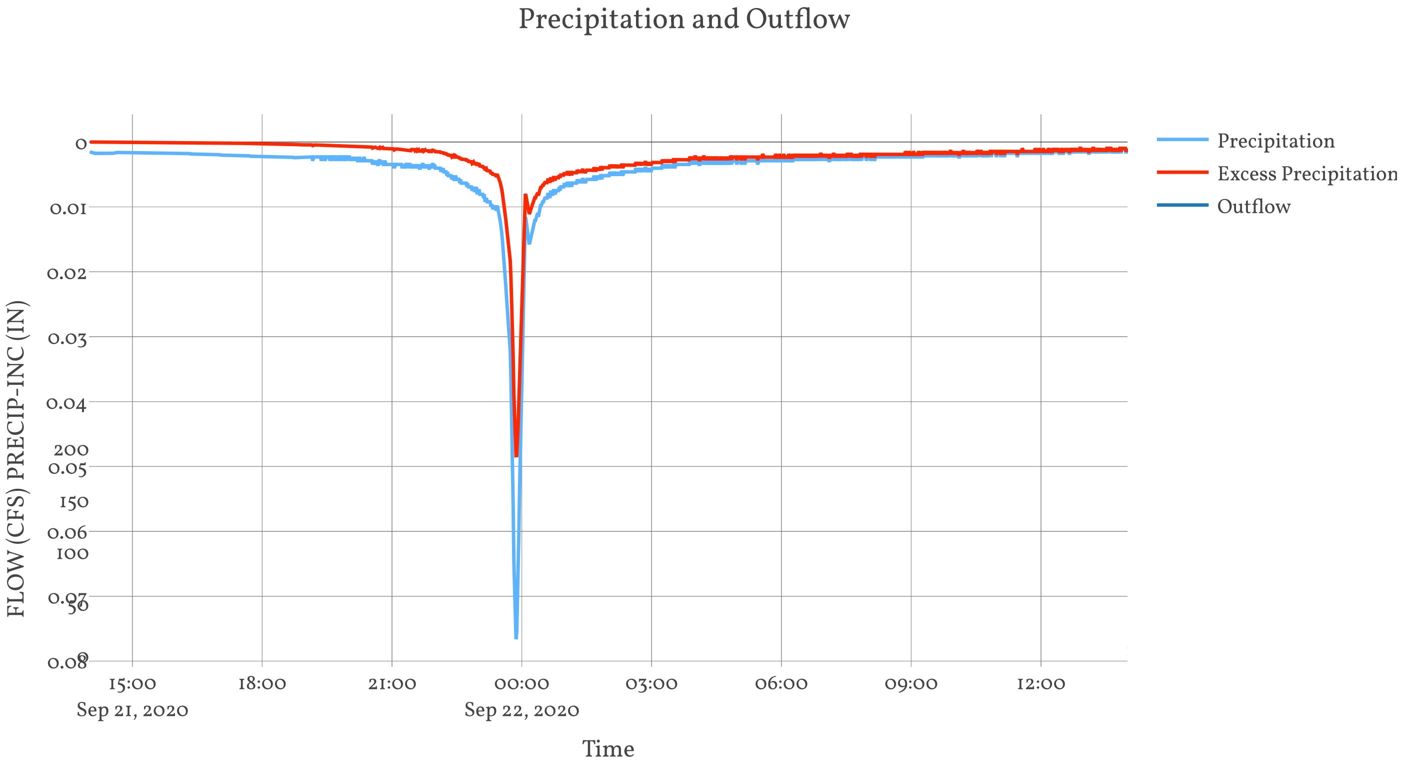
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	197.61
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	3.38
Precipitation Volume (AC - FT)	49.77
Loss Volume (AC - FT)	20.39
Excess Volume (AC - FT)	29.38
Direct Runoff Volume (AC - FT)	29.25
Baseflow Volume (AC - FT)	0

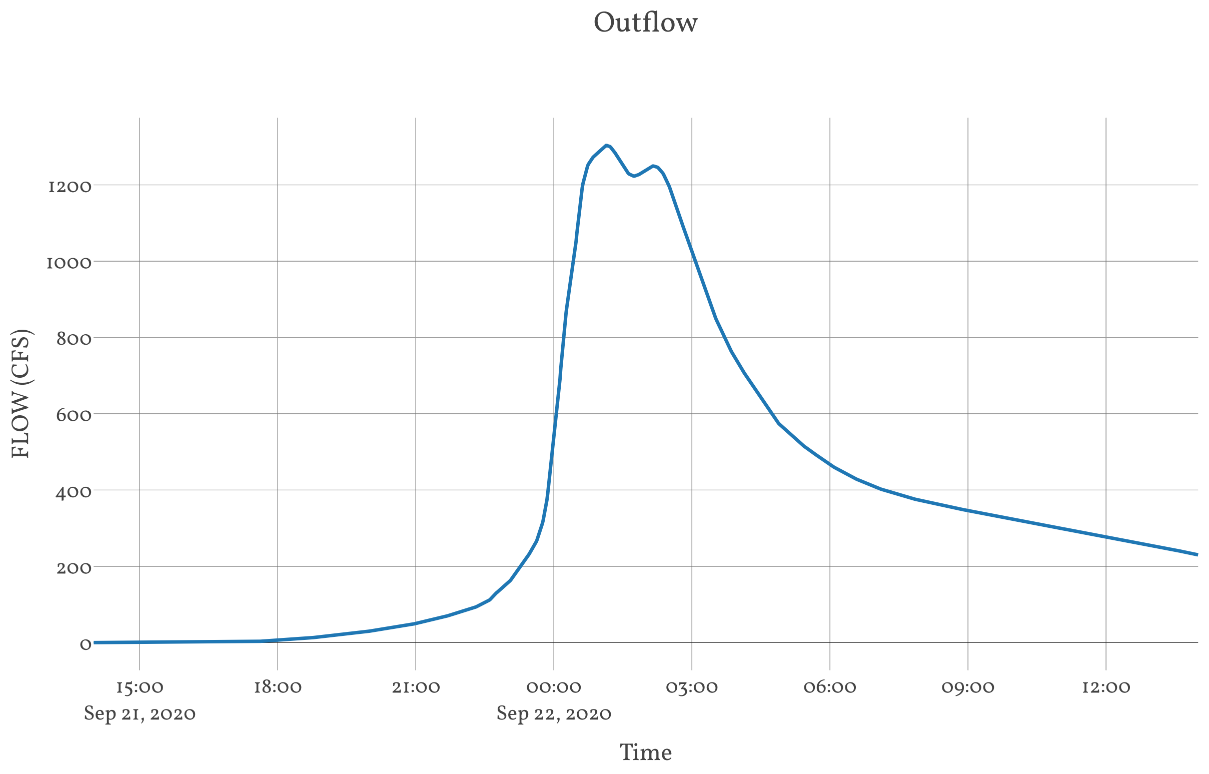

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
200
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	1303.35
Time of Peak Discharge	22Sep2020, 01:09
Volume (IN)	3.21



Reach: 14R

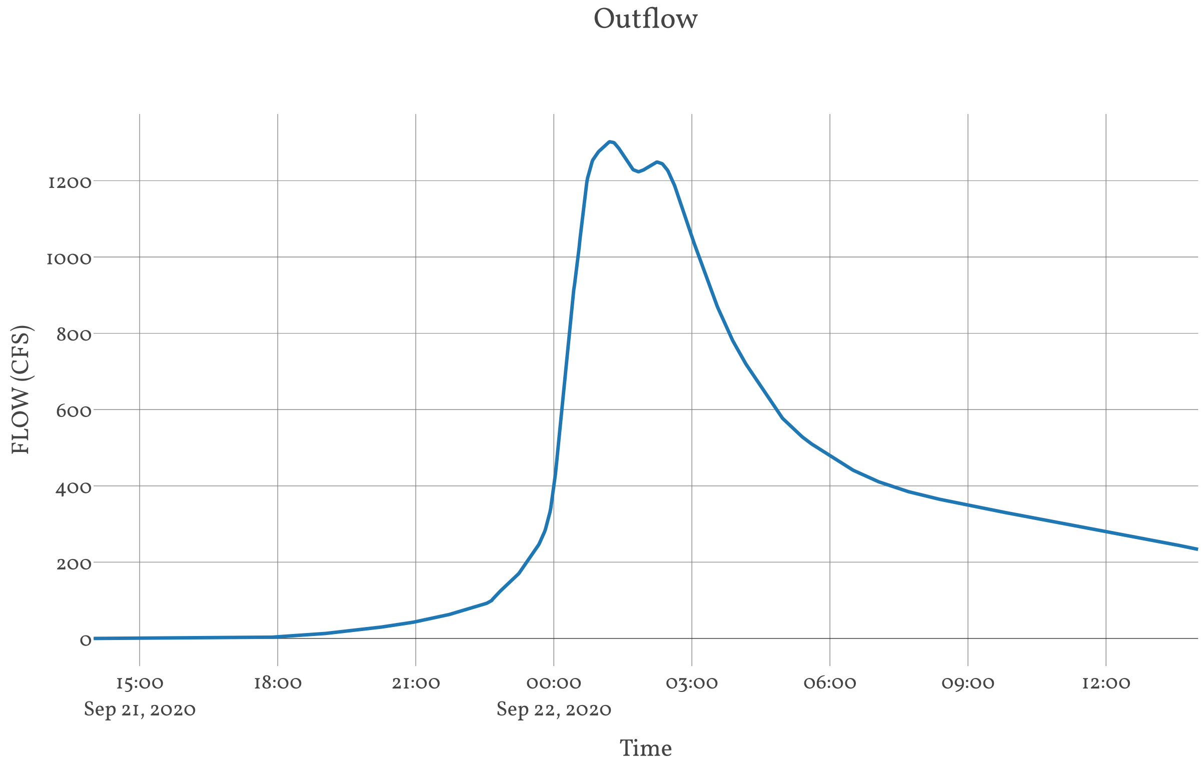
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	1302.34
Time of Peak Discharge	22Sep2020, 01:14
Volume (IN)	3.19
Peak Inflow (CFS)	1303.35
Inflow Volume (AC - FT)	712.17



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

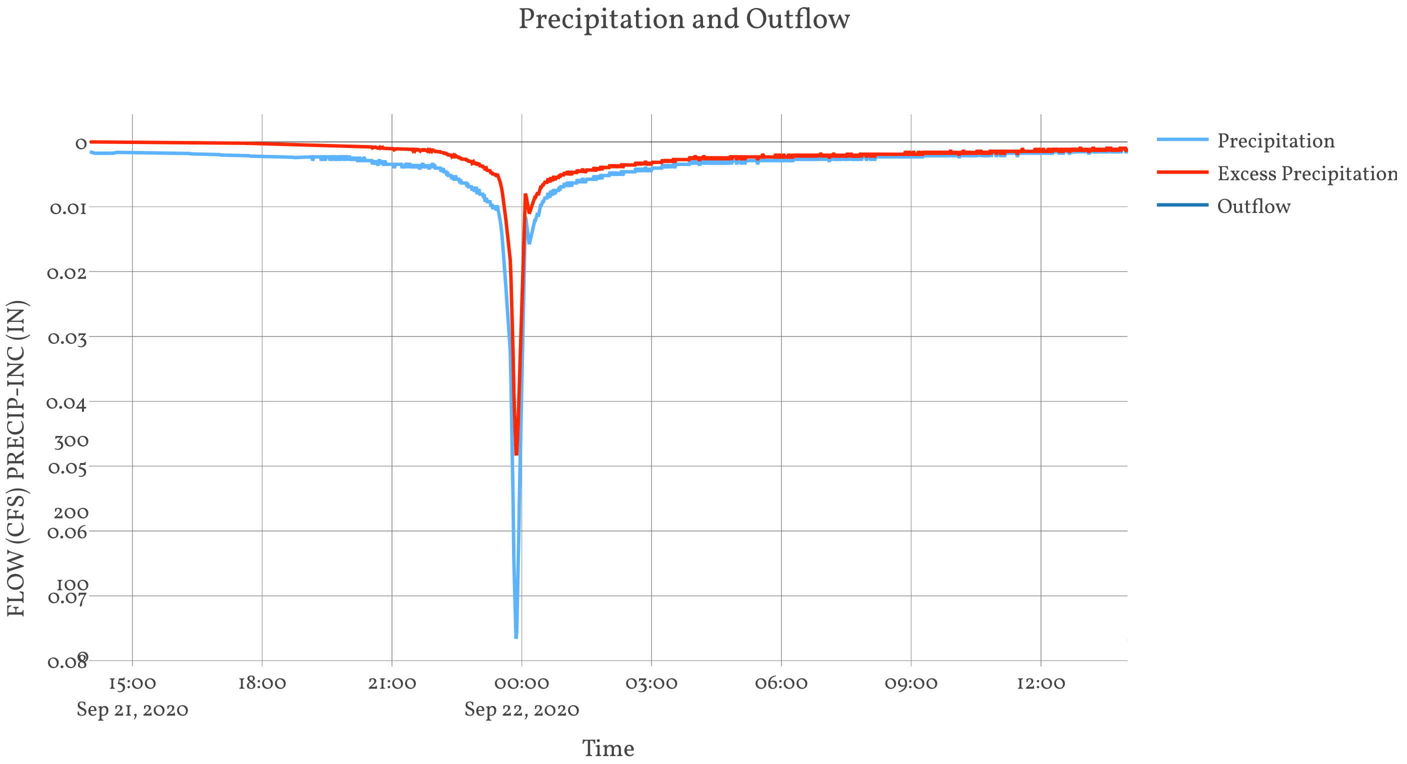
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	284.32
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	3.34
Precipitation Volume (AC - FT)	132.1
Loss Volume (AC - FT)	54.43
Excess Volume (AC - FT)	77.66
Direct Runoff Volume (AC - FT)	76.5
Baseflow Volume (AC - FT)	0

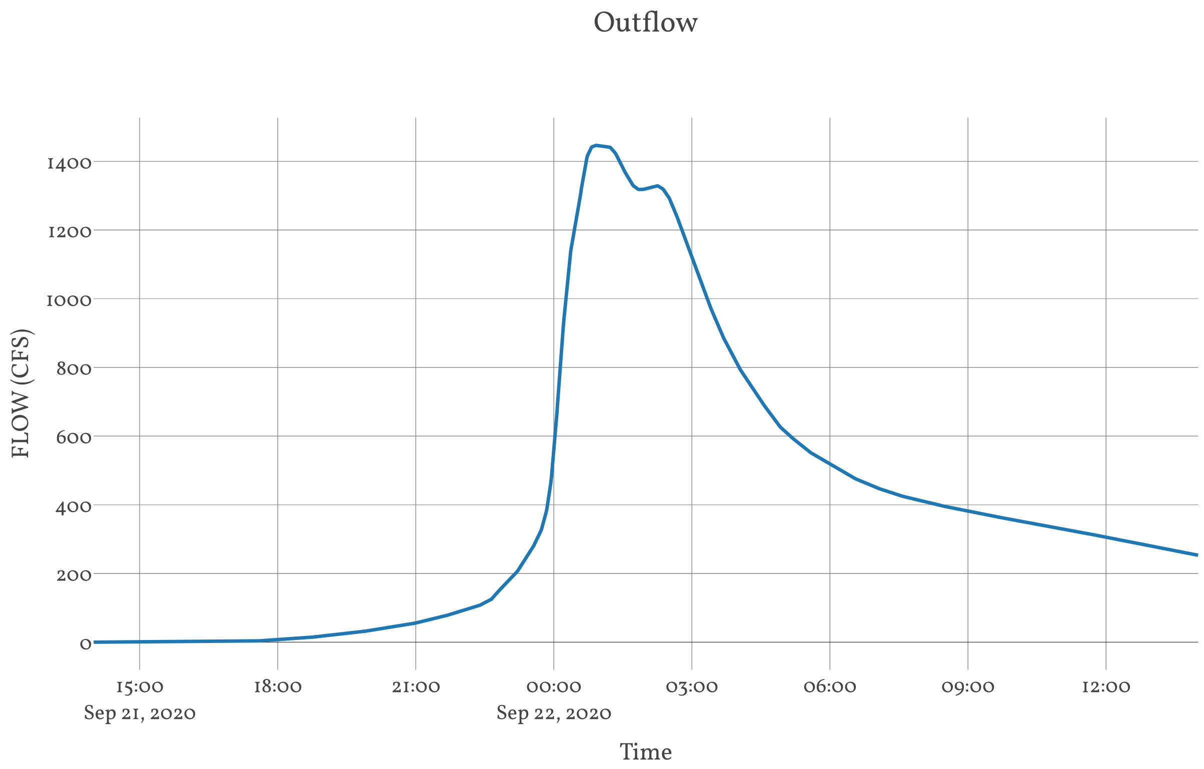

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	1446.43
Time of Peak Discharge	22Sep2020, 00:55
Volume (IN)	3.2



Reach: 13R

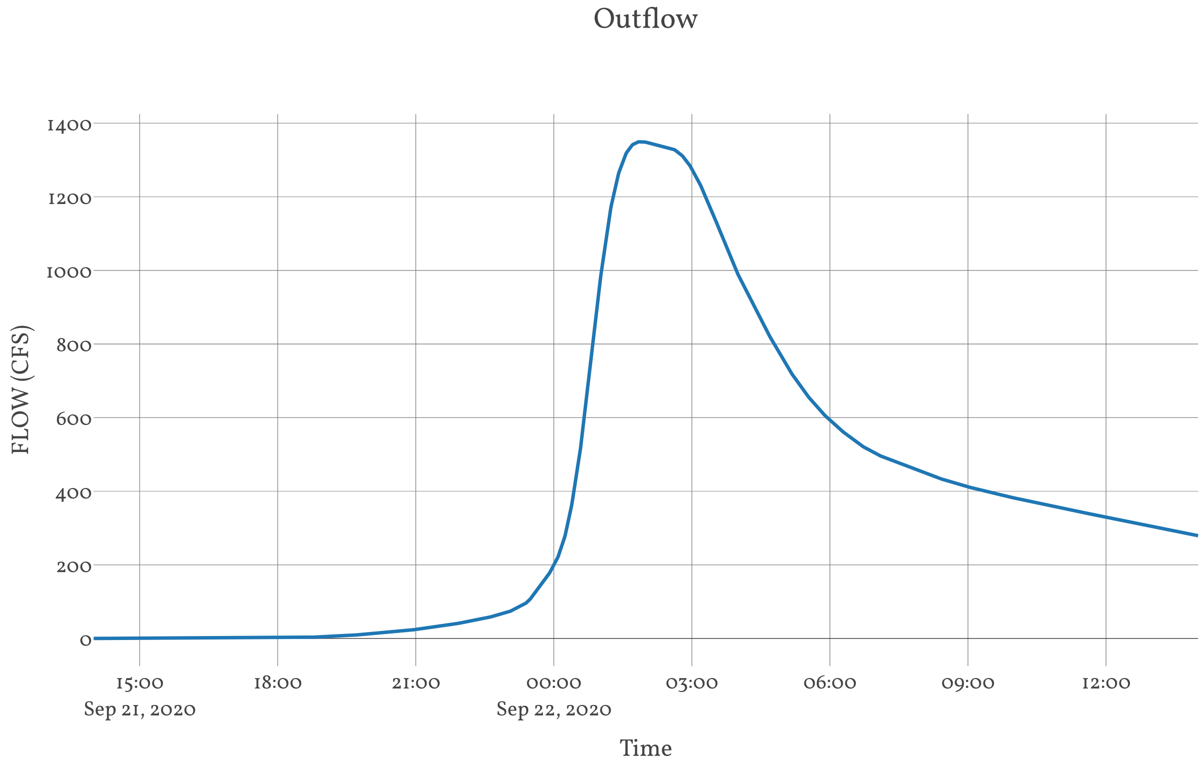
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	1349.74
Time of Peak Discharge	22Sep2020, 01:54
Volume (IN)	3.09
Peak Inflow (CFS)	1446.43
Inflow Volume (AC - FT)	784.95



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

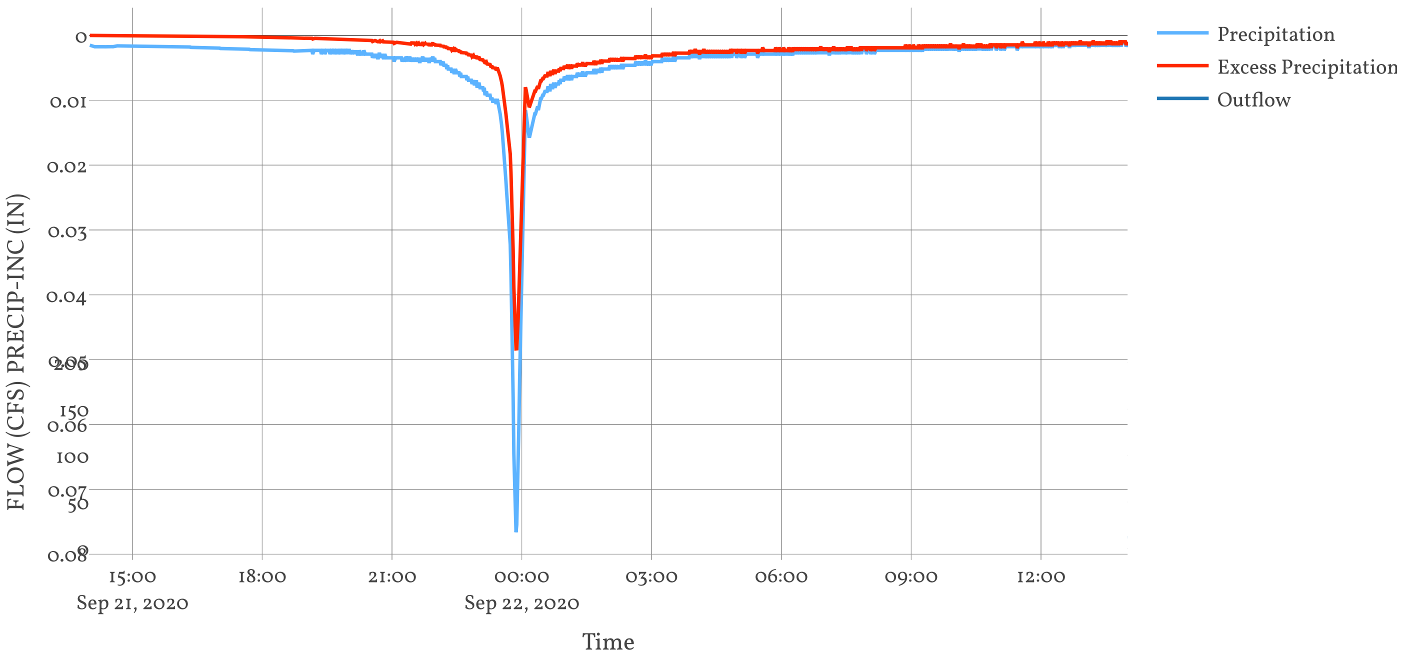
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	220.26
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	3.37
Precipitation Volume (AC - FT)	78.34
Loss Volume (AC - FT)	32.09
Excess Volume (AC - FT)	46.24
Direct Runoff Volume (AC - FT)	45.82
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



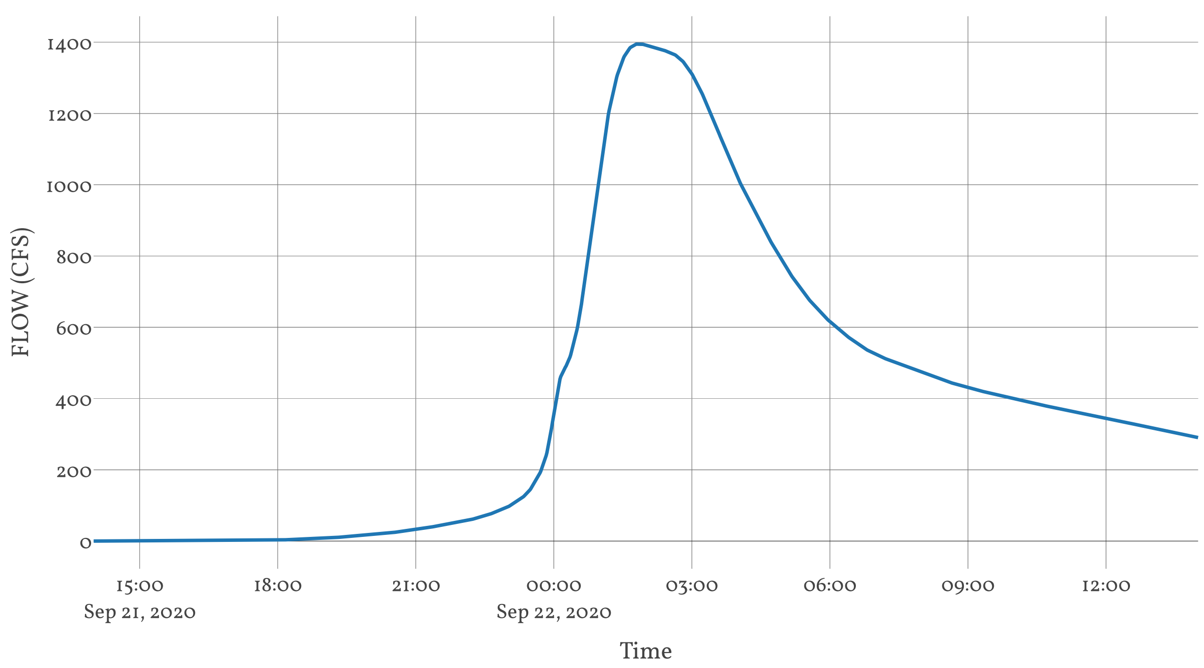
Junction: 12C

Downstream : Pacific Ocean

Results: 12C

Peak Discharge (CFS)	1395.18
Time of Peak Discharge	22Sep2020, 01:51
Volume (IN)	3.1

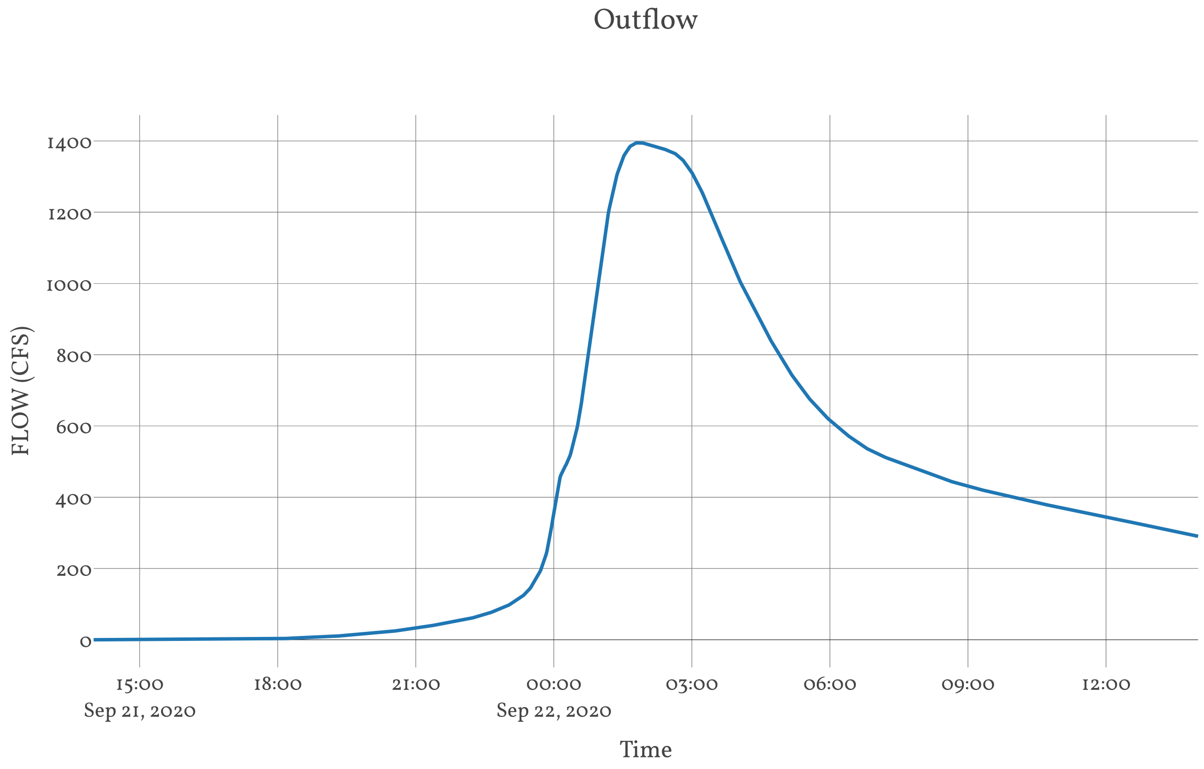
Outflow



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	1395.18
Time of Peak Discharge	22Sep2020, 01:51
Volume (IN)	3.1
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 025-mp-Post-Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:34

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	541.94	22Sep2020, 00:24	4.58
61b	0.61	622.67	22Sep2020, 00:15	4.61
J 60b 61b	1.25	1133.19	22Sep2020, 00:18	4.59
18r	1.25	970.44	22Sep2020, 01:02	4.42
62b	0.53	659.42	22Sep2020, 00:08	4.54
17c	1.78	1171.23	22Sep2020, 00:58	4.46
17r	1.78	1084.81	22Sep2020, 01:28	4.33
63b	0.6	577.75	22Sep2020, 00:17	4.57
16c	2.38	1302.64	22Sep2020, 01:24	4.39
16r	2.38	1280.27	22Sep2020, 01:45	4.3
64b	1.09	1035.45	22Sep2020, 00:18	4.58
20c	3.47	1645.35	22Sep2020, 00:53	4.39
20r	3.47	1641.33	22Sep2020, 01:04	4.33
65b	0.53	691.07	22Sep2020, 00:07	4.58
15c	4	1848.15	22Sep2020, 00:53	4.37
15r	4	1844.61	22Sep2020, 01:03	4.33
66b	0.16	268.89	22Sep2020, 00:02	4.55
14c	4.16	1890.72	22Sep2020, 01:01	4.34
14r	4.16	1889.72	22Sep2020, 01:06	4.32
67b	0.43	388.37	22Sep2020, 00:19	4.49
13c	4.59	2103.7	22Sep2020, 01:00	4.33
13r	4.59	1968.98	22Sep2020, 01:43	4.19
68b	0.26	300.46	22Sep2020, 00:09	4.53

12c	4.85	2033.78	22Sep2020, 01:41	4.21
Pacific Ocean	4.85	2033.78	22Sep2020, 01:41	4.21

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

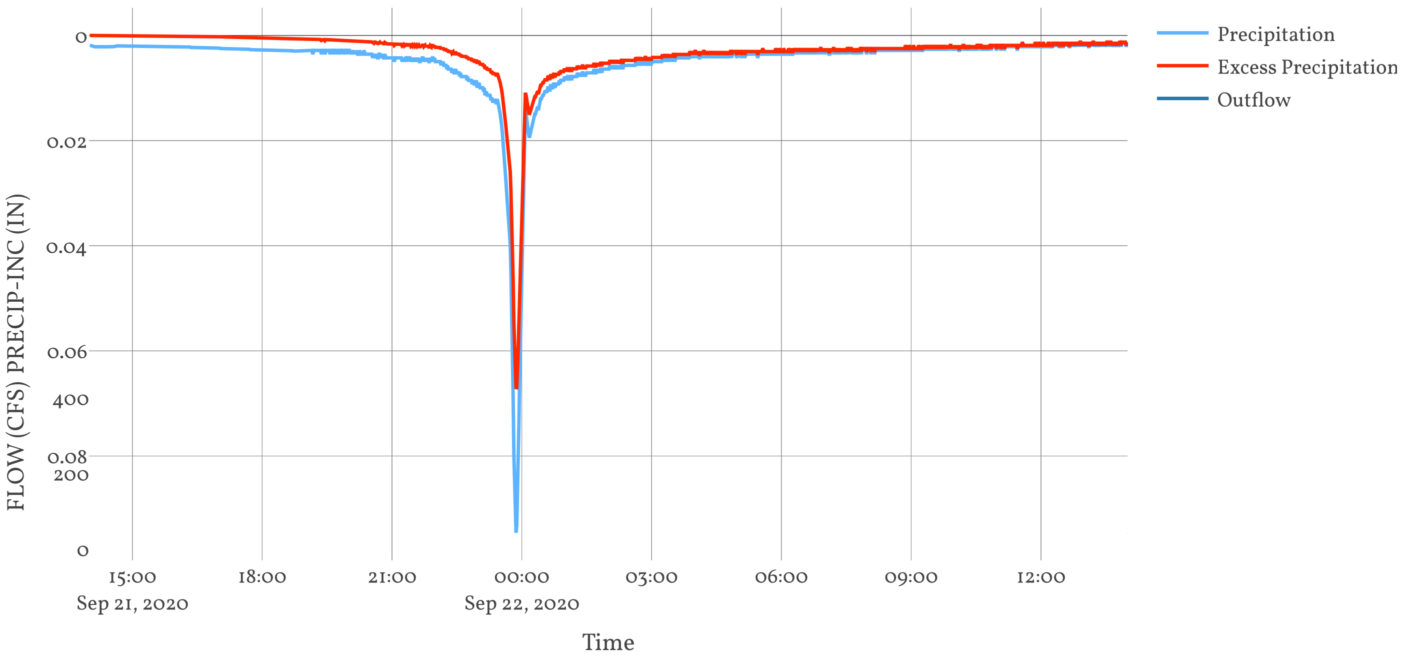
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	541.94
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	4.58
Precipitation Volume (AC - FT)	244.58
Loss Volume (AC - FT)	84.23
Excess Volume (AC - FT)	160.35
Direct Runoff Volume (AC - FT)	157.64
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

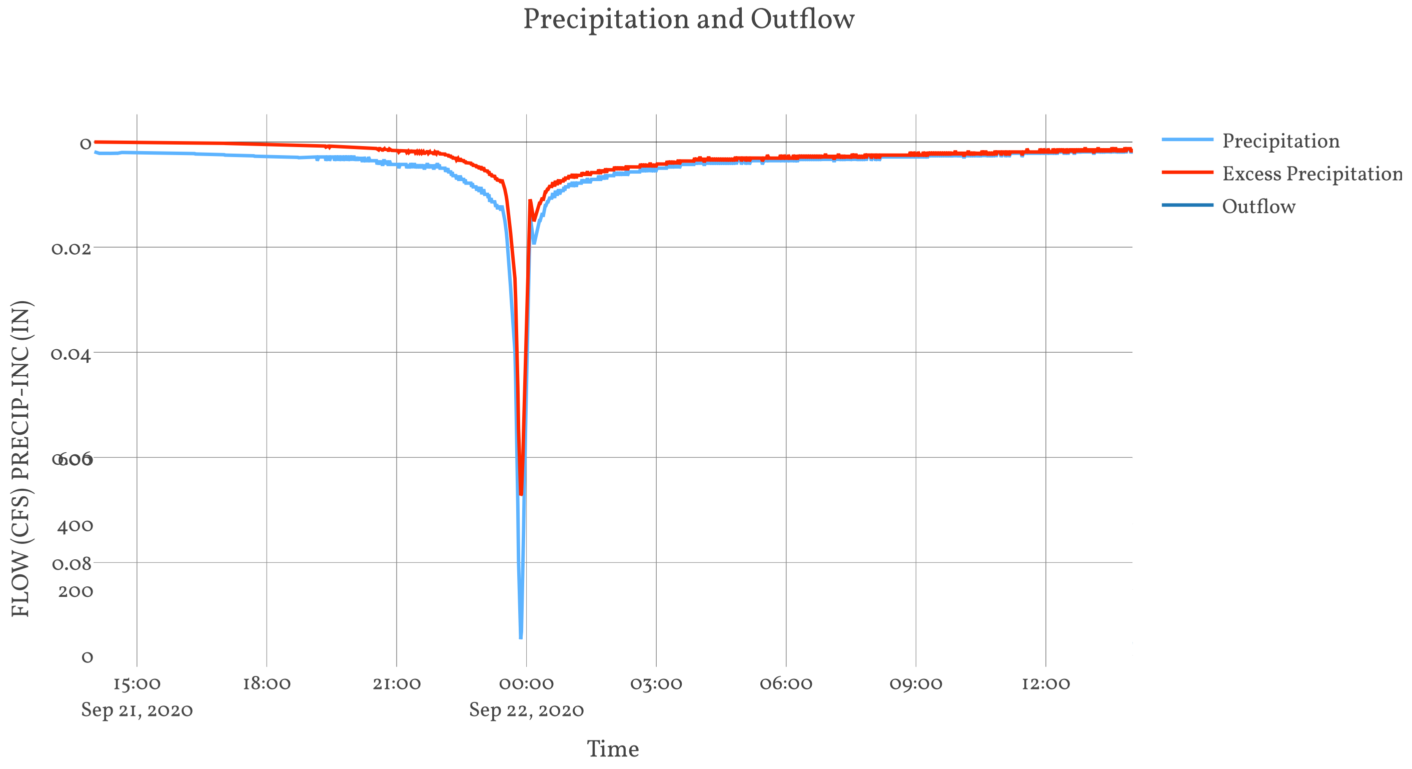
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	622.67
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	4.61
Precipitation Volume (AC - FT)	229.8
Loss Volume (AC - FT)	79.14
Excess Volume (AC - FT)	150.66
Direct Runoff Volume (AC - FT)	148.89
Baseflow Volume (AC - FT)	0

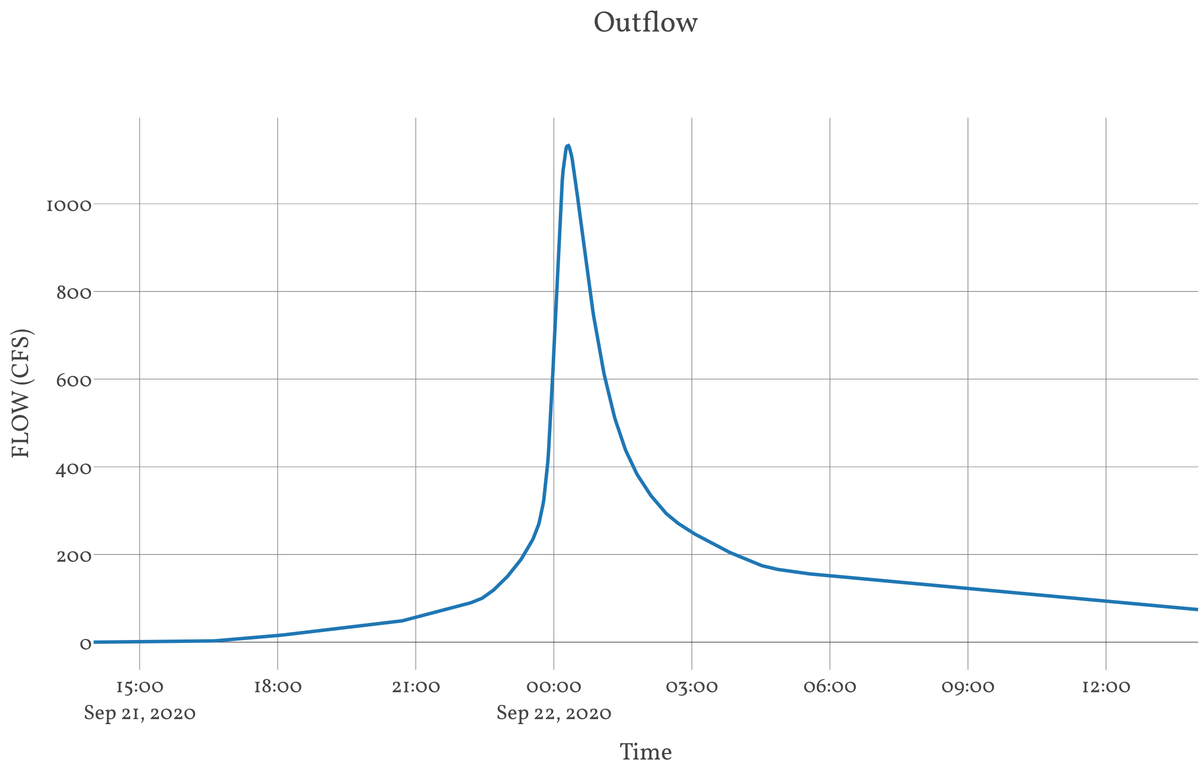

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
600
400
200
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1133.19
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	4.59



Reach: 18R

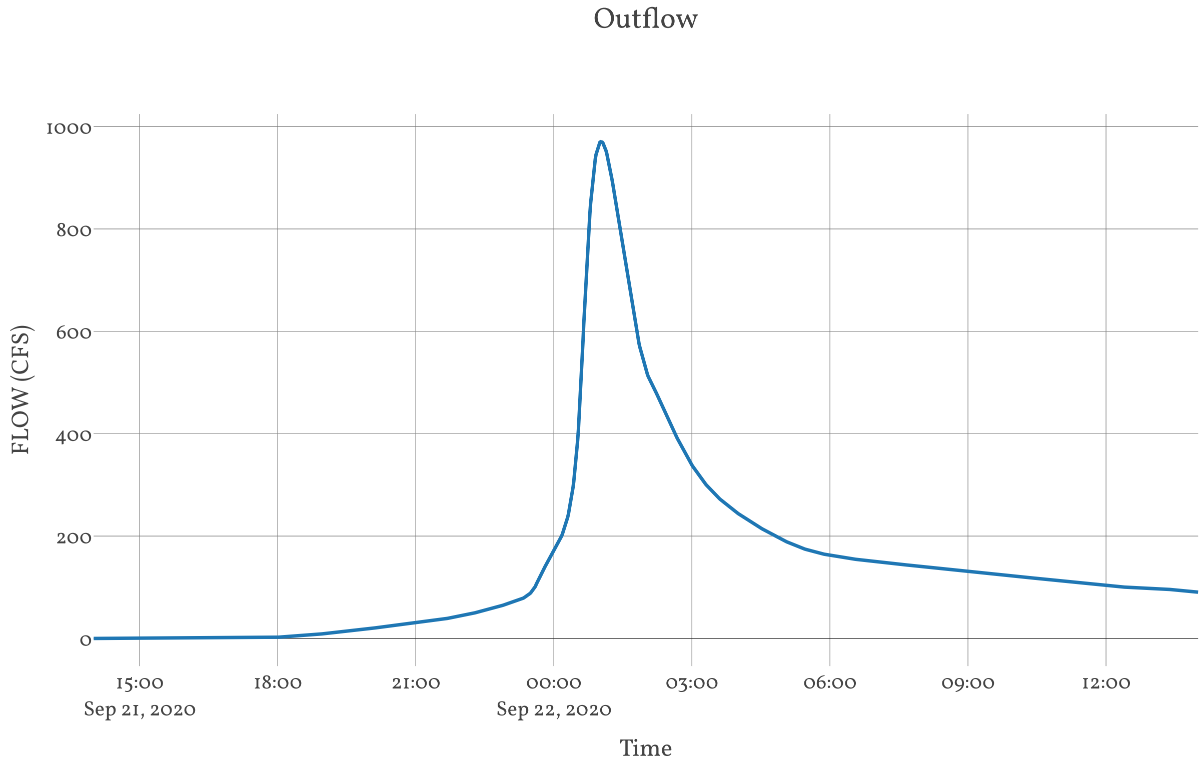
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	970.44
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	4.42
Peak Inflow (CFS)	1133.19
Inflow Volume (AC - FT)	306.52



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

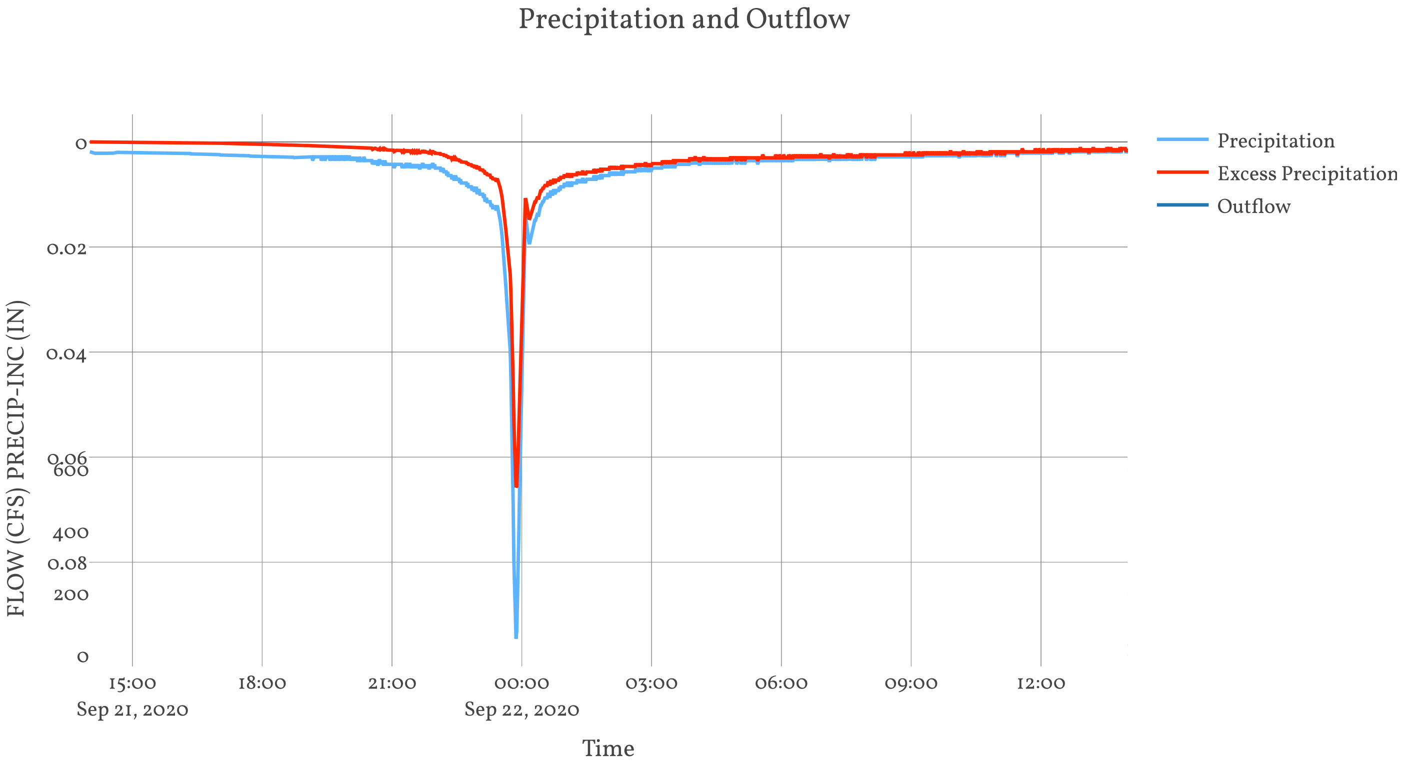
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	659.42
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	4.54
Precipitation Volume (AC - FT)	199.31
Loss Volume (AC - FT)	71.12
Excess Volume (AC - FT)	128.18
Direct Runoff Volume (AC - FT)	127.18
Baseflow Volume (AC - FT)	0

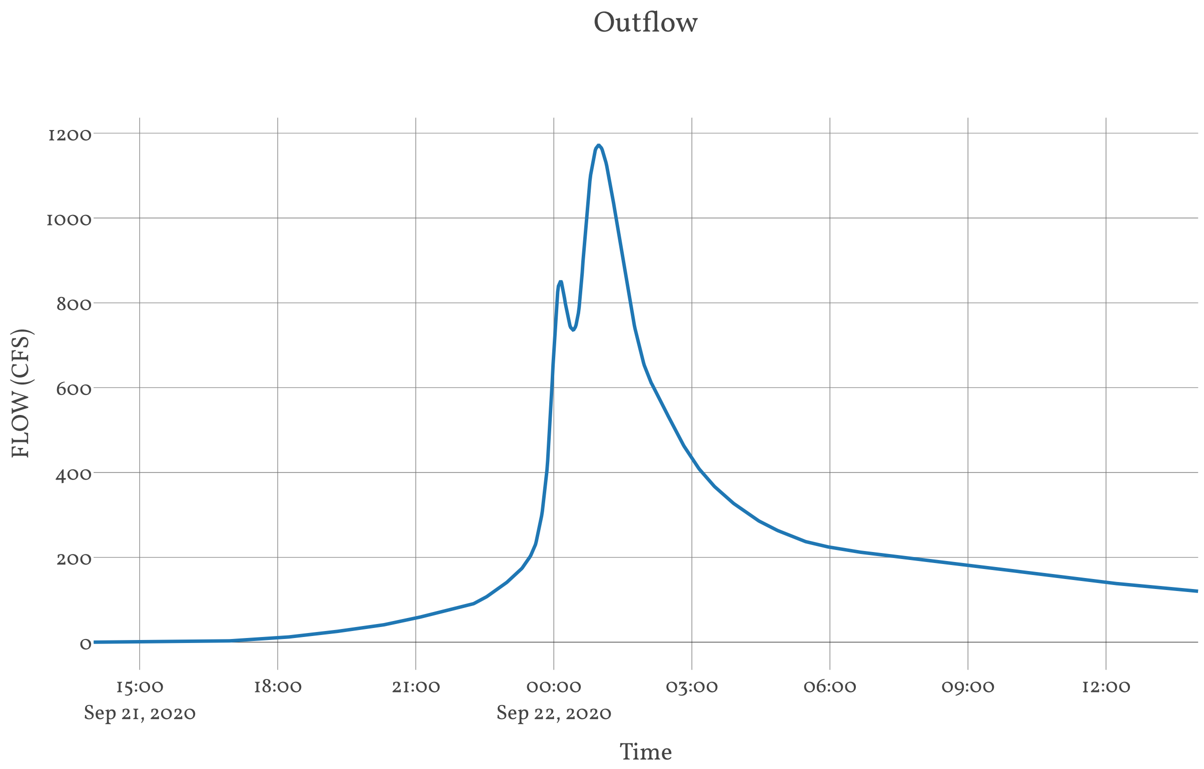

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	1171.23
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	4.46



Reach: 17R

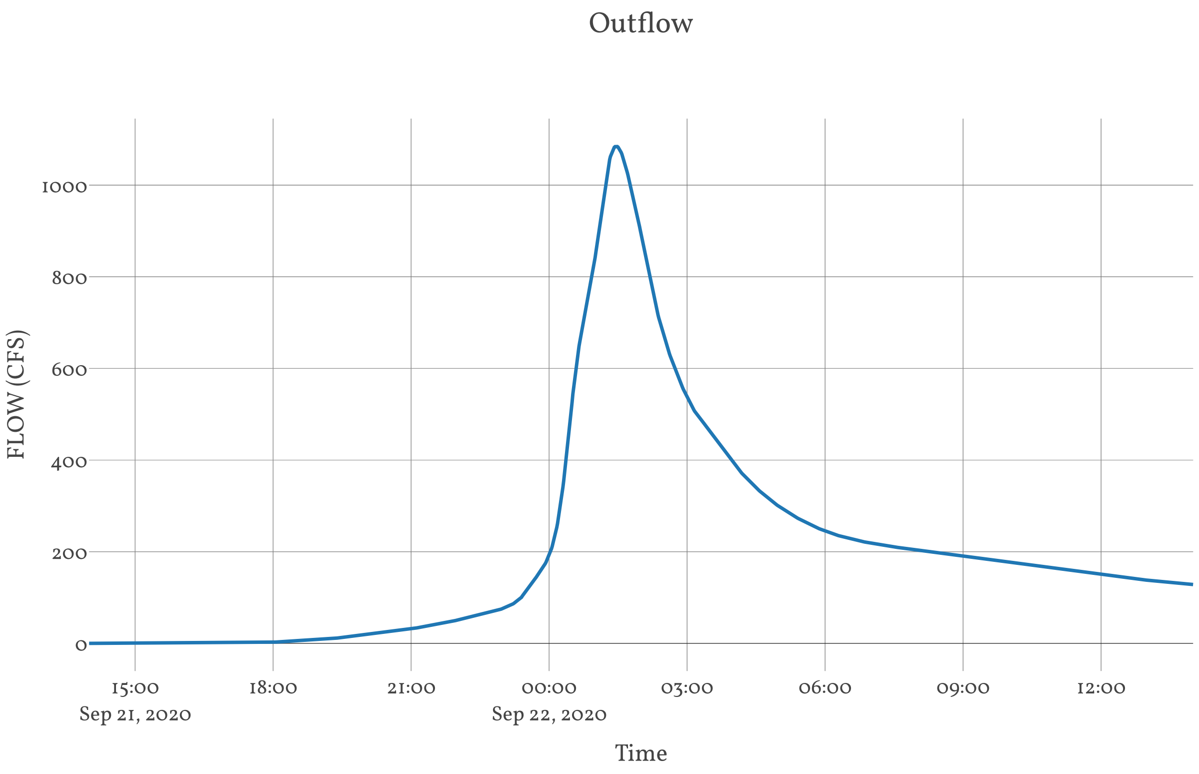
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1084.81
Time of Peak Discharge	22Sep2020, 01:28
Volume (IN)	4.33
Peak Inflow (CFS)	1171.23
Inflow Volume (AC - FT)	422.4



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

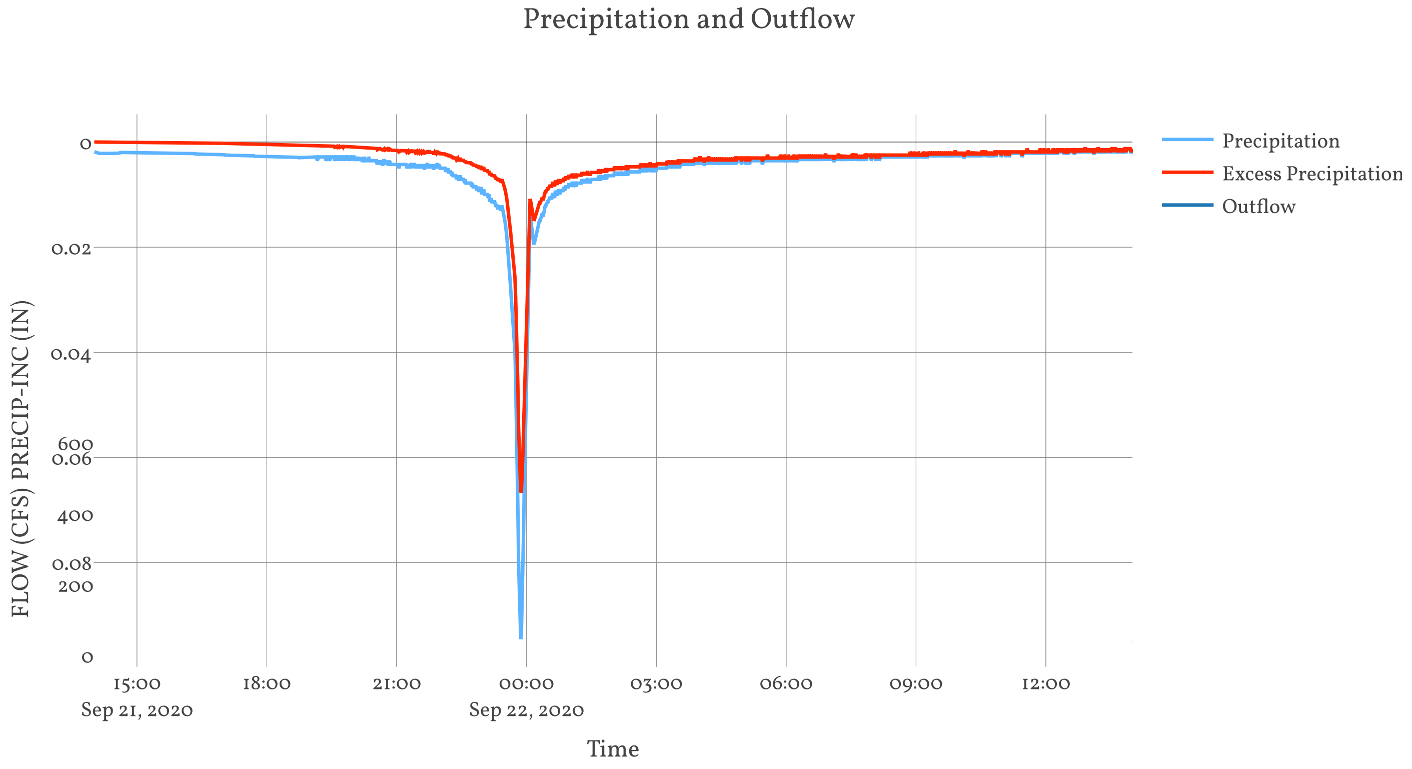
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	577.75
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	4.57
Precipitation Volume (AC - FT)	228.28
Loss Volume (AC - FT)	79.65
Excess Volume (AC - FT)	148.62
Direct Runoff Volume (AC - FT)	146.67
Baseflow Volume (AC - FT)	0

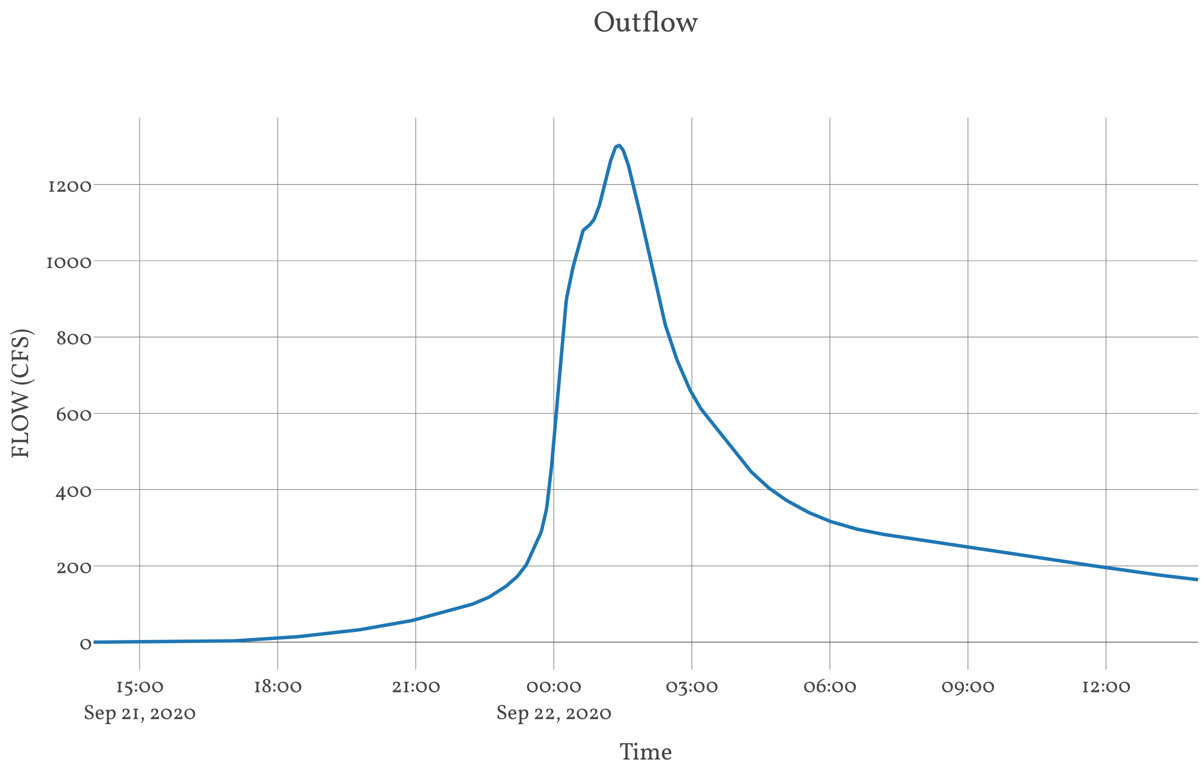

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1302.64
Time of Peak Discharge	22Sep2020, 01:24
Volume (IN)	4.39



Reach: 16R

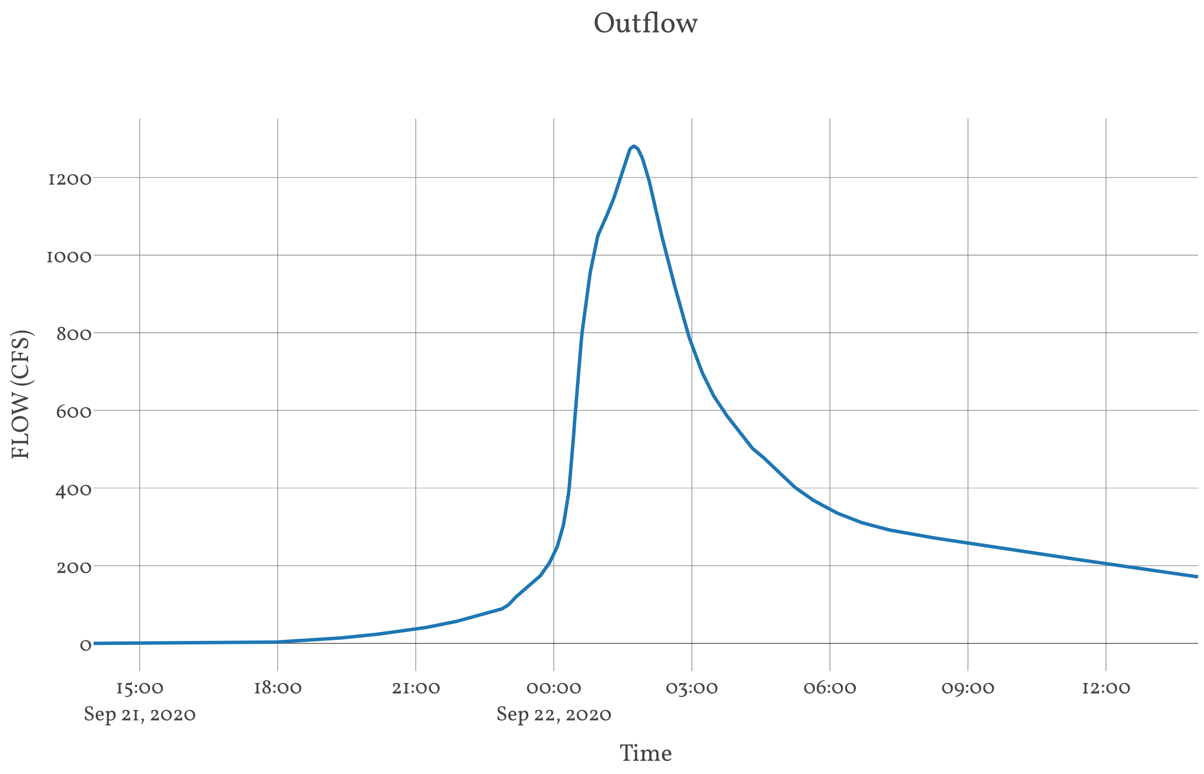
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1280.27
Time of Peak Discharge	22Sep2020, 01:45
Volume (IN)	4.3
Peak Inflow (CFS)	1302.64
Inflow Volume (AC - FT)	556.73



Subbasin: 64B

Area : 1.09
Downstream : 20C

Loss Rate: Scs

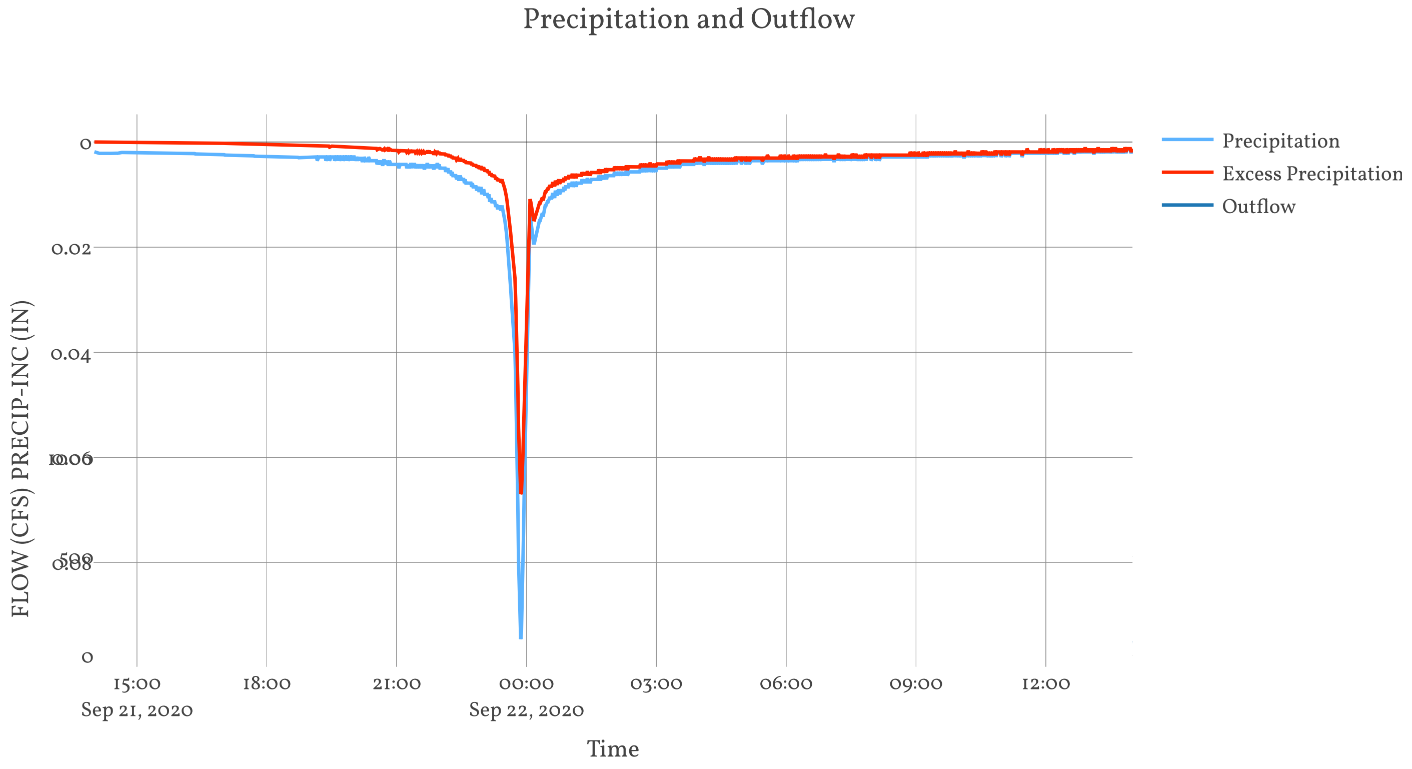
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1035.45
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	4.58
Precipitation Volume (AC - FT)	413.33
Loss Volume (AC - FT)	143.29
Excess Volume (AC - FT)	270.04
Direct Runoff Volume (AC - FT)	266.4
Baseflow Volume (AC - FT)	0

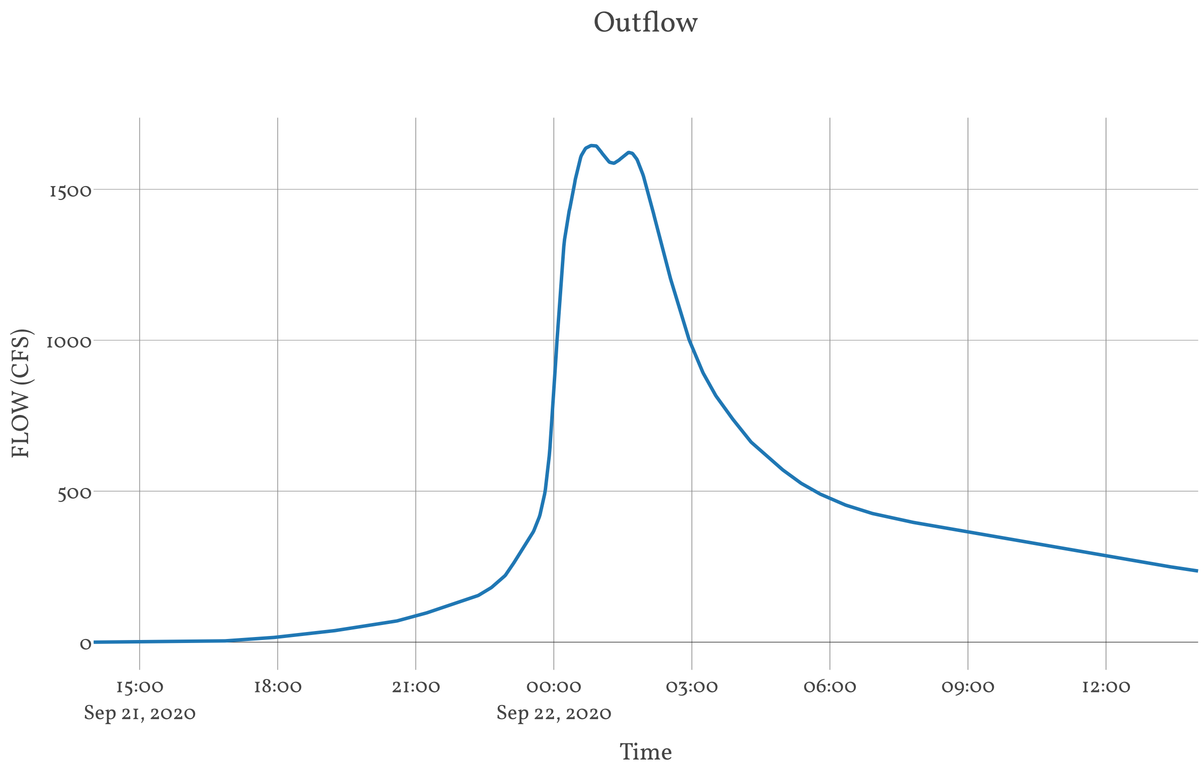

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
10
0.08
500
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	1645.35
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	4.39



Reach: 20R

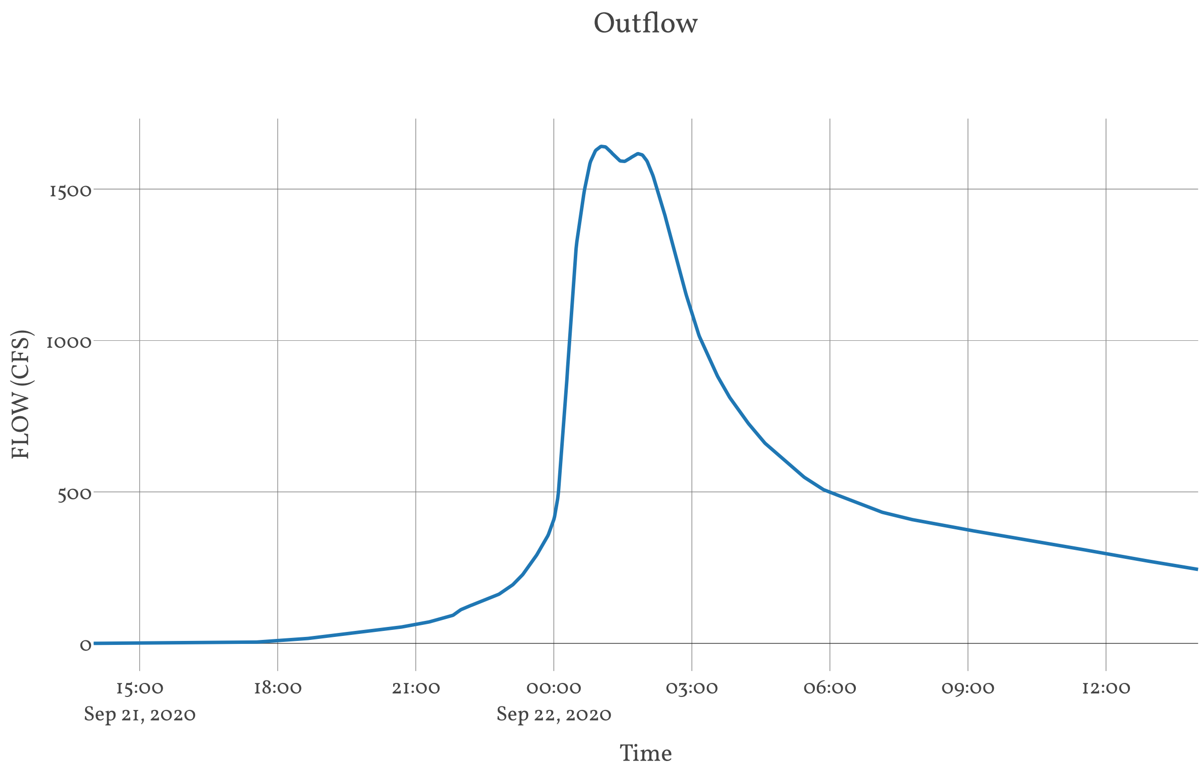
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	1641.33
Time of Peak Discharge	22Sep2020, 01:04
Volume (IN)	4.33
Peak Inflow (CFS)	1645.35
Inflow Volume (AC - FT)	811.84



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

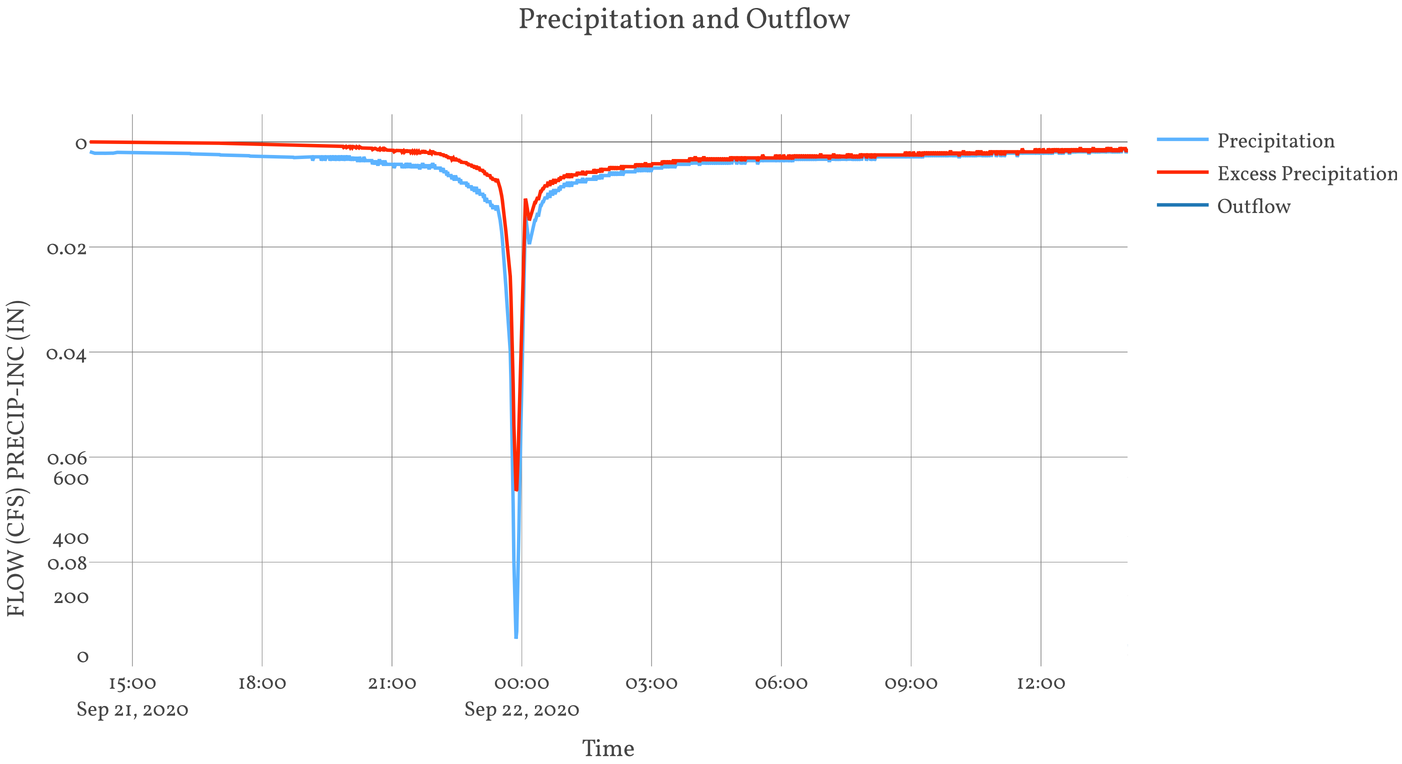
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	691.07
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	4.58
Precipitation Volume (AC - FT)	202.11
Loss Volume (AC - FT)	70.98
Excess Volume (AC - FT)	131.13
Direct Runoff Volume (AC - FT)	130.15
Baseflow Volume (AC - FT)	0

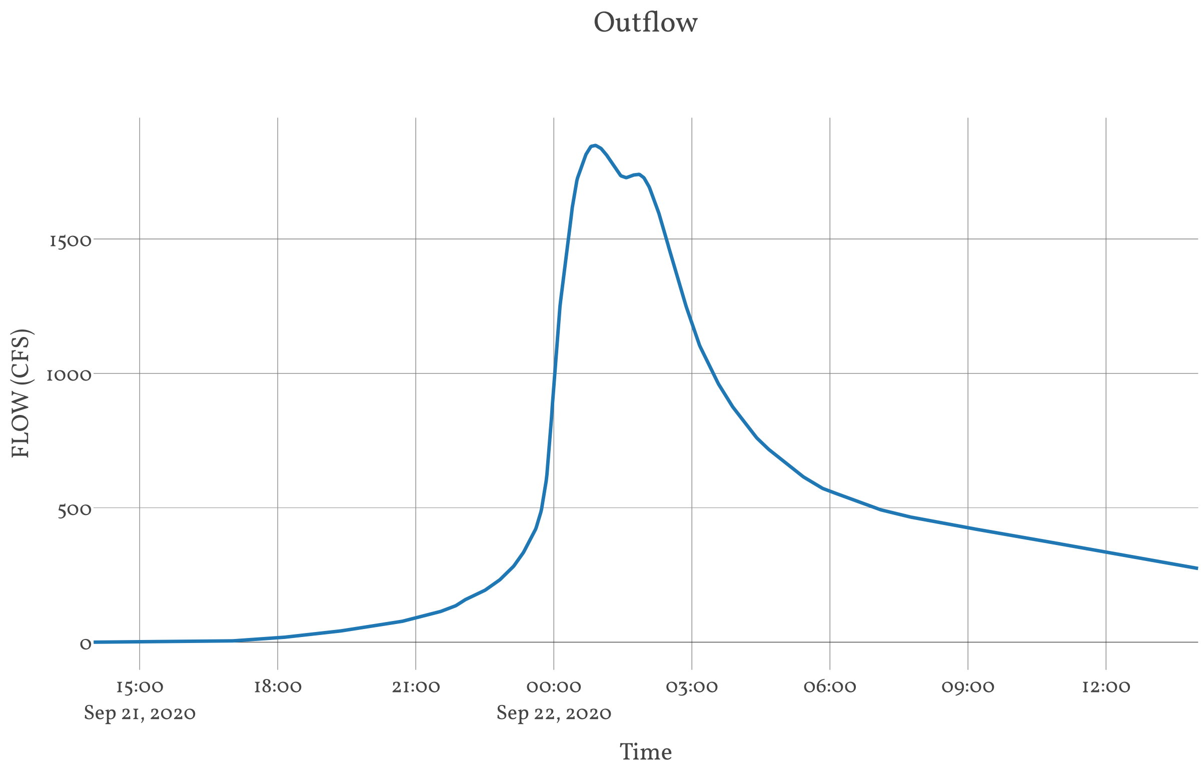

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	1848.15
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	4.37



Reach: 15R

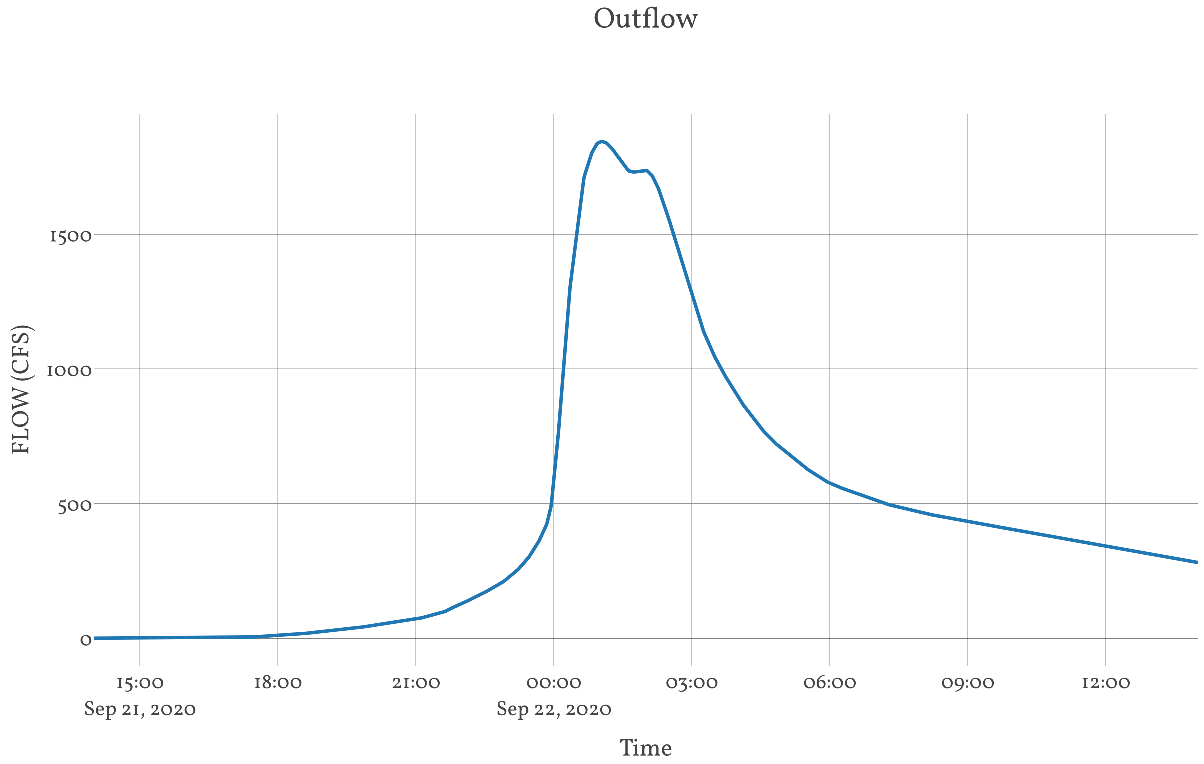
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	1844.61
Time of Peak Discharge	22Sep2020, 01:03
Volume (IN)	4.33
Peak Inflow (CFS)	1848.15
Inflow Volume (AC - FT)	931.8



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

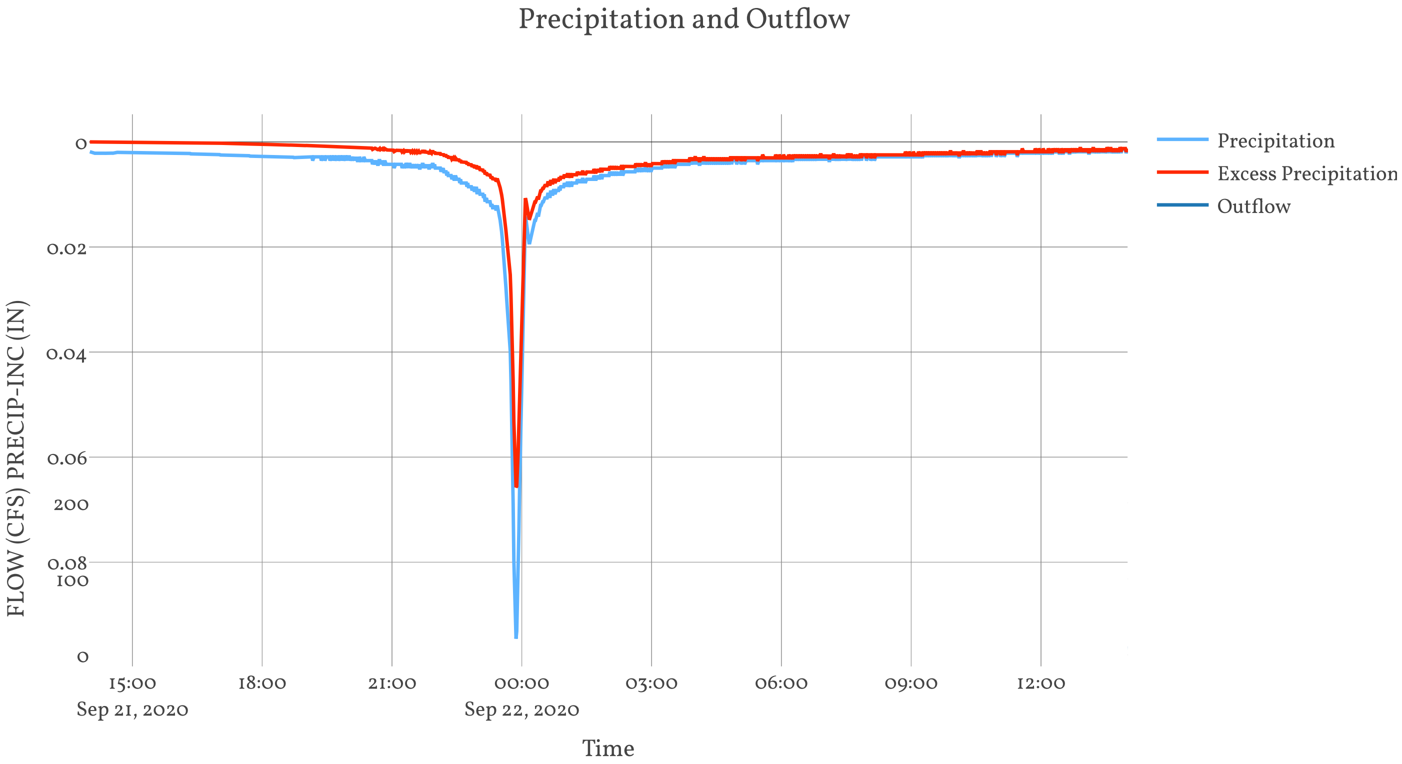
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	268.89
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	4.55
Precipitation Volume (AC - FT)	61.43
Loss Volume (AC - FT)	21.92
Excess Volume (AC - FT)	39.51
Direct Runoff Volume (AC - FT)	39.34
Baseflow Volume (AC - FT)	0

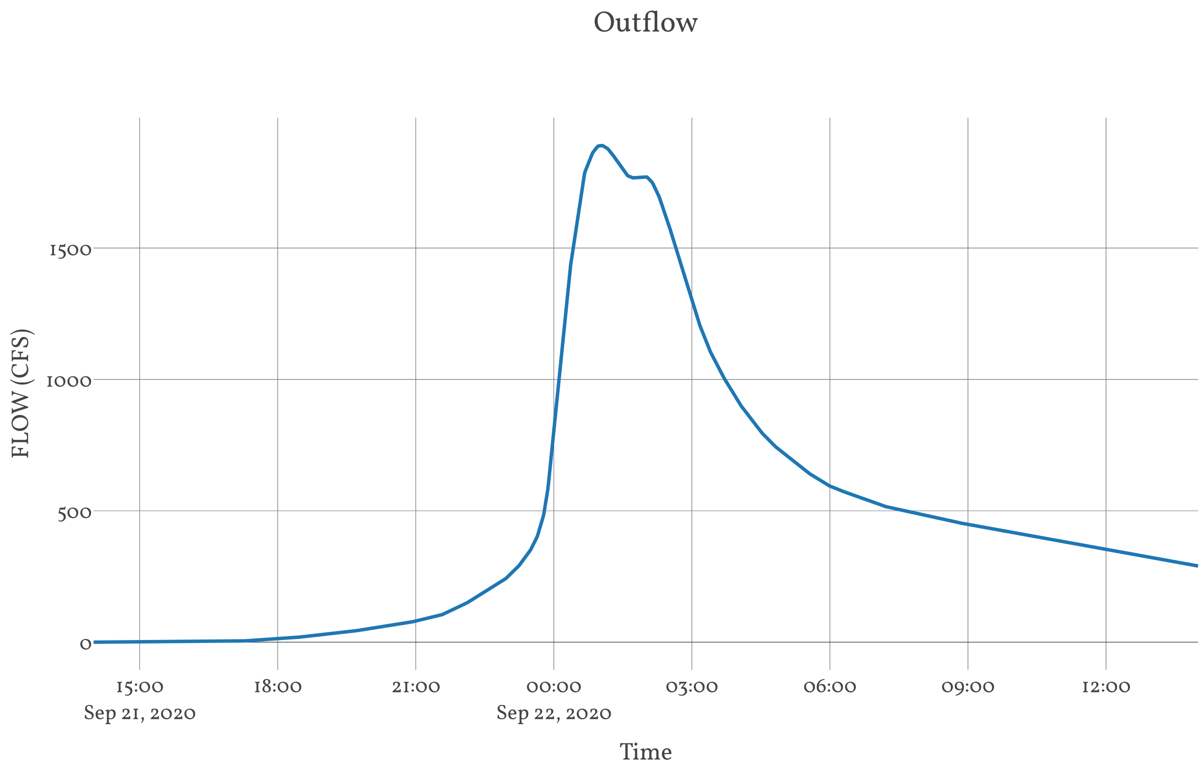

Precipitation and Outflow
0
0.02
0.04
0.06
200
0.08
100
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	1890.72
Time of Peak Discharge	22Sep2020, 01:01
Volume (IN)	4.34



Reach: 14R

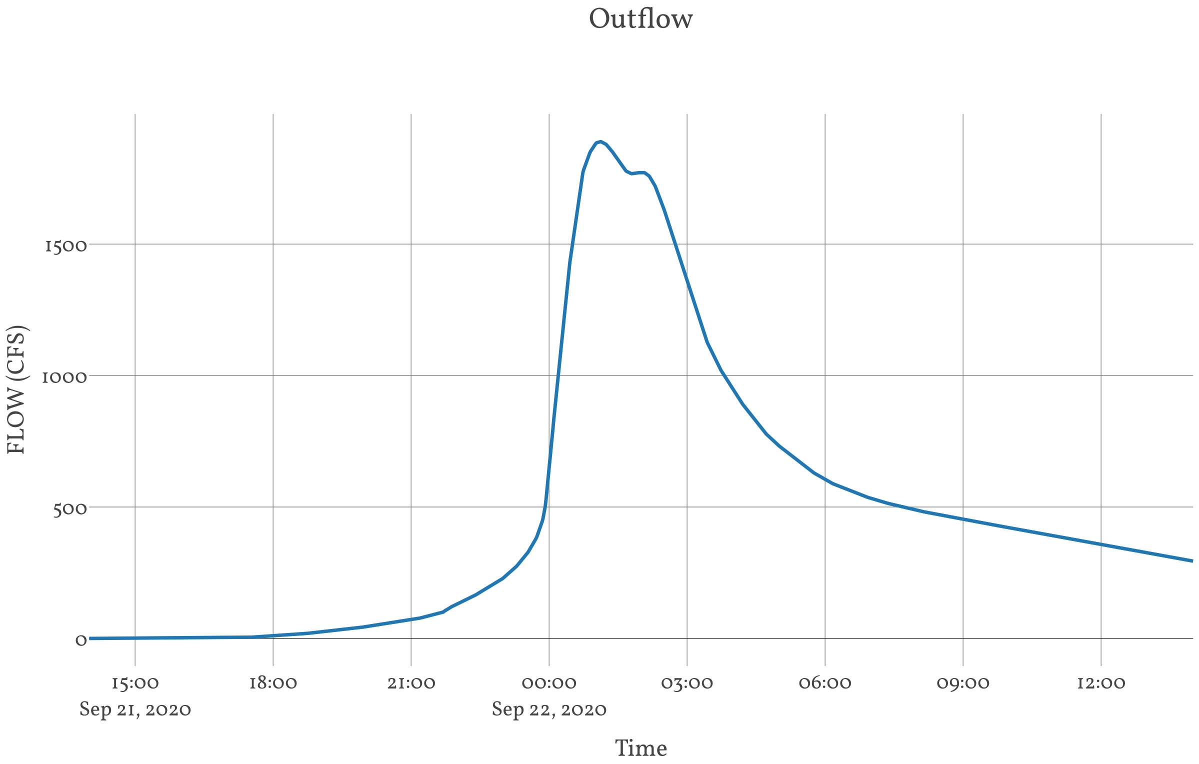
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	1889.72
Time of Peak Discharge	22Sep2020, 01:06
Volume (IN)	4.32
Peak Inflow (CFS)	1890.72
Inflow Volume (AC - FT)	963.37



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

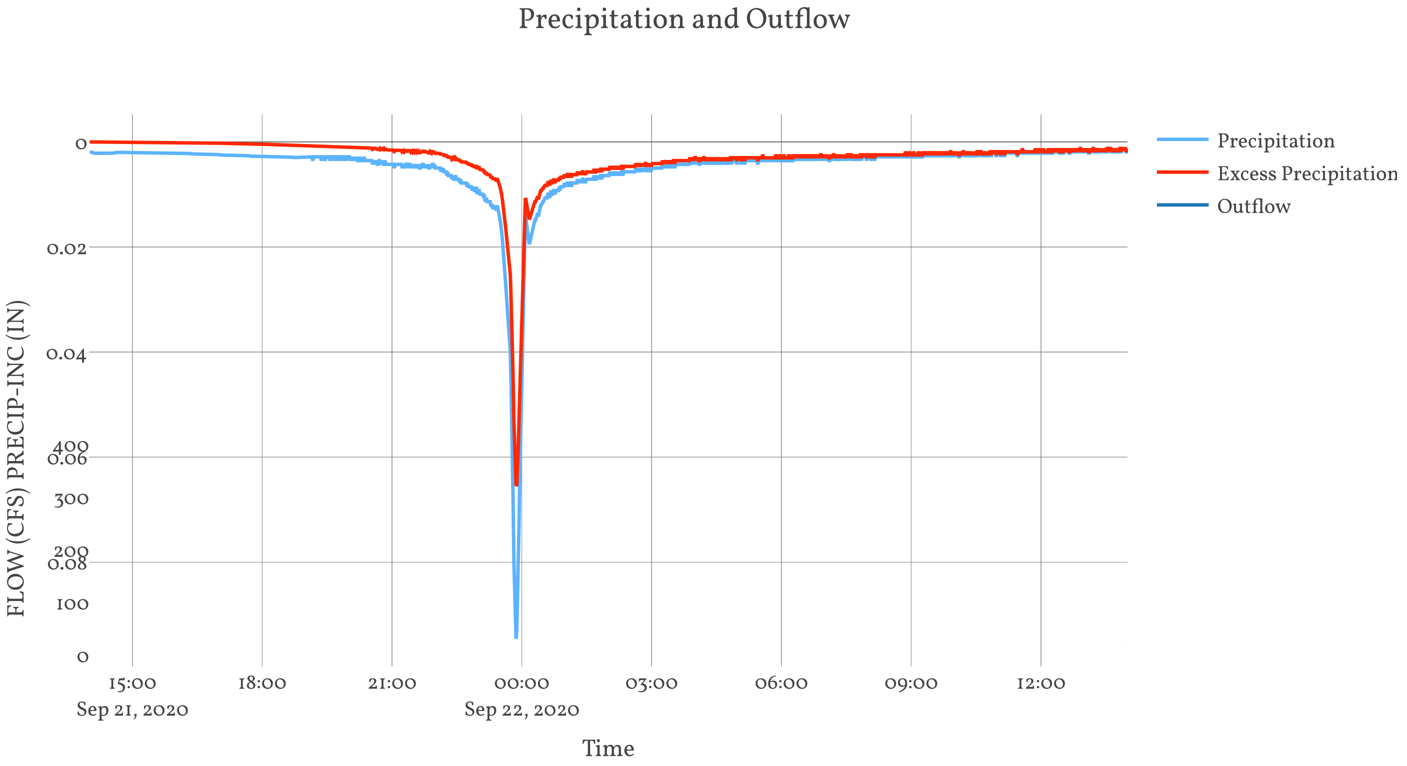
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	388.37
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	4.49
Precipitation Volume (AC - FT)	163.06
Loss Volume (AC - FT)	58.55
Excess Volume (AC - FT)	104.5
Direct Runoff Volume (AC - FT)	103.01
Baseflow Volume (AC - FT)	0

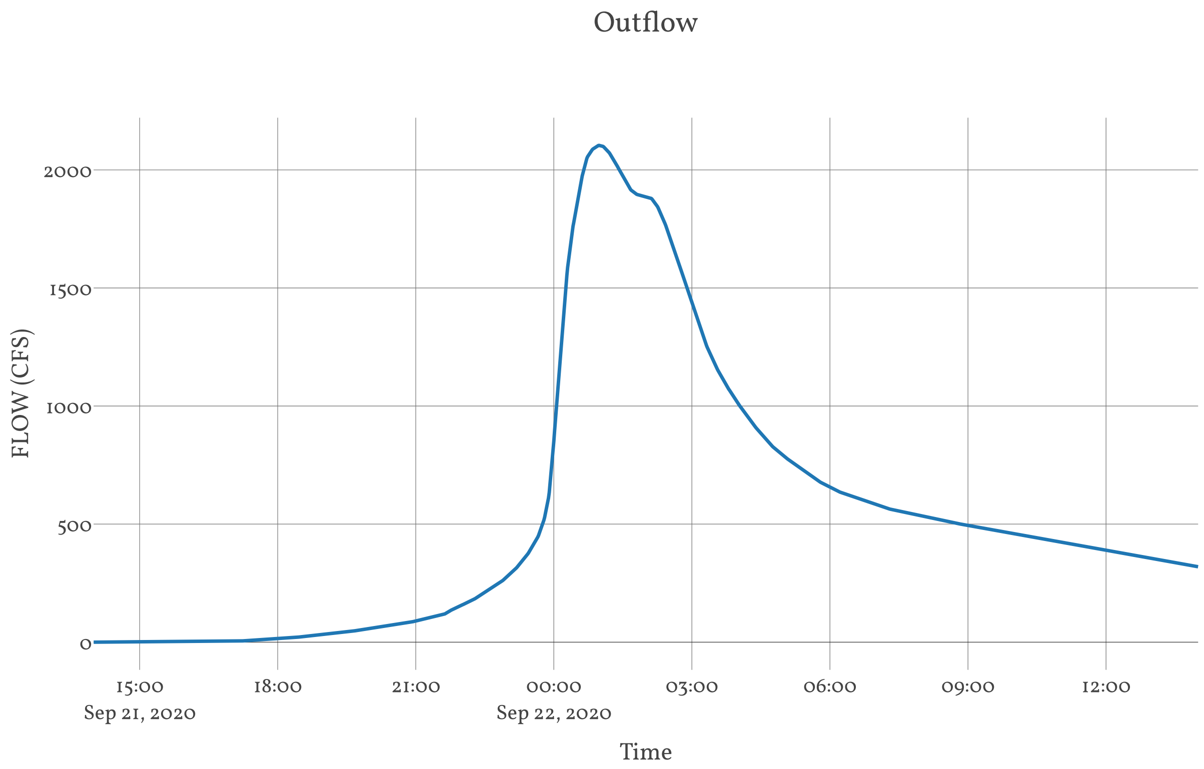

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	2103.7
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	4.33



Reach: 13R

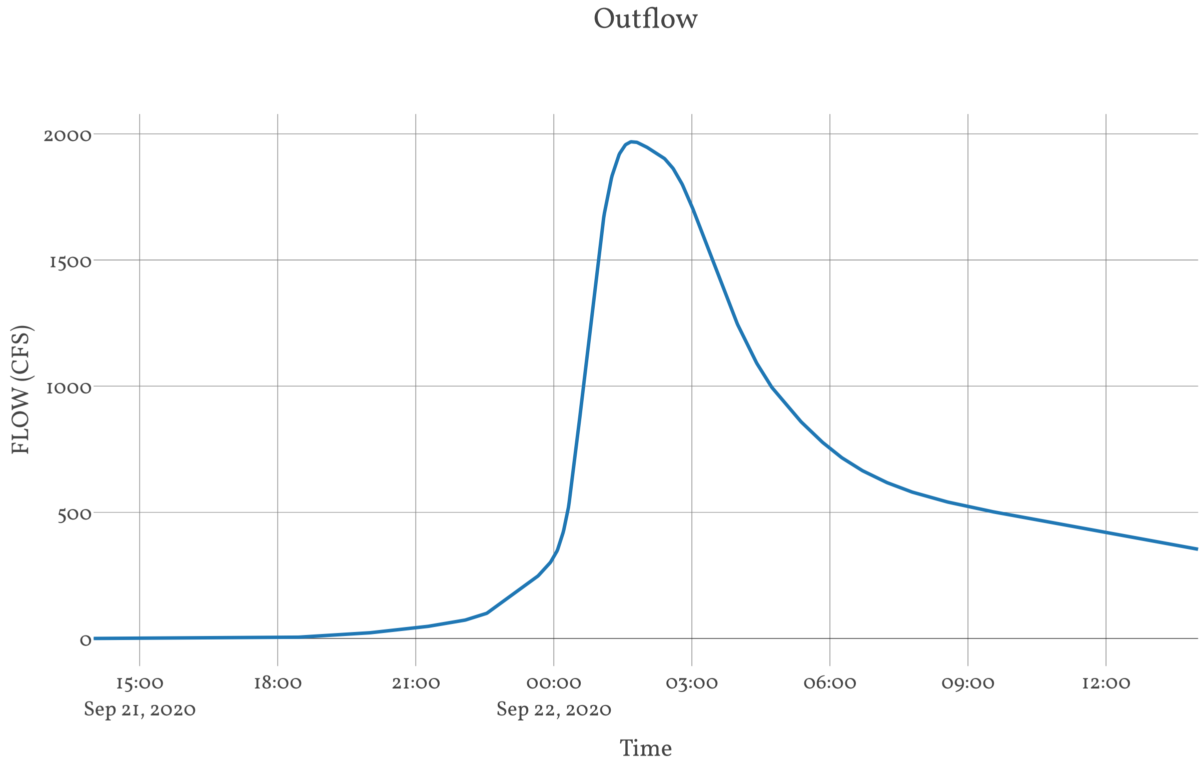
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	1968.98
Time of Peak Discharge	22Sep2020, 01:43
Volume (IN)	4.19
Peak Inflow (CFS)	2103.7
Inflow Volume (AC - FT)	1061.97



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

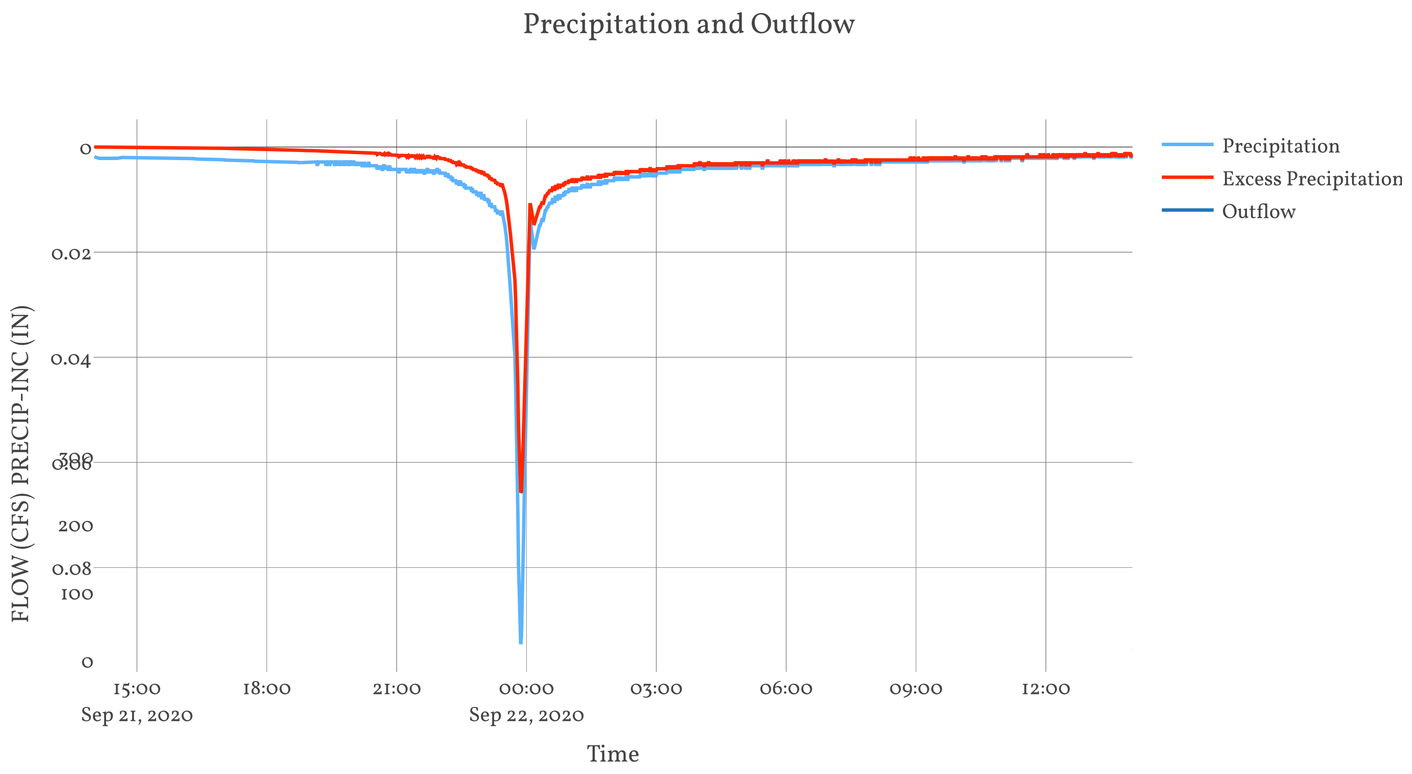
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	300.46
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	4.53
Precipitation Volume (AC - FT)	96.7
Loss Volume (AC - FT)	34.51
Excess Volume (AC - FT)	62.19
Direct Runoff Volume (AC - FT)	61.64
Baseflow Volume (AC - FT)	0

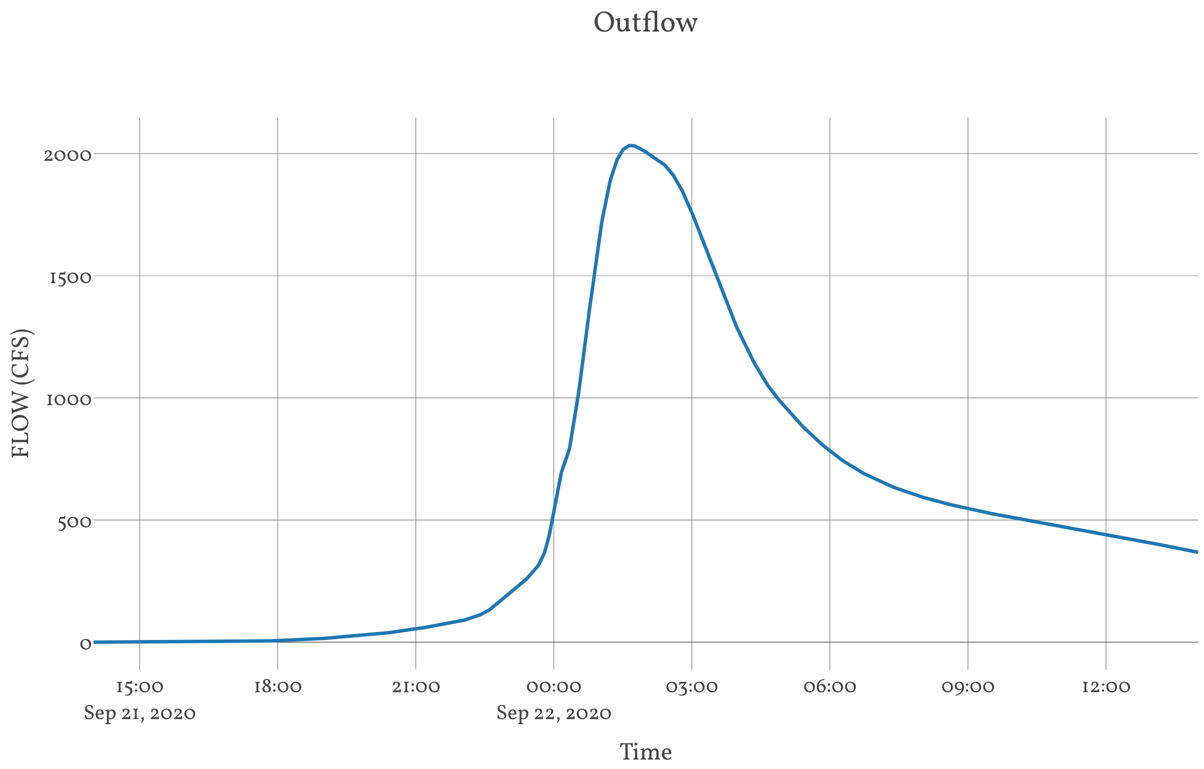

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

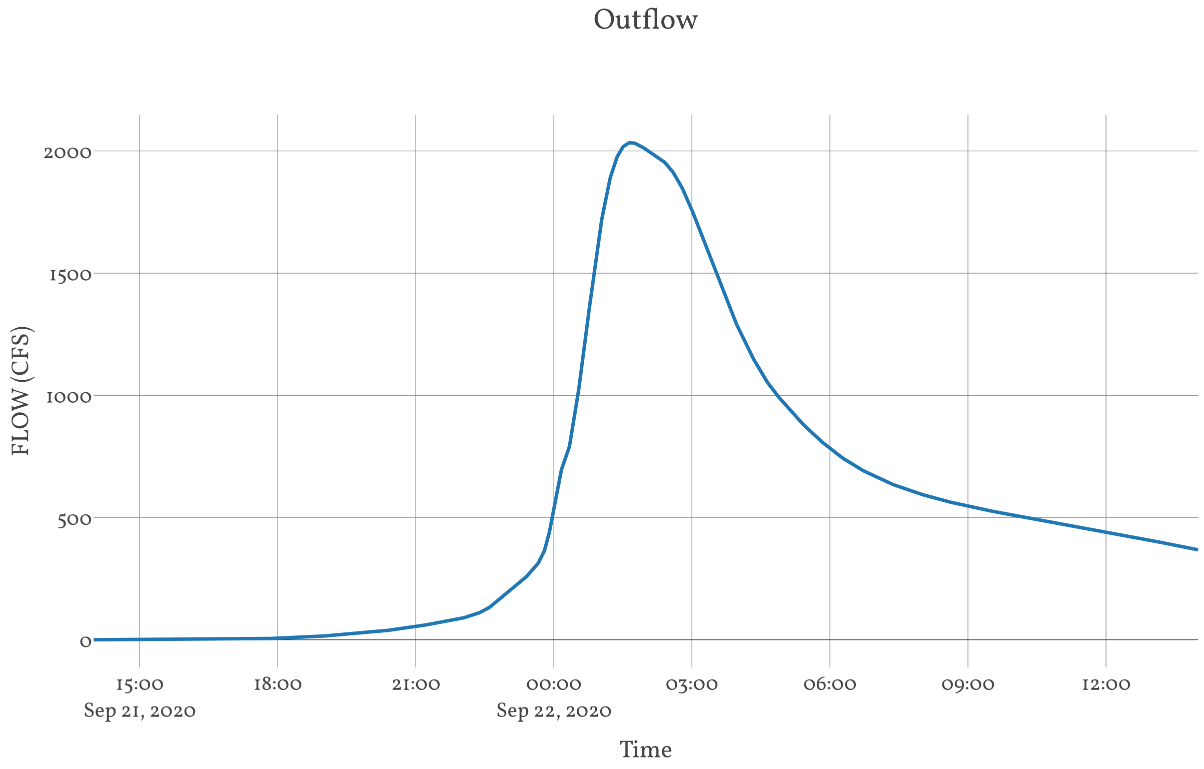
Peak Discharge (CFS)	2033.78
Time of Peak Discharge	22Sep2020, 01:41
Volume (IN)	4.21



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	2033.78
Time of Peak Discharge	22Sep2020, 01:41
Volume (IN)	4.21
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 050-mp-Post-Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 21:33

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	658.2	22Sep2020, 00:24	5.53
61b	0.61	755.86	22Sep2020, 00:15	5.56
J 60b 61b	1.25	1376.41	22Sep2020, 00:18	5.54
18r	1.25	1201.59	22Sep2020, 00:57	5.35
62b	0.53	801.86	22Sep2020, 00:08	5.48
17c	1.78	1461.83	22Sep2020, 00:54	5.39
17r	1.78	1346.99	22Sep2020, 01:22	5.25
63b	0.6	702.15	22Sep2020, 00:17	5.51
16c	2.38	1626.68	22Sep2020, 01:18	5.31
16r	2.38	1603.52	22Sep2020, 01:37	5.22
64b	1.09	1257.72	22Sep2020, 00:18	5.53
20c	3.47	2095.06	22Sep2020, 00:45	5.31
20r	3.47	2083.23	22Sep2020, 00:58	5.25
65b	0.53	839.53	22Sep2020, 00:07	5.53
15c	4	2343.64	22Sep2020, 00:53	5.29
15r	4	2337.96	22Sep2020, 01:01	5.25
66b	0.16	326.61	22Sep2020, 00:02	5.5
14c	4.16	2393.85	22Sep2020, 01:00	5.26
14r	4.16	2392.33	22Sep2020, 01:05	5.24
67b	0.43	472.93	22Sep2020, 00:19	5.43
13c	4.59	2655.4	22Sep2020, 00:58	5.25
13r	4.59	2490.9	22Sep2020, 01:35	5.09
68b	0.26	365.55	22Sep2020, 00:09	5.48

12c	4.85	2573.16	22Sep2020, 01:33	5.11
Pacific Ocean	4.85	2573.16	22Sep2020, 01:33	5.11

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

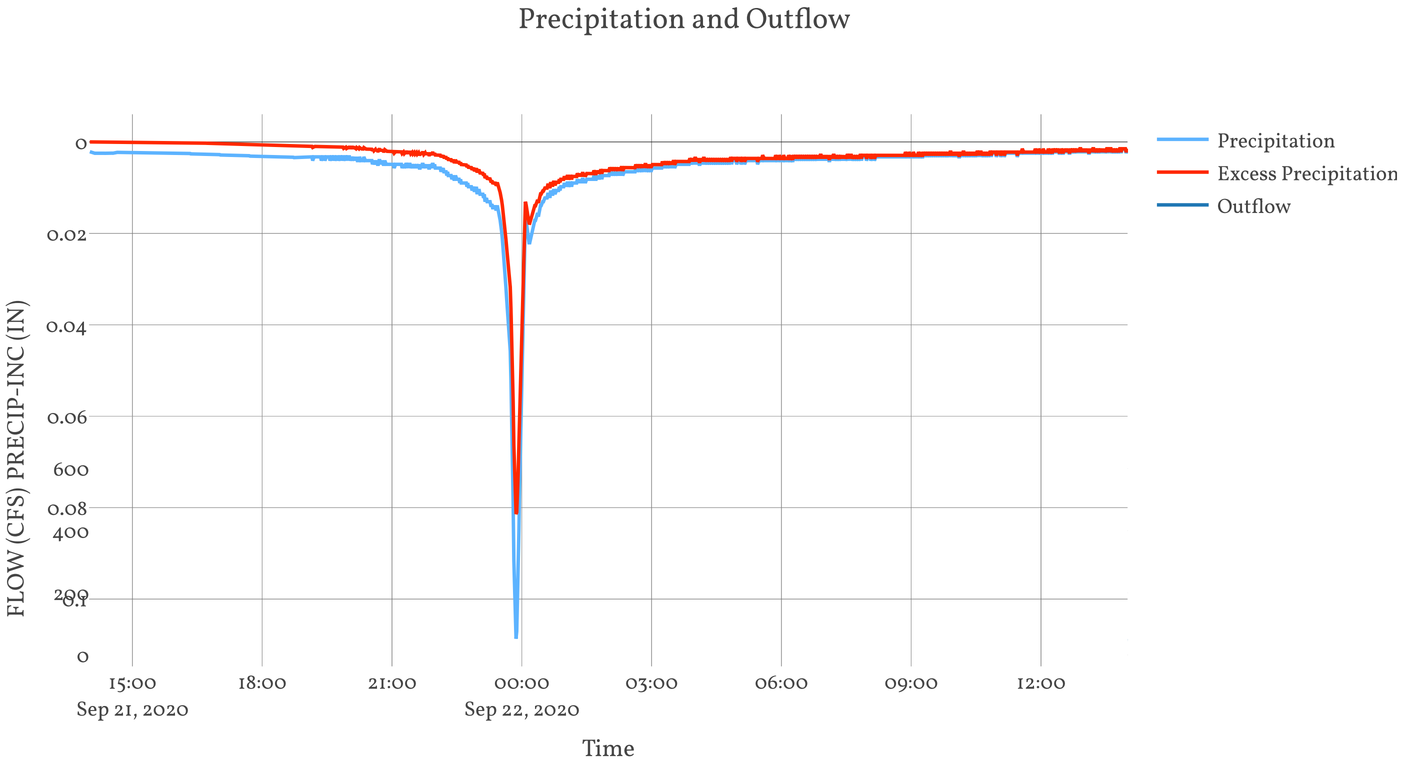
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	658.2
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	5.53
Precipitation Volume (AC - FT)	281.05
Loss Volume (AC - FT)	87.73
Excess Volume (AC - FT)	193.32
Direct Runoff Volume (AC - FT)	190.13
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

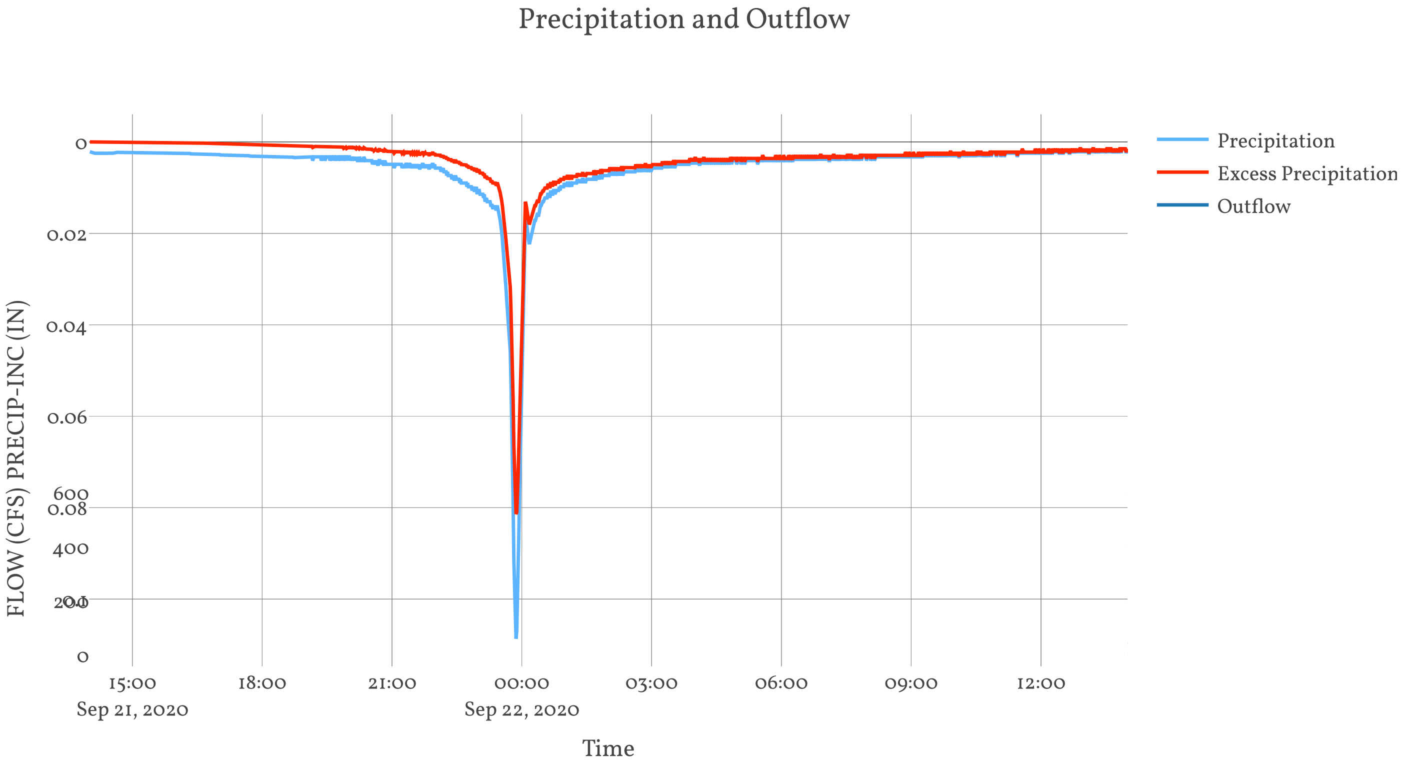
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	755.86
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	5.56
Precipitation Volume (AC - FT)	264.05
Loss Volume (AC - FT)	82.43
Excess Volume (AC - FT)	181.63
Direct Runoff Volume (AC - FT)	179.55
Baseflow Volume (AC - FT)	0

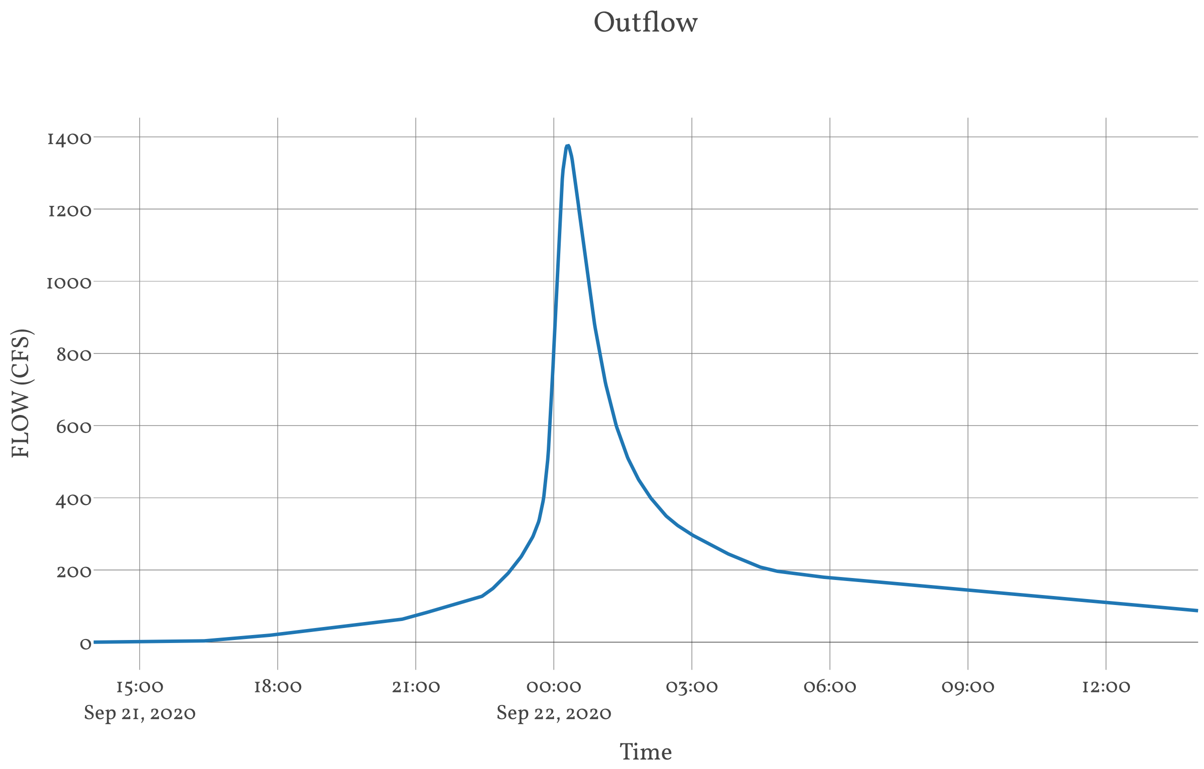

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1376.41
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	5.54



Reach: 18R

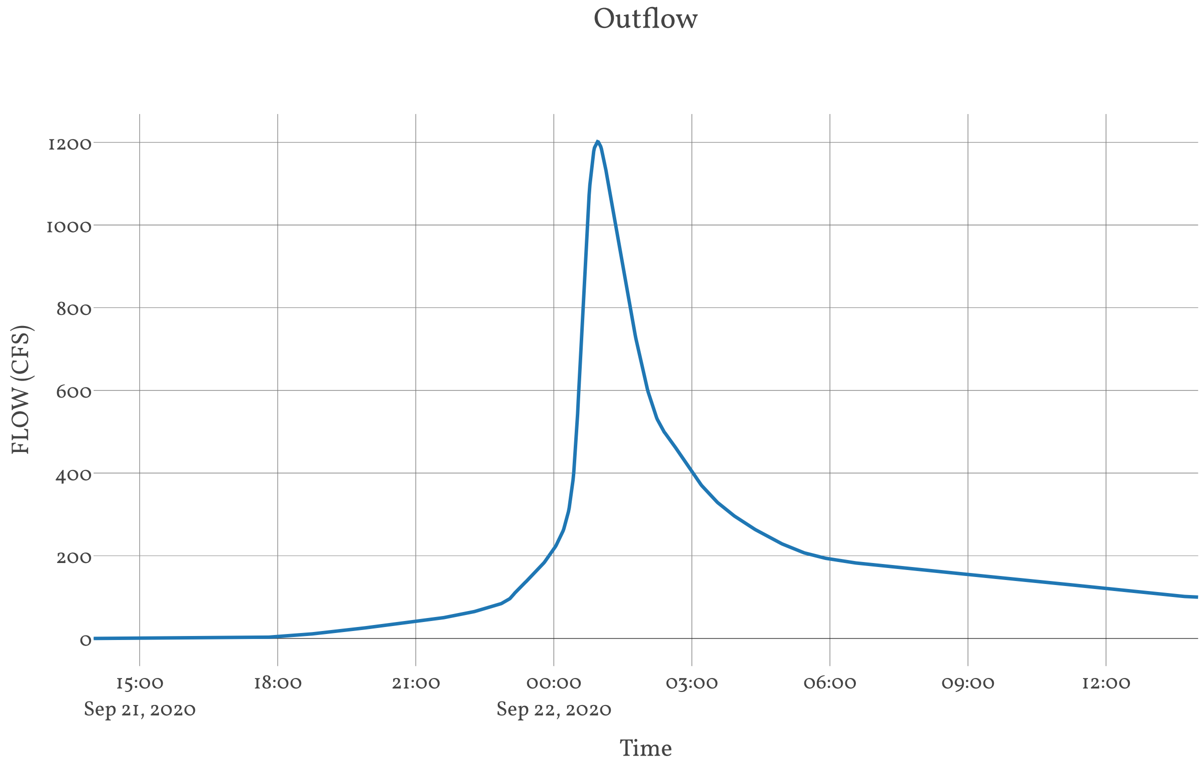
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	1201.59
Time of Peak Discharge	22Sep2020, 00:57
Volume (IN)	5.35
Peak Inflow (CFS)	1376.41
Inflow Volume (AC - FT)	369.68



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

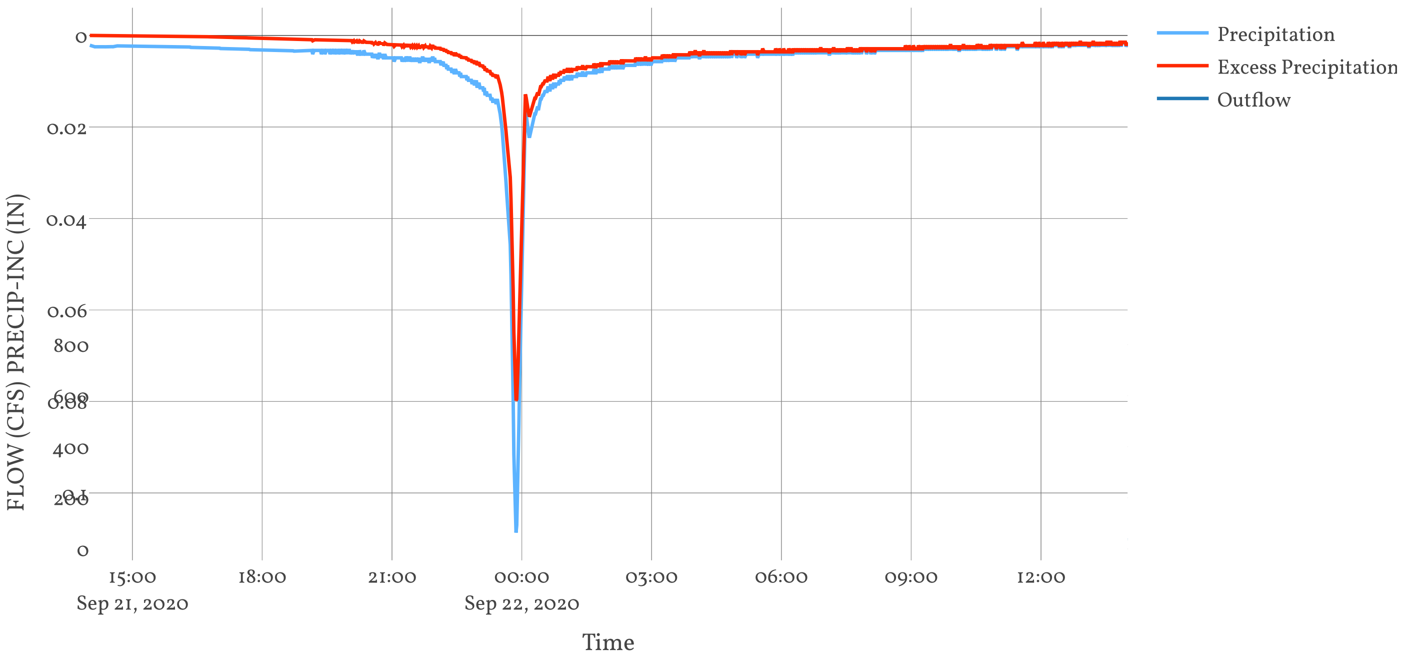
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	801.86
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	5.48
Precipitation Volume (AC - FT)	229.02
Loss Volume (AC - FT)	74.21
Excess Volume (AC - FT)	154.81
Direct Runoff Volume (AC - FT)	153.63
Baseflow Volume (AC - FT)	0

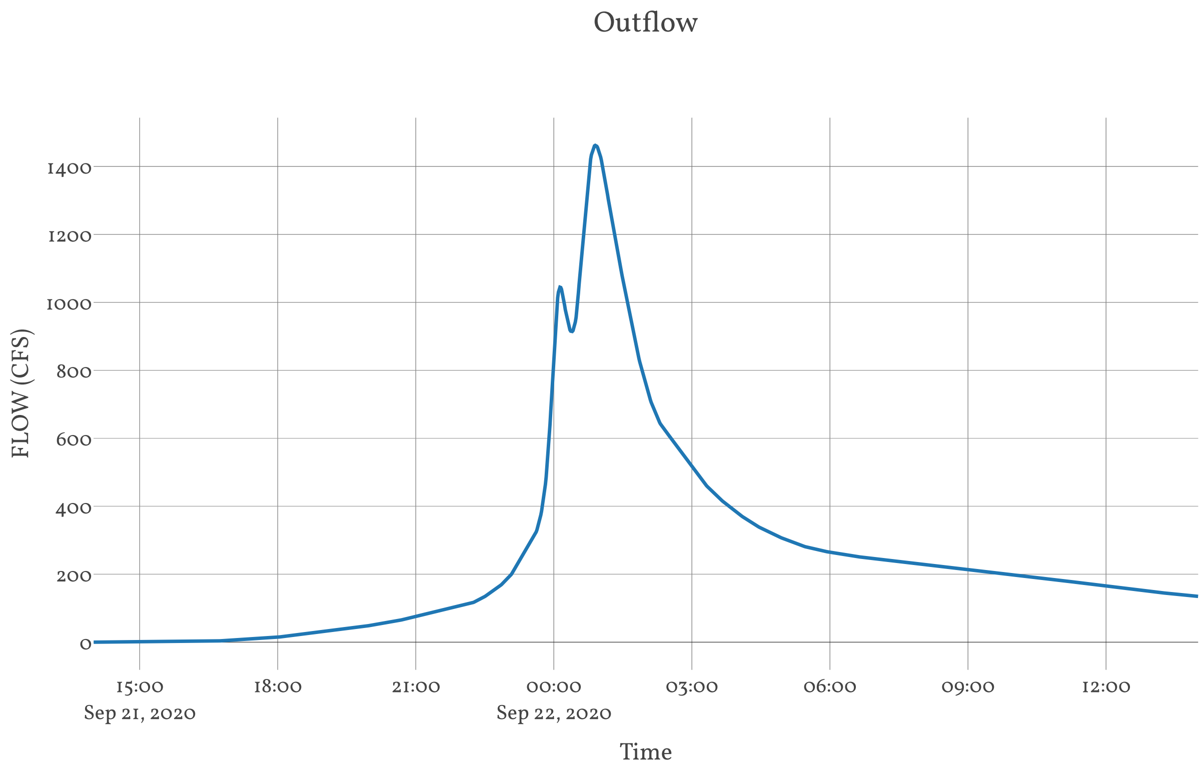
Precipitation and Outflow



Junction: 17C

Downstream : 17r

Results: 17C	
Peak Discharge (CFS)	1461.83
Time of Peak Discharge	22Sep2020, 00:54
Volume (IN)	5.39



Reach: 17R

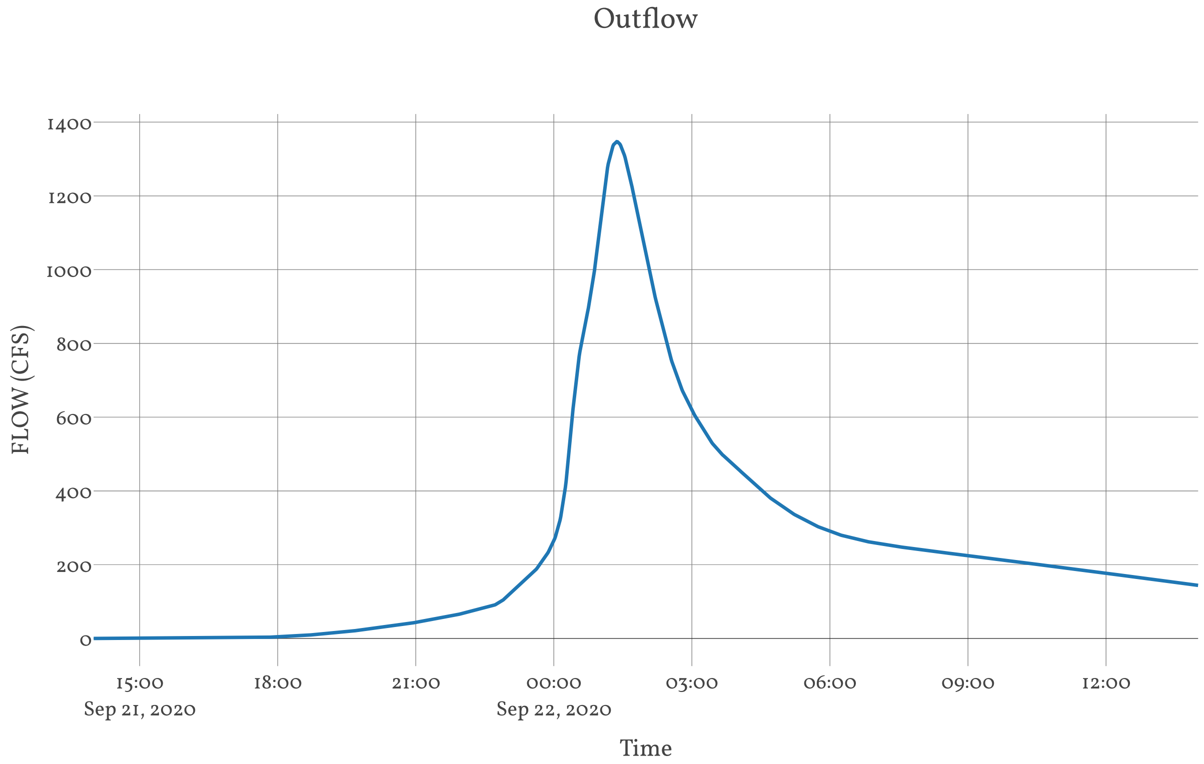
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1346.99
Time of Peak Discharge	22Sep2020, 01:22
Volume (IN)	5.25
Peak Inflow (CFS)	1461.83
Inflow Volume (AC - FT)	510.31



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

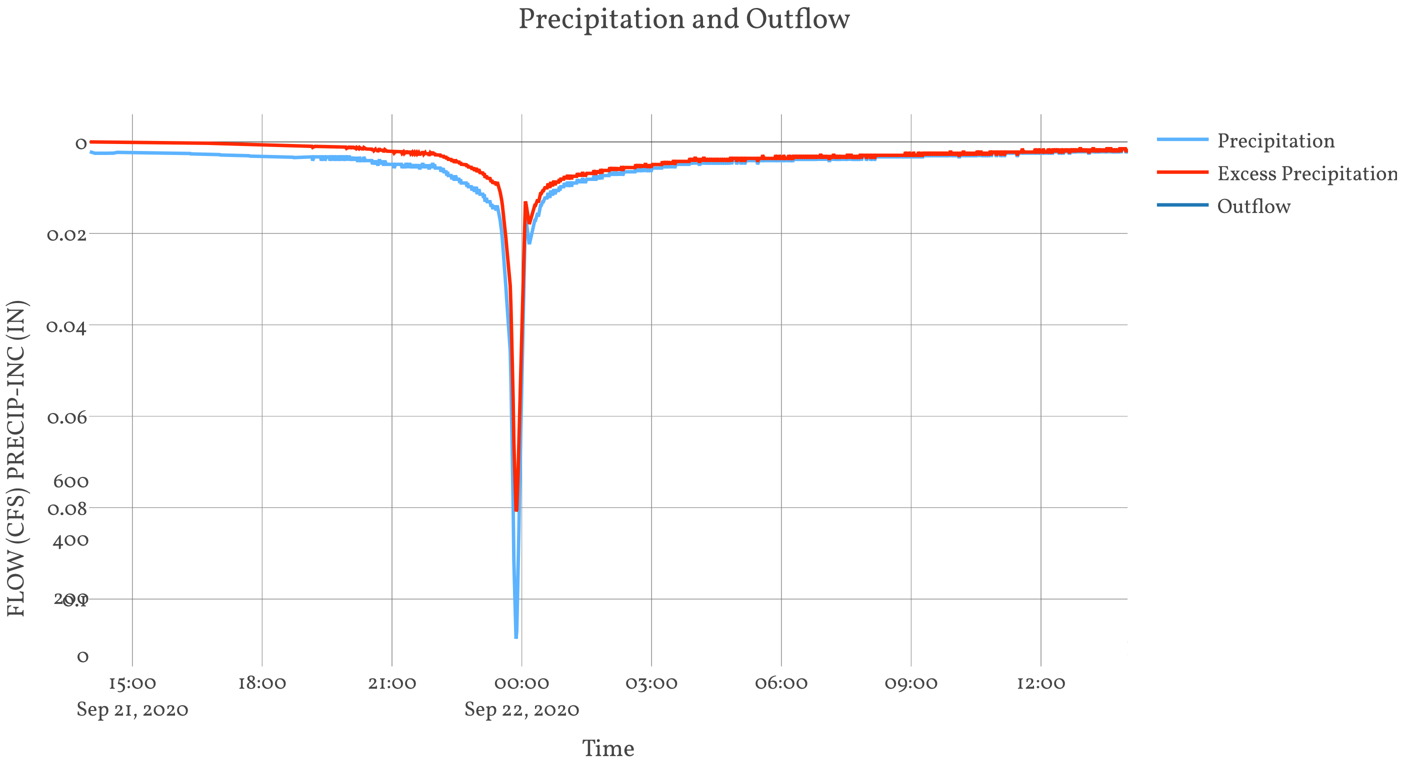
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	702.15
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	5.51
Precipitation Volume (AC - FT)	262.31
Loss Volume (AC - FT)	83.02
Excess Volume (AC - FT)	179.29
Direct Runoff Volume (AC - FT)	177
Baseflow Volume (AC - FT)	0

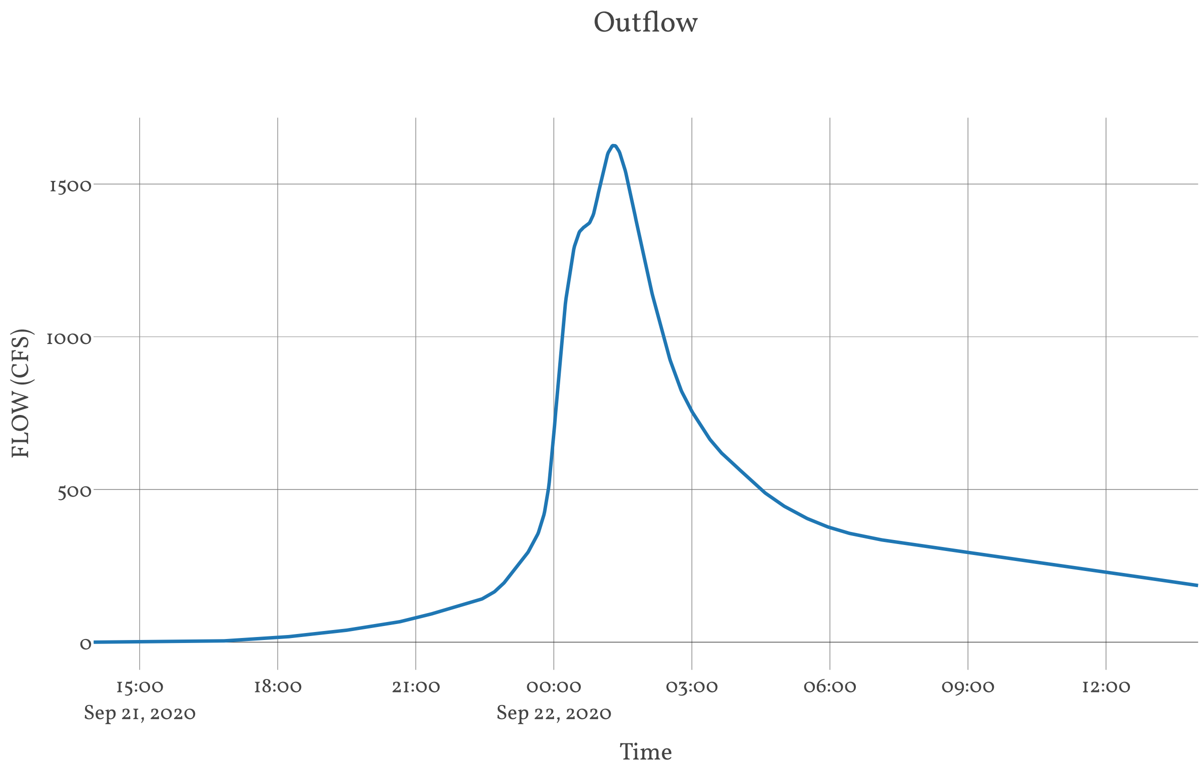

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1626.68
Time of Peak Discharge	22Sep2020, 01:18
Volume (IN)	5.31



Reach: 16R

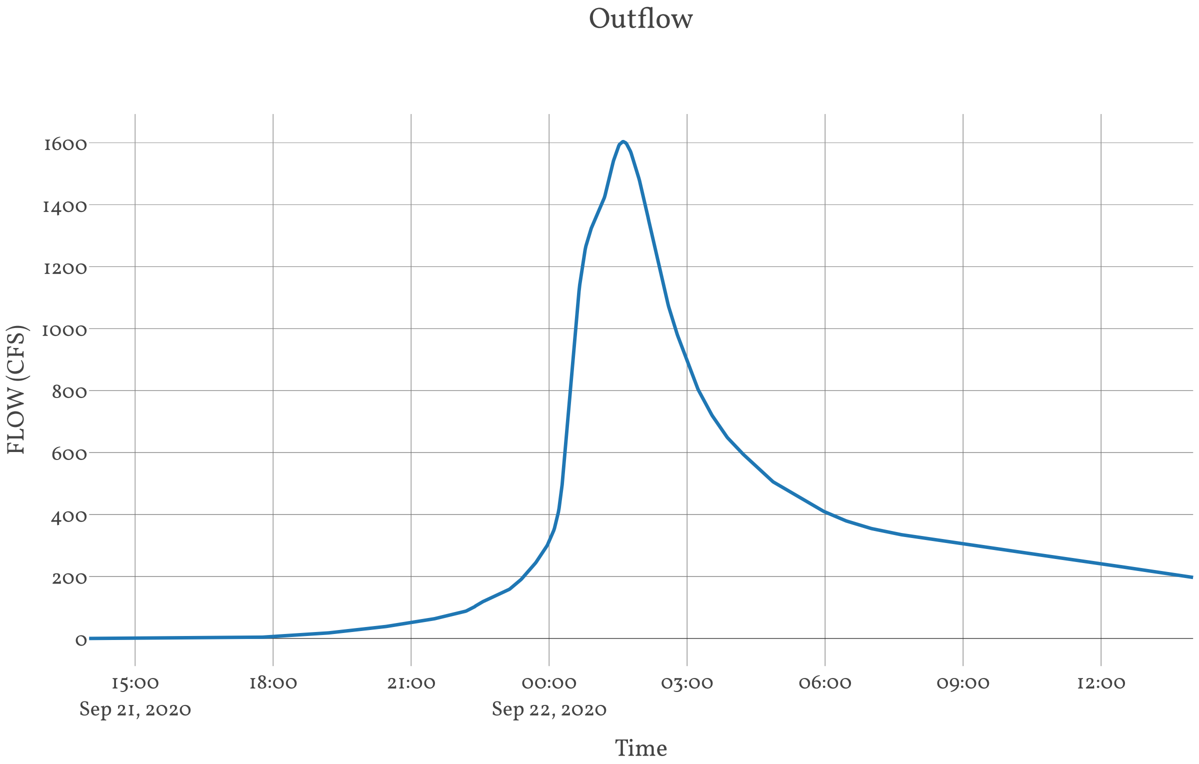
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1603.52
Time of Peak Discharge	22Sep2020, 01:37
Volume (IN)	5.22
Peak Inflow (CFS)	1626.68
Inflow Volume (AC - FT)	674.12



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

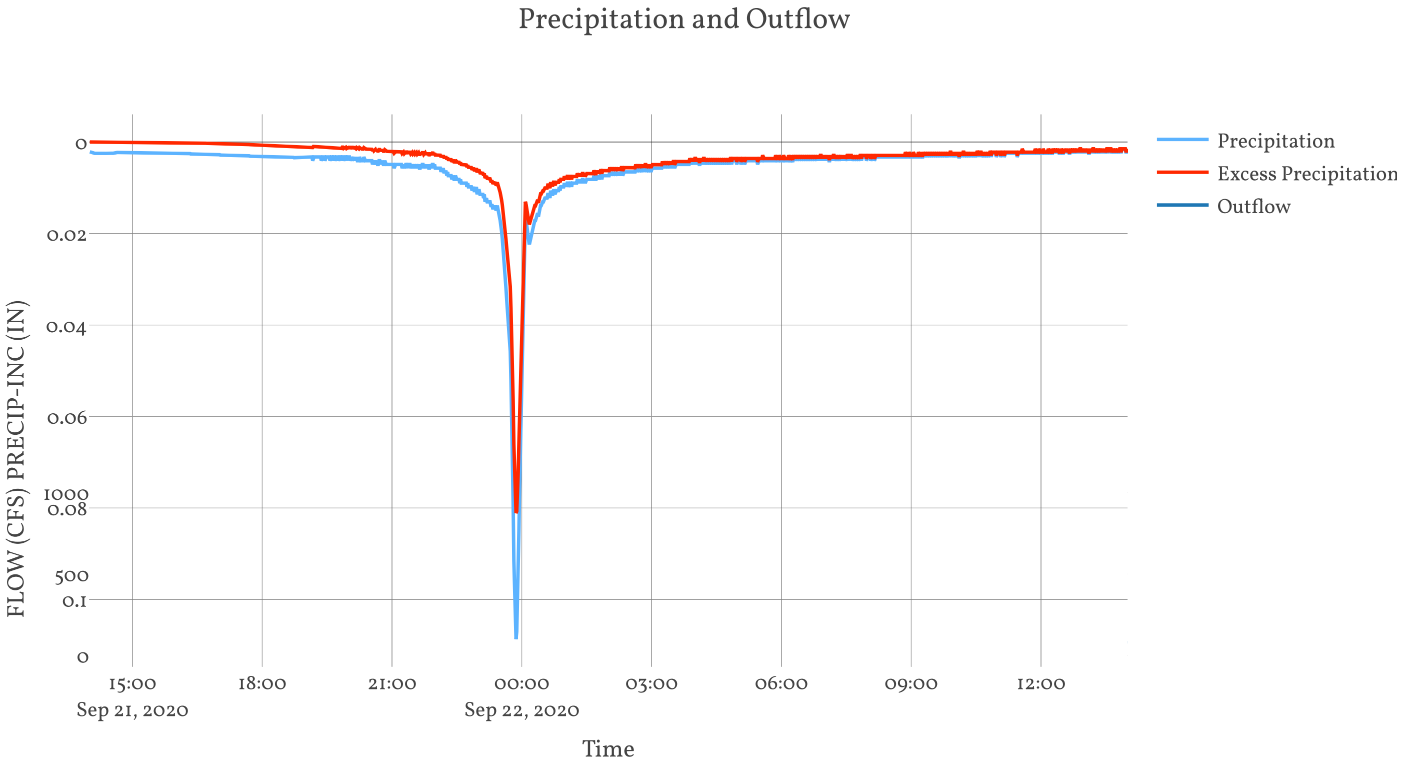
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1257.72
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	5.53
Precipitation Volume (AC - FT)	474.95
Loss Volume (AC - FT)	149.29
Excess Volume (AC - FT)	325.66
Direct Runoff Volume (AC - FT)	321.39
Baseflow Volume (AC - FT)	0

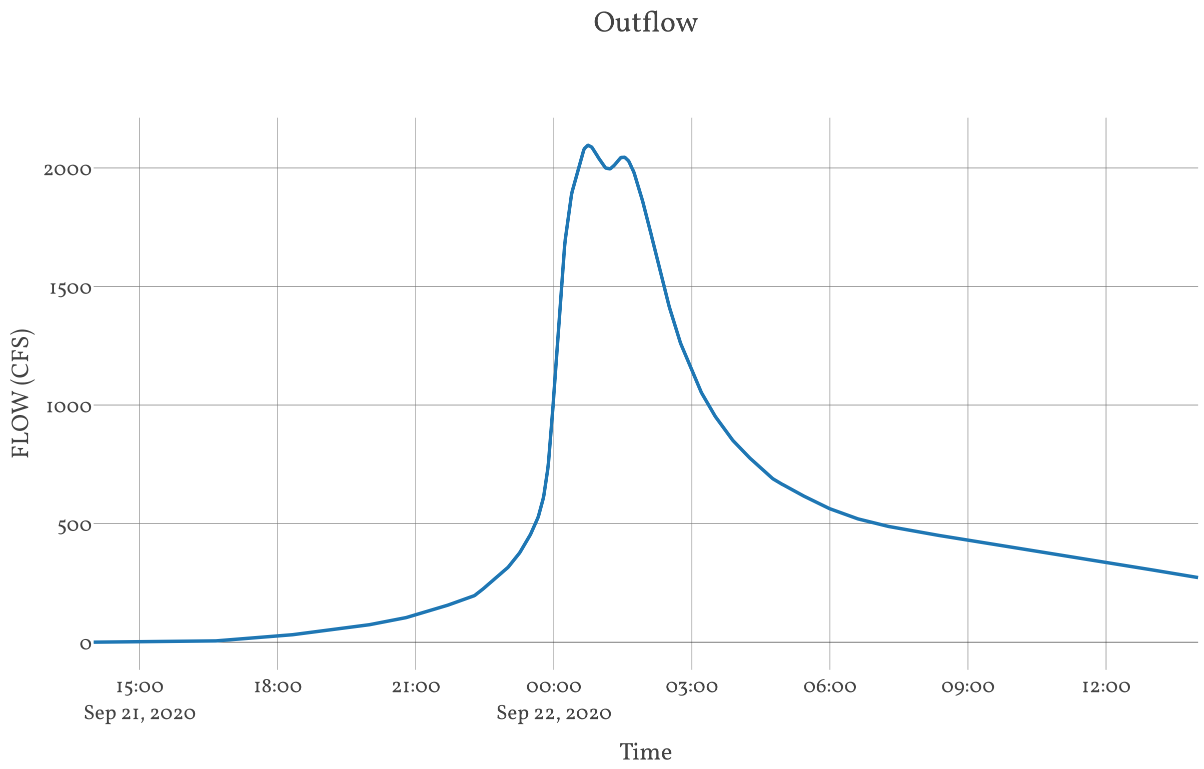

Precipitation and Outflow
0
0.02
0.04
0.06
1000
0.08
500
0.1
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	2095.06
Time of Peak Discharge	22Sep2020, 00:45
Volume (IN)	5.31



Reach: 20R

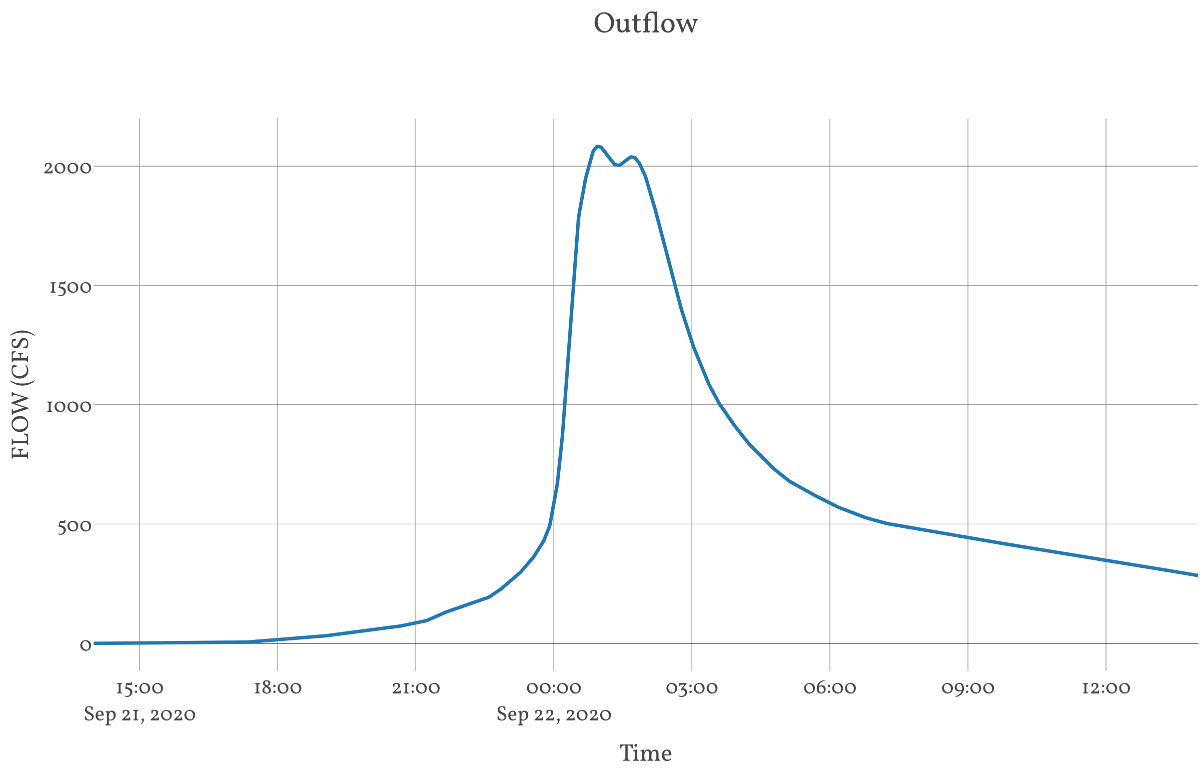
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	2083.23
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	5.25
Peak Inflow (CFS)	2095.06
Inflow Volume (AC - FT)	983.19



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

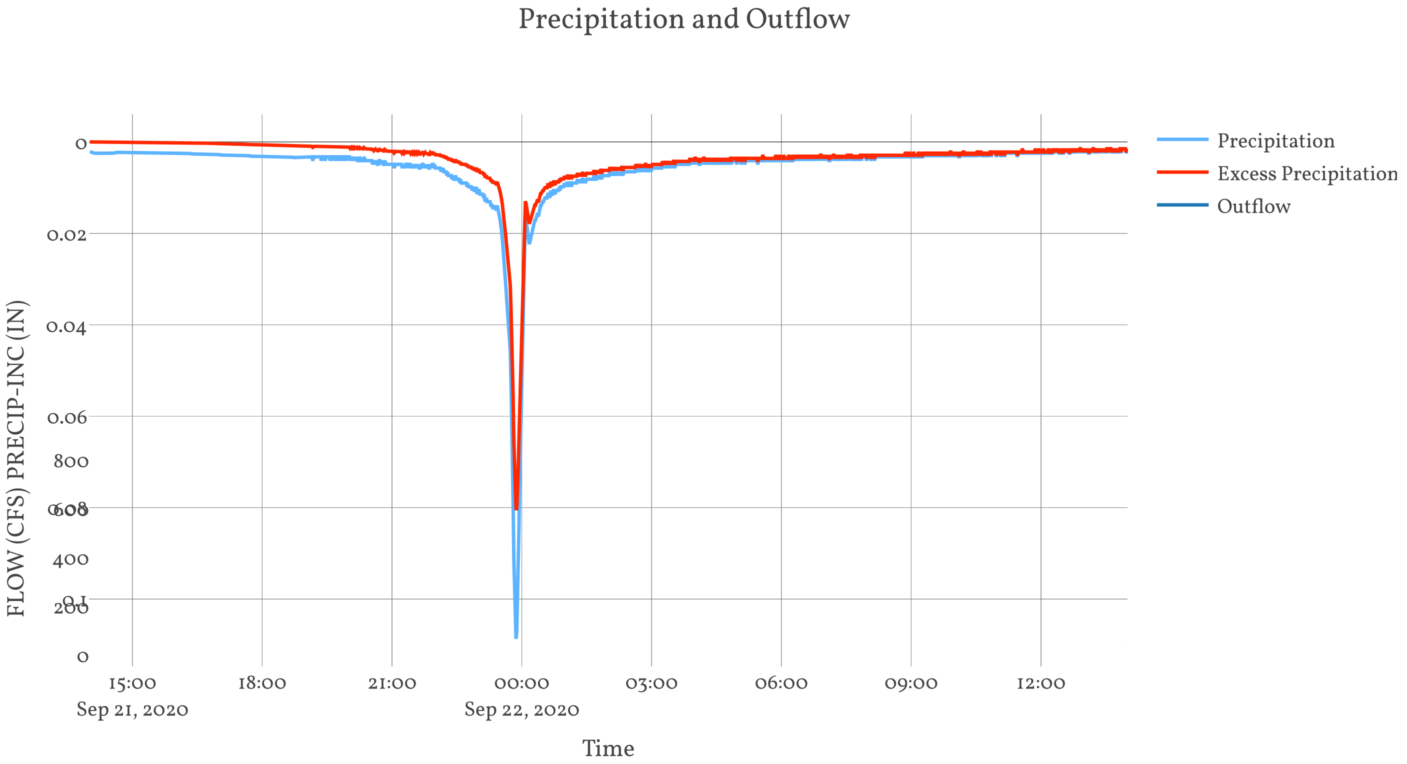
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	839.53
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	5.53
Precipitation Volume (AC - FT)	232.25
Loss Volume (AC - FT)	74
Excess Volume (AC - FT)	158.24
Direct Runoff Volume (AC - FT)	157.09
Baseflow Volume (AC - FT)	0

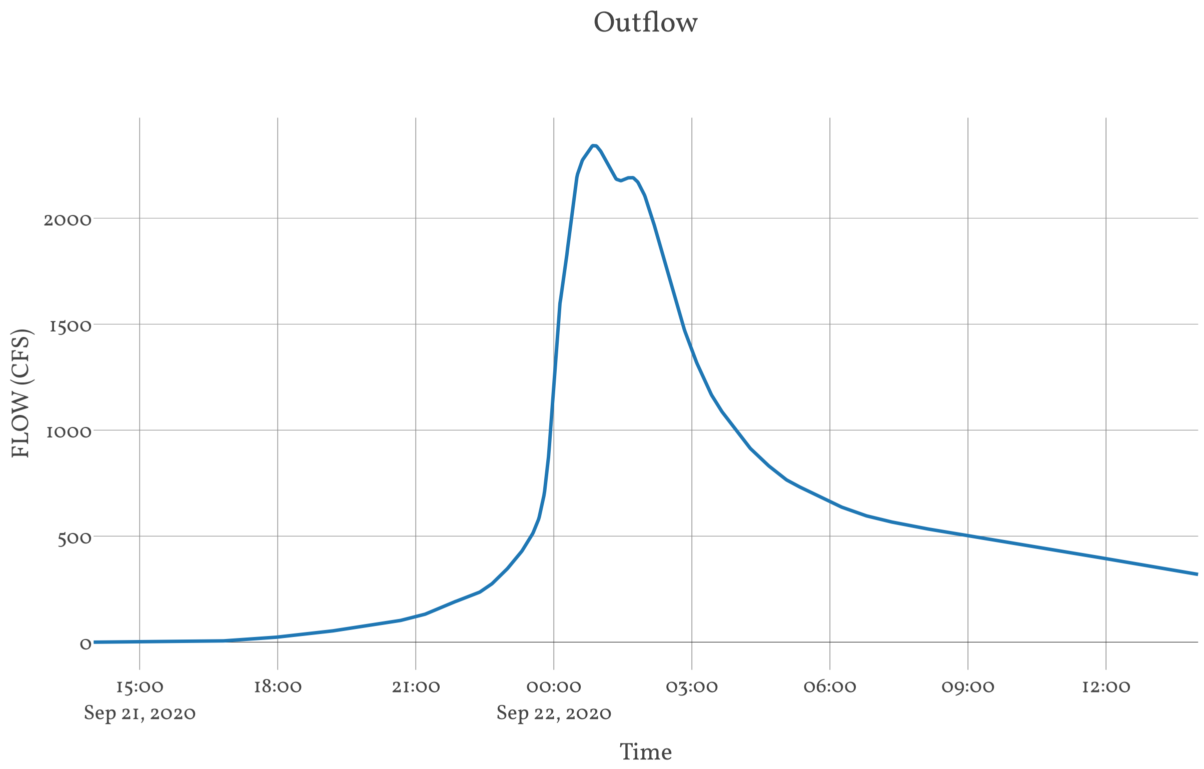

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
800
600
400
200
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	2343.64
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	5.29



Reach: 15R

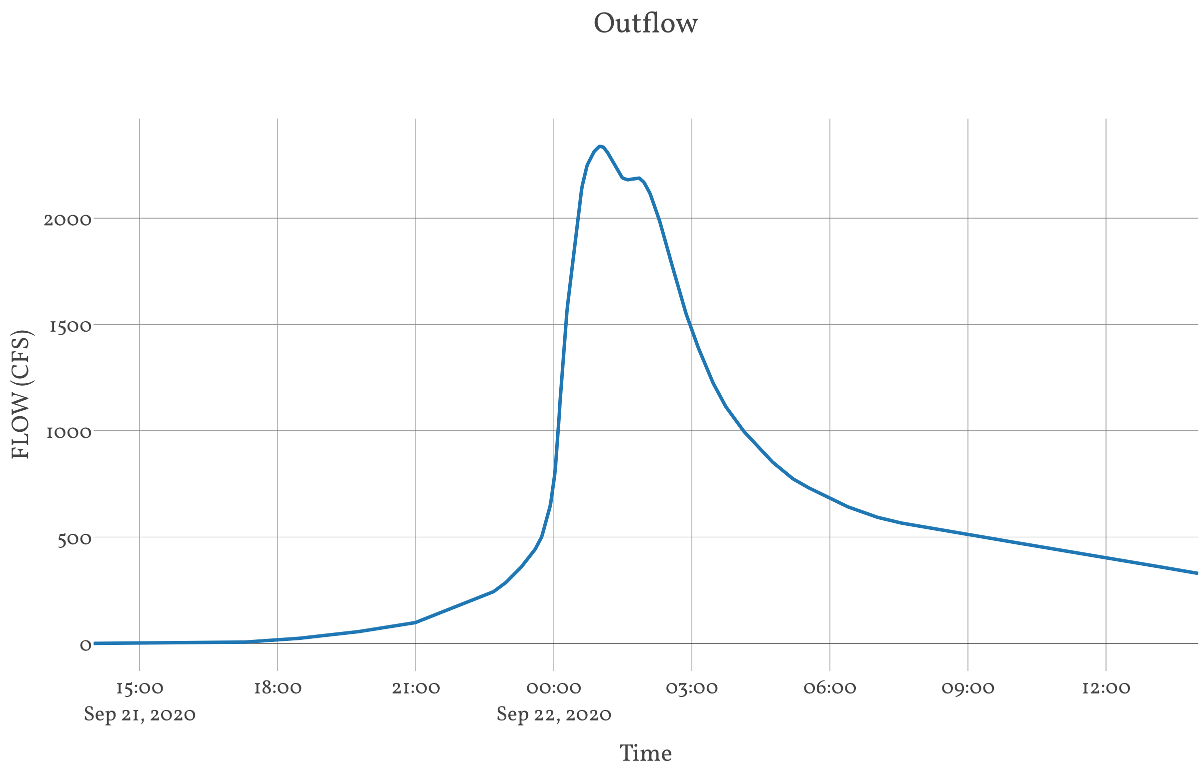
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	2337.96
Time of Peak Discharge	22Sep2020, 01:01
Volume (IN)	5.25
Peak Inflow (CFS)	2343.64
Inflow Volume (AC - FT)	1128.91



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

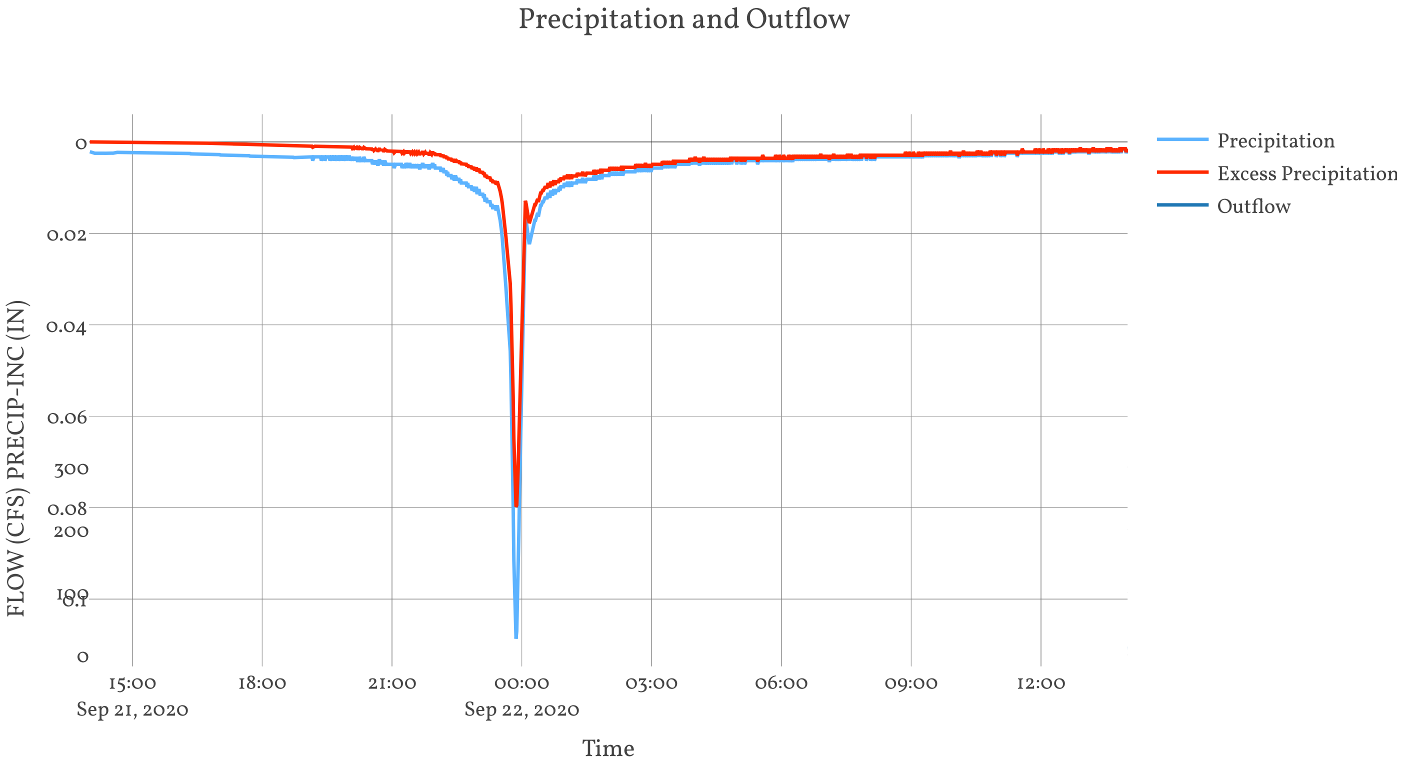
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	326.61
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	5.5
Precipitation Volume (AC - FT)	70.59
Loss Volume (AC - FT)	22.87
Excess Volume (AC - FT)	47.72
Direct Runoff Volume (AC - FT)	47.52
Baseflow Volume (AC - FT)	0

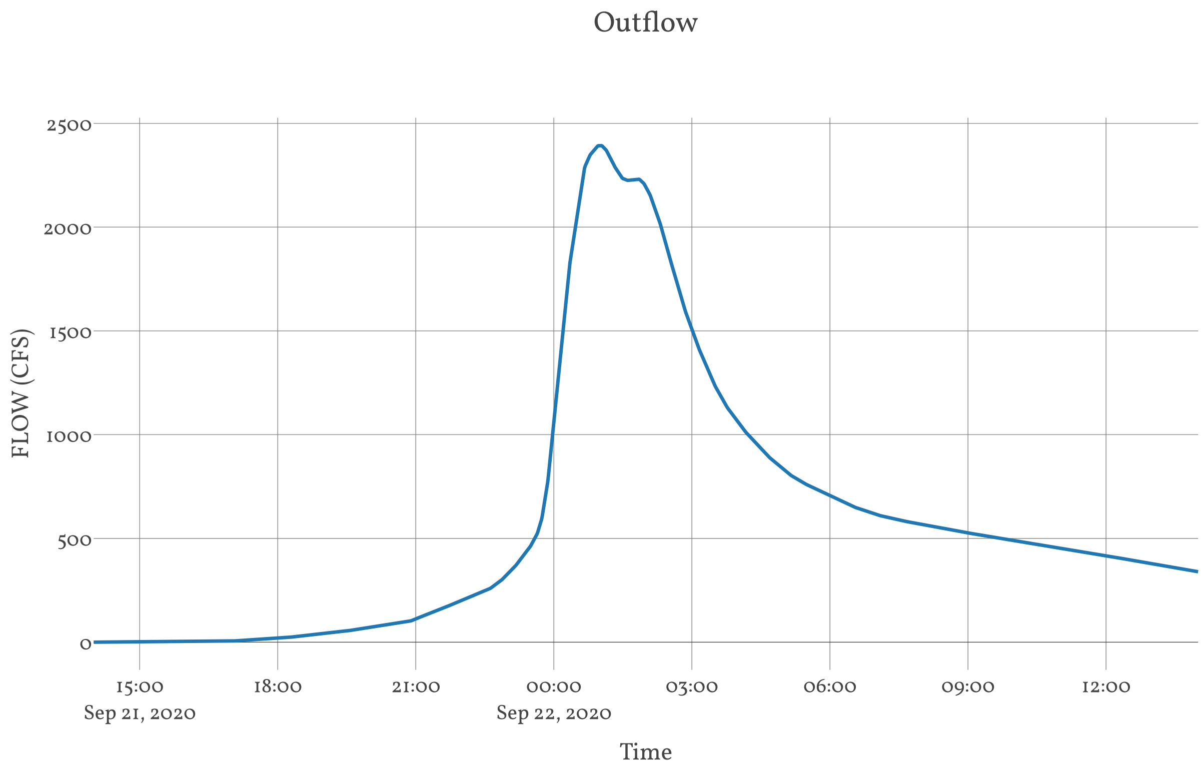

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	2393.85
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	5.26



Reach: 14R

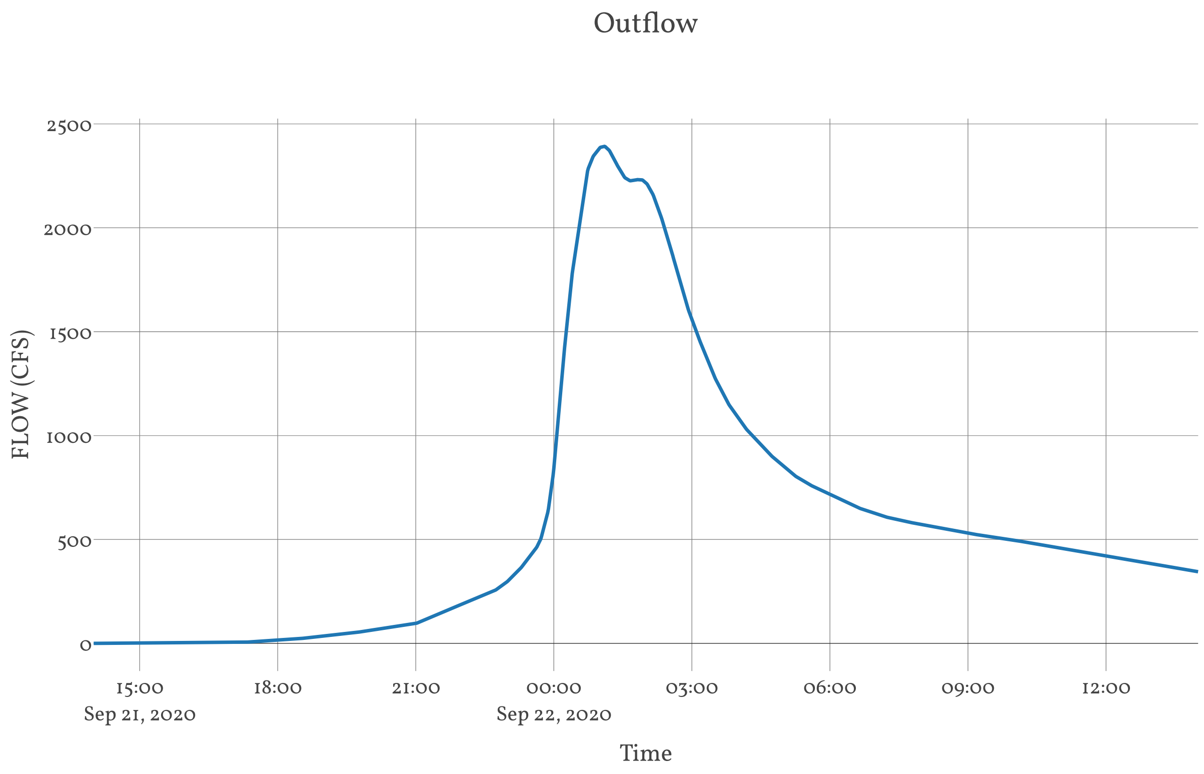
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	2392.33
Time of Peak Discharge	22Sep2020, 01:05
Volume (IN)	5.24
Peak Inflow (CFS)	2393.85
Inflow Volume (AC - FT)	1167.67



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

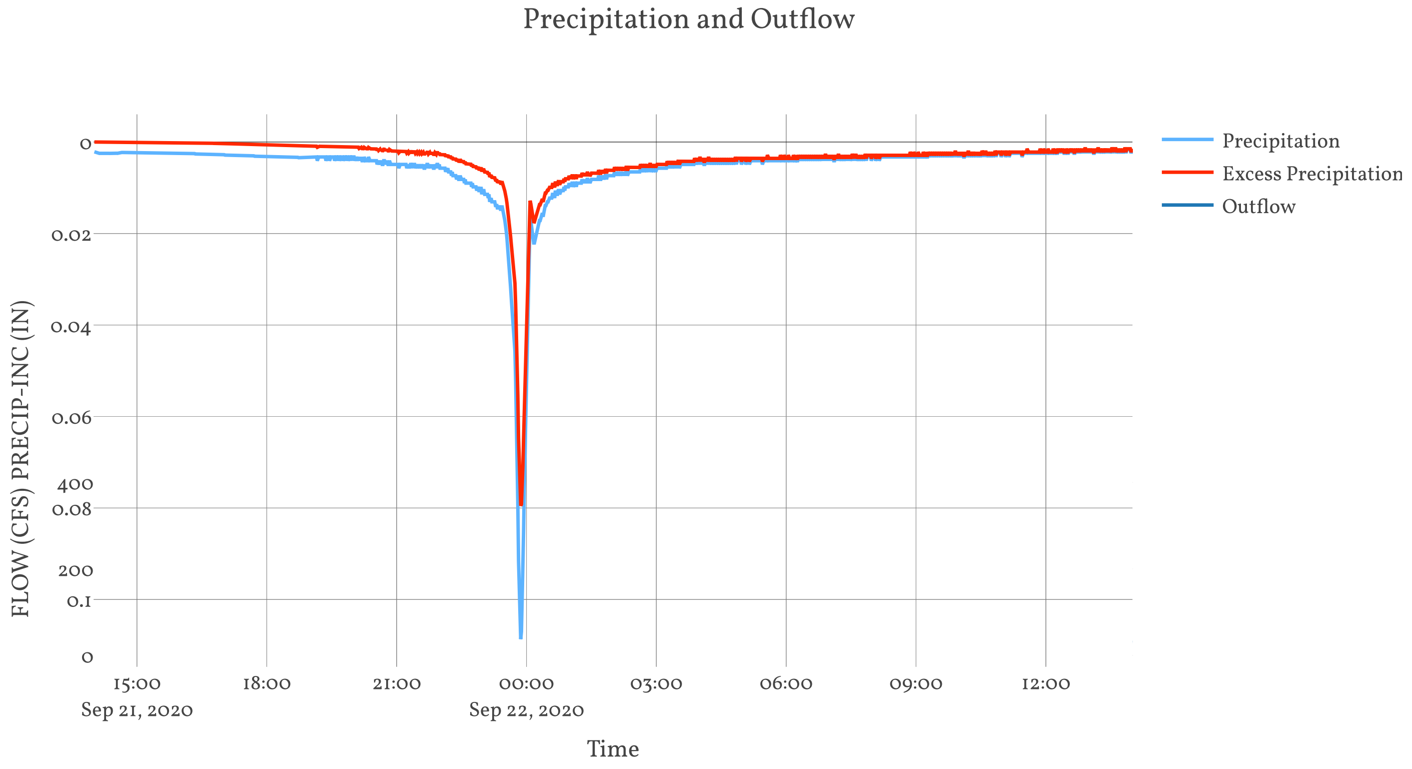
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	472.93
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	5.43
Precipitation Volume (AC - FT)	187.37
Loss Volume (AC - FT)	61.11
Excess Volume (AC - FT)	126.25
Direct Runoff Volume (AC - FT)	124.49
Baseflow Volume (AC - FT)	0

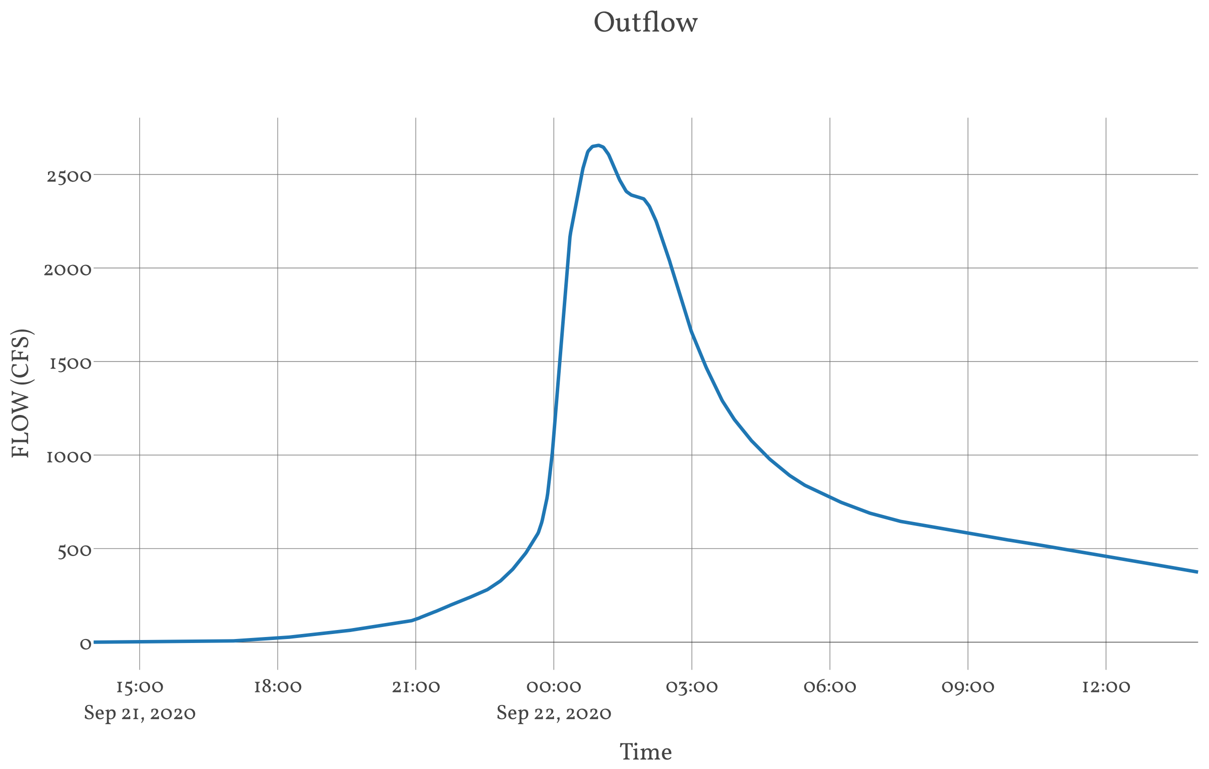

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	2655.4
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	5.25



Reach: 13R

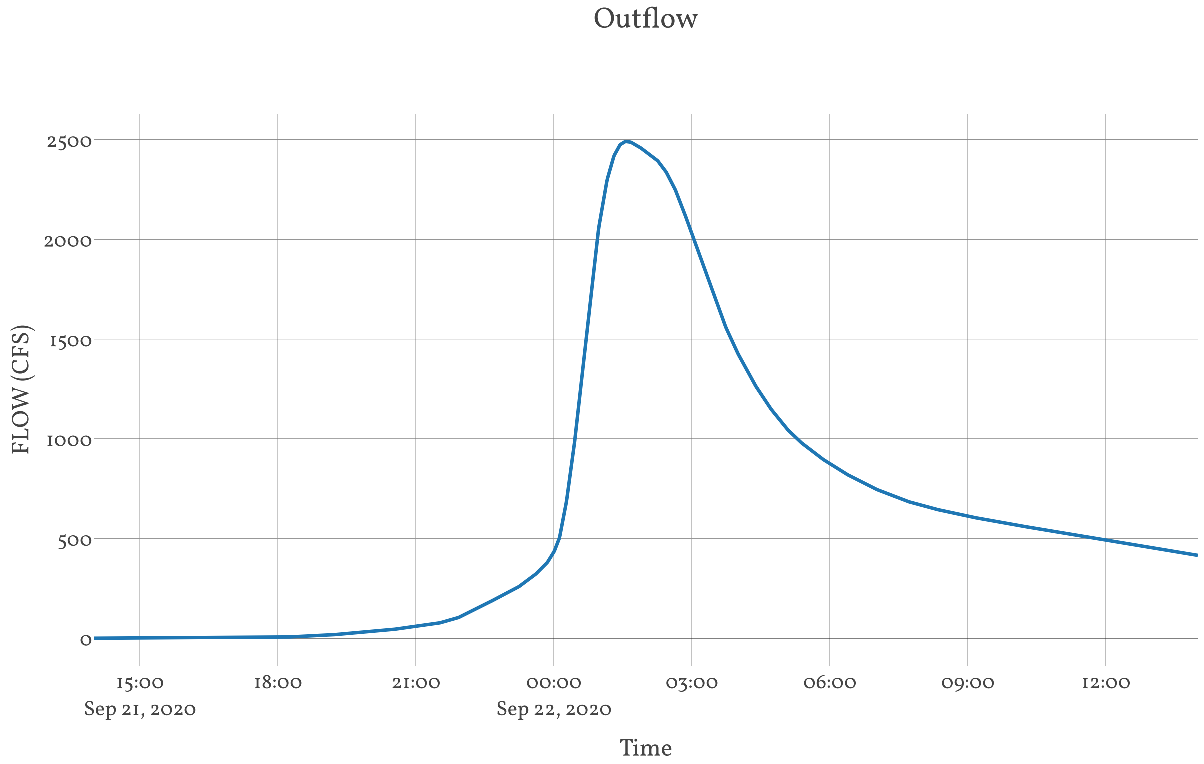
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	2490.9
Time of Peak Discharge	22Sep2020, 01:35
Volume (IN)	5.09
Peak Inflow (CFS)	2655.4
Inflow Volume (AC - FT)	1287.19



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

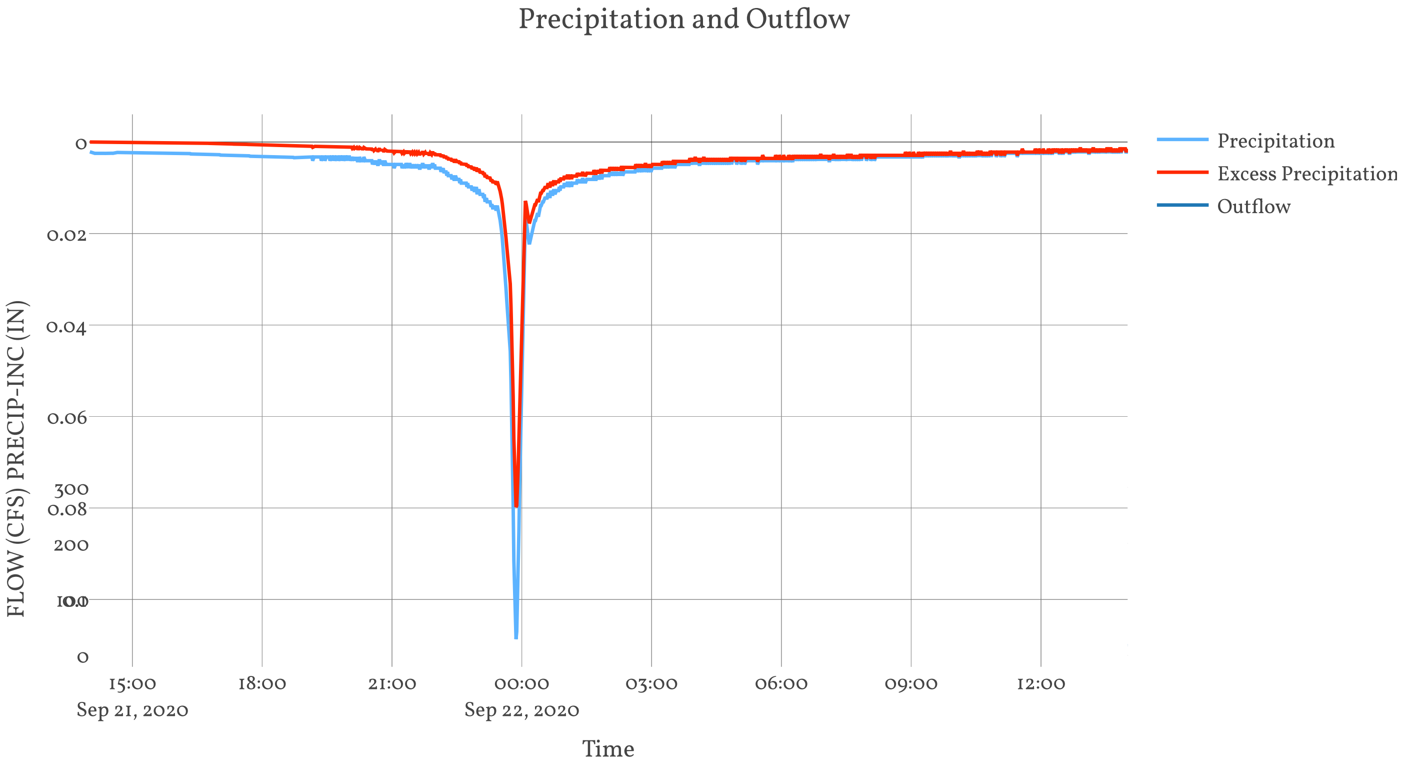
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	365.55
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	5.48
Precipitation Volume (AC - FT)	111.11
Loss Volume (AC - FT)	36
Excess Volume (AC - FT)	75.11
Direct Runoff Volume (AC - FT)	74.46
Baseflow Volume (AC - FT)	0

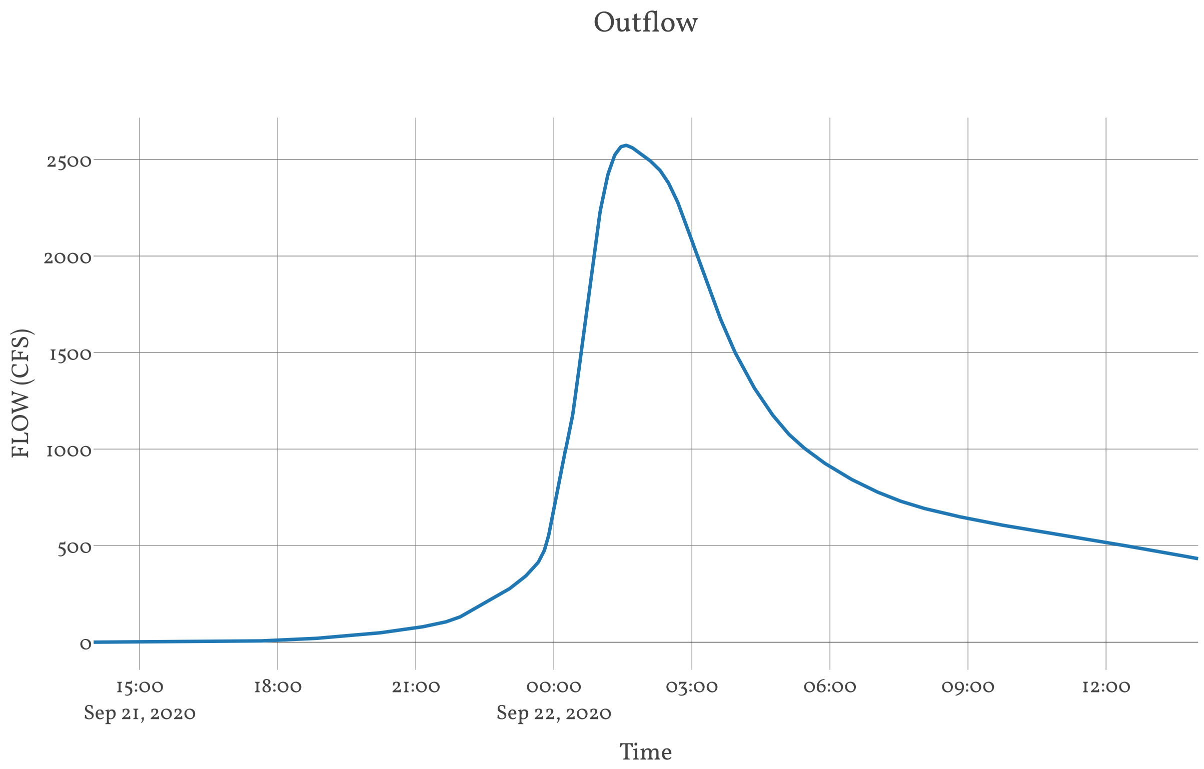

Precipitation and Outflow
0
0.02
0.04
0.06
300
0.08
200
100
0.1
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

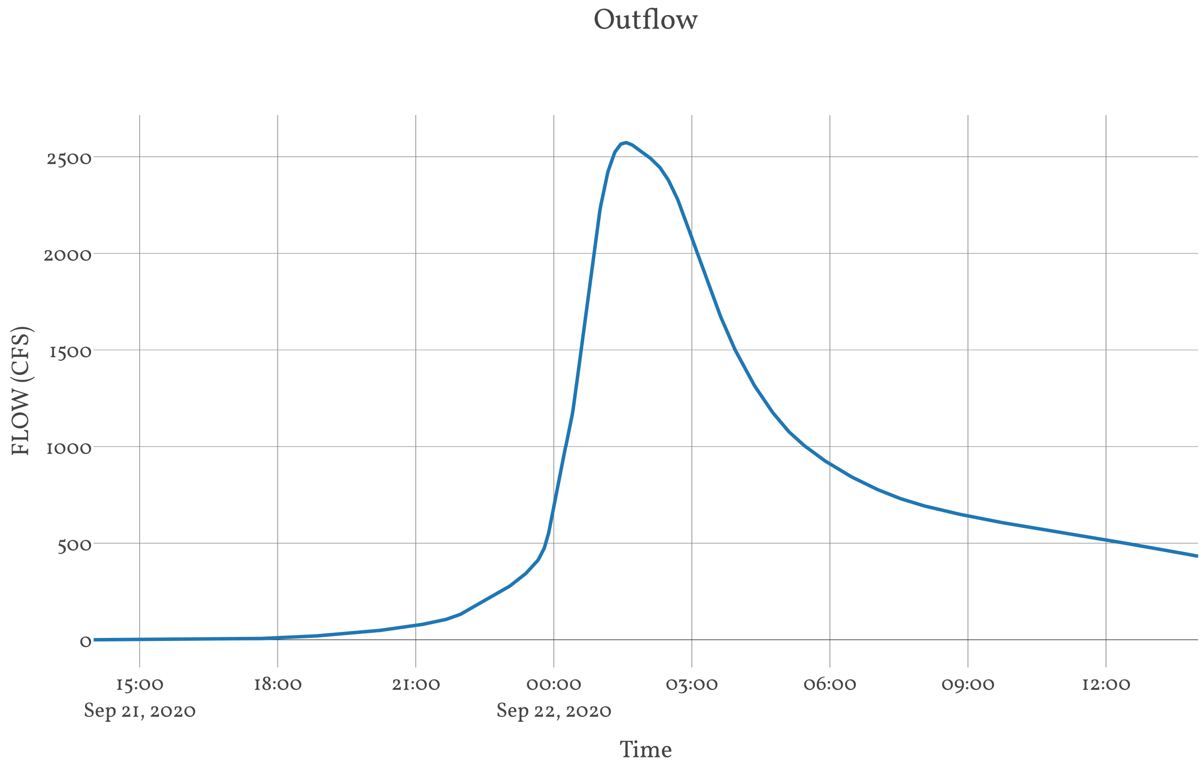
Peak Discharge (CFS)	2573.16
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	5.11



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	2573.16
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	5.11
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 100-mp-Post Fire
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:04

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	780.97	22Sep2020, 00:24	6.53
61b	0.61	896.67	22Sep2020, 00:14	6.56
J 60b 61b	1.25	1633.26	22Sep2020, 00:18	6.54
18r	1.25	1438.27	22Sep2020, 00:56	6.33
62b	0.53	952.41	22Sep2020, 00:08	6.48
17c	1.78	1753.66	22Sep2020, 00:52	6.37
17r	1.78	1634.93	22Sep2020, 01:18	6.22
63b	0.6	833.58	22Sep2020, 00:17	6.51
16c	2.38	1981.11	22Sep2020, 01:14	6.3
16r	2.38	1949.71	22Sep2020, 01:33	6.19
64b	1.09	1492.76	22Sep2020, 00:17	6.53
20c	3.47	2556.55	22Sep2020, 00:45	6.3
20r	3.47	2544.52	22Sep2020, 00:57	6.23
65b	0.53	996.31	22Sep2020, 00:07	6.53
15c	4	2859.17	22Sep2020, 00:51	6.27
15r	4	2853.59	22Sep2020, 00:59	6.22
66b	0.16	387.56	22Sep2020, 00:02	6.5
14c	4.16	2920.92	22Sep2020, 00:58	6.23
14r	4.16	2919.54	22Sep2020, 01:02	6.21
67b	0.43	562.44	22Sep2020, 00:19	6.42
13c	4.59	3247.98	22Sep2020, 00:53	6.23
13r	4.59	3059.42	22Sep2020, 01:31	6.05
68b	0.26	434.38	22Sep2020, 00:09	6.47

12c	4.85	3159.83	22Sep2020, 01:29	6.07
Pacific Ocean	4.85	3159.83	22Sep2020, 01:29	6.07

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

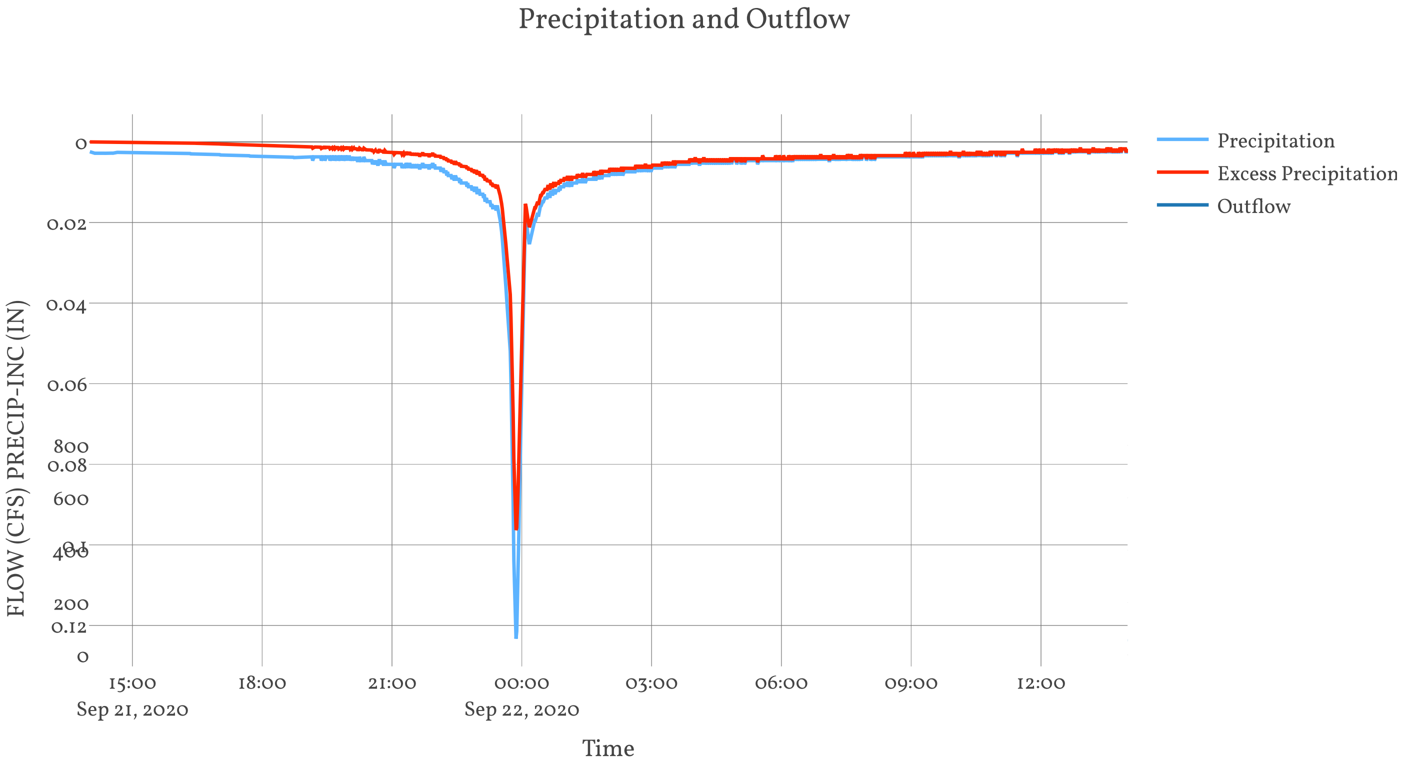
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	780.97
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	6.53
Precipitation Volume (AC - FT)	318.89
Loss Volume (AC - FT)	90.73
Excess Volume (AC - FT)	228.16
Direct Runoff Volume (AC - FT)	224.48
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

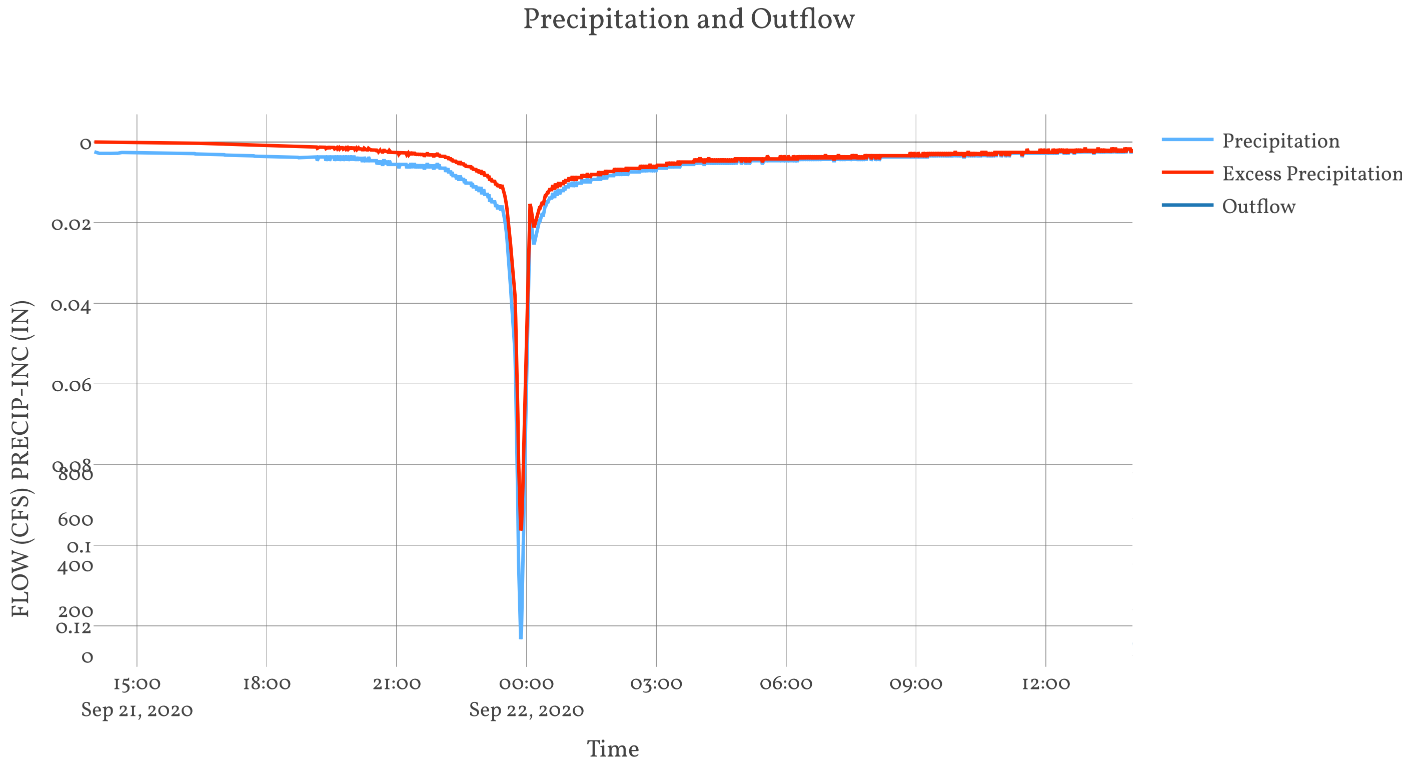
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	896.67
Time of Peak Discharge	22Sep2020, 00:14
Volume (IN)	6.56
Precipitation Volume (AC - FT)	299.61
Loss Volume (AC - FT)	85.24
Excess Volume (AC - FT)	214.36
Direct Runoff Volume (AC - FT)	211.97
Baseflow Volume (AC - FT)	0

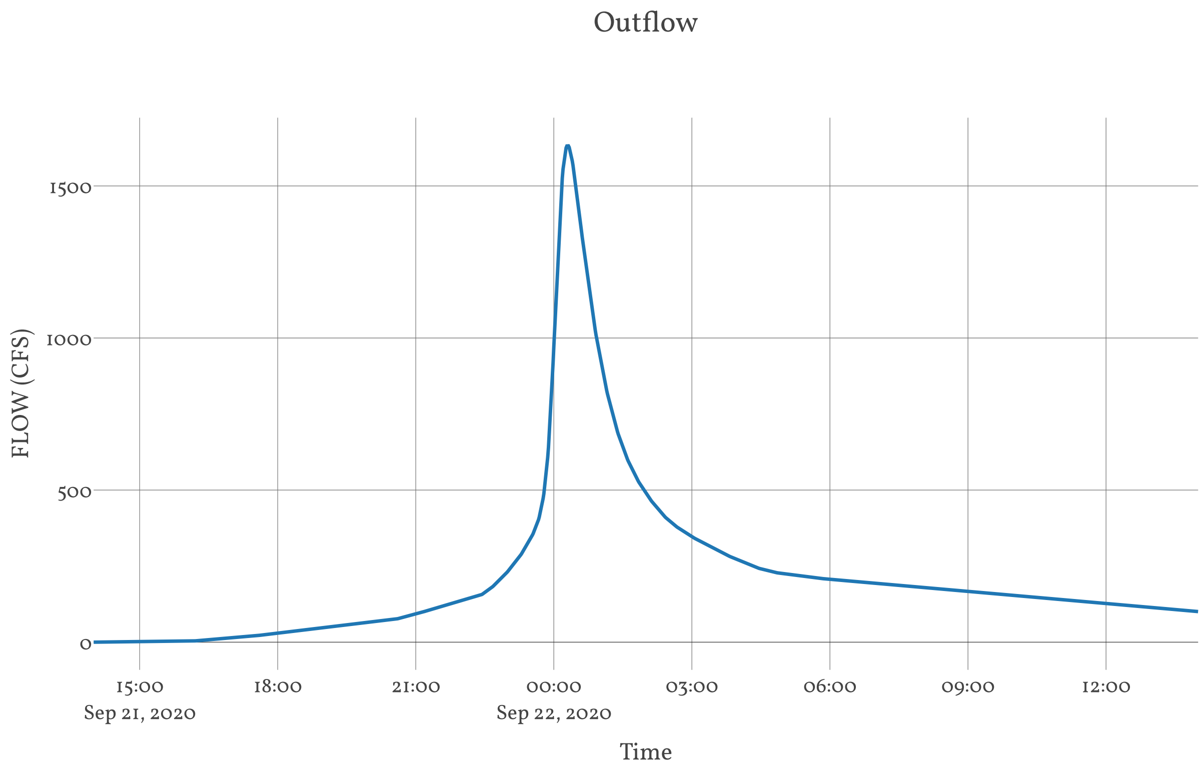

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
0.12
800
600
400
200
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1633.26
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	6.54



Reach: 18R

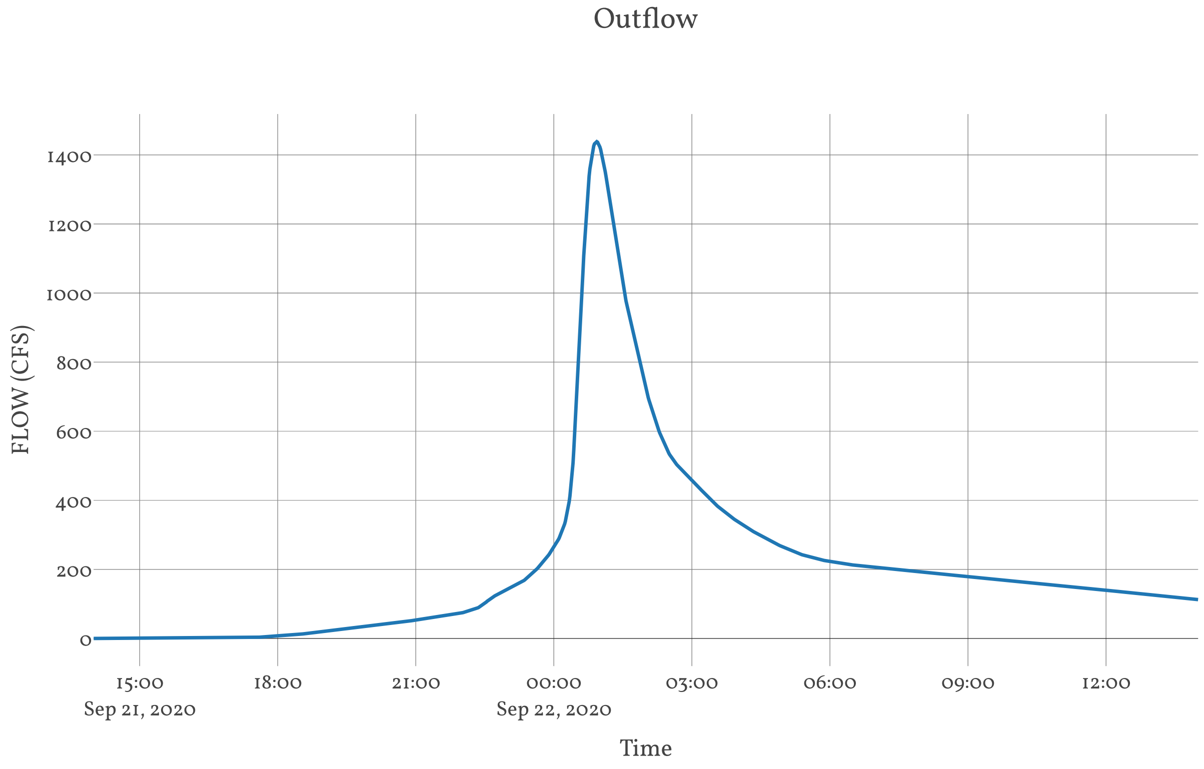
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	1438.27
Time of Peak Discharge	22Sep2020, 00:56
Volume (IN)	6.33
Peak Inflow (CFS)	1633.26
Inflow Volume (AC - FT)	436.45



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

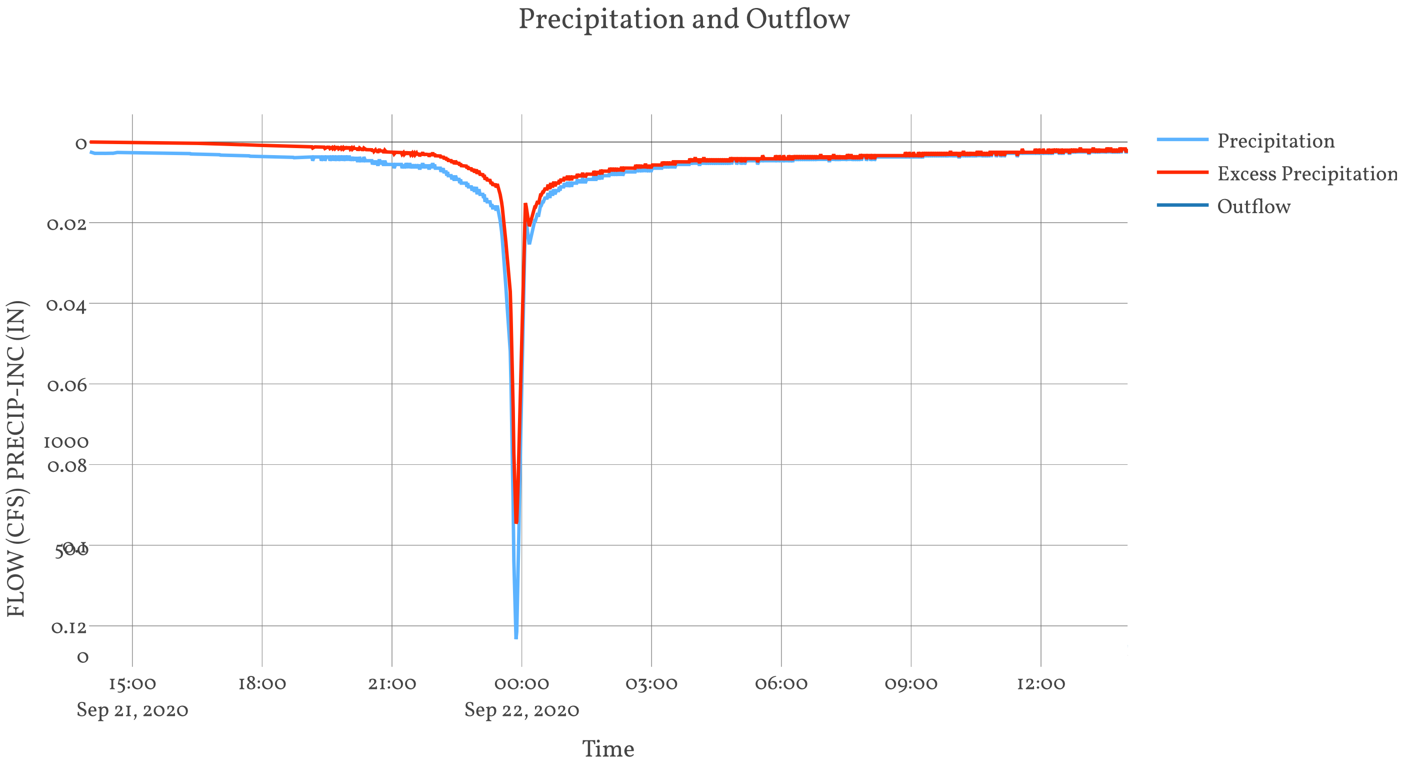
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	952.41
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	6.48
Precipitation Volume (AC - FT)	259.86
Loss Volume (AC - FT)	76.86
Excess Volume (AC - FT)	182.99
Direct Runoff Volume (AC - FT)	181.63
Baseflow Volume (AC - FT)	0

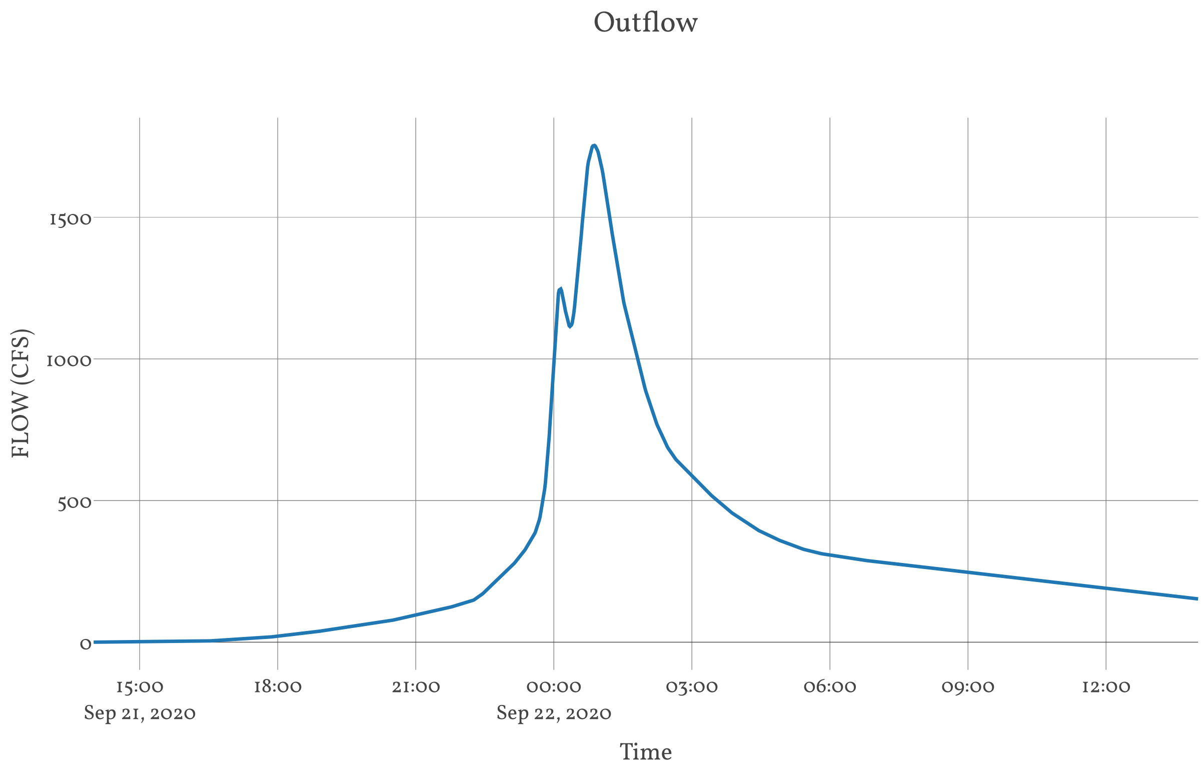

Precipitation and Outflow
0
0.02
0.04
0.06
1000
0.08
500
0.1
0.12
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	1753.66
Time of Peak Discharge	22Sep2020, 00:52
Volume (IN)	6.37



Reach: 17R

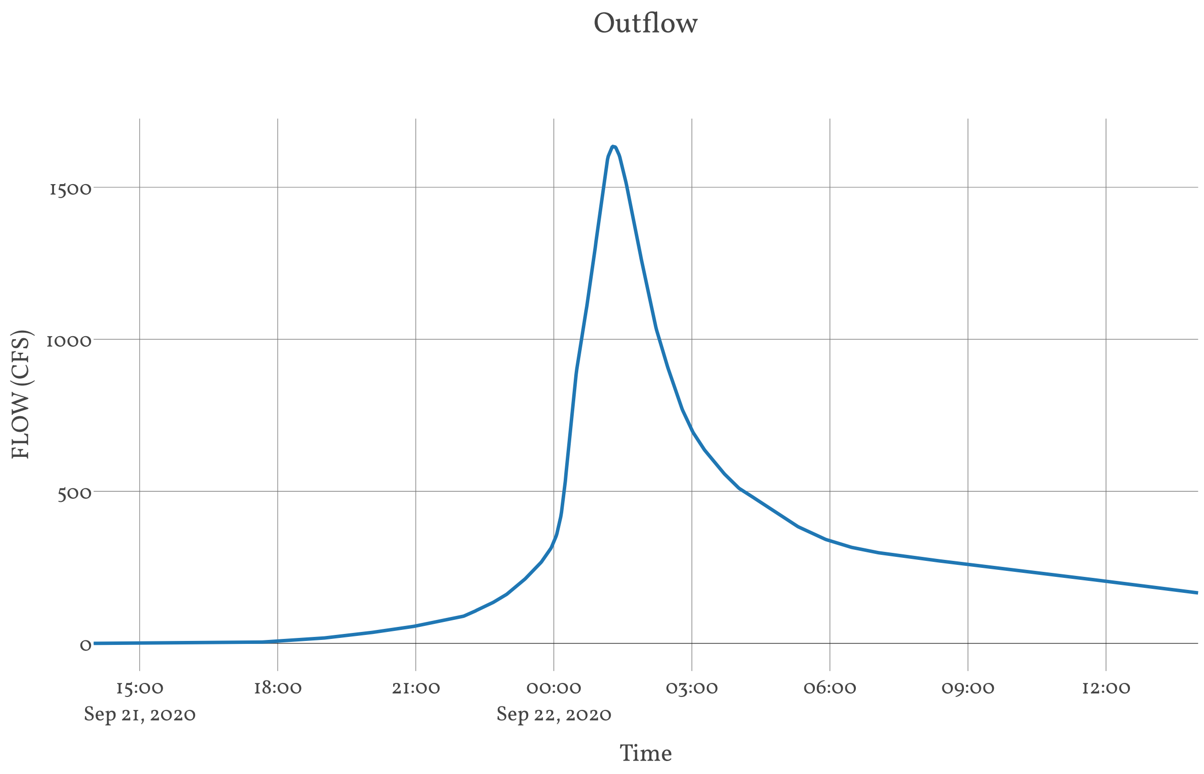
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1634.93
Time of Peak Discharge	22Sep2020, 01:18
Volume (IN)	6.22
Peak Inflow (CFS)	1753.66
Inflow Volume (AC - FT)	604.01



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

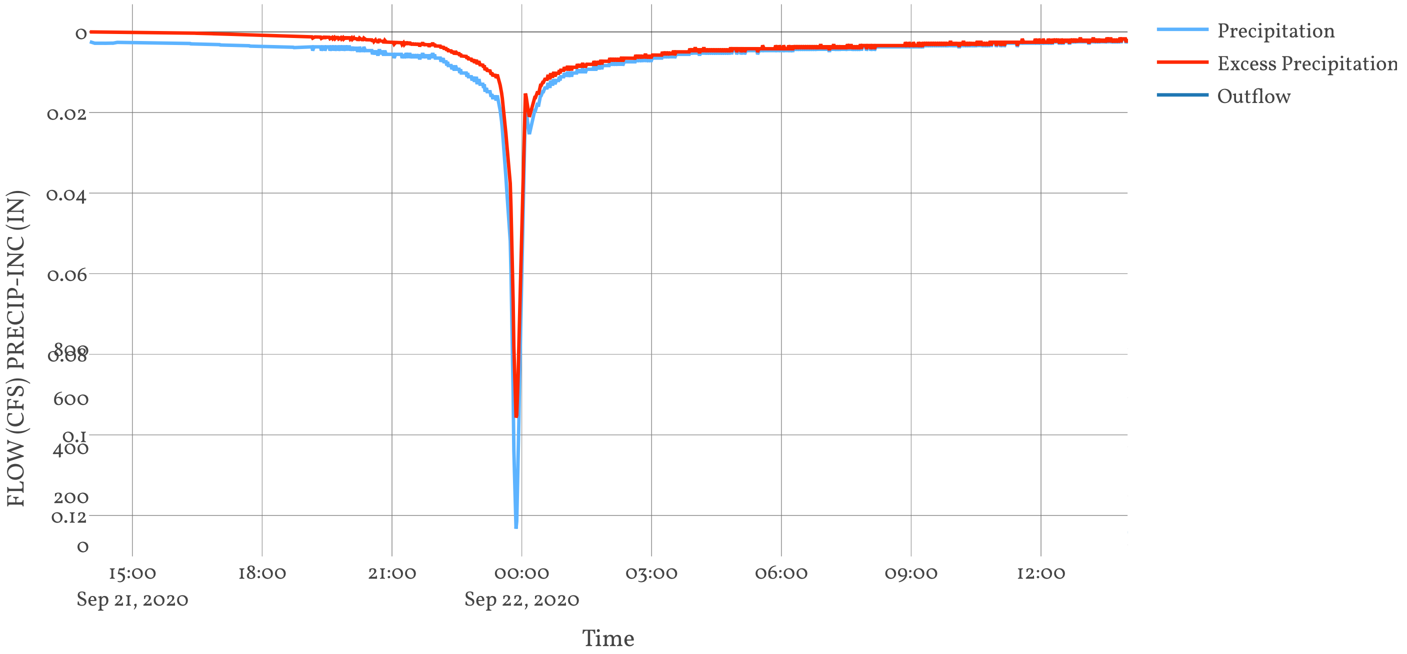
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	833.58
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	6.51
Precipitation Volume (AC - FT)	297.63
Loss Volume (AC - FT)	85.9
Excess Volume (AC - FT)	211.73
Direct Runoff Volume (AC - FT)	209.08
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

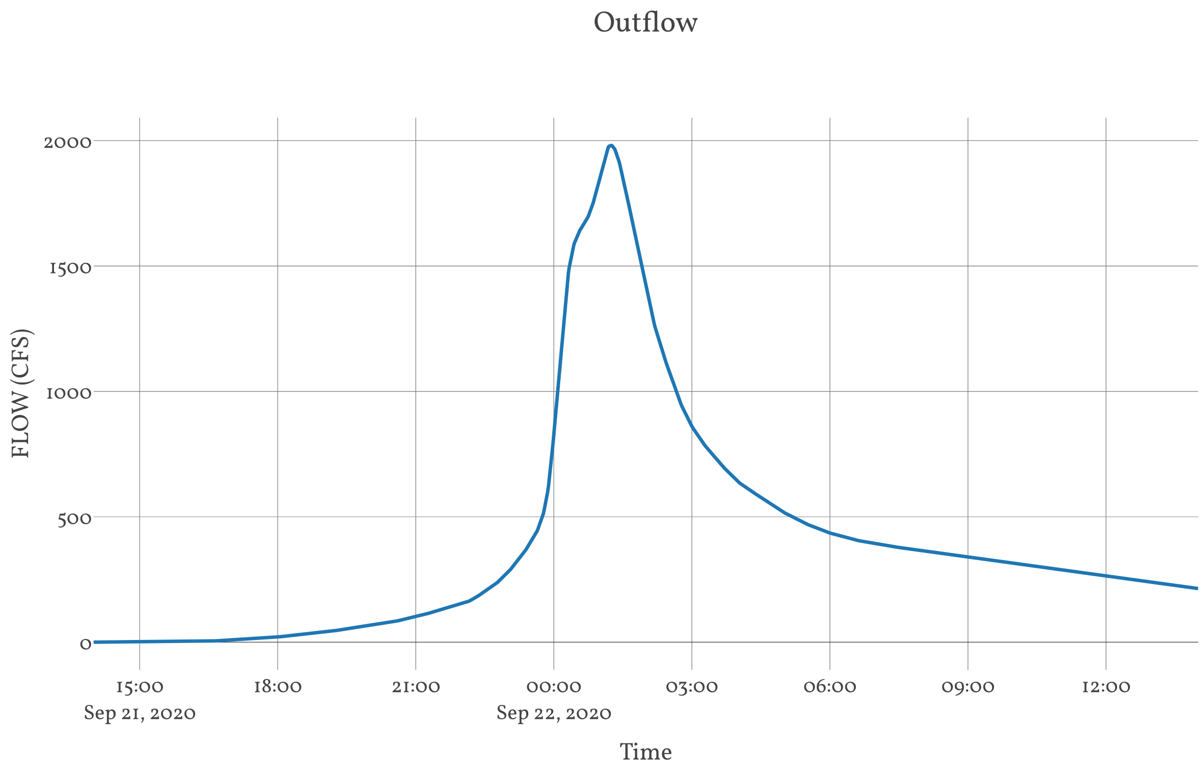


Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1981.11
Time of Peak Discharge	22Sep2020, 01:14
Volume (IN)	6.3



Reach: 16R

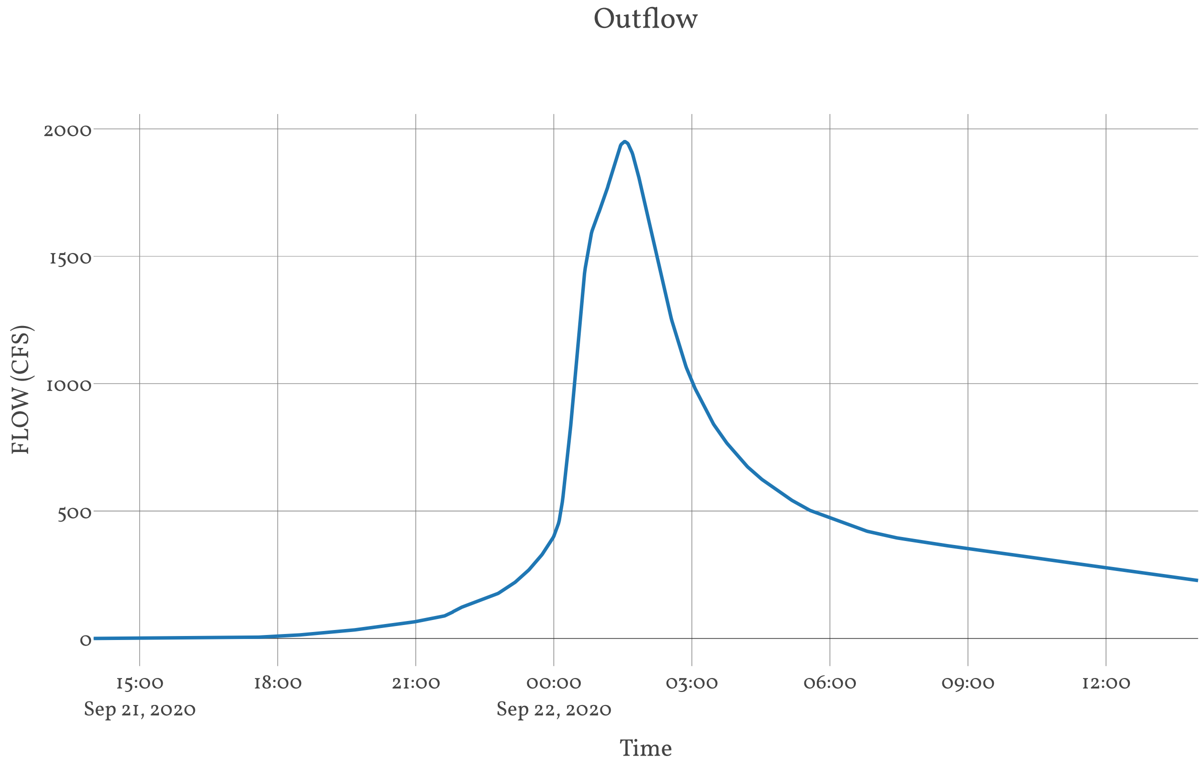
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1949.71
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	6.19
Peak Inflow (CFS)	1981.11
Inflow Volume (AC - FT)	798.7



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

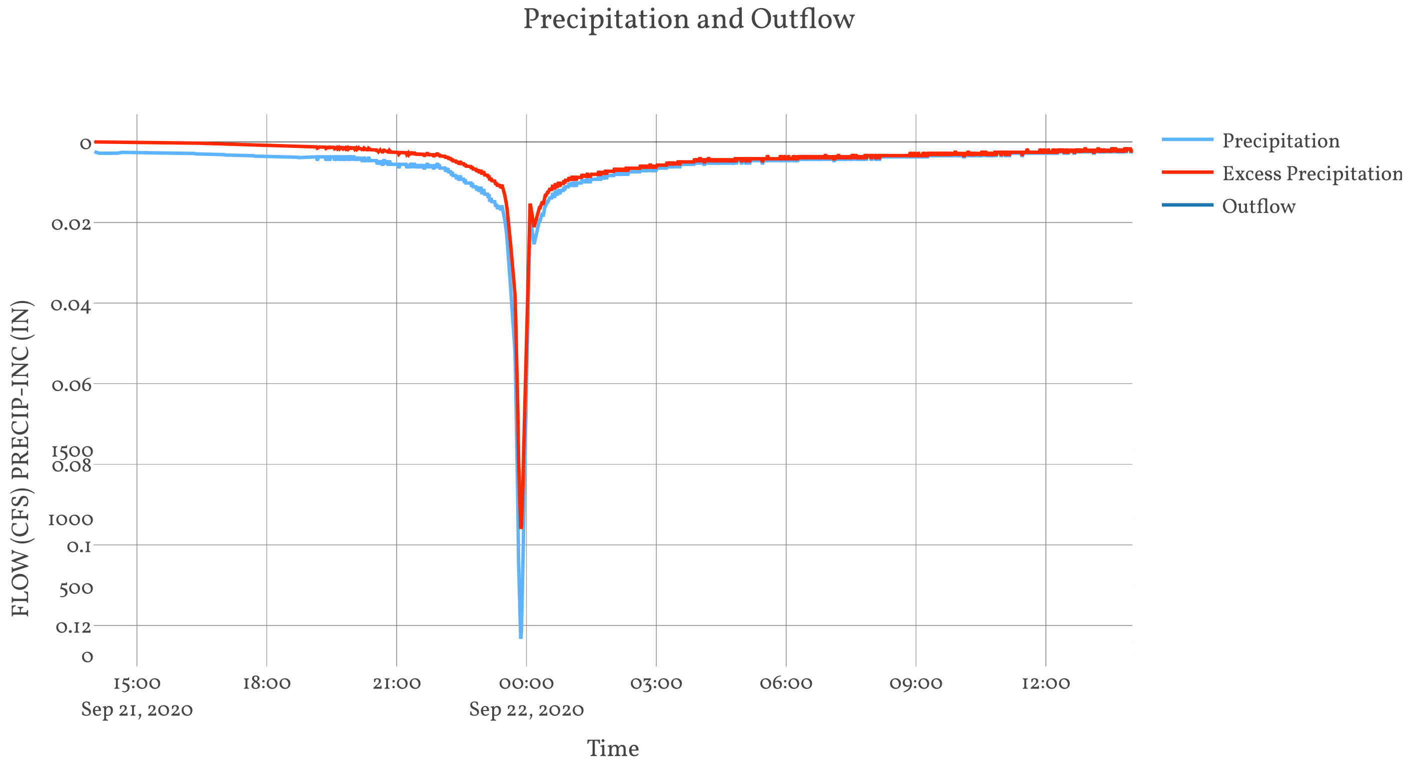
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1492.76
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	6.53
Precipitation Volume (AC - FT)	538.9
Loss Volume (AC - FT)	154.43
Excess Volume (AC - FT)	384.46
Direct Runoff Volume (AC - FT)	379.54
Baseflow Volume (AC - FT)	0

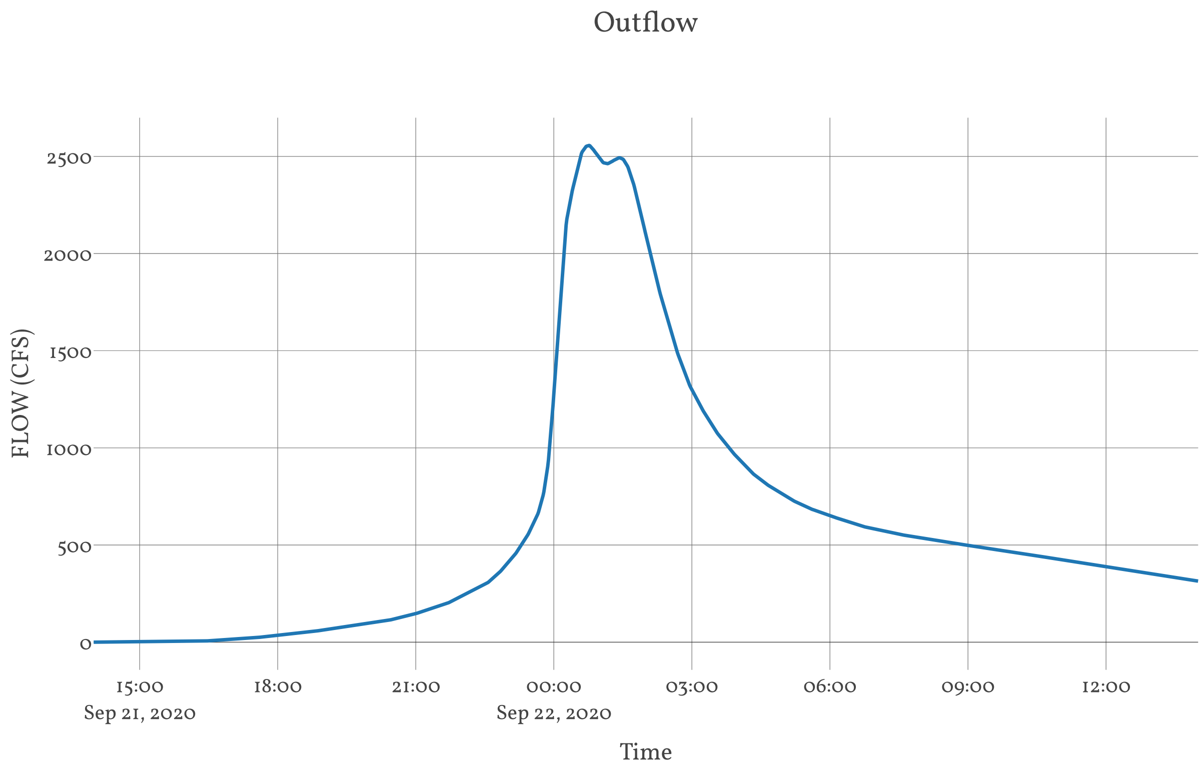

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
1500
1000
500
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	2556.55
Time of Peak Discharge	22Sep2020, 00:45
Volume (IN)	6.3



Reach: 20R

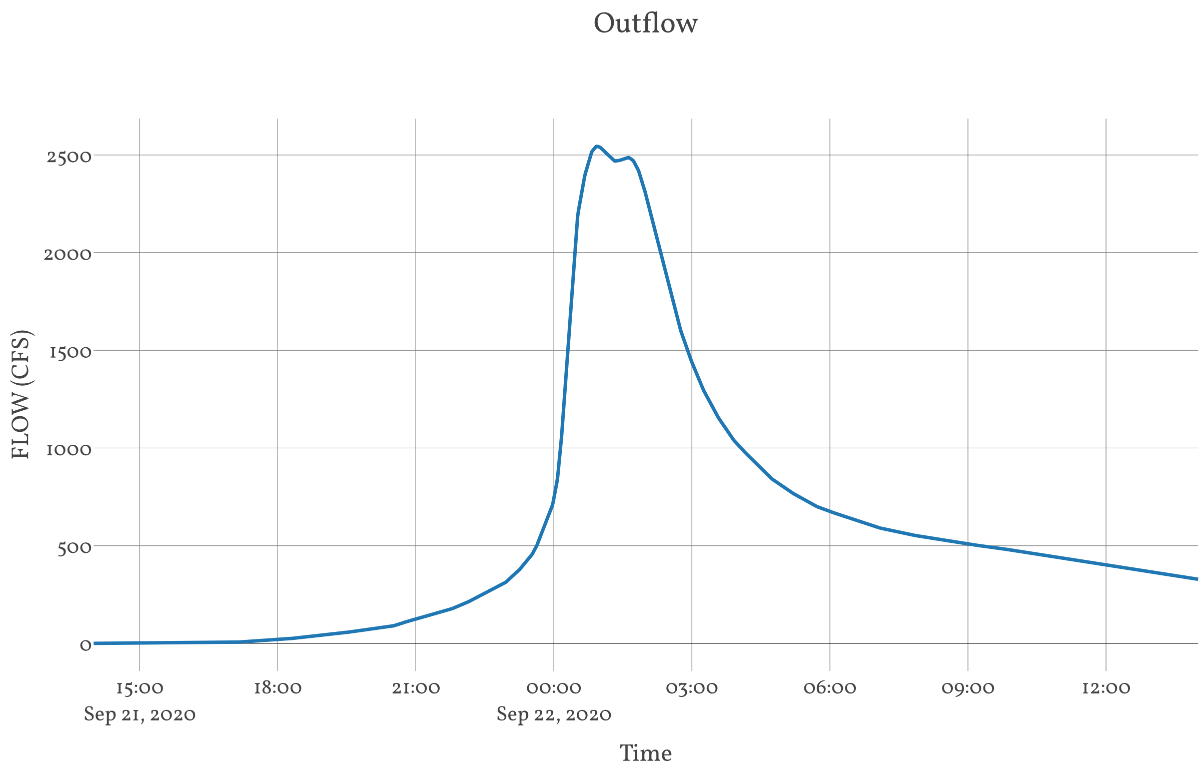
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	2544.52
Time of Peak Discharge	22Sep2020, 00:57
Volume (IN)	6.23
Peak Inflow (CFS)	2556.55
Inflow Volume (AC - FT)	1164.63



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

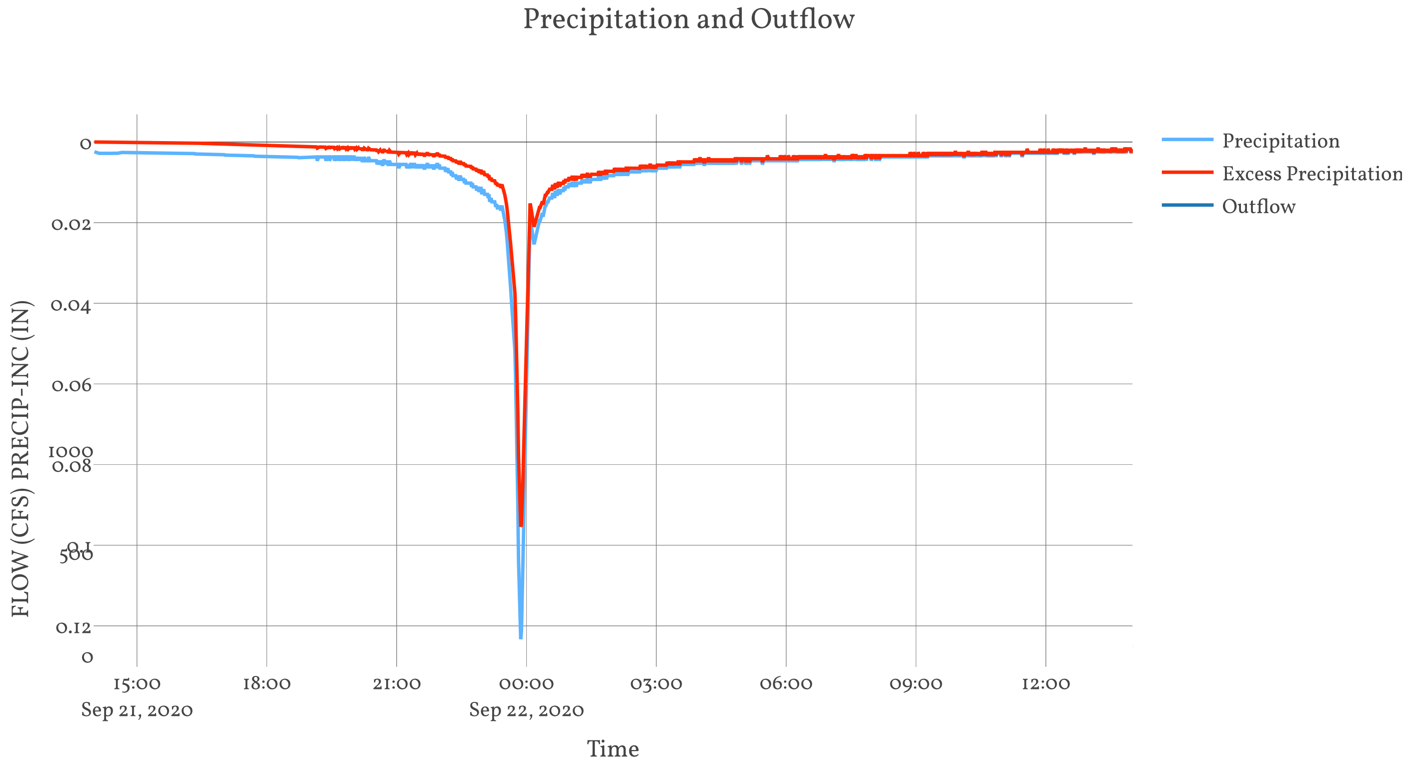
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	996.31
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	6.53
Precipitation Volume (AC - FT)	263.52
Loss Volume (AC - FT)	76.6
Excess Volume (AC - FT)	186.92
Direct Runoff Volume (AC - FT)	185.59
Baseflow Volume (AC - FT)	0

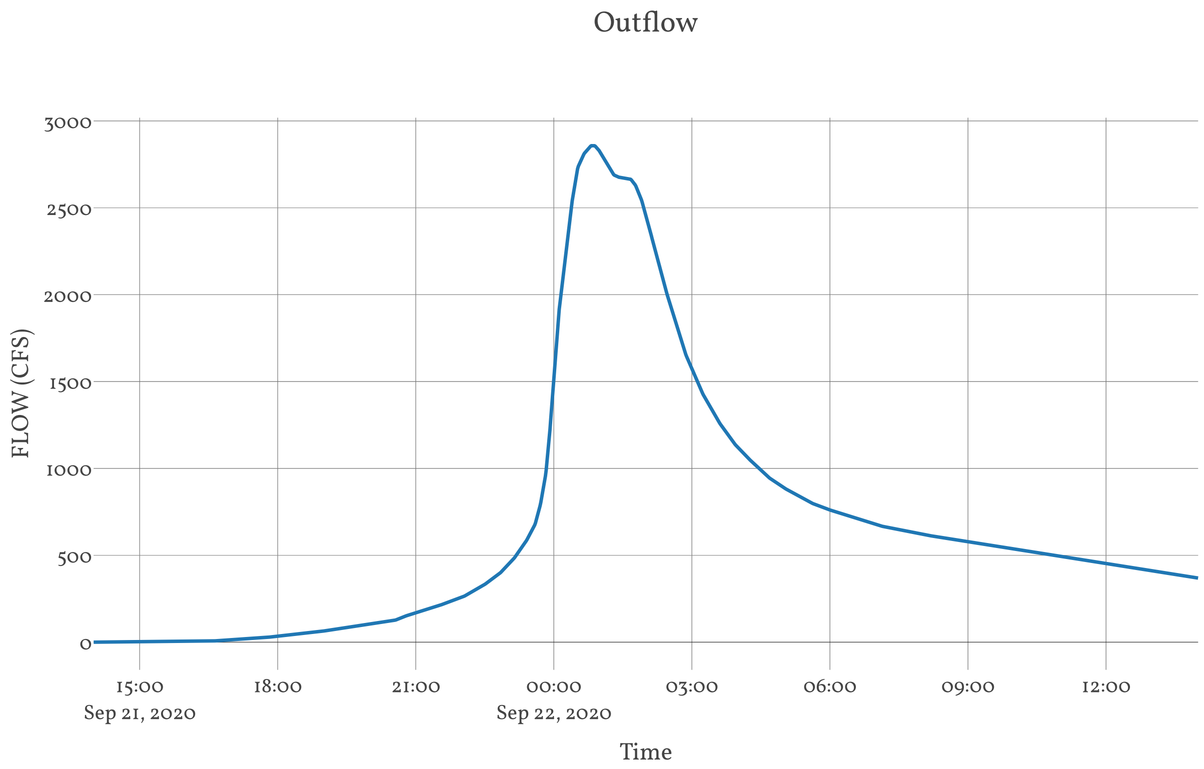

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
1000
0.08
0.1
500
0.12
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	2859.17
Time of Peak Discharge	22Sep2020, 00:51
Volume (IN)	6.27



Reach: 15R

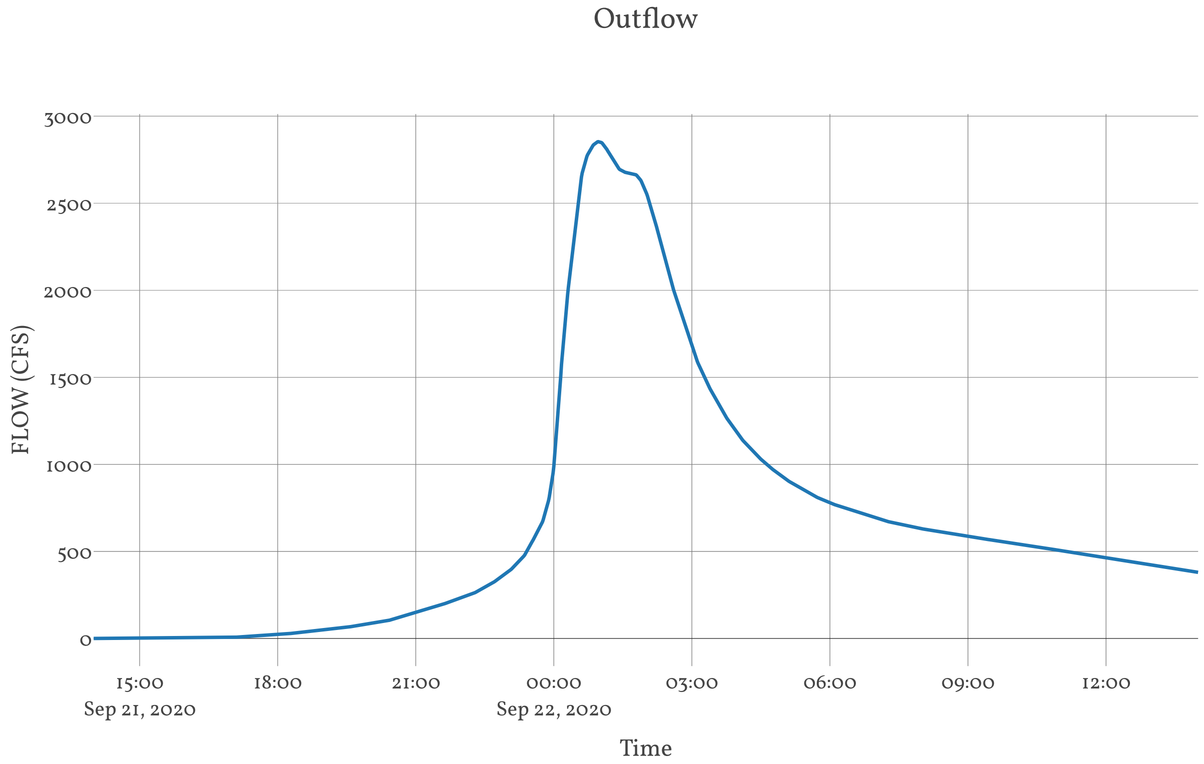
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	2853.59
Time of Peak Discharge	22Sep2020, 00:59
Volume (IN)	6.22
Peak Inflow (CFS)	2859.17
Inflow Volume (AC - FT)	1337.53



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

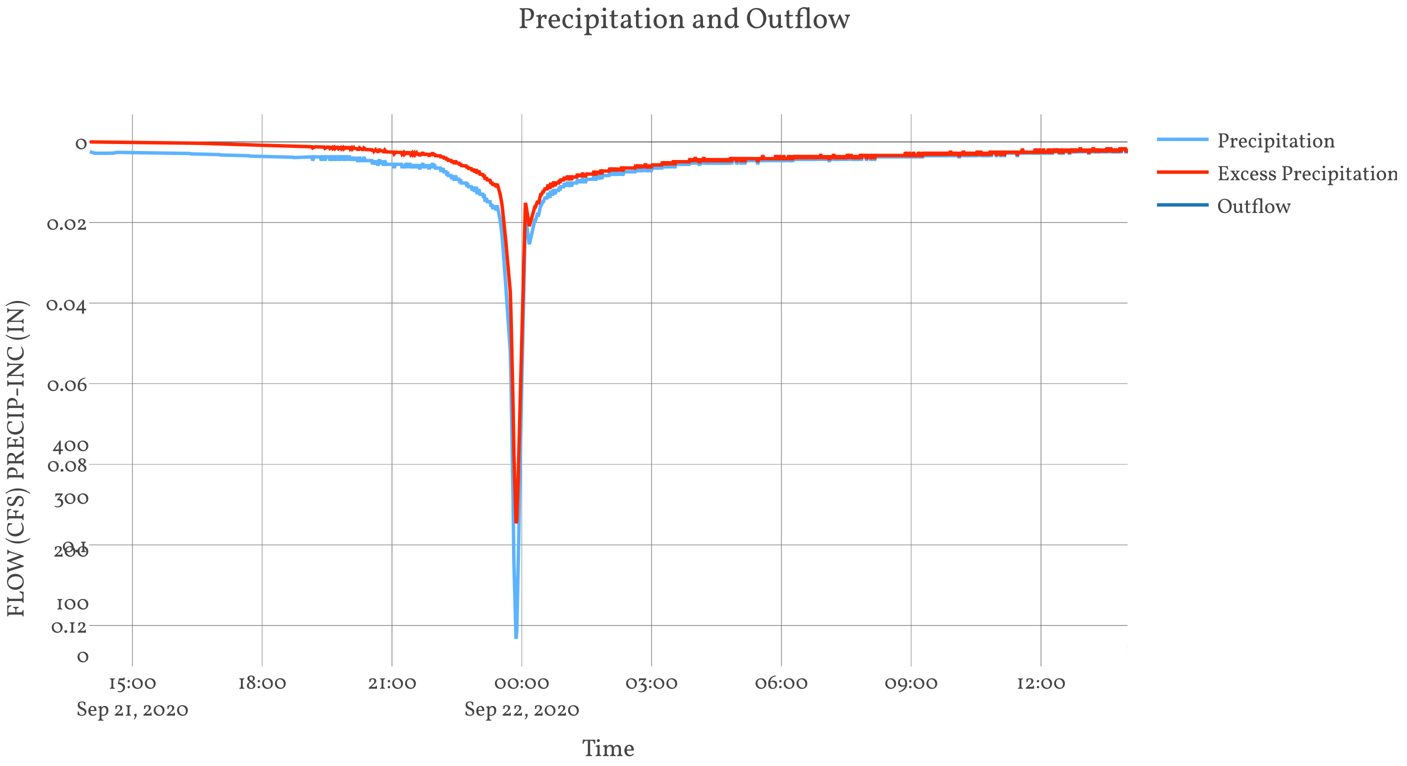
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	387.56
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	6.5
Precipitation Volume (AC - FT)	80.09
Loss Volume (AC - FT)	23.69
Excess Volume (AC - FT)	56.4
Direct Runoff Volume (AC - FT)	56.17
Baseflow Volume (AC - FT)	0

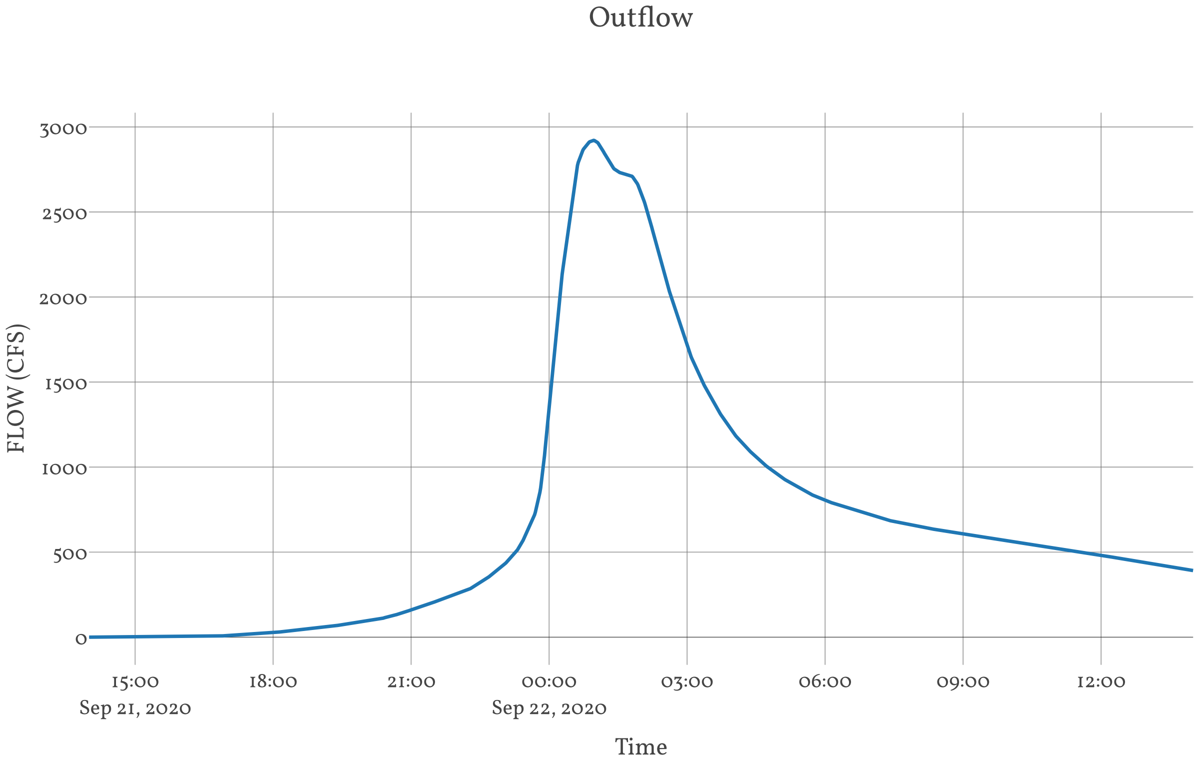

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	2920.92
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	6.23



Reach: 14R

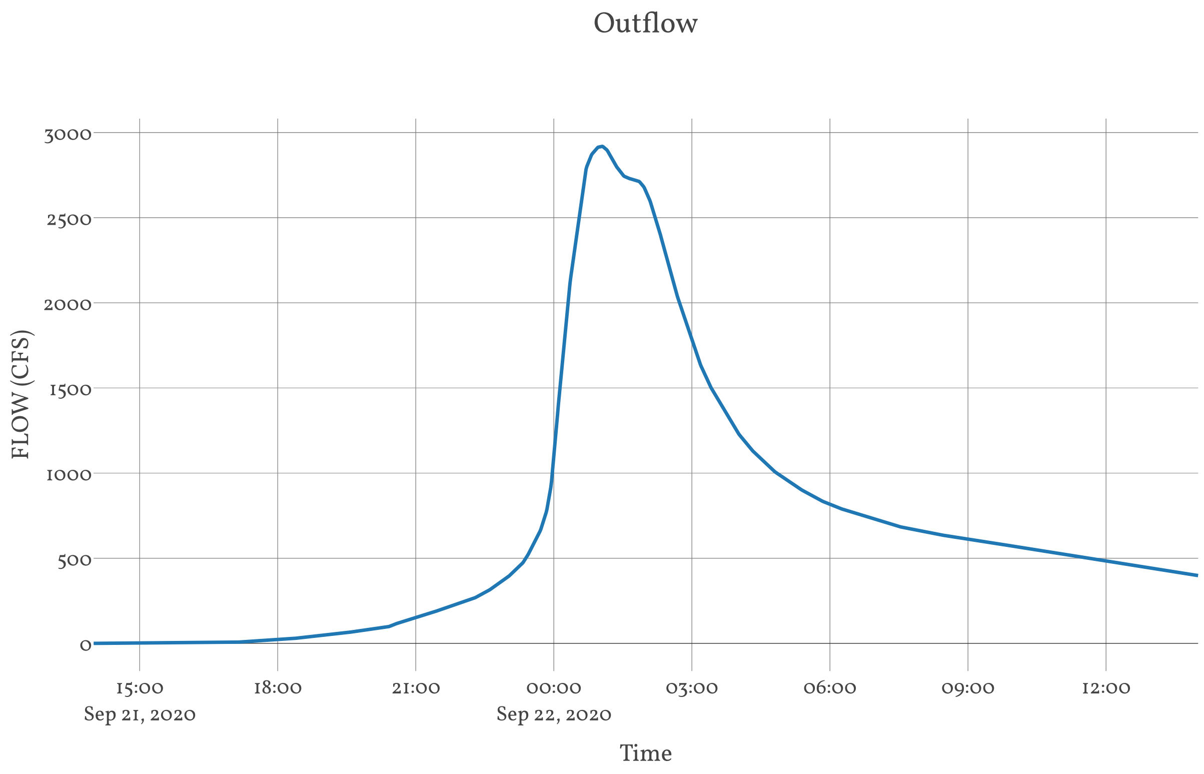
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	2919.54
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	6.21
Peak Inflow (CFS)	2920.92
Inflow Volume (AC - FT)	1383.9



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

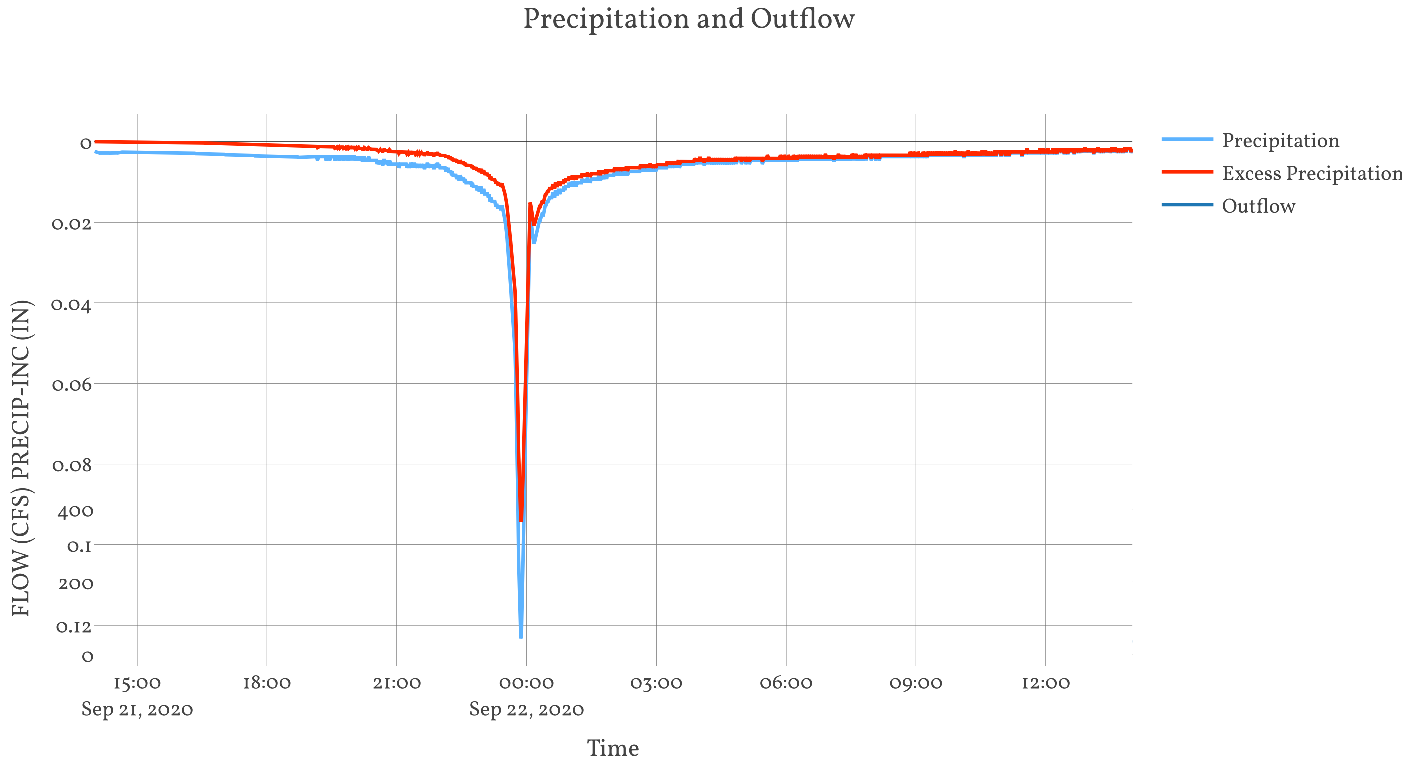
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	562.44
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	6.42
Precipitation Volume (AC - FT)	212.59
Loss Volume (AC - FT)	63.32
Excess Volume (AC - FT)	149.27
Direct Runoff Volume (AC - FT)	147.24
Baseflow Volume (AC - FT)	0

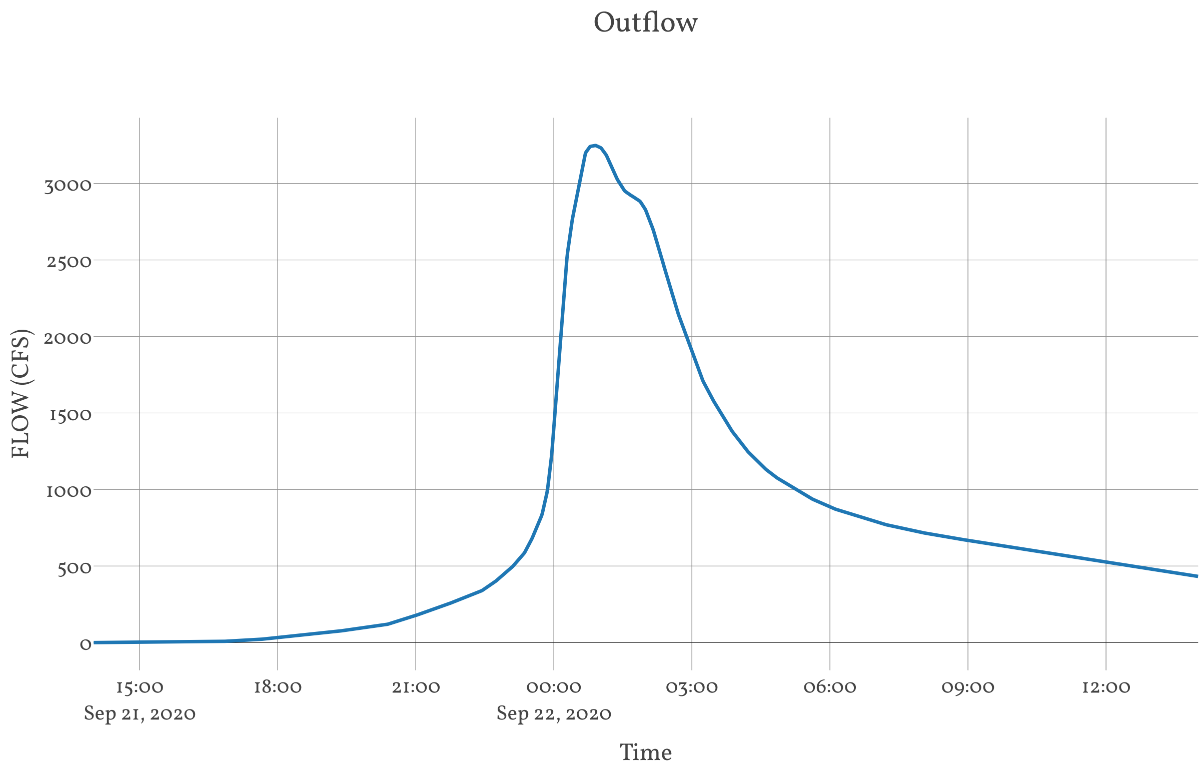

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
400
0.1
200
0.12
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	3247.98
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	6.23



Reach: 13R

Downstream : 12c

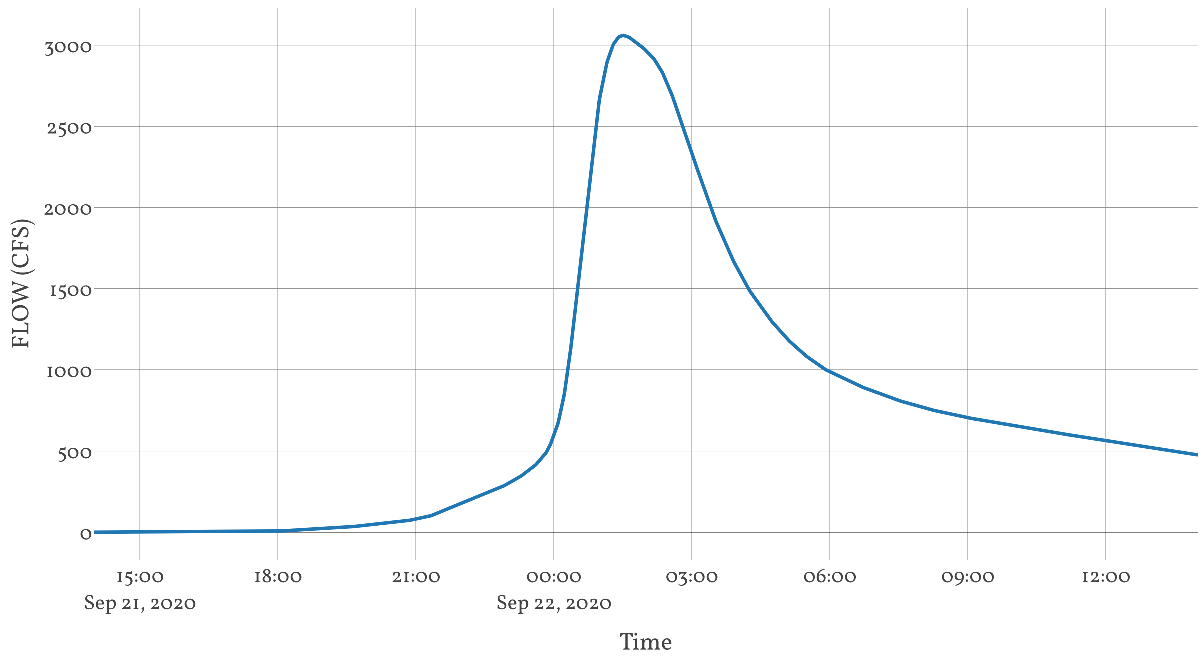
Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	3059.42
Time of Peak Discharge	22Sep2020, 01:31
Volume (IN)	6.05
Peak Inflow (CFS)	3247.98
Inflow Volume (AC - FT)	1525.57

Outflow



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

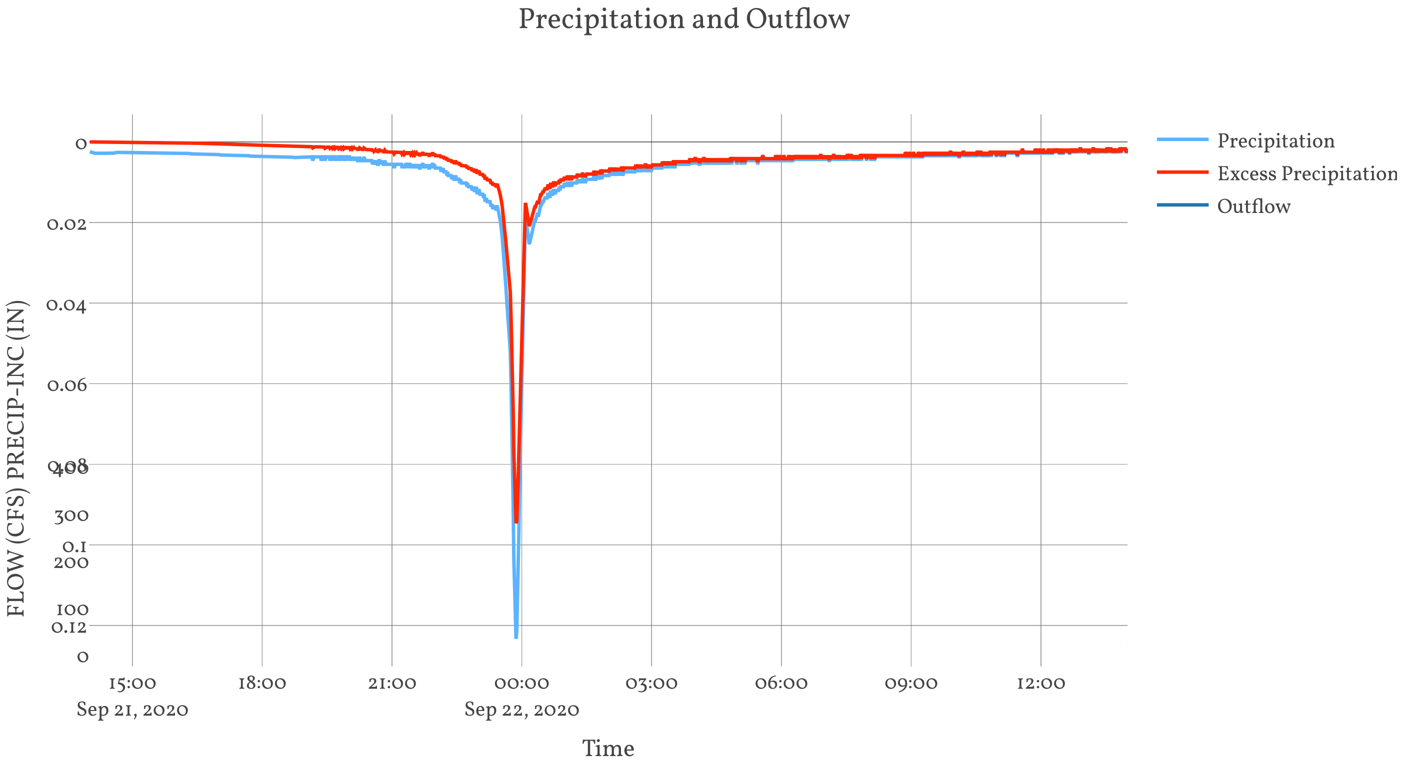
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	434.38
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	6.47
Precipitation Volume (AC - FT)	126.07
Loss Volume (AC - FT)	37.29
Excess Volume (AC - FT)	88.78
Direct Runoff Volume (AC - FT)	88.04
Baseflow Volume (AC - FT)	0

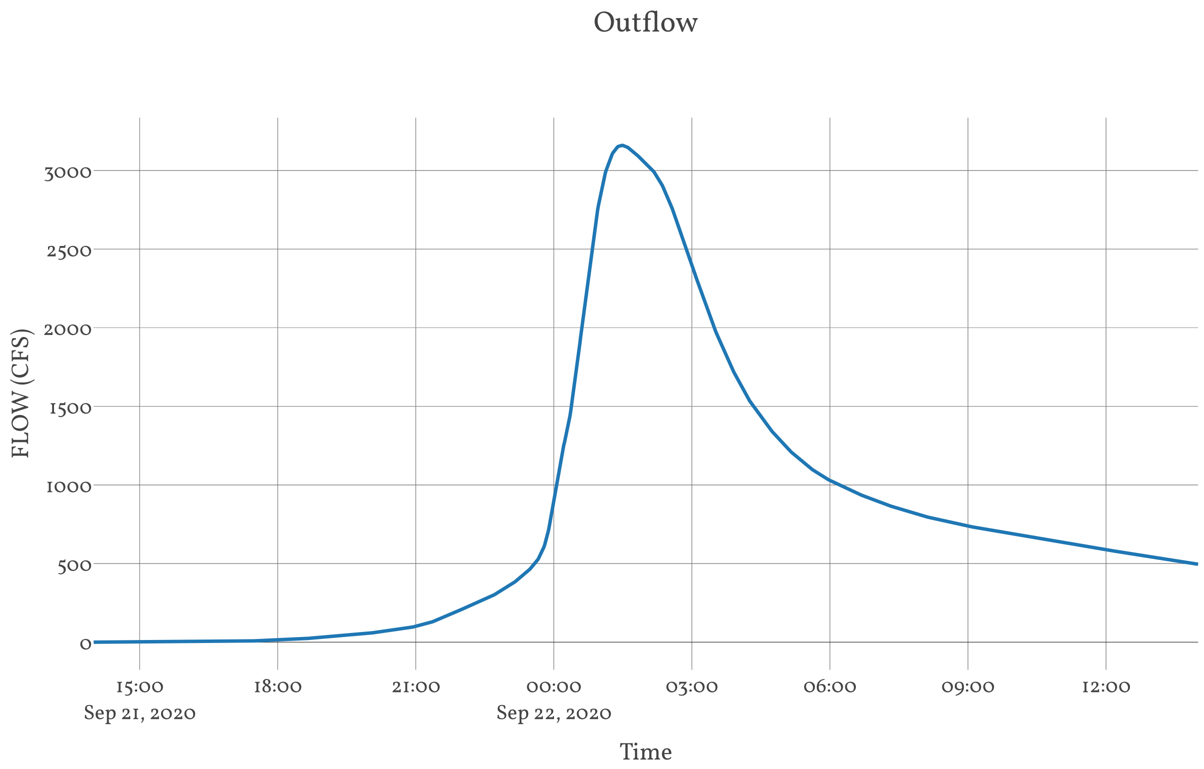

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

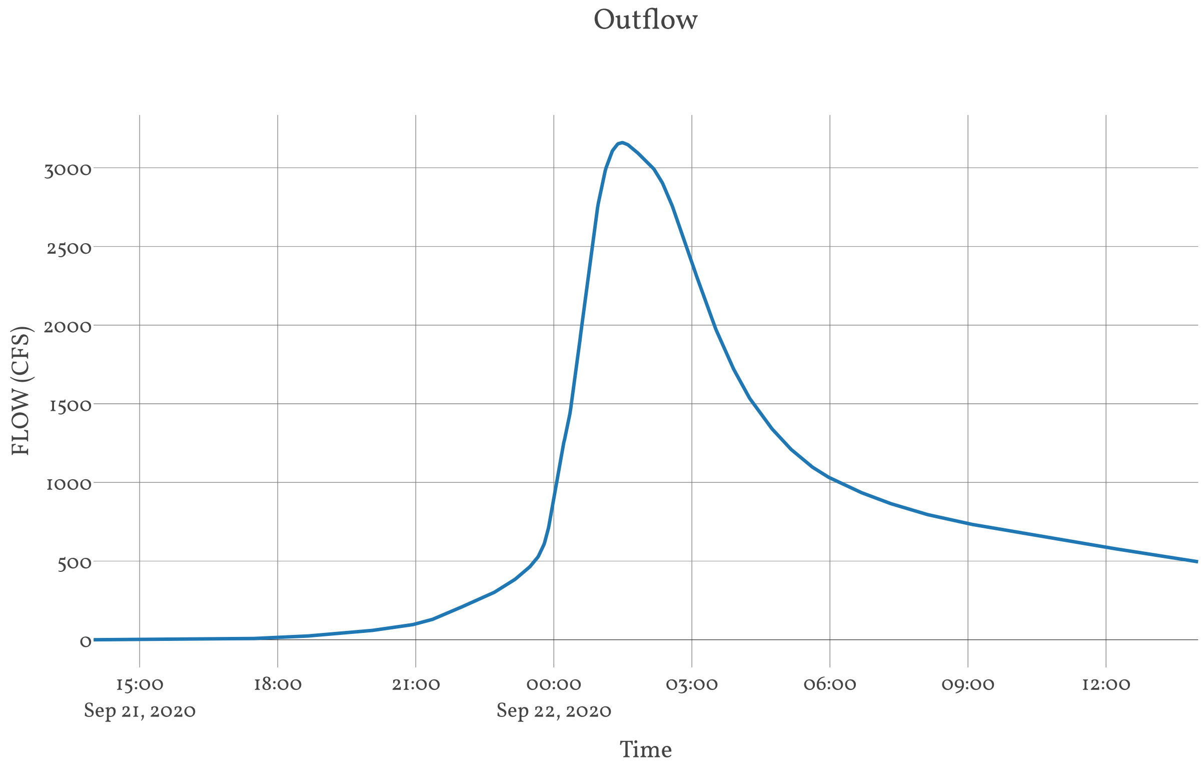
Peak Discharge (CFS)	3159.83
Time of Peak Discharge	22Sep2020, 01:29
Volume (IN)	6.07



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	3159.83
Time of Peak Discharge	22Sep2020, 01:29
Volume (IN)	6.07
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 002-yr Post-Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:40

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	188.07	22Sep2020, 00:25	1.68
61b	0.61	216.56	22Sep2020, 00:15	1.69
J 60b 61b	1.25	393.35	22Sep2020, 00:19	1.69
18r	1.25	314.24	22Sep2020, 01:20	1.62
62b	0.53	227.32	22Sep2020, 00:08	1.65
17c	1.78	373.3	22Sep2020, 01:17	1.63
17r	1.78	333.71	22Sep2020, 02:01	1.56
63b	0.6	199.83	22Sep2020, 00:18	1.67
16c	2.38	395.47	22Sep2020, 01:58	1.59
16r	2.38	386.19	22Sep2020, 02:30	1.54
64b	1.09	358.99	22Sep2020, 00:18	1.68
20c	3.47	483.09	22Sep2020, 02:25	1.58
20r	3.47	479.54	22Sep2020, 02:46	1.55
65b	0.53	239.37	22Sep2020, 00:07	1.68
15c	4	519.57	22Sep2020, 01:08	1.57
15r	4	518.2	22Sep2020, 01:19	1.55
66b	0.16	93.22	22Sep2020, 00:02	1.66
14c	4.16	533.79	22Sep2020, 01:19	1.55
14r	4.16	533.43	22Sep2020, 01:25	1.54
67b	0.43	132.97	22Sep2020, 00:20	1.63
13c	4.59	595.2	22Sep2020, 01:16	1.55
13r	4.59	552.12	22Sep2020, 03:24	1.47
68b	0.26	103.68	22Sep2020, 00:10	1.65

12c	4.85	568.99	22Sep2020, 03:22	1.48
Pacific Ocean	4.85	568.99	22Sep2020, 03:22	1.48

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

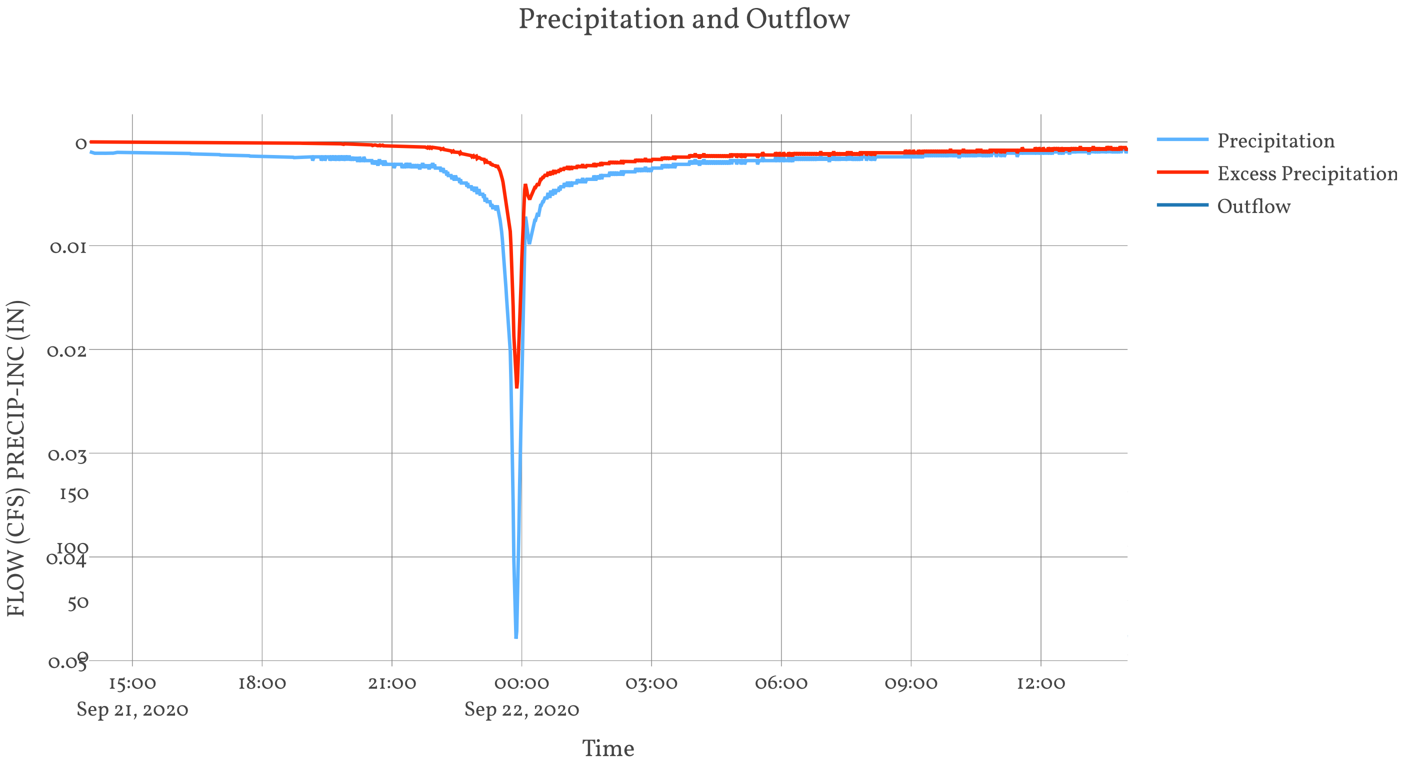
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	188.07
Time of Peak Discharge	22Sep2020, 00:25
Volume (IN)	1.68
Precipitation Volume (AC - FT)	123.84
Loss Volume (AC - FT)	64.78
Excess Volume (AC - FT)	59.06
Direct Runoff Volume (AC - FT)	57.9
Baseflow Volume (AC - FT)	0



Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

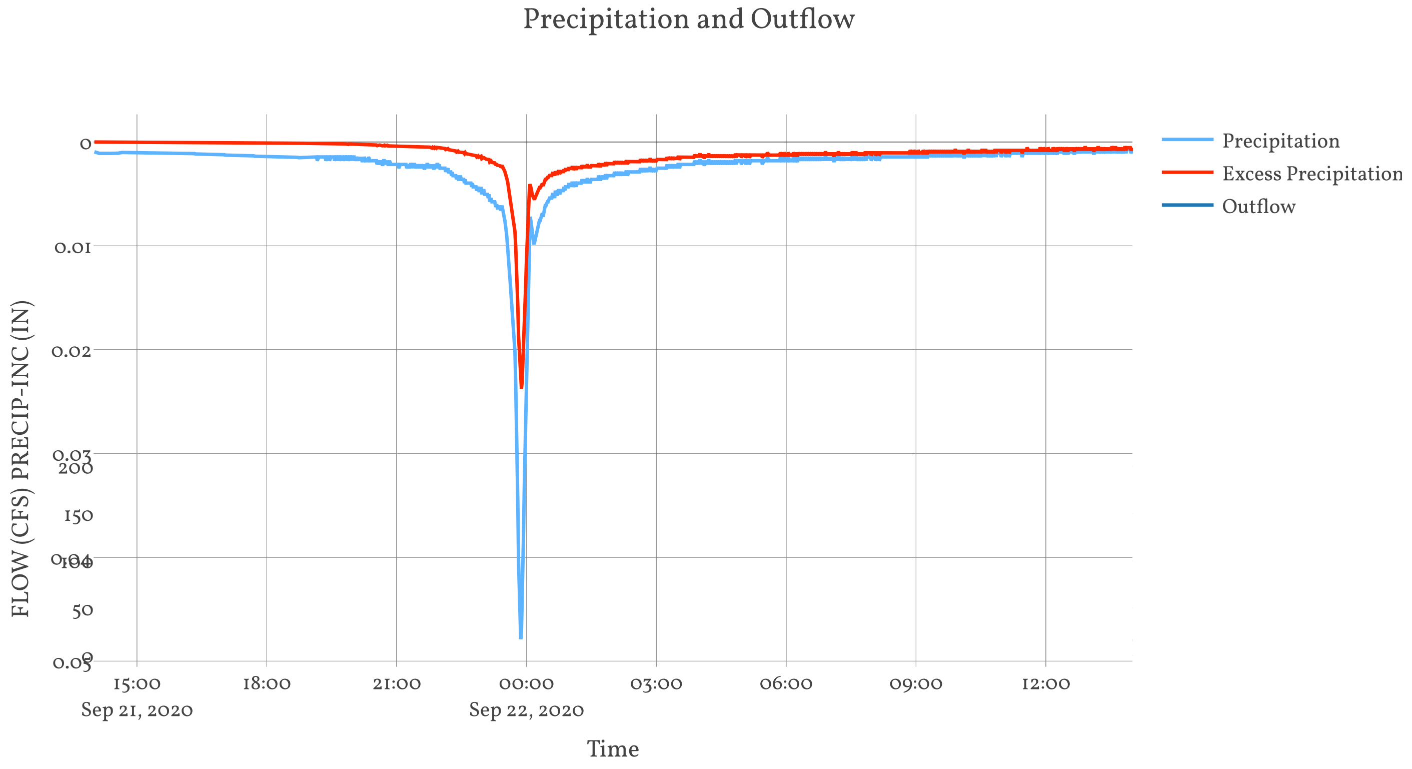
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	216.56
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	1.69
Precipitation Volume (AC - FT)	116.35
Loss Volume (AC - FT)	60.86
Excess Volume (AC - FT)	55.49
Direct Runoff Volume (AC - FT)	54.73
Baseflow Volume (AC - FT)	0

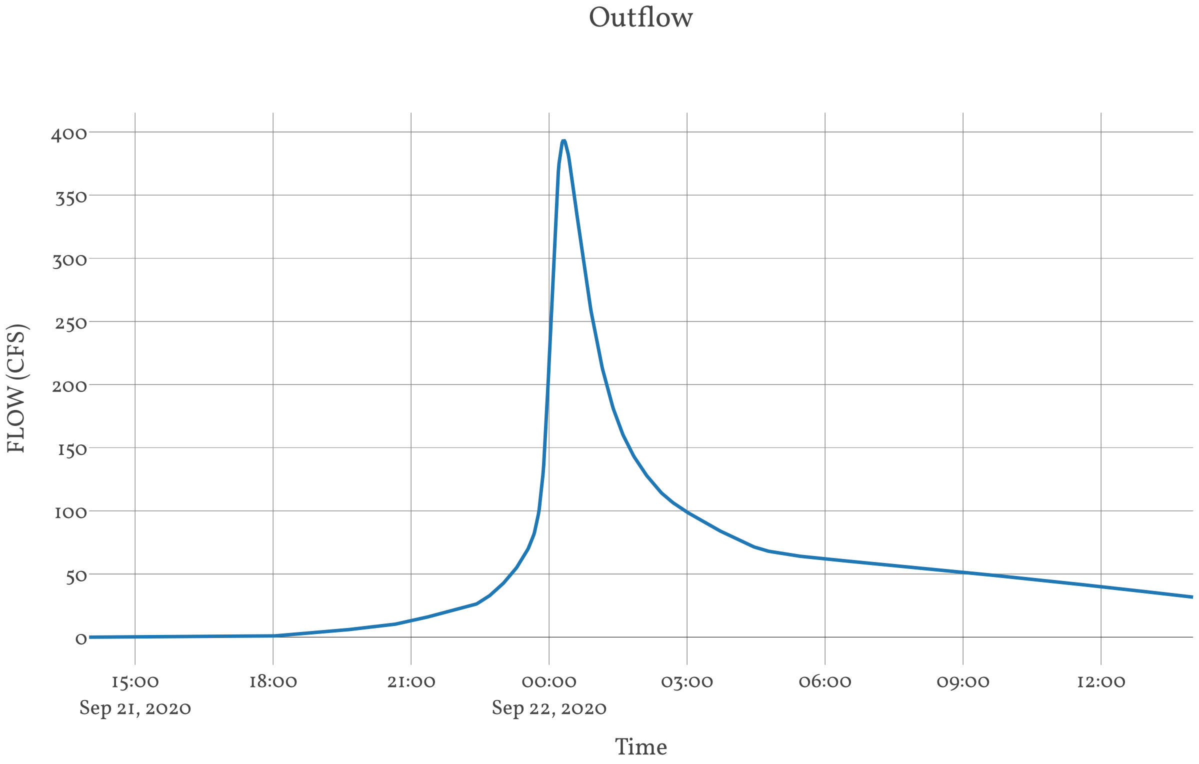

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
200
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	393.35
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	1.69



Reach: 18R

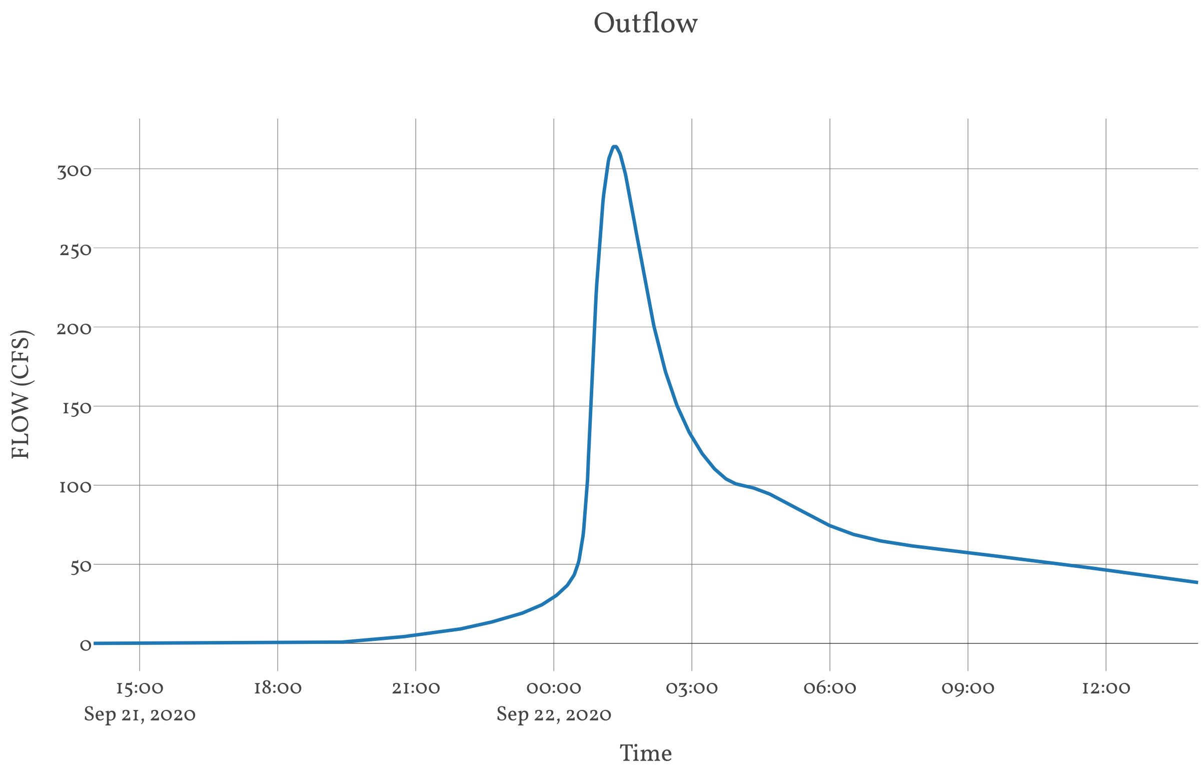
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	314.24
Time of Peak Discharge	22Sep2020, 01:20
Volume (IN)	1.62
Peak Inflow (CFS)	393.35
Inflow Volume (AC - FT)	112.63



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

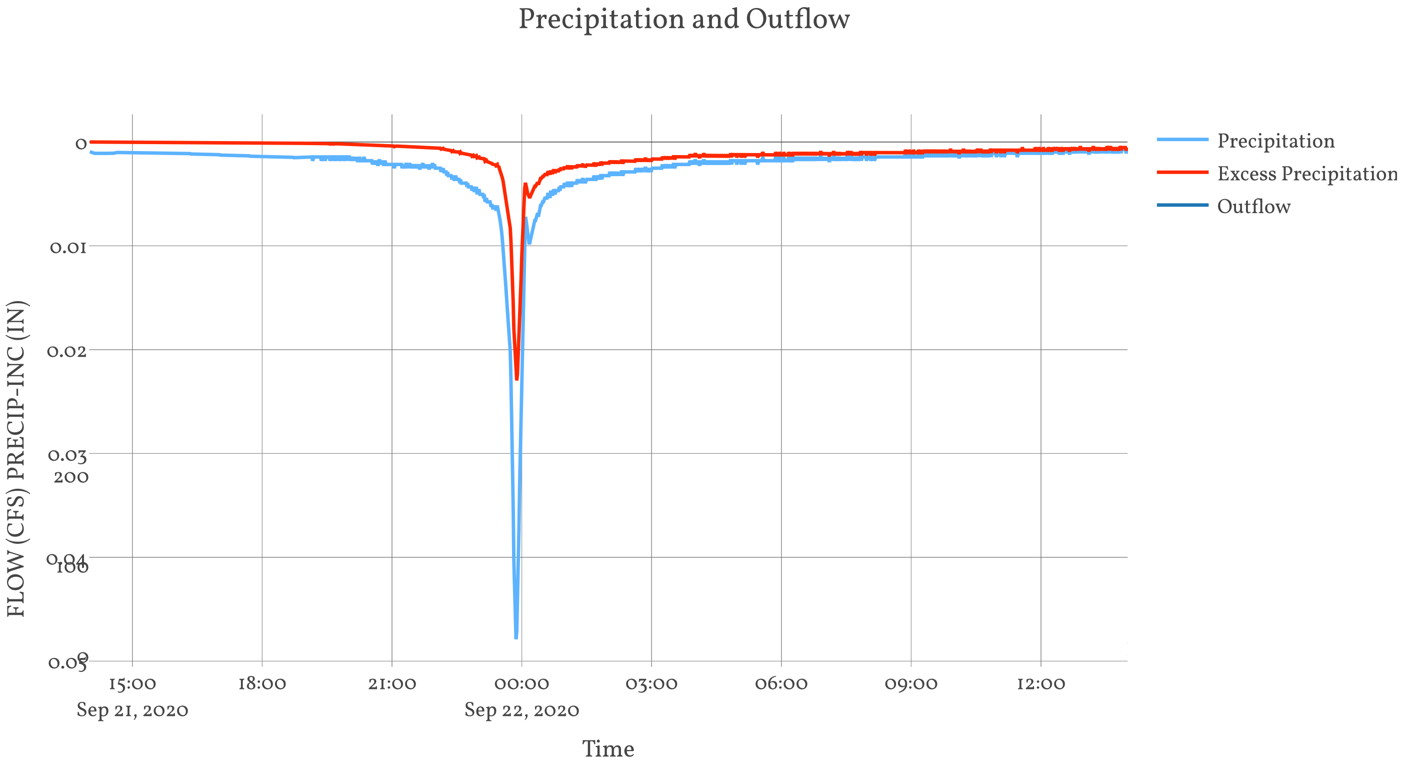
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	227.32
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	1.65
Precipitation Volume (AC - FT)	100.92
Loss Volume (AC - FT)	54.17
Excess Volume (AC - FT)	46.75
Direct Runoff Volume (AC - FT)	46.32
Baseflow Volume (AC - FT)	0

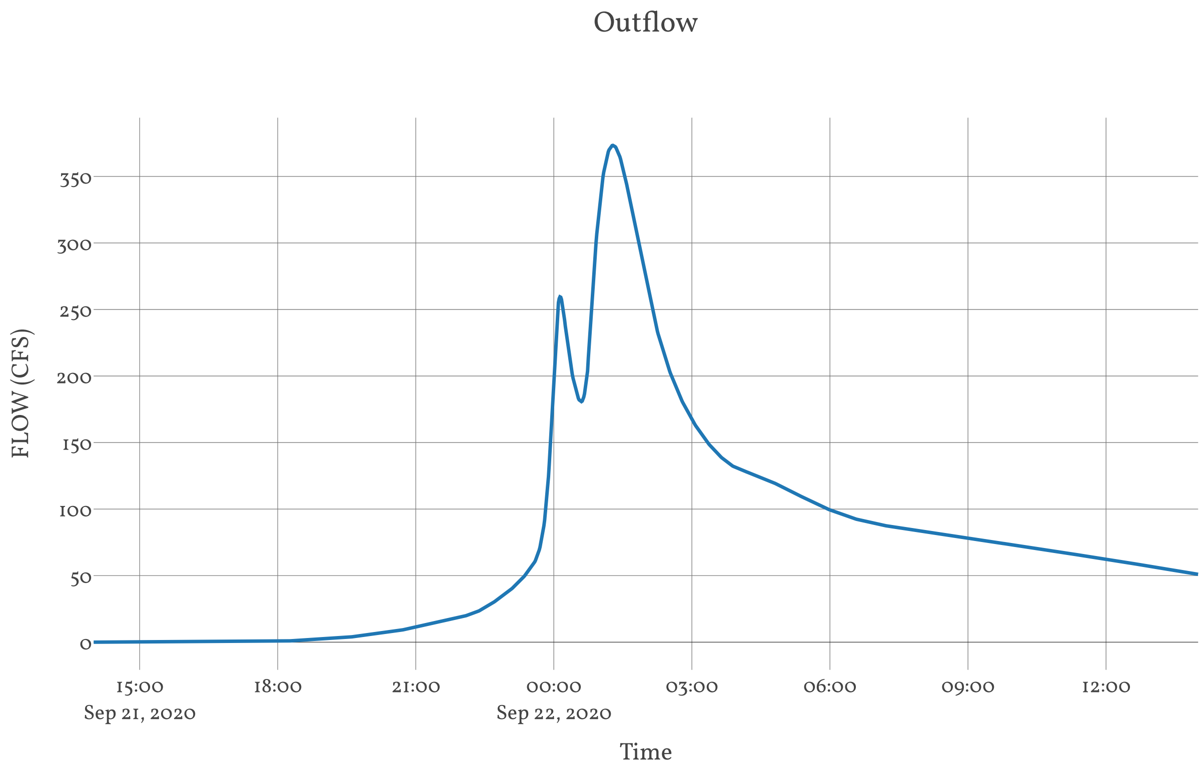

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
200
0.04
100
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	373.3
Time of Peak Discharge	22Sep2020, 01:17
Volume (IN)	1.63



Reach: 17R

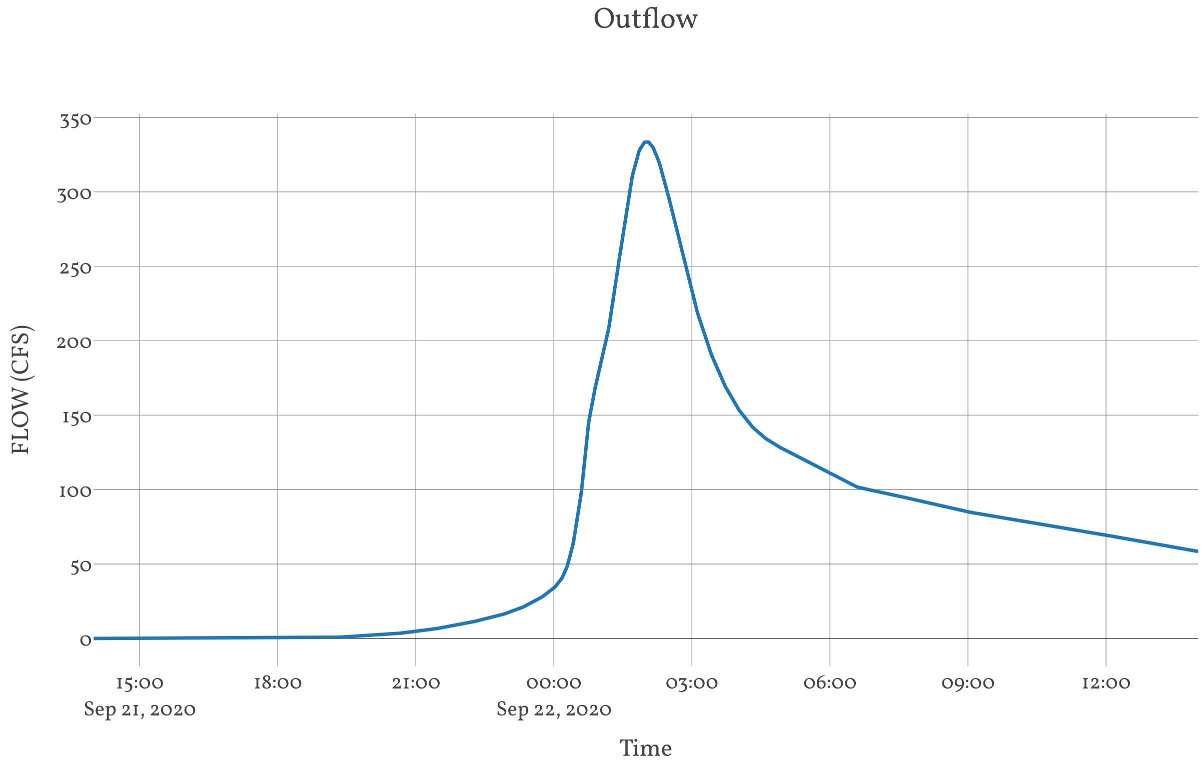
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	333.71
Time of Peak Discharge	22Sep2020, 02:01
Volume (IN)	1.56
Peak Inflow (CFS)	373.3
Inflow Volume (AC - FT)	154.15



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

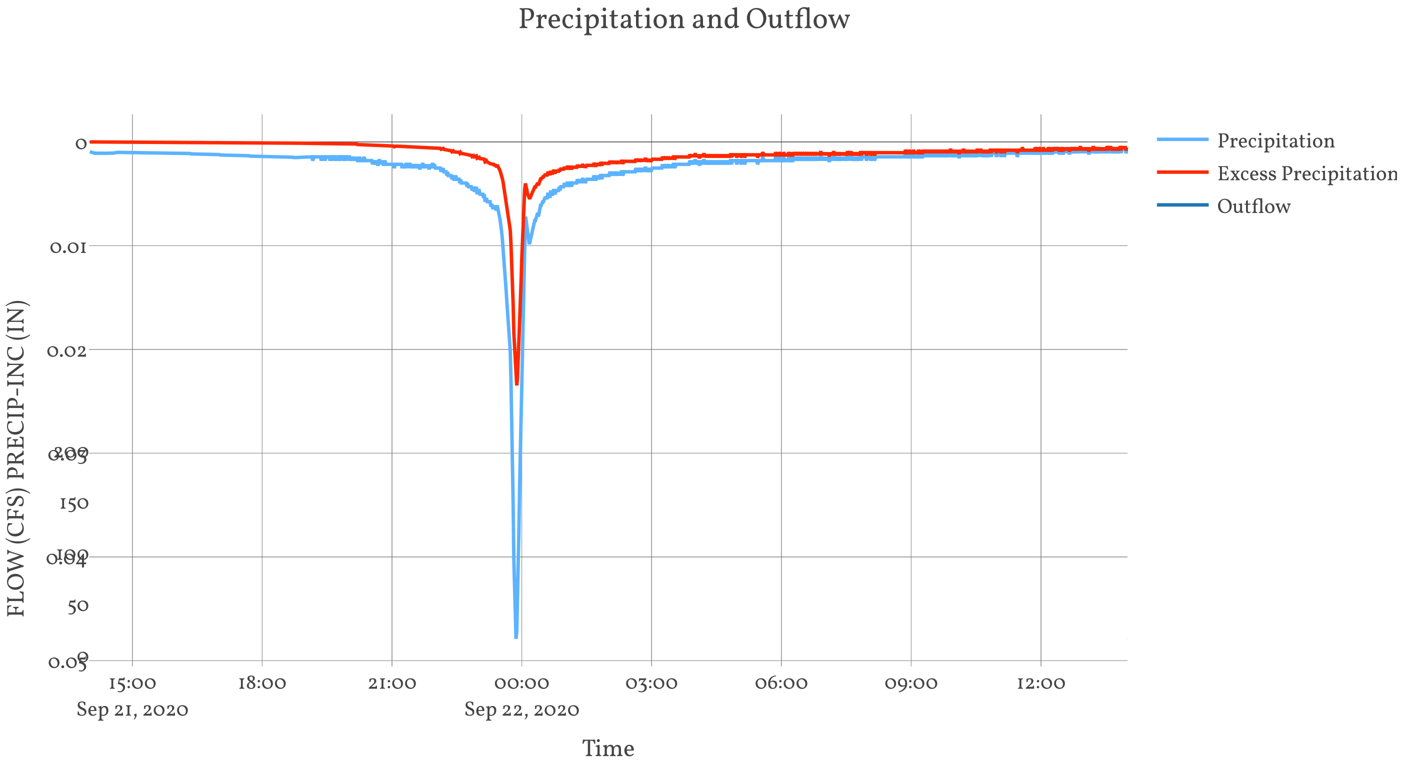
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	199.83
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	1.67
Precipitation Volume (AC - FT)	115.58
Loss Volume (AC - FT)	61.04
Excess Volume (AC - FT)	54.54
Direct Runoff Volume (AC - FT)	53.71
Baseflow Volume (AC - FT)	0

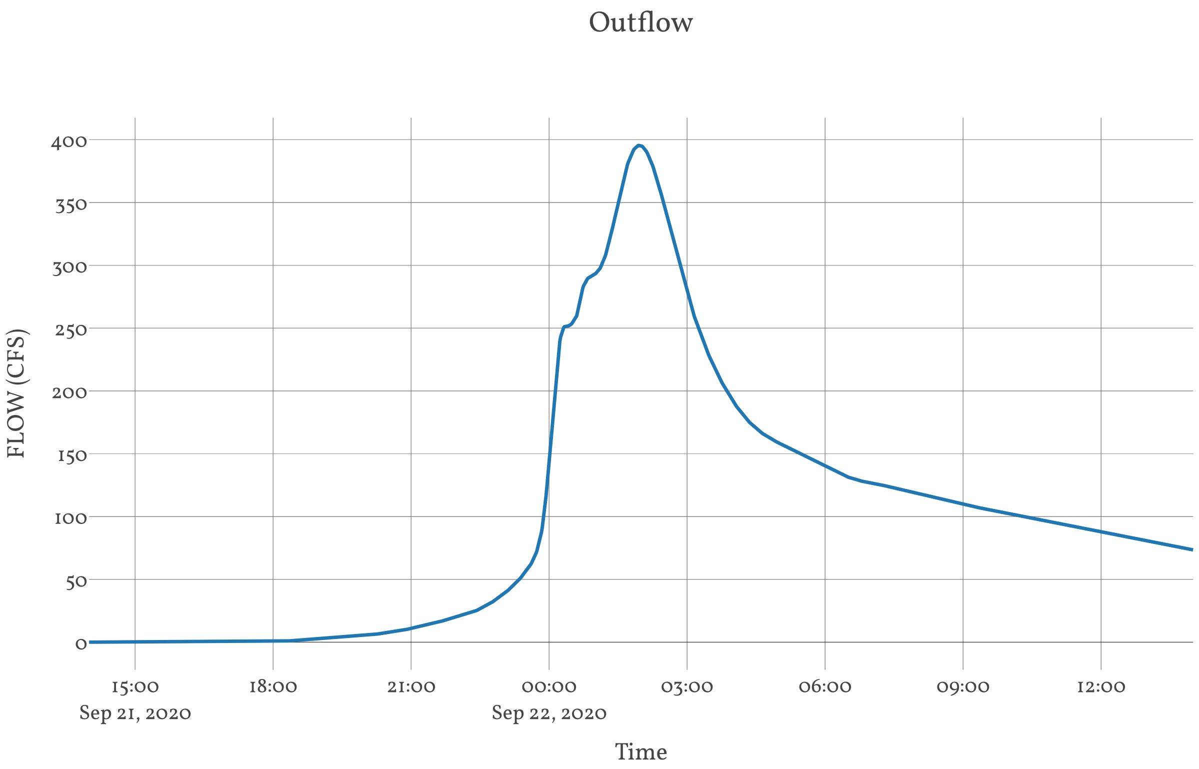

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
200
150
100
50
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	395.47
Time of Peak Discharge	22Sep2020, 01:58
Volume (IN)	1.59



Reach: 16R

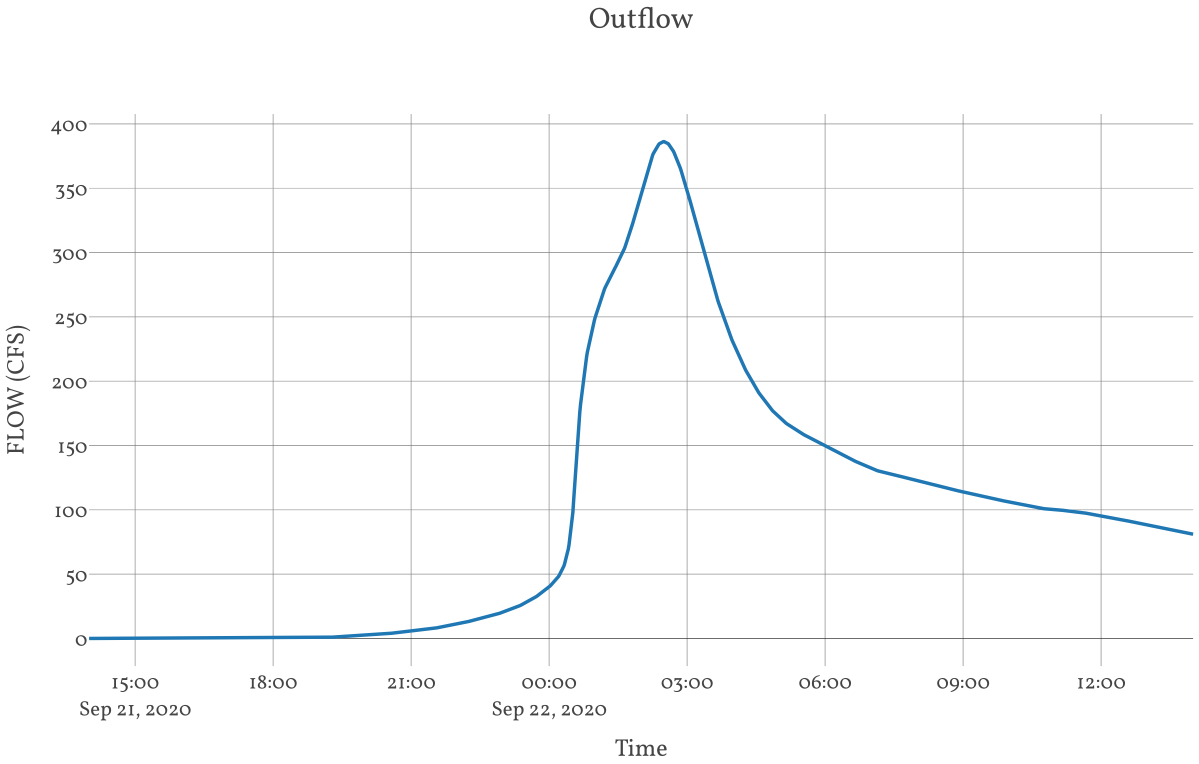
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	386.19
Time of Peak Discharge	22Sep2020, 02:30
Volume (IN)	1.54
Peak Inflow (CFS)	395.47
Inflow Volume (AC - FT)	201.8



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

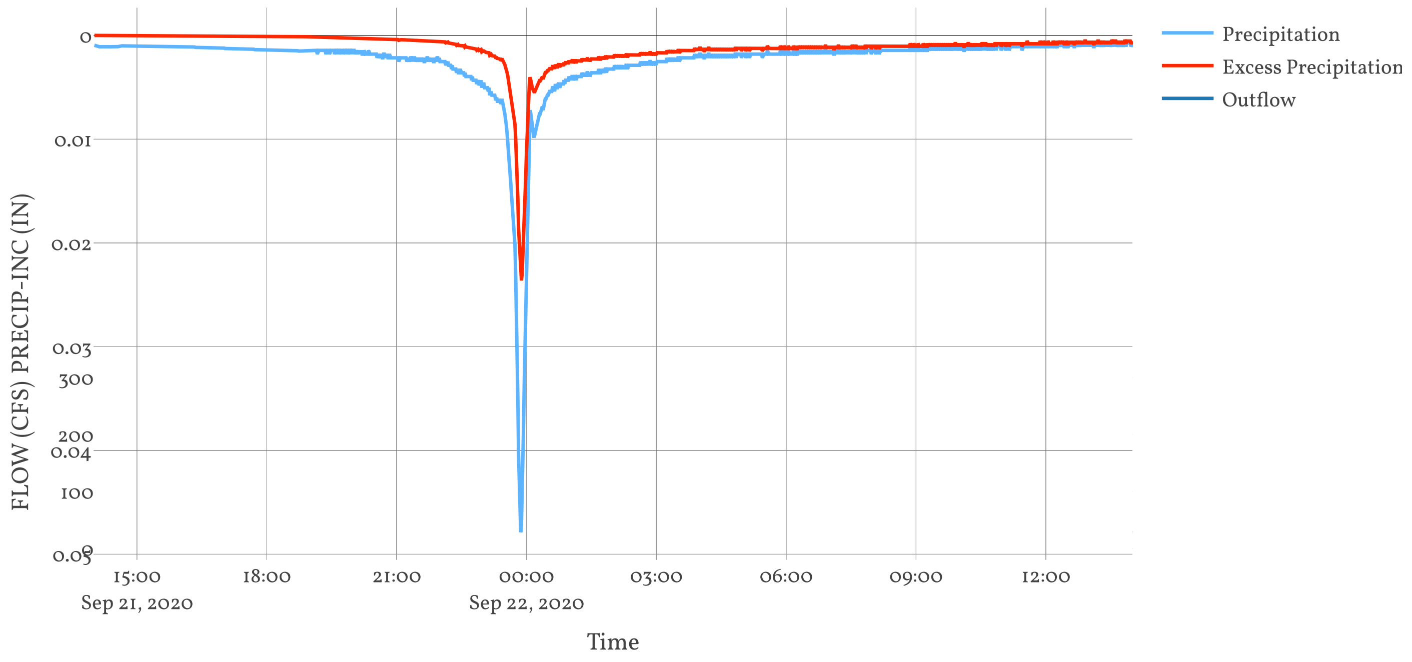
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	358.99
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	1.68
Precipitation Volume (AC - FT)	209.28
Loss Volume (AC - FT)	110
Excess Volume (AC - FT)	99.28
Direct Runoff Volume (AC - FT)	97.73
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

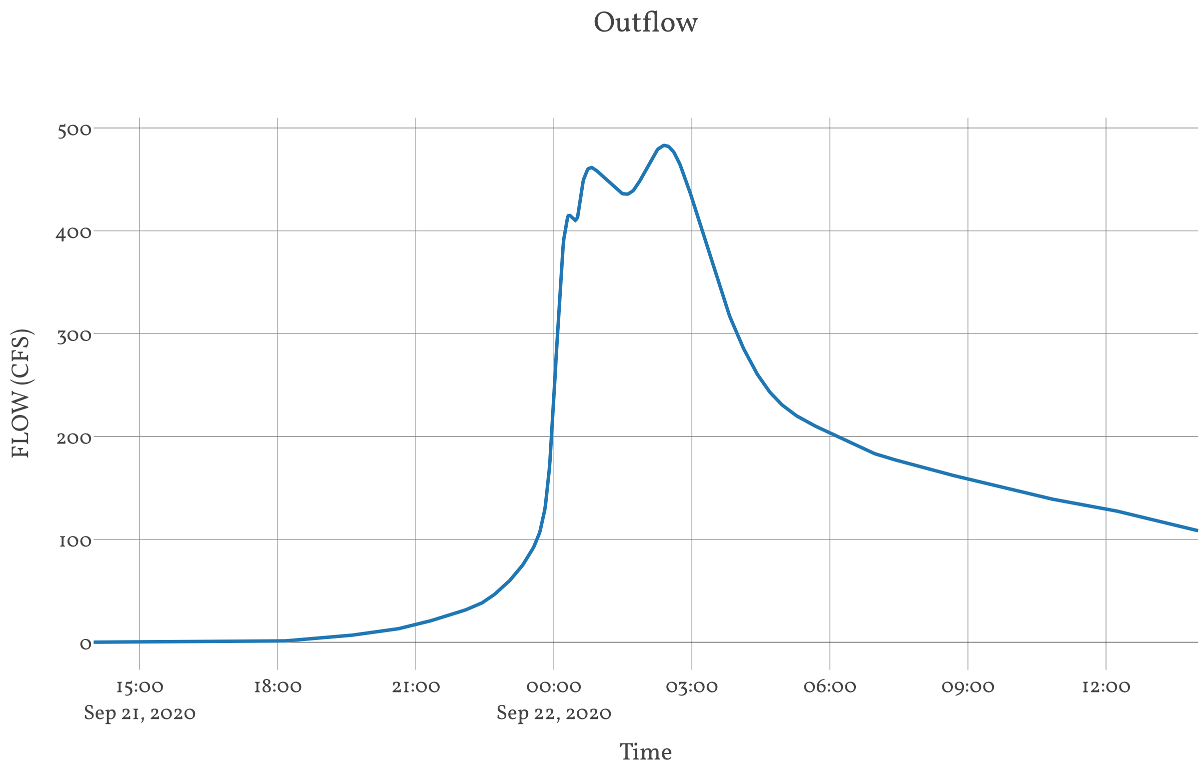


Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	483.09
Time of Peak Discharge	22Sep2020, 02:25
Volume (IN)	1.58



Reach: 20R

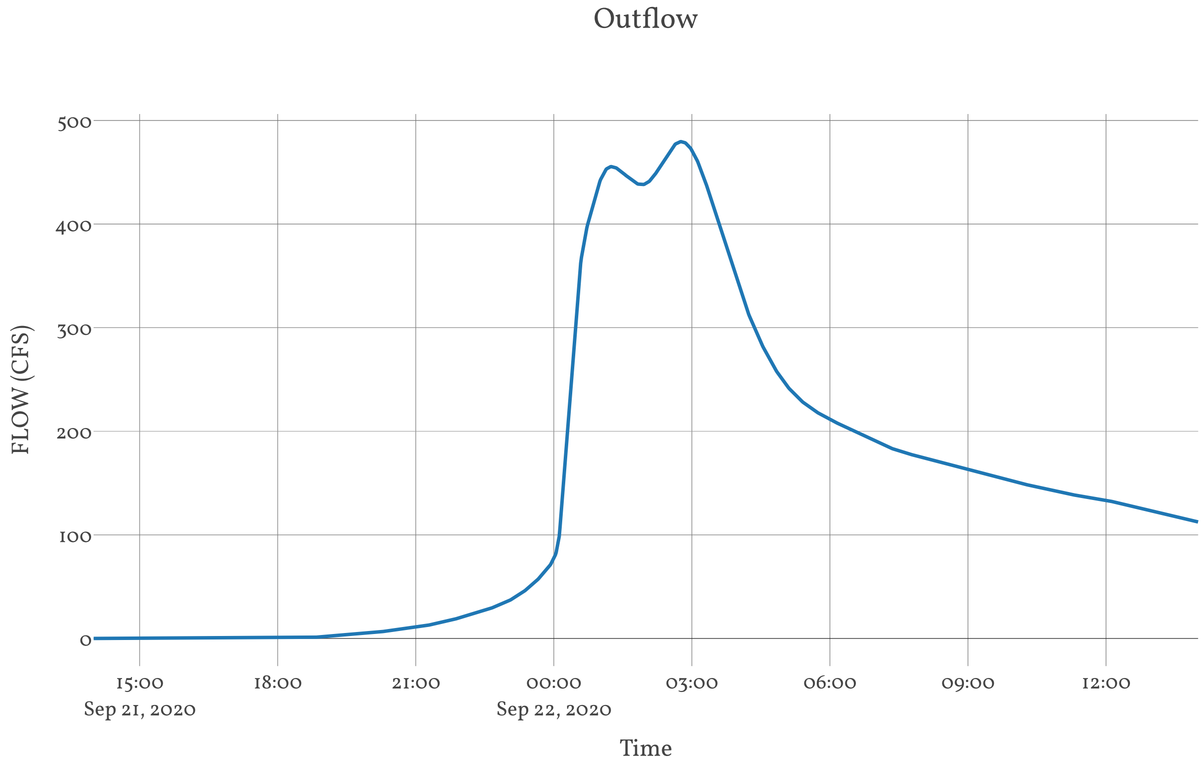
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	479.54
Time of Peak Discharge	22Sep2020, 02:46
Volume (IN)	1.55
Peak Inflow (CFS)	483.09
Inflow Volume (AC - FT)	293.05



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

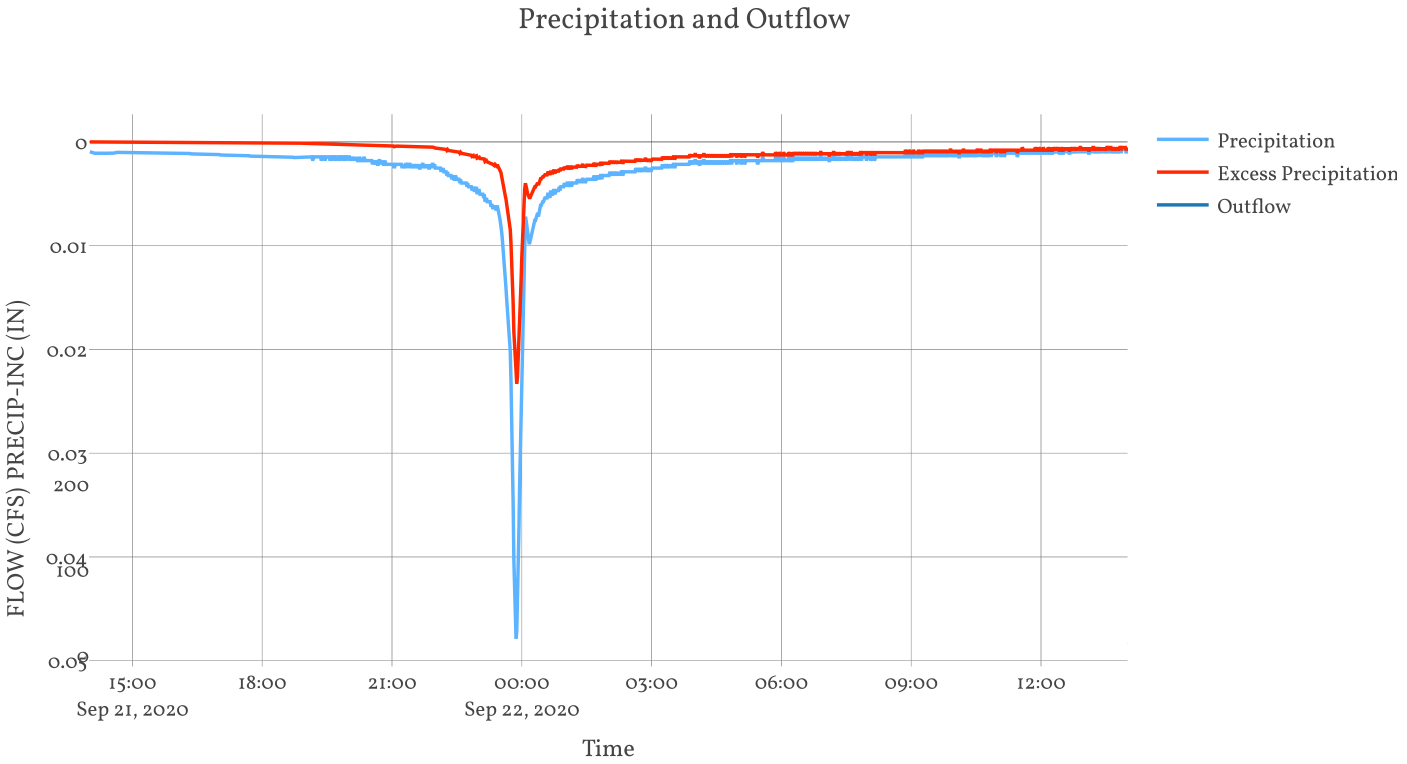
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	239.37
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	1.68
Precipitation Volume (AC - FT)	102.34
Loss Volume (AC - FT)	54.3
Excess Volume (AC - FT)	48.04
Direct Runoff Volume (AC - FT)	47.62
Baseflow Volume (AC - FT)	0

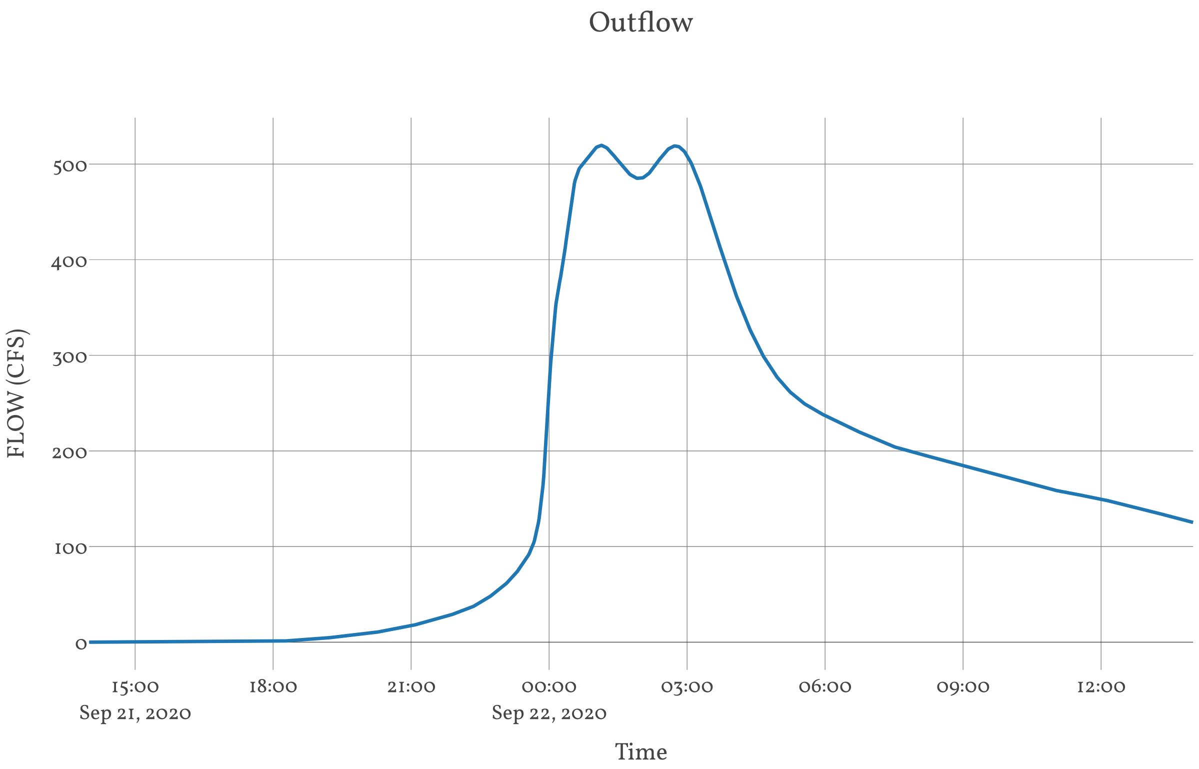

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
200
0.04
100
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	519.57
Time of Peak Discharge	22Sep2020, 01:08
Volume (IN)	1.57



Reach: 15R

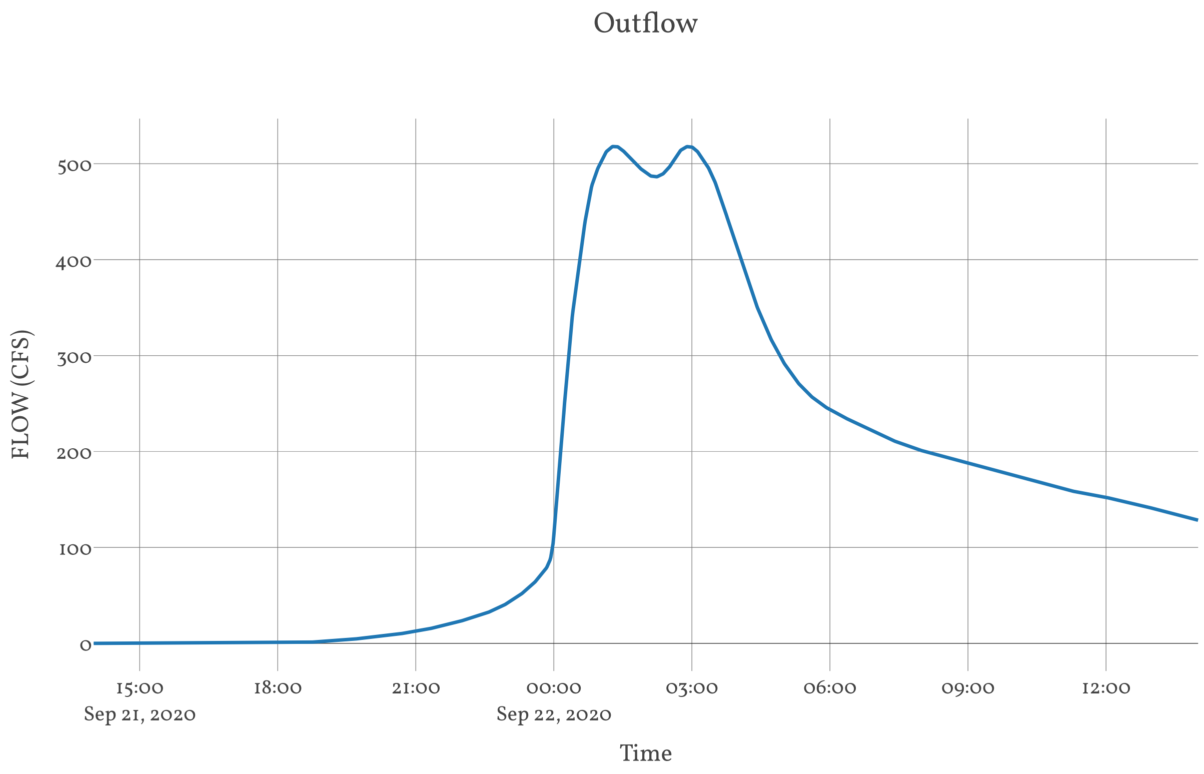
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	518.2
Time of Peak Discharge	22Sep2020, 01:19
Volume (IN)	1.55
Peak Inflow (CFS)	519.57
Inflow Volume (AC - FT)	334.44



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

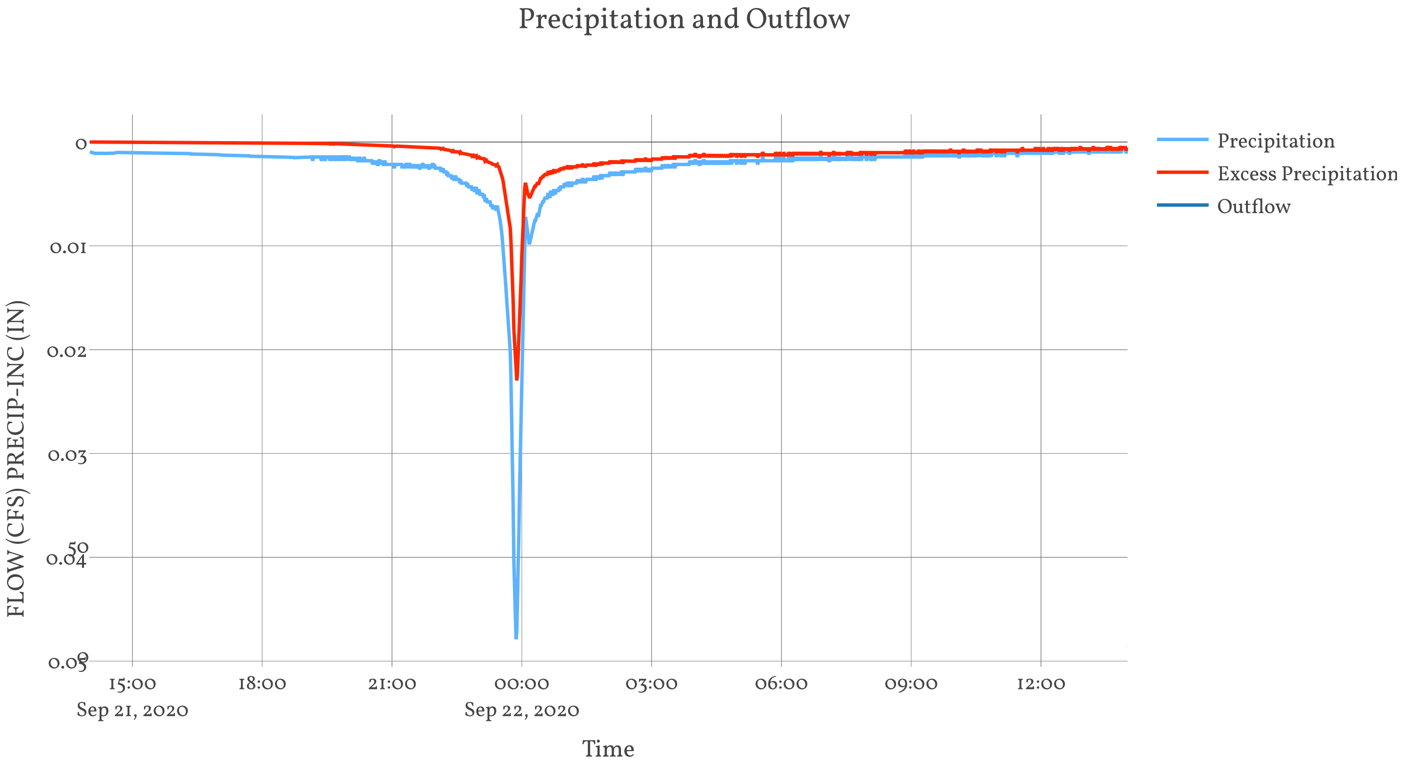
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	93.22
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	1.66
Precipitation Volume (AC - FT)	31.1
Loss Volume (AC - FT)	16.7
Excess Volume (AC - FT)	14.41
Direct Runoff Volume (AC - FT)	14.34
Baseflow Volume (AC - FT)	0

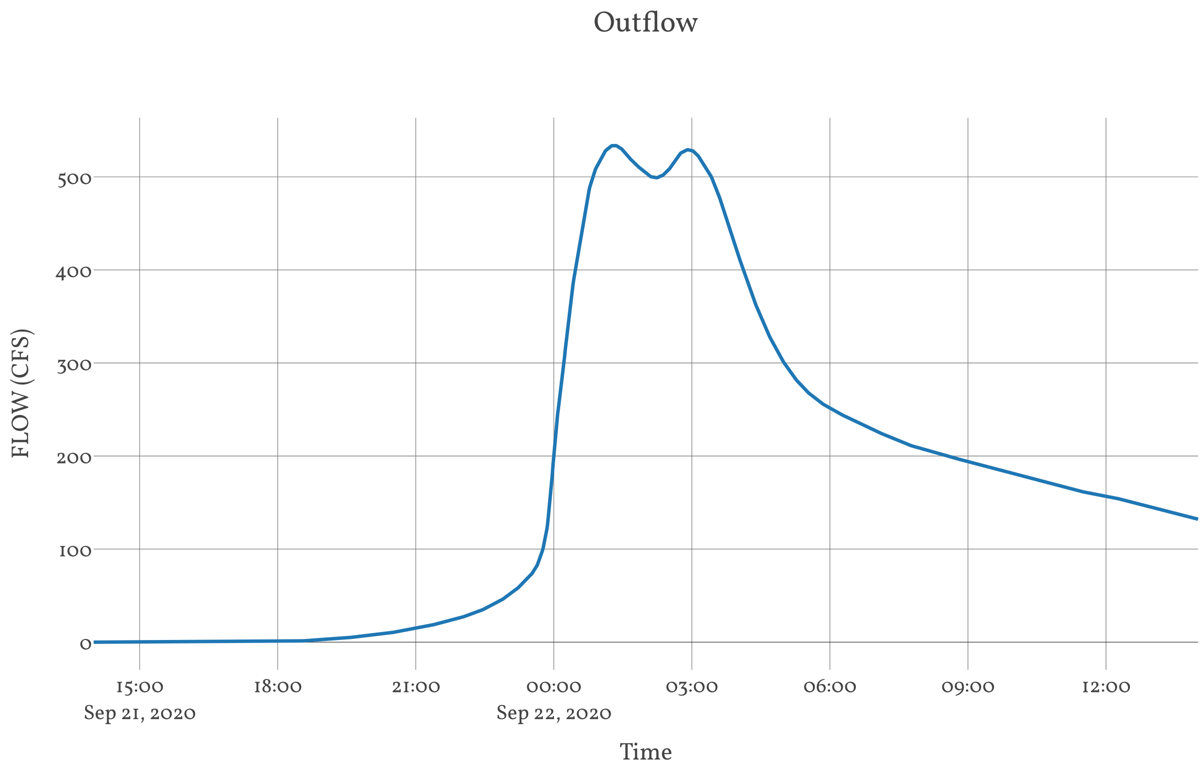

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	533.79
Time of Peak Discharge	22Sep2020, 01:19
Volume (IN)	1.55



Reach: 14R

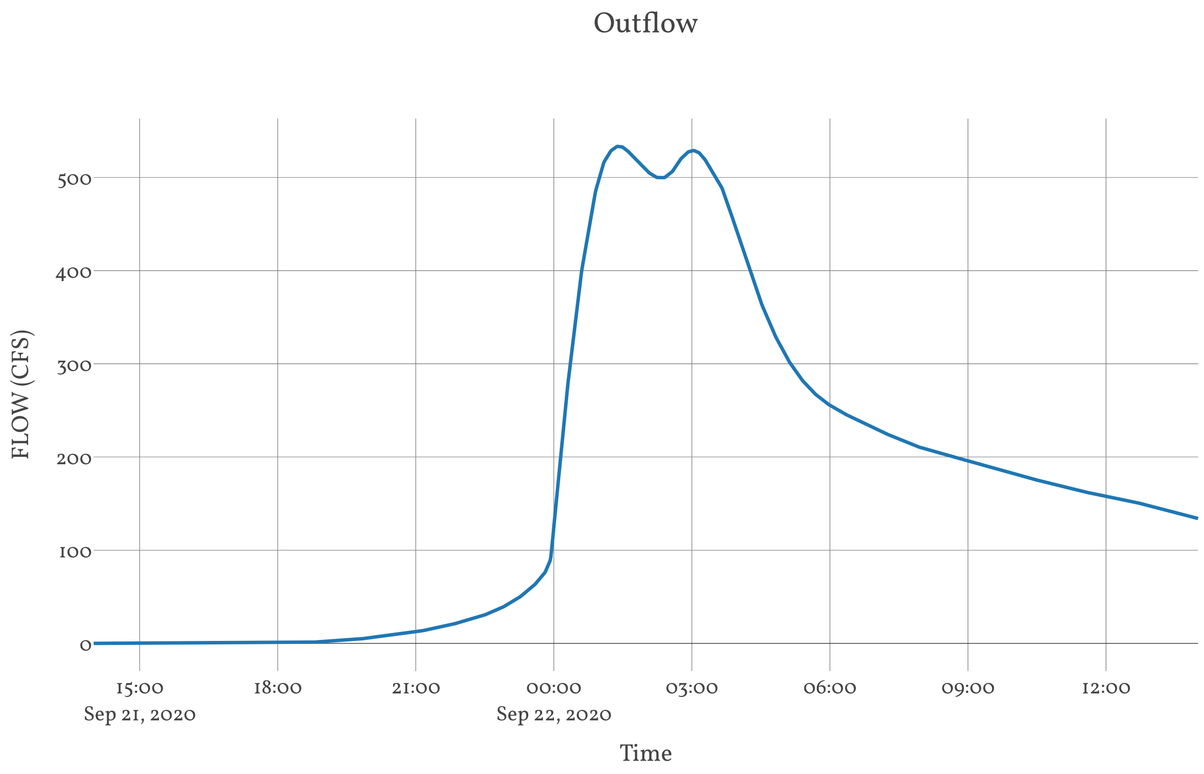
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	533.43
Time of Peak Discharge	22Sep2020, 01:25
Volume (IN)	1.54
Peak Inflow (CFS)	533.79
Inflow Volume (AC - FT)	344.17



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

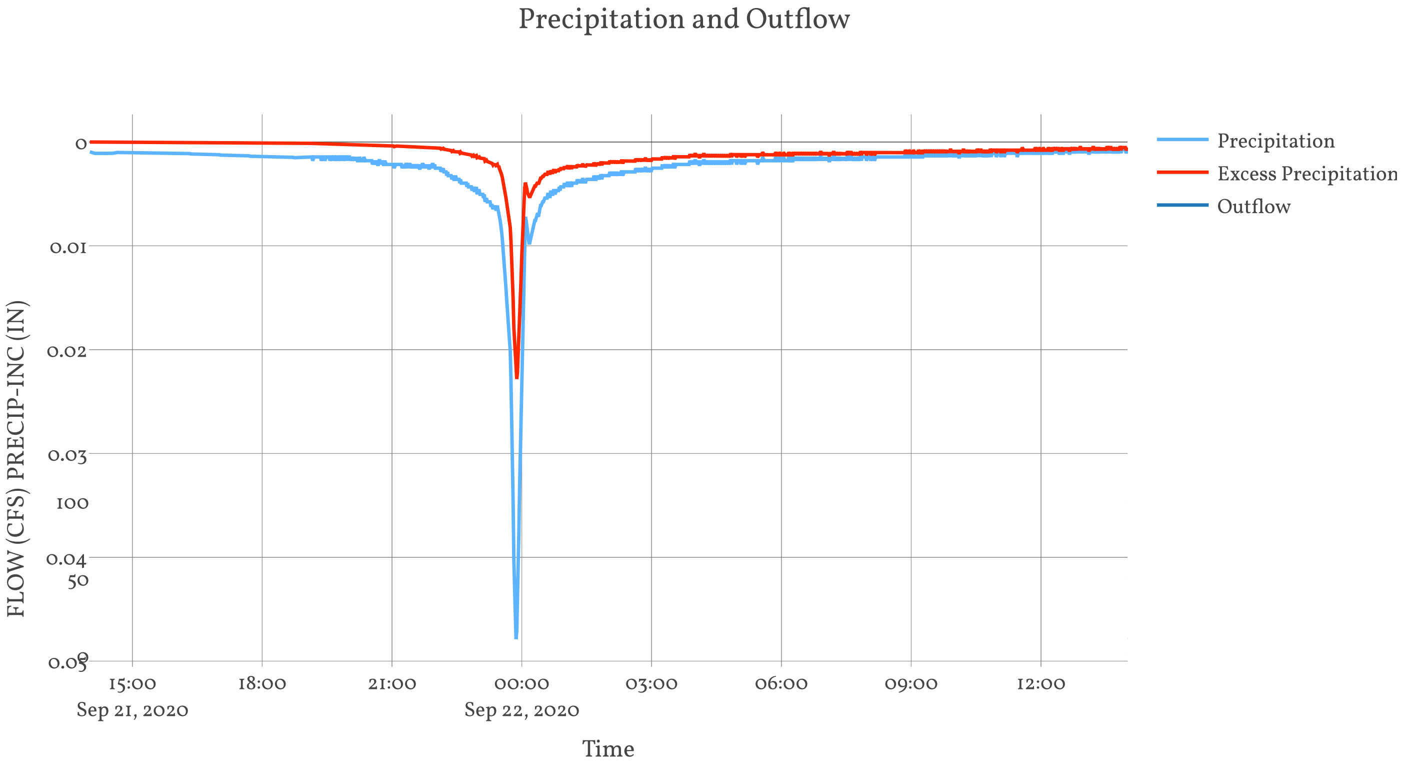
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	132.97
Time of Peak Discharge	22Sep2020, 00:20
Volume (IN)	1.63
Precipitation Volume (AC - FT)	82.56
Loss Volume (AC - FT)	44.52
Excess Volume (AC - FT)	38.04
Direct Runoff Volume (AC - FT)	37.41
Baseflow Volume (AC - FT)	0

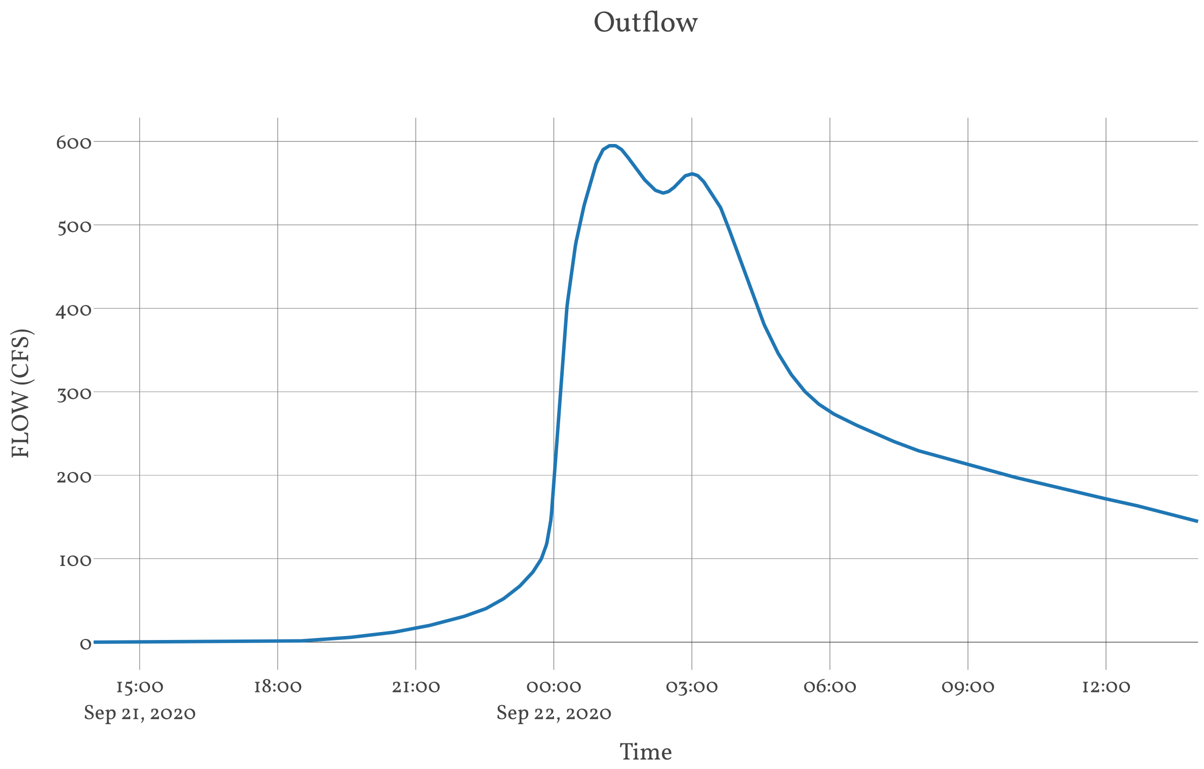

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
100
0.04
50
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	595.2
Time of Peak Discharge	22Sep2020, 01:16
Volume (IN)	1.55



Reach: 13R

Downstream : 12c

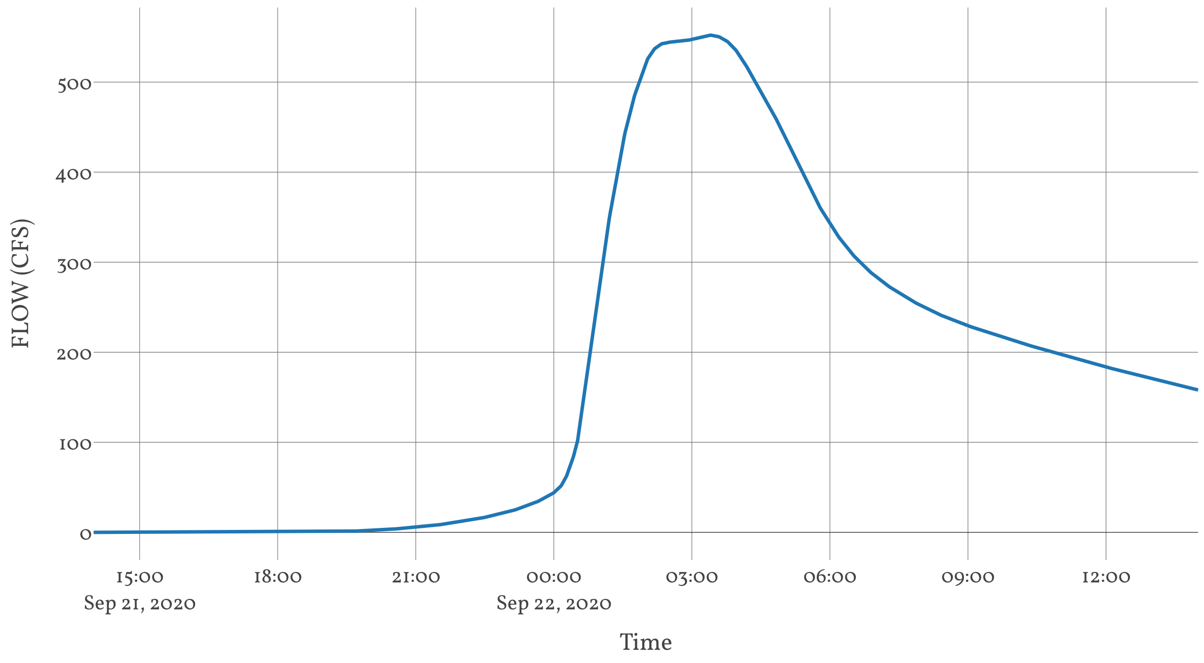
Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	552.12
Time of Peak Discharge	22Sep2020, 03:24
Volume (IN)	1.47
Peak Inflow (CFS)	595.2
Inflow Volume (AC - FT)	378.99

Outflow



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

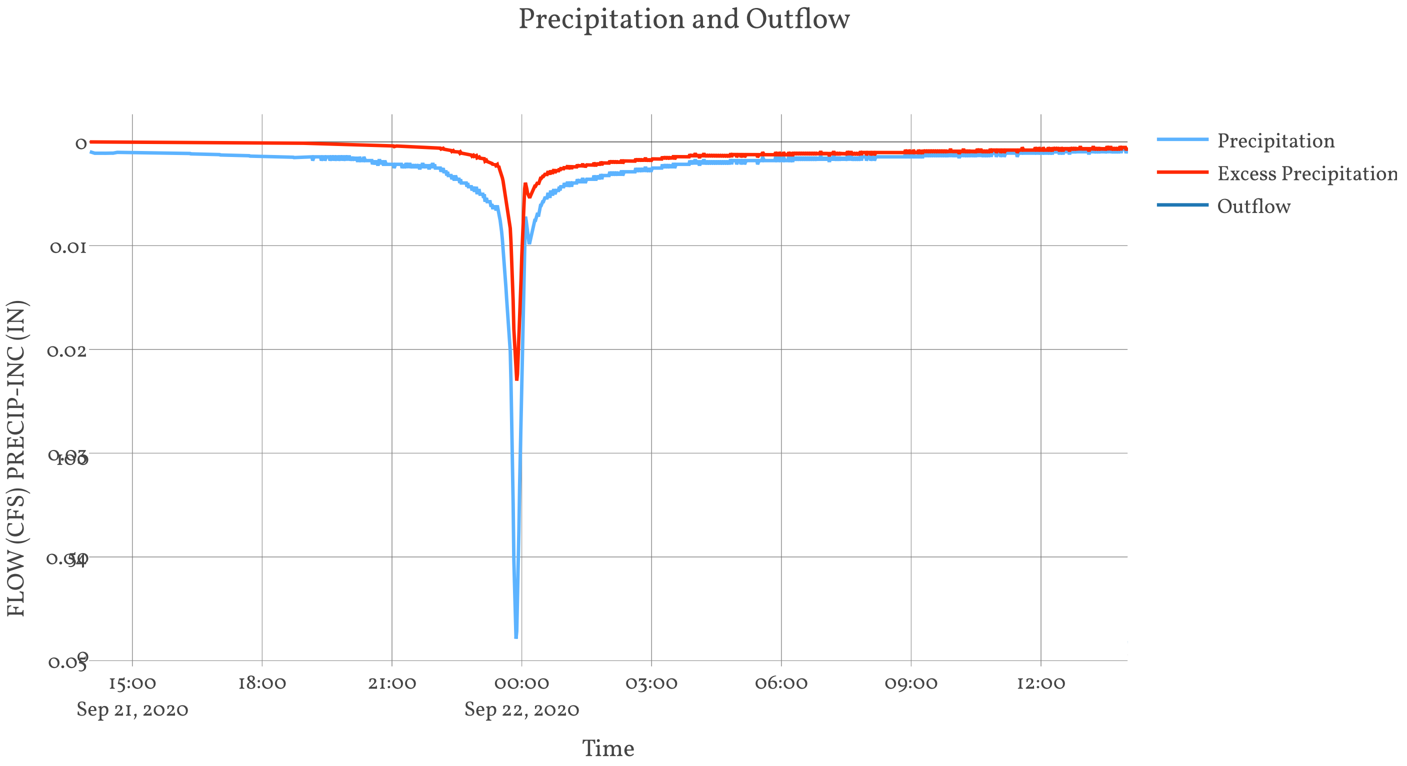
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	103.68
Time of Peak Discharge	22Sep2020, 00:10
Volume (IN)	1.65
Precipitation Volume (AC - FT)	48.96
Loss Volume (AC - FT)	26.23
Excess Volume (AC - FT)	22.73
Direct Runoff Volume (AC - FT)	22.5
Baseflow Volume (AC - FT)	0

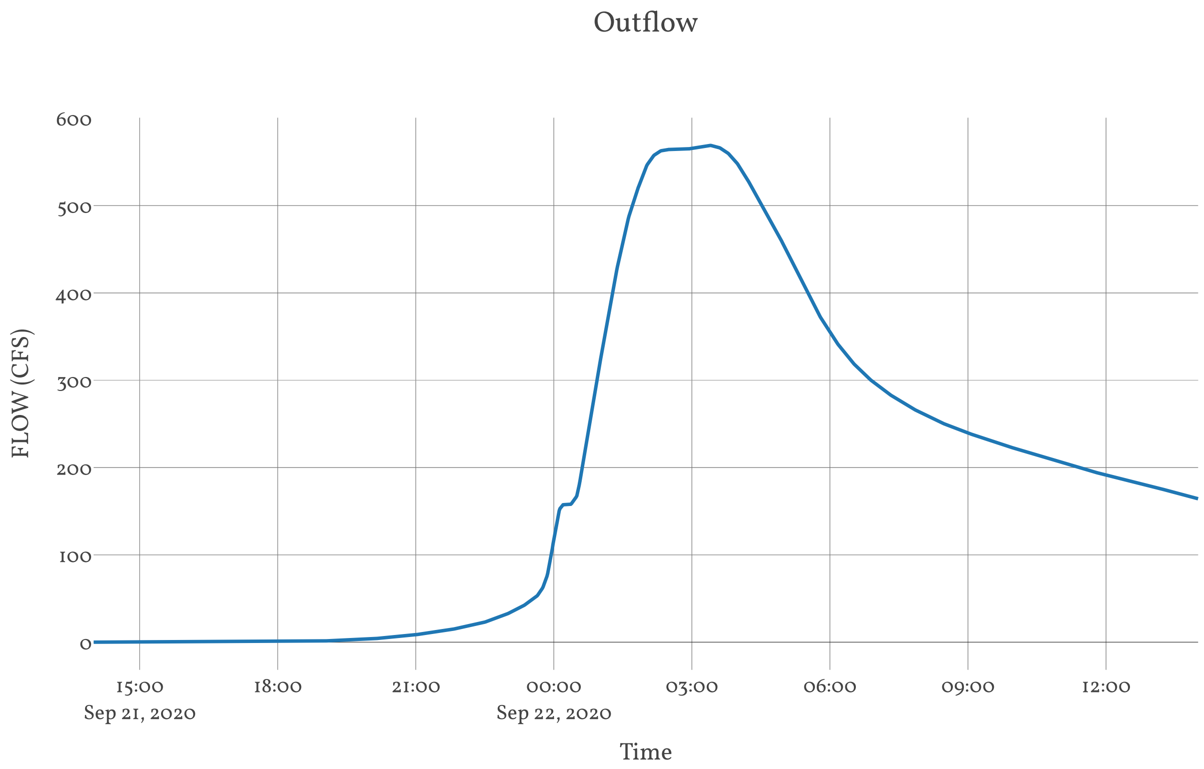

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
100
0.04
50
0.05
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

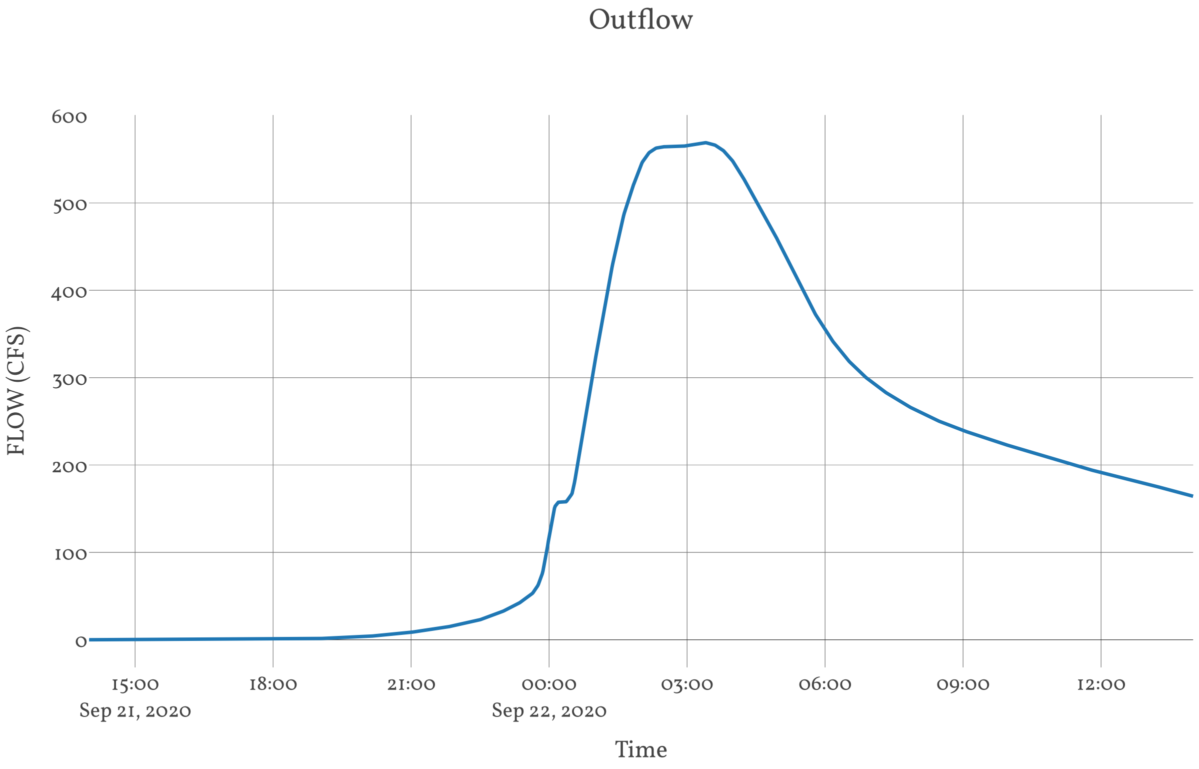
Peak Discharge (CFS)	568.99
Time of Peak Discharge	22Sep2020, 03:22
Volume (IN)	1.48



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	568.99
Time of Peak Discharge	22Sep2020, 03:22
Volume (IN)	1.48
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 005-yr Post-Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:41

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	299.05	22Sep2020, 00:24	2.6
61b	0.61	344.07	22Sep2020, 00:15	2.62
J 60b 61b	1.25	625.34	22Sep2020, 00:19	2.61
18r	1.25	502.51	22Sep2020, 01:13	2.5
62b	0.53	362.49	22Sep2020, 00:08	2.56
17c	1.78	599.85	22Sep2020, 01:11	2.52
17r	1.78	552.97	22Sep2020, 01:47	2.43
63b	0.6	318.15	22Sep2020, 00:17	2.59
16c	2.38	656.9	22Sep2020, 01:44	2.47
16r	2.38	644.4	22Sep2020, 02:08	2.4
64b	1.09	571.11	22Sep2020, 00:18	2.6
20c	3.47	809.6	22Sep2020, 02:04	2.46
20r	3.47	805.05	22Sep2020, 02:20	2.42
65b	0.53	380.96	22Sep2020, 00:07	2.59
15c	4	897.56	22Sep2020, 00:44	2.45
15r	4	894.79	22Sep2020, 01:00	2.42
66b	0.16	148.29	22Sep2020, 00:02	2.57
14c	4.16	922.42	22Sep2020, 00:58	2.42
14r	4.16	921.68	22Sep2020, 01:05	2.41
67b	0.43	212.62	22Sep2020, 00:19	2.53
13c	4.59	1044.93	22Sep2020, 00:59	2.42
13r	4.59	947.29	22Sep2020, 02:07	2.32
68b	0.26	165.24	22Sep2020, 00:10	2.57

12c	4.85	980.23	22Sep2020, 02:04	2.33
Pacific Ocean	4.85	980.23	22Sep2020, 02:04	2.33

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

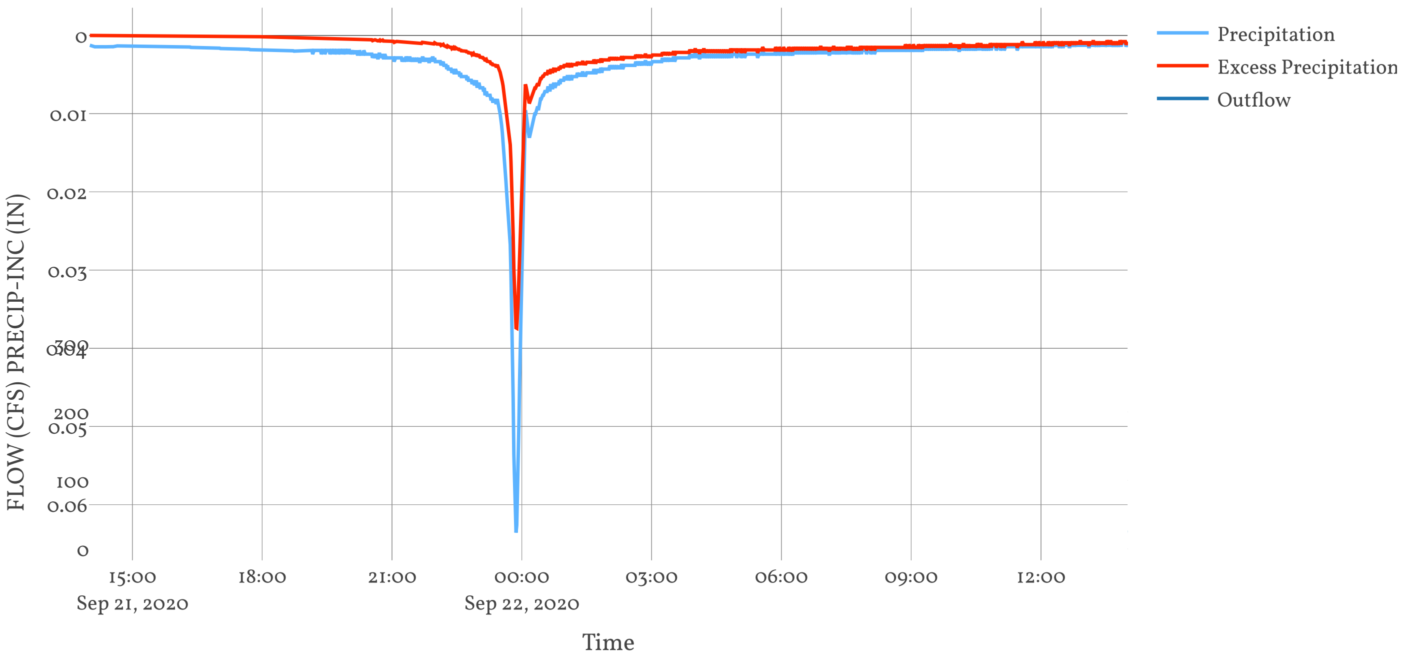
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	299.05
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	2.6
Precipitation Volume (AC - FT)	164.43
Loss Volume (AC - FT)	73.25
Excess Volume (AC - FT)	91.19
Direct Runoff Volume (AC - FT)	89.51
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

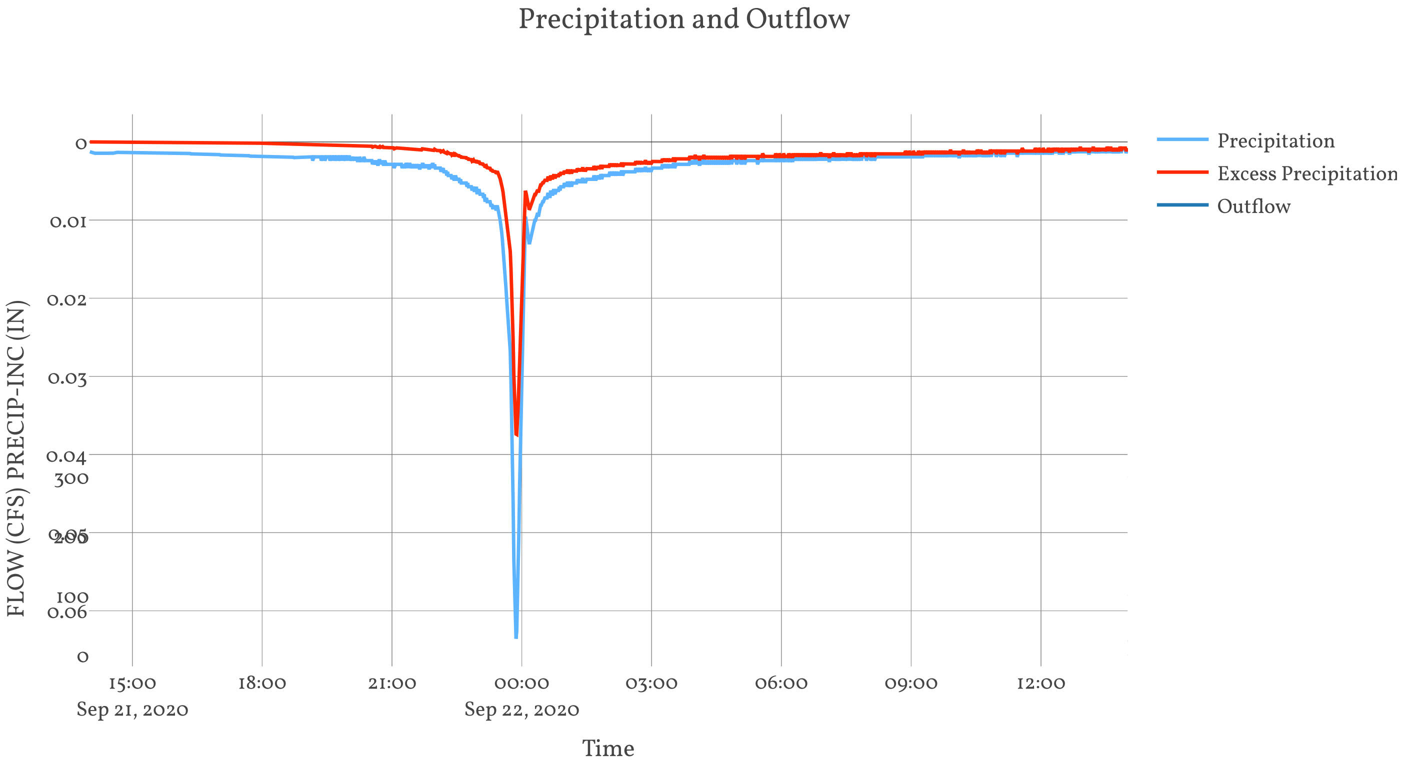
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	344.07
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	2.62
Precipitation Volume (AC - FT)	154.49
Loss Volume (AC - FT)	68.82
Excess Volume (AC - FT)	85.67
Direct Runoff Volume (AC - FT)	84.58
Baseflow Volume (AC - FT)	0

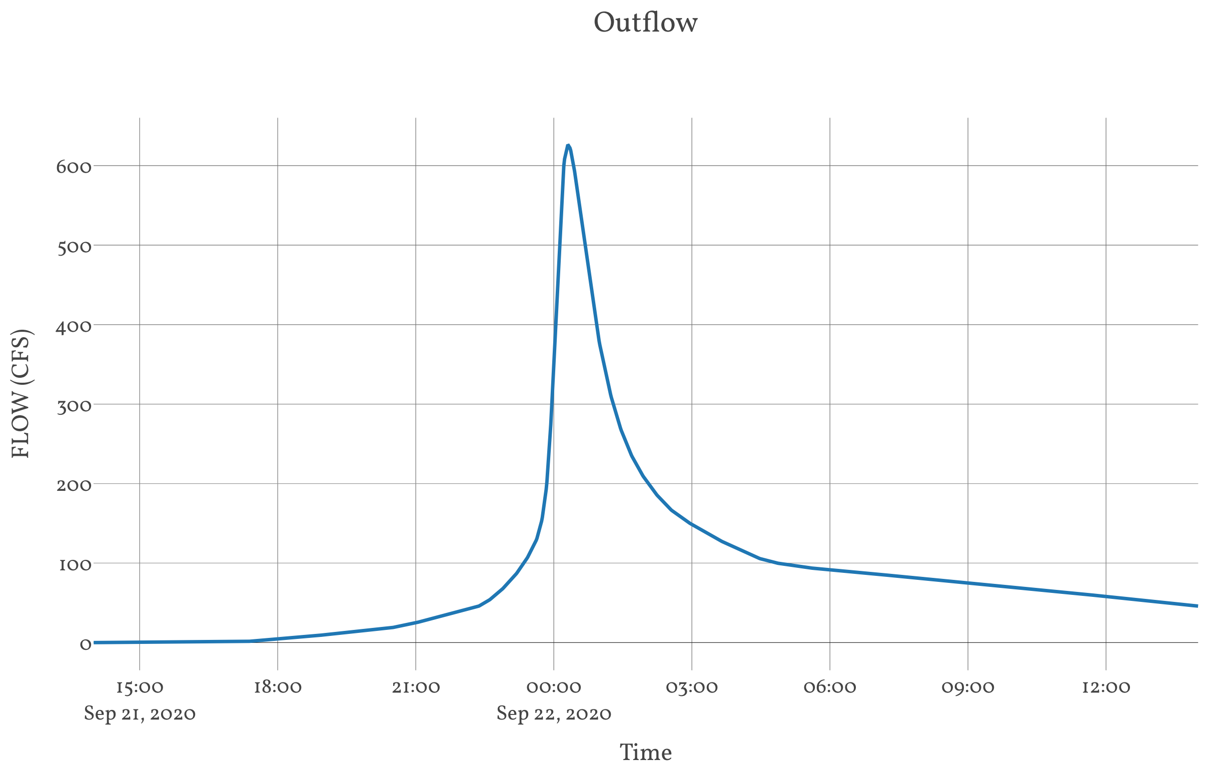

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	625.34
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	2.61



Reach: 18R

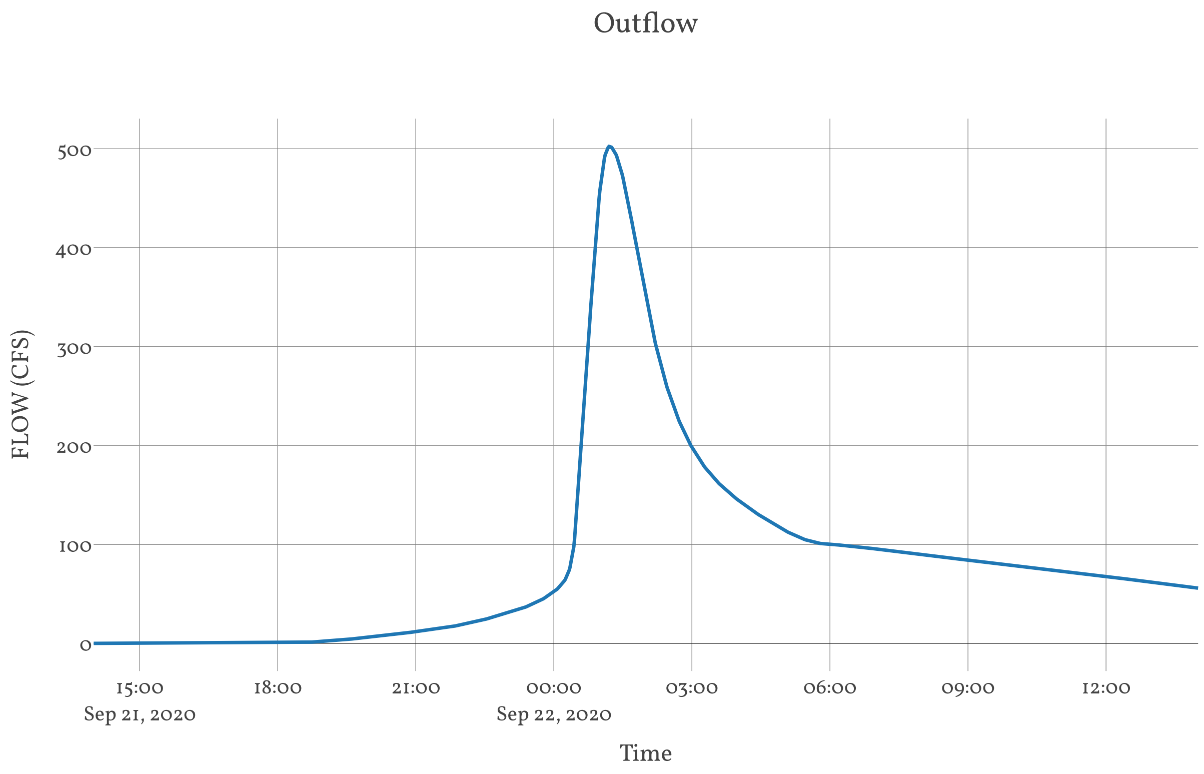
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	502.51
Time of Peak Discharge	22Sep2020, 01:13
Volume (IN)	2.5
Peak Inflow (CFS)	625.34
Inflow Volume (AC - FT)	174.09



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

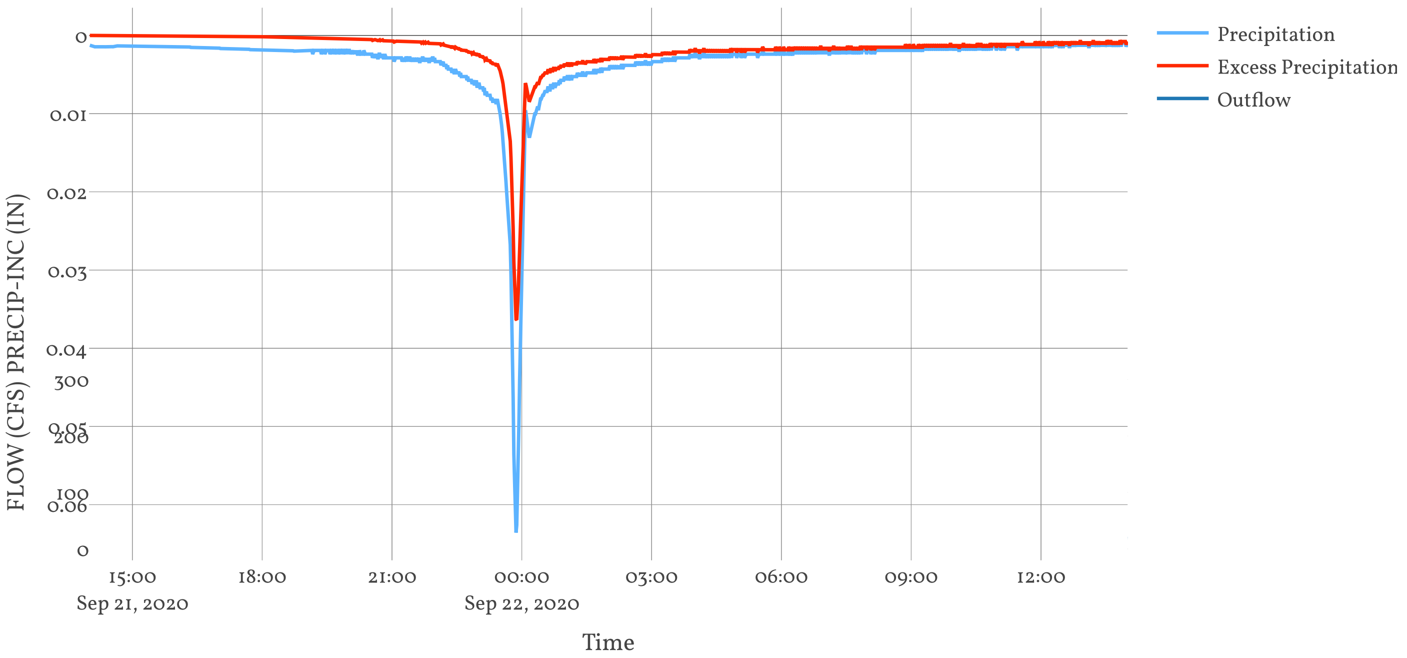
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	362.49
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	2.56
Precipitation Volume (AC - FT)	133.99
Loss Volume (AC - FT)	61.5
Excess Volume (AC - FT)	72.49
Direct Runoff Volume (AC - FT)	71.87
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



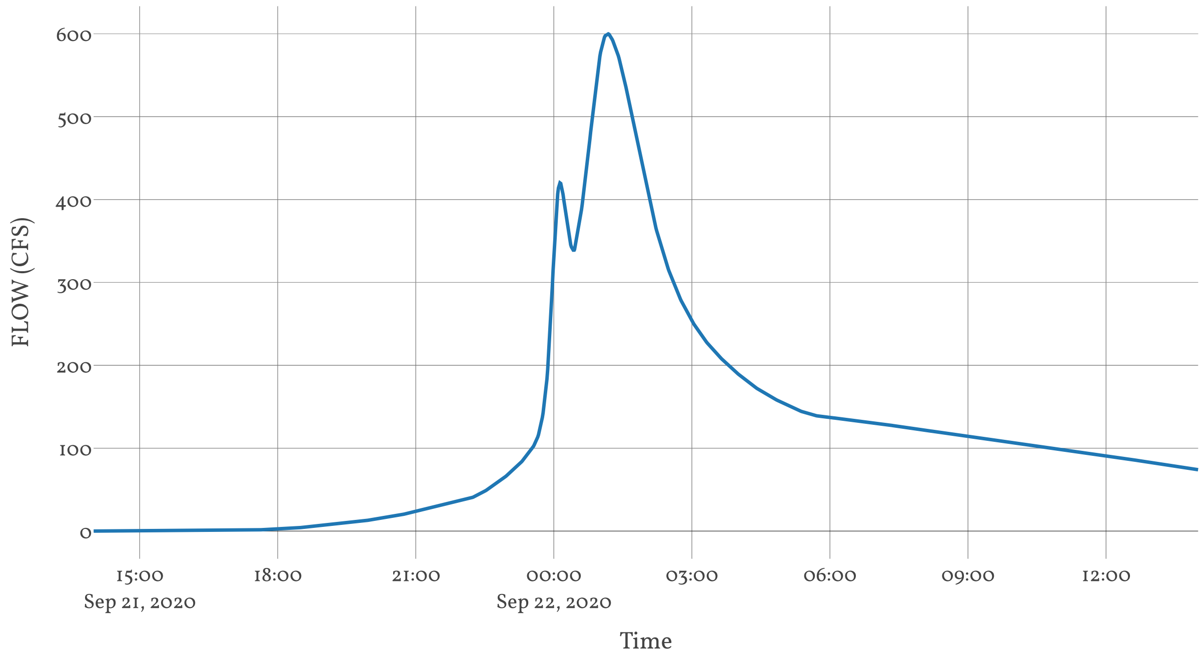
Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	599.85
Time of Peak Discharge	22Sep2020, 01:11
Volume (IN)	2.52

Outflow



Reach: 17R

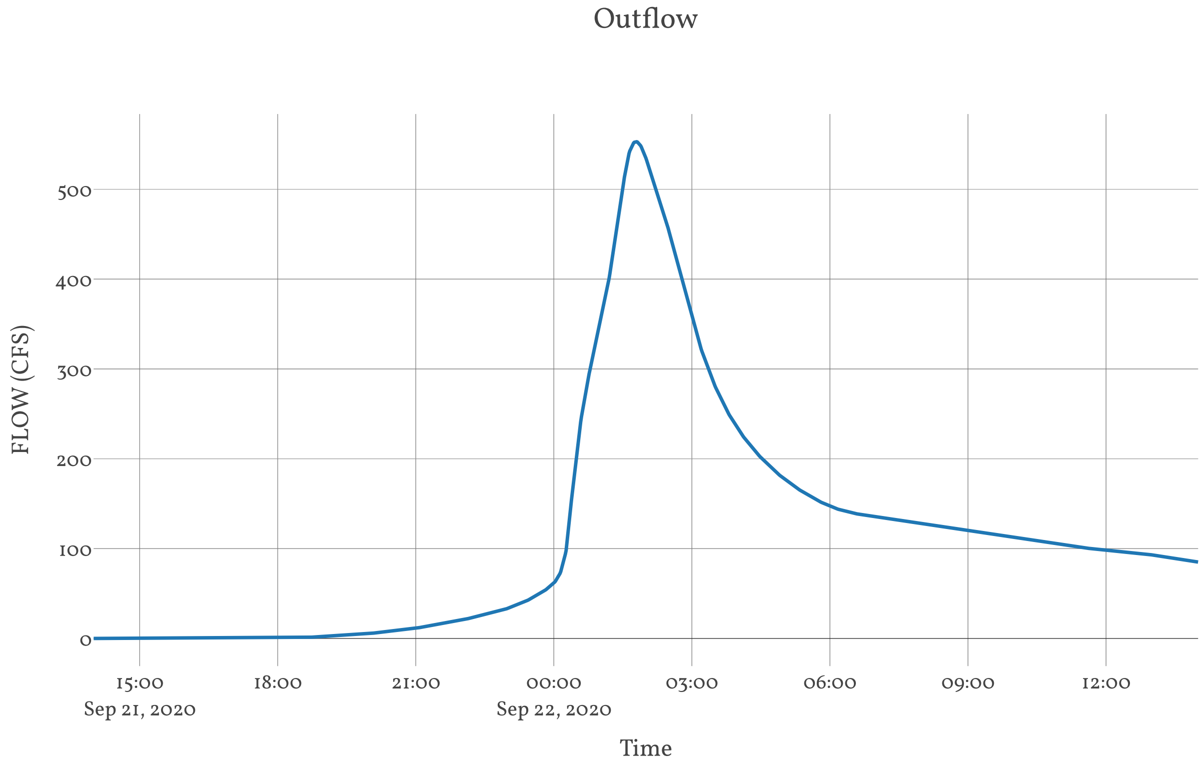
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	552.97
Time of Peak Discharge	22Sep2020, 01:47
Volume (IN)	2.43
Peak Inflow (CFS)	599.85
Inflow Volume (AC - FT)	238.98



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

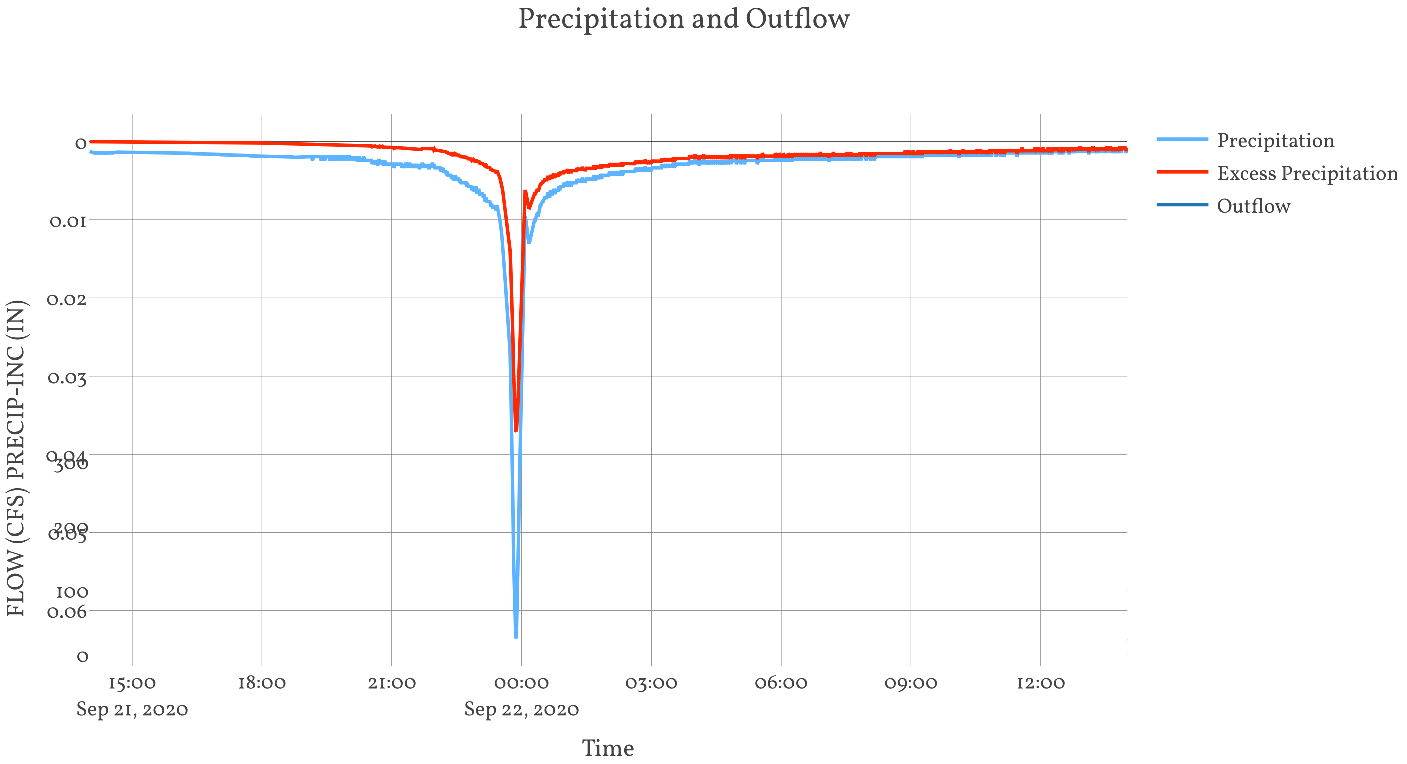
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	318.15
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	2.59
Precipitation Volume (AC - FT)	153.47
Loss Volume (AC - FT)	69.12
Excess Volume (AC - FT)	84.35
Direct Runoff Volume (AC - FT)	83.14
Baseflow Volume (AC - FT)	0

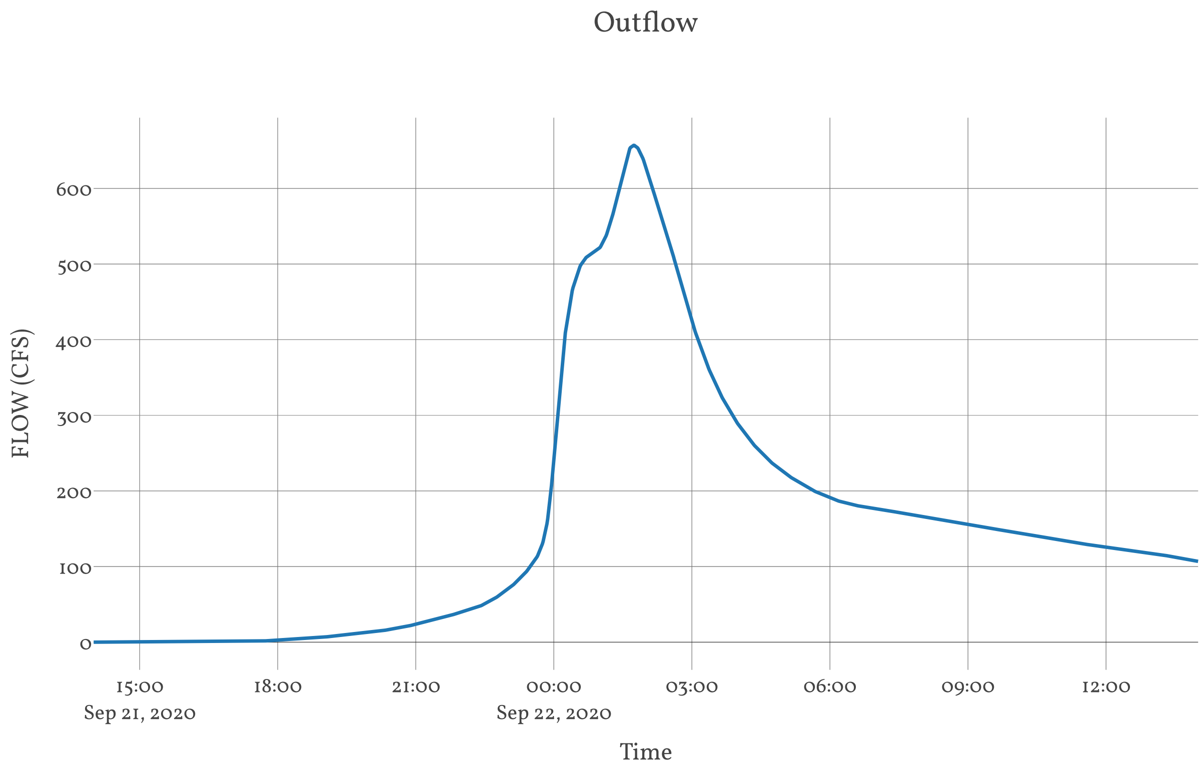

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	656.9
Time of Peak Discharge	22Sep2020, 01:44
Volume (IN)	2.47



Reach: 16R

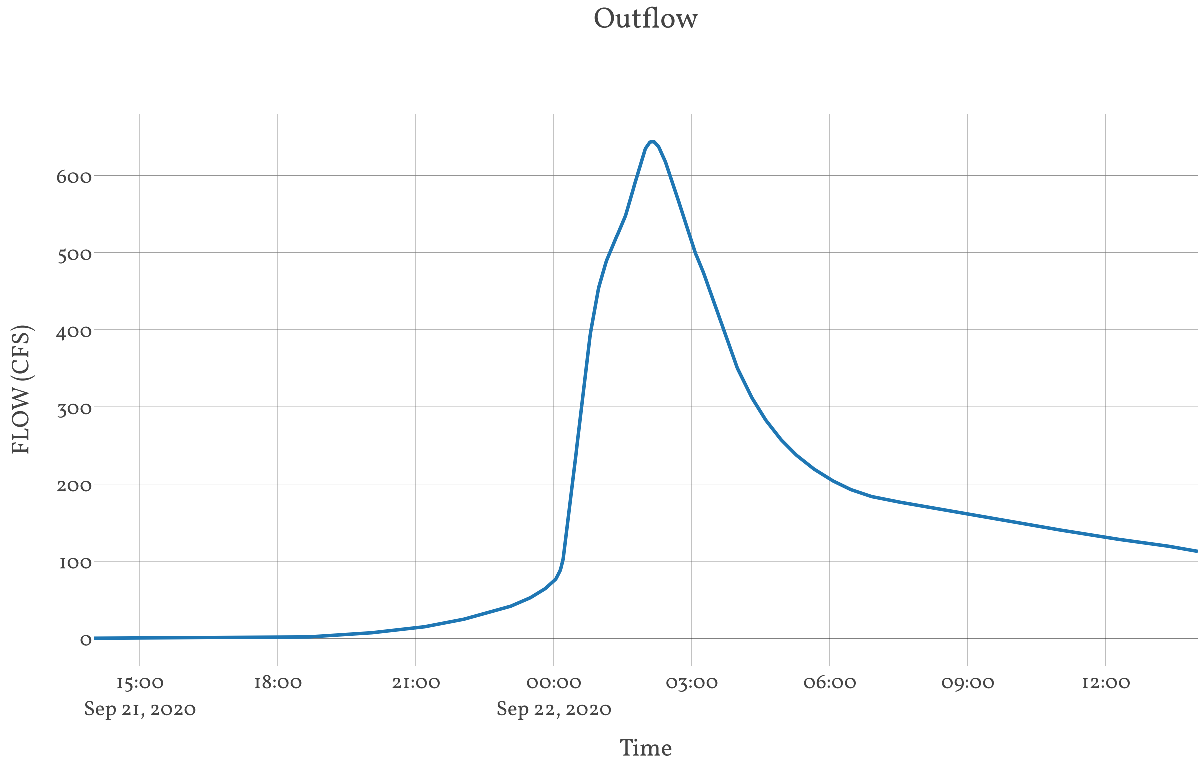
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	644.4
Time of Peak Discharge	22Sep2020, 02:08
Volume (IN)	2.4
Peak Inflow (CFS)	656.9
Inflow Volume (AC - FT)	313.31



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

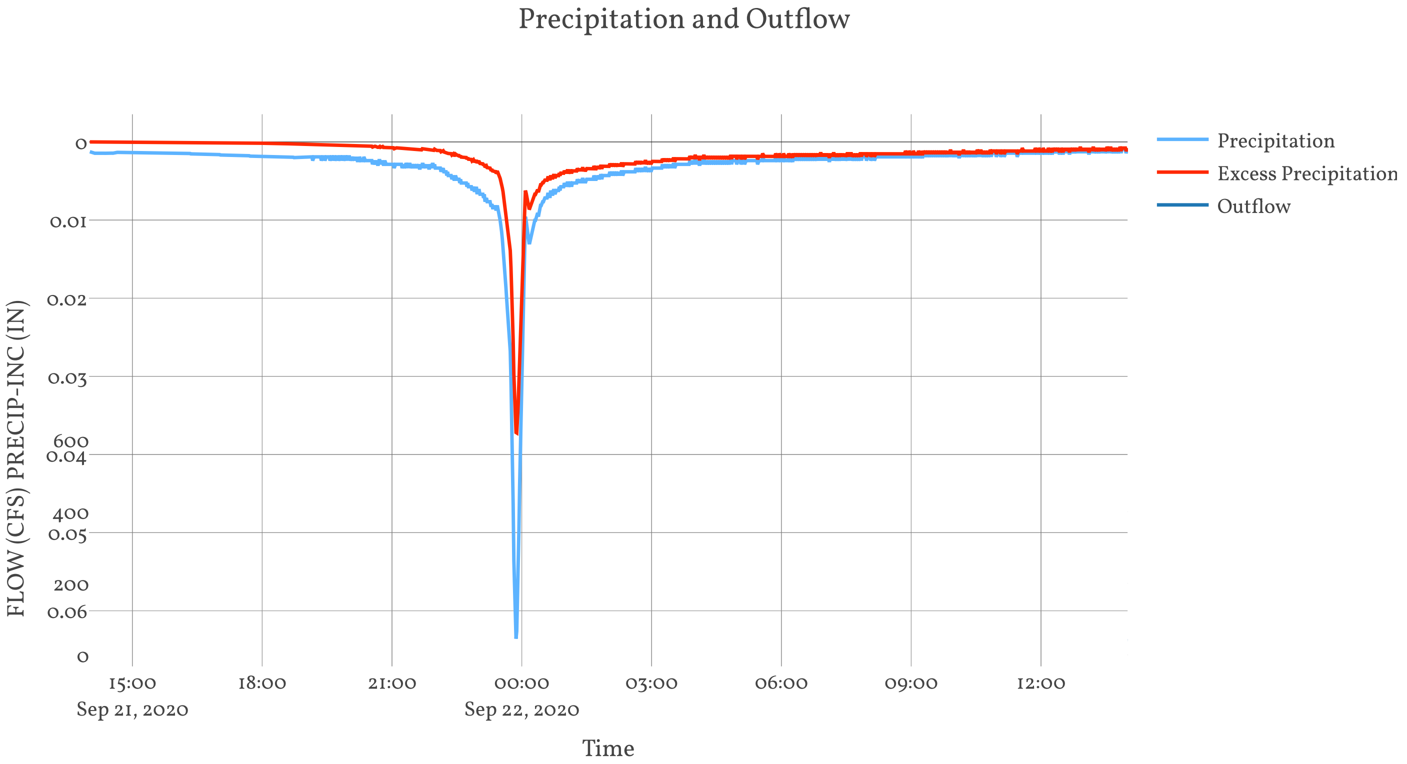
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	571.11
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	2.6
Precipitation Volume (AC - FT)	277.88
Loss Volume (AC - FT)	124.47
Excess Volume (AC - FT)	153.41
Direct Runoff Volume (AC - FT)	151.16
Baseflow Volume (AC - FT)	0

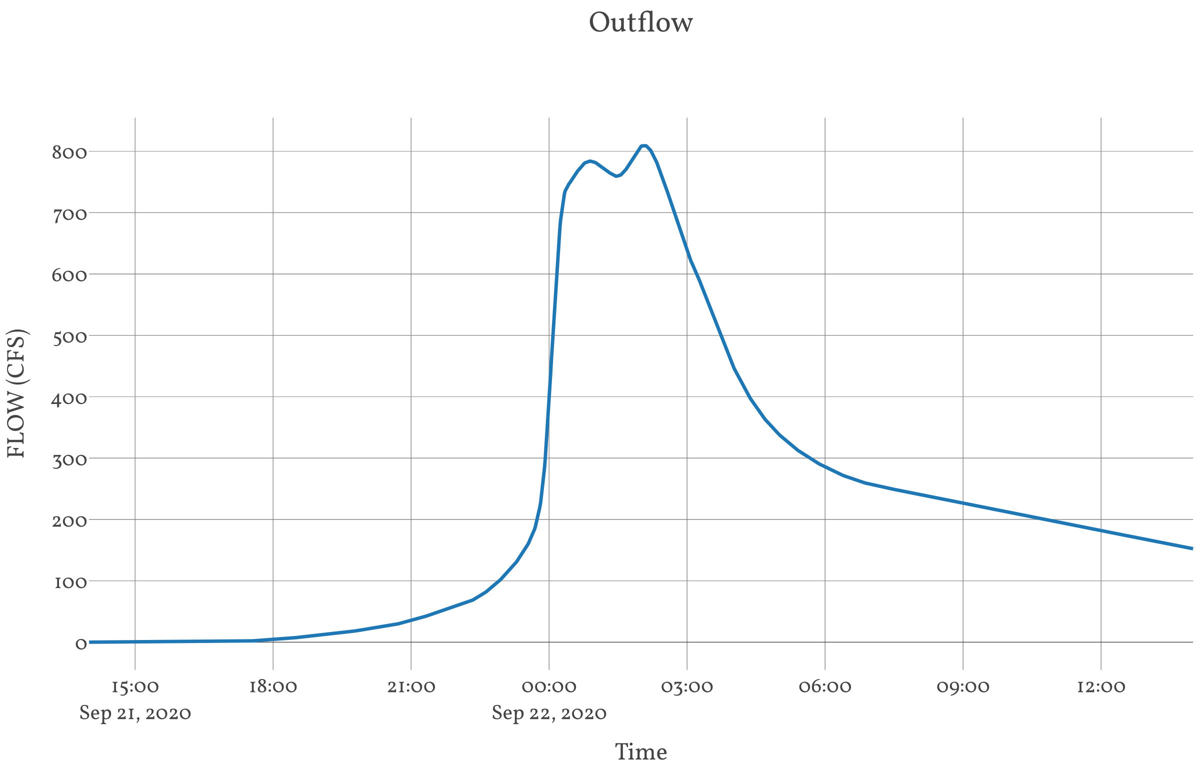

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	809.6
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.46



Reach: 20R

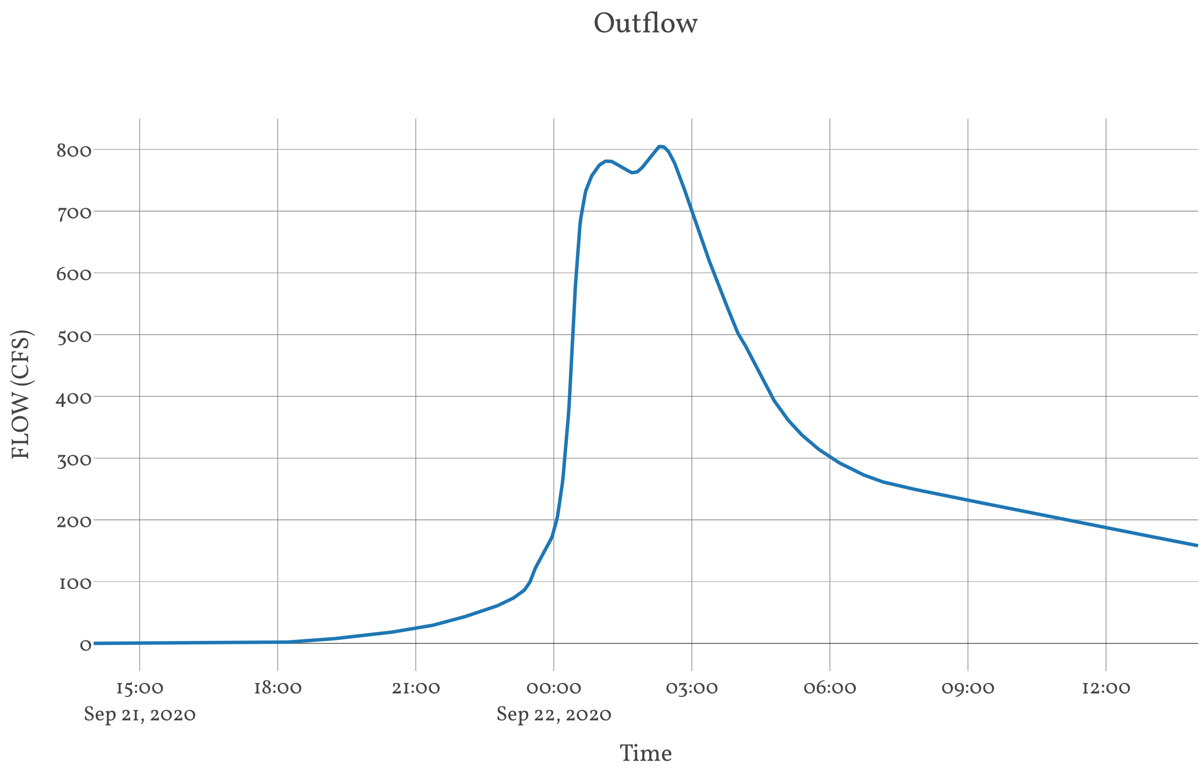
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	805.05
Time of Peak Discharge	22Sep2020, 02:20
Volume (IN)	2.42
Peak Inflow (CFS)	809.6
Inflow Volume (AC - FT)	455.71



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

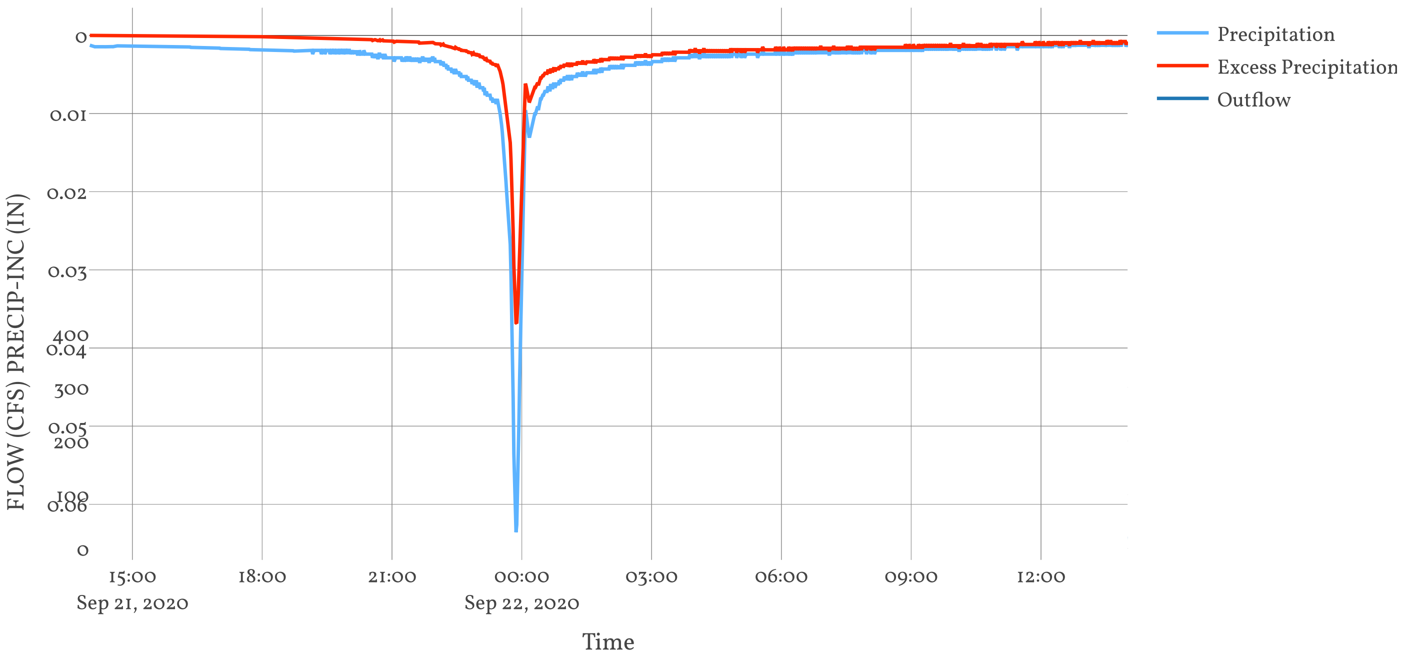
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	380.96
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	2.59
Precipitation Volume (AC - FT)	135.88
Loss Volume (AC - FT)	61.54
Excess Volume (AC - FT)	74.34
Direct Runoff Volume (AC - FT)	73.74
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

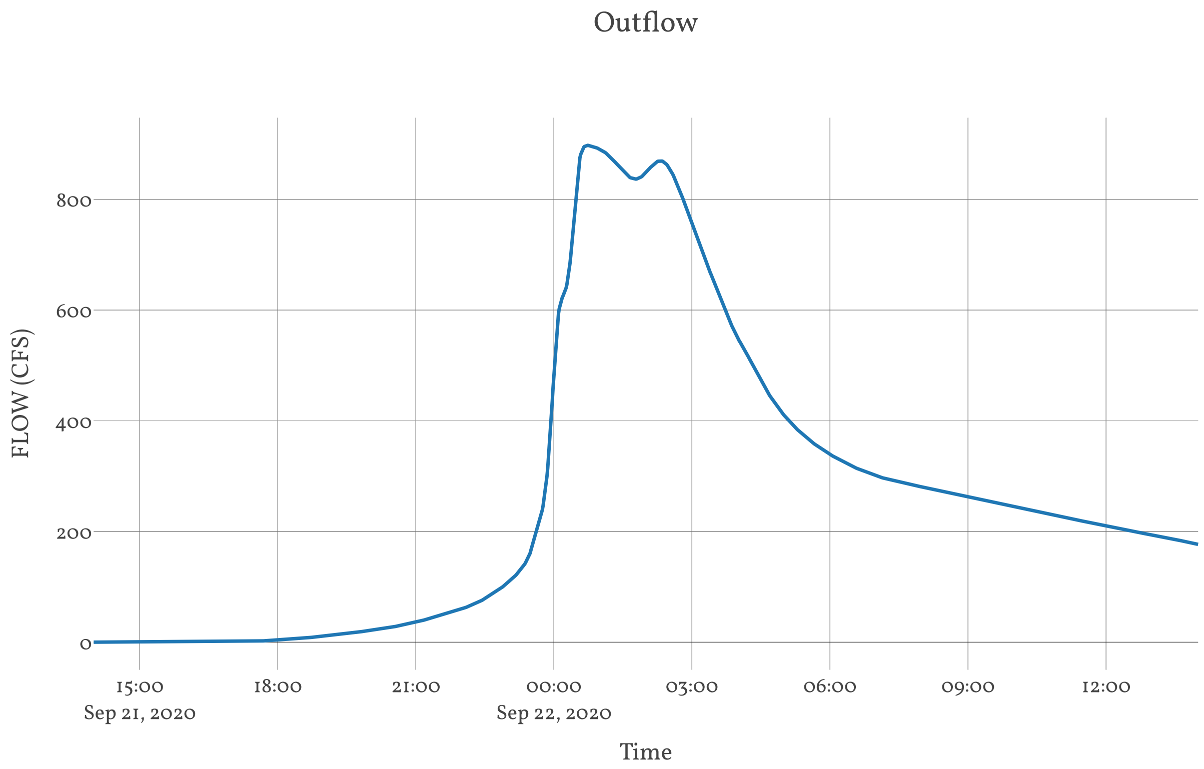


Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	897.56
Time of Peak Discharge	22Sep2020, 00:44
Volume (IN)	2.45



Reach: 15R

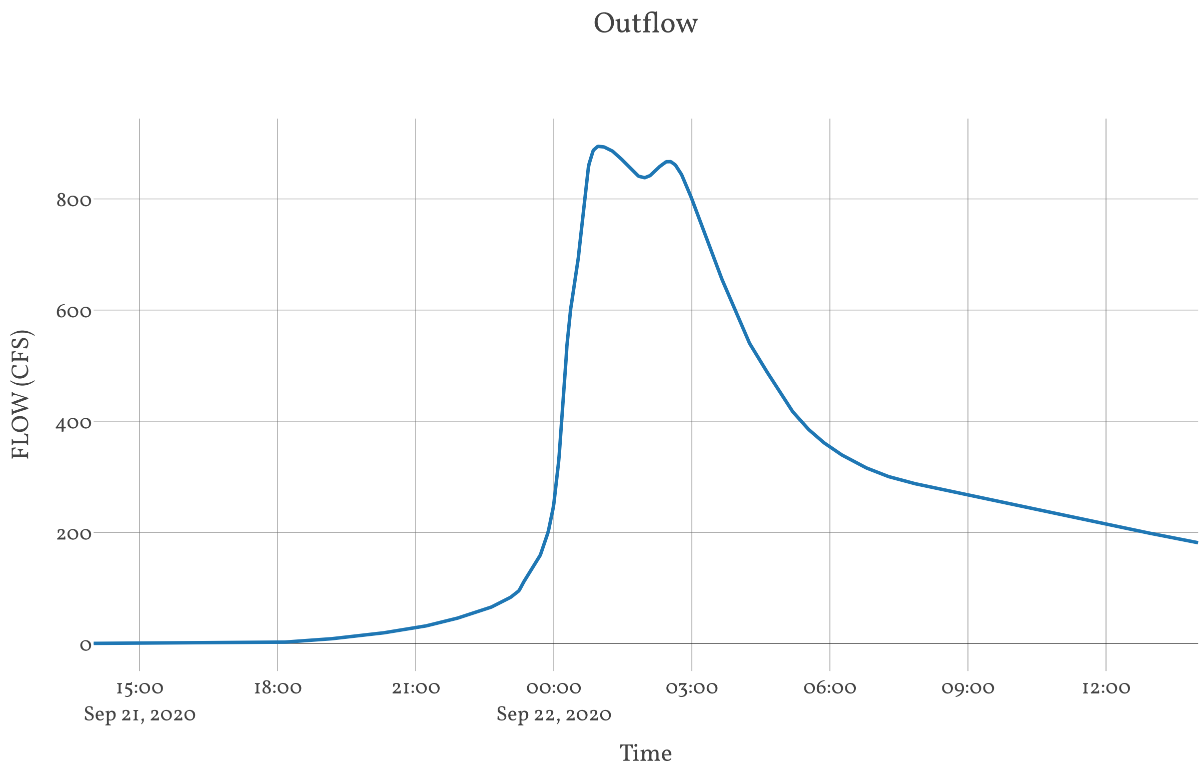
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	894.79
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	2.42
Peak Inflow (CFS)	897.56
Inflow Volume (AC - FT)	521.85



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

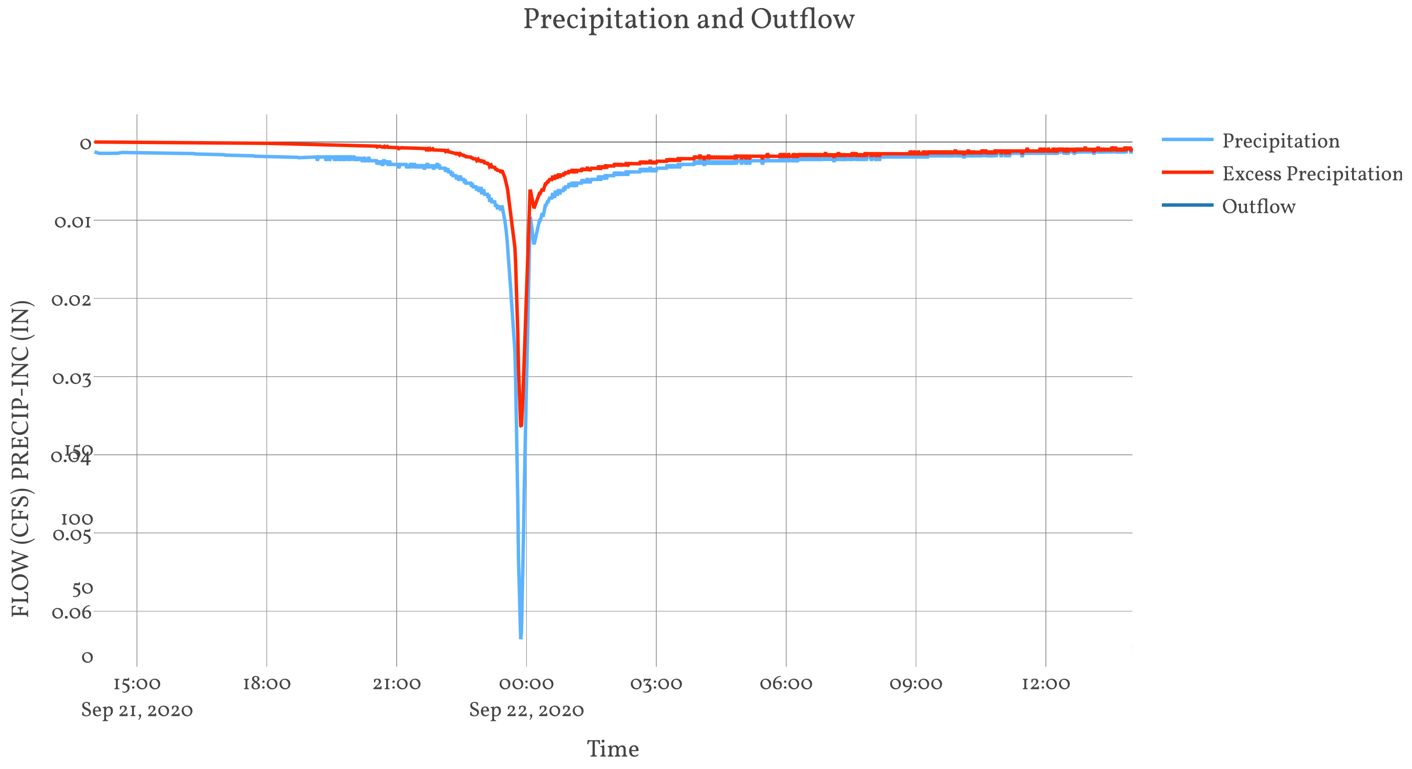
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	148.29
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	2.57
Precipitation Volume (AC - FT)	41.3
Loss Volume (AC - FT)	18.96
Excess Volume (AC - FT)	22.34
Direct Runoff Volume (AC - FT)	22.24
Baseflow Volume (AC - FT)	0

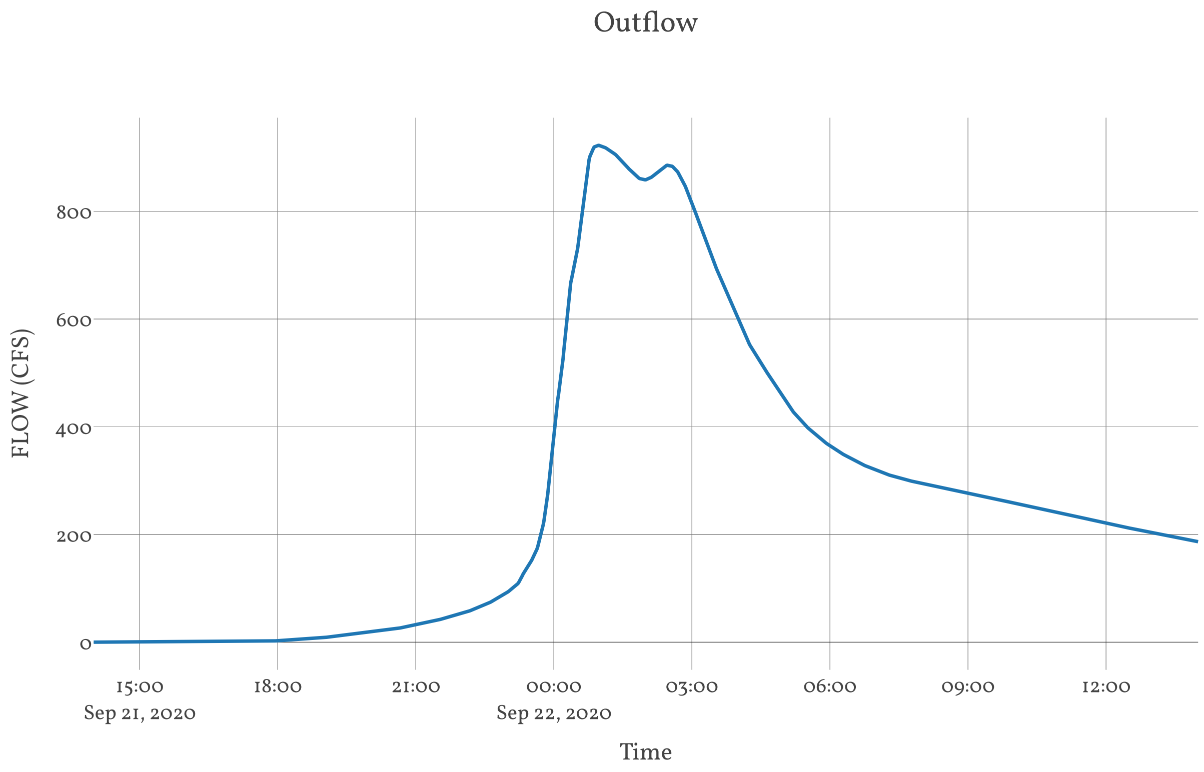

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	922.42
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	2.42



Reach: 14R

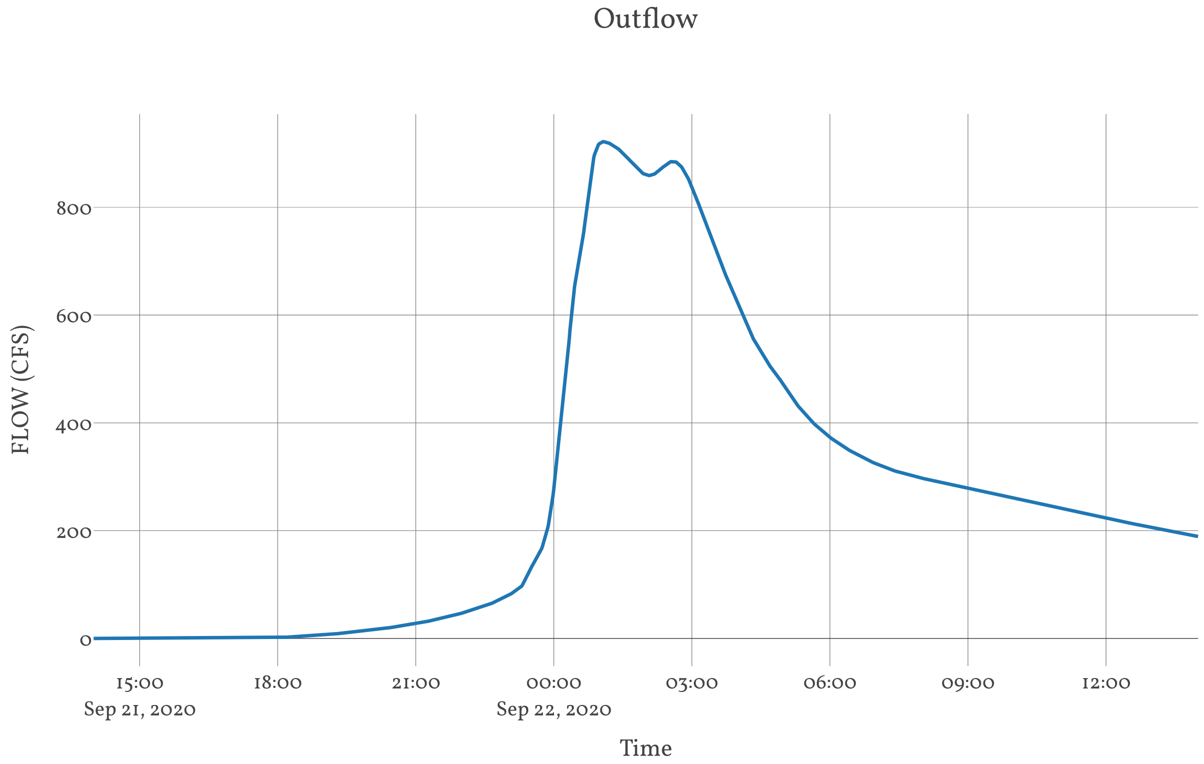
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	921.68
Time of Peak Discharge	22Sep2020, 01:05
Volume (IN)	2.41
Peak Inflow (CFS)	922.42
Inflow Volume (AC - FT)	538.39



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

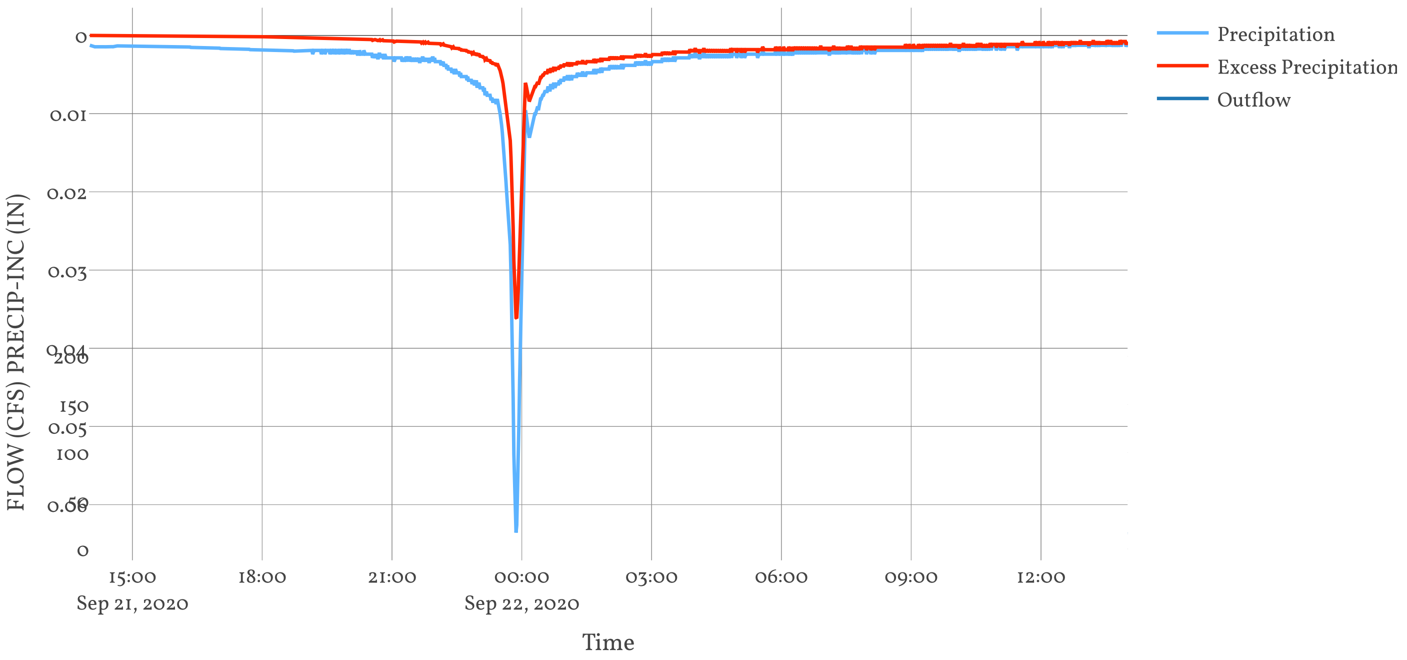
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	212.62
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	2.53
Precipitation Volume (AC - FT)	109.62
Loss Volume (AC - FT)	50.59
Excess Volume (AC - FT)	59.04
Direct Runoff Volume (AC - FT)	58.12
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

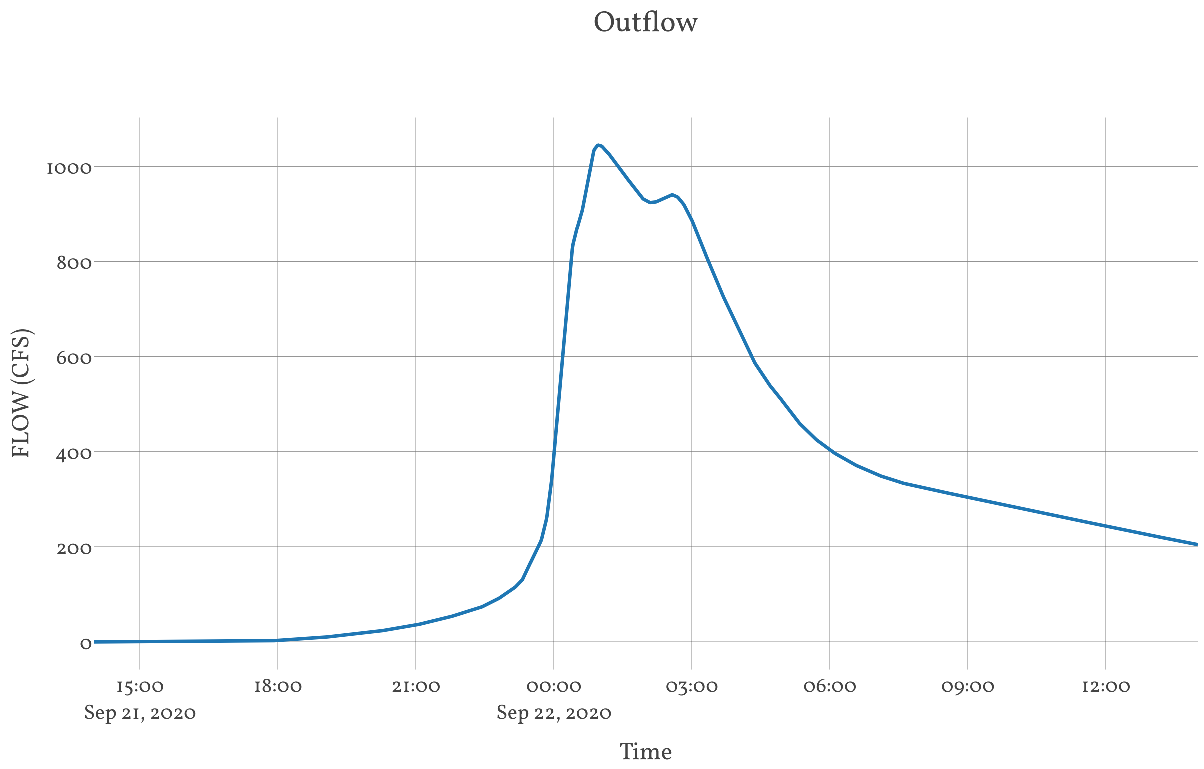


Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	1044.93
Time of Peak Discharge	22Sep2020, 00:59
Volume (IN)	2.42



Reach: 13R

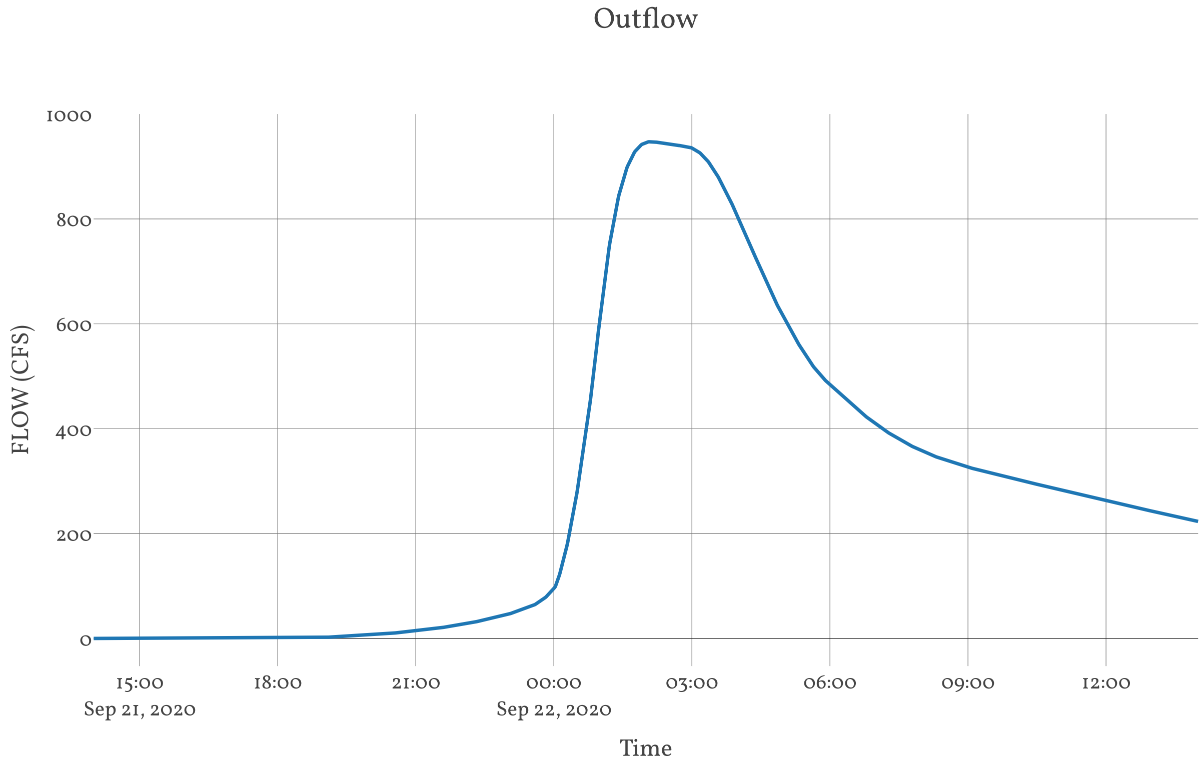
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	947.29
Time of Peak Discharge	22Sep2020, 02:07
Volume (IN)	2.32
Peak Inflow (CFS)	1044.93
Inflow Volume (AC - FT)	593.29



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

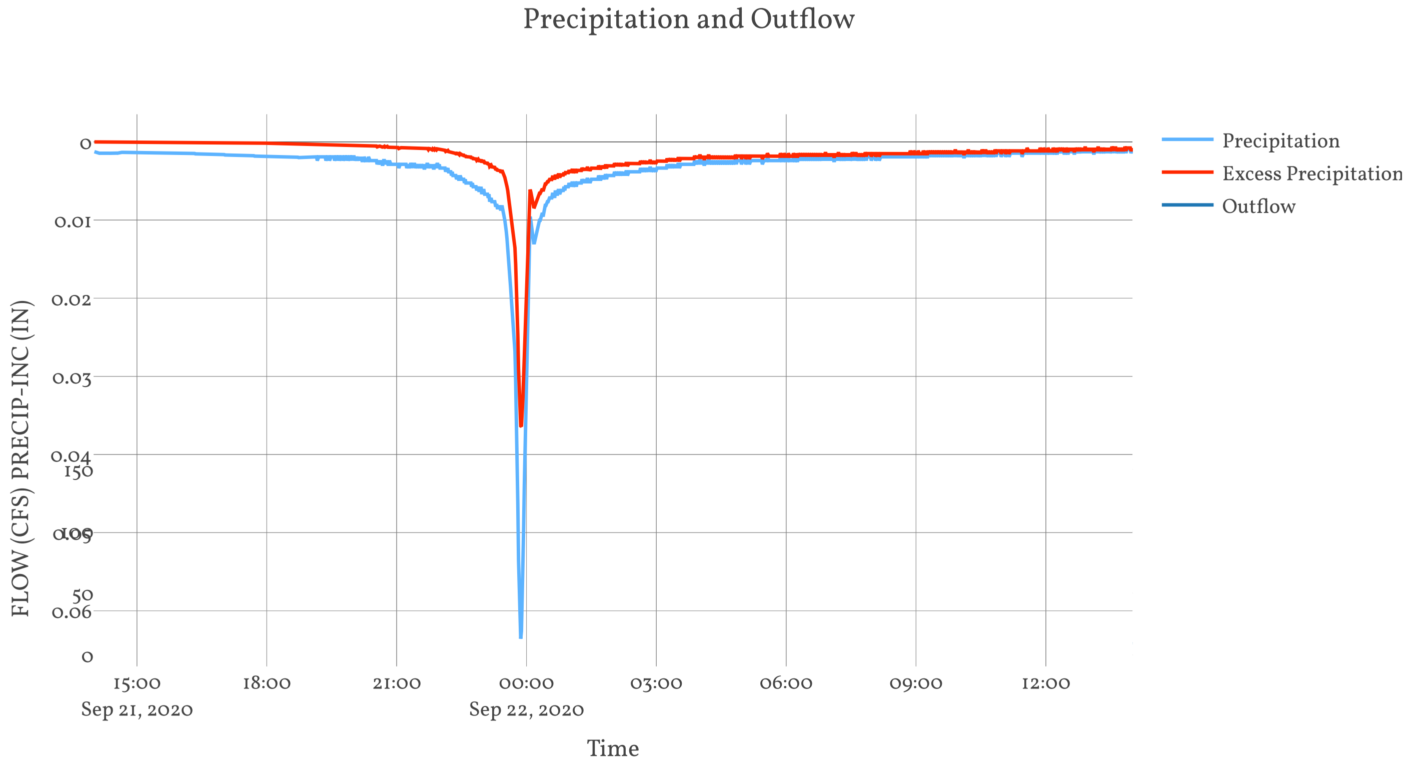
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	165.24
Time of Peak Discharge	22Sep2020, 00:10
Volume (IN)	2.57
Precipitation Volume (AC - FT)	65.01
Loss Volume (AC - FT)	29.78
Excess Volume (AC - FT)	35.23
Direct Runoff Volume (AC - FT)	34.89
Baseflow Volume (AC - FT)	0

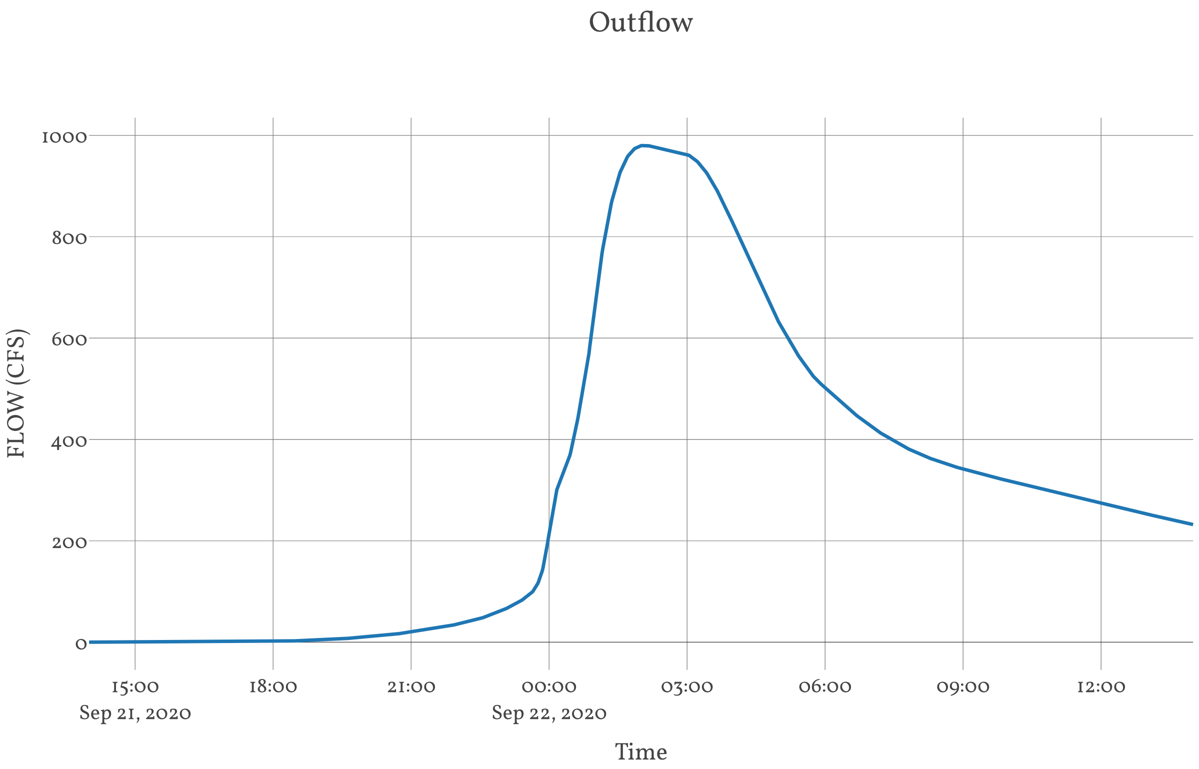

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

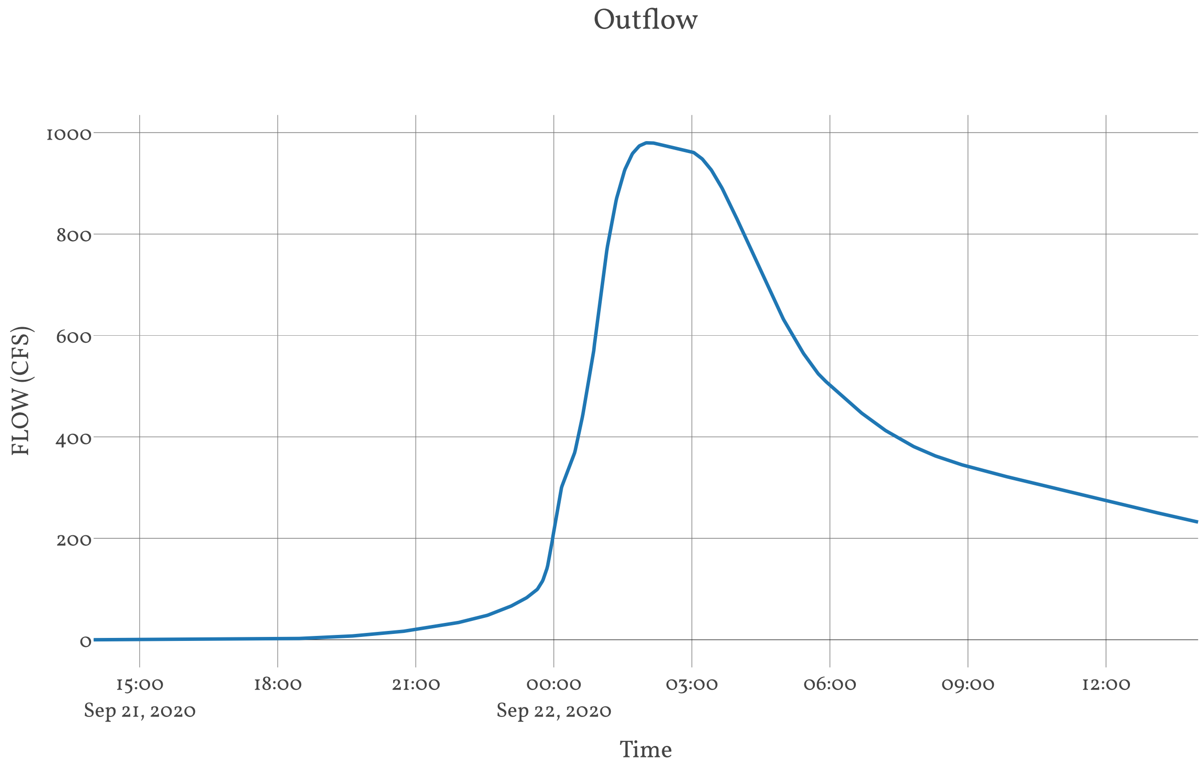
Peak Discharge (CFS)	980.23
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.33



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	980.23
Time of Peak Discharge	22Sep2020, 02:04
Volume (IN)	2.33
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 010-yr Post Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:43

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	398.39	22Sep2020, 00:24	3.41
61b	0.61	458.08	22Sep2020, 00:15	3.43
J 60b 61b	1.25	832.88	22Sep2020, 00:19	3.42
18r	1.25	702.52	22Sep2020, 01:04	3.29
62b	0.53	483.79	22Sep2020, 00:08	3.37
17c	1.78	845.88	22Sep2020, 01:02	3.32
17r	1.78	769.61	22Sep2020, 01:34	3.2
63b	0.6	424.27	22Sep2020, 00:17	3.4
16c	2.38	922.1	22Sep2020, 01:31	3.25
16r	2.38	904.53	22Sep2020, 01:54	3.18
64b	1.09	761.01	22Sep2020, 00:18	3.41
20c	3.47	1142.12	22Sep2020, 01:48	3.25
20r	3.47	1137.47	22Sep2020, 02:02	3.2
65b	0.53	507.77	22Sep2020, 00:07	3.41
15c	4	1274.95	22Sep2020, 01:00	3.23
15r	4	1270.86	22Sep2020, 01:10	3.2
66b	0.16	197.61	22Sep2020, 00:02	3.38
14c	4.16	1303.35	22Sep2020, 01:09	3.21
14r	4.16	1302.34	22Sep2020, 01:14	3.19
67b	0.43	284.32	22Sep2020, 00:19	3.34
13c	4.59	1446.43	22Sep2020, 00:55	3.2
13r	4.59	1349.74	22Sep2020, 01:54	3.09
68b	0.26	220.54	22Sep2020, 00:09	3.37

12c	4.85	1395.21	22Sep2020, 01:51	3.1
Pacific Ocean	4.85	1395.21	22Sep2020, 01:51	3.1

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

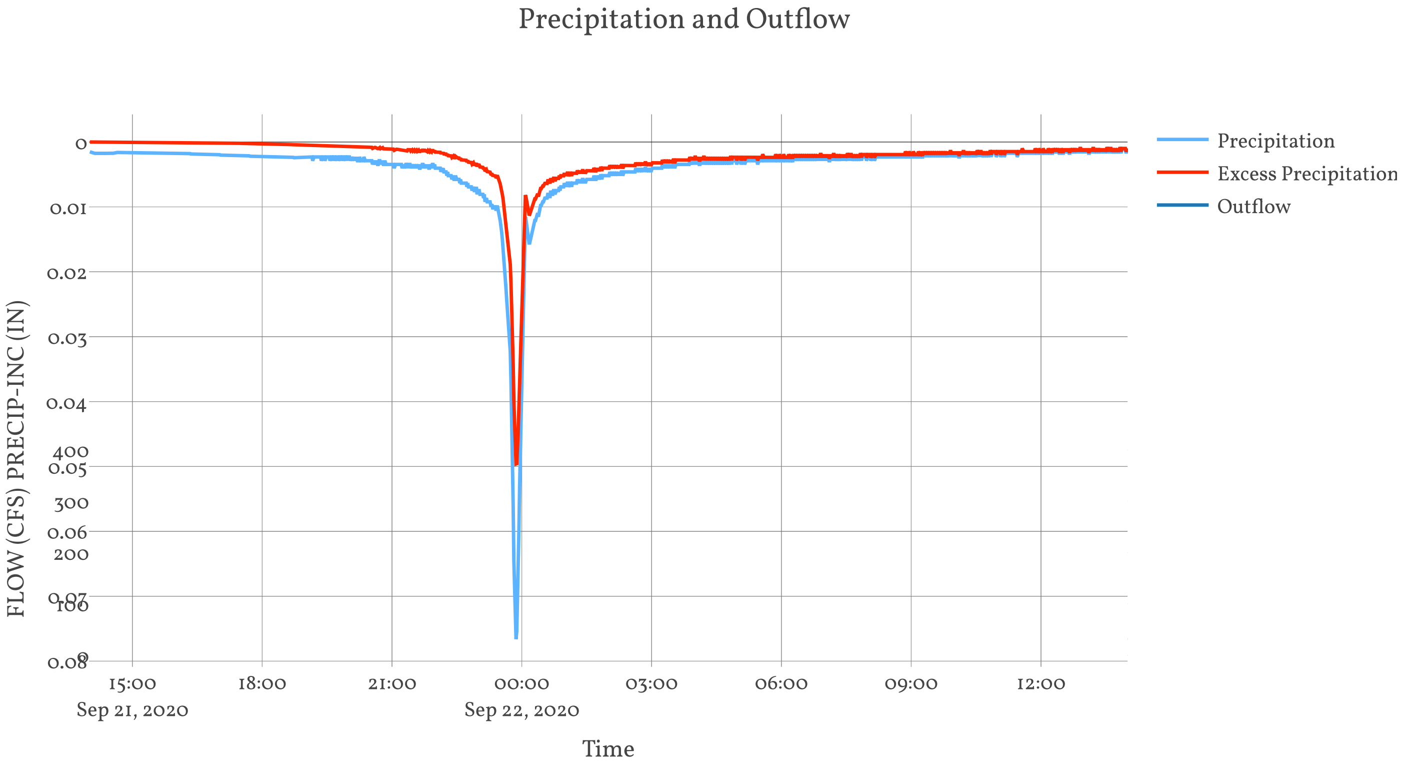
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	398.39
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	3.41
Precipitation Volume (AC - FT)	198.14
Loss Volume (AC - FT)	78.57
Excess Volume (AC - FT)	119.58
Direct Runoff Volume (AC - FT)	117.46
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

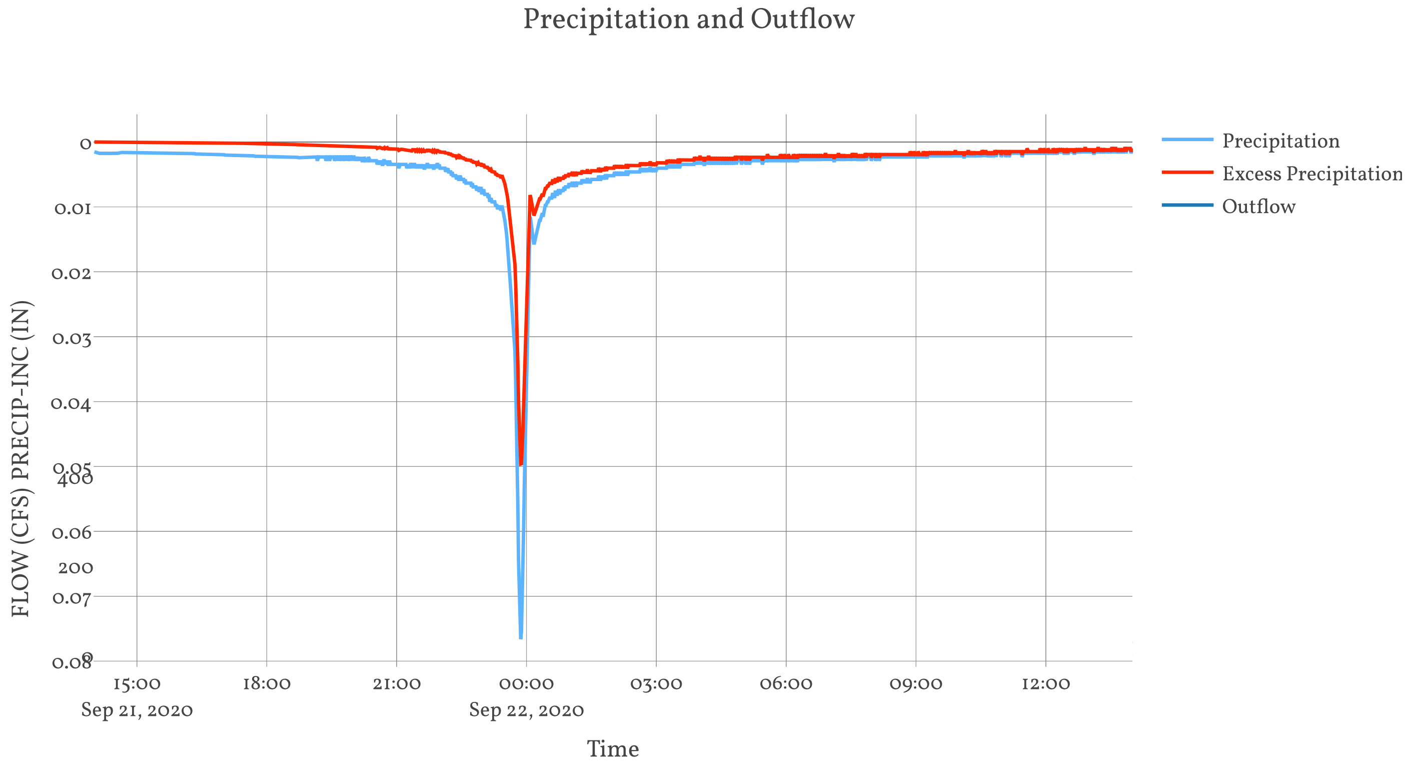
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	458.08
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	3.43
Precipitation Volume (AC - FT)	186.16
Loss Volume (AC - FT)	73.82
Excess Volume (AC - FT)	112.35
Direct Runoff Volume (AC - FT)	110.97
Baseflow Volume (AC - FT)	0

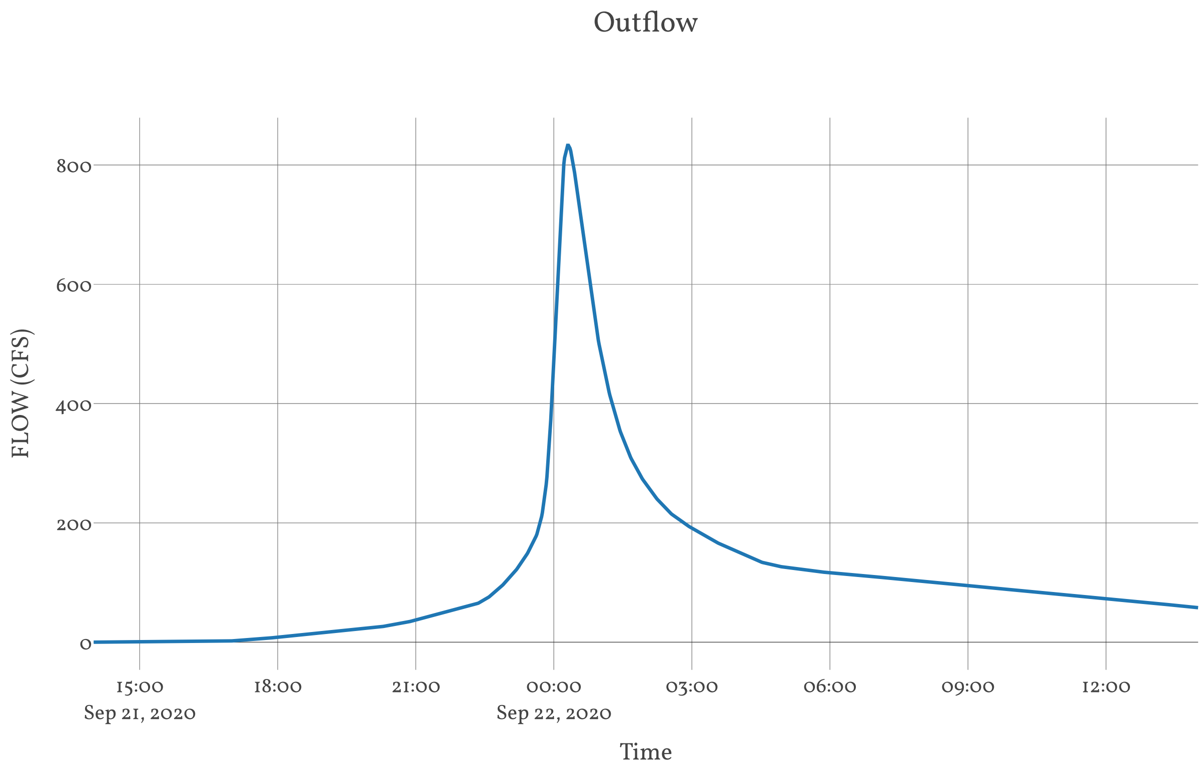

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
400
0.06
200
0.07
0.08
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	832.88
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	3.42



Reach: 18R

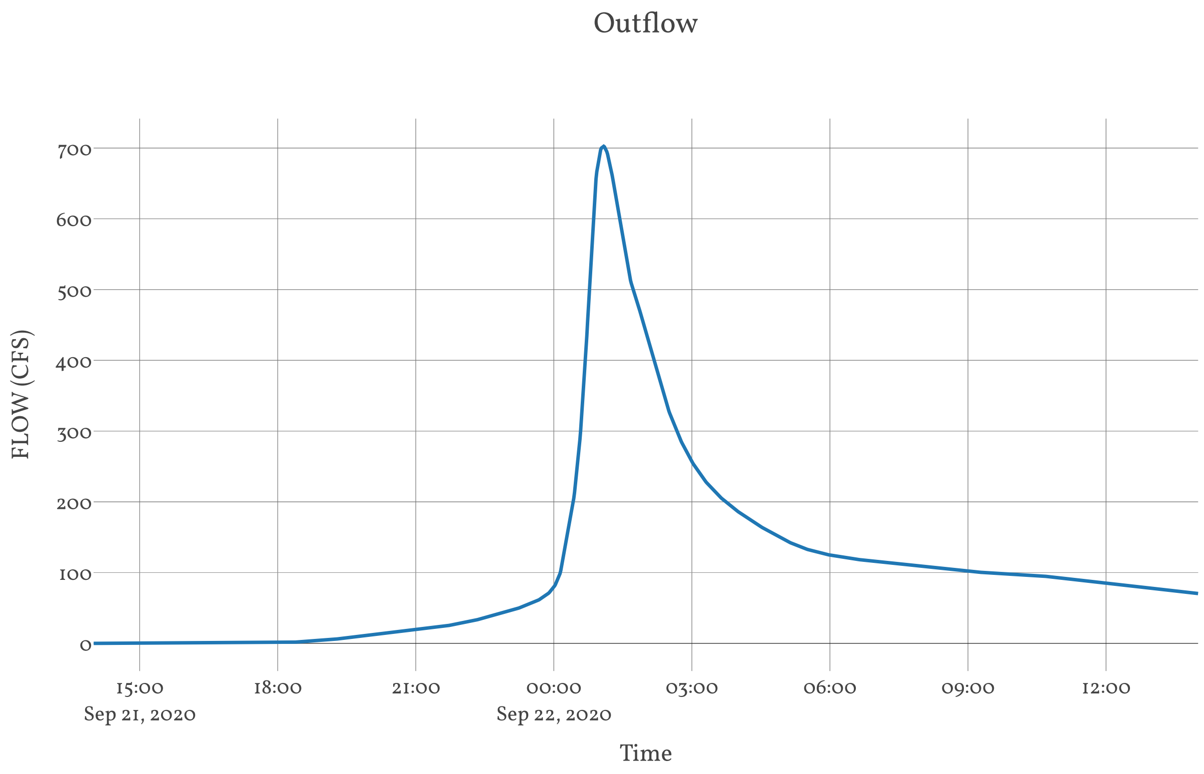
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	702.52
Time of Peak Discharge	22Sep2020, 01:04
Volume (IN)	3.29
Peak Inflow (CFS)	832.88
Inflow Volume (AC - FT)	228.43



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

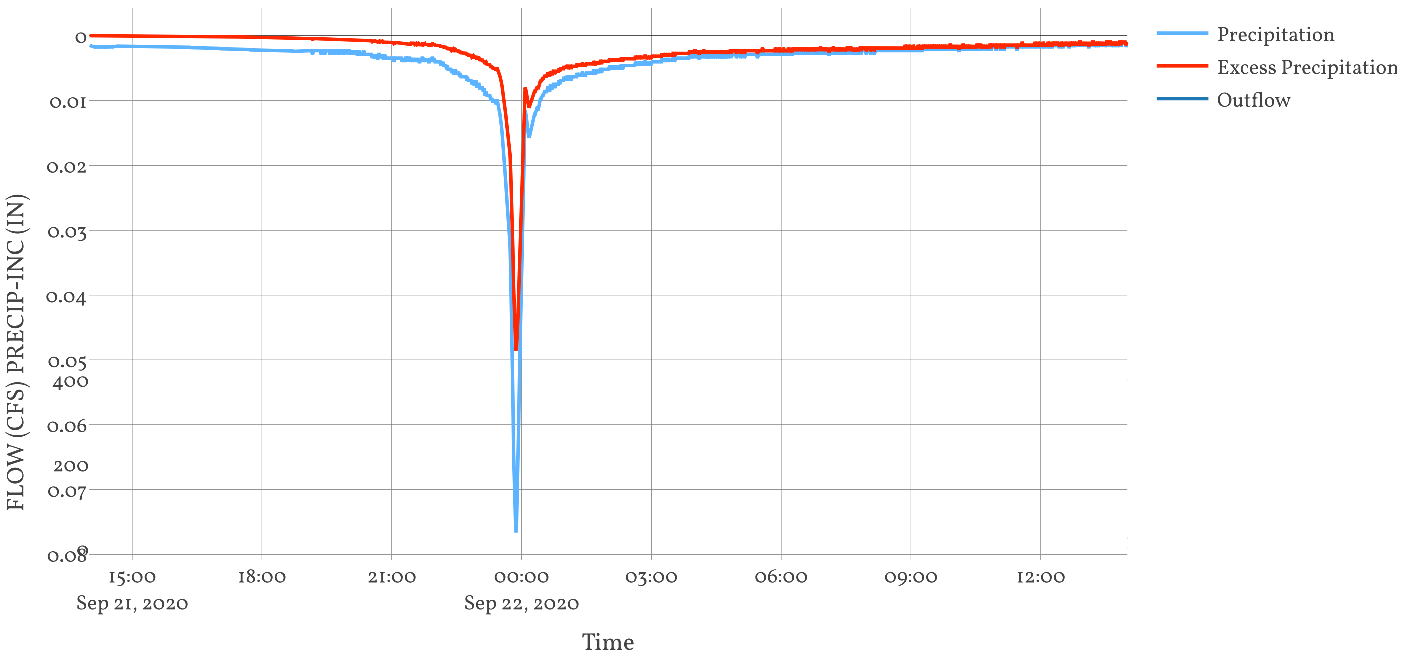
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	483.79
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	3.37
Precipitation Volume (AC - FT)	161.46
Loss Volume (AC - FT)	66.15
Excess Volume (AC - FT)	95.31
Direct Runoff Volume (AC - FT)	94.53
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

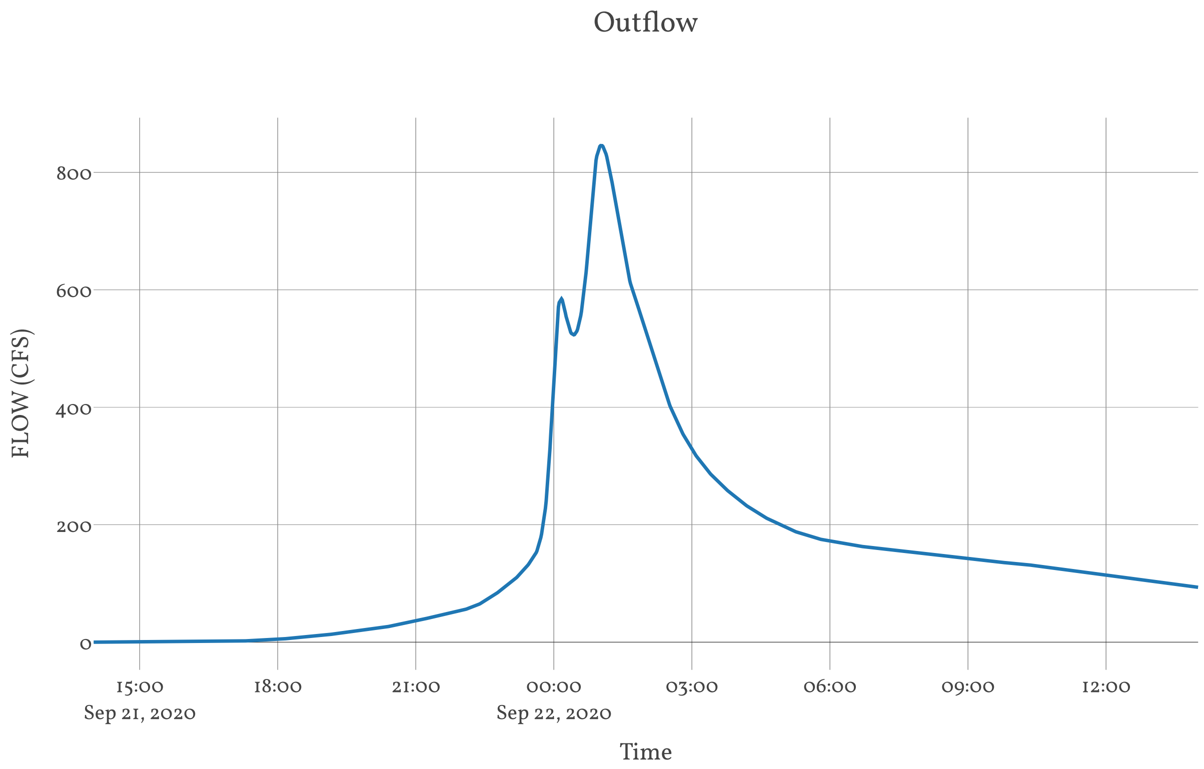


Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	845.88
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	3.32



Reach: 17R

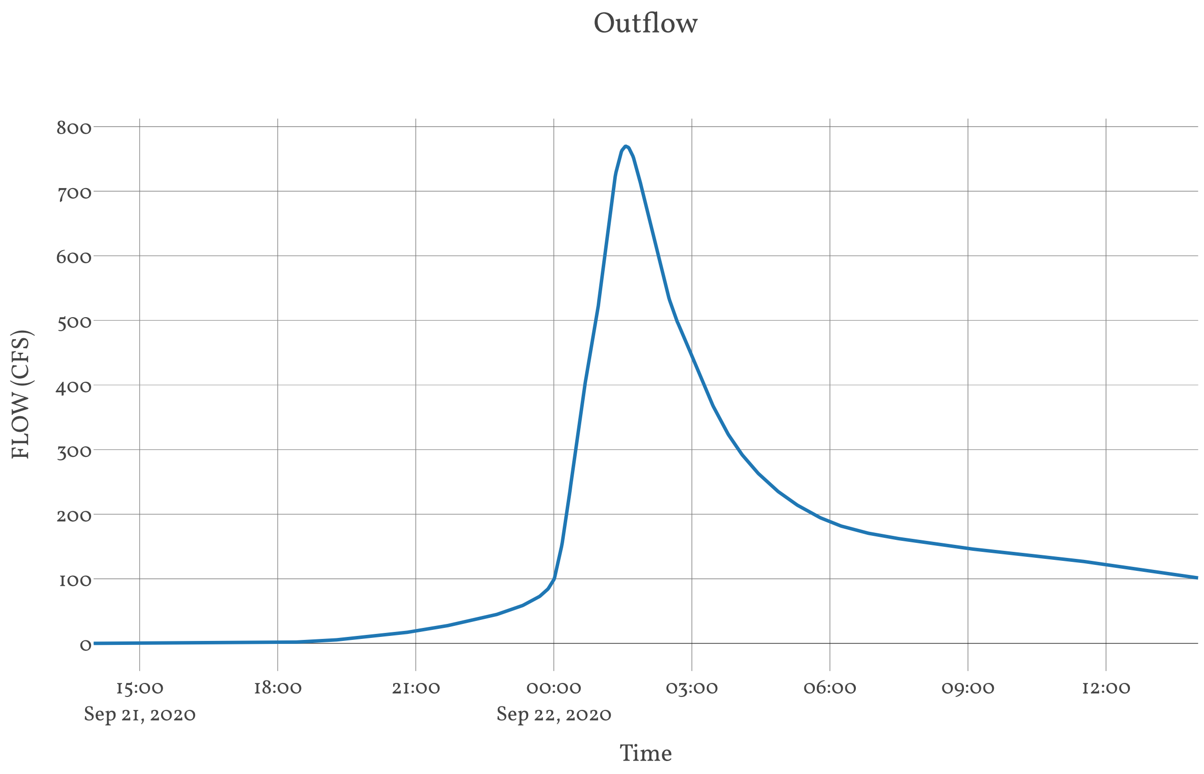
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	769.61
Time of Peak Discharge	22Sep2020, 01:34
Volume (IN)	3.2
Peak Inflow (CFS)	845.88
Inflow Volume (AC - FT)	314.17



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

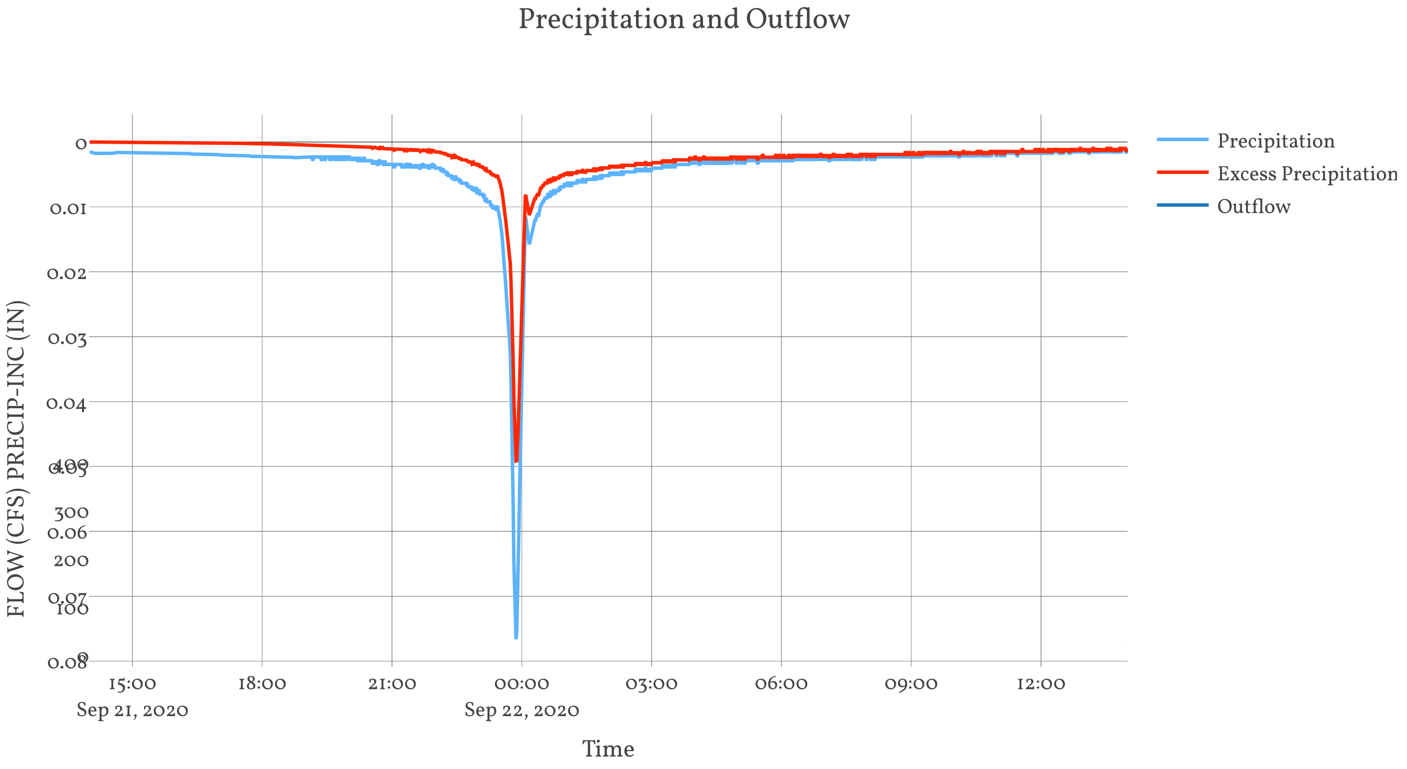
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	424.27
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	3.4
Precipitation Volume (AC - FT)	184.93
Loss Volume (AC - FT)	74.22
Excess Volume (AC - FT)	110.71
Direct Runoff Volume (AC - FT)	109.19
Baseflow Volume (AC - FT)	0

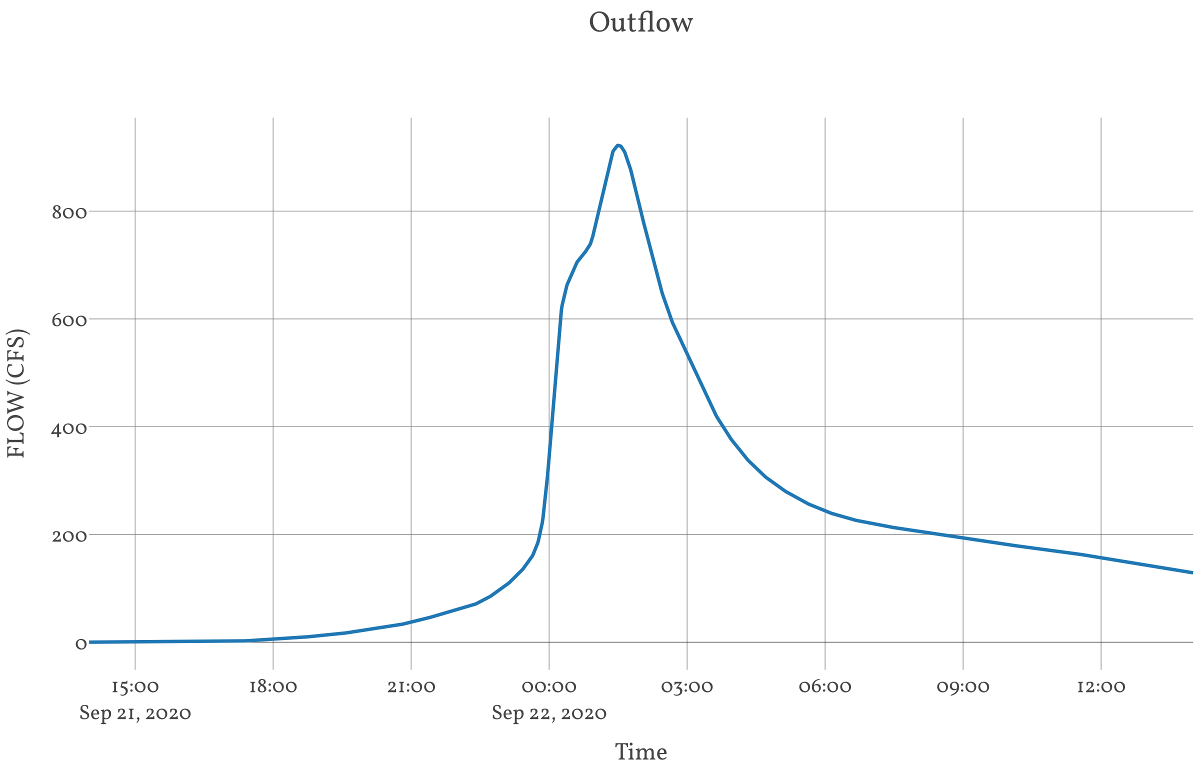

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
400
300
200
100
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	922.1
Time of Peak Discharge	22Sep2020, 01:31
Volume (IN)	3.25



Reach: 16R

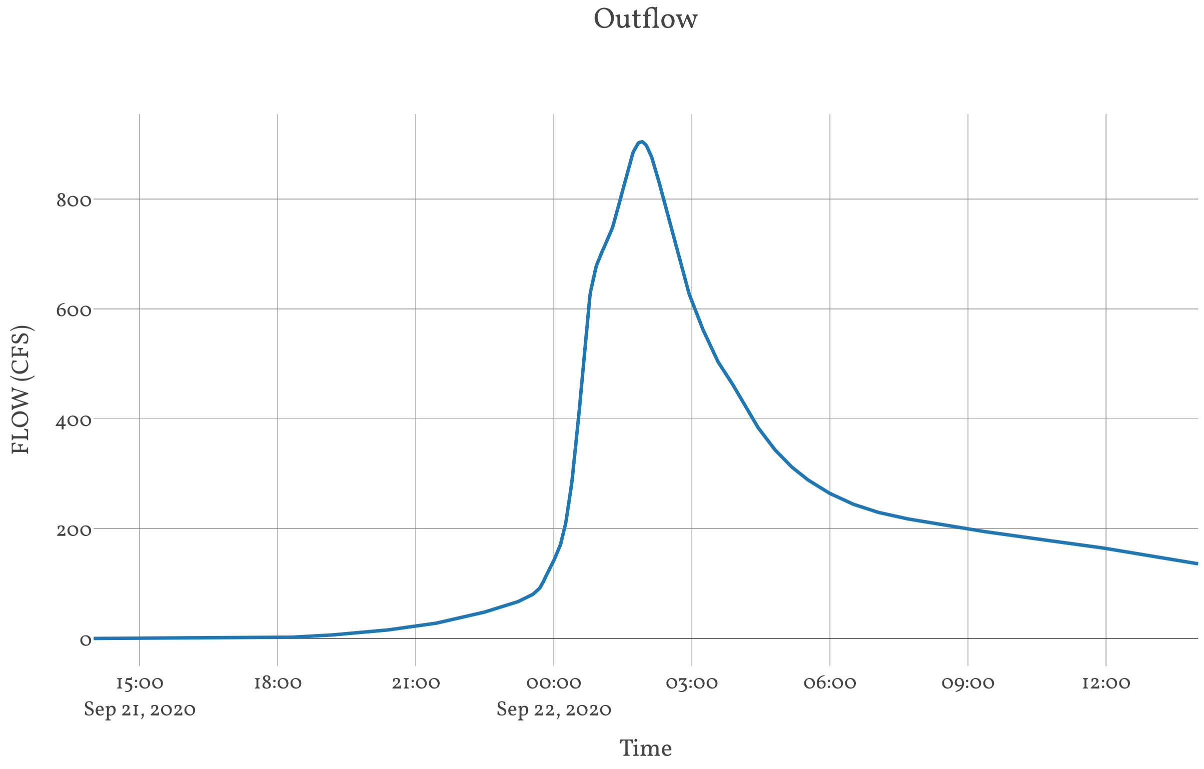
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	904.53
Time of Peak Discharge	22Sep2020, 01:54
Volume (IN)	3.18
Peak Inflow (CFS)	922.1
Inflow Volume (AC - FT)	412.59



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

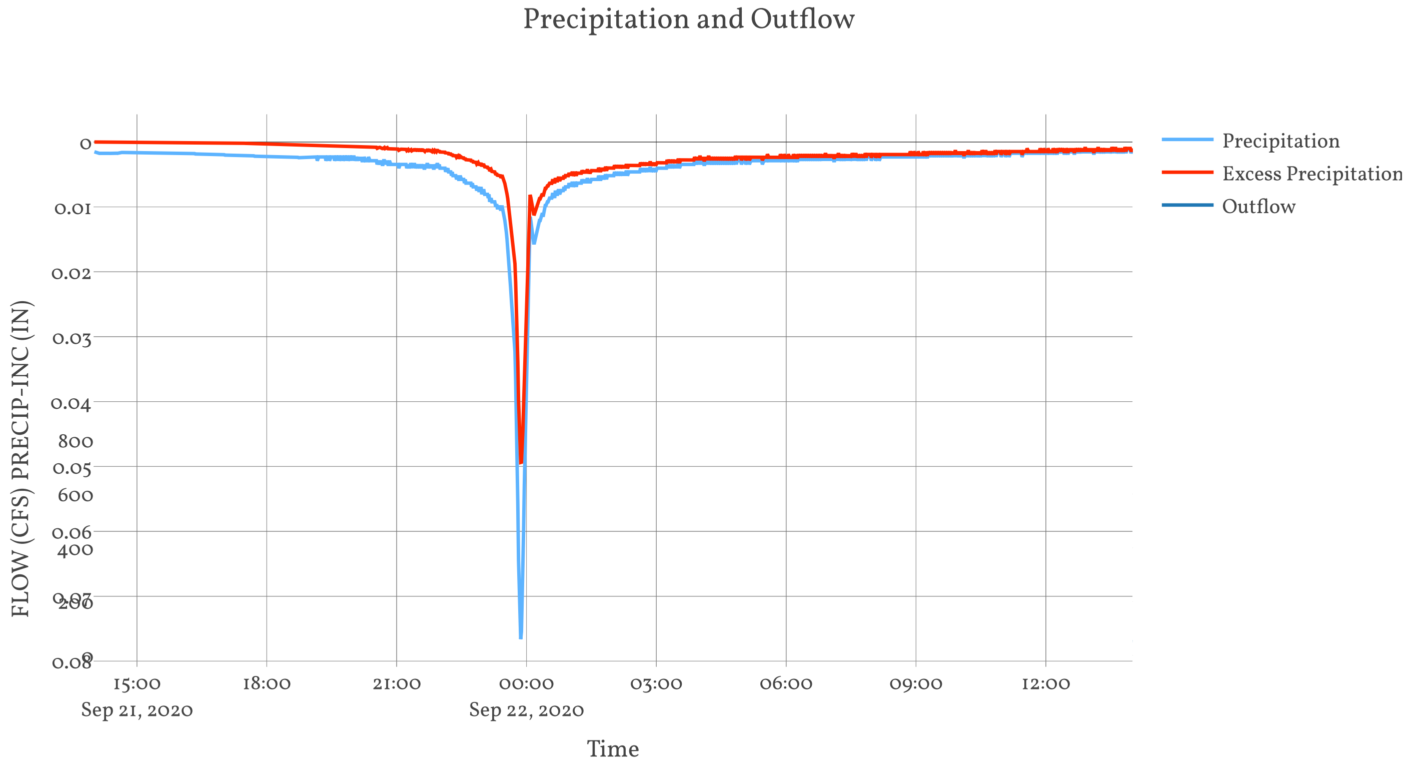
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	761.01
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	3.41
Precipitation Volume (AC - FT)	334.85
Loss Volume (AC - FT)	133.58
Excess Volume (AC - FT)	201.27
Direct Runoff Volume (AC - FT)	198.44
Baseflow Volume (AC - FT)	0

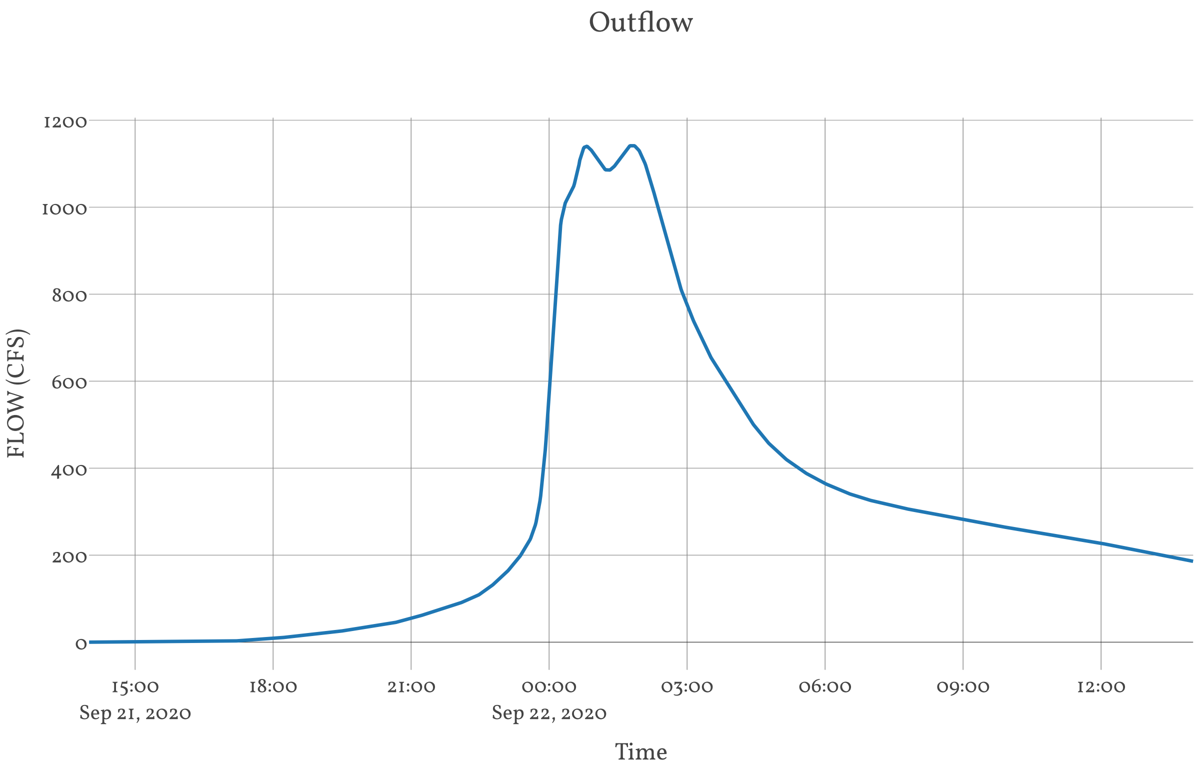

Precipitation and Outflow
0
0.01
0.02
0.03
0.04
800
0.05
600
0.06
400
0.07
200
0.08
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	1142.12
Time of Peak Discharge	22Sep2020, 01:48
Volume (IN)	3.25



Reach: 20R

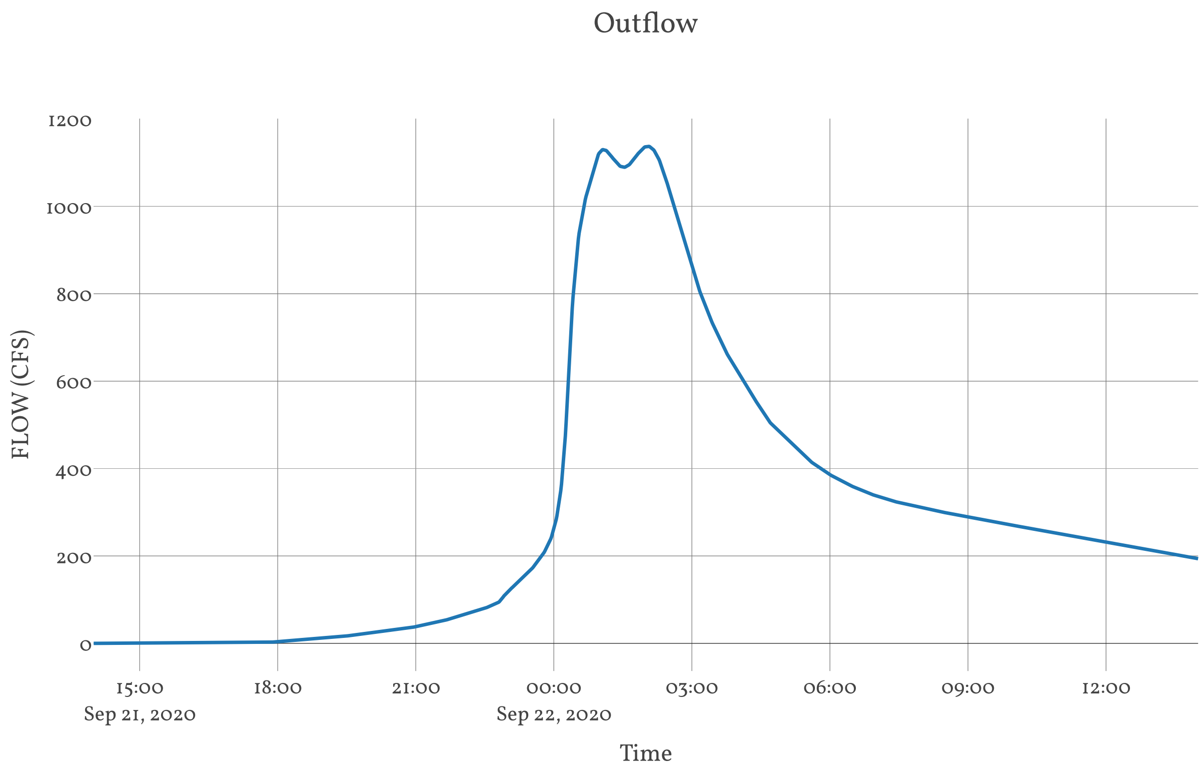
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	1137.47
Time of Peak Discharge	22Sep2020, 02:02
Volume (IN)	3.2
Peak Inflow (CFS)	1142.12
Inflow Volume (AC - FT)	601.28



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

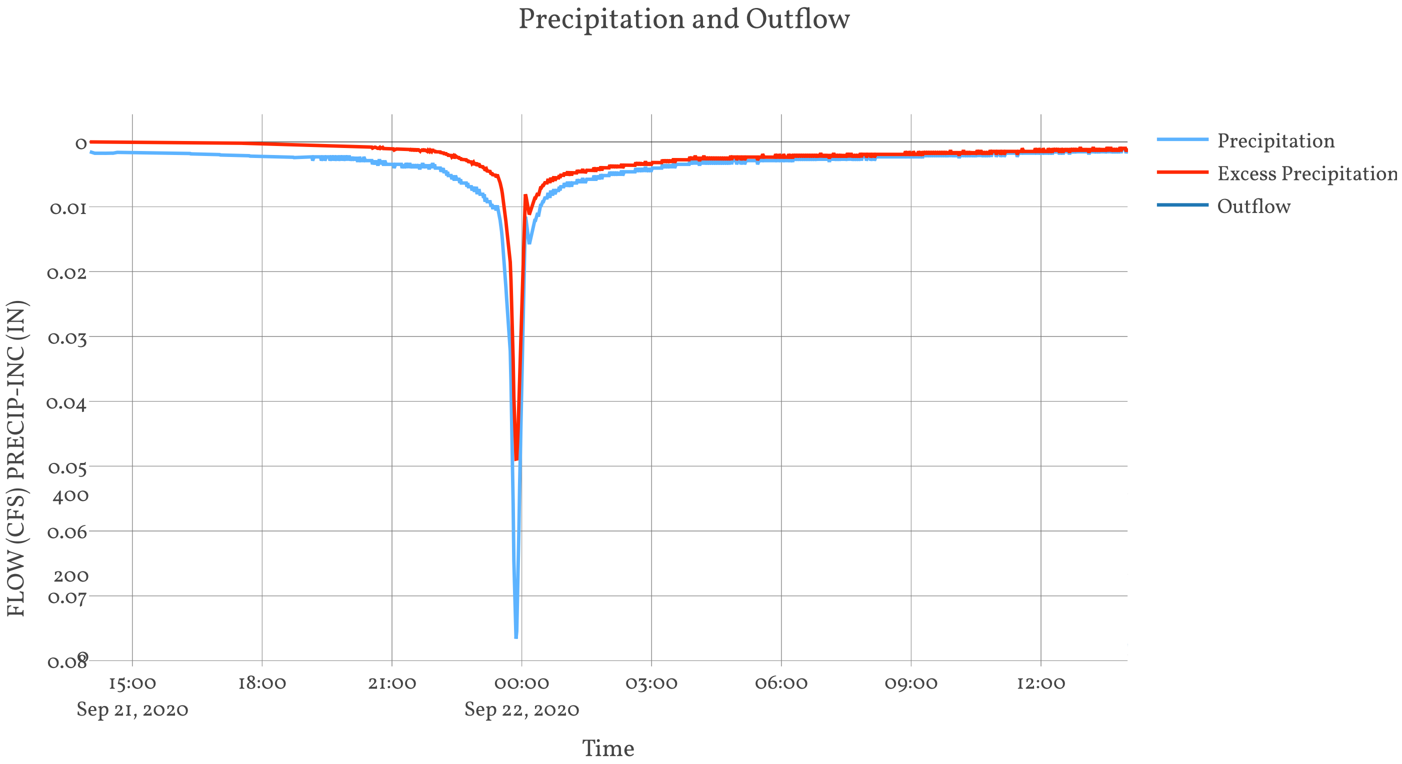
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	507.77
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	3.41
Precipitation Volume (AC - FT)	163.74
Loss Volume (AC - FT)	66.11
Excess Volume (AC - FT)	97.63
Direct Runoff Volume (AC - FT)	96.87
Baseflow Volume (AC - FT)	0

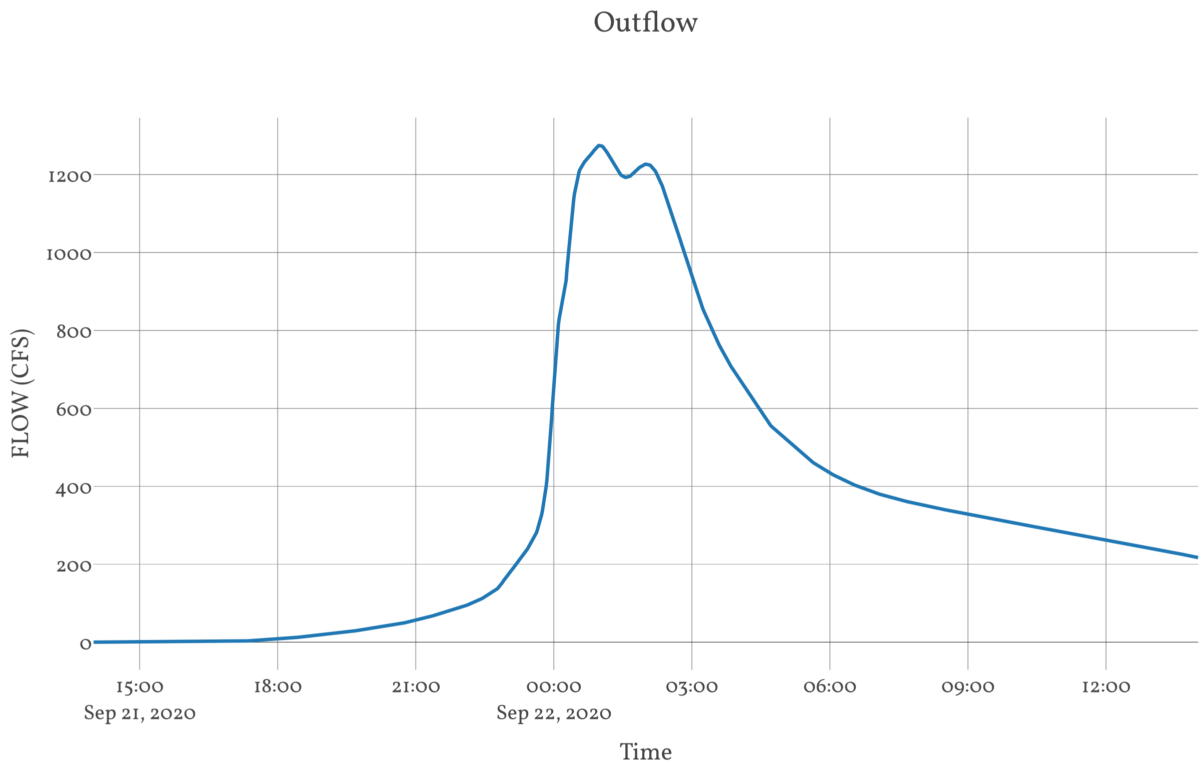

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
400
0.06
200
0.07
0.08
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	1274.95
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	3.23



Reach: 15R

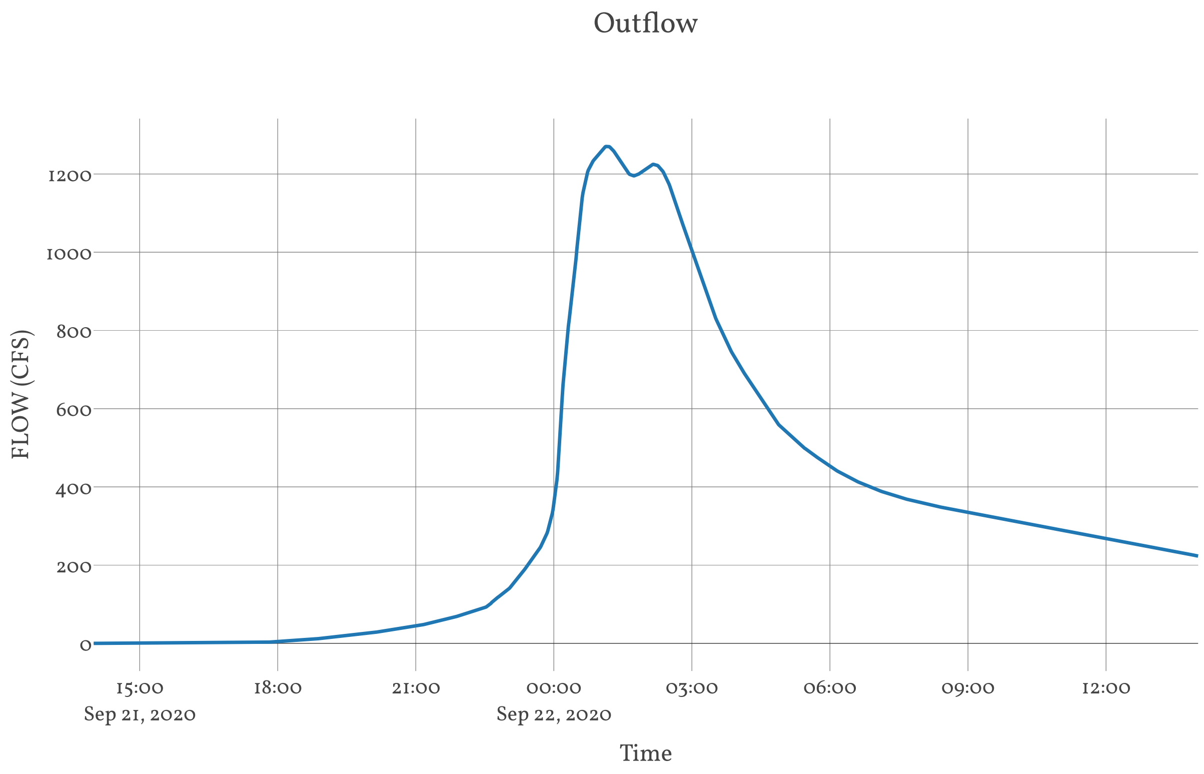
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	1270.86
Time of Peak Discharge	22Sep2020, 01:10
Volume (IN)	3.2
Peak Inflow (CFS)	1274.95
Inflow Volume (AC - FT)	689.49



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

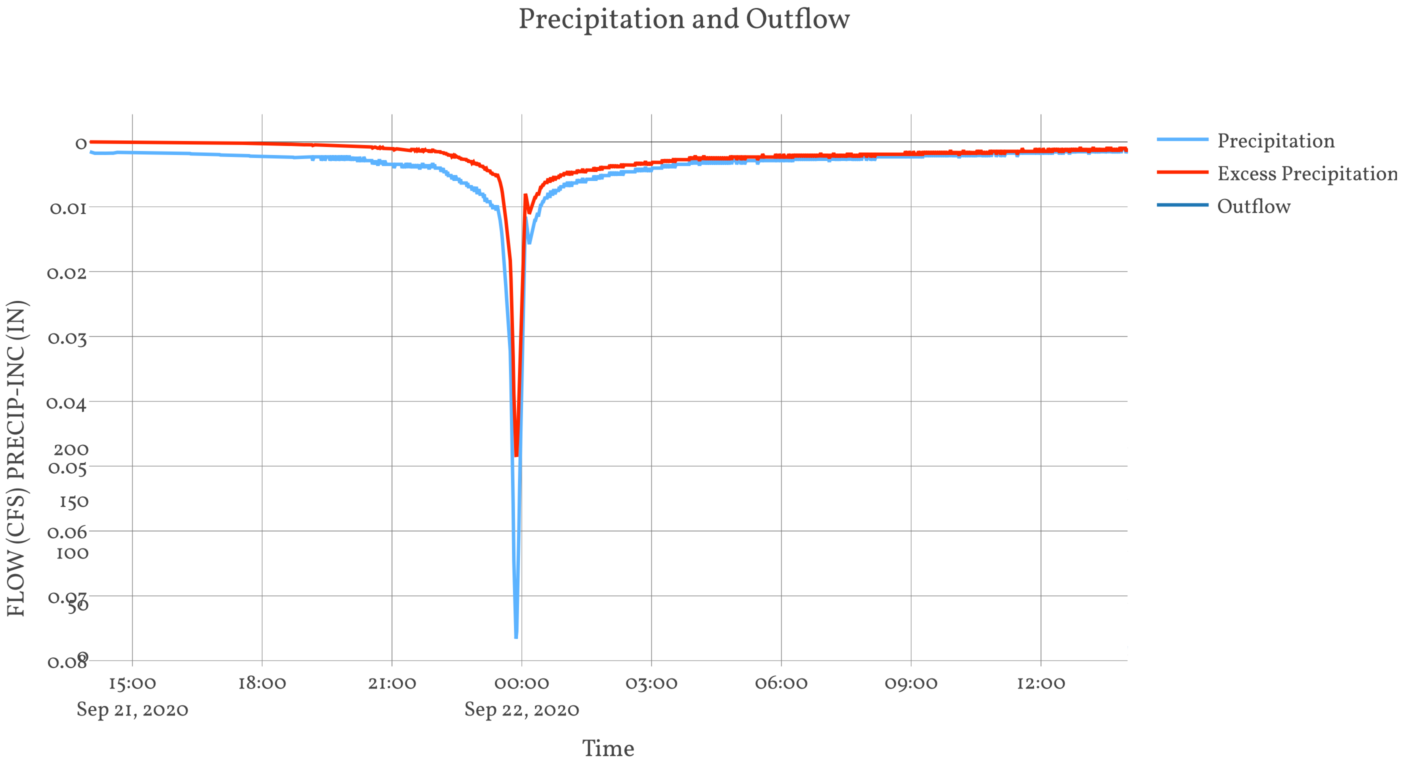
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	197.61
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	3.38
Precipitation Volume (AC - FT)	49.77
Loss Volume (AC - FT)	20.39
Excess Volume (AC - FT)	29.38
Direct Runoff Volume (AC - FT)	29.25
Baseflow Volume (AC - FT)	0

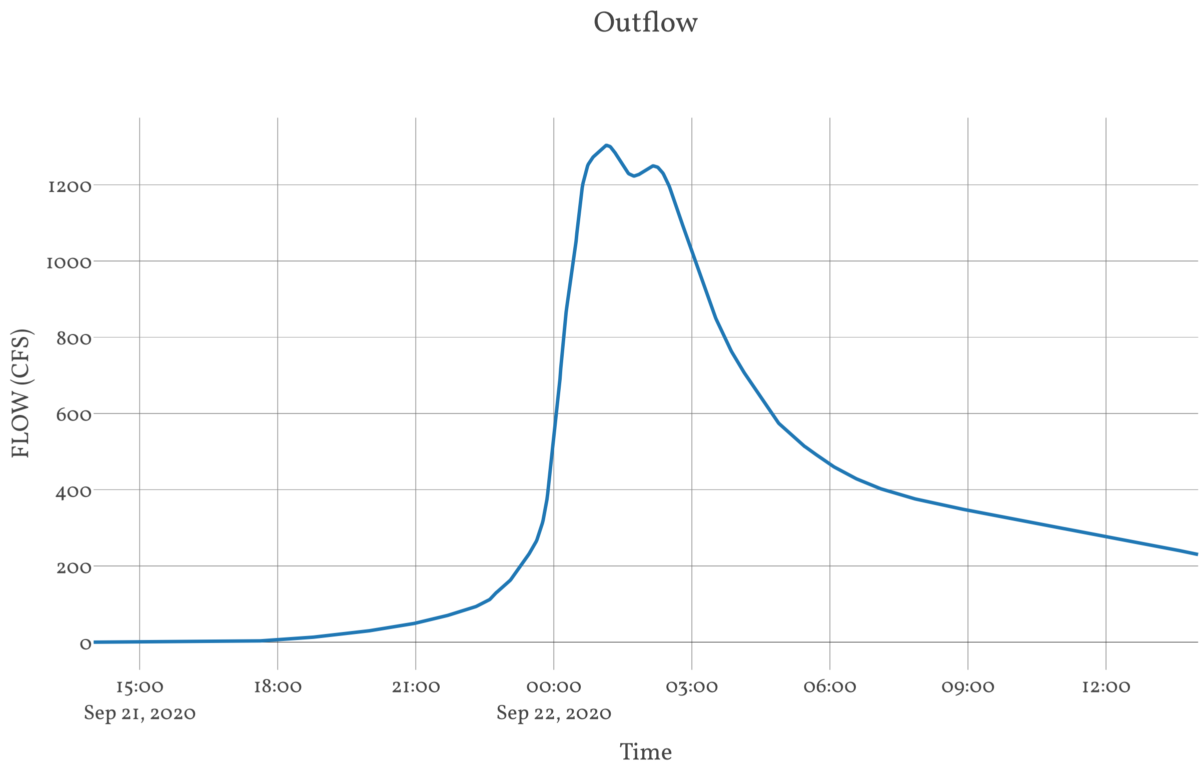

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
200
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	1303.35
Time of Peak Discharge	22Sep2020, 01:09
Volume (IN)	3.21



Reach: 14R

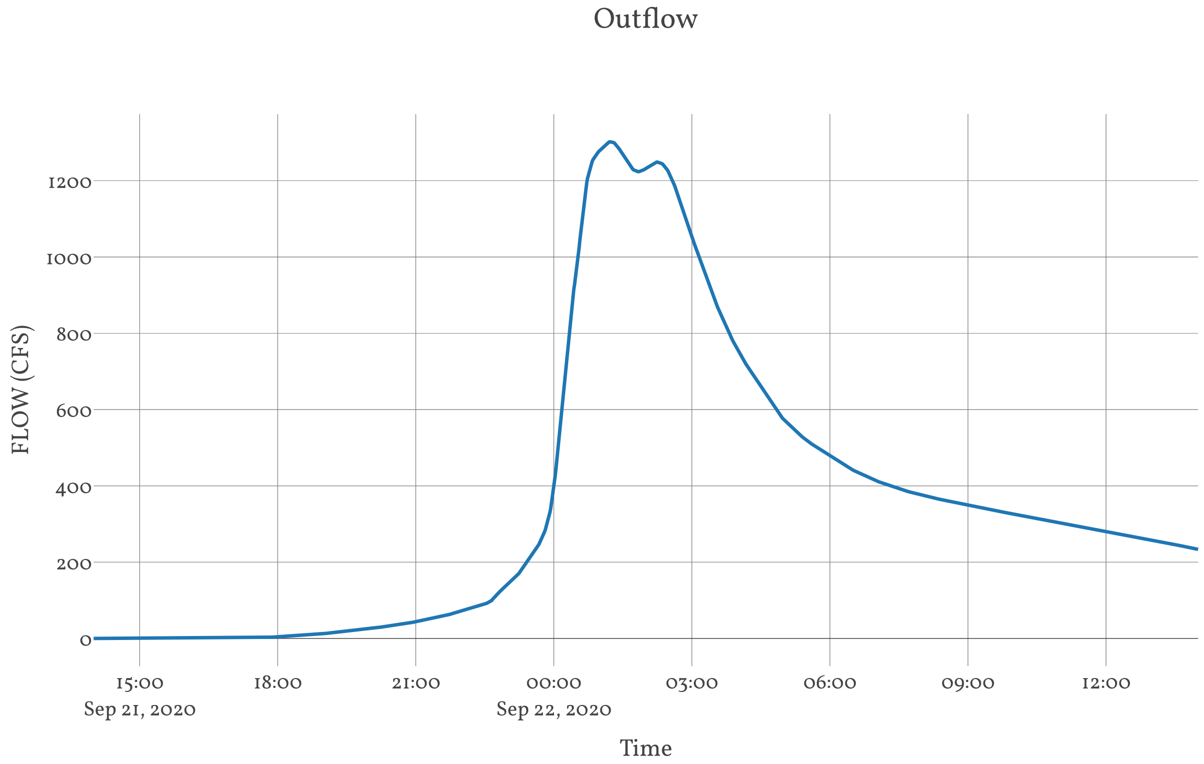
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	1302.34
Time of Peak Discharge	22Sep2020, 01:14
Volume (IN)	3.19
Peak Inflow (CFS)	1303.35
Inflow Volume (AC - FT)	712.17



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

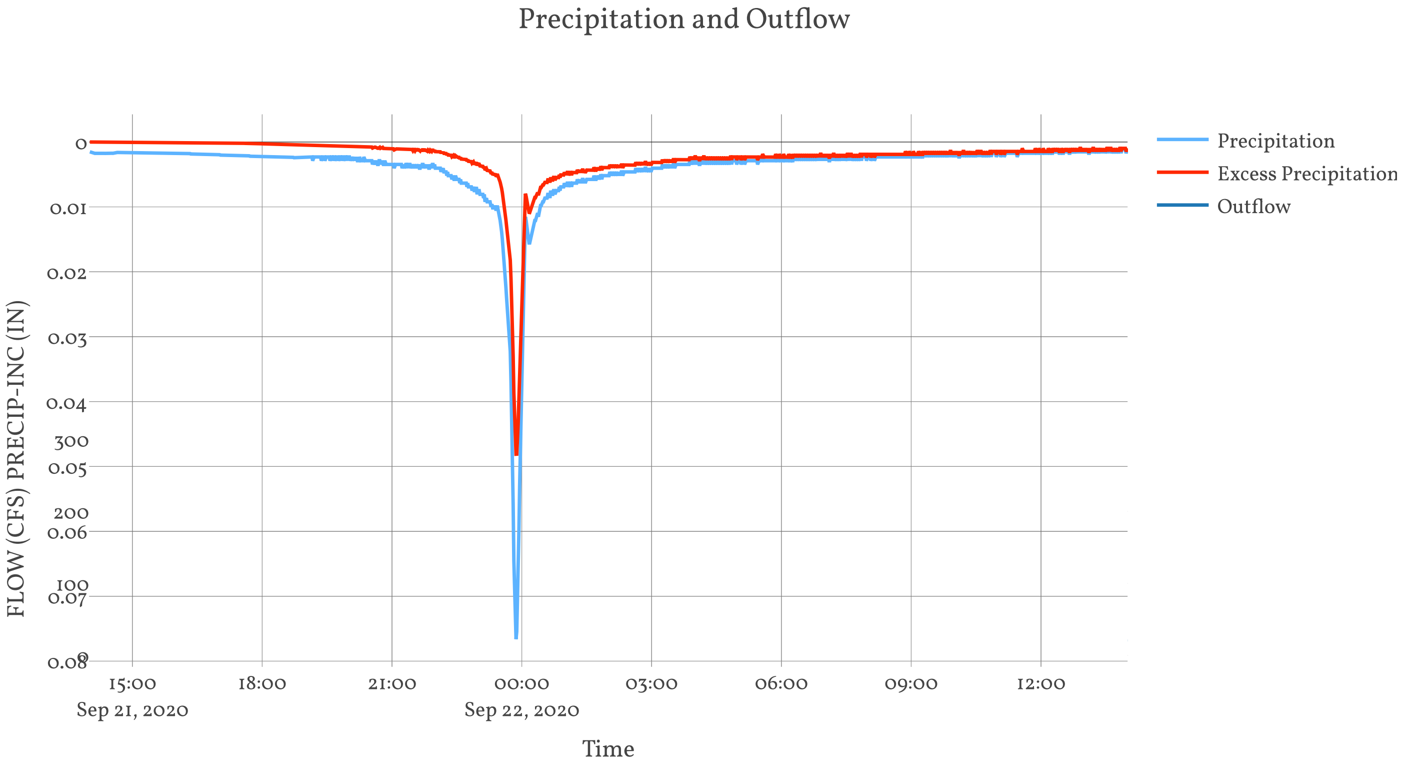
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	284.32
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	3.34
Precipitation Volume (AC - FT)	132.1
Loss Volume (AC - FT)	54.43
Excess Volume (AC - FT)	77.66
Direct Runoff Volume (AC - FT)	76.5
Baseflow Volume (AC - FT)	0



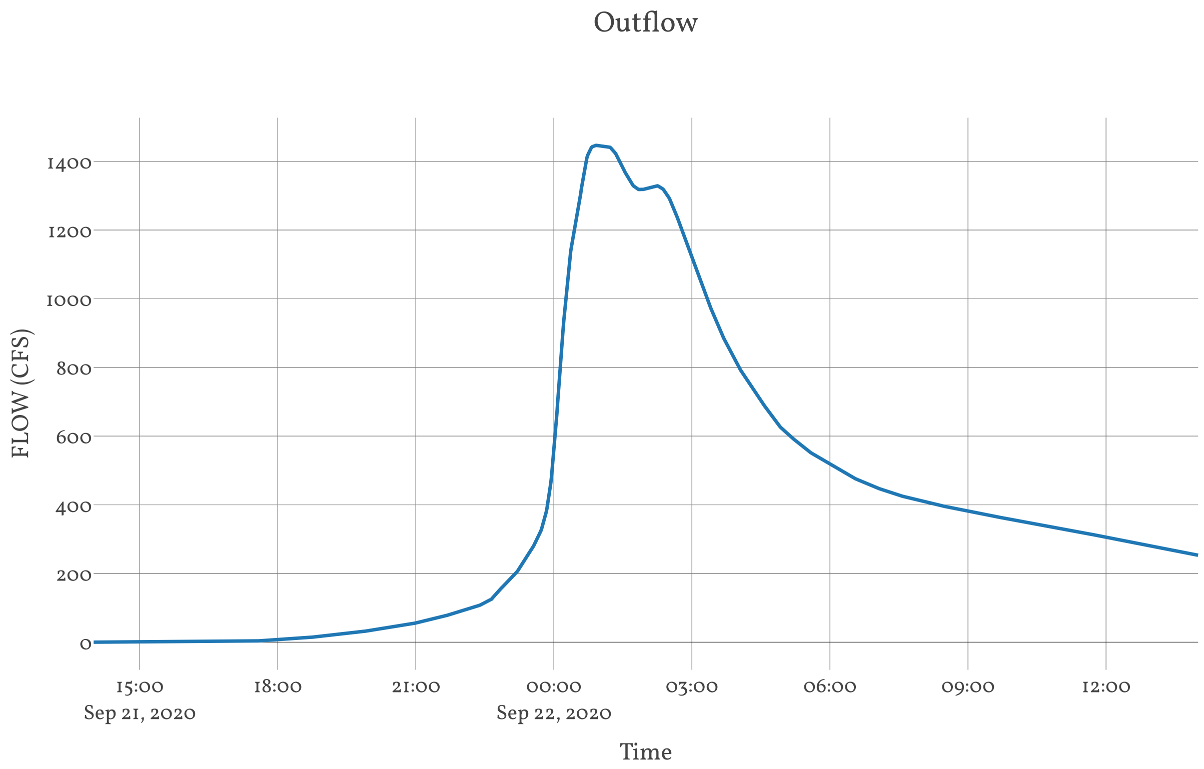
Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
300
0.05
200
0.06
100
0.07
0
0.08
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	1446.43
Time of Peak Discharge	22Sep2020, 00:55
Volume (IN)	3.2



Reach: 13R

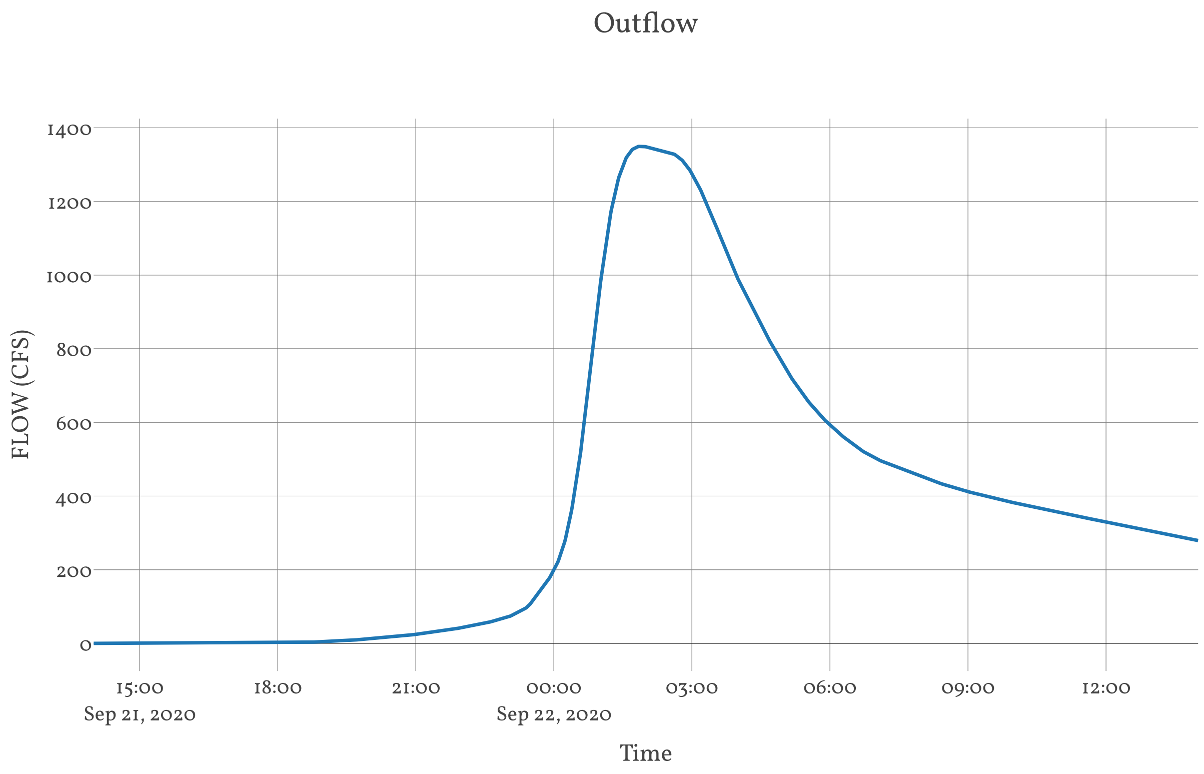
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	1349.74
Time of Peak Discharge	22Sep2020, 01:54
Volume (IN)	3.09
Peak Inflow (CFS)	1446.43
Inflow Volume (AC - FT)	784.95



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

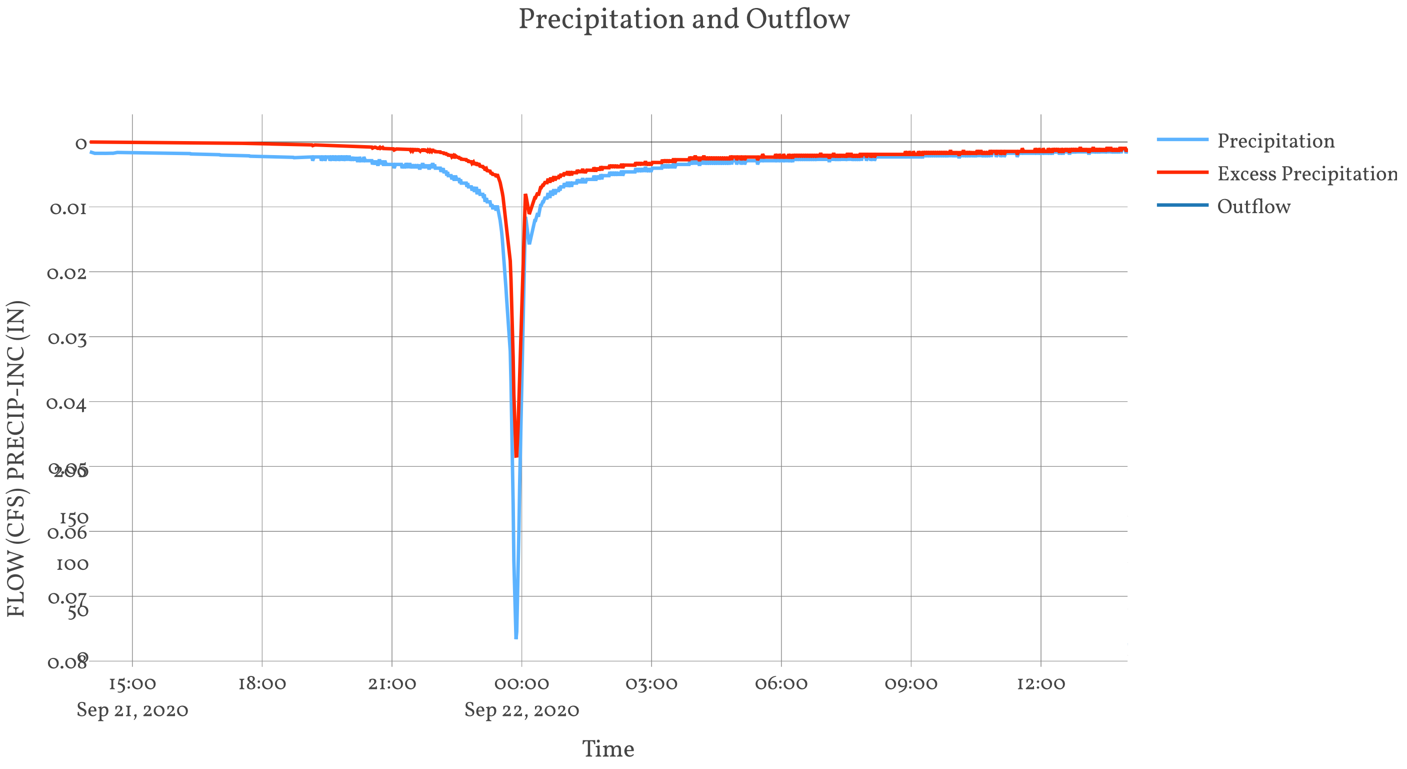
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	220.54
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	3.37
Precipitation Volume (AC - FT)	78.34
Loss Volume (AC - FT)	32.03
Excess Volume (AC - FT)	46.31
Direct Runoff Volume (AC - FT)	45.88
Baseflow Volume (AC - FT)	0

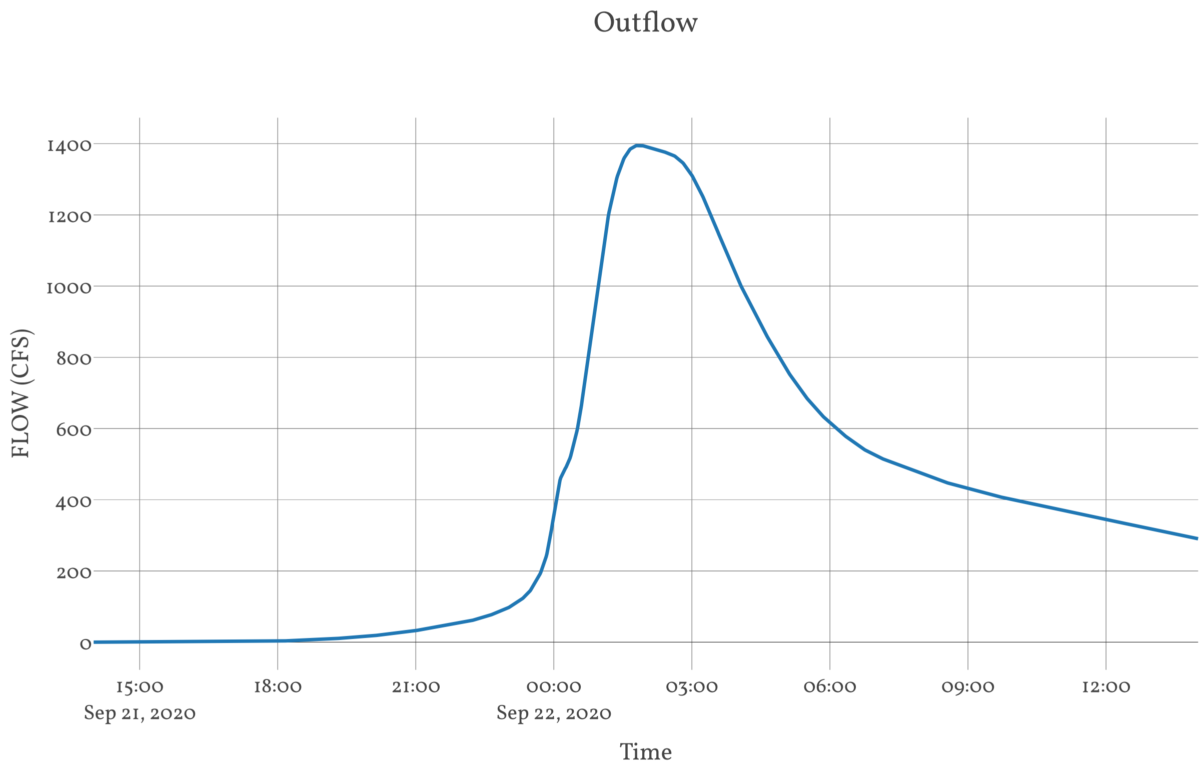

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
200
150
100
50
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

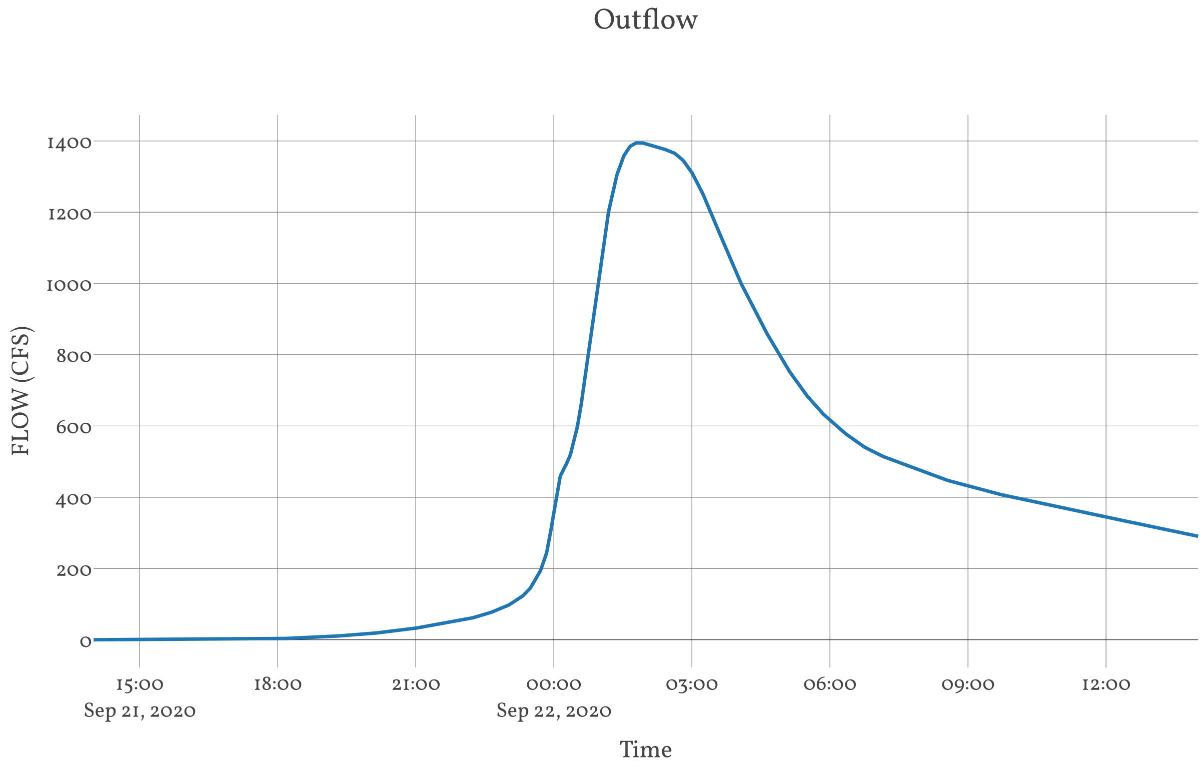
Peak Discharge (CFS)	1395.21
Time of Peak Discharge	22Sep2020, 01:51
Volume (IN)	3.1



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	1395.21
Time of Peak Discharge	22Sep2020, 01:51
Volume (IN)	3.1
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 025-yr Post Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:44

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	541.94	22Sep2020, 00:24	4.58
61b	0.61	622.67	22Sep2020, 00:15	4.61
J 60b 61b	1.25	1133.19	22Sep2020, 00:18	4.59
18r	1.25	970.44	22Sep2020, 01:02	4.42
62b	0.53	659.42	22Sep2020, 00:08	4.54
17c	1.78	1171.23	22Sep2020, 00:58	4.46
17r	1.78	1084.81	22Sep2020, 01:28	4.33
63b	0.6	577.75	22Sep2020, 00:17	4.57
16c	2.38	1302.64	22Sep2020, 01:24	4.39
16r	2.38	1280.27	22Sep2020, 01:45	4.3
64b	1.09	1035.45	22Sep2020, 00:18	4.58
20c	3.47	1645.35	22Sep2020, 00:53	4.39
20r	3.47	1641.33	22Sep2020, 01:04	4.33
65b	0.53	691.07	22Sep2020, 00:07	4.58
15c	4	1848.15	22Sep2020, 00:53	4.37
15r	4	1844.61	22Sep2020, 01:03	4.33
66b	0.16	268.89	22Sep2020, 00:02	4.55
14c	4.16	1890.72	22Sep2020, 01:01	4.34
14r	4.16	1889.72	22Sep2020, 01:06	4.32
67b	0.43	388.37	22Sep2020, 00:19	4.49
13c	4.59	2103.7	22Sep2020, 01:00	4.33
13r	4.59	1968.98	22Sep2020, 01:43	4.19
68b	0.26	300.75	22Sep2020, 00:09	4.54

12c	4.85	2033.81	22Sep2020, 01:41	4.21
Pacific Ocean	4.85	2033.81	22Sep2020, 01:41	4.21

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

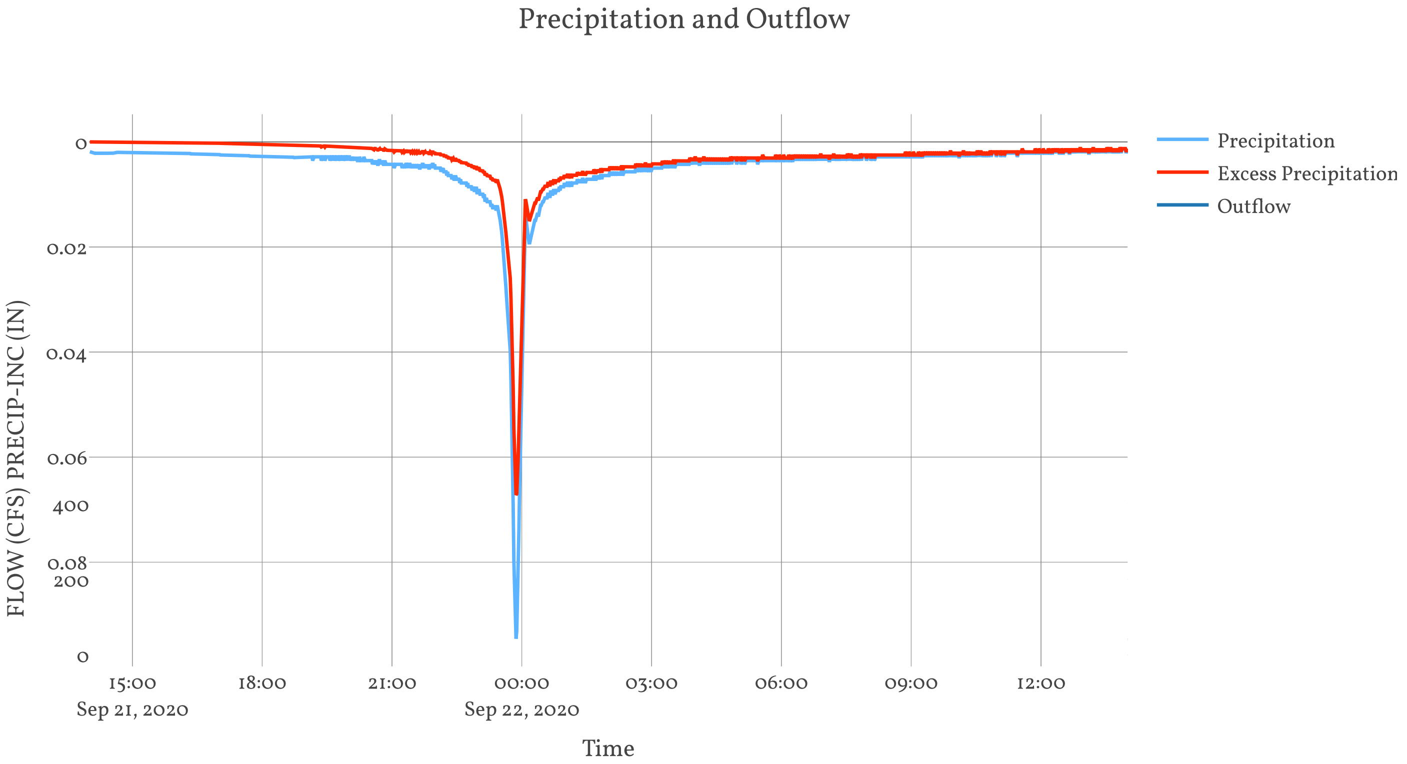
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	541.94
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	4.58
Precipitation Volume (AC - FT)	244.58
Loss Volume (AC - FT)	84.23
Excess Volume (AC - FT)	160.35
Direct Runoff Volume (AC - FT)	157.64
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
400
0.08
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

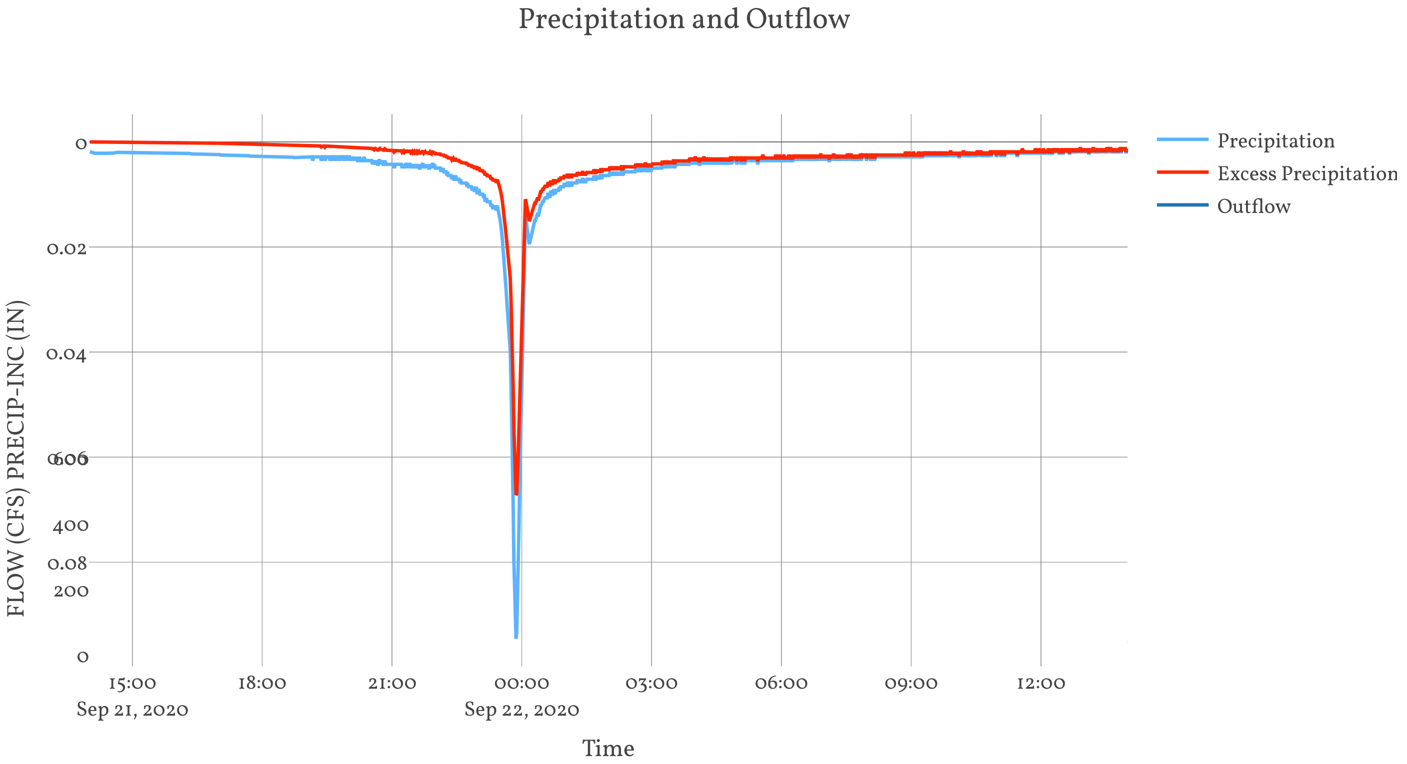
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	622.67
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	4.61
Precipitation Volume (AC - FT)	229.8
Loss Volume (AC - FT)	79.14
Excess Volume (AC - FT)	150.66
Direct Runoff Volume (AC - FT)	148.89
Baseflow Volume (AC - FT)	0

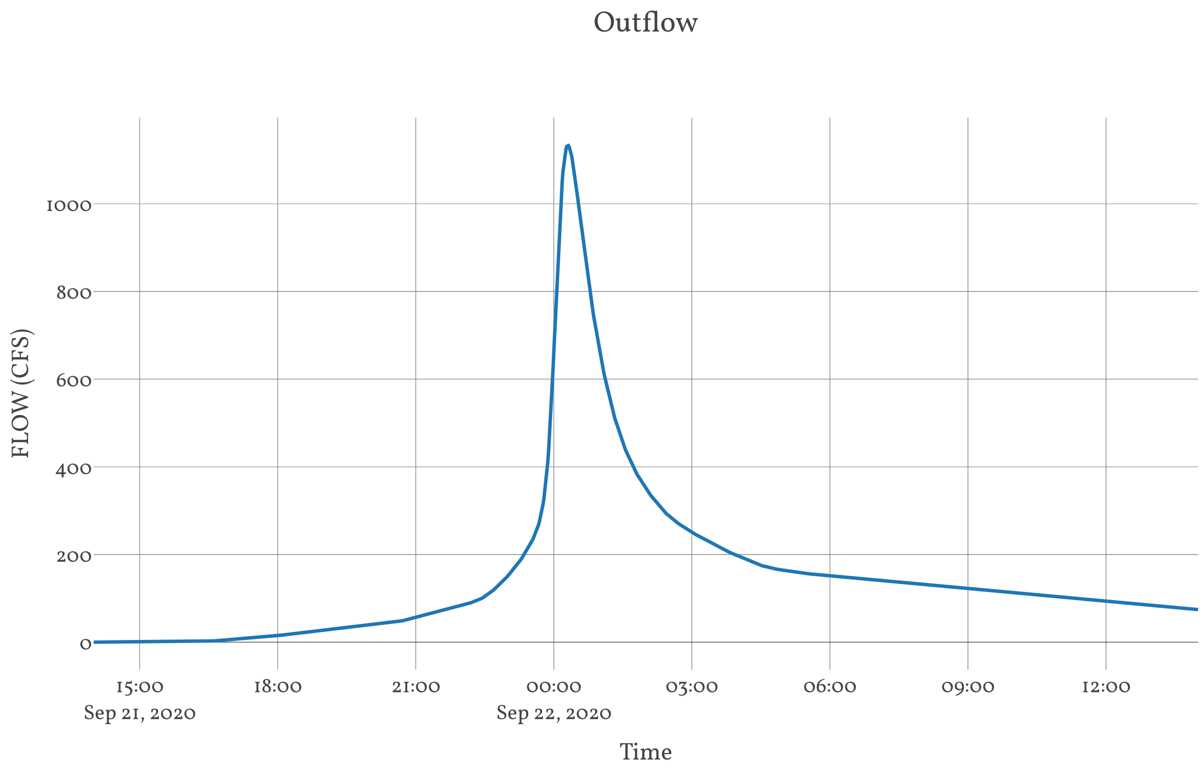

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1133.19
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	4.59



Reach: 18R

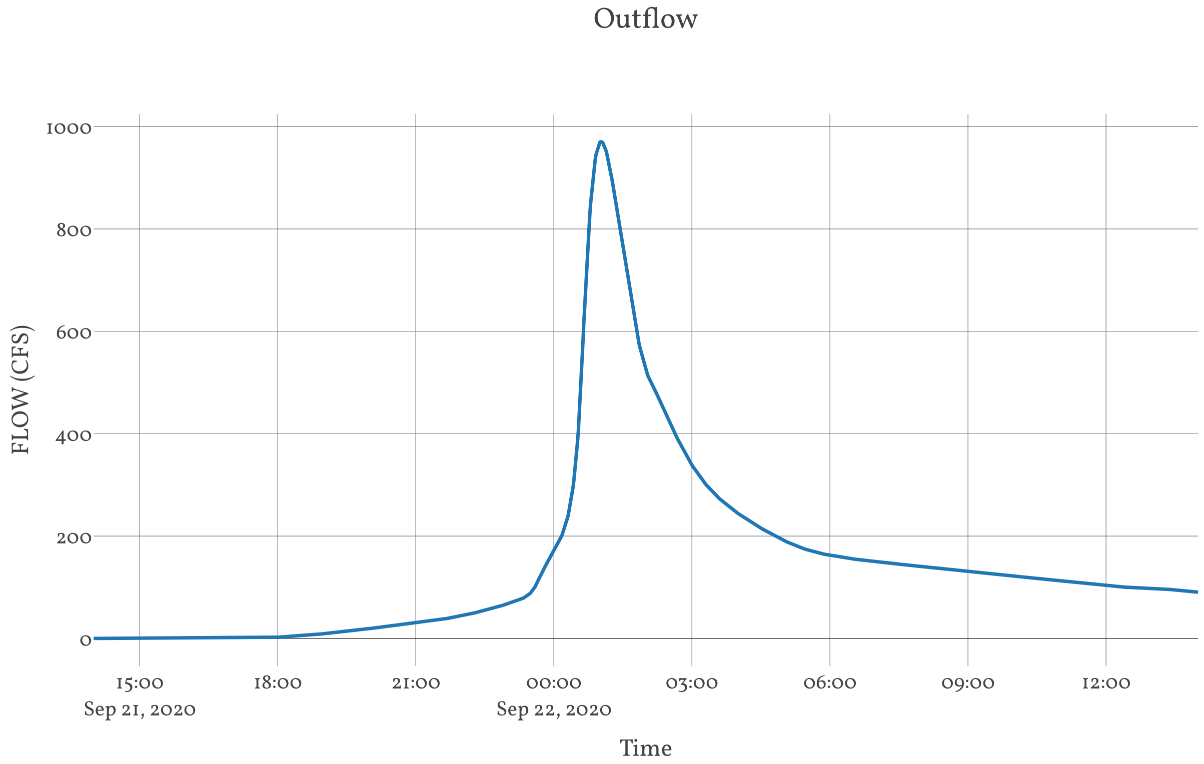
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	970.44
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	4.42
Peak Inflow (CFS)	1133.19
Inflow Volume (AC - FT)	306.52



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

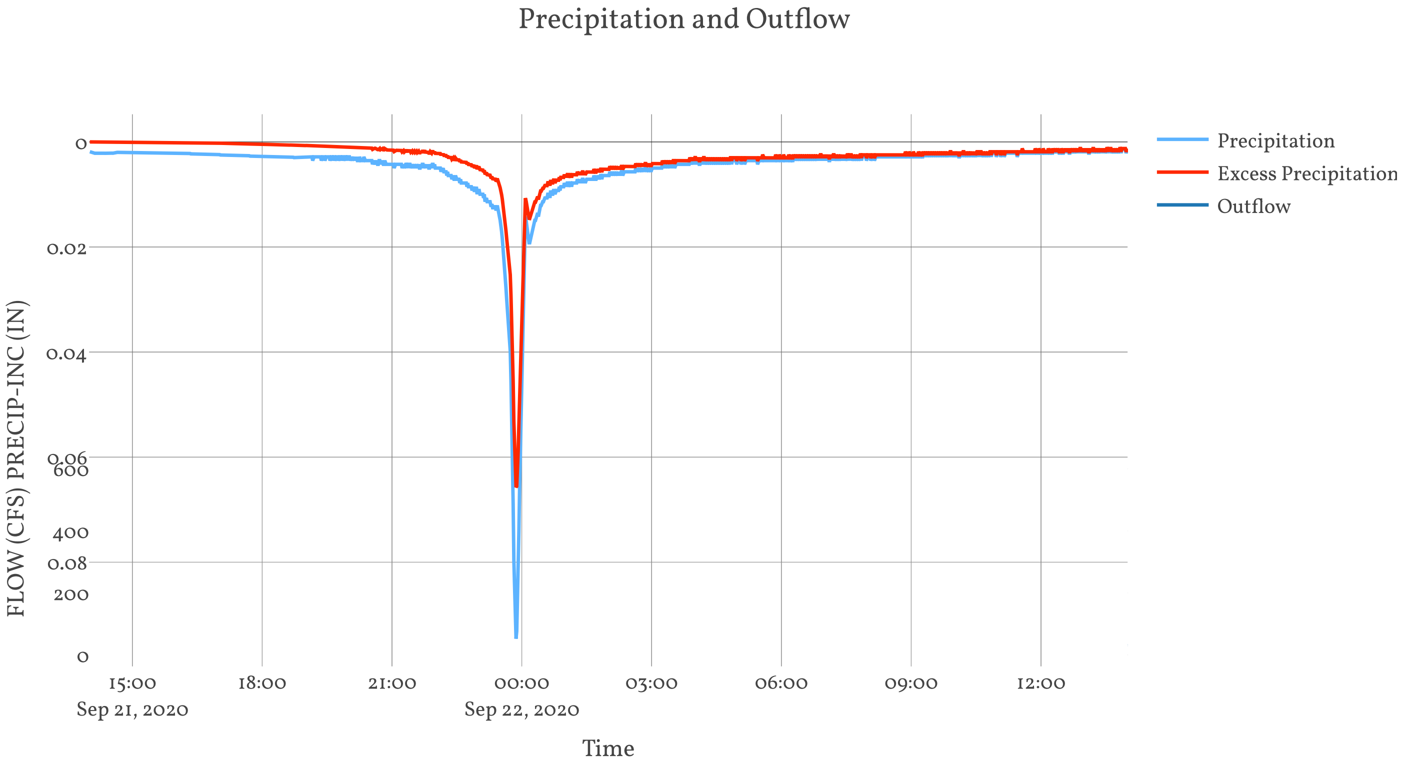
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	659.42
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	4.54
Precipitation Volume (AC - FT)	199.31
Loss Volume (AC - FT)	71.12
Excess Volume (AC - FT)	128.18
Direct Runoff Volume (AC - FT)	127.18
Baseflow Volume (AC - FT)	0

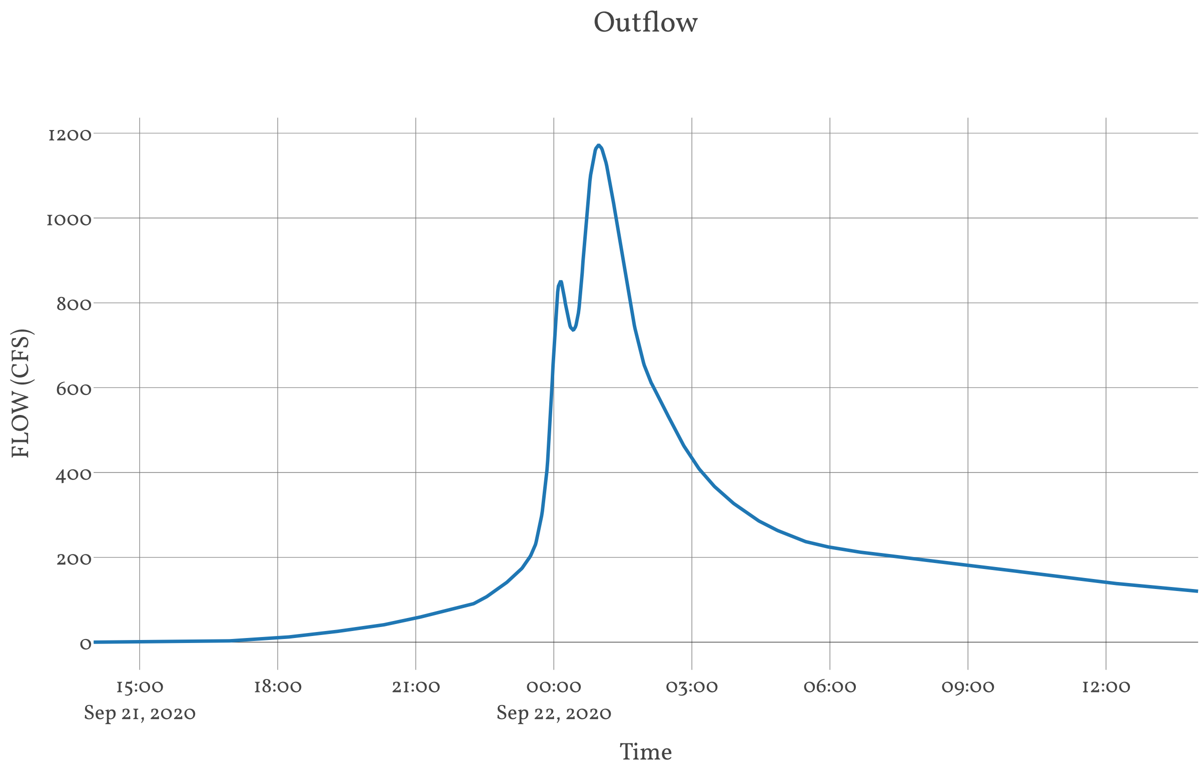

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	1171.23
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	4.46



Reach: 17R

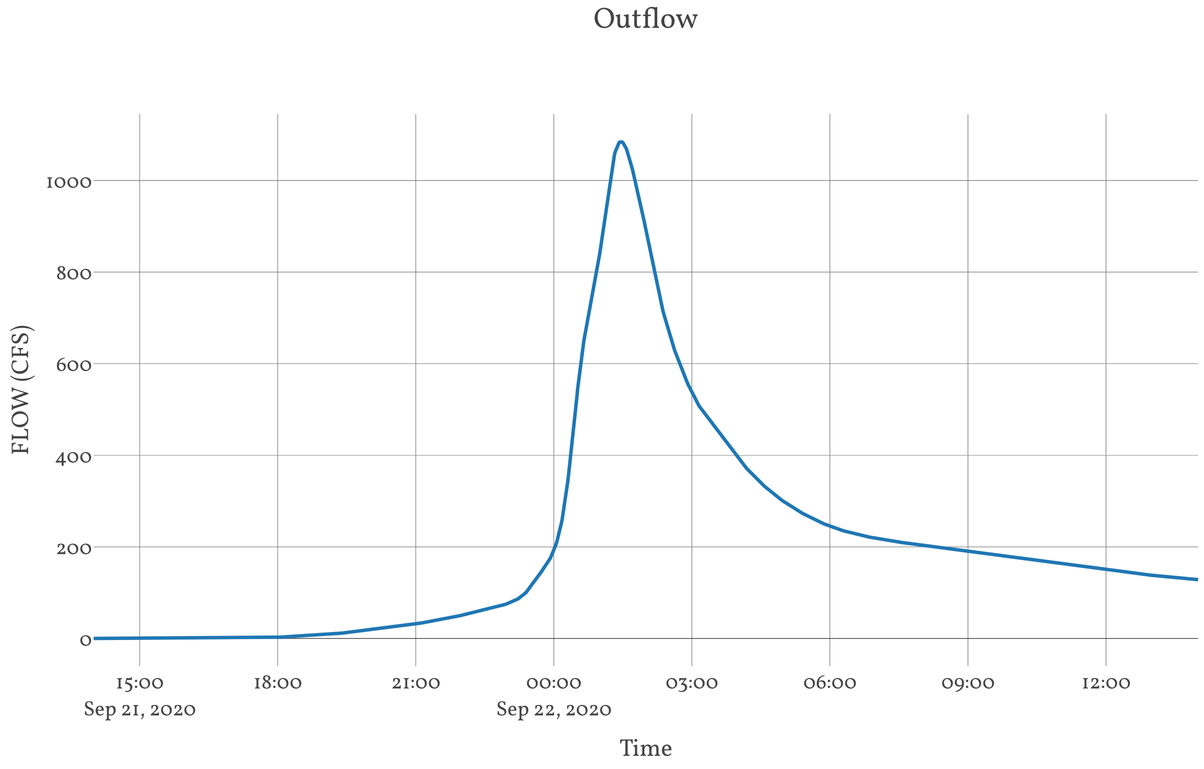
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1084.81
Time of Peak Discharge	22Sep2020, 01:28
Volume (IN)	4.33
Peak Inflow (CFS)	1171.23
Inflow Volume (AC - FT)	422.4



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

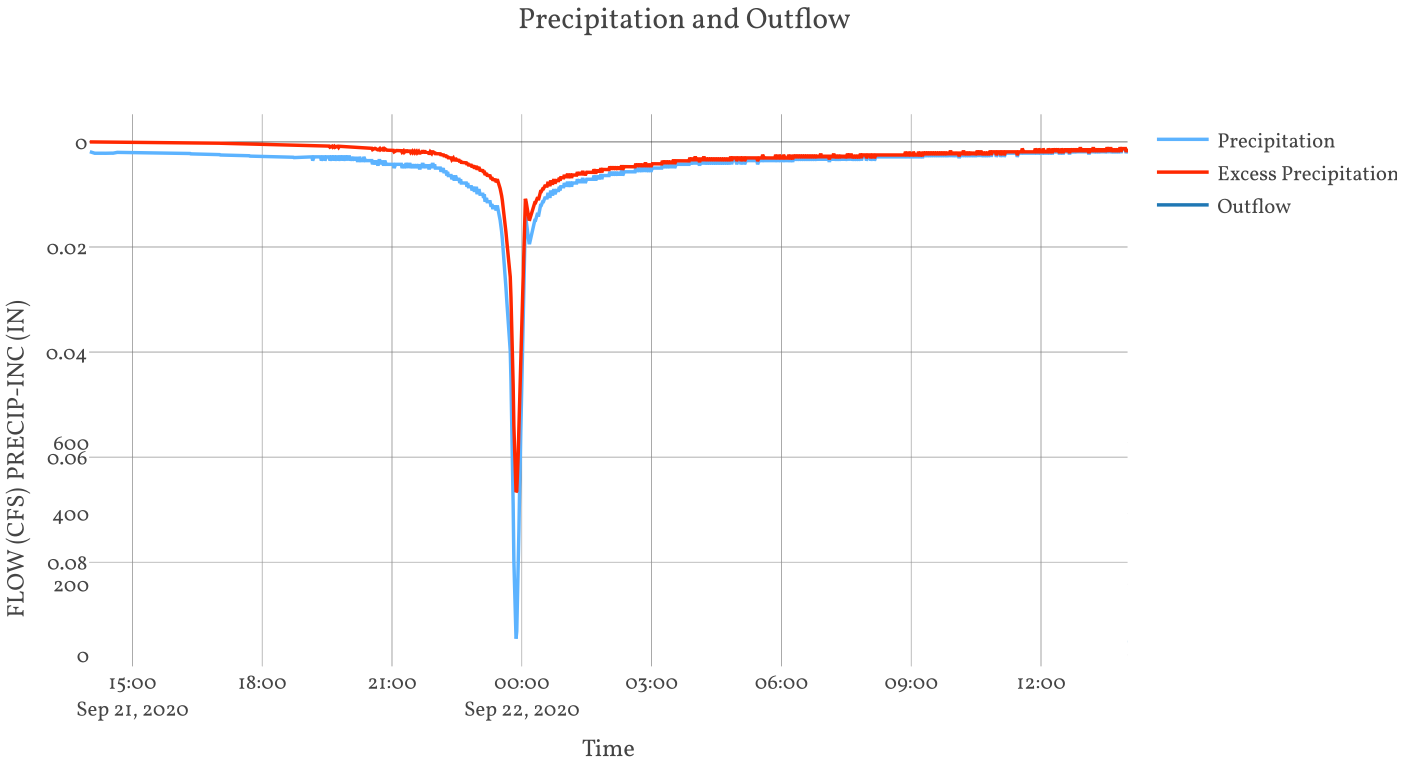
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	577.75
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	4.57
Precipitation Volume (AC - FT)	228.28
Loss Volume (AC - FT)	79.65
Excess Volume (AC - FT)	148.62
Direct Runoff Volume (AC - FT)	146.67
Baseflow Volume (AC - FT)	0

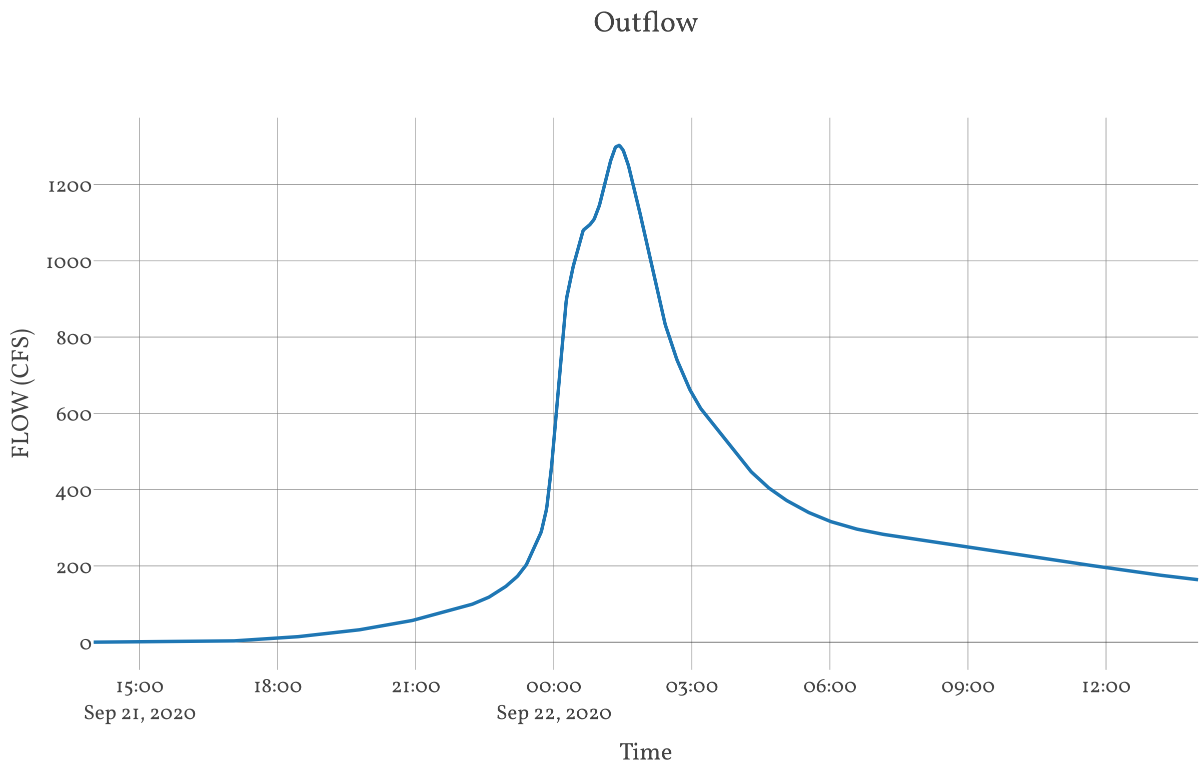

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1302.64
Time of Peak Discharge	22Sep2020, 01:24
Volume (IN)	4.39



Reach: 16R

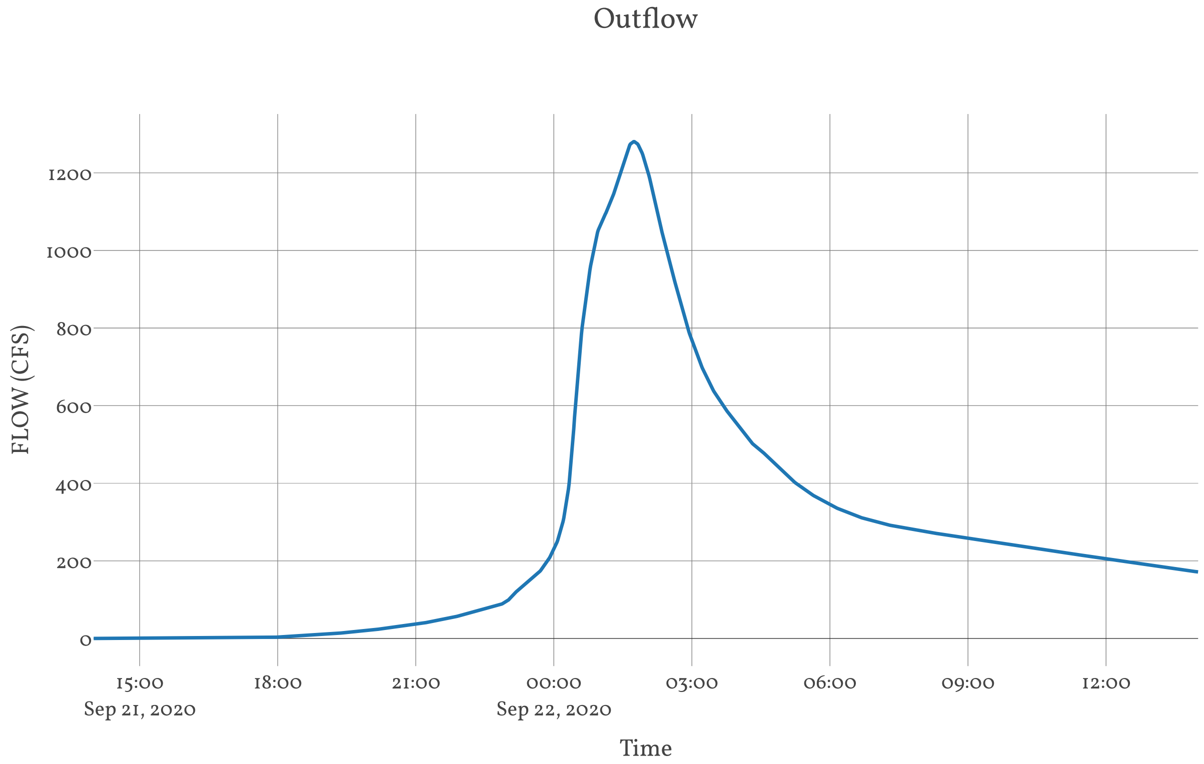
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1280.27
Time of Peak Discharge	22Sep2020, 01:45
Volume (IN)	4.3
Peak Inflow (CFS)	1302.64
Inflow Volume (AC - FT)	556.73



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

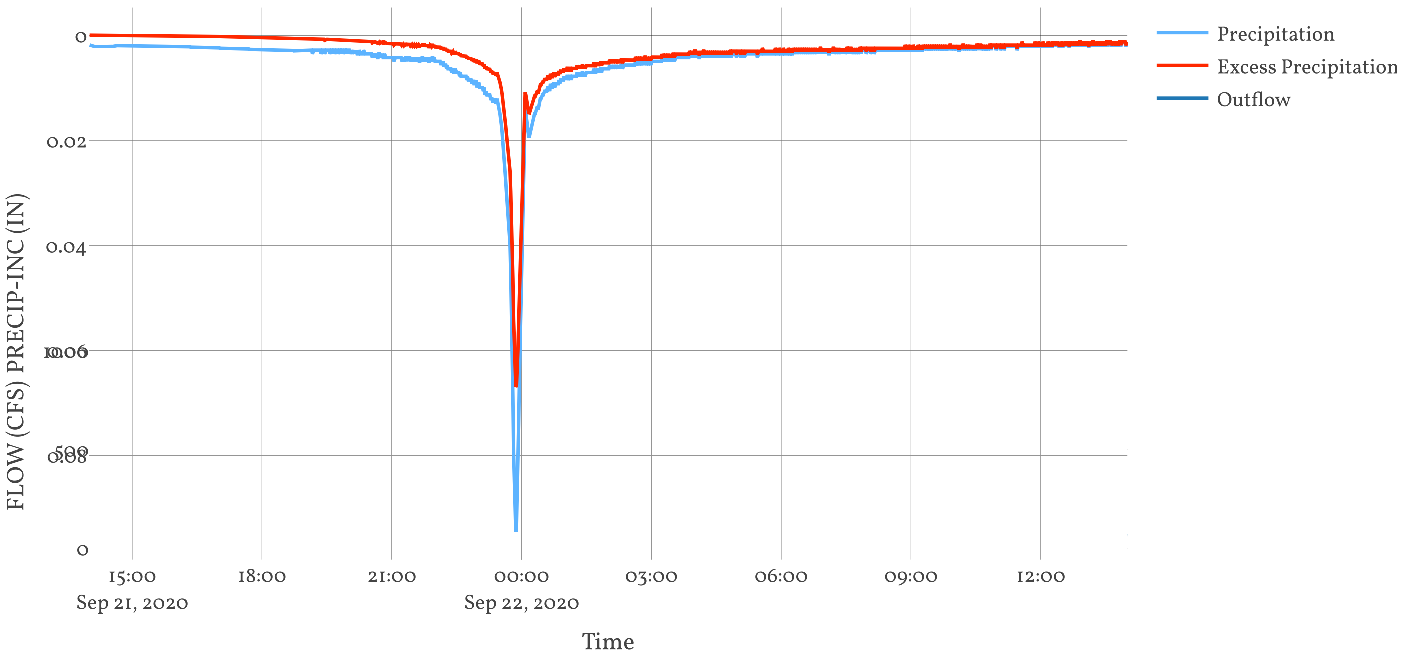
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1035.45
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	4.58
Precipitation Volume (AC - FT)	413.33
Loss Volume (AC - FT)	143.29
Excess Volume (AC - FT)	270.04
Direct Runoff Volume (AC - FT)	266.4
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

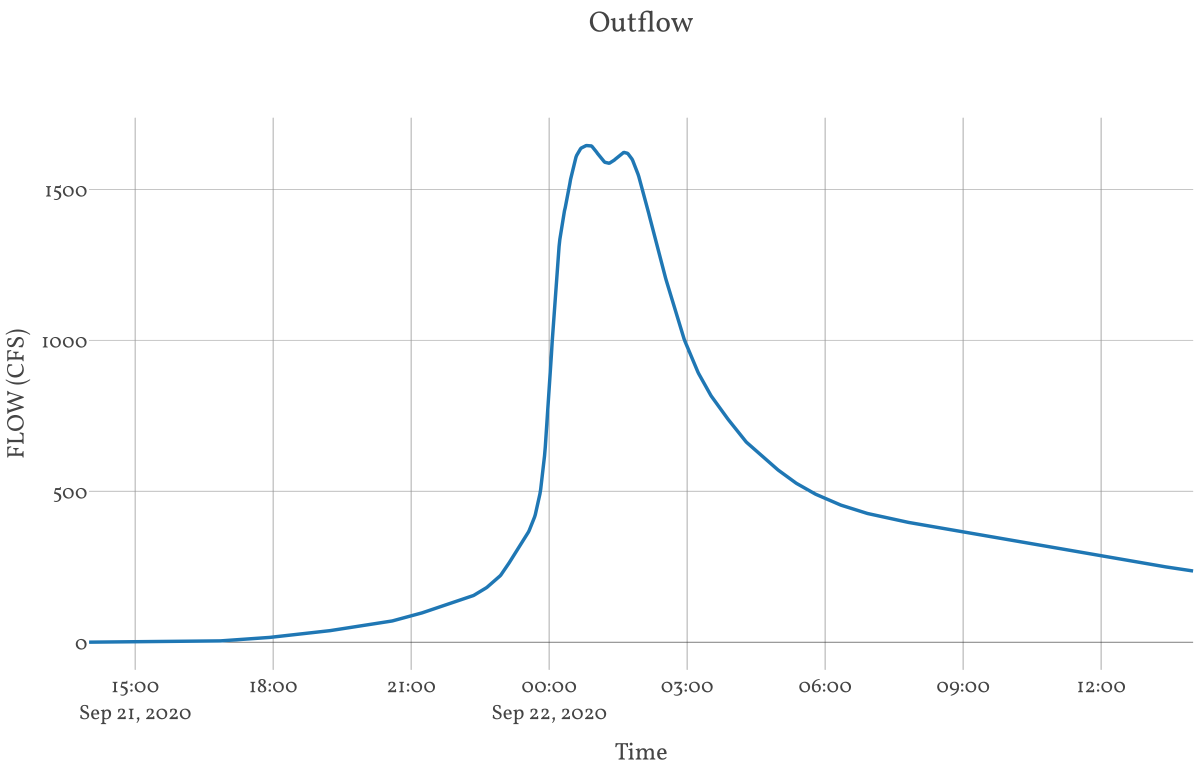


Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	1645.35
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	4.39



Reach: 20R

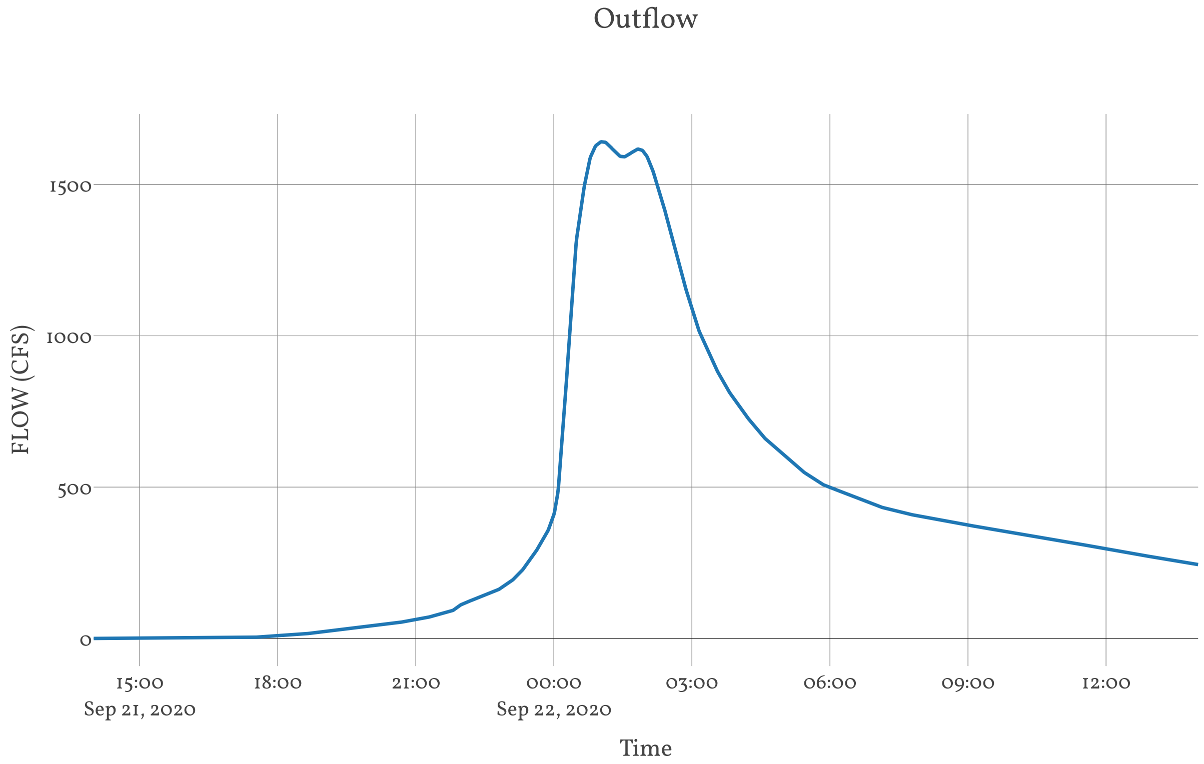
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	1641.33
Time of Peak Discharge	22Sep2020, 01:04
Volume (IN)	4.33
Peak Inflow (CFS)	1645.35
Inflow Volume (AC - FT)	811.84



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

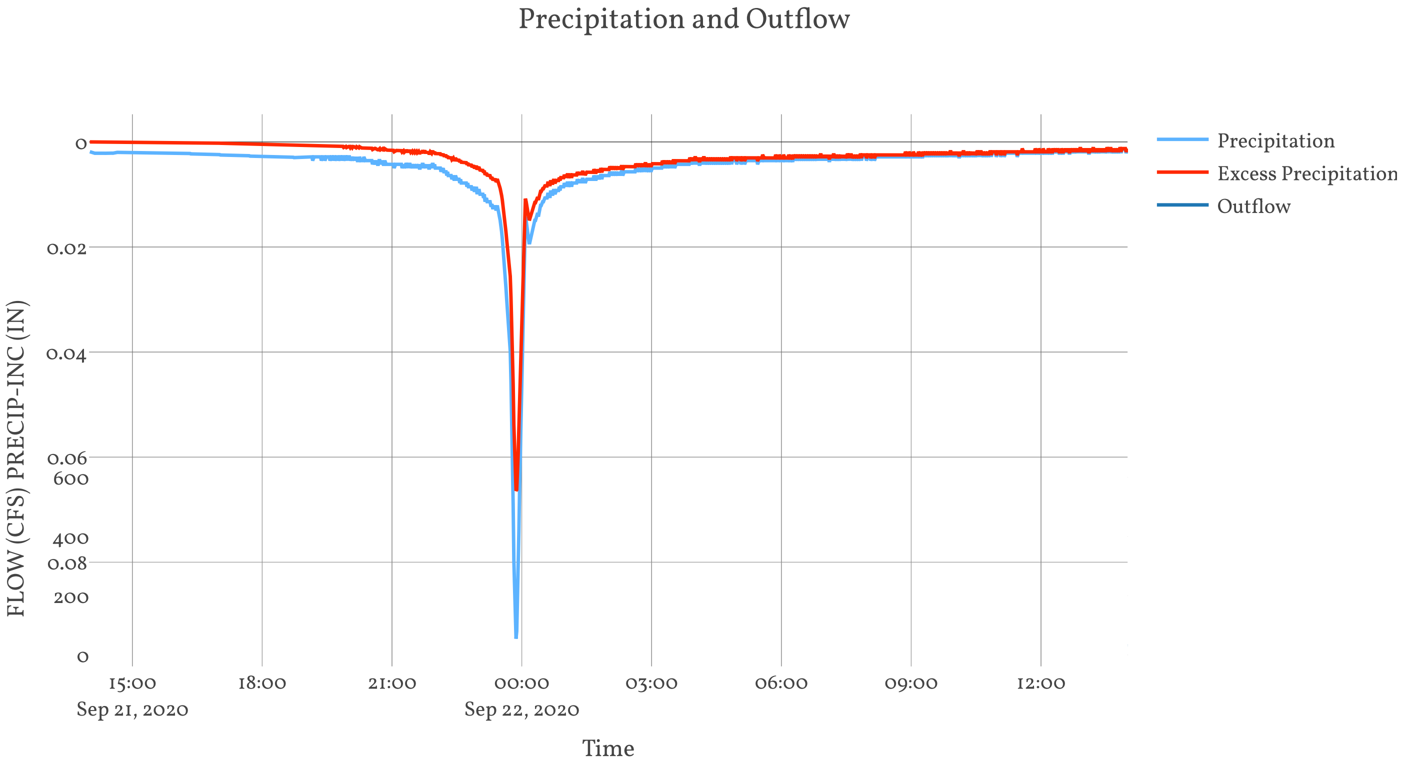
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	691.07
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	4.58
Precipitation Volume (AC - FT)	202.11
Loss Volume (AC - FT)	70.98
Excess Volume (AC - FT)	131.13
Direct Runoff Volume (AC - FT)	130.15
Baseflow Volume (AC - FT)	0

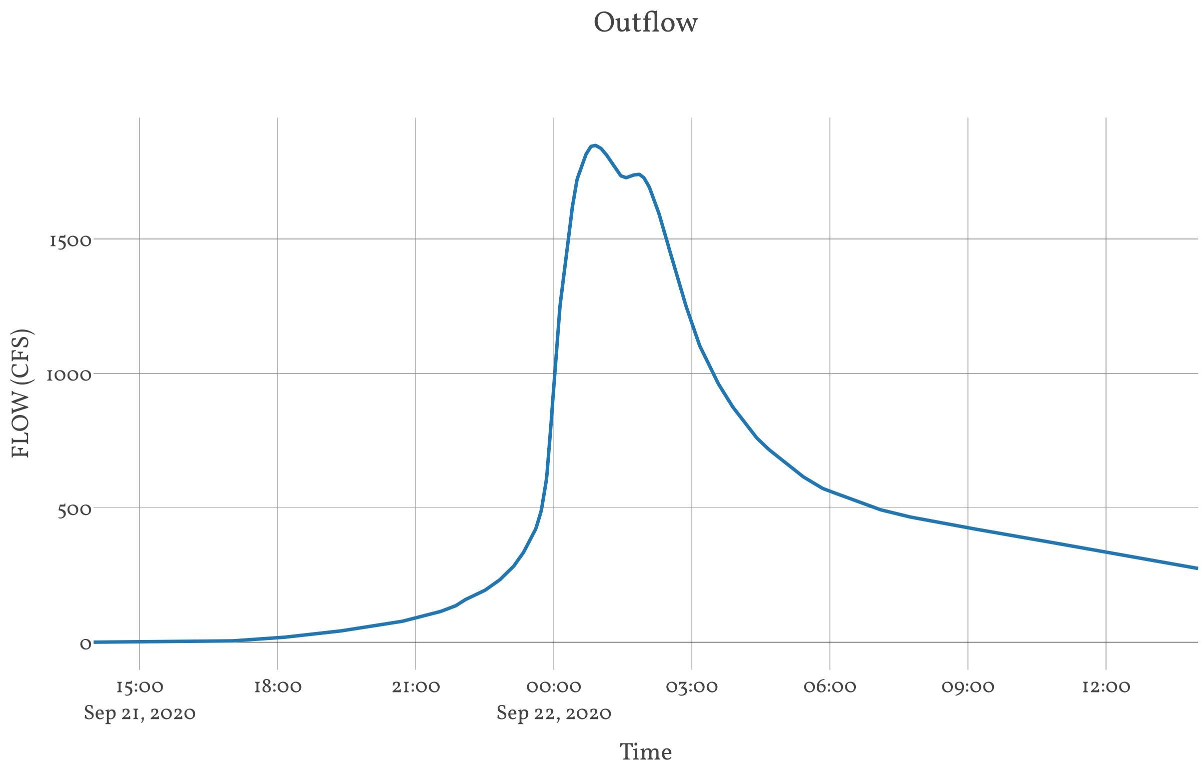

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	1848.15
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	4.37



Reach: 15R

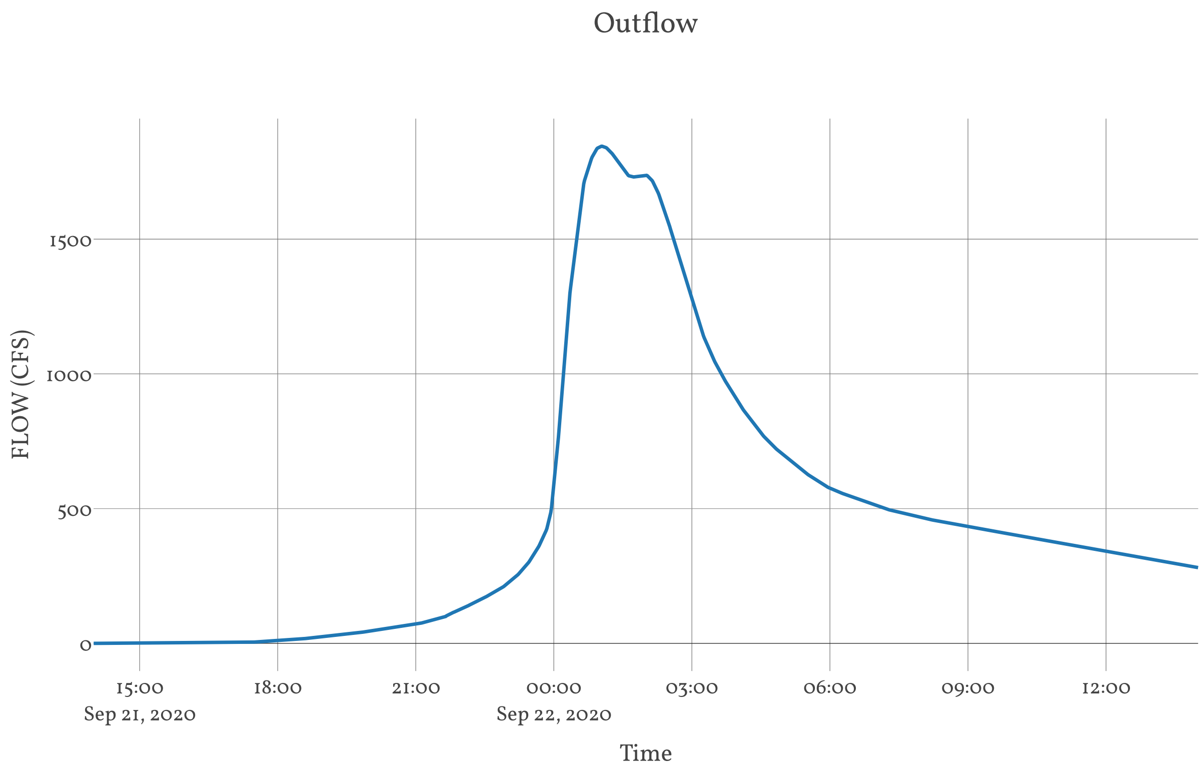
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	1844.61
Time of Peak Discharge	22Sep2020, 01:03
Volume (IN)	4.33
Peak Inflow (CFS)	1848.15
Inflow Volume (AC - FT)	931.8



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

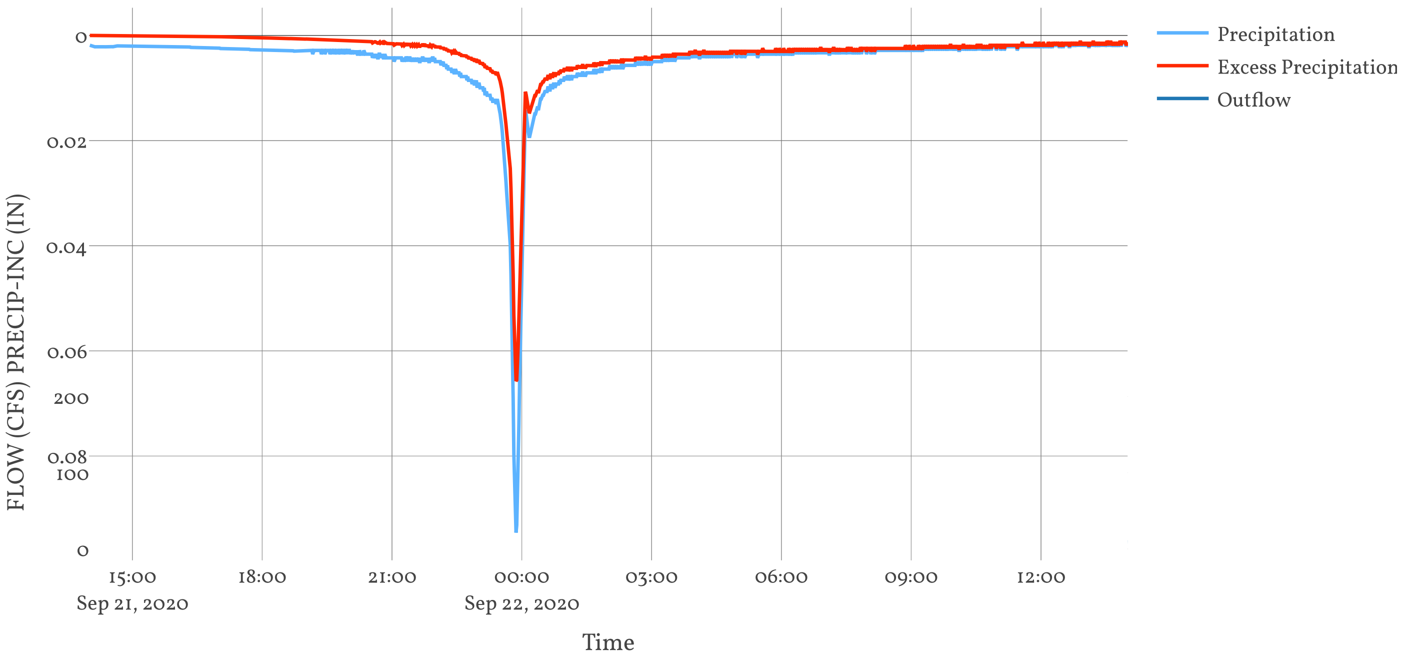
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	268.89
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	4.55
Precipitation Volume (AC - FT)	61.43
Loss Volume (AC - FT)	21.92
Excess Volume (AC - FT)	39.51
Direct Runoff Volume (AC - FT)	39.34
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

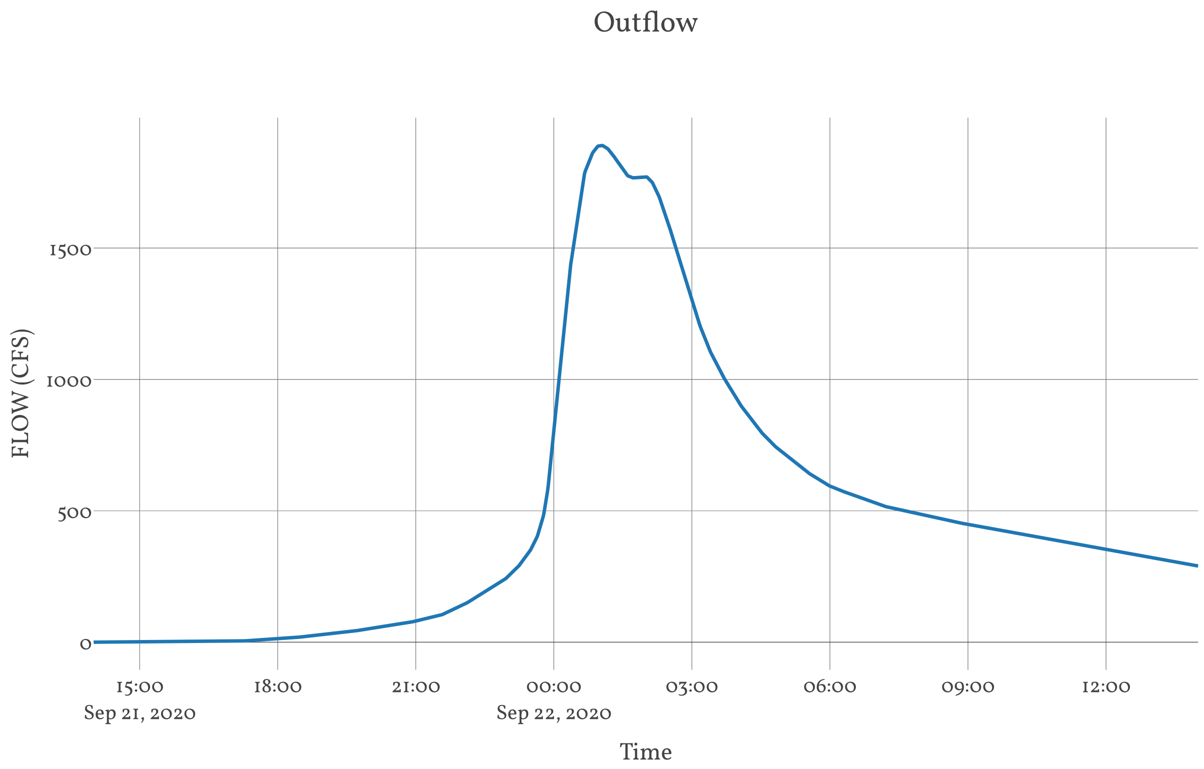


Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	1890.72
Time of Peak Discharge	22Sep2020, 01:01
Volume (IN)	4.34



Reach: 14R

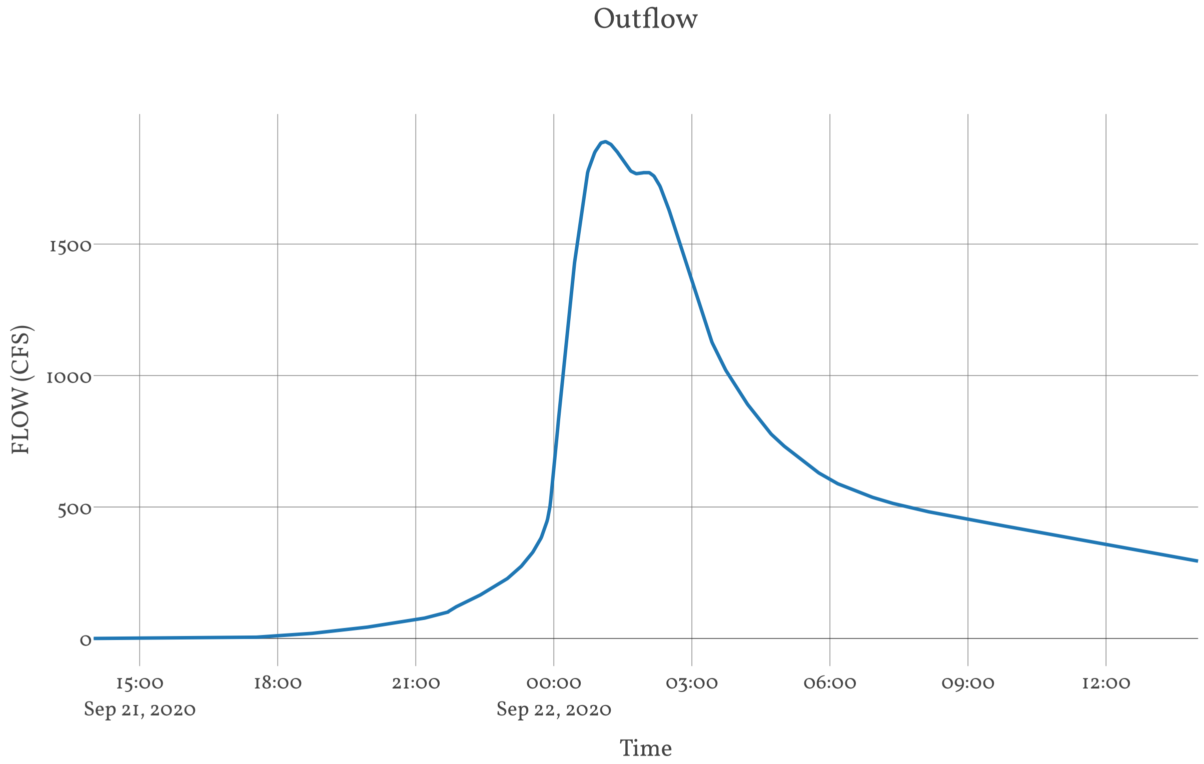
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	1889.72
Time of Peak Discharge	22Sep2020, 01:06
Volume (IN)	4.32
Peak Inflow (CFS)	1890.72
Inflow Volume (AC - FT)	963.37



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

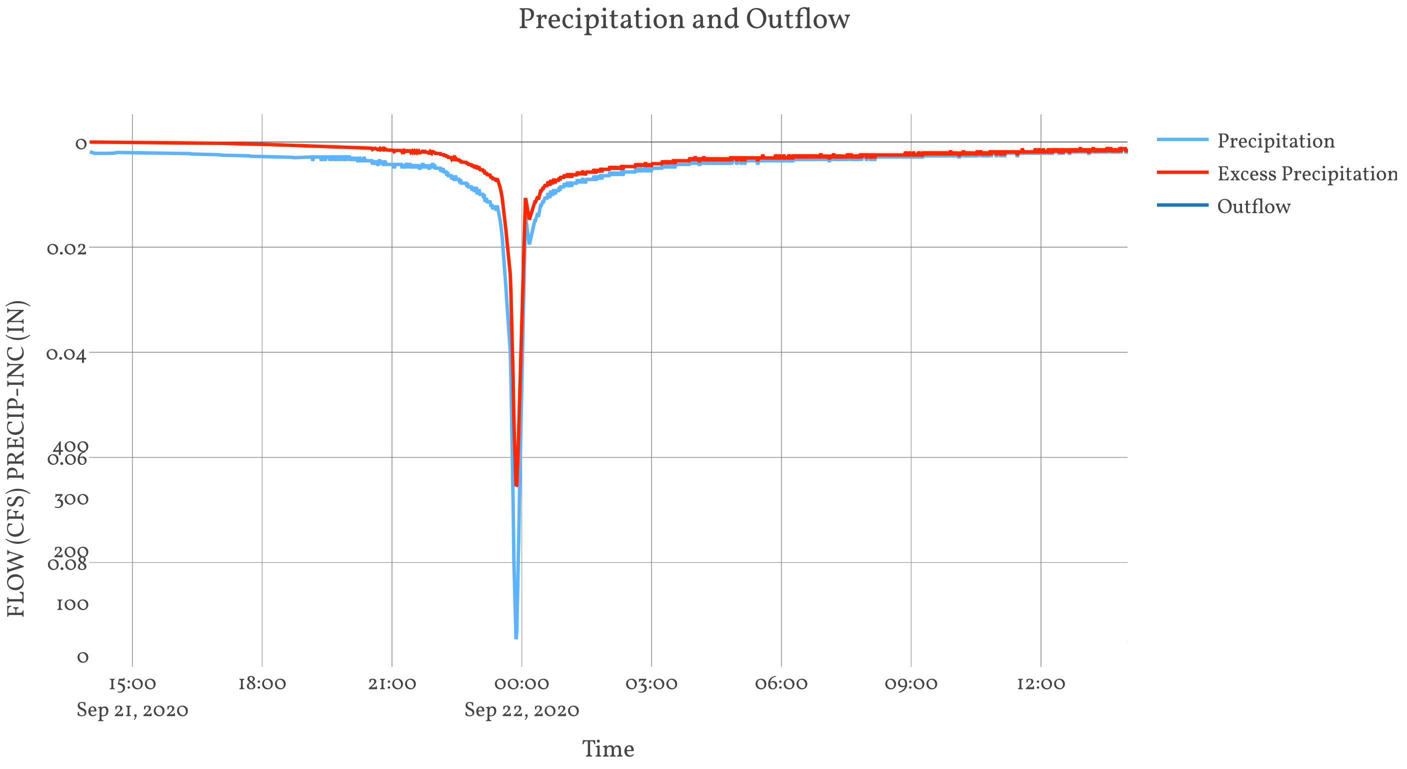
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

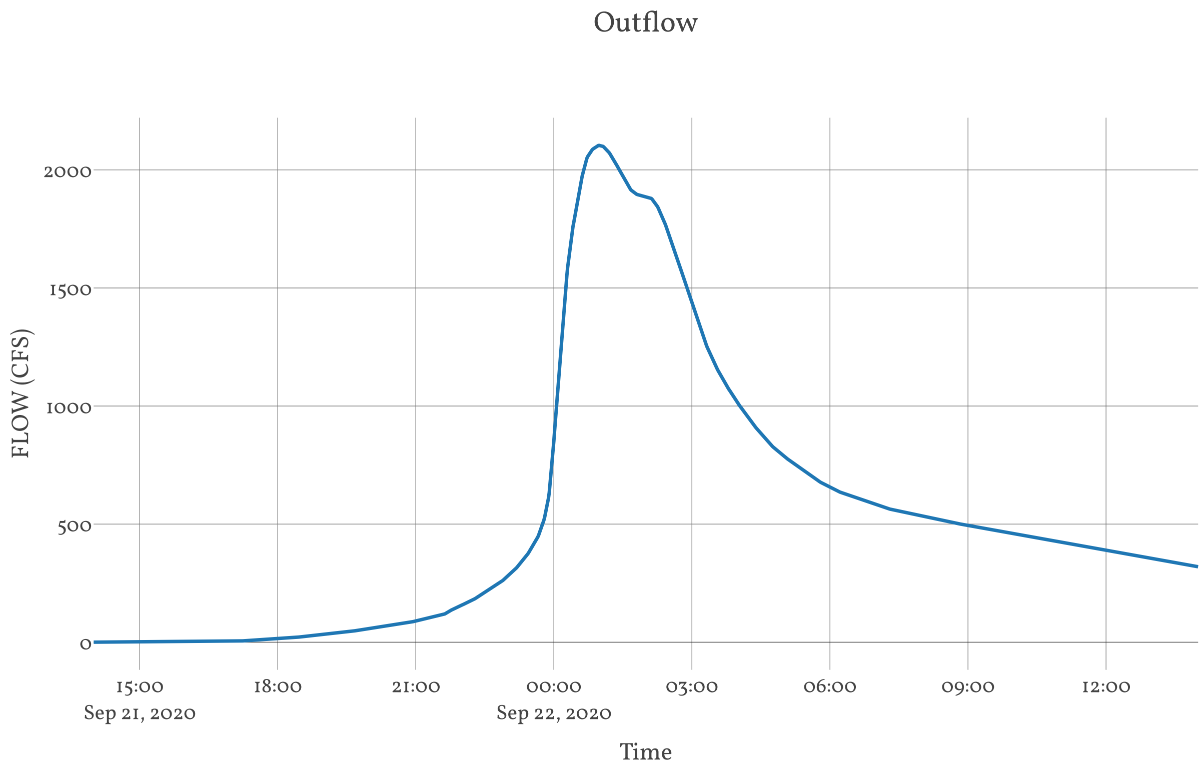
Peak Discharge (CFS)	388.37
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	4.49
Precipitation Volume (AC - FT)	163.06
Loss Volume (AC - FT)	58.55
Excess Volume (AC - FT)	104.5
Direct Runoff Volume (AC - FT)	103.01
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
400
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 13C

Downstream : 13r

Results: 13C	
Peak Discharge (CFS)	2103.7
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	4.33



Reach: 13R

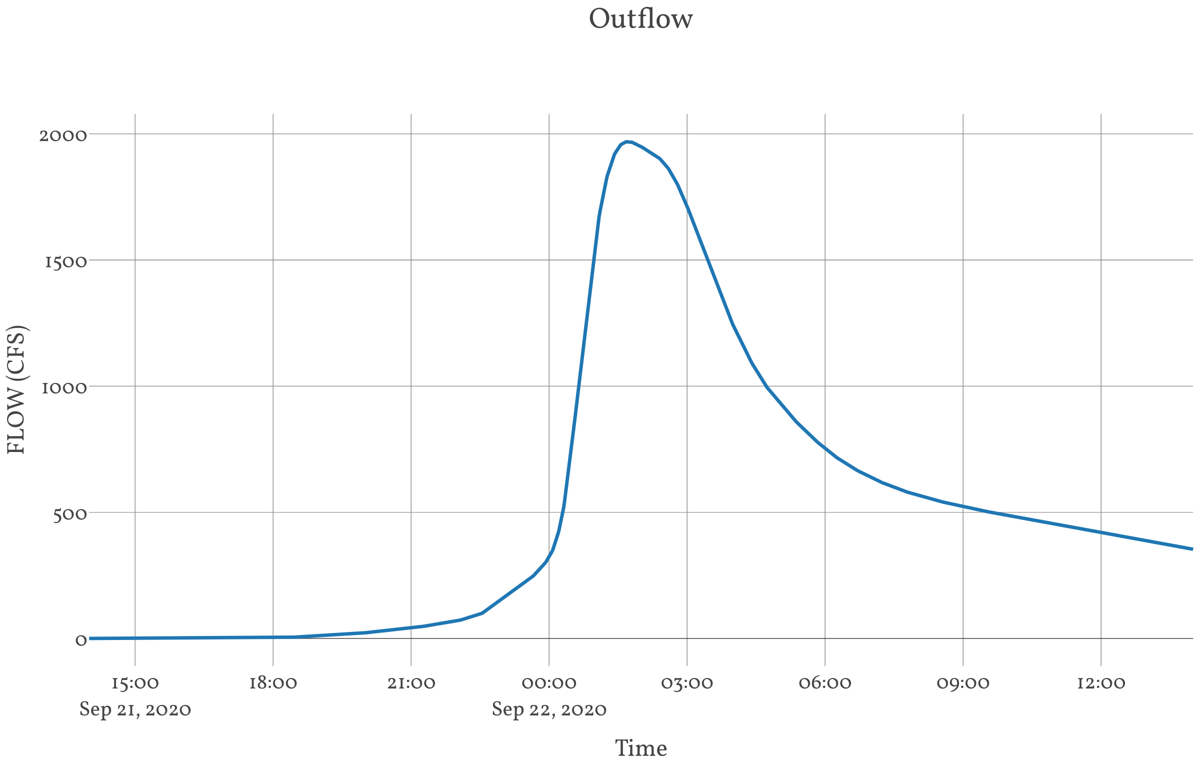
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	1968.98
Time of Peak Discharge	22Sep2020, 01:43
Volume (IN)	4.19
Peak Inflow (CFS)	2103.7
Inflow Volume (AC - FT)	1061.97



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

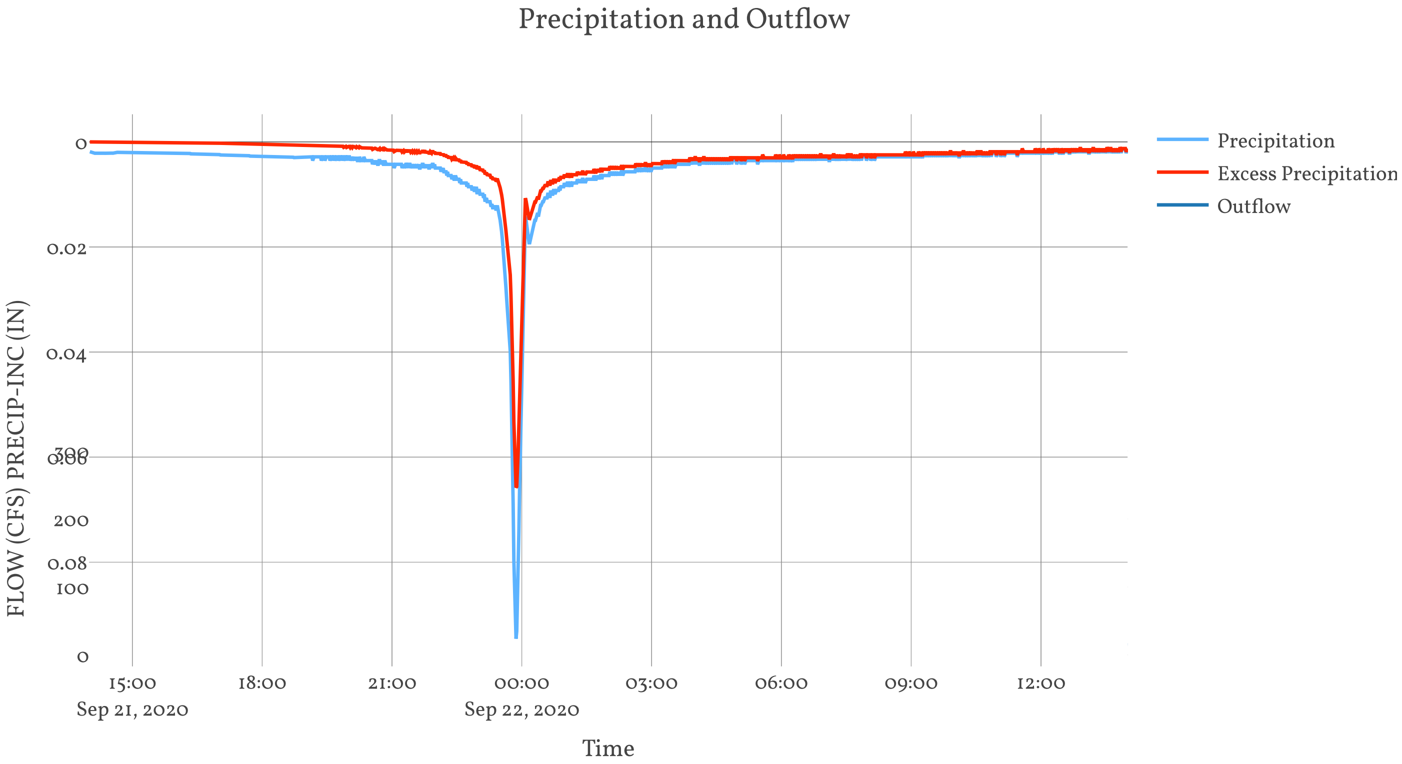
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	300.75
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	4.54
Precipitation Volume (AC - FT)	96.7
Loss Volume (AC - FT)	34.44
Excess Volume (AC - FT)	62.26
Direct Runoff Volume (AC - FT)	61.71
Baseflow Volume (AC - FT)	0

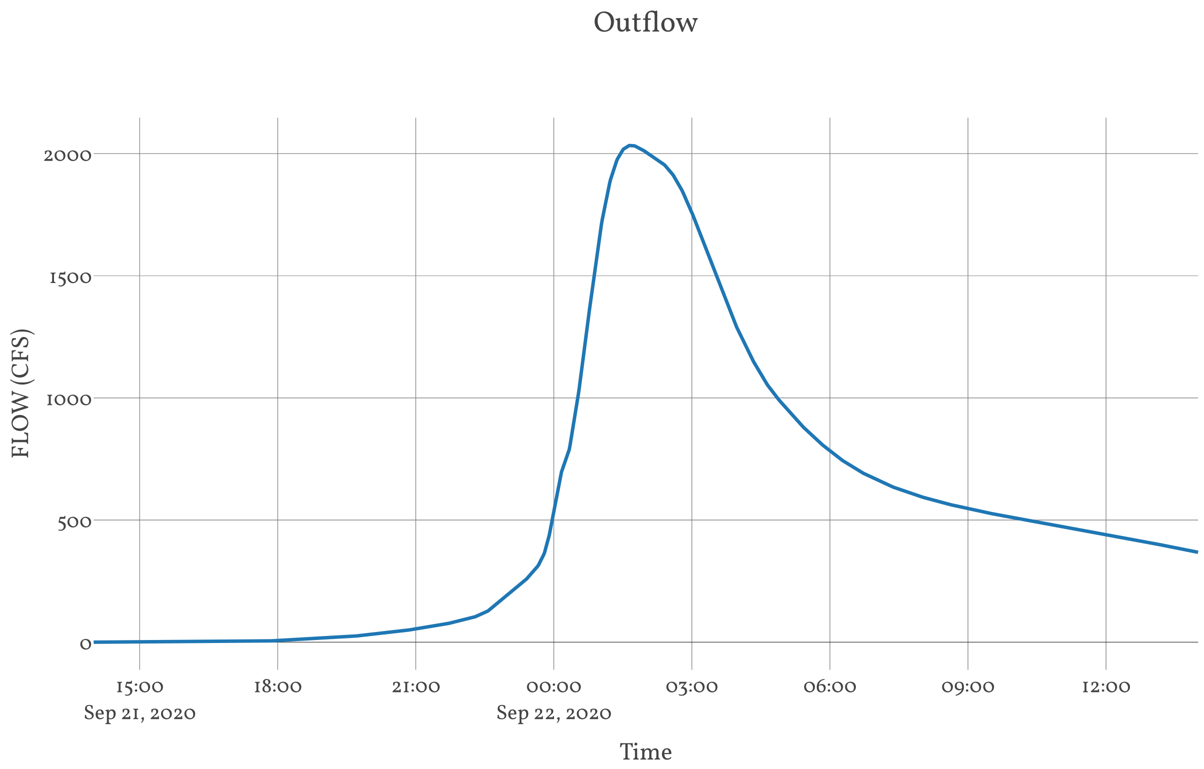

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

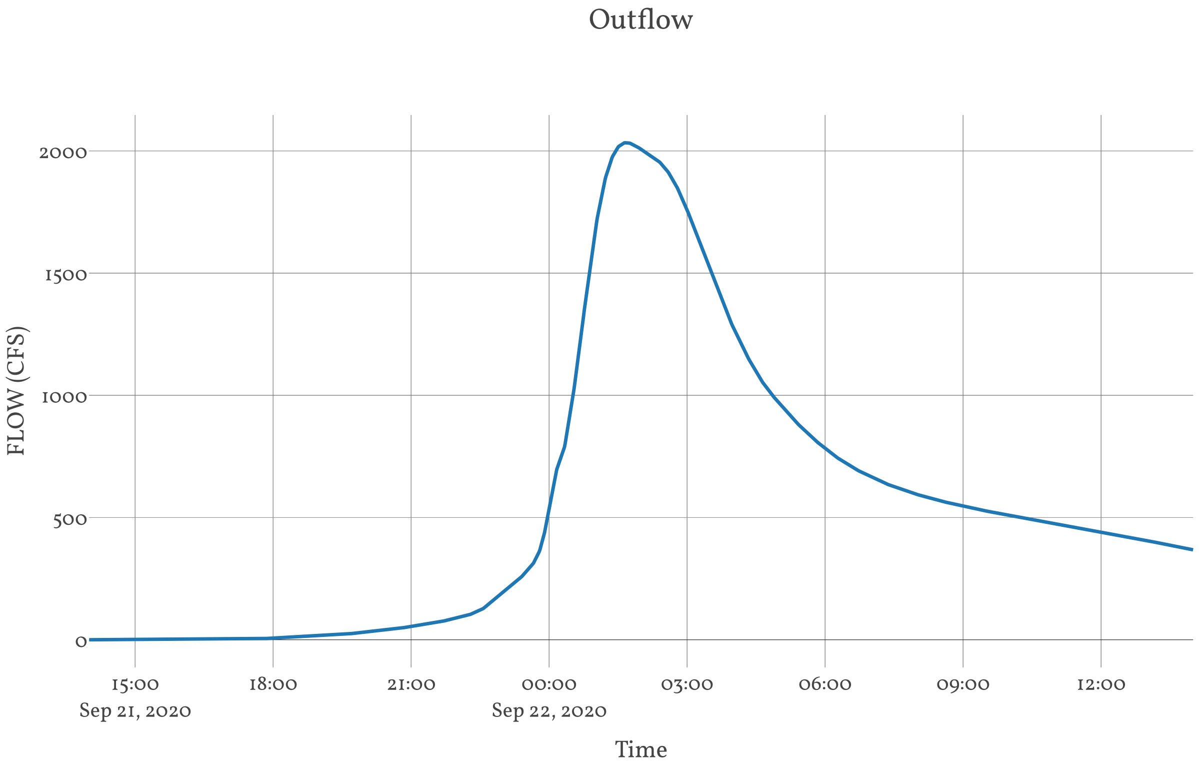
Peak Discharge (CFS)	2033.81
Time of Peak Discharge	22Sep2020, 01:41
Volume (IN)	4.21



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	2033.81
Time of Peak Discharge	22Sep2020, 01:41
Volume (IN)	4.21
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 050-yr Post Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 23:45

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	658.2	22Sep2020, 00:24	5.53
61b	0.61	755.86	22Sep2020, 00:15	5.56
J 60b 61b	1.25	1376.41	22Sep2020, 00:18	5.54
18r	1.25	1201.59	22Sep2020, 00:57	5.35
62b	0.53	801.86	22Sep2020, 00:08	5.48
17c	1.78	1461.83	22Sep2020, 00:54	5.39
17r	1.78	1346.99	22Sep2020, 01:22	5.25
63b	0.6	702.15	22Sep2020, 00:17	5.51
16c	2.38	1626.68	22Sep2020, 01:18	5.31
16r	2.38	1603.52	22Sep2020, 01:37	5.22
64b	1.09	1257.72	22Sep2020, 00:18	5.53
20c	3.47	2095.06	22Sep2020, 00:45	5.31
20r	3.47	2083.23	22Sep2020, 00:58	5.25
65b	0.53	839.53	22Sep2020, 00:07	5.53
15c	4	2343.64	22Sep2020, 00:53	5.29
15r	4	2337.96	22Sep2020, 01:01	5.25
66b	0.16	326.61	22Sep2020, 00:02	5.5
14c	4.16	2393.85	22Sep2020, 01:00	5.26
14r	4.16	2392.33	22Sep2020, 01:05	5.24
67b	0.43	472.93	22Sep2020, 00:19	5.43
13c	4.59	2655.4	22Sep2020, 00:58	5.25
13r	4.59	2490.9	22Sep2020, 01:35	5.09
68b	0.26	365.84	22Sep2020, 00:09	5.48

12c	4.85	2573.2	22Sep2020, 01:33	5.11
Pacific Ocean	4.85	2573.2	22Sep2020, 01:33	5.11

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

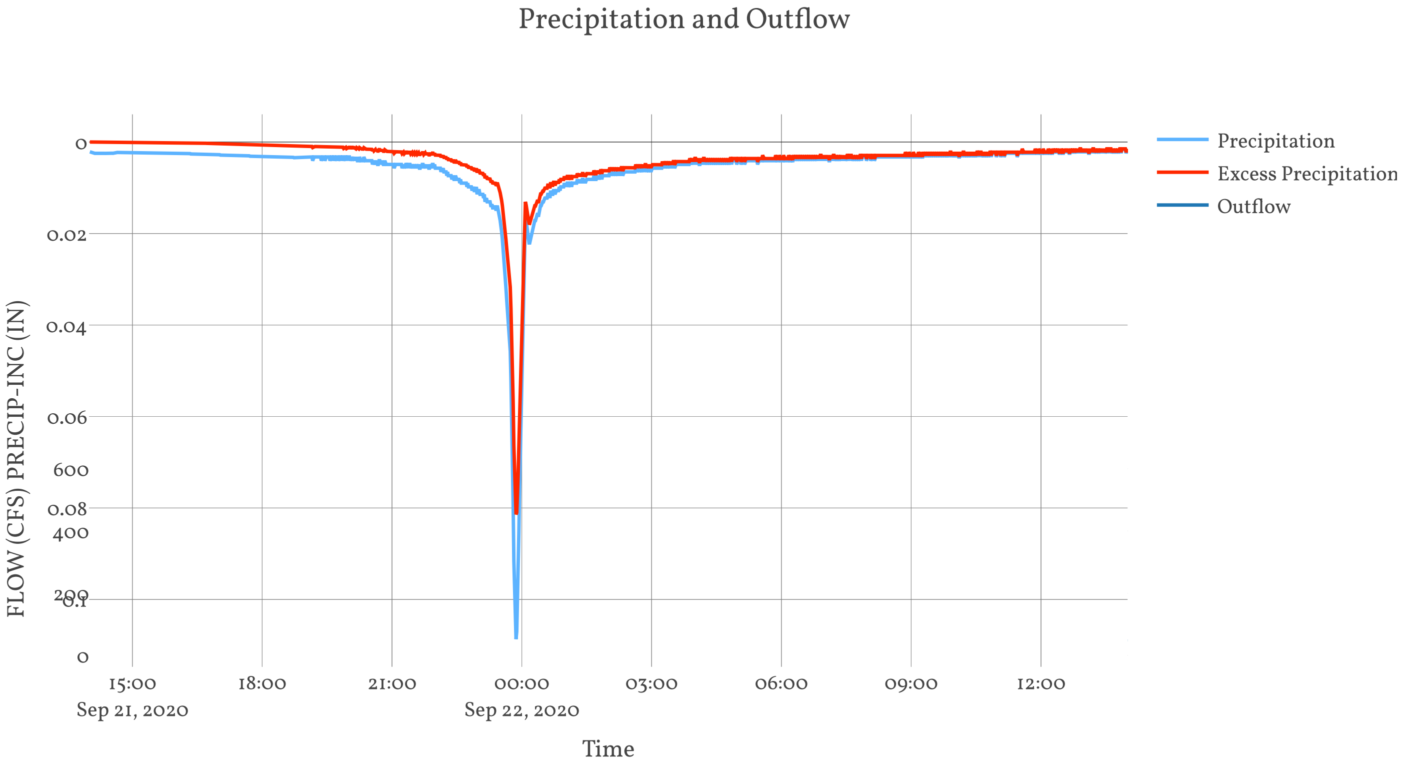
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	658.2
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	5.53
Precipitation Volume (AC - FT)	281.05
Loss Volume (AC - FT)	87.73
Excess Volume (AC - FT)	193.32
Direct Runoff Volume (AC - FT)	190.13
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

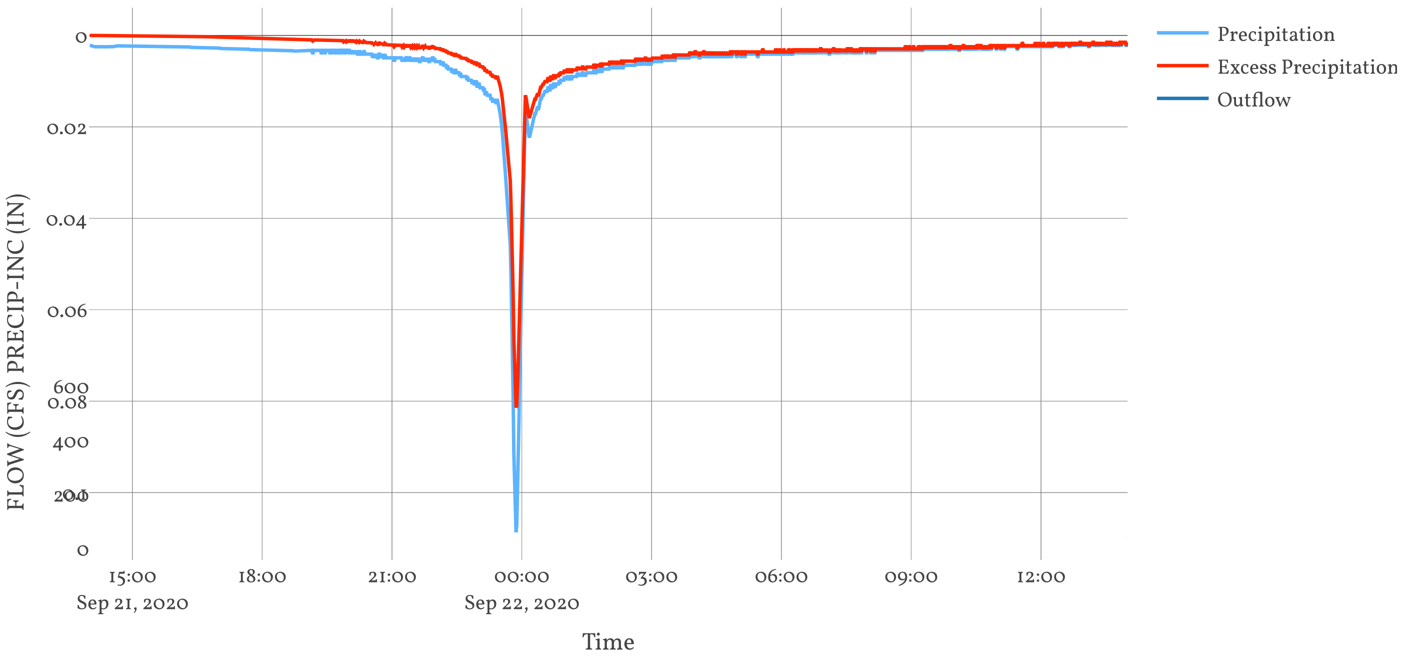
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	755.86
Time of Peak Discharge	22Sep2020, 00:15
Volume (IN)	5.56
Precipitation Volume (AC - FT)	264.05
Loss Volume (AC - FT)	82.43
Excess Volume (AC - FT)	181.63
Direct Runoff Volume (AC - FT)	179.55
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

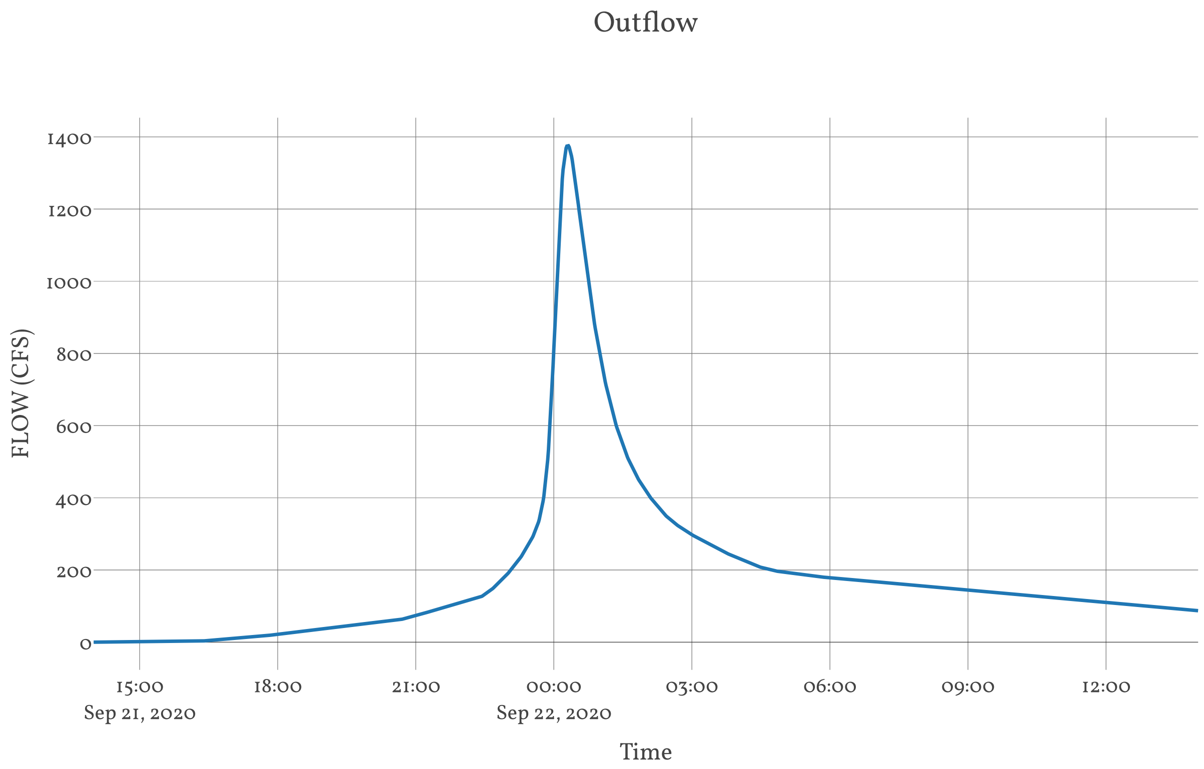


Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1376.41
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	5.54



Reach: 18R

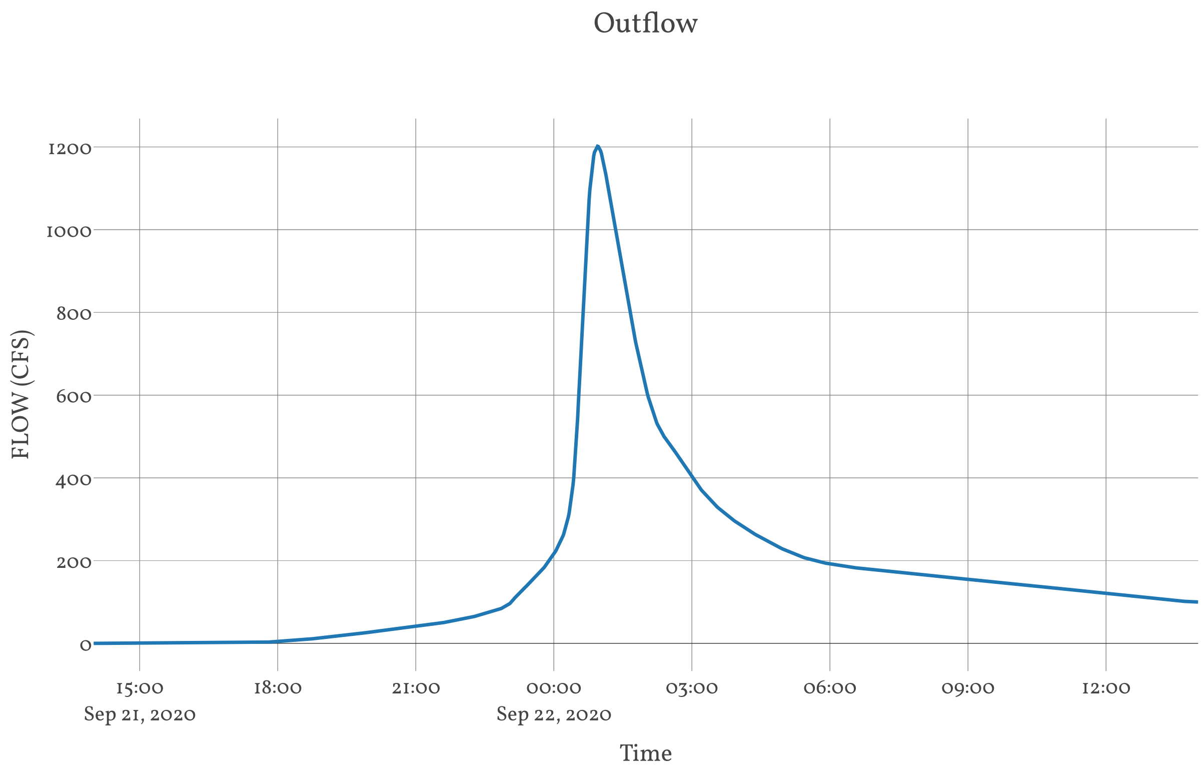
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	1201.59
Time of Peak Discharge	22Sep2020, 00:57
Volume (IN)	5.35
Peak Inflow (CFS)	1376.41
Inflow Volume (AC - FT)	369.68



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

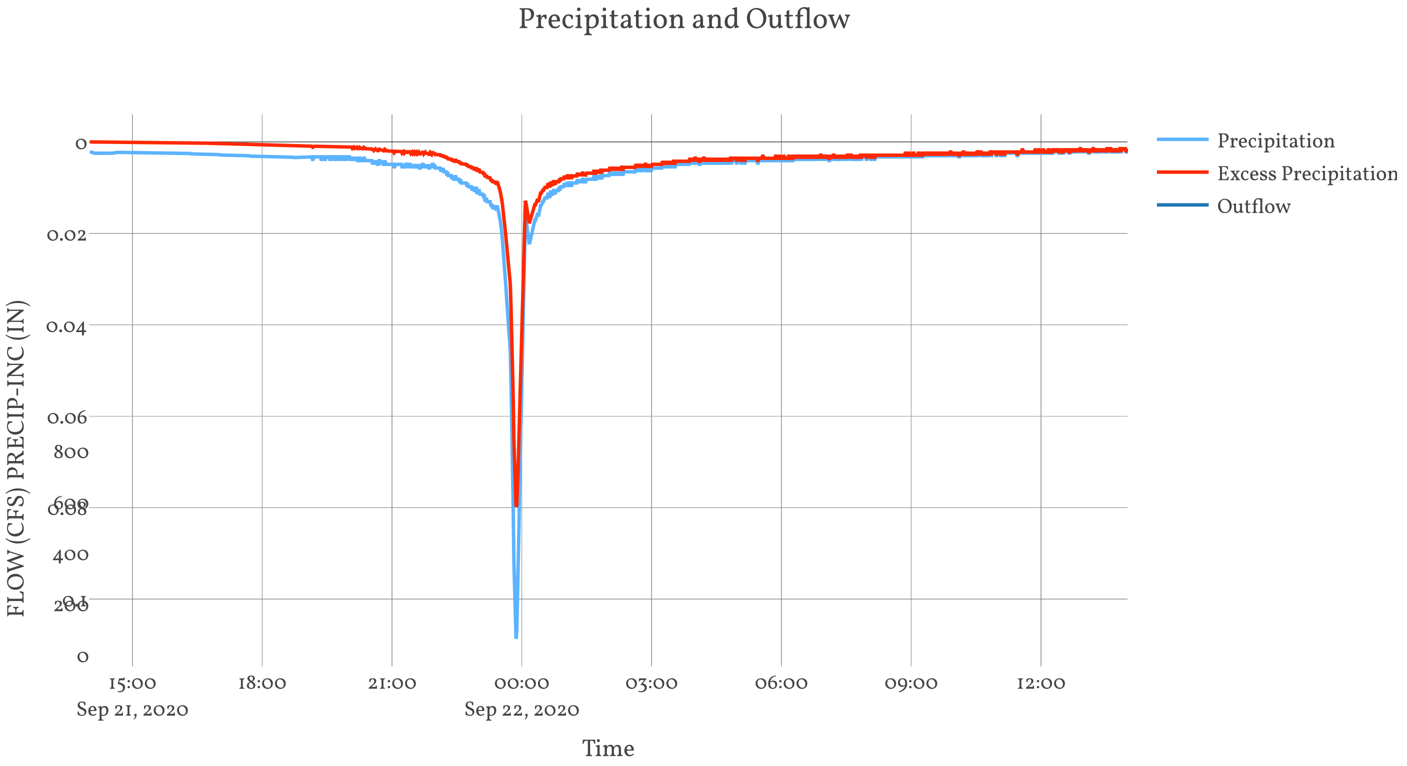
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	801.86
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	5.48
Precipitation Volume (AC - FT)	229.02
Loss Volume (AC - FT)	74.21
Excess Volume (AC - FT)	154.81
Direct Runoff Volume (AC - FT)	153.63
Baseflow Volume (AC - FT)	0

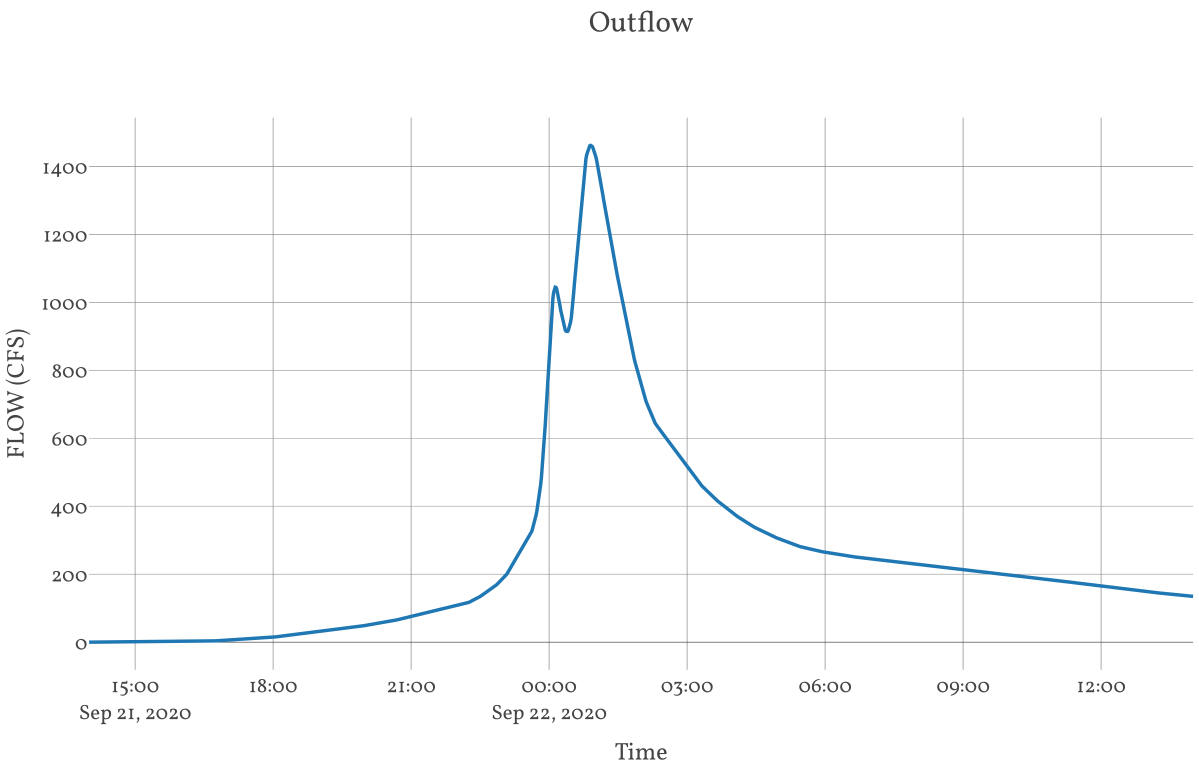

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	1461.83
Time of Peak Discharge	22Sep2020, 00:54
Volume (IN)	5.39



Reach: 17R

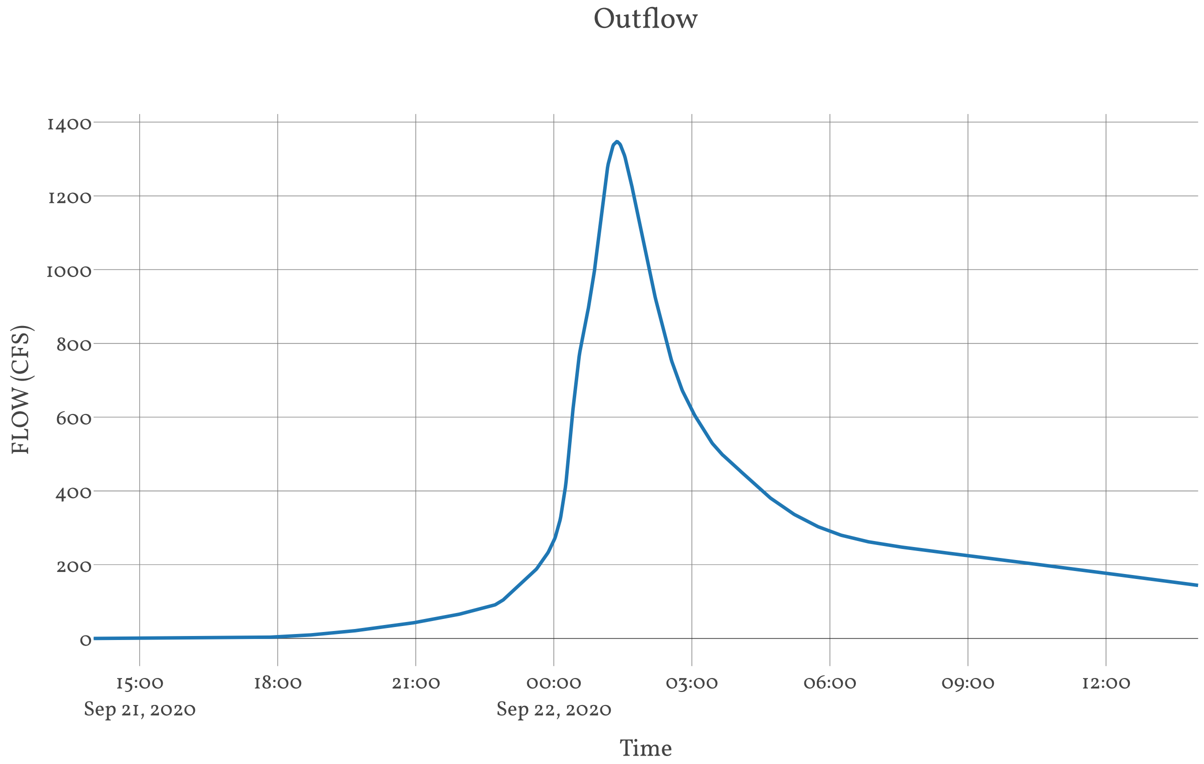
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1346.99
Time of Peak Discharge	22Sep2020, 01:22
Volume (IN)	5.25
Peak Inflow (CFS)	1461.83
Inflow Volume (AC - FT)	510.31



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

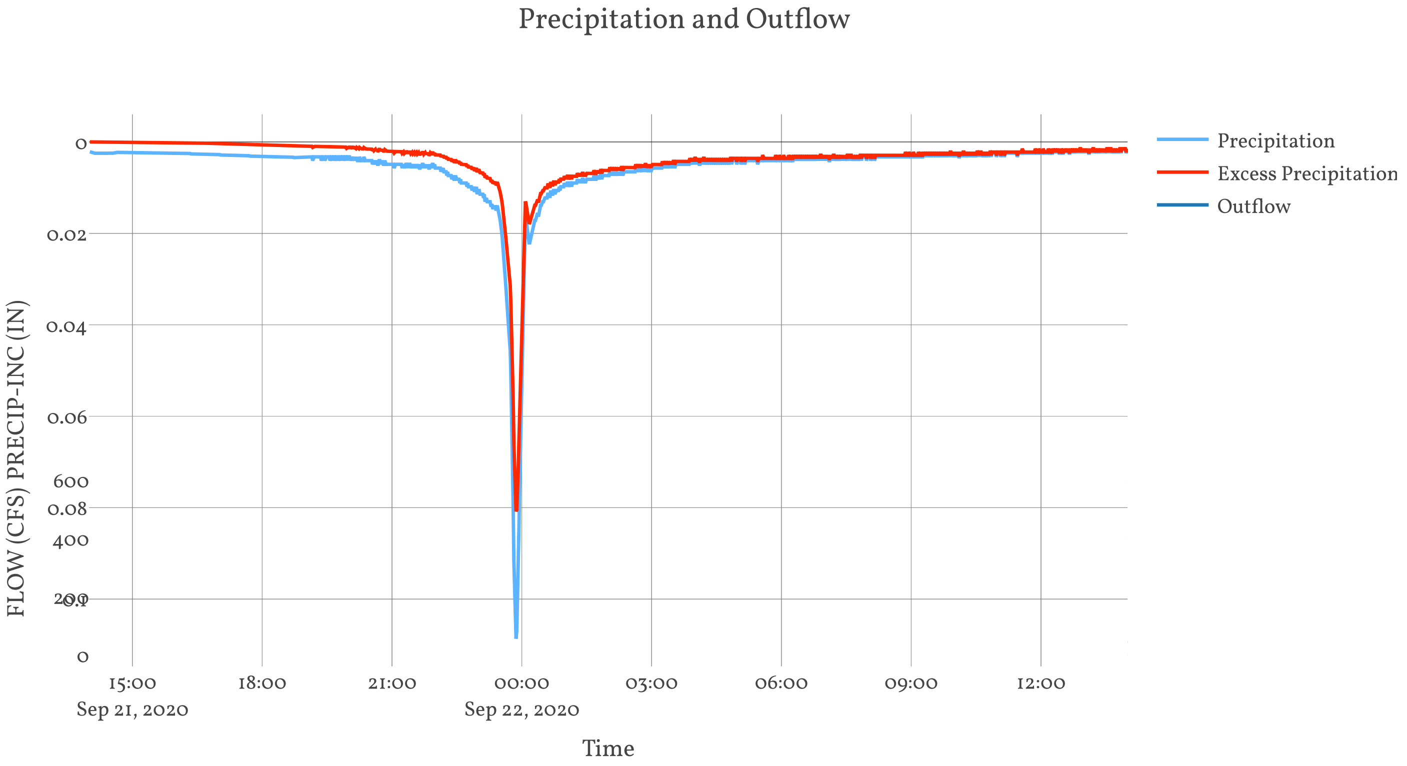
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	702.15
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	5.51
Precipitation Volume (AC - FT)	262.31
Loss Volume (AC - FT)	83.02
Excess Volume (AC - FT)	179.29
Direct Runoff Volume (AC - FT)	177
Baseflow Volume (AC - FT)	0

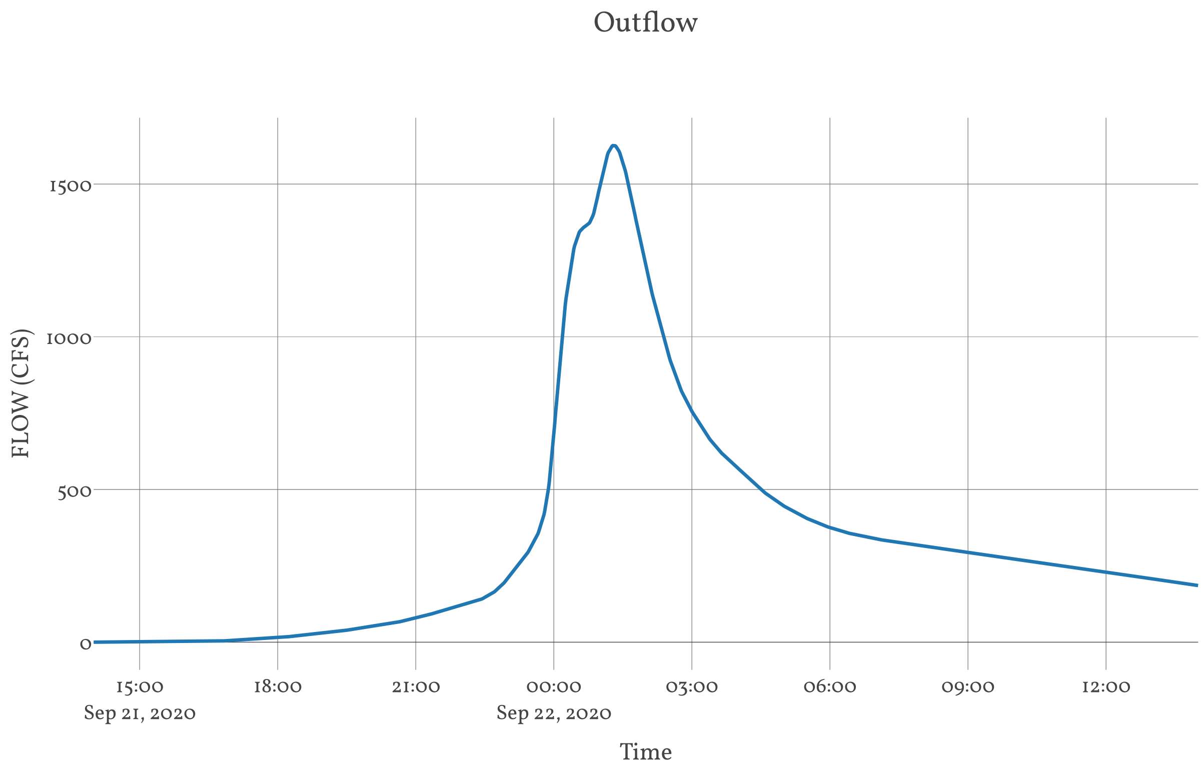

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
600
0.08
400
200
0.1
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1626.68
Time of Peak Discharge	22Sep2020, 01:18
Volume (IN)	5.31



Reach: 16R

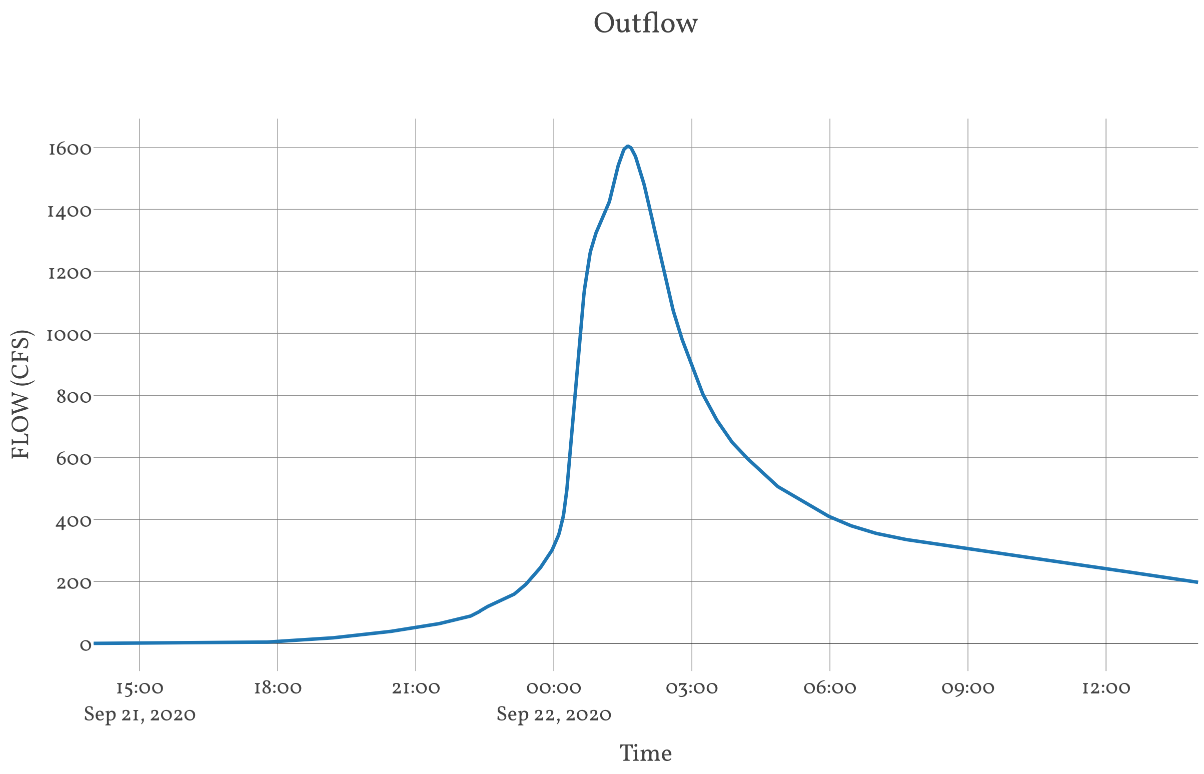
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1603.52
Time of Peak Discharge	22Sep2020, 01:37
Volume (IN)	5.22
Peak Inflow (CFS)	1626.68
Inflow Volume (AC - FT)	674.12



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

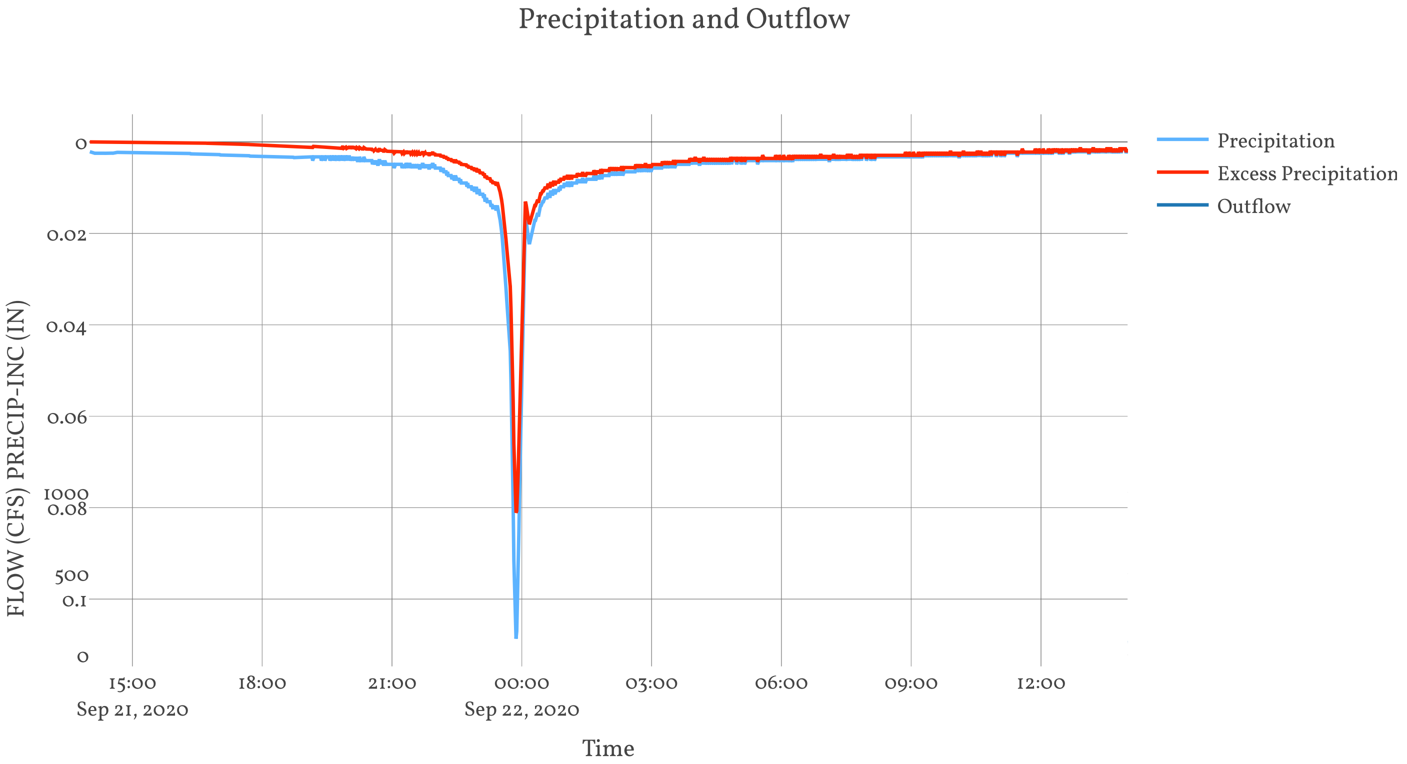
Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1257.72
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	5.53
Precipitation Volume (AC - FT)	474.95
Loss Volume (AC - FT)	149.29
Excess Volume (AC - FT)	325.66
Direct Runoff Volume (AC - FT)	321.39
Baseflow Volume (AC - FT)	0

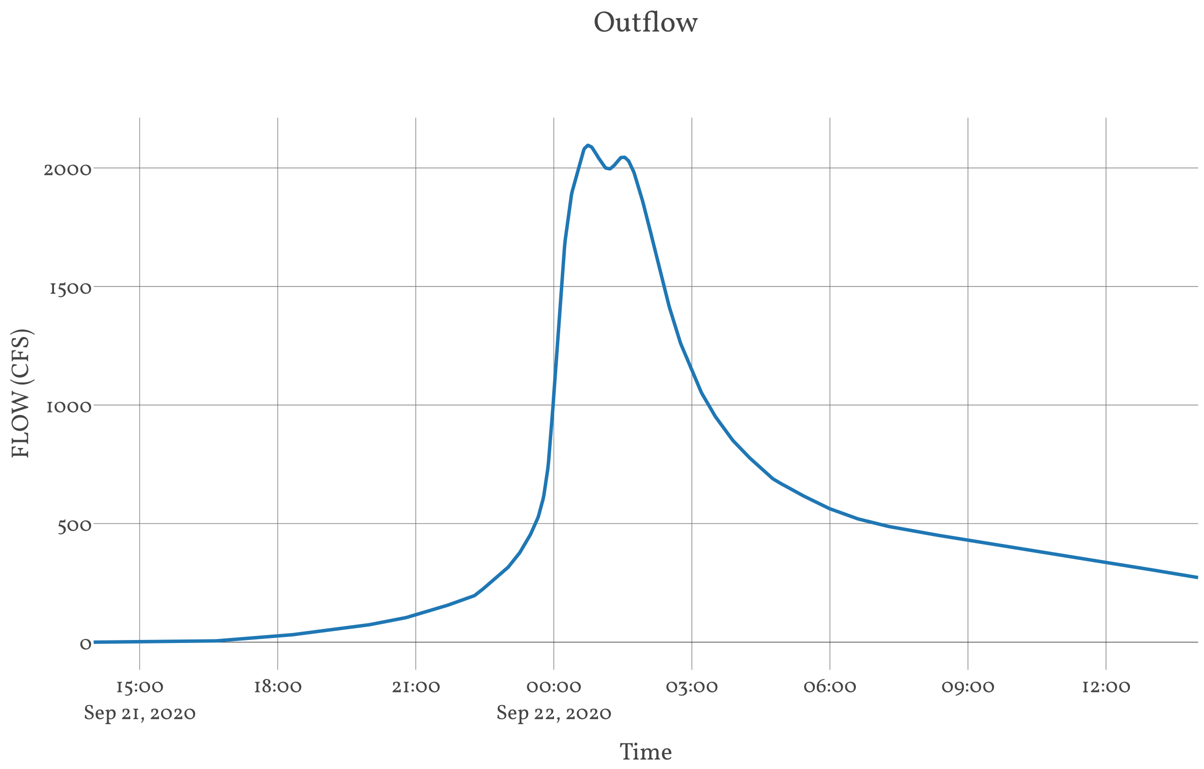

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
1000
0.08
500
0.1
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	2095.06
Time of Peak Discharge	22Sep2020, 00:45
Volume (IN)	5.31



Reach: 20R

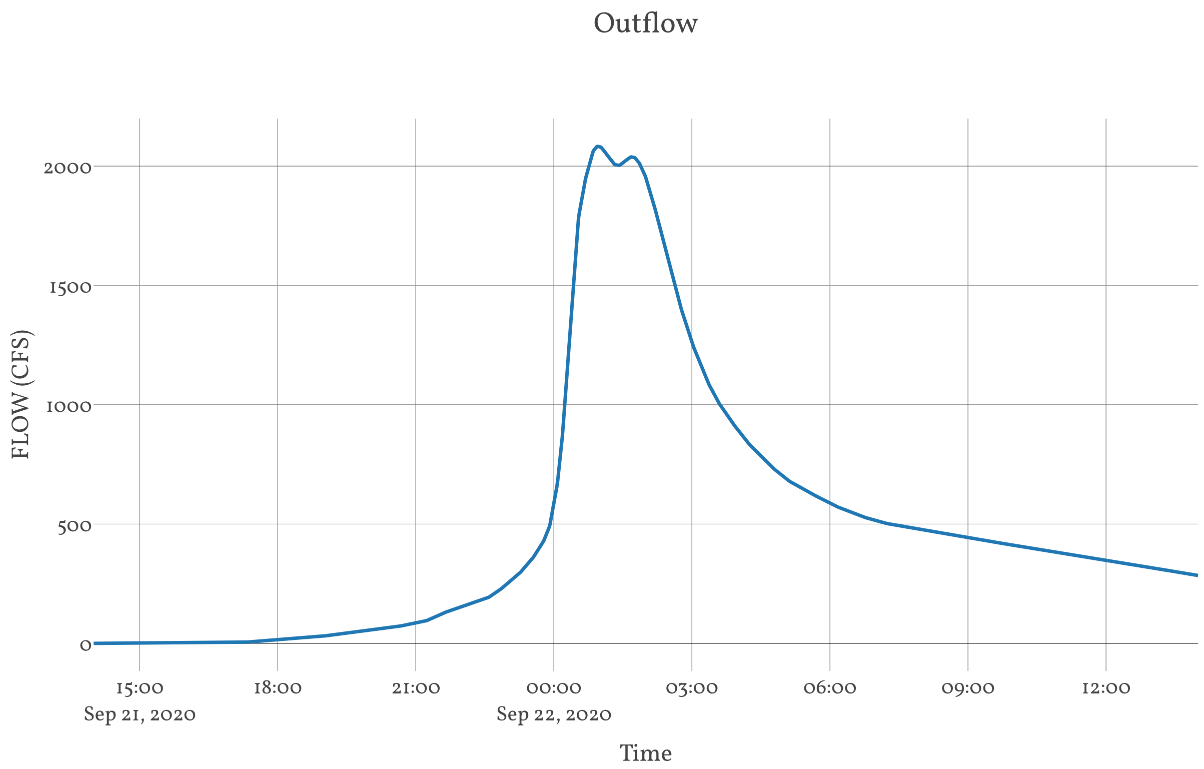
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	2083.23
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	5.25
Peak Inflow (CFS)	2095.06
Inflow Volume (AC - FT)	983.19



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

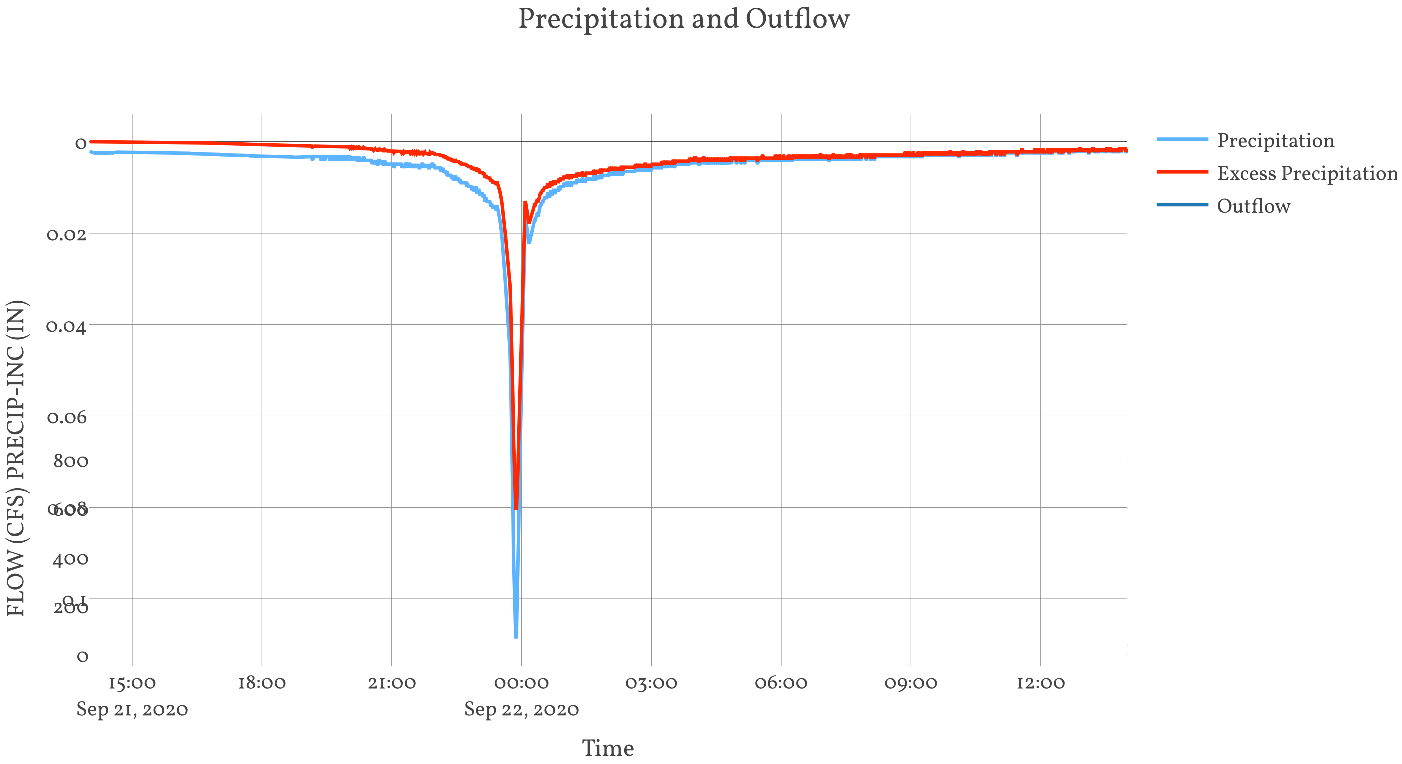
Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	839.53
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	5.53
Precipitation Volume (AC - FT)	232.25
Loss Volume (AC - FT)	74
Excess Volume (AC - FT)	158.24
Direct Runoff Volume (AC - FT)	157.09
Baseflow Volume (AC - FT)	0

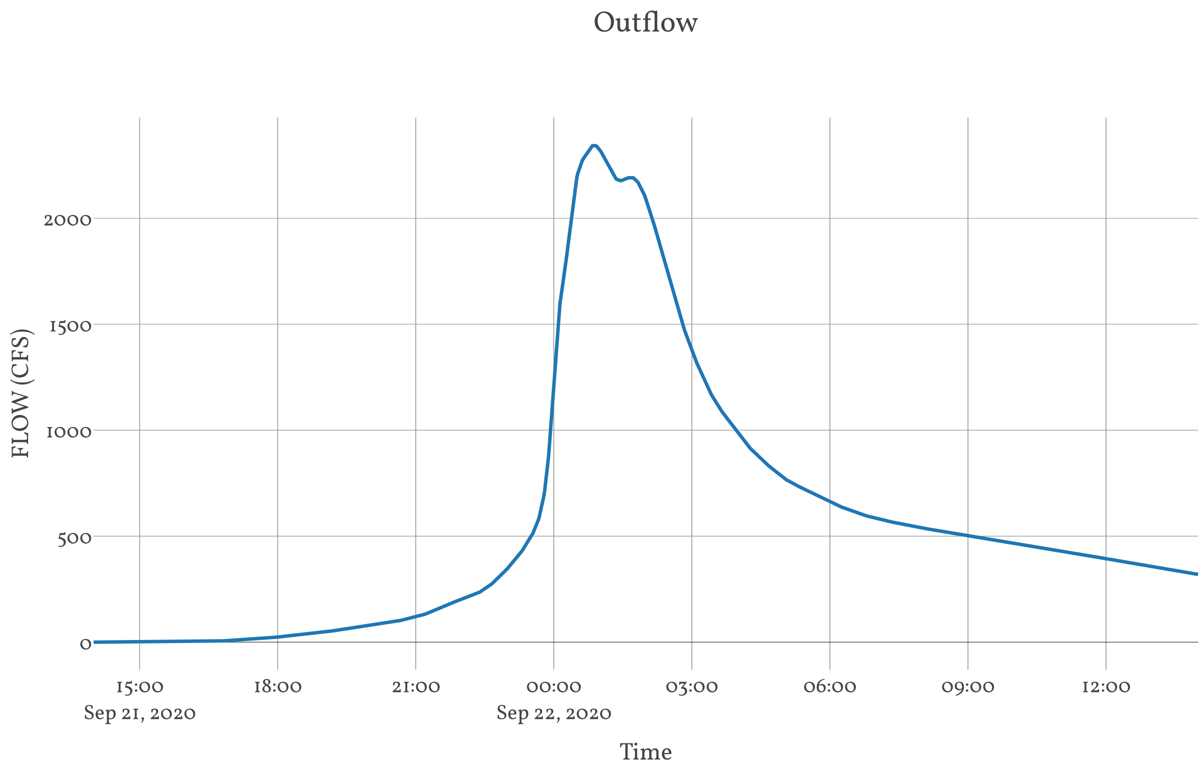

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
800
600
400
200
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	2343.64
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	5.29



Reach: 15R

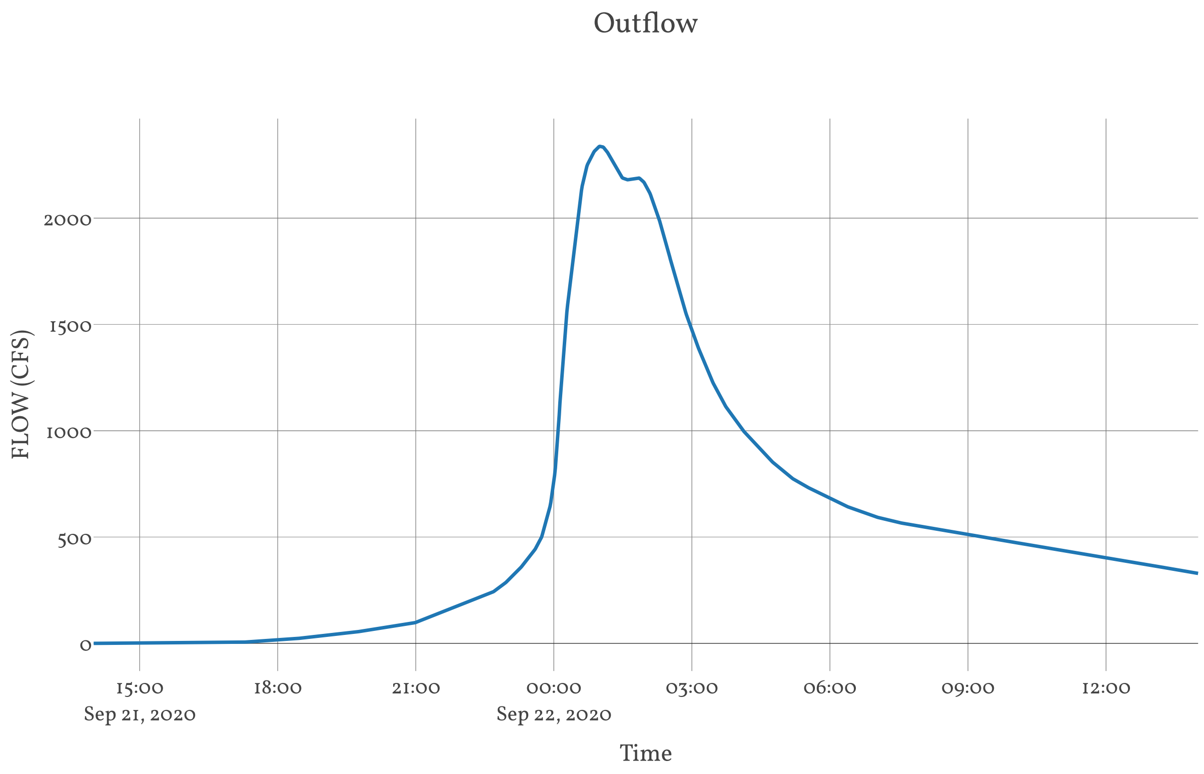
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	2337.96
Time of Peak Discharge	22Sep2020, 01:01
Volume (IN)	5.25
Peak Inflow (CFS)	2343.64
Inflow Volume (AC - FT)	1128.91



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

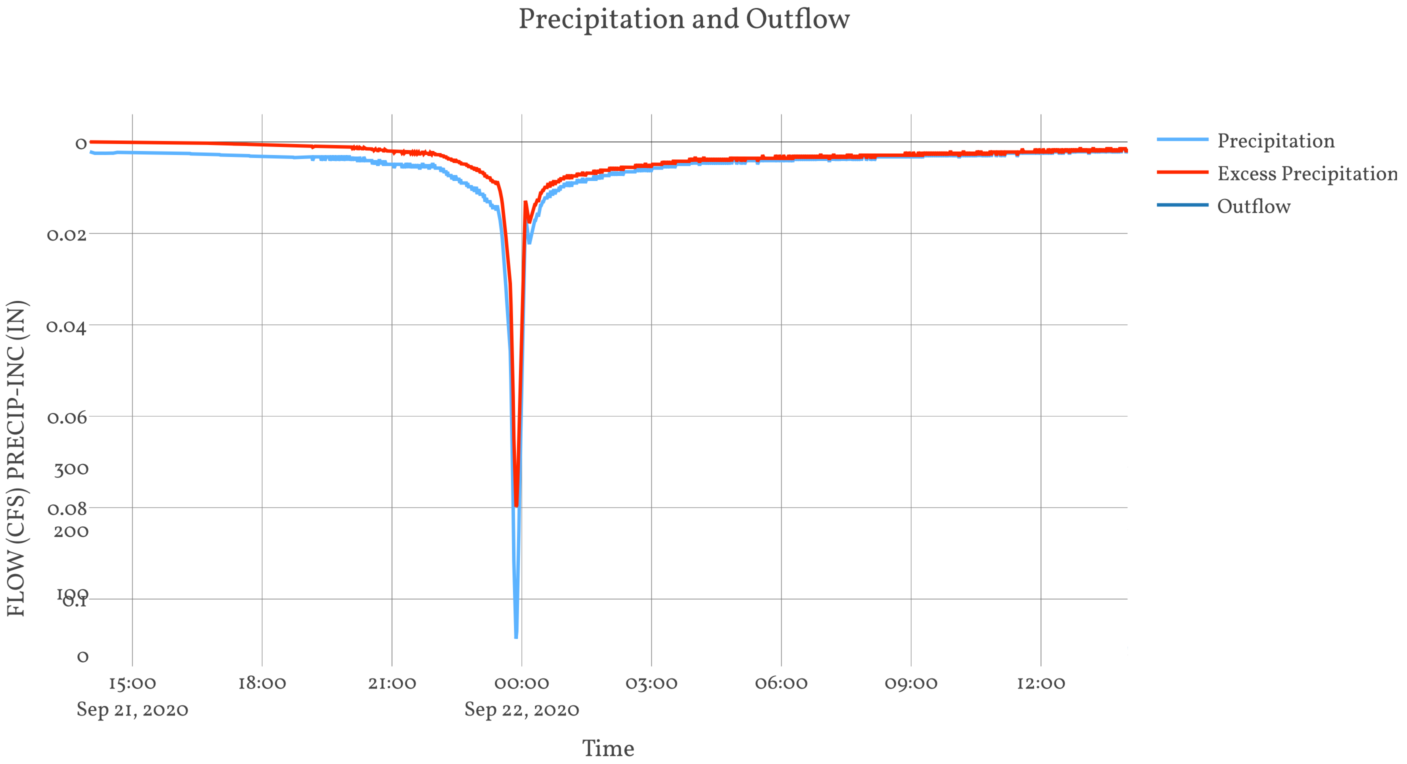
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	326.61
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	5.5
Precipitation Volume (AC - FT)	70.59
Loss Volume (AC - FT)	22.87
Excess Volume (AC - FT)	47.72
Direct Runoff Volume (AC - FT)	47.52
Baseflow Volume (AC - FT)	0

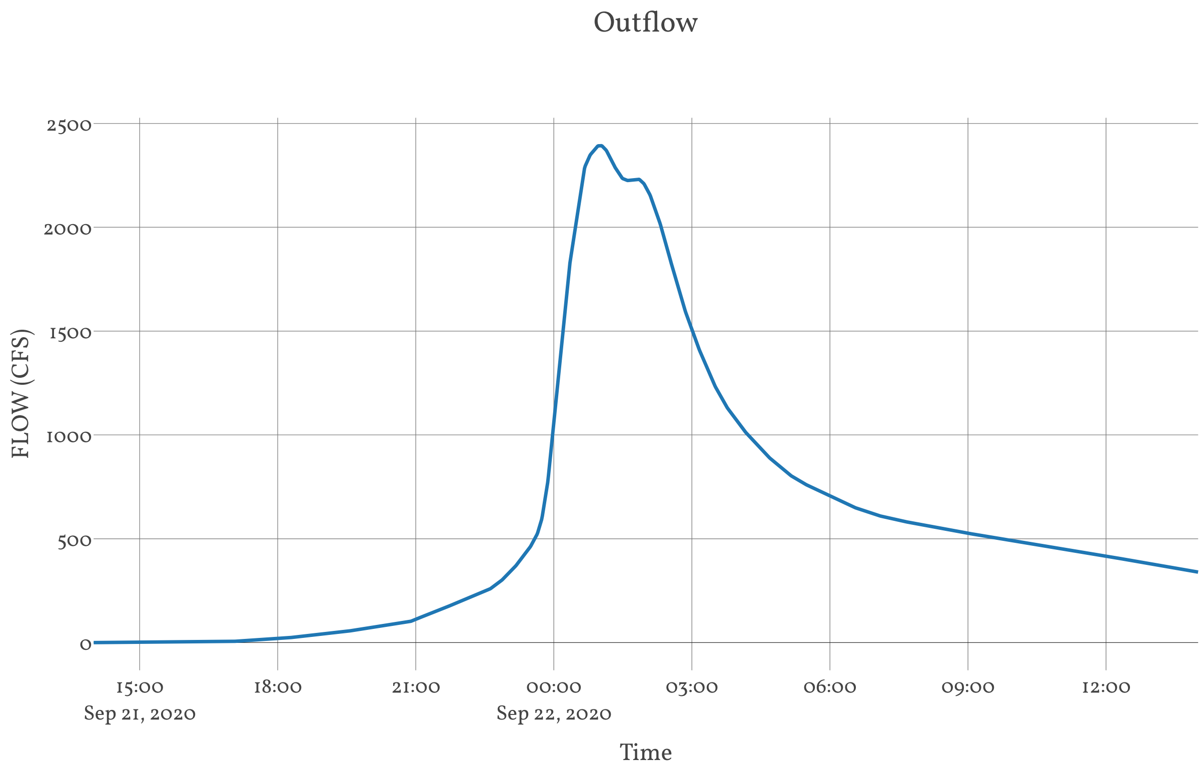

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
300
200
100
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	2393.85
Time of Peak Discharge	22Sep2020, 01:00
Volume (IN)	5.26



Reach: 14R

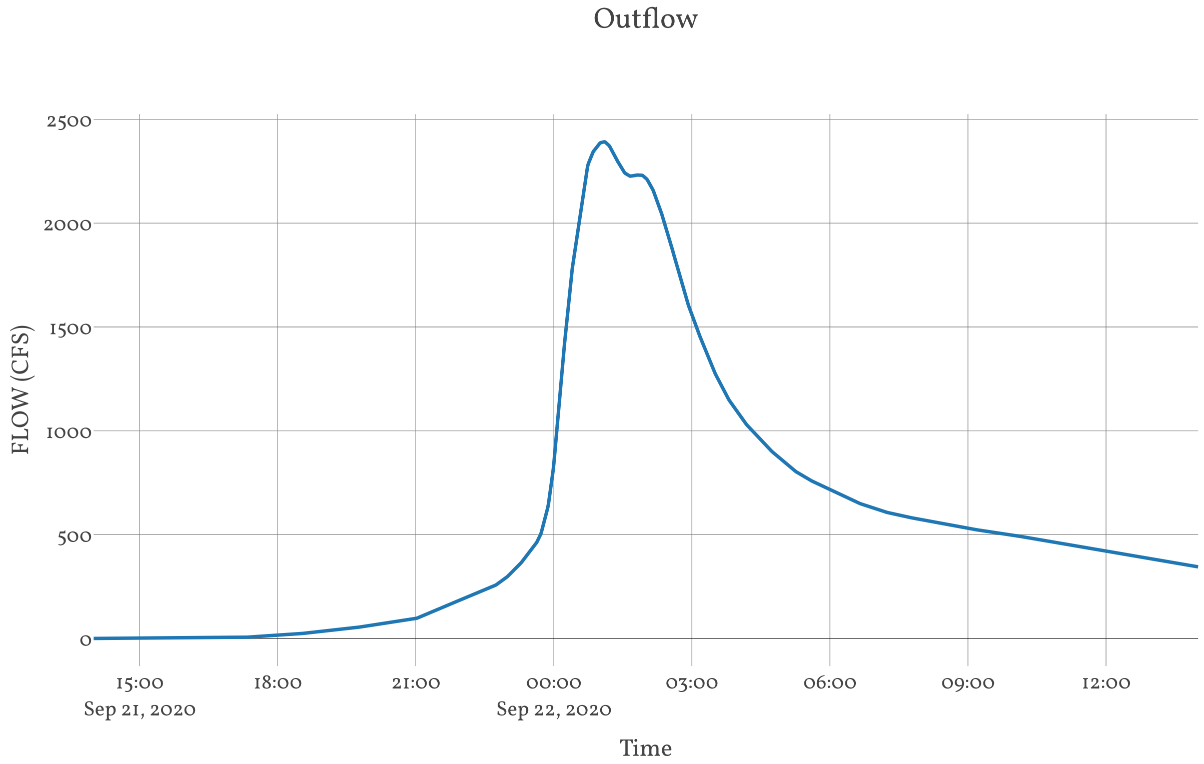
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	2392.33
Time of Peak Discharge	22Sep2020, 01:05
Volume (IN)	5.24
Peak Inflow (CFS)	2393.85
Inflow Volume (AC - FT)	1167.67



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

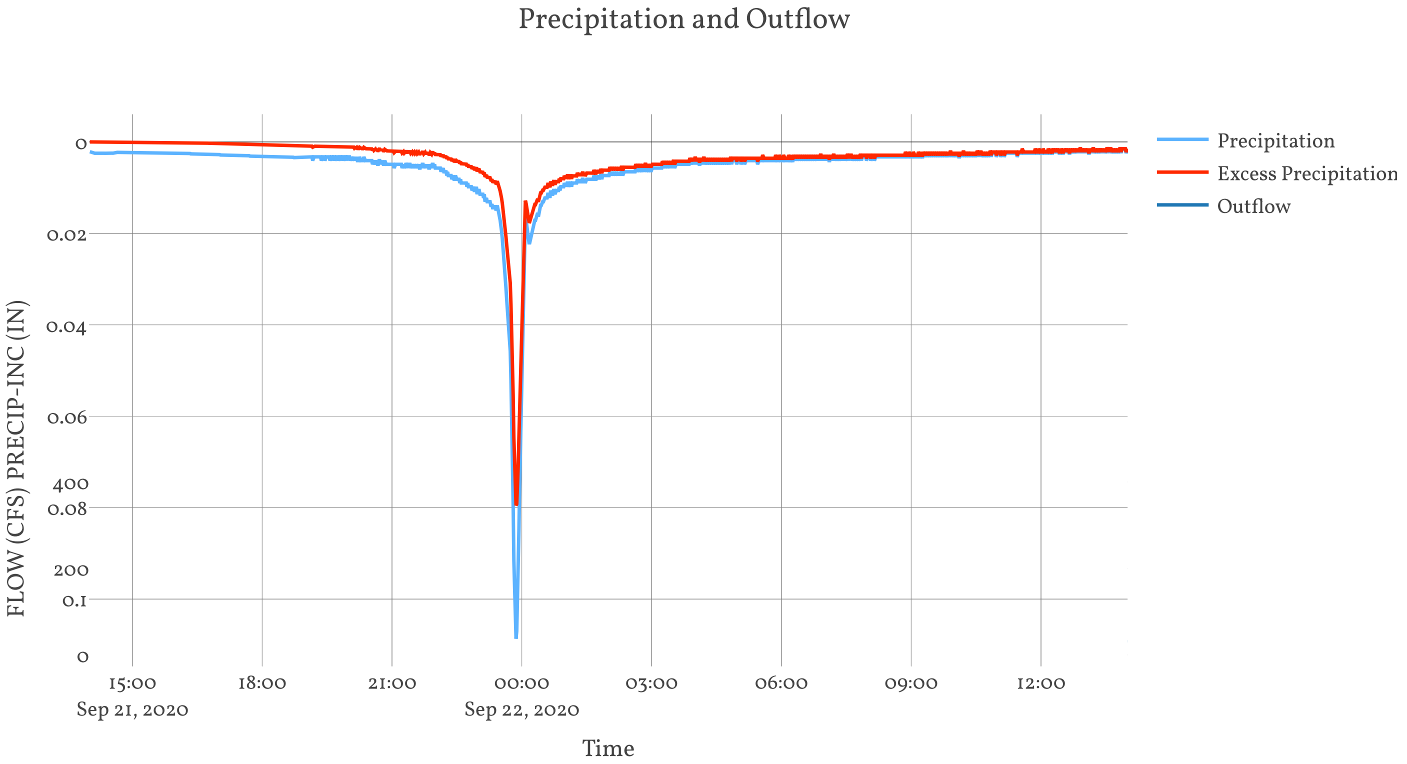
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	472.93
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	5.43
Precipitation Volume (AC - FT)	187.37
Loss Volume (AC - FT)	61.11
Excess Volume (AC - FT)	126.25
Direct Runoff Volume (AC - FT)	124.49
Baseflow Volume (AC - FT)	0

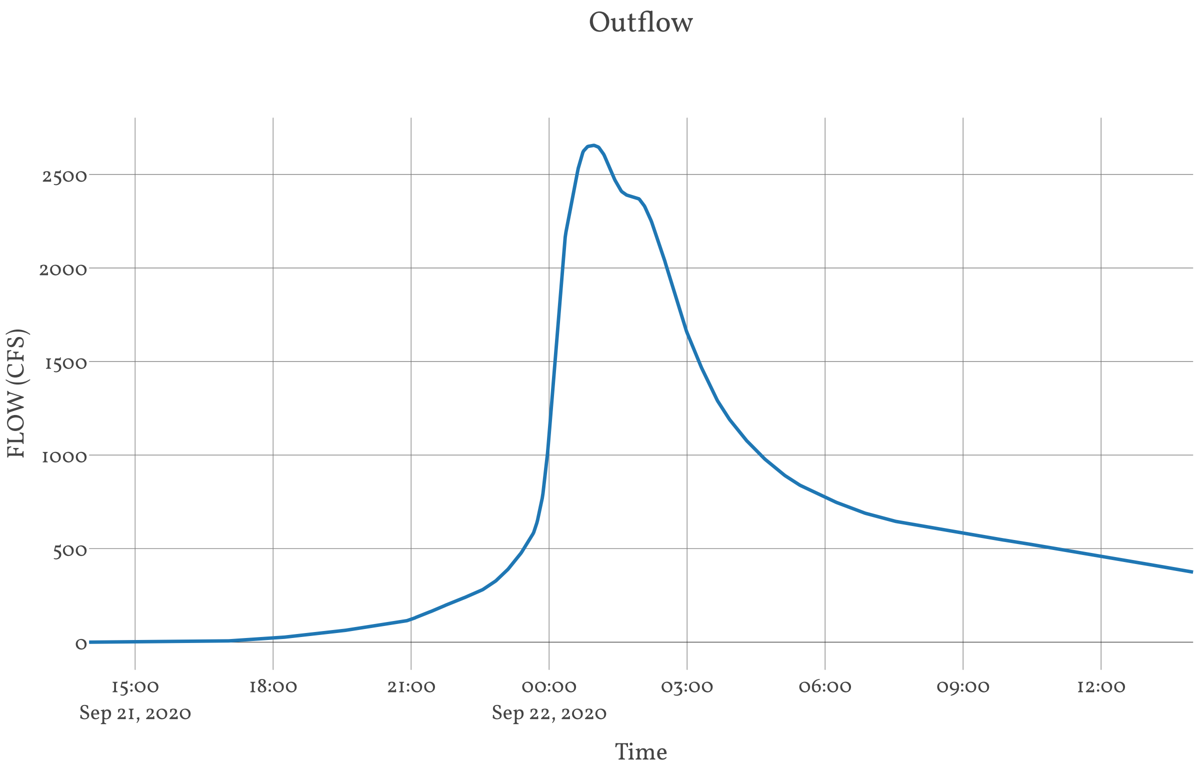

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
400
200
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	2655.4
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	5.25



Reach: 13R

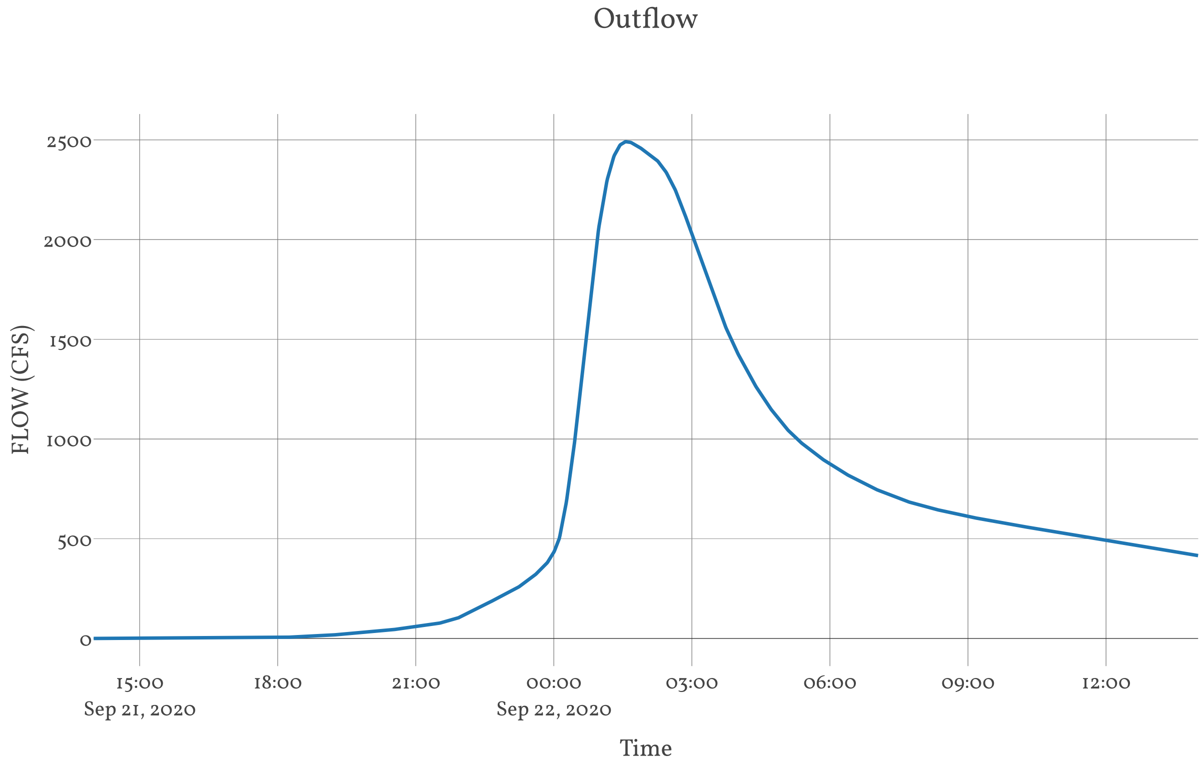
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	2490.9
Time of Peak Discharge	22Sep2020, 01:35
Volume (IN)	5.09
Peak Inflow (CFS)	2655.4
Inflow Volume (AC - FT)	1287.19



Subbasin: 68B

Area : 0.26
Downstream : I2C

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

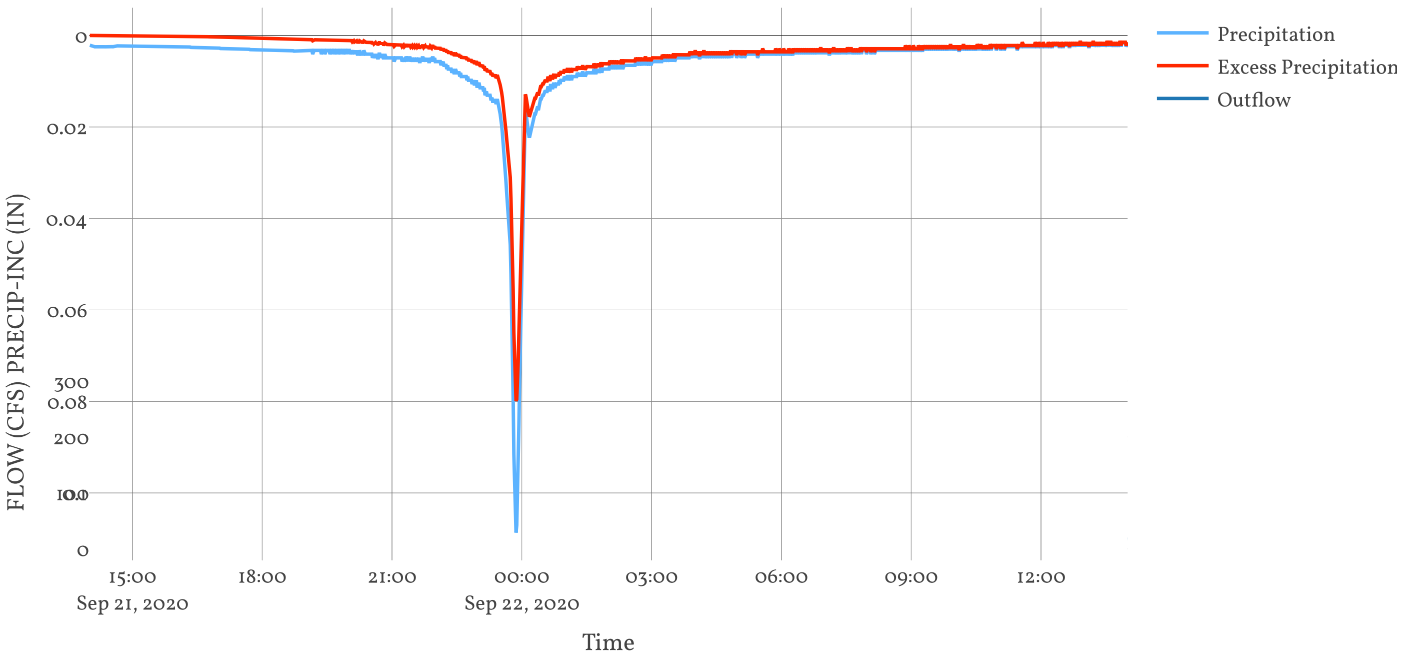
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	365.84
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	5.48
Precipitation Volume (AC - FT)	111.11
Loss Volume (AC - FT)	35.93
Excess Volume (AC - FT)	75.18
Direct Runoff Volume (AC - FT)	74.53
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

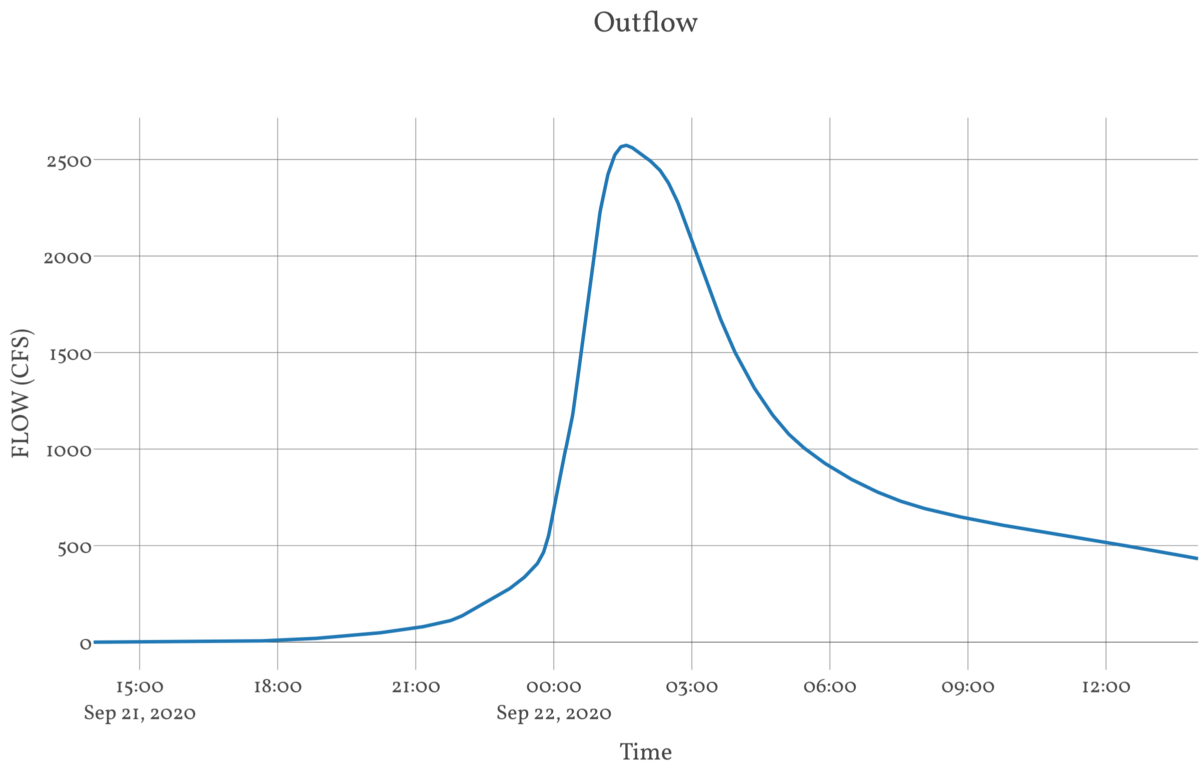


Junction: 12C

Downstream : Pacific Ocean

Results: 12C

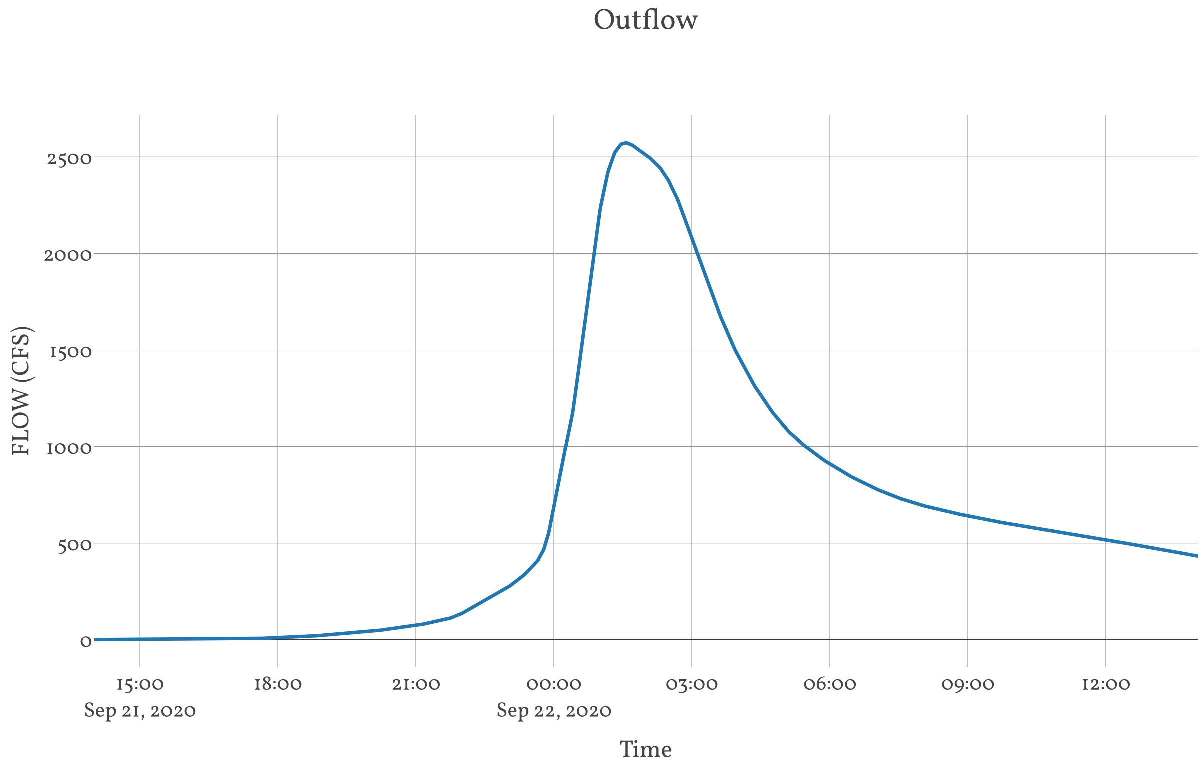
Peak Discharge (CFS)	2573.2
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	5.11



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	2573.2
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	5.11
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



Project: Little_Sycamore_May2021
Simulation Run: 100-yr Post-Dev
Simulation Start: 21 September 2020, 14:00
Simulation End: 22 September 2020, 14:00

HMS Version: 4.6.1
Executed: 29 April 2021, 21:34

Global Parameter Summary - Subbasin

Area

Element Name	Area
60b	0.65
61b	0.61
62b	0.53
63b	0.6
64b	1.09
65b	0.53
66b	0.16
67b	0.43
68b	0.26

Downstream

Element Name	Downstream
60b	J 60b 61b
61b	J 60b 61b
62b	17c
63b	16c
64b	20c
65b	15c
66b	14c
67b	13c
68b	12c

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number	Initial Abstraction
60b	0	75	0.2
61b	0	75	0.2
62b	0	73.9	0.2
63b	0	74.6	0.2
64b	0	74.8	0.2
65b	0	74.4	0.2
66b	0	73.9	0.2
67b	0	73.7	0.2
68b	0	73.9	0.2

Transform: User - Specified S - Graph

Element Name	S - graph	Lag Method	Lag
60b	Ellsworth S - Graph	Specified	0.52
61b	Ellsworth S - Graph	Specified	0.37
62b	Ellsworth S - Graph	Specified	0.25
63b	Ellsworth S - Graph	Specified	0.41
64b	Ellsworth S - Graph	Specified	0.42
65b	Ellsworth S - Graph	Specified	0.24
66b	Ellsworth S - Graph	Specified	0.14
67b	Ellsworth S - Graph	Specified	0.44
68b	Ellsworth S - Graph	Specified	0.28

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
18r	17c
17r	16c
16r	20c
20r	15c
15r	14c
14r	13c
13r	12c

Route: Modified Puls

Element Name	Method	Initial Variable	Number of Reaches	Storage Outflow Table Name
18r	Modified Puls	Combined Inflow	8	18r
17r	Modified Puls	Combined Inflow	4	17r
16r	Modified Puls	Combined Inflow	6	16r
20r	Modified Puls	Combined Inflow	6	20r
15r	Modified Puls	Combined Inflow	5	15r
14r	Modified Puls	Combined Inflow	5	14r
13r	Modified Puls	Combined Inflow	2	13r

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
60b	0.65	780.97	22Sep2020, 00:24	6.53
61b	0.61	896.67	22Sep2020, 00:14	6.56
J 60b 61b	1.25	1633.26	22Sep2020, 00:18	6.54
18r	1.25	1438.27	22Sep2020, 00:56	6.33
62b	0.53	952.41	22Sep2020, 00:08	6.48
17c	1.78	1753.66	22Sep2020, 00:52	6.37
17r	1.78	1634.93	22Sep2020, 01:18	6.22
63b	0.6	833.58	22Sep2020, 00:17	6.51
16c	2.38	1981.11	22Sep2020, 01:14	6.3
16r	2.38	1949.71	22Sep2020, 01:33	6.19
64b	1.09	1492.76	22Sep2020, 00:17	6.53
20c	3.47	2556.55	22Sep2020, 00:45	6.3
20r	3.47	2544.52	22Sep2020, 00:57	6.23
65b	0.53	996.31	22Sep2020, 00:07	6.53
15c	4	2859.17	22Sep2020, 00:51	6.27
15r	4	2853.59	22Sep2020, 00:59	6.22
66b	0.16	387.56	22Sep2020, 00:02	6.5
14c	4.16	2920.92	22Sep2020, 00:58	6.23
14r	4.16	2919.54	22Sep2020, 01:02	6.21
67b	0.43	562.44	22Sep2020, 00:19	6.42
13c	4.59	3247.98	22Sep2020, 00:53	6.23
13r	4.59	3059.42	22Sep2020, 01:31	6.05
68b	0.26	434.66	22Sep2020, 00:09	6.48

12c	4.85	3159.87	22Sep2020, 01:29	6.07
Pacific Ocean	4.85	3159.87	22Sep2020, 01:29	6.07

Subbasin: 60B

Area : 0.65
Downstream : J 60b 61b

Loss Rate: Scs

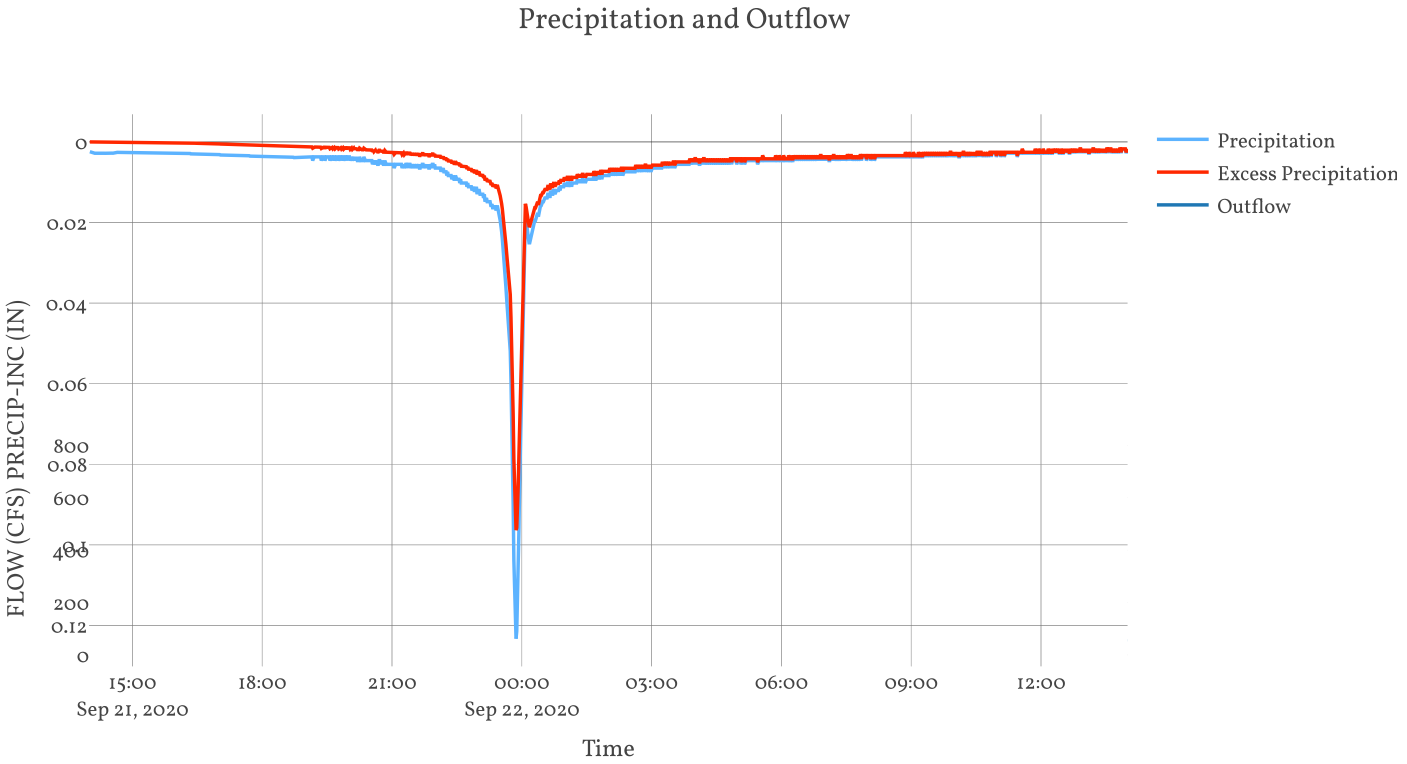
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.52

Results: 60B

Peak Discharge (CFS)	780.97
Time of Peak Discharge	22Sep2020, 00:24
Volume (IN)	6.53
Precipitation Volume (AC - FT)	318.89
Loss Volume (AC - FT)	90.73
Excess Volume (AC - FT)	228.16
Direct Runoff Volume (AC - FT)	224.48
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Subbasin: 61B

Area : 0.61
Downstream : J 60b 61b

Loss Rate: Scs

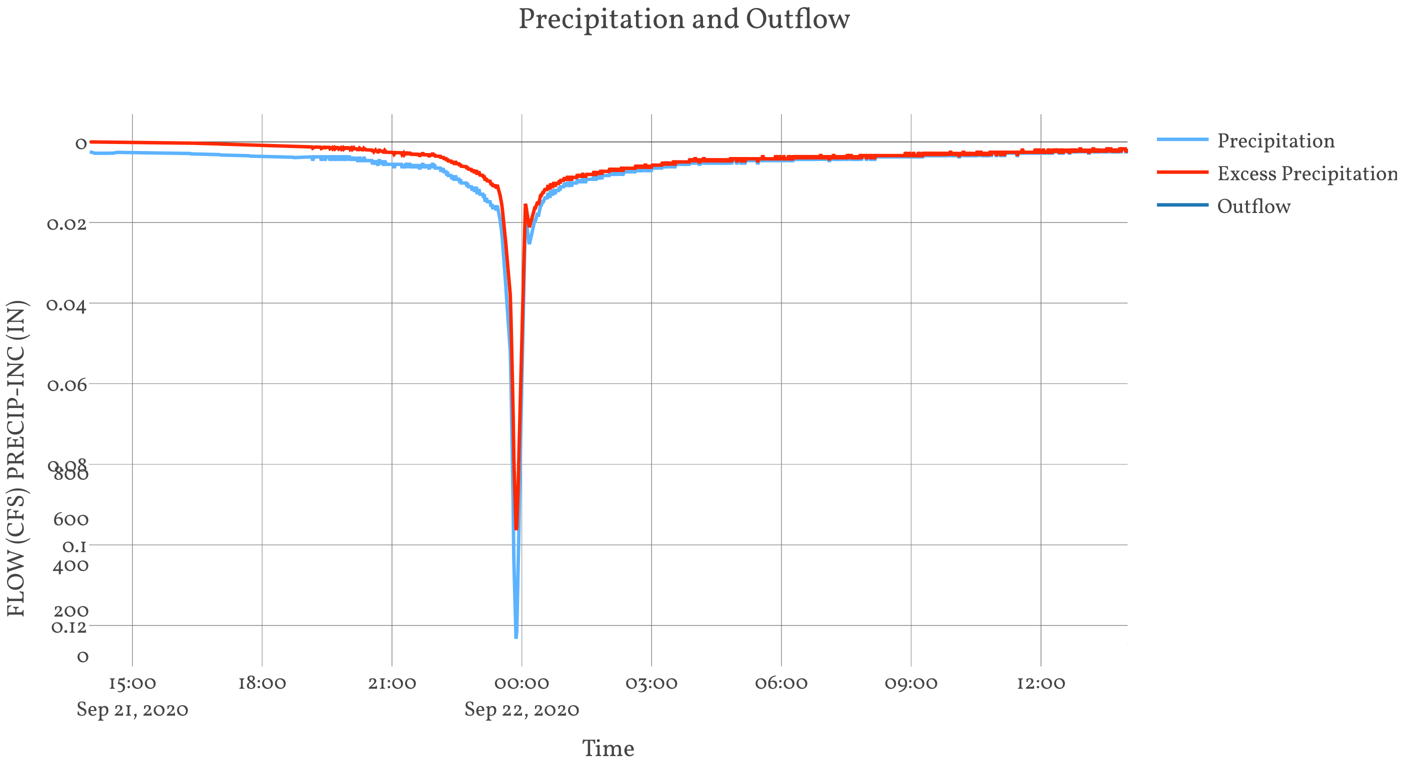
Percent Impervious Area	0
Curve Number	75
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.37

Results: 61B

Peak Discharge (CFS)	896.67
Time of Peak Discharge	22Sep2020, 00:14
Volume (IN)	6.56
Precipitation Volume (AC - FT)	299.61
Loss Volume (AC - FT)	85.24
Excess Volume (AC - FT)	214.36
Direct Runoff Volume (AC - FT)	211.97
Baseflow Volume (AC - FT)	0

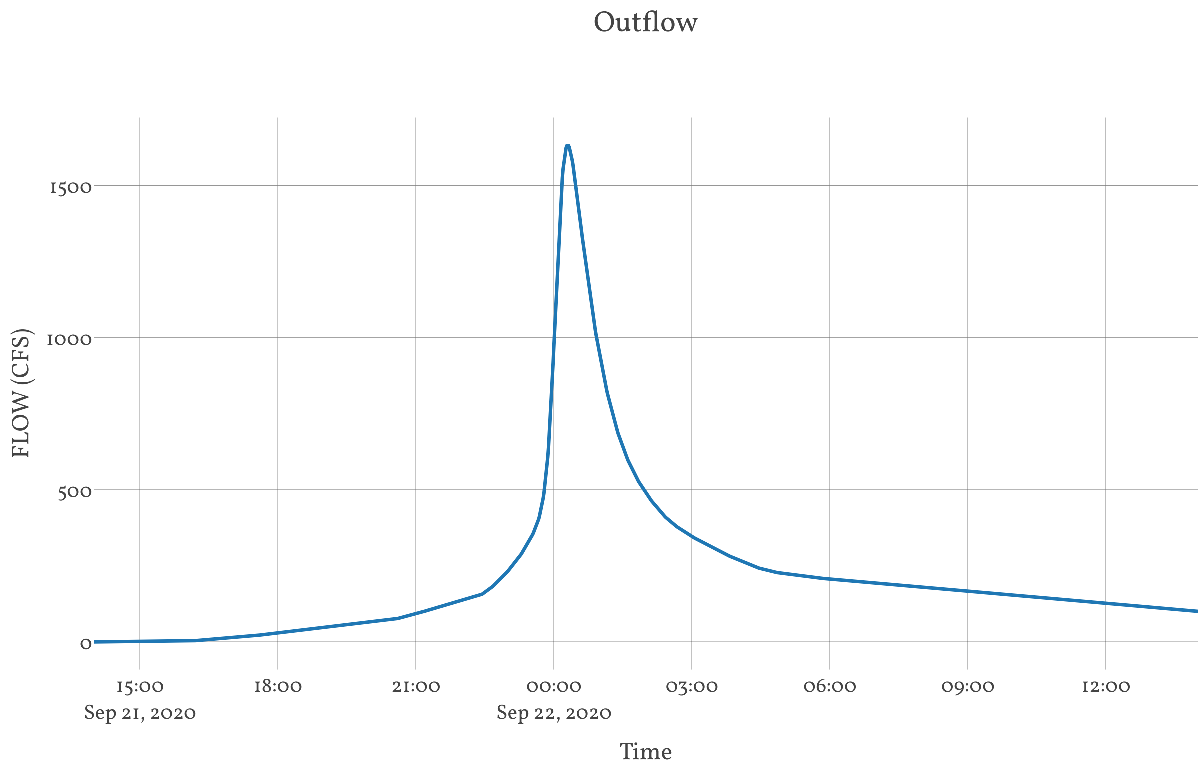

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: J 60B 61B

Downstream : 18r

Results: J 60B 61B

Peak Discharge (CFS)	1633.26
Time of Peak Discharge	22Sep2020, 00:18
Volume (IN)	6.54



Reach: 18R

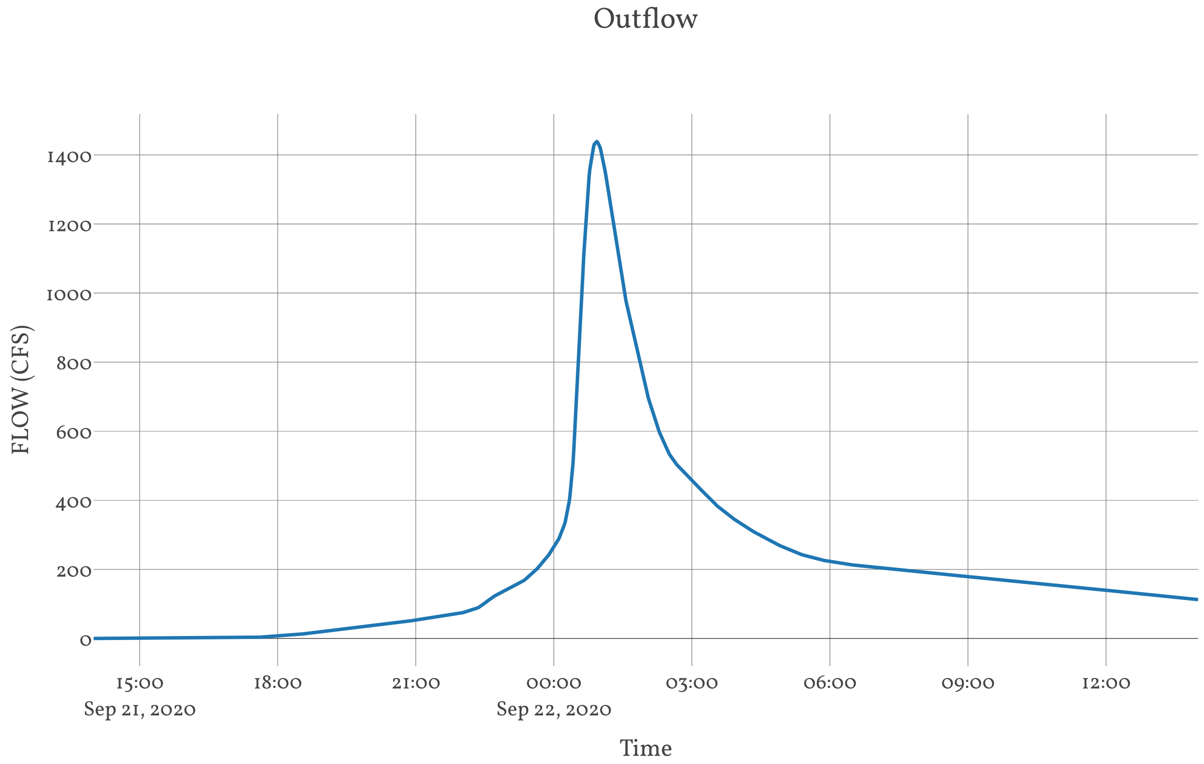
Downstream : 17c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	8
Storage Outflow Table Name	18r

Results: 18R

Peak Discharge (CFS)	1438.27
Time of Peak Discharge	22Sep2020, 00:56
Volume (IN)	6.33
Peak Inflow (CFS)	1633.26
Inflow Volume (AC - FT)	436.45



Subbasin: 62B

Area : 0.53
Downstream : 17c

Loss Rate: Scs

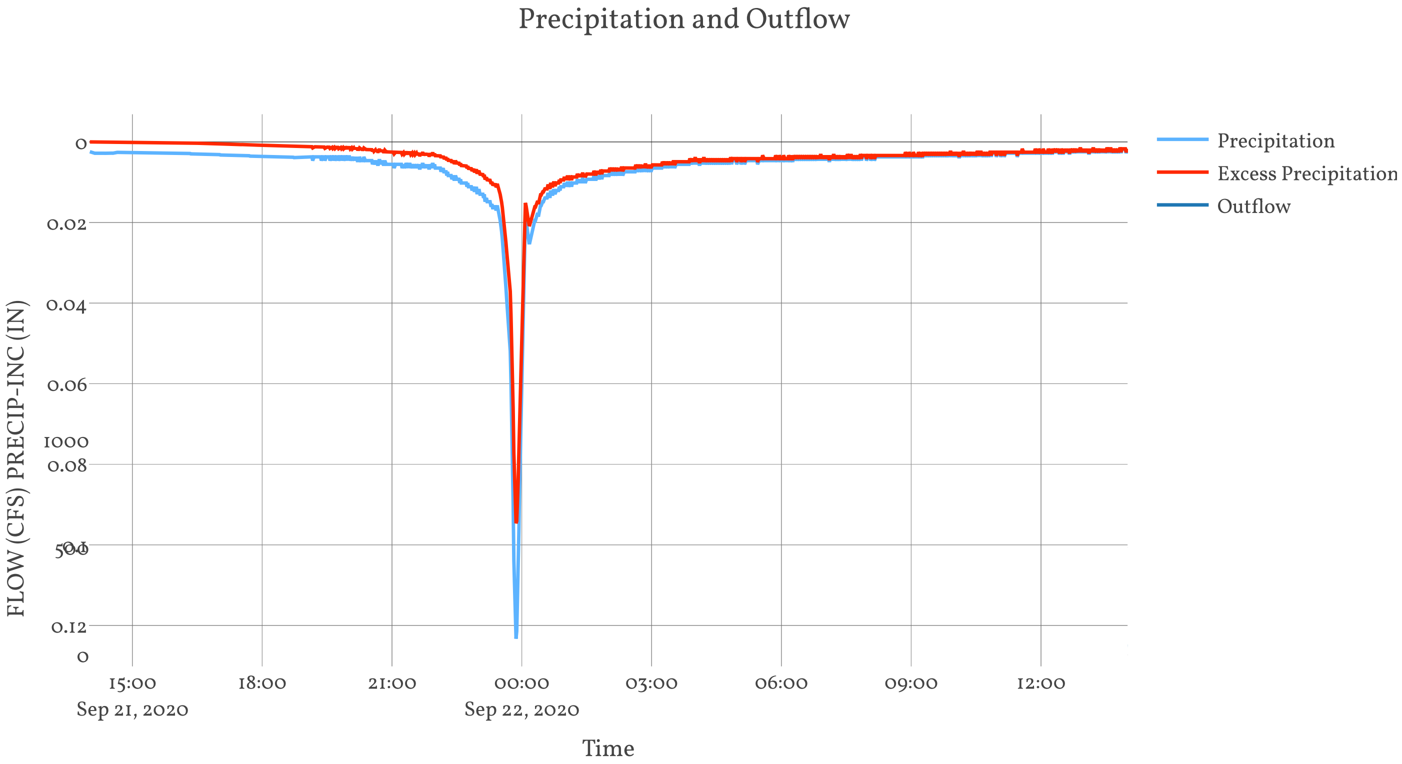
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.25

Results: 62B

Peak Discharge (CFS)	952.41
Time of Peak Discharge	22Sep2020, 00:08
Volume (IN)	6.48
Precipitation Volume (AC - FT)	259.86
Loss Volume (AC - FT)	76.86
Excess Volume (AC - FT)	182.99
Direct Runoff Volume (AC - FT)	181.63
Baseflow Volume (AC - FT)	0

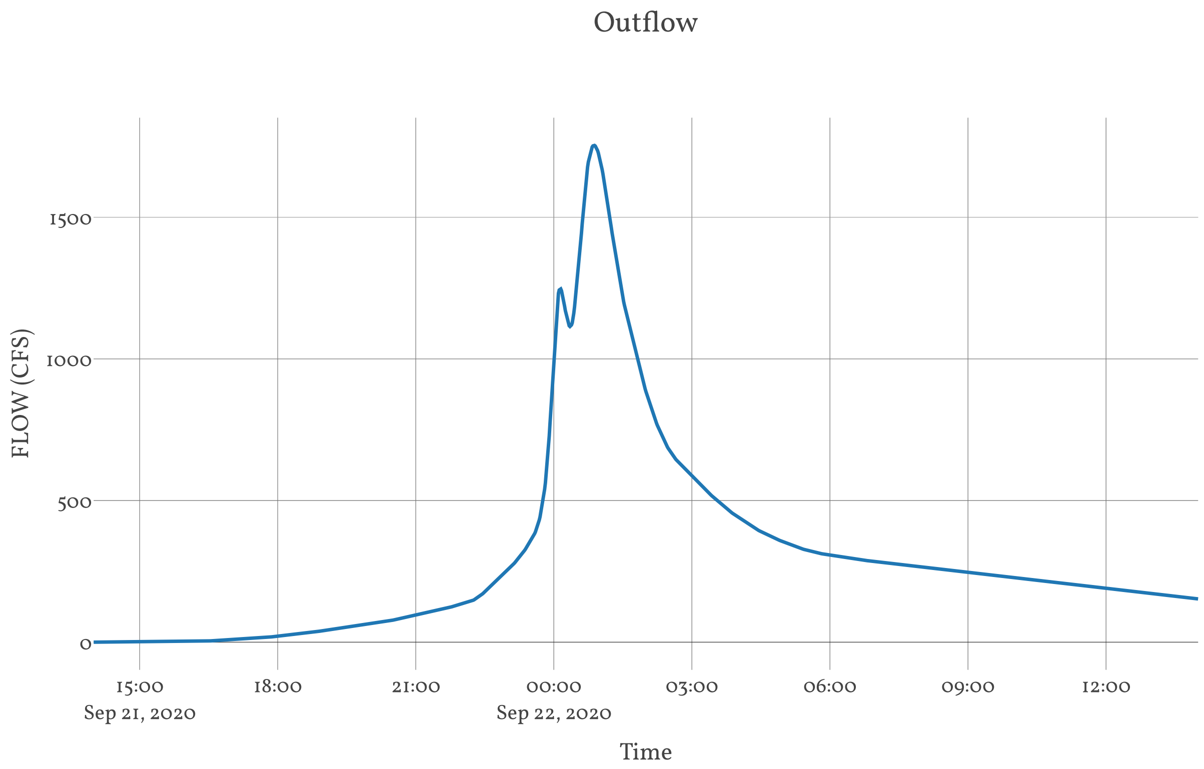

Precipitation and Outflow
Precipitation
Excess Precipitation
Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
1000
0.08
500
0.1
0.12
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time

Junction: 17C

Downstream : 17r

Results: 17C

Peak Discharge (CFS)	1753.66
Time of Peak Discharge	22Sep2020, 00:52
Volume (IN)	6.37



Reach: 17R

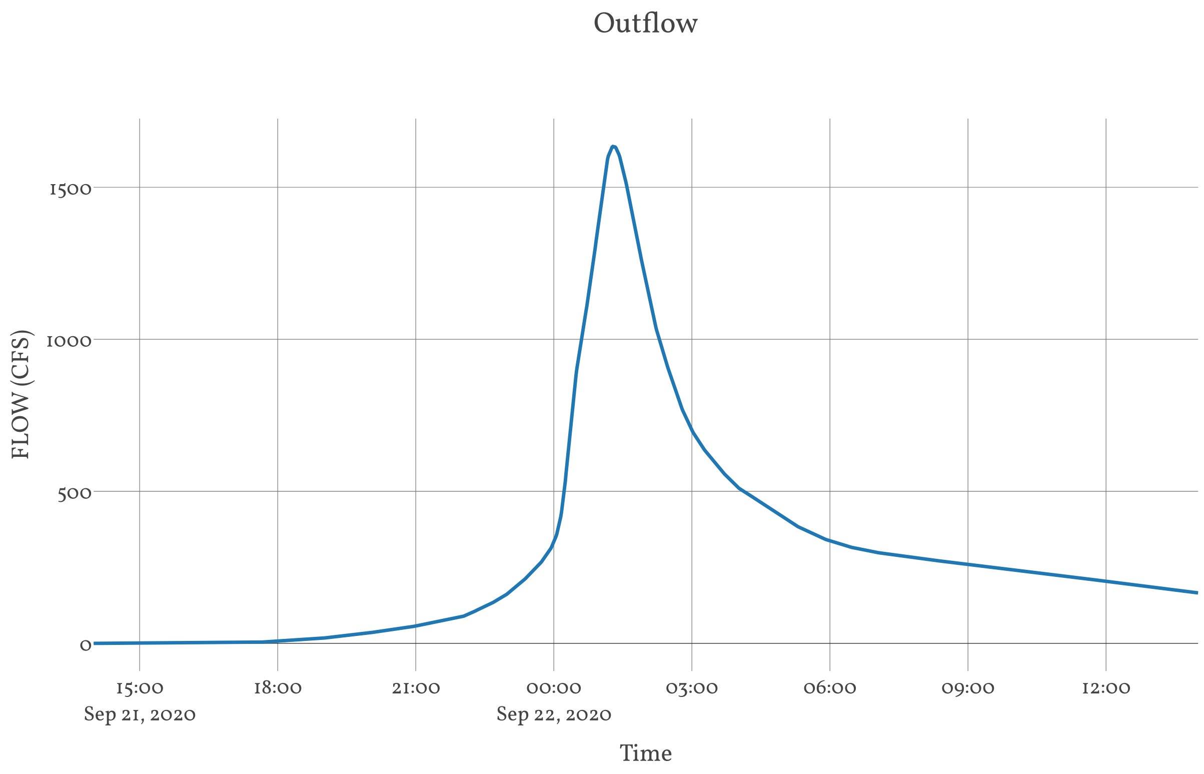
Downstream : 16c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	4
Storage Outflow Table Name	17r

Results: 17R

Peak Discharge (CFS)	1634.93
Time of Peak Discharge	22Sep2020, 01:18
Volume (IN)	6.22
Peak Inflow (CFS)	1753.66
Inflow Volume (AC - FT)	604.01



Subbasin: 63B

Area : 0.6
Downstream : 16c

Loss Rate: Scs

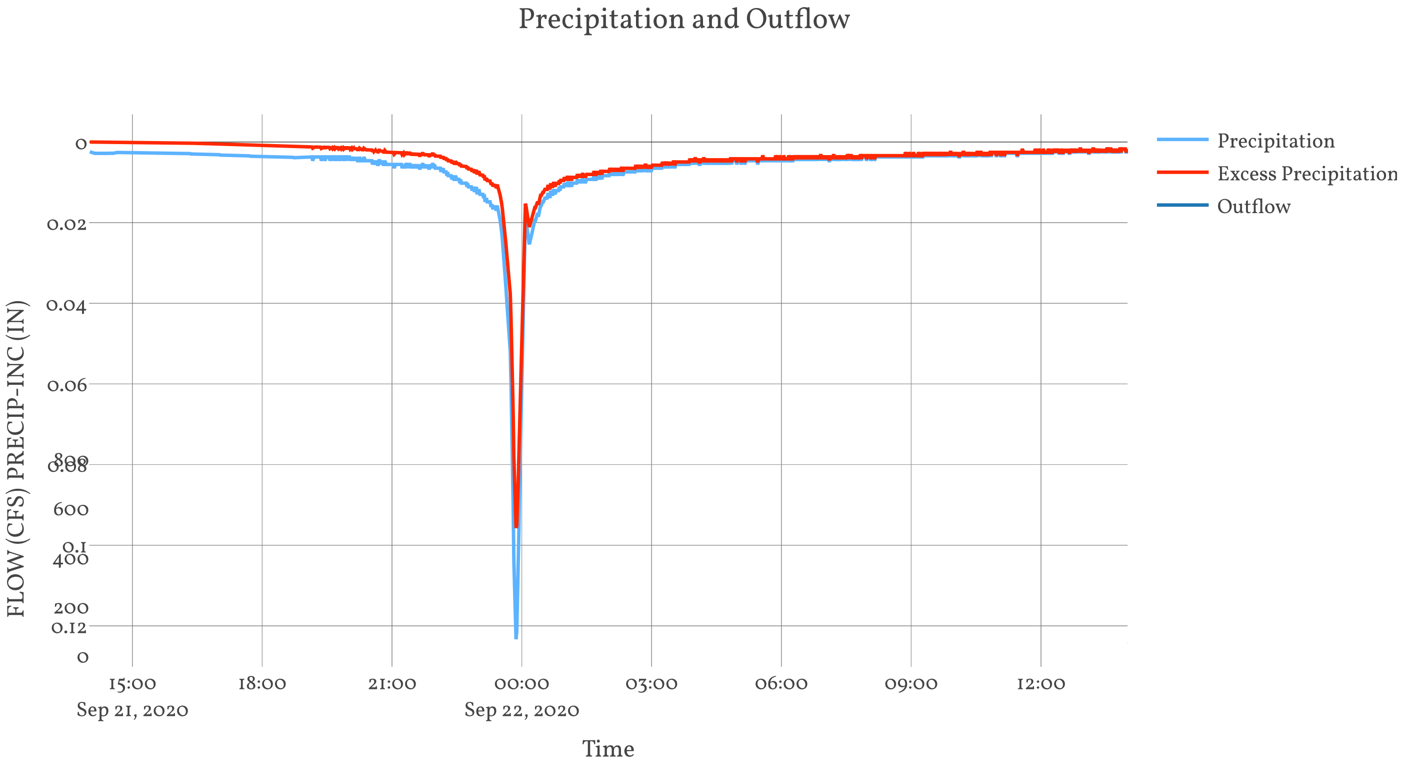
Percent Impervious Area	0
Curve Number	74.6
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.41

Results: 63B

Peak Discharge (CFS)	833.58
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	6.51
Precipitation Volume (AC - FT)	297.63
Loss Volume (AC - FT)	85.9
Excess Volume (AC - FT)	211.73
Direct Runoff Volume (AC - FT)	209.08
Baseflow Volume (AC - FT)	0

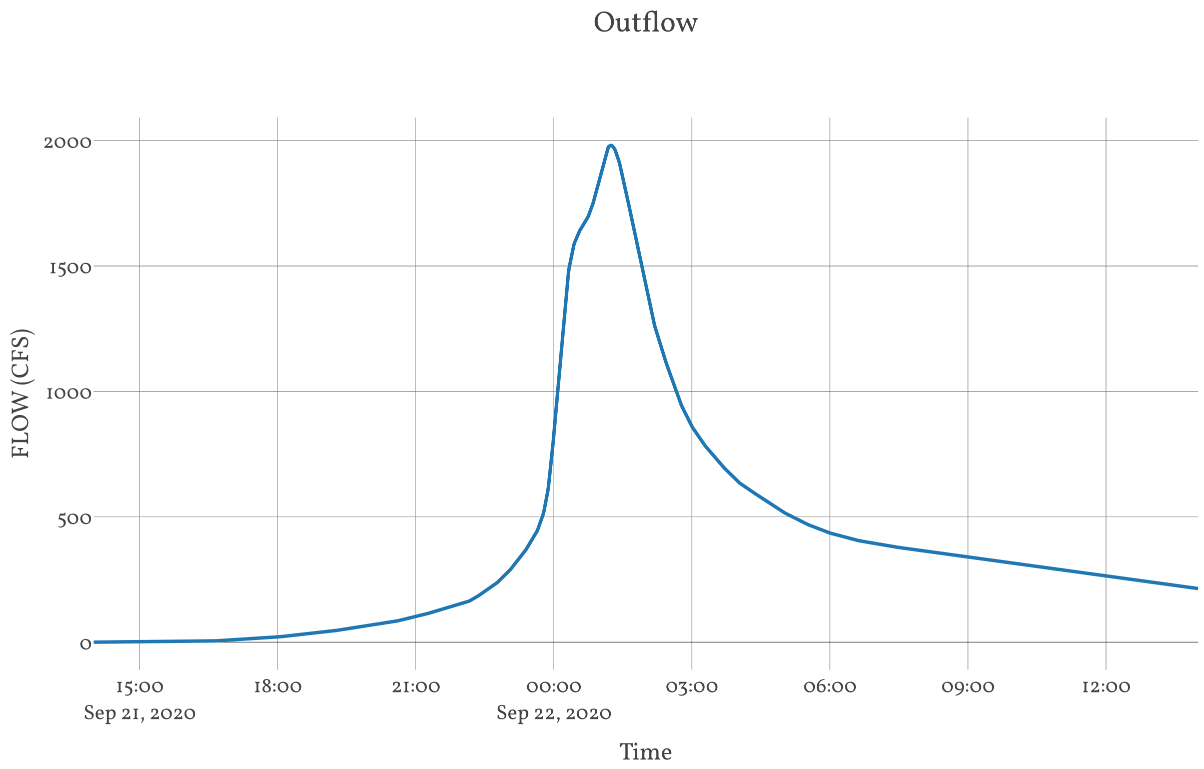

Precipitation and Outflow
FLOW (CFS) PRECIP-INC (IN)
0
0.02
0.04
0.06
0.08
0.1
0.12
800
600
400
200
0
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 16C

Downstream : 16r

Results: 16C

Peak Discharge (CFS)	1981.11
Time of Peak Discharge	22Sep2020, 01:14
Volume (IN)	6.3



Reach: 16R

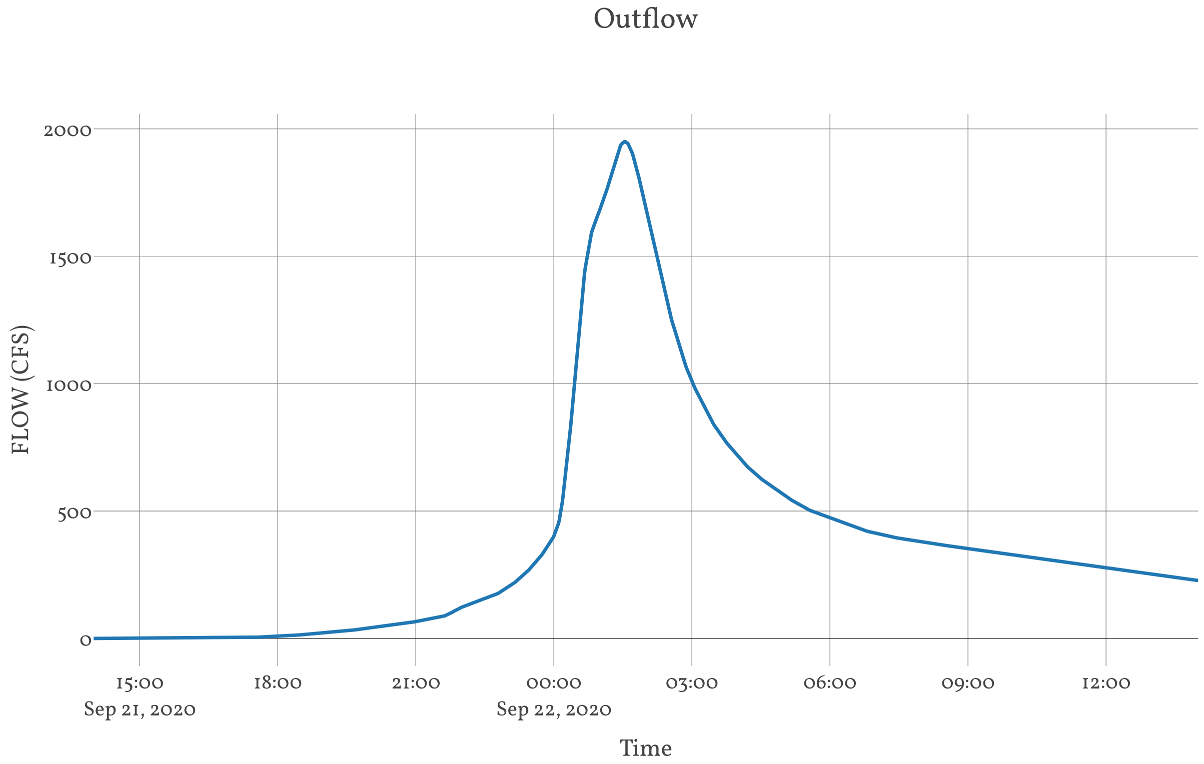
Downstream : 20c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	16r

Results: 16R

Peak Discharge (CFS)	1949.71
Time of Peak Discharge	22Sep2020, 01:33
Volume (IN)	6.19
Peak Inflow (CFS)	1981.11
Inflow Volume (AC - FT)	798.7



Subbasin: 64B

Area : 1.09
Downstream : 20c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.8
Initial Abstraction	0.2

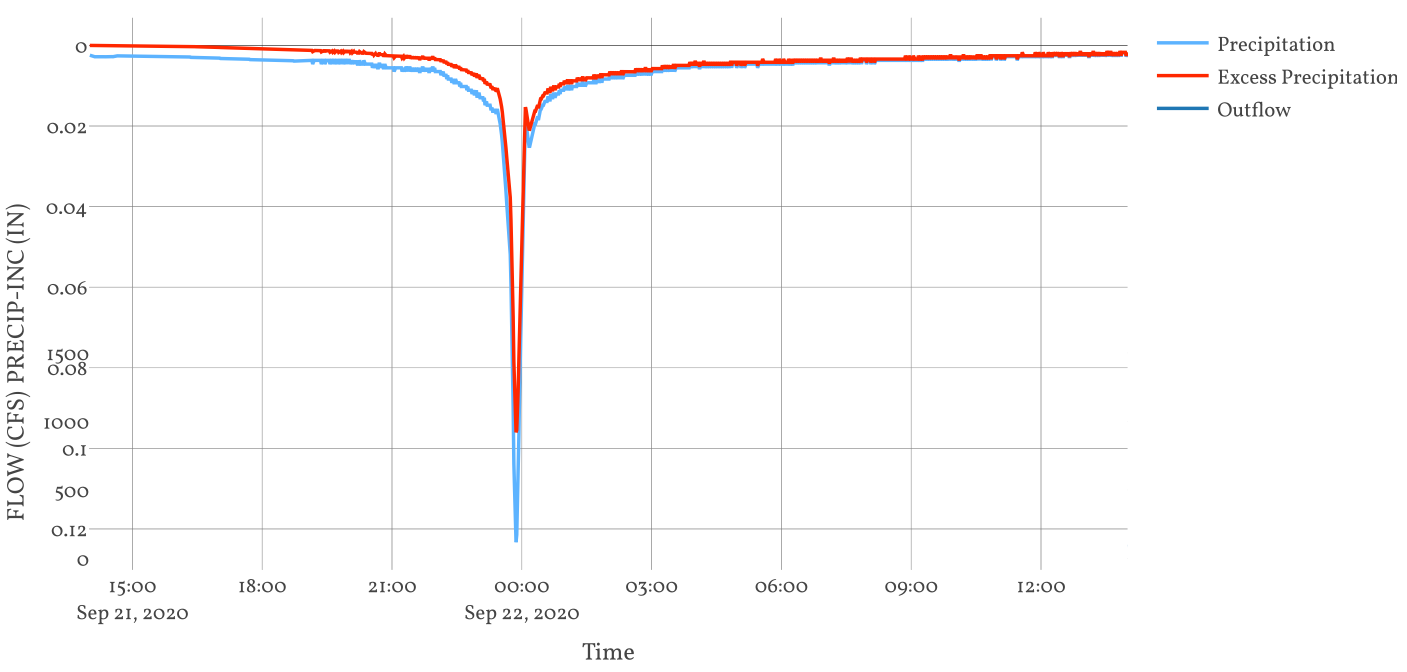
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.42

Results: 64B

Peak Discharge (CFS)	1492.76
Time of Peak Discharge	22Sep2020, 00:17
Volume (IN)	6.53
Precipitation Volume (AC - FT)	538.9
Loss Volume (AC - FT)	154.43
Excess Volume (AC - FT)	384.46
Direct Runoff Volume (AC - FT)	379.54
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

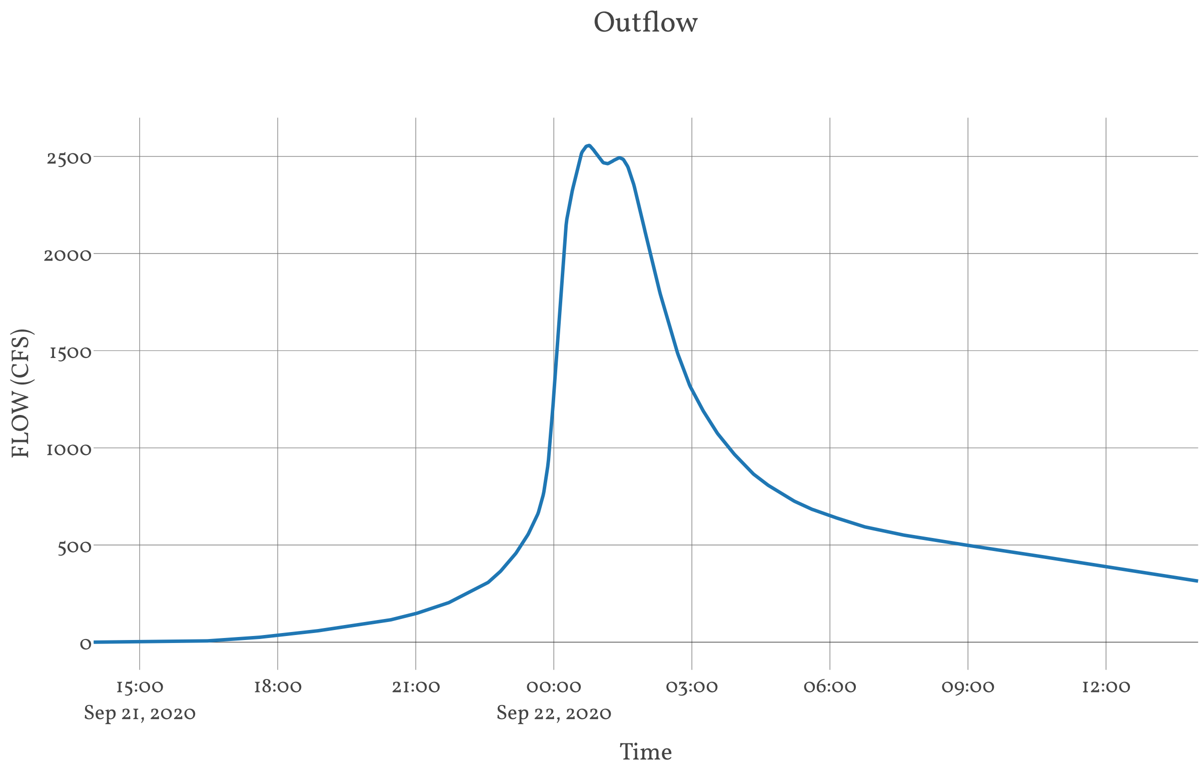


Junction: 20C

Downstream : 20r

Results: 20C

Peak Discharge (CFS)	2556.55
Time of Peak Discharge	22Sep2020, 00:45
Volume (IN)	6.3



Reach: 20R

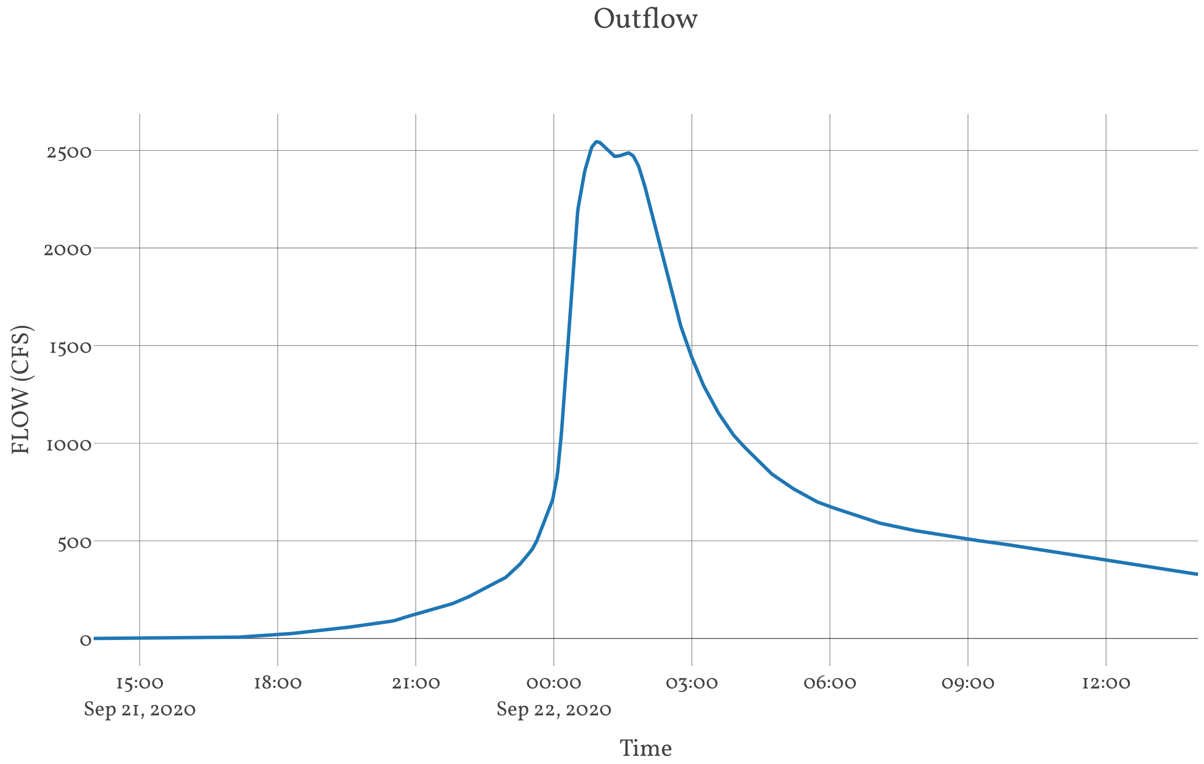
Downstream : 15c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	6
Storage Outflow Table Name	20r

Results: 20R

Peak Discharge (CFS)	2544.52
Time of Peak Discharge	22Sep2020, 00:57
Volume (IN)	6.23
Peak Inflow (CFS)	2556.55
Inflow Volume (AC - FT)	1164.63



Subbasin: 65B

Area : 0.53
Downstream : 15c

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.4
Initial Abstraction	0.2

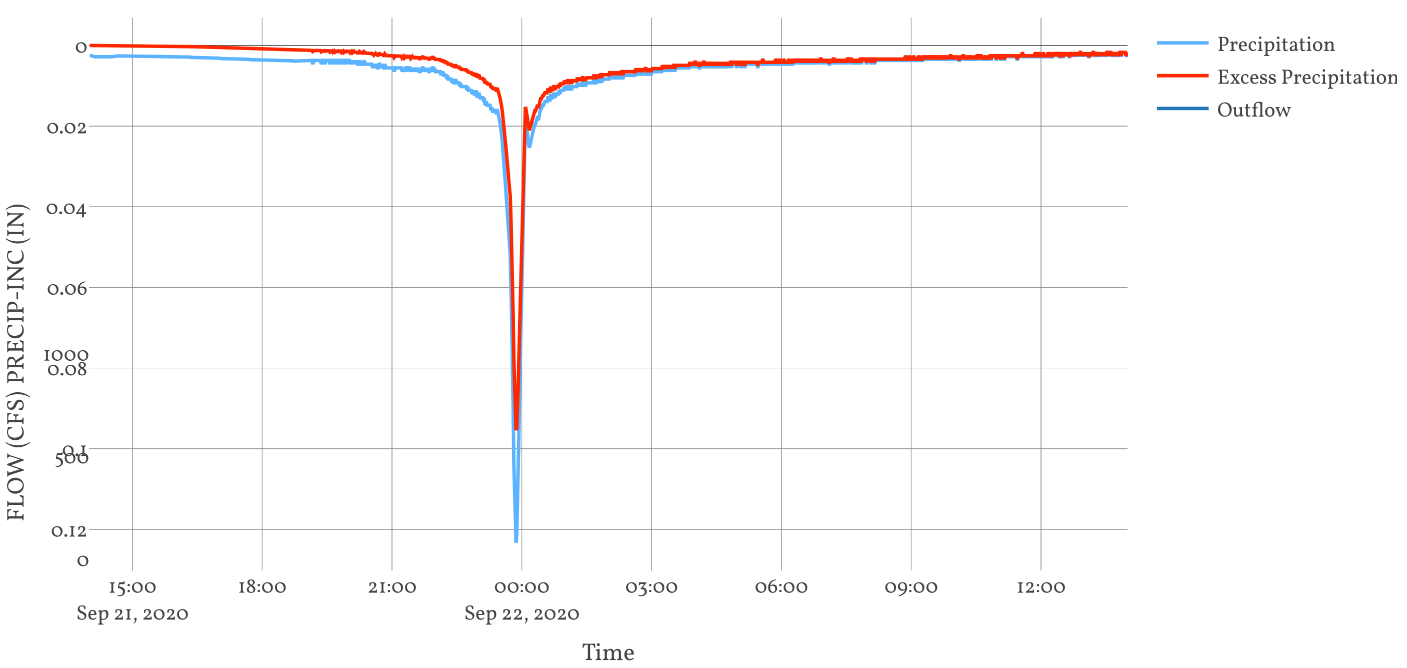
Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.24

Results: 65B

Peak Discharge (CFS)	996.31
Time of Peak Discharge	22Sep2020, 00:07
Volume (IN)	6.53
Precipitation Volume (AC - FT)	263.52
Loss Volume (AC - FT)	76.6
Excess Volume (AC - FT)	186.92
Direct Runoff Volume (AC - FT)	185.59
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

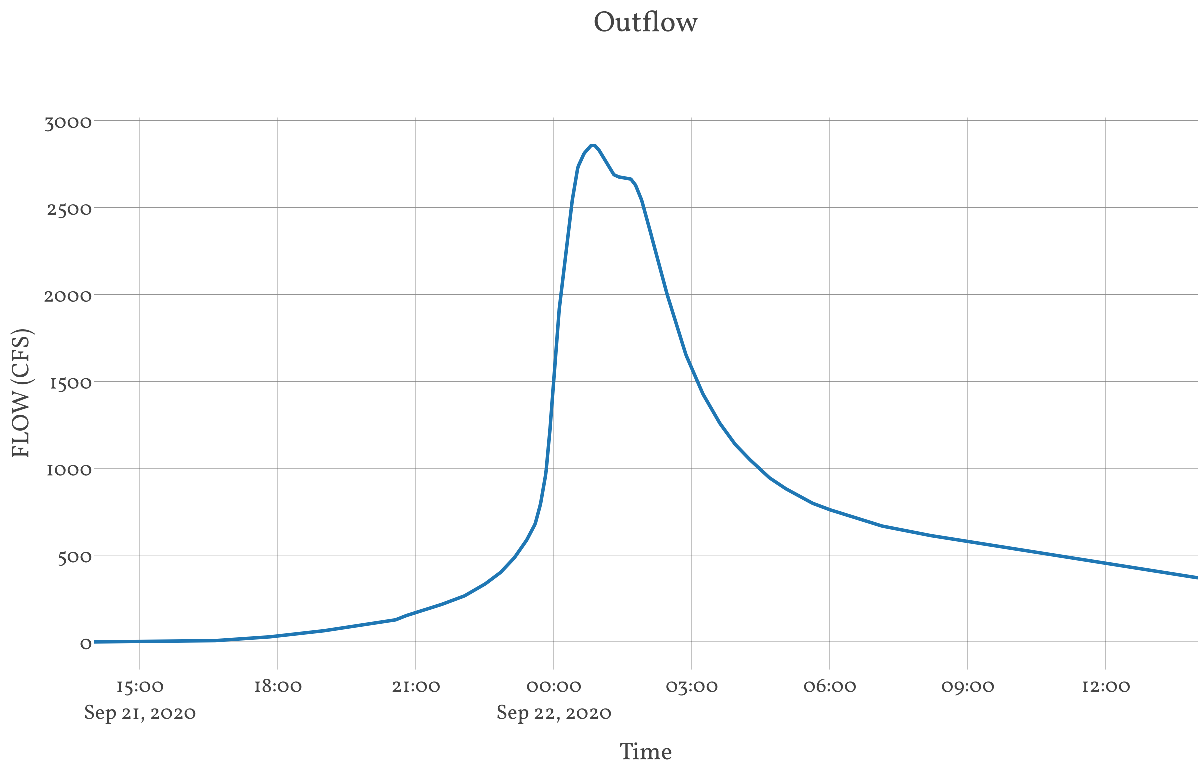


Junction: 15C

Downstream : 15r

Results: 15C

Peak Discharge (CFS)	2859.17
Time of Peak Discharge	22Sep2020, 00:51
Volume (IN)	6.27



Reach: 15R

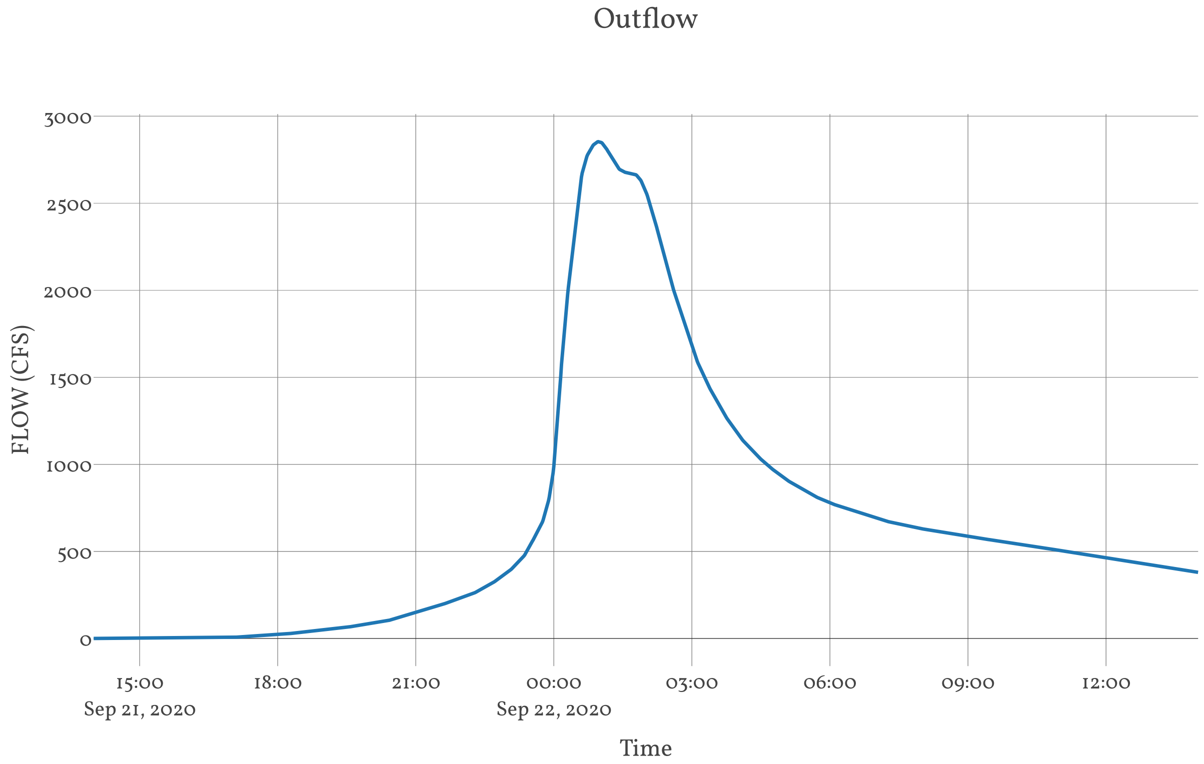
Downstream : 14c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	15r

Results: 15R

Peak Discharge (CFS)	2853.59
Time of Peak Discharge	22Sep2020, 00:59
Volume (IN)	6.22
Peak Inflow (CFS)	2859.17
Inflow Volume (AC - FT)	1337.53



Subbasin: 66B

Area : 0.16
Downstream : 14c

Loss Rate: Scs

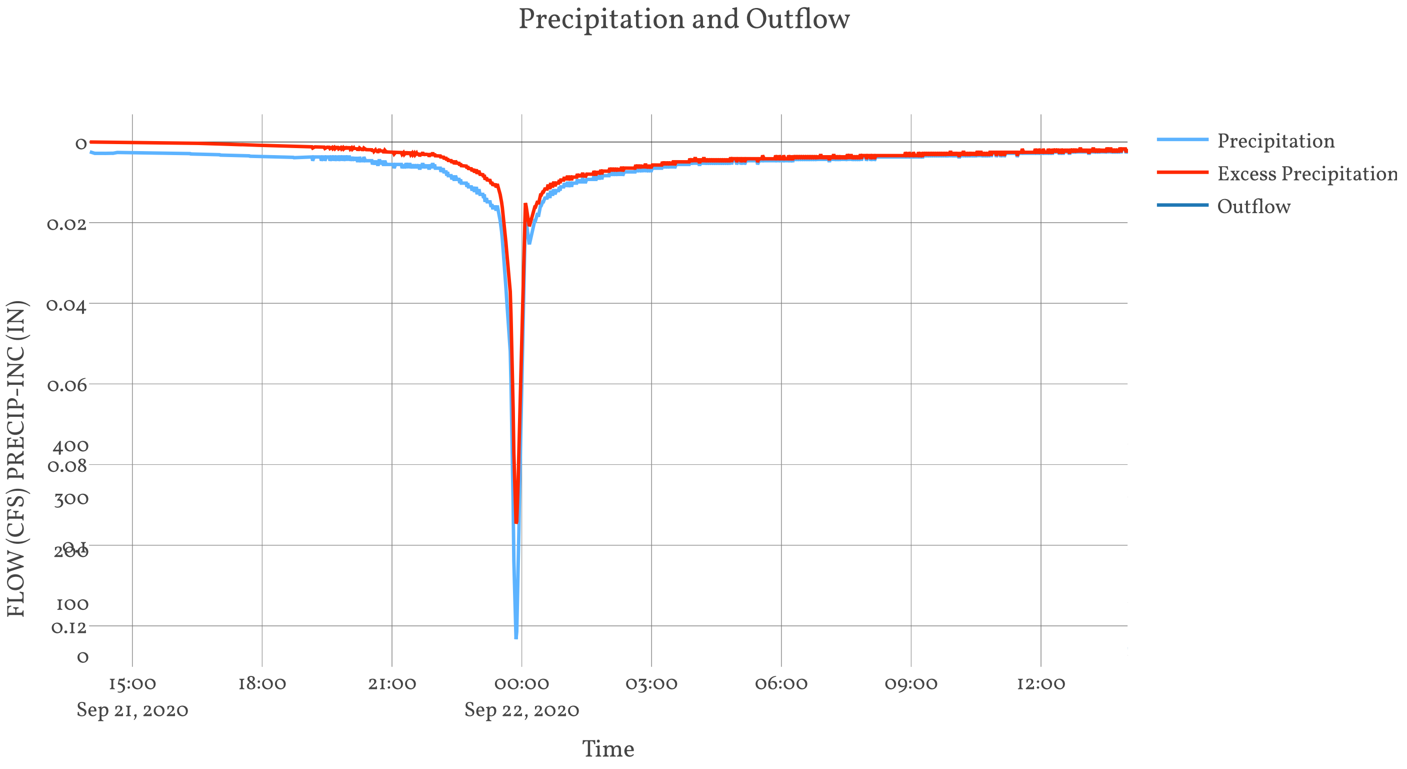
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.14

Results: 66B

Peak Discharge (CFS)	387.56
Time of Peak Discharge	22Sep2020, 00:02
Volume (IN)	6.5
Precipitation Volume (AC - FT)	80.09
Loss Volume (AC - FT)	23.69
Excess Volume (AC - FT)	56.4
Direct Runoff Volume (AC - FT)	56.17
Baseflow Volume (AC - FT)	0


Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
0.12
400
300
200
100
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

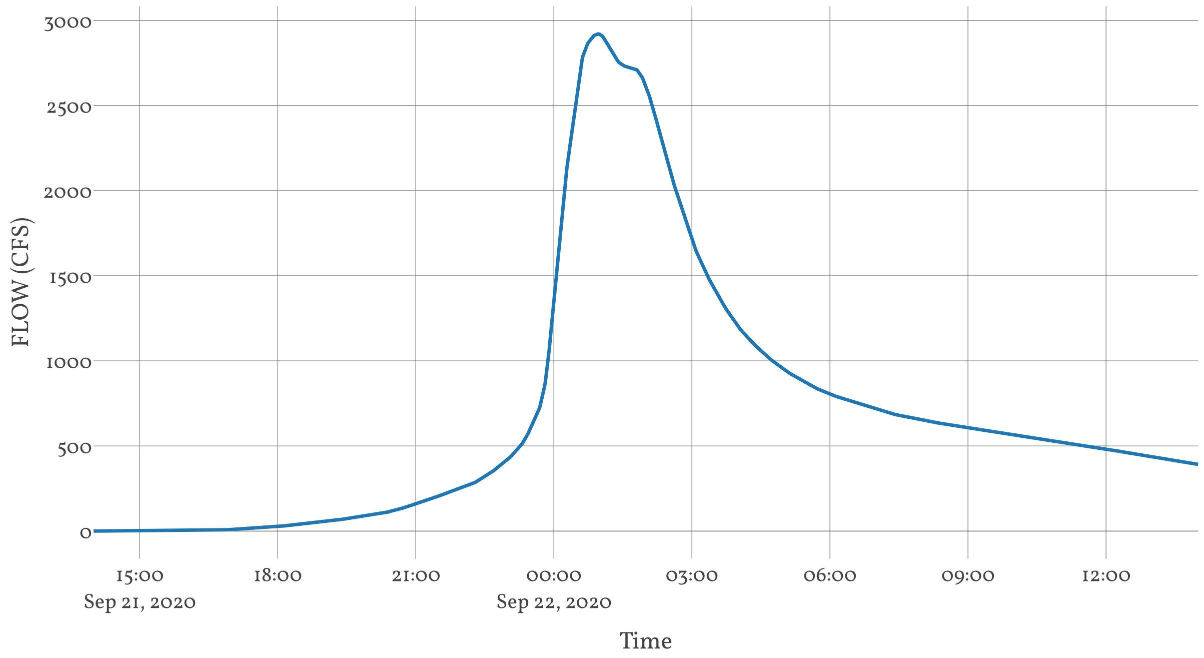
Junction: 14C

Downstream : 14r

Results: 14C

Peak Discharge (CFS)	2920.92
Time of Peak Discharge	22Sep2020, 00:58
Volume (IN)	6.23

Outflow



Reach: 14R

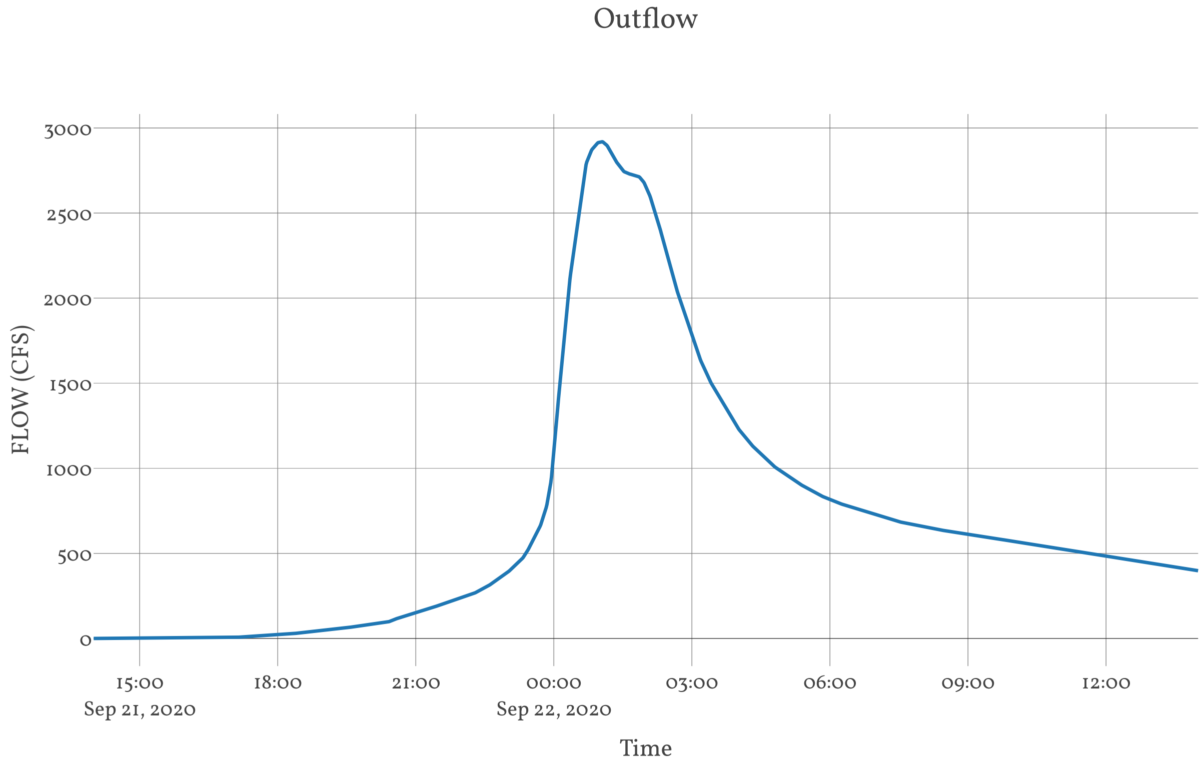
Downstream : 13c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	5
Storage Outflow Table Name	14r

Results: 14R

Peak Discharge (CFS)	2919.54
Time of Peak Discharge	22Sep2020, 01:02
Volume (IN)	6.21
Peak Inflow (CFS)	2920.92
Inflow Volume (AC - FT)	1383.9



Subbasin: 67B

Area : 0.43
Downstream : 13c

Loss Rate: Scs

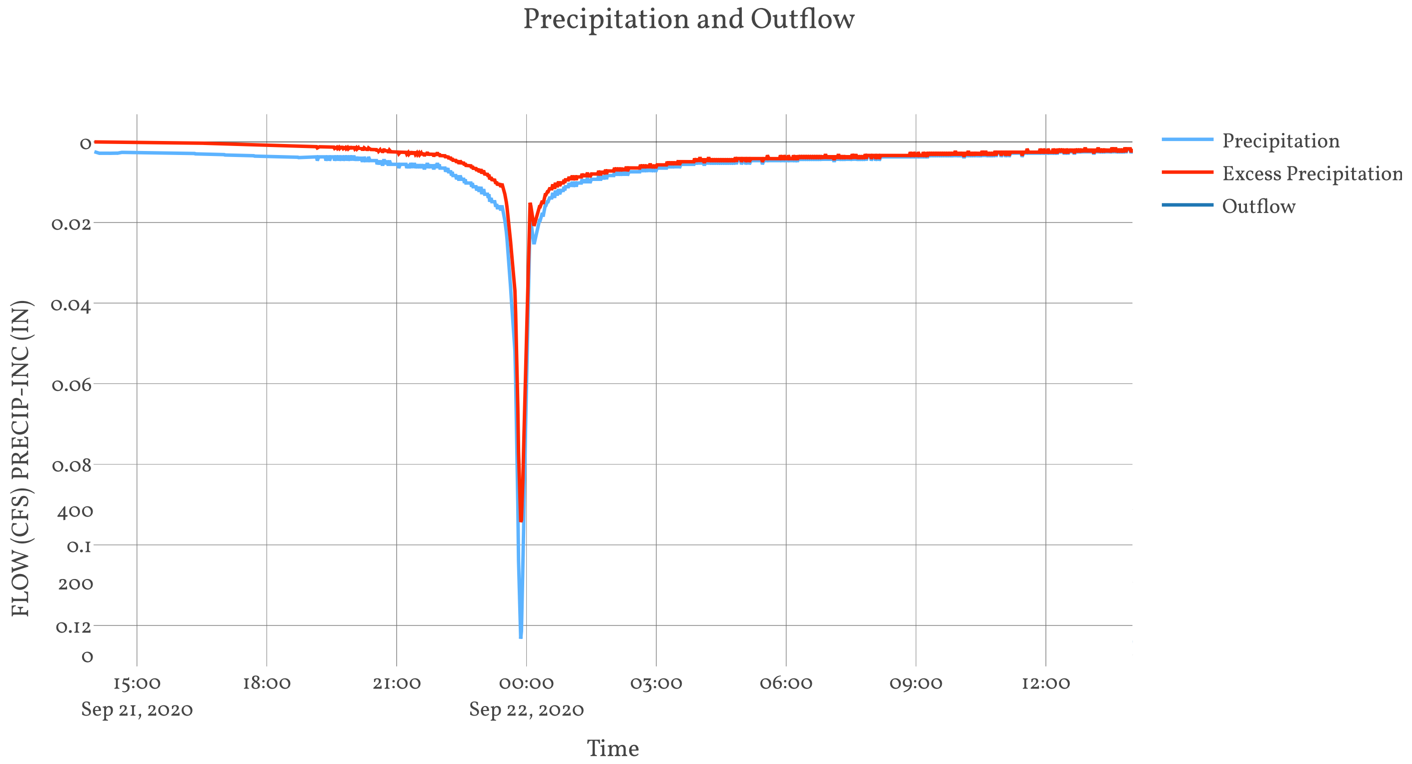
Percent Impervious Area	0
Curve Number	73.7
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.44

Results: 67B

Peak Discharge (CFS)	562.44
Time of Peak Discharge	22Sep2020, 00:19
Volume (IN)	6.42
Precipitation Volume (AC - FT)	212.59
Loss Volume (AC - FT)	63.32
Excess Volume (AC - FT)	149.27
Direct Runoff Volume (AC - FT)	147.24
Baseflow Volume (AC - FT)	0

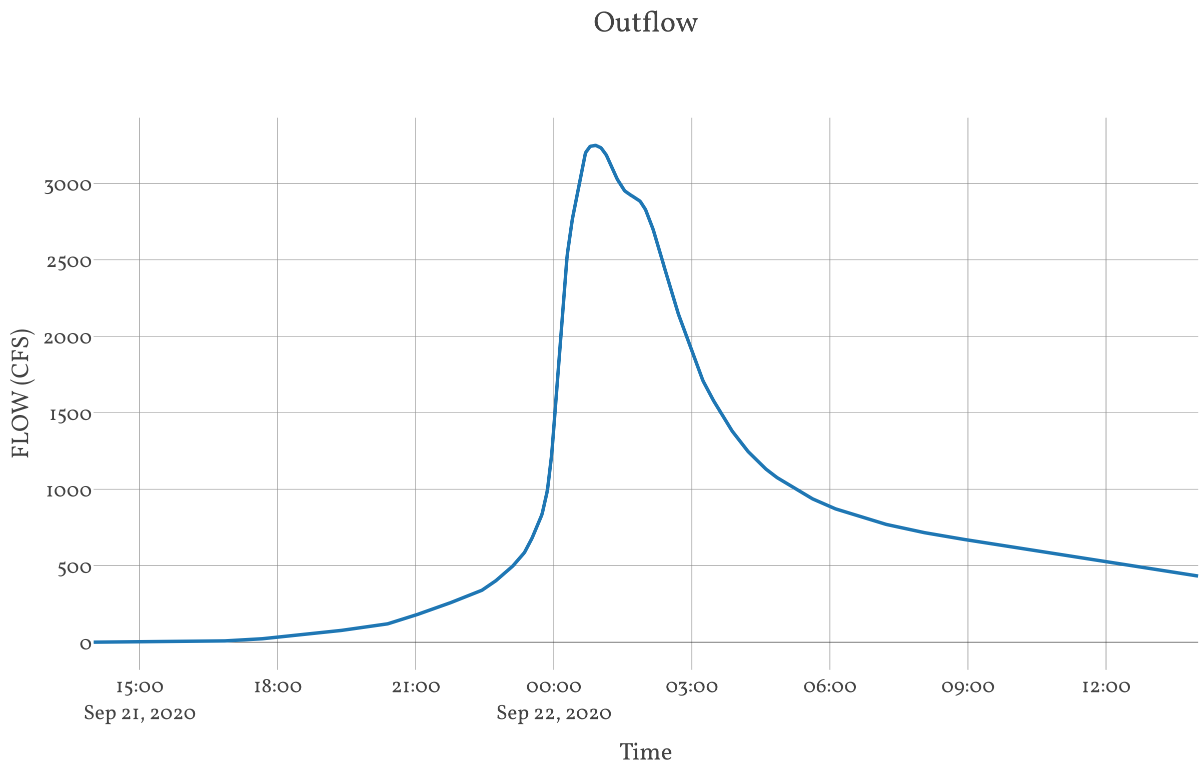

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
400
0.1
200
0.12
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 13C

Downstream : 13r

Results: 13C

Peak Discharge (CFS)	3247.98
Time of Peak Discharge	22Sep2020, 00:53
Volume (IN)	6.23



Reach: 13R

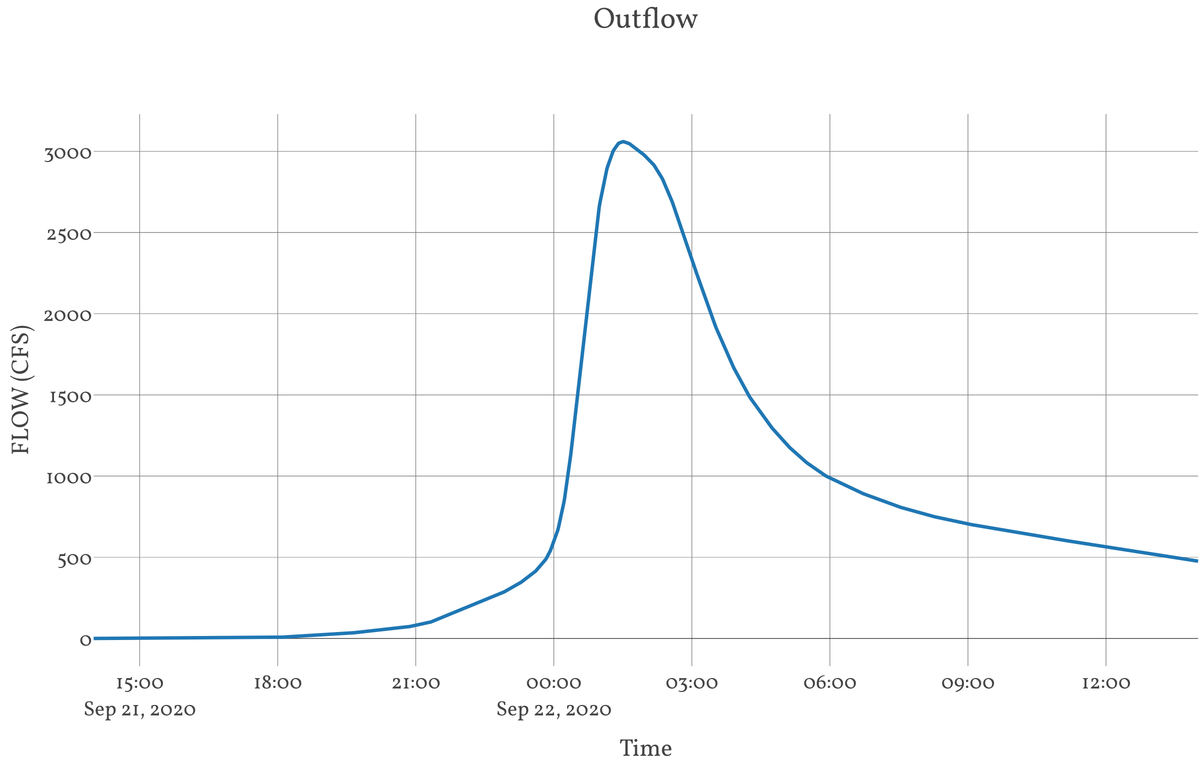
Downstream : 12c

Route: Modified Puls

Method	Modified Puls
Initial Variable	Combined Inflow
Number of Reaches	2
Storage Outflow Table Name	13r

Results: 13R

Peak Discharge (CFS)	3059.42
Time of Peak Discharge	22Sep2020, 01:31
Volume (IN)	6.05
Peak Inflow (CFS)	3247.98
Inflow Volume (AC - FT)	1525.57



Subbasin: 68B

Area : 0.26
Downstream : 12c

Loss Rate: Scs

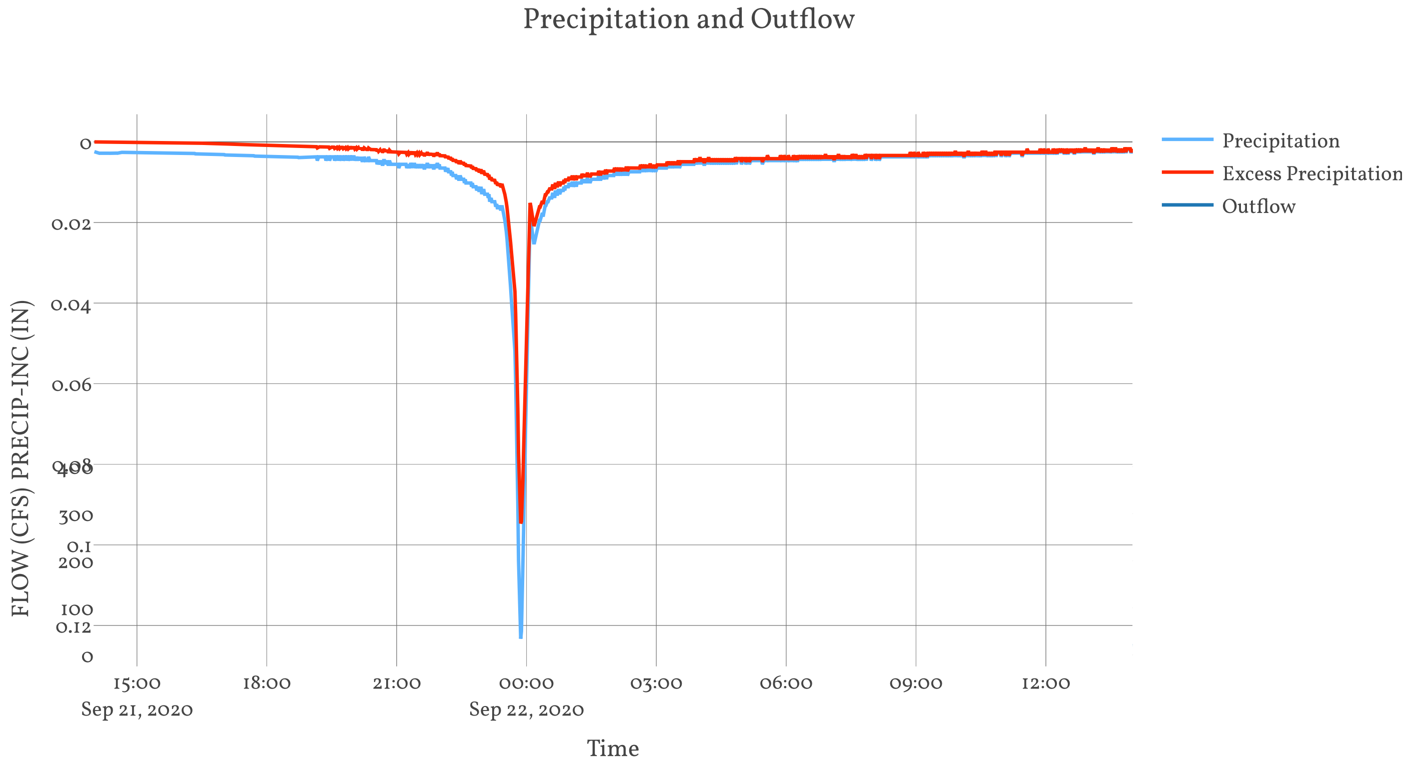
Percent Impervious Area	0
Curve Number	73.9
Initial Abstraction	0.2

Transform: User - Specified S - Graph

S - graph	Ellsworth S - Graph
Lag Method	Specified
Lag	0.28

Results: 68B

Peak Discharge (CFS)	434.66
Time of Peak Discharge	22Sep2020, 00:09
Volume (IN)	6.48
Precipitation Volume (AC - FT)	126.07
Loss Volume (AC - FT)	37.22
Excess Volume (AC - FT)	88.86
Direct Runoff Volume (AC - FT)	88.11
Baseflow Volume (AC - FT)	0

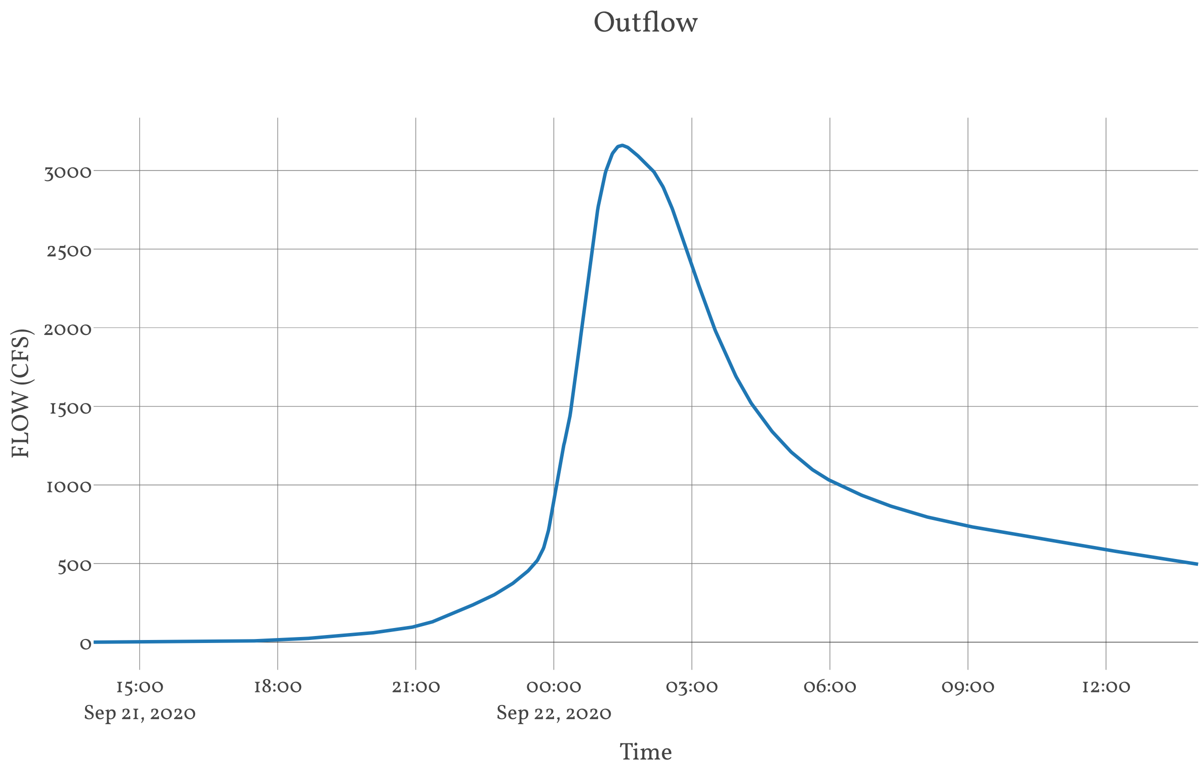

Precipitation and Outflow
0
0.02
0.04
0.06
0.08
0.1
0.12
400
300
200
100
0
FLOW (CFS) PRECIP-INC (IN)
15:00
Sep 21, 2020
18:00
21:00
00:00
Sep 22, 2020
03:00
06:00
09:00
12:00
Time
Precipitation
Excess Precipitation
Outflow

Junction: 12C

Downstream : Pacific Ocean

Results: 12C

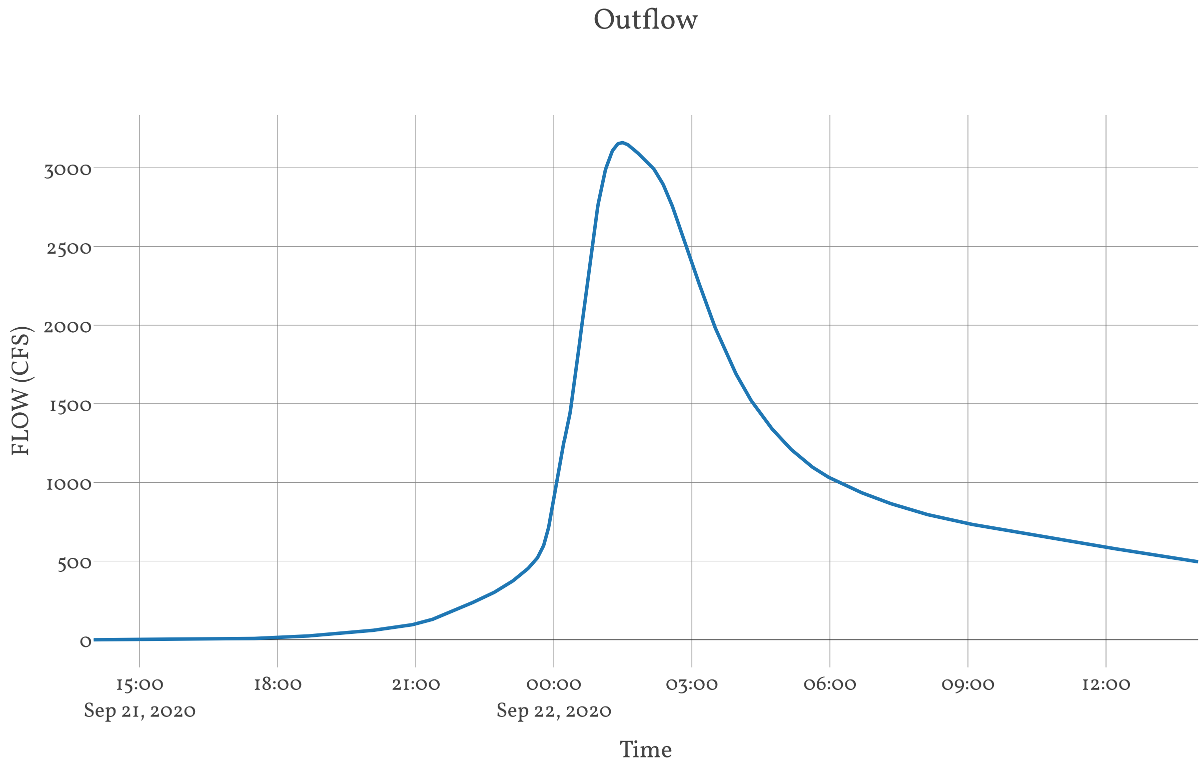
Peak Discharge (CFS)	3159.87
Time of Peak Discharge	22Sep2020, 01:29
Volume (IN)	6.07



Sink: Pacific Ocean

Results: Pacific Ocean

Peak Discharge (CFS)	3159.87
Time of Peak Discharge	22Sep2020, 01:29
Volume (IN)	6.07
Observed Flow Gage	Not specified
Observed Flow Volume (AC - FT)	Not specified
Observed Flow's RMSE Stdev	Not specified
Observed Flow's Percent Bias	Not specified
Observed Flow's Nash Sutcliffe	Not specified



DEVELOPMENT AREA 1
ROW
CAMP HESS KRAMER (LOWER CAMP)
YERBA BUENA ROAD
CAMP HESS KRAMER (MIDDLE CAMP)
DEVELOPMENT AREA 1
POOL
PACIFIC COAST HIGHWAY
PACIFIC OCEAN
YERBA BUENA ROAD
DEVELOPMENT AREA 3
CAMP FIRE ROAD
DEVELOPMENT AREA 2
YERBA BUENA ROAD
GINDLING HILLTOP CAMP (UPPER CAMP)
DEVELOPMENT AREA 4
POOL
N
1"=150'

LEGEND

▨ EXISTING ROAD, PATH, COURTYARD (IMPERVIOUS)

▨ PRE-FIRE EXISTING BUILDING (IMPERVIOUS)

DEVELOPMENT AREA 1 - 1,351,281 SF (31.0 ACRES)
IMPERVIOUS AREA- 398,500 SF (9.1 ACRES)

DEVELOPMENT AREA 2 - 1,173,726 SF (26.9 ACRES)
IMPERVIOUS AREA - 255,800 SF (5.9 ACRES)

DEVELOPMENT AREA 3 - 14,175 SF
IMPERVIOUS AREA - 3,600 SF (0.1 ACRES)

DEVELOPMENT AREA 4 - 24,485 SF
IMPERVIOUS AREA - 3,300 SF (0.1 ACRES)

ALL DEVELOPMENT AREAS - 2,564,000 SF (58.9 ACRES)
IMPERVIOUS AREA - 661,000 SF (15.2 ACRES)
EXISTING IMPERVIOUS AREA: 26%

IMPERVIOUS SURFACE EXHIBIT - PRE-FIRE 2017
CAMP HESS KRAMER / GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD

COUNTY OF VENTURA, CALIFORNIA
MARCH 30, 2021

Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

36-EXB SAVE DATE: 3/31/2021 4:37:06 PM PLOT BY: Steward, Craig PLOT DATE: 3/31/2021 4:37:38 PM DRAWING: c:\users\csteward\documents\1-stantec\chk\drainage\impervious-comparison.dwg

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DEVELOPMENT AREA 1
ROW
CAMP HESS KRAMER (LOWER CAMP)
YERBA BUENA ROAD
CAMP HESS KRAMER (MIDDLE CAMP)
DEVELOPMENT AREA 1
YERBA BUENA ROAD
PACIFIC COAST HIGHWAY
PACIFIC OCEAN
POOL
DEVELOPMENT AREA 3
CAMP FIRE ROAD
DEVELOPMENT AREA 2
YERBA BUENA ROAD
GINDLING HILLTOP CAMP (UPPER CAMP)
DEVELOPMENT AREA 4
POOL
LEGEND
PROPOSED ROAD
PROPOSED BUILDING
PROPOSED IMPERVIOUS SITE (PATH/COURTYARD/ETC)
EXISTING IMPERVIOUS
N
1"=150'

DEVELOPMENT AREA 1 - 1,351,281 SF (31.0 ACRES)
EXISTING IMPERVIOUS AREA - 124,000 SF (2.8 ACRES)
NEW/REPLACED IMPERVIOUS AREA - 212,500 SF (4.9 ACRES)
TOTAL IMPERVIOUS AREA - 336,000 SF (7.7 ACRES)

DEVELOPMENT AREA 2 - 1,173,726 SF (26.9 ACRES)
EXISTING IMPERVIOUS AREA - 220,500 SF (5.1 ACRES)
NEW/REPLACED IMPERVIOUS AREA - 28,000 SF (0.6 ACRES)
TOTAL IMPERVIOUS AREA - 228,500 SF (5.7 ACRES)

DEVELOPMENT AREA 3 - 14,175 SF (0.3 ACRES)
EXISTING IMPERVIOUS AREA -
NEW/REPLACED IMPERVIOUS AREA - 3,600 SF (0.1 ACRES)
TOTAL IMPERVIOUS AREA - 3,600 SF (0.1 ACRES)

DEVELOPMENT AREA 4 - 24,485 SF (0.6 ACRES)
EXISTING IMPERVIOUS AREA -
NEW/REPLACED IMPERVIOUS AREA - 3,300 SF (0.1 ACRES)
TOTAL IMPERVIOUS AREA - 3,300 SF (0.1 ACRES)

ALL DEVELOPMENT AREAS - 2,563,668 SF (58.9 ACRES)
EXISTING IMPERVIOUS AREA - 334,000 SF (7.9 ACRES)
NEW/REPLACED IMPERVIOUS AREA - 247,000 SF (5.7 ACRES)
TOTAL IMPERVIOUS AREA - 581,000 SF (13.6 ACRES)
TOTAL IMPERVIOUS AREA: 23%

IMPERVIOUS SURFACE EXHIBIT - PROPOSED 2021
CAMP HESS KRAMER / GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD

COUNTY OF VENTURA, CALIFORNIA
MARCH 31, 2021

Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

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POST-DEVELOPMENT INCREASED IMPERVIOUSNESS

Development Area 1	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	396,500				
2021 Dev Impervious	449,000	738	38,965	12,797	
Increased Impervious	52,500	738	38,965	12,797	52,500

Development Area 2	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	255,800				
2021 Dev Impervious	279,212		9,437		
Increased Impervious	23,412		9,437		9,437

Note: Not all of Development Area 2 drains to the Little Sycamore Creek watersheds.

Development Area 3	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	3,600		3,600		
2021 Dev Impervious	3,600		3,600		
Increased Impervious	0		0		0

Development Area 4	**Total Site**	**Increased Imperviousness in Watersheds**			
	sf	66B	67B	68B	Total
2017 Imperv	3,300		3,300		
2021 Dev Impervious	3,300				
Increased Impervious	0		0		0

Project Total New Impervious by Watershed (sf)		738	48,402	12,797	61,937
Project Total New Impervious by Watershed (sm)		0.00003	0.00174	0.00046	0.00222

Watershed Area, sm		0.162	0.43	0.255
Increased Percent Impervious		0.0%	0.4%	0.2%

EXHIBIT 14A. AMC II NRCS CURVE NUMBERS FOR UNDEVELOPED LAND

UNDEVELOPED LAND USE AND CONDITION		% Impervious		HYDROLOGIC SOIL GROUP AND VCWPD NUMBERS						
Poor: Less than 50% Cover Fair: From 50% to 75% Cover Good: More Than 75% Cover		Effective	Average	A (1), (2)		B		C		D (3)
				7	6	5	4	3	2	1
Grassland (Annual Grass)	Poor	0	0	46	57	60	63	68	72	76
“	Fair	0	0	21	42	47	53	60	66	70
“	Good	0	0	-	-	41	47	54	59	64
Open Brush (Sagebrush, Flattop Buckwheat)	Poor	0	0	31	51	55	60	66	70	75
“	Fair	0	0	22	40	44	49	54	58	61
“	Good	0	0	-	-	33	39	46	51	56
Big Brush (Scrub Oak, Manzanita, Ceanothis)	Fair	0	0	23	39	42	46	51	54	59
“	Good	0	0	-	-	29	34	41	46	51
Chamise (Narrow Leaf Chaparral)	Fair	0	0	21	43	48	55	63	68	75
“	Good	0	0	-	-	44	49	55	60	64
Oak Savannah (Sparse Oaks & Annual Grass)	Poor	0	0	34	53	57	62	67	71	-
“	Fair	0	0	22	41	45	51	57	61	-
Orchard	Poor	0	0	42	56	59	62	65	67	71
Woodland	Fair	0	0	-	-	35	39	43	47	-
Pinon & Juniper	Fair	0	0	-	-	43	48	54	58	62
Forest	Fair	0	0	22	41	45	50	56	60	64
Pasture or Range	Poor	0	0	61	76	78	81	84	87	89
“	Fair	0	0	40	61	65	71	77	81	84
“	Good	0	0	29	52	57	64	71	76	80
	NOTE: WPD MODIFIED RATIONAL METHOD USES SOIL TYPES 1-7 AND EFFECTIVE IMPERVIOUS PERCENTAGE IN VCRat MODEL									
Note (1)	Curve numbers for soil types 6 and 7 not all available									
Note (2)	For CNs<30, ensure that P-0.2*S > 0									
Note (3)	Curve numbers for soil type 1 not all available									
Reference:	Boyle, 1967. Revised Hydrologic Analysis, Zone II except Pasture from NRCS TR-55 Table 2-2c. For other land use types see TR-55									

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APPENDIX B

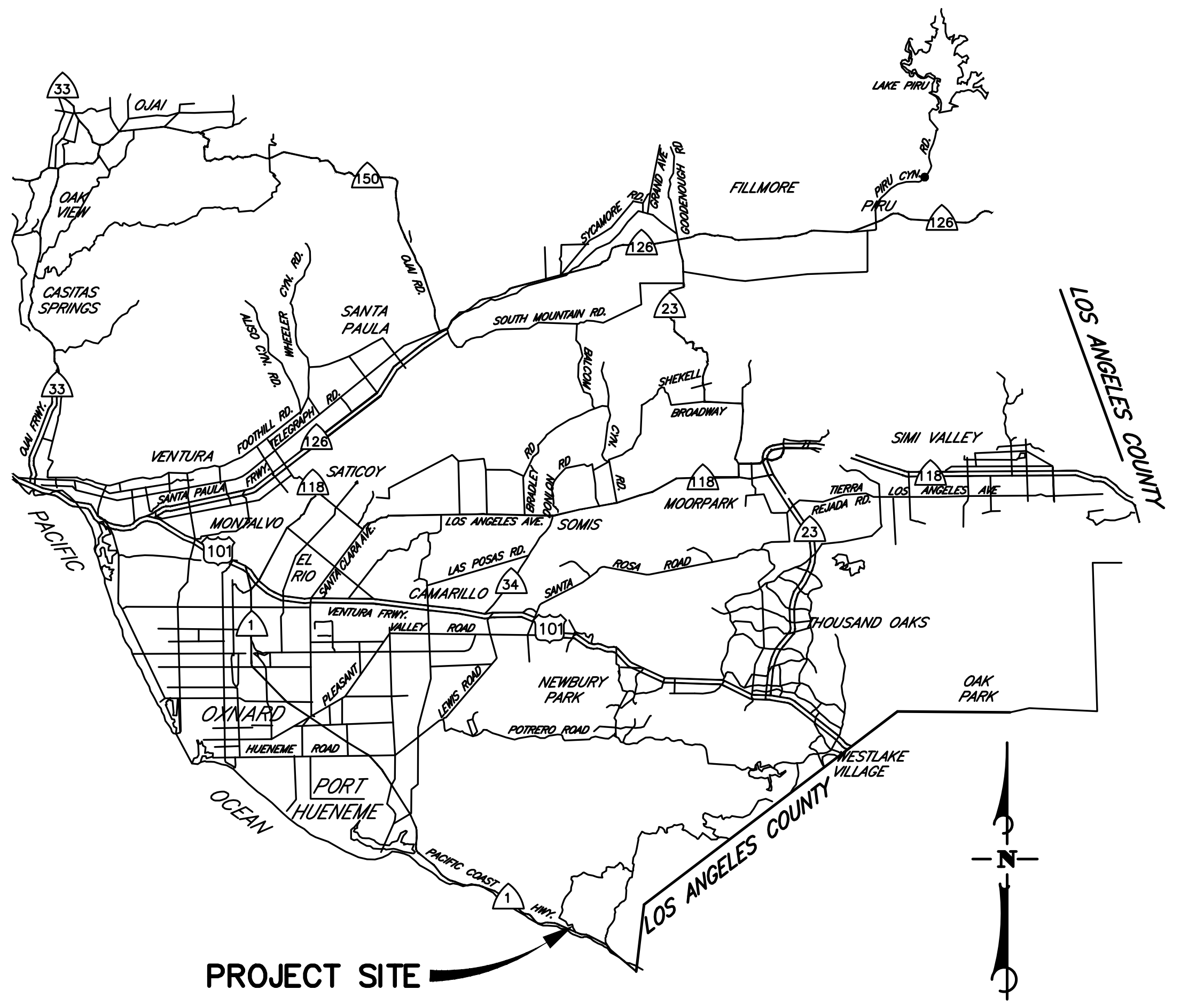
HYDRAULIC ANALYSIS

CAMP HESS KRAMER/GINDLING HILLTOP CAMP

WOOLSEY FIRE REBUILD

11495 & 11677 PACIFIC COAST HIGHWAY

COUNTY OF VENTURA, CALIFORNIA



LOCATION MAP

SCALE: N.T.S.

PROPERTY INFORMATION

PROJECT SITE ADDRESS:
CAMP HESS KRAMER
11495 PACIFIC COAST HIGHWAY (STATE HIGHWAY 1)
MALIBU, CA 92065
T: (310) 457-7861
F: (310) 457-4614

ASSESSOR'S PARCEL NUMBERS	ACREAGE	GENERAL PLAN	ZONE DESIGNATION
APN 700-0-070-450 APN 700-0-060-310 APN 700-0-060-140	55.90 ACRES 43.23 ACRES 80.00 ACRES	DEVELOPED AREAS: RURAL (2 ACRE MIN.) UNDEVELOPED AREAS: OPEN SPACE (10 ACRE MIN.)	DEVELOPED AREAS: COASTAL RESOURCE EXCLUSIVE (CRE-20 AC/M) UNDEVELOPED AREAS COASTAL OPEN SPACE (COS-10 AC SFD/M)
APN 700-0-060-260	8.20 ACRES	OPEN SPACE (10 ACRE MIN.)	COASTAL OPEN SPACE (COS-10 AC SFD/M)
TOTAL	187.33 ACRES		

PROJECT DIRECTORY

PROPERTY OWNER/APPLICANT:
WILSHIRE BOULEVARD TEMPLE CAMPS
ALBERTO VALNER, EXECUTIVE DIRECTOR
DOUG LYNN, CAMP DIRECTOR
RICK WATERS, DIRECTOR OF CONSTRUCTION & FACILITIES
C/O CAMP HESS KRAMER
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LOS ANGELES, CA 90010-2703
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F: (213) 388-2595

CIVIL ENGINEER:
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HADY IZADPANAH, P.E.

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STRUCTURAL FOCUS (SF)
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ARCHEOLOGIST:
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MITCH MARKEN CFP, CRAM

GEOTECHNICAL ENGINEER:
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VENTURA, CA 93003
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PATRICK BOALES, ASSOCIATE GEOLOGIST

GEOMORPHOLOGY:
ESA ASSOCIATES
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JORGEN BLOMBERG, DESIGN TEAM DIRECTOR

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INTERFACE ENGINEERS
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JOEL CRUZ, PRINCIPAL

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SAN RAFAEL, CA 94903
T: (415) 492 - 0420
PIETER COLENBRANDER, PRINCIPAL ELECTRICAL
DAVID ORGISH, PRINCIPAL LIGHTING DESIGN

FOOD SERVICE
CINI LITTLE INTERNATIONAL
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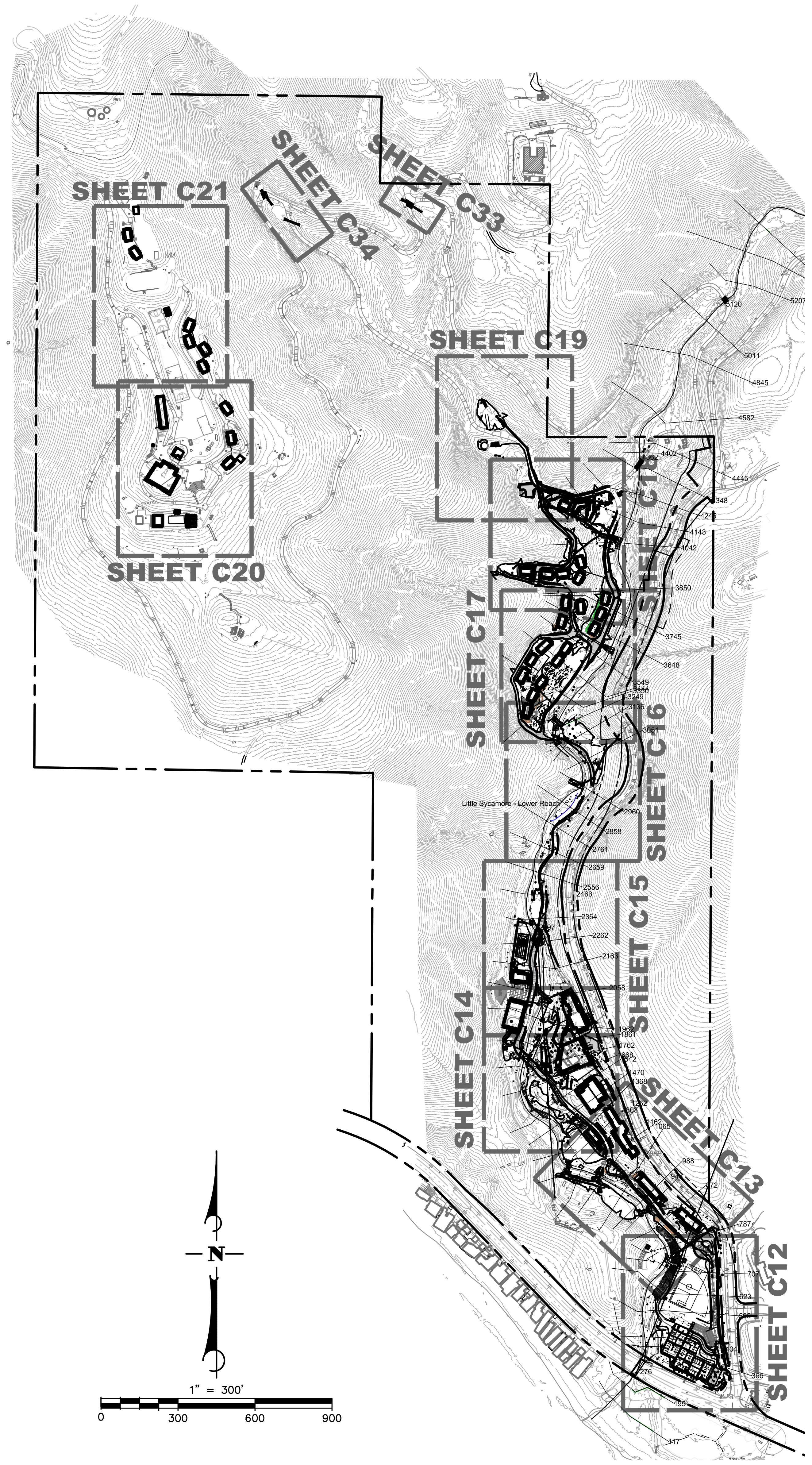
SAN FRANCISCO, CALIFORNIA 94105
T: (415) 922 - 5900
KEITH SHORT, DESIGN DIRECTOR

POOL
AQUATIC DESIGN GROUP
2226 FARADAY AVE.
CARLSBAD, CA 92008
T: (800) 938-0542
DENNIS BERKSHIRE,PRESIDENT

PARKING
WATRY DESIGN INC.
200 GATEWAY PLACE #550
SAN JOSE, CA 95110
T: (833) 917-7275
GENARO MORALES, DIRECTOR OF ARCH DESIGN



ESTIMATED EARTHWORK QUANTITIES

EARTHWORK QUANTITIES:

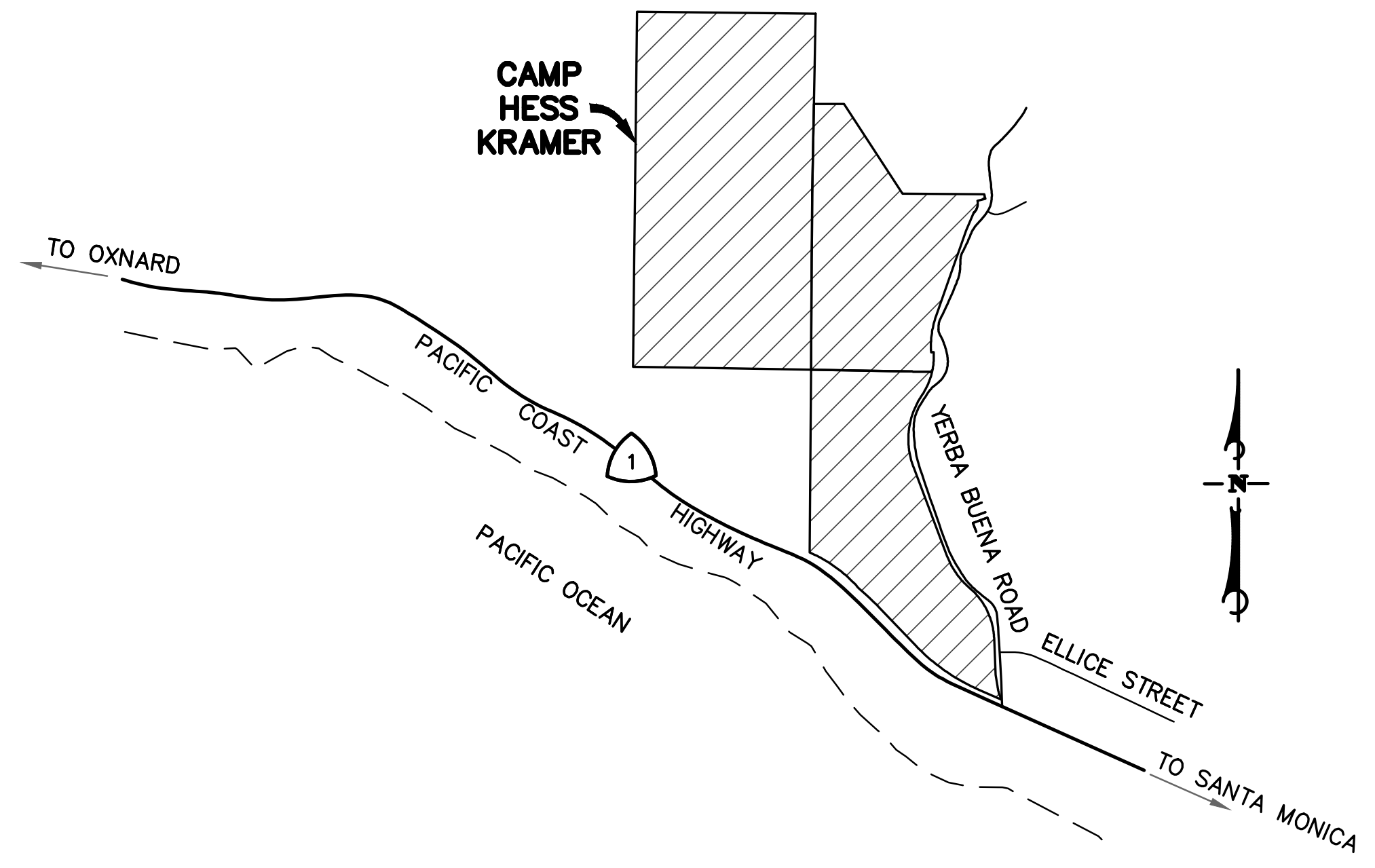
	CUT	FILL
LOWER CAMP (PHASE 1):		
SITE GRADING	16,500 C.Y.	9,500 C.Y.
STOCKPILED MATERIAL	–	3,500 C.Y
ROAD EXPANSION/WIDENING	1,900 C.Y.	–
BRIDGES	900 C.Y.	–
STORM WATER TREATMENT EXCAVATION	1,300 C.Y.	–
CREEK RESTORATION	7,100 C.Y.	200
SUBTOTAL	27,700 C.Y.	13,200 C.Y.
MIDDLE CAMP (PHASE 1):		
SITE GRADING	9,000 C.Y.	12,000 C.Y.
STOCKPILED MATERIAL	–	7,600 C.Y
ROAD EXPANSION/WIDENING	2,000 C.Y.	–
BRIDGES	100 C.Y.	–
STORM WATER TREATMENT EXCAVATION	300 C.Y.	–
CREEK RESTORATION	5,400 C.Y.	100
SUBTOTAL	16,800 C.Y.	19,700 C.Y.
TOTAL PHASE 1:	44,500 C.Y.	32,900 C.Y.
UPPER CAMP (PHASE 2):		
SITE GRADING	2,200 C.Y.	–
TOTAL PHASE 2:	2,200 C.Y.	–

EARTHWORK NOTES:

THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISH GRADE OR SUBGRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. PROPOSED SUBGRADE ELEVATION IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED BENEATH PAVEMENTS OR STRUCTURES.

THE EARTHWORK QUANTITIES ABOVE ARE FOR BUILDING PERMIT PURPOSES ONLY. THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, OVER EXCAVATION AND RE-COMPACTION, TRENCHING, AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING A LUMP SUM BID PRICE FOR EARTHWORK. THE EARTHWORK SHALL BE BALANCED ONSITE.



VICINITY MAP

SCALE: N.T.S.

SHEET INDEX

SHEET NO.	DESCRIPTION
C1	TITLE SHEET
C2	GENERAL NOTES & INFORMATION
C3	SURVEY NOTES & SHEET INDEX
C4	TOPOGRAPHIC MAP – LOWER CAMP
C5	TOPOGRAPHIC MAP – LOWER CAMP
C6	TOPOGRAPHIC MAP – LOWER CAMP
C7	TOPOGRAPHIC MAP – MIDDLE CAMP
C8	TOPOGRAPHIC MAP – MIDDLE CAMP
C9	TOPOGRAPHIC MAP – MIDDLE CAMP
C10	TOPOGRAPHIC MAP – UPPER CAMP
C11	TOPOGRAPHIC MAP – UPPER CAMP
C12	GRADING & DRAINAGE PLAN – LOWER CAMP
C13	GRADING & DRAINAGE PLAN – LOWER CAMP
C14	GRADING & DRAINAGE PLAN – LOWER CAMP
C15	GRADING & DRAINAGE PLAN – LOWER CAMP
C16	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C17	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C18	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C19	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C20	GRADING & DRAINAGE PLAN – UPPER CAMP
C21	GRADING & DRAINAGE PLAN – UPPER CAMP
C22	ROAD SECTIONS
C23	BRIDGE 1P & 2V PLAN & PROFILE
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C25	BRIDGE 5P & 6V PLAN & PROFILE
C26	BRIDGE 9P PLAN & PROFILE
C27	STORM DRAIN PLAN & PROFILE – LINE A
C28	STORM DRAIN PLAN & PROFILE – LINE B
C29	STORM DRAIN PLAN & PROFILE – LINE E
C30	STORM DRAIN PLAN & PROFILE – LINE G1
C31	STORM DRAIN PLAN & PROFILE – LINE G1
C32	STORM DRAIN PLAN & PROFILE – LINE G2
C33	STORM DRAIN PLAN & PROFILE – LINE G3
C34	STORM DRAIN PLAN & PROFILE – LINE G4
C35	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C36	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C37	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C38	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C39	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C40	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C41	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C42	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C43	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C44	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C45	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C46	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C47	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C48	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C49	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C50	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C51	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C52	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C53	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C54	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C55	DRY UTILITY IMPROVEMENT PLAN – UPPER CAMP
C56	DRY UTILITY IMPROVEMENT PLAN – UPPER CAMP
C57	UTILITY DETAILS
C58	DETAILS
C59	DETAILS
C60	EROSION CONTROL DETAILS & NOTES
C61	EROSION CONTROL PLAN – LOWER CAMP
C62	EROSION CONTROL PLAN – LOWER CAMP
C63	EROSION CONTROL PLAN – MIDDLE CAMP
C64	EROSION CONTROL PLAN – MIDDLE CAMP
C65	EROSION CONTROL PLAN – MIDDLE CAMP
C66	EROSION CONTROL PLAN – UPPER CAMP
C67	EROSION CONTROL PLAN – UPPER CAMP
ESA PLANS	
R1	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R2	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R3	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R4	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R5	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
R6	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
R7	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
R8	CREEK RESTORATION CROSS SECTIONS
R9	CREEK RESTORATION TYPICAL DETAILS
R10	CREEK RESTORATION TYPICAL DETAILS
R11	CREEK RESTORATION TYPICAL DETAILS
R12	CREEK RESTORATION TYPICAL DETAILS
R13	CREEK RESTORATION TYPICAL DETAILS
R14	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R15	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R16	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R17	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R18	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP
R19	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP
R20	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVIA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

TITLE SHEET
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C1 OF C67
PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:06:41 PM

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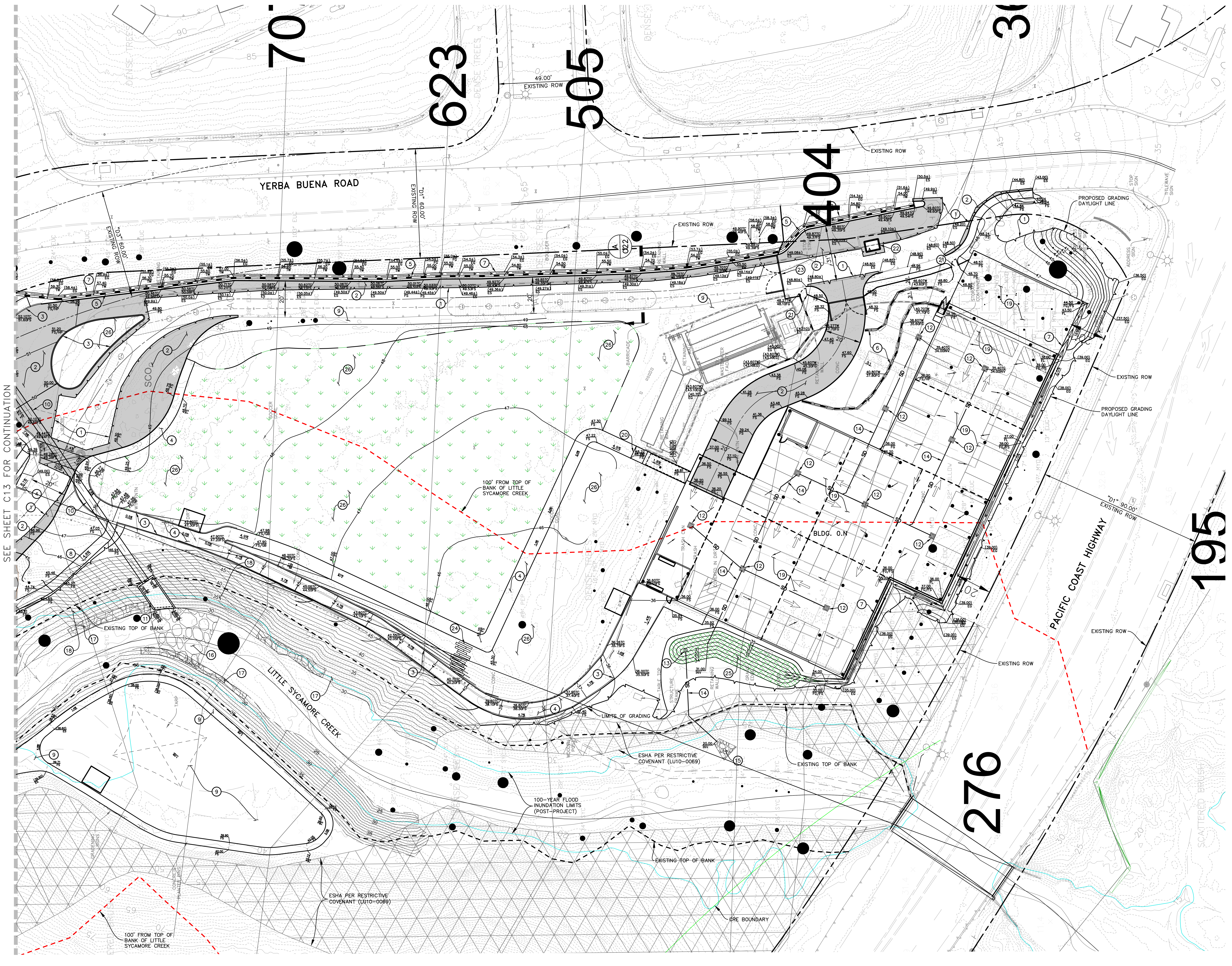
SEE SHEET C13 FOR CONTINUATION
YERBA BUENA ROAD
EXISTING ROW
"D3" 60.00' EXISTING ROW
"D1" 60.00' EXISTING ROW
49.00' EXISTING ROW
PROPOSED GRADING DAYLIGHT LINE
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
BLDG. O.N
"D1" 90.00' EXISTING ROW
PACIFIC COAST HIGHWAY
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
CRE BOUNDARY
70
623
505
404
195
276
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED 6" CURB.
4. PROPOSED CONCRETE WALKWAY.
5. PROPOSED CONCRETE SITE RETAINING WALL.
6. PROPOSED STONE CLAD RETAINING WALL.
7. PROPOSED CONCRETE SWALE.
8. PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET C58.
9. PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
10. PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
11. PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
12. PROPOSED 24"X24" STORM DRAIN INLET.
13. PROPOSED STORM DRAIN OUTLET/OVERFLOW; FINAL SIZE TBD.
14. PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
15. PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
16. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
17. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
18. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
19. PROPOSED AT-GRADE PARKING WITH RAISED TENNIS COURTS ABOVE. SEE ARCHITECTURAL PLANS. SEE DETAIL "A", SHEET C58 FOR TENNIS COURT LEVEL FINISH SURFACE ELEVATIONS.
20. PROPOSED 8' WIDE PEDESTRIAN BRIDGE CONNECTING THE FIELD LEVEL TO THE TENNIS COURTS.
21. PROPOSED 8' HIGH PEDESTRIAN GATE. SEE LANDSCAPE PLANS.
22. PROPOSED GATE SHACK. SEE ARCHITECTURAL PLANS.
23. PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
24. PROPOSED TIMBER STEPS.
25. PROPOSED WATER QUALITY TREATMENT AREA (BIO-1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
26. PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C12 OF C67

PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:07:37 PM

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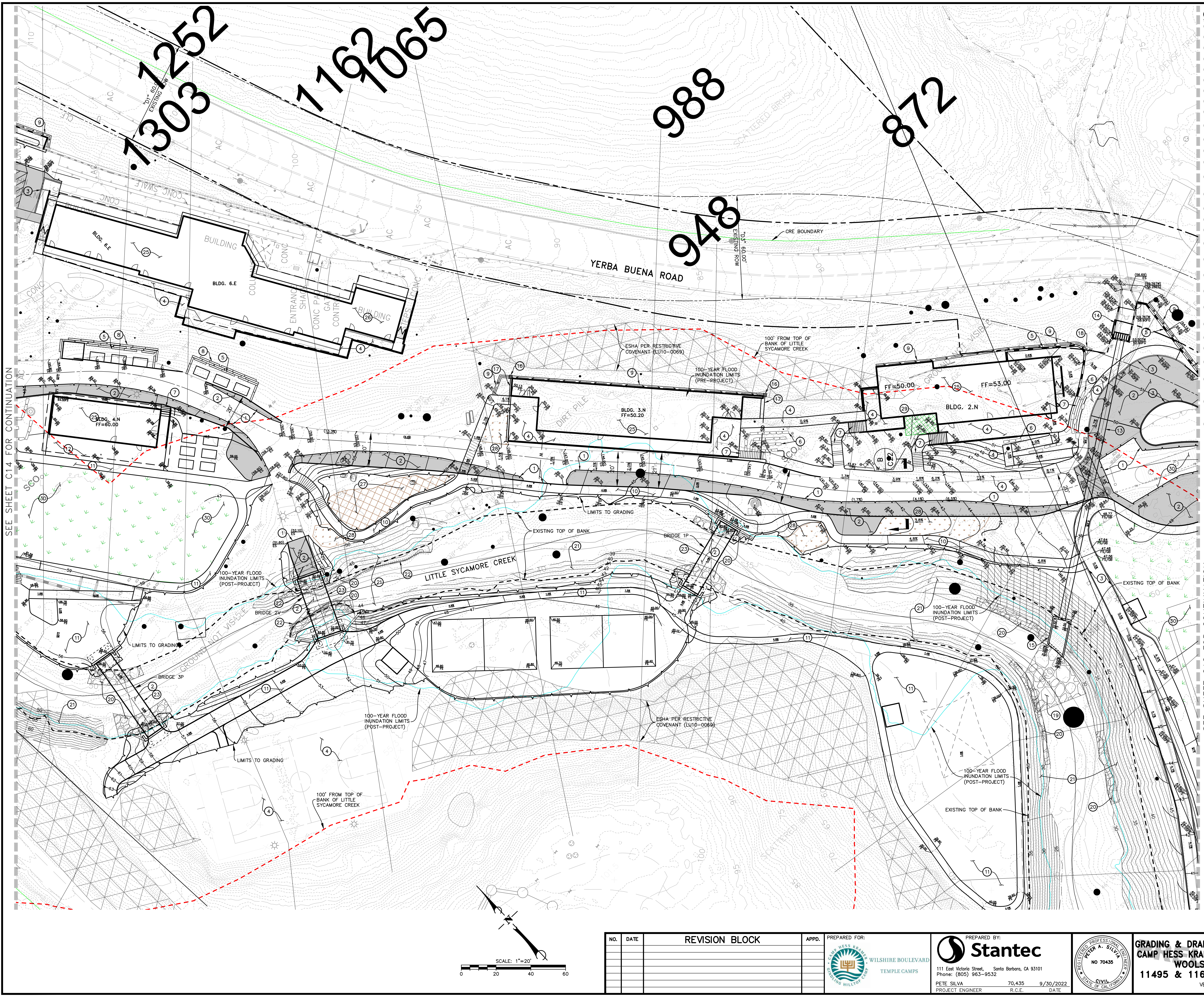
1252
1303
1162
1065
988
872
948
"D1" 60.00' EXISTING ROW
"D3" 60.00' EXISTING ROW
CRE BOUNDARY
YERBA BUENA ROAD
CONC SWALE
BUILDING
BLDG. 6.E
BLDG. 4.N FF=60.00
BLDG. 3.N FF=50.20
BLDG. 2.N
FF=50.00
FF=53.00
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (PRE-PROJECT)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
LIMITS TO GRADING
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
BRIDGE 1P
BRIDGE 2V
BRIDGE 3P
DIRT PILE
SEE SHEET C14 FOR CONTINUATION
SEE SHEET C12 FOR CONTINUATION
SCALE: 1"=20'
0
20
40
60
PRELIMINARY

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED 6" CURB.
④ PROPOSED CONCRETE WALKWAY.
⑤ PROPOSED CONCRETE SITE RETAINING WALL.
⑥ PROPOSED STONE BOULDER WALL.
⑦ PROPOSED CONCRETE STEPS.
⑧ PROPOSED TIMBER STEPS.
⑨ PROPOSED CONCRETE SWALE.
⑩ PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET SHEET C58.
⑪ PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
⑫ PROPOSED PERMEABLE PAVERS. SEE DETAIL "D", SHEET C58.
⑬ PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
⑭ PROPOSED STORM DRAIN "LINE A" INLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "J", SHEET C59.
⑮ PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
⑯ PROPOSED 18"X18" STORM DRAIN INLET.
⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑱ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
⑲ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑳ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉑ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉒ EXISTING MASONRY ABUTMENTS AND WALLS TO BE REMOVED. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉓ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉔ PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉕ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉖ EXISTING BUILDING TO REMAIN.
㉗ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
㉘ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉙ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H', SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉚ PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER
GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C13 OF C67

PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:08:36 PM

DRAWING: v: \2042\active\2042586200\drawing\exhibit_files\2042586200_civil_base.dwg

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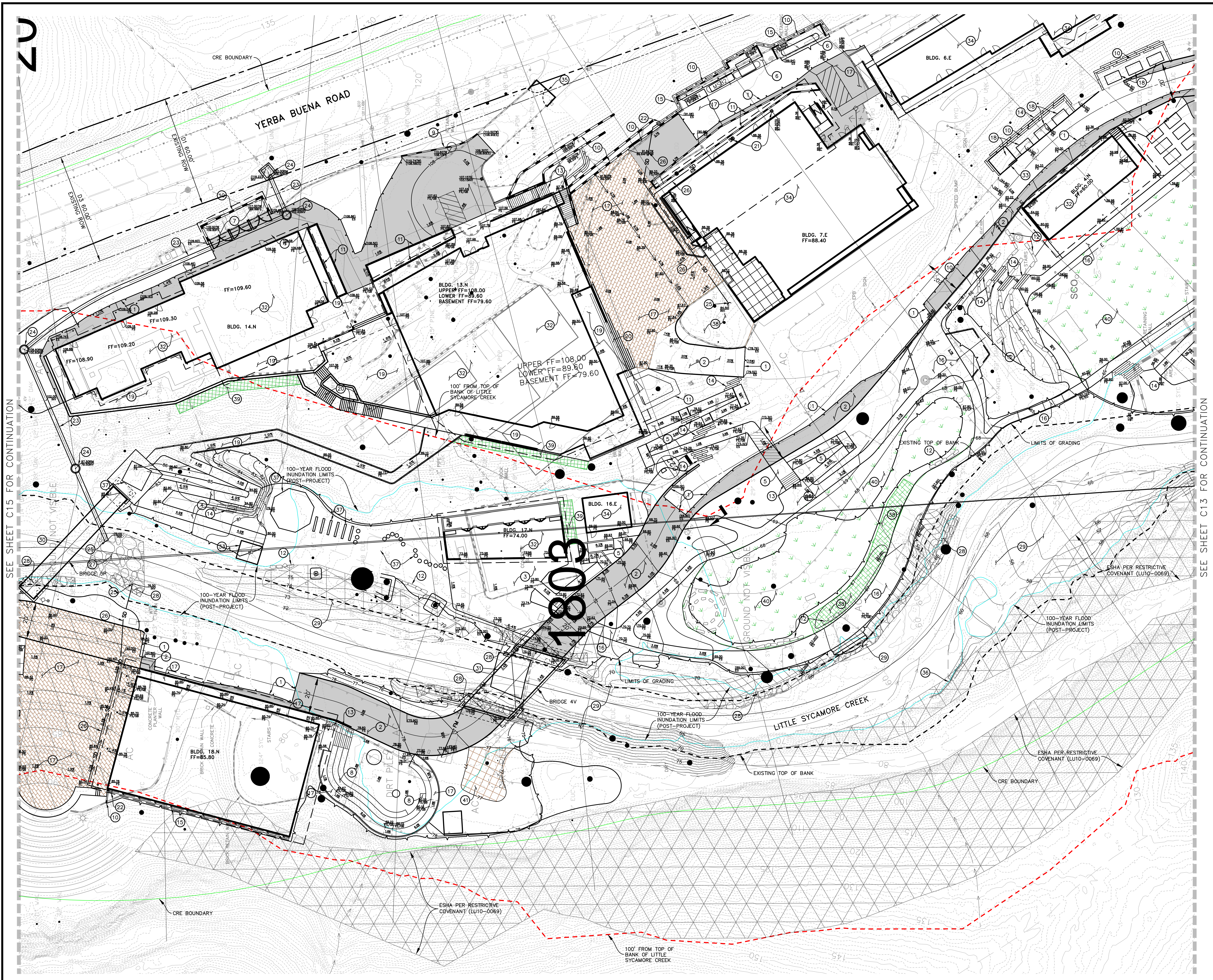
YERBA BUENA ROAD
CRE BOUNDARY
D1 60.00' EXISTING ROW
D3 60.00' EXISTING ROW
BLDG. 14.N
FF=109.60
FF=109.30
FF=109.20
FF=108.90
BLDG. 13.N
UPPER FF=108.00
LOWER FF=89.60
BASEMENT FF=79.60
BLDG. 7.E
FF=88.40
BLDG. 6.E
BLDG. 4.N
FF=60.00
BLDG. 16.E
BLDG. 17.N
FF=74.00
BLDG. 18.N
FF=85.80
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
EXISTING TOP OF BANK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LITTLE SYCAMORE CREEK
BRIDGE 4V
BRIDGE 5P
GROUND NOT VISIBLE
1803
SEE SHEET C15 FOR CONTINUATION
SEE SHEET C13 FOR CONTINUATION
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED CONCRETE PAVEMENT.
4. PROPOSED 6" CURB.
5. PROPOSED CONCRETE WALKWAY/RAMP.
6. PROPOSED CONCRETE SLABS FOR UTILITY PADS.
7. PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
8. PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
9. PROPOSED GRAVITY WALL.
10. PROPOSED SITE RETAINING WALL.
11. PROPOSED PLANTER WALL. SEE LANDSCAPE PLANS.
12. PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
13. PROPOSED CONCRETE STEPS.
14. PROPOSED TIMBER STEPS.
15. PROPOSED CONCRETE SWALE.
16. PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
17. PROPOSED WATER QUALITY TREATMENT AREA (INF–5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C59. SEE STORMWATER EXHIBITS AND REPORT.
18. PROPOSED PLANTERS. SEE LANDSCAPE PLANS.
19. PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
20. PROPOSED WOOD DECKING STEPS. SEE LANDSCAPE PLANS.
21. PROPOSED 12"X12" STORM DRAIN INLET.
22. PROPOSED 18"X18" STORM DRAIN INLET.
23. PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
24. PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
25. PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.
26. PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
27. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
28. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
29. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
30. PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
31. PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
32. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
33. PROPOSED SHED. SEE ARCHITECTURAL PLANS.
34. EXISTING BUILDING TO REMAIN.
35. PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
36. REMOVE DAMAGED WALL.
37. PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
38. PROPOSED WATER QUALITY TREATMENT AREA (BIO–1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
39. PROPOSED WATER QUALITY TREATMENT AREA (BIO–2: PLANTER BOX). SEE DETAIL "H" SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
40. PROPOSED WATER QUALITY TREATMENT AREA (BIO–4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.
41. PROPOSED WATER QUALITY TREATMENT AREA (INF–1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963–9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER PETER A. SILVIA NO 70435 CIVIL STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY

VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C14 OF C67

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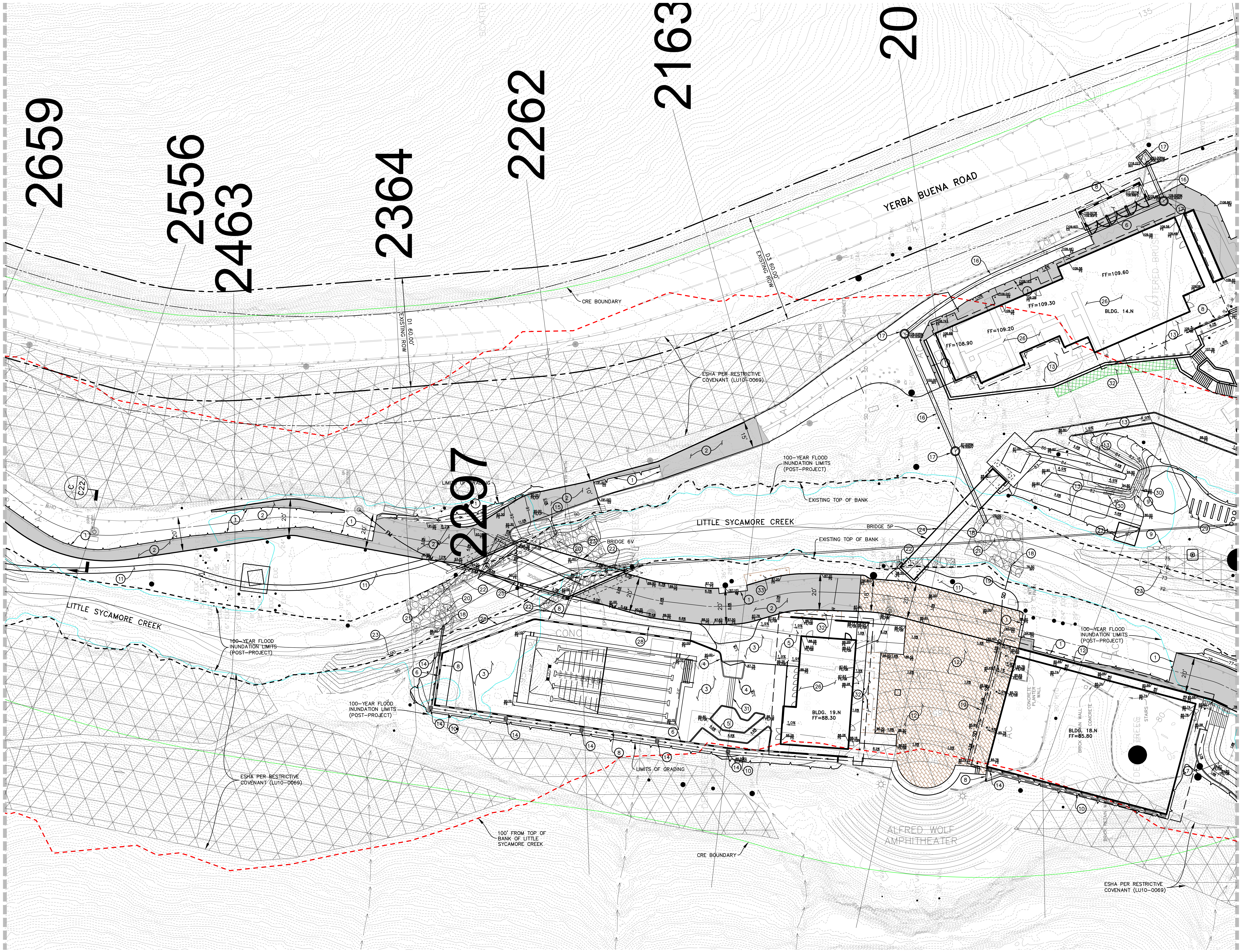
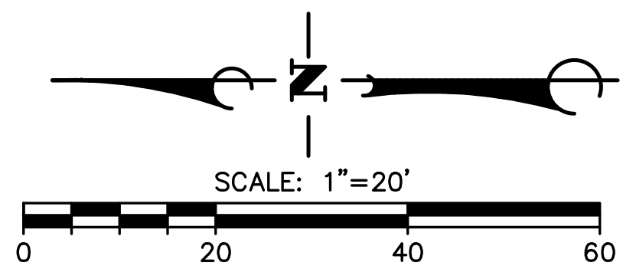

2659
2556
2463
2364
2262
2163
20
2297
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
LITTLE SYCAMORE CREEK
SEE SHEET C16 FOR CONTINUATION
SEE SHEET C14 FOR CONTINUATION
D1 60.00' EXISTING ROW
D3 60.00' EXISTING ROW
CRE BOUNDARY
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
EXISTING TOP OF BANK
LIMITS OF GRADING
BRIDGE 6V
BRIDGE 5P
BLDG. 14.N
FF=109.60
FF=109.30
FF=109.20
FF=108.90
BLDG. 19.N FF=88.30
BLDG. 18.N FF=85.80
ALFRED WOLF AMPHITHEATER
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
C C22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SCALE: 1"=20'
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60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE WALKWAY/RAMP.
⑥ PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
⑦ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
⑧ PROPOSED RETAINING WALL.
⑨ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑩ PROPOSED CONCRETE SWALE.
⑪ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
⑫ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
⑬ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑭ PROPOSED 18"X18" STORM DRAIN INLET.
⑮ PROPOSED CALTRANS DOWNDRAIN.
⑯ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
⑱ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59.
⑲ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑳ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
㉑ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉒ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉓ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉔ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉕ PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉖ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉗ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉘ PROPOSED "CONTEMPO" SECURITY FENCE.
㉙ PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
㉚ PROPOSED TIMBER STEPS.
㉛ PROPOSED CONCRETE STEPS.
㉜ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
㉝ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉞ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

GRADING & DRAINAGE PLAN – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
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SHEET
C15 OF C67

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5/01/2021

DESIGN PAS CHECKED HI

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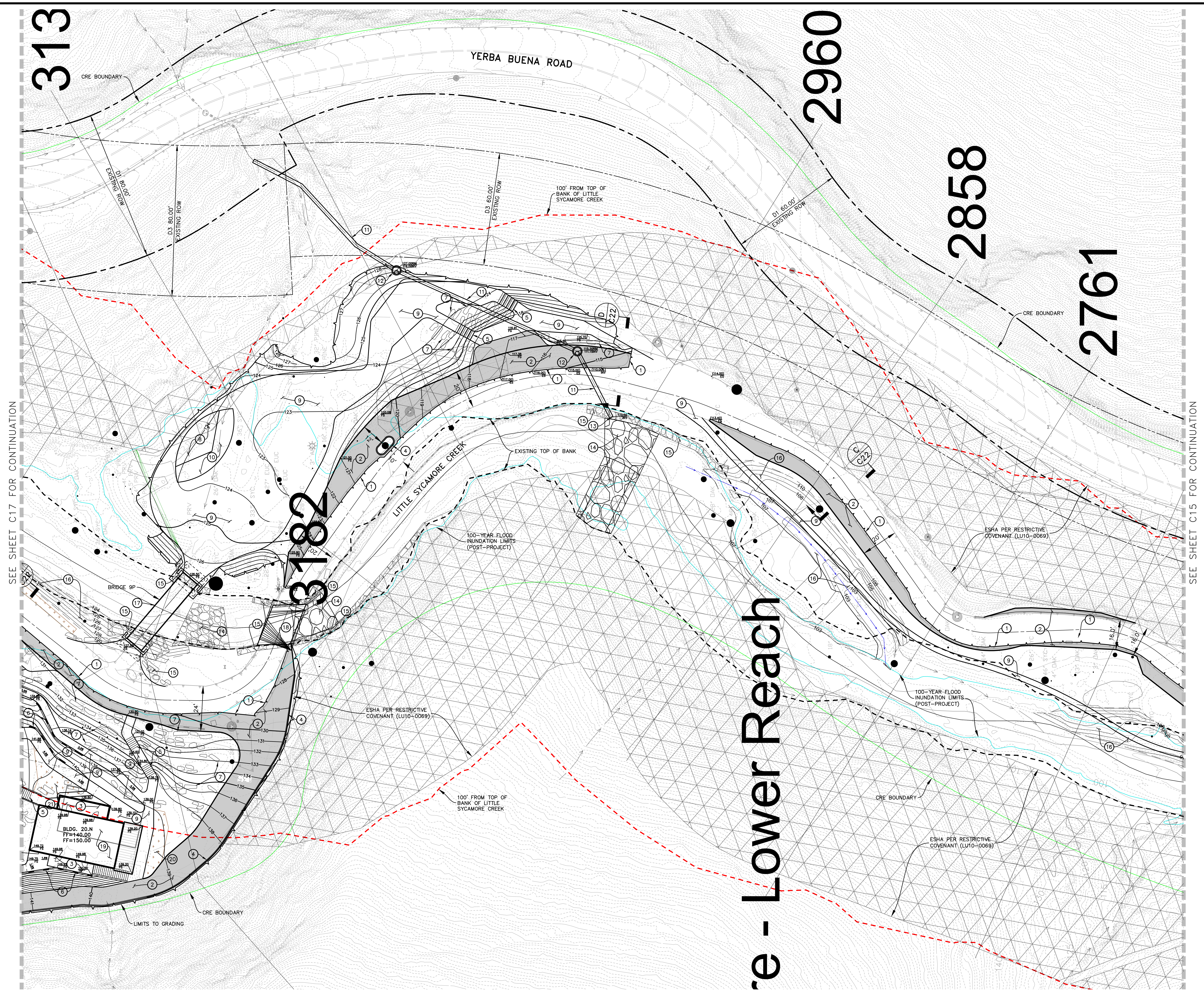
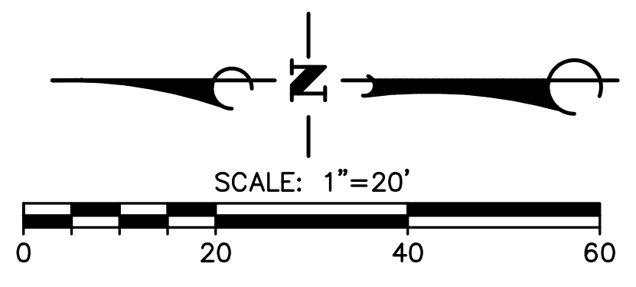

313
2960
2858
2761
3182
e - Lower Reach
YERBA BUENA ROAD
CRE BOUNDARY
D1 80.00' EXISTING ROW
D3 80.00' EXISTING ROW
D3 60.00' EXISTING ROW
D1 60.00' EXISTING ROW
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
BRIDGE 9P
BLDG. 20.N
FF=140.00
FF=150.00
LIMITS TO GRADING
D C22
C C22
SEE SHEET C17 FOR CONTINUATION
SEE SHEET C15 FOR CONTINUATION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SCALE: 1"=20'
0
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CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
⑥ PROPOSED RETAINING WALL.
⑦ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑧ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
⑨ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
⑩ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑪ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑫ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
⑬ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.
⑭ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑮ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑯ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑰ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
⑱ EXISTING VEHICULAR BRIDGE TO REMAIN.
⑲ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
⑳ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

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PREPARED FOR:
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WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
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Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
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CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN – MIDDLE CAMP
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PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C16 OF C67
PLAN DATE
5/01/2021

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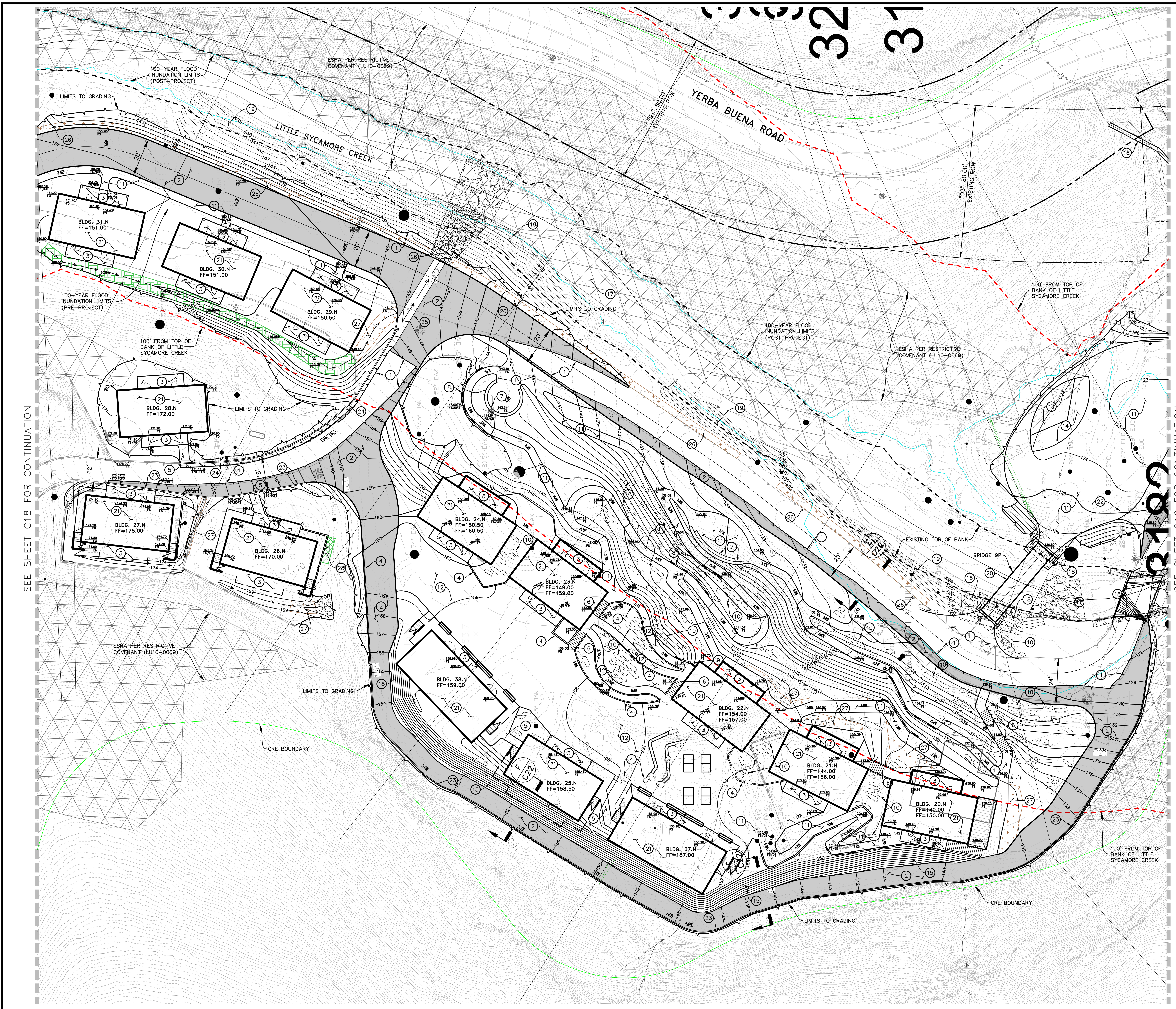
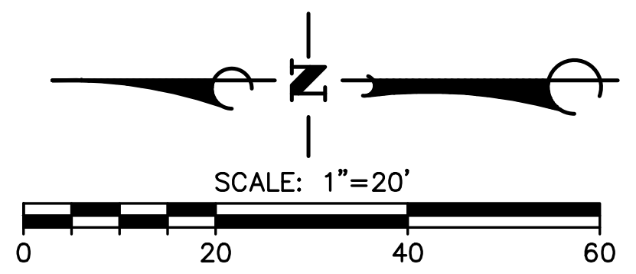

SEE SHEET C18 FOR CONTINUATION
SEE SHEET C16 FOR CONTINUATION
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
"D1" 80.00' EXISTING ROW
"D3" 80.00' EXISTING ROW
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100-YEAR FLOOD INUNDATION LIMITS (PRE-PROJECT)
LIMITS TO GRADING
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
BRIDGE 9P
CRE BOUNDARY
BLDG. 31.N FF=151.00
BLDG. 30.N FF=151.00
BLDG. 29.N FF=150.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 26.N FF=170.00
BLDG. 24.N FF=150.50 FF=160.50
BLDG. 23.N FF=149.00 FF=159.00
BLDG. 22.N FF=154.00 FF=157.00
BLDG. 21.N FF=144.00 FF=156.00
BLDG. 20.N FF=140.00 FF=150.00
BLDG. 38.N FF=159.00
BLDG. 25.N FF=158.50
BLDG. 37.N FF=157.00
C22
C29

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE WALKWAY/RAMP.
⑥ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
⑦ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
⑧ PROPOSED GRAVITY WALL.
⑨ PROPOSED RETAINING WALL.
⑩ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑪ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
⑫ PROPOSED PERMEABLE DECOMPOSED GRANITE PATH. SEE DETAIL 'B", SHEET C58. SEE LANDSCAPE PLANS.
⑬ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
⑭ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑮ PROPOSED CEMENT TREATED BASE 1:1 SLOPE.
⑯ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑱ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑲ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑳ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉑ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉒ PROPOSED RECLAIMED LOG BENCH. SEE LANDSCAPE PLANS.
㉓ PROPOSED 8" CURB.
㉔ PROPOSED 8" CURB AND 24" GUTTER.
㉕ PROPOSED 6' CONCRETE RIBBON GUTTER.
㉖ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
㉗ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉘ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉙ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.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SCALE: 1"=20'
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WILSHIRE BOULEVARD
TEMPLE CAMPS

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PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

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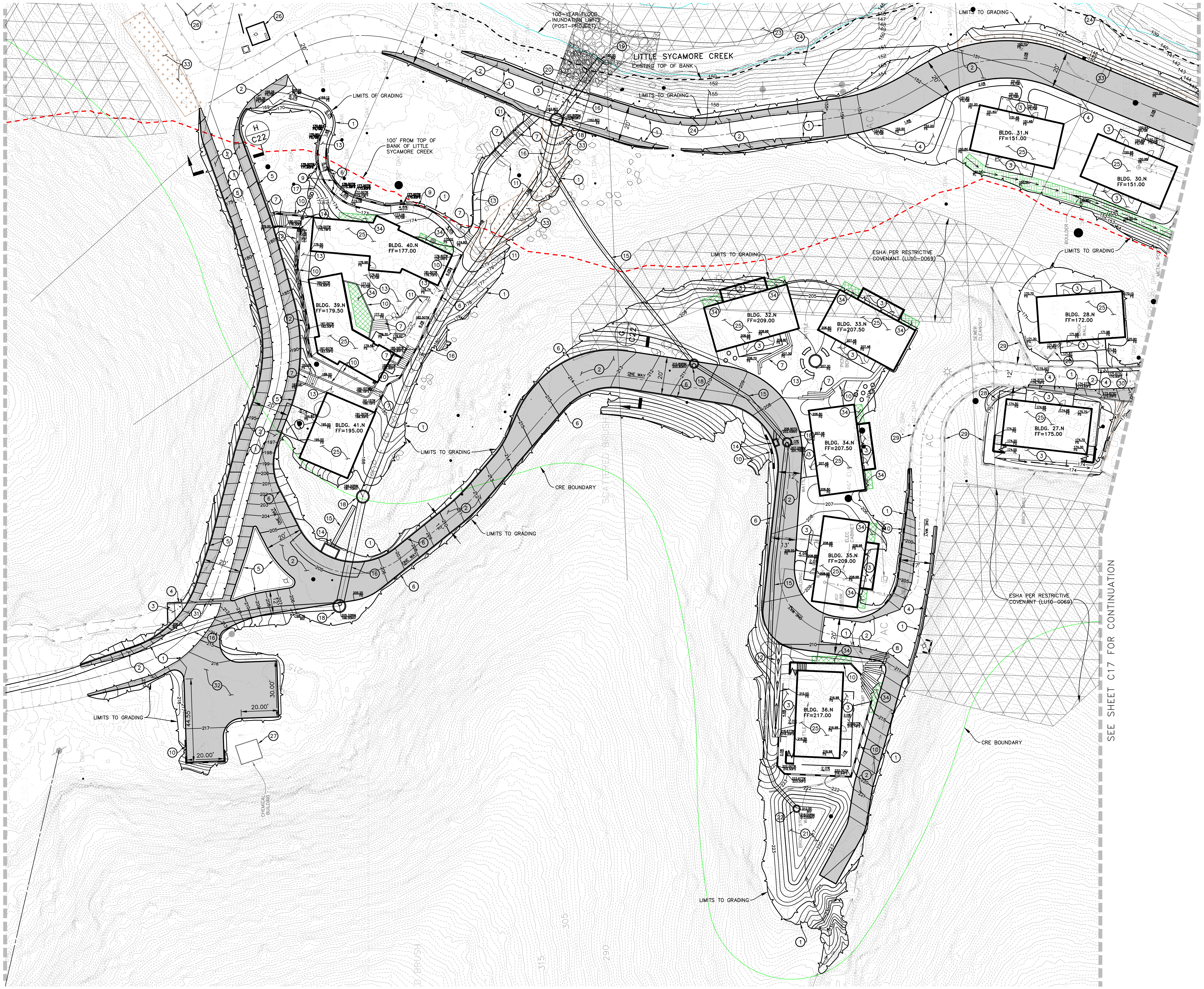
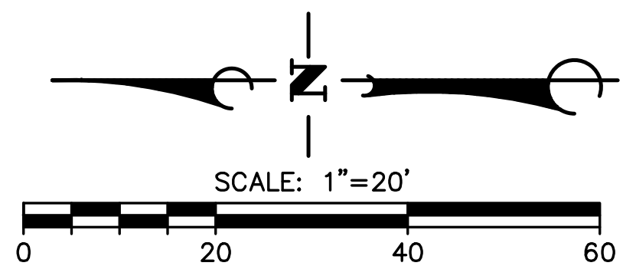

SEE SHEET C19 FOR CONTINUATION
SEE SHEET C17 FOR CONTINUATION
LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
LIMITS OF GRADING
LIMITS TO GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
CRE BOUNDARY
ONE WAY
BLDG. 31.N FF=151.00
BLDG. 30.N FF=151.00
BLDG. 40.N FF=177.00
BLDG. 39.N FF=179.50
BLDG. 41.N FF=195.00
BLDG. 32.N FF=209.00
BLDG. 33.N FF=207.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 34.N FF=207.50
BLDG. 35.N FF=209.00
BLDG. 36.N FF=217.00
H C22
20.00'
30.00'
44.55'
20.00'
CHEMICAL BUILDING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SCALE: 1"=20'
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CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 8" CURB.
⑤ PROPOSED ROLLED CURB.
⑥ PROPOSED AC DIKE.
⑦ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
⑧ PROPOSED TIMBER STEPS. SEE LANDSCAPE PLANS.
⑨ PROPOSED GRAVITY WALL.
⑩ PROPOSED RETAINING WALL.
⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑫ PROPOSED CONCRETE SWALE.
⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
⑲ PROPOSED STORM DRAIN OUTLET WITH HEADWALL; FINAL DESIGN TBD. SEE STORM DRAIN PLANS.
⑳ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
㉑ PROPOSED DEBRIS BASIN.
㉒ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
㉓ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉔ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉕ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉖ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉗ EXISTING BUILDING TO REMAIN.
㉘ PORTION OF EXISTING RETAINING WALL TO BE REMOVED.
㉙ EXISTING RETAINING WALL TO REMAIN.
㉚ PROPOSED 24" GUTTER.
㉛ PROPOSED ASPHALT BERM.
㉜ PROPOSED FIRE TRUCK HAMMER HEAD.
㉝ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉞ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN - MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C18 OF C67
PLAN DATE
5/01/2021

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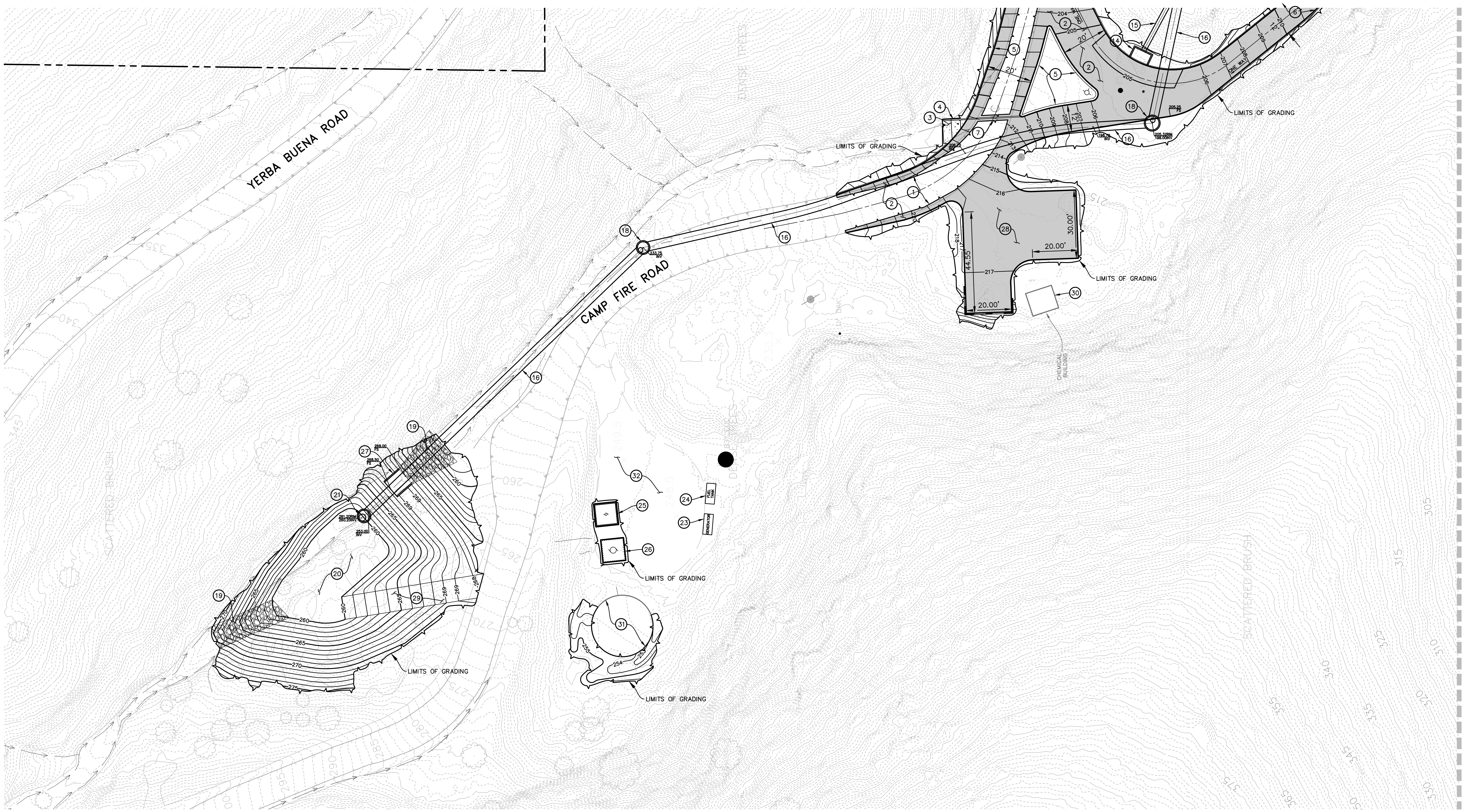

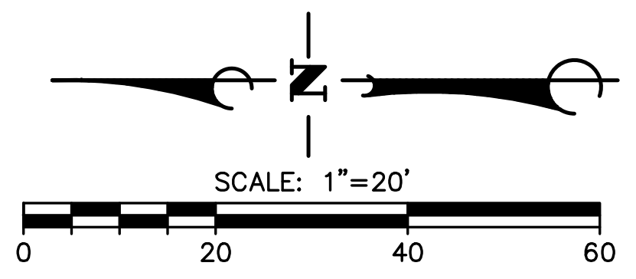

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 8" CURB.
⑤ PROPOSED ROLLED CURB.
⑥ PROPOSED AC DIKE.
⑦ PROPOSED ASPHALT BERM.
⑧ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
⑨ PROPOSED GRAVITY WALL.
⑩ PROPOSED RETAINING WALL.
⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑫ PROPOSED CONCRETE SWALE.
⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
⑲ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
⑳ PROPOSED DEBRIS BASIN.
㉑ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
㉒ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉓ PROPOSED GENERATOR PAD.
㉔ PROPOSED FUEL TANK PAD.
㉕ PROPOSED WATER PUMP STRUCTURE.
㉖ PROPOSED FIRE PUMP STRUCTURE.
㉗ PROPOSED P.C.C. OVERFLOW STRUCTURE.
㉘ PROPOSED FIRE TRUCK HAMMER HEAD.
㉙ PROPOSED GRAVEL ACCESS RAMP.
㉚ EXISTING BUILDING TO REMAIN.
㉛ EXISTING WATER TANK TO REMAIN.
㉜ EXISTING GRAVEL SURFACE TO REMAIN.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
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STANTEC PROJECT NO.
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PLAN DATE
5/01/2021

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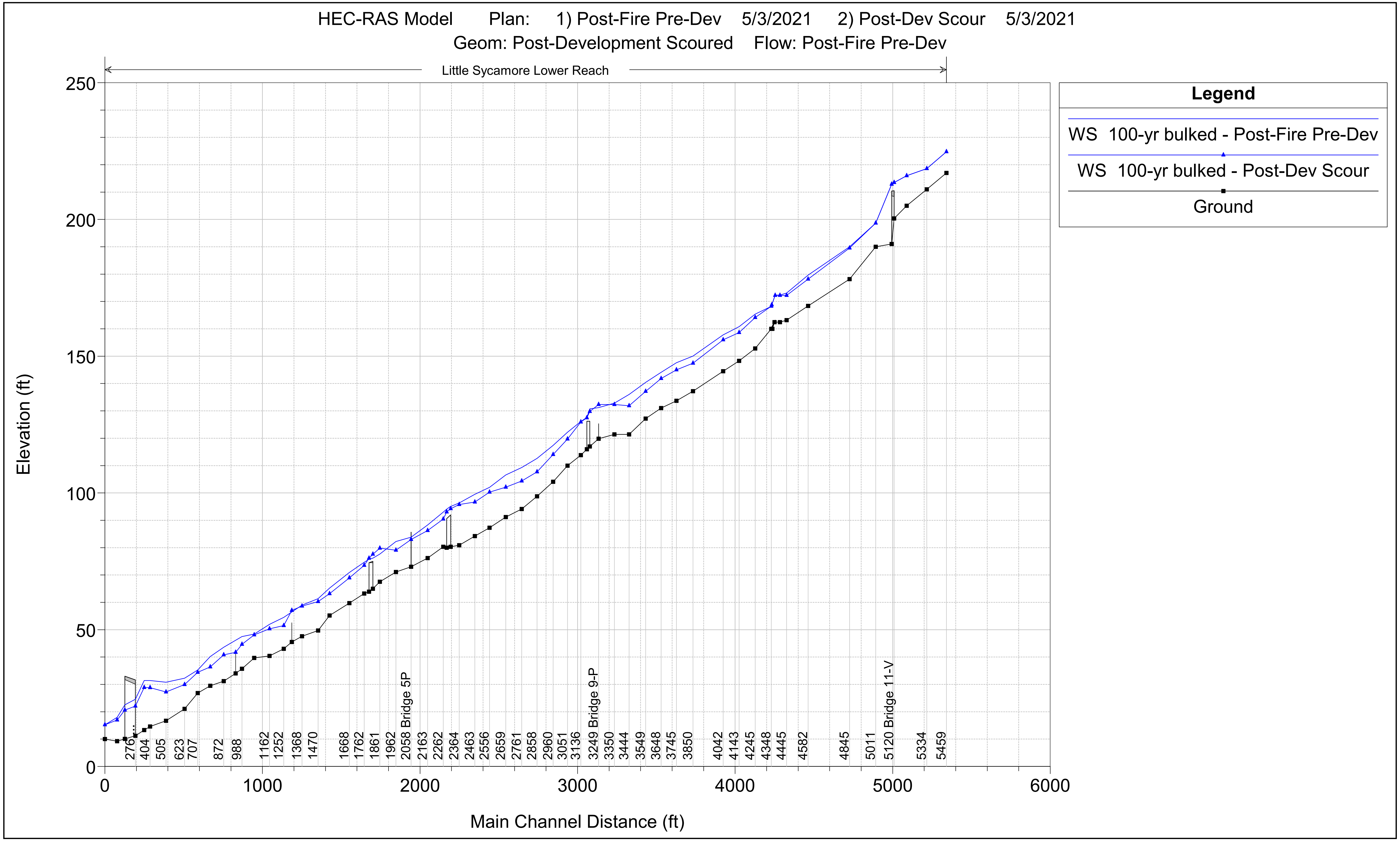
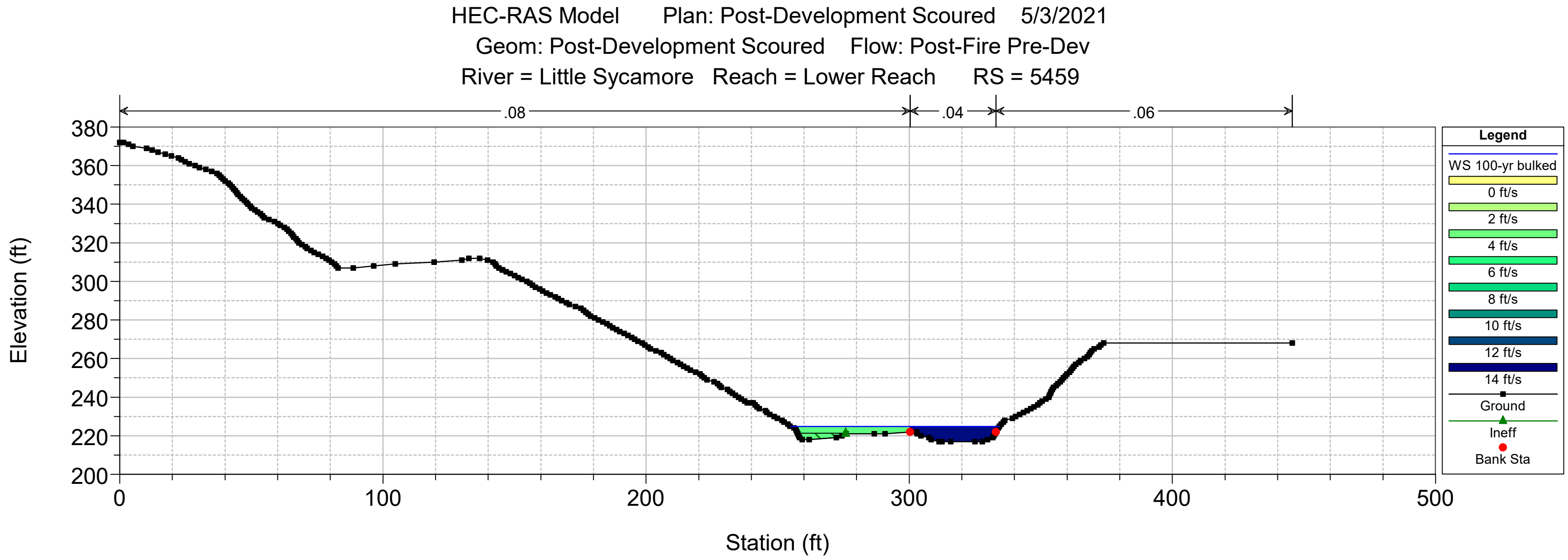
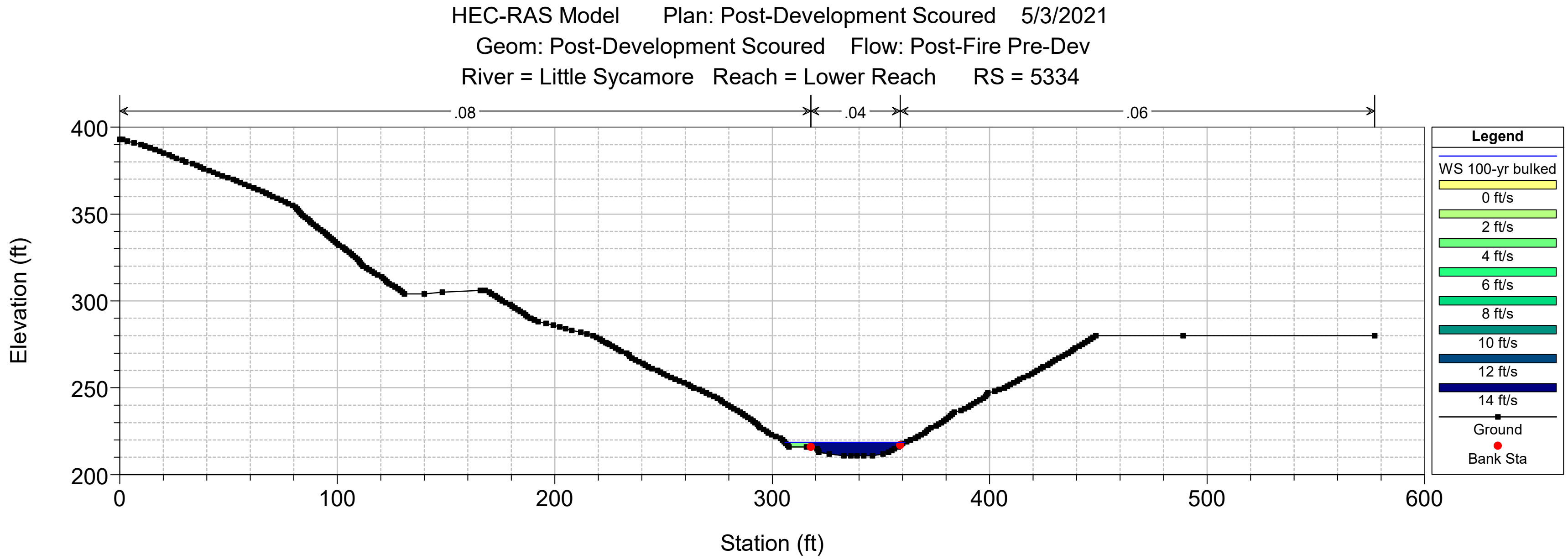
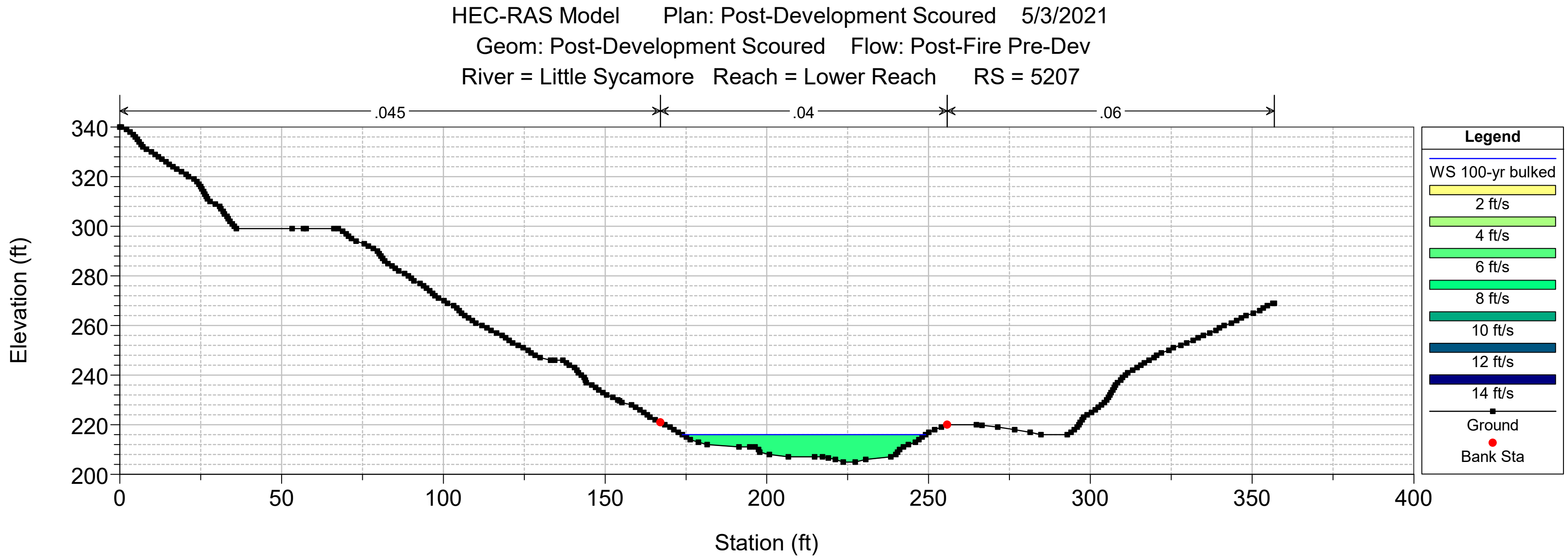

HEC-RAS Model Plan: 1) Post-Fire Pre-Dev 5/3/2021 2) Post-Dev Scour 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
Little Sycamore Lower Reach
Legend
WS 100-yr bulked - Post-Fire Pre-Dev
WS 100-yr bulked - Post-Dev Scour
Ground
Elevation (ft)
250
200
150
100
50
0
Main Channel Distance (ft)
0
1000
2000
3000
4000
5000
6000
276
404
505
623
707
872
988
1162
1252
1368
1470
1668
1762
1861
1962
2058 Bridge 5P
2163
2262
2364
2463
2556
2659
2761
2858
2960
3051
3136
3249 Bridge 9-P
3350
3444
3549
3648
3745
3850
4042
4143
4245
4348
4445
4582
4845
5011
5120 Bridge 11-V
5334
5459

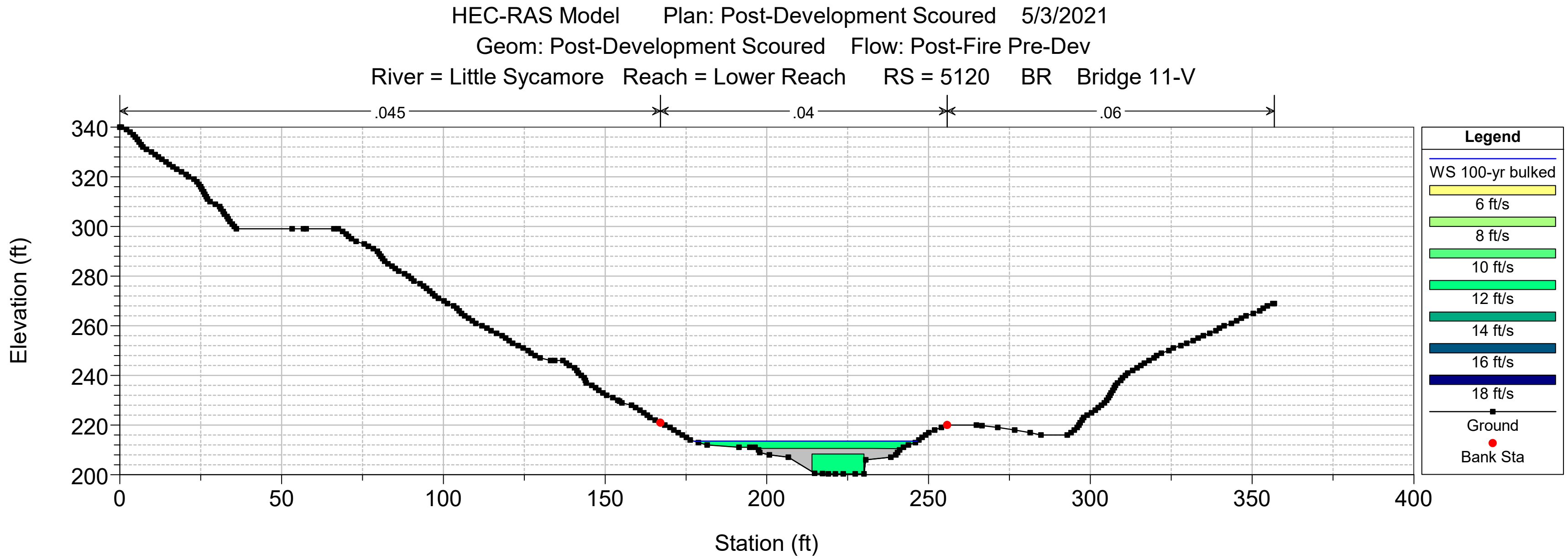


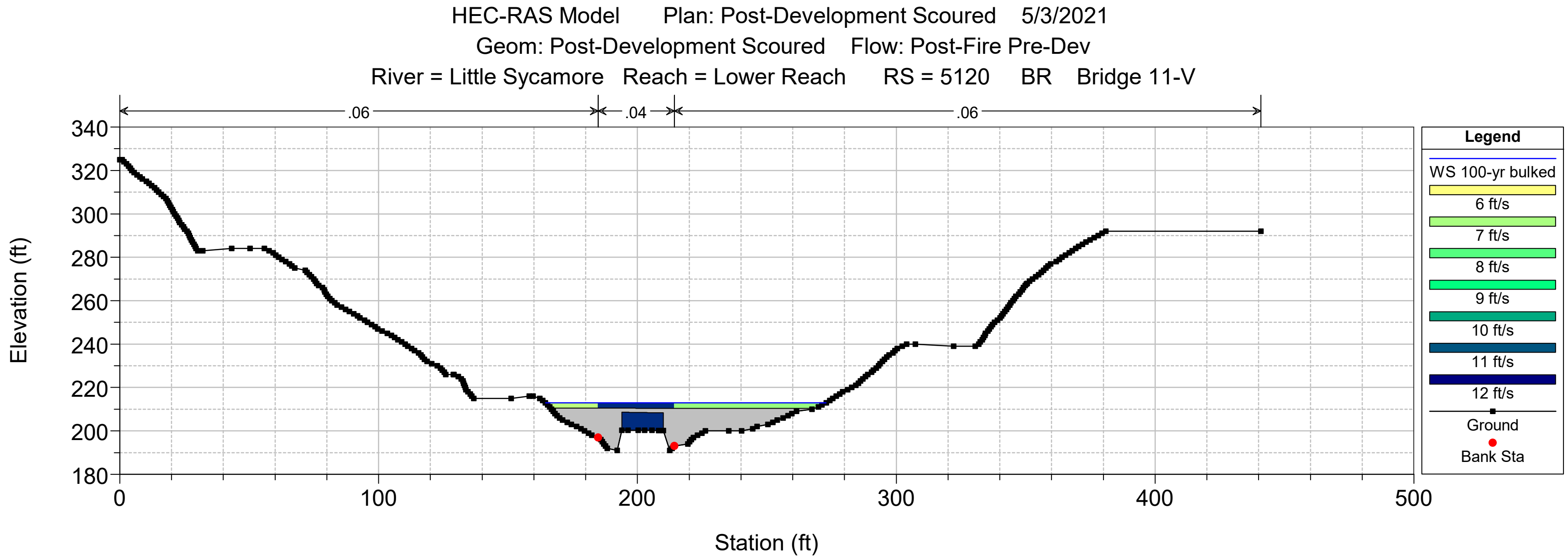
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5459

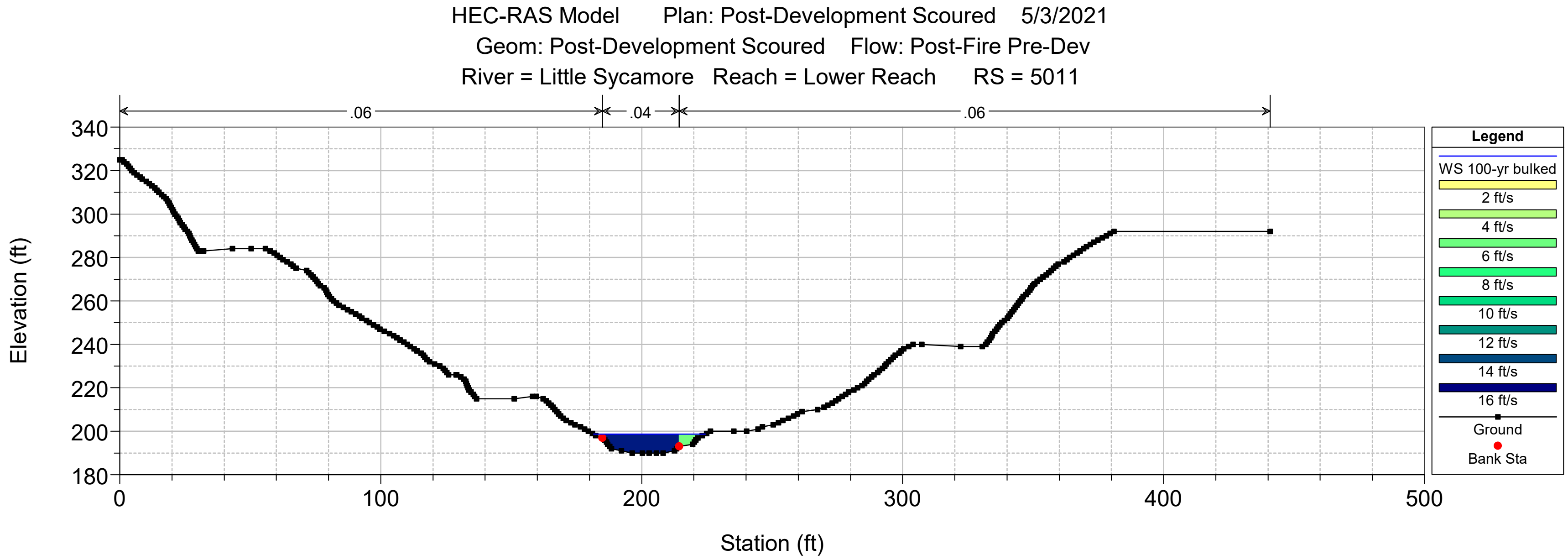


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5334

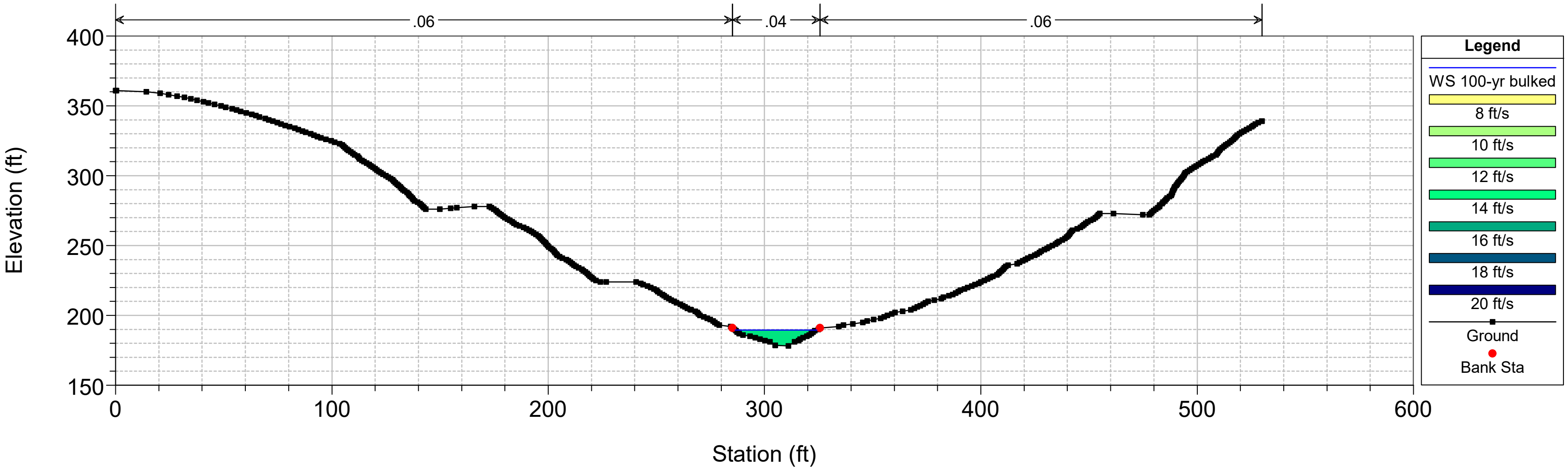

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5207
.045
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5120 BR Bridge 11-V
.045
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta

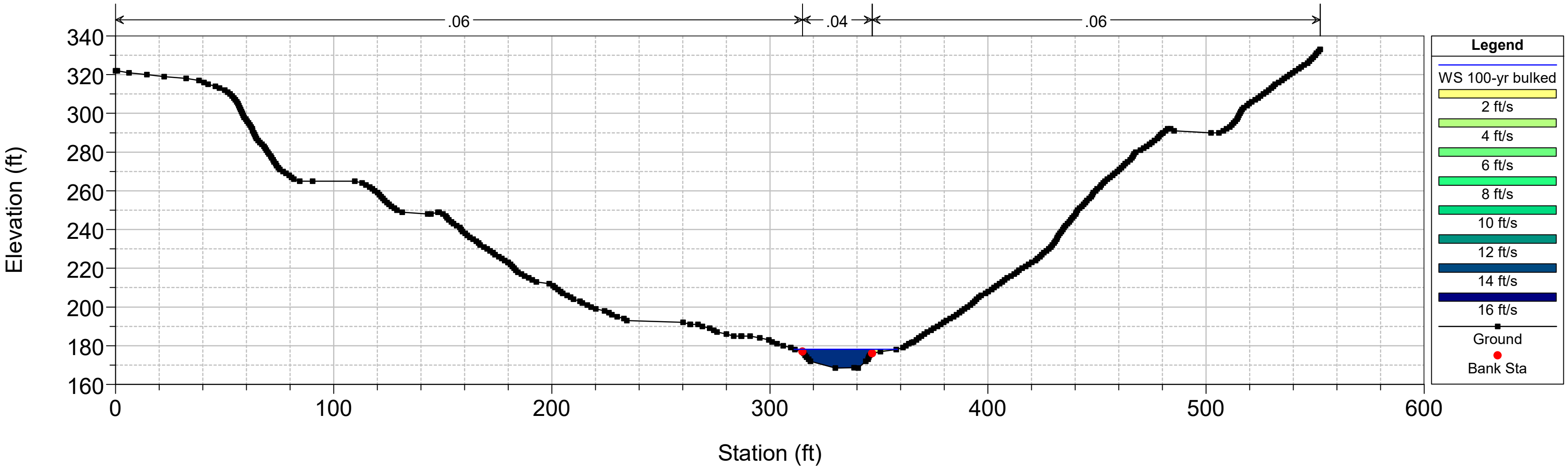

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5120 BR Bridge 11-V
.06
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
180
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
7 ft/s
8 ft/s
9 ft/s
10 ft/s
11 ft/s
12 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5011
.06
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
180
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta

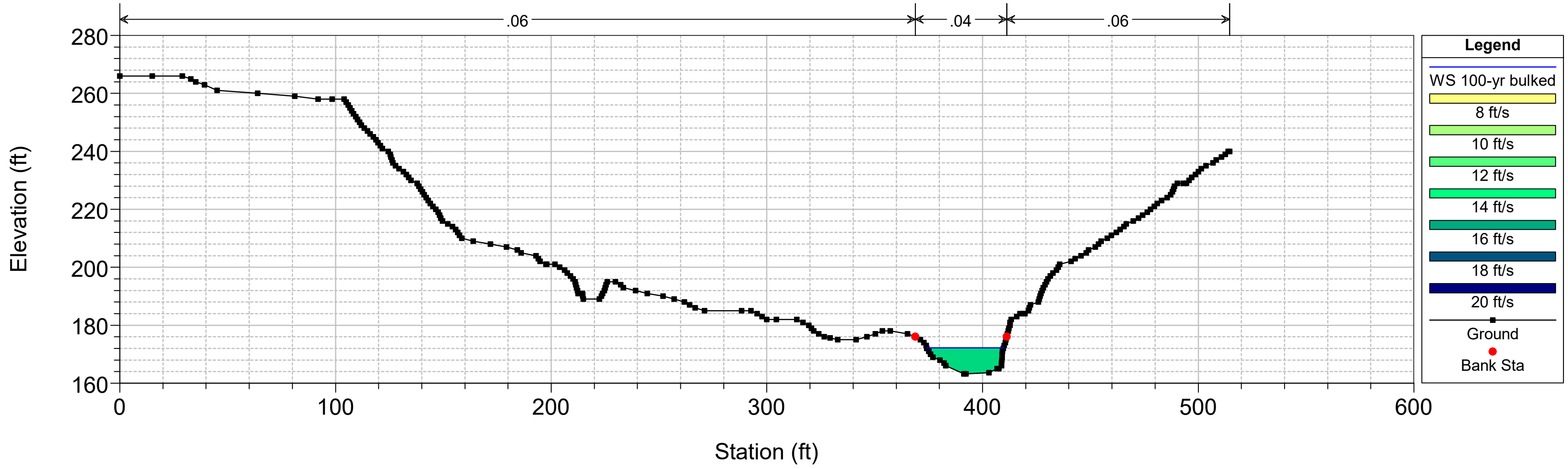
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4845



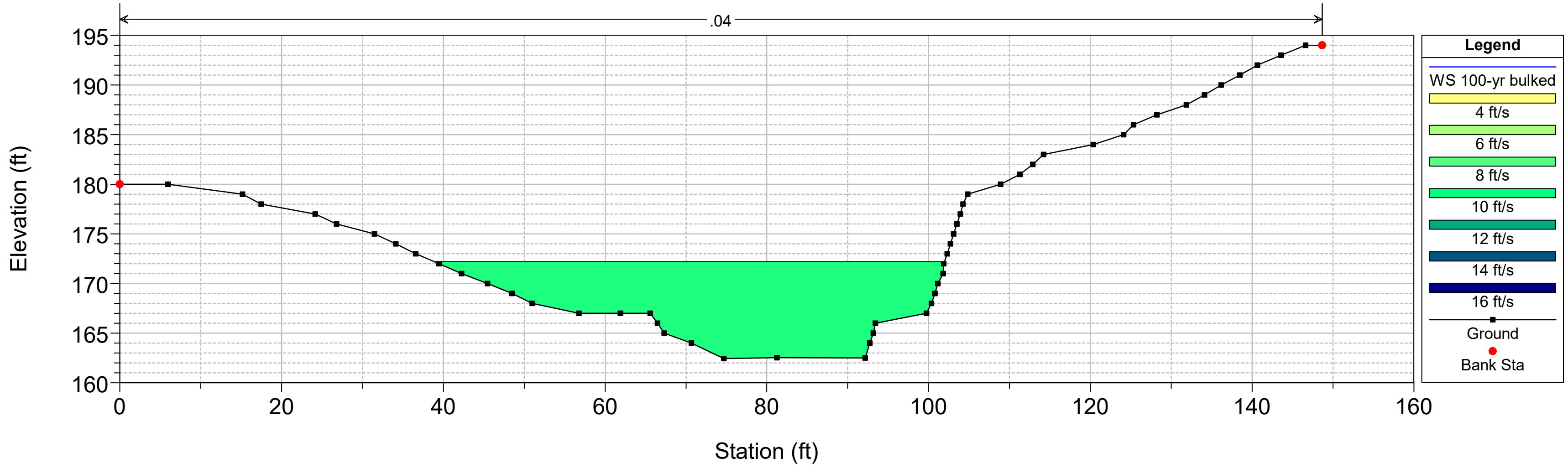
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4582

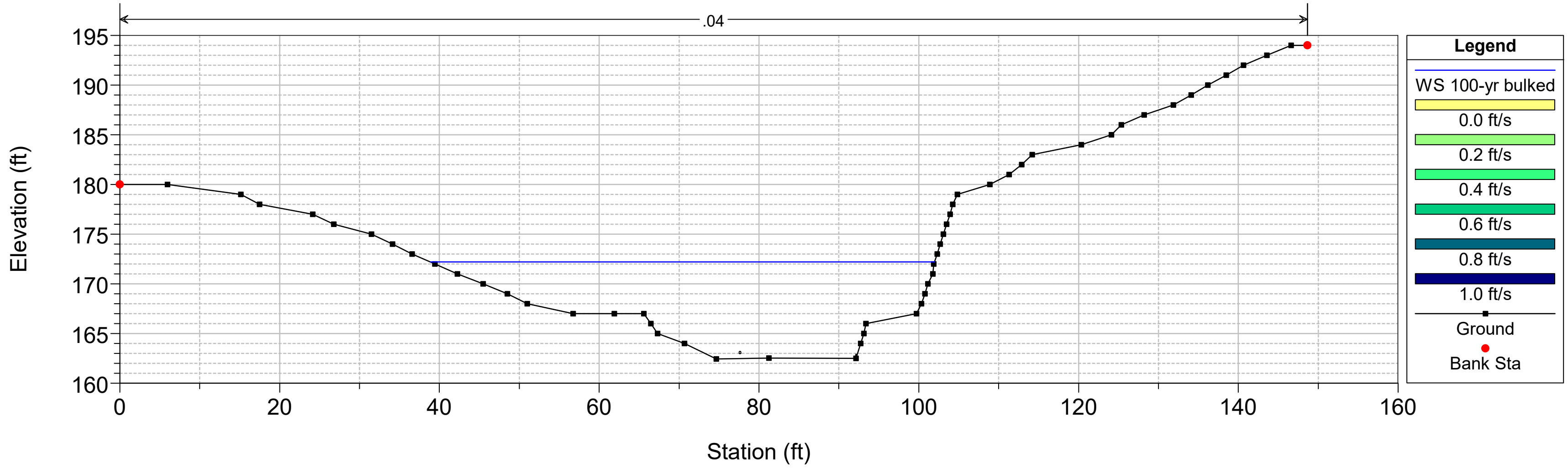


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4445

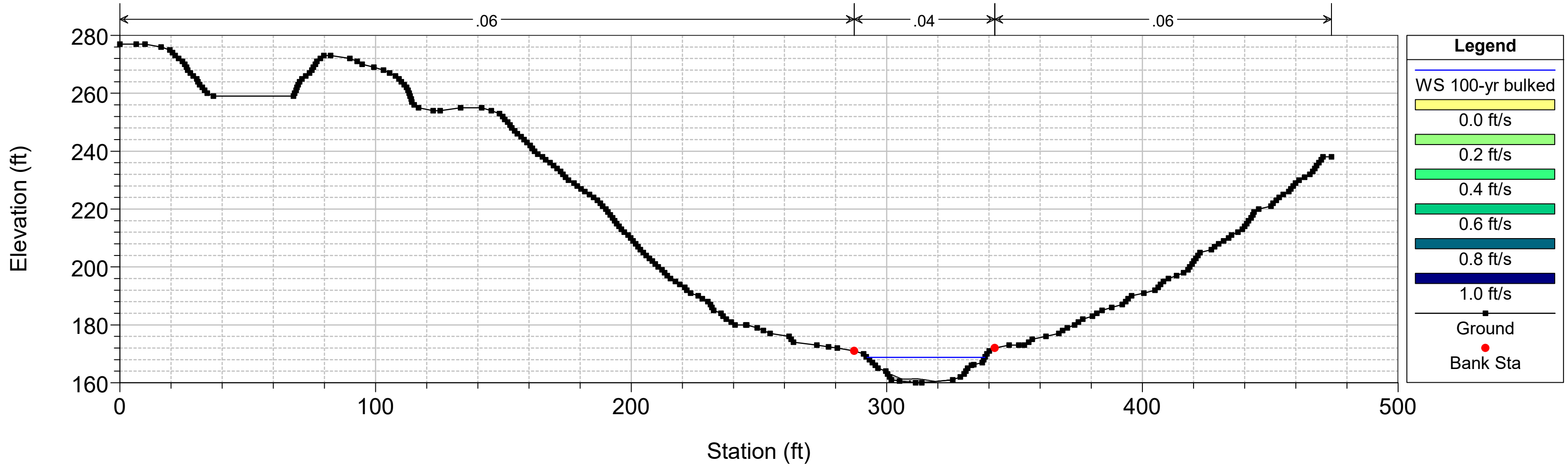


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4402

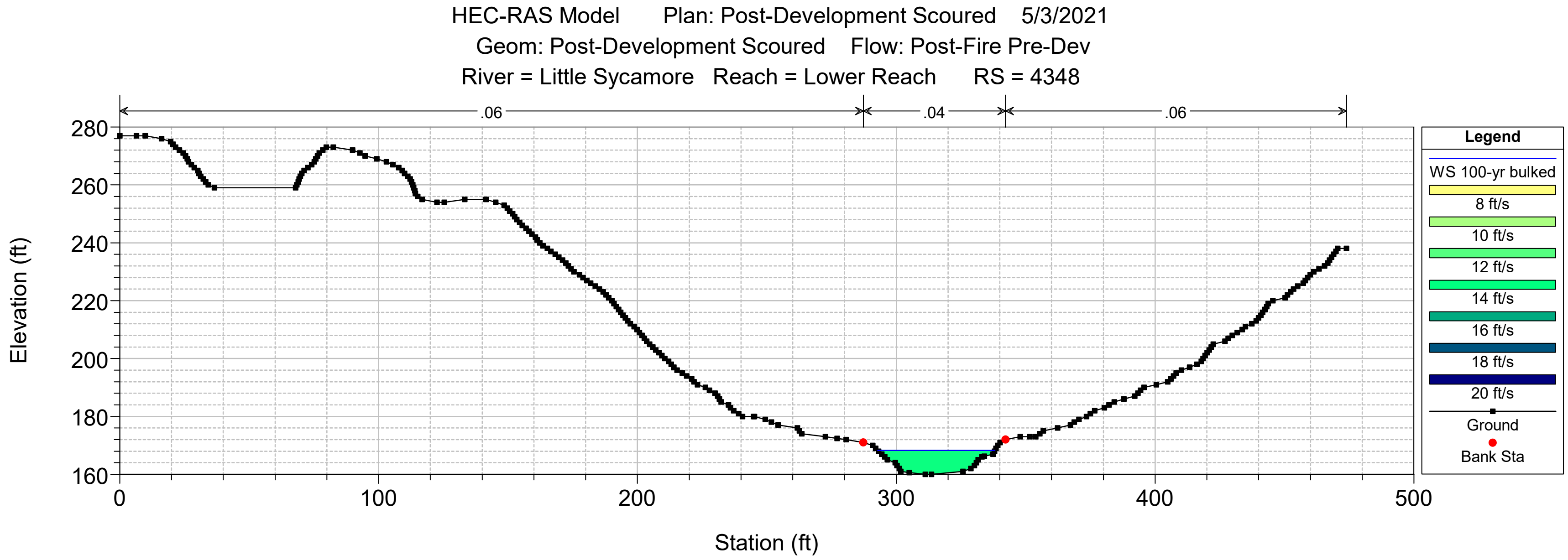


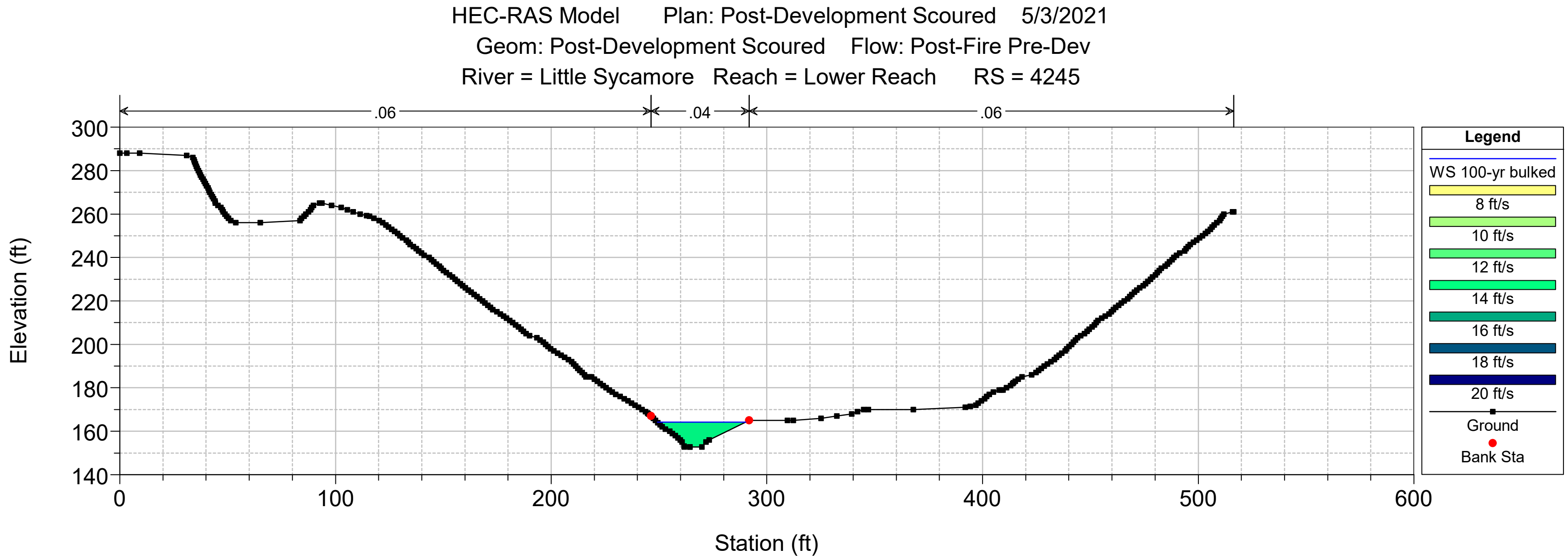


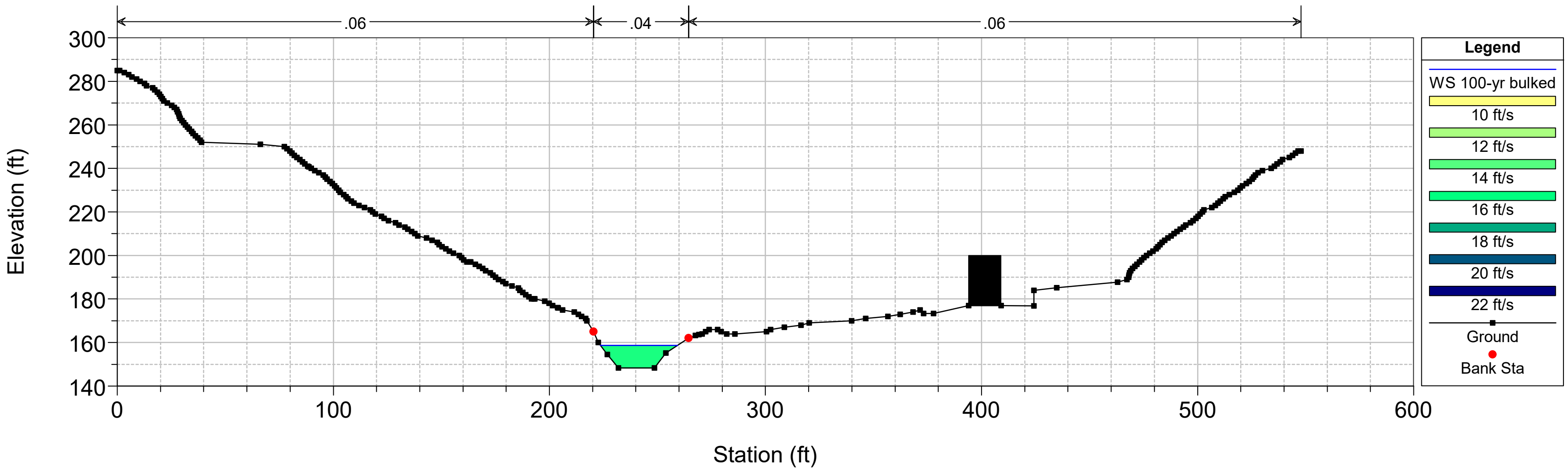
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4362 Culv Arizona Crossing 10-A-V



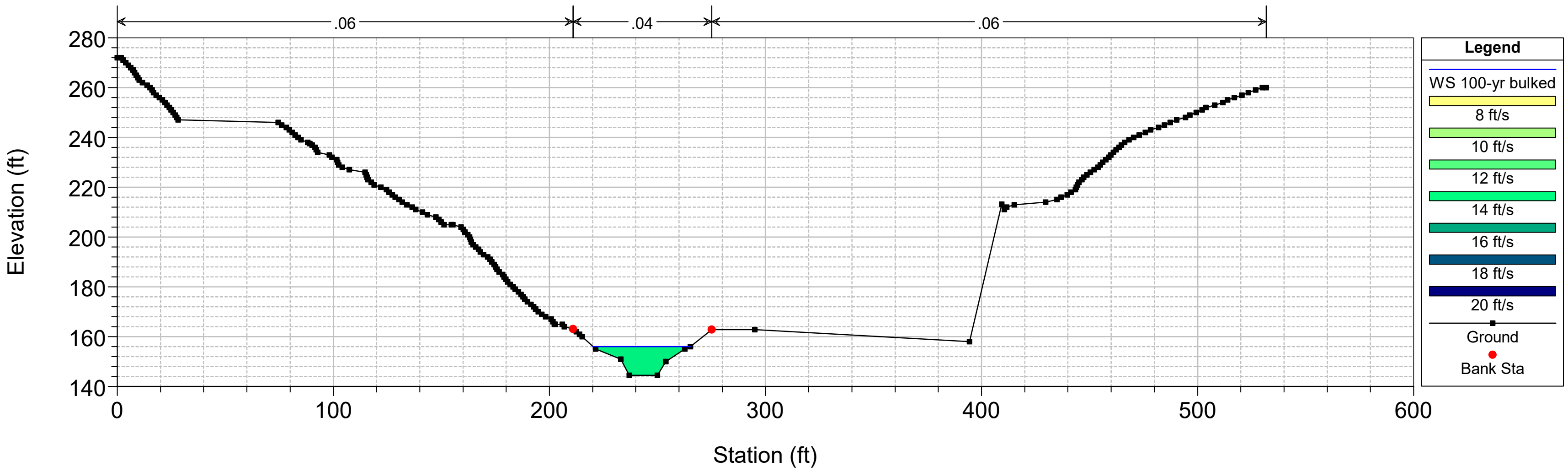
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4362 Culv Arizona Crossing 10-A-V


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4348
.06
.04
.06
Elevation (ft)
280
260
240
220
200
180
160
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta

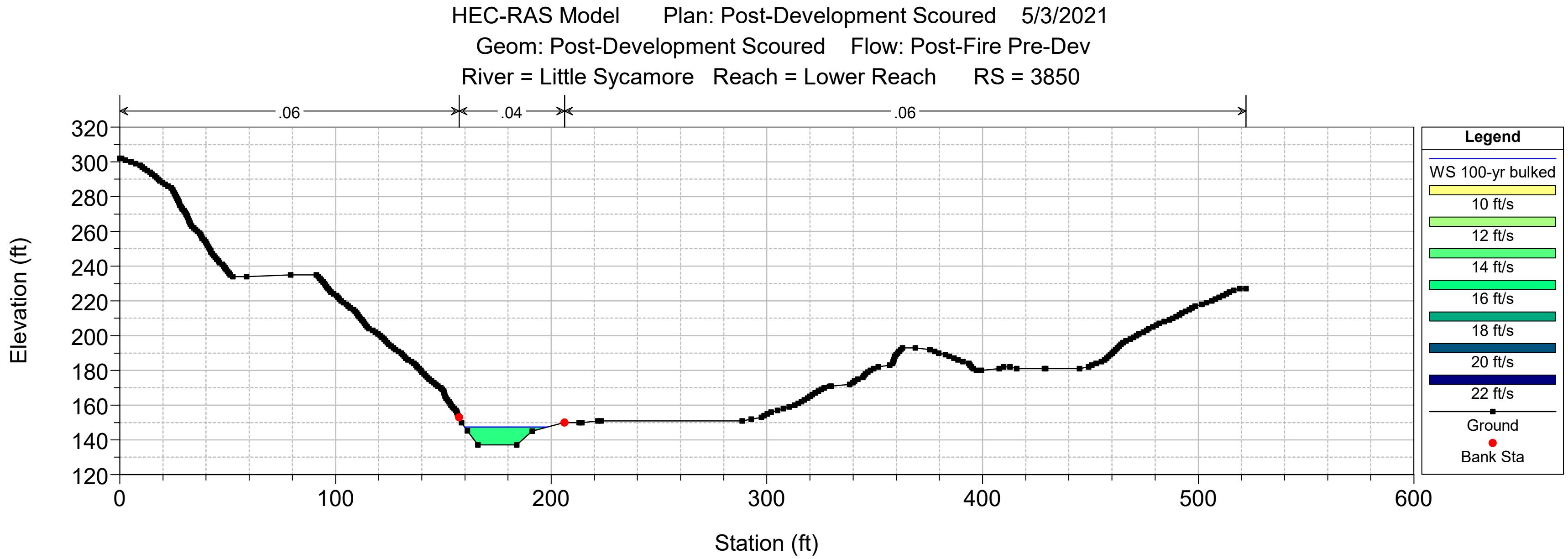

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4245
.06
.04
.06
Elevation (ft)
300
280
260
240
220
200
180
160
140
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta

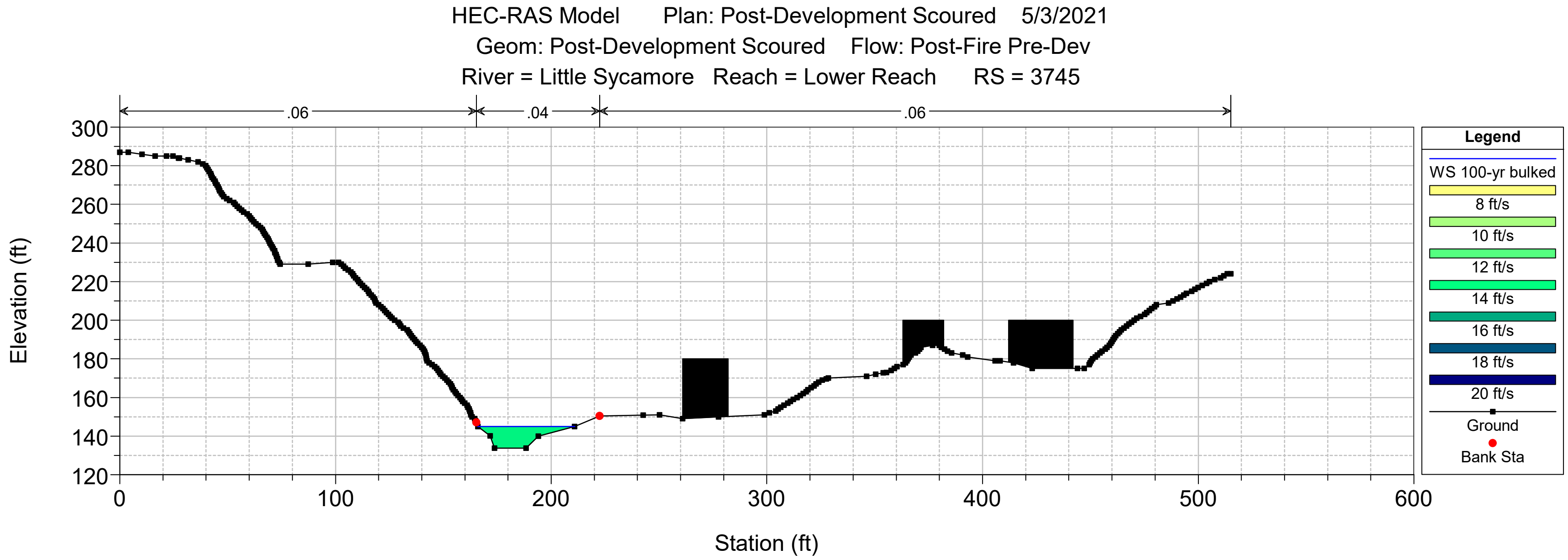


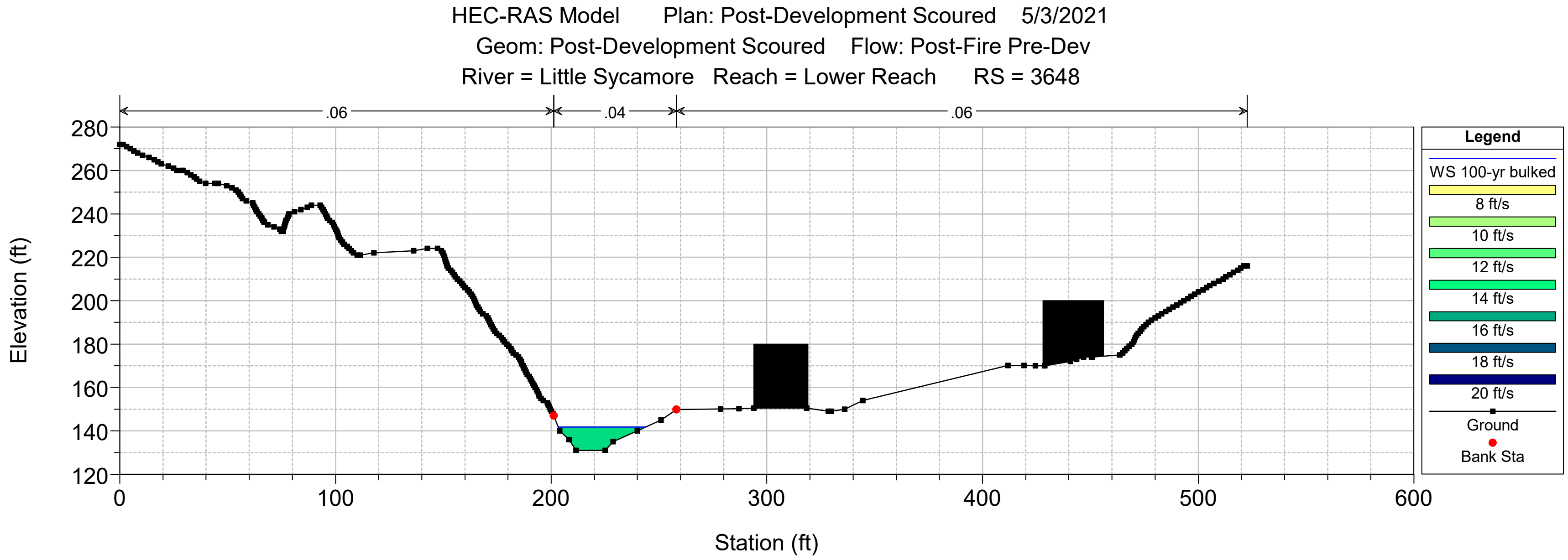
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4143

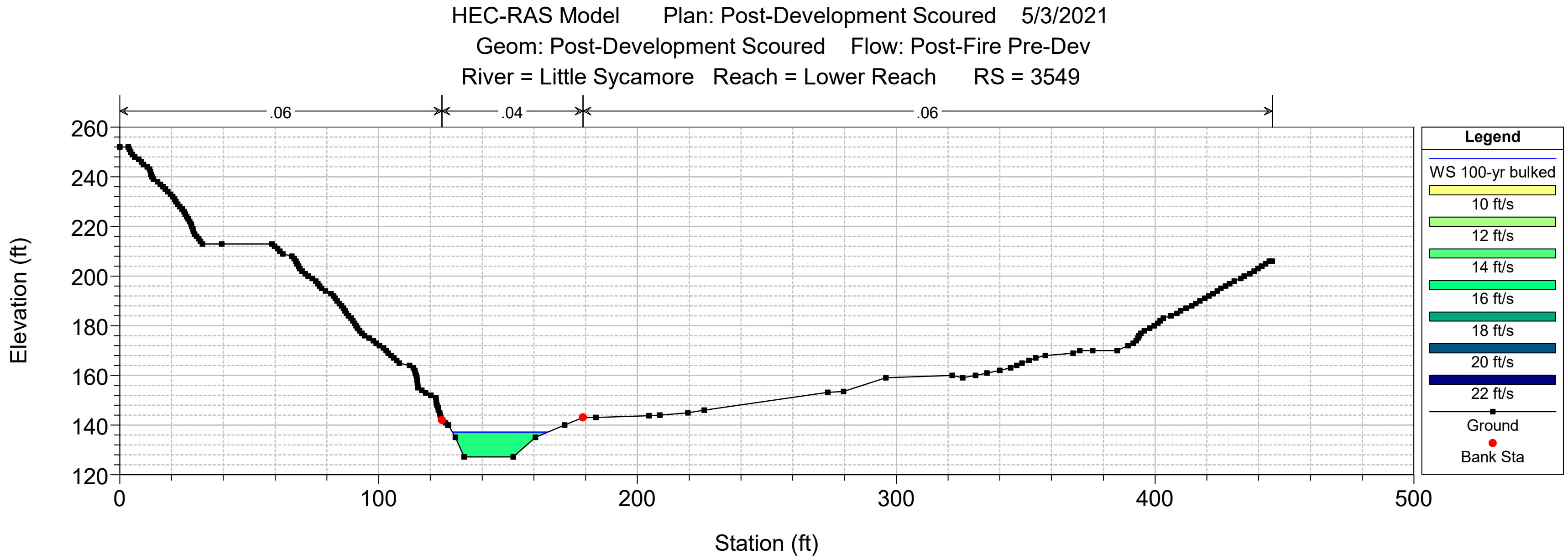


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4042

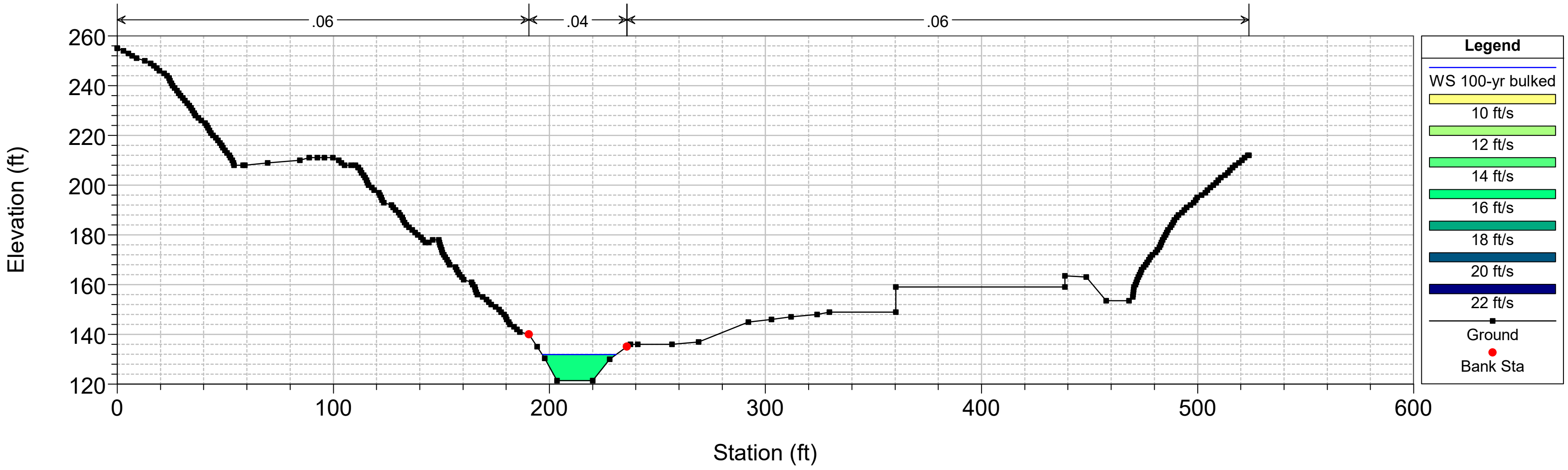

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3850
.06
.04
.06
Elevation (ft)
320
300
280
260
240
220
200
180
160
140
120
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3745
.06
.04
.06
Elevation (ft)
300
280
260
240
220
200
180
160
140
120
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta

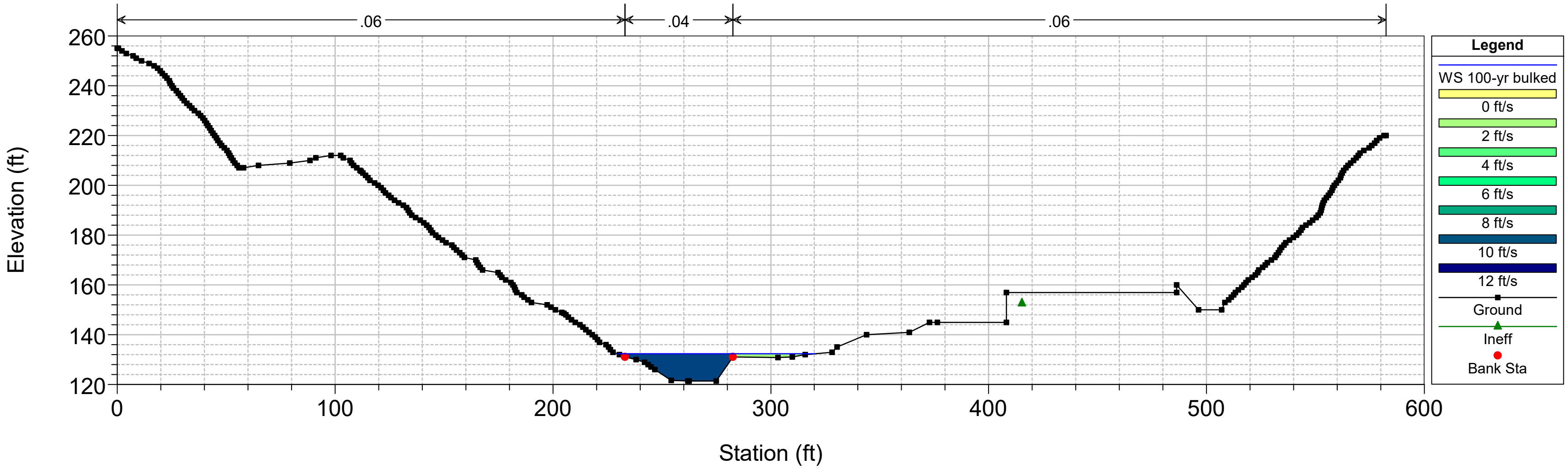

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3648
.06
.04
.06
Elevation (ft)
280
260
240
220
200
180
160
140
120
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta

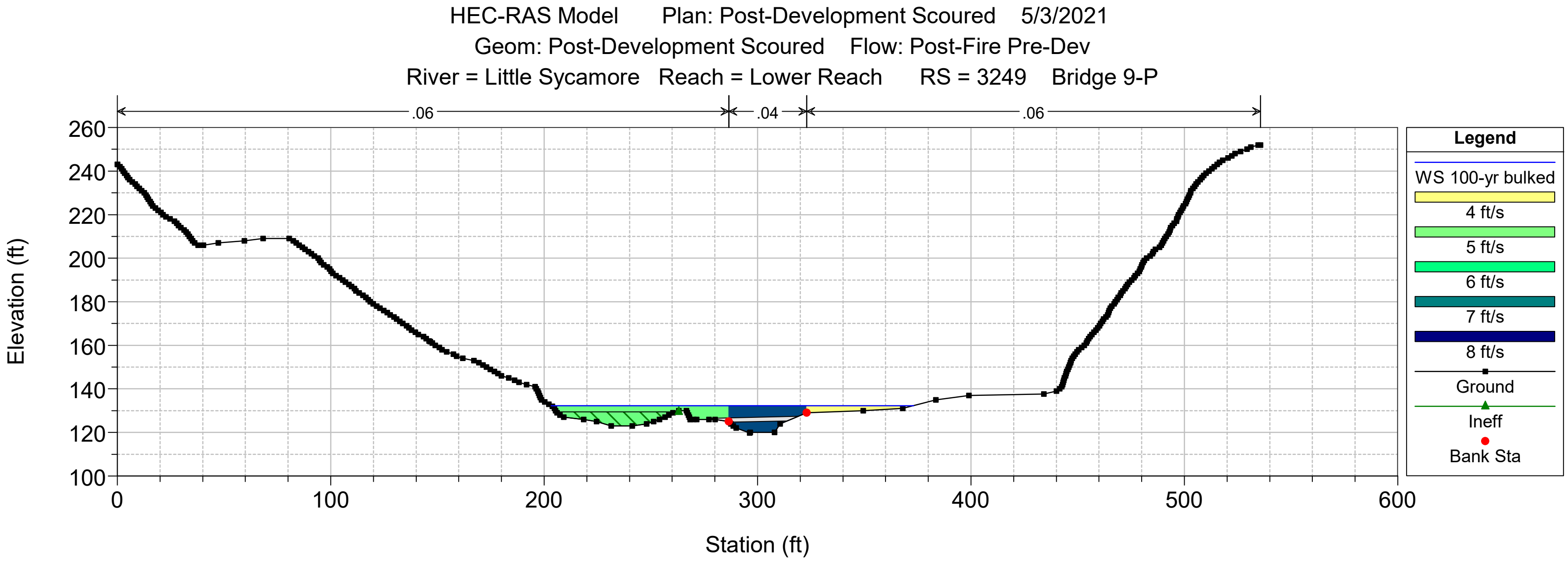

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3549
.06
.04
.06
Elevation (ft)
260
240
220
200
180
160
140
120
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
Ground
Bank Sta

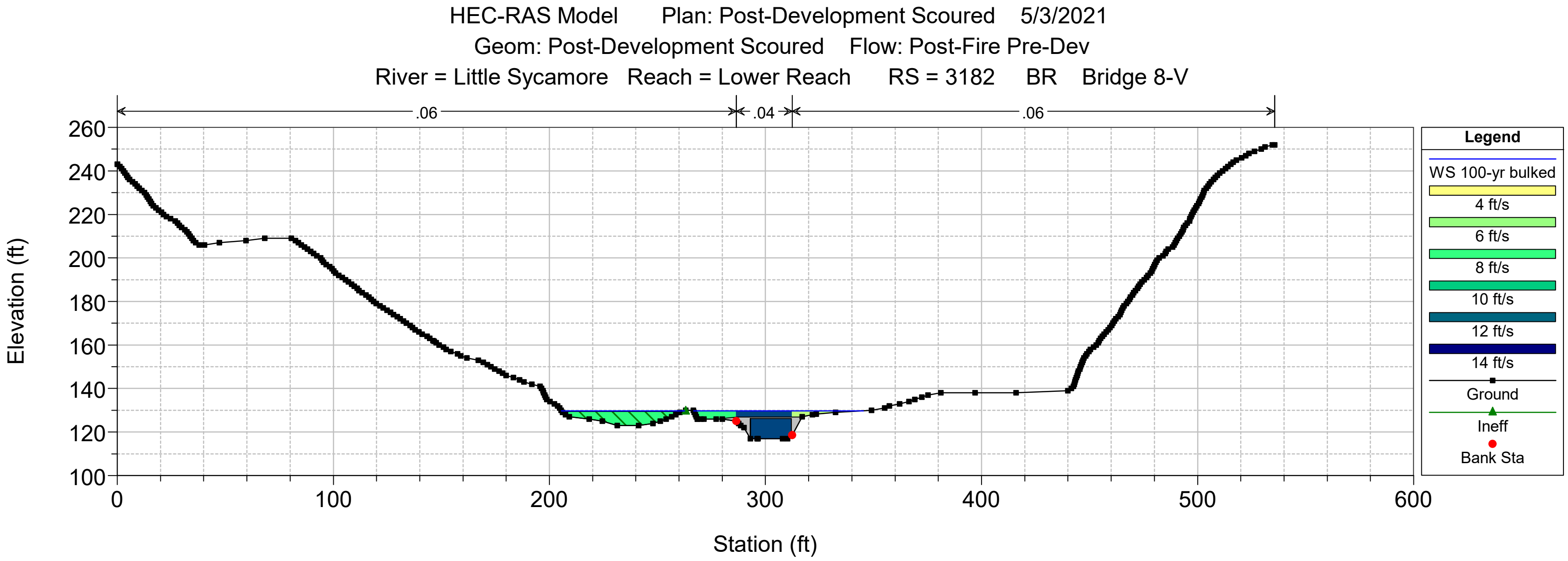
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3444

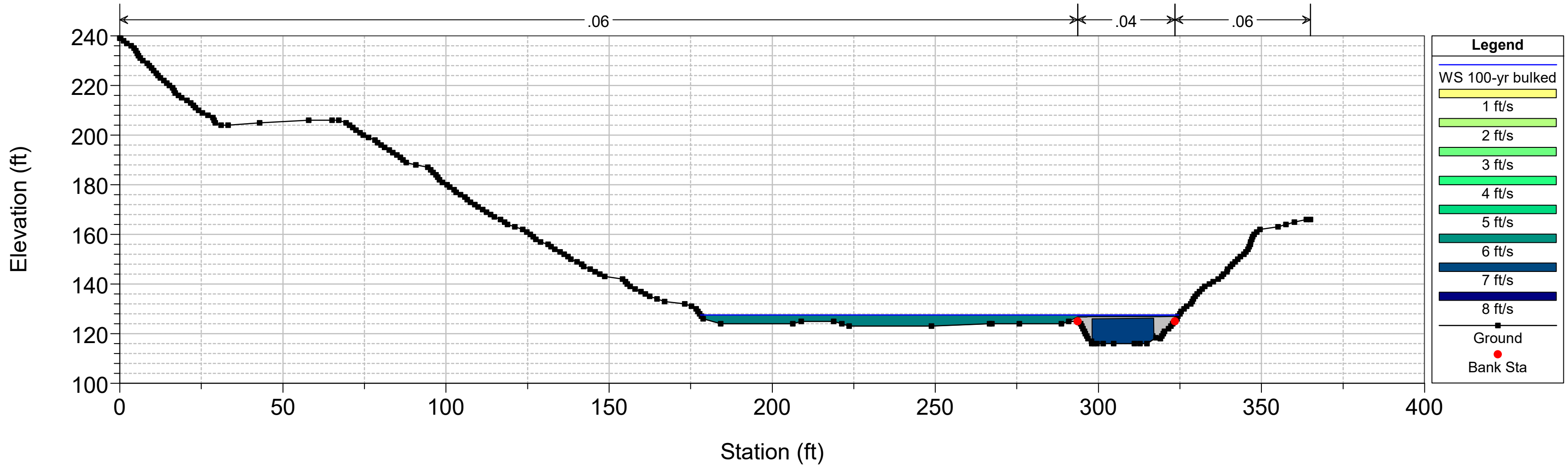


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3350

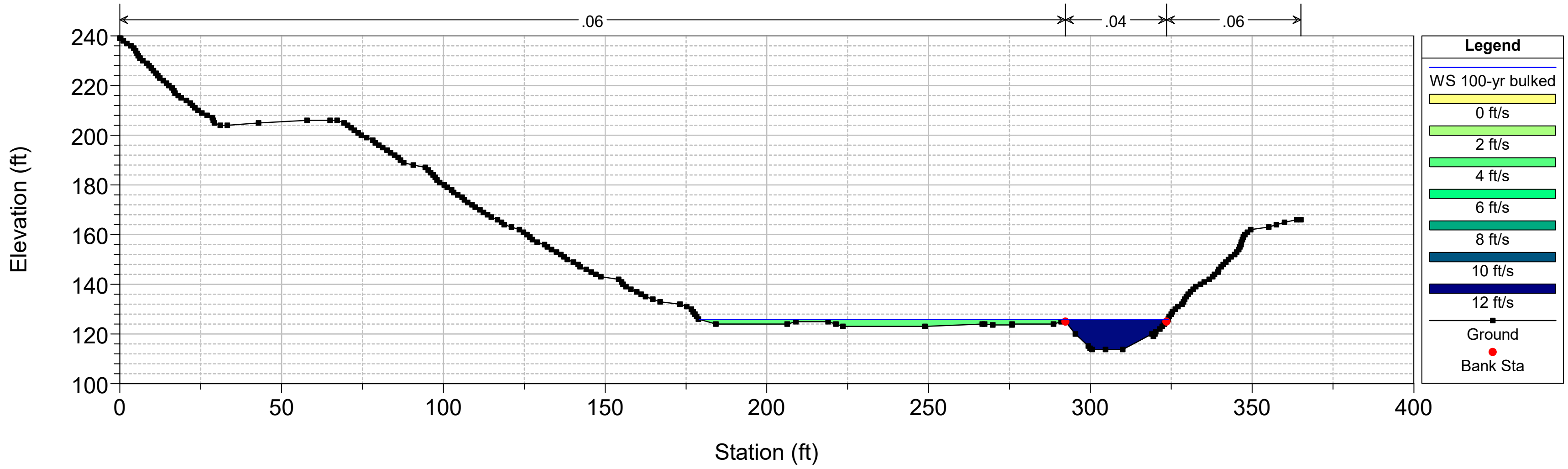



HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3249 Bridge 9-P


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3182 BR Bridge 8-V

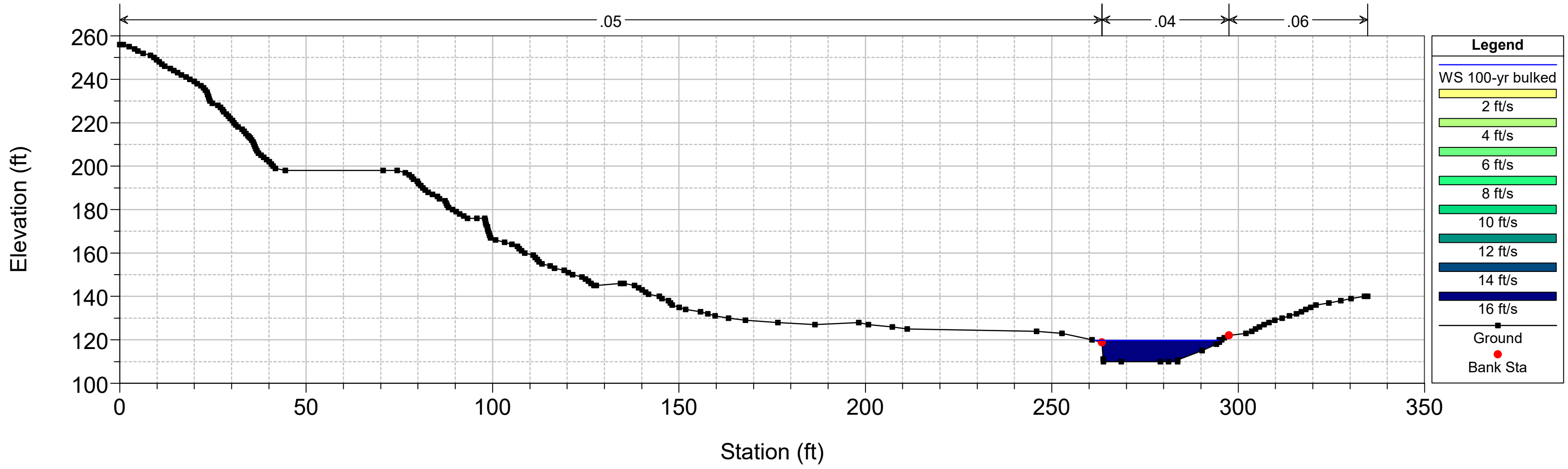


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3182 BR Bridge 8-V

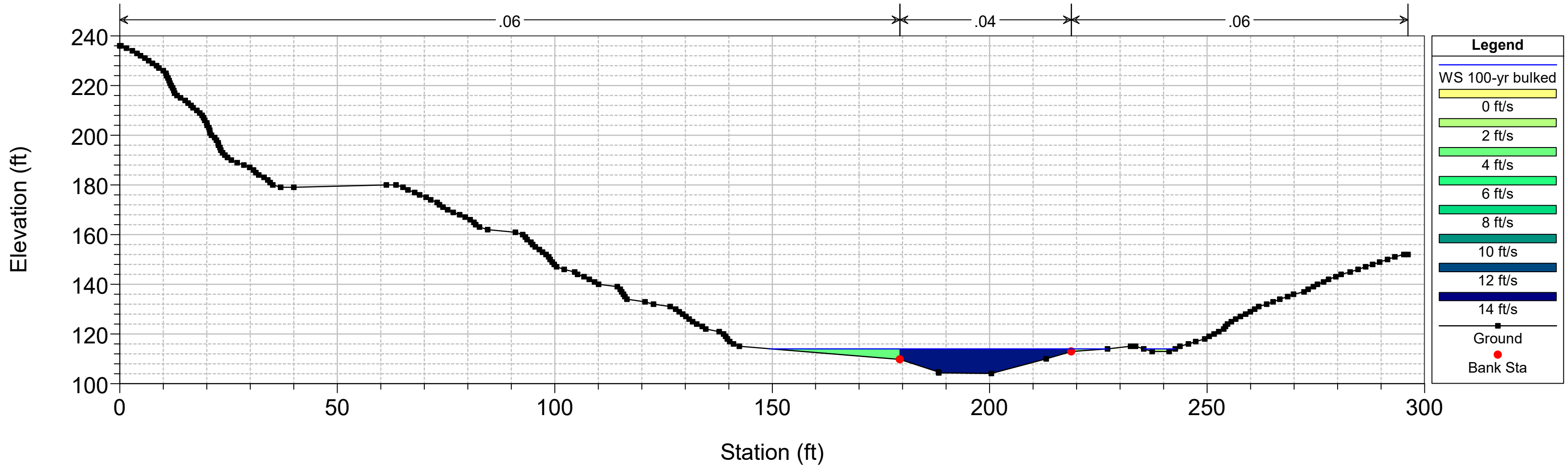


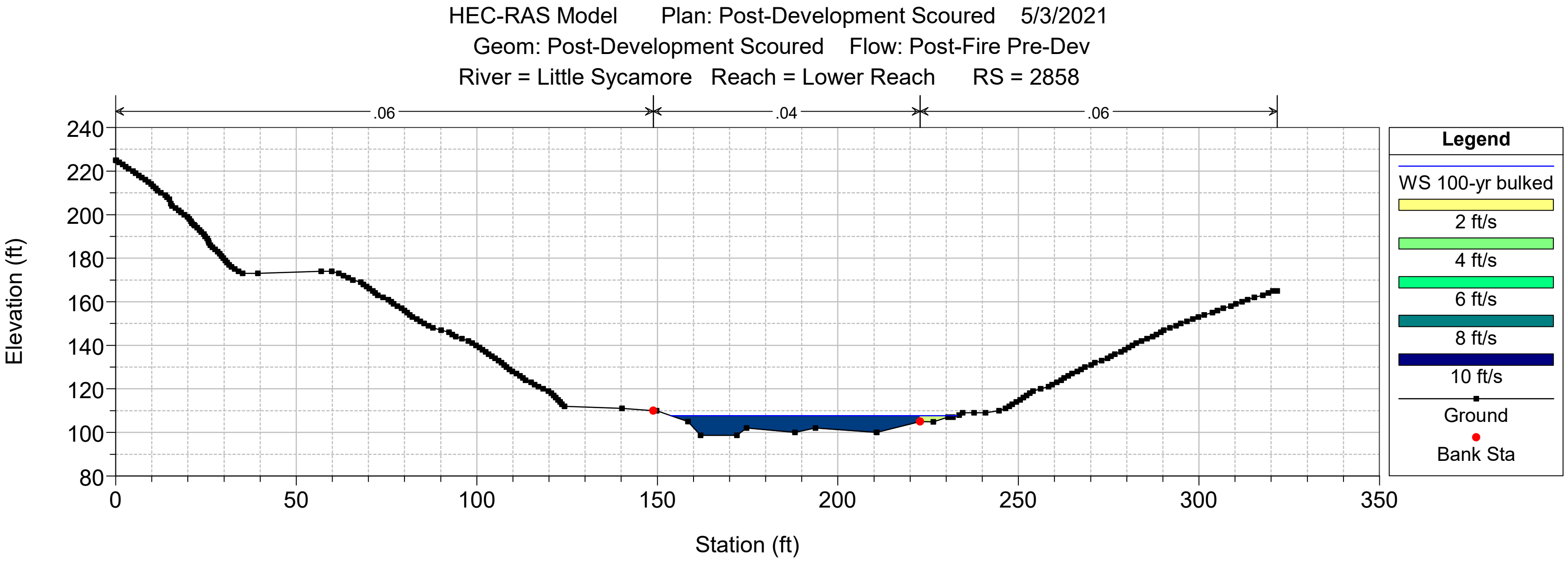
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3136

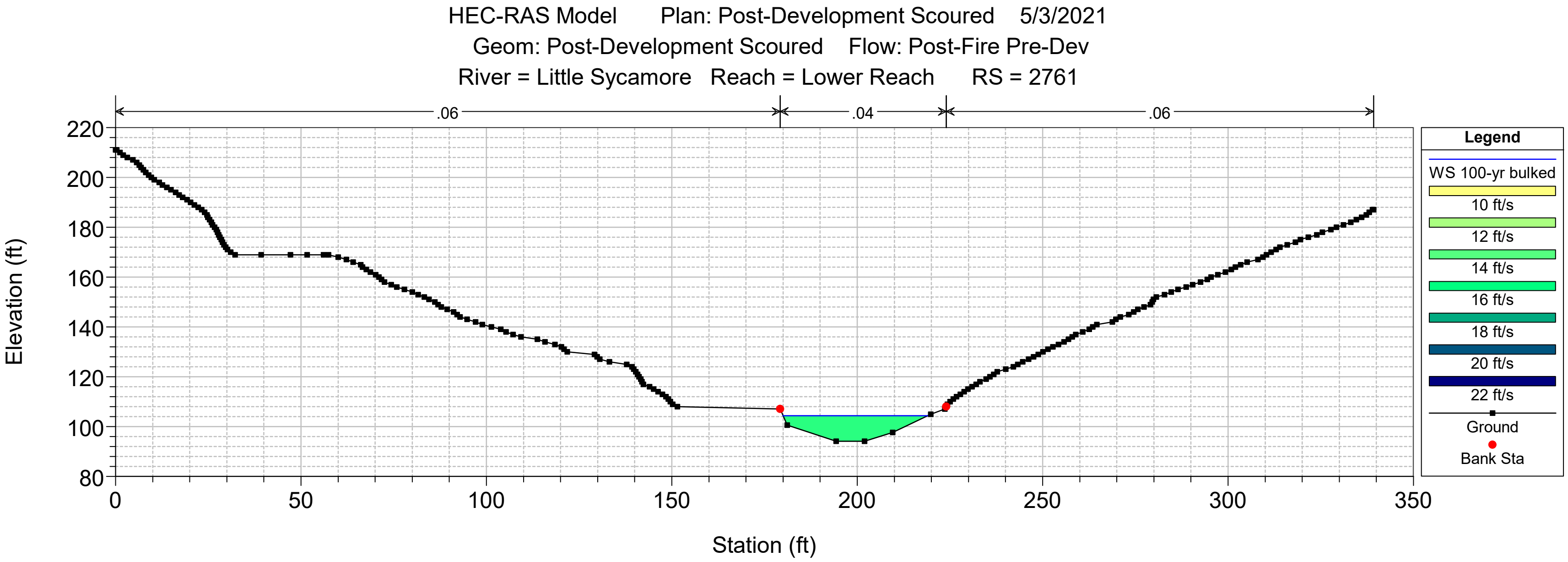
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3051



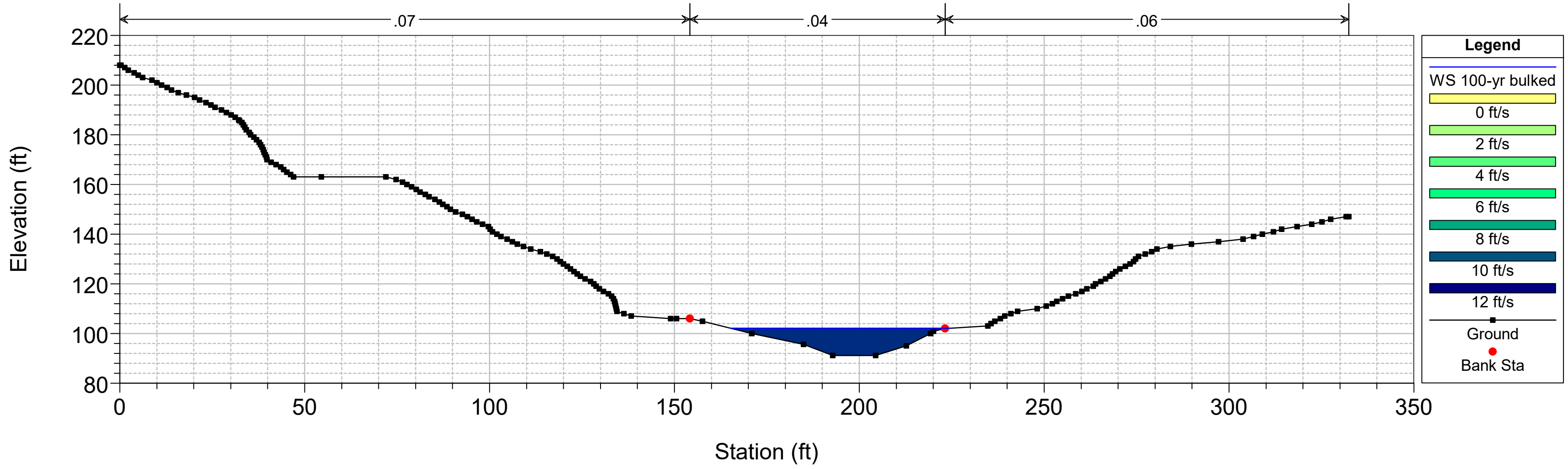
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2960



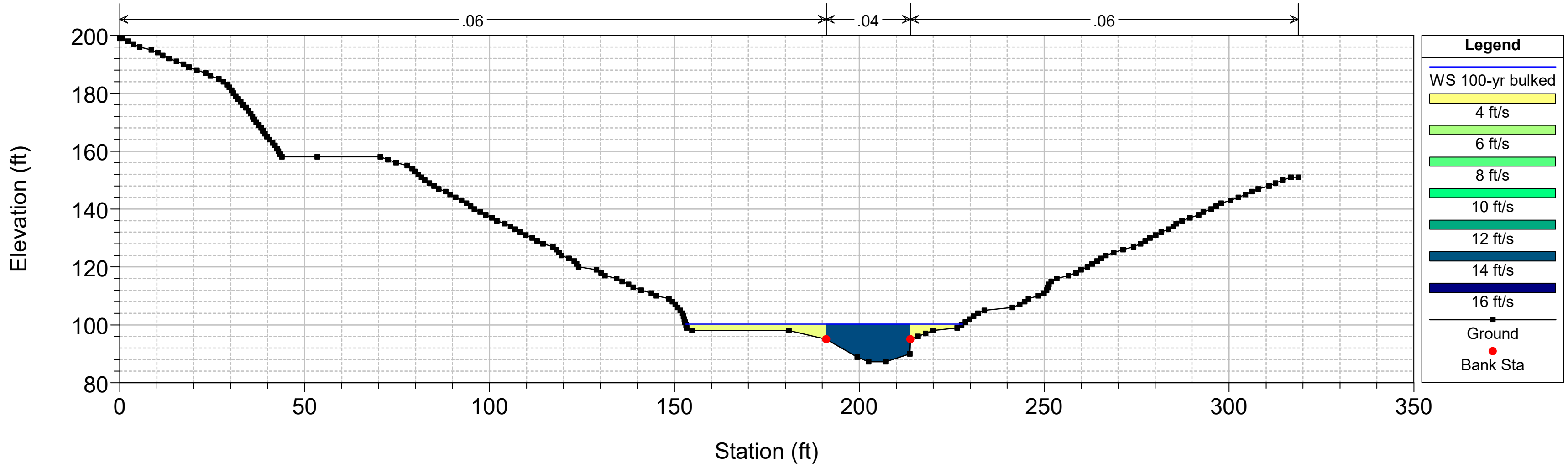

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2858

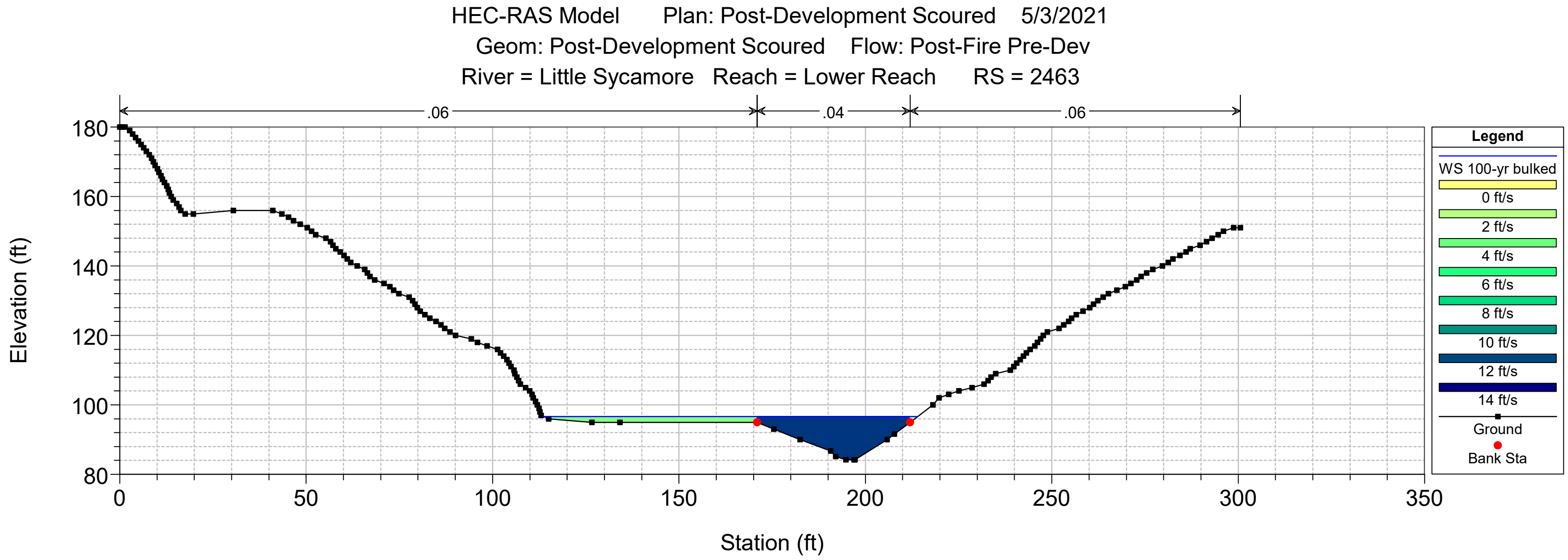

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2761

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2659

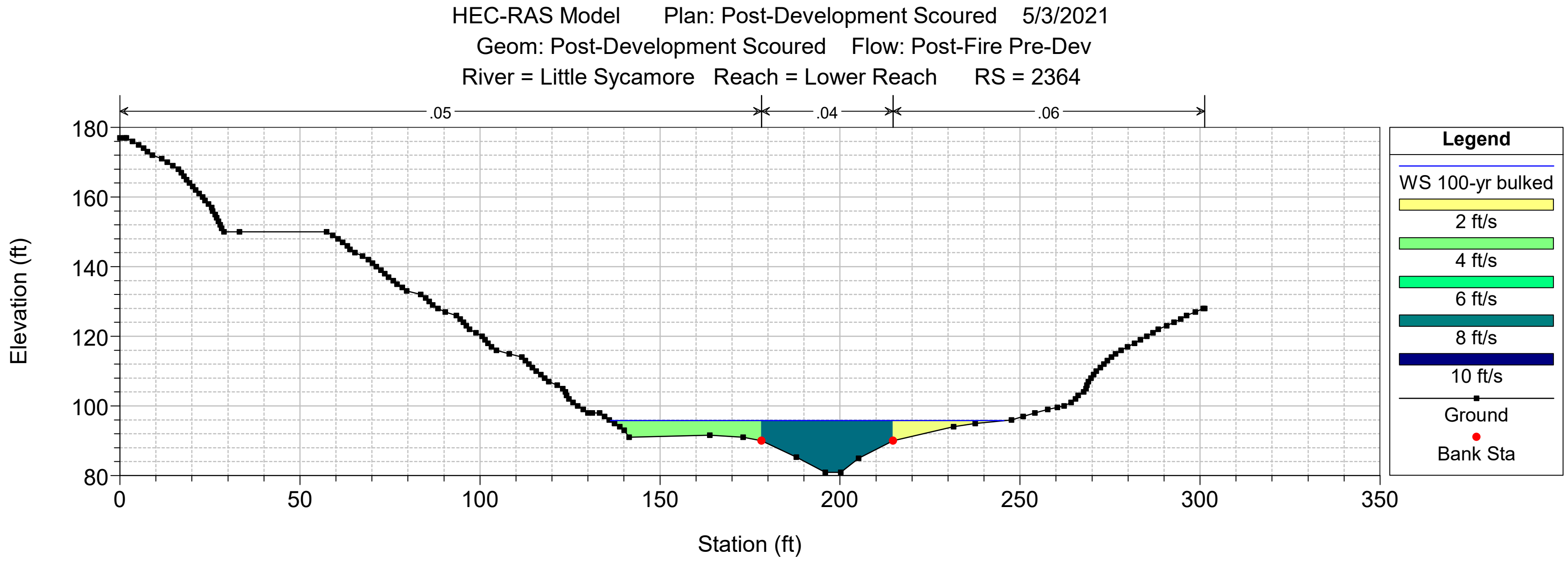


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2556

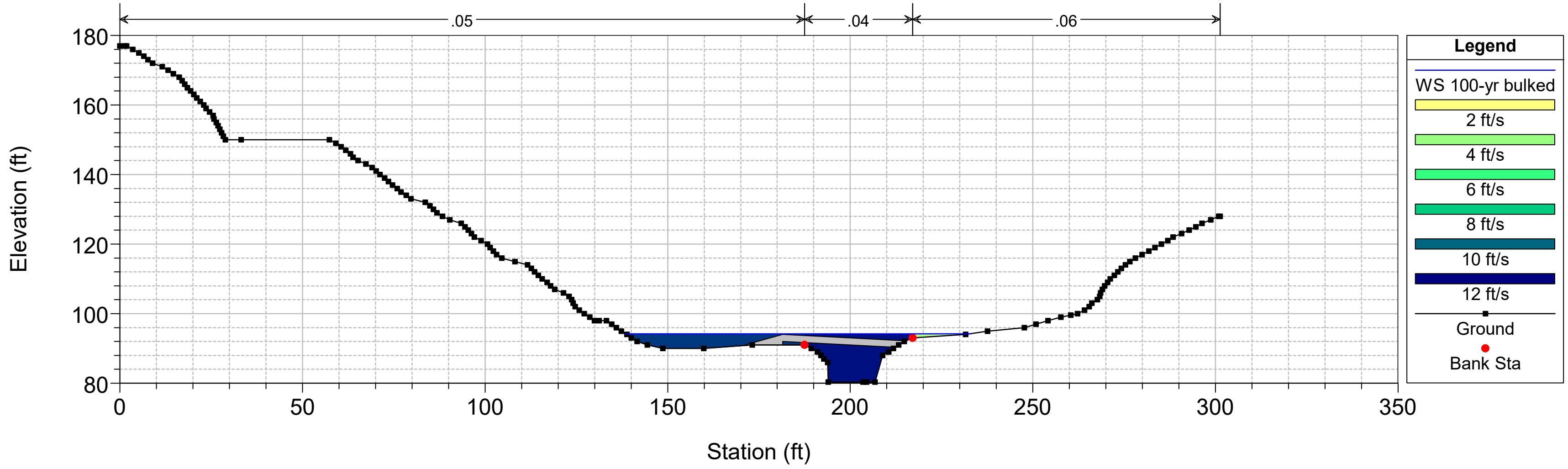




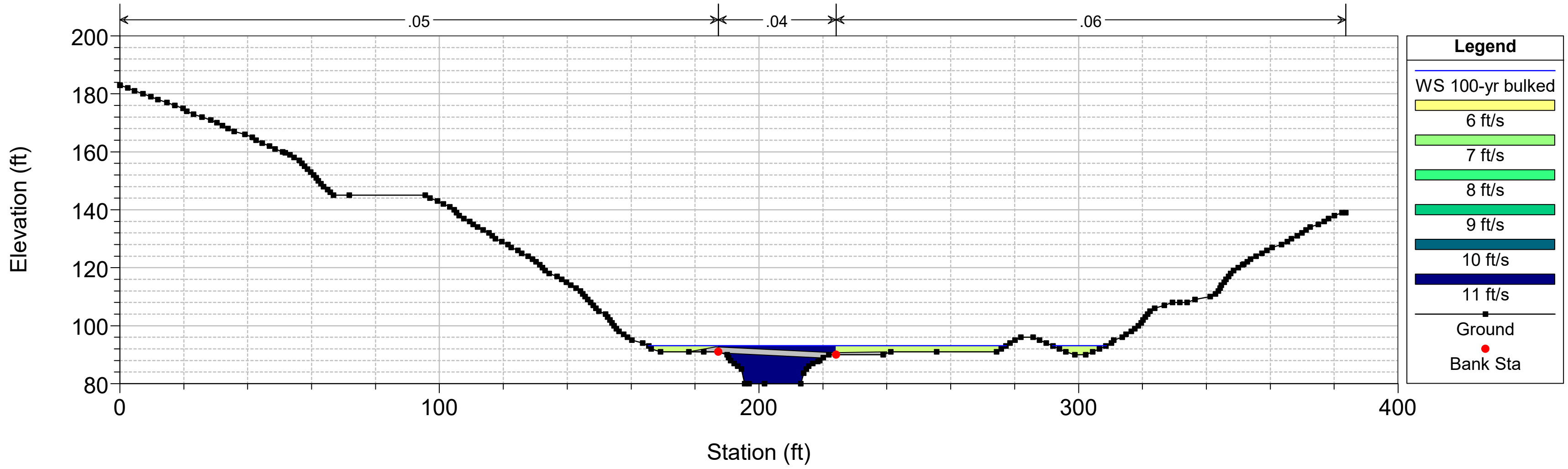
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2463



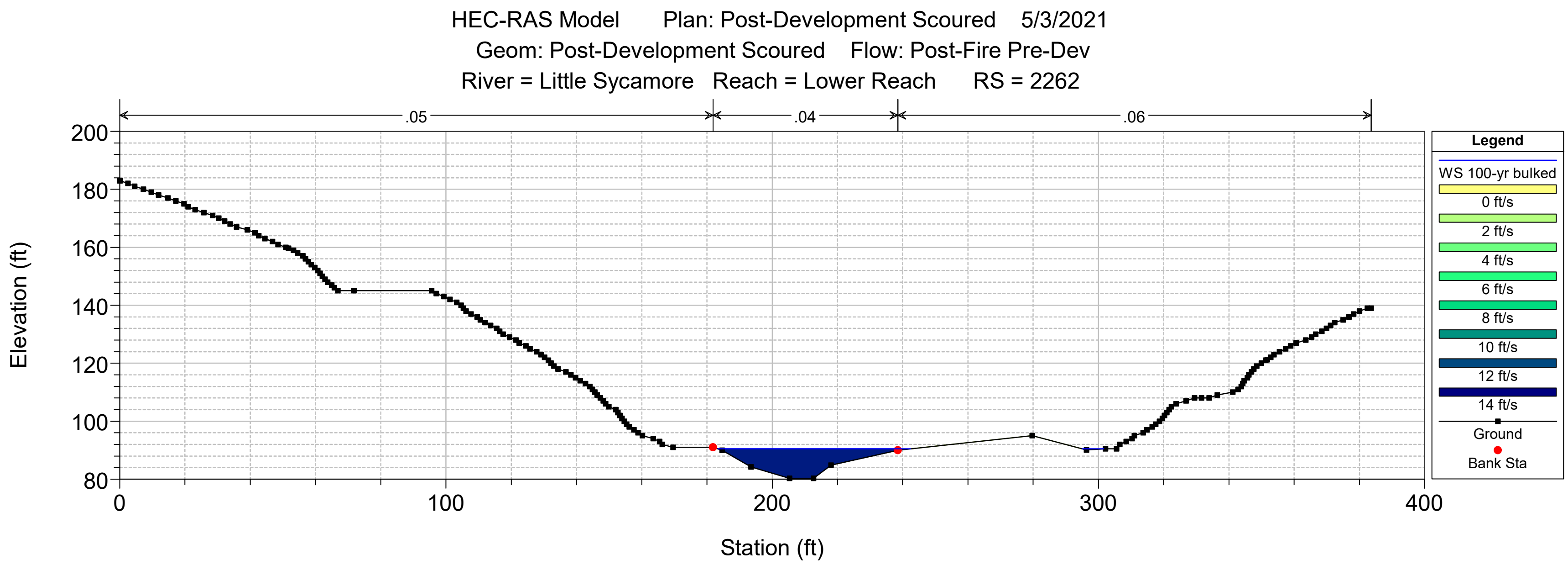
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2364

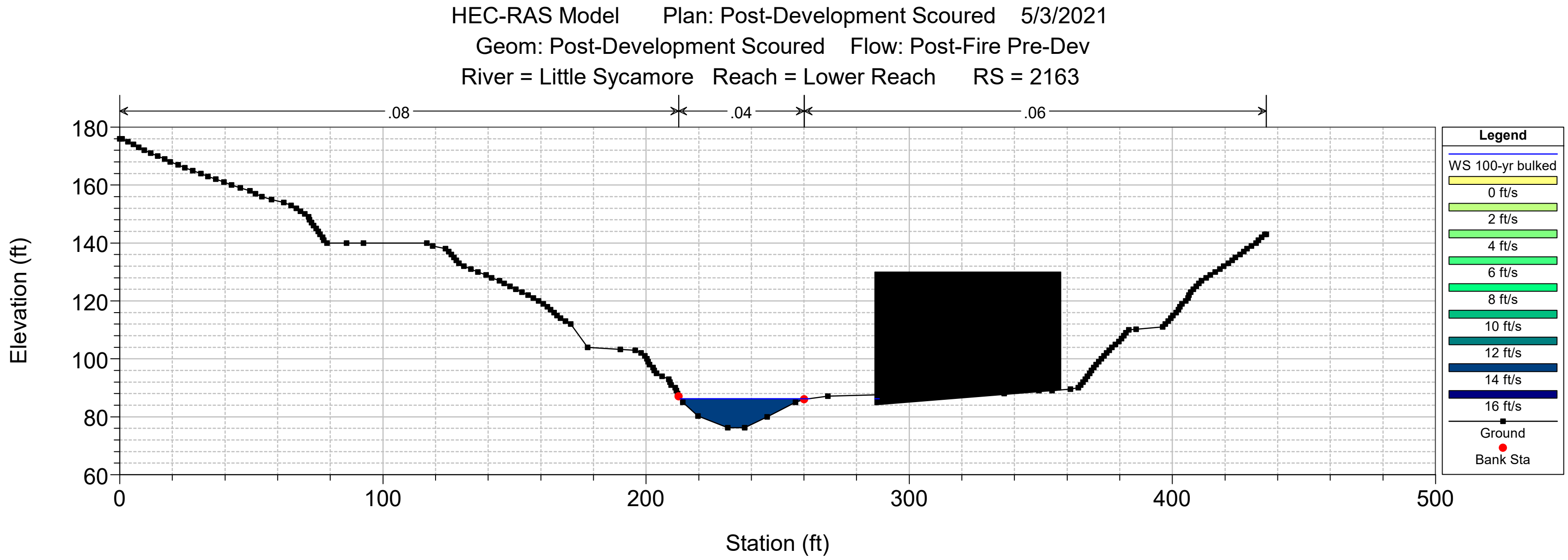


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2297 BR Bridge 6-V

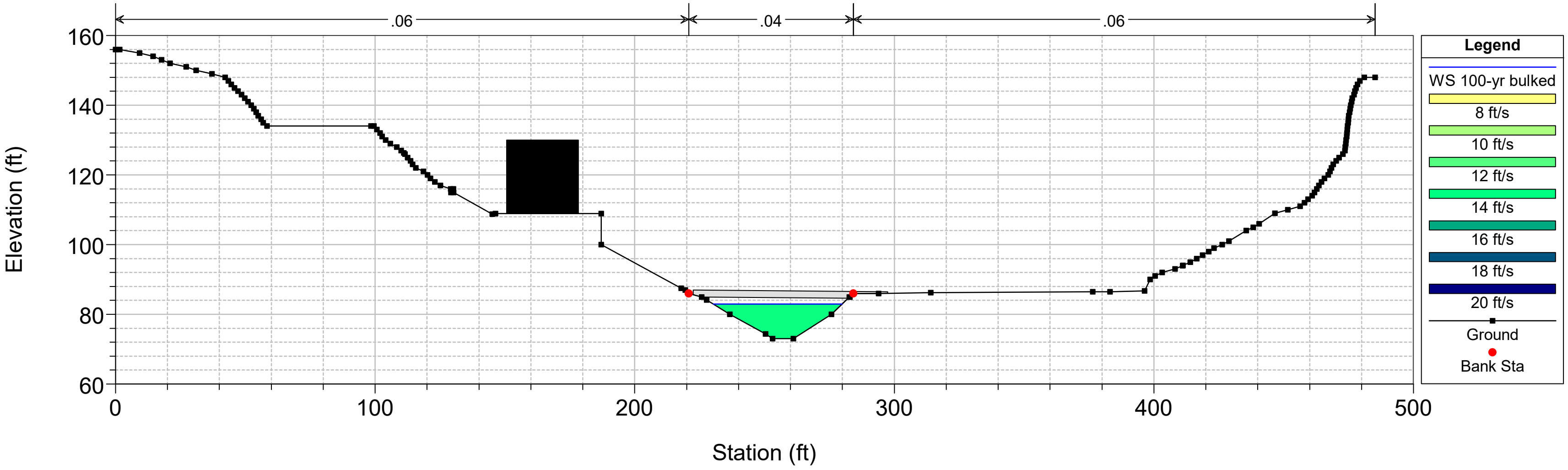


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2297 BR Bridge 6-V

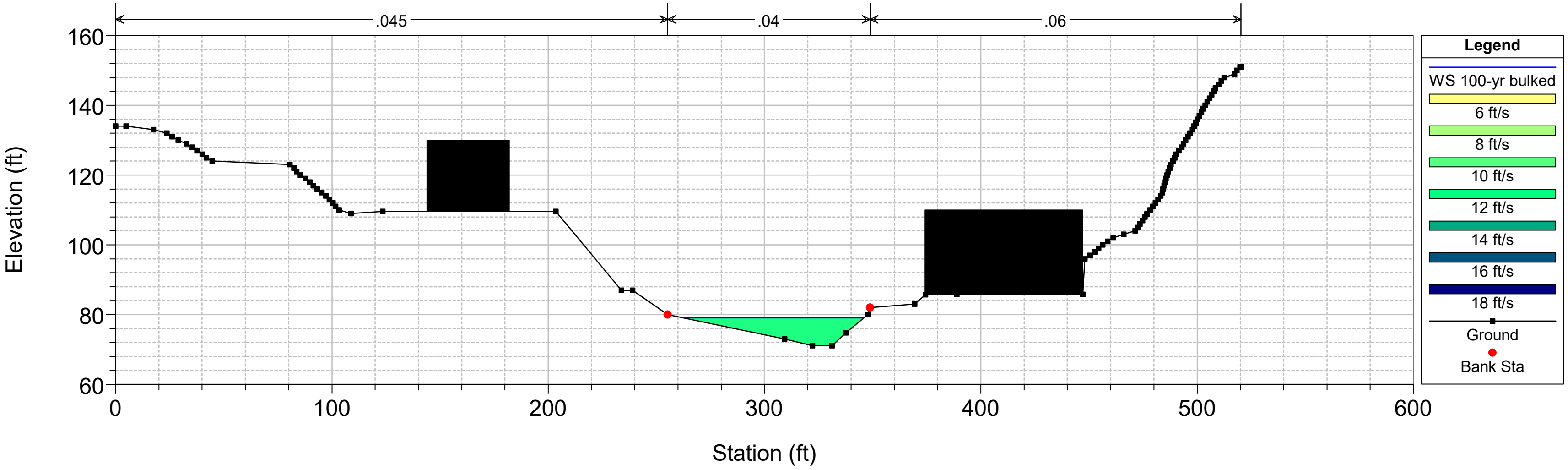

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2262

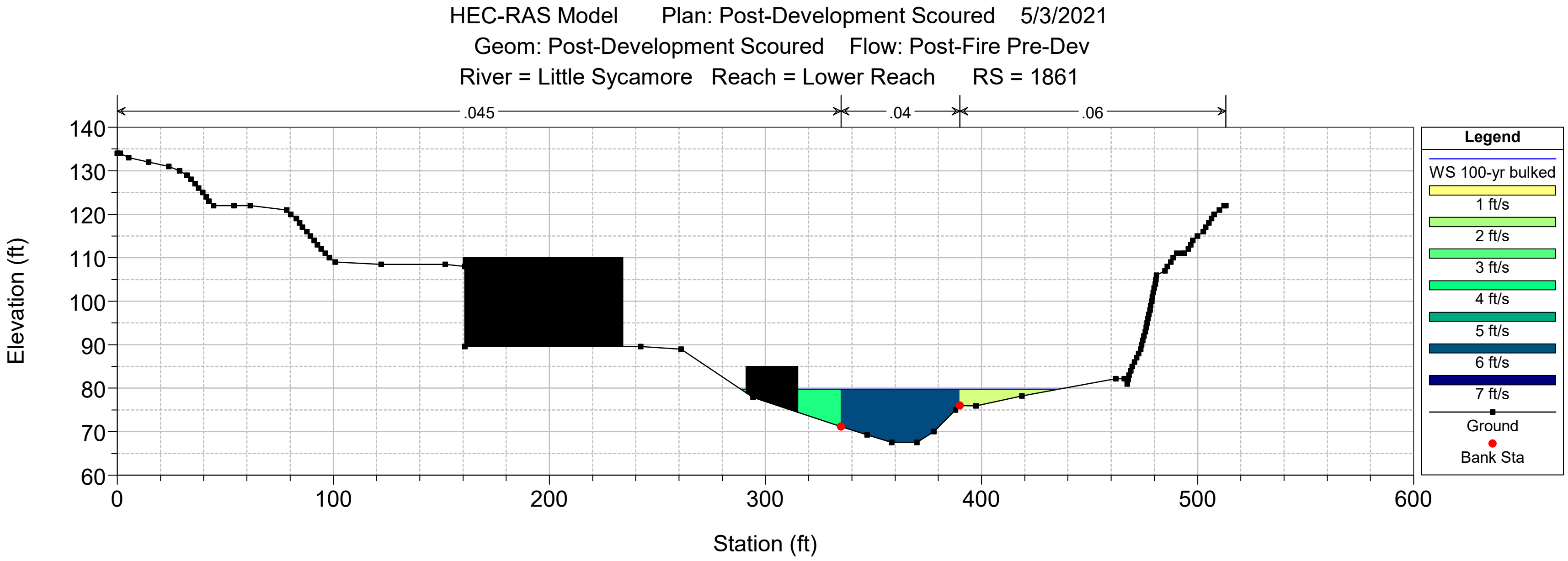

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2163

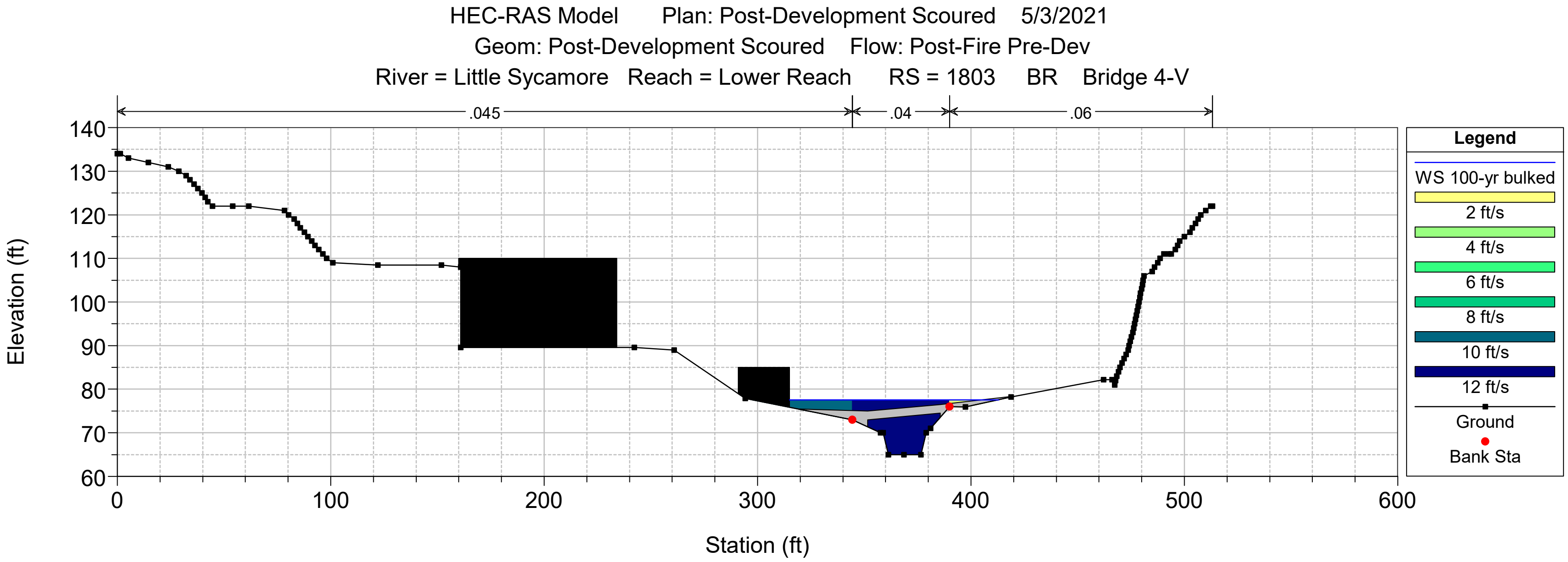
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2058 Bridge 5P



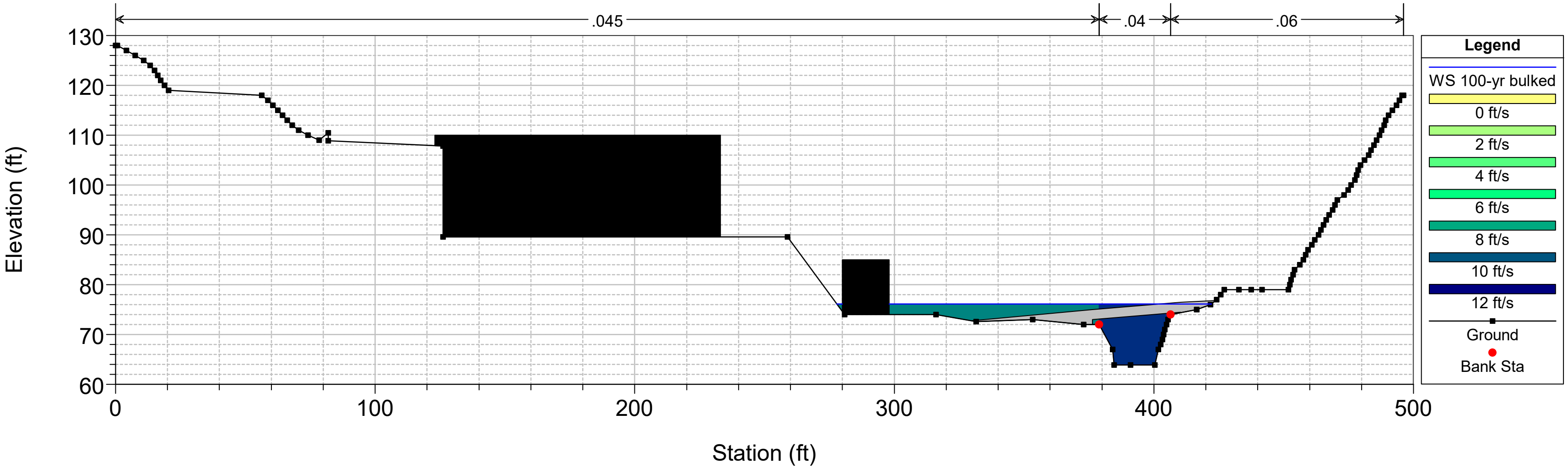
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1962



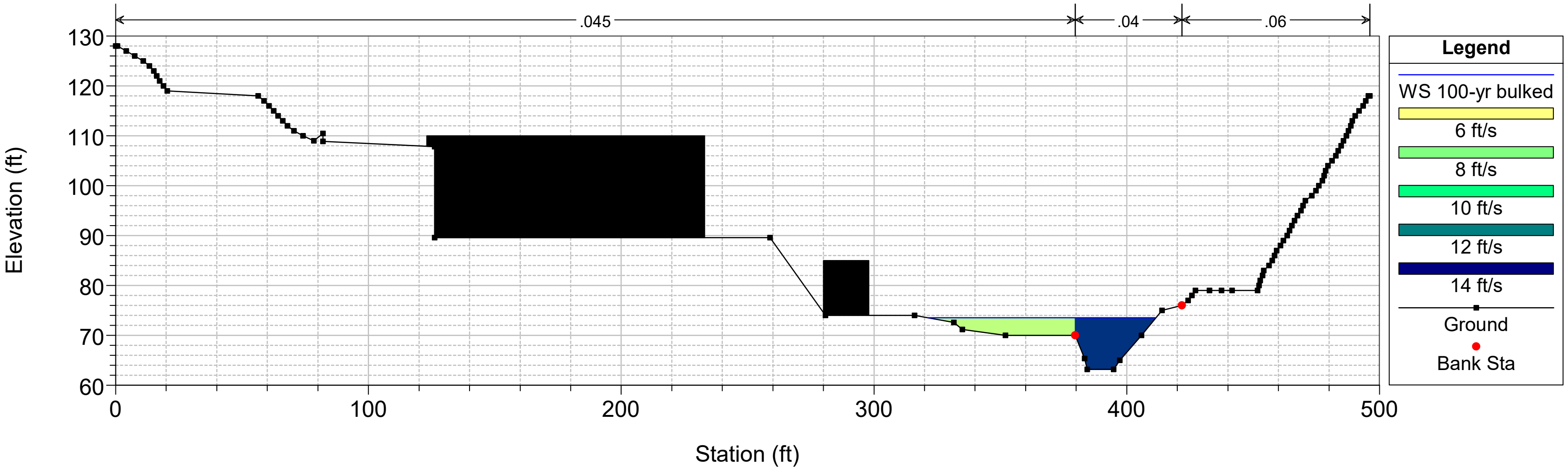

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1861
.045
.04
.06
Elevation (ft)
140
130
120
110
100
90
80
70
60
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
7 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1803 BR Bridge 4-V
.045
.04
.06
Elevation (ft)
140
130
120
110
100
90
80
70
60
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

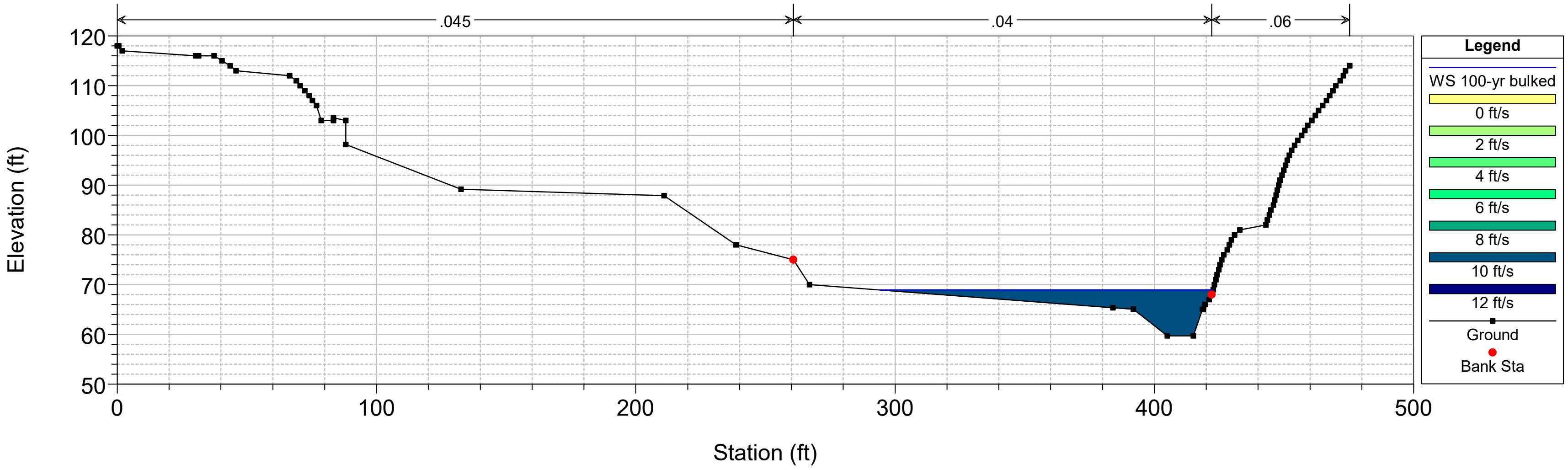
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1803 BR Bridge 4-V



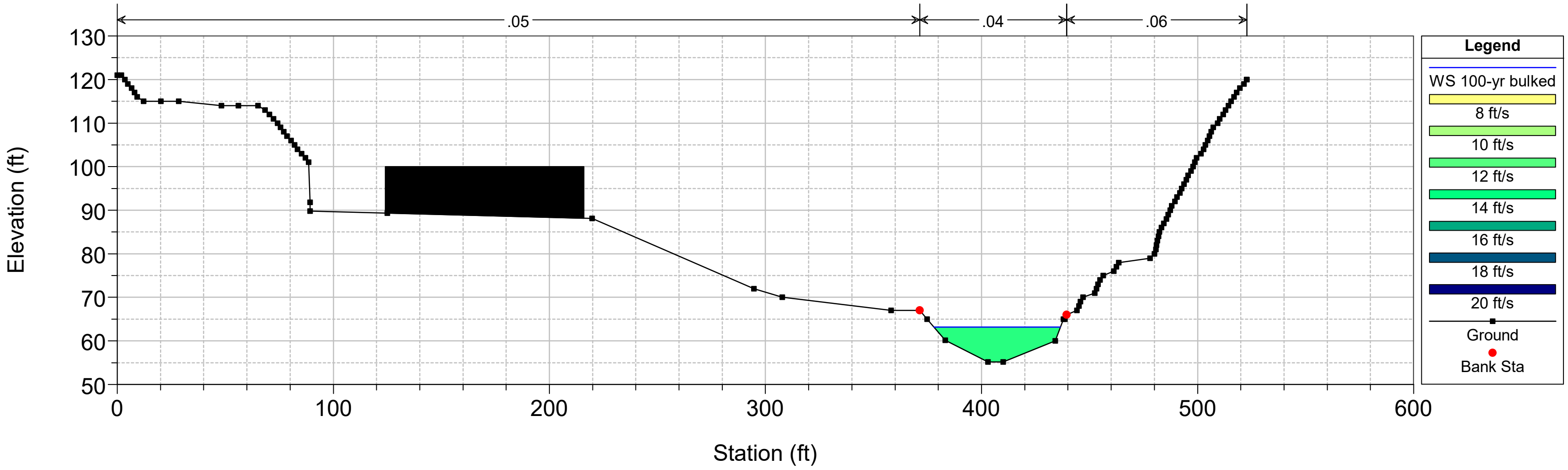
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1762



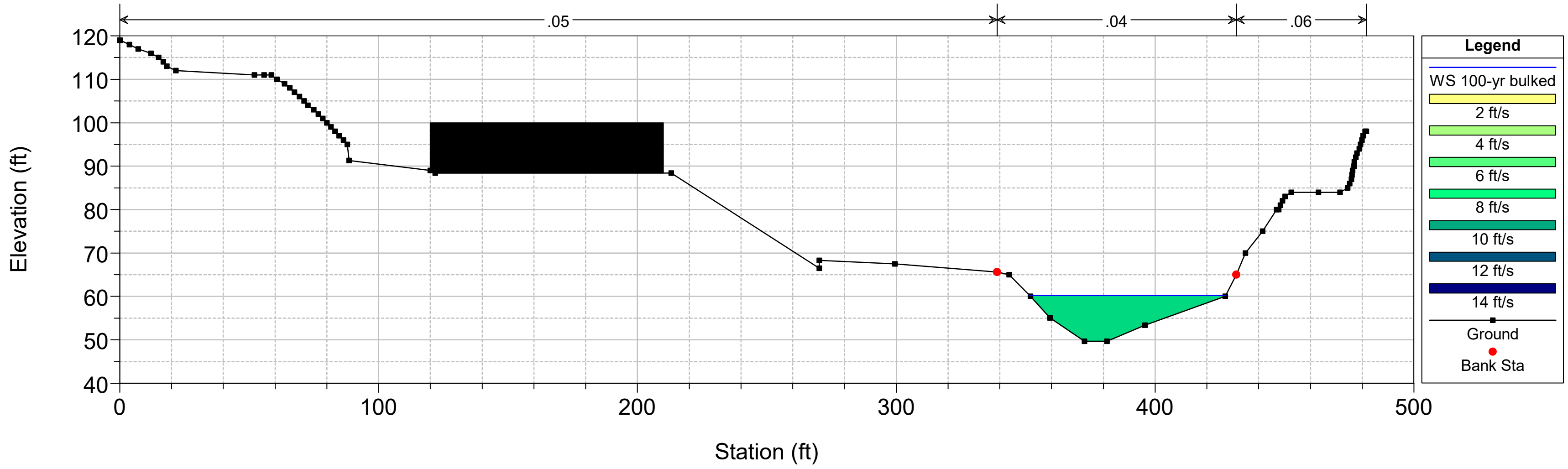
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1668



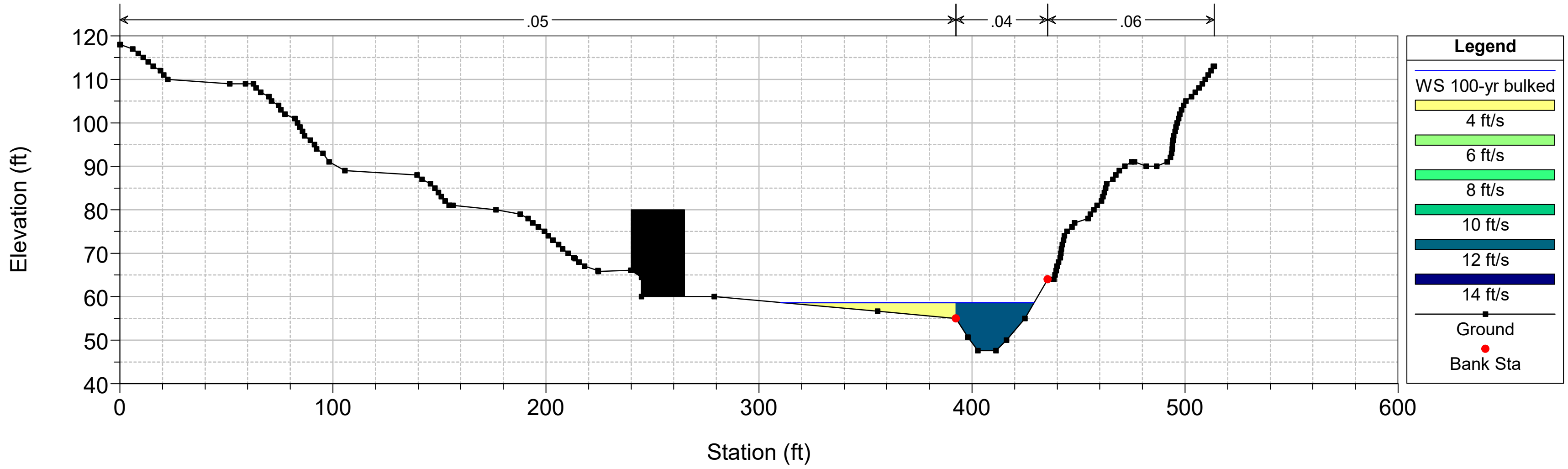
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1542



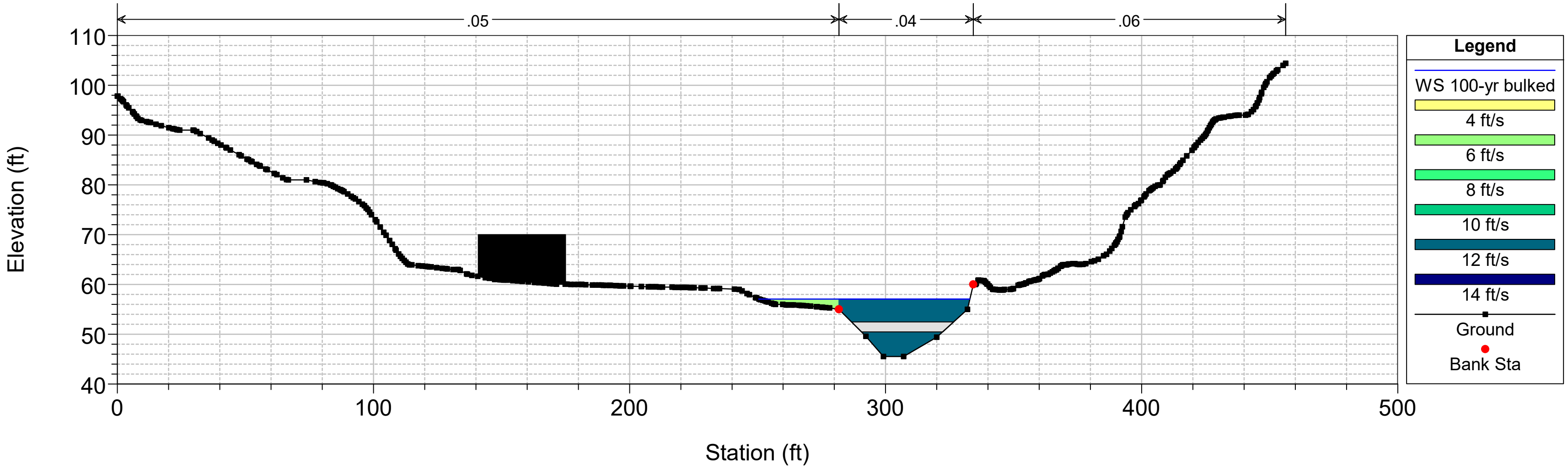
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1470



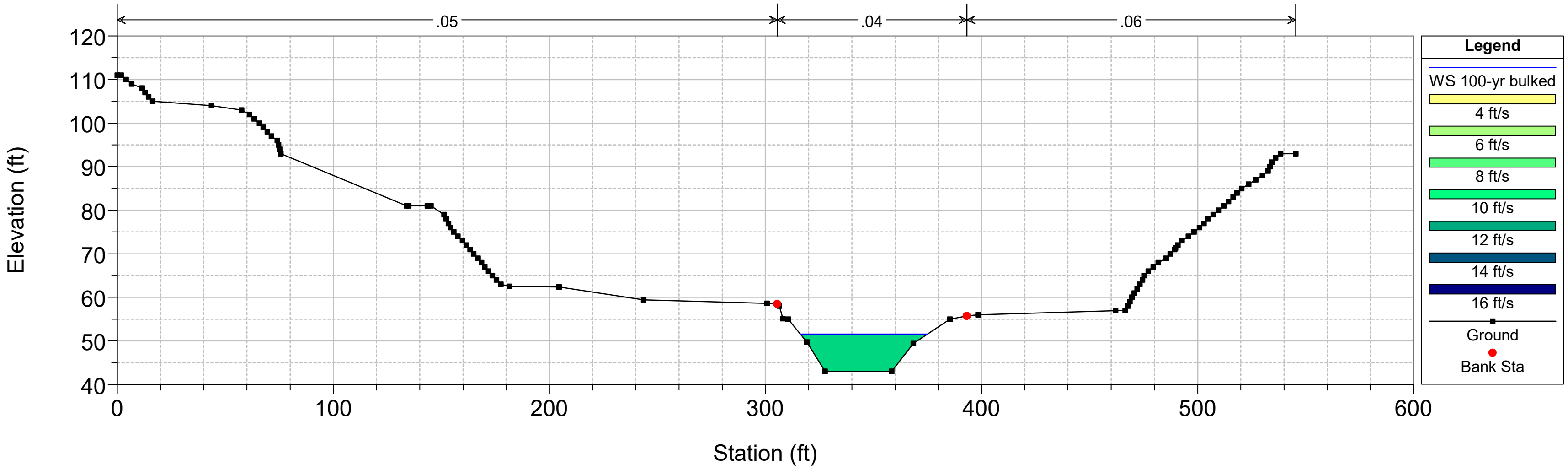
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1368



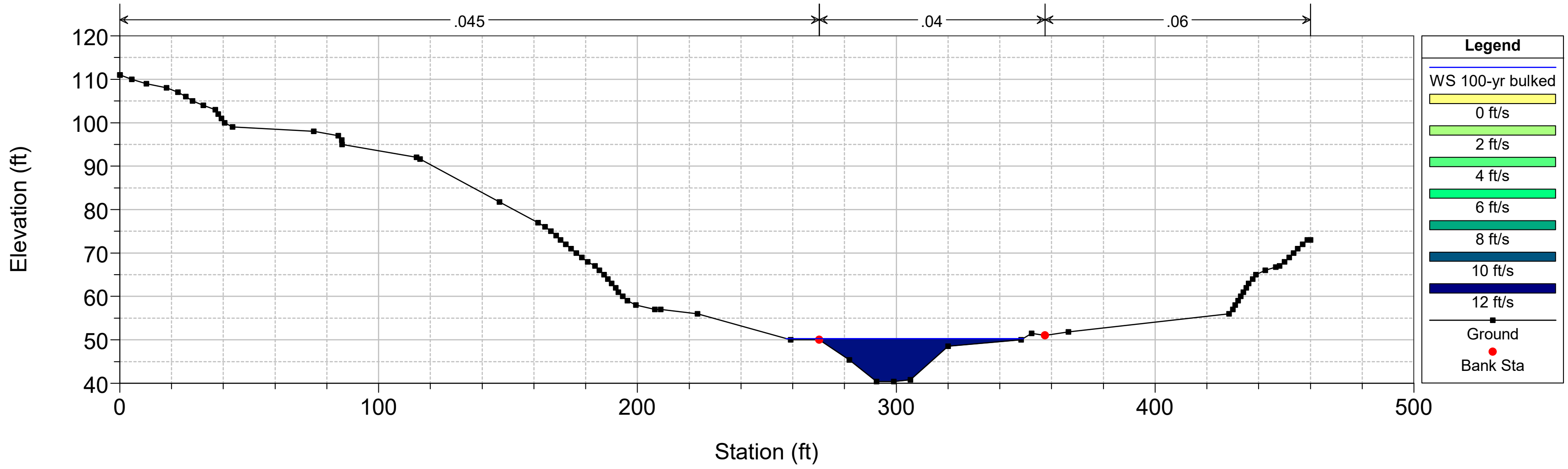
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1303 Bridge 3-P



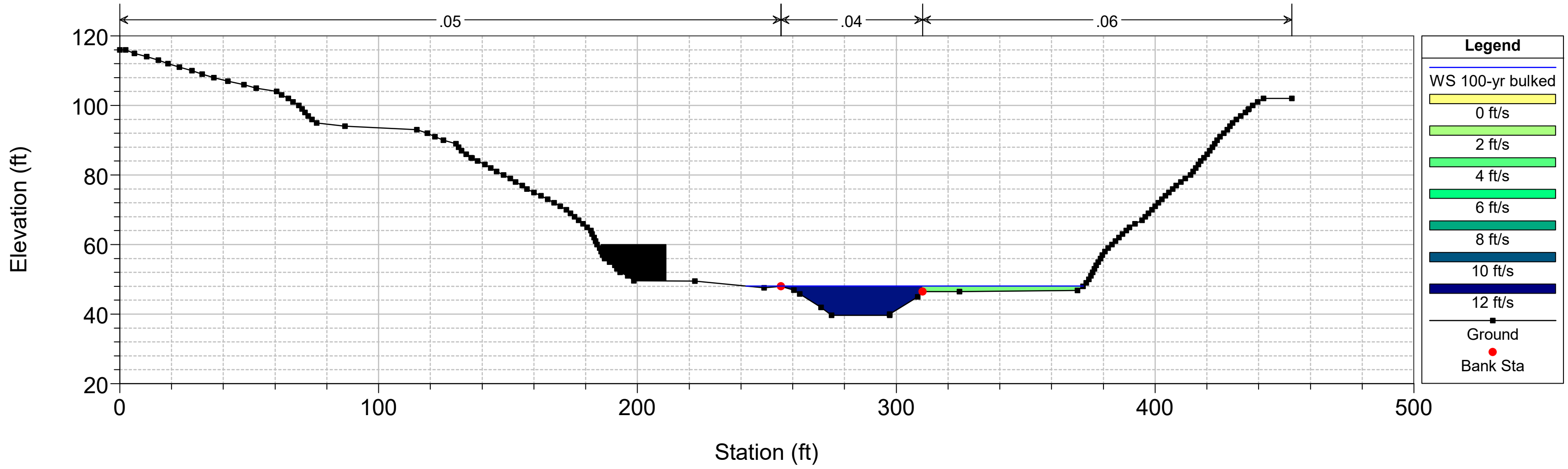
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1252



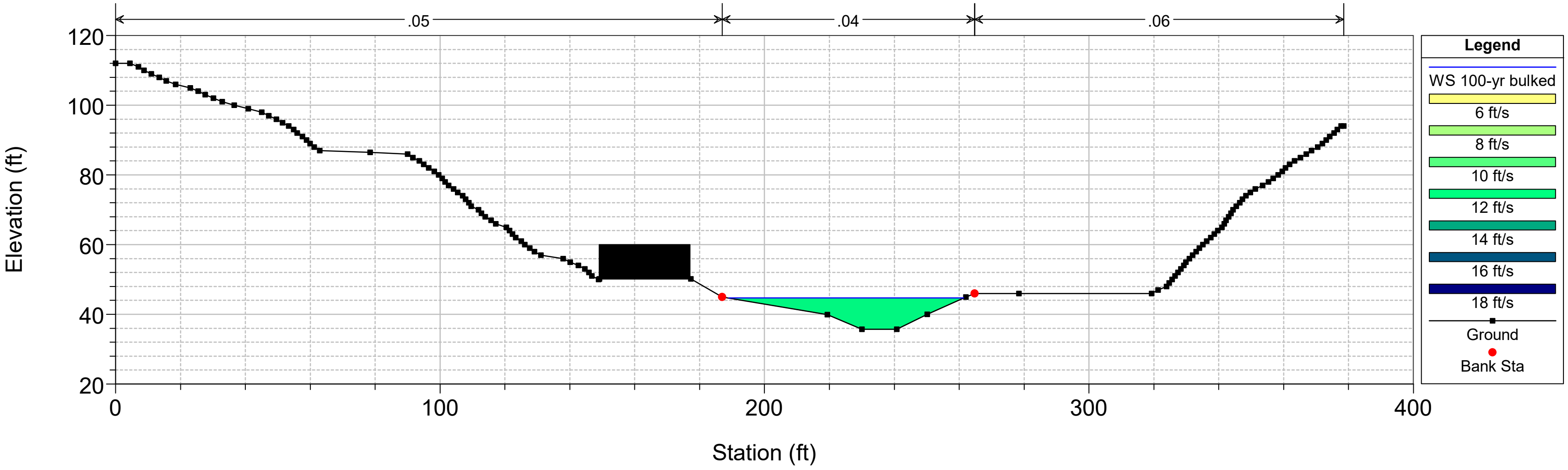
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1162



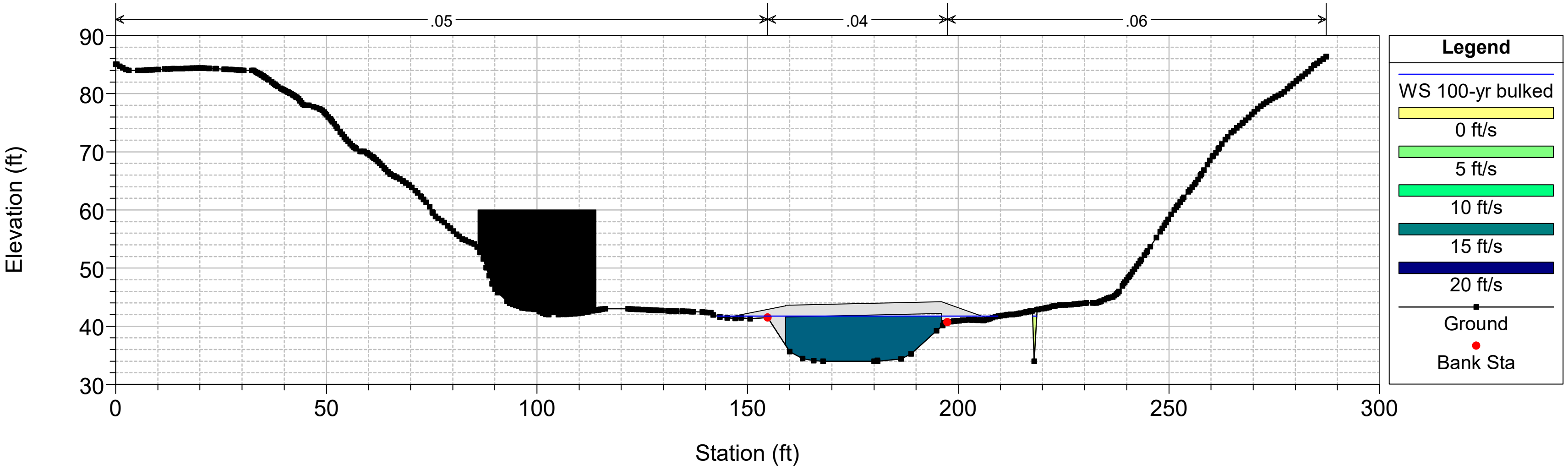
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1065

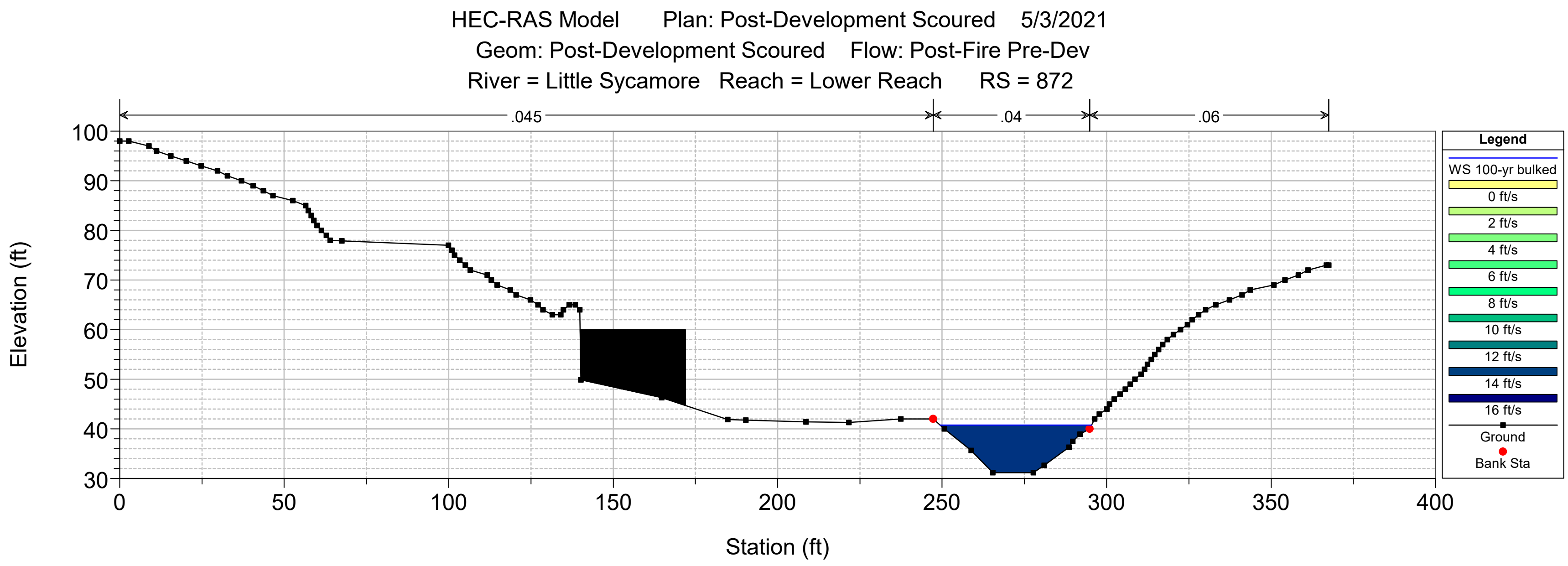


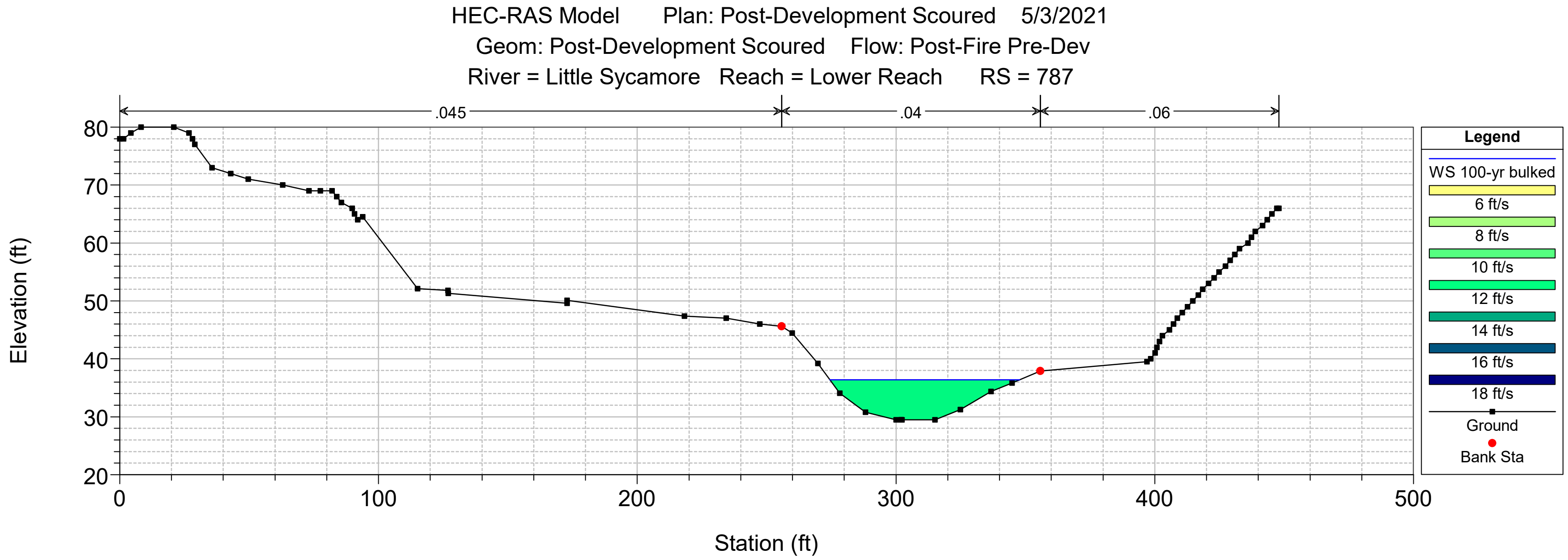
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 988



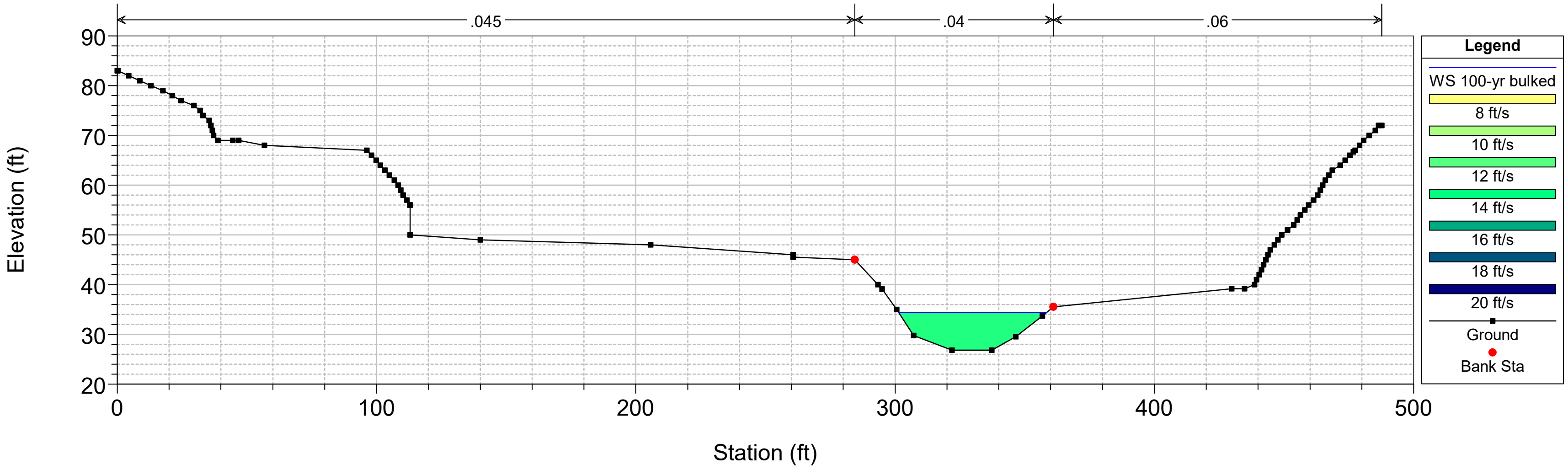
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 948 Bridge 1-P



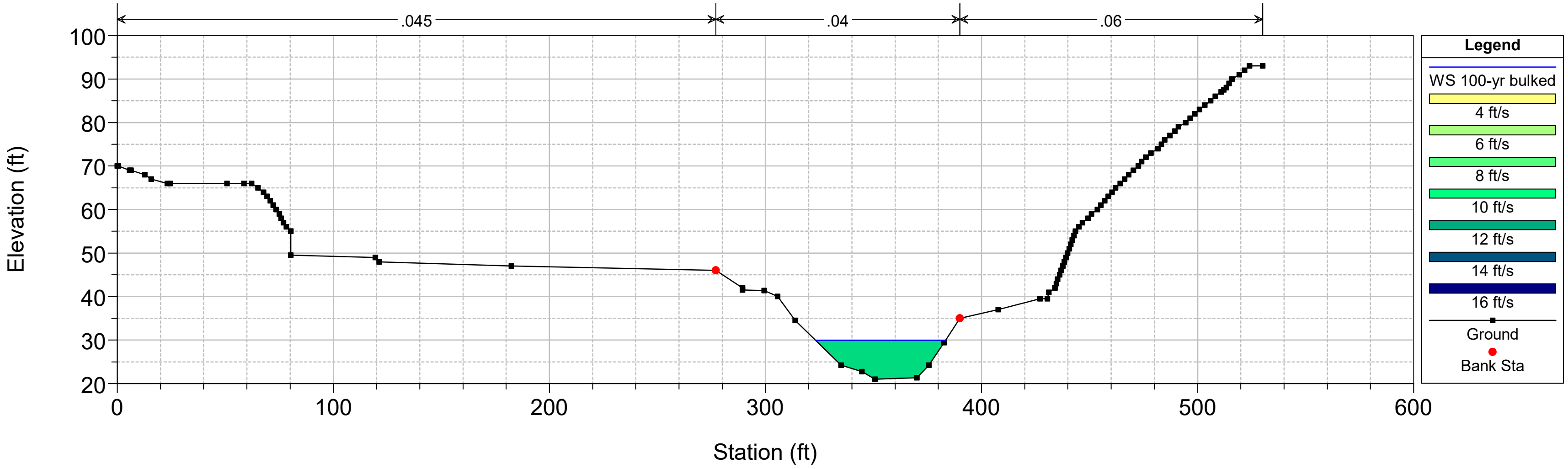

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 872
.045
.04
.06
Elevation (ft)
Station (ft)
100
90
80
70
60
50
40
30
0
50
100
150
200
250
300
350
400
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 787
.045
.04
.06
Elevation (ft)
Station (ft)
80
70
60
50
40
30
20
0
100
200
300
400
500
Legend
WS 100-yr bulked
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta

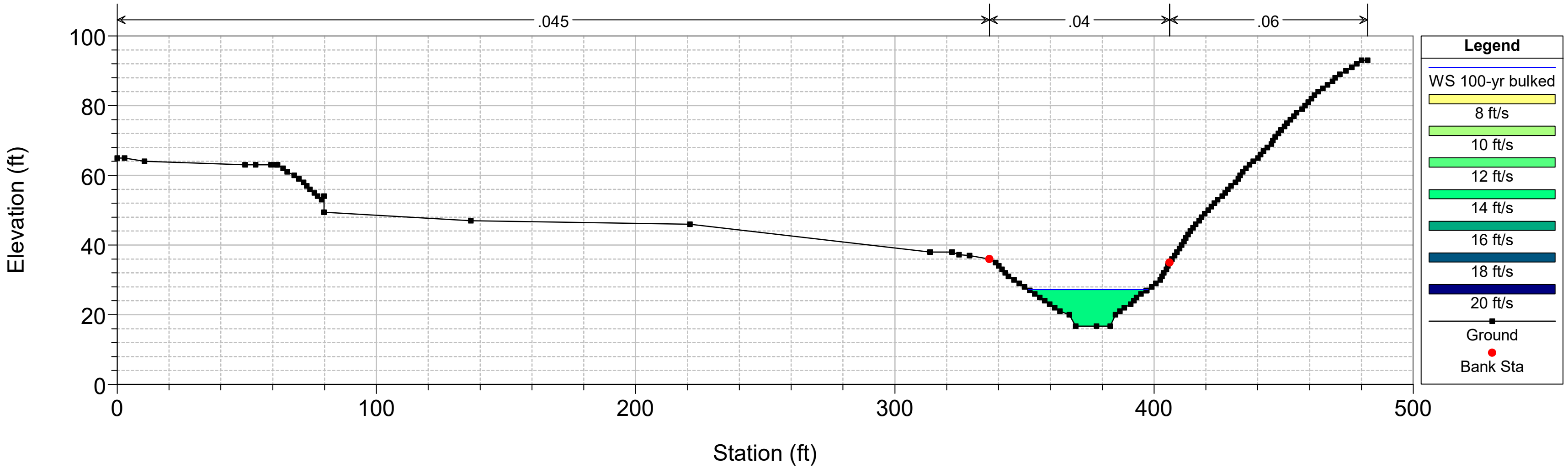
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 707



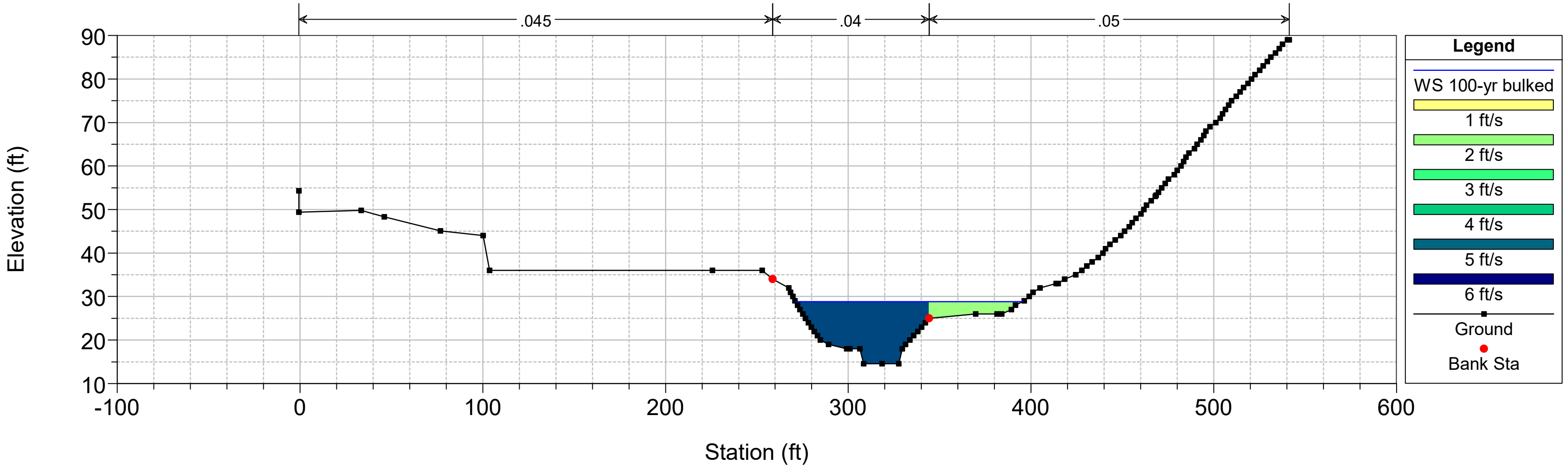
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 623

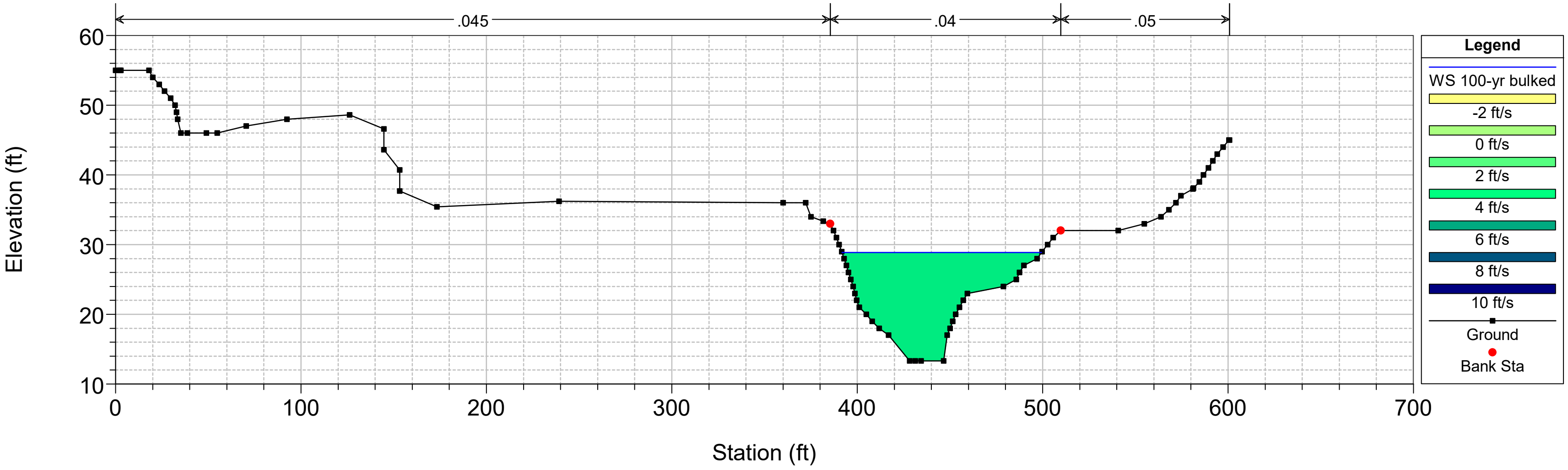


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 505

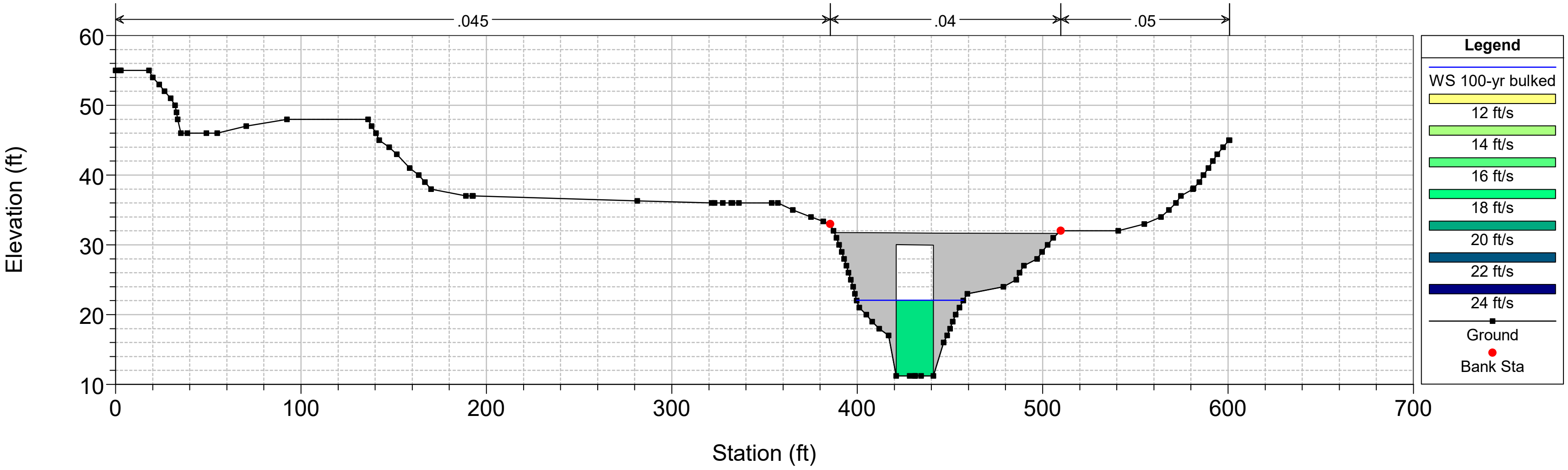


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 404

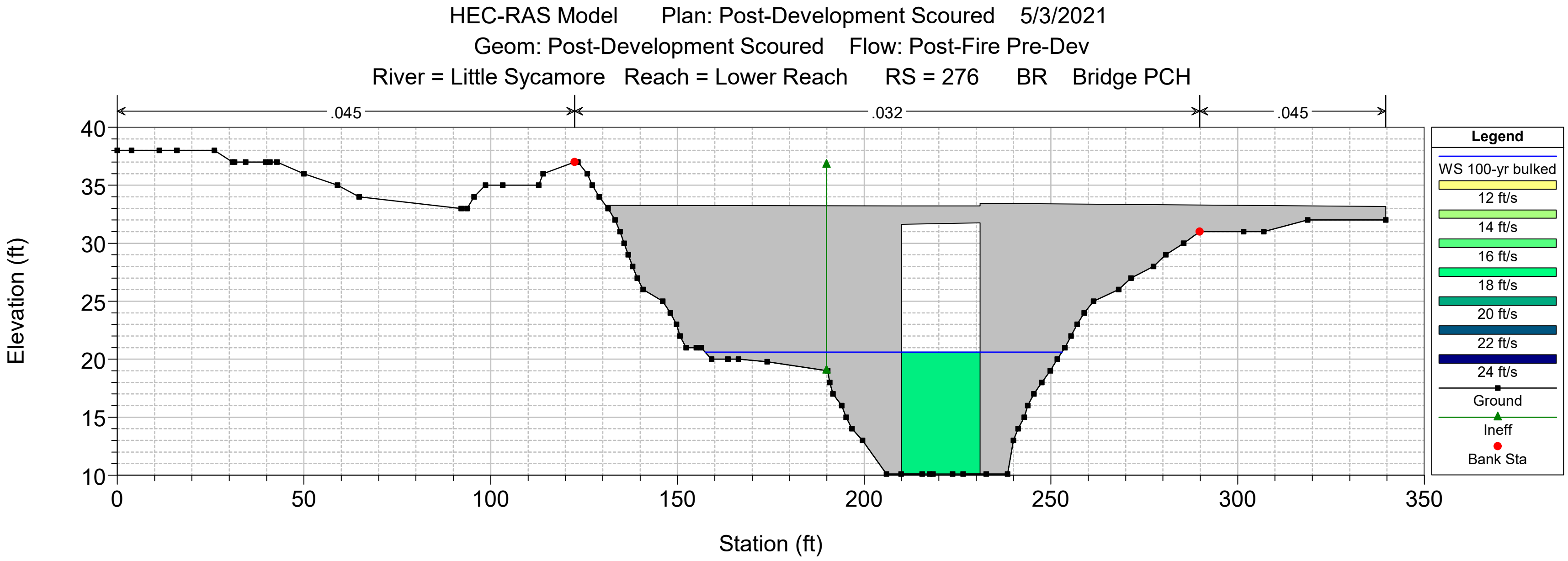


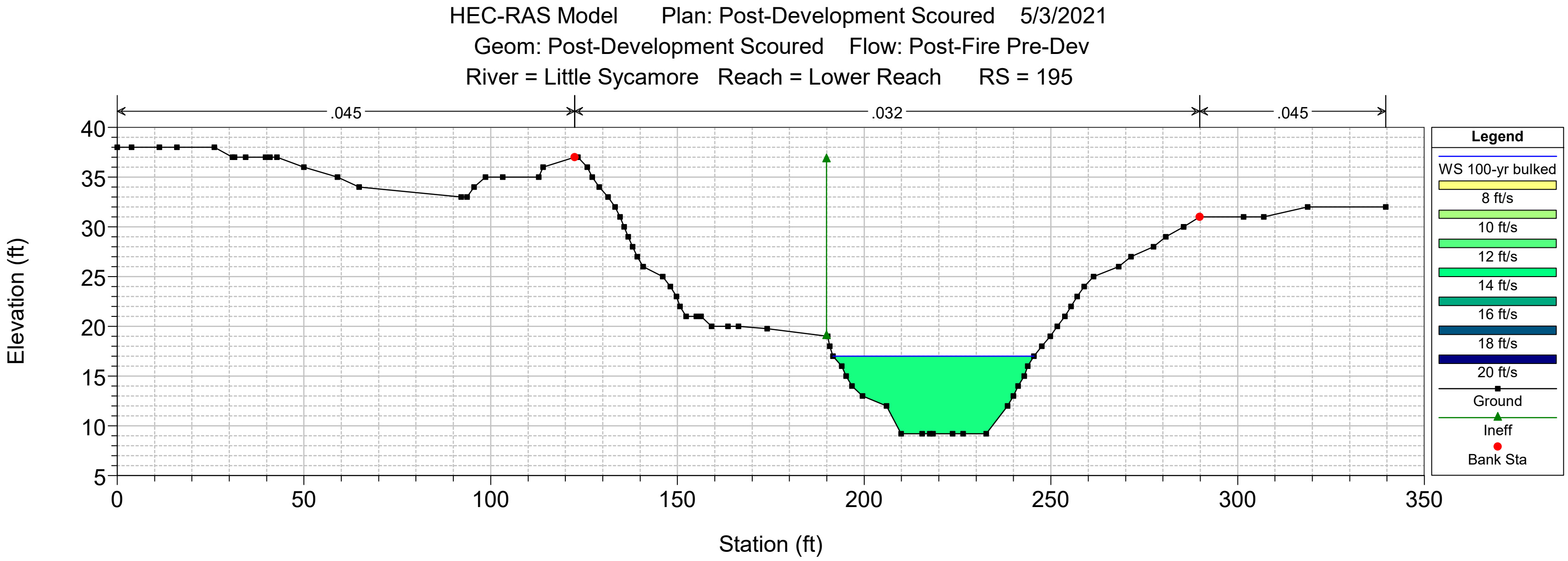


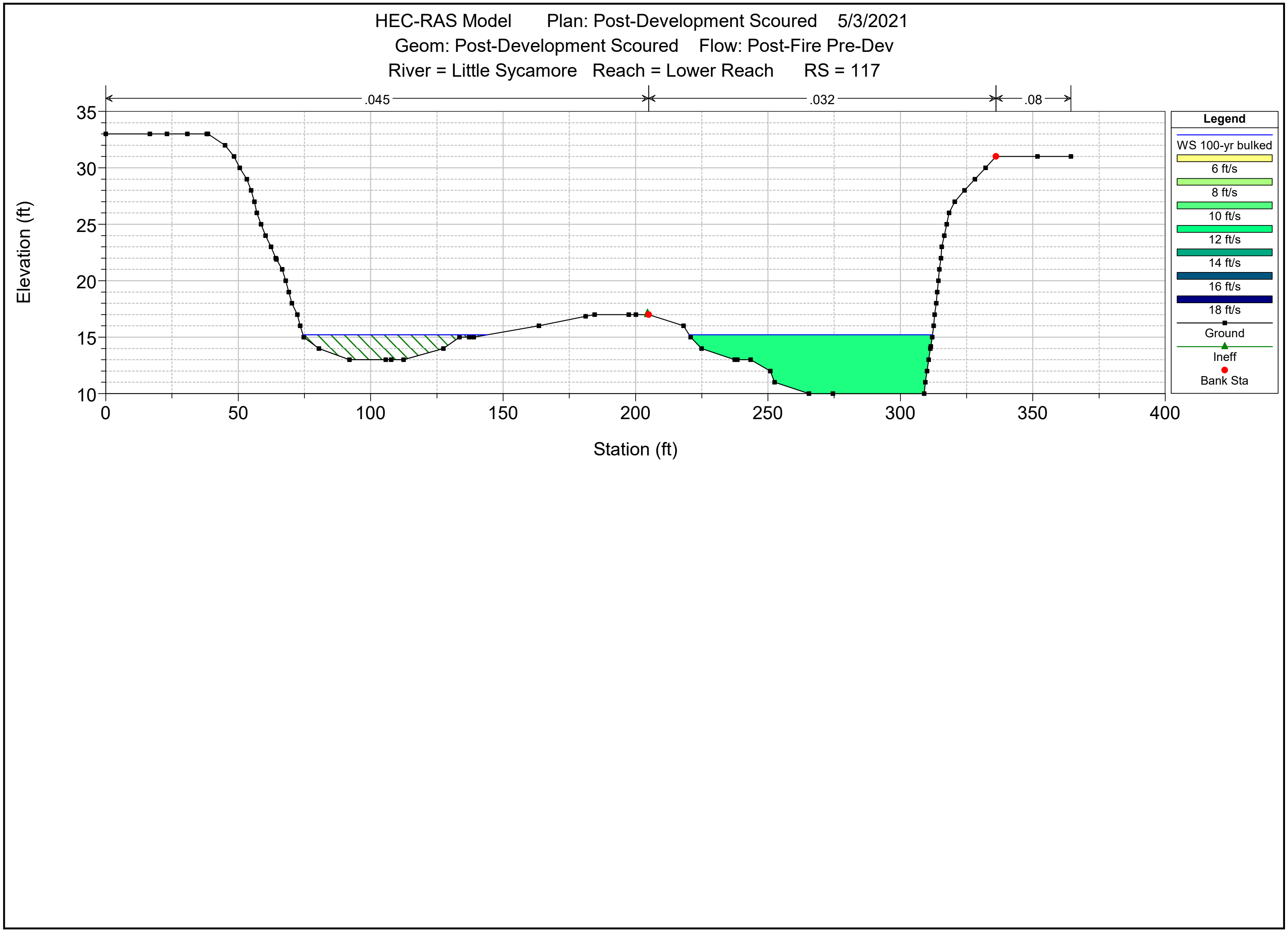
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 366



HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 276 BR Bridge PCH


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 276 BR Bridge PCH


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 195

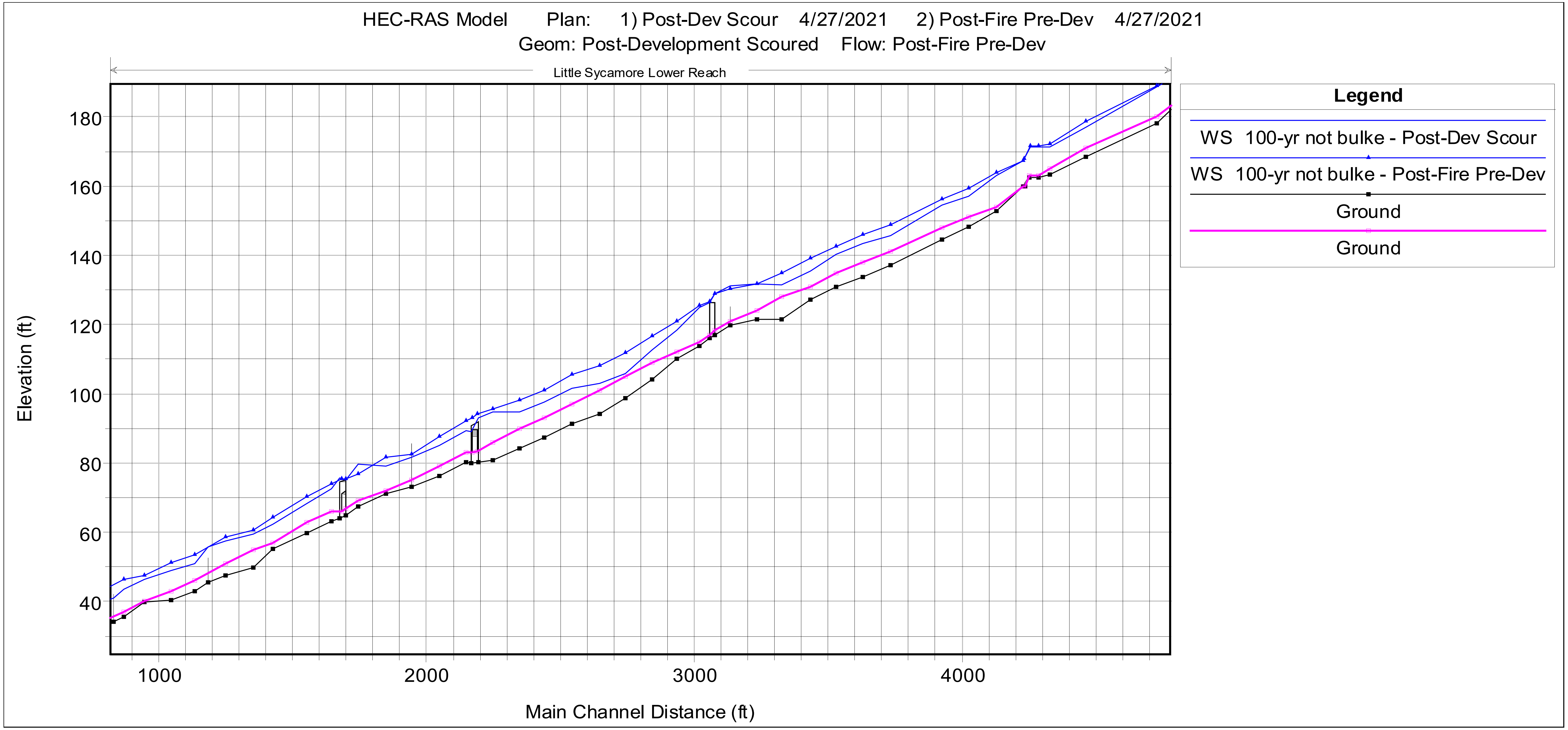

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 117
.045
.032
.08
Elevation (ft)
35
30
25
20
15
10
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Ineff
Bank Sta

HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked

Reach	River Sta	Profile	Plan	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)	
Lower Reach	117	100-yr bulked	Post-Fire Pre-Dev	4065.00	10.00	15.21	15.21	17.20	0.010114	11.31	359.45	161.45	1.01
Lower Reach	117	100-yr bulked	Post-Dev Scour	4065.00	10.00	15.21	15.21	17.20	0.010114	11.31	359.45	161.45	1.01
Lower Reach	195	100-yr bulked	Post-Fire Pre-Dev	4065.00	11.00	17.96	17.96	20.70	0.009351	13.27	306.36	56.68	1.01
Lower Reach	195	100-yr bulked	Post-Dev Scour	4065.00	9.20	16.99	16.99	19.80	0.009329	13.46	301.98	53.78	1.00
Lower Reach	276			Bridge									
Lower Reach	366	100-yr bulked	Post-Fire Pre-Dev	4065.00	16.00	31.44	23.10	31.64	0.000498	3.58	1135.93	119.34	0.20
Lower Reach	366	100-yr bulked	Post-Dev Scour	4065.00	13.30	28.85	21.75	29.16	0.000928	4.47	910.25	107.50	0.27
Lower Reach	404	100-yr bulked	Post-Fire Pre-Dev	4065.00	17.00	31.44		31.67	0.000527	4.08	1144.95	134.74	0.21
Lower Reach	404	100-yr bulked	Post-Dev Scour	4065.00	14.60	28.82		29.23	0.001125	5.30	856.03	124.31	0.30
Lower Reach	505	100-yr bulked	Post-Fire Pre-Dev	4065.00	19.00	30.79		32.12	0.004837	9.26	439.10	58.63	0.60
Lower Reach	505	100-yr bulked	Post-Dev Scour	4065.00	16.70	27.22	27.22	30.34	0.015379	14.16	286.99	46.07	1.00
Lower Reach	623	100-yr bulked	Post-Fire Pre-Dev	4065.00	22.00	32.24	32.24	35.28	0.014957	13.99	290.51	47.98	1.00
Lower Reach	623	100-yr bulked	Post-Dev Scour	4065.00	21.03	29.92		31.75	0.008139	10.85	374.55	60.02	0.77
Lower Reach	707	100-yr bulked	Post-Fire Pre-Dev	4065.00	27.00	35.25	35.25	38.39	0.014623	14.22	285.85	45.54	1.00
Lower Reach	707	100-yr bulked	Post-Dev Scour	4065.00	26.80	34.42	34.42	37.13	0.014426	13.22	307.59	57.06	1.00
Lower Reach	787	100-yr bulked	Post-Fire Pre-Dev	4065.00	30.00	40.18	40.18	42.17	0.008802	11.80	429.70	122.86	0.79
Lower Reach	787	100-yr bulked	Post-Dev Scour	4065.00	29.50	36.39	36.39	38.68	0.014591	12.13	335.05	73.36	1.00
Lower Reach	872	100-yr bulked	Post-Fire Pre-Dev	4065.00	33.00	43.55	43.55	45.44	0.007585	11.74	442.94	125.81	0.74
Lower Reach	872	100-yr bulked	Post-Dev Scour	4065.00	31.20	40.79	40.79	44.01	0.015068	14.39	282.73	46.10	1.02
Lower Reach	948	100-yr bulked	Post-Dev Scour	4065.00	34.00	41.73	41.73	45.80	0.023438	16.20	255.76	37.77	1.03
Lower Reach	988	100-yr bulked	Post-Fire Pre-Dev	4065.00	37.00	47.49	47.49	49.13	0.006683	11.18	514.46	168.79	0.71
Lower Reach	988	100-yr bulked	Post-Dev Scour	4065.00	35.70	44.68	44.68	46.99	0.014832	12.19	333.44	72.33	1.00
Lower Reach	1065	100-yr bulked	Post-Fire Pre-Dev	4065.00	40.00	48.36	48.36	50.25	0.009787	11.73	440.21	132.18	0.83
Lower Reach	1065	100-yr bulked	Post-Dev Scour	4065.00	39.70	48.10	48.10	50.05	0.009802	11.58	420.06	130.31	0.84
Lower Reach	1162	100-yr bulked	Post-Fire Pre-Dev	4065.00	43.00	51.97	51.97	53.83	0.009008	12.97	468.03	117.72	0.82
Lower Reach	1162	100-yr bulked	Post-Dev Scour	4065.00	40.40	50.31	50.31	52.41	0.014407	11.63	352.70	91.74	0.97
Lower Reach	1252	100-yr bulked	Post-Fire Pre-Dev	4065.00	46.00	54.50	54.50	56.99	0.012389	12.95	343.15	71.45	0.94
Lower Reach	1252	100-yr bulked	Post-Dev Scour	4065.00	43.00	51.53		53.41	0.008397	10.99	369.97	58.72	0.77
Lower Reach	1303	100-yr bulked	Post-Dev Scour	4065.00	45.50	57.07	57.07	59.23	0.028345	12.04	357.99	82.41	0.61
Lower Reach	1368	100-yr bulked	Post-Fire Pre-Dev	4065.00	51.00	58.98	58.98	61.77	0.013772	14.20	342.97	84.53	0.98
Lower Reach	1368	100-yr bulked	Post-Dev Scour	4065.00	47.60	58.65	58.65	60.70	0.008848	12.33	427.80	118.84	0.79
Lower Reach	1470	100-yr bulked	Post-Fire Pre-Dev	4065.00	55.00	61.33	61.33	63.55	0.015454	11.96	339.79	76.46	1.00
Lower Reach	1470	100-yr bulked	Post-Dev Scour	4065.00	49.70	60.27		61.50	0.005602	8.90	456.97	75.99	0.64
Lower Reach	1542	100-yr bulked	Post-Fire Pre-Dev	4065.00	57.00	65.22	65.22	67.77	0.015468	12.80	317.63	63.62	1.01
Lower Reach	1542	100-yr bulked	Post-Dev Scour	4065.00	55.20	63.19	63.19	65.85	0.014438	13.08	310.86	58.52	1.00
Lower Reach	1668	100-yr bulked	Post-Fire Pre-Dev	4065.00	63.00	70.91	70.91	72.28	0.009599	11.47	508.09	160.68	0.81
Lower Reach	1668	100-yr bulked	Post-Dev Scour	4065.00	59.70	68.93	68.93	70.53	0.017124	10.13	401.47	128.70	1.01
Lower Reach	1762	100-yr bulked	Post-Fire Pre-Dev	4065.00	66.00	74.64	74.64	76.16	0.009959	11.80	477.85	143.17	0.79
Lower Reach	1762	100-yr bulked	Post-Dev Scour	4065.00	63.20	73.53	73.53	75.71	0.012080	13.22	381.45	90.22	0.88
Lower Reach	1807			Bridge									
Lower Reach	1861	100-yr bulked	Post-Fire Pre-Dev	4065.00	69.00	77.68	76.15	78.47	0.004073	8.23	631.96	158.92	0.55
Lower Reach	1861	100-yr bulked	Post-Dev Scour	4065.00	67.50	79.78	75.10	80.30	0.001304	6.12	796.35	123.35	0.34
Lower Reach	1962	100-yr bulked	Post-Fire Pre-Dev	4065.00	72.00	82.26	82.26	84.12	0.009913	12.40	420.30	106.49	0.81
Lower Reach	1962	100-yr bulked	Post-Dev Scour	4065.00	71.10	79.06	78.92	81.05	0.013762	11.32	359.22	83.30	0.96
Lower Reach	2058	100-yr bulked	Post-Fire Pre-Dev	4065.00	75.00	83.85	83.85	86.71	0.014745	13.56	299.80	53.03	1.01
Lower Reach	2058	100-yr bulked	Post-Dev Scour	4065.00	73.00	82.95	82.95	85.91	0.014490	13.81	294.37	49.62	1.00
Lower Reach	2163	100-yr bulked	Post-Fire Pre-Dev	4065.00	79.00	88.27	88.27	90.08	0.008364	11.75	488.04	142.14	0.78
Lower Reach	2163	100-yr bulked	Post-Dev Scour	4065.00	76.20	86.25	86.25	89.32	0.014593	14.05	289.48	49.19	1.00
Lower Reach	2262	100-yr bulked	Post-Fire Pre-Dev	4065.00	83.00	93.01	93.01	94.88	0.008668	12.01	468.48	128.33	0.77
Lower Reach	2262	100-yr bulked	Post-Dev Scour	4065.00	80.30	90.46	90.46	93.19	0.014465	13.26	308.40	65.46	0.99
Lower Reach	2297			Bridge									
Lower Reach	2364	100-yr bulked	Post-Fire Pre-Dev	4065.00	86.00	96.32	95.15	97.53	0.005400	10.31	540.29	113.19	0.63
Lower Reach	2364	100-yr bulked	Post-Dev Scour	4065.00	80.90	95.79	93.04	96.68	0.002526	8.29	641.99	109.31	0.45
Lower Reach	2463	100-yr bulked	Post-Fire Pre-Dev	4065.00	90.00	99.52	99.52	101.91	0.010790	12.62	361.84	104.09	0.88
Lower Reach	2463	100-yr bulked	Post-Dev Scour	4065.00	84.20	96.67	96.67	98.95	0.009547	12.52	391.77	100.37	0.81
Lower Reach	2556	100-yr bulked	Post-Fire Pre-Dev	4065.00	93.00	102.02	102.02	104.48	0.011768	14.32	388.95	77.15	0.93
Lower Reach	2556	100-yr bulked	Post-Dev Scour	4065.00	87.30	100.28	100.28	103.01	0.009184	14.24	380.17	74.82	0.77
Lower Reach	2659	100-yr bulked	Post-Fire Pre-Dev	4065.00	97.00	106.58	106.58	109.04	0.010624	13.78	410.50	96.00	0.90
Lower Reach	2659	100-yr bulked	Post-Dev Scour	4065.00	91.20	102.12		103.99	0.008244	10.96	370.90	59.37	0.76
Lower Reach	2761	100-yr bulked	Post-Fire Pre-Dev	4065.00	101.00	109.28	109.28	111.84	0.011414	13.11	346.15	74.53	0.90

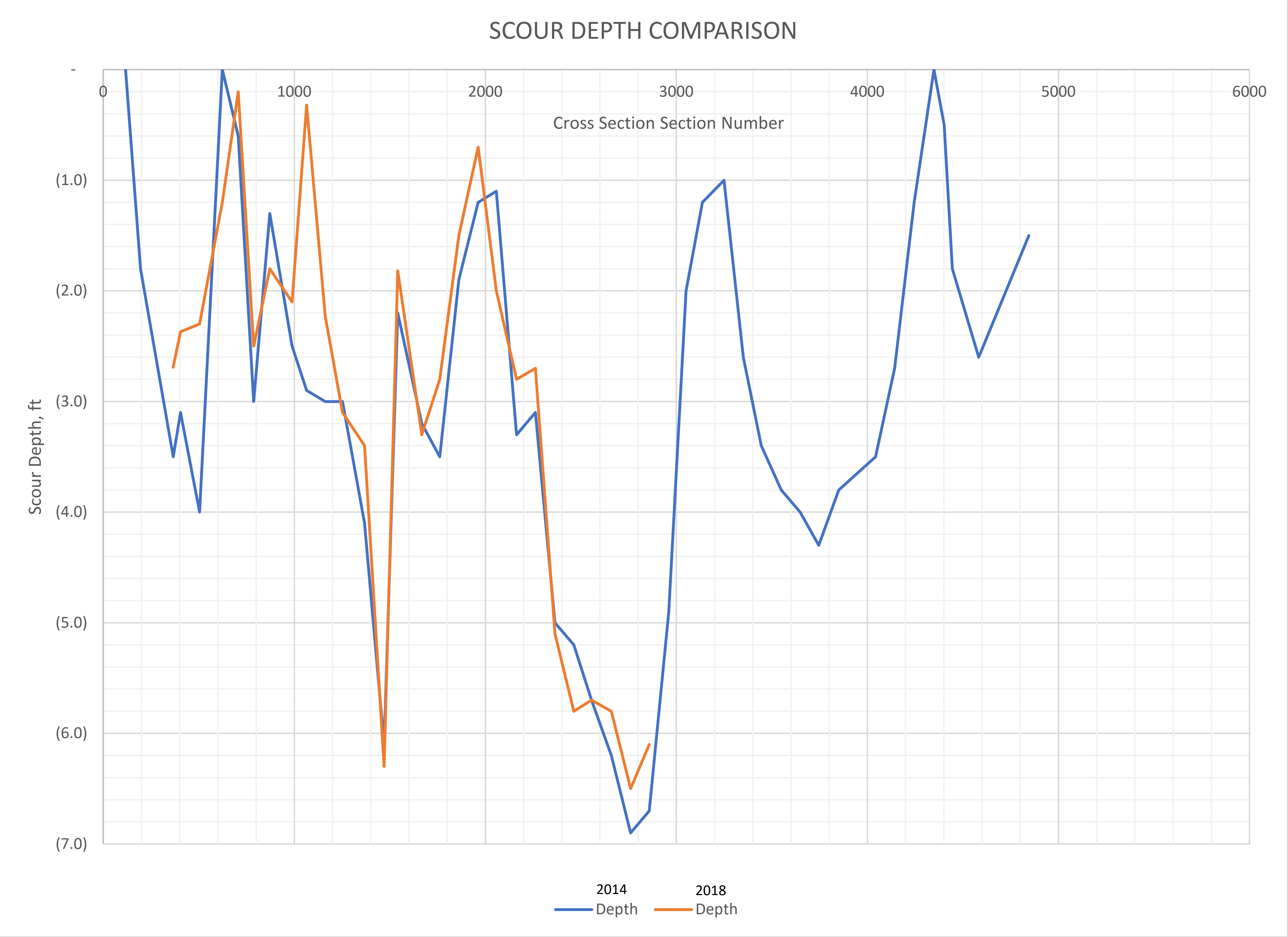
HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked (Continued)

Reach	River Sta	Profile	Plan	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)	
Lower Reach	2761	100-yr bulked	Post-Dev Scour	4065.00	94.10	104.39	104.39	107.91	0.015585	15.04	270.33	39.00	1.01
Lower Reach	2858	100-yr bulked	Post-Fire Pre-Dev	4065.00	105.00	112.66	112.66	114.51	0.009871	11.90	455.43	124.20	0.85
Lower Reach	2858	100-yr bulked	Post-Dev Scour	4065.00	98.75	107.73		109.00	0.005740	9.06	461.83	79.37	0.63
Lower Reach	2960	100-yr bulked	Post-Fire Pre-Dev	4065.00	109.00	117.38	117.38	119.35	0.010960	13.44	457.08	108.14	0.88
Lower Reach	2960	100-yr bulked	Post-Dev Scour	4065.00	104.10	114.03	114.03	116.66	0.010723	13.43	355.23	85.34	0.89
Lower Reach	3051	100-yr bulked	Post-Fire Pre-Dev	4065.00	112.00	122.21	122.21	124.91	0.011589	13.95	338.21	64.47	0.90
Lower Reach	3051	100-yr bulked	Post-Dev Scour	4065.00	110.00	119.73	119.73	123.70	0.017964	15.99	255.05	33.55	0.99
Lower Reach	3136	100-yr bulked	Post-Fire Pre-Dev	4065.00	115.00	126.09	126.09	127.83	0.008707	11.94	511.70	145.33	0.72
Lower Reach	3136	100-yr bulked	Post-Dev Scour	4065.00	113.80	125.92	125.92	127.65	0.008584	11.77	506.93	144.98	0.70
Lower Reach	3182			Bridge									
Lower Reach	3249	100-yr bulked	Post-Fire Pre-Dev	4065.00	121.00	131.20	131.20	132.95	0.006479	12.21	551.44	151.02	0.70
Lower Reach	3249	100-yr bulked	Post-Dev Scour	4065.00	119.80	132.31	131.15	132.93	0.009169	7.43	686.52	169.83	0.32
Lower Reach	3350	100-yr bulked	Post-Fire Pre-Dev	4065.00	124.00	132.86	132.86	135.39	0.011378	12.96	348.13	84.68	0.90
Lower Reach	3350	100-yr bulked	Post-Dev Scour	4065.00	121.38	132.34		133.99	0.006180	10.42	427.85	90.56	0.66
Lower Reach	3444	100-yr bulked	Post-Fire Pre-Dev	4065.00	128.00	136.03	136.03	139.25	0.014378	14.39	284.01	62.53	0.98
Lower Reach	3444	100-yr bulked	Post-Dev Scour	4065.00	121.40	131.88	131.88	135.71	0.016902	15.69	259.03	34.19	1.01
Lower Reach	3549	100-yr bulked	Post-Fire Pre-Dev	4065.00	131.00	140.43	140.43	143.69	0.015281	14.48	280.77	43.28	1.00
Lower Reach	3549	100-yr bulked	Post-Dev Scour	4065.00	127.20	137.12	137.12	140.75	0.016617	15.27	266.14	36.80	1.00
Lower Reach	3648	100-yr bulked	Post-Fire Pre-Dev	4065.00	135.00	144.10	144.10	147.78	0.016517	15.40	263.91	35.85	1.00
Lower Reach	3648	100-yr bulked	Post-Dev Scour	4065.00	131.00	141.81	141.81	145.22	0.016154	14.82	274.36	40.61	1.00
Lower Reach	3745	100-yr bulked	Post-Fire Pre-Dev	4065.00	138.00	147.59	147.59	150.58	0.014239	13.90	298.41	60.52	0.97
Lower Reach	3745	100-yr bulked	Post-Dev Scour	4065.00	133.70	145.01	145.01	148.18	0.016472	14.27	284.82	44.95	1.00
Lower Reach	3850	100-yr bulked	Post-Fire Pre-Dev	4065.00	141.00	150.03	150.03	153.08	0.014986	14.02	290.18	55.48	1.00
Lower Reach	3850	100-yr bulked	Post-Dev Scour	4065.00	137.20	147.45	147.45	150.96	0.016417	15.04	270.34	38.50	1.00
Lower Reach	4042	100-yr bulked	Post-Fire Pre-Dev	4065.00	148.00	157.82	157.82	161.17	0.015819	14.69	276.69	41.54	1.00
Lower Reach	4042	100-yr bulked	Post-Dev Scour	4065.00	144.50	155.97	155.97	159.17	0.016411	14.36	283.05	45.04	1.01
Lower Reach	4143	100-yr bulked	Post-Fire Pre-Dev	4065.00	151.00	160.81	160.81	164.29	0.015510	14.96	271.75	39.24	1.00
Lower Reach	4143	100-yr bulked	Post-Dev Scour	4065.00	148.30	158.68	158.68	162.37	0.016343	15.41	263.74	35.76	1.00
Lower Reach	4245	100-yr bulked	Post-Fire Pre-Dev	3650.00	154.00	165.36	165.36	168.25	0.013395	13.65	276.06	68.86	0.93
Lower Reach	4245	100-yr bulked	Post-Dev Scour	3650.00	152.80	164.16	164.16	167.35	0.016383	14.32	254.98	40.89	1.01
Lower Reach	4348	100-yr bulked	Post-Fire Pre-Dev	3650.00	160.00	168.22	168.22	171.16	0.015189	13.76	265.32	45.16	1.00
Lower Reach	4348	100-yr bulked	Post-Dev Scour	3650.00	160.00	168.29	168.29	171.23	0.015179	13.74	265.55	45.28	1.00
Lower Reach	4362			Culvert									
Lower Reach	4402	100-yr bulked	Post-Fire Pre-Dev	3650.00	163.00	172.37	170.65	173.70	0.006384	9.27	393.87	63.65	0.66
Lower Reach	4402	100-yr bulked	Post-Dev Scour	3650.00	162.45	172.21	170.45	173.55	0.006424	9.29	392.96	63.11	0.66
Lower Reach	4445	100-yr bulked	Post-Fire Pre-Dev	3650.00	165.00	173.10	173.10	176.52	0.016939	14.84	245.90	36.27	1.01
Lower Reach	4445	100-yr bulked	Post-Dev Scour	3650.00	163.20	172.25	172.25	175.71	0.016648	14.92	244.60	35.64	1.00
Lower Reach	4582	100-yr bulked	Post-Fire Pre-Dev	3650.00	171.00	179.66	179.66	182.69	0.011856	14.26	286.15	54.69	0.91
Lower Reach	4582	100-yr bulked	Post-Dev Scour	3650.00	168.40	178.17	178.17	181.50	0.013384	14.71	259.24	47.37	0.94
Lower Reach	4845	100-yr bulked	Post-Fire Pre-Dev	3650.00	180.00	190.00	190.00	193.27	0.015511	14.50	251.78	38.82	1.00
Lower Reach	4845	100-yr bulked	Post-Dev Scour	3650.00	178.19	189.57	189.57	192.89	0.016135	14.61	249.86	37.78	1.00
Lower Reach	5011	100-yr bulked	Post-Fire Pre-Dev	3650.00	190.00	198.65	198.65	202.10	0.013267	15.28	263.41	42.74	0.97
Lower Reach	5011	100-yr bulked	Post-Dev Scour	3650.00	190.00	198.65	198.65	202.10	0.013267	15.28	263.41	42.74	0.97
Lower Reach	5120			Bridge									
Lower Reach	5207	100-yr bulked	Post-Fire Pre-Dev	3650.00	205.00	215.96	212.92	216.73	0.003046	7.03	519.05	75.15	0.47
Lower Reach	5207	100-yr bulked	Post-Dev Scour	3650.00	205.00	215.96	212.92	216.73	0.003046	7.03	519.05	75.15	0.47
Lower Reach	5334	100-yr bulked	Post-Fire Pre-Dev	3650.00	211.00	218.58	218.58	221.44	0.013081	13.74	287.94	55.10	0.97
Lower Reach	5334	100-yr bulked	Post-Dev Scour	3650.00	211.00	218.58	218.58	221.44	0.013081	13.74	287.94	55.10	0.97
Lower Reach	5459	100-yr bulked	Post-Fire Pre-Dev	3650.00	217.00	224.77	224.77	227.20	0.012813	13.69	371.47	79.18	0.94
Lower Reach	5459	100-yr bulked	Post-Dev Scour	3650.00	217.00	224.77	224.77	227.20	0.012813	13.69	371.47	79.18	0.94

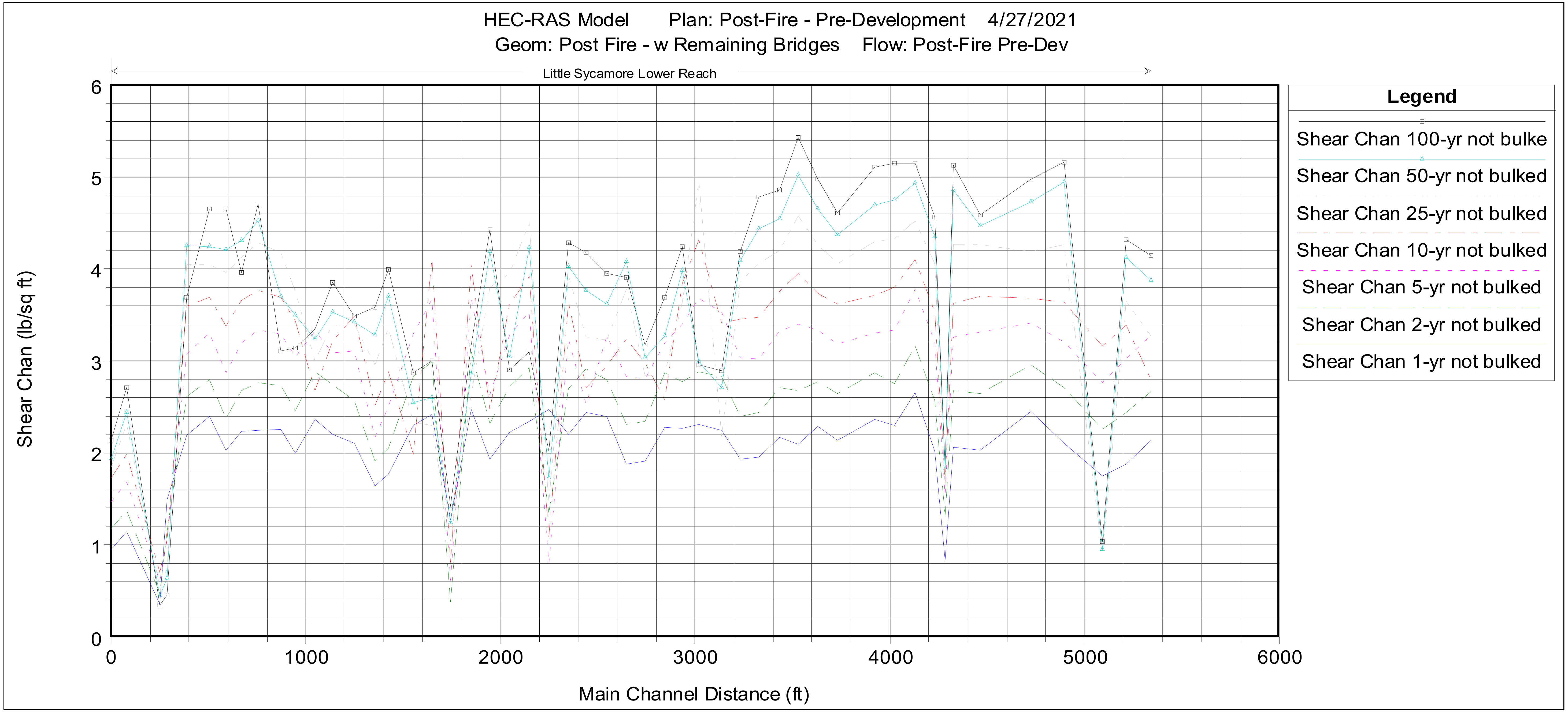

HEC-RAS Model Plan: 1) Post-Dev Scour 4/27/2021 2) Post-Fire Pre-Dev 4/27/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
Little Sycamore Lower Reach
Elevation (ft)
180
160
140
120
100
80
60
40
1000
2000
3000
4000
Main Channel Distance (ft)
Legend
WS 100-yr not bulke - Post-Dev Scour
WS 100-yr not bulke - Post-Fire Pre-Dev
Ground
Ground

Scour Comparison Analysis

	2020	2014	Scour	2018	Scour
Station	**Elevation**	**Elevation**	Depth	**Elevation**	Depth
117	10	10.0	-		
195	11	9.2	(1.8)		
366	16	12.5	(3.5)	13.3	(2.7)
404	17	13.9	(3.1)	14.6	(2.4)
505	19	15.0	(4.0)	16.7	(2.3)
623	22	22.0	-	20.8	(1.2)
707	27	26.4	(0.6)	26.8	(0.2)
787	32	29.0	(3.0)	29.5	(2.5)
872	33	31.7	(1.3)	31.2	(1.8)
988	37	34.5	(2.5)	34.9	(2.1)
1065	40	37.1	(2.9)	39.7	(0.3)
1162	43	40.0	(3.0)	40.8	(2.2)
1252	46	43.0	(3.0)	42.9	(3.1)
1368	51	46.9	(4.1)	47.6	(3.4)
1470	56	49.9	(6.1)	49.7	(6.3)
1542	57	54.8	(2.2)	55.2	(1.8)
1668	63	59.8	(3.2)	59.7	(3.3)
1762	66	62.5	(3.5)	63.2	(2.8)
1861	69	67.1	(1.9)	67.5	(1.5)
1962	72	70.8	(1.2)	71.3	(0.7)
2058	75	73.9	(1.1)	73.0	(2.0)
2163	79	75.7	(3.3)	76.2	(2.8)
2262	83	79.9	(3.1)	80.3	(2.7)
2364	86	81.0	(5.0)	80.9	(5.1)
2463	90	84.8	(5.2)	84.2	(5.8)
2556	93	87.3	(5.7)	87.3	(5.7)
2659	97	90.8	(6.2)	91.2	(5.8)
2761	101	94.1	(6.9)	94.5	(6.5)
2858	105	98.3	(6.7)	98.9	(6.1)
2960	109	104.1	(4.9)		
3051	112	110.0	(2.0)		
3136	115	113.8	(1.2)		
3249	121	120.0	(1.0)		
3350	124	121.4	(2.6)		
3444	128	124.6	(3.4)		
3549	131	127.2	(3.8)		
3648	135	131.0	(4.0)		
3745	138	133.7	(4.3)		
3850	141	137.2	(3.8)		
4042	148	144.5	(3.5)		
4143	151	148.3	(2.7)		
4245	154	152.8	(1.2)		
4348	160	160.0	-		
4402	163	162.5	(0.5)		
4445	165	163.2	(1.8)		
4582	171	168.4	(2.6)		
4845	180	178.5	(1.5)		


SCOUR DEPTH COMPARISON
Cross Section Section Number
0
1000
2000
3000
4000
5000
6000
Scour Depth, ft
-
(1.0)
(2.0)
(3.0)
(4.0)
(5.0)
(6.0)
(7.0)
2014 Depth
2018 Depth

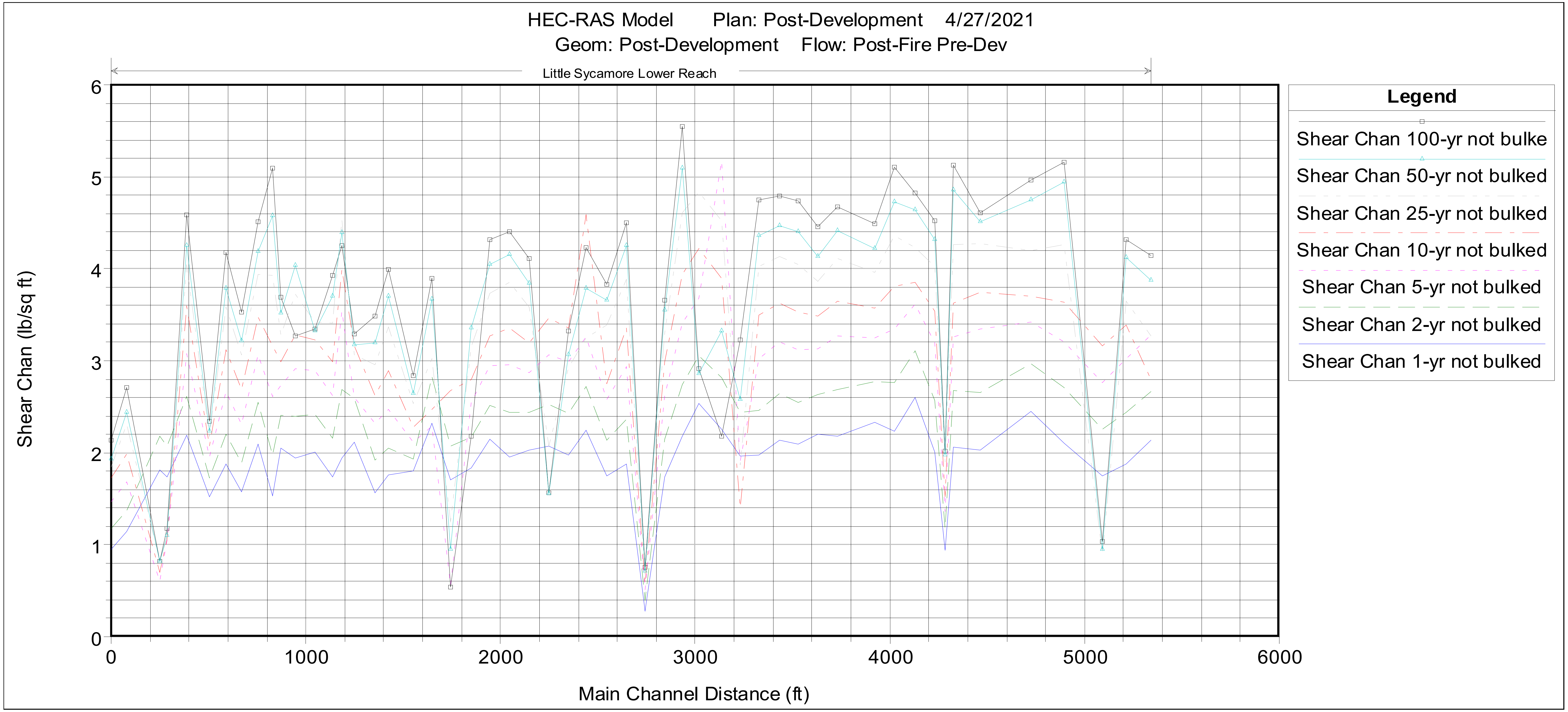
Post-Fire, Pre-Development



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.703388453	77.6	1.141696811	77.6	1.368046522	77.6	1.680717111	77.6	1.987666726	77.6	2.314466	77.6	2.439956188
248.94	0.343714476	248.94	0.361240953	248.94	0.470368117	248.94	0.601264834	248.94	0.705022395	248.94	0.540111244	248.94	0.445672214
286.79	0.453210205	286.79	1.491343379	286.79	1.140955925	286.79	1.042088628	286.79	1.058745861	286.79	0.734351158	286.79	0.633240283
387.49	3.695083857	387.49	2.188152552	387.49	2.608703852	387.49	3.072193623	387.49	3.589620113	387.49	4.044895649	387.49	4.253977776
505.31	4.651733398	505.31	2.396822453	505.31	2.795744419	505.31	3.29976511	505.31	3.695736885	505.31	4.046444416	505.31	4.242692471
589.23	4.654993534	589.23	2.030388832	589.23	2.372887373	589.23	2.868565559	589.23	3.382663012	589.23	3.96236515	589.23	4.203422546
668.97	3.959862947	668.97	2.235546112	668.97	2.681573629	668.97	3.192373276	668.97	3.657744884	668.97	4.12434864	668.97	4.309940815
754.27	4.70284605	754.27	2.24826026	754.27	2.767726898	754.27	3.336613417	754.27	3.763040066	754.27	4.28907299	754.27	4.516798496
870.5	3.111606836	870.5	2.254004955	870.5	2.72761178	870.5	3.289911509	870.5	3.686351299	870.5	4.180016041	870.5	3.69786787
947.99	3.142518759	947.99	1.996211886	947.99	2.46566987	947.99	3.045657396	947.99	3.429419279	947.99	3.750015974	947.99	3.497653008
1044.84	3.350493193	1044.84	2.364188433	1044.84	2.876202345	1044.84	3.320783138	1044.84	2.675062656	1044.84	2.999514341	1044.84	3.23883152
1134.85	3.854235172	1134.85	2.196121454	1134.85	2.744570971	1134.85	3.087471724	1134.85	3.214880228	1134.85	3.40217638	1134.85	3.530450583
1251.18	3.490711451	1251.18	2.105843067	1251.18	2.568990469	1251.18	3.10763216	1251.18	3.480506659	1251.18	3.397166967	1251.18	3.418609142
1353.32	3.581417561	1353.32	1.642957091	1353.32	1.913918138	1353.32	2.164697409	1353.32	2.513470173	1353.32	2.959820271	1353.32	3.276737213
1425.6	3.995445728	1425.6	1.76584208	1425.6	2.047630548	1425.6	2.499600172	1425.6	2.886327028	1425.6	3.35095191	1425.6	3.700675964
1551.52	2.874196529	1551.52	2.297993183	1551.52	2.831849337	1551.52	3.29110837	1551.52	1.987472773	1551.52	2.335641861	1551.52	2.542364836
1645.89	3.000026941	1645.89	2.412563324	1645.89	2.992352247	1645.89	3.671649456	1645.89	4.107242107	1645.89	2.298070669	1645.89	2.597097397
1745.34	1.419588089	1745.34	1.271828771	1745.34	0.374024212	1745.34	0.612818122	1745.34	0.80493927	1745.34	1.045722723	1745.34	1.24345541
1846.79	3.173028469	1846.79	2.475396872	1846.79	3.100571156	1846.79	3.684305429	1846.79	4.030702114	1846.79	2.635053873	1846.79	2.861521482
1943.2	4.424213886	1943.2	1.929999948	1943.2	2.319247484	1943.2	2.638061762	1943.2	2.466350794	1943.2	3.797864437	1943.2	4.189178467
2048.51	2.906226397	2048.51	2.219758034	2048.51	2.721997261	2048.51	3.277062654	2048.51	3.615992069	2048.51	3.951519012	2048.51	3.038144827
2147.4	3.096805096	2147.4	2.338124752	2147.4	2.920098305	2147.4	3.524108171	2147.4	3.914994478	2147.4	4.503354549	2147.4	4.235442162
2249.05	2.023352861	2249.05	2.468644142	2249.05	1.351000905	2249.05	0.803338289	2249.05	1.084716439	2249.05	1.456405997	2249.05	1.731252789
2348.05	4.287589073	2348.05	2.199077845	2348.05	2.69446826	2348.05	3.241208792	2348.05	3.631913662	2348.05	3.931488037	2348.05	4.022571087
2441.36	4.17590332	2441.36	2.436615467	2441.36	2.912823915	2441.36	2.525366068	2441.36	2.710033894	2441.36	3.258345127	2441.36	3.765317202
2544.08	3.952722549	2544.08	2.398552895	2544.08	2.789872885	2544.08	3.266804218	2544.08	2.940839052	2544.08	3.226047277	2544.08	3.616457224
2645.8	3.902448416	2645.8	1.875349641	2645.8	2.311301708	2645.8	2.831725121	2645.8	3.235344648	2645.8	3.77268362	2645.8	4.07990694
2742.83	3.176100731	2742.83	1.907185793	2742.83	2.338008165	2742.83	2.809354067	2742.83	2.973177433	2742.83	2.836844921	2742.83	3.029089212
2844.37	3.689989328	2844.37	2.273057699	2844.37	2.868818045	2844.37	3.189250708	2844.37	2.577575922	2844.37	2.855574369	2844.37	3.268930912
2935.8	4.241570473	2935.8	2.264400005	2935.8	2.769975424	2935.8	3.397620201	2935.8	3.842506647	2935.8	3.63887763	2935.8	3.985328674
3020.65	2.958565235	3020.65	2.306562185	3020.65	2.879511118	3020.65	3.676714897	3020.65	4.317813396	3020.65	4.958456993	3020.65	2.987204552
3133.22	2.892803431	3133.22	2.243953705	3133.22	2.830340862	3133.22	3.523970842	3133.22	3.412109375	3133.22	2.175982237	3133.22	2.707642078
3233.79	4.181791782	3233.79	1.936094165	3233.79	2.390562534	3233.79	3.02872324	3233.79	3.451993465	3233.79	3.861609697	3233.79	4.092702389
3327.3	4.782934666	3327.3	1.949944615	3327.3	2.437722445	3327.3	3.022139311	3327.3	3.476525068	3327.3	4.052227974	3327.3	4.429865837
3431.95	4.855642319	3431.95	2.171914577	3431.95	2.711390495	3431.95	3.325437546	3431.95	3.75248003	3431.95	4.201432705	3431.95	4.538480282
3530.69	5.427078724	3530.69	2.090618134	3530.69	2.672679901	3530.69	3.395678997	3530.69	3.948801994	3530.69	4.576802254	3530.69	5.019784451
3627.72	4.969460487	3627.72	2.290750265	3627.72	2.773071289	3627.72	3.330588341	3627.72	3.731995821	3627.72	4.267673492	3627.72	4.651538849
3732.61	4.610225677	3732.61	2.135167837	3732.61	2.639624119	3732.61	3.184592009	3732.61	3.612842798	3732.61	4.053394318	3732.61	4.373222351
3924.45	5.104465961	3924.45	2.359345436	3924.45	2.86768508	3924.45	3.303678274	3924.45	3.707674742	3924.45	4.294125557	3924.45	4.695009708
4025.42	5.150004864	4025.42	2.296461344	4025.42	2.75142622	4025.42	3.338035107	4025.42	3.798663616	4025.42	4.327486992	4025.42	4.752797604
4127.4	5.145168304	4127.4	2.655558586	4127.4	3.156490803	4127.4	3.773305655	4127.4	4.09675312	4127.4	4.524348736	4127.4	4.935251713

4229.91	4.566906452	4229.91	2.015562773	4229.91	2.567733049	4229.91	3.21001935	4229.91	3.524240732	4229.91	4.057714462	4229.91	4.345502377
4284.28	1.850292563	4284.28	0.835739076	4284.28	1.321419001	4284.28	1.538870335	4284.28	1.673491478	4284.28	1.623676777	4284.28	1.823855042
4326.65	5.126880646	4326.65	2.066061497	4326.65	2.671705246	4326.65	3.263078928	4326.65	3.623650074	4326.65	4.260176182	4326.65	4.860029221
4463.44	4.583981037	4463.44	2.032129049	4463.44	2.640650034	4463.44	3.311764717	4463.44	3.70207262	4463.44	4.264324665	4463.44	4.463983536
4726.29	4.978009224	4726.29	2.45314455	4726.29	2.961586475	4726.29	3.413385868	4726.29	3.678003788	4726.29	4.18439579	4726.29	4.728346348
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.74512291	5088.67	2.25167346	5088.67	2.758068085	5088.67	3.167146683	5088.67	0.896869123	5088.67	0.947973013
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

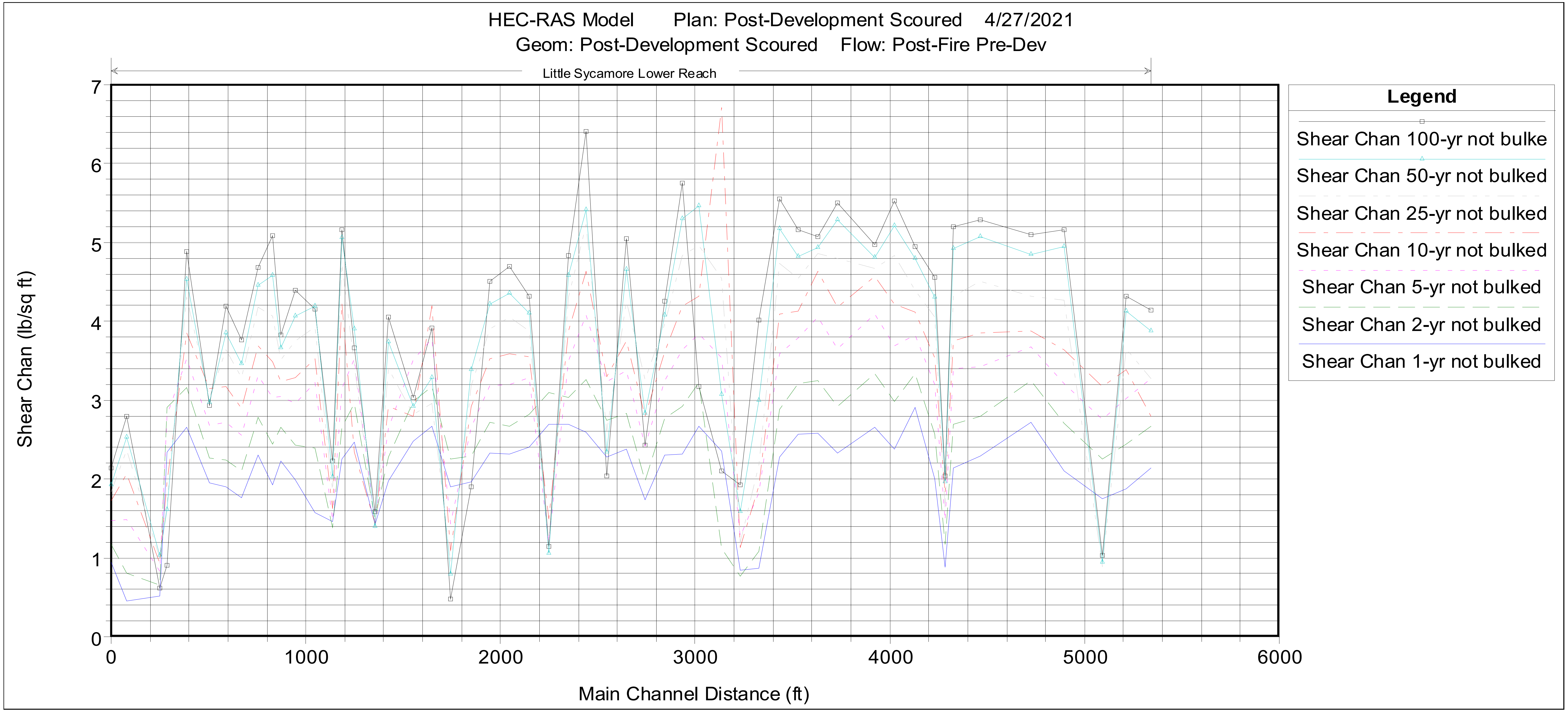
Post-Fire, Post-Development



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.703388453	77.6	1.141696811	77.6	1.368046522	77.6	1.680717111	77.6	1.987666726	77.6	2.314466	77.6	2.439956188
248.94	0.818382263	248.94	1.813119888	248.94	2.181265354	248.94	0.60166049	248.94	0.704857647	248.94	0.815811217	248.94	0.818742573
286.79	1.172142148	286.79	1.734660506	286.79	2.073633909	286.79	1.042935371	286.79	1.05845511	286.79	1.076459289	286.79	1.106020093
387.49	4.589851379	387.49	2.188152552	387.49	2.608703852	387.49	3.072193623	387.49	3.589620113	387.49	4.044895649	387.49	4.253977776
505.31	2.339621305	505.31	1.525794387	505.31	1.724587321	505.31	1.954495549	505.31	2.074371099	505.31	2.182151079	505.31	2.229355335
589.23	4.176728725	589.23	1.88110733	589.23	2.196297884	589.23	2.66608882	589.23	3.118161917	589.23	3.577818394	589.23	3.791172504
668.97	3.530309916	668.97	1.575666308	668.97	1.890519023	668.97	2.311037779	668.97	2.68997097	668.97	3.066508293	668.97	3.214378834
754.27	4.513989449	754.27	2.096242428	754.27	2.541588545	754.27	3.061299086	754.27	3.471279621	754.27	3.936411619	754.27	4.18943119
829.94	5.092406273	829.94	1.533261538	829.94	1.972465038	829.94	2.610453606	829.94	3.166508198	829.94	3.925302744	829.94	4.580565929
870.5	3.695412874	870.5	2.050345421	870.5	2.406298876	870.5	2.730717659	870.5	2.991778374	870.5	3.280050516	870.5	3.52248764
947.99	3.270717382	947.99	1.945144296	947.99	2.400224447	947.99	2.913832426	947.99	3.279509306	947.99	3.721509457	947.99	4.040867329
1044.84	3.341142893	1044.84	2.002196312	1044.84	2.415961504	1044.84	2.891813278	1044.84	3.222553492	1044.84	3.420023203	1044.84	3.322248697
1134.85	3.930010557	1134.85	1.740577579	1134.85	2.159100533	1134.85	2.626650333	1134.85	2.985991478	1134.85	3.412624121	1134.85	3.698951483
1186.13	4.251726151	1186.13	1.941067696	1186.13	2.684263229	1186.13	3.542742014	1186.13	3.997159481	1186.13	4.533449173	1186.13	4.39303875
1251.18	3.296373129	1251.18	2.114600658	1251.18	2.593178272	1251.18	2.605823755	1251.18	3.163478374	1251.18	3.061168432	1251.18	3.17055583
1353.32	3.482430935	1353.32	1.561947346	1353.32	1.918657541	1353.32	2.324704409	1353.32	2.617501497	1353.32	2.954262495	1353.32	3.194576263
1425.6	3.988613605	1425.6	1.7589463	1425.6	2.045609474	1425.6	2.472081423	1425.6	2.896196842	1425.6	3.366747618	1425.6	3.706145287
1551.52	2.842478752	1551.52	1.800990582	1551.52	1.930176497	1551.52	2.118559122	1551.52	2.281148672	1551.52	2.53412509	1551.52	2.646815062
1645.89	3.891829014	1645.89	2.31668067	1645.89	2.827485085	1645.89	2.290580988	1645.89	2.46901226	1645.89	3.024615288	1645.89	3.664481163
1745.34	0.538135886	1745.34	1.701598048	1745.34	2.069151163	1745.34	0.564451039	1745.34	2.674675226	1745.34	1.250567675	1745.34	0.954371393
1846.79	2.179247379	1846.79	1.831426859	1846.79	2.171171427	1846.79	2.547992229	1846.79	2.7947402	1846.79	3.148342133	1846.79	3.360514641
1943.2	4.321713448	1943.2	2.143776417	1943.2	2.509639263	1943.2	2.94651413	1943.2	3.27197504	1943.2	3.733614683	1943.2	4.047966003
2048.51	4.407795429	2048.51	1.950847983	2048.51	2.439461708	2048.51	2.953485489	2048.51	3.357496977	2048.51	3.851572514	2048.51	4.160010815
2147.4	4.109573364	2147.4	2.026242495	2147.4	2.441935301	2147.4	2.872155905	2147.4	3.198229074	2147.4	3.584641695	2147.4	3.837845564
2249.05	1.566898227	2249.05	2.074809313	2249.05	2.529220343	2249.05	3.061310053	2249.05	3.462342262	2249.05	2.075015545	2249.05	1.554825425
2348.05	3.327395201	2348.05	1.969970465	2348.05	2.430294275	2348.05	2.988370657	2348.05	3.350782871	2348.05	2.921376705	2348.05	3.063514948
2441.36	4.232916355	2441.36	2.242810726	2441.36	2.721218348	2441.36	3.26123333	2441.36	4.583899021	2441.36	3.248616695	2441.36	3.784754992
2544.08	3.834454298	2544.08	1.744105816	2544.08	2.133593798	2544.08	2.580547333	2544.08	2.747323513	2544.08	3.386411905	2544.08	3.662545443
2645.8	4.494993687	2645.8	1.878621101	2645.8	2.361494541	2645.8	2.933747768	2645.8	3.352637291	2645.8	3.88863039	2645.8	4.254697323
2742.83	0.757985353	2742.83	0.276474565	2742.83	0.397040039	2742.83	0.507766187	2742.83	0.570455849	2742.83	0.647778332	2742.83	0.709769368
2844.37	3.660311222	2844.37	1.737481475	2844.37	2.142537832	2844.37	2.621665716	2844.37	2.983970881	2844.37	3.307453156	2844.37	3.545269251
2935.8	5.54168272	2935.8	2.178490877	2935.8	2.737053871	2935.8	3.405778408	2935.8	3.942078114	2935.8	4.604347706	2935.8	5.097040176
3020.65	2.909868717	3020.65	2.53184247	3020.65	3.058018446	3020.65	3.681459665	3020.65	4.218832016	3020.65	4.833191395	3020.65	2.858137608
3133.22	2.17925024	3133.22	2.258458614	3133.22	2.817173004	3133.22	5.171425343	3133.22	3.896897793	3133.22	4.520766258	3133.22	3.31910944
3233.79	3.229267597	3233.79	1.96869576	3233.79	2.443116903	3233.79	1.909534216	3233.79	1.404062986	3233.79	1.861769438	3233.79	2.576592445
3327.3	4.746603489	3327.3	1.976385117	3327.3	2.460542917	3327.3	3.023250103	3327.3	3.496150255	3327.3	4.025384903	3327.3	4.359009266
3431.95	4.787042141	3431.95	2.139727116	3431.95	2.648216248	3431.95	3.200370789	3431.95	3.62610817	3431.95	4.133219719	3431.95	4.470973969
3530.69	4.741533756	3530.69	2.091272831	3530.69	2.545295238	3530.69	3.121544361	3530.69	3.533170462	3530.69	4.05039978	3530.69	4.407945633
3627.72	4.452517986	3627.72	2.197816133	3627.72	2.635948896	3627.72	3.128293037	3627.72	3.482616425	3627.72	3.860357046	3627.72	4.131286621
3732.61	4.672281265	3732.61	2.176596165	3732.61	2.68512702	3732.61	3.268046618	3732.61	3.648741007	3732.61	4.108590603	3732.61	4.414248943
3924.45	4.491084576	3924.45	2.32625246	3924.45	2.778359175	3924.45	3.246356487	3924.45	3.574937105	3924.45	3.959542513	3924.45	4.218408108

4025.42	5.100600243	4025.42	2.238582373	4025.42	2.758176565	4025.42	3.350358486	4025.42	3.8073771	4025.42	4.357707024	4025.42	4.731964588
4127.4	4.825512886	4127.4	2.597528934	4127.4	3.105097055	4127.4	3.620461702	4127.4	3.854121447	4127.4	4.230101109	4127.4	4.640548229
4229.91	4.51708889	4229.91	2.010860443	4229.91	2.571186066	4229.91	3.194596529	4229.91	3.536028385	4229.91	4.024029255	4229.91	4.312310696
4284.28	2.017047405	4284.28	0.943041921	4284.28	1.179848909	4284.28	1.355609417	4284.28	1.516325474	4284.28	1.896381497	4284.28	1.971314549
4326.65	5.127000332	4326.65	2.065654039	4326.65	2.671665192	4326.65	3.261983156	4326.65	3.623684168	4326.65	4.260208607	4326.65	4.860124111
4463.44	4.603263855	4463.44	2.031263351	4463.44	2.650016785	4463.44	3.349256992	4463.44	3.748144388	4463.44	4.273152828	4463.44	4.513811588
4726.29	4.968895912	4726.29	2.454773426	4726.29	2.967579603	4726.29	3.421108484	4726.29	3.700984001	4726.29	4.195031643	4726.29	4.746049881
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.74512291	5088.67	2.25167346	5088.67	2.758068085	5088.67	3.167146683	5088.67	0.896869123	5088.67	0.947973013
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

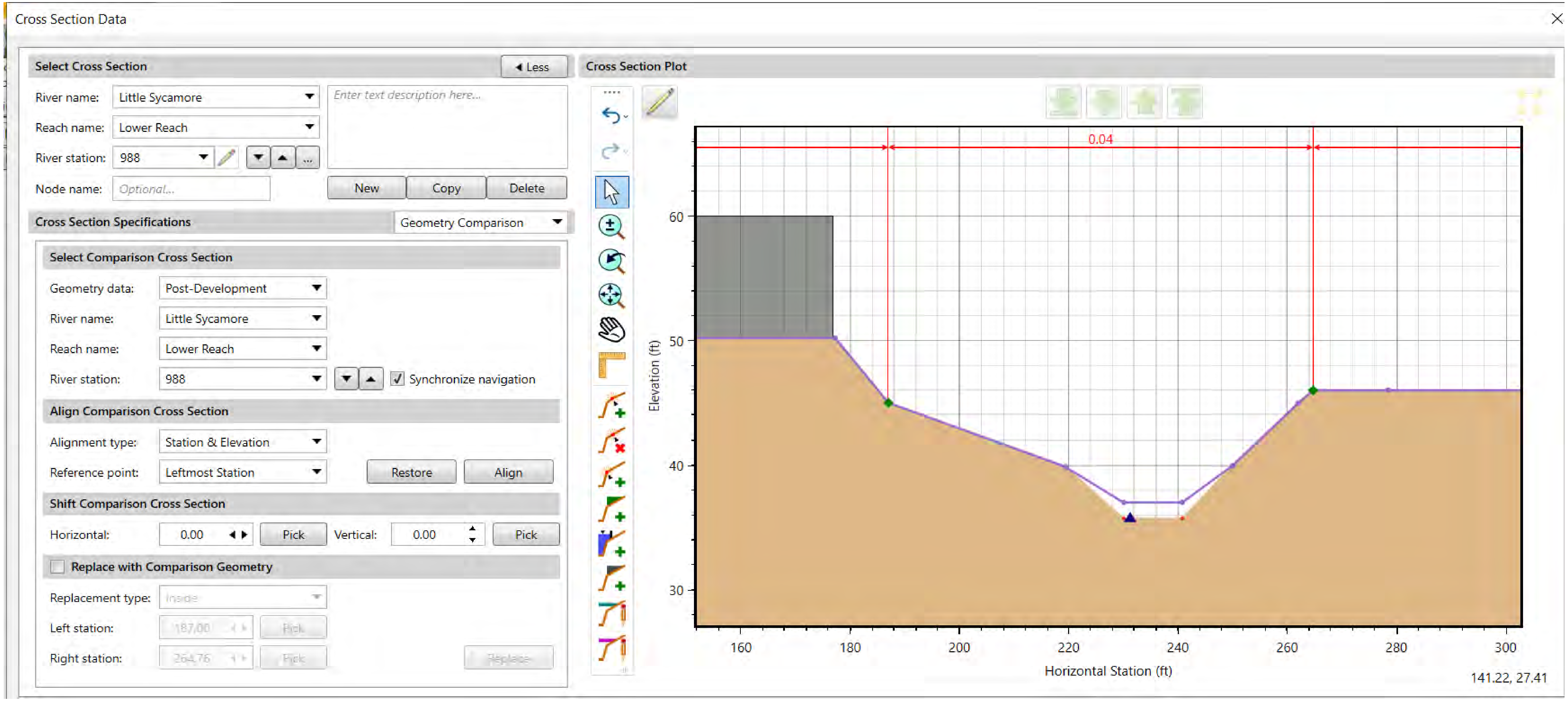
Post Development with Scour



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.800700665	77.6	0.450432092	77.6	0.810203433	77.6	1.488419414	77.6	2.067630529	77.6	2.361685276	77.6	2.533234119
248.94	0.61399895	248.94	0.510533929	248.94	0.660030603	248.94	0.834961295	248.94	0.930115759	248.94	0.998967588	248.94	1.031199574
286.79	0.90568912	286.79	2.343175888	286.79	2.905864716	286.79	2.806242228	286.79	1.958188772	286.79	1.672083497	286.79	1.610926151
387.49	4.880543232	387.49	2.655575991	387.49	3.162184238	387.49	3.525389433	387.49	3.850014448	387.49	4.304958344	387.49	4.532369614
505.31	2.92975235	505.31	1.955260873	505.31	2.270879984	505.31	2.685689926	505.31	3.142838955	505.31	3.028710365	505.31	2.97584939
589.23	4.19210434	589.23	1.90626514	589.23	2.235415459	589.23	2.714730024	589.23	3.169786692	589.23	3.632832527	589.23	3.847948313
668.97	3.759789467	668.97	1.761220694	668.97	2.108423233	668.97	2.552453995	668.97	2.900464058	668.97	3.285674334	668.97	3.455943346
754.27	4.68725872	754.27	2.299429893	754.27	2.776388407	754.27	3.310473919	754.27	3.694975853	754.27	4.179368019	754.27	4.459667683
829.94	5.088226318	829.94	1.932383657	829.94	2.436626196	829.94	3.040217638	829.94	3.486223221	829.94	4.066179276	829.94	4.586238384
870.5	3.831036329	870.5	2.234609604	870.5	2.656130314	870.5	3.049030781	870.5	3.238527536	870.5	3.511985064	870.5	3.665446281
947.99	4.39464283	947.99	1.986897349	947.99	2.433868408	947.99	2.954331398	947.99	3.288722038	947.99	3.753118515	947.99	4.069470406
1044.84	4.157723904	1044.84	1.57615602	1044.84	2.390345573	1044.84	3.217099667	1044.84	3.528017521	1044.84	3.923645258	1044.84	4.191583633
1134.85	2.228172779	1134.85	1.462739706	1134.85	1.387800932	1134.85	1.47043705	1134.85	1.625304222	1134.85	1.850923419	1134.85	2.029774904
1186.13	5.16698122	1186.13	2.258691788	1186.13	2.657833338	1186.13	3.141887426	1186.13	4.233765125	1186.13	4.73568058	1186.13	5.056593895
1251.18	3.666116714	1251.18	2.462536335	1251.18	2.962927103	1251.18	3.526185036	1251.18	2.346624613	1251.18	3.449034929	1251.18	3.904093504
1353.32	1.581783533	1353.32	1.422588587	1353.32	1.497657537	1353.32	1.448587894	1353.32	1.435178518	1353.32	1.383013606	1353.32	1.402405739
1425.6	4.04879427	1425.6	1.980154753	1425.6	2.274729967	1425.6	2.642222166	1425.6	2.926282883	1425.6	3.405030012	1425.6	3.733216047
1551.52	3.032073021	1551.52	2.480365276	1551.52	2.981884003	1551.52	3.509203434	1551.52	2.797260761	1551.52	2.819491148	1551.52	2.923645735
1645.89	3.916155815	1645.89	2.66700387	1645.89	3.173490763	1645.89	3.771393061	1645.89	4.188324928	1645.89	2.958190918	1645.89	3.283647537
1745.34	0.480857134	1745.34	1.895206094	1745.34	2.251318693	1745.34	1.430911541	1745.34	1.089304209	1745.34	0.941054344	1745.34	0.789856434
1846.79	1.900241733	1846.79	1.968032956	1846.79	2.289981365	1846.79	2.657705545	1846.79	2.920004845	1846.79	3.187879324	1846.79	3.386994839
1943.2	4.502747059	1943.2	2.325224161	1943.2	2.722008228	1943.2	3.179826021	1943.2	3.520637751	1943.2	3.901517153	1943.2	4.219164848
2048.51	4.690546989	2048.51	2.31448555	2048.51	2.673184872	2048.51	3.200976849	2048.51	3.591954231	2048.51	4.05136776	2048.51	4.358943939
2147.4	4.323764801	2147.4	2.406153679	2147.4	2.821618795	2147.4	3.283292294	2147.4	3.544782162	2147.4	3.87608099	2147.4	4.108220577
2249.05	1.139769793	2249.05	2.692094803	2249.05	3.094177485	2249.05	1.201012135	2249.05	1.50047791	2249.05	1.130627394	2249.05	1.053495169
2348.05	4.840378761	2348.05	2.690585375	2348.05	3.031570435	2348.05	3.505358934	2348.05	3.872674227	2348.05	4.302873135	2348.05	4.579888344
2441.36	6.4142313	2441.36	2.594298363	2441.36	3.260054827	2441.36	4.081573486	2441.36	4.636506081	2441.36	5.228922367	2441.36	5.415633678
2544.08	2.044864416	2544.08	2.283827305	2544.08	2.746570587	2544.08	3.239488602	2544.08	3.297921181	2544.08	2.607882261	2544.08	2.34451437
2645.8	5.050286293	2645.8	2.382595062	2645.8	2.837244511	2645.8	3.371741056	2645.8	3.751538515	2645.8	4.256382942	2645.8	4.663995266
2742.83	2.433570862	2742.83	1.732624769	2742.83	1.97764039	2742.83	2.41729641	2742.83	2.793636084	2742.83	3.256540298	2742.83	2.834443808
2844.37	4.255380154	2844.37	2.303130627	2844.37	2.768572569	2844.37	3.245614529	2844.37	3.61186862	2844.37	3.96100378	2844.37	4.074622154
2935.8	5.750124454	2935.8	2.319115162	2935.8	2.9255898	2935.8	3.644037008	2935.8	4.187333584	2935.8	4.830219269	2935.8	5.301642418
3020.65	3.176444054	3020.65	2.67288208	3020.65	3.217249632	3020.65	3.845665455	3020.65	4.312055111	3020.65	4.963970184	3020.65	5.458473682
3133.22	2.098932505	3133.22	2.354814291	3133.22	1.118947625	3133.22	3.532648087	3133.22	6.715595245	3133.22	4.545220375	3133.22	3.065684319
3233.79	1.920098662	3233.79	0.843539596	3233.79	0.763274848	3233.79	1.271697998	3233.79	1.134733915	3233.79	1.193005085	3233.79	1.588521361
3327.3	4.015743732	3327.3	0.868811309	3327.3	1.079763889	3327.3	1.829590678	3327.3	1.916389227	3327.3	2.178752184	3327.3	2.996569633
3431.95	5.548572063	3431.95	2.281148195	3431.95	2.879059553	3431.95	3.589644432	3431.95	4.097111702	3431.95	4.734415054	3431.95	5.173863411
3530.69	5.156169891	3530.69	2.57200098	3530.69	3.204813957	3530.69	3.792361498	3530.69	4.131856918	3530.69	4.541067123	3530.69	4.822448254
3627.72	5.072691917	3627.72	2.574827433	3627.72	3.248927116	3627.72	4.055029869	3627.72	4.627181053	3627.72	4.854703426	3627.72	4.928986549
3732.61	5.503067017	3732.61	2.328924894	3732.61	2.925653219	3732.61	3.645806789	3732.61	4.181595325	3732.61	4.793232441	3732.61	5.292403698
3924.45	4.97595787	3924.45	2.656090736	3924.45	3.331306934	3924.45	4.091975212	3924.45	4.5703969	3924.45	4.668673992	3924.45	4.805522442

4025.42	5.531811237	4025.42	2.383010387	4025.42	2.982164383	4025.42	3.694983959	4025.42	4.22228384	4025.42	4.834305763	4025.42	5.216771126
4127.4	4.953886986	4127.4	2.909204245	4127.4	3.334248543	4127.4	3.829876184	4127.4	4.117008209	4127.4	4.391065598	4127.4	4.796323776
4229.91	4.558244228	4229.91	2.004521608	4229.91	2.570549488	4229.91	3.20115757	4229.91	3.533443689	4229.91	4.056278229	4229.91	4.311732292
4284.28	2.044019222	4284.28	0.882965982	4284.28	1.16843009	4284.28	1.467133522	4284.28	1.819189429	4284.28	1.619704604	4284.28	1.960428238
4326.65	5.198393345	4326.65	2.134659767	4326.65	2.699781656	4326.65	3.394062281	4326.65	3.754738092	4326.65	4.314439297	4326.65	4.927453995
4463.44	5.289433002	4463.44	2.296989441	4463.44	2.793565989	4463.44	3.424823999	4463.44	3.855123997	4463.44	4.50691843	4463.44	5.071501255
4726.29	5.102583408	4726.29	2.724640608	4726.29	3.244042873	4726.29	3.676114321	4726.29	3.883848906	4726.29	4.315837383	4726.29	4.847494125
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.745121121	5088.67	2.251671076	5088.67	2.758066416	5088.67	3.167144537	5088.67	0.896868765	5088.67	0.947972894
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

Comparitive Sections



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 988

Node name: Optional...

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 988

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

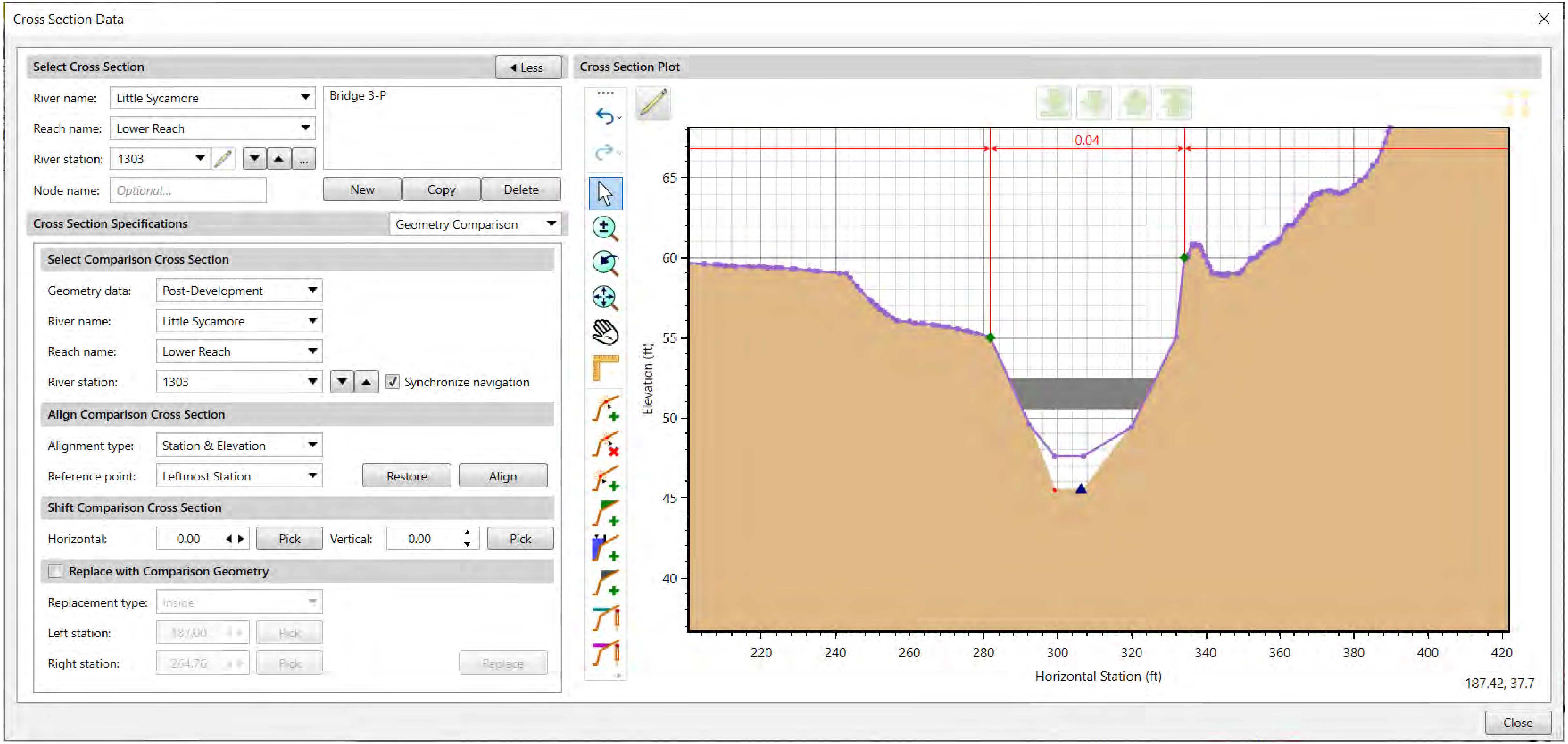
☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 187.00

Right station: 264.76

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Cross Section Plot
0.04
60
50
40
30
Elevation (ft)
160
180
200
220
240
260
280
300
Horizontal Station (ft)
141.22, 27.41



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1303

Node name: Optional...

Bridge 3-P

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1303

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

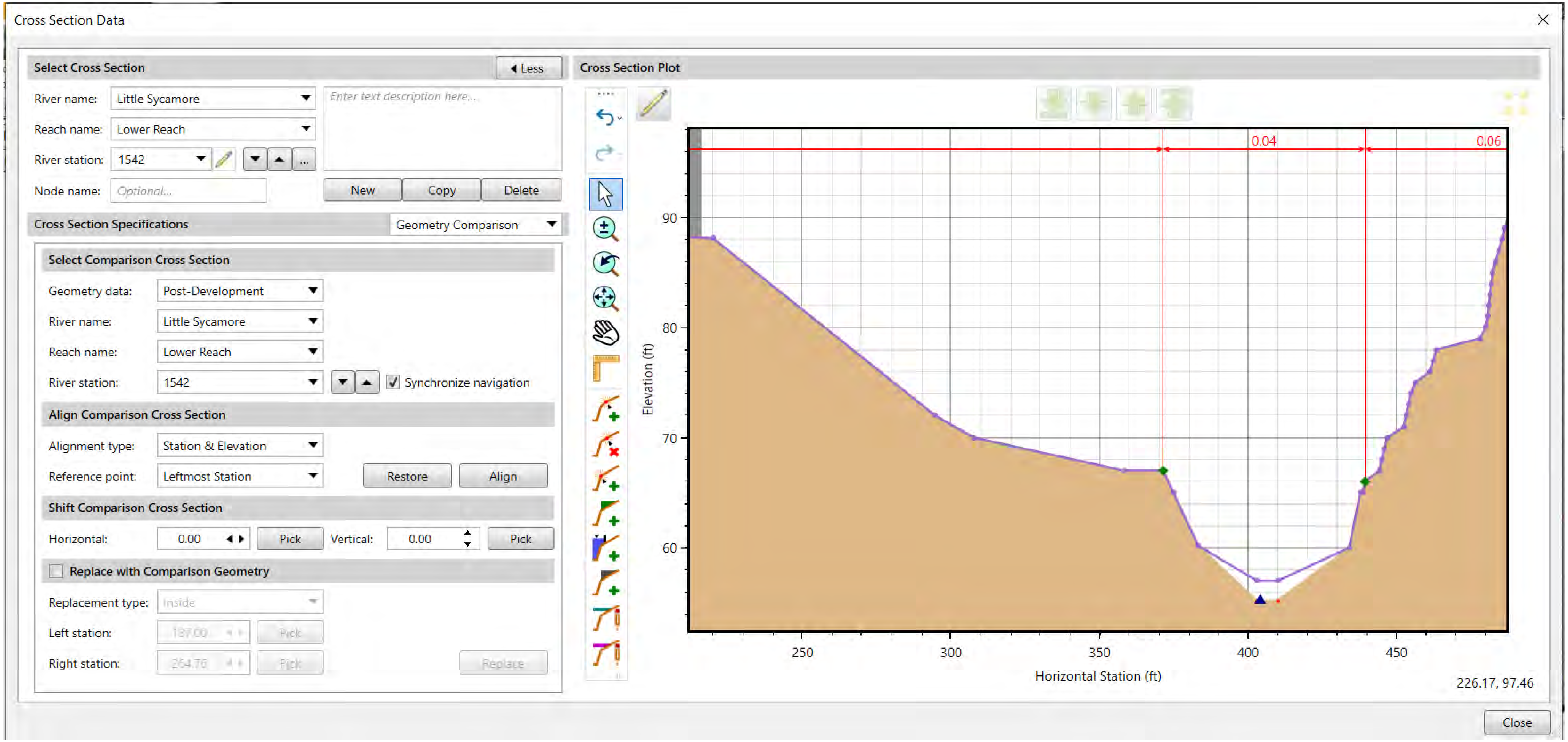
☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 187.00

Right station: 264.76

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Cross Section Plot
0.04
65
60
55
50
45
40
Elevation (ft)
220
240
260
280
300
320
340
360
380
400
420
Horizontal Station (ft)
187.42, 37.7
Close


Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Cross Section Plot
0.04
0.06
90
80
70
60
Elevation (ft)
250
300
350
400
450
Horizontal Station (ft)
Close

Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1542

Enter text description here...

Node name: Optional...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1542

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

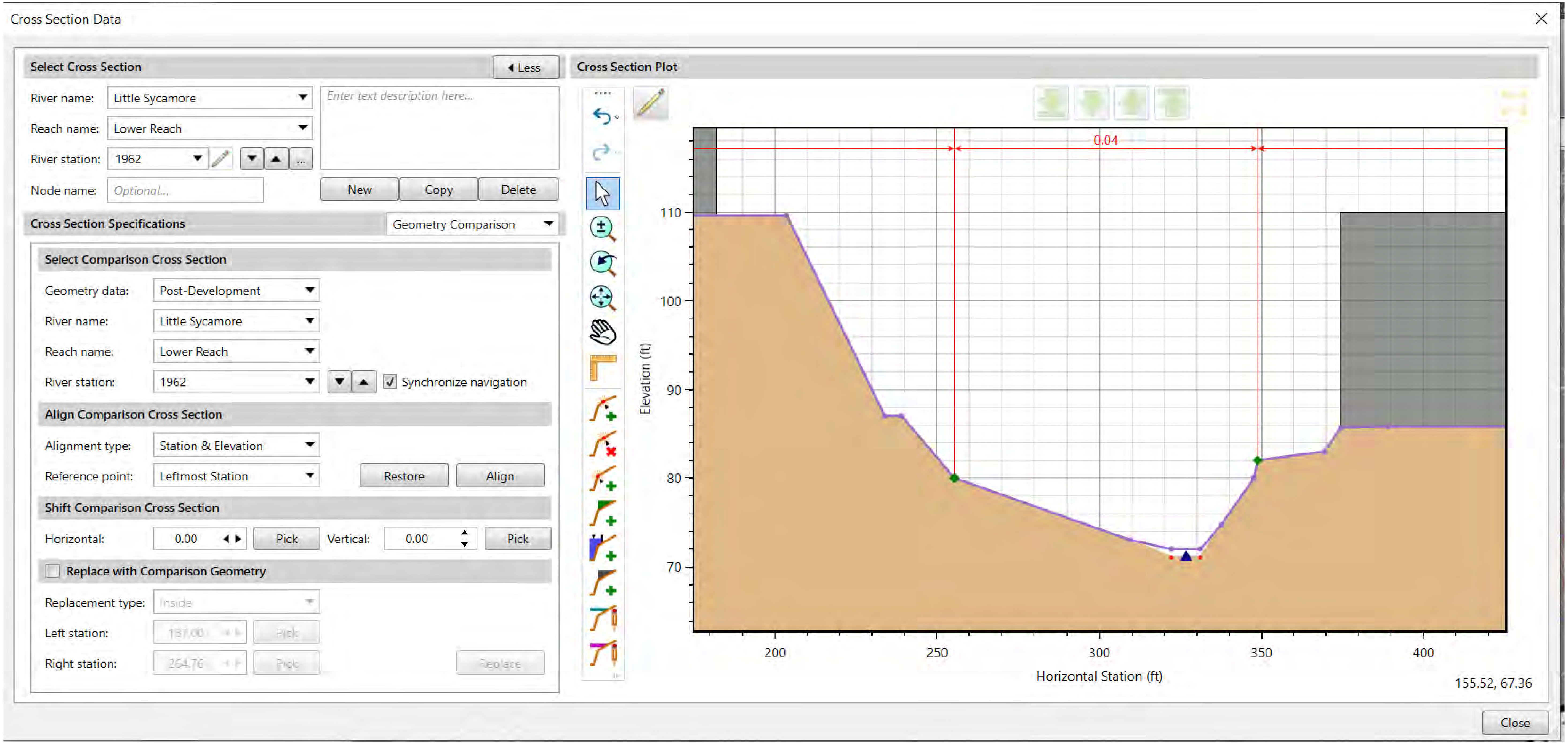
☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 187.00

Right station: 264.76

226.17, 97.46



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1962

Node name: *Optional...*

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1962

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

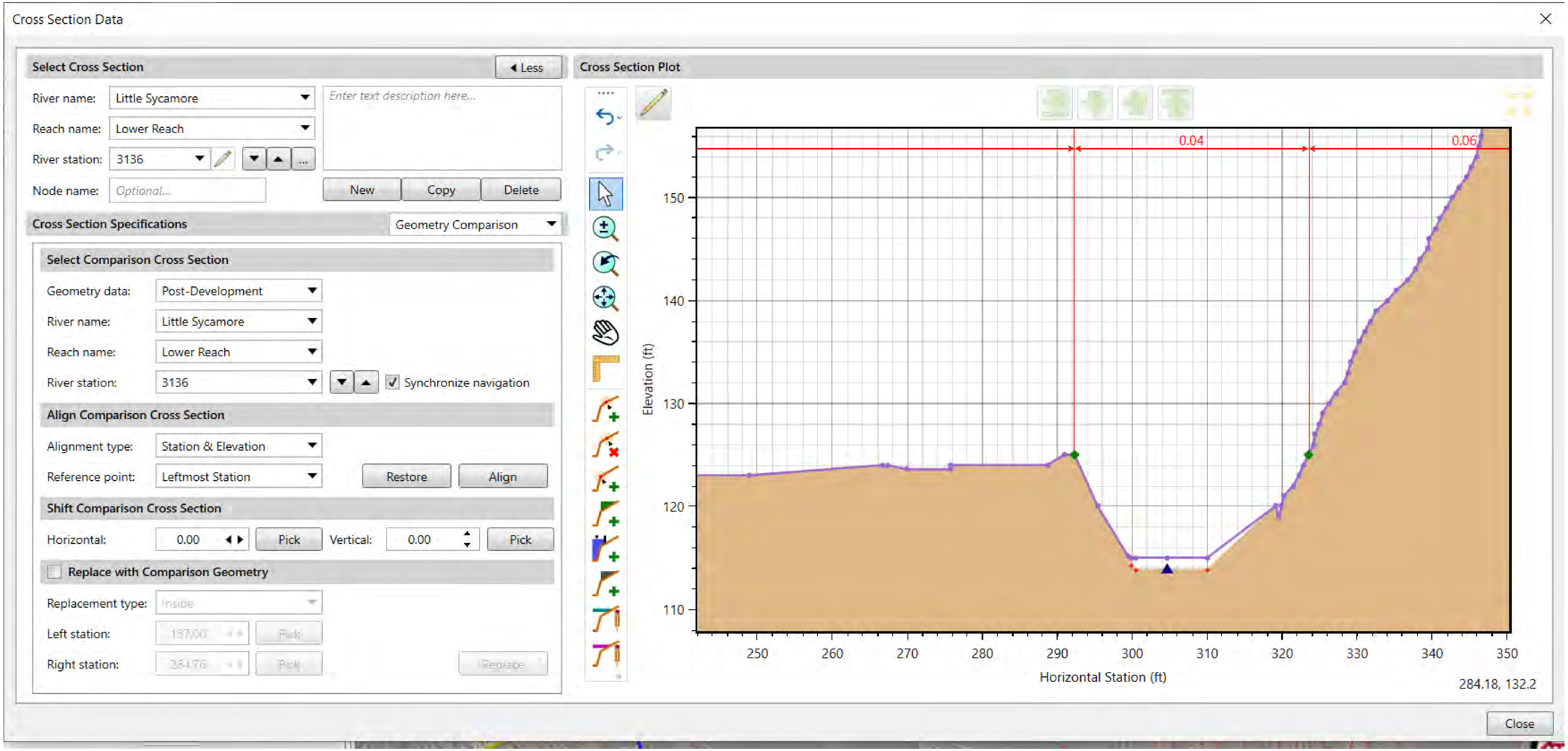
Replacement type: Inside

Left station: 197.00

Right station: 264.76

Cross Section Plot

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
110
100
90
80
70
Elevation (ft)
200
250
300
350
400
Horizontal Station (ft)
155.52, 67.36
Close



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 3136

Node name: *Optional...*

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 3136

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

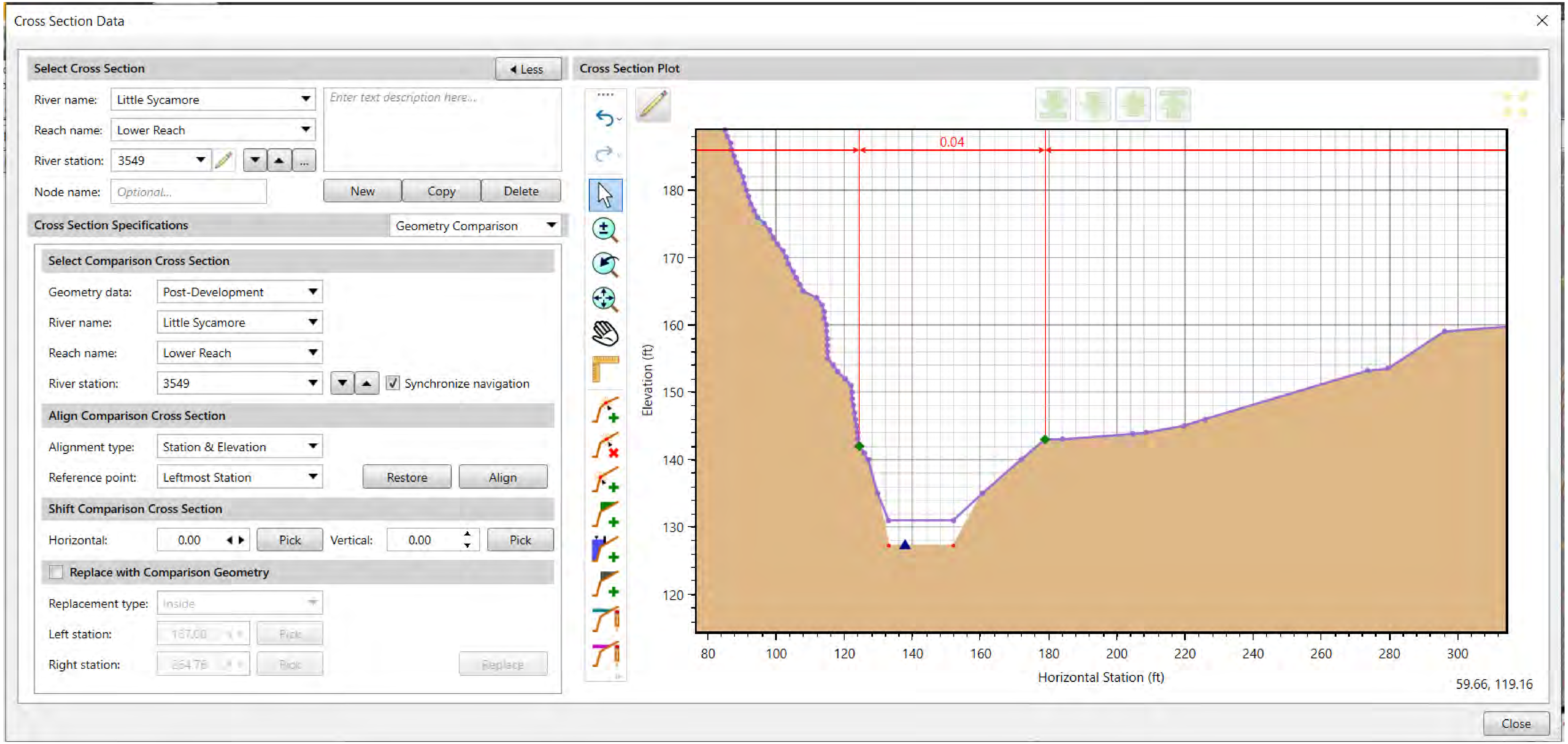
☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 137.00

Right station: 284.76

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Cross Section Plot
0.04
0.06
150
140
130
120
110
Elevation (ft)
250
260
270
280
290
300
310
320
330
340
350
Horizontal Station (ft)
284.18, 132.2
Close



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 3549

Node name: *Optional...*

Enter text description here...

Cross Section Specifications Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 3549

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

Replacement type: Inside

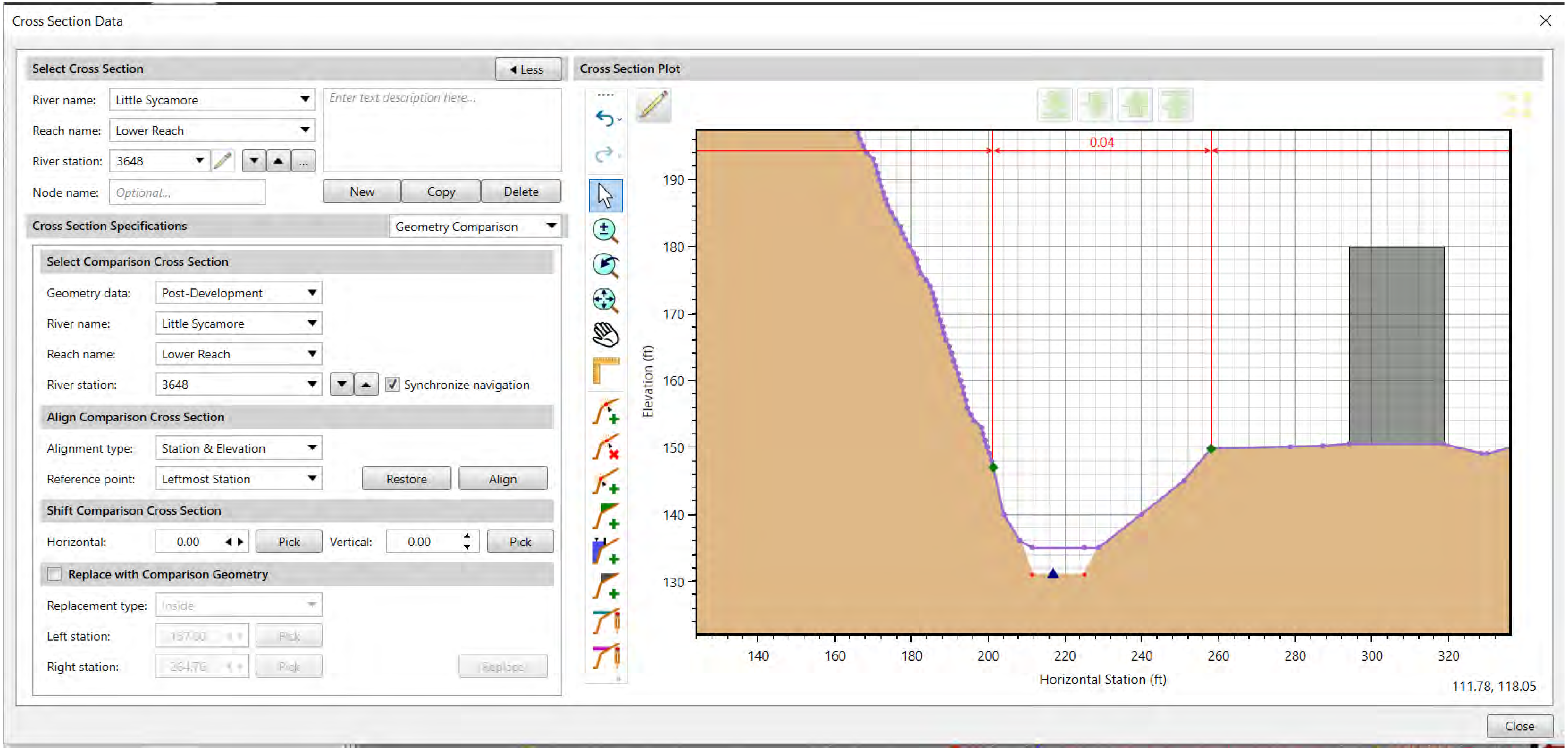
Left station: 167.00

Right station: 254.76

Cross Section Plot

59.66, 119.16

◂ Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
180
170
160
150
140
130
120
Elevation (ft)
80
100
120
140
160
180
200
220
240
260
280
300
Horizontal Station (ft)
Close


Cross Section Data
Select Cross Section
◂ Less
New
Copy
Delete
Cross Section Plot
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
190
180
170
160
150
140
130
Elevation (ft)
140
160
180
200
220
240
260
280
300
320
Horizontal Station (ft)
111.78, 118.05
Close

River name: Little Sycamore
Reach name: Lower Reach
River station: 3648
Enter text description here...
Node name: Optional...

Cross Section Specifications Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development
River name: Little Sycamore
Reach name: Lower Reach
River station: 3648
☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation
Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00
Vertical: 0.00

☐ **Replace with Comparison Geometry**

Replacement type: Inside
Left station: 137.00
Right station: 264.76

APPENDIX B

HYDRAULIC ANALYSIS

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: HEC-RAS Model
Project File : Little Sycamore Creek-WMS Flows-local.prj
Run Date and Time: 5/3/2021 3:48:51 PM

Project in English units

Project Description:
CRS Info=<SpatialReference> <CoordinateSystem Code="2874" Unit="US_survey_Foot" AcadCode="CAHP-VF" /></SpatialReference>

PLAN DATA

Plan Title: Post-Development Scoured
Plan File : C:\Users\csteward\Documents\1-Stantec\CHK\Drainage\GeoHECRAS\Little Sycamore Creek-WMS Flows-local.p05

Geometry Title: Post-Development Scoured
Geometry File : C:\Users\csteward\Documents\1-Stantec\CHK\Drainage\GeoHECRAS\Little Sycamore Creek-WMS Flows-local.g06

Flow Title   : Post-Fire Pre-Dev
Flow File   : C:\Users\csteward\Documents\1-Stantec\CHK\Drainage\GeoHECRAS\Little Sycamore Creek-WMS Flows-local.f01

Plan Description:
Post-Development Condition with creek bottom scoured to pre-2017 level

Plan Summary Information:
Number of: Cross Sections =   53   Multiple Openings =   0

```
         Culverts       =    1    Inline Structures  =    0
         Bridges        =    5    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         =  0.33
    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: Post-Fire Pre-Dev
Flow File : C:\Users\csteward\Documents\1-Stantec\CHK\Drainage\GeoHECRAS\Little Sycamore Creek-WMS Flows-
local.f01

Flow Data (cfs)

  River           Reach           RS          100-yr bulked 1-yr not bulked 2-yr not bulked 5-yr not bulked10-yr not bulked25-yr
not bulked50-yr not bulked
  Little Sycamore Lower Reach     5459                3650          310          570          980          1300          1890
2575
  Little Sycamore Lower Reach     4143                4065          315          550          950          1350          1970
2490
  Little Sycamore Lower Reach     787                 4065          325          535          920          1395          2035
2395


Boundary Conditions

  River           Reach           Profile                    Upstream               Downstream

  Little Sycamore Lower Reach     100-yr bulked                Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     1-yr not bulked              Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     2-yr not bulked              Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     5-yr not bulked              Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     10-yr not bulked              Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     25-yr not bulked              Critical        Normal S = 0.023226
  Little Sycamore Lower Reach     50-yr not bulked              Critical        Normal S = 0.023226




GEOMETRY DATA
```

Geometry Title: Post-Development Scoured
Geometry File : C:\Users\csteward\Documents\1-Stantec\CHK\Drainage\GeoHECRAS\Little Sycamore Creek-WMS Flows-local.g06

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 5459

INPUT
Description:
Station Elevation Data   num=   240

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     372    1.48     372    3.34     371    5.03     370    10.2     369
   12.28     368   14.56     367   17.32     366   19.66     365   22.27     364
   23.43     363   24.86     362   26.38     361   28.57     360   30.33     359
   32.71     358   34.92     357   36.91     356    37.8     355    38.5     354
   39.21     353   40.09     352   41.21     351   41.88     350   42.66     349
   43.24     348   43.91     347    44.5     346   44.95     345   45.83     344
    46.5     343   47.38     342   48.17     341   48.73     340    49.6     339
   50.18     338   51.38     337    52.4     336   53.43     335   54.21     334
   54.87     333   56.73     332   58.83     331   60.17     330   60.96     329
   62.59     328    63.6     327   64.22     326   65.08     325   65.61     324
   66.15     323   66.96     322   67.59     321   68.14     320   69.21     319
    70.5     318   71.19     317   72.61     316   73.88     315   75.37     314
   77.14     313    78.4     312   79.52     311   80.53     310   81.65     309
   82.34     308   82.95     307    88.7     307   96.52     308   104.7     309
  119.44     310  130.04     311  132.65     312  136.78     312  139.73     311
  141.87     310   142.6     309  143.04     308   144.1     307  145.35     306
  145.49  305.91  146.86     305  148.41     304  150.03     303  151.36     302
  152.82     301  154.78     300  155.87     299  156.81     298  157.98     297
  159.63     296  160.74     295  162.11     294  163.65     293  165.47     292
  166.58     291   167.9     290   169.7     289  170.77     288  173.16     287
  175.26     286  176.24     285  177.13     284  177.97     283  178.91     282
  180.44     281  181.89     280  183.56     279  185.06     278  186.19     277
  187.33     276   188.8     275  189.99     274  191.71     273  193.08     272
   194.5     271  195.65     270  196.82     269  198.55     268  199.51     267
  200.73     266  201.67     265  203.71     264   205.7     263  206.69     262
   208.1     261  209.16     260  210.22     259  211.94     258  213.03     257
  214.27     256  215.67     255  216.85     254  218.83     253   220.5     252
  221.15     251  222.05     250  223.13     249  225.87     248  227.17     247
  227.94     246  228.64     245  230.96     244  231.81     243  232.76     242
  233.94     241  235.15     240  236.19     239  237.49     238  238.42     237
   240.1     237  240.72     237  241.51     236  242.13     235  243.01     234
  245.31     233  245.89     232     247     231  248.64     230  249.84     229
  251.71     228  252.47     227  253.88     226  254.71     225  256.18     224
  256.94     223  257.32     222  257.65     221  257.97     220  258.33     219
  259.27     218  261.95     218  272.34     219  274.41     220  275.91     221
  286.66     221  290.86     221  300.36     222  302.68     222  303.02     221
  304.47     220  307.42     219  308.34     218  311.39     217   312.4     217
  315.82     217  324.93     217  327.73     217  329.78     218  331.74     219
  332.17     220  332.59     221  332.97     222  333.32     223  333.85     224
  334.33     225  334.92     226   335.7     227  336.29     228  339.19     229
  340.4     230  341.92     231  343.42     232  344.84     233  346.19     234
 347.39     235  348.77     236  349.59     237  350.44     238  351.88     239
    353     240  353.25     241  353.74     242  353.97     243  354.34     244
 354.81     245  355.81     246  356.52     247  357.31     248  357.98     249
 358.59     250  359.31     251  359.88     252  360.86     253  361.44     254
 361.97     255  362.59     256  363.21     257  364.42     258  365.16     259
 366.61     260  367.64     261   368.3     262  368.83     263  369.39     264
  370.2     265  372.07     266  372.76     267  373.86     268  445.49     268

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .08  300.36     .04  332.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        300.36  332.97           125.24  125.24  125.24             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0  275.86  221.36       T

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            227.20    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.43    Wt. n-Val.               0.080      0.040      0.060
  W.S. Elev (ft)            224.77    Reach Len. (ft)          125.24     125.24     125.24
  Crit W.S. (ft)            224.77    Flow Area (sq ft)        153.12     216.74       1.61
  E.G. Slope (ft/ft)      0.012813    Area (sq ft)             200.62     216.74       1.61
  Q Total (cfs)            3650.00    Flow (cfs)               679.30    2967.74       2.96
  Top Width (ft)             79.18    Top Width (ft)            45.31      32.61       1.25
  Vel Total (ft/s)            9.83    Avg. Vel. (ft/s)           4.44      13.69       1.83
  Max Chl Dpth (ft)           7.77    Hydr. Depth (ft)           3.38       6.65       1.29
  Conv. Total (cfs)        32245.0    Conv. (cfs)              6001.1    26217.8       26.1
  Length Wtd. (ft)          125.24    Wetted Per. (ft)          49.96      36.89       3.05
  Min Ch El (ft)            217.00    Shear (lb/sq ft)           2.45       4.70       0.42
  Alpha                       1.62    Stream Power (lb/ft s)    10.88      64.36       0.78
  Frctn Loss (ft)             1.62    Cum Volume (acre-ft)       4.39      38.73       1.65
  C & E Loss (ft)             0.04    Cum SA (acres)             1.54       5.95       0.90


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 5334
```

INPUT
Description:
Station Elevation Data num= 269

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	393	1.31	393	3.49	392	6.55	391	9.84	390
11.53	389	13.94	388	16.31	387	18.41	386	20.17	385
22.64	384	24.14	383	26.02	382	28.77	381	30.4	380
33.42	379	35.38	378	37.03	377	38.59	376	41.06	375
43.16	374	44.93	373	47.09	372	49.72	371	52.21	370
53.68	369	55.5	368	57.49	367	59.35	366	61.65	365
63.54	364	65.7	363	67.33	362	68.88	361	70.41	360
72.34	359	74.2	358	76.1	357	77.42	356	79.42	355
80.85	354	81.44	353	82.15	352	82.83	351	83.52	350
84.19	349	85.21	348	86.48	347	87.38	346	87.88	345
88.96	344	90.25	343	91.04	342	92.4	341	93.51	340
94.52	339	95.38	338	96.27	337	97.22	336	98.09	335
99.06	334	100	333	100.82	332	102.58	331	103.47	330
104.24	329	105.52	328	106.41	327	107.26	326	108.31	325
109.26	324	110.06	323	110.5	322	111.23	321	111.83	320
113.44	319	114.7	318	116.05	317	117.12	316	118.51	315
120.47	314	121.24	313	122.18	312	122.91	311	123.78	310
125.26	309	126.55	308	128.01	307	129.06	306	129.91	305
130.93	304	140.05	304	148.29	305	165.83	306	167.96	306
169.93	305	170.95	304	172.51	303	173.58	302	174.75	301
175.83	300	177.38	299	179.48	298	180.49	297	181.67	296
183.13	295	184.19	294	185.69	293	186.61	292	187.48	291
188.79	290	188.98	289.9	190.71	289	192.38	288	195.99	287
199.32	286	202.32	285	205.06	284	207.79	283	211.93	282
214.76	281	217.67	280	219.21	279	220.8	278	221.93	277
223.54	276	224.33	275.5	225.1	275	226.43	274	227.93	273
229.3	272	230.55	271	233.07	270	234.19	269	234.48	268
235.49	267	237.15	266	238.68	265	240.59	264	241.61	263
242.97	262	244.81	261	247.24	260	248.7	259	250.19	258
251.67	257	253.52	256	255.38	255	257.42	254	259.52	253
261.37	252	262.5	251	263.93	250	266.44	249	268.04	248
269.7	247	271.22	246	273.2	245	274.86	244	276.36	243
277	242	278.38	241	279.64	240	280.96	239	282.35	238
283.97	237	285.25	236	286.45	235	287.6	234	288.77	233
290.09	232	291.23	231	292.14	230	293.18	229	293.78	228
294.45	227	296.05	226	297.35	225	298.2	224	299.64	223
301.72	222	303.83	221	304.81	220	305.61	219	306.3	218
307.18	217	307.7	216	315.79	216	317.85	216	320.66	215
321.09	214	321.44	213	326.2	212	332.99	211	336.19	211
338.98	211	342.03	211	346.12	211	350.89	212	353.45	213
354.96	214	356.25	215	357.92	216	358.89	217	359.89	218
361.8	219	363.58	220	365.87	221	367.02	222	368.5	223
370.19	224	370.98	225	371.76	226	372.99	227	375.36	228
376.5	229	377.78	230	378.93	231	379.91	232	381.08	233
381.93	234	382.77	235	383.74	236	386.76	237	388.36	238
390.35	239	391.4	240	392.72	241	394.06	242	395.56	243
397.09	244	398.11	245	398.63	246	399.16	247	402.39	248
404.4	249	406.74	250	408.21	251	409.5	252	411.08	253
412.65	254	413.75	255	415.57	256	417.71	257	419.26	258

```
 420.67     259  421.78     260   423.4     261  424.53     262   426.7     263
 427.74     264     429    265   430.1     266  431.82     267  433.39     268
 434.78     269  436.08     270   437.4     271  438.32     272   439.3     273
 441.17     274  442.56     275   443.7     276  445.05     277  446.38     278
 447.53     279  448.85     280  488.98     280     577     280

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .08  317.85     .04  358.89     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        317.85  358.89           127.22  127.22  127.22             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            221.44    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.86    Wt. n-Val.                 0.080      0.040      0.060
  W.S. Elev (ft)            218.58    Reach Len. (ft)           127.22     127.22     127.22
  Crit W.S. (ft)            218.58    Flow Area (sq ft)          28.35     258.19       1.40
  E.G. Slope (ft/ft)      0.013081    Area (sq ft)               28.35     258.19       1.40
  Q Total (cfs)            3650.00    Flow (cfs)                 99.65    3547.76       2.59
  Top Width (ft)             55.10    Top Width (ft)             11.95      41.04       2.11
  Vel Total (ft/s)           12.68    Avg. Vel. (ft/s)            3.52      13.74       1.85
  Max Chl Dpth (ft)           7.58    Hydr. Depth (ft)            2.37       6.29       0.67
  Conv. Total (cfs)        31913.3    Conv. (cfs)                871.3    31019.4       22.6
  Length Wtd. (ft)          127.22    Wetted Per. (ft)           13.31      44.39       2.67
  Min Ch El (ft)            211.00    Shear (lb/sq ft)            1.74       4.75       0.43
  Alpha                       1.14    Stream Power (lb/ft s)      6.11      65.26       0.79
  Frctn Loss (ft)             0.71    Cum Volume (acre-ft)        4.06      38.05       1.64
  C & E Loss (ft)             0.63    Cum SA (acres)              1.46       5.84       0.90


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 5207
```

```
INPUT
Description:
Station Elevation Data    num=      227
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     340     .41     340    2.12     339    3.17     338    4.16     337
    4.77     336    5.38     335    5.92     334    6.61     333    7.17     332
    8.21     331    9.76     330    10.9     329   11.96     328   13.03     327
   14.25     326    15.3     325   16.41     324   17.63     323   19.01     322
   20.49     321   21.22     320   22.91     319   23.79     318   24.49     317
   25.03     316   25.36     315   25.88     314   26.25     313   26.69     312
   27.12     311   27.86     310   29.53     309   30.84     308   31.26     307
   31.95     306   32.28     305   33.12     304   33.46     303   34.04     302
   34.73     301   35.38     300   35.99     299   53.24     299   56.82     299
   57.62     299   66.14     299   67.56     299   68.92     298   69.95     297
   70.69     296   71.56     295   73.03     294   75.54     293   76.83     292
   78.37     291    79.6     290   80.16     289   80.74     288   81.29     287
   81.91     286   82.86     285   84.13     284    85.1     283   86.25     282
   87.99     281   89.21     280   90.09     279   90.92     278    92.8     277
   93.92     276   94.78     275   95.77     274   96.67     273   97.41     272
   98.49     271  100.22     270  101.32     269  103.21     268  104.15     267
  104.94     266   105.6     265  106.63     264   107.8     263  108.94     262
  110.07     261   111.9     260  113.47     259  114.78     258  116.49     257
  118.14     256  119.24     255  120.35     254  121.41     253  123.11     252
  124.63     251  126.21     250   127.1     249  128.36     248  129.94     247
  133.12     246   134.4     246  136.91     246  138.05     245  138.94     244
  140.52     243  141.25     242  141.77     241  142.63     240   143.5     239
  143.89     238  144.21     237  145.85     236  147.02     235  148.07     234
   149.3     233   150.5     232   152.4     231  153.95     230  154.46  229.59
   155.2     229  158.12     228  159.38     227  160.79     226  161.91     225
     163     224  163.84     223  165.46     222  167.08     221  168.49     220
  170.09     219  171.23     218  172.56     217  173.85     216   175.1     215
  176.33     214  178.86     213  181.52     212  191.34     211  194.71     211
  196.37     211  197.47     210  197.76     209  200.73     208  206.68     207
  214.79     207  217.22     207  218.98  206.56   221.2     206  223.63     205
   227.3     205   230.6     206   238.3     207   239.9     208  240.43     209
  241.03     210  242.16     211  243.72     212  245.86     213  247.03     214
     248     215  249.08     216  250.06     217  251.88     218   253.9     219
  255.75     220  264.77     220  266.46  219.77  271.32     219  276.57     218
  281.38     217  284.68     216  292.88     216  294.04     217  295.04     218
  295.93     219  296.47     220  296.85     221  297.44     222  297.86     223
  298.94     224  300.35     225  301.52     226  302.45     227  303.39     228
  304.34     229  305.02     230  305.53     231  306.06     232   306.4     233
  306.92     234  307.39     235  307.78     236  308.35     237  309.35     238
  309.91     239   310.8     240  311.54     241  313.11     242  314.38     243
  315.58     244  316.64     245   318.1     246  319.65     247  320.51     248
  321.89     249  324.24     250  325.63     251  327.95     252  329.76     253
  331.76     254  333.28     255   334.9     256  336.87     257  338.83     258
  339.92     259   341.3     260  343.57     261  345.19     262  346.66     263
  348.13     264  350.39     265  352.35     266  353.43     267  354.64     268
  356.44     269  356.82     269

Manning's n Values       num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  167.08     .04  255.75     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       167.08  255.75          196.02  196.02  196.02            .3       .5

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            216.73    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.77    Wt. n-Val.                            0.040
  W.S. Elev (ft)            215.96    Reach Len. (ft)           79.82      79.82      79.82
  Crit W.S. (ft)            212.92    Flow Area (sq ft)                    519.05
  E.G. Slope (ft/ft)      0.003046    Area (sq ft)                         519.05
  Q Total (cfs)            3650.00    Flow (cfs)                          3650.00
  Top Width (ft)             75.15    Top Width (ft)                        75.15
  Vel Total (ft/s)            7.03    Avg. Vel. (ft/s)                       7.03
  Max Chl Dpth (ft)          10.96    Hydr. Depth (ft)                       6.91
  Conv. Total (cfs)        66138.4    Conv. (cfs)                         66138.4
  Length Wtd. (ft)           79.82    Wetted Per. (ft)                      81.70
  Min Ch El (ft)            205.00    Shear (lb/sq ft)                       1.21
  Alpha                       1.00    Stream Power (lb/ft s)                 8.49
  Frctn Loss (ft)             0.57    Cum Volume (acre-ft)       4.01      36.92       1.64
  C & E Loss (ft)             0.44    Cum SA (acres)             1.45       5.67       0.89


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.

BRIDGE


RIVER: Little Sycamore
REACH: Lower Reach        RS: 5120

INPUT
Description: Bridge 11-V
Distance from Upstream XS =   79.82
Deck/Roadway Width        =   15.26
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      70
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
  196.46  210.55   -1.81  196.63  210.55       0  213.99  210.54  184.75
  213.99  210.54  208.41     214  210.54  208.41  214.03  210.54  208.41
  215.32  210.54  208.41  215.57  210.54  208.41  215.81  210.54  208.41
   216.3  210.54   208.4  216.81  210.54   208.4  216.98  210.54   208.4
  217.02  210.54   208.4  217.09  210.54   208.4  217.75  210.54   208.4
  218.16  210.54   208.4  218.48  210.54   208.4  218.99  210.54   208.4
   219.2  210.54   208.4  219.33  210.54   208.4  219.89  210.53   208.4
  219.93  210.53   208.4  220.51  210.53  208.39  220.65  210.53  208.39
  220.89  210.53  208.39  221.38  210.53  208.39  221.68  210.53  208.39
  222.11  210.53  208.39  222.79  210.53  208.39  222.83  210.53  208.39
  222.86  210.53  208.39  222.96  210.53  208.39  223.56  210.53  208.39
  224.03  210.53  208.38  224.29  210.53  208.38   224.7  210.53  208.38
  225.01  210.53  208.38  225.21  210.53  208.38  225.74  210.53  208.38
  226.04  210.53  208.38  226.38  210.53  208.38  226.47  210.53  208.38
   226.6  210.53  208.38  227.19  210.53  208.38  227.56  210.53  208.38
  227.92  210.53  208.38   228.5  210.53  208.37  228.65  210.53  208.37
  228.74  210.53  208.37  229.11  210.53  208.37  229.37  210.53  208.37
  229.91  210.53  208.37     230  210.53  208.37     230  210.53  184.75
  230.02  210.53  204.96   230.1  210.53  204.94   230.4  210.53  204.87
  230.83  210.53  204.78  231.09  210.53  204.73  231.16  210.53  204.71
  231.16  210.53  204.74  231.16  210.53  184.75  231.55  210.53       0
  232.19  210.53       0  232.26  210.53       0  232.28  210.53       0
  232.31  210.53       0  232.63  210.53       0  241.75  210.52       0
   242.8  210.52       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=     228
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     340     .41     340    2.12     339    3.17     338    4.16     337
    4.77     336    5.38     335    5.92     334    6.61     333    7.17     332
    8.21     331    9.76     330    10.9     329   11.96     328   13.03     327
   14.25     326    15.3     325   16.41     324   17.63     323   19.01     322
   20.49     321   21.22     320   22.91     319   23.79     318   24.49     317
   25.03     316   25.36     315   25.88     314   26.25     313   26.69     312
   27.12     311   27.86     310   29.53     309   30.84     308   31.26     307
   31.95     306   32.28     305   33.12     304   33.46     303   34.04     302
   34.73     301   35.38     300   35.99     299   53.24     299   56.82     299
   57.62     299   66.14     299   67.56     299   68.92     298   69.95     297
   70.69     296   71.56     295   73.03     294   75.54     293   76.83     292
   78.37     291    79.6     290   80.16     289   80.74     288   81.29     287
   81.91     286   82.86     285   84.13     284    85.1     283   86.25     282
   87.99     281   89.21     280   90.09     279   90.92     278    92.8     277
   93.92     276   94.78     275   95.77     274   96.67     273   97.41     272
   98.49     271  100.22     270  101.32     269  103.21     268  104.15     267
  104.94     266   105.6     265  106.63     264   107.8     263  108.94     262
  110.07     261   111.9     260  113.47     259  114.78     258  116.49     257
  118.14     256  119.24     255  120.35     254  121.41     253  123.11     252
  124.63     251  126.21     250   127.1     249  128.36     248  129.94     247
  133.12     246   134.4     246  136.91     246  138.05     245  138.94     244
  140.52     243  141.25     242  141.77     241  142.63     240   143.5     239
  143.89     238  144.21     237  145.85     236  147.02     235  148.07     234
   149.3     233   150.5     232   152.4     231  153.95     230  154.46  229.59
   155.2     229  158.12     228  159.38     227  160.79     226  161.91     225
     163     224  163.84     223  165.46     222  167.08     221  168.49     220
  170.09     219  171.23     218  172.56     217  173.85     216   175.1     215
  176.33     214  178.86     213  181.52     212  191.34     211  194.71     211
  196.37     211  197.47     210  197.76     209  200.73     208  206.68     207
  214.79  200.58  217.22   200.5  218.98   200.4   221.2  200.34  223.63  200.34
   227.3  200.34     230  200.34   230.6     206   238.3     207   239.9     208
  240.43     209  241.03     210  242.16     211  243.72     212  245.86     213
  247.03     214     248     215  249.08     216  250.06     217  251.88     218
   253.9     219  255.75     220  264.77     220  266.46  219.77  271.32     219
  276.57     218  281.38     217  284.68     216  292.88     216  294.04     217
  295.04     218  295.93     219  296.47     220  296.85     221  297.44     222
  297.86     223  298.94     224  300.35     225  301.52     226  302.45     227
  303.39     228  304.34     229  305.02     230  305.53     231  306.06     232
   306.4     233  306.92     234  307.39     235  307.78     236  308.35     237
  309.35     238  309.91     239   310.8     240  311.54     241  313.11     242
  314.38     243  315.58     244  316.64     245   318.1     246  319.65     247
  320.51     248  321.89     249  324.24     250  325.63     251  327.95     252
  329.76     253  331.76     254  333.28     255   334.9     256  336.87     257
  338.83     258  339.92     259   341.3     260  343.57     261  345.19     262
  346.66     263  348.13     264  350.39     265  352.35     266  353.43     267
  354.64     268  356.44     269  356.82     269

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045   167.08      .04   255.75      .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        167.08  255.75             .3       .5

Downstream  Deck/Roadway Coordinates
    num=      70
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  166.02   210.5       0  194.03  210.46  169.75  194.03  210.46  208.63
  195.99  210.46  208.59  196.01  210.46  208.59  196.65  210.46  208.58
   196.9  210.46  208.57  197.14  210.46  208.57  197.63  210.46  208.56
  198.14  210.46  208.55  198.31  210.46  208.54  198.35  210.46  208.54
  198.42  210.46  208.54  199.08  210.46  208.53  199.49  210.45  208.52
  199.81  210.45  208.51  200.32  210.45   208.5  200.53  210.45   208.5
  200.66  210.45   208.5  201.22  210.45  208.49  201.26  210.45  208.49
  201.84  210.45  208.47  201.98  210.45  208.47  202.22  210.45  208.47
  202.71  210.45  208.46  203.01  210.45  208.45  203.44  210.45  208.44
  204.12  210.45  208.43  204.16  210.45  208.43  204.19  210.45  208.43
  204.29  210.45  208.42  204.89  210.45  208.41  205.36  210.45   208.4
  205.62  210.45   208.4  206.03  210.45  208.39  206.34  210.45  208.38
  206.54  210.44  208.38  207.07  210.44  208.37  207.37  210.44  208.36
  207.71  210.44  208.36   207.8  210.44  208.35  207.93  210.44  208.35
  208.52  210.44  208.34  208.89  210.44  208.33  209.25  210.44  208.32
  209.64  210.44  208.32  209.83  210.44  208.31  209.98  210.44  208.31
  209.99  210.44  208.31  210.07  210.44  192.98  210.09  210.44  189.15
  210.09  210.44  169.75  210.44  210.44       0   210.7  210.44       0
  211.24  210.44       0  211.43  210.44       0  211.73  210.44       0
  212.16  210.44       0  212.42  210.44       0  212.88  210.44       0
  213.52  210.44       0  213.59  210.44       0  213.61  210.44       0
  213.64  210.44       0  213.96  210.43       0  213.98  210.43       0
  218.16  210.42       0  218.16  210.42       0  218.16  210.42       0
  269.03  210.36       0

Downstream Bridge Cross Section Data
Station Elevation Data     num=      264
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      325      .88      325     1.61      324     2.63      323     3.34      322
    4.05      321     4.61      320     5.49      319     6.65      318     7.79      317
    8.67      316    10.23      315    11.25      314    12.26      313    13.44      312
   14.17     311   15.04     310   16.03     309   16.91     308   17.79     307
   18.35     306   18.88     305   19.26     304   19.77     303   20.26     302
    20.6     301   21.16     300   21.82     299   22.39     298   22.79     297
   23.15     296   23.92     295   24.58     294    25.1     293   25.98     292
   26.49     291   26.88     290   27.24     289   27.64     288   28.14     287
   28.68     286   29.11     285    29.5     284   30.14     283   32.06     283
   43.24     284    50.3     284   55.88     284   57.65     283   59.19     282
    60.3     281    61.4     280   62.58     279   64.07     278   65.58     277
   66.44     276   67.62     275   71.62     274   72.34     273   73.26     272
   74.01     271   74.88     270   75.47     269   76.09     268   76.86     267
   78.29     266   78.95     265   79.27     264   79.78     263   80.36     262
   81.08     261   81.87     260   83.05     259   83.97     258   85.68     257
   87.24     256   88.74     255   90.41     254   91.89     253    92.7     252
   94.53     251    95.7     250   97.28     249   98.64     248   99.67     247
  101.38     246  103.35     245  104.91     244  106.16     243  107.43     242
  108.91     241   110.2     240  111.28     239  112.74     238   113.9     237
  115.46     236  116.33     235  116.94     234  117.73     233  118.75     232
  120.57     231  122.66     230  123.92     229  124.59     228  125.32     227
  125.98     226  128.87     226   129.1     226  130.73     225  131.94     224
  132.56     223   132.8     222  133.19     221  133.53     220  133.77     219
  134.55     218  135.46     217  135.92     216  136.76     215  151.19     215
  158.17     216  159.71     216  162.28     215  163.41     214  164.41     213
  165.28     212  166.05     211  166.74     210  167.47     209  168.17     208
  168.95     207  169.91     206  171.09     205  172.89     204  174.41     203
  176.54     202  178.17     201  179.56     200   181.1     199  182.36     198
  184.89     197  185.82     196  186.47     195  186.99     194  187.69     193
  188.36     192  192.21     191     194  200.32   196.3   200.3   200.3  200.28
  202.79  200.26  205.62  200.24  208.23  200.22     210   200.2  212.53     191
  213.34     192  214.31     193  219.52     194  220.13     195  220.79     196
  221.58     197  223.16     198  224.87     199  226.29     200  235.24     200
  240.21     200  244.57     201  246.22     202  250.43     203  252.36     204
  254.06     205  256.23     206  258.21     207  259.68     208  261.46     209
  267.44     210  269.87     211   271.3     212  273.01     213   274.3     214
  275.42     215  276.77     216  278.12     217  279.27     218  281.22     219
  282.75     220  284.38     221   285.4     222  286.14     223  287.03     224
  288.06     225     289     226  290.46     227   291.1     228  292.22     229
  293.17     230  293.74     231  294.61     232  295.46     233  296.32     234
  297.21     235  298.64     236  299.43     237  300.38     238  302.25     239
  303.94     240  307.34     240   322.2     239  330.52     239  331.81     240
  332.43     241  333.24     242   333.7     243  334.18     244  334.46     245
  335.34     246  335.93     247  336.57     248  337.21     249  337.95     250
  339.04     251  340.16     252  340.68     253  341.27     254   341.9     255
  342.53     256  343.15     257  343.79     258  344.32     259  345.05     260
  345.67     261  346.15     262  347.33     263  347.93     264  348.68     265
  349.15     266  349.76     267   350.3  267.65  350.59     268  351.52     269
  352.63     270  353.82     271  355.01     272  355.96     273  356.92     274
  357.77     275  358.64     276  359.64     277  361.77     278     363     279
  363.99     280  365.36     281  366.87     282  367.94     283  369.36     284
  370.43     285  371.88     286  373.24     287  374.85     288  376.49     289
  378.07     290  379.49     291  380.96     292  440.85     292

Manning's n Values        num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   184.89      .04   214.31      .06
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
      184.89  214.31            .3       .5

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

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = 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 #100-yr bulked

  E.G. US. (ft)             216.73    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)             215.96    E.G. Elev (ft)               215.73        214.47
  Q Total (cfs)            3650.00    W.S. Elev (ft)               213.51        212.88
  Q Bridge (cfs)           1477.85    Crit W.S. (ft)               213.51        212.88
  Q Weir (cfs)                        Max Chl Dpth (ft)             13.17         12.80
  Weir Sta Lft (ft)                   Vel Total (ft/s)              11.96          9.38
  Weir Sta Rgt (ft)                   Flow Area (sq ft)            305.29        389.19
  Weir Submerg                        Froude # Chl                   0.58          0.50
  Weir Max Depth (ft)                 Specif Force (cu ft)        2772.80       2552.11
  Min El Weir Flow (ft)     210.53    Hydr Depth (ft)                4.43          3.59
  Min El Prs (ft)           208.41    W.P. Total (ft)              127.07        158.72
  Delta EG (ft)              14.63    Conv. Total (cfs)           20343.4       22300.7
  Delta WS (ft)              17.31    Top Width (ft)                68.88        108.29
  BR Open Area (sq ft)      128.72    Frctn Loss (ft)                0.45          1.85
  BR Open Vel (ft/s)         11.48    C & E Loss (ft)                0.32          0.56
  BR Sluice Coef                      Shear Total (lb/sq ft)         4.83          4.10
  BR Sel Method        Energy only    Power Total (lb/ft s)         57.73         38.46


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 5011

INPUT
Description:
Station Elevation Data    num=     262
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     325     .88     325    1.61     324    2.63     323    3.34     322
    4.05     321    4.61     320    5.49     319    6.65     318    7.79     317
    8.67     316   10.23     315   11.25     314   12.26     313   13.44     312
   14.17     311   15.04     310   16.03     309   16.91     308   17.79     307
   18.35     306   18.88     305   19.26     304   19.77     303   20.26     302
    20.6     301   21.16     300   21.82     299   22.39     298   22.79     297
   23.15     296   23.92     295   24.58     294    25.1     293   25.98     292
   26.49     291   26.88     290   27.24     289   27.64     288   28.14     287
   28.68     286   29.11     285    29.5     284   30.14     283   32.06     283
   43.24     284    50.3     284   55.88     284   57.65     283   59.19     282
    60.3     281    61.4     280   62.58     279   64.07     278   65.58     277
   66.44     276   67.62     275   71.62     274   72.34     273   73.26     272
   74.01     271   74.88     270   75.47     269   76.09     268   76.86     267
   78.29     266   78.95     265   79.27     264   79.78     263   80.36     262
   81.08     261   81.87     260   83.05     259   83.97     258   85.68     257
   87.24     256   88.74     255   90.41     254   91.89     253    92.7     252
   94.53     251    95.7     250   97.28     249   98.64     248   99.67     247
  101.38     246  103.35     245  104.91     244  106.16     243  107.43     242
  108.91     241   110.2     240  111.28     239  112.74     238   113.9     237
  115.46     236  116.33     235  116.94     234  117.73     233  118.75     232
  120.57     231  122.66     230  123.92     229  124.59     228  125.32     227
  125.98     226  128.87     226   129.1     226  130.73     225  131.94     224
  132.56     223   132.8     222  133.19     221  133.53     220  133.77     219
  134.55     218  135.46     217  135.92     216  136.76     215  151.19     215
```

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 158.17    216  159.71    216  162.28    215  163.41    214  164.41    213
 165.28    212  166.05    211  166.74    210  167.47    209  168.17    208
 168.95    207  169.91    206  171.09    205  172.89    204  174.41    203
 176.54    202  178.17    201  179.56    200   181.1    199  182.36    198
 184.89    197  185.82    196  186.47    195  186.99    194  187.69    193
 188.36    192  192.21    191   196.3    190   200.3    190  202.79    190
 205.62    190  208.23    190  212.53    191  213.34    192  214.31    193
 219.52    194  220.13    195  220.79    196  221.58    197  223.16    198
 224.87    199  226.29    200  235.24    200  240.21    200  244.57    201
 246.22    202  250.43    203  252.36    204  254.06    205  256.23    206
 258.21    207  259.68    208  261.46    209  267.44    210  269.87    211
  271.3    212  273.01    213   274.3    214  275.42    215  276.77    216
 278.12    217  279.27    218  281.22    219  282.75    220  284.38    221
  285.4    222  286.14    223  287.03    224  288.06    225     289    226
 290.46    227   291.1    228  292.22    229  293.17    230  293.74    231
 294.61    232  295.46    233  296.32    234  297.21    235  298.64    236
 299.43    237  300.38    238  302.25    239  303.94    240  307.34    240
  322.2    239  330.52    239  331.81    240  332.43    241  333.24    242
  333.7    243  334.18    244  334.46    245  335.34    246  335.93    247
 336.57    248  337.21    249  337.95    250  339.04    251  340.16    252
 340.68    253  341.27    254   341.9    255  342.53    256  343.15    257
 343.79    258  344.32    259  345.05    260  345.67    261  346.15    262
 347.33    263  347.93    264  348.68    265  349.15    266  349.76    267
  350.3 267.65  350.59    268  351.52    269  352.63    270  353.82    271
 355.01    272  355.96    273  356.92    274  357.77    275  358.64    276
 359.64    277  361.77    278     363    279  363.99    280  365.36    281
 366.87    282  367.94    283  369.36    284  370.43    285  371.88    286
 373.24    287  374.85    288  376.49    289  378.07    290  379.49    291
 380.96    292  440.85    292

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  184.89     .04  214.31     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        184.89  214.31          166.36  166.36  166.36            .3        .5

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           202.10    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              3.45    Wt. n-Val.                0.060      0.040      0.060
  W.S. Elev (ft)           198.65    Reach Len. (ft)          166.36     166.36     166.36
  Crit W.S. (ft)           198.65    Flow Area (sq ft)          3.19     224.87      35.35
  E.G. Slope (ft/ft)     0.013267    Area (sq ft)               3.19     224.87      35.35
  Q Total (cfs)           3650.00    Flow (cfs)                 8.12    3435.97     205.91
  Top Width (ft)            42.74    Top Width (ft)             3.35      29.42       9.97
  Vel Total (ft/s)          13.86    Avg. Vel. (ft/s)           2.55      15.28       5.83
  Max Chl Dpth (ft)          8.65    Hydr. Depth (ft)           0.95       7.64       3.55
  Conv. Total (cfs)       31689.2    Conv. (cfs)                70.5    29831.1     1787.7
  Length Wtd. (ft)         166.36    Wetted Per. (ft)           3.77      33.32      12.11
  Min Ch El (ft)           190.00    Shear (lb/sq ft)           0.70       5.59       2.42
  Alpha                      1.15    Stream Power (lb/ft s)     1.78      85.40      14.08
  Frctn Loss (ft)            2.43    Cum Volume (acre-ft)       3.95      35.58       1.41
  C & E Loss (ft)            0.06    Cum SA (acres)             1.41       5.45       0.80
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Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 4845

INPUT
Description:
Station Elevation Data    num=     360
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     361     .34     361   14.22     360   20.58     359   24.47     358
   28.49     357   31.82     356   34.78     355   37.69     354   40.68     353
   42.92     352   45.82     351   48.73     350   50.96     349   53.94     348
   55.99     347   57.78     346   60.44     345   63.02     344   64.86     343
   66.52     342   69.13     341    70.8     340   72.69     339    74.7     338
   76.53     337   78.35     336   80.43     335   82.89     334   84.47     333
   86.42     332   87.84     331   90.21     330   91.73     329   93.28     328
   94.97     327   97.29     326   99.71     325  101.26     324  103.53     323
  104.87     322  105.48     321  106.19     320  106.91     319  107.66     318
  108.68     317  109.62     316  110.56     315  111.86     314  112.41     313
  112.81     312  113.93     311  114.85     310   116.1     309   117.3     308
   118.1     307  118.97     306  119.91     305  120.82     304  121.73     303
  122.62     302  123.62     301  125.05     300  126.07     299  127.09     298
   128.1     297   128.7     296  129.36     295  130.07     294  130.83     293
   131.6     292  132.14     291   132.8     290  133.59     289  134.71     288
  135.45     287   135.8     286  136.52     285  137.18     284   137.6     283
  138.28     282  139.59     281  140.74     280  141.39     279  142.05     278
  142.54     277  143.34     276  149.88     276  154.92  276.65  157.69     277
  165.84     278  172.75     278  173.74     277  174.88     276  175.88     275
  176.64     274  177.37     273  178.26     272  179.15     271  179.99     270
  181.22     269  182.25     268   183.4     267  184.17     266  185.27     265
  186.69     264  188.67     263  190.01     262  191.22     261  192.25     260
  193.29     259  194.34     258  195.44     257  196.14     256  196.66     255
  197.27     254  197.95     253  198.59     252   199.1     251  199.79     250
  200.22     249  201.17     248     202     247  202.68     246  203.17     245
  203.81     244  204.22     243  205.23     242  206.44     241  208.45     240
  209.35     239   210.3     238  211.12     237  211.93     236  212.83     235
  214.15     234  215.56     233   216.3     232  217.16     231  217.96     230
  218.63     229  219.36     228  220.11     227  220.92     226  222.13     225
  224.15     224   226.8     224  240.62     224  242.78     223  243.89     222
   245.9     221  247.36     220  248.93     219  250.08     218   250.7     217
  251.59     216  252.75     215  253.65     214  254.56     213  255.75     212
  256.88     211   258.2     210  259.28     209  261.02     208  262.19     207
  263.27     206  264.32     205  265.65  204.25  266.09     204  267.95     203
   268.9     202  269.51     201  270.12     200  271.94     199  273.56     198
  274.82     197  276.19     196  277.11     195  278.01     194  279.13     193
   284.3     192   285.2     191   286.1     190  286.77     189   287.3     188
  288.33     187  290.07     186  293.27     185  295.77     184  297.89     183
  300.14     182  302.51     181  304.88   178.5  304.92   178.5     311  178.19
  313.89     181  315.77     182  316.48     183  317.83     184   319.5     185
  320.69     186  321.58     187  322.36     188  323.16     189  324.91     190
  325.61     191  334.29     192  336.56     193  340.76     194  345.39     195
  347.46     196  350.47     197  353.72     198  355.38     199  356.85     200
  358.81     201  360.34     202  363.84     203  367.69     204   369.2     205
   370.6     206  371.96     207  373.36     208  374.35     209  375.63     210
  378.49     211  381.72     212  382.64     213  385.23     214  386.98     215
  388.42     216  389.63     217  390.47     218  392.39     219  393.88     220
  395.86     221  397.32     222  399.08     223     400     224  401.66     225
  403.17     226   404.3     227  405.57     228  407.48     229  408.23     230
  408.83     231  409.56     232  410.25     233  410.83     234  411.53     235
  412.64     236  416.84     237  417.85     238   419.3     239  420.55     240
  421.68     241  423.15     242  424.92     243  426.02     244  427.07     245
   427.9     246  429.38     247  430.66     248  431.53     249  433.09     250
  434.48     251  435.28     252  436.17     253  437.58     254   438.9     255
  439.63     256  440.38     257  440.87     258   441.3     259  441.78     260
  442.43     261  444.54     262  446.02     263  446.94     264  447.67     265
  448.53     266  449.46     267  450.78     268  451.94     269  452.95     270
  453.76     271  454.36     272  454.92  272.84  455.03     273  461.31     273
  474.88     272  477.86     272  478.53     273  479.04     274  479.83     275
   480.8     276   481.8     277  482.58     278  482.79     279  483.77     280
  484.29     281  485.03     282  485.62     283  486.13     284  487.19     285
     488     286  488.29     287  488.58     288  488.76     289  489.08     290
  489.35     291  489.66     292  490.27     293  490.74     294  491.12     295
  491.67     296  492.32     297  492.71     298  493.28     299  493.83     300
  494.11     301  494.54     302  495.47     303  496.54     304  497.54     305
  498.57     306  499.47     307  500.62     308  501.76     309  502.67     310
  503.66     311   505.2     312  506.28     313  507.29     314  508.69     315
  509.23     316  509.74     317  510.17     318  510.58     319  511.61     320
  512.36     321  513.14     322  514.14     323  515.05     324  515.93     325
   516.7     326  517.34     327  517.92     328  518.43     329  519.61     330
  520.52     331  521.56     332  522.78     333  524.05     334  525.21     335
  525.95     336   526.9     337  528.23     338  529.81     339  529.94     339

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06    285.2      .04   325.61      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          285.2  325.61            262.85  262.85  262.85              .1        .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             192.89    Element                    Left OB    Channel    Right OB
  Vel Head (ft)                3.32    Wt. n-Val.                              0.040
  W.S. Elev (ft)             189.57    Reach Len. (ft)            262.85     262.85     262.85
  Crit W.S. (ft)          189.57    Flow Area (sq ft)                249.86
  E.G. Slope (ft/ft)     0.016135    Area (sq ft)                    249.86
  Q Total (cfs)          3650.00    Flow (cfs)                    3650.00
  Top Width (ft)            37.78    Top Width (ft)                   37.78
  Vel Total (ft/s)        14.61    Avg. Vel. (ft/s)                14.61
  Max Chl Dpth (ft)         11.38    Hydr. Depth (ft)                   6.61
  Conv. Total (cfs)       28734.6    Conv. (cfs)                   28734.6
  Length Wtd. (ft)         262.85    Wetted Per. (ft)                  45.87
  Min Ch El (ft)          178.19    Shear (lb/sq ft)                  5.49
  Alpha                   1.00    Stream Power (lb/ft s)             80.15
  Frctn Loss (ft)           3.85    Cum Volume (acre-ft)       3.94      34.67       1.35
  C & E Loss (ft)           0.00    Cum SA (acres)            1.41       5.32       0.78


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 4582

INPUT
Description:
Station Elevation Data    num=     338
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     322     .83     322    6.12     321   14.41     320   22.27     319
    32.3     318   38.23     317   40.51     316   42.37     315   45.73     314
   47.72     313   50.09     312   51.44     311   52.51     310   53.41     309
   54.22     308   54.97     307    55.6     306   56.08     305   56.51     304
   56.93     303   57.34     302   57.72     301   58.14     300   58.53     299
   58.88     298   59.77     297   60.23     296   60.99     295   61.63     294
   62.22     293   62.64     292   62.89     291   63.36     290   63.79     289
   64.16     288   64.62     287   65.38     286    66.2     285   67.16     284
   68.13     283   68.59     282   69.16     281   69.75     280   70.41     279
   71.09     278   71.51     277   72.26     276   72.69     275   73.45     274
   73.87     273   74.69     272    75.3     271   76.77     270   78.15     269
    79.6     268   80.72     267   81.71     266   84.46     265   90.32     265
   109.7     265  113.05     264  114.77     263  116.56     262  117.74     261
  118.86     260  120.22     259  120.97     258  121.77     257  122.55     256
  123.33     255  124.41     254  125.36     253  126.48     252  127.86     251
  129.01     250   131.4     249  143.12     248  144.53     248  147.83     249
  148.42     249  150.14     248  151.44     247  151.97     246  152.81     245
  154.05     244  154.98     243  156.43     242  157.84     241  158.41     240
  159.04     239  160.28     238  161.27     237  162.44     236  163.95     235
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   165.4     234  166.54     233  167.19     232  168.84     231  170.37     230
  171.67     229  173.05     228  173.99     227  175.69     226  177.05     225
  178.48     224  179.93     223  180.02  222.92  181.07     222  181.98     221
  182.69     220  183.49     219  184.46     218  186.08     217  187.55     216
  189.46     215  191.09     214  192.91     213  198.83     212  200.62     211
  201.54     210  202.86     209  204.09     208  205.07     207  206.98     206
   208.6     205  209.99     204  212.91     203  214.04     202  216.28     201
  217.97     200  220.18     199  224.19     198   226.2     197  227.55     196
  230.05     195  233.03     194  234.47     193   260.2     192  263.46     191
  263.57     191  267.07     191  269.06     190  272.46     189  274.32     188
  275.72     187  280.03     186  283.36     185  286.78     185  287.04     185
  290.98     185  295.31     184  299.47     183  301.03     182  303.27     181
   306.1     180  309.54     179  311.45     178  315.01     177  315.61     176
  316.22     175  316.87     174  317.73     173  318.61     172  330.02   168.4
  338.66  168.67  340.44   168.4  343.97     172  345.01     173  345.31     174
  345.75     175  346.97     176   350.7     177  357.96     178  361.07     179
  362.38     180  363.65     181  365.04  181.63  365.86     182  367.19     183
  368.22     184  369.53     185  370.85     186  372.14     187  373.89     188
  375.16     189  376.85     190   378.3     191  379.68     192  380.91     193
  382.67     194   384.3     195  385.56     196  386.94     197  387.97     198
  389.26     199  390.55     200  391.95     201  393.04     202  393.92     203
  394.77     204  395.75     205  396.82     206  398.93     207  400.08     208
  401.76     209  402.76     210  403.95     211  405.27     212  406.59     213
   407.6     214  408.81     215  410.57     216  412.06     217  413.18     218
  414.23     219  415.69     220  417.23     221  418.64     222   420.1     223
  421.84     224  422.69     225  423.88     226  424.65     227  425.66     228
  426.76     229   427.9     230  428.84     231  429.51     232  430.26     233
  430.85     234  431.45     235  431.84     236  432.25     237  433.02     238
  433.61     239  434.31     240  434.87     241   435.6     242  436.49     243
  437.31     244     438     245  438.66     246  439.45     247  440.27     248
  440.55     249  441.06     250  441.99     251  443.08     252  443.88     253
  444.65     254   445.3     255  446.43     256  447.31     257  447.86     258
  448.29     259  449.36     260  450.08     261  451.33     262  451.86     263
   452.8     264  453.66     265  454.75     266  455.98     267  457.15     268
  458.04     269  459.29     270  460.18     271  461.11     272  462.11     273
   462.9     274  463.94     275  465.16     276  466.01     277  466.49     278
  466.93     279  467.76     280  469.97     281  471.41     282  472.78     283
  474.06     284  475.17     285  476.37     286  477.69     287  478.35     288
  479.14     289  480.02  289.85  480.18     290  481.39     291  482.42     292
  483.76     292  485.31     291  502.25     290  505.87     290  507.93     291
  509.43     292  510.85     293  511.78     294  512.58     295  513.36     296
  514.16     297   514.6     298  515.08     299  515.55     300  515.99     301
  516.54     302  517.24     303  518.79     304  519.77     305  520.93     306
  522.56     307  523.84     308  524.93     309  526.33     310  527.47     311
   528.7     312  529.89     313  530.81     314  531.72     315  533.23     316
   534.7     317  535.82     318  537.21     319  538.44     320  539.67     321
   540.9     322   542.5     323  543.66     324  544.92     325  546.62     326
  547.37     327  548.29     328  549.07     329  550.03     330  550.61     331
  551.53     332  552.21     333   552.4     333

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   315.01      .04   346.97      .06
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       315.01  346.97          136.79  136.79  136.79            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           181.50    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              3.33    Wt. n-Val.              0.060      0.040      0.060
  W.S. Elev (ft)           178.17    Reach Len. (ft)         136.79     136.79     136.79
  Crit W.S. (ft)           178.17    Flow Area (sq ft)         2.41     245.68      11.14
  E.G. Slope (ft/ft)     0.013384    Area (sq ft)              2.41     245.68      11.14
  Q Total (cfs)           3650.00    Flow (cfs)                4.89    3614.29      30.83
  Top Width (ft)            47.37    Top Width (ft)            3.89      31.96      11.52
  Vel Total (ft/s)          14.08    Avg. Vel. (ft/s)          2.02      14.71       2.77
  Max Chl Dpth (ft)          9.77    Hydr. Depth (ft)          0.62       7.69       0.97
  Conv. Total (cfs)       31550.5    Conv. (cfs)               42.3    31241.8      266.5
  Length Wtd. (ft)         136.79    Wetted Per. (ft)          4.07      38.79      11.75
  Min Ch El (ft)           168.40    Shear (lb/sq ft)          0.50       5.29       0.79
  Alpha                      1.08    Stream Power (lb/ft s)    1.00      77.85       2.19
  Frctn Loss (ft)            2.04    Cum Volume (acre-ft)      3.94      33.17       1.31
  C & E Loss (ft)            0.01    Cum SA (acres)            1.40       5.11       0.75


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 4445

INPUT
Description:
Station Elevation Data    num=     221
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     266   15.07     266   29.04     266   32.85     265    35.2     264
   39.24     263   45.06     261   63.94     260   81.16     259   91.97     258
   98.48     258  104.04     258  104.94     257  105.93     256  106.66     255
  107.51     254  108.31     253  109.44     252  110.28     251  111.19     250
  112.02     249   113.3     248  114.83     247  116.05     246  117.57     245
  118.71     244  119.74     243  120.76     242  121.77     241   124.5     240
  125.34     239   125.7     238  126.26     237  126.66     236  127.76     235
  129.43     234  131.45     233  132.83     232   133.9     231  134.95     230
  137.87     229  138.72     228  139.45     227  140.34     226  141.14     225
  142.02     224  142.97     223  143.96     222   145.2     221  146.55     220
  147.66     219  148.21     218  148.86     217  149.66     216  152.01     215
  154.24     214  155.66     213  156.63     212  157.54     211   158.6     210
  163.86     209  171.89     208  179.28     207  184.23     206  186.01     205
  192.94     204  194.08     203   194.8     202  197.62     201  197.98     201
   201.7     201  203.92     200  206.24     199  207.47     198  208.87     197
  210.19     196  211.05     195  211.42     194  211.77     193  212.12     192
  212.44     191  212.92     191  214.45     191  214.56  190.52  214.68     190
  214.89     189  222.38     189  223.27     190  223.88     191  224.63     192
  225.04     193  225.44     194  225.94     195  229.75     195  232.23     194
  233.51     193  239.14     192  244.58     191  251.86     190  257.04     189
  261.75     188  264.15     187  266.71     186   271.1     185  288.33     185
  292.66     185  295.52     184  297.81     183   299.9     182  304.34     182
  313.88     182  316.76     181  319.48     180  320.68     179  321.74     178
  324.08     177  326.64     176  329.34  175.58  332.82     175  341.39     175
  346.36     176  350.29     177  353.57     178  357.26     178  365.15     177
  368.85     176  371.12     175  372.84     174  373.92     173  374.13     172
  375.07     171  375.91     170  377.01     169  380.27     168  382.12     167
  382.91     166  391.31   163.2   392.3   163.2  403.04  163.59  406.79     165
  407.53     165  408.81     166  408.86     167  408.94     168  409.04     169
  409.13     170  409.22     171  409.61     172  410.04     173  410.52     174
  410.88     175  411.18     176  411.52     177  411.92     178  412.25     179
  412.67     180  412.71     181  413.31     182  415.78     183  417.34     184
  418.91     184  419.69     184  421.27     185  421.73     186  422.27     187
  425.84     188  426.21     189  426.62     190  427.08     191  427.65     192
   428.2     193  428.98     194  429.67     195  430.36     196   431.4     197
  432.69     198  434.23     199  435.02     200  435.79     201  441.07     202
  442.93     203   445.7     204  448.13     205  449.09     206  452.31     207
  453.69     208  455.01     209  457.78     210  459.68     211  462.04     212
  463.77     213  465.57     214   466.6     215  469.93     216  472.25     217
   474.2     218  476.32     219  477.84     220  479.67     221     481     222
  483.07     223  485.62     224  487.14     225  488.01     226  488.61     227
  489.01     228  490.31     229  493.09     229  494.57     229   495.8     230
  496.98     231  498.77     232  500.05     233   501.4     234  503.62     235
  506.85     236   508.3     237  510.74     238  512.48     239  513.82     240
  514.56     240

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .06   368.85     .04   411.18     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        368.85  411.18             42.37   42.37   42.37              .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            175.71    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               3.46    Wt. n-Val.                            0.040
  W.S. Elev (ft)            172.25    Reach Len. (ft)            42.37      42.37      42.37
  Crit W.S. (ft)            172.25    Flow Area (sq ft)                    244.60
  E.G. Slope (ft/ft)      0.016648    Area (sq ft)                         244.60
  Q Total (cfs)            3650.00    Flow (cfs)                          3650.00
  Top Width (ft)             35.64    Top Width (ft)                        35.64
  Vel Total (ft/s)           14.92    Avg. Vel. (ft/s)                      14.92
  Max Chl Dpth (ft)           9.05    Hydr. Depth (ft)                       6.86
  Conv. Total (cfs)        28288.6    Conv. (cfs)                         28288.6
  Length Wtd. (ft)          42.37    Wetted Per. (ft)                  44.53
  Min Ch El (ft)           163.20    Shear (lb/sq ft)                   5.71
  Alpha                     1.00    Stream Power (lb/ft s)            85.19
  Frctn Loss (ft)            0.41    Cum Volume (acre-ft)       3.93      32.41       1.30
  C & E Loss (ft)            0.64    Cum SA (acres)             1.39       5.01       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 4402

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     180    5.96     180   15.16     179   17.48     178   24.15     177
   26.79     176   31.48     175   34.13     174   36.59     173   39.45     172
   42.26     171   45.47     170    48.5     169   50.99     168   56.75     167
   61.88     167   65.57     167   66.48     166   67.29     165   70.68     164
   74.66  162.45   81.23  162.54   92.14   162.5   92.72     164   93.15     165
    93.4     166   99.72     167  100.35     168  100.79     169  101.14     170
  101.78     171  101.88     172  102.31     173  102.69     174  103.09     175
  103.48     176  103.91     177  104.26     178  104.82     179  108.89     180
   111.3     181  112.88     182  114.21     183  120.36     184  124.12     185
  125.35     186  128.21     187  131.88     188  134.11     189  136.18     190
  138.49     191  140.65     192  143.56     193   146.6     194  148.66     194

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06       0     .04  148.66     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0  148.66             54.37   54.37   54.37             .3       .5

CROSS SECTION OUTPUT  Profile #100-yr bulked
```

E.G. Elev (ft)	173.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.040	
W.S. Elev (ft)	172.21	Reach Len. (ft)	54.37	54.37	54.37
Crit W.S. (ft)	170.45	Flow Area (sq ft)		392.96	
E.G. Slope (ft/ft)	0.006424	Area (sq ft)		392.96	
Q Total (cfs)	3650.00	Flow (cfs)		3650.00	
Top Width (ft)	63.11	Top Width (ft)		63.11	
Vel Total (ft/s)	9.29	Avg. Vel. (ft/s)		9.29	
Max Chl Dpth (ft)	9.76	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	45539.8	Conv. (cfs)		45539.8	
Length Wtd. (ft)	54.37	Wetted Per. (ft)		71.31	
Min Ch El (ft)	162.45	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		20.53	
Frctn Loss (ft)		Cum Volume (acre-ft)	3.93	32.09	1.30
C & E Loss (ft)		Cum SA (acres)	1.39	4.96	0.73

CULVERT

RIVER: Little Sycamore
REACH: Lower Reach RS: 4362

INPUT
Description: Arizona Crossing 10-A-V
Distance from Upstream XS = 34.48
Deck/Roadway Width = 13.55
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 136

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
64.87	162.99	0	65.15	162.99	0	65.65	162.91	0
65.87	162.87	0	66.19	162.81	0	66.59	162.74	0
66.86	162.7	0	67.03	165.14	0	67.31	164.82	0
67.96	164.08	0	68.03	164	0	68.07	163.95	0
68.33	163.66	0	68.74	163.19	0	69.29	162.56	0
69.46	162.37	0	69.72	162.07	0	70.18	161.54	0
70.42	161.27	0	70.5	161.25	0	70.9	161.17	0
71.48	161.05	0	71.62	161.02	0	71.71	161	0
72.22	160.9	0	72.34	160.87	0	72.93	160.75	0
73.06	160.73	0	73.25	160.69	0	73.78	160.58	0
73.87	160.56	0	74.14	160.56	0	74.5	160.57	0
75.01	160.57	0	75.21	160.57	0	75.35	160.57	0
75.93	160.58	0	76.11	160.58	0	76.57	160.58	0
76.65	160.58	0	76.78	160.59	0	77.37	160.59	0
77.78	160.6	0	78.09	160.6	0	78.54	160.6	0
78.81	160.6	0	79	160.61	0	79.53	160.61	0
80	160.61	0	80.21	160.62	0	80.25	160.62	0
80.3	160.62	0	80.97	160.62	0	81.42	160.63	0
81.69	160.63	0	82.07	160.63	0	82.4	160.64	0
82.64	160.64	0	83.12	160.64	0	83.83	160.65	0
83.84	160.65	0	83.89	160.65	0	84.56	160.66	0
85.06	160.66	0	85.28	160.66	0	85.6	160.66	0
86	160.67	0	86.28	160.67	0	86.72	160.68	0

87.36	160.68	0	87.44	160.68	0	87.49	160.68	0
87.78	160.68	0	88.16	160.69	0	88.7	160.69	0
88.88	160.69	0	89.12	160.7	0	89.51	160.7	0
89.59	160.71	0	89.92	160.73	0	90.31	160.75	0
90.89	160.79	0	91.03	160.8	0	91.13	160.81	0
91.48	160.83	0	91.66	161.4	0	91.75	161.68	0
92.15	162.94	0	92.34	160.51	0	92.47	160.51	0
92.65	160.51	0	93.19	160.5	0	93.56	160.5	0
93.91	160.5	0	94.42	160.5	0	94.63	160.5	0
94.77	160.51	0	95.35	160.51	0	95.55	160.51	0
95.98	160.51	0	96.06	160.51	0	96.18	160.51	0
96.78	160.53	0	97.2	160.54	0	97.5	160.54	0
97.94	160.54	0	98.22	160.54	0	98.41	160.54	0
98.94	160.54	0	99.44	160.56	0	99.63	160.56	0
99.66	160.56	0	99.71	160.56	0	100.38	160.56	0
100.84	160.58	0	101.1	160.6	0	101.47	160.62	0
101.82	160.64	0	102.05	160.65	0	102.54	160.69	0
103.24	160.75	0	103.25	160.75	0	103.27	160.75	0
103.33	160.76	0	103.97	160.82	0	104.48	160.87	0
104.69	160.89	0	105	160.92	0	105.41	160.96	0
105.69	161.01	0	106.13	161.08	0	106.77	161.21	0
106.85	161.23	0	106.91	161.25	0	107.22	161.31	0
107.52	161.31	0						

Upstream Bridge Cross Section Data
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	180	5.96	180	15.16	179	17.48	178	24.15	177
26.79	176	31.48	175	34.13	174	36.59	173	39.45	172
42.26	171	45.47	170	48.5	169	50.99	168	56.75	167
61.88	167	65.57	167	66.48	166	67.29	165	70.68	164
74.66	162.45	81.23	162.54	92.14	162.5	92.72	164	93.15	165
93.4	166	99.72	167	100.35	168	100.79	169	101.14	170
101.78	171	101.88	172	102.31	173	102.69	174	103.09	175
103.48	176	103.91	177	104.26	178	104.82	179	108.89	180
111.3	181	112.88	182	114.21	183	120.36	184	124.12	185
125.35	186	128.21	187	131.88	188	134.11	189	136.18	190
138.49	191	140.65	192	143.56	193	146.6	194	148.66	194

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.04	148.66	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	148.66	.3	.5

Downstream Deck/Roadway Coordinates
num= 136

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
292.81	162.99	0	293.09	162.99	0	293.59	162.91	0
293.81	162.87	0	294.13	162.81	0	294.53	162.74	0
294.8	162.7	0	295.25	162.62	0	295.72	165.12	0
295.9	165.05	0	295.97	165.03	0	296.01	165.01	0
296.27	164.91	0	296.68	164.76	0	297.23	164.55	0

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  297.4  164.49       0  297.66  164.39       0  298.12  164.22       0
 298.44   164.1       0  298.84  163.95       0  299.42  163.73       0
 299.56  163.68       0  299.65  163.64       0  300.16  163.45       0
 300.28   163.4       0  300.87  163.18       0     301  163.13       0
 301.19  163.06       0  301.72  162.86       0  302.08  162.73       0
 302.44  162.59       0  302.95   162.4       0  303.15  162.33       0
 303.29  162.27       0  303.87  162.05       0  304.05  161.99       0
 304.51  161.81       0  304.59  161.78       0  304.72  161.74       0
 305.31  161.51       0  305.72  161.36       0  305.85  161.31       0
 306.03  161.31       0  306.48  161.32       0  306.75  161.32       0
 306.94  161.33       0  307.47  161.33       0  307.94  161.34       0
 308.15  161.34       0  308.19  161.34       0  308.24  161.34       0
 308.91  161.35       0  309.36  161.36       0  309.63  161.36       0
 310.01  161.37       0  310.34  161.37       0  310.58  161.38       0
 311.06  161.38       0  311.77  161.39       0  311.78  161.39       0
 311.83  161.39       0  312.19   161.4       0   312.5  161.36       0
    313  161.29       0  313.22  161.26       0  313.54  161.22       0
 313.94  161.16       0  314.22  161.13       0  314.66  161.07       0
  315.3  160.98       0  315.38  160.97       0  315.43  160.96       0
 315.72  160.92       0   316.1  160.87       0  316.64   160.8       0
 316.82  160.77       0  317.06  160.74       0  317.53  160.68       0
 317.86  160.63       0  318.25  160.58       0  318.83   160.5       0
 318.97  160.48       0  319.07  160.47       0  319.14  160.46       0
  319.6   160.5       0  319.69  160.51       0  320.28  160.56       0
 320.41  160.58       0  320.59  160.59       0  321.13  160.64       0
  321.5  160.67       0  321.85  160.71       0  322.36  160.75       0
 322.57  160.77       0  322.71  160.78       0  323.29  160.84       0
 323.49  160.86       0  323.54  160.86       0  323.92  160.89       0
    324   160.9       0  324.12  160.91       0  324.72  160.95       0
 325.14  160.99       0  325.44  161.01       0  325.78  161.04       0
 325.88  160.54       0  326.16  160.54       0  326.35  160.54       0
 326.88  160.54       0  327.38  160.56       0  327.57  160.56       0
  327.6  160.56       0  327.65  160.56       0  328.32  160.56       0
 328.78  160.58       0  329.04   160.6       0  329.41  160.62       0
 329.76  160.64       0  329.99  160.65       0  330.48  160.69       0
 331.18  160.75       0  331.19  160.75       0  331.21  160.75       0
 331.27  160.76       0  331.91  160.82       0  332.42  160.87       0
 332.63  160.89       0  332.94  160.92       0  333.35  160.96       0
 333.63  161.01       0  334.07  161.08       0  334.71  161.21       0
 334.79  161.23       0  334.85  161.25       0  335.16  161.31       0
 335.46  161.31       0
```

Downstream Bridge Cross Section Data
Station Elevation Data   num=   243

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      0     277    6.44     277    9.81     277   16.14     276    19.6     275
  20.57     274   21.57     273   23.03     272   24.51     271   25.36     270
  26.07     269   26.55     268   27.59     267   28.72     266   30.11     265
  30.56     264   31.23     263   32.27     262   33.12     261   34.23     260
  36.56     259   67.94     259    68.4     260    68.9     261   69.31     262
  69.71     263   70.27     264   71.17     265   72.66     266   74.15     267
  75.14     268   75.73     269   76.42     270    77.1     271   78.45     272
  79.76     273   82.46     273   89.96     272    92.8     271   94.82     270
  99.31     269  103.08     268  105.54     267  107.74     266  109.17     265
  110.07     264  111.23     263  112.14     262  112.71     261   113.2     260
  113.56     259  113.94     258  114.17     257  115.15     256  116.77     255
  122.53     254  125.32     254  133.27     255  141.53     255  145.25     254
  148.47     253  149.76     252   150.6     251  151.72     250  152.59     249
  153.31     248  154.49     247  155.46     246  156.91     245  158.11     244
  159.18     243  160.52     242  161.24     241  161.26  240.98  162.26     240
  163.48     239  165.25     238  166.55     237  168.24     236  169.64     235
  171.04     234  172.33     233   173.3     232  174.34     231  175.47     230
  177.66     229  178.93     228  180.39     227  181.85     226  183.74     225
  185.27     224  186.77     223  187.91     222   188.9     221  190.14     220
  190.95     219  191.78     218   192.7     217  193.56     216  194.37     215
   195.3     214  196.21     213  197.29     212  198.77     211  199.84     210
  200.74     209  201.75     208  202.68     207  203.61     206  204.74     205
  205.92     204  207.12     203  208.28     202   209.4     201  210.53     200
  212.05     199   213.1     198  214.11     197  215.31     196  217.34     195
  218.98     194  220.91     193   221.8     192  223.21     191  226.23     190
  227.79     189  229.96     188  231.01     187  231.65     186  232.32     185
  235.18     184  235.99     183  237.23     182  239.14     181   240.6     180
  244.81     180  245.15     180  249.37     179  251.76     178  254.31     177
  261.77     176   262.6     175   263.5     174  272.62     173  277.19  172.44
  280.62     172   287.3     171  290.88     170  291.98     169  293.17     168
  294.38     167  295.49     166  296.58     165  299.63     164  300.27     163
  301.13     162  301.78     161  305.01  160.61  311.26     160  313.64     160
  325.78     161  328.79     162  330.23     163  330.92     164  331.67     165
  333.06     166  334.03  166.23  337.39     167  337.95     168  338.48     169
  339.18     170  340.12     171   342.2     172  347.84     173  351.57     173
  353.84     173  355.46     174  356.83     175   362.3     176  367.29     177
  368.79     178  370.56     179   373.5     180  374.96     181  376.62     182
   380.4     183  382.16     184  384.17     185  387.96     186  392.07     187
  393.42     188  394.42     189  395.73     190  400.53     191  404.86     192
  406.11     193   407.1     194  408.19     195  410.19     196  413.36     197
  416.12     198  417.81     199  418.48     200  419.36     201  420.13     202
  420.92     203  421.72     204  422.53     205  426.94     206  428.18     207
  429.81     208  431.74     209  433.69     210  434.89     211  437.32     212
  439.06     213  439.99     214  440.82     215   441.5     216  442.46     217
  443.15     218  443.69     219  445.47     220  450.29     221  451.11     222
  452.36     223  453.46     224  455.07     225  457.28     226  458.05     227
  458.93     228  459.93     229  461.26  229.98  461.29     230  463.38     231
  465.46     232  466.66     233  467.39     234  468.16     235  468.98     236
  469.92     237  470.58     238  473.97     238

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06    287.3      .04    342.2      .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         287.3   342.2             .3       .5

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular     .25
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
            30.58   20.87       .1      .11        0                  .5                1
Upstream   Elevation =  162.96
         Centerline Station =  77.62
Downstream Elevation =  160.42
         Centerline Station =  309.05

CULVERT OUTPUT  Profile #100-yr bulked  Culv Group:  Culvert #1

  Q Culv Group (cfs)          0.04    Culv Full Len (ft)         20.87
  # Barrels                      1    Culv Vel US (ft/s)          0.78
  Q Barrel (cfs)              0.04    Culv Vel DS (ft/s)          0.78
  E.G. US. (ft)             173.56    Culv Inv El Up (ft)       162.96
  W.S. US. (ft)             172.21    Culv Inv El Dn (ft)       160.42
  E.G. DS (ft)              171.23    Culv Frctn Ls (ft)          2.32
  W.S. DS (ft)              168.29    Culv Exit Loss (ft)         0.00
  Delta EG (ft)               2.33    Culv Entr Loss (ft)         0.00
  Delta WS (ft)               3.91    Q Weir (cfs)             3650.83
  E.G. IC (ft)              163.11    Weir Sta Lft (ft)          35.12
  E.G. OC (ft)              173.56    Weir Sta Rgt (ft)         102.54
  Culvert Control           Outlet    Weir Submerg                0.38
  Culv WS Inlet (ft)        163.21    Weir Max Depth (ft)        11.15
  Culv WS Outlet (ft)       160.67    Weir Avg Depth (ft)         7.17
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)    483.66
  Culv Crt Depth (ft)         0.12    Min El Weir Flow (ft)     162.46


CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 4348

INPUT
Description:
Station Elevation Data    num=      243
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     277    6.44     277    9.81     277   16.14     276    19.6     275
   20.57     274   21.57     273   23.03     272   24.51     271   25.36     270
   26.07     269   26.55     268   27.59     267   28.72     266   30.11     265
   30.56     264   31.23     263   32.27     262   33.12     261   34.23     260
   36.56     259   67.94     259    68.4     260    68.9     261   69.31     262
   69.71     263   70.27     264   71.17     265   72.66     266   74.15     267
   75.14     268   75.73     269   76.42     270    77.1     271   78.45     272
   79.76     273   82.46     273   89.96     272    92.8     271   94.82     270
   99.31     269  103.08     268  105.54     267  107.74     266  109.17     265
  110.07     264  111.23     263  112.14     262  112.71     261   113.2     260
  113.56     259  113.94     258  114.17     257  115.15     256  116.77     255
  122.53     254  125.32     254  133.27     255  141.53     255  145.25     254
  148.47     253  149.76     252   150.6     251  151.72     250  152.59     249
  153.31     248  154.49     247  155.46     246  156.91     245  158.11     244
  159.18     243  160.52     242  161.24     241  161.26  240.98  162.26     240
  163.48     239  165.25     238  166.55     237  168.24     236  169.64     235
  171.04     234  172.33     233   173.3     232  174.34     231  175.47     230
  177.66     229  178.93     228  180.39     227  181.85     226  183.74     225
  185.27     224  186.77     223  187.91     222   188.9     221  190.14     220
  190.95     219  191.78     218   192.7     217  193.56     216  194.37     215
   195.3     214  196.21     213  197.29     212  198.77     211  199.84     210
  200.74     209  201.75     208  202.68     207  203.61     206  204.74     205
  205.92     204  207.12     203  208.28     202   209.4     201  210.53     200
  212.05     199   213.1     198  214.11     197  215.31     196  217.34     195
  218.98     194  220.91     193   221.8     192  223.21     191  226.23     190
  227.79     189  229.96     188  231.01     187  231.65     186  232.32     185
  235.18     184  235.99     183  237.23     182  239.14     181   240.6     180
  244.81     180  245.15     180  249.37     179  251.76     178  254.31     177
  261.77     176   262.6     175   263.5     174  272.62     173  277.19  172.44
  280.62     172   287.3     171  290.88     170  291.98     169  293.17     168
  294.38     167  295.49     166  296.58     165  299.63     164  300.27     163
  301.13     162  301.78     161  305.01  160.61  311.26     160  313.64     160
  325.78     161  328.79     162  330.23     163  330.92     164  331.67     165
  333.06     166  334.03  166.23  337.39     167  337.95     168  338.48     169
  339.18     170  340.12     171   342.2     172  347.84     173  351.57     173
  353.84     173  355.46     174  356.83     175   362.3     176  367.29     177
  368.79     178  370.56     179   373.5     180  374.96     181  376.62     182
   380.4     183  382.16     184  384.17     185  387.96     186  392.07     187
  393.42     188  394.42     189  395.73     190  400.53     191  404.86     192
  406.11     193   407.1     194  408.19     195  410.19     196  413.36     197
  416.12     198  417.81     199  418.48     200  419.36     201  420.13     202
  420.92     203  421.72     204  422.53     205  426.94     206  428.18     207
  429.81     208  431.74     209  433.69     210  434.89     211  437.32     212
  439.06     213  439.99     214  440.82     215   441.5     216  442.46     217
  443.15     218  443.69     219  445.47     220  450.29     221  451.11     222
  452.36     223  453.46     224  455.07     225  457.28     226  458.05     227
  458.93     228  459.93     229  461.26  229.98  461.29     230  463.38     231
  465.46     232  466.66     233  467.39     234  468.16     235  468.98     236
  469.92     237  470.58     238  473.97     238

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06    287.3      .04    342.2      .06

Bank Sta: Left    Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
           287.3    342.2            102.51  102.51  102.51              .3        .5

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            171.23    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.94    Wt. n-Val.                            0.040
  W.S. Elev (ft)            168.29    Reach Len. (ft)           102.51     102.51     102.51
```

```
 Crit W.S. (ft)          168.29    Flow Area (sq ft)                 265.55
 E.G. Slope (ft/ft)     0.015179    Area (sq ft)                     265.55
 Q Total (cfs)          3650.00    Flow (cfs)                    3650.00
 Top Width (ft)           45.28    Top Width (ft)                    45.28
 Vel Total (ft/s)        13.74    Avg. Vel. (ft/s)               13.74
 Max Chl Dpth (ft)          8.29    Hydr. Depth (ft)                    5.86
 Conv. Total (cfs)       29625.9    Conv. (cfs)                    29625.9
 Length Wtd. (ft)         102.51    Wetted Per. (ft)                    51.02
 Min Ch El (ft)          160.00    Shear (lb/sq ft)                   4.93
 Alpha                    1.00    Stream Power (lb/ft s)           67.79
 Frctn Loss (ft)           1.62    Cum Volume (acre-ft)       3.93      31.25       1.30
 C & E Loss (ft)           0.07    Cum SA (acres)            1.39       4.89       0.73
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
        water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
        program defaulted to critical depth.

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 4245

INPUT
Description:
Station Elevation Data   num=   273

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      0     288    3.29     288    9.25     288   30.98     287   33.84     286
  34.34     285   34.61     284   35.08     283   35.48     282   35.92     281
   36.4     280   36.91     279   37.41     278    37.9     277   38.55     276
   39.1     275    39.7     274   40.27     273   40.84     272    41.3     271
  41.76     270   42.41     269   42.98     268   43.47     267   44.09     266
  44.32     265   45.56     264   46.83     263   47.51     262   47.96     261
  48.69     260   49.58     259   50.38     258   51.45     257   53.77     256
  65.16     256    83.6     257   84.24     258   85.51     259   86.31     260
  87.43     261    88.4     262   89.02     263   89.82     264   92.66     265
  93.76     265   98.12     264   102.6     263  105.54     262   108.2     261
  111.4     260  114.36  259.32  115.77     259  117.81     258  120.18     257
 121.91     256   123.3     255  124.62     254  126.11     253  127.38     252
 128.71     251  129.88     250  131.14     249   132.8     248  133.78     247
 134.62     246   136.1     245   137.5     244  138.54     243  139.84     242
 141.11     241  143.45     240  144.47     239  145.56     238  146.85     237
 148.15     236  148.99     235     150     234  151.42     233  152.82     232
 154.17     231  155.42     230  156.49     229   157.9     228  159.01     227
 160.14     226  161.49     225  162.86     224  164.27     223  165.67     222
 166.88     221  168.21     220  169.32     219  170.57     218  171.86     217
```

```
  172.92     216  174.81     215  176.47     214   177.9     213  179.32     212
  180.75     211  182.17     210  183.53     209  184.77     208  186.06     207
  187.13     206  188.32     205  190.02     204  193.36     203  194.88     202
  196.31     201  197.44     200  198.51     199  199.72     198  201.27     197
     203     196  204.61     195  206.22     194  208.01     193  209.51     192
  210.43     191  211.38     190  212.37     189  213.31     188  214.33     187
  215.39     186  216.13     185  217.88     185  218.67     185  219.99     184
  221.34     183  222.71     182  224.07     181  225.44     180  226.95     179
  228.35     178  229.87     177  232.01     176  233.89     175  235.62     174
  237.27     173  238.87     172  240.51     171  242.16     170  243.72     169
  244.67  168.33  245.13     168  246.32     167  247.36     166  248.38     165
  249.41     164  250.55     163  251.48     162  252.94     161  255.04     160
  256.19     159   257.5     158  258.75     157  259.82     156  260.72     155
   261.6  153.16   261.7   152.8   264.3   152.8  264.36   152.8  269.83   152.8
  271.74     155  273.26     156  291.86     165  309.48     165  312.22     165
  325.15     166  332.39     167  339.29     168  341.99     169  344.92     170
  347.12     170  367.89     170  392.01     171  394.28  171.49  396.91     172
  397.94     173  399.51     174  400.92     175  401.92     176  403.05     177
  404.98     178   407.7     179  408.62     179  409.43     179   411.1     180
  412.97     181  413.91     182  414.36  182.34  415.23     183  416.46     184
  418.34     185  422.81     186  424.74     187  426.03     188  427.24     189
  428.55     190  430.04     191  431.65     192  433.28     193   434.3     194
  435.52     195  436.71     196  438.37     197  439.06     198  440.08     199
  441.33     200  442.18     201  443.09     202  444.07     203  445.44     204
  447.31     205  448.53     206  449.37     207  450.76     208  451.82     209
  452.63     210  453.45     211  455.21     212  456.83     213  458.58     214
  459.72     215  460.65     216  461.73     217  463.04     218  464.32     219
  465.69     220  467.29     221  468.27     222  469.16     223  470.45     224
  471.52     225  472.79     226  474.45     227  475.58     228  476.69     229
  477.85     230  478.87     231  480.12     232  480.97     233  481.91     234
  482.84     235  484.62     236  485.75     237  486.69     238  487.85     239
  488.74     240  489.89     241  491.37     242  493.74     243  494.37     244
  495.27     245  496.25     246   497.8     247  499.25     248  500.57     249
  501.99     250  503.25     251  504.36     252  505.65     253  506.37     254
  507.35     255  508.55     256  509.92     257  510.45     258  511.18     259
   511.8     260  515.85     261  516.51     261

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  246.32     .04  291.86     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        246.32  291.86          101.98  101.98  101.98            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           167.35    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              3.18    Wt. n-Val.                          0.040
  W.S. Elev (ft)           164.16    Reach Len. (ft)          101.98     101.98     101.98
  Crit W.S. (ft)           164.16    Flow Area (sq ft)                   254.98
  E.G. Slope (ft/ft)     0.016383    Area (sq ft)                        254.98
  Q Total (cfs)           3650.00    Flow (cfs)                         3650.00
  Top Width (ft)            40.89    Top Width (ft)                       40.89
  Vel Total (ft/s)          14.32    Avg. Vel. (ft/s)                     14.32
```

```
 Max Chl Dpth (ft)        11.36    Hydr. Depth (ft)                  6.24
 Conv. Total (cfs)       28516.8    Conv. (cfs)                  28516.8
 Length Wtd. (ft)         101.98   Wetted Per. (ft)                 48.81
 Min Ch El (ft)          152.80    Shear (lb/sq ft)                  5.34
 Alpha                      1.00    Stream Power (lb/ft s)          76.48
 Frctn Loss (ft)            1.67    Cum Volume (acre-ft)       3.93      30.64      1.30
 C & E Loss (ft)            0.05    Cum SA (acres)             1.39       4.79      0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 4143

INPUT
Description:
Station Elevation Data    num=     219
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     285    1.09     285    3.29     284    5.23     283    6.79     282
    8.88     281   10.53     280   12.59     279   13.53     278   16.44     277
   17.27     276   18.57     275   19.44     274   20.18     273   20.79     272
    21.5     271    23.1     270   25.25     269   26.37     268   27.46     267
   27.89     266    28.4     265   28.74     264   29.16     263   29.87     262
    30.7     261   31.56     260   32.44     259   33.29     258   34.39     257
   35.03     256    36.2     255   37.17     254    38.3     253   39.02     252
   66.18     251   77.27     250   78.54     249   79.84     248   80.88     247
   81.94     246   83.12     245   84.51     244   85.71     243   86.82     242
   88.17     241   88.73  240.64   89.71     240   91.41     239   93.34     238
    95.3     237   96.22     236   97.03     235   98.48     234   99.54     233
  100.66     232  101.43     231  102.44     230  103.21     229  104.83     228
  105.91     227  106.68     226  108.35     225  109.54     224  111.83     223
  114.37     222  117.09     221  118.22     220  119.47     219  122.29     218
  123.51     217  125.57     216  128.81     215  130.43     214  133.08     213
  134.44     212  136.27     211  137.66     210   139.1     209  143.16     208
  145.75     207  148.11     206   148.9     205  150.28     204  152.09     203
  153.63     202  155.54     201  158.28     200  159.44     199  160.37     198
   161.8     197  163.37     197  163.64     197  165.77     196  167.51     195
  169.11     194   170.5     193  172.68     192   173.9     191  175.12     190
   176.5     189  178.44     188  179.83     187  182.61     186  185.59     185
  186.35     184  187.65     183  189.03     182  190.51     181  191.71     180
  192.87     180  193.19     180  197.77     179  199.86     178  201.49     177
  203.84     176  204.07   175.9  206.12     175  211.52     174  213.38     173
  214.95     172  216.81     171  217.35     170  220.48     165   222.6     160
  226.75  154.49     232   148.3   248.6   148.3  253.96  155.17  264.47     162
  267.52  163.24   269.2   163.6  270.66     164  272.26     165  273.87     166
  277.89     166   279.5     165  282.05     164  285.91     164  300.49     165
  302.41     166  308.71     167  316.49     168   320.2     169  339.87     170
  346.44     171  356.65     172   362.4     173  368.29     174  371.62     175
  373.23   173.4  377.73   173.4  394.03     177  409.03     177  424.23   176.8
  424.23     184  434.83   185.2  463.03   187.7  467.36     189  468.12     190
   468.3     191  468.57     192  469.07     193  469.88     194  470.91     195
  471.85     196  473.06     197  474.11     198  475.16     199  476.32     200
  477.91     201  479.33     202  480.81     203   481.6     204   482.6     205
  483.57     206  484.81     207  486.24     208  487.68     209  489.08     210
  490.47     211  491.93     212  493.47     213  494.55     214  496.67     215
  497.95     216  499.24     217  500.22     218  501.18     219  502.17     220
   502.9     221  506.55     222  508.21     223  509.36     224  510.54     225
  511.81     226  512.86     227  514.74     228  516.94     229  518.63     230
  519.64     231  520.83     232  522.58     233  523.95     234  525.22     235
  525.92     236  526.73     237  527.95     238  529.94     239  534.06     240
   535.5     241  536.82     242  538.26     243  539.39     244   542.5     245
  543.97     246  545.26     247  546.49     248   547.8     248

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   220.48      .04   264.47      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          220.48   264.47              100.97   100.97   100.97              .1        .3
Blocked Obstructions       num=        1
    Sta L    Sta R     Elev
      394      409      200

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             162.37    Element                    Left OB     Channel    Right OB
  Vel Head (ft)                3.69    Wt. n-Val.                               0.040
  W.S. Elev (ft)             158.68    Reach Len. (ft)             100.97      100.97      100.97
  Crit W.S. (ft)             158.68    Flow Area (sq ft)                       263.74
  E.G. Slope (ft/ft)       0.016343    Area (sq ft)                            263.74
  Q Total (cfs)             4065.00    Flow (cfs)                             4065.00
  Top Width (ft)              35.76    Top Width (ft)                           35.76
  Vel Total (ft/s)            15.41    Avg. Vel. (ft/s)                         15.41
  Max Chl Dpth (ft)           10.38    Hydr. Depth (ft)                          7.38
  Conv. Total (cfs)         31798.1    Conv. (cfs)                            31798.1
  Length Wtd. (ft)           100.97    Wetted Per. (ft)                         45.11
  Min Ch El (ft)             148.30    Shear (lb/sq ft)                          5.97
  Alpha                        1.00    Stream Power (lb/ft s)                   91.95
  Frctn Loss (ft)              1.65    Cum Volume (acre-ft)          3.93       30.03        1.30
  C & E Loss (ft)              0.15    Cum SA (acres)                1.39        4.70        0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
```

```
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 4042

INPUT
Description:
Station Elevation Data    num=      181
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     272    1.71     272    2.68     271    3.95     270    5.13     269
    6.28     268     7.3     267    7.95     266    8.76     265    9.47     264
   10.21     263   11.65     262   13.83     261    15.1     260   16.09     259
    16.8     258   18.06     257   19.49     256   20.83     255   22.03     254
   23.01     253   24.11     252    24.9     251   25.84     250   26.76     249
   27.49     248   28.15     247   74.41     246   76.16     245   78.25     244
   79.66     243      81     242   82.29     241    83.7     240   84.99     239
   88.19     238   89.16  237.52   90.22     237   91.57     236   92.14     235
   92.72     234   98.21     233   99.44     232  101.51     231  101.91     230
  102.48     229  104.08     228  107.43     227  114.63     226  115.17     225
   115.7     224  116.05     223  117.56     222  118.88     221  122.01     220
  124.52     219  125.74     218  127.28     217  128.66     216  130.43     215
  131.88     214  134.01     213  136.52     212  138.14     211  141.25     210
  143.57     209   147.4     208  148.81     207  149.95     206   151.3     205
  154.62     205  155.38     205   159.1     204  160.17     203  160.92     202
  162.23     201  163.04     200  163.47     199   163.9     198  164.63     197
  165.93     196  167.28     195  168.03     194  169.48     193  171.45     192
  172.48     191  173.34     190  174.37     189  175.14     188  175.73     187
  176.68     186  178.29     185  179.06     184  179.85     183  180.58     182
   181.9     181  183.24     180  184.16     179  185.66     178  186.93     177
  187.82     176  188.65     175  189.83     174  191.42     173   192.7     172
   193.7     171  194.82     170  196.44     169  198.18     168  200.83     167
  201.57     166  202.29     165  202.67     165  206.01     165  206.93     164
  210.93     163  212.48     162  213.98     161  215.15     160  221.41     155
  233.01  150.92     237   144.5     250   144.5  253.89     150  262.66     155
   265.3  155.99  275.16   162.8  295.06   162.8  394.46     158  409.36   213.2
  410.52     211  411.65     212  415.18     213  429.63     214     435     215
  436.85     216  439.71     217  441.46     218  443.51     219  443.83     220
  444.42     221  445.05     222  446.42     223  447.28     224  448.69     225
  450.31     226  452.13     227   453.9     228  454.96     229     456     230
  457.58     231  458.88     232  459.91     233  461.02     234  462.23     235
  463.65     236  464.76     237  466.25     238   468.2     239  470.35     240
  472.98     241  475.79     242  478.29     243  481.97     244  484.58     245
  487.39     246  490.32     247  494.36     248  496.38     249  499.42     250
  502.04     251  503.87     252   507.9     253  511.73     254  513.87     255
  517.02     256  520.47     257  523.56     258  526.83     259  529.95     260
  531.73     260

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  210.93     .04  275.16     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        210.93  275.16          191.84  191.84  191.84            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           159.17    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              3.21    Wt. n-Val.                          0.040
  W.S. Elev (ft)           155.97    Reach Len. (ft)          191.84     191.84     191.84
  Crit W.S. (ft)           155.97    Flow Area (sq ft)                  283.05
  E.G. Slope (ft/ft)     0.016411    Area (sq ft)                       283.05
  Q Total (cfs)           4065.00    Flow (cfs)                        4065.00
  Top Width (ft)            45.04    Top Width (ft)                      45.04
  Vel Total (ft/s)          14.36    Avg. Vel. (ft/s)                    14.36
  Max Chl Dpth (ft)         11.47    Hydr. Depth (ft)                     6.28
  Conv. Total (cfs)       31732.2    Conv. (cfs)                       31732.2
  Length Wtd. (ft)         191.84    Wetted Per. (ft)                    53.99
  Min Ch El (ft)           144.50    Shear (lb/sq ft)                     5.37
  Alpha                      1.00    Stream Power (lb/ft s)              77.13
  Frctn Loss (ft)            3.15    Cum Volume (acre-ft)       3.93      29.39       1.30
  C & E Loss (ft)            0.03    Cum SA (acres)             1.39       4.61       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3850

INPUT
Description:
Station Elevation Data    num=     280
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     302     .85     302     2.6     301    5.14     300    7.27     299
    9.42     298   10.43     297   11.56     296   12.76     295   14.09     294
   14.95     293    16.3     292   17.04     291   17.84     290   18.57     289
   19.74     288   21.01     287   22.28     286   23.86     285    24.5     284
```

24.82	283	25.32	282	25.72	281	26.1	280	26.6	279
26.99	278	27.41	277	27.66	276	27.93	275	28.51	274
29.02	273.04	29.04	273	29.8	272	30.31	271	30.74	270
31.19	269	31.45	268	31.8	267	32.15	266	32.54	265
32.83	264	33.26	263	34.23	262	35.1	261	36.07	260
36.94	259	37.46	258	37.85	257	38.19	256	39.19	255
39.8	254	40.16	253	40.65	252	41.16	251	41.62	250
42.09	249	42.31	248	42.94	247	43.64	246	44.32	245
45.02	244	45.76	243	46.2	242	47.51	241	48.15	240
48.74	239	49.3	238	49.97	237	50.69	236	51.13	235
52.41	234	58.74	234	79.28	235	91.08	235	92.1	234
92.71	233	93.43	232	94.23	231	94.86	230	95.37	229
95.87	228	96.5	227	97.26	226	97.94	225	99.14	224
100.53	223	101.16	222	101.88	221	102.65	220	103.68	219
105.11	218	105.95	217	106.88	216	108.26	215	109.14	214
109.77	213	110.32	212	110.94	211	111.53	210	112.21	209
112.97	208	113.52	207	114.01	206	114.74	205	115.52	204
117.26	203	118.47	202	119.67	201	120.8	200	121.65	199
122.51	198	123.21	197	123.99	196	124.74	195	125.84	194
126.93	193	127.83	192	129.24	191	130.48	190	131.08	189
131.86	188	132.53	187	133.64	186	135.21	185	136.3	184
137.25	183	137.88	182	138.84	181	139.67	180	140.03	179
141.04	178	141.84	177	142.63	176	143.38	175	144.5	174
145.53	173	146.5	172	147.44	171	148.76	170	149.53	169
150.17	168	150.31	167	150.57	166	150.82	165	151.28	164
151.92	163	152.58	162	153.12	161	153.57	160	154.2	159
155.11	158	155.87	157	156.25	156	156.54	155	156.86	154
157.29	153	158.39	150	161.17	145.24	166	137.2	184	137.2
191.16	145	205.88	150	206.23	150	212.99	150	214.25	150
221.72	151	223.11	151	288.53	151	292.74	152	297.5	153
298.71	154	300.14	155	302.03	156	304.92	157	307.66	158
310.35	159	312.96	160	314.62	161	316.02	162	317.45	163
318.88	164	320	165	321.12	166	322.39	167	323.86	168
325.26	169	326.65	170	329.02	170.77	329.73	171	338.45	172
339.84	173	340.74	174	342.17	175	344.44	176	345.01	177
345.68	178	346.8	179	347.98	180	349.51	181	351.68	182
357	183	358.23	184	358.54	185	358.79	186	359.08	187
359.32	188	359.88	189	360.53	190	361.26	191	362.07	192
362.95	193	368.82	193	375.62	192	377.83	191	379.67	190
382.81	189	384.52	188	386.71	187	388.68	186	390.88	185
393.61	184	394.14	183	394.92	182	395.65	181	397.18	180
399.49	180	407.68	181	409.75	182	412.7	182	415.78	181
428.68	181	429.21	181	444.97	181	449.15	182	450.64	183
452.61	184	455.14	185	456.6	186	457.49	187	458.34	188
459.25	189	460.06	190	460.94	191	461.74	192	462.6	193
463.43	194	464.25	195	465.11	196	466.55	197	468.45	198
470.05	199	471.32	200	472.45	201	474.61	202	476.06	203
477.03	204	478.99	205	480.55	206	481.96	207	484.21	208
486.66	209	488.11	210	489.77	211	491.22	212	492.38	213
494.09	214	495.87	215	497.15	216	498.53	217	501.63	218
503.87	219	506.32	220	507.94	221	509.67	222	511.45	223
513.03	224	514.44	225	516.47	226	519.3	227	522.1	227

Manning's n Values num= 3

```
    Sta   n Val     Sta   n Val     Sta   n Val
      0     .06  157.29     .04  206.23     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        157.29  206.23          104.89  104.89  104.89            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           150.96    Element                Left OB    Channel   Right OB
  Vel Head (ft)              3.51    Wt. n-Val.                          0.040
  W.S. Elev (ft)           147.45    Reach Len. (ft)          104.89     104.89     104.89
  Crit W.S. (ft)           147.45    Flow Area (sq ft)                  270.34
  E.G. Slope (ft/ft)     0.016417    Area (sq ft)                       270.34
  Q Total (cfs)           4065.00    Flow (cfs)                        4065.00
  Top Width (ft)            38.50    Top Width (ft)                      38.50
  Vel Total (ft/s)          15.04    Avg. Vel. (ft/s)                    15.04
  Max Chl Dpth (ft)         10.25    Hydr. Depth (ft)                     7.02
  Conv. Total (cfs)       31725.6    Conv. (cfs)                       31725.6
  Length Wtd. (ft)         104.89    Wetted Per. (ft)                    48.15
  Min Ch El (ft)           137.20    Shear (lb/sq ft)                     5.75
  Alpha                      1.00    Stream Power (lb/ft s)              86.53
  Frctn Loss (ft)            1.72    Cum Volume (acre-ft)       3.93      28.18       1.30
  C & E Loss (ft)            0.10    Cum SA (acres)             1.39       4.42       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3745

INPUT
Description:
Station Elevation Data    num=      261
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     287    3.99     287   10.25     286   16.33     285   21.62     285
   24.58     285    27.2     284   27.56  283.92   31.73     283   36.27     282
   38.44     281   39.82     280   40.33     279   40.83     278   41.45     277
   42.05     276   42.43     275   42.84     274   43.47     273   44.17     272
   44.45     271   45.15     270   45.65     269   45.99     268   46.34     267
   47.01     266   47.51     265   48.25     264    49.5     263   50.96     262
   52.79     261   53.49     260   54.37     259   55.36     258   56.45     257
   57.45     256   58.99     255   59.96     254    60.7     253   61.37     252
   62.12     251   63.11     250   64.14     249   65.22     248   66.08     247
   66.47     246   66.98     245   67.63     244   68.29     243   68.78     242
    69.2     241   69.62     240   70.17     239   70.71     238   71.14     237
    71.7     236   71.97     235   72.46     234   72.73     233   73.08     232
   73.31     231   73.87     230   74.34     229   87.36     229   98.65     230
  101.44     230   102.7     229  103.68     228   104.6     227  105.88     226
  107.06     225  107.88     224  108.48     223  109.25     222  110.28     221
  110.83     220  111.63     219  112.51     218  113.44     217  114.43     216
  115.26     215  115.67     214  116.58     213  117.34     212  118.03     211
  118.33     210  118.71     209  119.96     208  121.09     207  122.04     206
  122.81     205  123.62     204  124.57     203  125.33     202  126.24     201
  127.41     200  128.99     199  129.77     198  130.24     197  131.52     196
  133.25     195  133.95     194  134.46     193  135.15     192  135.81     191
  136.65     190  137.34     189  138.16     188   139.2     187  139.96     186
  140.75     185  141.21     184  141.53     183  141.89     182   142.1     181
  142.17     180  142.45     179  143.35     178  144.74     177  146.01     176
  146.89     175  147.59     174  148.21     173  148.88     172   149.7     171
  150.69     170  151.69     169  152.51     168  153.29     167  153.83     166
  154.13     165  154.62     164  155.42     163  155.99     162  156.83     161
  157.72     160  158.47     159  159.01     158  159.94     157  160.94     156
  161.46     155  161.94     154  162.27     153  162.57     152  162.78     151
  163.25     150  164.55     149  164.92     148  165.35     147  165.98     145
  171.71   140.1   173.7   133.7   188.3   133.7  194.06     140   210.9     145
  222.46   150.4  242.66   150.9  250.26     151  260.87     149  277.53     150
  298.88     151  301.17     152  304.08     153  305.25     154   306.4     155
  307.97     156  309.63     157  310.95     158  312.27     159  314.04     160
  315.57     161  316.84     162  318.19     163  319.08     164  320.56     165
   321.9     166  322.78     167  324.04     168  325.68     169  327.56  169.68
  328.46     170  346.21     171   350.4     172  353.94  172.73   355.4     173
   357.6     174  359.04     175  360.39     176  363.14     177   364.2     178
  364.95     179  365.49     180  366.02     181  366.78     182  368.81     183
  369.95     184  370.69     185  371.37     186  376.83     187  379.96     187
  380.95     186  382.45     185  383.69     184  385.71     183  390.74     182
  393.12     181  405.89     179  408.13     179  414.31     178     423     175
  444.07     175  447.15     175  449.38     177  449.83     178  450.36     179
  451.07     180  452.21     181  453.23     182  454.43     183  455.37     184
  456.87     185  457.72     186  458.81     187  459.44     188  459.97     189
  460.48     190  461.04     191  461.71     192  462.68     193  463.48     194
  464.33     195  465.48     196  466.69     197  467.81     198  469.06     199
  470.22     200  471.55     201  473.26     202  475.14     203  476.13     204
  477.37     205  478.46     206  479.77     207  480.53     208   486.3     209
  488.22     210  490.19     211  491.82     212  493.36     213  494.46     214
  496.96     215  498.49     216   499.9     217  501.84     218  503.85     219
   505.2     220  507.64     221   510.4     222  511.84     223  513.45     224
  515.13     224

Manning's n Values        num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   165.35      .04   222.46      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
         165.35  222.46              97.03    97.03    97.03              .1        .3
Blocked Obstructions      num=        3
   Sta L    Sta R     Elev    Sta L    Sta R     Elev    Sta L    Sta R     Elev
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    261     282     180     363     382     200     412     442     200

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            148.18    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               3.17    Wt. n-Val.                             0.040
  W.S. Elev (ft)            145.01    Reach Len. (ft)             97.03      97.03      97.03
  Crit W.S. (ft)            145.01    Flow Area (sq ft)                     284.82
  E.G. Slope (ft/ft)      0.016472    Area (sq ft)                          284.82
  Q Total (cfs)            4065.00    Flow (cfs)                           4065.00
  Top Width (ft)             44.95    Top Width (ft)                         44.95
  Vel Total (ft/s)           14.27    Avg. Vel. (ft/s)                       14.27
  Max Chl Dpth (ft)          11.31    Hydr. Depth (ft)                        6.34
  Conv. Total (cfs)        31672.4    Conv. (cfs)                          31672.4
  Length Wtd. (ft)           97.03    Wetted Per. (ft)                       54.99
  Min Ch El (ft)            133.70    Shear (lb/sq ft)                        5.33
  Alpha                       1.00    Stream Power (lb/ft s)                 76.02
  Frctn Loss (ft)             1.58    Cum Volume (acre-ft)         3.93      27.51       1.30
  C & E Loss (ft)             0.02    Cum SA (acres)               1.39       4.32       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3648

INPUT
Description:
Station Elevation Data    num=      234
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     272    1.44     272     3.1     271    4.92     270    6.56     269
    8.26     268    10.6     267    13.5     266      16     265   17.61     264
   19.27     263   22.52     262   24.94     261   26.57     260   28.94     260
   29.21     260   31.32     259   32.92     258   34.54     257   35.55     256
    36.9     255   39.81     254   44.11     254   45.61     254   49.57     253
   51.94     252   53.84     251   54.95     250   55.62     249   56.27     248
   56.87     247   58.69     246   61.65     245   62.04     244   62.53     243
   63.04     242   63.65     241   64.49     240   65.16     239   65.83     238
   66.32     237   66.85  236.28   67.06     236   68.71     235   71.52     234
   74.16     233   74.83     232   75.69     232   75.87     233   76.21     234
   76.47     235   76.73     236    77.1     237   77.69     238   78.08     239
   78.41     240   80.92     241   83.94     242      87     243   88.81     244
   92.95     244   93.56     243   94.23     242   94.85     241   95.38     240
   95.93     239   96.29     238   97.16     237    98.4     236   99.07     235
   99.59     234  100.06     233  100.55     232  101.03     231  101.34     230
  101.72     229  102.39     228  103.24     227  103.96     226  105.39     225
  106.29     224  107.41     223  108.36     222  110.06     221  111.42     221
  117.83     222  136.28     223  142.54     224  147.29     224  149.05     223
  149.83     222  150.19     221  150.61     220  150.88     219  151.15     218
  151.47     217  151.79     216  152.36     215   153.4     214  154.25     213
  155.05     212  155.65     211  156.56     210  157.56     209  158.63     208
  159.22     207  160.09     206  161.22     205  162.07     204  162.95     203
  163.64     202  164.08     201  164.49     200  164.93     199  165.35     198
  166.04     197  166.63     196  167.26     195  168.31     194  169.91     193
  170.58     192  171.11     191   171.6     190  172.09     189  172.68     188
  173.14     187  173.93     186   174.7     185  175.87     184  177.03     183
  177.62     182  178.36     181  179.45     180  180.41     179  181.28     178
  181.75     177  182.37     176  183.79     175  184.87     174  185.55     173
  186.06     172   186.3     171  186.99     170   187.4     169  187.94     168
  188.39     167  188.94     166  189.84     165  190.45     164  190.96     163
  191.48     162  192.03     161  192.58     160  193.18     159   193.6     158
  194.12     157  194.47     156  195.24     155  196.36     154  198.29     153
  198.68     152  199.14     151  199.62     150  200.19     149  200.76     148
  201.26     147  203.99     140  208.25  136.03   211.5     131     225     131
  228.71     135  239.92     140  250.89     145  258.05   149.8  278.55   150.1
  287.05   150.2  293.95   150.5  318.55   150.5  328.45   149.1  329.85     149
  336.15     150  344.45     154  411.75   170.1  419.25   170.1  424.57     170
  428.88     170   440.8     172  443.58     173   446.9     174  450.54     174
  450.97     174  463.69     175     465     176  465.88     177  466.92     178
  467.93     179  469.24     180  469.98     181  470.42     182  470.82     183
  471.37     184  472.11     185   473.1     186  473.76     187  474.81     188
  475.87     189  476.91     190  478.23     191  480.06     192  481.48     193
  483.05     194  484.86     195  486.53     196  488.24     197  490.04     198
  491.82     199  493.33     200  495.18     201  496.66     202  498.31     203
  500.12     204   502.2     205  503.88     206  505.38     207  507.28     208
  509.52     209  511.53     210  512.86     211  514.65     212  516.28     213
   518.3     214  519.72     215   521.2     216  522.64     216

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  201.26     .04  258.05     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        201.26  258.05            98.74   98.74   98.74             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     294     319     180     428     456     200

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            145.22    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               3.41    Wt. n-Val.                            0.040
  W.S. Elev (ft)            141.81    Reach Len. (ft)             98.74      98.74      98.74
  Crit W.S. (ft)            141.81    Flow Area (sq ft)                    274.36
  E.G. Slope (ft/ft)      0.016154    Area (sq ft)                         274.36
  Q Total (cfs)            4065.00    Flow (cfs)                          4065.00
  Top Width (ft)            40.61    Top Width (ft)                   40.61
  Vel Total (ft/s)          14.82    Avg. Vel. (ft/s)                 14.82
  Max Chl Dpth (ft)         10.81    Hydr. Depth (ft)                  6.76
  Conv. Total (cfs)       31983.0    Conv. (cfs)                    31983.0
  Length Wtd. (ft)          98.74    Wetted Per. (ft)                 49.35
  Min Ch El (ft)           131.00    Shear (lb/sq ft)                  5.61
  Alpha                      1.00    Stream Power (lb/ft s)           83.06
  Frctn Loss (ft)            1.62    Cum Volume (acre-ft)       3.93      26.88      1.30
  C & E Loss (ft)            0.02    Cum SA (acres)             1.39       4.23      0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 3549

INPUT
Description:
Station Elevation Data    num=      182
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     252    3.32     252    3.68     251    4.17     250    4.82     249
    5.77     248    7.34     247    8.34     246    9.14     245   10.61     244
   11.56     243   11.82     242   12.12     241    12.4     240      13     239
   14.61     238   15.71     237   16.68     236   17.65     235   18.54     234
   19.58     233   20.39     232   21.05     231   21.65     230   22.31     229
   23.15     228   24.05     227   24.77     226   25.29     225   25.79     224
   26.41     223   26.94     222    27.5     221   27.72     220   28.19     219
   28.47     218   28.93     217   29.69     216   30.48     215   31.11     214
   31.99     213    39.4     213    58.8     213   59.82     212   60.89     211
   61.81     210   62.98     209   66.51     208   67.41     207   68.03     206
   68.54     205   69.03     204   69.51     203   70.44     202   71.68     201
   72.73     200   74.41     199   75.71     198   76.47     197   77.22     196
   77.98     195   79.42     194   81.54     193    82.6     192   83.24     191
   84.01     190   84.91     189   85.62     188   86.48     187   87.04     186
   87.59     185    88.4     184   89.36     183   90.06     182   90.67     181
   91.25     180   91.86     179   92.65     178   93.54     177   94.54     176
   96.41     175   97.95     174   99.13     173  100.31     172  101.91     171
  102.92     170  103.74     169  104.79     168   105.8     167  106.99     166
  107.95     165  111.93     164  113.42     163  113.93     162  114.19     161
  114.58     160  114.75     159  114.92     158  115.01     157  115.12     156
  115.21     155  116.73     154  118.12     153  120.16     152  122.06     151
   122.2     150  122.33     149  122.49     148  122.98     147   123.1     146
  123.61     145  123.79     144  124.03     143  124.41     142  125.83     141
  126.74     140     127     140  129.68  135.07     133   127.2     152   127.2
  160.53     135   171.9     140  178.91     143  183.91     143  204.51   143.8
  208.62     144  219.51     145  225.81     146  273.51   153.2  279.61   153.5
  296.01     159  321.61     160  325.63     159  330.68     160  335.04     161
  339.97     162  344.19     163  346.56     164  348.55     165  351.33     166
  353.86     167  357.63     168  368.28     169  370.86     170  375.91     170
  385.36     170  389.48     172  391.52     173  392.69     174  393.41     175
  393.83     176  394.48     177  395.89     178  397.92     179  399.74     180
  401.06     181  401.93     182  403.13     183  406.11     184  408.42     185
   409.8     186  412.03     187  414.15     188  415.68     189  417.28     190
  419.15     191  420.84     192  422.33     193  424.05     194  425.46     195
  427.23     196   428.8     197  430.61     198  433.14     199  434.49     200
  436.54     201  438.27     202  439.77     203  441.17     204   442.7     205
  444.19     206  445.26     206

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   124.41      .04   178.91      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        124.41  178.91           104.65  104.65  104.65             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            140.75    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               3.63    Wt. n-Val.                            0.040
  W.S. Elev (ft)            137.12    Reach Len. (ft)           104.65     104.65     104.65
  Crit W.S. (ft)            137.12    Flow Area (sq ft)                    266.14
  E.G. Slope (ft/ft)      0.016617    Area (sq ft)                         266.14
  Q Total (cfs)            4065.00    Flow (cfs)                          4065.00
  Top Width (ft)             36.80    Top Width (ft)                        36.80
  Vel Total (ft/s)           15.27    Avg. Vel. (ft/s)                      15.27
  Max Chl Dpth (ft)           9.92    Hydr. Depth (ft)                       7.23
  Conv. Total (cfs)        31534.3    Conv. (cfs)                         31534.3
  Length Wtd. (ft)          104.65    Wetted Per. (ft)                      46.72
  Min Ch El (ft)            127.20    Shear (lb/sq ft)                       5.91
  Alpha                       1.00    Stream Power (lb/ft s)                90.27
  Frctn Loss (ft)             1.75    Cum Volume (acre-ft)        3.93      26.27       1.30
  C & E Loss (ft)             0.02    Cum SA (acres)              1.39       4.14       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION
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RIVER: Little Sycamore
REACH: Lower Reach RS: 3444

INPUT
Description:
Station Elevation Data num= 216

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	255	.04	255	2.84	254	5.09	253	6.96	252
8.95	251	12.79	250	15.37	249	16.89	248	18.22	247
19.44	246	21.62	245	22.96	244	24	243	24.37	242
25.01	241	25.61	240	26.54	239	27.68	238	28.42	237
29.3	236	30.31	235	31.29	234	32.3	233	33.29	232
34.16	231	34.81	230	35.59	229	36.17	228	37.53	227
38.92	226	40.63	225	41.4	224	41.98	223	42.71	222
43.32	221	44.33	220	45.58	219	46.52	218	47.49	217
48.28	216	48.92	215	49.82	214	50.8	213	51.81	212
52.41	211	53.17	210	53.69	209	54.09	208	58.24	208
58.98	208	69.65	209	84.55	210	88.87	211	92.62	211
95.85	211	99.75	211	102.46	210	103.72	209	105.21	208
108.16	208	110.26	208	111.43	207.13	111.6	207	112.48	206
113.01	205	114.08	204	114.63	203	115.31	202	115.81	201
116.36	200	117.75	199	118.95	198	121.1	197	121.6	196
122.12	195	122.56	194	123.32	193	126.89	192	127.63	191
128.75	190	130.25	189	130.99	188	131.91	187	132.35	186
132.97	185	133.73	184	135.02	183	136.49	182	137.88	181
139.04	180	140.51	179	141.5	178	142.58	177	144.27	177
145.93	178	148.79	178	149.13	177	149.29	176	149.72	175
150.14	174	150.5	173	151.13	172	151.86	171	152.64	170
153.24	169	153.87	168	156.47	167	157.07	166	157.77	165
158.39	164	159.58	163	160.27	162	163.92	161	164.57	160
165.45	159	165.69	158	166.19	157	166.65	156	169.13	155
170.9	154	172.01	153	173	152	175.02	151	176.67	150
177.69	149	178.96	148	179.78	147	180.17	146	181.12	145
181.77	144	183.64	143	185.03	142	186.33	141	190.53	140
194.29	135	197.9	130.41	203.5	121.4	220	121.4	227.92	130
235.93	135	237.52	136	240.86	136	256.74	136	269.04	137
292.04	145	302.84	146	311.84	147	323.94	148	329.54	149
360.34	149	360.34	159	438.64	159	438.64	163.5	448.54	163
457.74	153.5	468.24	153.5	469.95	155	470.14	156	470.27	157
470.38	158	470.54	159	471.25	160	471.63	161	472.02	162
472.63	163	473.12	164	473.67	165	474.12	166	475.06	167
475.98	168	476.69	169	477.46	170	478.15	171	479.14	172
480.54	173	481.43	174	482.3	175	482.81	176	483.27	177
483.78	178	484.47	179	485.24	180	485.68	181	486.31	182
487.36	183	488.08	184	488.63	185	489.28	186	490.38	187
491.16	188	492.77	189	493.78	190	494.87	191	496.75	192
498.19	193	499.14	194	499.77	195	501.88	196	503.62	197
504.49	198	505.87	199	507.28	200	508.55	201	509.59	202
510.82	203	512.62	204	514.07	205	515.01	206	516.18	207
517.43	208	519.22	209	520.52	210	521.79	211	523.2	212
523.7	212								

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Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .06  190.53     .04  235.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        190.53  235.93           93.51   93.51   93.51            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           135.71    Element                   Left OB    Channel   Right OB
  Vel Head (ft)              3.83    Wt. n-Val.                            0.040
  W.S. Elev (ft)           131.88    Reach Len. (ft)             93.51      93.51      93.51
  Crit W.S. (ft)           131.88    Flow Area (sq ft)                    259.03
  E.G. Slope (ft/ft)     0.016902    Area (sq ft)                         259.03
  Q Total (cfs)           4065.00    Flow (cfs)                          4065.00
  Top Width (ft)            34.19    Top Width (ft)                        34.19
  Vel Total (ft/s)          15.69    Avg. Vel. (ft/s)                      15.69
  Max Chl Dpth (ft)         10.48    Hydr. Depth (ft)                       7.58
  Conv. Total (cfs)       31267.0    Conv. (cfs)                         31267.0
  Length Wtd. (ft)          93.51    Wetted Per. (ft)                      44.22
  Min Ch El (ft)           121.40    Shear (lb/sq ft)                       6.18
  Alpha                      1.00    Stream Power (lb/ft s)                97.00
  Frctn Loss (ft)            0.90    Cum Volume (acre-ft)         3.93      25.64       1.30
  C & E Loss (ft)            0.65    Cum SA (acres)               1.39       4.06       0.73


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3350

INPUT
Description:
Station Elevation Data    num=     234
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     255     .55     255    2.11     254    4.21     253    7.21     252
    8.73     251    11.1     250   14.58     249    16.9     248   18.56     247
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   19.71     246   20.69     245   21.95     244   22.89     243   23.87     242
   24.32     241   25.06     240    25.8     239   27.12     238    28.1     237
   28.96     236   29.78     235    30.7     234   31.96     233   33.13     232
   34.23     231    35.5     230   37.16     229    38.2     228   39.36     227
   40.15     226   40.93     225   41.56     224    42.4     223   43.15     222
    43.9     221   44.69     220   45.54     219   46.24     218   47.12     217
   47.96     216   49.18     215   50.41     214   51.13     213   51.71     212
   52.35     211   53.12     210   54.01     209   54.99     208   55.87     207
   58.05     207   64.91     208   79.15     209   88.51     210   91.15     211
   98.15     212  102.59     212  103.73     211  106.83     210  107.58     209
  108.47     208  109.91     207  111.45     206  111.92  205.64  112.74     205
  113.96     204  115.03     203  115.97     202  118.09     201  119.72     200
   121.1     199  122.13     198  123.14     197  124.62     196  125.69     195
  127.26     194  129.17     193  131.27     192  132.79     191  133.54     190
  134.29     189  135.19     188  136.93     187  139.13     186   140.7     185
  142.06     184   143.1     183  143.88     182  144.75     181  146.23     180
  147.47     179  149.31     178  150.91     177  153.58     176  154.58     175
  155.79     174  157.21     173  158.28     172  159.37     171  164.63     170
  165.18     169  165.76     168  166.59     167  167.66     166  174.77     165
  175.69     164  176.56     163  178.36     162  180.66     161  181.69     160
  182.29     159  182.79     158  183.34     157   185.7     156  186.82     155
  188.56     154  190.07     153  197.36     152   199.1     151  201.11     150
  204.05     149  204.98  148.58     206     148  207.05     147  208.52     146
  210.26     145  212.34     144  213.76     143  215.07     142  216.61     141
  218.05     140  219.39     139  220.42     138  221.43     137   224.4     136
  225.55     135  226.35     134  227.58     133  230.49     132  233.11     131
  238.15     130  242.05     129  243.62     128  244.96     127  246.75     126
  254.28  121.61  261.92   121.4  262.42   121.4     275  121.38  282.56     131
  303.32   130.8  309.92     131  315.82     132  328.12     133  330.42     135
  343.92     140  363.62     141  372.82     145  376.42     145  408.12     145
  408.12     157  486.22     157  486.22     160  496.32     150  506.92     150
  508.41     153  510.12     154  511.38     155  512.44     156  513.31     157
  514.66     158  516.18     159  517.14     160  518.04     161  519.11     162
  520.92     163  522.46     164  523.49     165  524.02     166  525.74     167
     527     168  527.94     169  529.76     170  531.45     171  532.11     172
  532.97     173  533.66     174  534.43     175  535.53     176   536.4     177
  538.05     178  539.81     179  541.34     180   542.4     181   543.4     182
     544     183  545.58     184  547.42     185  548.71     186  550.31     187
  551.27     188  552.22     189  552.67     190  552.89     191   553.1     192
  553.57     193  554.02     194  554.96     195  555.92     196  556.75     197
  557.56     198  557.93     199  558.69     200   559.6     201  560.56     202
  561.49     203  561.74     204  562.31     205  562.96     206  564.04     207
   564.9     208  566.15     209  567.47     210  568.74     211  569.72     212
  570.51     213  572.18     214  574.58     215  575.87     216  577.23     217
  578.11     218  579.51     219  581.41     220  582.41     220

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   233.11      .04   282.56      .06

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
          233.11  282.56           100.57  100.57  100.57            .1       .3
Ineffective Flow     num=       1
   Sta L    Sta R     Elev  Permanent
   415.3  582.41  152.56       T

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            133.99    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               1.65    Wt. n-Val.                0.060      0.040      0.060
  W.S. Elev (ft)            132.34    Reach Len. (ft)           100.57     100.57     100.57
  Crit W.S. (ft)                      Flow Area (sq ft)          2.38     380.27      45.21
  E.G. Slope (ft/ft)      0.006180    Area (sq ft)               2.38     380.27      45.21
  Q Total (cfs)            4065.00    Flow (cfs)                 3.36    3962.12      99.52
  Top Width (ft)             90.56    Top Width (ft)             3.62      49.45      37.49
  Vel Total (ft/s)            9.50    Avg. Vel. (ft/s)           1.41      10.42       2.20
  Max Chl Dpth (ft)          10.96    Hydr. Depth (ft)           0.66       7.69       1.21
  Conv. Total (cfs)        51710.5    Conv. (cfs)                42.8    50401.7     1266.0
  Length Wtd. (ft)          100.57    Wetted Per. (ft)           3.86      56.42      37.59
  Min Ch El (ft)            121.38    Shear (lb/sq ft)           0.24       2.60       0.46
  Alpha                       1.17    Stream Power (lb/ft s)     0.34      27.09       1.02
  Frctn Loss (ft)             0.75    Cum Volume (acre-ft)       3.93      24.96       1.25
  C & E Loss (ft)             0.31    Cum SA (acres)             1.39       3.97       0.69


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3249

INPUT
Description: Bridge 9-P
Station Elevation Data    num=     278
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     243     .18     243    1.28     242       2     241    2.79     240
    3.49     239    4.38     238    4.87     237    5.73     236    7.04     235
    8.32     234     9.2     233   10.22     232   11.33     231   12.62     230
   13.41     229   13.98     228   14.59     227   15.34     226   15.86     225
   16.64     224   17.86     223   19.08     222   20.49     221   21.42     220
   22.79     219   24.66     218   26.81     217    27.9     216   28.68     215
   29.74     214    31.3     213   32.28     212   33.04     211   33.77     210
   34.57     209   35.27     208   36.27     207    37.9     206    40.3     206
   47.32     207   59.59     208    68.3     209   80.51     209   82.42     208
   83.79     207   85.18     206   86.63     205   87.97     204   89.57     203
   90.89     202    92.3     201   94.08     200   94.84     199   95.45     198
   96.66     197   98.29     196   99.41     195  100.17     194  100.97     193
   102.5     192  104.14     191  105.66     190  106.91     189  108.47     188
  109.69     187  111.08     186  111.81     185  113.36     184  115.06     183
  116.48     182  117.57     181  118.57     180  119.87     179  121.54     178
   123.1     177  124.82     176  126.47     175  127.86     174   129.6     173
  130.88     172  132.39     171  133.76     170  135.51     169  136.62     168
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   137.8     167  139.67     166  141.07     165  143.46     164  144.66     163
  146.15     162  146.61  161.68  147.61     161  148.93     160  150.94     159
  152.17     158  154.36     157  157.54     156  159.02     155  161.83     154
  167.09     153  169.45     152  171.35     151  172.95     150  174.74     149
  176.73     148  178.27     147  179.97     146  183.35     145  186.15     144
  188.23     143  191.81     142  195.69     141  196.31     140  196.96     139
  197.35     138  197.79     137  198.24     136  198.73     135  200.24     134
  202.24     133  203.81     132  204.74     131  205.39     130  206.05     129
  207.41     128  209.17     127  218.48     126  224.52     125  231.48     123
  241.29     123  247.97     124  251.35     125  254.01     126  256.59     127
  258.43     128   260.4     129  263.13     130   266.6     130  267.07     129
  267.63     128  268.02     127  268.47     126  268.51     126   270.1     126
   271.5     126  277.21     126  280.06     126  286.55     125  287.58     124
  288.58     123  289.98     122  296.35   119.8  296.61     120  307.93     120
  310.59     124  323.09     129  349.49     130  368.09     131  383.59     135
  398.99     137  434.09   137.6     440     139  441.52     140   442.5     141
   442.9     142  443.15     143  443.48     144  443.81     145  444.33     146
  444.56     147  444.82     148  445.47     149  445.77     150  446.21     151
  446.59     152  446.61  152.05  446.96     153  447.45     154  448.17     155
  448.78     156  449.66     157  450.42     158  451.89     159  453.02     160
  454.01     161  454.44     162  455.14     163  455.89     164  456.68     165
  457.65     166  458.64     167  459.45     168  460.23     169  460.81     170
  461.54     171   462.2     172  463.21     173  464.03     174  464.43     175
   464.8     176  465.35     177  465.95     178  467.03     179  467.67     180
   468.5     181  468.97     182  469.91     183  470.35     184  471.24     185
  472.11     186  472.73     187  473.45     188  474.26     189  475.27     190
  476.34     191     477     192   478.1     193  478.87     194  479.24     195
  479.82     196  480.13     197  480.65     198  481.25     199  482.24     200
  483.89     201     485     202  485.48     203  486.45     204  488.39     205
  489.16     206  489.69     207  490.21     208  490.79     209  491.52     210
  492.26     211  492.82     212  493.23     213  493.58     214   494.4     215
  495.16     216  496.31     217  496.44     218  496.96     219  497.32     220
  497.88     221  498.47     222  499.14     223  499.65     224  500.49     225
   500.9     226  501.35     227  501.91     228  502.32     229  502.84     230
  503.02     231  503.98     232  504.78     233  505.49     234  506.26     235
  507.39     236  508.18     237  509.08     238  510.19     239  511.51     240
  512.89     241  514.06     242  515.39     243  516.41     244  517.95     245
   520.4     246  522.29     247  523.72     248   526.3     249   529.4     250
  531.16     251  534.55     252  535.62     252

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   286.55      .04   323.09      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          286.55  323.09             112.57  112.57  112.57              .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
       0  263.09  129.48        T
Cross Section Lid
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
     278   126.5   124.5      322   127.5   125.5
```

```
CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           132.93    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              0.63    Wt. n-Val.              0.060      0.040      0.060
  W.S. Elev (ft)           132.31    Reach Len. (ft)          56.10      56.10      56.10
  Crit W.S. (ft)           131.15    Flow Area (sq ft)       289.63     285.87     111.02
  E.G. Slope (ft/ft)     0.009169    Area (sq ft)            528.96     285.87     111.02
  Q Total (cfs)           4065.00    Flow (cfs)             1495.43    2123.14     446.43
  Top Width (ft)           169.83    Top Width (ft)           83.22      36.54      50.06
  Vel Total (ft/s)           5.92    Avg. Vel. (ft/s)          5.16       7.43       4.02
  Max Chl Dpth (ft)         12.51    Hydr. Depth (ft)          3.48       7.82       2.22
  Conv. Total (cfs)       42452.8    Conv. (cfs)            15617.5    22173.0     4662.3
  Length Wtd. (ft)          56.10    Wetted Per. (ft)         90.15      94.75      50.28
  Min Ch El (ft)           119.80    Shear (lb/sq ft)          1.84       1.73       1.26
  Alpha                      1.15    Stream Power (lb/ft s)    9.50      12.83       5.08
  Frctn Loss (ft)            0.89    Cum Volume (acre-ft)      3.32      24.19       1.07
  C & E Loss (ft)            0.15    Cum SA (acres)            1.29       3.87       0.59


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  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: Little Sycamore
REACH: Lower Reach        RS: 3182

INPUT
Description: Bridge 8-V
Distance from Upstream XS =    56.1
Deck/Roadway Width        =   17.88
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      86
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
  280.18  126.18       0  286.89  126.87       0  288.39  126.87       0
  288.63  126.87       0  288.94  126.87       0  289.62  126.87       0
  289.69  126.87       0  289.72  126.87       0  289.82  126.87       0
   290.5  126.87       0  290.75  126.87       0  291.25  126.87       0
  291.29  126.87       0  291.81  126.87       0  292.07  126.87       0
  292.82  126.87       0  292.86  126.87       0  292.87  126.87       0
  292.89  126.87       0  292.98  126.87  101.35  292.98  126.87  120.72
  292.99  126.87  126.16  293.02  126.87  101.35  293.02  126.87  126.22
  293.64  126.87  126.22  293.93  126.87  126.22  294.42  126.87  126.22
  294.53  126.87  126.22  294.99  126.87  126.22  295.21  126.87  126.22
```

295.83	126.87	126.22	295.99	126.87	126.22	296.05	126.87	126.22
296.17	126.87	126.22	296.77	126.87	126.22	297.11	126.87	126.22
297.56	126.87	126.22	297.81	126.87	126.22	298.17	126.87	126.22
298.34	126.87	126.22	298.83	126.87	126.22	299.12	126.87	126.22
299.23	126.87	126.22	299.44	126.87	126.22	299.91	126.86	126.22
300.29	126.86	126.22	300.69	126.86	126.22	301.08	126.86	126.22
301.35	126.86	126.22	301.47	126.86	126.22	301.84	126.86	126.22
302.26	126.86	126.22	302.41	126.86	126.22	302.72	126.86	126.22
303.04	126.86	126.22	303.47	126.86	126.22	303.83	126.86	126.22
304.36	126.86	126.22	304.53	126.86	126.22	304.61	126.86	126.22
304.84	126.86	126.22	305.39	126.86	126.22	305.59	126.86	126.22
306	126.86	126.22	306.18	126.86	126.22	306.65	126.86	126.22
306.96	126.86	126.22	307.63	126.86	126.22	307.71	126.86	126.22
307.74	126.86	126.22	307.84	126.86	126.22	308.53	126.86	126.22
308.77	126.86	126.22	309.27	126.86	126.22	309.31	126.86	126.22
309.83	126.86	126.22	310.09	126.86	126.22	310.85	126.86	126.22
310.87	126.86	126.22	312.04	126.86	126.22	312.04	126.86	101.35
312.2	126.86	0	313.04	126.87	0	313.04	126.87	0
313.04	126.87	0	316.73	126.92	0			

Upstream Bridge Cross Section Data
Station Elevation Data   num=   289

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	243	.18	243	1.28	242	2	241	2.79	240
3.49	239	4.38	238	4.87	237	5.73	236	7.04	235
8.32	234	9.2	233	10.22	232	11.33	231	12.62	230
13.41	229	13.98	228	14.59	227	15.34	226	15.86	225
16.64	224	17.86	223	19.08	222	20.49	221	21.42	220
22.79	219	24.66	218	26.81	217	27.9	216	28.68	215
29.74	214	31.3	213	32.28	212	33.04	211	33.77	210
34.57	209	35.27	208	36.27	207	37.9	206	40.3	206
47.32	207	59.59	208	68.3	209	80.51	209	82.42	208
83.79	207	85.18	206	86.63	205	87.97	204	89.57	203
90.89	202	92.3	201	94.08	200	94.84	199	95.45	198
96.66	197	98.29	196	99.41	195	100.17	194	100.97	193
102.5	192	104.14	191	105.66	190	106.91	189	108.47	188
109.69	187	111.08	186	111.81	185	113.36	184	115.06	183
116.48	182	117.57	181	118.57	180	119.87	179	121.54	178
123.1	177	124.82	176	126.47	175	127.86	174	129.6	173
130.88	172	132.39	171	133.76	170	135.51	169	136.62	168
137.8	167	139.67	166	141.07	165	143.46	164	144.66	163
146.15	162	146.61	161.68	147.61	161	148.93	160	150.94	159
152.17	158	154.36	157	157.54	156	159.02	155	161.83	154
167.09	153	169.45	152	171.35	151	172.95	150	174.74	149
176.73	148	178.27	147	179.97	146	183.35	145	186.15	144
188.23	143	191.81	142	195.69	141	196.31	140	196.96	139
197.35	138	197.79	137	198.24	136	198.73	135	200.24	134
202.24	133	203.81	132	204.74	131	205.39	130	206.05	129
207.41	128	209.17	127	218.48	126	224.52	125	231.48	123
241.29	123	247.97	124	251.35	125	254.01	126	256.59	127
258.43	128	260.4	129	263.13	130	266.6	130	267.07	129
267.63	128	268.02	127	268.47	126	268.51	126	270.1	126
271.5	126	277.21	126	280.06	126	286.55	125	287.58	124
288.58	123	289.98	122	293	117	296.19	117	296.61	117

```
  307.93     117  310.24     117  312.45   118.5  316.95     127  321.72     128
  323.49  128.17  332.39     129  349.08     130  355.13     131  357.39     132
  362.04     133  366.44     134  369.15     135  372.33     136  375.28     137
  381.19     138  397.07     138  415.93     138     440     139  441.52     140
   442.5     141   442.9     142  443.15     143  443.48     144  443.81     145
  444.33     146  444.56     147  444.82     148  445.47     149  445.77     150
  446.21     151  446.59     152  446.61  152.05  446.96     153  447.45     154
  448.17     155  448.78     156  449.66     157  450.42     158  451.89     159
  453.02     160  454.01     161  454.44     162  455.14     163  455.89     164
  456.68     165  457.65     166  458.64     167  459.45     168  460.23     169
  460.81     170  461.54     171   462.2     172  463.21     173  464.03     174
  464.43     175   464.8     176  465.35     177  465.95     178  467.03     179
  467.67     180   468.5     181  468.97     182  469.91     183  470.35     184
  471.24     185  472.11     186  472.73     187  473.45     188  474.26     189
  475.27     190  476.34     191     477     192   478.1     193  478.87     194
  479.24     195  479.82     196  480.13     197  480.65     198  481.25     199
  482.24     200  483.89     201     485     202  485.48     203  486.45     204
  488.39     205  489.16     206  489.69     207  490.21     208  490.79     209
  491.52     210  492.26     211  492.82     212  493.23     213  493.58     214
   494.4     215  495.16     216  496.31     217  496.44     218  496.96     219
  497.32     220  497.88     221  498.47     222  499.14     223  499.65     224
  500.49     225   500.9     226  501.35     227  501.91     228  502.32     229
  502.84     230  503.02     231  503.98     232  504.78     233  505.49     234
  506.26     235  507.39     236  508.18     237  509.08     238  510.19     239
  511.51     240  512.89     241  514.06     242  515.39     243  516.41     244
  517.95     245   520.4     246  522.29     247  523.72     248   526.3     249
   529.4     250  531.16     251  534.55     252  535.62     252

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   286.55      .04   312.45      .06

Bank Sta: Left    Right     Coeff Contr.    Expan.
        286.55   312.45               .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev  Permanent
       0   263.09   129.48        T

Downstream  Deck/Roadway Coordinates
    num=       25
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
  290.95  125.04       0   293.51  126.75       0   296.43  126.76       0
  296.67  126.77       0   296.98  126.77       0   297.66  126.77       0
  297.73  126.77       0   297.76  126.77       0   297.86  126.77       0
  298.01  126.77    96.4   298.01  126.77  114.88   298.01  126.77  126.04
  316.97  126.87  126.19   317.09  126.87  114.76   317.09  126.87    96.4
  317.31  126.87  120.03   317.35  126.87       0   317.87  126.87       0
     318  126.88       0      318  126.88       0      318  126.88       0
  318.13  126.88       0   318.89  126.88       0   318.91  126.88       0
  324.74  126.91       0

Downstream Bridge Cross Section Data
Station Elevation Data     num=      202
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

```
      0     239     .27     239    1.12     238    2.16     237    3.46     236
   4.36     235     4.9     234    5.37     233    5.69     232    6.24     231
    7.1     230    8.44     229    9.07     228    9.74     227   10.37     226
  11.15     225    11.7     224   12.41     223   13.49     222   14.43     221
   15.2     220   16.19     219   16.69     218   17.03     217   18.02     216
  18.97     215   20.56     214   21.79     213   22.52     212   23.21     211
  24.17     210   25.34     209   27.02     208   28.59     207   28.91     206
  29.27     205   31.08     204   33.25     204   42.85     205   57.87     206
  65.04     206   67.12     206   69.33     205   70.42     204   71.47     203
  72.45     202   73.65     201   74.65     200    76.3     199   78.22     198
     79     197   80.09     196   81.22     195   82.63     194   83.69     193
  84.96     192   86.04     191   86.79     190   87.77     189   90.72     188
   94.4     187   95.34     186   96.02     185    96.9     184   97.48     183
  98.02     182   98.89     181  100.31     180  101.17     179  102.51     178
 103.14     177  104.46     176  105.76     175  106.55     174  107.48     173
 108.85     172  109.85     171   111.3     170  112.43     169  113.67     168
 114.86     167  116.75     166     118     165  118.83     164  121.09     163
 123.49     162  124.74     161  125.82     160  126.74     159  127.59     158
 128.96     157  131.29     156  132.16     155  133.38     154  134.95     153
 136.27     152  137.35     151  138.33     150  140.18     149  141.64     148
 142.26     147  144.15     146  145.73     145  147.18     144  148.69     143
 154.15     142  155.05     141  155.52     140  156.45     139  157.96     138
 159.78     137  161.12     136  162.45     135  164.73     134     167     133
 173.15     132  175.21     131  176.64     130  177.23     129  177.78     128
  178.3     127  178.87     126  184.22     124  206.29     124  208.94     125
 218.87     125  221.32     124  223.56     123  248.84     123   266.6     124
 267.34     124  275.78     124  288.63     124  290.92     125  293.65     125
 294.59     124  294.92     123  295.28     122  295.69     121  296.03     120
 296.44     119  296.79     118  297.87     117     298     116  298.72     116
 299.61     116  301.49     116  304.64     116  311.01     116  312.72     116
 314.87     116  317.64   118.3  319.04     118  319.48     119  319.89     120
 320.22     121  321.46     122  322.22     123   322.8     124   323.5     125
 324.12     126  324.38     127  324.97     128  325.33     129  326.21     130
 327.09     131  328.28     132  328.73     133  329.12     134  329.66     135
 330.24     136  330.96     137  331.76     138  332.57     139  334.04     140
 335.18     141  336.73     142  337.76     143  338.36     144  339.39     145
 339.58     146  340.45     147  341.09     148  341.87     149   342.7     150
 343.53     151  344.59     152  345.19     153  345.88     154   346.2     155
 346.53     156  346.69     157  347.01     158  347.32     159  347.73     160
  348.5     161  349.54     162  355.09     163  357.46     164  360.05     165
 363.71     166  365.04     166

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  293.65     .04   323.5     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        293.65   323.5             .1       .3

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

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = 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 #100-yr bulked

  E.G. US. (ft)              132.93    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)              132.31    E.G. Elev (ft)               131.89        128.15
  Q Total (cfs)             4065.00    W.S. Elev (ft)               129.77        127.48
  Q Bridge (cfs)            2111.33    Crit W.S. (ft)               129.77        126.30
  Q Weir (cfs)                         Max Chl Dpth (ft)             12.77         11.48
  Weir Sta Lft (ft)                    Vel Total (ft/s)              10.80          6.55
  Weir Sta Rgt (ft)                    Flow Area (sq ft)            376.43        620.85
  Weir Submerg                         Froude # Chl                   0.58          0.34
  Weir Max Depth (ft)                  Specif Force (cu ft)        3141.83       2814.16
  Min El Weir Flow (ft)      125.99    Hydr Depth (ft)                2.78          4.23
  Min El Prs (ft)            126.22    W.P. Total (ft)              215.50        210.70
  Delta EG (ft)                5.28    Conv. Total (cfs)           22007.3       36920.4
  Delta WS (ft)                6.39    Top Width (ft)               135.50        146.61
  BR Open Area (sq ft)       174.38    Frctn Loss (ft)                0.34          0.39
  BR Open Vel (ft/s)          12.11    C & E Loss (ft)                0.43          0.11
  BR Sluice Coef                       Shear Total (lb/sq ft)         3.72          2.23
  BR Sel Method         Energy only    Power Total (lb/ft s)         40.18         14.60


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
        sections.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 3136

INPUT
Description:
Station Elevation Data    num=     193
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     239     .27     239    1.12     238    2.16     237    3.46     236
    4.36     235     4.9     234    5.37     233    5.69     232    6.24     231
     7.1     230    8.44     229    9.07     228    9.74     227   10.37     226
   11.15     225    11.7     224   12.41     223   13.49     222   14.43     221
    15.2     220   16.19     219   16.69     218   17.03     217   18.02     216
   18.97     215   20.56     214   21.79     213   22.52     212   23.21     211
   24.17     210   25.34     209   27.02     208   28.59     207   28.91     206
   29.27     205   31.08     204   33.25     204   42.85     205   57.87     206
   65.04     206   67.12     206   69.33     205   70.42     204   71.47     203
   72.45     202   73.65     201   74.65     200    76.3     199   78.22     198
      79     197   80.09     196   81.22     195   82.63     194   83.69     193
   84.96     192   86.04     191   86.79     190   87.77     189   90.72     188
    94.4     187   95.34     186   96.02     185    96.9     184   97.48     183
   98.02     182   98.89     181  100.31     180  101.17     179  102.51     178
  103.14     177  104.46     176  105.76     175  106.55     174  107.48     173
  108.85     172  109.85     171   111.3     170  112.43     169  113.67     168
  114.86     167  116.75     166     118     165  118.83     164  121.09     163
  123.49     162  124.74     161  125.82     160  126.74     159  127.59     158
  128.96     157  131.29     156  132.16     155  133.38     154  134.95     153
  136.27     152  137.35     151  138.33     150  140.18     149  141.64     148
  142.26     147  144.15     146  145.73     145  147.18     144  148.69     143
  154.15     142  155.05     141  155.52     140  156.45     139  157.96     138
  159.78     137  161.12     136  162.45     135  164.73     134     167     133
  173.15     132  175.21     131  176.64     130  177.23     129  177.78     128
   178.3     127  178.87     126  184.22     124  206.29     124  208.94     125
  218.87     125  221.32     124  223.56     123  248.84     123   266.6     124
  267.34     124  269.84   123.6  275.74   123.6  275.78     124  288.63     124
  290.92     125  292.28     125  295.35     120  299.38  115.19  299.89  114.18
  300.52   113.8  304.64   113.8     310   113.8  319.06  120.01  319.48     119
  319.89     120  320.22     121  321.46     122  322.22     123   322.8     124
   323.5     125  324.12     126  324.38     127  324.97     128  325.33     129
  326.21     130  327.09     131  328.28     132  328.73     133  329.12     134
  329.66     135  330.24     136  330.96     137  331.76     138  332.57     139
  334.04     140  335.18     141  336.73     142  337.76     143  338.36     144
  339.39     145  339.58     146  340.45     147  341.09     148  341.87     149
   342.7     150  343.53     151  344.59     152  345.19     153  345.88     154
   346.2     155  346.53     156  346.69     157  347.01     158  347.32     159
  347.73     160   348.5     161  349.54     162  355.09     163  357.46     164
  360.05     165  363.71     166  365.04     166
```

```
Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   292.28      .04    323.5      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        292.28   323.5            84.85   84.85   84.85            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)           127.65    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              1.74    Wt. n-Val.                 0.060      0.040      0.060
  W.S. Elev (ft)           125.92    Reach Len. (ft)            84.85      84.85      84.85
  Crit W.S. (ft)           125.92    Flow Area (sq ft)         235.28     271.38       0.26
  E.G. Slope (ft/ft)     0.008584    Area (sq ft)              235.28     271.38       0.26
  Q Total (cfs)           4065.00    Flow (cfs)                871.27    3193.49       0.23
  Top Width (ft)           144.98    Top Width (ft)            113.19      31.22       0.57
  Vel Total (ft/s)           8.02    Avg. Vel. (ft/s)            3.70      11.77       0.89
  Max Chl Dpth (ft)         12.12    Hydr. Depth (ft)            2.08       8.69       0.46
  Conv. Total (cfs)       43874.6    Conv. (cfs)               9403.9    34468.2        2.5
  Length Wtd. (ft)          84.85    Wetted Per. (ft)          114.76      42.93       1.08
  Min Ch El (ft)           113.80    Shear (lb/sq ft)            1.10       3.39       0.13
  Alpha                      1.74    Stream Power (lb/ft s)      4.07      39.87       0.12
  Frctn Loss (ft)            1.02    Cum Volume (acre-ft)        2.33      23.53       0.96
  C & E Loss (ft)            0.22    Cum SA (acres)              1.04       3.79       0.53


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 3051

INPUT
Description:
Station Elevation Data     num=      181
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0      256      .97      256     2.53      255     3.97      254     4.89      253
    6.24      252     8.19      251     9.14      250     9.84      249    10.57      248
    11.27     247   12.07     246   13.54     245   14.48     244   15.52     243
    16.53     242   17.75     241   18.79     240   19.97     239   20.76     238
    21.79     237   22.45     236   22.96     235   23.41     234    23.6     233
     23.8     232   23.99     231    24.2     230   24.82     229   26.31     228
    27.03     227   27.54     226    27.9     225   28.55     224   29.17     223
    29.59     222   30.26     221    30.6     220   31.08     219   31.75     218
    32.82     217   33.38     216   33.87     215   34.38     214   34.73  213.47
    35.04     213    35.4     212   35.79     211   36.01     210   36.24     209
    36.53     208   36.82     207   37.18     206   37.91     205    38.6     204
    39.38     203   40.06     202   40.66     201   41.13     200   41.78     199
    44.42     198   70.65     198   74.39     198   76.56     197   77.65     196
    78.32     195   78.78     194    79.8     193   80.13     192   80.75     191
    81.29     190   81.92     189    82.7     188   83.85     187   85.18     186
    85.76     185   87.23     184   87.59     183    87.8     182   88.22     181
    89.25     180   90.21     179   91.13     178   92.23     177   93.28     176
    95.79     176   97.89     176   98.03     175   98.14     174   98.32     173
    98.62     172   98.68     171   98.87     170   99.08     169   99.25     168
    99.47     167  100.77     166   103.2     165  105.15     164  106.65     163
    107.1     162   107.8     161  108.64     160  110.91     159  111.47     158
   112.02     157   112.5     156  113.25     155  115.44     154  116.58     153
    119.2     152  120.31     151  121.46     150  123.94     149   124.9     148
   125.72     147  126.41     146  127.15     145  127.81     145  134.32     146
   135.26     146  138.06     145  139.17     144  140.13     143  141.04     142
   141.84     141  144.76     140  145.46     139  147.12     138  147.68     137
   148.19     136  150.02     135  151.76     134  155.81     133  157.76     132
   159.68     131  163.31     130  167.86     129  176.49     128   186.5     127
   198.21     128  200.81     127  207.21     126  211.21     125  245.89     124
   252.71     123  260.81     120  263.44  118.78  263.81   111.1  263.82     110
   268.66     110   279.1     110  281.31     110  283.75     110  283.76  110.76
   290.31     115  294.15     118  294.92     119  294.95     120  295.55     120
   296.27     121  297.56     122  302.05     123  303.67     124  304.68     125
   305.69     126  306.89     127  308.26     128  309.79     129  311.75     130
   313.75     131  315.62     132  316.96     133  318.15     134  319.49     135
    320.9     136  324.28     137  327.52     138  330.28     139  333.86     140
   334.73     140

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  263.44     .04  297.56     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        263.44  297.56           91.43   91.43   91.43             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            123.70    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               3.97    Wt. n-Val.                0.050      0.040
  W.S. Elev (ft)            119.73    Reach Len. (ft)           91.43      91.43      91.43
  Crit W.S. (ft)            119.73    Flow Area (sq ft)          0.97     254.08
  E.G. Slope (ft/ft)      0.017964    Area (sq ft)               0.97     254.08
  Q Total (cfs)            4065.00    Flow (cfs)                 2.21    4062.79
  Top Width (ft)             33.55    Top Width (ft)             2.05      31.50
  Vel Total (ft/s)           15.94    Avg. Vel. (ft/s)           2.27      15.99
  Max Chl Dpth (ft)           9.73    Hydr. Depth (ft)           0.47       8.07
  Conv. Total (cfs)       30329.1    Conv. (cfs)              16.5    30312.7
  Length Wtd. (ft)          91.43    Wetted Per. (ft)          2.26      44.15
  Min Ch El (ft)           110.00    Shear (lb/sq ft)          0.48       6.45
  Alpha                      1.01    Stream Power (lb/ft s)    1.10     103.21
  Frctn Loss (ft)            1.25    Cum Volume (acre-ft)      2.10      23.02      0.96
  C & E Loss (ft)            0.40    Cum SA (acres)            0.93       3.73      0.53


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 2960

INPUT
Description:
Station Elevation Data    num=     179
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     236     .28     236    1.55     235    2.92     234    3.93     233
    4.78     232     5.8     231    6.67     230    7.53     229    8.45     228
    8.99     227   10.02     226   10.58     225   10.76     224   11.08     223
   11.32     222   11.53     221   11.79     220   12.14     219   12.45     218
   12.65     217   13.17     216   13.99     215   15.01     214   15.72     213
   16.37     212   16.84     211    17.7     210   18.37     209   18.91     208
   19.26     207   19.56     206   20.02     205    20.1     204   20.45     203
   20.67     202   20.76     201   21.07     200   21.79     199   22.19     198
   22.63     197   22.72     196   23.01     195   23.24     194   23.61     193
   24.19     192   24.76     191   25.62     190   26.96     189    28.5     188
   29.85     187   30.77     186   31.26     185   31.96     184   33.16     183
   34.06     182   34.55     181   35.18     180   36.97     179   40.02     179
   61.28     180   63.53     180    65.1     179   66.25     178   67.79     177
   68.95     176   70.45     175   71.52     174   72.98     173   73.49     172
   74.32     171   75.41     170   76.69     169   78.15     168   79.41     167
   80.53     166    81.4     165   81.85     164    82.7     163   84.57     162
   90.98     161   92.61     160   93.27     159   93.65     158   94.53     157
   94.89     156   95.51     155   96.45     154   97.19     153   97.99     152
    98.6     151   98.98     150   99.43     149   99.87     148  100.44     147
  102.19     146  104.61     145  105.24     144  106.71     143  107.93     142
  109.16     141  110.08     140  114.37     139  115.08     138  115.39     137
  115.77     136  116.14     135  116.57     134  120.79     133  122.68     132
  126.55     131  127.81     130  128.64     129  129.41     128  130.16     127
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 130.93    126  131.68    125  132.63    124  133.94    123  134.73    122
 137.83    121  138.81    120  139.29    119  139.67    118  140.21    117
 141.09    116  142.46    115   179.4  109.8  188.26 104.75   188.3  104.4
  200.4  104.1  212.97    110   218.8    113  227.12    114  232.38    115
 233.55    115  235.44    114  237.34    113  241.29    113  242.69    114
 243.76    115  245.67    116  247.35    117  249.48    118  250.47    119
 251.57    120  252.68    121  253.81    122  254.24    123  254.68    124
 255.54    125   256.6    126  257.65    127  258.85    128  259.93    129
 260.96    130  261.87    131   263.7    132  265.15    133  266.72    134
 268.55    135  269.86    136  272.29    137  273.19    138  274.43    139
 275.38    140  276.78    141  277.92    142  279.62    143   280.8    144
 282.89    145  284.69    146  286.41    147  288.06    148  289.66    149
 291.48    150  293.17    151  295.26    152  296.17    152

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   179.4     .04   218.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         179.4   218.8          101.54  101.54  101.54            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            116.66    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.62    Wt. n-Val.                0.060      0.040      0.060
  W.S. Elev (ft)            114.03    Reach Len. (ft)          101.54     101.54     101.54
  Crit W.S. (ft)            114.03    Flow Area (sq ft)         63.69     281.23      10.30
  E.G. Slope (ft/ft)      0.010723    Area (sq ft)              63.69     281.23      10.30
  Q Total (cfs)            4065.00    Flow (cfs)               267.56    3777.82      19.62
  Top Width (ft)             85.34    Top Width (ft)            30.08      39.40      15.85
  Vel Total (ft/s)           11.44    Avg. Vel. (ft/s)           4.20      13.43       1.90
  Max Chl Dpth (ft)           9.93    Hydr. Depth (ft)           2.12       7.14       0.65
  Conv. Total (cfs)        39255.8    Conv. (cfs)              2583.8    36482.5      189.5
  Length Wtd. (ft)          101.54    Wetted Per. (ft)          30.38      43.10      16.51
  Min Ch El (ft)            104.10    Shear (lb/sq ft)           1.40       4.37       0.42
  Alpha                       1.29    Stream Power (lb/ft s)     5.90      58.68       0.80
  Frctn Loss (ft)             0.78    Cum Volume (acre-ft)       2.03      22.46       0.95
  C & E Loss (ft)             0.41    Cum SA (acres)             0.90       3.65       0.51


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
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.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.
```

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 2858

INPUT
Description:

```
Station Elevation Data    num=     195
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     225     .17     225       1     224    1.92     223    2.74     222
    3.57     221    4.79     220    5.52     219    6.42     218    7.23     217
    8.23     216    9.05     215    9.79     214   10.42     213   11.09     212
   11.57     211   12.48     210   13.72     209    14.2     208   14.88     207
   15.24     205   15.59     204   16.56     203   17.47     202   18.13     201
   19.01     200    19.9     199   20.36     198   20.88     197   21.07     196
   21.65  195.33   21.93     195    22.6     194   23.21     193   23.69     192
   24.41     191   24.76     190   25.35     189   25.63     188   25.84     187
   26.23     186   26.78     185   27.56     184   28.24     183   28.85     182
   29.27     181   29.83     180   30.35     179   30.88     178   31.42     177
   32.05     176   32.93     175   34.04     174   35.14     173   39.36     173
   56.91     174    59.8     174   61.78     173   63.11     172   64.37     171
   65.68     170   67.85     169   68.64     168   69.46     167   70.24     166
   71.19     165   71.86     164   72.62     163   74.07     162   75.52     161
   76.29     160   76.94     159   78.03     158   79.12     157   79.97     156
   80.73     155   81.43     154   82.19     153   83.37     152   84.39     151
   85.41     150   86.59     149   87.87     148   90.12     147   92.29     146
    93.2     145   94.17     144   95.92     143   97.65     142   98.75     141
    99.8     140  100.72     139  101.57     138  102.42     137  103.31     136
  104.19     135  105.08     134  106.03     133  106.82     132   107.6     131
  108.26     130     109     129  109.87     128  110.99     127  111.93     126
  112.79     125  113.47     124  115.04     123  116.01     122  117.08     121
  118.41     120  119.85     119  120.62     118  121.28     117  121.87     116
  122.51     115  123.09     114  123.59     113  124.27     112   140.2     111
  148.86     110  149.76     110   158.5     105     162   98.75     172   98.75
   174.7     102  188.12     100   193.8     102   210.7     100   210.8     100
   222.8     105  226.42  104.82  230.46     107  231.85     107  233.54     108
  234.56     109  237.71     109  240.89     109  244.62     110  246.44     111
   247.5     112   248.3     113  249.44     114  250.46     115  251.34     116
  252.29     117  253.11     118  254.05     119  256.16     120  258.31     121
  259.34     122  260.63     123   261.8     124  262.67     125   263.8     126
  264.86     127  266.31     128  267.36     129  268.41     130  270.11     131
  271.15     132  273.07     133  274.69     134  275.66     135   276.7     136
  278.41     137  279.48     138  280.48     139  281.57     140  282.64     141
   284.1     142  285.61     143  287.19     144  288.25     145  289.41     146
  290.21     147  291.92     148  293.66     149  294.98     150  296.68     151
  298.29     152  299.86     153  301.47     154  303.75     155  305.08     156
  306.74     157  308.84     158  310.18     159  311.93     160  313.45     161
  315.35     162  317.65     163  319.23     164  320.47     165  321.65     165

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  148.86     .04   222.8     .06
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       148.86   222.8          97.03   97.03   97.03            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            109.00    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.26    Wt. n-Val.                          0.040      0.060
  W.S. Elev (ft)            107.73    Reach Len. (ft)           97.03      97.03      97.03
  Crit W.S. (ft)                      Flow Area (sq ft)                  442.76      19.07
  E.G. Slope (ft/ft)      0.005740    Area (sq ft)                       442.76      19.07
  Q Total (cfs)            4065.00    Flow (cfs)                        4013.51      51.49
  Top Width (ft)             79.37    Top Width (ft)                      69.08      10.29
  Vel Total (ft/s)            8.80    Avg. Vel. (ft/s)                     9.06       2.70
  Max Chl Dpth (ft)           8.98    Hydr. Depth (ft)                     6.41       1.85
  Conv. Total (cfs)        53652.9    Conv. (cfs)                       52973.4      679.5
  Length Wtd. (ft)           97.03    Wetted Per. (ft)                    76.60      11.05
  Min Ch El (ft)             98.75    Shear (lb/sq ft)                     2.07       0.62
  Alpha                       1.05    Stream Power (lb/ft s)              18.78       1.67
  Frctn Loss (ft)             0.86    Cum Volume (acre-ft)       1.96     21.62       0.91
  C & E Loss (ft)             0.23    Cum SA (acres)             0.86      3.53       0.48


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2761

INPUT
Description:
Station Elevation Data    num=     198
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     211     .33     211    1.18     210    2.05     209    3.18     208
    4.65     207    5.68     206    6.39     205    6.87     204    7.52     203
    8.13     202    8.95     201    9.62     200   10.44     199   11.73     198
   12.63     197   13.79     196   14.93     195   16.17     194   17.16     193
   18.08     192   19.29     191    20.2     190   21.22     189   22.27     188
   23.19     187      24     186   24.63     185   24.92     184   25.39     183
   25.81     182   26.17     181   26.69     180   27.17     179   27.52     178
   27.84     177   28.14     176   28.52     175   28.87     174   29.25     173
   29.73     172   30.19     171   31.05     170   32.25     169   39.28     169
   47.19     169   51.62     169   56.08     169   57.45     169   60.07     168
   62.28     167   64.04     166   66.15     165   66.62     164   67.61     163
   68.71     162   70.17     161   71.01     160   71.72     159   72.49     158
   74.32     157   75.85     156   77.85     155   80.01     154   81.62     153
  83.28     152    84.5     151   86.09     150   86.98     149   87.84     148
  89.42     147   91.12     146   92.08     145   92.92     144    94.8     143
  97.09     142   98.89     141  101.32     140  103.88     139  105.26     138
 107.17     137  109.34     136  113.72     135  115.81     134  118.51     133
 120.23     132  120.96     131   121.8     130  129.16     129  129.86     128
 130.55     127  133.19     126  137.82     125  139.29     124  139.75     123
 140.27     122  140.79     121  141.18     120  141.59     119  141.92     118
  142.3     117  143.96     116  145.07     115  146.25     114  147.46     113
 148.43     112  149.06     111  149.57     110   150.2     109  151.52     108
  179.2     107  181.09  100.61   194.3    94.1     202    94.1  209.59   97.69
 219.82     105  223.65     107     224     108  224.36     109  225.06     110
 225.88     111  226.74     112  227.77     113  228.84     114  229.85     115
 230.96     116  232.08     117  233.11     118  234.74     119  235.75     120
 236.83     121  237.77     122  240.01     123  242.07     124  243.27     125
 244.61     126  246.19     127  247.59     128  248.84     129   250.1     130
 251.44     131  252.76     132  254.28     133   255.8     134  256.93     135
 257.97     136  258.94     137  260.81     138  262.56     139  263.47     140
 264.65     141  268.82     142  269.73     143  270.92     144  273.19     145
 274.53     146  275.64     147  277.33     148  279.08     149  279.51     150
 279.84     151  280.63     152  282.89     153  284.67     154  286.51     155
 288.68     156  290.45     157  292.54     158  294.39     159  295.45     160
 297.21     161  299.29     162  300.85     163  301.95     164  303.41     165
  305.1     166  308.02     167  309.43     168  310.33     169  311.61     170
 312.96     171  314.02     172  315.96     173  318.13     174  319.52     175
 321.63     176  323.91     177  325.47     178  327.71     179  329.25     180
 331.13     181  333.06     182  334.63     183  335.99     184  337.31     185
 338.04     186  338.96     187  339.28     187

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   179.2     .04     224     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        179.2     224          101.72  101.72  101.72             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            107.91    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               3.51    Wt. n-Val.                           0.040
  W.S. Elev (ft)            104.39    Reach Len. (ft)          101.72     101.72     101.72
  Crit W.S. (ft)            104.39    Flow Area (sq ft)                   270.33
  E.G. Slope (ft/ft)      0.015585    Area (sq ft)                        270.33
  Q Total (cfs)            4065.00    Flow (cfs)                         4065.00
  Top Width (ft)             39.00    Top Width (ft)                       39.00
  Vel Total (ft/s)           15.04    Avg. Vel. (ft/s)                     15.04
  Max Chl Dpth (ft)          10.29    Hydr. Depth (ft)                      6.93
  Conv. Total (cfs)        32561.7    Conv. (cfs)                        32561.7
  Length Wtd. (ft)          101.72    Wetted Per. (ft)                     46.30
  Min Ch El (ft)             94.10    Shear (lb/sq ft)                      5.68
  Alpha                       1.00    Stream Power (lb/ft s)               85.42
  Frctn Loss (ft)             1.12    Cum Volume (acre-ft)       1.96      20.82       0.89
  C & E Loss (ft)             0.49    Cum SA (acres)             0.86       3.41       0.47
```

```
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2659

INPUT
Description:
Station Elevation Data    num=     164
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     208     .34     208    1.32     207    2.33     206    3.87     205
    4.98     204    6.16     203    8.65     202   10.03     201   11.33     200
   12.81     199   14.02     198   15.78     197   17.97     196   20.24     195
   21.55     194    23.3     193   24.62     192   25.77     191    27.5     190
   28.83     189   30.07     188   31.19     187   32.15     186   32.42  185.68
      33     185   33.39     184   33.79     183   34.24     182   34.96     181
   35.35     180   36.28     179   36.99     178   37.68     177   38.06     176
   38.46     175   38.78     174   39.04     173   39.31     172   39.65     171
   39.83     170    40.9     169   42.24     168   43.51     167   44.28     166
   45.21     165   46.18     164   46.98     163   54.49     163   71.96     163
   74.71     162    76.5     161   77.68     160    78.9     159   80.15     158
   81.17     157   82.64     156   83.63     155   85.22     154   86.42     153
   87.33     152   88.45     151    89.4     150   90.87     149   92.62     148
   93.96     147   95.24     146    96.5     145   98.11     144   99.66     143
  100.12     142  100.77     141  101.95     140  103.06     139  104.75     138
  106.17     137  107.48     136  109.17     135  111.13     134  113.71     133
  115.46     132   117.1     131  118.24     130  119.11     129  120.01     128
  120.99     127   121.9     126  122.81     125  123.73     124  124.59     123
  125.81     122  127.33     121   128.2     120  128.84     119  129.71     118
  130.78     117  132.14     116  132.99     115  133.51     114  133.77     113
  133.94     112   134.1     111  134.26     110  134.45     109  136.31     108
  138.33     107  148.98     106  150.57     106  154.21     106  157.61     105
  170.93     100  184.93   95.59   192.8    91.2   204.4    91.2  212.74      95
  219.27     100   220.1     101   223.2     102  234.77     103  235.64     104
  236.65     105  238.19     106  239.35     107  241.02     108  242.85     109
  248.07     110  250.55     111  252.22     112  253.37     113  254.98     114
  256.57     115  258.51     116  260.17     117  261.57     118  263.24     119
  263.89     120  265.35     121  266.55     122  267.75     123   268.5     124
  269.38     125  270.47     126  271.99     127  273.22     128  274.19     129
   274.7     130  275.51     131  277.32     132  279.06     133  280.48     134
  284.12     135  289.83     136  297.13     137   303.8     138  306.63     139
  308.97     140  312.01     141  314.21     142  318.44     143  322.32     144
  325.14     145  327.49     146  331.69     147  332.42     147

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .07  154.21     .04   223.2     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        154.21   223.2          102.72  102.72  102.72             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            103.99    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               1.87    Wt. n-Val.                          0.040      0.060
  W.S. Elev (ft)            102.12    Reach Len. (ft)          102.72     102.72     102.72
  Crit W.S. (ft)                      Flow Area (sq ft)                  370.81       0.09
  E.G. Slope (ft/ft)      0.008244    Area (sq ft)                       370.81       0.09
  Q Total (cfs)            4065.00    Flow (cfs)                        4064.97       0.03
  Top Width (ft)             59.37    Top Width (ft)                      57.93       1.44
  Vel Total (ft/s)           10.96    Avg. Vel. (ft/s)                    10.96       0.35
  Max Chl Dpth (ft)          10.92    Hydr. Depth (ft)                     6.40       0.06
  Conv. Total (cfs)        44771.3    Conv. (cfs)                       44771.0        0.3
  Length Wtd. (ft)          102.72    Wetted Per. (ft)                    63.28       1.45
  Min Ch El (ft)             91.20    Shear (lb/sq ft)                     3.02       0.03
  Alpha                       1.00    Stream Power (lb/ft s)              33.06       0.01
  Frctn Loss (ft)             0.89    Cum Volume (acre-ft)       1.96     20.07       0.89
  C & E Loss (ft)             0.09    Cum SA (acres)             0.86      3.29       0.47


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
         sections.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 2556

INPUT
Description:
Station Elevation Data    num=     170
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     199      .7     199    2.18     198    3.71     197    5.37     196
     8.5     195   10.29     194   11.63     193    13.3     192   15.29     191
   17.19     190   18.62     189   18.71  188.96   20.87     188   23.22     187
   24.49     186   26.75     185   28.03     184      29     183   29.65     182
   30.24     181   30.72     180   31.35     179   31.96     178   32.68     177
   33.36     176   34.15     175   34.79     174   35.35     173    35.9     172
   36.32     171   36.88     170   37.62     169   38.23     168   38.68     167
   39.28     166   39.81     165   40.53     164   41.28     163   41.93     162
    42.5     161    42.9     160   43.33     159   43.87     158   53.36     158
   70.47     158   72.54     157   74.76     156   77.75     155    79.1     154
    79.8     153   80.72     152   81.57     151    82.5     150   83.71     149
   84.96     148   86.26     147   88.16     146   89.37     145   90.82     144
   92.4     143   93.77     142   94.88     141   95.88     140   97.44     139
  98.97     138  100.65     137  102.01     136  104.09     135  105.65     134
 106.95     133  108.29     132  109.81     131  111.51     130  112.89     129
 114.49     128  117.12     127  118.11     126  118.76     125  119.43     124
 121.51     123  122.89     122  123.57     121  124.06     120  128.91     119
 130.18     118  131.21     117  134.35     116  135.89     115  137.63     114
 138.83     113  141.03     112  143.74     111  145.13     110  148.46     109
 149.41     108  150.23     107  150.85     106  151.59     105  152.21     104
 152.44     103  152.65     102  152.86     101  153.19     100  153.33      99
 154.73      98  180.95      98  191.11      95  199.47    88.9   202.5    87.3
  207.1    87.3  213.68      90  213.84      95  215.89      96  217.96      97
  219.9      98  226.44      99  227.62     100  228.69     101  229.77     102
 230.87     103  232.05     104  233.83     105  241.37     106  243.39     107
  244.7     108  245.76     109  248.42     110  249.91     111  250.64     112
 251.11     113  251.27     114  251.89     115  253.38     116  256.66     117
  258.6     118  259.99     119  261.66     120  262.95     121  264.29     122
 265.39     123  266.65     124  268.76     125  271.29     126  274.18     127
 276.06     128  277.35     129  278.63     130   280.2     131  281.71     132
  283.6     133  284.91     134  285.73     135  287.31     136  289.42     137
 291.76     138  293.04     139  295.17     140  296.56     141  297.85     142
 300.38     143  302.53     144  304.42     145  306.27     146  307.93     147
  310.8     148  312.53     149  314.44     150  316.72     151  318.71     151

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .06   191.11      .04   213.84      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         191.11  213.84            93.31   93.31   93.31              .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            103.01    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.74    Wt. n-Val.                 0.060      0.040      0.060
  W.S. Elev (ft)            100.28    Reach Len. (ft)            93.31      93.31      93.31
  Crit W.S. (ft)            100.28    Flow Area (sq ft)         100.66     243.94      35.57
  E.G. Slope (ft/ft)      0.009184    Area (sq ft)              100.66     243.94      35.57
  Q Total (cfs)            4065.00    Flow (cfs)                443.21    3473.84     147.95
  Top Width (ft)             74.82    Top Width (ft)             38.01      22.73      14.08
  Vel Total (ft/s)           10.69    Avg. Vel. (ft/s)            4.40      14.24       4.16
  Max Chl Dpth (ft)          12.98    Hydr. Depth (ft)            2.65      10.73       2.53
  Conv. Total (cfs)        42417.5    Conv. (cfs)               4624.9    36248.8     1543.8
  Length Wtd. (ft)           93.31    Wetted Per. (ft)           39.83      30.49      15.33
  Min Ch El (ft)             87.30    Shear (lb/sq ft)            1.45       4.59       1.33
  Alpha                       1.54    Stream Power (lb/ft s)      6.38      65.32       5.53
  Frctn Loss (ft)             0.87    Cum Volume (acre-ft)        1.84      19.35       0.85
  C & E Loss (ft)             0.14    Cum SA (acres)              0.82       3.20       0.45


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
```

```
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2463

INPUT
Description:
Station Elevation Data    num=     156
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     180     .55     180     1.4     180    2.65     179    3.47     178
    4.26     177    5.03     176    5.71     175    6.42     174    7.14     173
     7.9     172    8.53     171    9.01     170    9.48     169   10.14     168
   10.51     167   11.06     166    11.4     165   11.97     164   12.59     163
   13.02     162   13.34     161   13.81     160    14.3     159   15.28     158
    15.9     157   16.37     156   17.55     155   19.77     155   30.44     156
   41.06     156    43.5     155   45.24     154    46.6     153   48.42     152
   50.26     151   51.45     150   52.53     149    55.3     148   56.54     147
    57.2     146   57.95     145   59.11     144   60.15     143   61.03     142
   61.91     141   63.67     140   65.67     139    66.4     138   67.11     137
   68.34     136   70.87     135   72.42     134   73.46     133   74.86     132
   77.63     131   78.58     130   79.16     129   79.78     128   80.58     127
   81.81     126   83.15     125   84.83     124   86.13     123   87.15     122
   88.59     121   90.03     120   94.33     119   95.97     118    98.5     117
  101.36     116  102.13     115     103     114  103.83     113  104.41     112
  104.96     111  105.75     110     106     109   106.5     108     107     107
  107.49     106  108.86     105  109.92     104  110.57     103  110.93     102
  111.51     101  111.98     100  112.46      99  112.68      98  112.98      97
  115.02      96  126.61      95  134.12      95  170.96      95  175.43   93.06
   182.5      90  190.73    86.7     192   85.09  194.77    84.2     197    84.2
  197.17    84.2  205.79      90  207.77   91.61  211.97      95  218.11     100
  219.79     102  222.32     103  225.05     104  228.58     105   231.8     106
  232.88     107  233.72     108  234.92     109  238.86     110  239.79     111
  240.59     112  241.54     113  242.36     114  243.15     115  244.23     116
  245.41     117  246.17     118  246.98     119  247.72     120  248.85     121
  251.98     122  253.21     123  254.56     124  255.28     125  256.54     126
  258.39     127  260.14     128   261.2     129  262.39     130  263.74     131
  265.17     132  267.44     133  269.72     134  271.22     135  272.79     136
  273.99     137  275.44     138  277.05     139  279.65     140   281.2     141
  282.49     142  284.39     143  286.02     144  287.14     145  289.78     146
  291.47     147  293.01     148  294.66     149  296.05     150  298.78     151
  300.55     151

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  170.96     .04  211.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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      170.96  211.97             99      99      99            .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             98.95    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               2.27    Wt. n-Val.               0.060      0.040      0.060
  W.S. Elev (ft)             96.67    Reach Len. (ft)          99.00      99.00      99.00
  Crit W.S. (ft)             96.67    Flow Area (sq ft)        88.20     301.86       1.72
  E.G. Slope (ft/ft)      0.009547    Area (sq ft)             88.20     301.86       1.72
  Q Total (cfs)            4065.00    Flow (cfs)              283.82    3778.07       3.11
  Top Width (ft)            100.37    Top Width (ft)           57.31      41.01       2.05
  Vel Total (ft/s)           10.38    Avg. Vel. (ft/s)          3.22      12.52       1.81
  Max Chl Dpth (ft)          12.47    Hydr. Depth (ft)          1.54       7.36       0.84
  Conv. Total (cfs)        41602.3    Conv. (cfs)             2904.7    38665.7       31.8
  Length Wtd. (ft)           99.00    Wetted Per. (ft)         57.51      47.14       2.65
  Min Ch El (ft)             84.20    Shear (lb/sq ft)          0.91       3.82       0.39
  Alpha                       1.36    Stream Power (lb/ft s)    2.94      47.77       0.70
  Frctn Loss (ft)             0.44    Cum Volume (acre-ft)      1.64      18.76       0.81
  C & E Loss (ft)             0.42    Cum SA (acres)            0.71       3.13       0.43


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2364

INPUT
Description:
Station Elevation Data    num=     137
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     177    1.26     177    1.81     177    3.53     176    5.17     175
    6.56     174    7.66     173    8.98     172   11.59     171   13.19     170
   14.67     169   16.24     168   17.06     167   17.75     166    18.5     165
   19.34     164   20.21     163   21.04     162   22.02     161   22.97     160
   23.64     159   24.57     158   25.49     157   25.77     156   26.44     155
   26.87     154   27.39     153   27.87     152   28.29     151   28.92     150
   33.22     150   57.39     150   59.13     149    60.6     148   61.86     147
  63.16    146   63.89    145   65.24    144   67.41    143   69.04    142
  70.18    141   71.18    140   72.48    139   73.52    138   74.63    137
  75.91    136   76.94    135   78.39    134   79.66    133   83.58    132
   84.9    131   85.89    130   86.85    129   88.31    128   90.36    127
  93.45    126   94.52    125   95.37    124   96.23    123    97.1    122
  98.89    121  100.63    120  101.42    119  102.25    118  103.17    117
  104.6    116  108.16    115  111.62    114  112.63    113  113.56    112
 114.56    111  115.61    110  116.95    109  117.94    108  119.09    107
 121.45    106  122.98    105   123.7    104  124.09    103  124.68    102
 125.81    101  127.17    100  128.68     99  129.95     98  131.22     98
 133.26     98  134.64     97  135.93     96  137.35     95  138.82     94
 140.07     93  141.46     91  163.86   91.6  173.13     91  178.17     90
 187.88  85.27  195.91   80.9  200.21   80.9  205.14     85  214.71     90
 231.58     94  237.57     95  247.66     96  250.86     97  254.12     98
 257.67     99  260.38   99.6  262.23    100  264.16    101  265.39    102
 266.12    103  267.69    104   268.3    105  268.58    106  268.99    107
 269.69    108  270.44    109  271.16    110  272.27    111  273.28    112
 274.22    113  275.37    114  276.55    115  278.05    116  279.87    117
 281.78    118  283.45    119  285.22    120  286.94    121   288.4    122
 290.72    123   292.8    124  294.61    125  296.27    126  298.68    127
 300.86    128  301.26    128

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  178.17     .04  214.71     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.17  214.71          101.65  101.65  101.65             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)              96.68    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                0.89    Wt. n-Val.                 0.050      0.040      0.060
  W.S. Elev (ft)              95.79    Reach Len. (ft)            54.46      54.46      54.46
  Crit W.S. (ft)              93.04    Flow Area (sq ft)         179.32     387.86      74.81
  E.G. Slope (ft/ft)       0.002526    Area (sq ft)              179.32     387.86      74.81
  Q Total (cfs)             4065.00    Flow (cfs)                683.21    3215.76     166.04
  Top Width (ft)             109.31    Top Width (ft)             41.94      36.54      30.83
  Vel Total (ft/s)             6.33    Avg. Vel. (ft/s)            3.81       8.29       2.22
  Max Chl Dpth (ft)           14.89    Hydr. Depth (ft)            4.28      10.61       2.43
  Conv. Total (cfs)         80873.6    Conv. (cfs)              13592.4    63977.9     3303.3
  Length Wtd. (ft)            54.46    Wetted Per. (ft)           44.02      41.45      31.42
  Min Ch El (ft)              80.90    Shear (lb/sq ft)            0.64       1.48       0.38
  Alpha                        1.42    Stream Power (lb/ft s)      2.45      12.24       0.83
  Frctn Loss (ft)              0.34    Cum Volume (acre-ft)        1.33      17.98       0.72
  C & E Loss (ft)              0.11    Cum SA (acres)              0.60       3.04       0.39


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.
```

```
BRIDGE


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2297

INPUT
Description: Bridge 6-V
Distance from Upstream XS =   54.46
Deck/Roadway Width        =   25.52
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  171.13      91       0   181.5      94       0   181.5      94      92
   218.5      92      90   218.5      92       0  231.58      91       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=     149
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     177    1.26     177    1.81     177    3.53     176    5.17     175
    6.56     174    7.66     173    8.98     172   11.59     171   13.19     170
   14.67     169   16.24     168   17.06     167   17.75     166    18.5     165
   19.34     164   20.21     163   21.04     162   22.02     161   22.97     160
   23.64     159   24.57     158   25.49     157   25.77     156   26.44     155
   26.87     154   27.39     153   27.87     152   28.29     151   28.92     150
   33.22     150   57.39     150   59.13     149    60.6     148   61.86     147
   63.16     146   63.89     145   65.24     144   67.41     143   69.04     142
   70.18     141   71.18     140   72.48     139   73.52     138   74.63     137
   75.91     136   76.94     135   78.39     134   79.66     133   83.58     132
    84.9     131   85.89     130   86.85     129   88.31     128   90.36     127
   93.45     126   94.52     125   95.37     124   96.23     123    97.1     122
   98.89     121  100.63     120  101.42     119  102.25     118  103.17     117
   104.6     116  108.16     115  111.62     114  112.63     113  113.56     112
  114.56     111  115.61     110  116.95     109  117.94     108  119.09     107
  121.45     106  122.98     105   123.7     104  124.09     103  124.68     102
  125.81     101  127.17     100  128.68      99  129.95      98  131.22      98
  133.26      98  134.64      97  135.93      96  137.35      95  138.82      94
  140.07      93  141.66      92  144.43      91  148.64      90  159.91      90
  173.13      91   187.5      91  189.33      90  191.02      89  191.94      88
  192.74      87  193.77      86     194    80.3  203.52    80.3  204.46    80.3
  206.78    80.3  208.87      88  210.52      89  211.82      90  213.24      91
  214.73      92  217.07      93  231.58      94  237.57      95  247.66      96
  250.86      97  254.12      98  257.67      99  260.38    99.6  262.23     100
  264.16     101  265.39     102  266.12     103  267.69     104   268.3     105
  268.58     106  268.99     107  269.69     108  270.44     109  271.16     110
  272.27     111  273.28     112  274.22     113  275.37     114  276.55     115
  278.05     116  279.87     117  281.78     118  283.45     119  285.22     120
  286.94     121   288.4     122  290.72     123   292.8     124  294.61     125
  296.27     126  298.68     127  300.86     128  301.26     128

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05   187.5     .04  217.07     .06
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
        187.5  217.07            .1       .3

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  178.02      91       0   186.5   92.73       0   186.5   92.73   90.73
   223.5   90.73   88.73   223.5   90.73       0     240      91       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=     189
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     183     .08     183     2.5     182    4.58     181    7.23     180
    9.69     179    11.9     178   14.75     177   17.18     176   19.71     175
   20.91     174   23.09     173   25.74     172   28.46     171   30.32     170
   32.14     169   33.87     168   35.79     167   39.11     166   41.43     165
   42.59     164   44.51     163   46.82     162   48.52     161   50.95     160
   51.74  159.66   53.24     159   54.54     158   56.12     157   56.93     156
    57.8     155   58.75     154   59.75     153   60.66     152   61.42     151
   62.13     150   62.89     149   63.73     148   65.02     147   65.83     146
   66.87     145   71.76     145    95.6     145   97.05     144   99.39     143
  101.24     142  103.25     141  104.62     140  105.34     139  106.13     138
  107.67     137  109.51     136  110.58     135  111.97     134  113.67     133
  115.54     132  116.49     131  117.49     130   119.5     129  121.45     128
  122.46     127  124.53     126  125.77     125  127.79     124  129.14     123
  130.22     122  131.37     121  132.22     120  133.09     119  134.33     118
  136.79     117   138.3     116  139.74     115  141.11     114  142.76     113
  144.13     112  144.89     111  145.61     110  146.37     109  147.29     108
  148.18     107  148.94     106  149.89     105  152.03     104  152.66     103
  153.33     102  153.99     101  154.67     100  155.38      99   156.2      98
  157.62      97  158.88      96   160.2      95  163.56      94  165.53      93
  166.27      92  169.15      91  178.02      91  182.76      91  187.26      91
  190.05      90  190.51      89  191.12      88  192.19      87  193.35      86
   194.5      85  195.54      80  196.91      80  201.74      80  213.12      80
  213.97    83.6  214.83      85  215.56      86  216.81      87  218.39    87.7
  219.06      88  220.12      89   221.9      90  224.16      90  238.88      90
  241.24      91  255.58      91  274.37      91  275.82      92  277.28      93
   278.6      94  280.12      95  281.92      96  285.82      96  287.82      95
  289.87      94  292.01      93  294.05      92  296.05      91  298.83      90
  302.23      90  304.43      91  306.57      92  308.53      93  310.28      94
  311.05      95   313.7      96  314.89      97  316.51      98  317.61      99
  318.74     100  319.64     101  320.21     102  320.94     103  321.66     104
  322.37     105  323.84     106  326.84     107  329.43     108  331.66     108
  333.97     108  336.45     109  341.23     110  342.85     111  343.78     112
  344.28     113   344.7     114  345.63     115  346.16     116  346.92     117
  347.61     118  348.49     119  349.98     120  351.33     121  351.74  121.28
  352.79     122  353.79     123  355.56     124  357.38     125  358.94     126
  360.61     127  363.53     128  365.34     129  366.59     130  368.47     131
  369.89     132  371.21     133  372.44     134     375     135  376.84     136
  378.22     137  380.07     138  382.45     139  383.63     139

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     0     .05  187.26     .04  224.16     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
       187.26  224.16            .1       .3

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

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = 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 #100-yr bulked

  E.G. US. (ft)               96.68    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)               95.79    E.G. Elev (ft)             96.23        94.61
  Q Total (cfs)             4065.00    W.S. Elev (ft)             94.23        93.08
  Q Bridge (cfs)            2273.00    Crit W.S. (ft)             94.23        93.08
  Q Weir (cfs)                         Max Chl Dpth (ft)          13.93        13.08
  Weir Sta Lft (ft)                    Vel Total (ft/s)           11.13         9.19
  Weir Sta Rgt (ft)                    Flow Area (sq ft)         365.09       442.47
  Weir Submerg                         Froude # Chl                0.54         0.48
  Weir Max Depth (ft)                  Specif Force (cu ft)     3096.91      3112.92
  Min El Weir Flow (ft)       90.01    Hydr Depth (ft)             3.86         3.43
  Min El Prs (ft)             92.00    W.P. Total (ft)           172.93       207.51
  Delta EG (ft)                3.48    Conv. Total (cfs)        22316.8      24469.0
  Delta WS (ft)                5.33    Top Width (ft)             94.47       128.81
  BR Open Area (sq ft)       177.69    Frctn Loss (ft)             0.77         0.42
  BR Open Vel (ft/s)          12.79    C & E Loss (ft)             0.14         0.12
  BR Sluice Coef                       Shear Total (lb/sq ft)      4.37         3.67
  BR Sel Method         Energy only    Power Total (lb/ft s)      48.69        33.75


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
```

indicate
the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.

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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

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

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 2262

INPUT
Description:

```
Station Elevation Data    num=     160
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     183     .08     183     2.5     182    4.58     181    7.23     180
    9.69     179    11.9     178   14.75     177   17.18     176   19.71     175
   20.91     174   23.09     173   25.74     172   28.46     171   30.32     170
   32.14     169   33.87     168   35.79     167   39.11     166   41.43     165
   42.59     164   44.51     163   46.82     162   48.52     161   50.95     160
   51.74  159.66   53.24     159   54.54     158   56.12     157   56.93     156
    57.8     155   58.75     154   59.75     153   60.66     152   61.42     151
   62.13     150   62.89     149   63.73     148   65.02     147   65.83     146
   66.87     145   71.76     145    95.6     145   97.05     144   99.39     143
  101.24     142  103.25     141  104.62     140  105.34     139  106.13     138
  107.67     137  109.51     136  110.58     135  111.97     134  113.67     133
  115.54     132  116.49     131  117.49     130   119.5     129  121.45     128
  122.46     127  124.53     126  125.77     125  127.79     124  129.14     123
  130.22     122  131.37     121  132.22     120  133.09     119  134.33     118
  136.79     117   138.3     116  139.74     115  141.11     114  142.76     113
  144.13     112  144.89     111  145.61     110  146.37     109  147.29     108
  148.18     107  148.94     106  149.89     105  152.03     104  152.66     103
  153.33     102  153.99     101  154.67     100  155.38      99   156.2      98
  157.62      97  158.88      96   160.2      95  163.56      94  165.53      93
  166.27      92  169.64      91  181.84      91  184.68      90  193.52   84.23
   205.3    80.3   212.7    80.3  218.08   84.84  238.53      90  279.69      95
  296.34    90.1  302.14    90.5  305.54    90.5  306.57      92  308.53      93
  310.28      94  311.05      95   313.7      96  314.89      97  316.51      98
  317.61      99  318.74     100  319.64     101  320.21     102  320.94     103
  321.66     104  322.37     105  323.84     106  326.84     107  329.43     108
  331.66     108  333.97     108  336.45     109  341.23     110  342.85     111
  343.78     112  344.28     113   344.7     114  345.63     115  346.16     116
  346.92     117  347.61     118  348.49     119  349.98     120  351.33     121
  351.74  121.28  352.79     122  353.79     123  355.56     124  357.38     125
  358.94     126  360.61     127  363.53     128  365.34     129  366.59     130
  368.47     131  369.89     132  371.21     133  372.44     134     375     135
  376.84     136  378.22     137  380.07     138  382.45     139  383.63     139

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .05  181.84     .04  238.53     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        181.84  238.53            98.89   98.89   98.89             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             93.19    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.73    Wt. n-Val.                           0.040      0.060
  W.S. Elev (ft)             90.46    Reach Len. (ft)            98.89      98.89      98.89
  Crit W.S. (ft)             90.46    Flow Area (sq ft)                   306.34       2.06
  E.G. Slope (ft/ft)      0.014465    Area (sq ft)                        306.34       2.06
  Q Total (cfs)            4065.00    Flow (cfs)                         4062.90       2.10
  Top Width (ft)             65.46    Top Width (ft)                       55.16      10.29
  Vel Total (ft/s)           13.18    Avg. Vel. (ft/s)                     13.26       1.02
  Max Chl Dpth (ft)          10.16    Hydr. Depth (ft)                      5.55       0.20
  Conv. Total (cfs)        33798.2    Conv. (cfs)                        33780.8       17.4
  Length Wtd. (ft)           98.89    Wetted Per. (ft)                     59.90      10.39
  Min Ch El (ft)             80.30    Shear (lb/sq ft)                      4.62       0.18
  Alpha                       1.01    Stream Power (lb/ft s)               61.26       0.18
  Frctn Loss (ft)             1.44    Cum Volume (acre-ft)        1.07     17.32       0.59
  C & E Loss (ft)             0.03    Cum SA (acres)              0.52      2.96       0.32


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used critical
         depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 2163
```

```
INPUT
Description:
Station Elevation Data    num=     158
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     176      .9     176    3.07     175    5.22     174    7.22     173
    9.32     172   11.75     171   14.44     170   17.08     169   19.23     168
   22.18     167   24.71     166   27.68     165   30.79     164   33.52     163
   36.46     162   39.65     161    42.5     160   45.78     159   49.46     158
   51.53     157   53.98     156   57.66     155   62.33     154   65.07     153
   67.11     152    68.7     151   70.36     150   71.75     149   72.06     148
   72.91     147   73.67     146   74.59     145    75.4     144   76.14     143
   77.06     142   77.53     141    78.7     140    86.2     140   92.66     140
  116.63     140   118.9     139  123.77     138  124.97     137  125.99     136
  126.96     135  127.92     134  128.91     133  130.82     132  133.39     131
  136.12     130  139.25     129  141.33     128  144.29     127  146.09     126
  148.29     125  150.56     124  152.82     123  155.18     122  157.18     121
  159.11     120  160.89     119  162.47     118  163.69     117  165.06     116
  166.19     115  167.53     114  169.35     113  171.41     112  177.82     104
  190.25  103.31  195.83     103  198.14     102   199.5     101  200.34     100
  200.77      99  201.32      98  202.66      97  203.13      96  203.95      95
  206.06      94  208.65      93  209.06      92  209.48      91  211.11      90
  211.54      89  211.96      88  212.41      87   213.9      85  219.76   80.28
     231    76.2   237.5    76.2  245.98      80  256.73      85  260.07      86
   269.1    87.1   289.7    87.6   310.2    87.8   336.1      88   349.3      89
   354.3      89   361.2    89.5  364.27      90  365.12      91  366.06      92
  366.88      93  367.71      94  368.57      95  369.22      96  370.17      97
  370.98      98  371.96      99  372.95     100  373.99     101  374.99     102
  375.97     103  377.04     104  378.33     105  379.61     106  380.71     107
  381.49     108  382.35     109  383.48     110   386.2  110.21  396.26     111
  397.34     112  398.36     113  399.37     114  400.21     115  401.43     116
  402.29     117  402.82     118  403.65     119  405.09     120  405.89     121
   406.3     122  406.91     123  407.91     124  409.01     125     410     126
   411.1     127  412.78     128   414.4     129  416.25     130  418.03     131
  419.47     132   421.3     133  422.64     134  423.92     135  425.66     136
  427.13     137  428.37     138  429.96     139  431.84     140  432.73     141
  433.89     142  435.07     143  435.65     143

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  212.41     .04  260.07     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          212.41  260.07           105.31  105.31  105.31             .1       .3
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
  357.57  286.92     130

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             89.32    Element                Left OB    Channel   Right OB
  Vel Head (ft)               3.07    Wt. n-Val.                          0.040      0.060
  W.S. Elev (ft)             86.25    Reach Len. (ft)         105.31     105.31     105.31
  Crit W.S. (ft)             86.25    Flow Area (sq ft)                  289.22       0.27
  E.G. Slope (ft/ft)      0.014593    Area (sq ft)                       289.22       0.27
  Q Total (cfs)           4065.00    Flow (cfs)                     4064.80       0.20
  Top Width (ft)             49.19    Top Width (ft)                    47.10       2.09
  Vel Total (ft/s)         14.04    Avg. Vel. (ft/s)                 14.05       0.75
  Max Chl Dpth (ft)          10.05    Hydr. Depth (ft)                   6.14       0.13
  Conv. Total (cfs)       33650.7    Conv. (cfs)                    33649.0        1.7
  Length Wtd. (ft)         105.31    Wetted Per. (ft)                  52.18       2.10
  Min Ch El (ft)            76.20    Shear (lb/sq ft)                  5.05       0.11
  Alpha                    1.00    Stream Power (lb/ft s)             70.97       0.09
  Frctn Loss (ft)            1.53    Cum Volume (acre-ft)        1.07      16.65       0.59
  C & E Loss (ft)            0.03    Cum SA (acres)             0.52       2.84       0.31
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
        depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
        the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
        water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
        program defaulted to critical depth.

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 2058

INPUT
Description: Bridge 5P

```
Station Elevation Data    num=     128
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0     156     1.62     156      9.2     155    14.43     154    17.69     153
   20.98     152    27.22     151    31.03     150    37.08     149    42.16     148
   43.41     147    44.57     146     45.8     145     47.2     144    48.52     143
   49.79     142    51.03     141    52.22     140    53.31     139    54.11     138
   54.93     137    56.04     136    56.88     135    58.38     134    98.45     134
   99.57     134   100.71     133   101.95     132    102.7     131   104.03     130
  105.82     129   108.38     128   110.06     127   111.06  126.28   111.44     126
  112.51     125   113.65     124   114.45     123   115.66     122   118.59     121
  120.14     120   121.31     119   123.02     118   125.12     117    129.1     116
  129.22     115   130.12     116   130.16     116   130.25     115   145.06   108.7
  146.36   108.9   187.06   108.9   187.06     100   217.87    87.5   219.51      87
  220.84      86   225.79      85   227.75   84.13   236.59      80   250.43   74.37
   253.1      73   261.06      73   275.84      80   282.72      85   282.93      85
  284.22      86   293.96      86   314.06    86.2   376.46    86.5   383.06    86.5
  396.36    86.7    398.5      90   400.42      91   403.18      92   408.17      93
  411.06   93.94   411.24      94   414.07      95   416.55      96   418.73      97
  421.07      98   423.15      99    426.3     100   428.89     101   435.61     104
  438.29     105   440.49     106   446.58     109   451.59     110   456.37     111
  457.97     112   459.34     113   460.93     114   461.84     115   462.77     116
  463.55     117   464.61     118   465.73     119   467.11     120   467.88     121
  468.35     122   469.11     123   470.16     124   471.29     125   472.86     126
  473.59     127  473.76     128  473.92     129  474.08     130  474.22     131
  474.36     132  474.51     133  474.65     134  474.78     135  474.97     136
   475.1     137  475.39     138  475.64     139  475.89     140  476.17     141
  476.45     142  477.07     143  477.47     144  477.92     145  478.48     146
  479.38     147  481.01     148  485.24     148

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .06  220.84     .04  284.22     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        220.84  284.22            96.41   96.41   96.41             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  150.67  178.26     130
Cross Section Lid
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   222.5      87       0   222.5      87      85   297.5    86.5    84.5
   297.5    86.5       0

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            85.91    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              2.96    Wt. n-Val.                          0.040
  W.S. Elev (ft)            82.95    Reach Len. (ft)            96.41      96.41      96.41
  Crit W.S. (ft)            82.95    Flow Area (sq ft)                  294.37
  E.G. Slope (ft/ft)     0.014490    Area (sq ft)                       294.37
  Q Total (cfs)           4065.00    Flow (cfs)                        4065.00
  Top Width (ft)            49.62    Top Width (ft)                      49.62
  Vel Total (ft/s)          13.81    Avg. Vel. (ft/s)                    13.81
  Max Chl Dpth (ft)          9.95    Hydr. Depth (ft)                     5.93
  Conv. Total (cfs)       33769.4    Conv. (cfs)                       33769.4
  Length Wtd. (ft)          96.41    Wetted Per. (ft)                    54.24
  Min Ch El (ft)            73.00    Shear (lb/sq ft)                     4.91
  Alpha                      1.00    Stream Power (lb/ft s)              67.79
  Frctn Loss (ft)            1.36    Cum Volume (acre-ft)        1.07      15.94       0.59
  C & E Loss (ft)            0.29    Cum SA (acres)              0.52       2.72       0.30


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION
```

```
RIVER: Little Sycamore
REACH: Lower Reach        RS: 1962

INPUT
Description:
Station Elevation Data    num=      100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     134    4.84     134   17.43     133   23.69     132   26.19     131
   28.97     130   32.83     129   35.41     128    37.6     127   40.04     126
   41.98     125   44.65     124   80.63     123    82.5     122   83.68     121
   85.44     120   87.85     119   89.79     118   91.43     117   93.22     116
    95.3     115   97.26     114   98.87     113  100.44     112  101.66     111
  103.33     110  108.84     109  123.54   109.6  203.54   109.6  233.84      87
  239.04      87  255.31      80   309.3   73.05   322.2    71.1   331.2    71.1
   337.6   74.75  347.72      80  348.83      82  369.41      83  374.44    85.7
  388.94    85.8  447.08    85.8  448.04      96  450.57      97  452.61      98
   454.4      99  456.34     100  458.63     101  461.23     102   466.1     103
  471.31     104  472.61     105  473.59     106  474.68     107  475.81     108
  476.74  108.82  476.94     109  478.25     110  479.46     111  480.68     112
  481.98     113  483.19     114  483.97     115  484.28     116  484.79     117
  485.29     118  485.64     119  486.09     120  486.68     121   487.3     122
  487.87     123  488.88     124  489.67     125  490.35     126  491.48     127
  492.83     128   493.7     129  494.71     130  495.76     131  496.74     132
  497.69     133  498.55     134  499.41     135  500.22     136  501.05     137
  502.01     138  502.82     139  503.67     140  504.61     141  505.69     142
  506.69     143  507.81     144  508.46     145  509.95     146  511.14     147
  512.51     148  517.21     149   518.4     150  519.79     151  520.23     151

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  255.31     .04  348.83     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        255.31  348.83          101.45  101.45  101.45             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     144     182     130     374     447     110

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             81.05    Element                Left OB    Channel   Right OB
  Vel Head (ft)               1.99    Wt. n-Val.                          0.040
  W.S. Elev (ft)             79.06    Reach Len. (ft)          101.45     101.45     101.45
  Crit W.S. (ft)             78.92    Flow Area (sq ft)                  359.22
  E.G. Slope (ft/ft)      0.013762    Area (sq ft)                       359.22
  Q Total (cfs)            4065.00    Flow (cfs)                        4065.00
  Top Width (ft)             83.30    Top Width (ft)                      83.30
  Vel Total (ft/s)           11.32    Avg. Vel. (ft/s)                    11.32
  Max Chl Dpth (ft)           7.96    Hydr. Depth (ft)                     4.31
  Conv. Total (cfs)        34651.3    Conv. (cfs)                       34651.3
  Length Wtd. (ft)          101.45    Wetted Per. (ft)                    85.85
  Min Ch El (ft)             71.10    Shear (lb/sq ft)                     3.60
  Alpha                     1.00    Stream Power (lb/ft s)              40.68
  Frctn Loss (ft)            0.31    Cum Volume (acre-ft)       1.07      15.22       0.59
  C & E Loss (ft)            0.44    Cum SA (acres)             0.52       2.58       0.30


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.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 1861

INPUT
Description:
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     134    1.37     134    5.24     133    14.5     132   23.89     131
   28.83     130   32.27     129   34.08     128      36     127   37.71     126
   39.59     125   41.11     124   42.45     123   44.58     122      54     122
   61.56     122   78.39     121   80.26     120    82.9     119   84.33     118
   85.77     117    87.7     116   89.34     115   91.13     114    92.6     113
   94.39     112   96.25     111   98.14     110  100.91     109  122.13   108.5
  151.83   108.5  160.93     108  160.93    89.6  242.24    89.6  260.93      89
  294.21    77.9  334.97   71.19  347.12   69.27   358.4    67.5   370.1    67.5
  377.88      70  387.93      75  390.03      76  397.43    75.9  418.73    78.2
  462.13    82.2  466.13    82.2  467.38      81  467.79      82  468.31      83
  469.08      84  469.76      85  470.85      86  471.77      87  472.77      88
  473.68      89  474.04      90  474.64      91  475.19      92  475.89      93
  476.28      94  476.64      95  477.11      96  477.52      97  477.94      98
  478.31      99   478.8     100  479.11     101  479.49     102  479.94     103
  480.41     104  480.67     105  481.04     106  484.96     107  486.02     108
  487.55     109  488.65     110  490.34     111  492.76     111  493.78     111
  495.76     112  496.88     113  497.82     114  499.98     115   502.6     116
  503.76     117  505.17     118  506.45     119  507.63     120  510.08     121
  512.28     122  513.13     122

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  334.97     .04  390.03     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        334.97  390.03            99.45   99.45   99.45             .3       .5
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     160     234     110     291     315      85

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            80.30    Element                  Left OB    Channel   Right OB
  Vel Head (ft)             0.51    Wt. n-Val.              0.045      0.040      0.060
  W.S. Elev (ft)           79.78    Reach Len. (ft)         44.72      44.72      44.72
  Crit W.S. (ft)           75.10    Flow Area (sq ft)      139.77     556.39     100.19
  E.G. Slope (ft/ft)    0.001304    Area (sq ft)           139.77     556.39     100.19
  Q Total (cfs)          4065.00    Flow (cfs)             511.86    3402.79     150.35
  Top Width (ft)          123.35    Top Width (ft)          22.41      55.06      45.88
  Vel Total (ft/s)          5.10    Avg. Vel. (ft/s)         3.66       6.12       1.50
  Max Chl Dpth (ft)        12.28    Hydr. Depth (ft)         6.24      10.11       2.18
  Conv. Total (cfs)     112588.1    Conv. (cfs)           14176.9    94246.9     4164.2
  Length Wtd. (ft)         44.72    Wetted Per. (ft)        28.93      57.14      46.08
  Min Ch El (ft)           67.50    Shear (lb/sq ft)         0.39       0.79       0.18
  Alpha                     1.27    Stream Power (lb/ft s)   1.44       4.85       0.27
  Frctn Loss (ft)           0.16    Cum Volume (acre-ft)     0.91      14.15       0.47
  C & E Loss (ft)           0.47    Cum SA (acres)           0.49       2.42       0.25
```

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.
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.

BRIDGE

RIVER: Little Sycamore
REACH: Lower Reach   RS: 1803

INPUT
Description: Bridge 4-V
Distance from Upstream XS =   44.72
Deck/Roadway Width   =   24.74
Weir Coefficient   =   2.6
Upstream Deck/Roadway Coordinates

```
   num=      7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     265    68.8       0  317.71    75.5       0   351.6      75       0
   351.6      75      73   385.6    76.5    74.5   385.6    76.5       0
  419.04   78.34       0
```

Upstream Bridge Cross Section Data

```
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     134    1.37     134    5.24     133    14.5     132   23.89     131
   28.83     130   32.27     129   34.08     128      36     127   37.71     126
   39.59     125   41.11     124   42.45     123   44.58     122      54     122
   61.56     122   78.39     121   80.26     120    82.9     119   84.33     118
   85.77     117    87.7     116   89.34     115   91.13     114    92.6     113
   94.39     112   96.25     111   98.14     110  100.91     109  122.13   108.5
  151.83   108.5  160.93     108  160.93    89.6  242.24    89.6  260.93      89
  294.21    77.9   344.4      73  357.63      70  358.83      70  361.26      65
  368.63      65  376.57      65  379.05      70  381.03      71  390.03      76
  397.43    75.9  418.73    78.2  462.13    82.2  466.13    82.2  467.38      81
  467.79     82  468.31     83  469.08     84  469.76     85  470.85     86
  471.77     87  472.77     88  473.68     89  474.04     90  474.64     91
  475.19     92  475.89     93  476.28     94  476.64     95  477.11     96
  477.52     97  477.94     98  478.31     99   478.8    100  479.11    101
  479.49    102  479.94    103  480.41    104  480.67    105  481.04    106
  484.96    107  486.02    108  487.55    109  488.65    110  490.34    111
  492.76    111  493.78    111  495.76    112  496.88    113  497.82    114
  499.98    115   502.6    116  503.76    117  505.17    118  506.45    119
  507.63    120  510.08    121  512.28    122  513.13    122

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045   344.4     .04  390.03     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         344.4  390.03             .3       .5
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     160     234     110     291     315      85

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   273.3      70       0   376.3      75       0   376.3      75      73
   410.3    76.5    74.5   410.3    76.5       0   471.5      78       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     128     .65     128    4.16     127    7.52     126   10.86     125
   13.34     124   15.05     123   16.25     122    17.4     121   18.89     120
   20.37     119   56.32     118   58.67     117   60.63     116   62.48     115
    64.3     114   66.13     113   68.02     112   70.57     111   74.13     110
   78.41     109   81.95   110.5   81.95   108.9   126.2   107.8   126.2    89.6
  258.85    89.6  280.85      74  316.05      74  331.55    72.6  353.29      73
  372.95      72  378.95      72  384.08      67  384.65    63.9  390.95    63.9
  400.39    63.9  401.73      67  402.63      68   403.3      69  403.72      70
  404.21      71  404.88      72  405.43      73  406.42      74  416.47   74.99
  416.53      75  421.84      76  424.22      77  425.76      78  427.13      79
  432.74      79  437.52      79  441.67      79  451.79      79  452.36      80
  452.84      81  453.67      82  454.23      83  456.22      84  457.52      85
  458.44      86  459.33      87   460.8      88     462      89  463.41      90
  464.35      91  465.32      92  466.41      93  467.52      94  468.86      95
  469.76      96  470.65      97  473.21      98  474.84      99  475.96     100
   477.4     101  478.12     102  478.66     103  479.59     104  481.18     105
  482.69     106  483.61     107  484.77     108  485.73     109  486.88     110
  487.74     111  488.66     112  489.25     113  490.37     114   491.9     115
  493.46     116  494.54     117  495.61     118  496.12     118

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  378.95     .04  406.42     .06

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

```
        378.95  406.42            .3       .5
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     123     233     110     280     298      85

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

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = 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 #100-yr bulked

  E.G. US. (ft)                80.30    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)                79.78    E.G. Elev (ft)              79.66         77.72
  Q Total (cfs)              4065.00    W.S. Elev (ft)              77.58         76.13
  Q Bridge (cfs)             2543.08    Crit W.S. (ft)              77.58         76.13
  Q Weir (cfs)                          Max Chl Dpth (ft)           12.58         12.23
  Weir Sta Lft (ft)                     Vel Total (ft/s)            11.37          9.98
  Weir Sta Rgt (ft)                     Flow Area (sq ft)          357.45        407.48
  Weir Submerg                          Froude # Chl                 0.58          0.51
  Weir Max Depth (ft)                   Specif Force (cu ft)      3126.27       2922.01
  Min El Weir Flow (ft)        75.01    Hydr Depth (ft)              3.96          3.85
  Min El Prs (ft)              74.50    W.P. Total (ft)            169.91        189.85
  Delta EG (ft)                 4.58    Conv. Total (cfs)         22183.1       25258.5
  Delta WS (ft)                 6.26    Top Width (ft)              90.21        105.95
  BR Open Area (sq ft)        200.84    Frctn Loss (ft)              0.73          0.51
  BR Open Vel (ft/s)           12.66    C & E Loss (ft)              0.24          0.18
  BR Sluice Coef                        Shear Total (lb/sq ft)       4.41          3.47
  BR Sel Method          Energy only    Power Total (lb/ft s)       50.16         34.62


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
```

```
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was
used.
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach       RS: 1762

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     128     .65     128    4.16     127    7.52     126   10.86     125
   13.34     124   15.05     123   16.25     122    17.4     121   18.89     120
   20.37     119   56.32     118   58.67     117   60.63     116   62.48     115
    64.3     114   66.13     113   68.02     112   70.57     111   74.13     110
   78.41     109   81.95   110.5   81.95   108.9   126.2   107.8   126.2    89.6
  258.85    89.6  280.85      74  316.05      74  331.55    72.6  334.97   71.19
  352.03      70  379.59      70  383.34   65.33   384.4    63.2   394.8    63.2
  397.29      65  405.77      70  413.91      75  421.84      76  424.22      77
  425.76      78  427.13      79  432.74      79  437.52      79  441.67      79
  451.79      79  452.36      80  452.84      81  453.67      82  454.23      83
  456.22      84  457.52      85  458.44      86  459.33      87   460.8      88
     462      89  463.41      90  464.35      91  465.32      92  466.41      93
  467.52      94  468.86      95  469.76      96  470.65      97  473.21      98
  474.84      99  475.96     100   477.4     101  478.12     102  478.66     103
  479.59     104  481.18     105  482.69     106  483.61     107  484.77     108
  485.73     109  486.88     110  487.74     111  488.66     112  489.25     113
  490.37     114   491.9     115  493.46     116  494.54     117  495.61     118
  496.12     118

Manning's n Values       num=      3
```

```
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .045  379.59     .04  421.84     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       379.59  421.84            94.37   94.37   94.37             .3       .5
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     123     233     110     280     298      85

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            75.71    Element                Left OB    Channel   Right OB
  Vel Head (ft)              2.19    Wt. n-Val.              0.045      0.040
  W.S. Elev (ft)            73.53    Reach Len. (ft)          94.37      94.37      94.37
  Crit W.S. (ft)            73.53    Flow Area (sq ft)       157.55     223.90
  E.G. Slope (ft/ft)     0.012080    Area (sq ft)            157.55     223.90
  Q Total (cfs)           4065.00    Flow (cfs)             1104.75    2960.25
  Top Width (ft)            90.22    Top Width (ft)           58.30      31.92
  Vel Total (ft/s)          10.66    Avg. Vel. (ft/s)          7.01      13.22
  Max Chl Dpth (ft)         10.33    Hydr. Depth (ft)          2.70       7.01
  Conv. Total (cfs)       36985.8    Conv. (cfs)            10051.7    26934.1
  Length Wtd. (ft)          94.37    Wetted Per. (ft)         58.66      38.42
  Min Ch El (ft)            63.20    Shear (lb/sq ft)          2.03       4.39
  Alpha                      1.24    Stream Power (lb/ft s)   14.20      58.10
  Frctn Loss (ft)            1.35    Cum Volume (acre-ft)      0.61      13.42       0.41
  C & E Loss (ft)            0.30    Cum SA (acres)            0.38       2.33       0.21


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 1668

INPUT
Description:
Station Elevation Data    num=       82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     118      .6     118    1.91     117   30.29     116   31.36     116
   37.38     116   40.35     115   43.57     114   45.86     113   66.43     112
   69.03     111   70.56     110   72.33     109   73.97     108   75.22     107
   76.86     106     78.6      103    83.41      103    83.41    103.5    88.11      103
   88.11    98.2    132.6    89.16   210.91     87.9   238.61       78   260.81       75
  267.02      70   383.99    65.35   391.91    65.04      405     59.7      415     59.7
  418.55      65   418.85       65   419.58       66   421.14       67   422.13       68
  422.66      69   423.17       70   423.76       71   424.16       72    424.8       73
  425.28      74   425.93       75   426.77       76   428.14       77   428.93       78
  429.72      79   430.99       80   432.93       81   443.02       82   443.61       83
  444.32      84   444.94       85   445.92       86    446.4       87   446.98       88
   447.4      89   447.98       90   448.48       91   449.24       92   449.86       93
  450.53      94    451.2       95   452.07       96   452.96       97   454.03       98
  455.35      99   456.78      100      458      101    459.1      102   460.77      103
  462.09     104   463.35      105   464.89      106   466.33      107   467.66      108
  468.84     109   469.97      110   471.69      111   472.89      112   473.75      113
  475.27     114    475.3      114

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045   260.81      .04   422.13      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        260.81  422.13           125.92  125.92  125.92             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             70.53    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.59    Wt. n-Val.                          0.040      0.060
  W.S. Elev (ft)             68.93    Reach Len. (ft)          125.92     125.92     125.92
  Crit W.S. (ft)             68.93    Flow Area (sq ft)                   401.25       0.23
  E.G. Slope (ft/ft)      0.017124    Area (sq ft)                        401.25       0.23
  Q Total (cfs)            4065.00    Flow (cfs)                         4064.73       0.27
  Top Width (ft)            128.70    Top Width (ft)                      128.20       0.49
  Vel Total (ft/s)           10.13    Avg. Vel. (ft/s)                     10.13       1.17
  Max Chl Dpth (ft)           9.23    Hydr. Depth (ft)                      3.13       0.47
  Conv. Total (cfs)        31064.4    Conv. (cfs)                        31062.4        2.1
  Length Wtd. (ft)          125.92    Wetted Per. (ft)                    133.38       1.05
  Min Ch El (ft)             59.70    Shear (lb/sq ft)                      3.22       0.23
  Alpha                       1.00    Stream Power (lb/ft s)               32.58       0.27
  Frctn Loss (ft)             1.98    Cum Volume (acre-ft)       0.44      12.75       0.41
  C & E Loss (ft)             0.11    Cum SA (acres)             0.32       2.15       0.21


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used critical
         depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.
```

```
CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 1542

INPUT
Description:
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     121    1.88     121    3.56     120    4.94     119    6.67     118
    7.97     117    9.22     116   12.19     115   20.21     115    28.5     115
   48.18     114   56.06     114   65.18     114   68.38     113    70.4     112
   72.28     111   74.22     110   75.61     109      77     108    78.6     107
   80.38     106      82     105   83.43     104   85.28     103   87.02     102
    88.6     101   89.22    91.8   89.22    89.8  124.92    89.3  219.82    88.1
  294.62      72  307.72      70  358.22      67  371.42      67  374.78      65
  383.23   60.18     403    55.2     410    55.2  434.06      60  437.85      65
  438.57      65  439.41      66  444.14      67  445.11      68  445.77      69
  446.95      70   452.4      71  453.21      72  453.93      73  454.81      74
  456.33      75  461.17      76  462.39      77   463.5      78  477.95      79
  480.05      80  480.65      81  481.02      82  481.38      83  481.86      84
  482.39      85  483.25      86   484.4      87  485.56      88  486.41      89
  487.36      90  488.01      91  489.53      92  490.43      93  491.76      94
  492.59      95  493.65      96  494.75      97  495.63      98  496.91      99
  497.92     100  498.73     101   499.5     102  501.61     103  502.74     104
  503.64     105  504.67     106  505.55     107  506.24     108  507.21     109
  509.28     110  510.24     111  511.87     112  512.98     113  514.32     114
  515.53     115  516.83     116  518.06     117  519.51     118   521.4     119
  522.71     120  522.87     120

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  371.42     .04  439.41     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        371.42  439.41           72.28   72.28   72.28            .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     124     216     100

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             65.85    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.66    Wt. n-Val.                           0.040
  W.S. Elev (ft)             63.19    Reach Len. (ft)            72.28      72.28      72.28
  Crit W.S. (ft)             63.19    Flow Area (sq ft)                   310.86
  E.G. Slope (ft/ft)      0.014438    Area (sq ft)                        310.86
  Q Total (cfs)            4065.00    Flow (cfs)                         4065.00
  Top Width (ft)             58.52    Top Width (ft)                       58.52
  Vel Total (ft/s)           13.08    Avg. Vel. (ft/s)                     13.08
  Max Chl Dpth (ft)           7.99    Hydr. Depth (ft)                      5.31
  Conv. Total (cfs)        33830.3    Conv. (cfs)                        33830.3
  Length Wtd. (ft)           72.28    Wetted Per. (ft)                     61.99
```

```
 Min Ch El (ft)           55.20   Shear (lb/sq ft)                4.52
 Alpha                  1.00   Stream Power (lb/ft s)            59.10
 Frctn Loss (ft)          0.61   Cum Volume (acre-ft)      0.44      11.72      0.41
 C & E Loss (ft)          0.43   Cum SA (acres)            0.32      1.88      0.21
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.

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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 1470

INPUT
Description:

```
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     119     .09     119    3.75     118    7.09     117   12.06     116
   15.05     115   16.86     114   18.18     113   21.71     112      52     111
   55.74     111   58.62     111   60.66     110   63.62     109   65.69     108
   67.43     107   69.45     106   71.18     105    72.7     104   74.88     103
   76.73     102   78.37     101   79.98     100   81.58      99   83.19      98
   84.78      97   86.39      96   87.95      95    88.6    91.3   119.9      89
   121.9    88.4   213.1    88.4   270.2    66.5   270.2    68.3   299.5    67.5
     339    65.6  343.65      65  351.82      60  359.38   55.04   372.7    49.7
   381.4    49.7  396.07   53.39  427.15      60  431.34      65  434.94      70
  441.51      75  447.01      80  447.78      80  448.43      81  449.25      82
  450.23      83  452.59      84  463.09      84  471.48      84   474.4      85
  475.15      86  475.81      87  476.12      88  476.35      89   476.9      90
  476.94      91  477.59      92  478.02      93  478.89      94  479.37      95
  479.97      96  480.37      97  481.17      98  481.63      98

Manning's n Values       num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05     339     .04  431.34     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           339  431.34          102.14  102.14  102.14            .1       .3
Blocked Obstructions     num=      1
```

```
  Sta L   Sta R    Elev
    120     210     100

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            61.50    Element                Left OB    Channel   Right OB
  Vel Head (ft)              1.23    Wt. n-Val.                       0.040
  W.S. Elev (ft)            60.27    Reach Len. (ft)          102.14     102.14     102.14
  Crit W.S. (ft)                     Flow Area (sq ft)               456.97
  E.G. Slope (ft/ft)     0.005602    Area (sq ft)                    456.97
  Q Total (cfs)           4065.00    Flow (cfs)                     4065.00
  Top Width (ft)            75.99    Top Width (ft)                   75.99
  Vel Total (ft/s)           8.90    Avg. Vel. (ft/s)                  8.90
  Max Chl Dpth (ft)         10.57    Hydr. Depth (ft)                  6.01
  Conv. Total (cfs)       54310.2    Conv. (cfs)                    54310.2
  Length Wtd. (ft)         102.14    Wetted Per. (ft)                 79.86
  Min Ch El (ft)            49.70    Shear (lb/sq ft)                  2.00
  Alpha                      1.00    Stream Power (lb/ft s)           17.80
  Frctn Loss (ft)            0.71    Cum Volume (acre-ft)       0.44      11.08       0.41
  C & E Loss (ft)            0.08    Cum SA (acres)             0.32       1.77       0.21


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
        sections.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 1368

INPUT
Description:
Station Elevation Data    num=     125
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     118     .24     118    6.07     117    8.61     116   10.93     115
   13.24     114   15.63     113   19.08     112   20.63     111   22.45     110
    51.6     109   58.98     109   62.63     109   63.89     108   66.05     107
   69.97     106   71.25     105   74.48     104    75.6     103   77.55     102
   82.19     101   83.37     100   84.49      99   85.67      98   86.69      97
   89.49      96   91.38      95   92.29      94   95.37      93   98.23      91
  105.62      89  139.56      88   141.9      87  145.82      86  147.82      85
  149.48      84  150.91      83  152.71      82  154.58      81  154.59      81
  156.41      81  176.57      80   187.9      79  191.57      78  193.83      77
  196.43      76  199.29      75  201.16      74  203.32      73  205.85      72
  207.78      71  210.47      70  213.19      69  213.73   68.77  215.53      68
  218.17      67  224.39      66  224.49    65.8  239.89    66.1  244.79    64.5
  244.79      60  278.99      60  355.69    56.7   392.5      55  398.08   50.67
   402.7    47.6   411.2    47.6  416.17      50  424.76      55  435.49      64
  438.36      64  439.02      65   439.5      66  439.95      67  440.62      68
  441.45      69  441.76      70  442.04      71  442.36      72   442.9      73
  443.35      74  444.56      75  446.86      76  448.15      77  454.39      78
  455.54      79  457.24      80  458.71      81  460.72      82  461.52      83
  462.13      84  462.72      85  463.18      86  466.18      87  467.55      88
  469.07      89  471.81      90  474.91      91  476.25      91  481.78      90
  486.67      90   491.6     91  493.19      92  493.71      93  493.99      94
  494.07      95  494.32      96  494.62      97  495.36      98   495.7      99
  496.26     100  496.93     101  497.57     102   498.4     103  499.38     104
  500.46     105  503.06     106  504.84     107   506.6     108  508.03     109
  509.43     110  510.88     111  512.27     112  513.26     113  513.73     113

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05   392.5     .04  435.49     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          392.5  435.49            65.05   65.05   65.05             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     240     265      80

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             60.70    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               2.05    Wt. n-Val.                 0.050      0.040
  W.S. Elev (ft)             58.65    Reach Len. (ft)            65.05      65.05      65.05
  Crit W.S. (ft)             58.65    Flow Area (sq ft)         147.59     280.21
  E.G. Slope (ft/ft)      0.008848    Area (sq ft)              147.59     280.21
  Q Total (cfs)            4065.00    Flow (cfs)                608.96    3456.04
  Top Width (ft)            118.84    Top Width (ft)             82.23      36.62
  Vel Total (ft/s)            9.50    Avg. Vel. (ft/s)            4.13      12.33
  Max Chl Dpth (ft)          11.05    Hydr. Depth (ft)            1.79       7.65
  Conv. Total (cfs)        43214.6    Conv. (cfs)               6473.8    36740.8
  Length Wtd. (ft)           65.05    Wetted Per. (ft)           82.31      42.25
  Min Ch El (ft)             47.60    Shear (lb/sq ft)            0.99       3.66
  Alpha                       1.46    Stream Power (lb/ft s)      4.09      45.18
  Frctn Loss (ft)             0.95    Cum Volume (acre-ft)        0.27      10.22       0.41
  C & E Loss (ft)             0.01    Cum SA (acres)              0.23       1.64       0.21


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
          depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
          the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
          water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
          program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
```

REACH: Lower Reach RS: 1303

INPUT
Description: Bridge 3-P
Station Elevation Data num= 423

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.84	.25	97.84	1.29	97.29	1.67	97.11	2.03	96.91
2.37	96.68	3.4	96.07	3.79	95.82	4.5	95.45	5.91	94.68
6.16	94.51	6.62	94.26	7.32	93.81	7.54	93.7	8.03	93.38
8.92	93.05	9.45	92.95	11.46	92.71	12.27	92.58	12.91	92.51
15.1	92.18	17.18	91.88	20.17	91.49	21.63	91.31	22.17	91.23
23.08	91.12	23.59	91.04	24.3	91	29.58	91	29.95	90.97
30.96	90.7	32.34	90.32	35.61	89.39	37.03	89	37.85	88.76
39.23	88.38	40.51	88.01	42.36	87.5	42.68	87.4	44.1	87.01
47.5	86.05	48.34	85.82	50.68	85.16	51.17	85.04	52.13	84.76
52.58	84.65	54.39	84.14	55.41	83.88	55.76	83.78	57.95	83.2
58.52	83.04	61.28	82.32	62.3	82.04	64.61	81.44	66.02	81.06
66.73	81	73.8	81	77.33	80.67	79.19	80.49	80.16	80.43
80.57	80.39	81.94	80.22	83.32	80.01	83.7	79.93	84.41	79.71
85.11	79.53	86.08	79.24	87	79.03	87.46	78.95	87.94	78.82
88.45	78.65	89.91	78.19	91.36	77.72	92.18	77.43	92.89	77.2
94.35	76.66	95.72	76.13	96.43	75.8	97.17	75.37	97.84	75.03
98.48	74.54	99.26	73.98	100.67	73.02	101.24	72.59	102.61	71.52
103.99	70.49	104.91	69.86	106.33	68.85	107.34	68.03	108.45	67.17
108.79	66.89	109.86	66.11	110.57	65.65	111.28	65.22	111.99	64.81
112.69	64.47	113.4	64.1	114.11	63.97	115.02	63.93	117.51	63.79
118.96	63.72	119.15	63.7	120.41	63.64	121.18	63.58	121.9	63.55
122.59	63.5	124.77	63.38	126.84	63.25	128.25	63.17	128.79	63.13
131.08	63	132.93	63	133.2	62.99	133.91	62.85	136.39	62.14
136.74	62.03	138.44	61.85	140.75	61.64	143.66	61.36	145.33	61.21
147.34	61.02	149.46	60.96	150.17	60.92	150.92	60.91	151.59	60.87
152.22	60.86	154.42	60.76	156.24	60.69	156.35	60.69	157.95	60.62
158.19	60.62	160.49	60.52	162.9	60.43	163.24	60.41	164.62	60.36
166.44	60.28	166.9	60.27	168.75	60.19	170.13	60.14	171.51	60.08
174.92	60.03	175.64	60.03	177.02	60.01	178.4	60	179.98	60
181.29	59.99	181.43	59.98	182.88	59.96	185.53	59.91	186.67	59.9
188.05	59.87	189.07	59.86	189.78	59.84	190.8	59.83	192.18	59.8
192.6	59.8	194.5	59.76	194.93	59.76	196.31	59.73	196.85	59.73
197.69	59.71	200.32	59.67	200.45	59.66	204.58	59.6	204.67	59.59
207.34	59.55	208.16	59.53	208.71	59.53	210.09	59.5	210.49	59.5
211.7	59.47	212.85	59.46	216.65	59.46	217.75	59.44	219.2	59.43
220.18	59.41	220.89	59.41	221.6	59.39	222.31	59.39	223.72	59.36
224.43	59.36	225.25	59.34	227.92	59.3	228.67	59.28	229.38	59.28
232.91	59.2	234.33	59.18	235.18	59.16	240.99	59.04	242.81	59
243.9	58.73	245.92	58.17	246.8	57.94	249.18	57.38	249.71	57.27
250.59	57.05	251.16	56.96	252.01	56.8	252.81	56.68	253.42	56.56
254.07	56.46	255.52	56.22	256.25	56.08	256.35	56.09	256.94	56
259.88	56	261.2	55.9	261.91	55.88	263.32	55.86	264.03	55.86
266.24	55.8	266.98	55.77	267.85	55.75	269.21	55.7	270.69	55.66
272.92	55.53	273.27	55.52	275.15	55.43	275.52	55.42	276.63	55.36
278.13	55.3	281.83	55	292.33	49.58	299.15	45.5	307	45.5
319.95	49.4	331.97	55	334.22	60	335.02	59.98	335.35	60.19
336.09	60.85	336.31	60.87	336.83	60.75	337.27	60.83	337.58	60.79
338.19	60.79	338.39	60.76	338.6	60.63	339.06	60.44	339.51	60.12

```
  339.81   60.08  340.38   59.69   340.9   59.44  341.76   59.06  342.04      59
  342.78   59.01  343.52   58.95     344   58.94  344.47   58.89  344.83   58.92
  345.07   58.88  345.51   58.92  345.88   58.91  346.32      59  348.64      59
  349.08   59.04  349.69   59.13  349.89   59.19  351.78   59.84  352.29   59.97
  352.32    59.9  352.82      60  353.09      60  353.81   60.06  353.99   60.09
   354.7   60.28  354.91   60.32  355.95   60.58   356.3   60.62  356.81   60.72
   357.9   60.85  358.31   60.87   358.7   60.92  359.09   60.94  359.51   60.99
   359.8   61.12  360.13   61.17  361.18   61.73   361.3   61.75  361.91   61.97
  362.22      62  363.27      62  363.51   62.04  364.34   62.31  365.12   62.53
   365.8   62.77  365.92   62.76   366.4   62.94  366.72   62.94  367.29   63.24
  367.44   63.25  368.32   63.64  368.49   63.73  368.79   63.77  369.13   63.92
  369.53   63.95  369.93   63.92  370.29   63.97  370.73   63.95  371.24   64.06
  371.62   64.12  373.13   64.17  373.28   64.15  373.94   64.16  374.78   64.03
  375.54   64.07   375.8   64.01  376.84   64.03  377.14   64.05  378.14   64.19
  380.35   64.56  381.59   64.78  383.11   65.07  385.16   65.74  386.24   66.03
  387.57    66.7  388.37   67.21  389.38   67.88  389.76   68.12  389.97   68.33
  390.42   68.59  390.77   69.03  391.26   69.48  391.46   69.72  391.94   70.65
  392.38   71.59  393.55   73.55  393.98   73.95  394.25   74.09   394.6   74.39
  395.75      75  397.19   75.63  397.25   75.76  397.73      76  398.75   76.24
  399.59   76.81  399.82   76.92  400.86    77.6   401.2    77.8  401.74   78.19
   402.8   78.81  403.24   78.94   403.6    79.1     404   79.21   404.4   79.39
   405.2    79.7  406.24   79.92  406.81   79.95  407.13   80.01  408.17   80.72
  408.41   80.86  409.23   81.52  410.01   81.99  410.26   82.12  410.73   82.25
  410.82   82.31  411.31   82.44  412.35   82.78  413.22   83.17   413.4   83.23
  413.73   83.42  414.02   83.65  414.82   84.12  415.22   84.41  416.09   84.94
  417.57   85.82  419.66   86.94  420.44   87.46  420.71   87.66  421.24   88.01
  422.04   88.51  422.99   89.01  423.64   89.34  424.21   89.68  424.44   89.78
  424.89   90.05  425.25   90.35  425.71    90.8  425.93   90.98  426.44   91.46
  426.85   91.88  427.21   92.16  427.65   92.56  428.02   92.83  428.45   93.03
   428.7   93.08  429.06   93.24  430.11   93.43  430.86   93.48   431.7   93.57
   432.2    93.6  434.07   93.74  434.87   93.81  436.47   93.93  437.27   93.98
  438.07      94  440.55      94  441.28    94.1   441.6   94.16  442.88   94.72
  443.68    95.1  444.49   95.69  444.73   95.88  445.18   96.43  445.29   96.48
  445.77   97.08  446.09   97.53  446.68   98.29  446.89   98.58  447.69    99.6
  448.18  100.03   448.5  100.34  448.91   100.7  449.95  101.51   450.1  101.58
  450.59  101.89  451.17  102.22   451.7  102.43  452.51  102.81  452.67  102.93
  453.08  103.12  455.17  104.02  456.24  104.39

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .05   281.83      .04   334.22      .06

Bank Sta: Left    Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          281.83  334.22             51.28   51.28   51.28             .1       .3
Blocked Obstructions       num=        1
    Sta L    Sta R     Elev
      141      175       70
Cross Section Lid
      num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
     270    52.5    50.5      340    52.5    50.5

CROSS SECTION OUTPUT  Profile #100-yr bulked
```

```
 E.G. Elev (ft)            59.23    Element                  Left OB    Channel   Right OB
 Vel Head (ft)              2.16    Wt. n-Val.                 0.050      0.040
 W.S. Elev (ft)            57.07    Reach Len. (ft)            51.28      51.28      51.28
 Crit W.S. (ft)            57.07    Flow Area (sq ft)          39.40     318.59
 E.G. Slope (ft/ft)     0.028345    Area (sq ft)               39.40     318.59
 Q Total (cfs)           4065.00    Flow (cfs)                229.06    3835.94
 Top Width (ft)            82.41    Top Width (ft)             31.34      51.07
 Vel Total (ft/s)          11.36    Avg. Vel. (ft/s)            5.81      12.04
 Max Chl Dpth (ft)         11.57    Hydr. Depth (ft)            1.26       6.24
 Conv. Total (cfs)       24144.6    Conv. (cfs)               1360.5    22784.0
 Length Wtd. (ft)          51.28    Wetted Per. (ft)           31.46     119.27
 Min Ch El (ft)            45.50    Shear (lb/sq ft)            2.22       4.73
 Alpha                      1.08    Stream Power (lb/ft s)     12.89      56.91
 Frctn Loss (ft)            0.72    Cum Volume (acre-ft)        0.13       9.77       0.41
 C & E Loss (ft)            0.08    Cum SA (acres)              0.14       1.57       0.21
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach RS: 1252

INPUT
Description:
Station Elevation Data num= 97

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      0     111    1.82     111    4.02     110     6.7     109   11.54     108
  12.84     107   14.47     106   16.33     105   43.59     104   57.56     103
  61.17     102   63.42     101   65.81     100    67.6      99   69.46      98
  71.31      97   74.02      96   74.63      95   75.19      94   75.65      93
 133.95      81  134.93      81  143.53      81  143.73      81  145.21      81
 151.21      79  152.25      78  153.28      77  154.28      76  155.74      75
 157.61      74  159.78      73  161.49      72  163.32      71  164.99      70
 167.01      69  168.52      68  170.12      67  171.77      66  173.55      65
 175.49      64  177.55      63  181.59    62.5  204.49    62.4  243.59    59.4
 300.74    58.6  305.49    58.5   306.4      58  308.05   55.12  310.43      55
  319.1   49.73  327.53      43   358.4      43  368.47   49.42  385.35      55
 393.29    55.7  398.37      56  462.05   56.94  466.55      57  467.68      58
```

```
  468.66      59  469.55      60  470.67      61     472      62  473.28      63
  474.47      64  475.48      65  477.14      66  479.53      67  481.73      68
   485.4      69  487.28      70  489.33      71  489.79   71.31  490.82      72
  492.73      73  495.78      74  498.32      75  500.88      76  502.94      77
     505      78  507.22      79  509.76      80   512.1      81  514.27      82
  516.49      83  518.15      84  520.33      85  523.64      86  526.83      87
  529.98      88  532.63      89  533.47      90  534.32      91  536.14      92
  538.42      93  545.45      93

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .05   305.49     .04   393.29     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        305.49  393.29            90.01   90.01   90.01              .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             53.41    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.88    Wt. n-Val.                            0.040
  W.S. Elev (ft)             51.53    Reach Len. (ft)            90.01      90.01      90.01
  Crit W.S. (ft)                      Flow Area (sq ft)                    369.97
  E.G. Slope (ft/ft)      0.008397    Area (sq ft)                         369.97
  Q Total (cfs)            4065.00    Flow (cfs)                          4065.00
  Top Width (ft)             58.72    Top Width (ft)                        58.72
  Vel Total (ft/s)           10.99    Avg. Vel. (ft/s)                      10.99
  Max Chl Dpth (ft)           8.53    Hydr. Depth (ft)                       6.30
  Conv. Total (cfs)        44360.6    Conv. (cfs)                         44360.6
  Length Wtd. (ft)           90.01    Wetted Per. (ft)                      63.80
  Min Ch El (ft)             43.00    Shear (lb/sq ft)                       3.04
  Alpha                       1.00    Stream Power (lb/ft s)                33.40
  Frctn Loss (ft)             0.97    Cum Volume (acre-ft)        0.11       9.36       0.41
  C & E Loss (ft)             0.02    Cum SA (acres)              0.12       1.51       0.21


CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 1162

INPUT
Description:
Station Elevation Data    num=       75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     111     .15     111    4.66     110   10.32     109   18.07     108
   22.41     107   25.53     106   28.06     105   32.28     104   36.86     103
   38.08     102   39.29     101    40.5     100   43.51      99   74.92      98
   84.44      97   85.81      96   85.88      95   114.7      92  115.97   91.62
  146.64   81.78  161.54      77  164.26      76  166.55      75  168.58      74
  170.33      73  172.28      72   174.3      71  176.39      70  178.48      69
  180.72      68  183.63      67  185.33      66  187.09      65  188.55      64
  190.04      63  191.57      62  192.61      61  194.27      60  196.14      59
  199.39      58  206.77      57  208.94      57  223.24      56  259.24      50
```

```
   270.3      50  281.84   45.35   292.4    40.4     299    40.4  305.44   40.82
     320   48.52  348.28      50  352.24    51.5  357.44      51  366.54    51.8
  428.57      56  430.04      57  430.91      58  432.09      59  433.12      60
  434.11      61  435.18      62  436.14      63  437.66      64  438.91      65
  442.57      66  446.64   66.74  448.06      67  450.01      68  451.81      69
  453.46      70  455.08      71  457.03      72  458.79      73  460.06      73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045   270.3     .04  357.44     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         270.3  357.44            96.85   96.85   96.85            .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     115     156      70

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)              52.41    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                2.10    Wt. n-Val.                 0.045      0.040
  W.S. Elev (ft)              50.31    Reach Len. (ft)            96.85      96.85      96.85
  Crit W.S. (ft)              50.31    Flow Area (sq ft)           3.75     348.95
  E.G. Slope (ft/ft)       0.014407    Area (sq ft)                3.75     348.95
  Q Total (cfs)             4065.00    Flow (cfs)                  6.51    4058.49
  Top Width (ft)              91.74    Top Width (ft)             12.94      78.81
  Vel Total (ft/s)            11.53    Avg. Vel. (ft/s)            1.73      11.63
  Max Chl Dpth (ft)            9.91    Hydr. Depth (ft)            0.29       4.43
  Conv. Total (cfs)         33866.8    Conv. (cfs)                 54.2    33812.6
  Length Wtd. (ft)            96.85    Wetted Per. (ft)           12.96      82.83
  Min Ch El (ft)              40.40    Shear (lb/sq ft)            0.26       3.79
  Alpha                        1.02    Stream Power (lb/ft s)      0.45      44.07
  Frctn Loss (ft)              1.14    Cum Volume (acre-ft)        0.10       8.62       0.41
  C & E Loss (ft)              0.05    Cum SA (acres)              0.11       1.37       0.21


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 1065

INPUT
```

```
Description:
Station Elevation Data    num=     139
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     116     2.3     116     5.6     115   10.33     114   14.94     113
   18.63     112   23.02     111   27.84     110    31.8     109   36.29     108
   41.76     107   47.96     106    52.7     105   60.57     104   62.51     103
   65.13     102    66.9     101   69.17     100   70.39      99   71.53      98
   72.77      97   74.21      96      76      95   86.99      94  114.74      93
  118.85      92  121.71      91     125      90  129.86      89  130.94      88
  132.01      87  133.84      86  135.74      85  136.04   84.88  138.21      84
  141.01      83  143.36      82  145.61      81  148.27      80  150.84      79
  152.95      78  155.54      77  157.31      76  159.99      75  162.72      74
  165.33      73  167.75      72   170.2      71  172.54      70  174.13      69
  175.68      68  177.27      67  178.96      66  180.57      65  181.97      64
  182.43      63   183.2      62  183.87      61  184.41      60  185.45      59
  185.98      58  186.55      57  187.37      56   189.2      55  191.23      54
  192.09      53  193.28      52  196.23      51  198.64    49.6  222.24    49.5
  248.94    47.6   255.5      48  260.39   46.85  262.65   45.79  270.93    41.9
     275    39.7   297.4    39.7   297.5      40  308.29      45  310.24    46.5
  324.44    46.5  370.04    46.8  372.12      48  373.44      49   374.4      50
  375.15      51  375.84      52  376.54      53  377.25      54     378      55
  378.88      56   379.6      57  380.57      58  381.91      59  383.28      60
  384.64      61  385.99      62  387.36      63  388.86      64  390.13      65
  392.24      66  394.95      67  396.17      68  397.45      69  398.78      70
  399.99      71  401.21      72   402.6      73  403.97      74  405.36      75
  406.77      76  408.18      77  409.99      78  411.65      79  413.69      80
  414.65      81  415.71      82  416.71      83  417.68      84  418.91      85
  420.12      86   421.1      87  422.19      88  423.03      89   423.9      90
  425.02      91  426.56      92  427.94      93  428.91      94  429.97      95
  431.34      96  433.05      97  434.93      98  436.04   98.82  436.29      99
  437.73     100  439.59     101  441.91     102  452.84     102

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05   255.5     .04  310.24     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          255.5  310.24            77.49   77.49   77.49             .1       .3
Blocked Obstructions     num=       1
    Sta L   Sta R    Elev
      186     211      60

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             50.05    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               1.95    Wt. n-Val.                0.050      0.040      0.060
  W.S. Elev (ft)             48.10    Reach Len. (ft)           77.49      77.49      77.49
  Crit W.S. (ft)             48.10    Flow Area (sq ft)          3.70     326.16      90.19
  E.G. Slope (ft/ft)      0.009802    Area (sq ft)               3.70     326.16      90.19
  Q Total (cfs)            4065.00    Flow (cfs)                 4.57    3777.61     282.81
  Top Width (ft)            130.31    Top Width (ft)            13.56      54.74      62.01
  Vel Total (ft/s)            9.68    Avg. Vel. (ft/s)           1.24      11.58       3.14
  Max Chl Dpth (ft)           8.40    Hydr. Depth (ft)           0.27       5.96       1.45
  Conv. Total (cfs)        41059.0    Conv. (cfs)                46.2    38156.2     2856.6
  Length Wtd. (ft)          77.49    Wetted Per. (ft)          13.59      58.36      62.37
  Min Ch El (ft)            39.70    Shear (lb/sq ft)           0.17       3.42       0.88
  Alpha                      1.34    Stream Power (lb/ft s)     0.21      39.61       2.77
  Frctn Loss (ft)            0.92    Cum Volume (acre-ft)       0.09       7.87       0.31
  C & E Loss (ft)            0.04    Cum SA (acres)             0.08       1.22       0.14
```

```
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 988

INPUT
Description:
Station Elevation Data    num=     125
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     112     4.4     112       7     111    8.73     110   10.98     109
   13.43     108   15.65     107   18.53     106   23.04     105   25.47     104
   27.59     103   30.17     102   32.84     101   36.55     100   40.85      99
   45.06      98   47.22      97   49.56      96   51.49      95   53.35      94
   54.89      93   55.98      92   57.56      91   58.87      90   59.92      89
   61.25      88   62.93      87   78.47   86.43   89.97      86   91.66      85
   93.62      84   94.96      83   96.53      82   98.24      81   99.56      80
  100.69      79   101.6      78  102.63      77  104.16      76  105.44      75
  106.98      74  107.89      73  108.86      72  109.63      71  111.88      70
  112.77      69  113.88      68  115.72      67  117.15      66  120.45      65
  121.39      64   122.3      63  123.31      62     125      61   126.1      60
  127.65      59  129.06      58  131.07      57  137.95      56  140.14      55
  142.62      54  144.64      53   145.9      52  146.81      51  148.88      50
  149.16    50.2  177.26    50.2     187      45  219.32   39.88     230    35.7
   240.8    35.7  250.12      40  262.08      45  264.76      46  278.36      46
  319.26      46  321.32      47   323.9      48  324.72      49  325.57      50
  326.56      51   327.4      52  328.36      53  329.24      54  329.86      55
  330.92      56  331.95      57  333.02      58  334.04      59  335.12      60
  336.28      61  337.52      62  338.63      63  339.74      64  340.94      65
   341.7      66  342.22      67  343.08      68  343.79      69  344.43      70
  345.37      71  346.45      72  347.24      73  348.36      74  349.72      75
  351.28      76  353.48      77   355.3      78   356.8      79  358.28      80
  359.55      81  360.57      82  361.83      83  363.35      84  365.18      85
  366.95      86  368.58      87  370.47      88  371.95      89  373.09      90
  374.19      91  375.53      92   376.5      93  377.74      94  378.47      94
```

```
Manning's n Values       num=       3
     Sta   n Val      Sta   n Val     Sta   n Val
       0     .05      187     .04  264.76     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            187  264.76             40.56   40.56   40.56            .1        .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     149     177      60

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             46.99    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               2.31    Wt. n-Val.                           0.040
  W.S. Elev (ft)             44.68    Reach Len. (ft)            40.56      40.56      40.56
  Crit W.S. (ft)             44.68    Flow Area (sq ft)                   333.44
  E.G. Slope (ft/ft)      0.014832    Area (sq ft)                        333.44
  Q Total (cfs)            4065.00    Flow (cfs)                         4065.00
  Top Width (ft)             72.33    Top Width (ft)                       72.33
  Vel Total (ft/s)           12.19    Avg. Vel. (ft/s)                     12.19
  Max Chl Dpth (ft)           8.98    Hydr. Depth (ft)                      4.61
  Conv. Total (cfs)        33377.6    Conv. (cfs)                        33377.6
  Length Wtd. (ft)           40.56    Wetted Per. (ft)                     75.38
  Min Ch El (ft)             35.70    Shear (lb/sq ft)                      4.10
  Alpha                       1.00    Stream Power (lb/ft s)               49.93
  Frctn Loss (ft)             0.75    Cum Volume (acre-ft)        0.09      7.28       0.23
  C & E Loss (ft)             0.18    Cum SA (acres)              0.07      1.11       0.09


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
         depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 948

INPUT
Description: Bridge 1-P
Station Elevation Data    num=     434
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   85.05     .29   85.05       1   84.73     1.7   84.45    2.41   84.13
    3.12      84    5.32      84    6.56   84.02    6.74   84.02    7.36   84.04
```

8.17	84.08	8.77	84.1	9.59	84.14	10.19	84.16	11.6	84.23
12.31	84.26	13.01	84.27	13.57	84.29	13.87	84.29	14.98	84.31
15.84	84.32	16.72	84.35	17.78	84.37	18.14	84.38	19.19	84.4
19.57	84.4	20.08	84.41	20.59	84.4	20.99	84.38	21.99	84.34
22.2	84.34	23.62	84.28	23.84	84.28	25.74	84.2	26.2	84.19
27.15	84.15	27.61	84.14	28.57	84.1	29.27	84.05	29.54	84.04
29.98	84.01	30.41	84	32.39	84	32.81	83.98	33.22	83.79
33.52	83.67	33.81	83.52	34.22	83.37	34.62	83.2	34.93	83.09
35.24	82.91	35.64	82.72	36.03	82.51	36.34	82.38	37.05	82.01
37.43	81.79	37.76	81.64	38.09	81.45	38.46	81.25	39.17	80.92
39.51	80.79	39.88	80.67	40.24	80.54	40.58	80.38	40.94	80.26
41.29	80.12	41.64	80	42	79.83	42.36	79.65	42.71	79.45
43.04	79.35	43.41	79.16	43.79	78.74	44.12	78.45	44.45	78.15
44.83	78	45.53	78	45.85	77.99	46.95	77.77	47.65	77.61
48.36	77.4	48.66	77.27	49.07	77.12	49.48	76.83	49.78	76.61
50.06	76.38	50.48	76	50.91	75.68	51.19	75.44	51.46	75.19
51.9	74.81	52.33	74.37	52.6	74.08	53.31	73.43	53.76	73.03
54.27	72.56	54.72	72.17	55.18	71.8	55.67	71.38	56.14	71.03
56.61	70.77	56.84	70.67	57.08	70.54	58.03	70.09	58.26	70.04
58.48	70.02	58.97	70.08	59.67	69.81	59.88	69.67	60.38	69.45
60.88	69.19	61.09	69.07	61.29	68.94	61.79	68.65	62.31	68.3
62.69	68.02	63.21	67.65	63.73	67.23	64.09	66.97	64.62	66.57
65.16	66.2	65.33	66.11	66.04	65.87	66.58	65.67	66.74	65.62
67.45	65.35	68.16	65.01	68.3	64.92	68.86	64.66	69.57	64.31
69.71	64.22	70.28	63.88	71.11	63.31	71.69	62.9	72.4	62.38
72.51	62.27	73.1	61.79	73.7	61.33	74.52	60.54	75.13	59.67
75.32	59.49	75.93	58.87	76.55	58.55	77.35	58.18	77.98	57.83
78.76	57.29	79.4	56.88	79.47	56.84	80.17	56.37	80.93	55.84
81.59	55.45	82.25	55.03	82.34	54.98	83	54.8	83.74	54.55
84.42	54.37	85.1	54.16	85.83	53.66	86.53	52.71	87.24	51.56
87.93	50.11	87.95	50.06	88.66	48.7	89.35	47.31	90.07	46.37
90.76	45.78	92.9	44.34	93.56	43.97	93.61	43.95	94.31	43.77
94.97	43.56	95.73	43.4	96.37	43.2	96.5	43.18	97.14	43.11
97.92	43	98.56	43	99.18	42.94	99.35	42.91	100.58	42.59
100.77	42.51	101.38	42.27	102.09	42.05	102.8	42	105.05	42
105.62	42.03	106.47	42.03	107.04	42.06	107.9	42.12	108.45	42.15
109	42.15	109.87	42.21	110.4	42.28	110.57	42.31	110.75	42.32
111.81	42.46	111.99	42.5	112.17	42.5	113.21	42.64	113.4	42.69
113.6	42.69	114.11	42.77	114.61	42.82	114.82	42.87	115.02	42.89
115.52	42.98	116.23	43	121.63	43	122.14	42.98	122.59	42.97
123.57	42.93	124.01	42.92	124.99	42.88	125.84	42.84	126.42	42.82
126.83	42.8	127.54	42.78	127.84	42.76	128.25	42.75	128.65	42.73
129.27	42.71	129.66	42.69	131.08	42.65	131.45	42.65	131.78	42.64
132.12	42.64	132.49	42.63	133.2	42.63	134.61	42.59	134.97	42.57
135.66	42.55	136.02	42.53	136.73	42.51	137.07	42.49	139.24	42.43
139.87	42.41	140.3	42.37	141.28	42.34	141.84	41.93	143.45	41.58
145.15	41.43	147.01	41.34	148.41	41.44	150.56	41.29	154.8	41.5
160.01	35.64	163.04	34.43	165.7	34.07	167.94	34	180	34
180.79	34.11	180.88	34	186.45	34.4	188.83	35.23	194.88	39.21
196.32	40.14	196.82	40.58	197.41	40.67	198.24	40.81	198.94	40.87
199.08	40.87	199.65	40.92	200.22	40.95	201.06	41.03	201.62	41.06
202.48	41.12	203.02	41.08	203.18	41.09	203.35	41.08	203.89	41.12
204.43	41.04	204.6	41.05	204.77	41.04	205.31	41.07	205.83	41
206.01	41	206.2	41.02	206.72	41.16	207.23	41.26	207.62	41.36

```
  208.13    41.5  208.84   41.64  209.55   41.75  210.04   41.78  210.47   41.83
  210.96   41.87  211.44   41.93  211.67   41.98  212.38   42.04  212.85   42.02
  213.32   42.03  213.79    42.1  214.25   42.15   214.5   42.21  214.75   42.23
  215.65   42.37  215.91   42.42  216.17   42.45  216.62   42.52  217.06   42.58
  217.32   42.64   217.6   42.67  218.03      34  218.74   42.85  219.02   42.89
  219.86   42.99  220.45   43.07  220.86   43.15  221.27   43.22  221.57   43.28
  222.27    43.4  222.67   43.44  222.98    43.5  224.07   43.64  224.39   43.64
  225.48   43.67  225.81   43.69  226.51   43.72  226.88   43.73  227.57   43.79
  228.28   43.83  228.64   43.86  228.99    43.9  230.05   43.99  230.42      44
  231.84      44  232.17   44.01  232.49   44.01  232.88   44.02  233.27   44.13
  233.58   44.23   233.9   44.32  234.69   44.56   235.3   44.75   235.7   44.89
  236.12   44.95   236.7   45.05  237.12   45.27  237.54   45.52  237.83   45.74
  238.11   45.98  238.97   46.96  239.24   47.33  239.51   47.58  239.95   47.97
  240.39   48.39  240.65   48.63  240.91    48.9  241.36   49.34  241.82    49.8
  242.32   50.31  242.77   50.78  243.24   51.25  243.48    51.5  244.19   52.22
  244.66   52.71   244.9   52.95   245.6   53.72  247.02   55.26  247.93   56.26
  248.43   56.82  248.94   57.38  249.33   57.83  249.84    58.4  250.55   59.22
  251.26   59.99  251.79    60.5  252.14   60.83  252.67   61.37  253.21   61.89
  253.54   62.19  254.64   63.15  254.95   63.44   255.5   63.93  256.06   64.41
  256.35   64.68  256.91   65.25  257.49    65.9  257.62   66.08  257.75   66.23
  258.33   66.85  259.16   67.79  259.74   68.52  260.34   69.16  260.45   69.27
  260.56   69.35  261.16   69.82  261.76   70.51  261.96    70.7  262.57   71.33
  263.37   72.12  263.98   72.58  264.77   73.29   265.4   73.62   266.1   74.12
  266.81   74.52  267.46   74.93  267.58      75  268.23   75.45  268.88   75.88
  268.98   75.94  269.64   76.42  270.31   76.87  271.05   77.38  271.79   77.87
  272.47   78.22  273.16   78.51  273.19   78.53  273.88   78.84  274.58   79.18
  275.26   79.44  275.29   79.46     276   79.72  276.01   79.73  276.71   79.95
   277.4   80.32  278.12   80.85   278.8   81.27  278.86    81.3  279.54   81.75
  280.21   82.16  280.95   82.58  281.61   82.95  281.66   82.97  282.36    83.4
  283.01   83.79  283.78    84.3  284.42   84.84  284.56   84.93  285.19   85.23
  285.82   85.59  286.61   85.98  287.31   86.38  287.34   86.38

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
       0      .05   154.8      .04  197.41      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         154.8  197.41            75.67   75.67   75.67             .1       .3
Blocked Obstructions      num=       1
    Sta L    Sta R     Elev
       86      114       60
Cross Section Lid
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     145    41.5       0     159    43.5       0     159    43.6    41.6
     196    44.2    42.2     196    44.2       0     208    41.1       0

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             45.80    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               4.07    Wt. n-Val.                0.050      0.040      0.060
  W.S. Elev (ft)             41.73    Reach Len. (ft)           75.67      75.67      75.67
  Crit W.S. (ft)             41.73    Flow Area (sq ft)          0.57     250.51       4.68
  E.G. Slope (ft/ft)      0.023438    Area (sq ft)               0.57     250.51       4.68
```

```
 Q Total (cfs)           4065.00    Flow (cfs)                 0.71    4057.39       6.90
 Top Width (ft)            37.77    Top Width (ft)              3.83      29.09       4.84
 Vel Total (ft/s)          15.89   Avg. Vel. (ft/s)            1.26      16.20       1.47
 Max Chl Dpth (ft)          7.73    Hydr. Depth (ft)            0.15       8.61       0.97
 Conv. Total (cfs)       26552.3    Conv. (cfs)                 4.7    26502.5       45.1
 Length Wtd. (ft)          75.67    Wetted Per. (ft)            3.92      52.12      19.44
 Min Ch El (ft)            34.00    Shear (lb/sq ft)           0.21       7.03       0.35
 Alpha                      1.04    Stream Power (lb/ft s)     0.27     113.91       0.52
 Frctn Loss (ft)            1.40    Cum Volume (acre-ft)        0.09       7.01       0.23
 C & E Loss (ft)            0.26    Cum SA (acres)              0.07       1.06       0.09
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.

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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

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

CROSS SECTION

RIVER: Little Sycamore
REACH: Lower Reach   RS: 872

INPUT
Description:

```
Station Elevation Data    num=      93
    Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
      0      98     2.71      98     8.87      97    11.18      96    15.51      95
  20.23      94    24.73      93    29.75      92    32.78      91    37.01      90
  40.55      89    43.64      88    46.57      87     52.6      86    56.55      85
  57.32      84    58.23      83    59.02      82       60      81    61.32      80
  62.83      79    63.97      78     67.5    77.9    99.91      77   100.94      76
 101.81      75    103.4      74   105.07      73   106.55      72   111.71      71
 112.96      70   114.76      69   118.75      68   120.53      67   124.86      66
 127.13      65   128.65      64   131.52      63   134.11      63   134.87      64
 136.69      65    138.5      65   139.85      64   140.21    49.9   164.81    46.3
 184.81    41.9   190.31   41.79   208.61    41.4   221.61    41.3   237.42      42
 247.27      42   250.68      40   258.81   35.62   265.39    31.2    277.7    31.2
 281.05   32.65   288.51    36.3   289.72   37.47   291.96   38.95   294.81      40
 296.38      42   297.81      43   300.05      44   300.86      45   302.29      46
 304.05      47   305.67      48   307.18      49   308.58      50    310.5      51
 311.54      52   312.43      53   313.54      54   314.67      55   315.78      56
 317.03      57   318.48      58   320.28      59   322.44      60   324.54      61
 326.03      62   327.92      63   330.06      64   333.15      65   337.38      66
  341.2      67   343.62      68   350.87      69    354.2      70   358.26      71
  361.23      72  366.81      73   367.5      73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  247.27     .04  294.81     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        247.27  294.81             85.3    85.3    85.3            .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     134     172      60

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             44.01    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               3.22    Wt. n-Val.                          0.040      0.060
  W.S. Elev (ft)             40.79    Reach Len. (ft)           85.30      85.30      85.30
  Crit W.S. (ft)             40.79    Flow Area (sq ft)                   282.49       0.25
  E.G. Slope (ft/ft)      0.015068    Area (sq ft)                        282.49       0.25
  Q Total (cfs)            4065.00    Flow (cfs)                         4064.71       0.29
  Top Width (ft)             46.10    Top Width (ft)                       45.48       0.62
  Vel Total (ft/s)           14.38    Avg. Vel. (ft/s)                     14.39       1.19
  Max Chl Dpth (ft)           9.59    Hydr. Depth (ft)                      6.21       0.40
  Conv. Total (cfs)        33115.8    Conv. (cfs)                        33113.4        2.4
  Length Wtd. (ft)           85.30    Wetted Per. (ft)                     50.40       1.01
  Min Ch El (ft)             31.20    Shear (lb/sq ft)                      5.27       0.23
  Alpha                       1.00    Stream Power (lb/ft s)               75.87       0.27
  Frctn Loss (ft)             1.26    Cum Volume (acre-ft)       0.09       6.55       0.23
  C & E Loss (ft)             0.28    Cum SA (acres)             0.06       0.99       0.08


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 787

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
      0      78    1.44      78    4.33      79     8.2      80   20.89      80
   26.79      79   28.12      78      29      77   35.64      73   42.89      72
   49.65      71   62.91      70   73.16      69   77.53      69   82.08      69
   83.81      68    85.7      67   89.79      66   90.73      65   91.93      64
    93.9    64.5   115.1    52.1   126.8    51.8   126.9    51.3   172.9    49.6
   172.9    50.1   218.2    47.4   234.4      47   247.4      46  255.85   45.59
  259.86   44.45  269.83   39.19  278.22   34.06  288.19   30.78     300    29.5
  301.92    29.5     302    29.5  302.28    29.5  315.09    29.5  324.92   31.22
  336.73   34.37  344.86   35.85   355.8    37.9     397    39.5  398.41      40
  400.11      41  400.84      42  401.88      43  402.92      44  405.62      45
  407.21      46  408.69      47   410.6      48   412.7      49  414.69      50
  416.86      51  418.51      52  420.76      53  422.92      54  424.86      55
  427.32      56   429.1      57  430.97      58  432.72      59  436.06      60
  437.38      61  438.86      62  441.68      63  443.46      64  445.23      65
  447.15      66  447.93      66

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .045   255.85      .04    355.8      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          255.85   355.8            79.74   79.74   79.74              .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)              38.68    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                2.29    Wt. n-Val.                            0.040
  W.S. Elev (ft)              36.39    Reach Len. (ft)            79.74      79.74      79.74
  Crit W.S. (ft)              36.39    Flow Area (sq ft)                    335.05
  E.G. Slope (ft/ft)       0.014591    Area (sq ft)                         335.05
  Q Total (cfs)             4065.00    Flow (cfs)                          4065.00
  Top Width (ft)              73.36    Top Width (ft)                        73.36
  Vel Total (ft/s)            12.13    Avg. Vel. (ft/s)                      12.13
  Max Chl Dpth (ft)            6.89    Hydr. Depth (ft)                       4.57
  Conv. Total (cfs)         33652.9    Conv. (cfs)                         33652.9
  Length Wtd. (ft)            79.74    Wetted Per. (ft)                      75.36
  Min Ch El (ft)              29.50    Shear (lb/sq ft)                       4.05
  Alpha                        1.00    Stream Power (lb/ft s)                49.13
  Frctn Loss (ft)              1.16    Cum Volume (acre-ft)        0.09       5.94       0.22
  C & E Loss (ft)              0.04    Cum SA (acres)              0.06       0.88       0.08


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used 
critical
         depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may 
indicate
         the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the 
calculated
         water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
         program defaulted to critical depth.

CROSS SECTION
```

```
RIVER: Little Sycamore
REACH: Lower Reach        RS: 707

INPUT
Description:
Station Elevation Data    num=      84
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      83     .21      83    4.44      82     8.7      81   12.95      80
   17.55      79   21.27      78   24.61      77   29.61      76   31.88      75
   33.01      74   35.44      73   36.13      72   36.68      71   37.16      70
   38.86      69   44.62      69   46.82      69   56.77      68   96.24      67
   98.04      66    99.9      65  101.47      64  103.29      63  104.98      62
  106.87      61  108.36      60  109.35      59  110.23      58  111.66      57
  112.85      56   112.9      56   112.9      50  139.99      49  205.69      48
  260.69      46  260.69    45.5  284.48      45  293.37      40  294.98   39.14
  300.64   34.98  307.16   29.79  321.88    26.8  337.27    26.8  346.56   29.55
  356.75   33.73  361.04    35.5  429.79    39.2  434.79    39.2  438.66      40
  439.39      41  440.44      42  441.34      43  442.11      44  443.02      45
  443.86      46  444.76      47  446.27      48  447.62      49  449.07      50
  451.34      51  453.73      52  455.05      53  456.36      54  458.04      55
  459.53      56   461.4      57  463.04      58  464.04      59  464.92      60
  465.93      61  467.33      62  468.64      63   471.7      64  473.64      65
  475.35      66  476.79   66.71  477.39      67  479.18      68  480.67      69
  482.83      70  485.24      71  486.48      72  487.75      72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  284.48     .04  361.04     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        284.48  361.04            83.92   83.92   83.92             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)              37.13    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                2.71    Wt. n-Val.                            0.040
  W.S. Elev (ft)              34.42    Reach Len. (ft)            83.92      83.92      83.92
  Crit W.S. (ft)              34.42    Flow Area (sq ft)                    307.59
  E.G. Slope (ft/ft)       0.014426    Area (sq ft)                         307.59
  Q Total (cfs)             4065.00    Flow (cfs)                          4065.00
  Top Width (ft)              57.06    Top Width (ft)                        57.06
  Vel Total (ft/s)            13.22    Avg. Vel. (ft/s)                      13.22
  Max Chl Dpth (ft)            7.62    Hydr. Depth (ft)                       5.39
  Conv. Total (cfs)         33844.1    Conv. (cfs)                         33844.1
  Length Wtd. (ft)            83.92    Wetted Per. (ft)                      60.34
  Min Ch El (ft)              26.80    Shear (lb/sq ft)                       4.59
  Alpha                        1.00    Stream Power (lb/ft s)                60.67
  Frctn Loss (ft)              0.89    Cum Volume (acre-ft)        0.09       5.36       0.22
  C & E Loss (ft)              0.27    Cum SA (acres)              0.06       0.76       0.08


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
```

```
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 623

INPUT
Description:
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      70     .41      70    5.66      69    6.23      69    6.41      69
   12.67      68   15.76      67   23.22      66   24.53      66   50.79      66
   58.59      66   62.15      66   65.18      65    67.7      64   69.35      63
   70.76      62   72.15      61   73.59      60   75.02      59   75.86      58
    76.9      57   78.25      56   80.25      55   80.26      55   80.26    49.5
  119.42      49  121.22      48  182.42      47  277.02      46  289.42      42
  289.42    41.5   299.4   41.36  305.65      40  313.77   34.51  335.06   24.21
  344.66   22.76  350.75   21.03  370.02   21.33  375.66   24.26  382.64   29.44
     390      35  407.77      37  427.12    39.5  430.42    39.5  431.13      41
  433.93      42   434.6      43  435.25      44  436.17      45  436.88      46
  437.62      47  438.36      48   439.1      49  439.78      50  440.59      51
  441.33      52  441.99      53  442.75      54  443.51      55  445.03      56
  446.73      57  449.25      58  450.89      59  453.63      60   455.3      61
  456.97      62  458.69      63  460.39      64  462.07      65  464.19      66
  466.17      67  468.14      68  470.31      69  472.53      70  474.01      71
  476.11      72  478.43      73  481.71      74  483.34      75  484.75      76
  487.15      77  489.48      78  491.17      79  494.57      80  496.59      81
  498.66      82  500.93      83  503.34      84  506.02      85  508.18      86
  510.95      87  512.15   87.51   513.3      88  514.51      89   515.9      90
  519.36      91  521.79      92   524.1      93  530.09      93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  277.02     .04     390     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        277.02     390          117.82  117.82  117.82             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            31.75    Element                   Left OB    Channel   Right OB
  Vel Head (ft)              1.83    Wt. n-Val.                              0.040
```

```
 W.S. Elev (ft)            29.92    Reach Len. (ft)          117.82     117.82     117.82
 Crit W.S. (ft)                     Flow Area (sq ft)                 374.55
 E.G. Slope (ft/ft)     0.008139    Area (sq ft)                      374.55
 Q Total (cfs)           4065.00    Flow (cfs)                       4065.00
 Top Width (ft)            60.02    Top Width (ft)                     60.02
 Vel Total (ft/s)          10.85    Avg. Vel. (ft/s)                   10.85
 Max Chl Dpth (ft)          8.89    Hydr. Depth (ft)                    6.24
 Conv. Total (cfs)       45058.9    Conv. (cfs)                      45058.9
 Length Wtd. (ft)         117.82    Wetted Per. (ft)                   64.27
 Min Ch El (ft)            21.03    Shear (lb/sq ft)                    2.96
 Alpha                      1.00    Stream Power (lb/ft s)             32.14
 Frctn Loss (ft)            1.29    Cum Volume (acre-ft)       0.09       4.70       0.22
 C & E Loss (ft)            0.13    Cum SA (acres)             0.06       0.64       0.08


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 505

INPUT
Description:
Station Elevation Data    num=     122
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      65    2.79      65   10.53      64   49.26      63   53.33      63
   59.36      63   61.39      63    61.8      63   63.99      62   65.61      61
   68.31      60    70.1      59   71.84      58   73.17      57   74.39      56
   76.04      55   77.25      54   78.84      53   79.74      54   79.74   49.37
  136.44      47  220.94      46  313.64      38  322.04      38  324.73   37.26
  328.77      37  336.52      36  338.85      35  340.14      34  341.35      33
  342.55      32  343.88      31  346.02      30  347.98      29     350      28
  352.01      27  353.96      26  355.88      25  357.81      24  359.77      23
  361.71      22  363.65      21  367.32      20  369.75    16.7  377.84    16.7
  383.07    16.7  385.17      20  386.84      21  388.54      22  391.02      23
  392.27      24  393.27      25  394.95      26  397.03   26.93  397.22      27
  399.14      28   400.7      29  402.42      30  403.12      31  403.77      32
  404.78      33  405.29      34  406.04      35  406.92      36  407.91      37
  408.88      38  409.82      39  410.62      40  411.49      41  412.17      42
  413.09      43  414.07      44  415.02      45  415.99      46  417.38      47
   418.3      48  419.51      49   420.9      50  422.14      51  423.32      52
  424.46      53  426.36      54  427.44      55   428.5      56   429.7      57
  431.36      58   432.5      59  433.19      60  434.22      61  435.44      62
  436.83      63  438.29      64  440.13      65  441.12      66   442.2      67
  443.74      68  445.25      69  445.86      70  446.69      71  447.98      72
  449.05      73  450.32      74  451.29      75  452.58      76  453.97      77
  454.96      78   457.1      79  458.26      80  459.49      81   460.7      82
  461.89      83  463.34      84   465.1      85  466.92      86  468.89      87
 469.89      88   471.7      89  474.01      90  476.28      91  478.27      92
    480      93  482.38      93

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .045  336.52     .04  406.04     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         336.52  406.04             100.7   100.7   100.7              .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             30.34    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               3.12    Wt. n-Val.                           0.040
  W.S. Elev (ft)             27.22    Reach Len. (ft)            100.70     100.70     100.70
  Crit W.S. (ft)             27.22    Flow Area (sq ft)                    286.99
  E.G. Slope (ft/ft)      0.015379    Area (sq ft)                         286.99
  Q Total (cfs)            4065.00    Flow (cfs)                          4065.00
  Top Width (ft)             46.07    Top Width (ft)                        46.07
  Vel Total (ft/s)           14.16    Avg. Vel. (ft/s)                      14.16
  Max Chl Dpth (ft)          10.52    Hydr. Depth (ft)                       6.23
  Conv. Total (cfs)        32779.2    Conv. (cfs)                         32779.2
  Length Wtd. (ft)          100.70    Wetted Per. (ft)                      53.23
  Min Ch El (ft)             16.70    Shear (lb/sq ft)                       5.18
  Alpha                       1.00    Stream Power (lb/ft s)                73.32
  Frctn Loss (ft)             0.28    Cum Volume (acre-ft)        0.09       3.81       0.22
  C & E Loss (ft)             0.81    Cum SA (acres)              0.06       0.50       0.08


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
          depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
          the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
          water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
          program defaulted to critical depth.

CROSS SECTION



RIVER: Little Sycamore
REACH: Lower Reach        RS: 404

INPUT
Description:
Station Elevation Data    num=     107
```

```
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -.64    54.3     -.64    49.4    33.46    49.8    46.12    48.3    76.86    45.1
  100.22      44   103.66      36   225.66      36   252.96      36   258.67      34
  267.42      32   268.42      31   269.62      30   270.87      29   272.19      28
  273.58      27   275.05      26   276.54      25   278.14      24   279.79      23
  281.42      22   283.05      21   284.65      20   289.13      19   299.21      18
  300.83      18   306.33      18   308.46    14.6   318.46    14.6   327.67    14.6
  329.49      18   331.31      19   333.69      20   335.83      21   337.95      22
  340.06      23   342.17      24   344.22      25   369.64      26    381.4      26
  383.97      26   389.22      27   391.51      28   396.31      29   399.03      30
  401.09      31   404.85      32   413.76   32.97   414.77      33   418.43      34
  424.51      35   427.86      36   430.59      37   433.37      38   436.75      39
  439.36      40   440.81      41   443.24      42   446.01      43   449.15      44
  451.19      45   453.72      46   455.31      47   457.44      48   460.05      49
   461.7      50    463.1      51   465.65      52   467.99      53   468.46   53.28
  469.69      54   471.49      55   473.35      56   475.19      57   478.36      58
  480.03      59   482.03      60   483.54      61    484.8      62   486.44      63
  489.43      64   490.85      65   492.93      66   494.58      67   495.67      68
  497.86      69   501.14      70    503.5      71   504.82      72   506.37      73
  508.07      74   509.68      75   512.23      76   514.34      77   516.31      78
  518.67      79   520.59      80   522.57      81   525.09      82   527.06      83
  529.19      84   531.26      85   533.67      86   535.75      87    537.6      88
  540.32      89   541.19      89

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    -.64    .045   258.67     .04   344.22     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        258.67  344.22            37.85   37.85   37.85             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             29.23    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.41    Wt. n-Val.                          0.040      0.050
  W.S. Elev (ft)             28.82    Reach Len. (ft)            37.85      37.85      37.85
  Crit W.S. (ft)                      Flow Area (sq ft)                  714.66     141.37
  E.G. Slope (ft/ft)      0.001125    Area (sq ft)                       714.66     141.37
  Q Total (cfs)            4065.00    Flow (cfs)                        3789.16     275.85
  Top Width (ft)            124.31    Top Width (ft)                      73.11      51.20
  Vel Total (ft/s)            4.75    Avg. Vel. (ft/s)                     5.30       1.95
  Max Chl Dpth (ft)          14.22    Hydr. Depth (ft)                     9.78       2.76
  Conv. Total (cfs)       121213.8    Conv. (cfs)                      112988.3     8225.4
  Length Wtd. (ft)           37.85    Wetted Per. (ft)                    81.40      51.61
  Min Ch El (ft)             14.60    Shear (lb/sq ft)                     0.62       0.19
  Alpha                       1.17    Stream Power (lb/ft s)               3.27       0.38
  Frctn Loss (ft)             0.04    Cum Volume (acre-ft)        0.09     2.65       0.06
  C & E Loss (ft)             0.03    Cum SA (acres)              0.06     0.36       0.02


CROSS SECTION


RIVER: Little Sycamore
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```
REACH: Lower Reach        RS: 366

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      55    2.32      55    2.83      55   18.02      55   19.99      54
   23.57      53   26.35      52   29.66      51   32.14      50   32.87      49
   33.46      48   35.21      46   38.68      46   48.99      46   54.87      46
    70.4      47   92.46      48  126.15    48.6  144.65    46.6  144.65    43.6
  153.25    40.7  153.25    37.7  173.35    35.4  239.15    36.2  360.05      36
  372.25      36  375.07      34  381.68   33.37  385.46      33  387.22      32
  388.83      31  390.23      30  391.61      29  392.86      28  394.13      27
  395.26      26  396.52      25  397.71      24  398.71      23  399.75      22
  401.05      21  404.91      20  408.09      19  411.85      18  416.93      17
  428.21    13.3  431.35    13.3  434.48    13.3  446.66    13.3  448.51      17
  450.05      18  451.45      19  453.07      20  455.07      21  457.19      22
  459.35      23  478.76      24  485.84      25  487.52      26  489.92      27
  496.92      28  499.73      29  502.64      30   505.7      31  509.72      32
  540.75      32  554.84      33  563.88      34  568.09      35  571.95      36
   574.5      37  581.05      38  581.35   38.09  584.44      39  586.79      40
  589.37      41  591.73      42  594.13      43   597.3      44  600.43      45
  600.81      45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  385.46     .04  509.72     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        385.46  509.72           171.34  171.34  171.34             .3       .5

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             29.16    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.31    Wt. n-Val.                            0.040
  W.S. Elev (ft)             28.85    Reach Len. (ft)            55.91      55.91      55.91
  Crit W.S. (ft)             21.75    Flow Area (sq ft)                    910.25
  E.G. Slope (ft/ft)      0.000928    Area (sq ft)                         910.25
  Q Total (cfs)            4065.00    Flow (cfs)                          4065.00
  Top Width (ft)            107.50    Top Width (ft)                       107.50
  Vel Total (ft/s)            4.47    Avg. Vel. (ft/s)                       4.47
  Max Chl Dpth (ft)          15.55    Hydr. Depth (ft)                       8.47
  Conv. Total (cfs)       133411.2    Conv. (cfs)                        133411.2
  Length Wtd. (ft)           55.91    Wetted Per. (ft)                     116.15
  Min Ch El (ft)             13.30    Shear (lb/sq ft)                       0.45
  Alpha                       1.00    Stream Power (lb/ft s)                 2.03
  Frctn Loss (ft)             0.14    Cum Volume (acre-ft)        0.09       1.94
  C & E Loss (ft)             1.53    Cum SA (acres)              0.06       0.28


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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.

BRIDGE



RIVER: Little Sycamore
REACH: Lower Reach        RS: 276

INPUT
Description: Bridge PCH
Distance from Upstream XS =   55.91
Deck/Roadway Width        =   66.63
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  386.89   31.75       0  420.98   31.72   10.15  420.98   31.72   16.03
  421.01   31.72   30.05  441.02    31.7   29.97  441.02    31.7   15.32
  441.02    31.7   10.15  509.06   31.63       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      55    2.32      55    2.83      55   18.02      55   19.99      54
   23.57      53   26.35      52   29.66      51   32.14      50   32.87      49
   33.46      48   35.21      46   38.68      46   48.99      46   54.87      46
    70.4      47   92.46      48  136.22      48  138.01      47  140.37      46
  142.19      45  147.51      44  151.73      43   158.6      41  163.57      40
  166.83      39  170.22      38  188.97      37  192.44      37  192.68      37
  281.35   36.31  321.41      36  322.67      36  323.07      36  327.51      36
  332.04      36  332.67      36  336.15      36  353.84      36  357.24      36
  365.22      35  375.07      34  381.68   33.37  385.46      33  387.22      32
  388.83      31  390.23      30  391.61      29  392.86      28  394.13      27
  395.26      26  396.52      25  397.71      24  398.71      23  399.75      22
  401.05      21  404.91      20  408.09      19  411.85      18  416.93      17
     421    11.2  428.21    11.2     431    11.2  431.35    11.2  434.48    11.2
     441    11.2  446.66      16  448.51      17  450.05      18  451.45      19
  453.07      20  455.07      21  457.19      22  459.35      23  478.76      24
  485.84      25  487.52      26  489.92      27  496.92      28  499.73      29
  502.64      30   505.7      31  509.72      32  540.75      32  554.84      33
  563.88      34  568.09      35  571.95      36   574.5      37  581.05      38
  581.35   38.09  584.44      39  586.79      40  589.37      41  591.73      42
  594.13      43   597.3      44  600.43      45  600.81      45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  385.46     .04  509.72     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
        385.46  509.72             .3       .5
```

```
Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   130.5   33.27       0     210   33.23    6.95     210   33.23   31.64
     231   33.22   31.75     231   33.44      10  349.01   33.15       0
  349.81   33.71       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      38    3.84      38    11.3      38      16      38   26.03      38
   30.86      37   31.43      37    34.4      37   39.67      37   40.91      37
   42.76      37   49.93      36   58.98      35   64.76      34    92.1      33
   93.63      33   95.51      34   98.61      35   103.2      35  112.86      35
  114.06      36  122.49      37  123.11      37  123.33      37  125.83      36
   127.2      35  129.09      34  131.44      33  133.26      32  134.63      31
  135.75      30  136.85      29  137.98      28  139.28      27  140.85      26
  146.04      25  148.06      24  149.74      23  150.67      22  152.31      21
  155.04      21  156.32      21  159.16      20  163.52      20  166.33      20
  174.06   19.77  190.26      19  190.82      18  191.64      17  194.02      16
  195.17      15  196.71      14  199.59      13  206.01    10.1  209.92    10.1
  215.53    10.1   217.6    10.1  218.39    10.1   223.7    10.1  226.53    10.1
   232.7    10.1   238.4    10.1     240      13  241.18      14  242.85      15
  243.82      16  245.48      17   247.6      18  249.81      19  251.75      20
  253.77      21  255.38      22  257.05      23  258.92      24   261.4      25
  268.14      26  271.44      27  277.49      28  280.75      29  285.53   29.99
  285.58      30  289.82      31  301.63      31  307.04      31  318.75      32
  339.67      32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  122.49    .032  289.82    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
        122.49  289.82             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0  189.93   36.78       T

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

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = 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 #100-yr bulked

 E.G. US. (ft)             29.16   Element                Inside BR US  Inside BR DS
 W.S. US. (ft)             28.85   E.G. Elev (ft)                27.48        25.88
 Q Total (cfs)           4065.00   W.S. Elev (ft)                22.06        20.62
 Q Bridge (cfs)          4065.00   Crit W.S. (ft)                22.06        20.62
 Q Weir (cfs)                      Max Chl Dpth (ft)             10.86        10.52
 Weir Sta Lft (ft)                 Vel Total (ft/s)              18.69        18.39
 Weir Sta Rgt (ft)                 Flow Area (sq ft)            217.55       221.00
 Weir Submerg                      Froude # Chl                   1.00         1.00
 Weir Max Depth (ft)               Specif Force (cu ft)        3541.97      3486.82
 Min El Weir Flow (ft)     33.18   Hydr Depth (ft)               10.86        10.52
 Min El Prs (ft)           30.05   W.P. Total (ft)               30.90        42.05
 Delta EG (ft)              9.35   Conv. Total (cfs)           29689.5      31021.5
 Delta WS (ft)             11.86   Top Width (ft)                20.03        21.00
 BR Open Area (sq ft)     376.74   Frctn Loss (ft)                1.19         0.60
 BR Open Vel (ft/s)        18.69   C & E Loss (ft)                0.08         1.22
 BR Sluice Coef                    Shear Total (lb/sq ft)         8.24         5.63
 BR Sel Method       Energy only   Power Total (lb/ft s)        153.98       103.64


Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream
     energy.  This is not physically possible, the momentum answer has been disregarded.
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
     depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
     the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
     water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
     program defaulted to critical depth.
Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
     depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
     the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
     water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
     program defaulted to critical depth.
```

```
CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 195

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      38    3.84      38    11.3      38      16      38   26.03      38
   30.86      37   31.43      37    34.4      37   39.67      37   40.91      37
   42.76      37   49.93      36   58.98      35   64.76      34    92.1      33
   93.63      33   95.51      34   98.61      35   103.2      35  112.86      35
  114.06      36  122.49      37  123.11      37  123.33      37  125.83      36
   127.2      35  129.09      34  131.44      33  133.26      32  134.63      31
  135.75      30  136.85      29  137.98      28  139.28      27  140.85      26
  146.04      25  148.06      24  149.74      23  150.67      22  152.31      21
  155.04      21  156.32      21  159.16      20  163.52      20  166.33      20
  174.06   19.77  190.26      19  190.82      18  191.64      17  194.02      16
  195.17      15  196.71      14  199.59      13  206.01      12  209.92     9.2
  215.53     9.2   217.6     9.2  218.39     9.2   223.7     9.2  226.53     9.2
   232.7     9.2   238.4      12     240      13  241.18      14  242.85      15
  243.82      16  245.48      17   247.6      18  249.81      19  251.75      20
  253.77      21  255.38      22  257.05      23  258.92      24   261.4      25
  268.14      26  271.44      27  277.49      28  280.75      29  285.53   29.99
  285.58      30  289.82      31  301.63      31  307.04      31  318.75      32
  339.67      32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  122.49    .032  289.82    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        122.49  289.82             77.6    77.6    77.6            .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0  189.93   36.78       T

CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)             19.80    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               2.82    Wt. n-Val.                           0.032
  W.S. Elev (ft)             16.99    Reach Len. (ft)           77.60      77.60      77.60
  Crit W.S. (ft)             16.99    Flow Area (sq ft)                   301.98
  E.G. Slope (ft/ft)      0.009329    Area (sq ft)                        301.98
  Q Total (cfs)            4065.00    Flow (cfs)                         4065.00
  Top Width (ft)             53.78    Top Width (ft)                       53.78
  Vel Total (ft/s)           13.46    Avg. Vel. (ft/s)                     13.46
  Max Chl Dpth (ft)           7.79    Hydr. Depth (ft)                      5.61
  Conv. Total (cfs)        42086.0    Conv. (cfs)                        42086.0
  Length Wtd. (ft)           77.60    Wetted Per. (ft)                     58.08
  Min Ch El (ft)              9.20    Shear (lb/sq ft)                      3.03
  Alpha                    1.00    Stream Power (lb/ft s)              40.77
  Frctn Loss (ft)            0.75    Cum Volume (acre-ft)       0.09       0.59
  C & E Loss (ft)             0.41    Cum SA (acres)             0.06       0.13


Warning: The energy equation could not be balanced within the specified number of iterations.  The program used
critical
        depth for the water surface and continued on with the calculations.
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may
indicate
        the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the
calculated
        water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
        program defaulted to critical depth.

CROSS SECTION


RIVER: Little Sycamore
REACH: Lower Reach        RS: 117

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      33   16.61      33   23.12      33   30.82      33    38.1      33
   38.62      33   44.99      32    48.4      31   50.58      30   53.24      29
   54.83      28   56.09      27   56.98      26   58.61      25   60.36      24
   62.41      23   64.14      22   64.41   21.89   66.59      21   67.97      20
   69.09      19   70.24      18   72.34      17   73.41      16   74.78      15
   80.44      14   92.02      13  105.71      13  107.72      13  112.46      13
  127.46      14  133.51      15  137.21      15  138.88      15  163.55      16
  181.15   16.84  184.54      17  197.46      17  200.14      17     205      17
  218.14      16  220.85      15  224.89      14  237.43      13  238.41      13
  243.43      13  250.87      12  252.48      11  265.48      10  274.51      10
  308.97      10  309.45      11  310.03      12  310.64      13  311.33      14
  311.46   14.19  312.01      15  312.55      16  312.95      17  313.56      18
  313.87      19  314.35      20  314.66      21  315.32      22  315.62      23
  316.57      24  317.51      25  318.36      26  320.52      27  324.22      28
  328.12      29  332.19      30  336.13      31  351.79      31  364.41      31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045     205    .032  336.13     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             205  336.13                0       0       0            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0  204.56   17.12       T
```

```
CROSS SECTION OUTPUT  Profile #100-yr bulked

  E.G. Elev (ft)            17.20    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              1.99    Wt. n-Val.                          0.032
  W.S. Elev (ft)            15.21    Reach Len. (ft)
  Crit W.S. (ft)            15.21    Flow Area (sq ft)                  359.45
  E.G. Slope (ft/ft)     0.010114    Area (sq ft)             100.74    359.45
  Q Total (cfs)           4065.00    Flow (cfs)                        4065.00
  Top Width (ft)           161.45    Top Width (ft)            69.60     91.85
  Vel Total (ft/s)          11.31    Avg. Vel. (ft/s)                    11.31
  Max Chl Dpth (ft)          5.21    Hydr. Depth (ft)                     3.91
  Conv. Total (cfs)       40419.4    Conv. (cfs)                       40419.4
  Length Wtd. (ft)                   Wetted Per. (ft)                    95.38
  Min Ch El (ft)            10.00    Shear (lb/sq ft)                     2.38
  Alpha                      1.00    Stream Power (lb/ft s)              26.91
  Frctn Loss (ft)                    Cum Volume (acre-ft)
  C & E Loss (ft)                    Cum SA (acres)


Warning: Divided flow computed for this cross-section.
Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below
critical
        depth). Water surface set to critical depth.
```

```
SUMMARY OF MANNING'S N VALUES

River:Little Sycamore

     Reach          River Sta.      n1       n2       n3

 Lower Reach          5459          .08      .04      .06
 Lower Reach          5334          .08      .04      .06
 Lower Reach          5207         .045      .04      .06
 Lower Reach          5120      Bridge
 Lower Reach          5011          .06      .04      .06
 Lower Reach          4845          .06      .04      .06
 Lower Reach          4582          .06      .04      .06
 Lower Reach          4445          .06      .04      .06
 Lower Reach          4402          .06      .04      .06
 Lower Reach          4362      Culvert
 Lower Reach          4348          .06      .04      .06
 Lower Reach          4245          .06      .04      .06
 Lower Reach          4143          .06      .04      .06
 Lower Reach          4042          .06      .04      .06
 Lower Reach          3850          .06      .04      .06
 Lower Reach          3745          .06      .04      .06
 Lower Reach          3648          .06      .04      .06
 Lower Reach          3549          .06      .04      .06
 Lower Reach          3444          .06      .04      .06
 Lower Reach          3350          .06      .04      .06
 Lower Reach          3249          .06      .04      .06
 Lower Reach          3182      Bridge
```

Lower Reach	3136	.06	.04	.06
Lower Reach	3051	.05	.04	.06
Lower Reach	2960	.06	.04	.06
Lower Reach	2858	.06	.04	.06
Lower Reach	2761	.06	.04	.06
Lower Reach	2659	.07	.04	.06
Lower Reach	2556	.06	.04	.06
Lower Reach	2463	.06	.04	.06
Lower Reach	2364	.05	.04	.06
Lower Reach	2297	Bridge		
Lower Reach	2262	.05	.04	.06
Lower Reach	2163	.08	.04	.06
Lower Reach	2058	.06	.04	.06
Lower Reach	1962	.045	.04	.06
Lower Reach	1861	.045	.04	.06
Lower Reach	1803	Bridge		
Lower Reach	1762	.045	.04	.06
Lower Reach	1668	.045	.04	.06
Lower Reach	1542	.05	.04	.06
Lower Reach	1470	.05	.04	.06
Lower Reach	1368	.05	.04	.06
Lower Reach	1303	.05	.04	.06
Lower Reach	1252	.05	.04	.06
Lower Reach	1162	.045	.04	.06
Lower Reach	1065	.05	.04	.06
Lower Reach	988	.05	.04	.06
Lower Reach	948	.05	.04	.06
Lower Reach	872	.045	.04	.06
Lower Reach	787	.045	.04	.06
Lower Reach	707	.045	.04	.06
Lower Reach	623	.045	.04	.06
Lower Reach	505	.045	.04	.06
Lower Reach	404	.045	.04	.05
Lower Reach	366	.045	.04	.05
Lower Reach	276	Bridge		
Lower Reach	195	.045	.032	.045
Lower Reach	117	.045	.032	.08

SUMMARY OF REACH LENGTHS

River: Little Sycamore

Reach	River Sta.	Left	Channel	Right
Lower Reach	5459	125.24	125.24	125.24
Lower Reach	5334	127.22	127.22	127.22
Lower Reach	5207	196.02	196.02	196.02
Lower Reach	5120	Bridge		
Lower Reach	5011	166.36	166.36	166.36
Lower Reach	4845	262.85	262.85	262.85
Lower Reach	4582	136.79	136.79	136.79

Lower Reach	4445	42.37	42.37	42.37
Lower Reach	4402	54.37	54.37	54.37
Lower Reach	4362	Culvert		
Lower Reach	4348	102.51	102.51	102.51
Lower Reach	4245	101.98	101.98	101.98
Lower Reach	4143	100.97	100.97	100.97
Lower Reach	4042	191.84	191.84	191.84
Lower Reach	3850	104.89	104.89	104.89
Lower Reach	3745	97.03	97.03	97.03
Lower Reach	3648	98.74	98.74	98.74
Lower Reach	3549	104.65	104.65	104.65
Lower Reach	3444	93.51	93.51	93.51
Lower Reach	3350	100.57	100.57	100.57
Lower Reach	3249	112.57	112.57	112.57
Lower Reach	3182	Bridge		
Lower Reach	3136	84.85	84.85	84.85
Lower Reach	3051	91.43	91.43	91.43
Lower Reach	2960	101.54	101.54	101.54
Lower Reach	2858	97.03	97.03	97.03
Lower Reach	2761	101.72	101.72	101.72
Lower Reach	2659	102.72	102.72	102.72
Lower Reach	2556	93.31	93.31	93.31
Lower Reach	2463	99	99	99
Lower Reach	2364	101.65	101.65	101.65
Lower Reach	2297	Bridge		
Lower Reach	2262	98.89	98.89	98.89
Lower Reach	2163	105.31	105.31	105.31
Lower Reach	2058	96.41	96.41	96.41
Lower Reach	1962	101.45	101.45	101.45
Lower Reach	1861	99.45	99.45	99.45
Lower Reach	1803	Bridge		
Lower Reach	1762	94.37	94.37	94.37
Lower Reach	1668	125.92	125.92	125.92
Lower Reach	1542	72.28	72.28	72.28
Lower Reach	1470	102.14	102.14	102.14
Lower Reach	1368	65.05	65.05	65.05
Lower Reach	1303	51.28	51.28	51.28
Lower Reach	1252	90.01	90.01	90.01
Lower Reach	1162	96.85	96.85	96.85
Lower Reach	1065	77.49	77.49	77.49
Lower Reach	988	40.56	40.56	40.56
Lower Reach	948	75.67	75.67	75.67
Lower Reach	872	85.3	85.3	85.3
Lower Reach	787	79.74	79.74	79.74
Lower Reach	707	83.92	83.92	83.92
Lower Reach	623	117.82	117.82	117.82
Lower Reach	505	100.7	100.7	100.7
Lower Reach	404	37.85	37.85	37.85
Lower Reach	366	171.34	171.34	171.34
Lower Reach	276	Bridge		
Lower Reach	195	77.6	77.6	77.6
Lower Reach	117	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Little Sycamore

Reach	River Sta.	Contr.	Expan.
Lower Reach	5459	.1	.3
Lower Reach	5334	.1	.3
Lower Reach	5207	.3	.5
Lower Reach	5120	Bridge	
Lower Reach	5011	.3	.5
Lower Reach	4845	.1	.3
Lower Reach	4582	.1	.3
Lower Reach	4445	.1	.3
Lower Reach	4402	.3	.5
Lower Reach	4362	Culvert	
Lower Reach	4348	.3	.5
Lower Reach	4245	.1	.3
Lower Reach	4143	.1	.3
Lower Reach	4042	.1	.3
Lower Reach	3850	.1	.3
Lower Reach	3745	.1	.3
Lower Reach	3648	.1	.3
Lower Reach	3549	.1	.3
Lower Reach	3444	.1	.3
Lower Reach	3350	.1	.3
Lower Reach	3249	.1	.3
Lower Reach	3182	Bridge	
Lower Reach	3136	.1	.3
Lower Reach	3051	.1	.3
Lower Reach	2960	.1	.3
Lower Reach	2858	.1	.3
Lower Reach	2761	.1	.3
Lower Reach	2659	.1	.3
Lower Reach	2556	.1	.3
Lower Reach	2463	.1	.3
Lower Reach	2364	.1	.3
Lower Reach	2297	Bridge	
Lower Reach	2262	.1	.3
Lower Reach	2163	.1	.3
Lower Reach	2058	.1	.3
Lower Reach	1962	.1	.3
Lower Reach	1861	.3	.5
Lower Reach	1803	Bridge	
Lower Reach	1762	.3	.5
Lower Reach	1668	.1	.3
Lower Reach	1542	.1	.3
Lower Reach	1470	.1	.3
Lower Reach	1368	.1	.3
Lower Reach	1303	.1	.3
Lower Reach	1252	.1	.3
Lower Reach	1162	.1	.3

```
 Lower Reach        1065          .1        .3
 Lower Reach        988           .1        .3
 Lower Reach        948           .1        .3
 Lower Reach        872           .1        .3
 Lower Reach        787           .1        .3
 Lower Reach        707           .1        .3
 Lower Reach        623           .1        .3
 Lower Reach        505           .1        .3
 Lower Reach        404           .1        .3
 Lower Reach        366           .3        .5
 Lower Reach        276      Bridge
 Lower Reach        195           .3        .5
 Lower Reach        117           .1        .3


Profile Output Table - Standard Table 1

  Reach        River Sta    Profile        Q Total   Min Ch El   W.S. Elev   Crit W.S.   E.G. Elev   E.G. Slope   Vel Chnl
Flow Area   Top Width   Froude # Chl
                                       (cfs)       (ft)        (ft)        (ft)        (ft)      (ft/ft)     (ft/s)     (sq ft)        (ft)

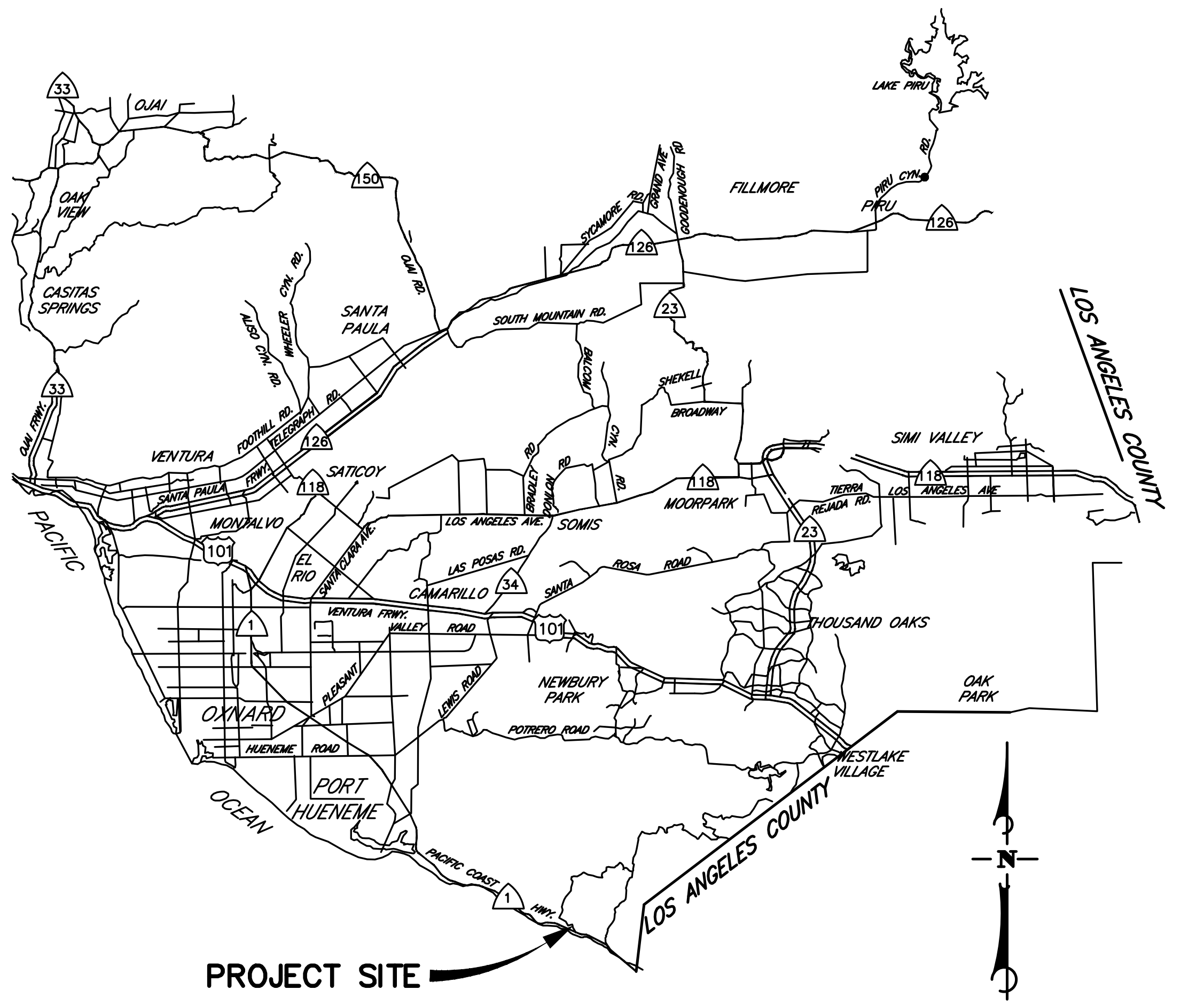
  Lower Reach   117          100-yr bulked   4065.00       10.00       15.21       15.21       17.20     0.010114      11.31
359.45       161.45           1.01
  Lower Reach   195          100-yr bulked   4065.00        9.20       16.99       16.99       19.80     0.009329      13.46
301.98       53.78           1.00
  Lower Reach   276                          Bridge
  Lower Reach   366          100-yr bulked   4065.00       13.30       28.85       21.75       29.16     0.000928       4.47
910.25      107.50           0.27
  Lower Reach   404          100-yr bulked   4065.00       14.60       28.82                   29.23     0.001125       5.30      856.03
124.31           0.30
  Lower Reach   505          100-yr bulked   4065.00       16.70       27.22       27.22       30.34     0.015379      14.16
286.99       46.07           1.00
  Lower Reach   623          100-yr bulked   4065.00       21.03       29.92                   31.75     0.008139      10.85
374.55       60.02           0.77
  Lower Reach   707          100-yr bulked   4065.00       26.80       34.42       34.42       37.13     0.014426      13.22
307.59       57.06           1.00
  Lower Reach   787          100-yr bulked   4065.00       29.50       36.39       36.39       38.68     0.014591      12.13
335.05       73.36           1.00
  Lower Reach   872          100-yr bulked   4065.00       31.20       40.79       40.79       44.01     0.015068      14.39
282.73       46.10           1.02
  Lower Reach   948          100-yr bulked   4065.00       34.00       41.73       41.73       45.80     0.023438      16.20
255.76       37.77           1.03
  Lower Reach   988          100-yr bulked   4065.00       35.70       44.68       44.68       46.99     0.014832      12.19
333.44       72.33           1.00
  Lower Reach   1065         100-yr bulked   4065.00       39.70       48.10       48.10       50.05     0.009802      11.58
420.06      130.31           0.84
  Lower Reach   1162         100-yr bulked   4065.00       40.40       50.31       50.31       52.41     0.014407      11.63
352.70       91.74           0.97
  Lower Reach   1252         100-yr bulked   4065.00       43.00       51.53                   53.41     0.008397      10.99
369.97       58.72           0.77
  Lower Reach   1303         100-yr bulked   4065.00       45.50       57.07       57.07       59.23     0.028345      12.04
357.99       82.41           0.61
  Lower Reach   1368         100-yr bulked   4065.00       47.60       58.65       58.65       60.70     0.008848      12.33
427.80      118.84           0.79
```

Lower Reach	1470	100-yr bulked	4065.00	49.70	60.27		61.50	0.005602	8.90	456.97	75.99	0.64
Lower Reach	1542	100-yr bulked	4065.00	55.20	63.19	63.19	65.85	0.014438	13.08	310.86	58.52	1.00
Lower Reach	1668	100-yr bulked	4065.00	59.70	68.93	68.93	70.53	0.017124	10.13	401.47	128.70	1.01
Lower Reach	1762	100-yr bulked	4065.00	63.20	73.53	73.53	75.71	0.012080	13.22	381.45	90.22	0.88
Lower Reach	1803	Bridge										
Lower Reach	1861	100-yr bulked	4065.00	67.50	79.78	75.10	80.30	0.001304	6.12	796.35	123.35	0.34
Lower Reach	1962	100-yr bulked	4065.00	71.10	79.06	78.92	81.05	0.013762	11.32	359.22	83.30	0.96
Lower Reach	2058	100-yr bulked	4065.00	73.00	82.95	82.95	85.91	0.014490	13.81	294.37	49.62	1.00
Lower Reach	2163	100-yr bulked	4065.00	76.20	86.25	86.25	89.32	0.014593	14.05	289.48	49.19	1.00
Lower Reach	2262	100-yr bulked	4065.00	80.30	90.46	90.46	93.19	0.014465	13.26	308.40	65.46	0.99
Lower Reach	2297	Bridge										
Lower Reach	2364	100-yr bulked	4065.00	80.90	95.79	93.04	96.68	0.002526	8.29	641.99	109.31	0.45
Lower Reach	2463	100-yr bulked	4065.00	84.20	96.67	96.67	98.95	0.009547	12.52	391.77	100.37	0.81
Lower Reach	2556	100-yr bulked	4065.00	87.30	100.28	100.28	103.01	0.009184	14.24	380.17	74.82	0.77
Lower Reach	2659	100-yr bulked	4065.00	91.20	102.12		103.99	0.008244	10.96	370.90	59.37	0.76
Lower Reach	2761	100-yr bulked	4065.00	94.10	104.39	104.39	107.91	0.015585	15.04	270.33	39.00	1.01
Lower Reach	2858	100-yr bulked	4065.00	98.75	107.73		109.00	0.005740	9.06	461.83	79.37	0.63
Lower Reach	2960	100-yr bulked	4065.00	104.10	114.03	114.03	116.66	0.010723	13.43	355.23	85.34	0.89
Lower Reach	3051	100-yr bulked	4065.00	110.00	119.73	119.73	123.70	0.017964	15.99	255.05	33.55	0.99
Lower Reach	3136	100-yr bulked	4065.00	113.80	125.92	125.92	127.65	0.008584	11.77	506.93	144.98	0.70
Lower Reach	3182	Bridge										
Lower Reach	3249	100-yr bulked	4065.00	119.80	132.31	131.15	132.93	0.009169	7.43	686.52	169.83	0.32
Lower Reach	3350	100-yr bulked	4065.00	121.38	132.34		133.99	0.006180	10.42	427.85	90.56	0.66
Lower Reach	3444	100-yr bulked	4065.00	121.40	131.88	131.88	135.71	0.016902	15.69	259.03	34.19	1.01
Lower Reach	3549	100-yr bulked	4065.00	127.20	137.12	137.12	140.75	0.016617	15.27	266.14	36.80	1.00
Lower Reach	3648	100-yr bulked	4065.00	131.00	141.81	141.81	145.22	0.016154	14.82	274.36	40.61	1.00
Lower Reach	3745	100-yr bulked	4065.00	133.70	145.01	145.01	148.18	0.016472	14.27	284.82	44.95	1.00
Lower Reach	3850	100-yr bulked	4065.00	137.20	147.45	147.45	150.96	0.016417	15.04	270.34	38.50	1.00
Lower Reach	4042	100-yr bulked	4065.00	144.50	155.97	155.97	159.17	0.016411	14.36			

										283.05	45.04	1.01
Lower Reach	4143	100-yr bulked	4065.00	148.30	158.68	158.68	162.37	0.016343	15.41	263.74	35.76	1.00
Lower Reach	4245	100-yr bulked	3650.00	152.80	164.16	164.16	167.35	0.016383	14.32	254.98	40.89	1.01
Lower Reach	4348	100-yr bulked	3650.00	160.00	168.29	168.29	171.23	0.015179	13.74	265.55	45.28	1.00
Lower Reach	4362	Culvert										
Lower Reach	4402	100-yr bulked	3650.00	162.45	172.21	170.45	173.55	0.006424	9.29	392.96	63.11	0.66
Lower Reach	4445	100-yr bulked	3650.00	163.20	172.25	172.25	175.71	0.016648	14.92	244.60	35.64	1.00
Lower Reach	4582	100-yr bulked	3650.00	168.40	178.17	178.17	181.50	0.013384	14.71	259.24	47.37	0.94
Lower Reach	4845	100-yr bulked	3650.00	178.19	189.57	189.57	192.89	0.016135	14.61	249.86	37.78	1.00
Lower Reach	5011	100-yr bulked	3650.00	190.00	198.65	198.65	202.10	0.013267	15.28	263.41	42.74	0.97
Lower Reach	5120	Bridge										
Lower Reach	5207	100-yr bulked	3650.00	205.00	215.96	212.92	216.73	0.003046	7.03	519.05	75.15	0.47
Lower Reach	5334	100-yr bulked	3650.00	211.00	218.58	218.58	221.44	0.013081	13.74	287.94	55.10	0.97
Lower Reach	5459	100-yr bulked	3650.00	217.00	224.77	224.77	227.20	0.012813	13.69	371.47	79.18	0.94

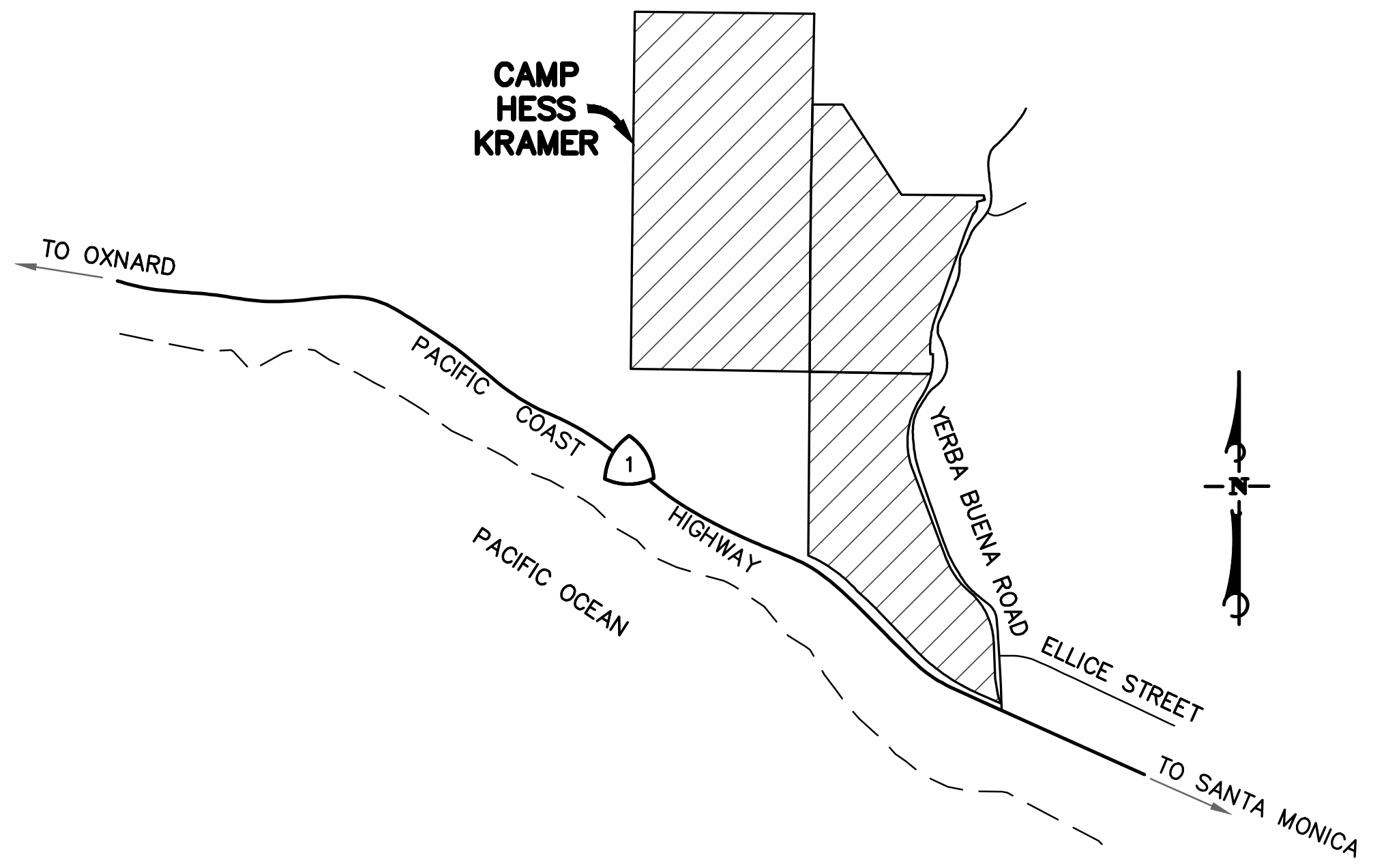
CAMP HESS KRAMER/GINDLING HILLTOP CAMP

WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HIGHWAY
COUNTY OF VENTURA, CALIFORNIA



LOCATION MAP

SCALE: N.T.S.



VICINITY MAP

SCALE: N.T.S.

PROPERTY INFORMATION

PROJECT SITE ADDRESS:
CAMP HESS KRAMER
11495 PACIFIC COAST HIGHWAY (STATE HIGHWAY 1)
MALIBU, CA 92065
T: (310) 457-7861
F: (310) 457-4614

ASSESSOR'S PARCEL NUMBERS	ACREAGE	GENERAL PLAN	ZONE DESIGNATION
APN 700-0-070-450 APN 700-0-060-310 APN 700-0-060-140	55.90 ACRES 43.23 ACRES 80.00 ACRES	DEVELOPED AREAS: RURAL (2 ACRE MIN.) UNDEVELOPED AREAS: OPEN SPACE (10 ACRE MIN.)	DEVELOPED AREAS: COASTAL RESOURCE EXCLUSIVE (CRE-20 AC/M) UNDEVELOPED AREAS COASTAL OPEN SPACE (COS-10 AC SFD/M)
APN 700-0-060-260	8.20 ACRES	OPEN SPACE (10 ACRE MIN.)	COASTAL OPEN SPACE (COS-10 AC SFD/M)
TOTAL	187.33 ACRES		

PROJECT DIRECTORY

PROPERTY OWNER/APPLICANT:
WILSHIRE BOULEVARD TEMPLE CAMPS
ALBERTO VALNER, EXECUTIVE DIRECTOR
DOUG LYNN, CAMP DIRECTOR
RICK WATERS, DIRECTOR OF CONSTRUCTION & FACILITIES
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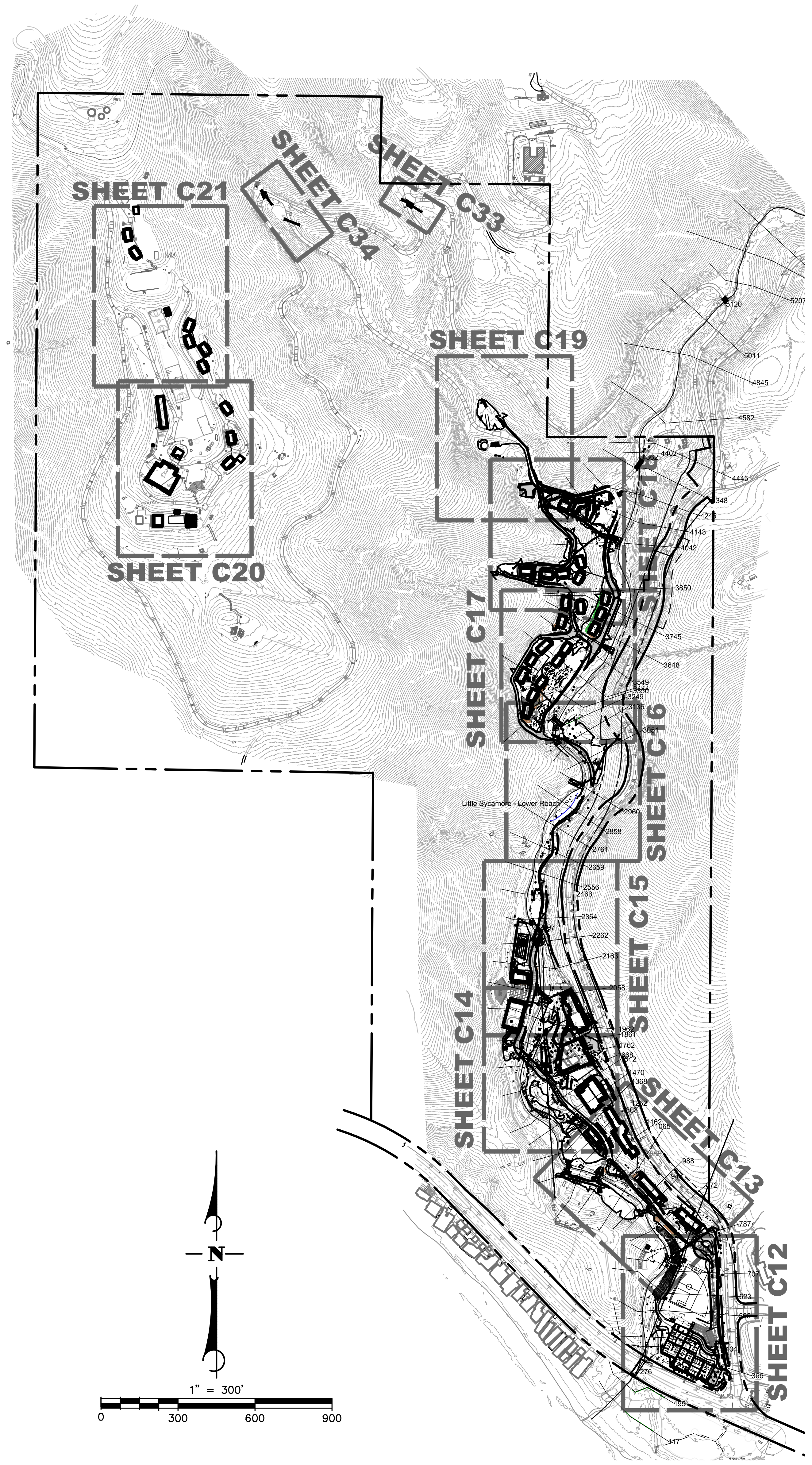
PARKING
WATRY DESIGN INC.
200 GATEWAY PLACE #550
SAN JOSE, CA 95110
T: (833) 917-7275
GENARO MORALES, DIRECTOR OF ARCH DESIGN



ESTIMATED EARTHWORK QUANTITIES

EARTHWORK QUANTITIES:

	CUT	FILL
LOWER CAMP (PHASE 1):		
SITE GRADING	16,500 C.Y.	9,500 C.Y.
STOCKPILED MATERIAL	–	3,500 C.Y
ROAD EXPANSION/WIDENING	1,900 C.Y.	–
BRIDGES	900 C.Y.	–
STORM WATER TREATMENT EXCAVATION	1,300 C.Y.	–
CREEK RESTORATION	7,100 C.Y.	200
SUBTOTAL	27,700 C.Y.	13,200 C.Y.
MIDDLE CAMP (PHASE 1):		
SITE GRADING	9,000 C.Y.	12,000 C.Y.
STOCKPILED MATERIAL	–	7,600 C.Y
ROAD EXPANSION/WIDENING	2,000 C.Y.	–
BRIDGES	100 C.Y.	–
STORM WATER TREATMENT EXCAVATION	300 C.Y.	–
CREEK RESTORATION	5,400 C.Y.	100
SUBTOTAL	16,800 C.Y.	19,700 C.Y.
TOTAL PHASE 1:	44,500 C.Y.	32,900 C.Y.
UPPER CAMP (PHASE 2):		
SITE GRADING	2,200 C.Y.	–
TOTAL PHASE 2:	2,200 C.Y.	–

EARTHWORK NOTES:

THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISH GRADE OR SUBGRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. PROPOSED SUBGRADE ELEVATION IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED BENEATH PAVEMENTS OR STRUCTURES.

THE EARTHWORK QUANTITIES ABOVE ARE FOR BUILDING PERMIT PURPOSES ONLY. THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, OVER EXCAVATION AND RE-COMPACTION, TRENCHING, AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING A LUMP SUM BID PRICE FOR EARTHWORK. THE EARTHWORK SHALL BE BALANCED ONSITE.

SHEET INDEX

SHEET NO.	DESCRIPTION
C1	TITLE SHEET
C2	GENERAL NOTES & INFORMATION
C3	SURVEY NOTES & SHEET INDEX
C4	TOPOGRAPHIC MAP – LOWER CAMP
C5	TOPOGRAPHIC MAP – LOWER CAMP
C6	TOPOGRAPHIC MAP – LOWER CAMP
C7	TOPOGRAPHIC MAP – MIDDLE CAMP
C8	TOPOGRAPHIC MAP – MIDDLE CAMP
C9	TOPOGRAPHIC MAP – MIDDLE CAMP
C10	TOPOGRAPHIC MAP – UPPER CAMP
C11	TOPOGRAPHIC MAP – UPPER CAMP
C12	GRADING & DRAINAGE PLAN – LOWER CAMP
C13	GRADING & DRAINAGE PLAN – LOWER CAMP
C14	GRADING & DRAINAGE PLAN – LOWER CAMP
C15	GRADING & DRAINAGE PLAN – LOWER CAMP
C16	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C17	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C18	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C19	GRADING & DRAINAGE PLAN – MIDDLE CAMP
C20	GRADING & DRAINAGE PLAN – UPPER CAMP
C21	GRADING & DRAINAGE PLAN – UPPER CAMP
C22	ROAD SECTIONS
C23	BRIDGE 1P & 2V PLAN & PROFILE
C24	BRIDGE 3P & 4V PLAN & PROFILE
C25	BRIDGE 5P & 6V PLAN & PROFILE
C26	BRIDGE 9P PLAN & PROFILE
C27	STORM DRAIN PLAN & PROFILE – LINE A
C28	STORM DRAIN PLAN & PROFILE – LINE B
C29	STORM DRAIN PLAN & PROFILE – LINE E
C30	STORM DRAIN PLAN & PROFILE – LINE G1
C31	STORM DRAIN PLAN & PROFILE – LINE G1
C32	STORM DRAIN PLAN & PROFILE – LINE G2
C33	STORM DRAIN PLAN & PROFILE – LINE G3
C34	STORM DRAIN PLAN & PROFILE – LINE G4
C35	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C36	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C37	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C38	WET UTILITY IMPROVEMENT PLAN – LOWER CAMP
C39	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C40	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C41	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C42	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C43	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C44	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
C45	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
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C47	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C48	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C49	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C50	DRY UTILITY IMPROVEMENT PLAN – LOWER CAMP
C51	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C52	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C53	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C54	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C55	DRY UTILITY IMPROVEMENT PLAN – UPPER CAMP
C56	DRY UTILITY IMPROVEMENT PLAN – UPPER CAMP
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C60	EROSION CONTROL DETAILS & NOTES
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C64	EROSION CONTROL PLAN – MIDDLE CAMP
C65	EROSION CONTROL PLAN – MIDDLE CAMP
C66	EROSION CONTROL PLAN – UPPER CAMP
C67	EROSION CONTROL PLAN – UPPER CAMP
ESA PLANS	
R1	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R2	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R3	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R4	LITTLE SYCAMORE CREEK GRADING PLAN – LOWER CAMP
R5	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
R6	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
R7	LITTLE SYCAMORE CREEK GRADING PLAN – MIDDLE CAMP
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R9	CREEK RESTORATION TYPICAL DETAILS
R10	CREEK RESTORATION TYPICAL DETAILS
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R15	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R16	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R17	CREEK RESTORATION REVEGETATION PLAN – LOWER CAMP
R18	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP
R19	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP
R20	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

TITLE SHEET
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200

SHEET
C1 OF C67

PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI

42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:06:41 PM

DRAWING: v:\2042\active\2042586200\drawing\exhibit_files\2042586200_civil_base.dwg

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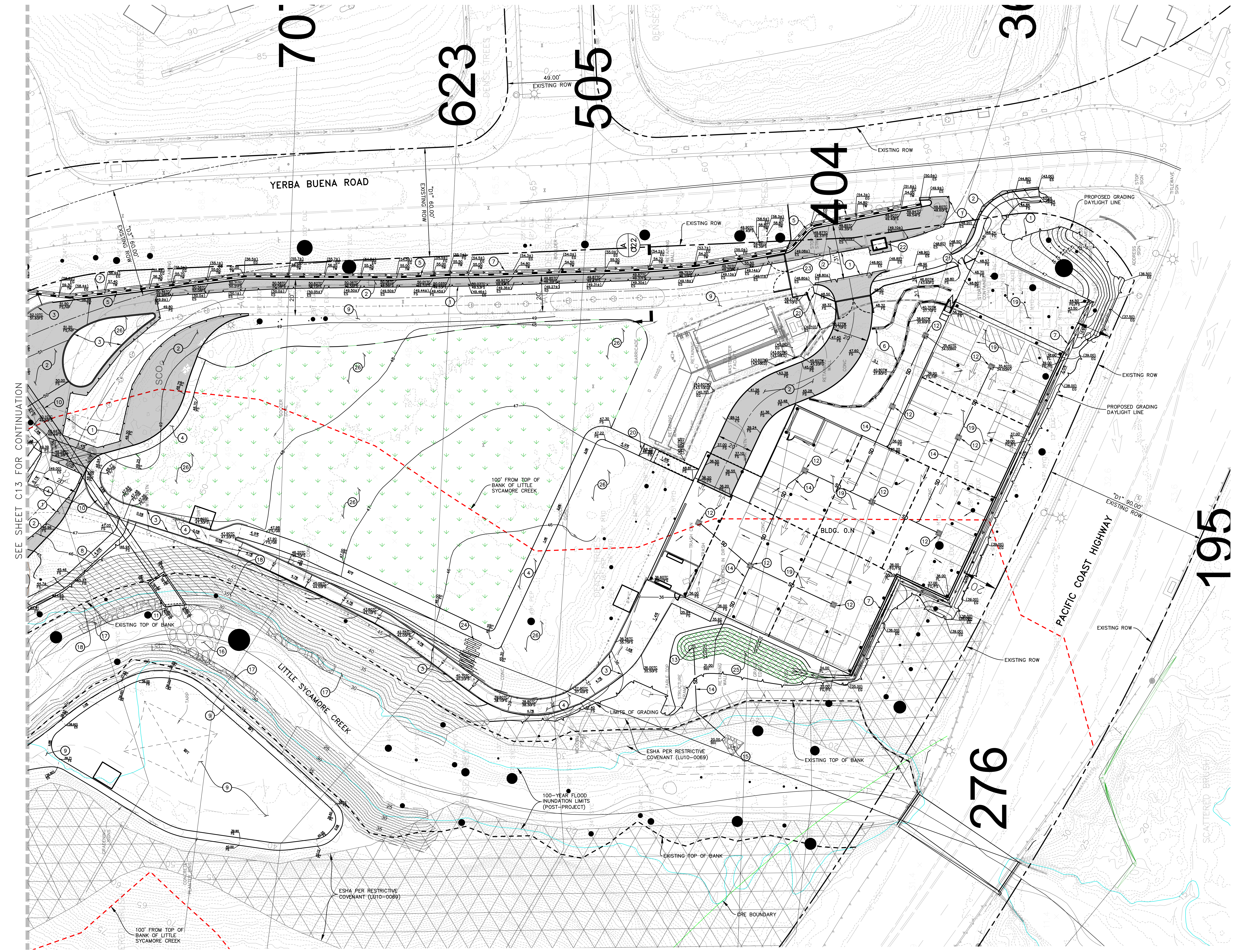
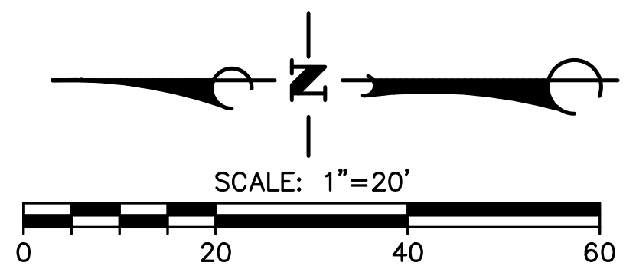

70
623
505
404
195
276
YERBA BUENA ROAD
EXISTING ROW
49.00'
"D1" 60.00'
"D3" 60.00'
"D1" 90.00'
SEE SHEET C13 FOR CONTINUATION
PROPOSED GRADING DAYLIGHT LINE
BLDG. O.N
PACIFIC COAST HIGHWAY
LITTLE SYCAMORE CREEK
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
CRE BOUNDARY
DENSE TREES
SCATTERED BRUSH

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED 6" CURB.
④ PROPOSED CONCRETE WALKWAY.
⑤ PROPOSED CONCRETE SITE RETAINING WALL.
⑥ PROPOSED STONE CLAD RETAINING WALL.
⑦ PROPOSED CONCRETE SWALE.
⑧ PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET C58.
⑨ PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
⑩ PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
⑪ PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
⑫ PROPOSED 24"X24" STORM DRAIN INLET.
⑬ PROPOSED STORM DRAIN OUTLET/OVERFLOW; FINAL SIZE TBD.
⑭ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑮ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
⑯ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑰ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑱ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑲ PROPOSED AT-GRADE PARKING WITH RAISED TENNIS COURTS ABOVE. SEE ARCHITECTURAL PLANS. SEE DETAIL "A", SHEET C58 FOR TENNIS COURT LEVEL FINISH SURFACE ELEVATIONS.
⑳ PROPOSED 8' WIDE PEDESTRIAN BRIDGE CONNECTING THE FIELD LEVEL TO THE TENNIS COURTS.
㉑ PROPOSED 8' HIGH PEDESTRIAN GATE. SEE LANDSCAPE PLANS.
㉒ PROPOSED GATE SHACK. SEE ARCHITECTURAL PLANS.
㉓ PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
㉔ PROPOSED TIMBER STEPS.
㉕ PROPOSED WATER QUALITY TREATMENT AREA (BIO-1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉖ PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.



SCALE: 1"=20'

NO.	DATE	REVISION BLOCK	APPD.

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WILSHIRE BOULEVARD TEMPLE CAMPS

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PETER A. SILVIA
NO 70435

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C12 OF C67
PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:07:37 PM

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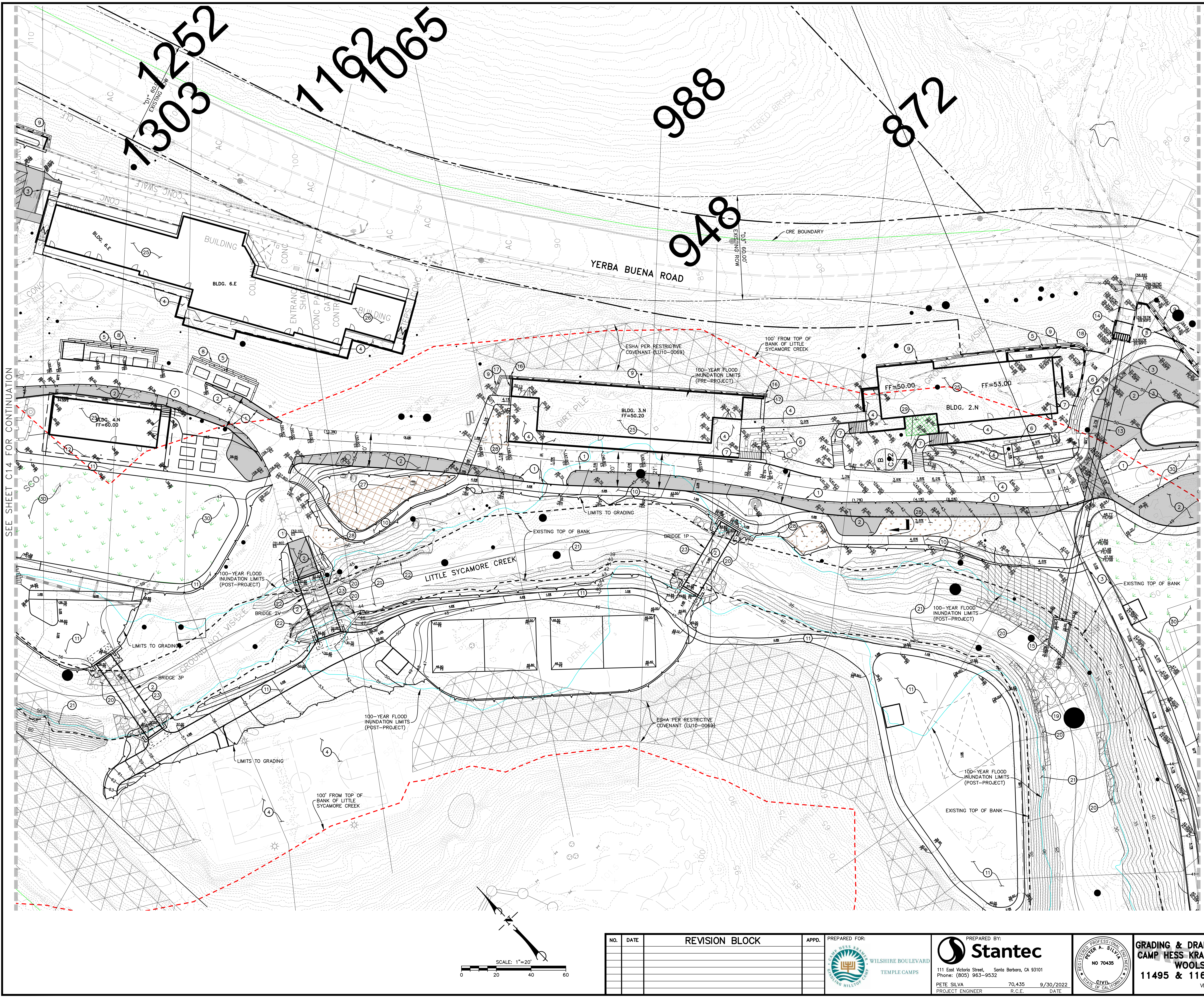
1252
1303
1162
1065
988
948
872
YERBA BUENA ROAD
CRE BOUNDARY
"D1" 60.00' EXISTING ROW
"D3" 60.00' EXISTING ROW
CONC SWALE
BUILDING
BLDG. 6.E
BLDG. 4.N FF=60.00
BLDG. 3.N FF=50.20
BLDG. 2.N
FF=50.00
FF=53.00
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (PRE-PROJECT)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
LIMITS TO GRADING
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
BRIDGE 1P
BRIDGE 2V
BRIDGE 3P
DIRT PILE
SCATTERED BRUSH
DENSE TREES
GROUND NOT VISIBLE
SEE SHEET C14 FOR CONTINUATION
SEE SHEET C12 FOR CONTINUATION
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED 6" CURB.
④ PROPOSED CONCRETE WALKWAY.
⑤ PROPOSED CONCRETE SITE RETAINING WALL.
⑥ PROPOSED STONE BOULDER WALL.
⑦ PROPOSED CONCRETE STEPS.
⑧ PROPOSED TIMBER STEPS.
⑨ PROPOSED CONCRETE SWALE.
⑩ PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET SHEET C58.
⑪ PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
⑫ PROPOSED PERMEABLE PAVERS. SEE DETAIL "D", SHEET C58.
⑬ PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
⑭ PROPOSED STORM DRAIN "LINE A" INLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "J", SHEET C59.
⑮ PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
⑯ PROPOSED 18"X18" STORM DRAIN INLET.
⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑱ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
⑲ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
⑳ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉑ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉒ EXISTING MASONRY ABUTMENTS AND WALLS TO BE REMOVED. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉓ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉔ PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉕ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉖ EXISTING BUILDING TO REMAIN.
㉗ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
㉘ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉙ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H', SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉚ PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

NO 70435

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C13 OF C67
PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:08:36 PM

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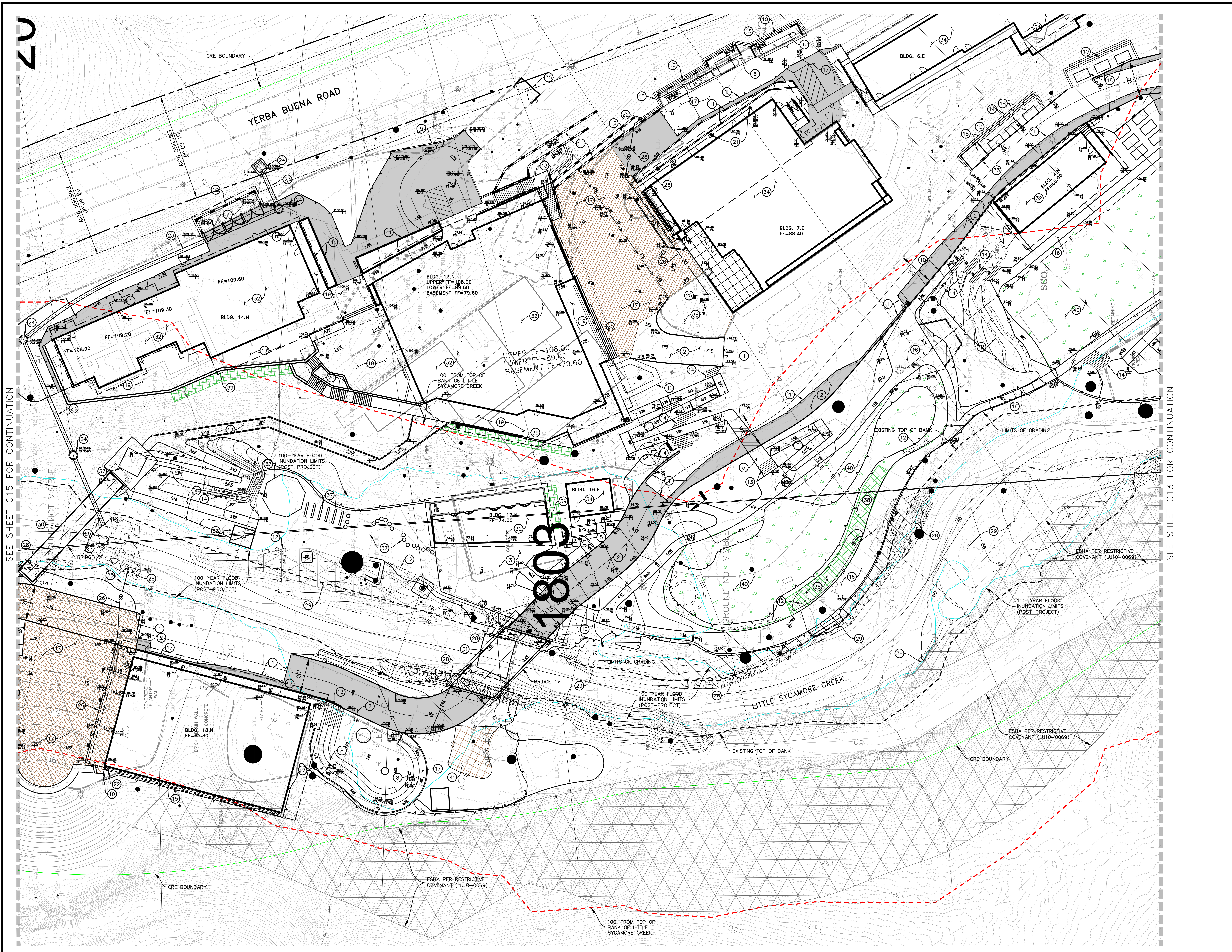
YERBA BUENA ROAD
CRE BOUNDARY
D1 60.00' EXISTING ROW
D3 60.00' EXISTING ROW
BLDG. 14.N
FF=109.60
FF=109.30
FF=109.20
FF=108.90
BLDG. 13.N
UPPER FF=108.00
LOWER FF=89.60
BASEMENT FF=79.60
BLDG. 7.E
FF=88.40
BLDG. 6.E
BLDG. 4.N
FF=60.00
BLDG. 16.E
BLDG. 17.N
FF=74.00
BLDG. 18.N
FF=85.80
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
EXISTING TOP OF BANK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LITTLE SYCAMORE CREEK
BRIDGE 5P
BRIDGE 4V
SEE SHEET C15 FOR CONTINUATION
SEE SHEET C13 FOR CONTINUATION
1803

SCALE: 1"=20'

0 20 40 60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE WALKWAY/RAMP.
⑥ PROPOSED CONCRETE SLABS FOR UTILITY PADS.
⑦ PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
⑧ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
⑨ PROPOSED GRAVITY WALL.
⑩ PROPOSED SITE RETAINING WALL.
⑪ PROPOSED PLANTER WALL. SEE LANDSCAPE PLANS.
⑫ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑬ PROPOSED CONCRETE STEPS.
⑭ PROPOSED TIMBER STEPS.
⑮ PROPOSED CONCRETE SWALE.
⑯ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
⑰ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C59. SEE STORMWATER EXHIBITS AND REPORT.
⑱ PROPOSED PLANTERS. SEE LANDSCAPE PLANS.
⑲ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑳ PROPOSED WOOD DECKING STEPS. SEE LANDSCAPE PLANS.
㉑ PROPOSED 12"X12" STORM DRAIN INLET.
㉒ PROPOSED 18"X18" STORM DRAIN INLET.
㉓ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
㉔ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
㉕ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.
㉖ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
㉗ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉘ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉙ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉚ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉛ PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉜ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉝ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉞ EXISTING BUILDING TO REMAIN.
㉟ PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
㊱ REMOVE DAMAGED WALL.
㊲ PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
㊳ PROPOSED WATER QUALITY TREATMENT AREA (BIO-1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㊴ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H" SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㊵ PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.
㊶ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C14 OF C67
PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:09:37 PM

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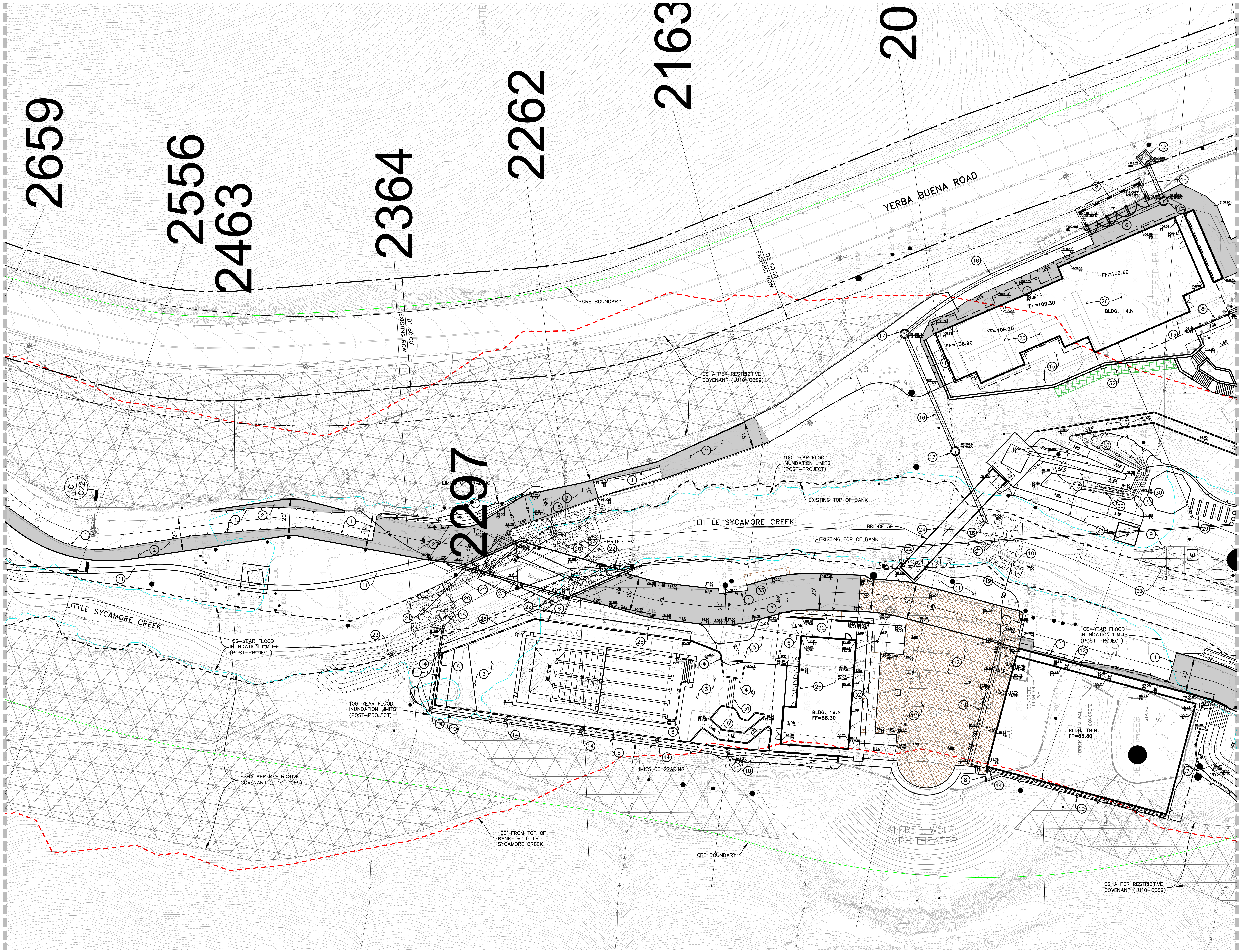
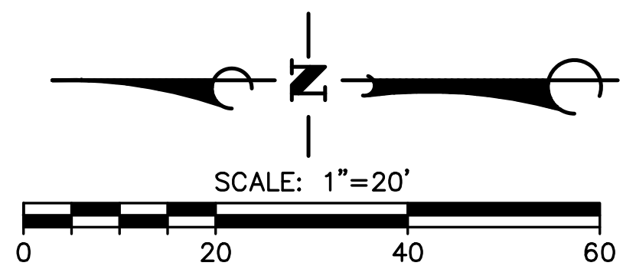

2659
2556
2463
2364
2262
2163
20
2297
YERBA BUENA ROAD
D3 60.00' EXISTING ROW
D1 60.00' EXISTING ROW
CRE BOUNDARY
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
FF=109.60
FF=109.30
FF=109.20
FF=108.90
BLDG. 14.N
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
BRIDGE 5P
BRIDGE 6V
LIMITS OF GRADING
SEE SHEET C16 FOR CONTINUATION
SEE SHEET C14 FOR CONTINUATION
BLDG. 19.N
FF=88.30
BLDG. 18.N
FF=85.80
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
ALFRED WOLF AMPHITHEATER
CONC

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED CONCRETE PAVEMENT.
4. PROPOSED 6" CURB.
5. PROPOSED CONCRETE WALKWAY/RAMP.
6. PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
7. PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
8. PROPOSED RETAINING WALL.
9. PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
10. PROPOSED CONCRETE SWALE.
11. PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
12. PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
13. PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
14. PROPOSED 18"X18" STORM DRAIN INLET.
15. PROPOSED CALTRANS DOWNDRAIN.
16. PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
17. PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
18. PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59.
19. PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
20. PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
21. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
22. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
23. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
24. PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
25. PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
26. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
27. PROPOSED SHED. SEE ARCHITECTURAL PLANS.
28. PROPOSED "CONTEMPO" SECURITY FENCE.
29. PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
30. PROPOSED TIMBER STEPS.
31. PROPOSED CONCRETE STEPS.
32. PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
33. PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
34. PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.


N
SCALE: 1"=20'
0
20
40
60

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C15 OF C67

PLAN DATE
5/01/2021

DESIGN ___PAS___ CHECKED ___HI___
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:10:36 PM

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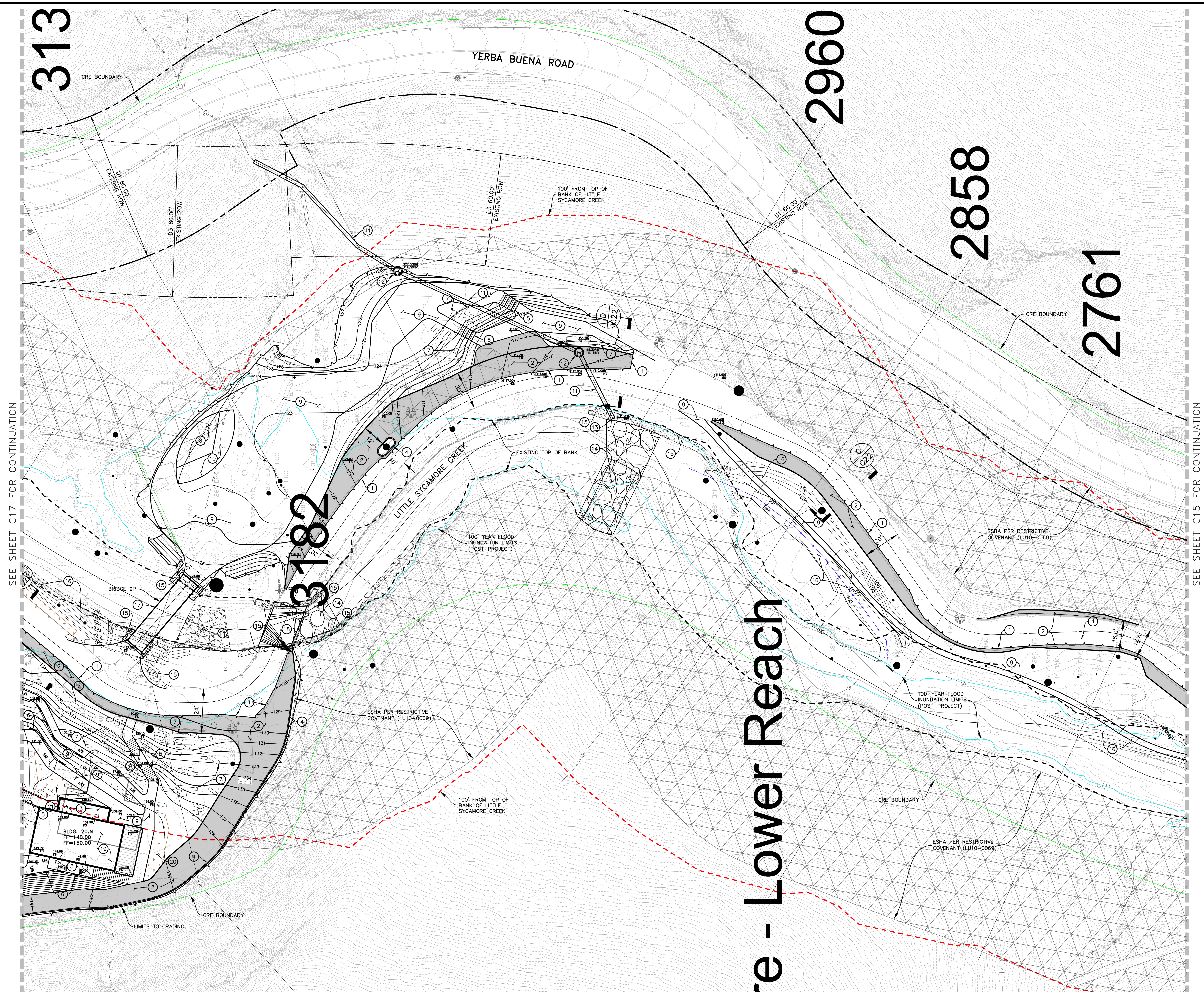
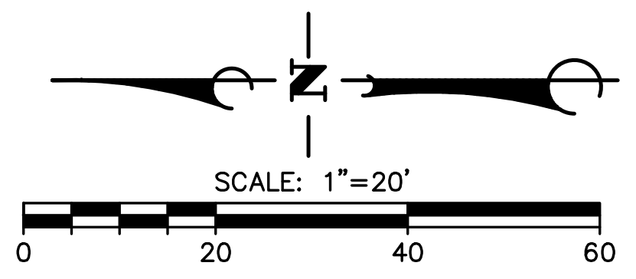

313
2960
2858
2761
3182
e - Lower Reach
YERBA BUENA ROAD
CRE BOUNDARY
D1 80.00' EXISTING ROW
D3 80.00' EXISTING ROW
D3 60.00' EXISTING ROW
D1 60.00' EXISTING ROW
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
BRIDGE 9P
BLDG. 20.N FF=140.00 FF=150.00
LIMITS TO GRADING
SEE SHEET C17 FOR CONTINUATION
SEE SHEET C15 FOR CONTINUATION
D C22
C C22


N
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.

② PROPOSED ASPHALT CONCRETE PAVEMENT.

③ PROPOSED CONCRETE PAVEMENT.

④ PROPOSED 6" CURB.

⑤ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.

⑥ PROPOSED RETAINING WALL.

⑦ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.

⑧ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

⑨ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.

⑩ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.

⑪ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.

⑫ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.

⑬ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.

⑭ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.

⑮ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.

⑯ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.

⑰ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.

⑱ EXISTING VEHICULAR BRIDGE TO REMAIN.

⑲ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.

⑳ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

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CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN - MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C16 OF C67

PLAN DATE
5/01/2021

DESIGN ___PAS___ CHECKED ___HI___

42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:11:37 PM

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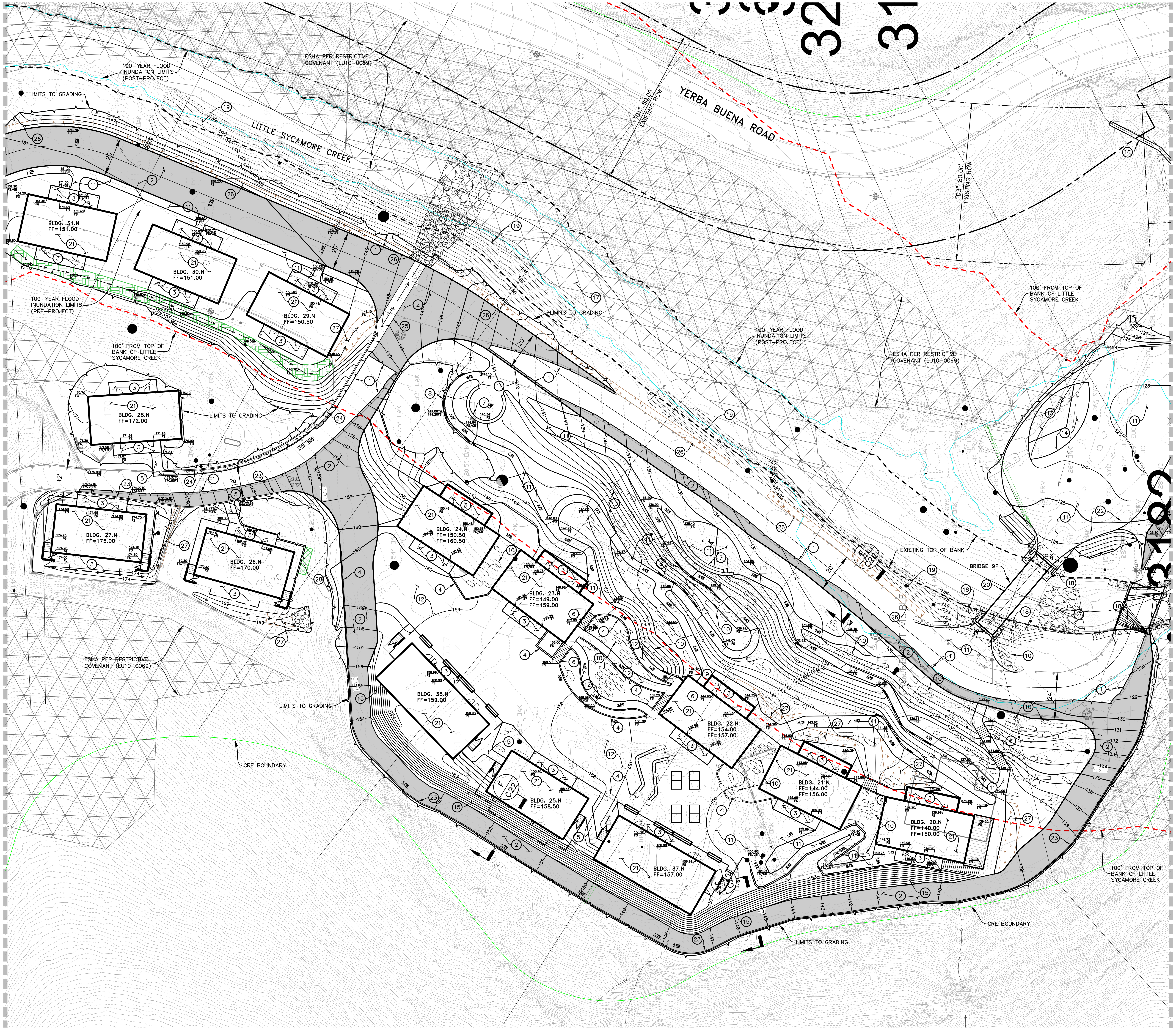
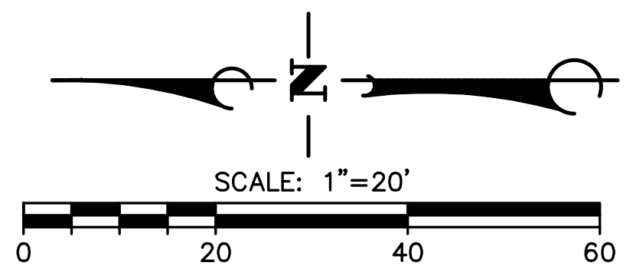

SEE SHEET C18 FOR CONTINUATION
SEE SHEET C16 FOR CONTINUATION
LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
"D1" 80.00' EXISTING ROW
"D3" 80.00' EXISTING ROW
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100-YEAR FLOOD INUNDATION LIMITS (PRE-PROJECT)
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LIMITS TO GRADING
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
BRIDGE 9P
CRE BOUNDARY
BLDG. 31.N FF=151.00
BLDG. 30.N FF=151.00
BLDG. 29.N FF=150.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 26.N FF=170.00
BLDG. 24.N FF=150.50 FF=160.50
BLDG. 23.N FF=149.00 FF=159.00
BLDG. 22.N FF=154.00 FF=157.00
BLDG. 21.N FF=144.00 FF=156.00
BLDG. 20.N FF=140.00 FF=150.00
BLDG. 38.N FF=159.00
BLDG. 25.N FF=158.50
BLDG. 37.N FF=157.00
C22
C23


N
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

- ① PROPOSED SAWCUT LINE.
- ② PROPOSED ASPHALT CONCRETE PAVEMENT.
- ③ PROPOSED CONCRETE PAVEMENT.
- ④ PROPOSED 6" CURB.
- ⑤ PROPOSED CONCRETE WALKWAY/RAMP.
- ⑥ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
- ⑦ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
- ⑧ PROPOSED GRAVITY WALL.
- ⑨ PROPOSED RETAINING WALL.
- ⑩ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
- ⑪ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
- ⑫ PROPOSED PERMEABLE DECOMPOSED GRANITE PATH. SEE DETAIL 'B", SHEET C58. SEE LANDSCAPE PLANS.
- ⑬ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ⑭ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
- ⑮ PROPOSED CEMENT TREATED BASE 1:1 SLOPE.
- ⑯ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑰ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑱ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑲ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑳ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
- ㉑ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
- ㉒ PROPOSED RECLAIMED LOG BENCH. SEE LANDSCAPE PLANS.
- ㉓ PROPOSED 8" CURB.
- ㉔ PROPOSED 8" CURB AND 24" GUTTER.
- ㉕ PROPOSED 6' CONCRETE RIBBON GUTTER.
- ㉖ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
- ㉗ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ㉘ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ㉙ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN - MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C17 OF C67

PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:12:41 PM

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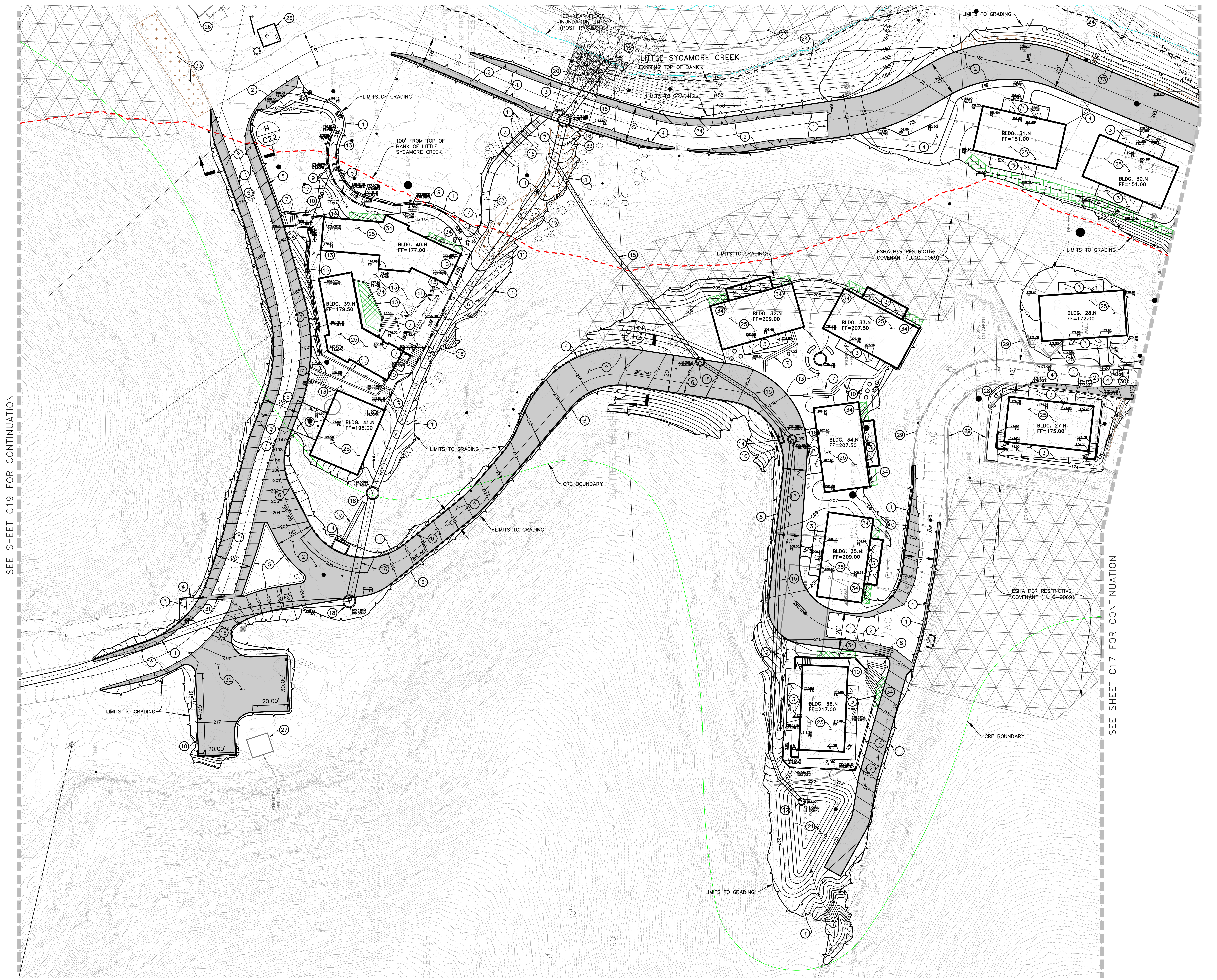
LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
LIMITS OF GRADING
LIMITS TO GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
CRE BOUNDARY
ONE WAY
BLDG. 31.N FF=151.00
BLDG. 30.N FF=151.00
BLDG. 40.N FF=177.00
BLDG. 39.N FF=179.50
BLDG. 41.N FF=195.00
BLDG. 32.N FF=209.00
BLDG. 33.N FF=207.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 34.N FF=207.50
BLDG. 35.N FF=209.00
BLDG. 36.N FF=217.00
H C22
C22
20.00'
30.00'
44.55'
20.00'
CHEMICAL BUILDING
SEE SHEET C19 FOR CONTINUATION
SEE SHEET C17 FOR CONTINUATION
N
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 8" CURB.
⑤ PROPOSED ROLLED CURB.
⑥ PROPOSED AC DIKE.
⑦ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
⑧ PROPOSED TIMBER STEPS. SEE LANDSCAPE PLANS.
⑨ PROPOSED GRAVITY WALL.
⑩ PROPOSED RETAINING WALL.
⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑫ PROPOSED CONCRETE SWALE.
⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
⑲ PROPOSED STORM DRAIN OUTLET WITH HEADWALL; FINAL DESIGN TBD. SEE STORM DRAIN PLANS.
⑳ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
㉑ PROPOSED DEBRIS BASIN.
㉒ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
㉓ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉔ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉕ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉖ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉗ EXISTING BUILDING TO REMAIN.
㉘ PORTION OF EXISTING RETAINING WALL TO BE REMOVED.
㉙ EXISTING RETAINING WALL TO REMAIN.
㉚ PROPOSED 24" GUTTER.
㉛ PROPOSED ASPHALT BERM.
㉜ PROPOSED FIRE TRUCK HAMMER HEAD.
㉝ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉞ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

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WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
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PETE SILVA	70,435	9/30/2022
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CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY

VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C18 OF C67

PLAN DATE
5/01/2021

DESIGN: PAS CHECKED: HI

42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT DATE:5/1/2021 9:13:45 PM PLOT BY: Steward, Craig

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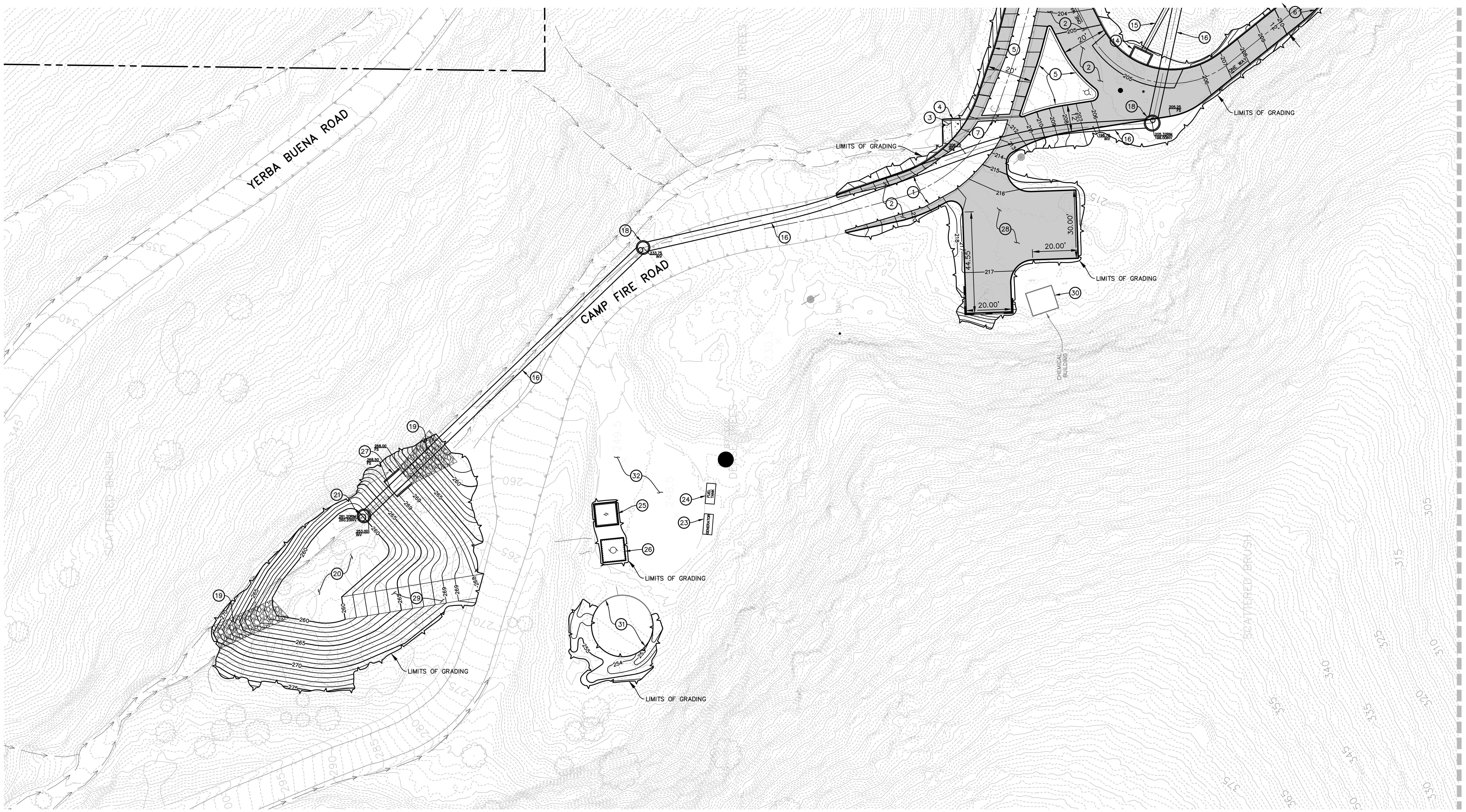
YERBA BUENA ROAD
CAMP FIRE ROAD
LIMITS OF GRADING
LIMITS OF GRADING
LIMITS OF GRADING
LIMITS OF GRADING
LIMITS OF GRADING
LIMITS OF GRADING
DENSE TREES
SCATTERED BRUSH
SCATTERED BRUSH
CHEMICAL BUILDING
SEE SHEET C18 FOR CONTINUATION
20.00'
30.00'
44.55'
20.00'
20'
1
2
3
4
5
6
7
14
15
16
18
19
20
21
23
24
25
26
27
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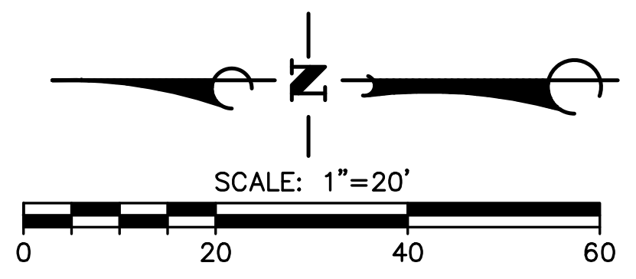
275
305
315
340
345
375


N
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

- ① PROPOSED SAWCUT LINE.
- ② PROPOSED ASPHALT CONCRETE PAVEMENT.
- ③ PROPOSED CONCRETE PAVEMENT.
- ④ PROPOSED 8" CURB.
- ⑤ PROPOSED ROLLED CURB.
- ⑥ PROPOSED AC DIKE.
- ⑦ PROPOSED ASPHALT BERM.
- ⑧ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
- ⑨ PROPOSED GRAVITY WALL.
- ⑩ PROPOSED RETAINING WALL.
- ⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
- ⑫ PROPOSED CONCRETE SWALE.
- ⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
- ⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
- ⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
- ⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
- ⑲ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
- ⑳ PROPOSED DEBRIS BASIN.
- ㉑ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
- ㉒ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
- ㉓ PROPOSED GENERATOR PAD.
- ㉔ PROPOSED FUEL TANK PAD.
- ㉕ PROPOSED WATER PUMP STRUCTURE.
- ㉖ PROPOSED FIRE PUMP STRUCTURE.
- ㉗ PROPOSED P.C.C. OVERFLOW STRUCTURE.
- ㉘ PROPOSED FIRE TRUCK HAMMER HEAD.
- ㉙ PROPOSED GRAVEL ACCESS RAMP.
- ㉚ EXISTING BUILDING TO REMAIN.
- ㉛ EXISTING WATER TANK TO REMAIN.
- ㉜ EXISTING GRAVEL SURFACE TO REMAIN.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
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WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
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PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C19 OF C67
PLAN DATE
5/01/2021

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/29/2021 2:55:08 PM PLOT BY: Steward, Craig PLOT DATE: 5/1/2021 9:14:47 PM

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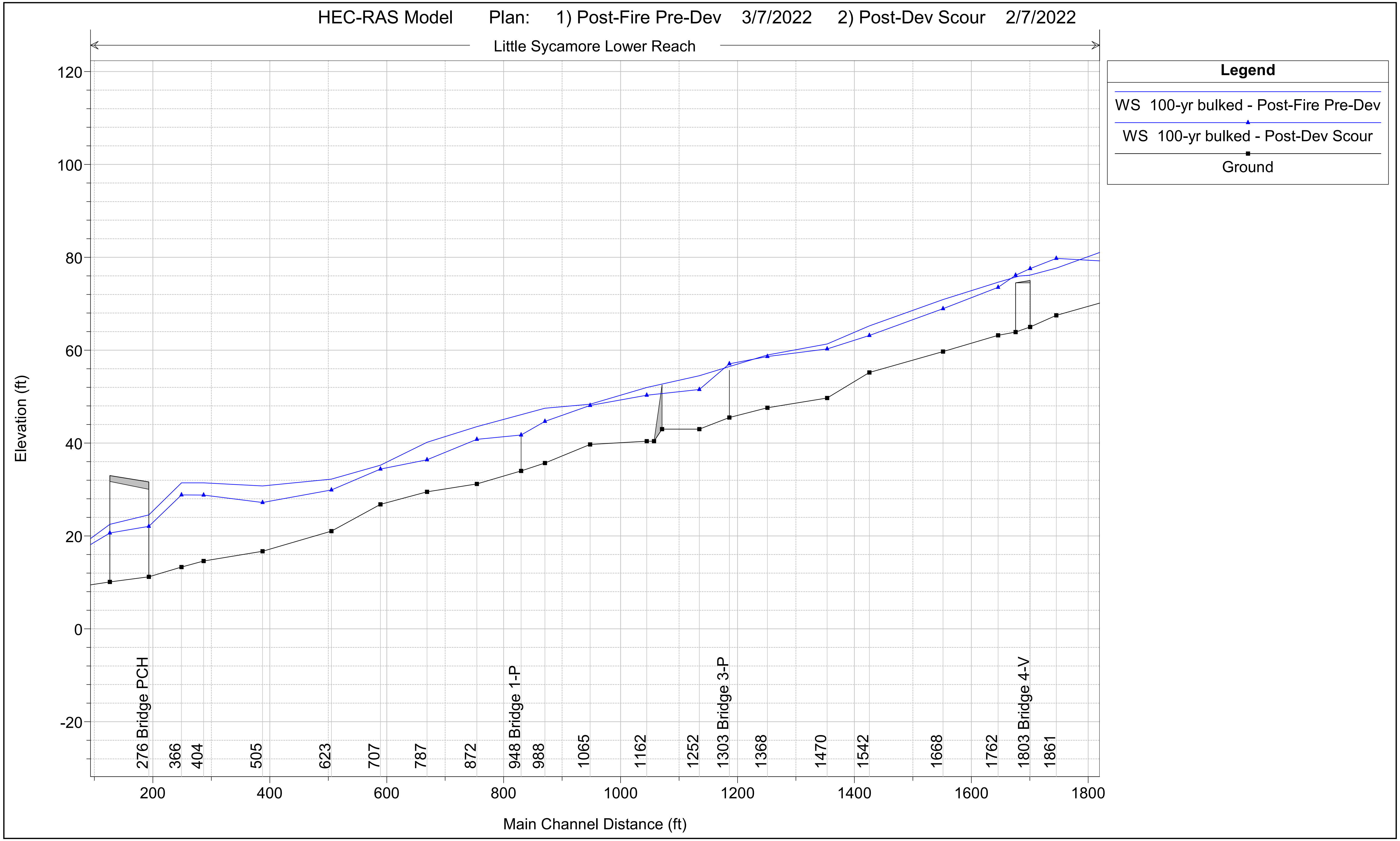
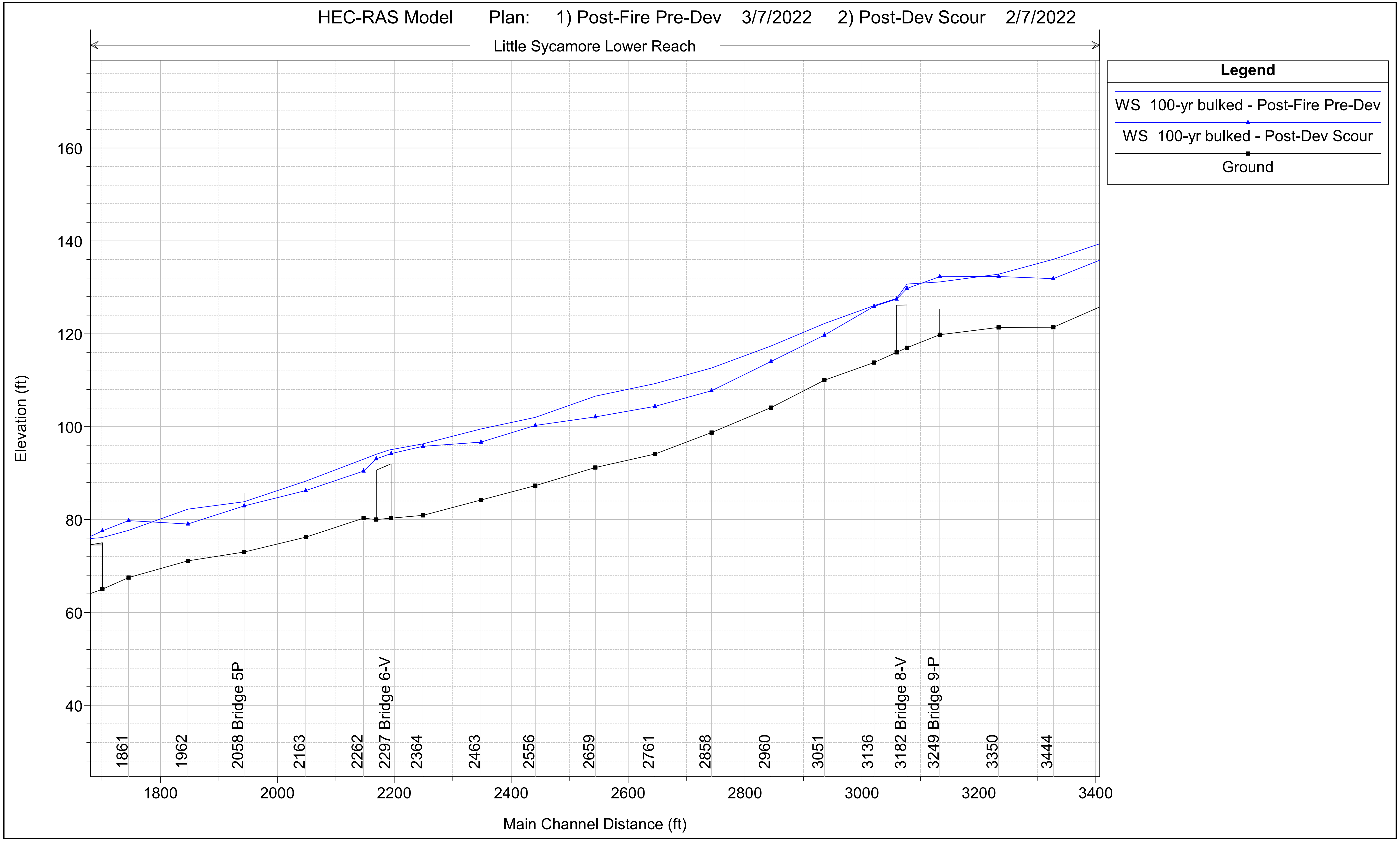
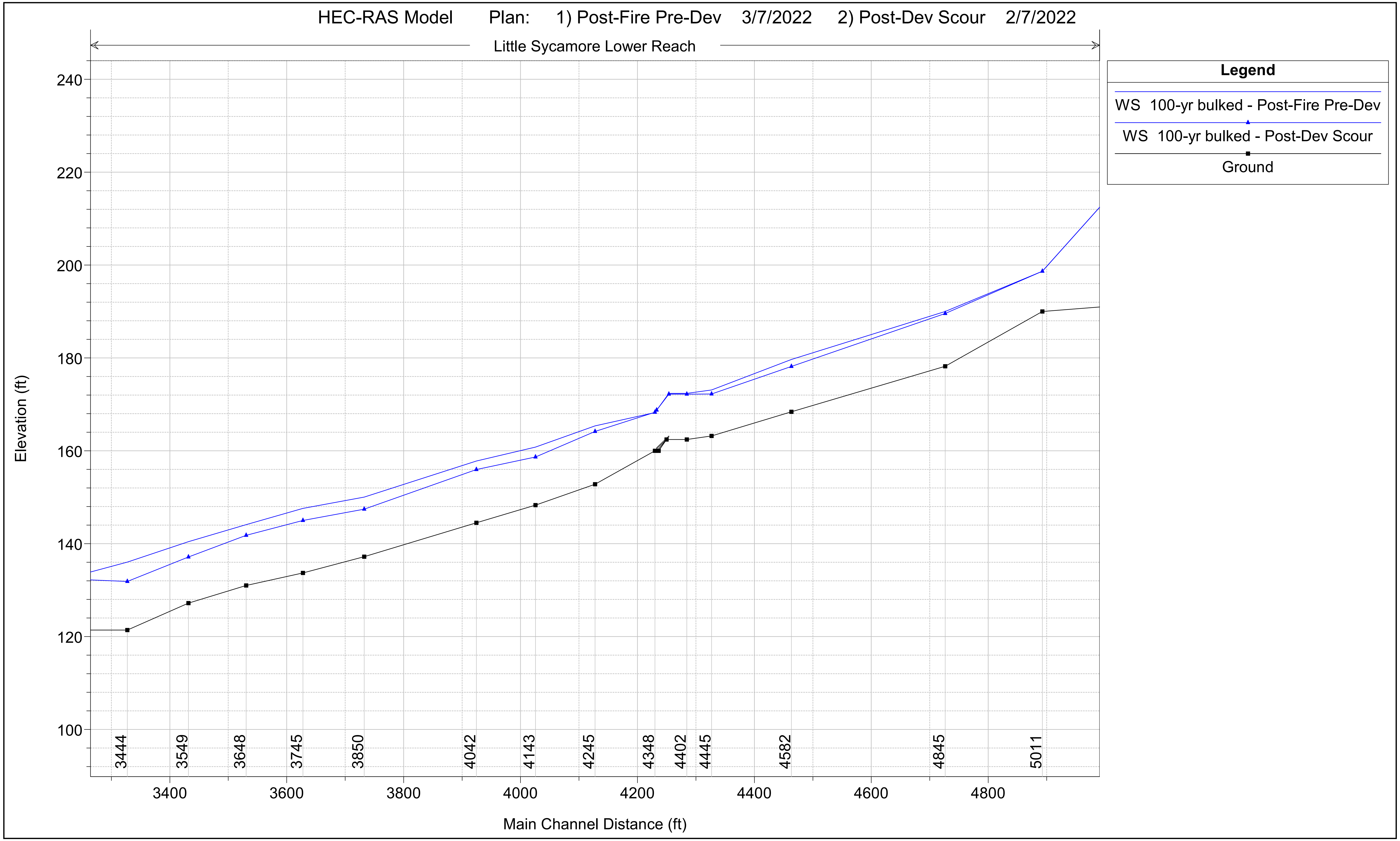


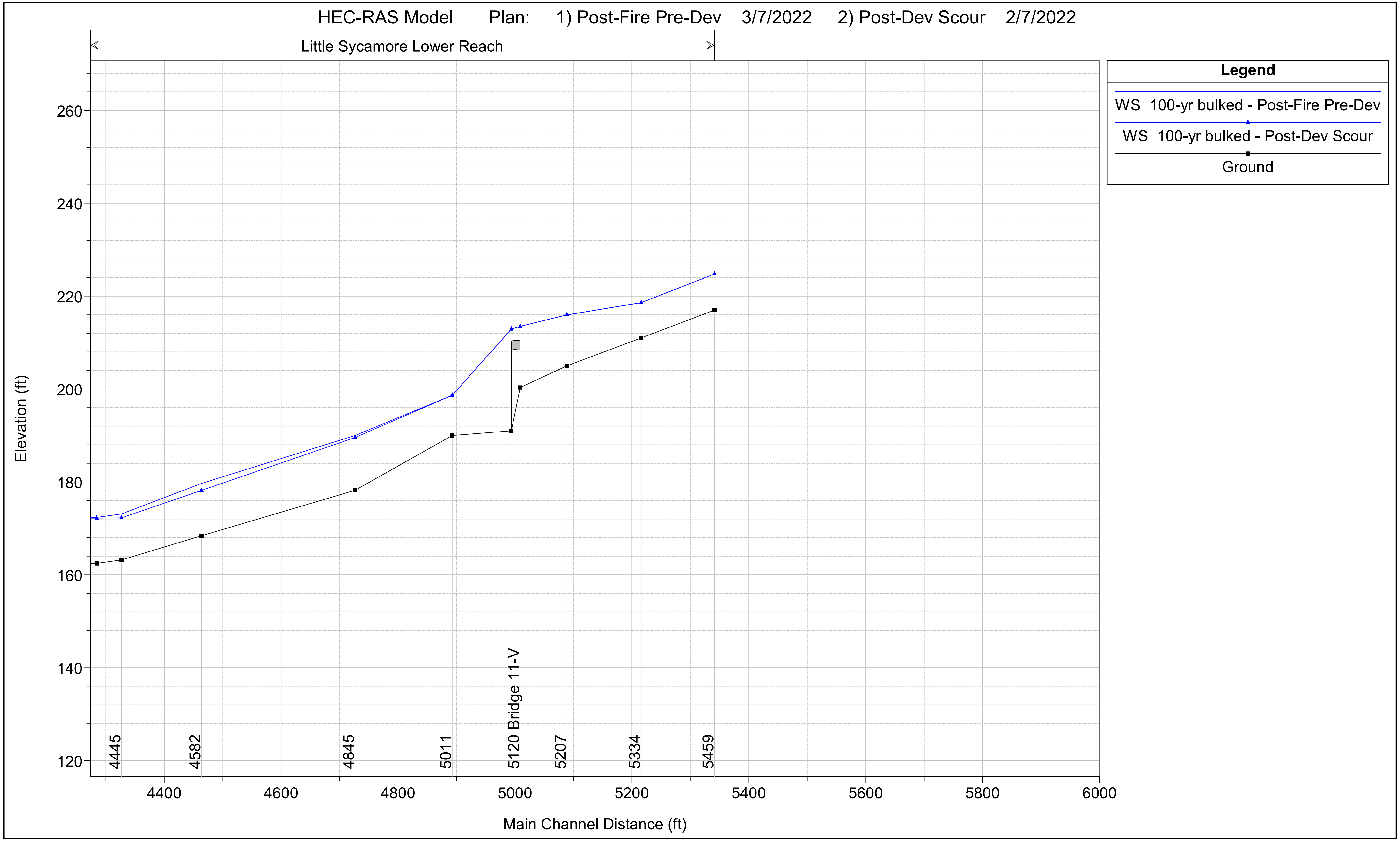
1 in Horiz. = 158.8042 ft 1 in Vert. = 20 ft



1 in Horiz. = 158.8042 ft 1 in Vert. = 20 ft

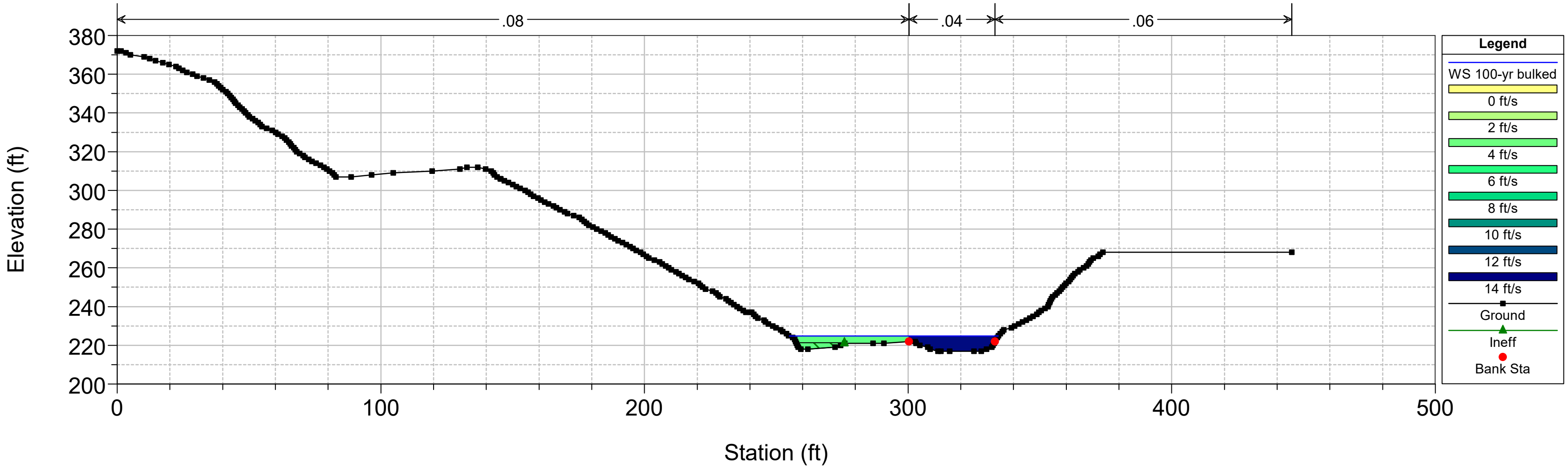


1 in Horiz. = 158.8042 ft 1 in Vert. = 20 ft

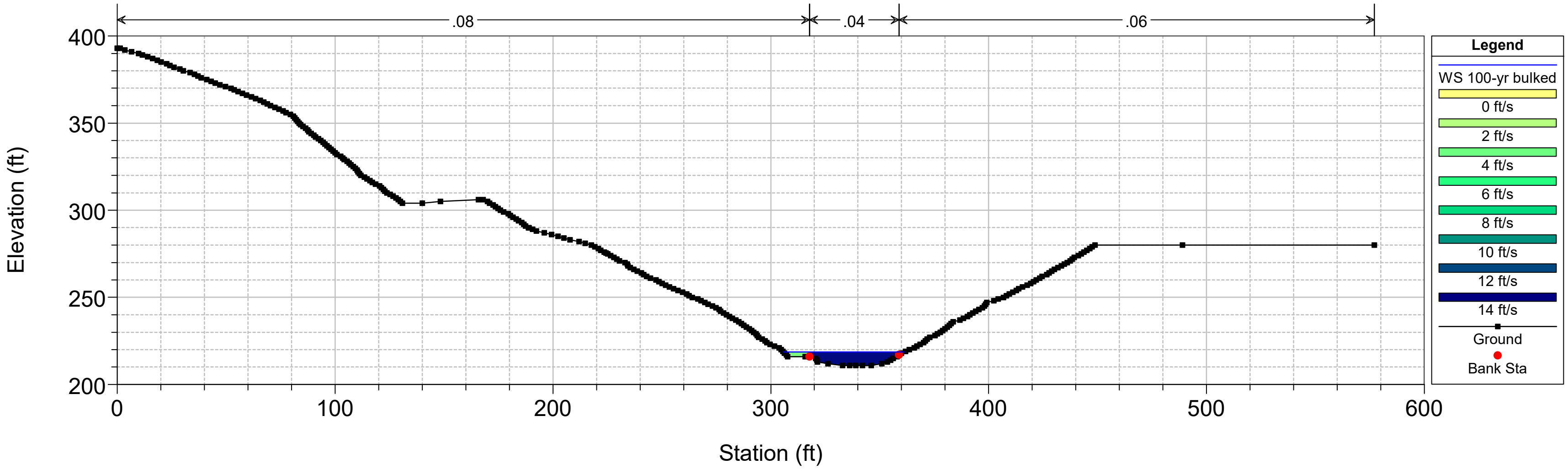


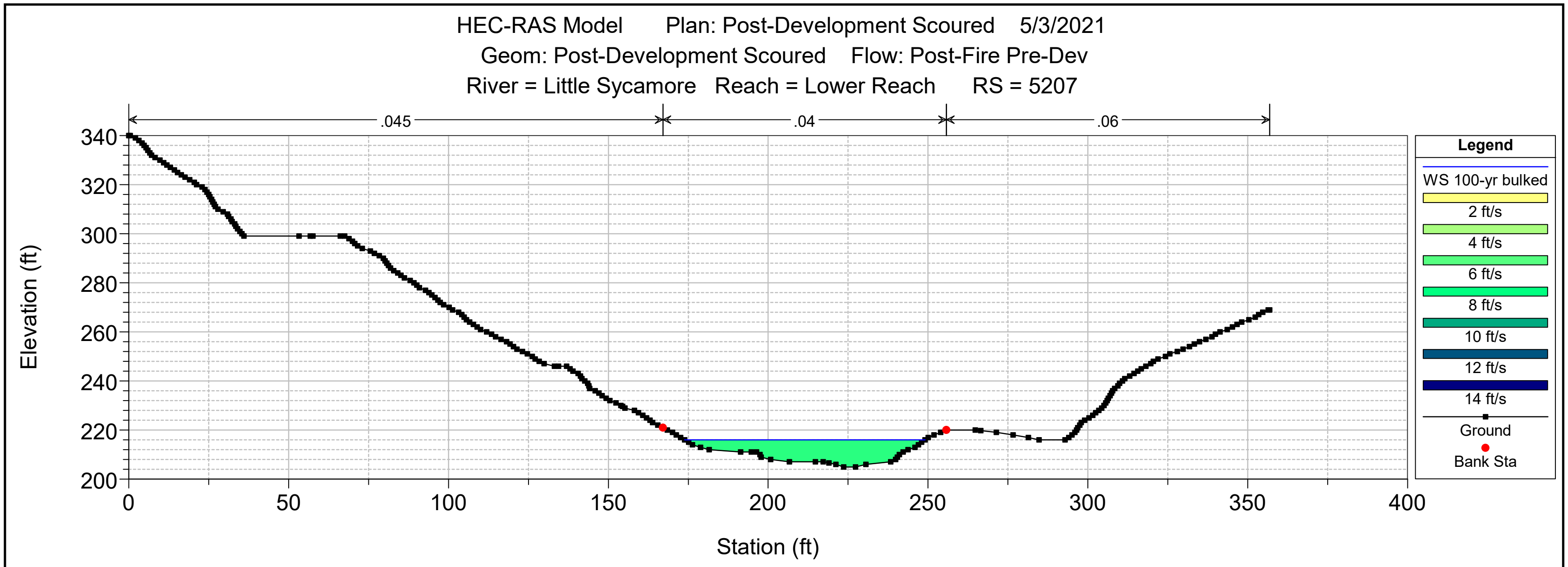
1 in Horiz. = 158.8042 ft 1 in Vert. = 20 ft

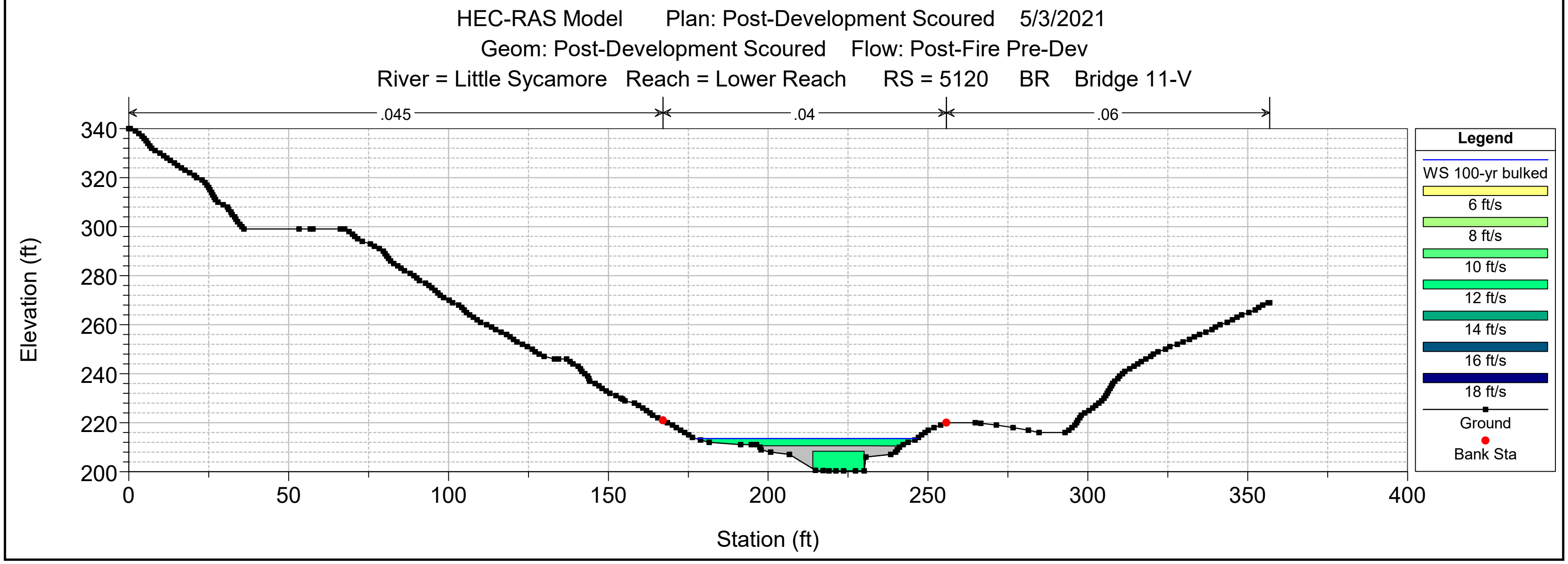
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5459

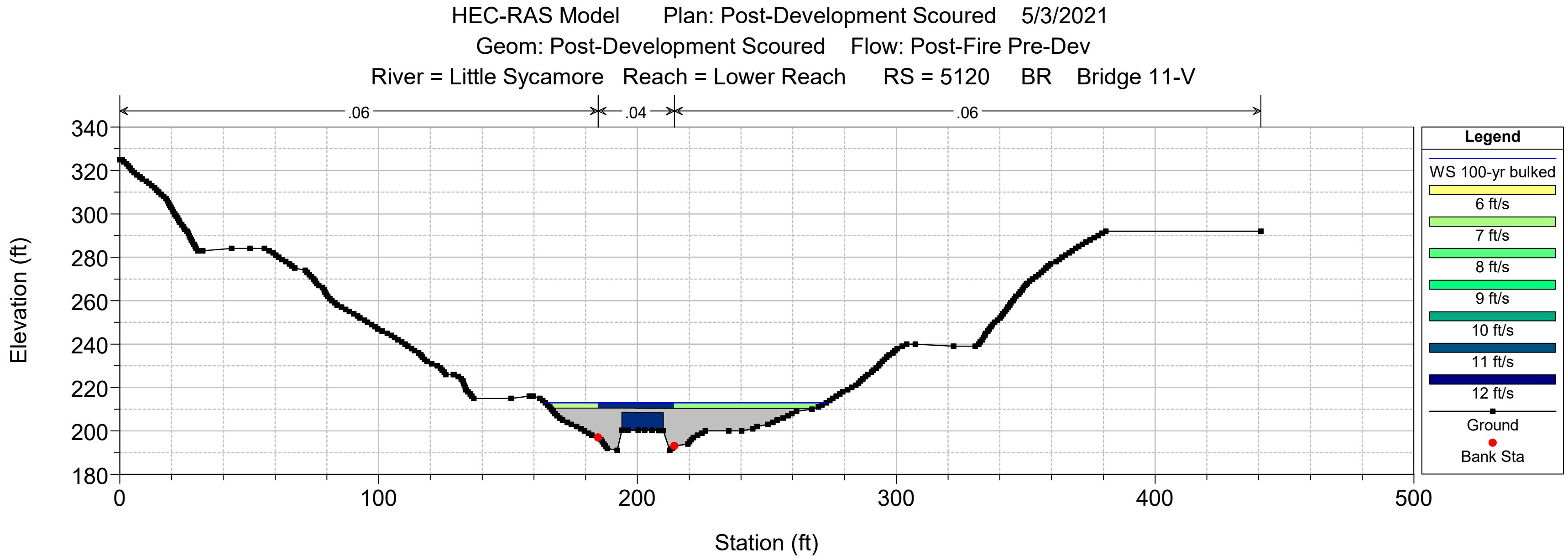


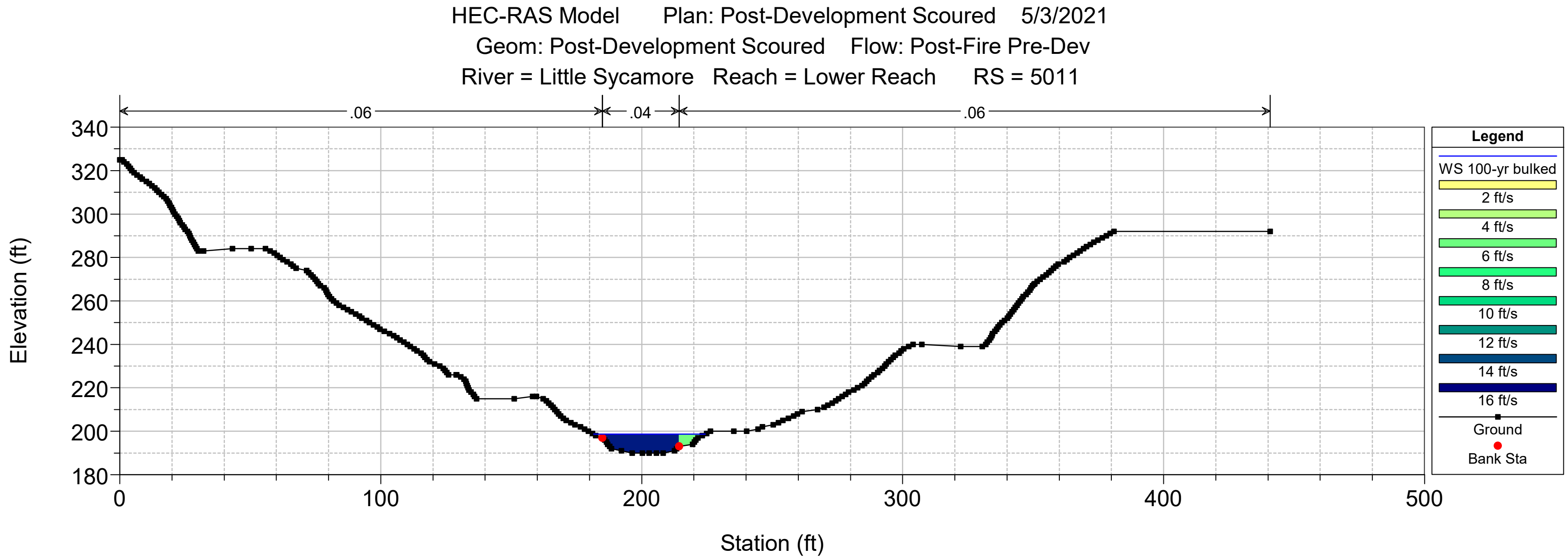
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5334

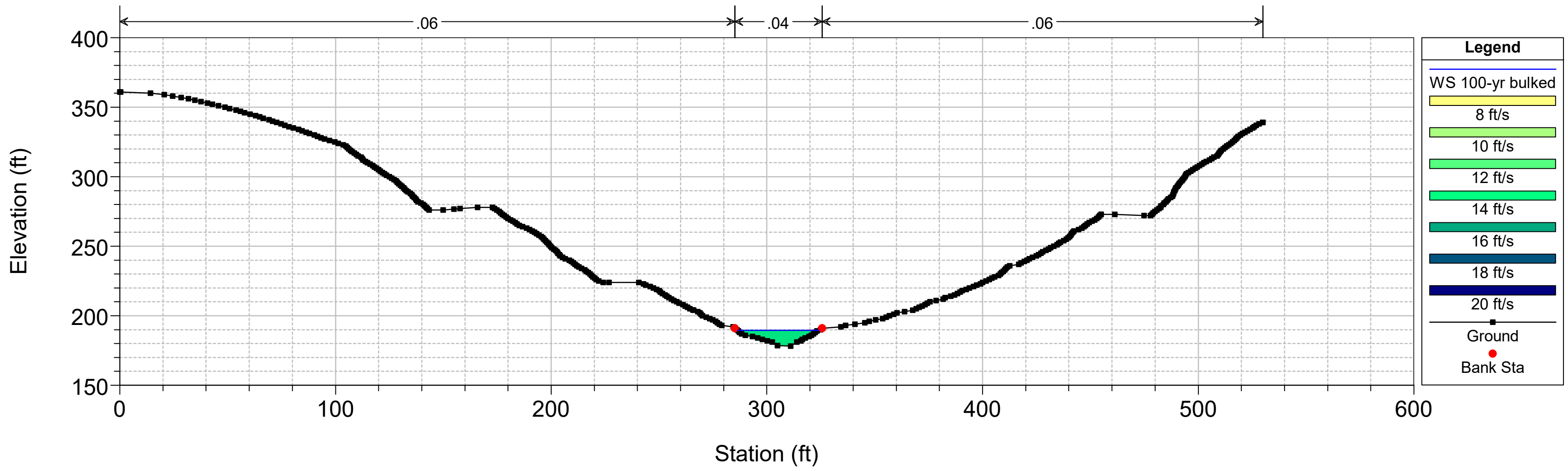



HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5207
.045
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta

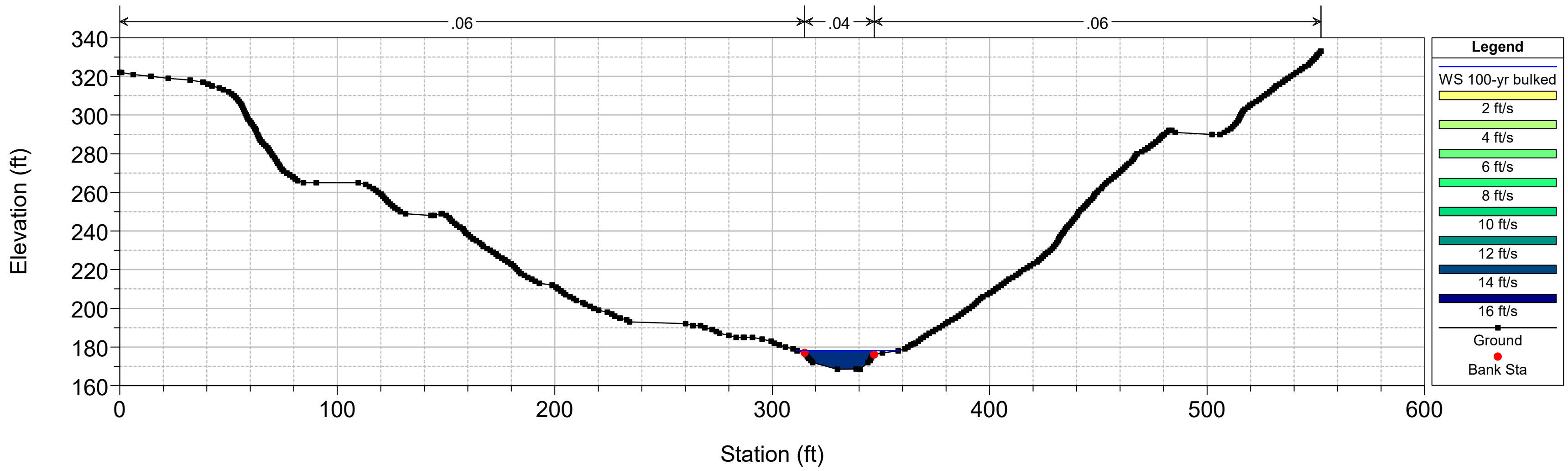

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5120 BR Bridge 11-V
.045
.04
.06
Elevation (ft)
340
320
300
280
260
240
220
200
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5120 BR Bridge 11-V

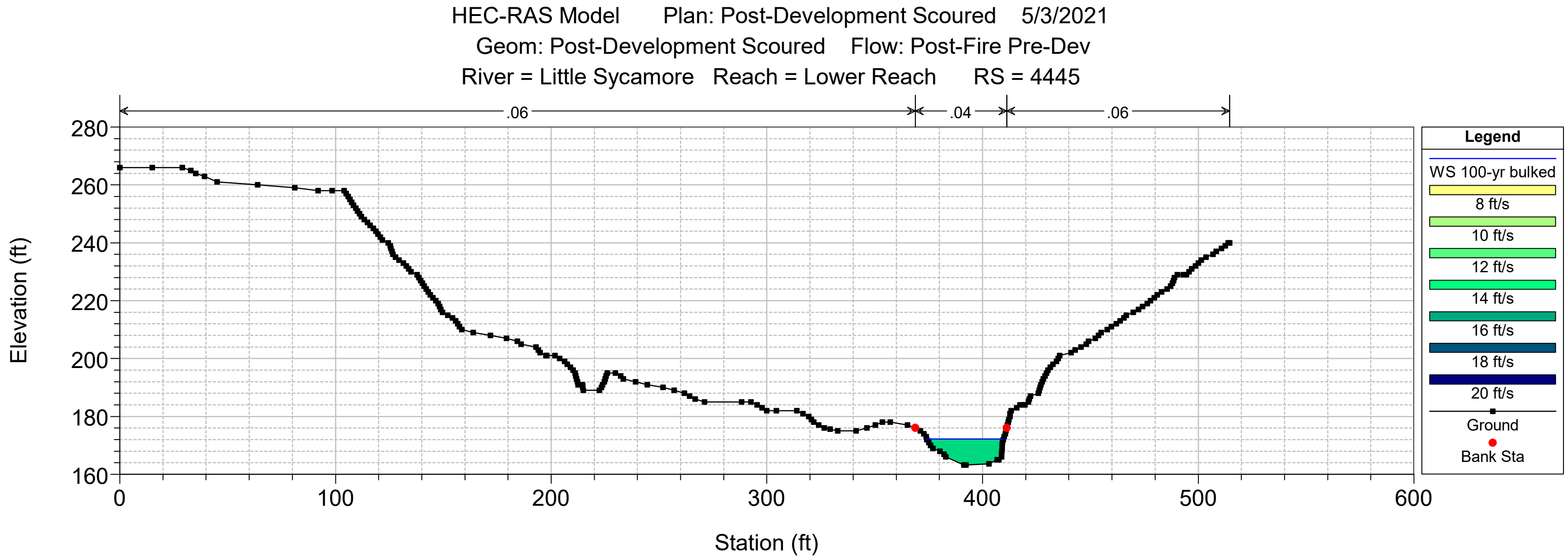

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 5011

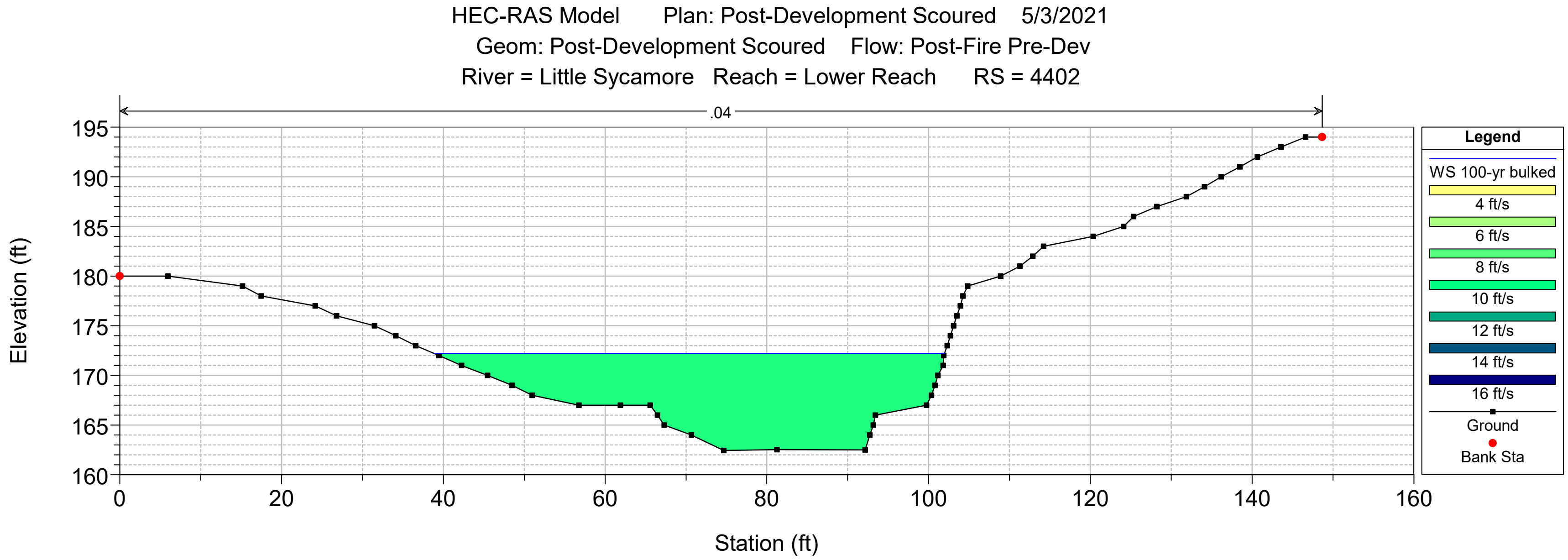


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4845

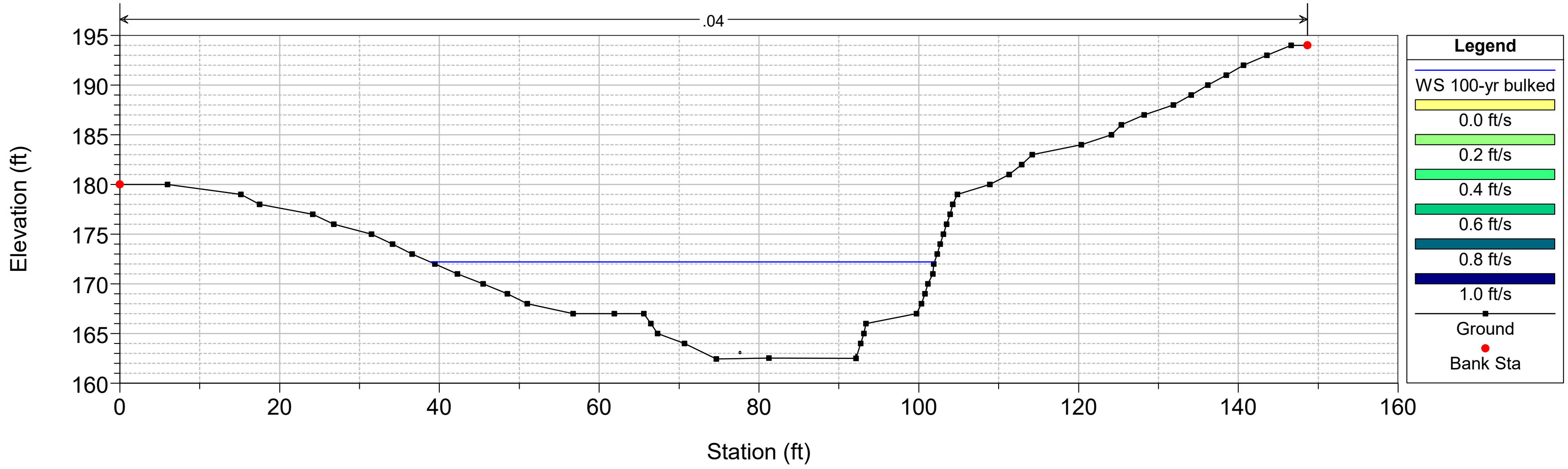


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4582

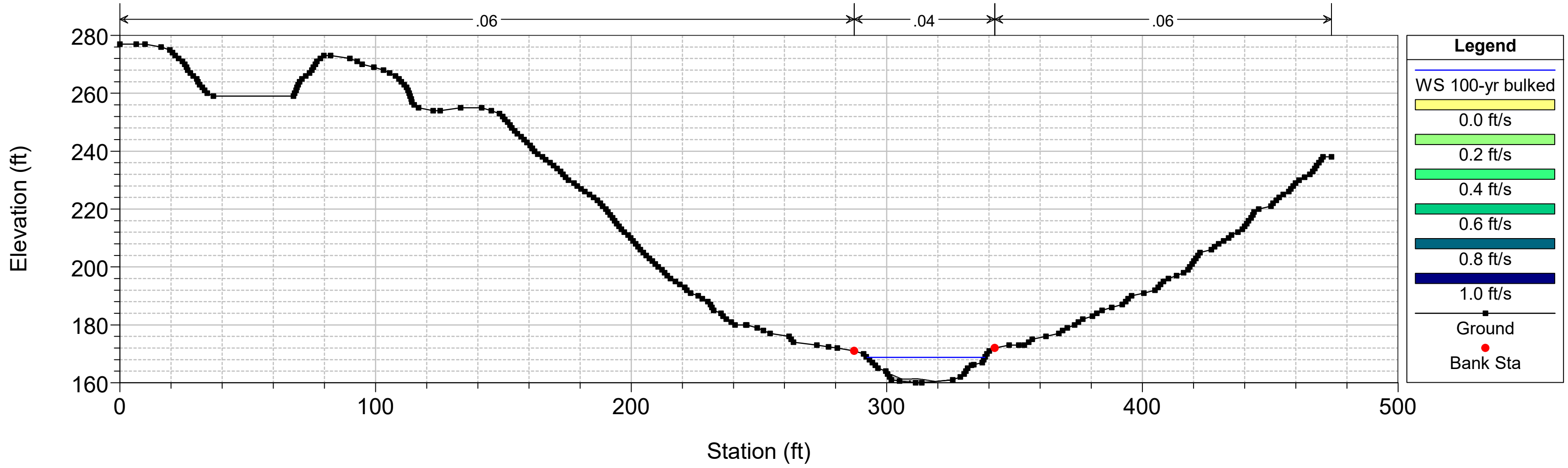

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4445


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4402

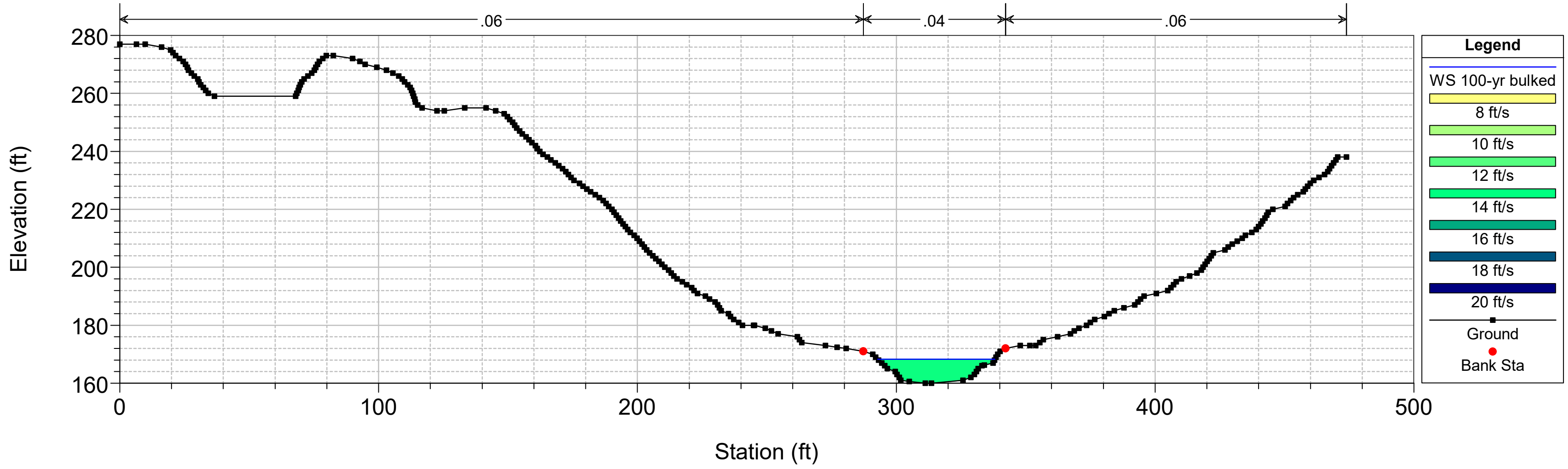
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4362 Culv Arizona Crossing 10-A-V



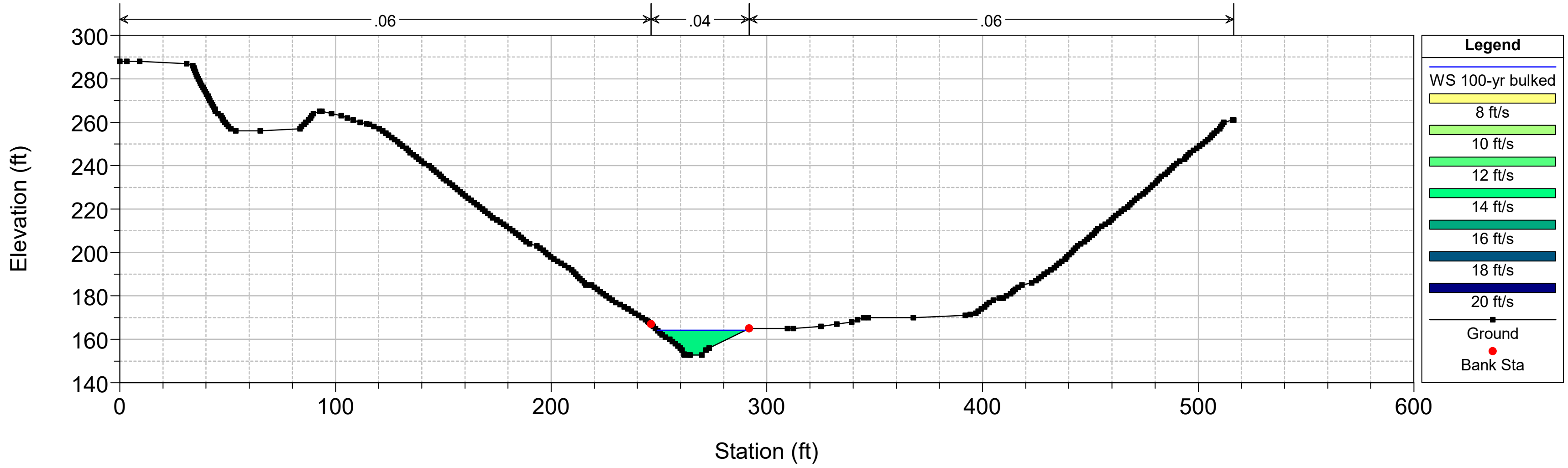
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4362 Culv Arizona Crossing 10-A-V

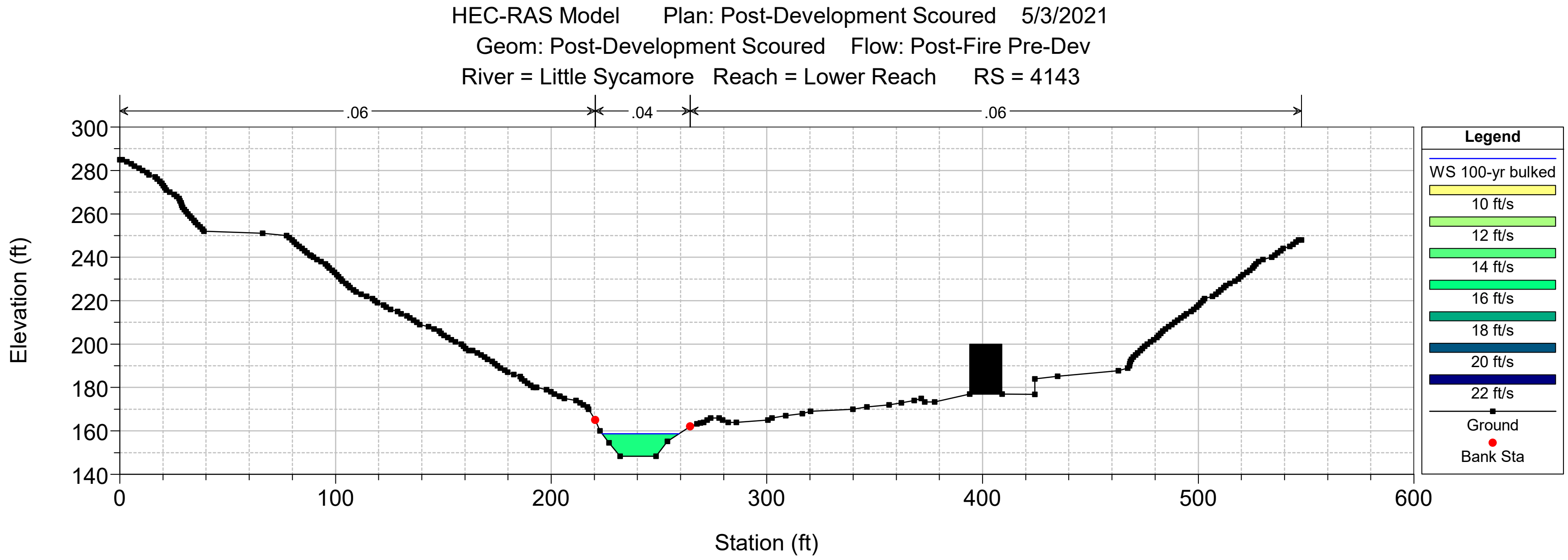


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4348

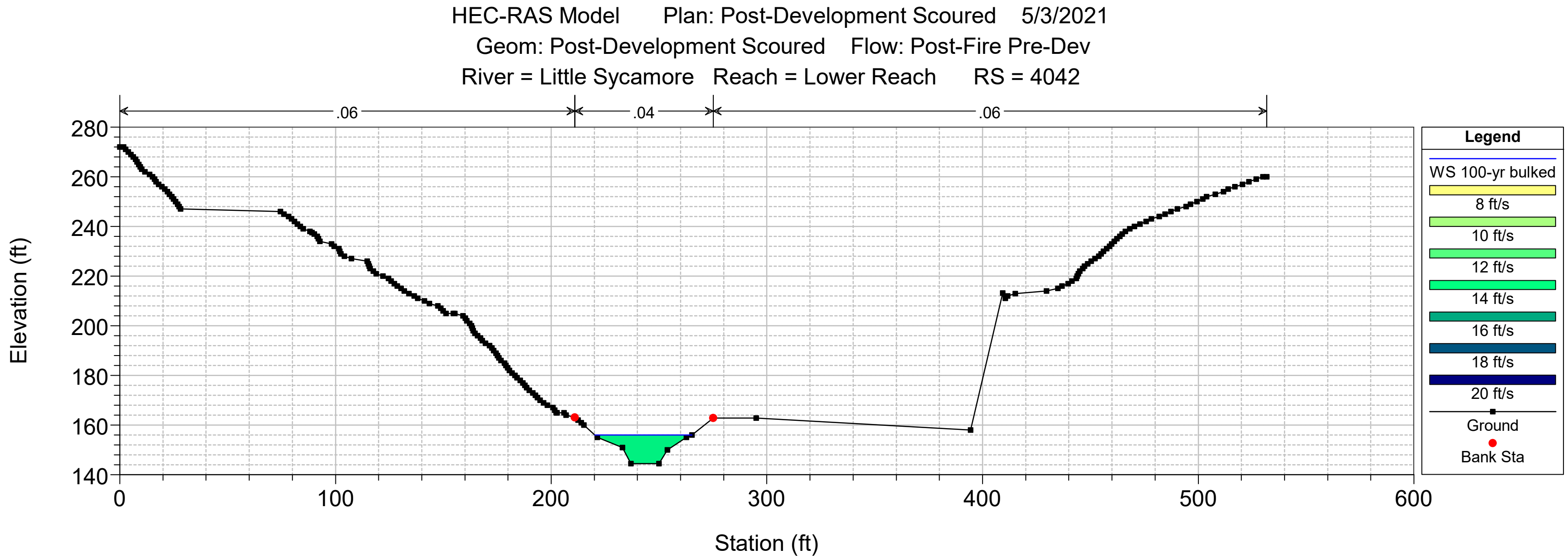


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4245

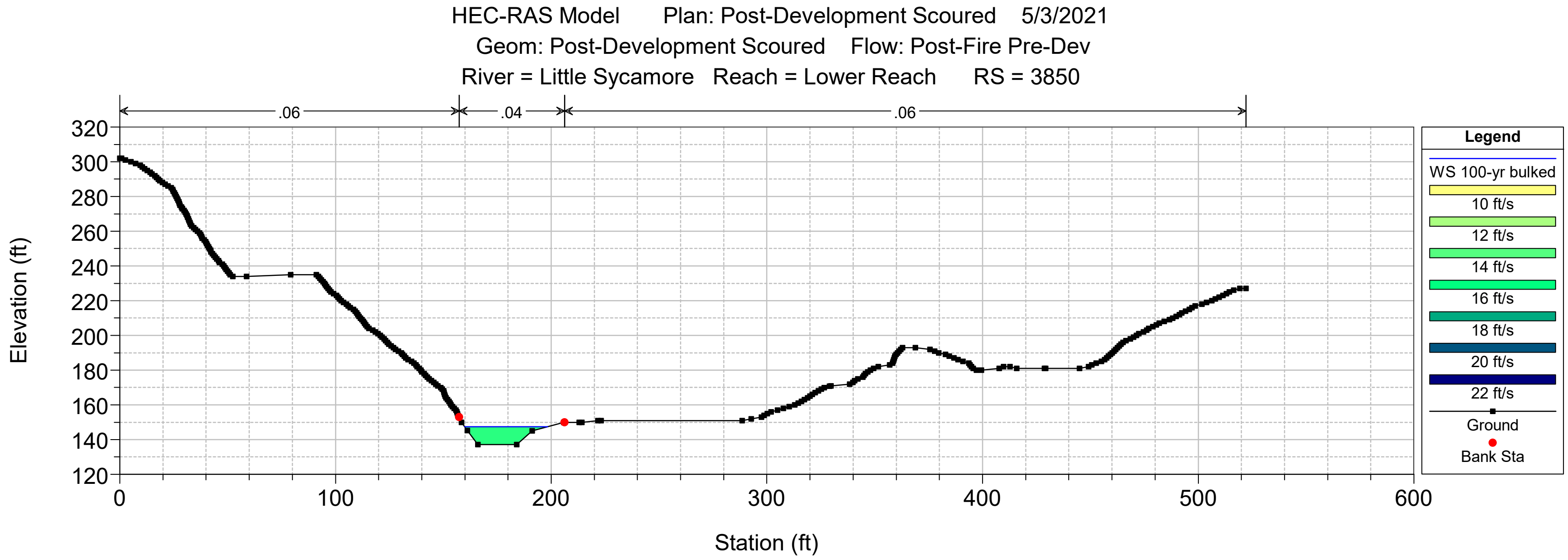




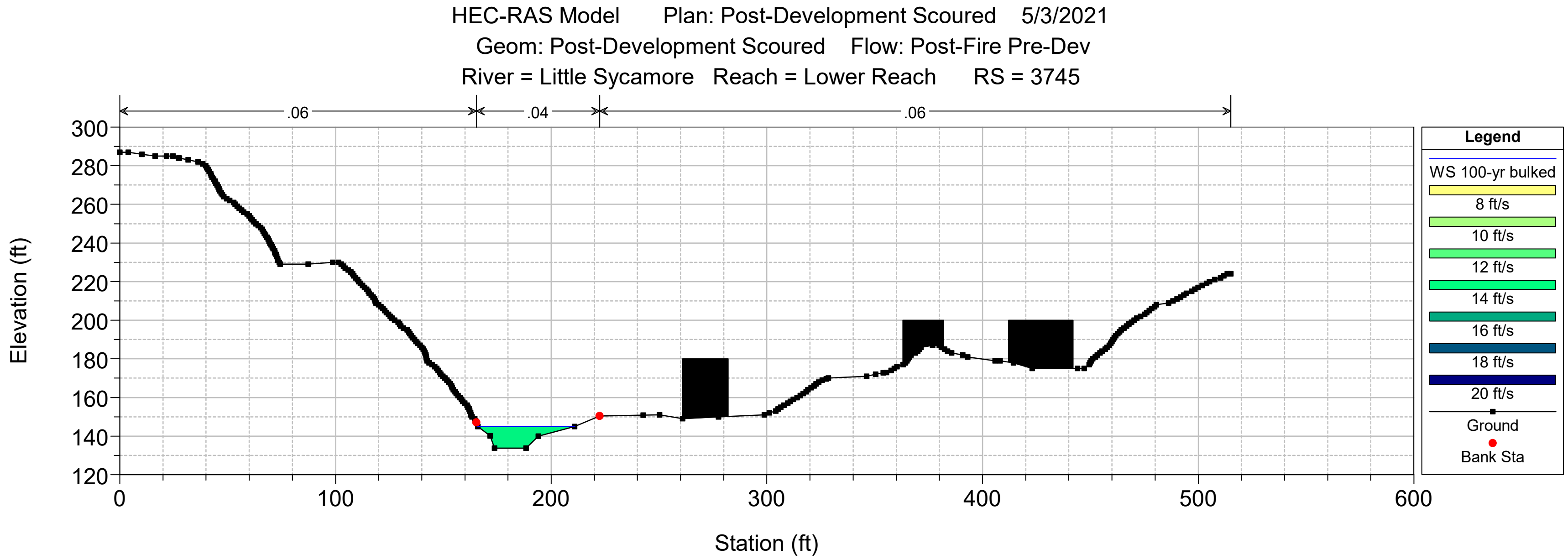
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4143



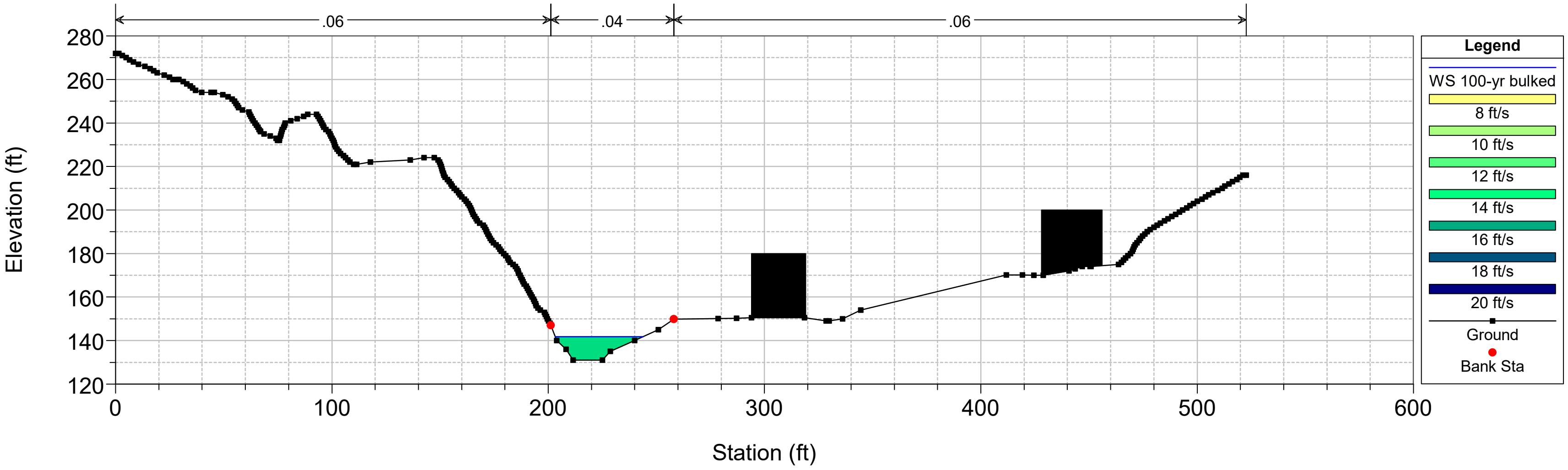
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 4042



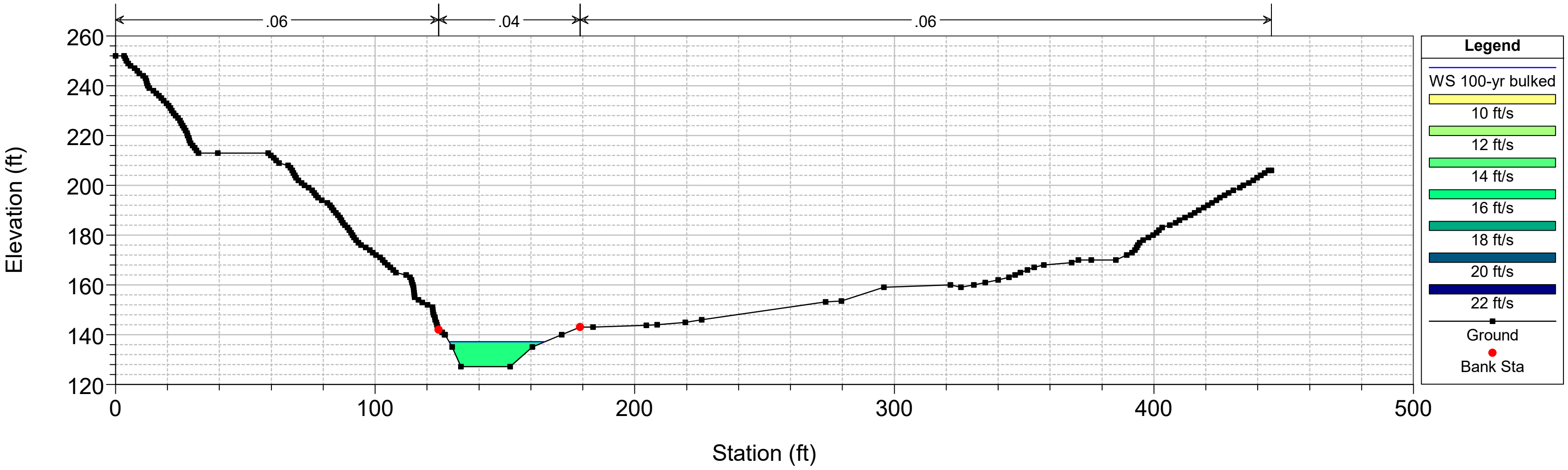
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3850



HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3745

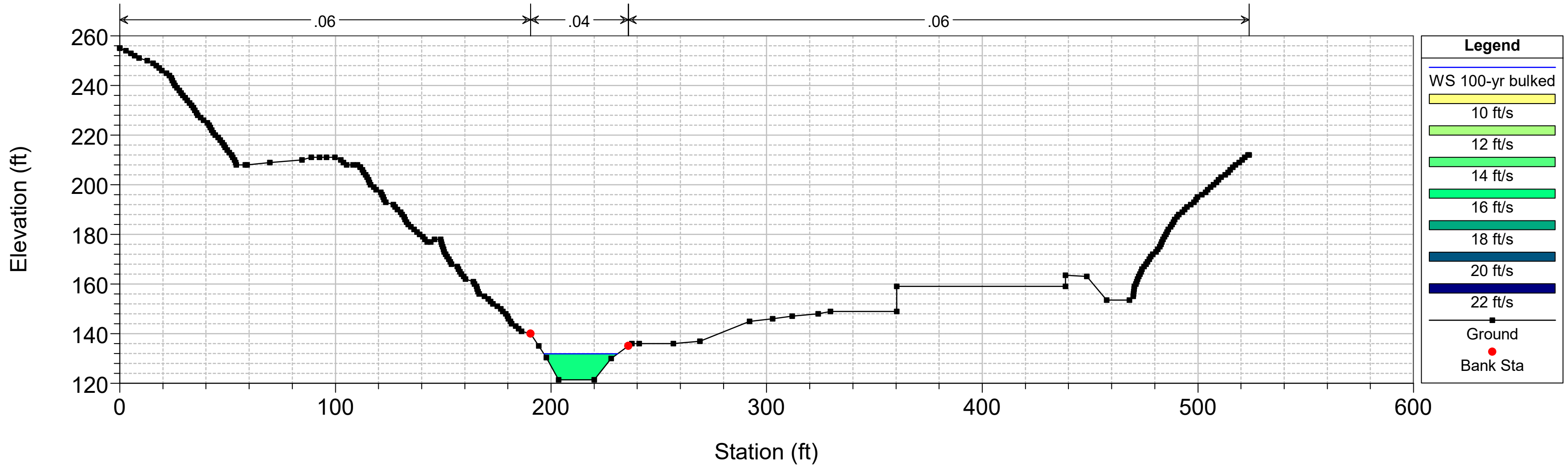


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3648

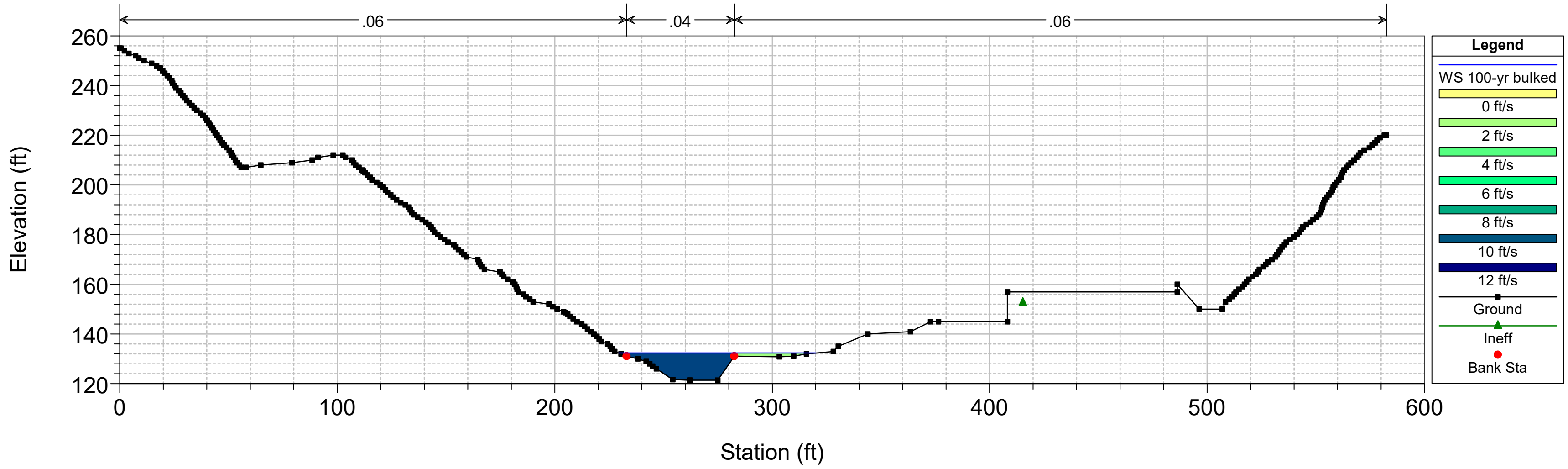


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3549

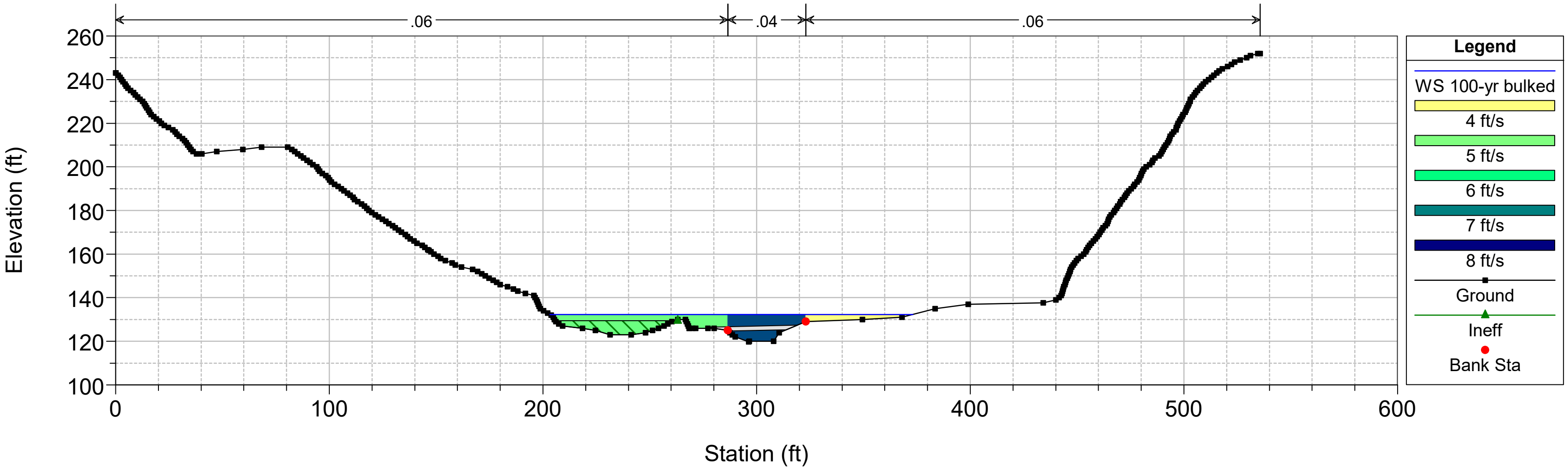
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3444



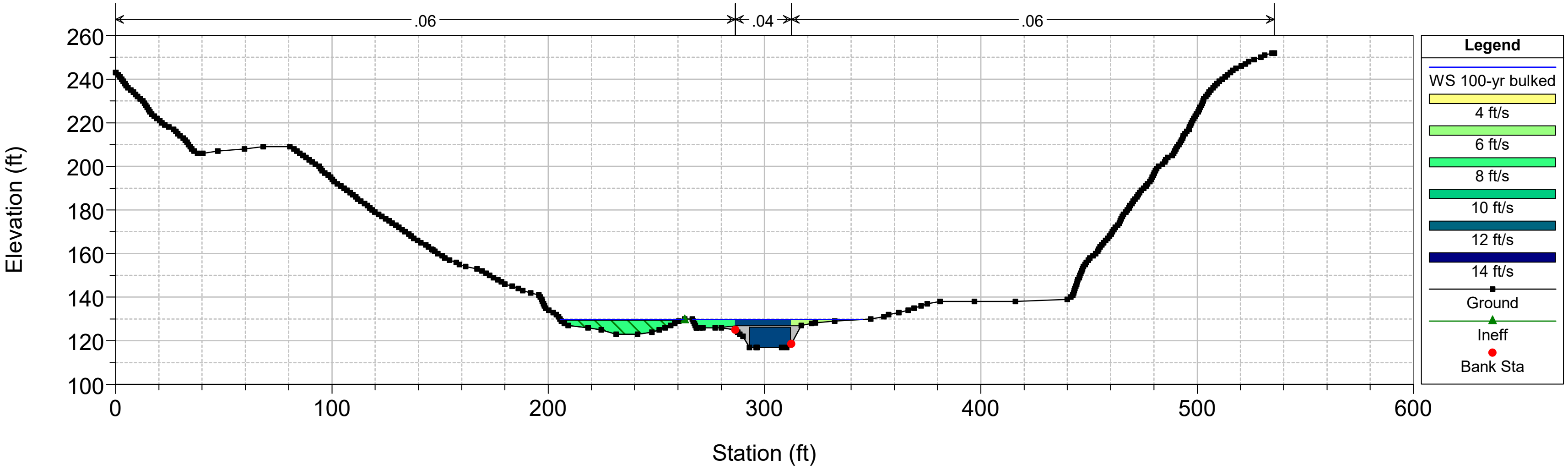
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3350

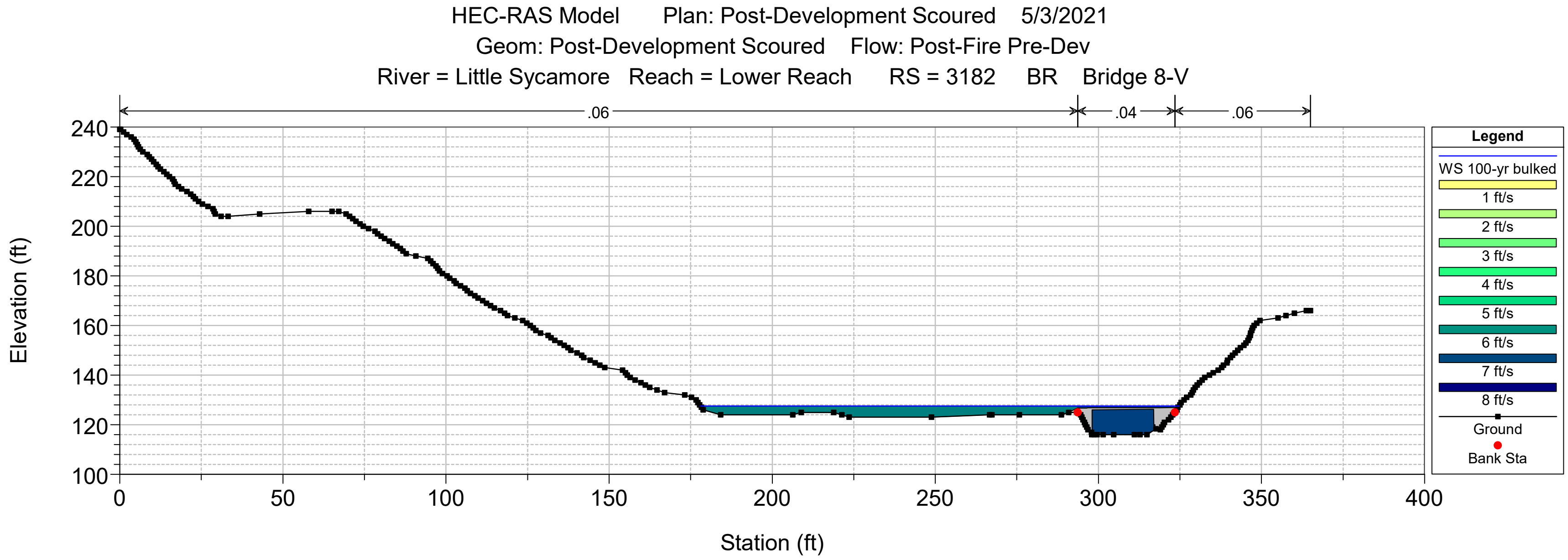


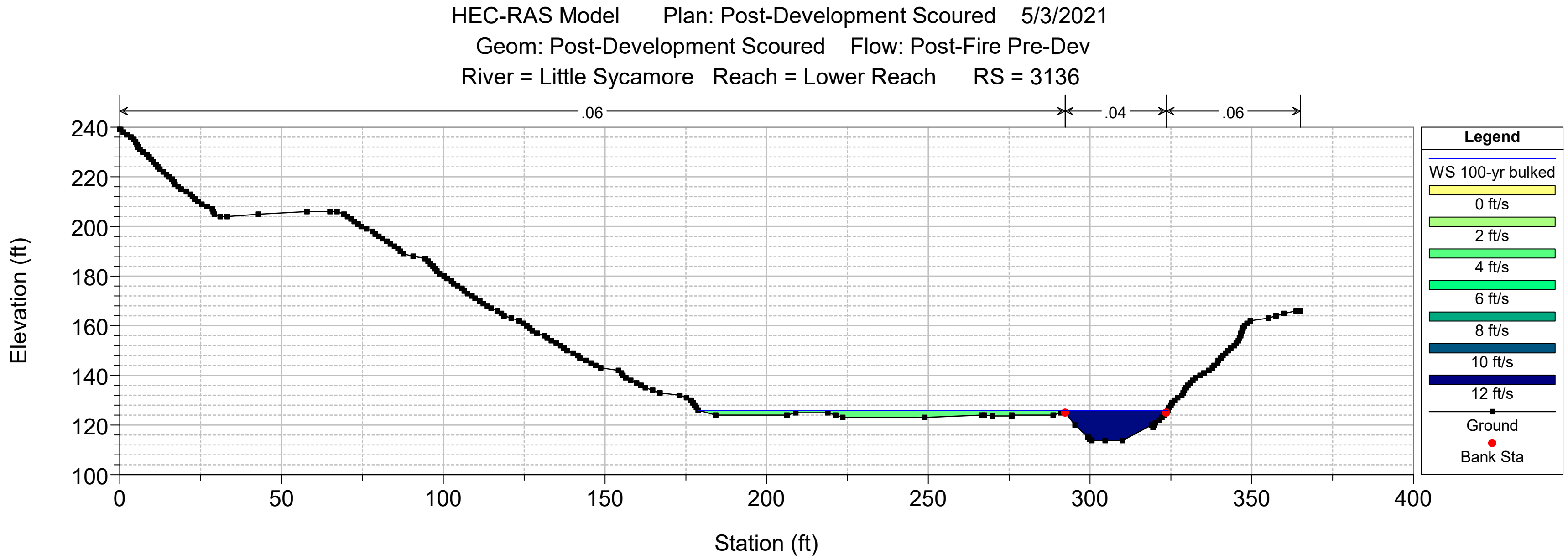
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3249 Bridge 9-P



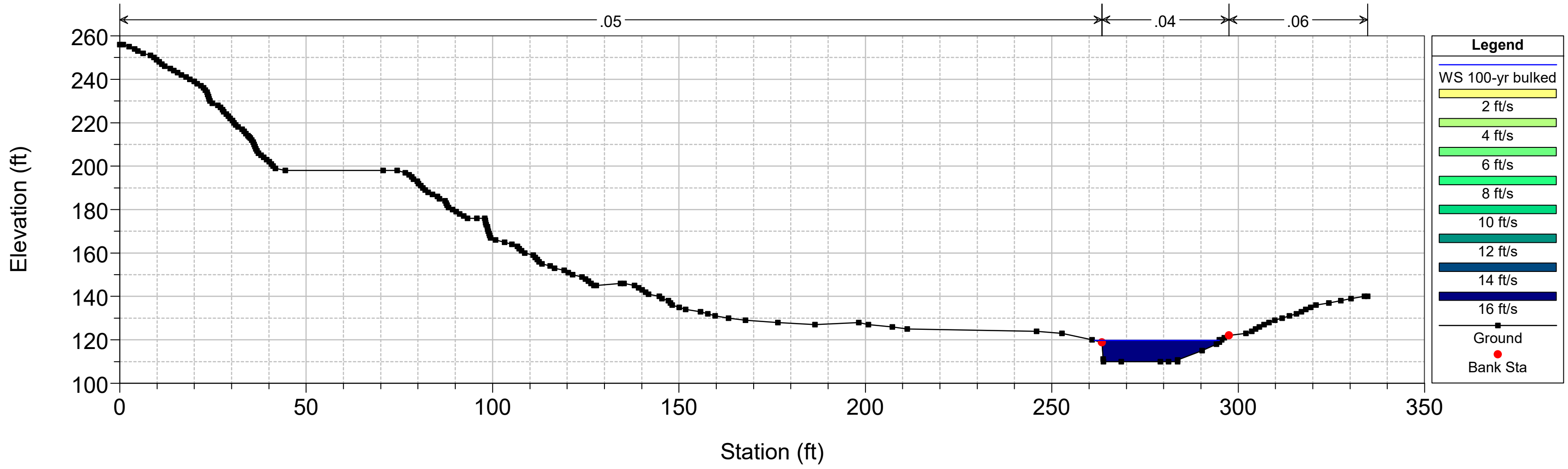
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3182 BR Bridge 8-V



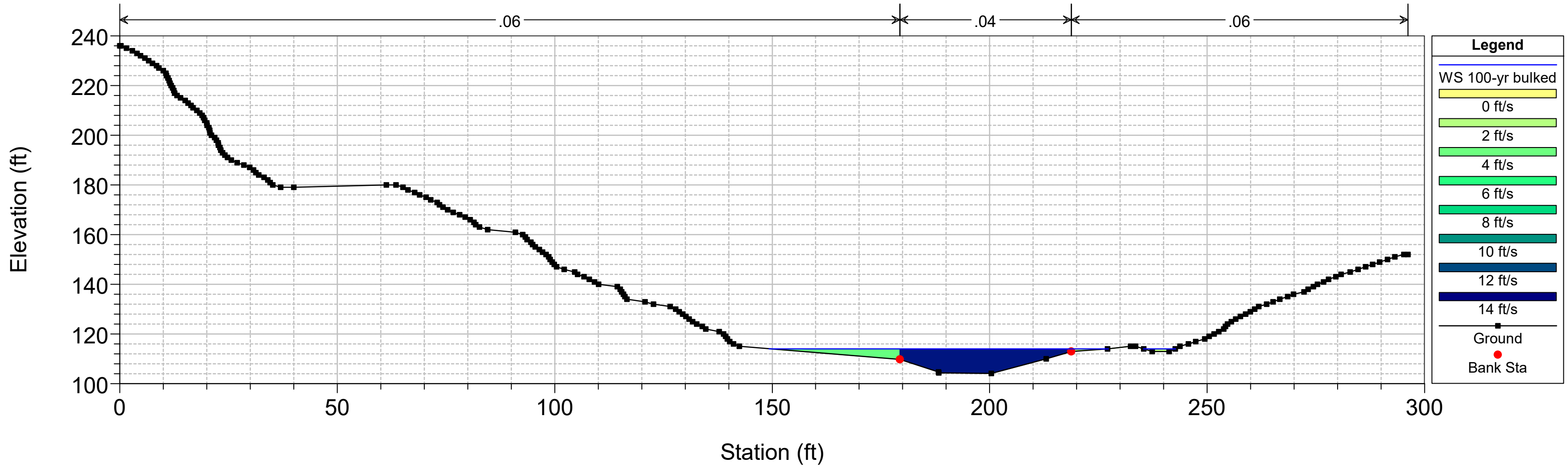

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3182 BR Bridge 8-V
.06
.04
.06
Elevation (ft)
240
220
200
180
160
140
120
100
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
1 ft/s
2 ft/s
3 ft/s
4 ft/s
5 ft/s
6 ft/s
7 ft/s
8 ft/s
Ground
Bank Sta

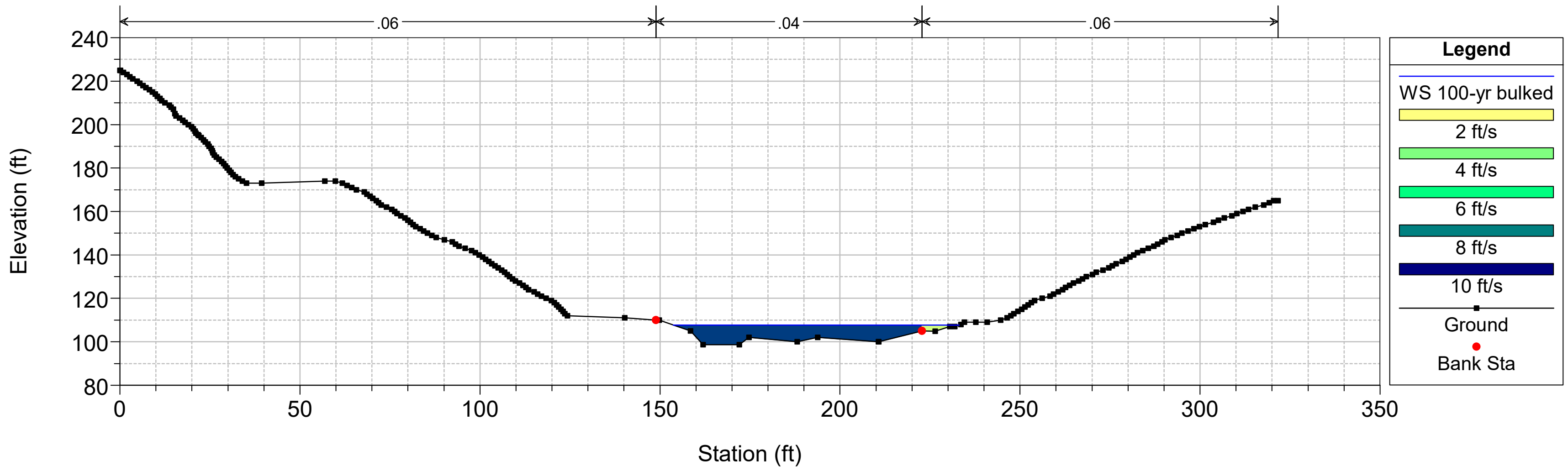

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3136
.06
.04
.06
Elevation (ft)
240
220
200
180
160
140
120
100
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

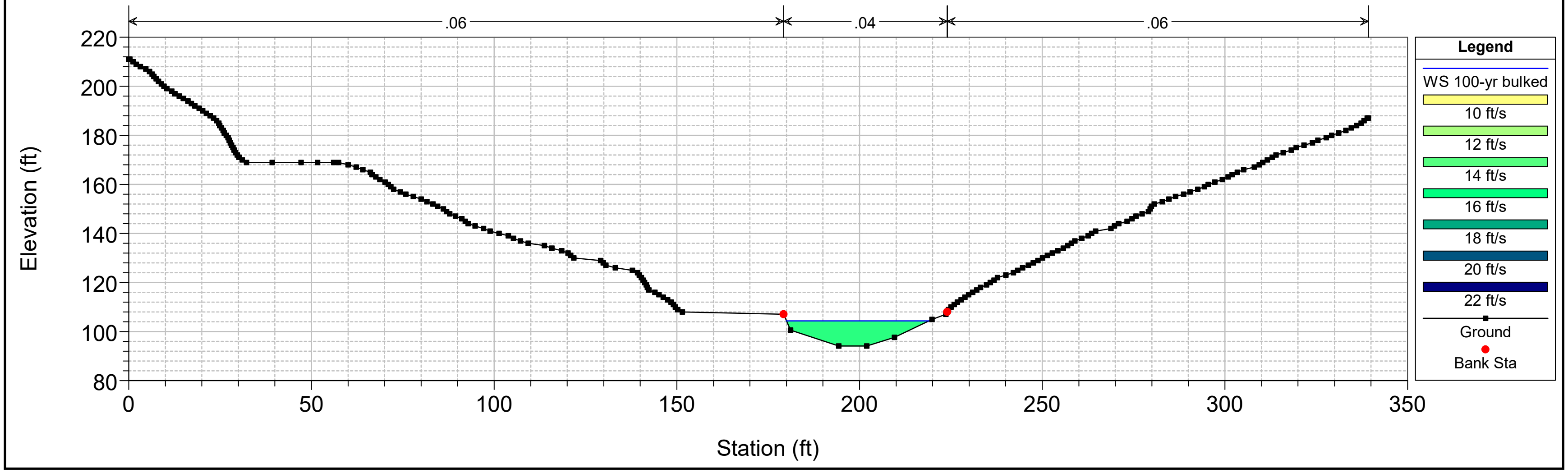
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 3051



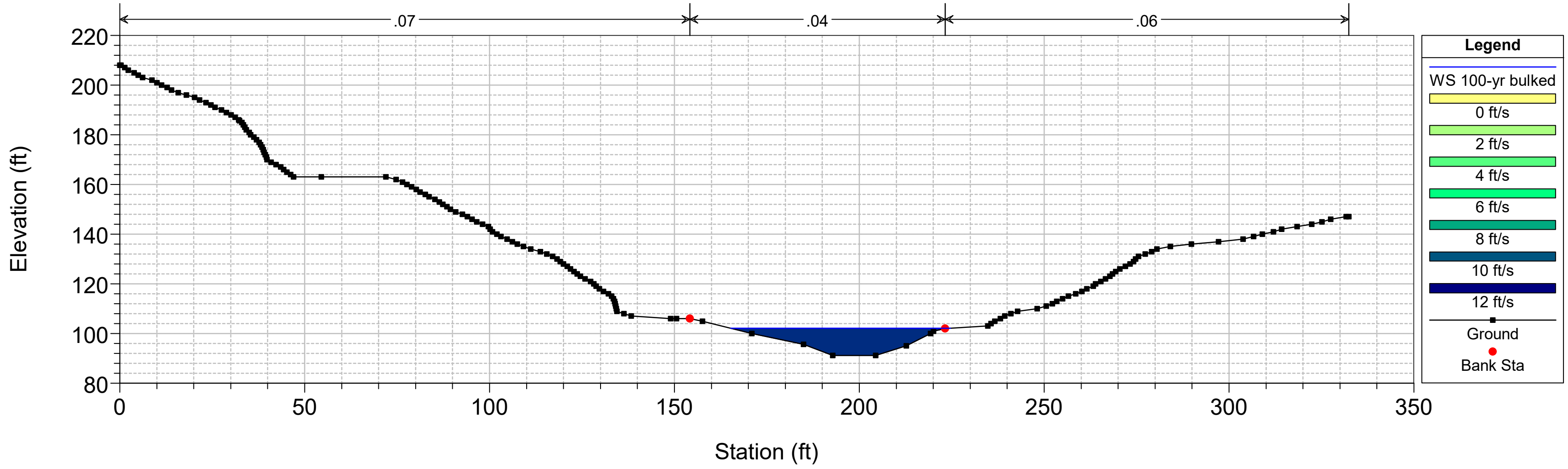
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2960



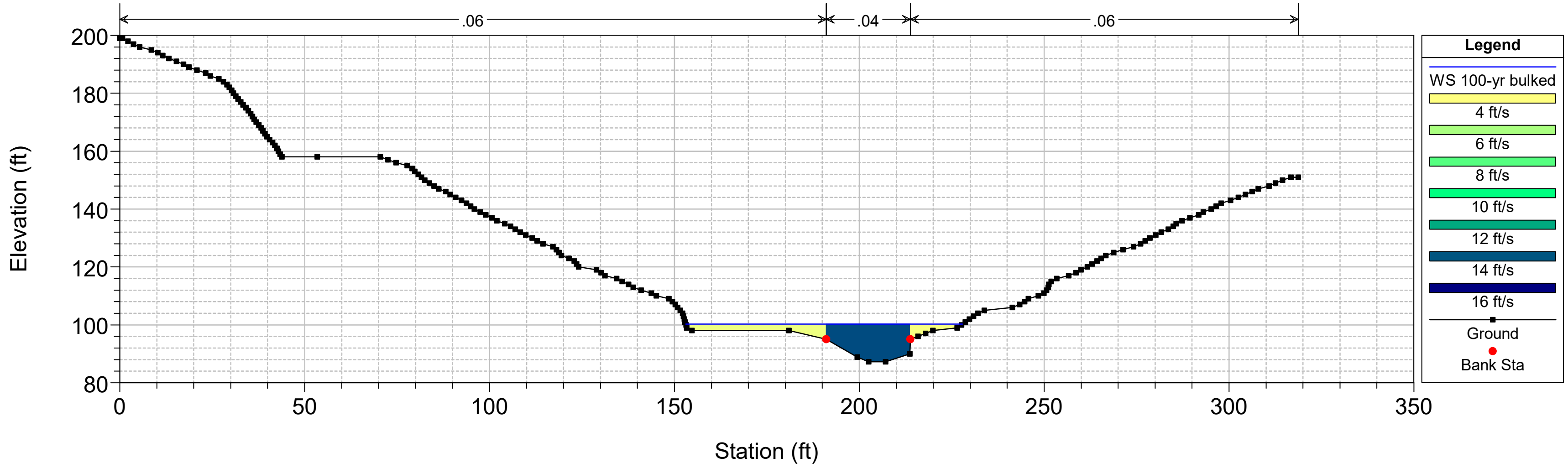

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2858

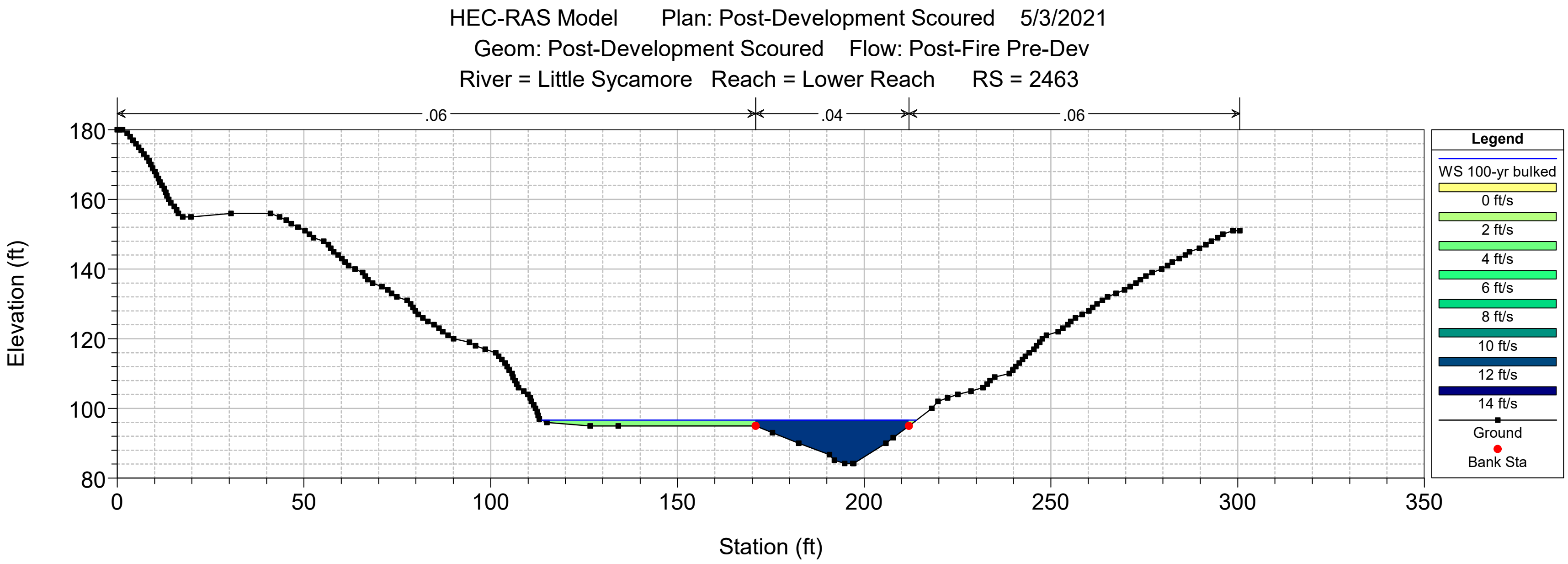

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2761

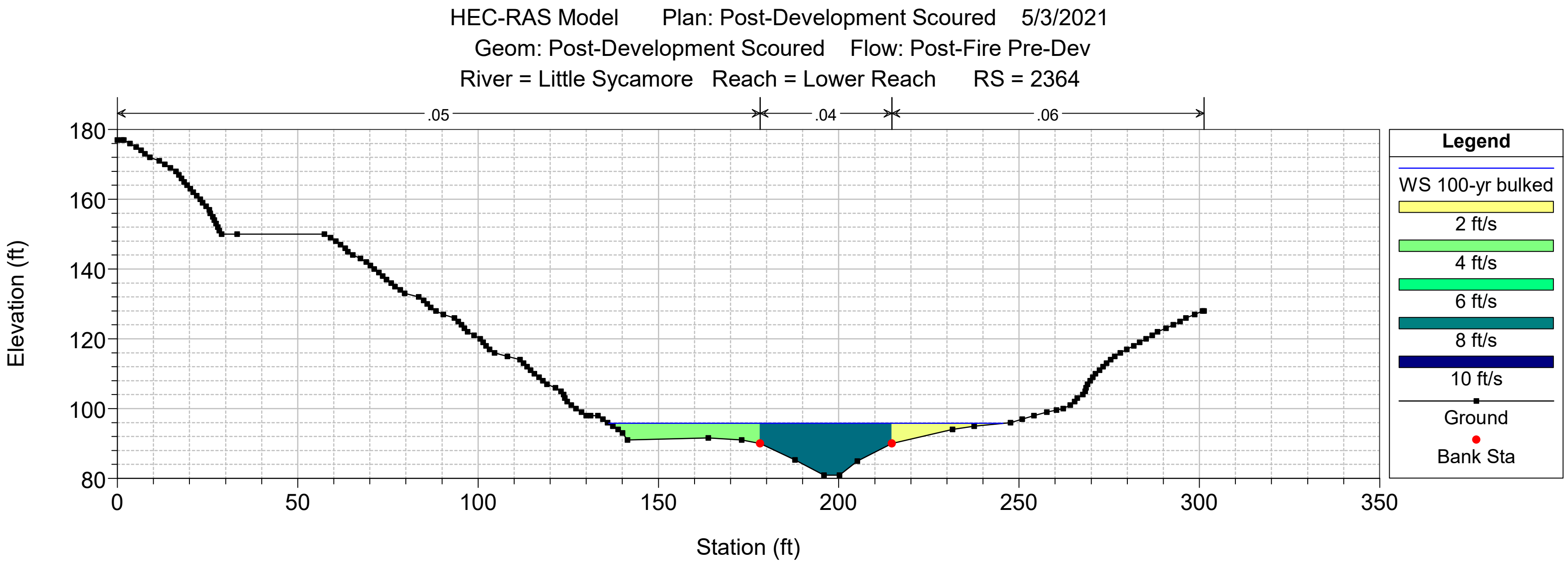
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2659

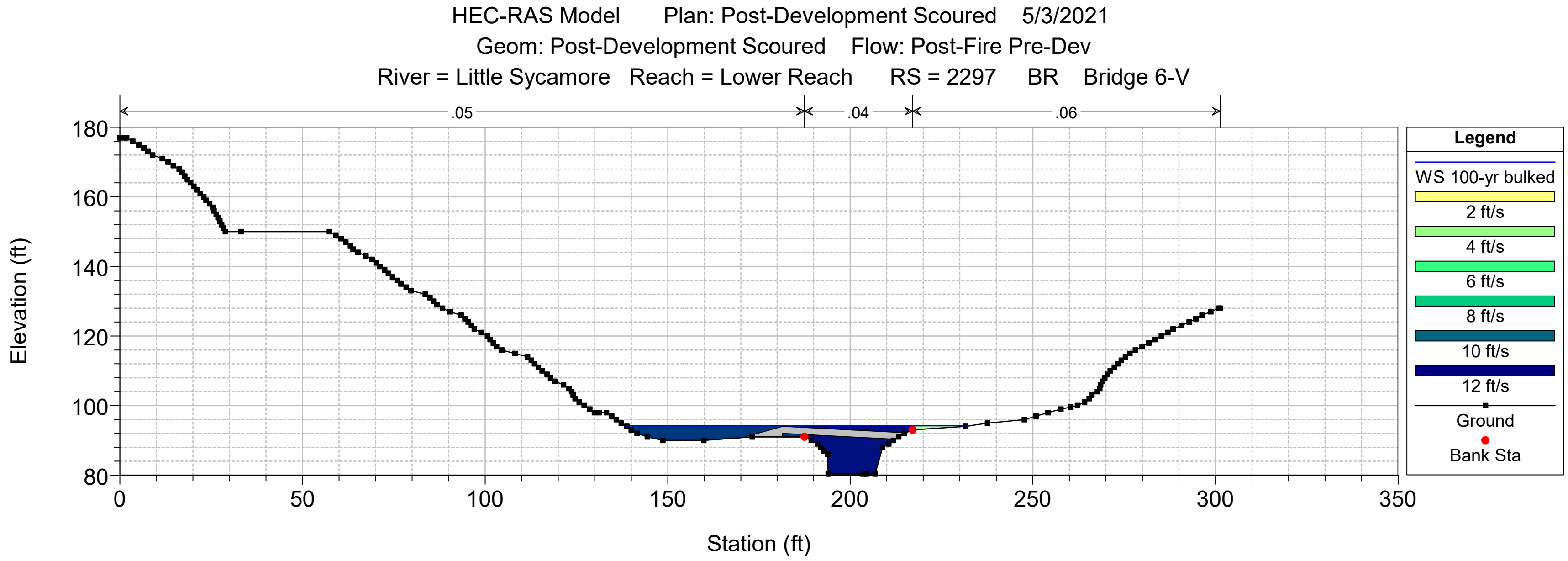


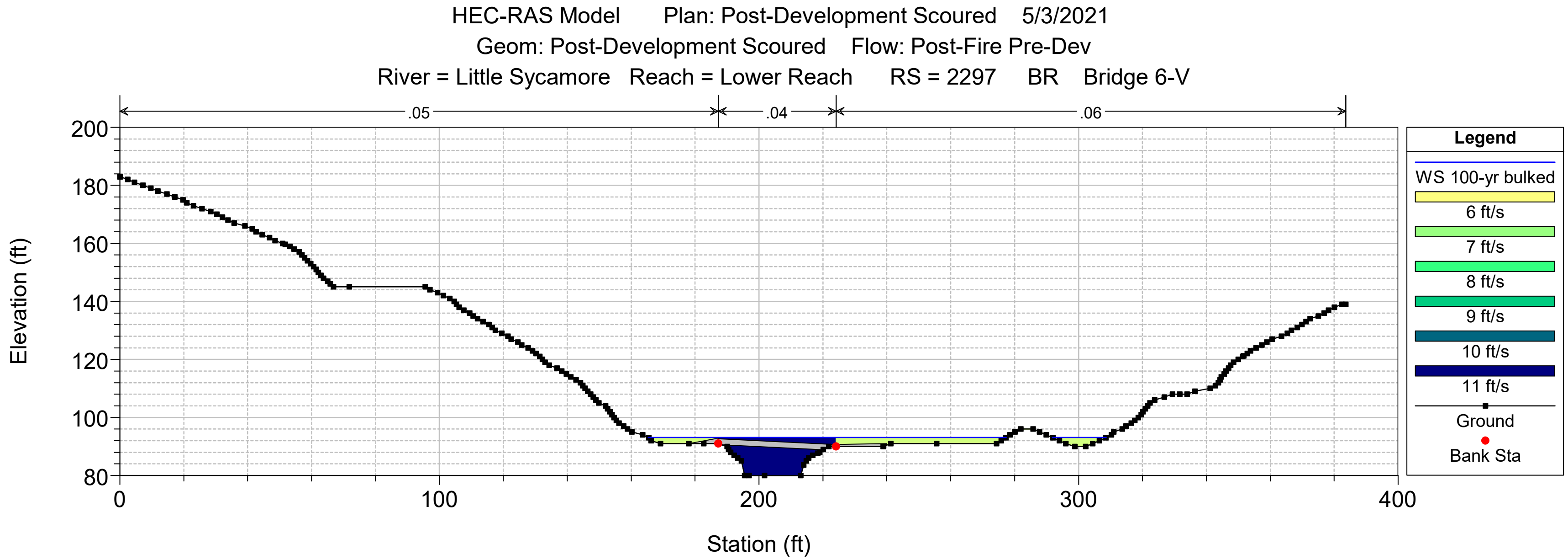
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2556

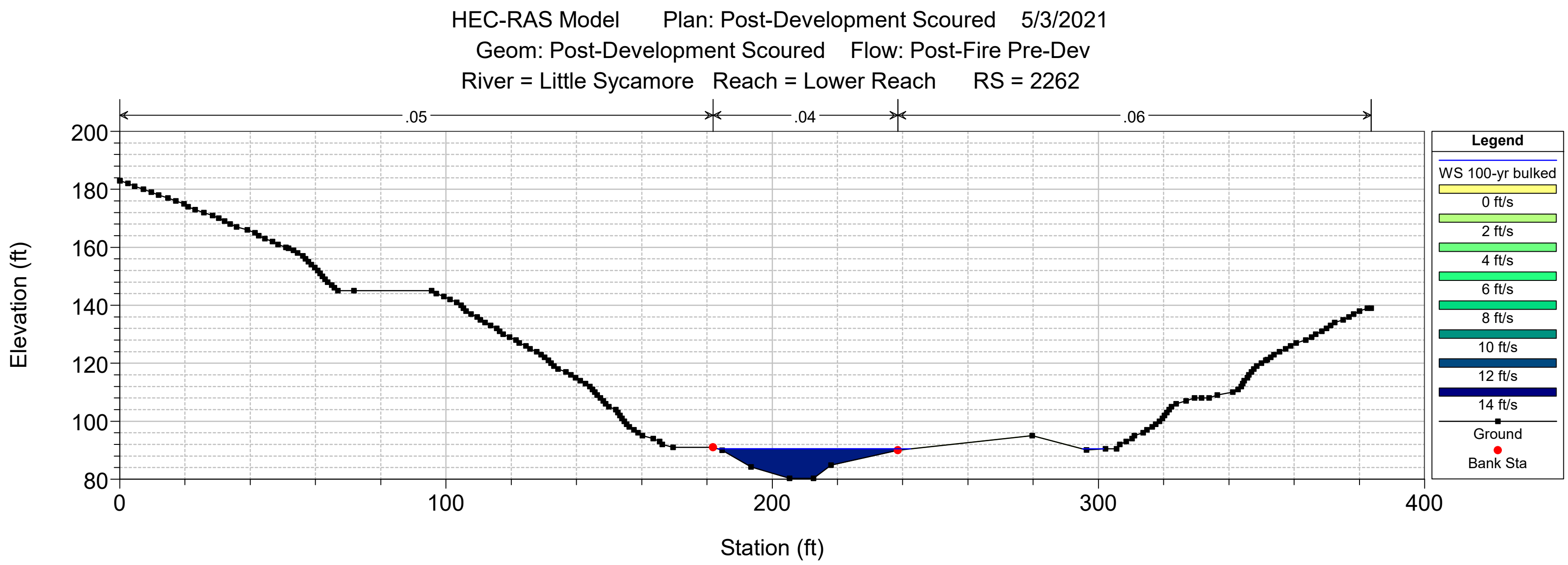


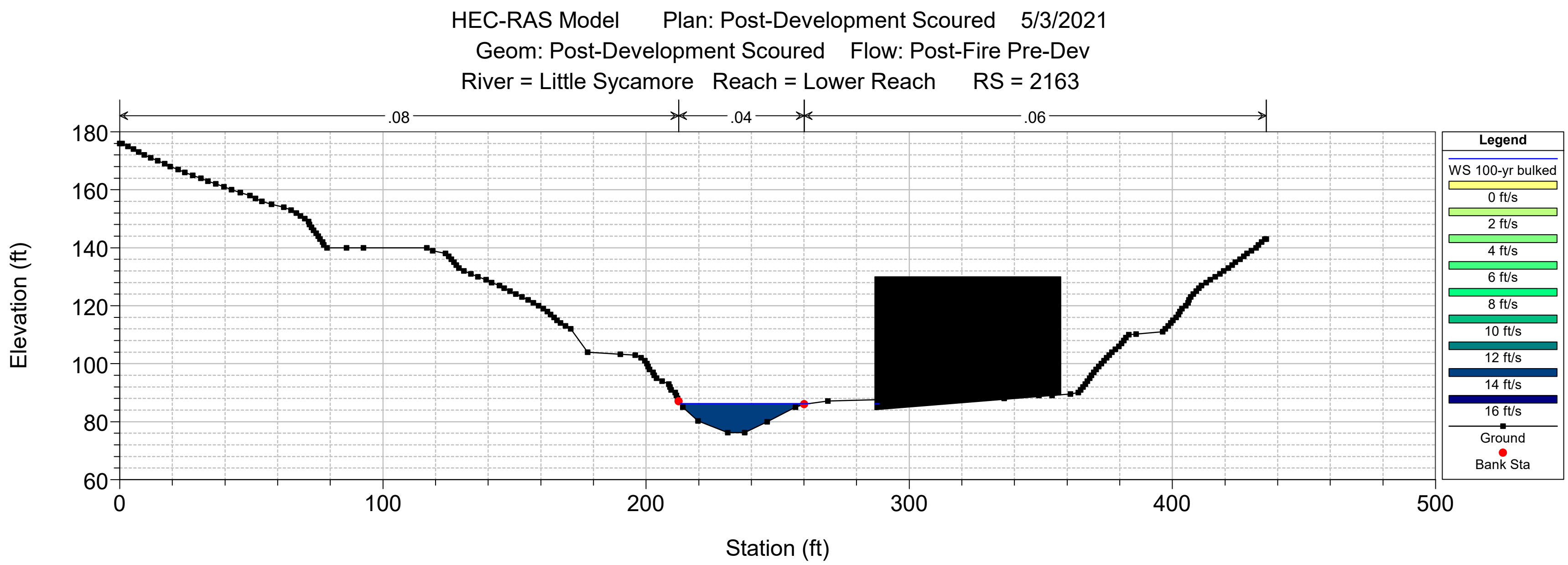

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2463
.06
.04
.06
Elevation (ft)
180
160
140
120
100
80
0
50
100
150
200
250
300
350
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2364
.05
.04
.06
Elevation (ft)
180
160
140
120
100
80
0
50
100
150
200
250
300
350
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
Ground
Bank Sta

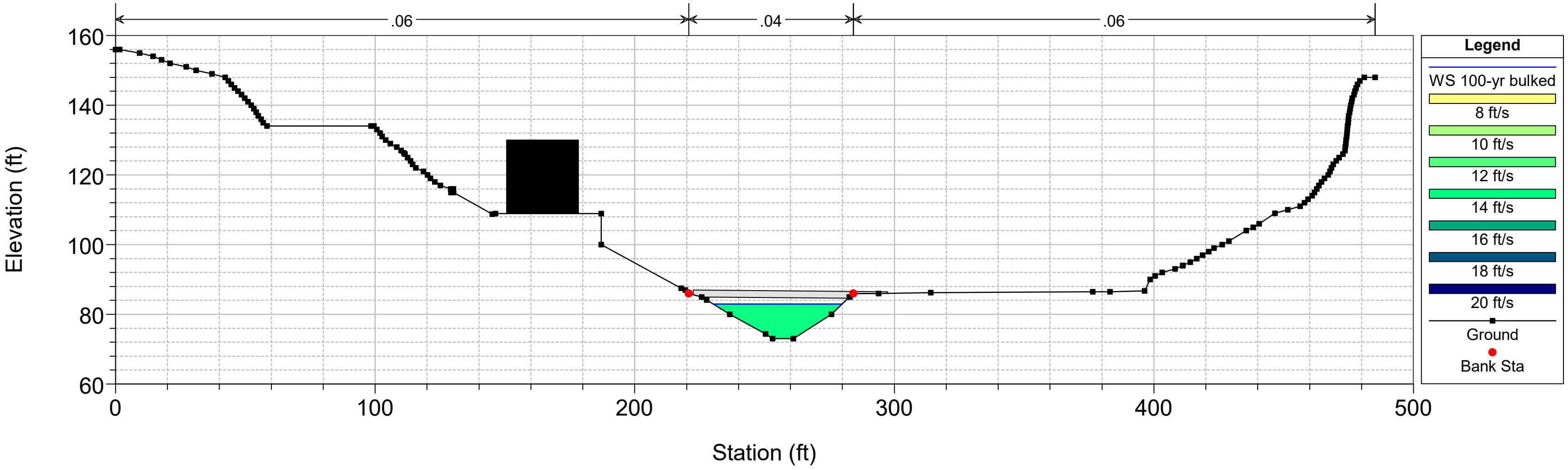

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2297 BR Bridge 6-V
.05
.04
.06
Elevation (ft)
180
160
140
120
100
80
0
50
100
150
200
250
300
350
Station (ft)
Legend
WS 100-yr bulked
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2297 BR Bridge 6-V
.05
.04
.06
Elevation (ft)
200
180
160
140
120
100
80
0
100
200
300
400
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
7 ft/s
8 ft/s
9 ft/s
10 ft/s
11 ft/s
Ground
Bank Sta

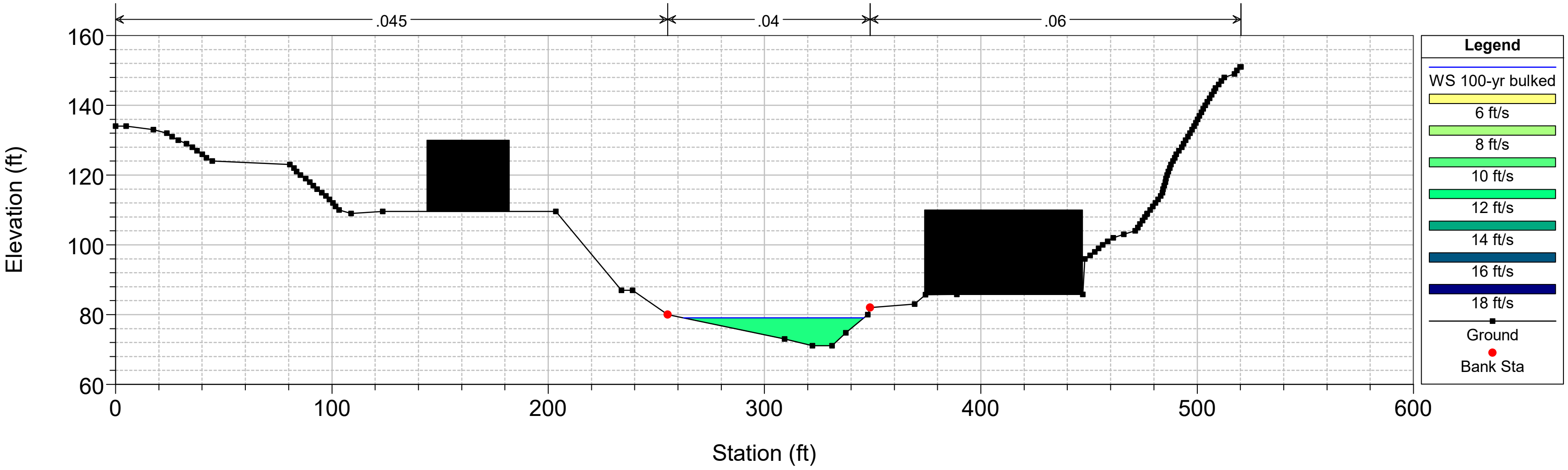

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2262


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2163

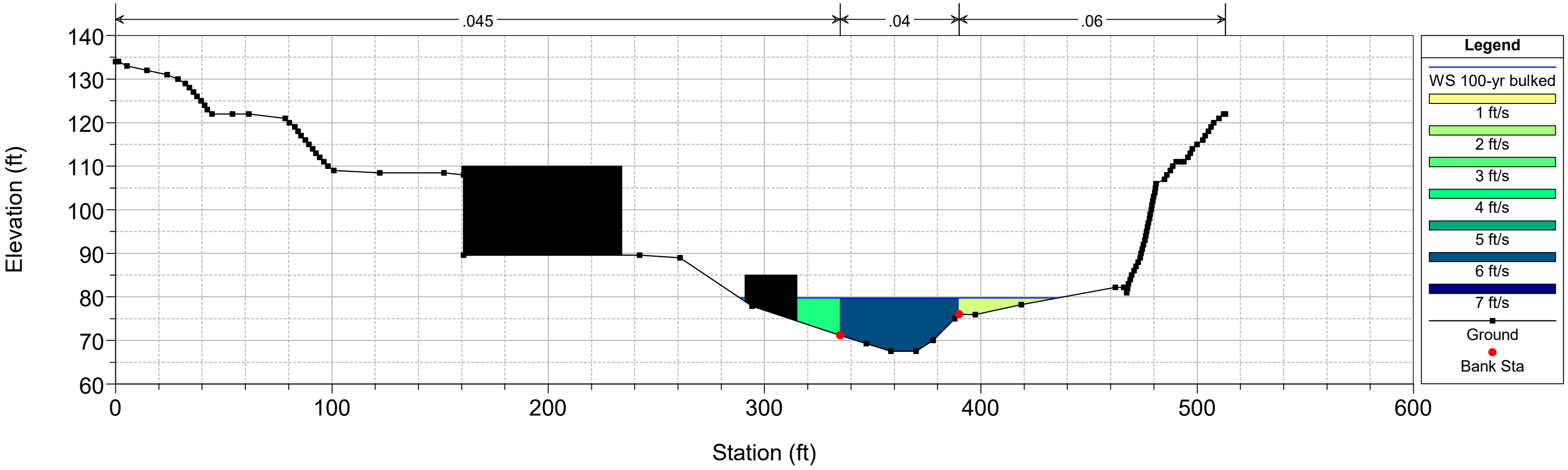
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 2058 Bridge 5P



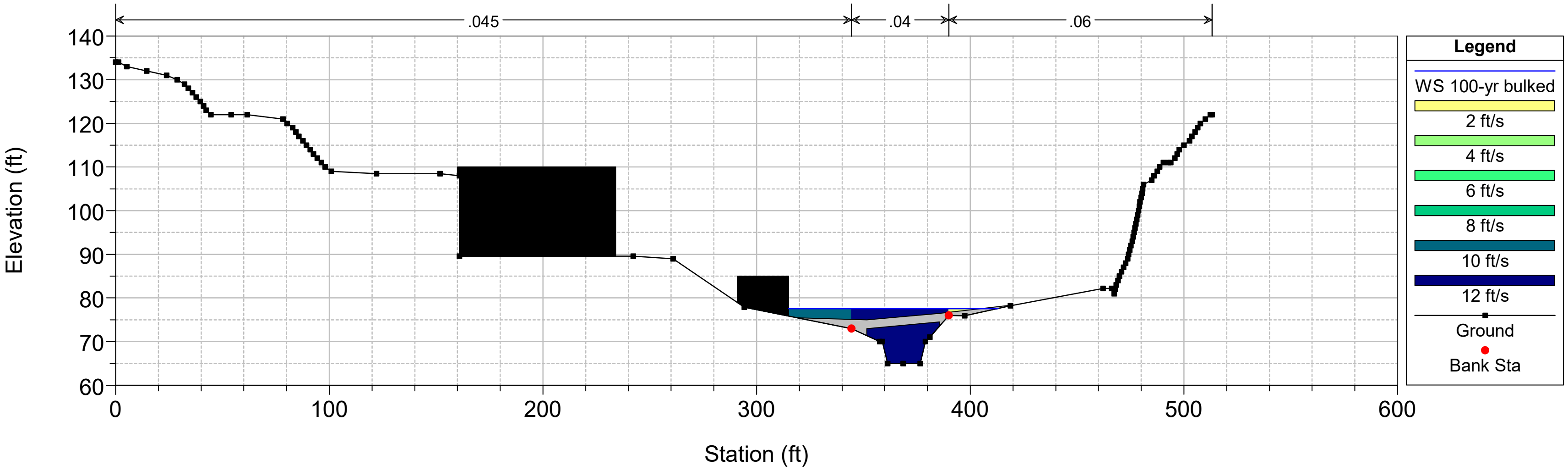
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1962



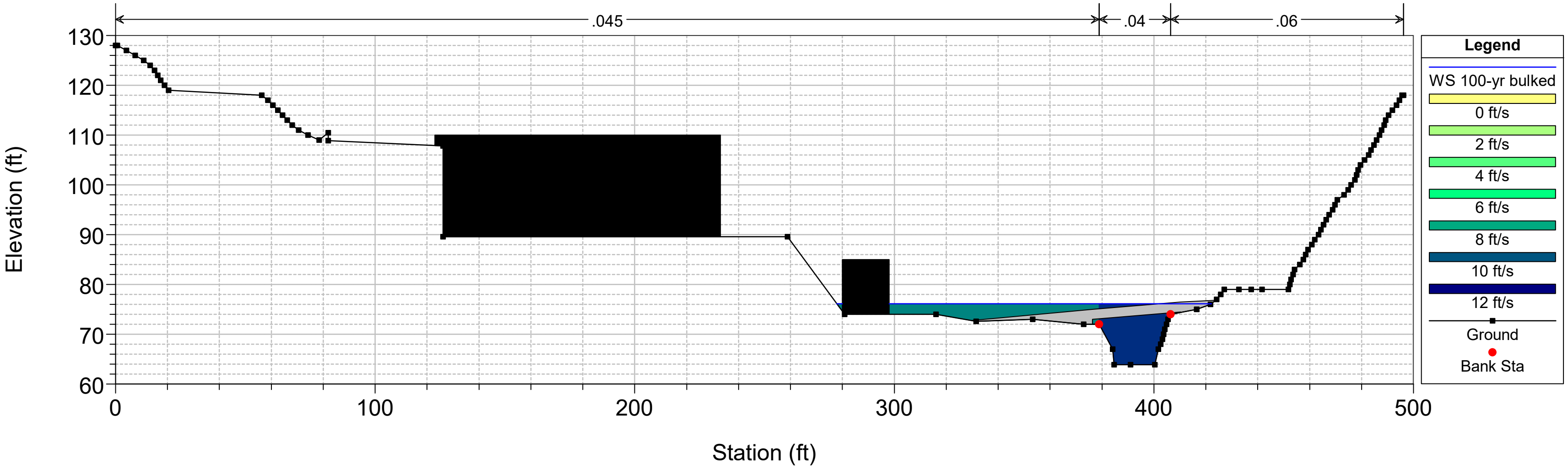
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1861



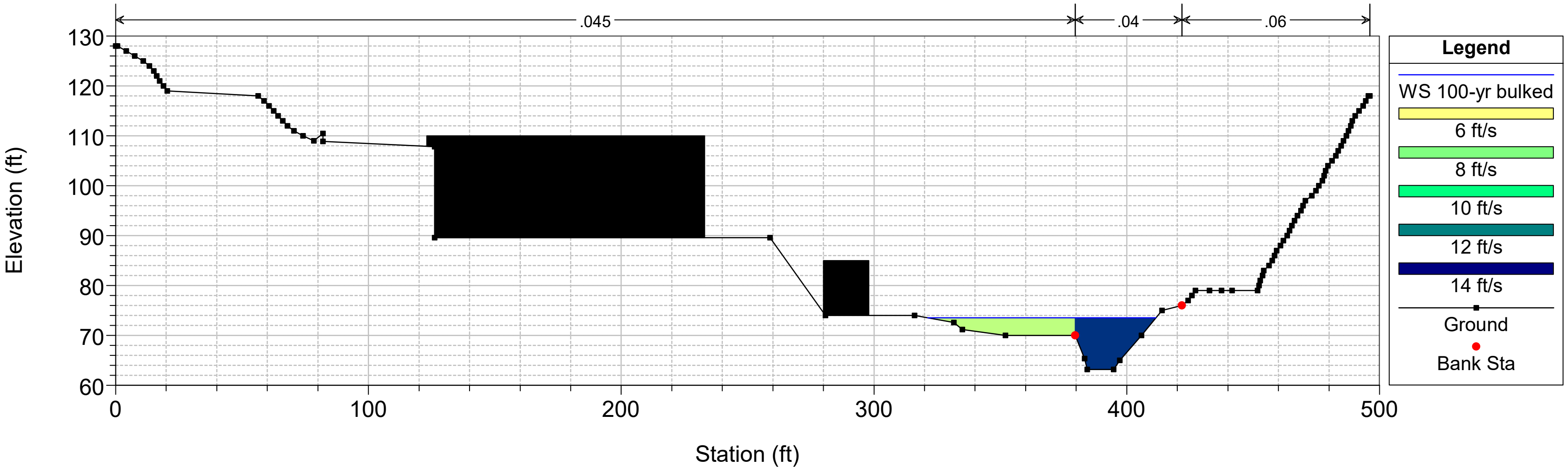
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1803 BR Bridge 4-V

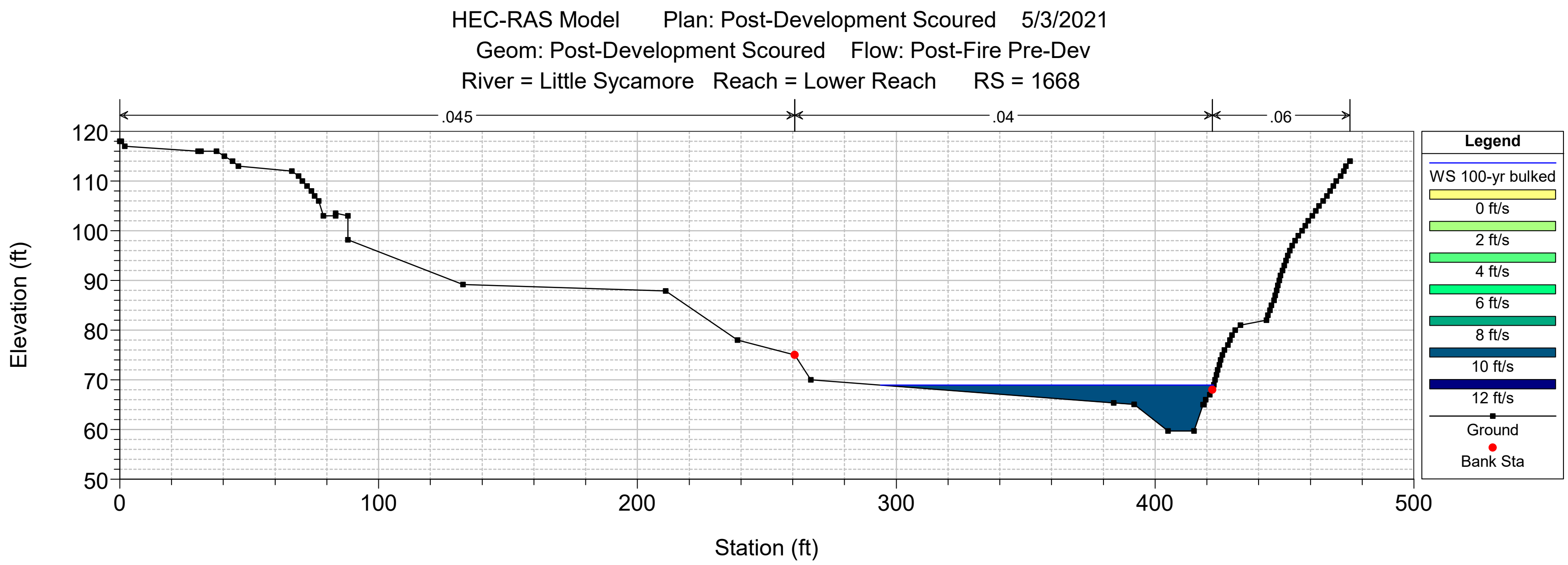


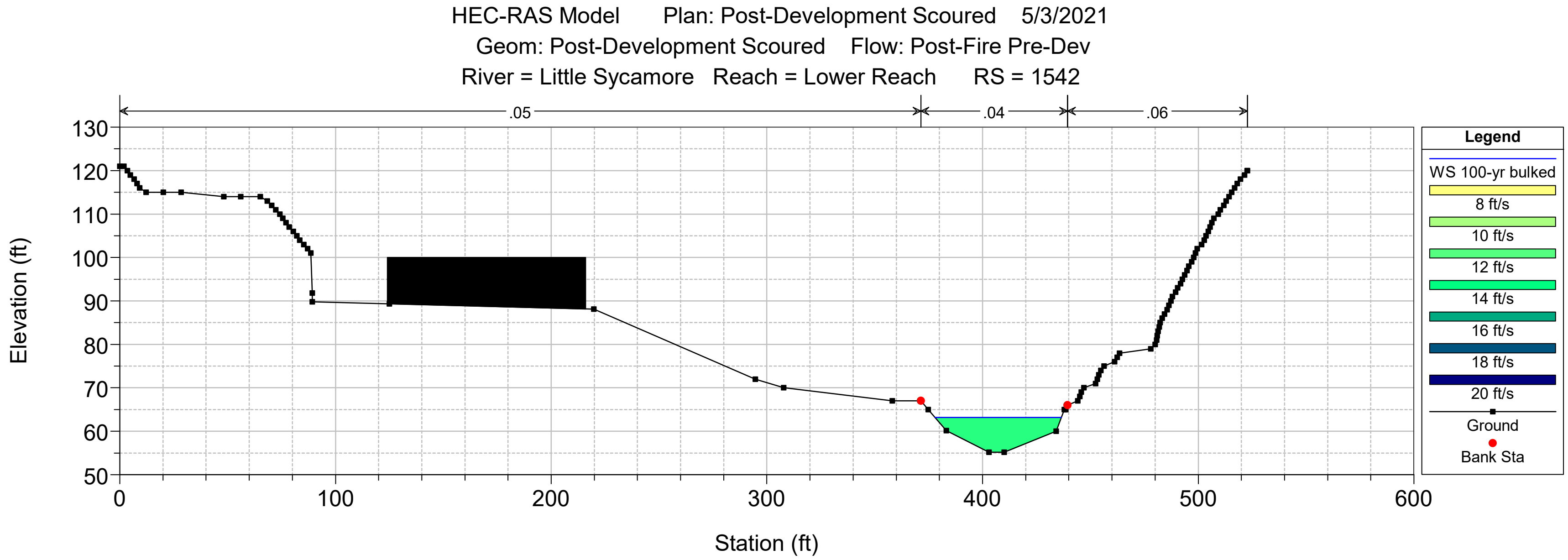
HEC-RAS Model   Plan: Post-Development Scoured   5/3/2021
Geom: Post-Development Scoured   Flow: Post-Fire Pre-Dev
River = Little Sycamore   Reach = Lower Reach   RS = 1803   BR   Bridge 4-V

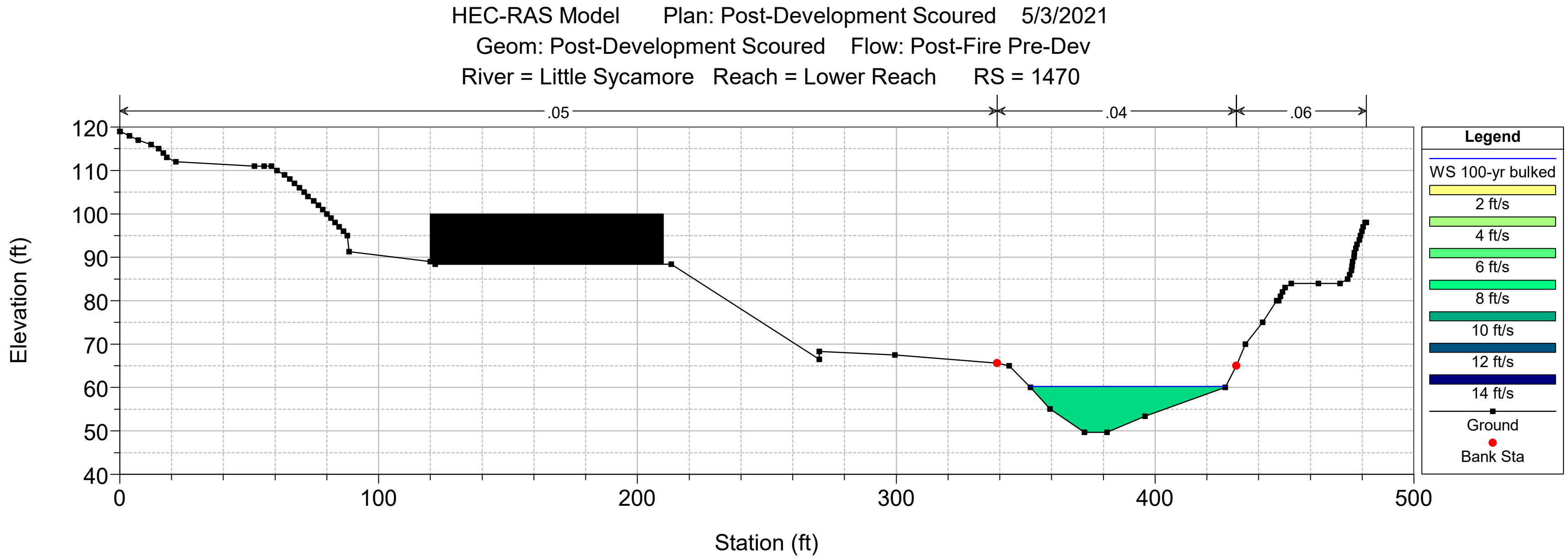


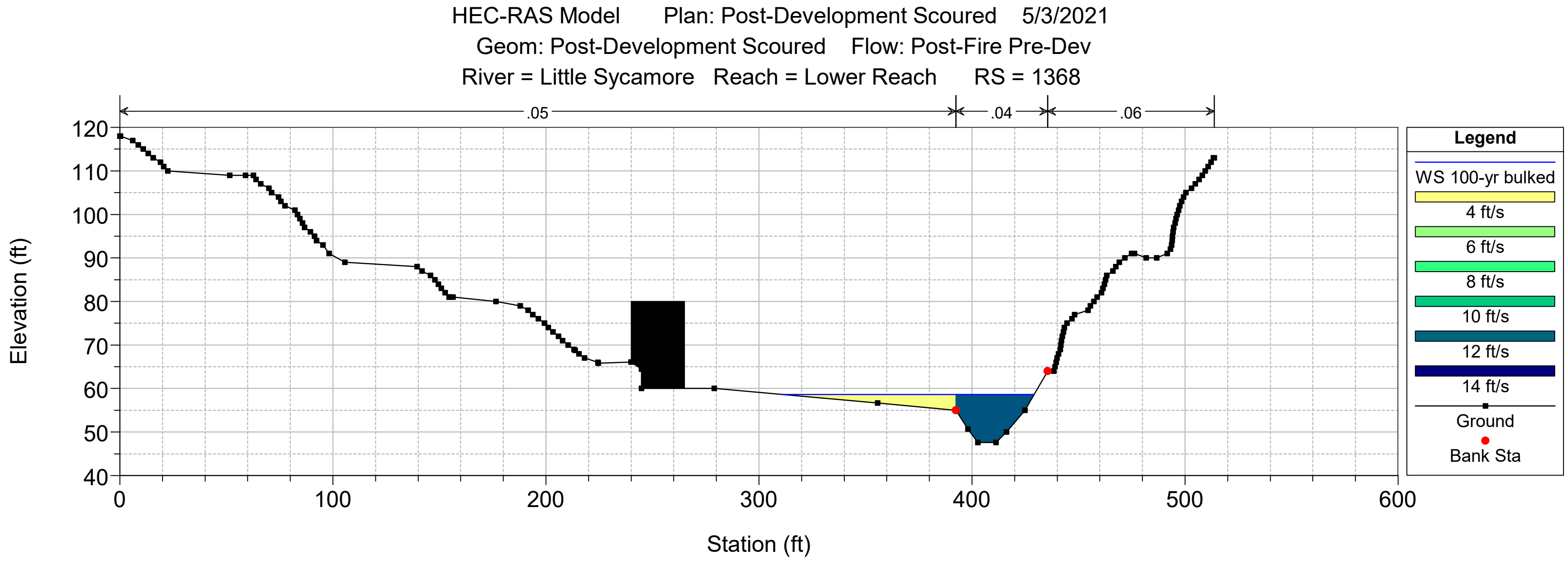
HEC-RAS Model   Plan: Post-Development Scoured   5/3/2021
Geom: Post-Development Scoured   Flow: Post-Fire Pre-Dev
River = Little Sycamore   Reach = Lower Reach   RS = 1762

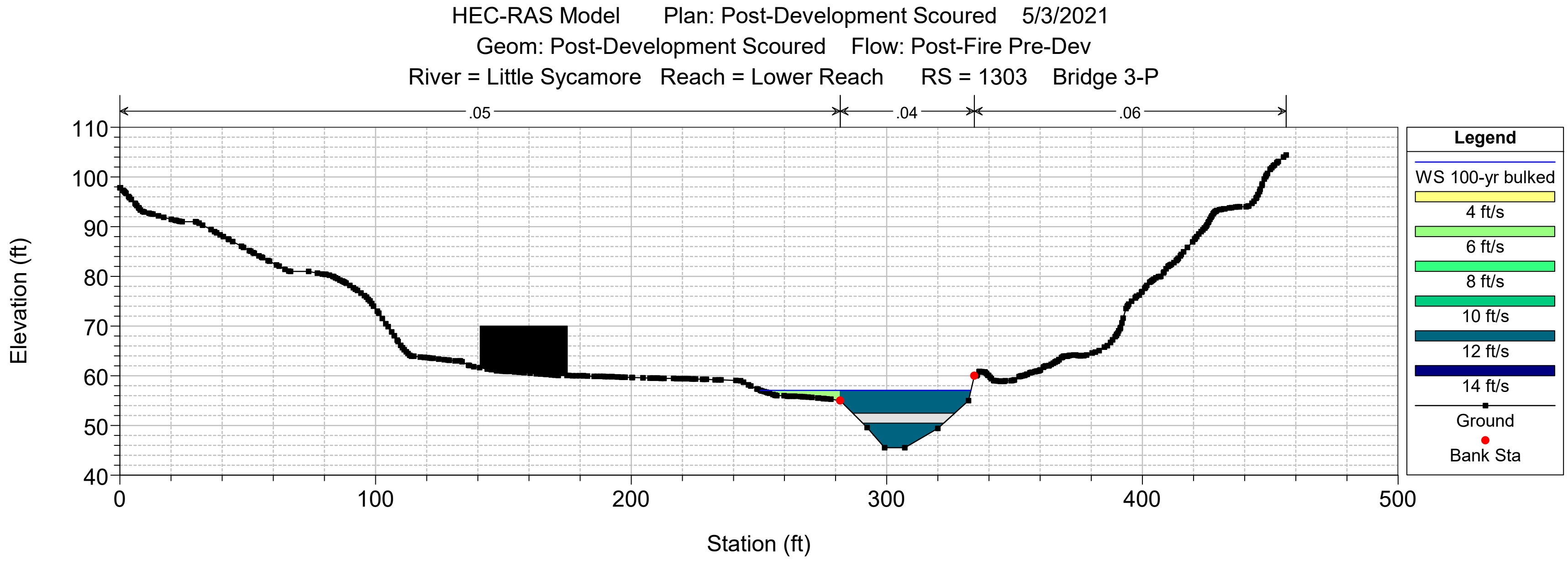


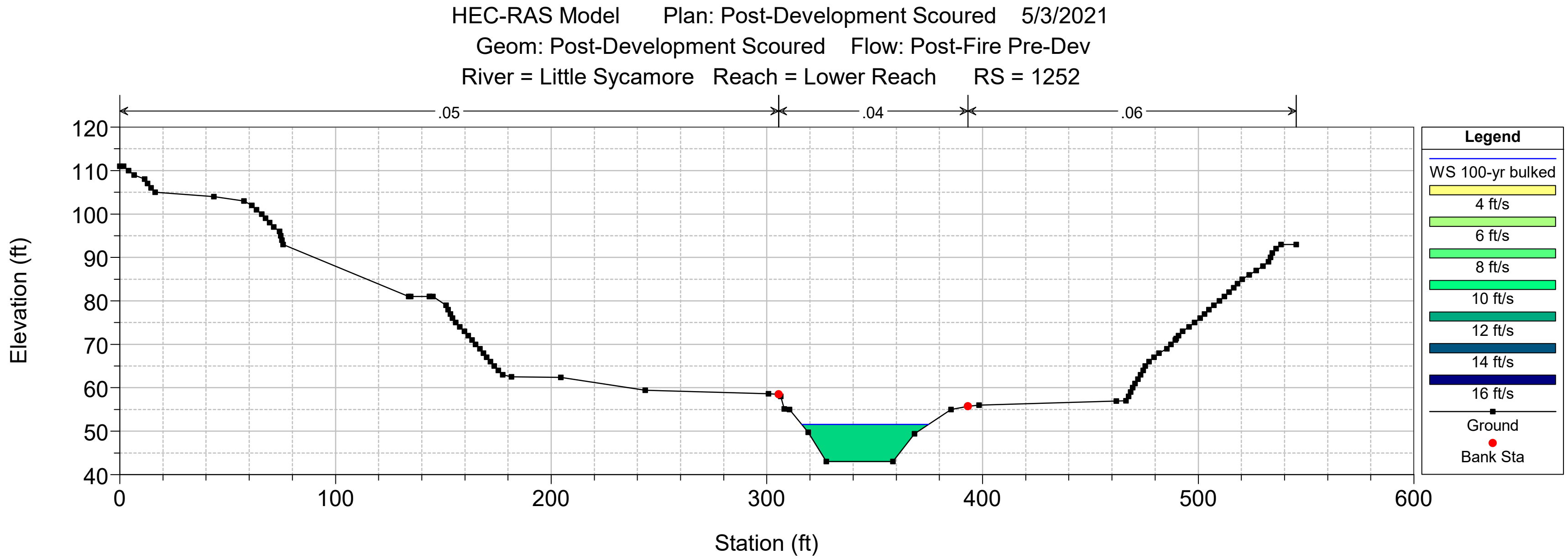

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1668
.045
.04
.06
Elevation (ft)
120
110
100
90
80
70
60
50
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

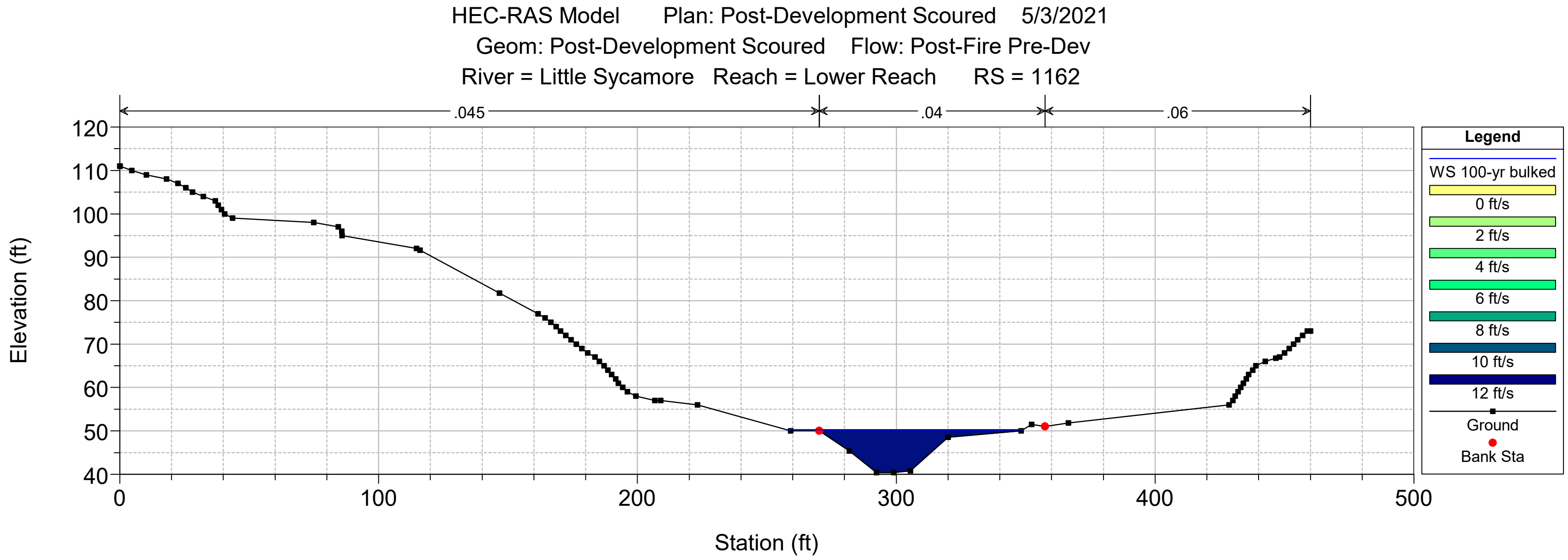

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1542
.05
.04
.06
Elevation (ft)
130
120
110
100
90
80
70
60
50
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta

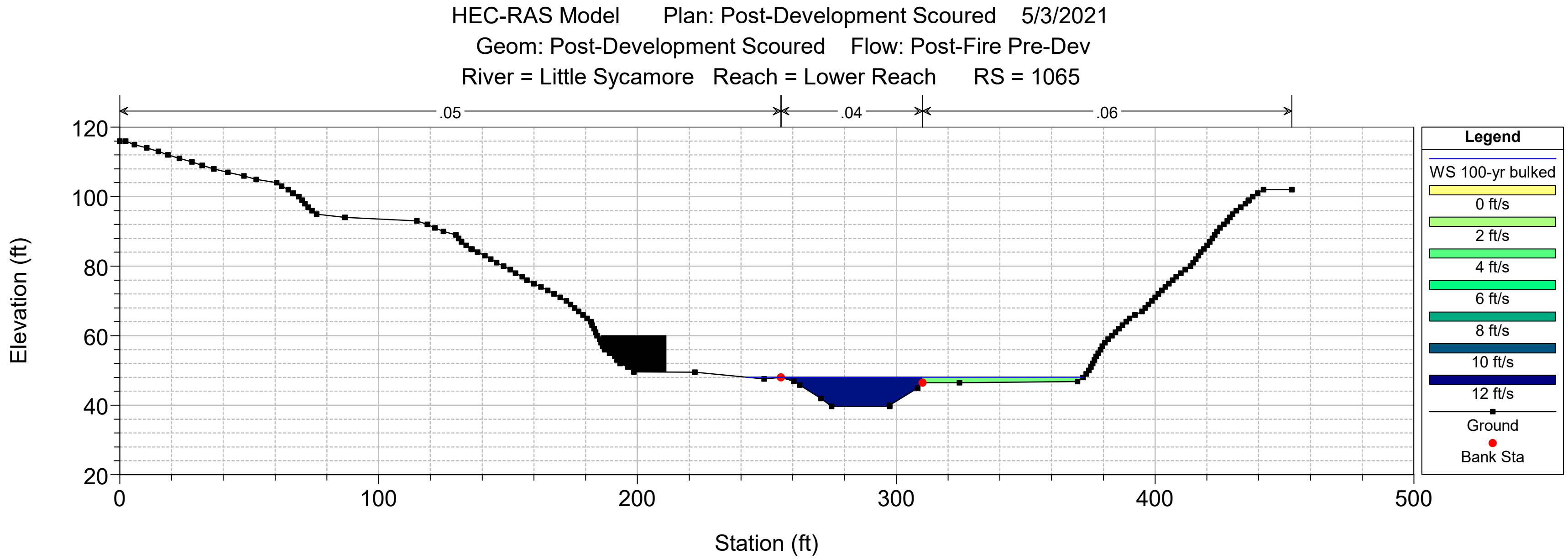

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1470


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1368

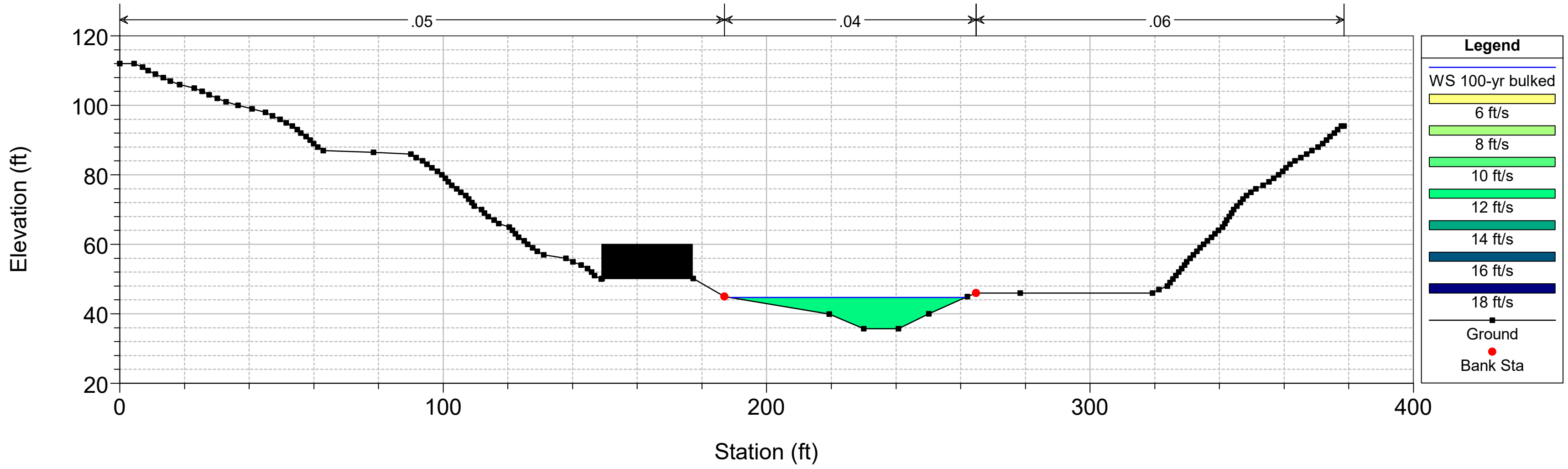

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1303 Bridge 3-P
.05
.04
.06
Elevation (ft)
110
100
90
80
70
60
50
40
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1252
.05
.04
.06
Elevation (ft)
120
110
100
90
80
70
60
50
40
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta

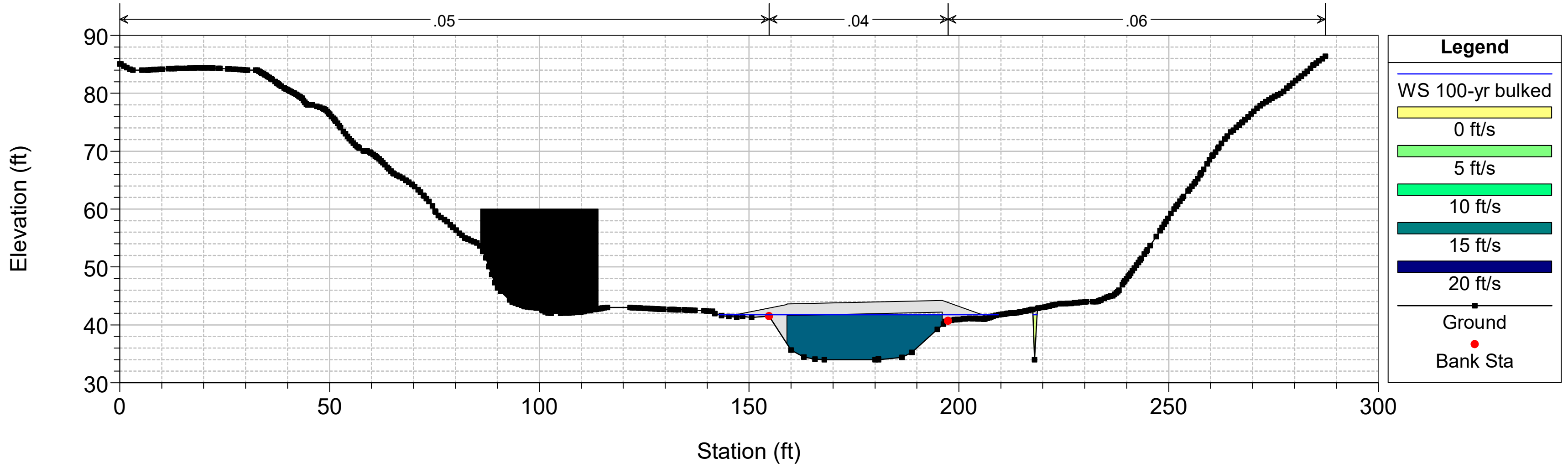

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1162
.045
.04
.06
Elevation (ft)
120
110
100
90
80
70
60
50
40
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

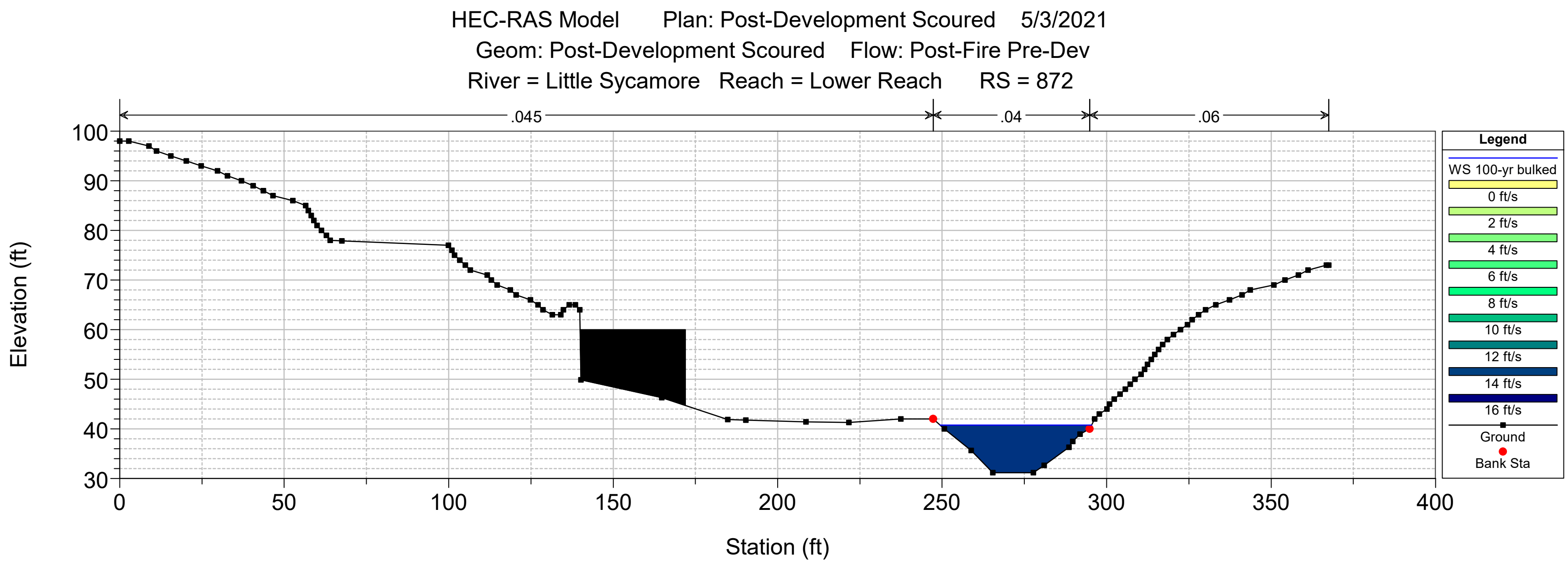

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 1065
.05
.04
.06
Elevation (ft)
120
100
80
60
40
20
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta

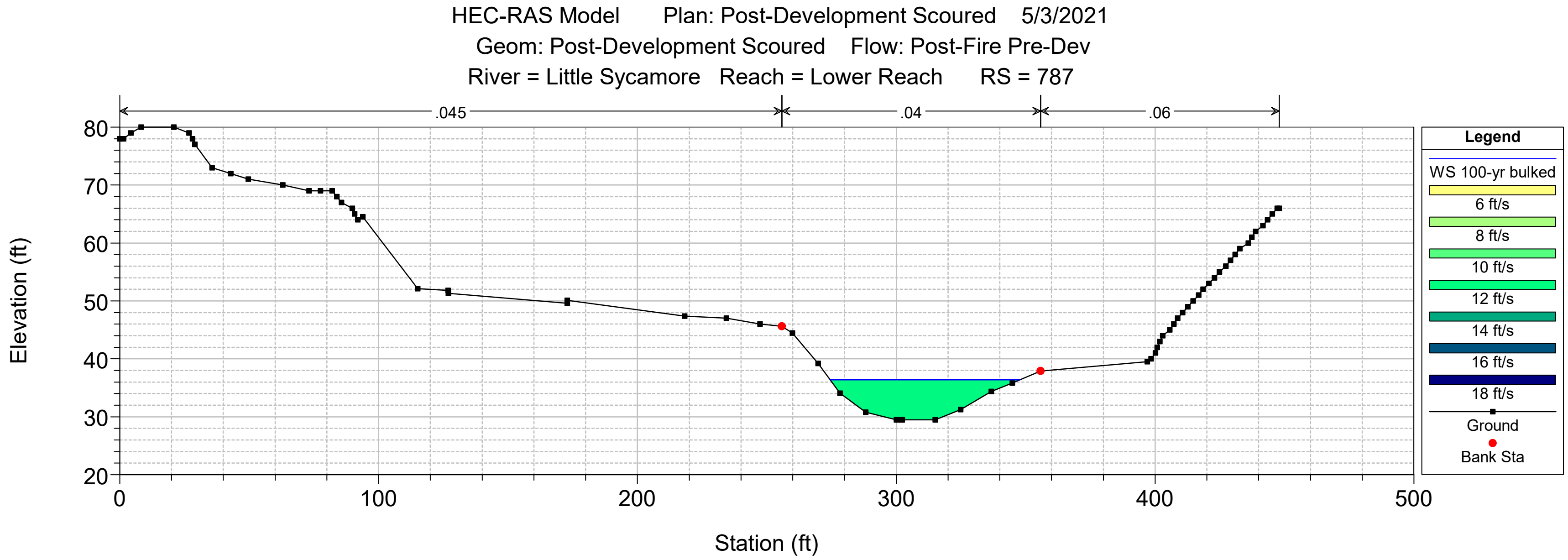
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 988

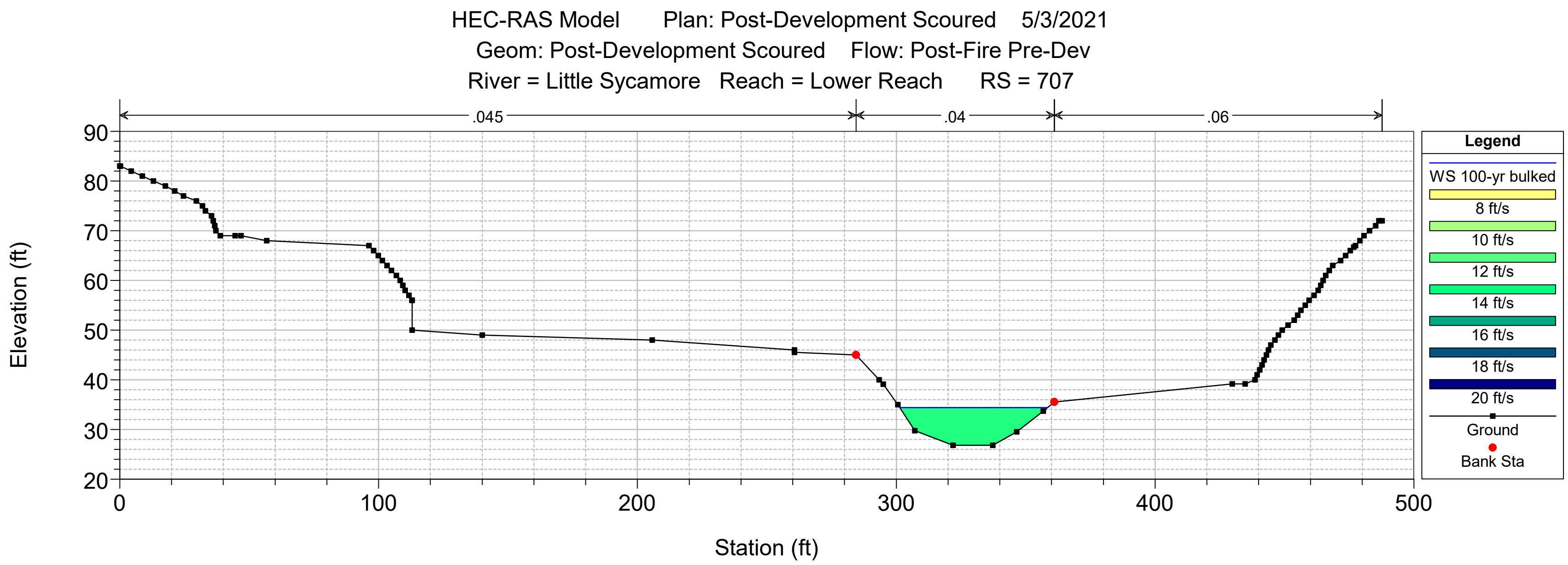


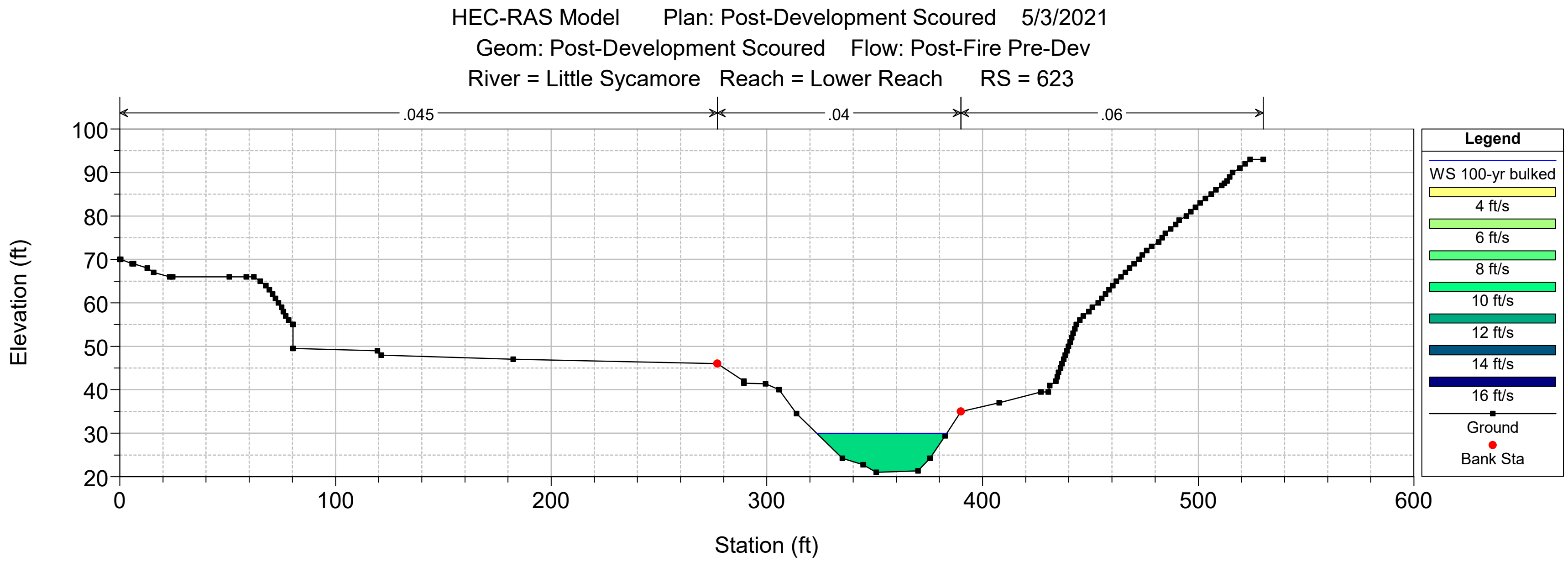
HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 948 Bridge 1-P

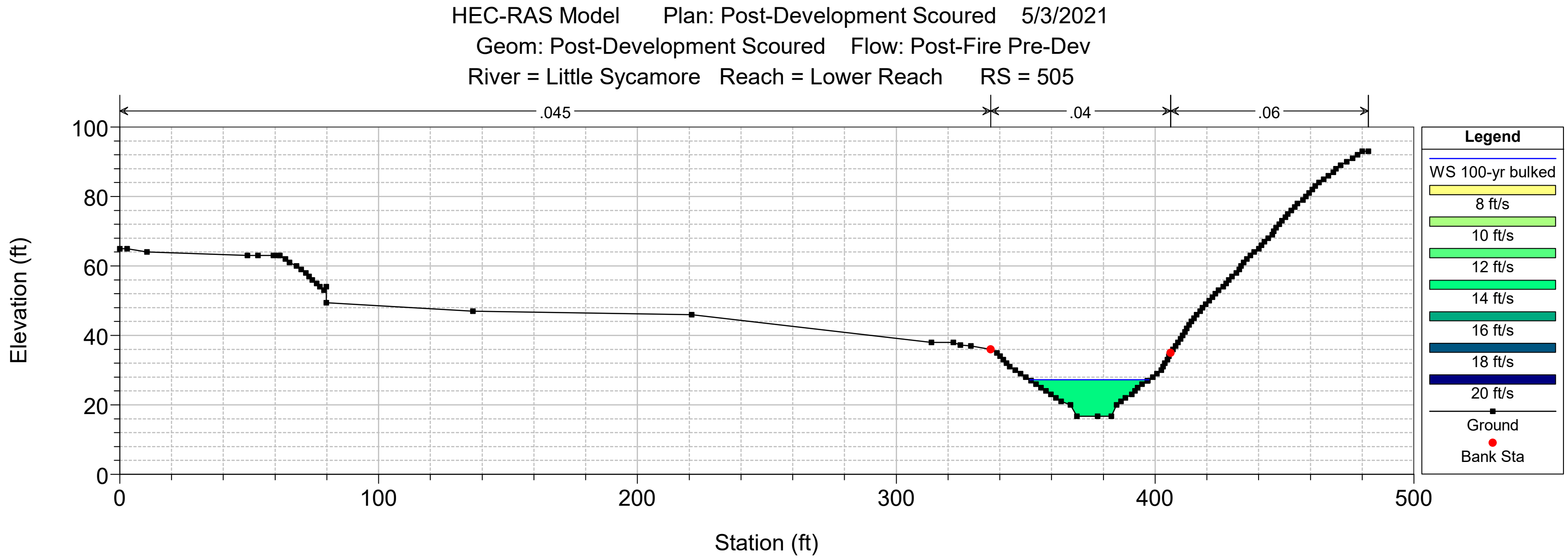


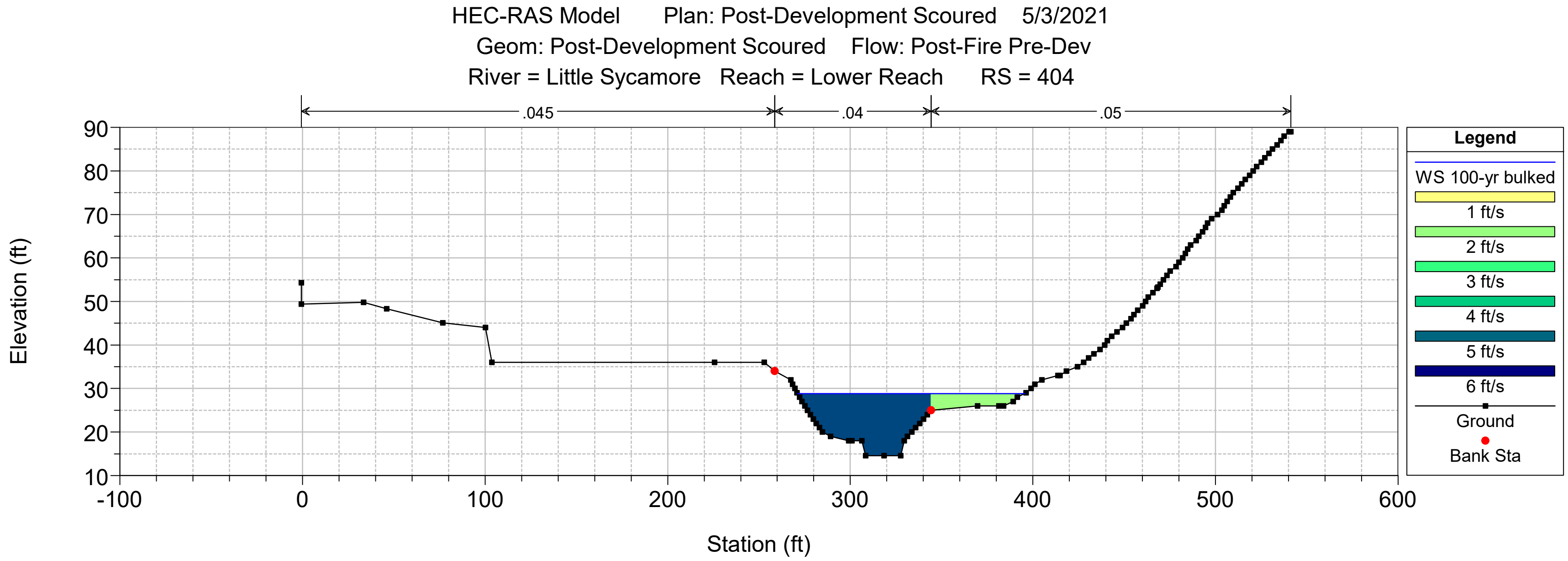

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 872
.045
.04
.06
Elevation (ft)
100
90
80
70
60
50
40
30
0
50
100
150
200
250
300
350
400
Station (ft)
Legend
WS 100-yr bulked
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta

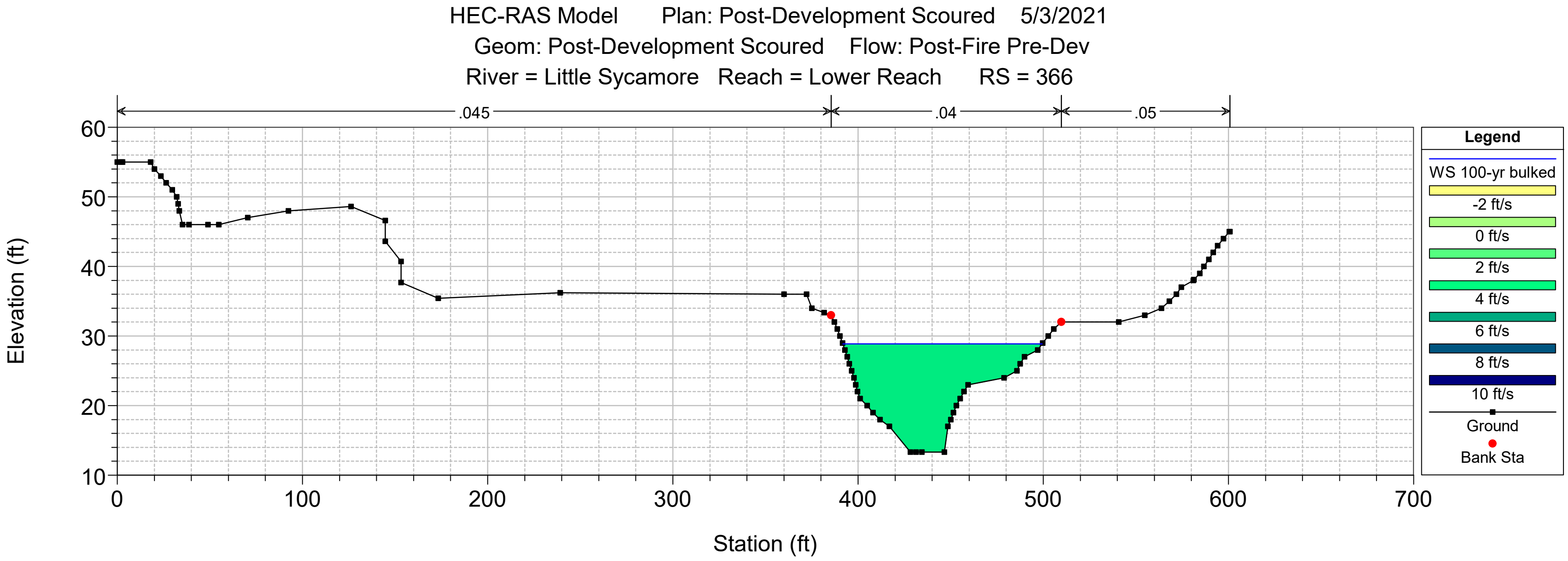

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 787
.045
.04
.06
Elevation (ft)
80
70
60
50
40
30
20
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta

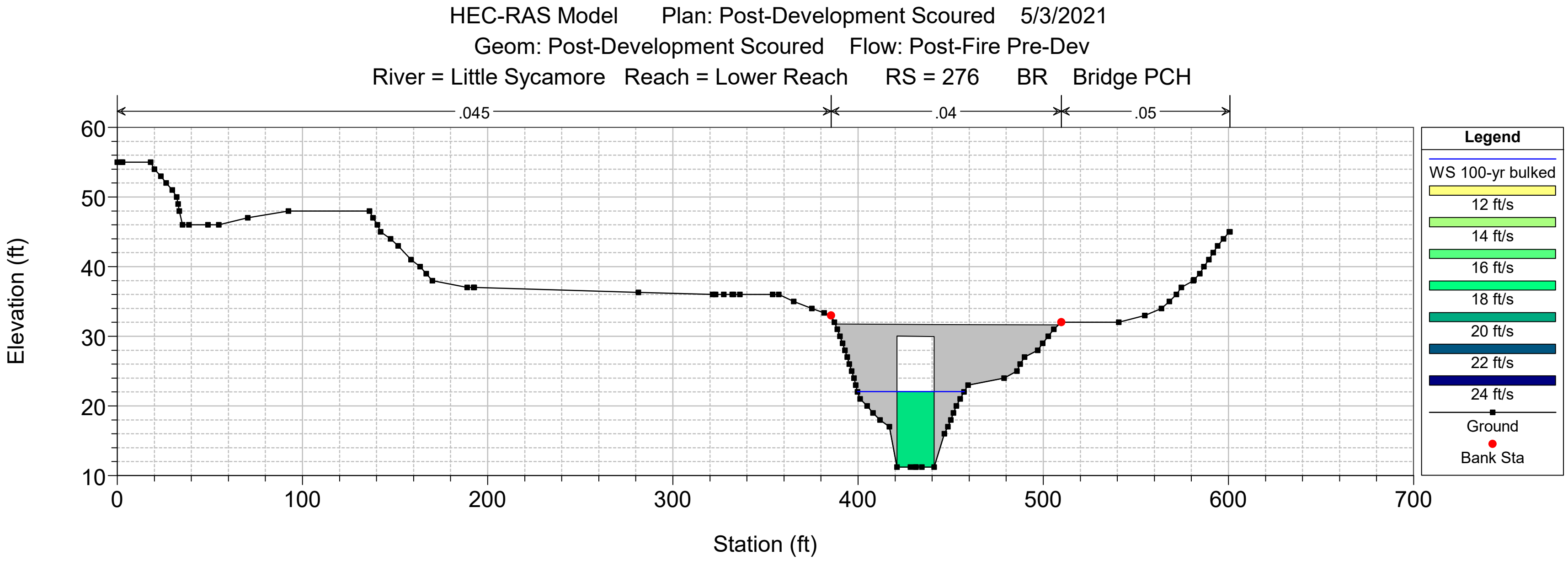

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 707
.045
.04
.06
Elevation (ft)
90
80
70
60
50
40
30
20
0
100
200
300
400
500
Station (ft)
Legend
WS 100-yr bulked
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 623
.045
.04
.06
Elevation (ft)
100
90
80
70
60
50
40
30
20
0
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr bulked
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta

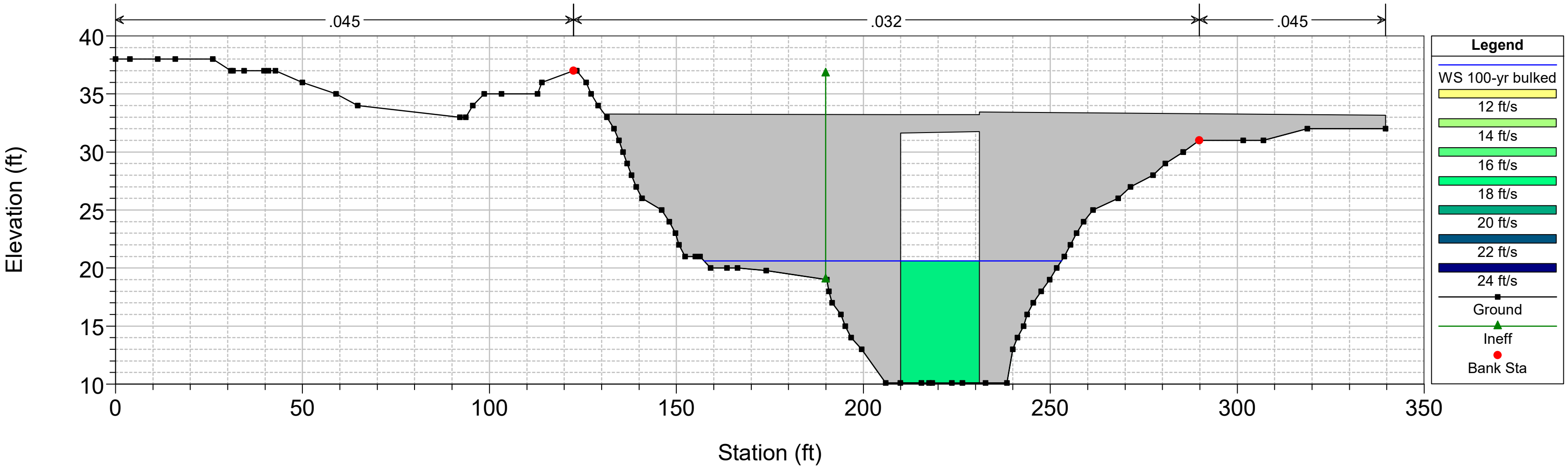

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 505


HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 404

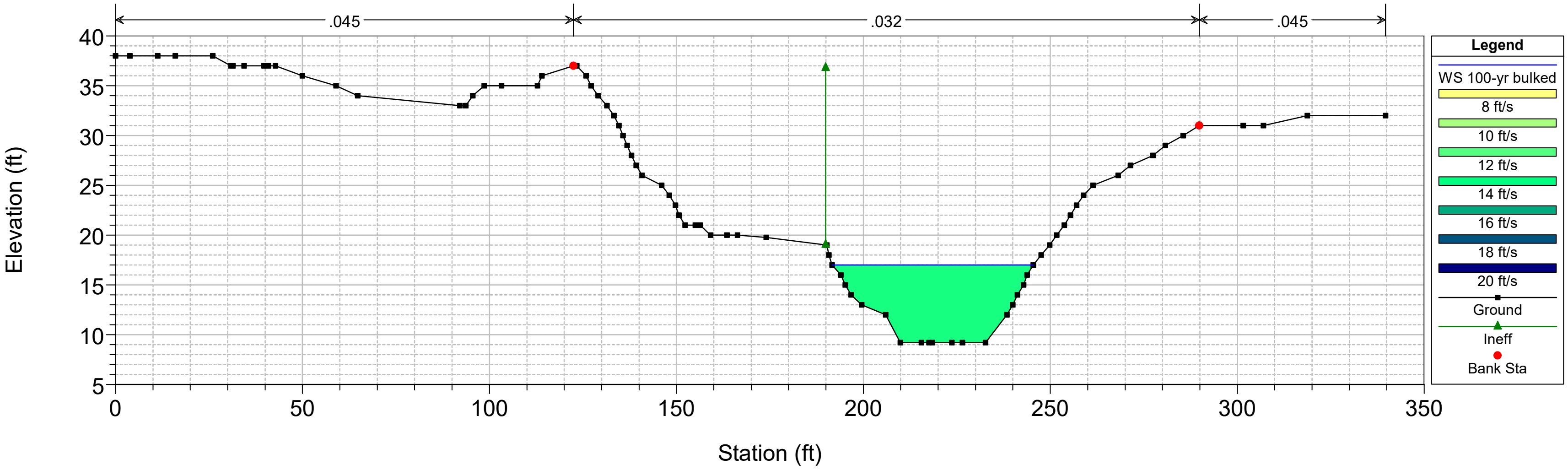

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 366

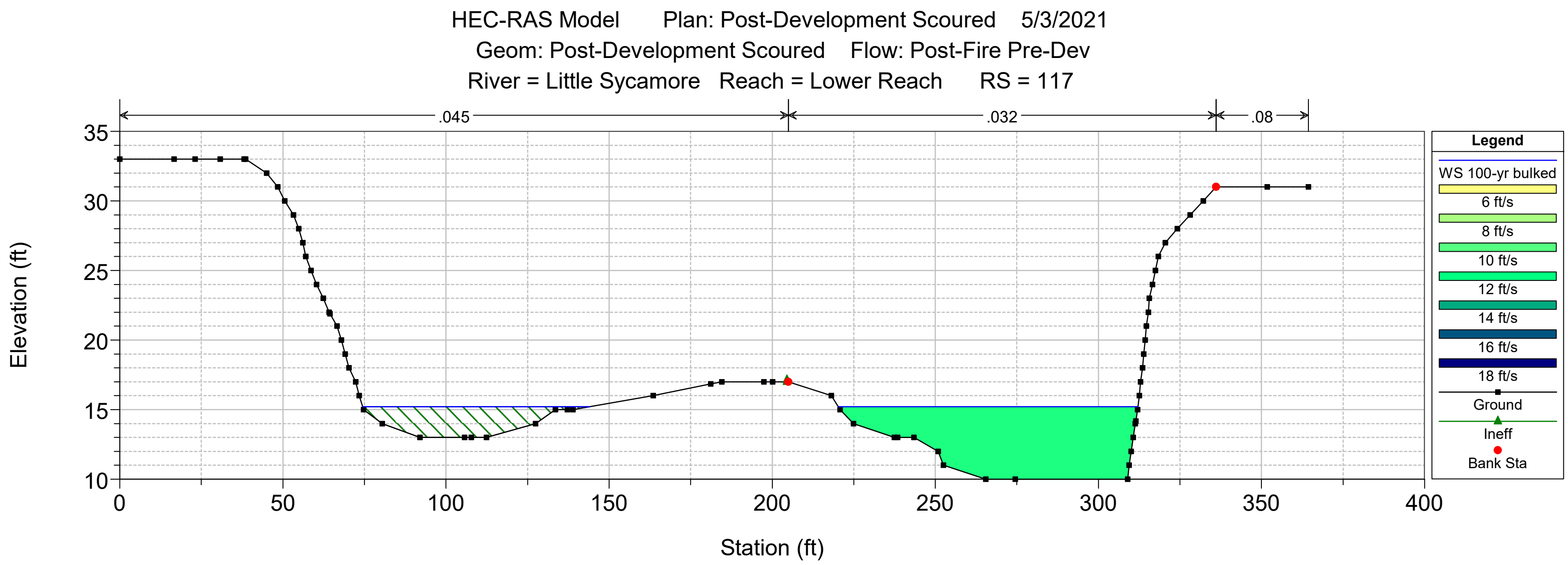

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 276 BR Bridge PCH

HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 276 BR Bridge PCH



HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 195





HEC-RAS Model Plan: Post-Development Scoured 5/3/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
River = Little Sycamore Reach = Lower Reach RS = 117

HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked

Reach	River Sta	Profile	Plan	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)	
Lower Reach	5459	100-yr bulked	Post-Fire Pre-Dev	3650.00	217.00	224.77	224.77	227.20	0.012813	13.69	371.47	79.18	0.94
Lower Reach	5459	100-yr bulked	Post-Dev Scour	3650.00	217.00	224.77	224.77	227.20	0.012813	13.69	371.47	79.18	0.94
Lower Reach	5334	100-yr bulked	Post-Fire Pre-Dev	3650.00	211.00	218.58	218.58	221.44	0.013081	13.74	287.94	55.10	0.97
Lower Reach	5334	100-yr bulked	Post-Dev Scour	3650.00	211.00	218.58	218.58	221.44	0.013081	13.74	287.94	55.10	0.97
Lower Reach	5207	100-yr bulked	Post-Fire Pre-Dev	3650.00	205.00	215.96	212.92	216.73	0.003046	7.03	519.05	75.15	0.47
Lower Reach	5207	100-yr bulked	Post-Dev Scour	3650.00	205.00	215.96	212.92	216.73	0.003046	7.03	519.05	75.15	0.47
Lower Reach	5120			Bridge									
Lower Reach	5011	100-yr bulked	Post-Fire Pre-Dev	3650.00	190.00	198.65	198.65	202.10	0.013267	15.28	263.41	42.74	0.97
Lower Reach	5011	100-yr bulked	Post-Dev Scour	3650.00	190.00	198.65	198.65	202.10	0.013267	15.28	263.41	42.74	0.97
Lower Reach	4845	100-yr bulked	Post-Fire Pre-Dev	3650.00	180.00	190.00	190.00	193.27	0.015511	14.50	251.78	38.82	1.00
Lower Reach	4845	100-yr bulked	Post-Dev Scour	3650.00	178.19	189.57	189.57	192.89	0.016135	14.61	249.86	37.78	1.00
Lower Reach	4582	100-yr bulked	Post-Fire Pre-Dev	3650.00	171.00	179.66	179.66	182.69	0.011856	14.26	286.15	54.69	0.91
Lower Reach	4582	100-yr bulked	Post-Dev Scour	3650.00	168.40	178.17	178.17	181.50	0.013384	14.71	259.24	47.37	0.94
Lower Reach	4445	100-yr bulked	Post-Fire Pre-Dev	3650.00	165.00	173.10	173.10	176.52	0.016939	14.84	245.90	36.27	1.01
Lower Reach	4445	100-yr bulked	Post-Dev Scour	3650.00	163.20	172.25	172.25	175.71	0.016648	14.92	244.60	35.64	1.00
Lower Reach	4402	100-yr bulked	Post-Fire Pre-Dev	3650.00	163.00	172.37	170.65	173.70	0.006384	9.27	393.87	63.65	0.66
Lower Reach	4402	100-yr bulked	Post-Dev Scour	3650.00	162.45	172.21	170.45	173.55	0.006424	9.29	392.96	63.11	0.66
Lower Reach	4362			Culvert									
Lower Reach	4348	100-yr bulked	Post-Fire Pre-Dev	3650.00	160.00	168.22	168.22	171.16	0.015189	13.76	265.32	45.16	1.00
Lower Reach	4348	100-yr bulked	Post-Dev Scour	3650.00	160.00	168.29	168.29	171.23	0.015179	13.74	265.55	45.28	1.00
Lower Reach	4245	100-yr bulked	Post-Fire Pre-Dev	3650.00	154.00	165.36	165.36	168.25	0.013395	13.65	276.06	68.86	0.93
Lower Reach	4245	100-yr bulked	Post-Dev Scour	3650.00	152.80	164.16	164.16	167.35	0.016383	14.32	254.98	40.89	1.01
Lower Reach	4143	100-yr bulked	Post-Fire Pre-Dev	4065.00	151.00	160.81	160.81	164.29	0.015510	14.96	271.75	39.24	1.00
Lower Reach	4143	100-yr bulked	Post-Dev Scour	4065.00	148.30	158.68	158.68	162.37	0.016343	15.41	263.74	35.76	1.00
Lower Reach	4042	100-yr bulked	Post-Fire Pre-Dev	4065.00	148.00	157.82	157.82	161.17	0.015819	14.69	276.69	41.54	1.00
Lower Reach	4042	100-yr bulked	Post-Dev Scour	4065.00	144.50	155.97	155.97	159.17	0.016411	14.36	283.05	45.04	1.01
Lower Reach	3850	100-yr bulked	Post-Fire Pre-Dev	4065.00	141.00	150.03	150.03	153.08	0.014986	14.02	290.18	55.48	1.00
Lower Reach	3850	100-yr bulked	Post-Dev Scour	4065.00	137.20	147.45	147.45	150.96	0.016417	15.04	270.34	38.50	1.00
Lower Reach	3745	100-yr bulked	Post-Fire Pre-Dev	4065.00	138.00	147.59	147.59	150.58	0.014239	13.90	298.41	60.52	0.97
Lower Reach	3745	100-yr bulked	Post-Dev Scour	4065.00	133.70	145.01	145.01	148.18	0.016472	14.27	284.82	44.95	1.00
Lower Reach	3648	100-yr bulked	Post-Fire Pre-Dev	4065.00	135.00	144.10	144.10	147.78	0.016517	15.40	263.91	35.85	1.00
Lower Reach	3648	100-yr bulked	Post-Dev Scour	4065.00	131.00	141.81	141.81	145.22	0.016154	14.82	274.36	40.61	1.00
Lower Reach	3549	100-yr bulked	Post-Fire Pre-Dev	4065.00	131.00	140.43	140.43	143.69	0.015281	14.48	280.77	43.28	1.00
Lower Reach	3549	100-yr bulked	Post-Dev Scour	4065.00	127.20	137.12	137.12	140.75	0.016617	15.27	266.14	36.80	1.00

HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked (Continued)

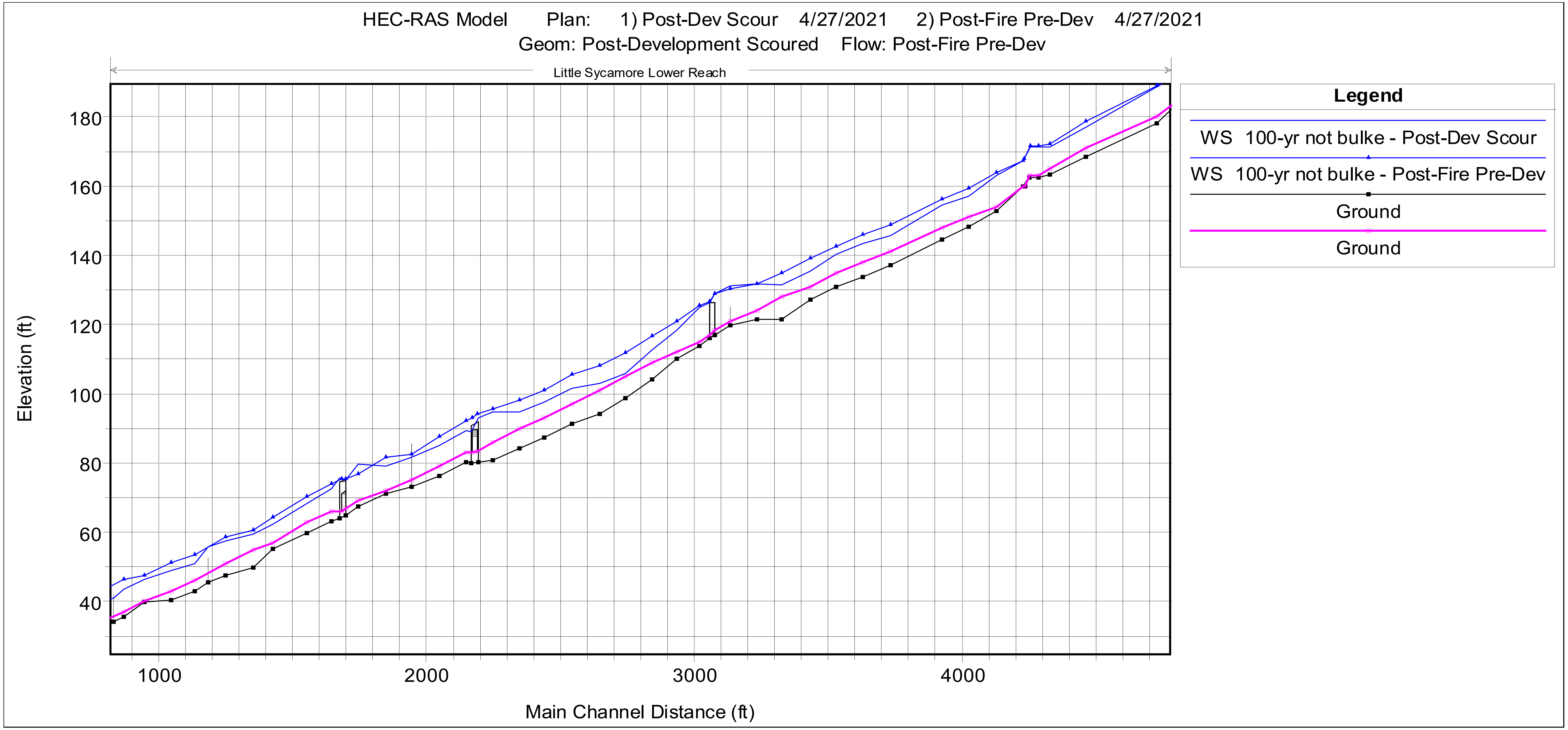
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Reach	3444	100-yr bulked	Post-Fire Pre-Dev	4065.00	128.00	136.03	136.03	139.25	0.014378	14.39	284.01	62.53	0.98
Lower Reach	3444	100-yr bulked	Post-Dev Scour	4065.00	121.40	131.88	131.88	135.71	0.016902	15.69	259.03	34.19	1.01
Lower Reach	3350	100-yr bulked	Post-Fire Pre-Dev	4065.00	124.00	132.86	132.86	135.39	0.011378	12.96	348.13	84.68	0.90
Lower Reach	3350	100-yr bulked	Post-Dev Scour	4065.00	121.38	132.34		133.99	0.006180	10.42	427.85	90.56	0.66
Lower Reach	3249	100-yr bulked	Post-Fire Pre-Dev	4065.00	121.00	131.20	131.20	132.95	0.006479	12.21	551.44	151.02	0.70
Lower Reach	3249	100-yr bulked	Post-Dev Scour	4065.00	119.80	132.31	131.15	132.93	0.009169	7.43	686.52	169.83	0.32
Lower Reach	3182			Bridge									
Lower Reach	3136	100-yr bulked	Post-Fire Pre-Dev	4065.00	115.00	126.09	126.09	127.83	0.008707	11.94	511.70	145.33	0.72
Lower Reach	3136	100-yr bulked	Post-Dev Scour	4065.00	113.80	125.92	125.92	127.65	0.008584	11.77	506.93	144.98	0.70
Lower Reach	3051	100-yr bulked	Post-Fire Pre-Dev	4065.00	112.00	122.21	122.21	124.91	0.011589	13.95	338.21	64.47	0.90
Lower Reach	3051	100-yr bulked	Post-Dev Scour	4065.00	110.00	119.73	119.73	123.70	0.017964	15.99	255.05	33.55	0.99
Lower Reach	2960	100-yr bulked	Post-Fire Pre-Dev	4065.00	109.00	117.38	117.38	119.35	0.010960	13.44	457.08	108.14	0.88
Lower Reach	2960	100-yr bulked	Post-Dev Scour	4065.00	104.10	114.03	114.03	116.66	0.010723	13.43	355.23	85.34	0.89
Lower Reach	2858	100-yr bulked	Post-Fire Pre-Dev	4065.00	105.00	112.66	112.66	114.51	0.009871	11.90	455.43	124.20	0.85
Lower Reach	2858	100-yr bulked	Post-Dev Scour	4065.00	98.75	107.73		109.00	0.005740	9.06	461.83	79.37	0.63
Lower Reach	2761	100-yr bulked	Post-Fire Pre-Dev	4065.00	101.00	109.28	109.28	111.84	0.011414	13.11	346.15	74.53	0.90
Lower Reach	2761	100-yr bulked	Post-Dev Scour	4065.00	94.10	104.39	104.39	107.91	0.015585	15.04	270.33	39.00	1.01
Lower Reach	2659	100-yr bulked	Post-Fire Pre-Dev	4065.00	97.00	106.58	106.58	109.04	0.010624	13.78	410.50	96.00	0.90
Lower Reach	2659	100-yr bulked	Post-Dev Scour	4065.00	91.20	102.12		103.99	0.008244	10.96	370.90	59.37	0.76
Lower Reach	2556	100-yr bulked	Post-Fire Pre-Dev	4065.00	93.00	102.02	102.02	104.48	0.011768	14.32	388.95	77.15	0.93
Lower Reach	2556	100-yr bulked	Post-Dev Scour	4065.00	87.30	100.28	100.28	103.01	0.009184	14.24	380.17	74.82	0.77
Lower Reach	2463	100-yr bulked	Post-Fire Pre-Dev	4065.00	90.00	99.52	99.52	101.91	0.010790	12.62	361.84	104.09	0.88
Lower Reach	2463	100-yr bulked	Post-Dev Scour	4065.00	84.20	96.67	96.67	98.95	0.009547	12.52	391.77	100.37	0.81
Lower Reach	2364	100-yr bulked	Post-Fire Pre-Dev	4065.00	86.00	96.32	95.15	97.53	0.005400	10.31	540.29	113.19	0.63
Lower Reach	2364	100-yr bulked	Post-Dev Scour	4065.00	80.90	95.79	93.04	96.68	0.002526	8.29	641.99	109.31	0.45
Lower Reach	2297			Bridge									
Lower Reach	2262	100-yr bulked	Post-Fire Pre-Dev	4065.00	83.00	93.01	93.01	94.88	0.008668	12.01	468.48	128.33	0.77
Lower Reach	2262	100-yr bulked	Post-Dev Scour	4065.00	80.30	90.46	90.46	93.19	0.014465	13.26	308.40	65.46	0.99
Lower Reach	2163	100-yr bulked	Post-Fire Pre-Dev	4065.00	79.00	88.27	88.27	90.08	0.008364	11.75	488.04	142.14	0.78
Lower Reach	2163	100-yr bulked	Post-Dev Scour	4065.00	76.20	86.25	86.25	89.32	0.014593	14.05	289.48	49.19	1.00
Lower Reach	2058	100-yr bulked	Post-Fire Pre-Dev	4065.00	75.00	83.85	83.85	86.71	0.014745	13.56	299.80	53.03	1.01
Lower Reach	2058	100-yr bulked	Post-Dev Scour	4065.00	73.00	82.95	82.95	85.91	0.014490	13.81	294.37	49.62	1.00
Lower Reach	1962	100-yr bulked	Post-Fire Pre-Dev	4065.00	72.00	82.26	82.26	84.12	0.009913	12.40	420.30	106.49	0.81

HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked (Continued)

Reach	River Sta	Profile	Plan	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)	
Lower Reach	1962	100-yr bulked	Post-Dev Scour	4065.00	71.10	79.06	78.92	81.05	0.013762	11.32	359.22	83.30	0.96
Lower Reach	1861	100-yr bulked	Post-Fire Pre-Dev	4065.00	69.00	77.68	76.15	78.47	0.004073	8.23	631.96	158.92	0.55
Lower Reach	1861	100-yr bulked	Post-Dev Scour	4065.00	67.50	79.78	75.10	80.30	0.001304	6.12	796.35	123.35	0.34
Lower Reach	1807			Bridge									
Lower Reach	1762	100-yr bulked	Post-Fire Pre-Dev	4065.00	66.00	74.64	74.64	76.16	0.009959	11.80	477.85	143.17	0.79
Lower Reach	1762	100-yr bulked	Post-Dev Scour	4065.00	63.20	73.53	73.53	75.71	0.012080	13.22	381.45	90.22	0.88
Lower Reach	1668	100-yr bulked	Post-Fire Pre-Dev	4065.00	63.00	70.91	70.91	72.28	0.009599	11.47	508.09	160.68	0.81
Lower Reach	1668	100-yr bulked	Post-Dev Scour	4065.00	59.70	68.93	68.93	70.53	0.017124	10.13	401.47	128.70	1.01
Lower Reach	1542	100-yr bulked	Post-Fire Pre-Dev	4065.00	57.00	65.22	65.22	67.77	0.015468	12.80	317.63	63.62	1.01
Lower Reach	1542	100-yr bulked	Post-Dev Scour	4065.00	55.20	63.19	63.19	65.85	0.014438	13.08	310.86	58.52	1.00
Lower Reach	1470	100-yr bulked	Post-Fire Pre-Dev	4065.00	55.00	61.33	61.33	63.55	0.015454	11.96	339.79	76.46	1.00
Lower Reach	1470	100-yr bulked	Post-Dev Scour	4065.00	49.70	60.27		61.50	0.005602	8.90	456.97	75.99	0.64
Lower Reach	1368	100-yr bulked	Post-Fire Pre-Dev	4065.00	51.00	58.98	58.98	61.77	0.013772	14.20	342.97	84.53	0.98
Lower Reach	1368	100-yr bulked	Post-Dev Scour	4065.00	47.60	58.65	58.65	60.70	0.008848	12.33	427.80	118.84	0.79
Lower Reach	1303	100-yr bulked	Post-Dev Scour	4065.00	45.50	57.07	57.07	59.23	0.028345	12.04	357.99	82.41	0.61
Lower Reach	1252	100-yr bulked	Post-Fire Pre-Dev	4065.00	46.00	54.50	54.50	56.99	0.012389	12.95	343.15	71.45	0.94
Lower Reach	1252	100-yr bulked	Post-Dev Scour	4065.00	43.00	51.53		53.41	0.008397	10.99	369.97	58.72	0.77
Lower Reach	1162	100-yr bulked	Post-Fire Pre-Dev	4065.00	43.00	51.97	51.97	53.83	0.009008	12.97	468.03	117.72	0.82
Lower Reach	1162	100-yr bulked	Post-Dev Scour	4065.00	40.40	50.31	50.31	52.41	0.014407	11.63	352.70	91.74	0.97
Lower Reach	1065	100-yr bulked	Post-Fire Pre-Dev	4065.00	40.00	48.36	48.36	50.25	0.009787	11.73	440.21	132.18	0.83
Lower Reach	1065	100-yr bulked	Post-Dev Scour	4065.00	39.70	48.10	48.10	50.05	0.009802	11.58	420.06	130.31	0.84
Lower Reach	988	100-yr bulked	Post-Fire Pre-Dev	4065.00	37.00	47.49	47.49	49.13	0.006683	11.18	514.46	168.79	0.71
Lower Reach	988	100-yr bulked	Post-Dev Scour	4065.00	35.70	44.68	44.68	46.99	0.014832	12.19	333.44	72.33	1.00
Lower Reach	948	100-yr bulked	Post-Dev Scour	4065.00	34.00	41.73	41.73	45.80	0.023438	16.20	255.76	37.77	1.03
Lower Reach	872	100-yr bulked	Post-Fire Pre-Dev	4065.00	33.00	43.55	43.55	45.44	0.007585	11.74	442.94	125.81	0.74
Lower Reach	872	100-yr bulked	Post-Dev Scour	4065.00	31.20	40.79	40.79	44.01	0.015068	14.39	282.73	46.10	1.02
Lower Reach	787	100-yr bulked	Post-Fire Pre-Dev	4065.00	30.00	40.18	40.18	42.17	0.008802	11.80	429.70	122.86	0.79
Lower Reach	787	100-yr bulked	Post-Dev Scour	4065.00	29.50	36.39	36.39	38.68	0.014591	12.13	335.05	73.36	1.00
Lower Reach	707	100-yr bulked	Post-Fire Pre-Dev	4065.00	27.00	35.25	35.25	38.39	0.014623	14.22	285.85	45.54	1.00
Lower Reach	707	100-yr bulked	Post-Dev Scour	4065.00	26.80	34.42	34.42	37.13	0.014426	13.22	307.59	57.06	1.00
Lower Reach	623	100-yr bulked	Post-Fire Pre-Dev	4065.00	22.00	32.24	32.24	35.28	0.014957	13.99	290.51	47.98	1.00
Lower Reach	623	100-yr bulked	Post-Dev Scour	4065.00	21.03	29.92		31.75	0.008139	10.85	374.55	60.02	0.77
Lower Reach	505	100-yr bulked	Post-Fire Pre-Dev	4065.00	19.00	30.79		32.12	0.004837	9.26	439.10	58.63	0.60

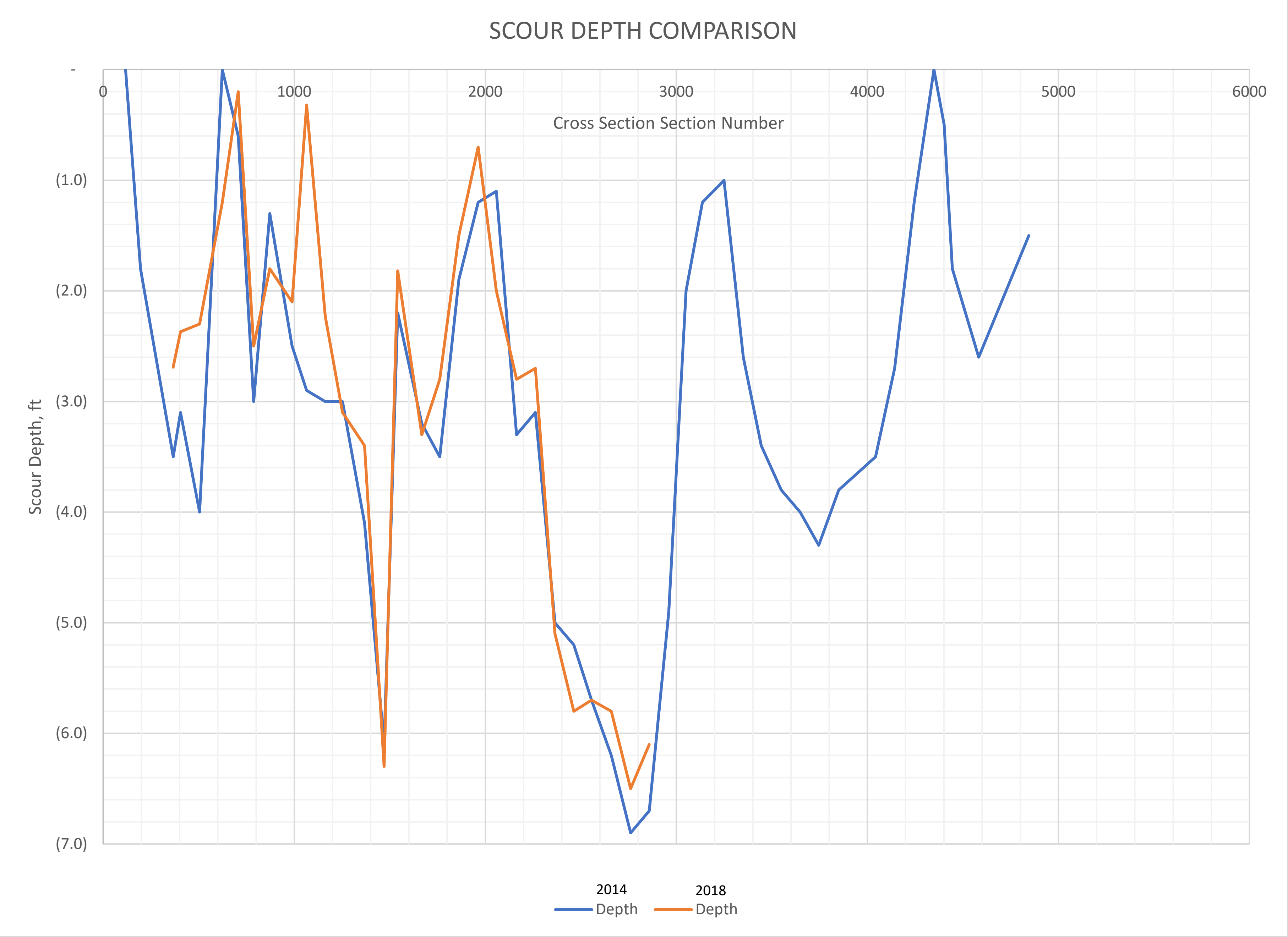
HEC-RAS River: Little Sycamore Reach: Lower Reach Profile: 100-yr bulked (Continued)

Reach	River Sta	Profile	Plan	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)	
Lower Reach	505	100-yr bulked	Post-Dev Scour	4065.00	16.70	27.22	27.22	30.34	0.015379	14.16	286.99	46.07	1.00
Lower Reach	404	100-yr bulked	Post-Fire Pre-Dev	4065.00	17.00	31.44		31.67	0.000527	4.08	1144.95	134.74	0.21
Lower Reach	404	100-yr bulked	Post-Dev Scour	4065.00	14.60	28.82		29.23	0.001125	5.30	856.03	124.31	0.30
Lower Reach	366	100-yr bulked	Post-Fire Pre-Dev	4065.00	16.00	31.44	23.10	31.64	0.000498	3.58	1135.93	119.34	0.20
Lower Reach	366	100-yr bulked	Post-Dev Scour	4065.00	13.30	28.85	21.75	29.16	0.000928	4.47	910.25	107.50	0.27
Lower Reach	276			Bridge									
Lower Reach	195	100-yr bulked	Post-Fire Pre-Dev	4065.00	11.00	17.96	17.96	20.70	0.009351	13.27	306.36	56.68	1.01
Lower Reach	195	100-yr bulked	Post-Dev Scour	4065.00	9.20	16.99	16.99	19.80	0.009329	13.46	301.98	53.78	1.00
Lower Reach	117	100-yr bulked	Post-Fire Pre-Dev	4065.00	10.00	15.21	15.21	17.20	0.010114	11.31	359.45	161.45	1.01
Lower Reach	117	100-yr bulked	Post-Dev Scour	4065.00	10.00	15.21	15.21	17.20	0.010114	11.31	359.45	161.45	1.01

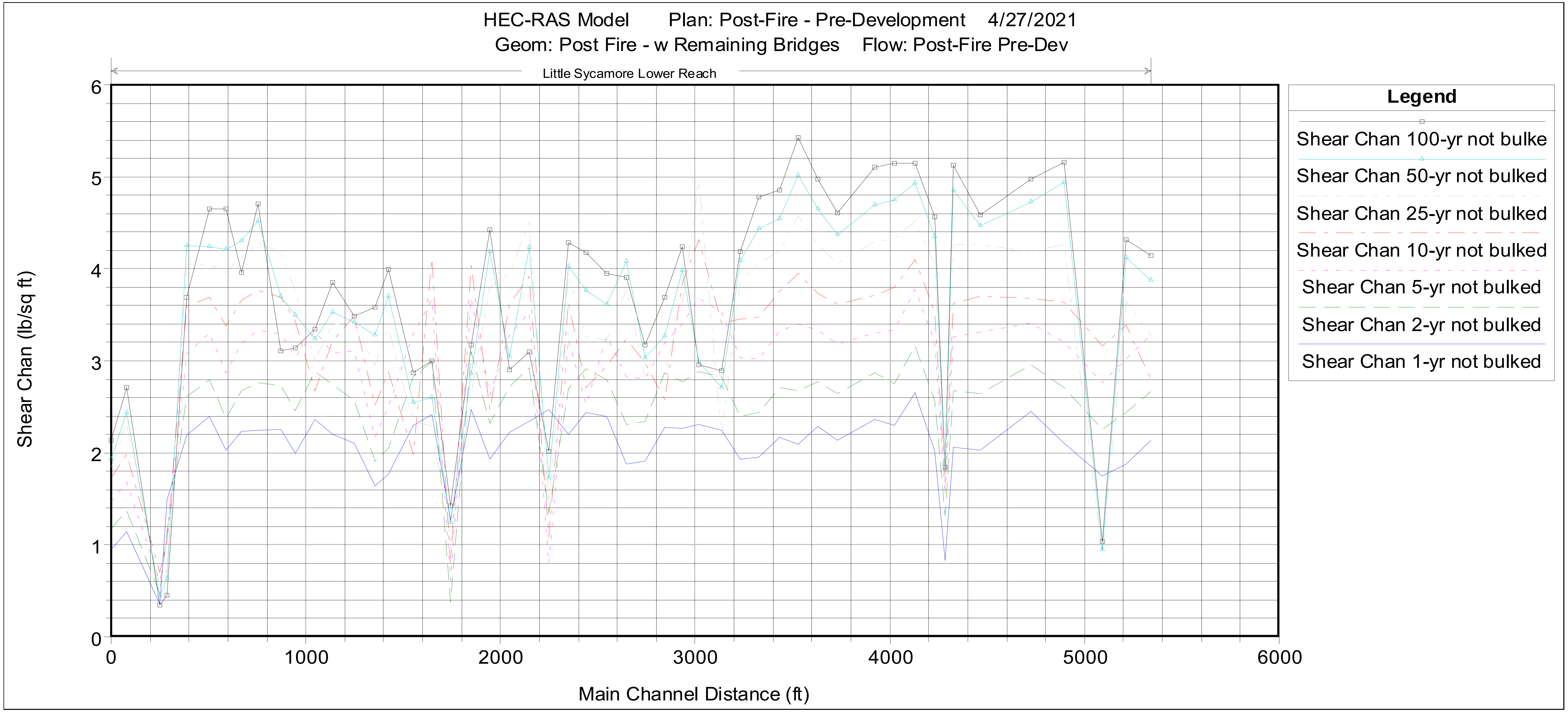

HEC-RAS Model Plan: 1) Post-Dev Scour 4/27/2021 2) Post-Fire Pre-Dev 4/27/2021
Geom: Post-Development Scoured Flow: Post-Fire Pre-Dev
Little Sycamore Lower Reach
Elevation (ft)
180
160
140
120
100
80
60
40
1000
2000
3000
4000
Main Channel Distance (ft)
Legend
WS 100-yr not bulke - Post-Dev Scour
WS 100-yr not bulke - Post-Fire Pre-Dev
Ground
Ground

Scour Comparison Analysis

	2020	2014	Scour	2018	Scour
Station	**Elevation**	**Elevation**	Depth	**Elevation**	Depth
117	10	10.0	-		
195	11	9.2	(1.8)		
366	16	12.5	(3.5)	13.3	(2.7)
404	17	13.9	(3.1)	14.6	(2.4)
505	19	15.0	(4.0)	16.7	(2.3)
623	22	22.0	-	20.8	(1.2)
707	27	26.4	(0.6)	26.8	(0.2)
787	32	29.0	(3.0)	29.5	(2.5)
872	33	31.7	(1.3)	31.2	(1.8)
988	37	34.5	(2.5)	34.9	(2.1)
1065	40	37.1	(2.9)	39.7	(0.3)
1162	43	40.0	(3.0)	40.8	(2.2)
1252	46	43.0	(3.0)	42.9	(3.1)
1368	51	46.9	(4.1)	47.6	(3.4)
1470	56	49.9	(6.1)	49.7	(6.3)
1542	57	54.8	(2.2)	55.2	(1.8)
1668	63	59.8	(3.2)	59.7	(3.3)
1762	66	62.5	(3.5)	63.2	(2.8)
1861	69	67.1	(1.9)	67.5	(1.5)
1962	72	70.8	(1.2)	71.3	(0.7)
2058	75	73.9	(1.1)	73.0	(2.0)
2163	79	75.7	(3.3)	76.2	(2.8)
2262	83	79.9	(3.1)	80.3	(2.7)
2364	86	81.0	(5.0)	80.9	(5.1)
2463	90	84.8	(5.2)	84.2	(5.8)
2556	93	87.3	(5.7)	87.3	(5.7)
2659	97	90.8	(6.2)	91.2	(5.8)
2761	101	94.1	(6.9)	94.5	(6.5)
2858	105	98.3	(6.7)	98.9	(6.1)
2960	109	104.1	(4.9)		
3051	112	110.0	(2.0)		
3136	115	113.8	(1.2)		
3249	121	120.0	(1.0)		
3350	124	121.4	(2.6)		
3444	128	124.6	(3.4)		
3549	131	127.2	(3.8)		
3648	135	131.0	(4.0)		
3745	138	133.7	(4.3)		
3850	141	137.2	(3.8)		
4042	148	144.5	(3.5)		
4143	151	148.3	(2.7)		
4245	154	152.8	(1.2)		
4348	160	160.0	-		
4402	163	162.5	(0.5)		
4445	165	163.2	(1.8)		
4582	171	168.4	(2.6)		
4845	180	178.5	(1.5)		


SCOUR DEPTH COMPARISON
-
(1.0)
(2.0)
(3.0)
(4.0)
(5.0)
(6.0)
(7.0)
Scour Depth, ft
0
1000
2000
3000
4000
5000
6000
Cross Section Section Number
2014 Depth
2018 Depth

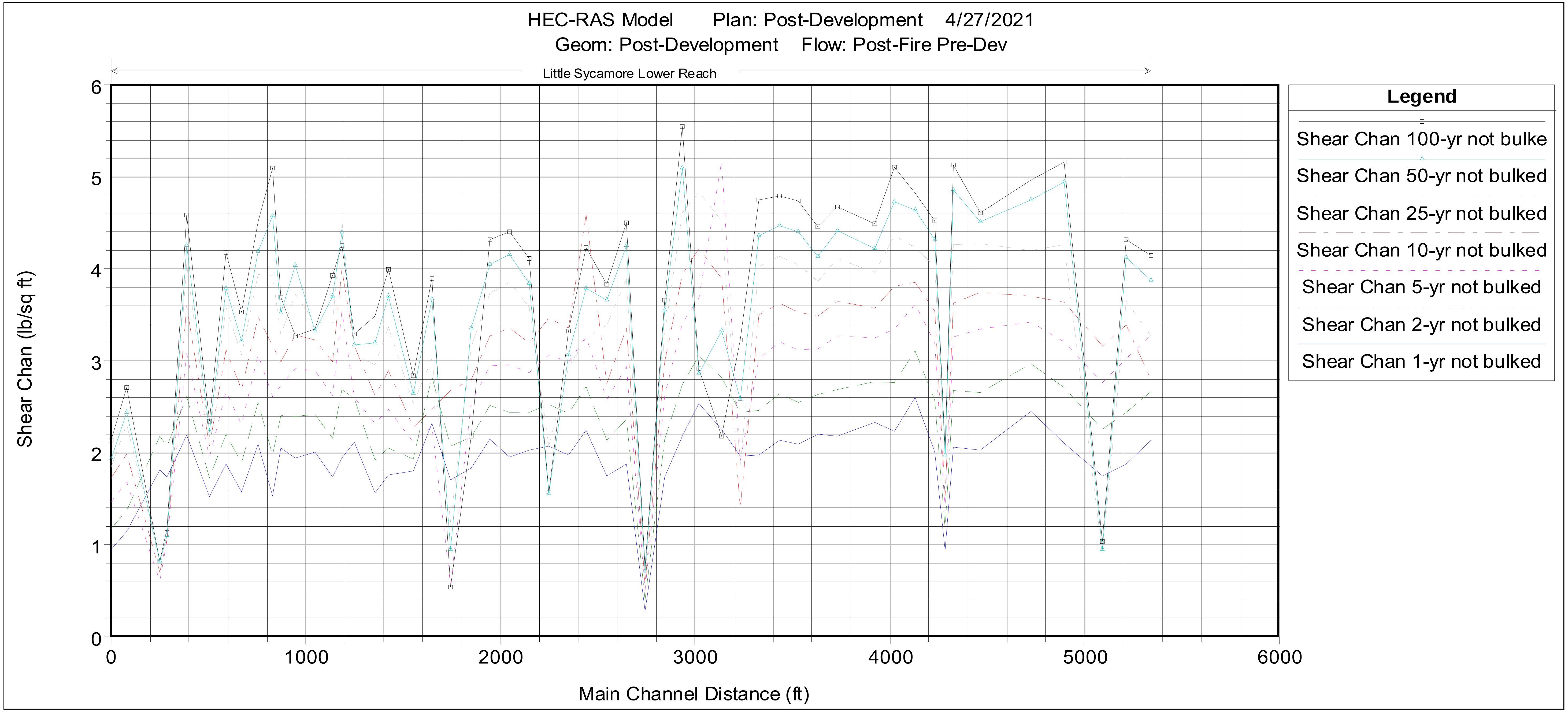
Post-Fire, Pre-Development



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.703388453	77.6	1.141696811	77.6	1.368046522	77.6	1.680717111	77.6	1.987666726	77.6	2.314466	77.6	2.439956188
248.94	0.343714476	248.94	0.361240953	248.94	0.470368117	248.94	0.601264834	248.94	0.705022395	248.94	0.540111244	248.94	0.445672214
286.79	0.453210205	286.79	1.491343379	286.79	1.140955925	286.79	1.042088628	286.79	1.058745861	286.79	0.734351158	286.79	0.633240283
387.49	3.695083857	387.49	2.188152552	387.49	2.608703852	387.49	3.072193623	387.49	3.589620113	387.49	4.044895649	387.49	4.253977776
505.31	4.651733398	505.31	2.396822453	505.31	2.795744419	505.31	3.29976511	505.31	3.695736885	505.31	4.046444416	505.31	4.242692471
589.23	4.654993534	589.23	2.030388832	589.23	2.372887373	589.23	2.868565559	589.23	3.382663012	589.23	3.96236515	589.23	4.203422546
668.97	3.959862947	668.97	2.235546112	668.97	2.681573629	668.97	3.192373276	668.97	3.657744884	668.97	4.12434864	668.97	4.309940815
754.27	4.70284605	754.27	2.24826026	754.27	2.767726898	754.27	3.336613417	754.27	3.763040066	754.27	4.28907299	754.27	4.516798496
870.5	3.111606836	870.5	2.254004955	870.5	2.72761178	870.5	3.289911509	870.5	3.686351299	870.5	4.180016041	870.5	3.69786787
947.99	3.142518759	947.99	1.996211886	947.99	2.46566987	947.99	3.045657396	947.99	3.429419279	947.99	3.750015974	947.99	3.497653008
1044.84	3.350493193	1044.84	2.364188433	1044.84	2.876202345	1044.84	3.320783138	1044.84	2.675062656	1044.84	2.999514341	1044.84	3.23883152
1134.85	3.854235172	1134.85	2.196121454	1134.85	2.744570971	1134.85	3.087471724	1134.85	3.214880228	1134.85	3.40217638	1134.85	3.530450583
1251.18	3.490711451	1251.18	2.105843067	1251.18	2.568990469	1251.18	3.10763216	1251.18	3.480506659	1251.18	3.397166967	1251.18	3.418609142
1353.32	3.581417561	1353.32	1.642957091	1353.32	1.913918138	1353.32	2.164697409	1353.32	2.513470173	1353.32	2.959820271	1353.32	3.276737213
1425.6	3.995445728	1425.6	1.76584208	1425.6	2.047630548	1425.6	2.499600172	1425.6	2.886327028	1425.6	3.35095191	1425.6	3.700675964
1551.52	2.874196529	1551.52	2.297993183	1551.52	2.831849337	1551.52	3.29110837	1551.52	1.987472773	1551.52	2.335641861	1551.52	2.542364836
1645.89	3.000026941	1645.89	2.412563324	1645.89	2.992352247	1645.89	3.671649456	1645.89	4.107242107	1645.89	2.298070669	1645.89	2.597097397
1745.34	1.419588089	1745.34	1.271828771	1745.34	0.374024212	1745.34	0.612818122	1745.34	0.80493927	1745.34	1.045722723	1745.34	1.24345541
1846.79	3.173028469	1846.79	2.475396872	1846.79	3.100571156	1846.79	3.684305429	1846.79	4.030702114	1846.79	2.635053873	1846.79	2.861521482
1943.2	4.424213886	1943.2	1.929999948	1943.2	2.319247484	1943.2	2.638061762	1943.2	2.466350794	1943.2	3.797864437	1943.2	4.189178467
2048.51	2.906226397	2048.51	2.219758034	2048.51	2.721997261	2048.51	3.277062654	2048.51	3.615992069	2048.51	3.951519012	2048.51	3.038144827
2147.4	3.096805096	2147.4	2.338124752	2147.4	2.920098305	2147.4	3.524108171	2147.4	3.914994478	2147.4	4.503354549	2147.4	4.235442162
2249.05	2.023352861	2249.05	2.468644142	2249.05	1.351000905	2249.05	0.803338289	2249.05	1.084716439	2249.05	1.456405997	2249.05	1.731252789
2348.05	4.287589073	2348.05	2.199077845	2348.05	2.69446826	2348.05	3.241208792	2348.05	3.631913662	2348.05	3.931488037	2348.05	4.022571087
2441.36	4.17590332	2441.36	2.436615467	2441.36	2.912823915	2441.36	2.525366068	2441.36	2.710033894	2441.36	3.258345127	2441.36	3.765317202
2544.08	3.952722549	2544.08	2.398552895	2544.08	2.789872885	2544.08	3.266804218	2544.08	2.940839052	2544.08	3.226047277	2544.08	3.616457224
2645.8	3.902448416	2645.8	1.875349641	2645.8	2.311301708	2645.8	2.831725121	2645.8	3.235344648	2645.8	3.77268362	2645.8	4.07990694
2742.83	3.176100731	2742.83	1.907185793	2742.83	2.338008165	2742.83	2.809354067	2742.83	2.973177433	2742.83	2.836844921	2742.83	3.029089212
2844.37	3.689989328	2844.37	2.273057699	2844.37	2.868818045	2844.37	3.189250708	2844.37	2.577575922	2844.37	2.855574369	2844.37	3.268930912
2935.8	4.241570473	2935.8	2.264400005	2935.8	2.769975424	2935.8	3.397620201	2935.8	3.842506647	2935.8	3.63887763	2935.8	3.985328674
3020.65	2.958565235	3020.65	2.306562185	3020.65	2.879511118	3020.65	3.676714897	3020.65	4.317813396	3020.65	4.958456993	3020.65	2.987204552
3133.22	2.892803431	3133.22	2.243953705	3133.22	2.830340862	3133.22	3.523970842	3133.22	3.412109375	3133.22	2.175982237	3133.22	2.707642078
3233.79	4.181791782	3233.79	1.936094165	3233.79	2.390562534	3233.79	3.02872324	3233.79	3.451993465	3233.79	3.861609697	3233.79	4.092702389
3327.3	4.782934666	3327.3	1.949944615	3327.3	2.437722445	3327.3	3.022139311	3327.3	3.476525068	3327.3	4.052227974	3327.3	4.429865837
3431.95	4.855642319	3431.95	2.171914577	3431.95	2.711390495	3431.95	3.325437546	3431.95	3.75248003	3431.95	4.201432705	3431.95	4.538480282
3530.69	5.427078724	3530.69	2.090618134	3530.69	2.672679901	3530.69	3.395678997	3530.69	3.948801994	3530.69	4.576802254	3530.69	5.019784451
3627.72	4.969460487	3627.72	2.290750265	3627.72	2.773071289	3627.72	3.330588341	3627.72	3.731995821	3627.72	4.267673492	3627.72	4.651538849
3732.61	4.610225677	3732.61	2.135167837	3732.61	2.639624119	3732.61	3.184592009	3732.61	3.612842798	3732.61	4.053394318	3732.61	4.373222351
3924.45	5.104465961	3924.45	2.359345436	3924.45	2.86768508	3924.45	3.303678274	3924.45	3.707674742	3924.45	4.294125557	3924.45	4.695009708
4025.42	5.150004864	4025.42	2.296461344	4025.42	2.75142622	4025.42	3.338035107	4025.42	3.798663616	4025.42	4.327486992	4025.42	4.752797604
4127.4	5.145168304	4127.4	2.655558586	4127.4	3.156490803	4127.4	3.773305655	4127.4	4.09675312	4127.4	4.524348736	4127.4	4.935251713

4229.91	4.566906452	4229.91	2.015562773	4229.91	2.567733049	4229.91	3.21001935	4229.91	3.524240732	4229.91	4.057714462	4229.91	4.345502377
4284.28	1.850292563	4284.28	0.835739076	4284.28	1.321419001	4284.28	1.538870335	4284.28	1.673491478	4284.28	1.623676777	4284.28	1.823855042
4326.65	5.126880646	4326.65	2.066061497	4326.65	2.671705246	4326.65	3.263078928	4326.65	3.623650074	4326.65	4.260176182	4326.65	4.860029221
4463.44	4.583981037	4463.44	2.032129049	4463.44	2.640650034	4463.44	3.311764717	4463.44	3.70207262	4463.44	4.264324665	4463.44	4.463983536
4726.29	4.978009224	4726.29	2.45314455	4726.29	2.961586475	4726.29	3.413385868	4726.29	3.678003788	4726.29	4.18439579	4726.29	4.728346348
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.74512291	5088.67	2.25167346	5088.67	2.758068085	5088.67	3.167146683	5088.67	0.896869123	5088.67	0.947973013
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

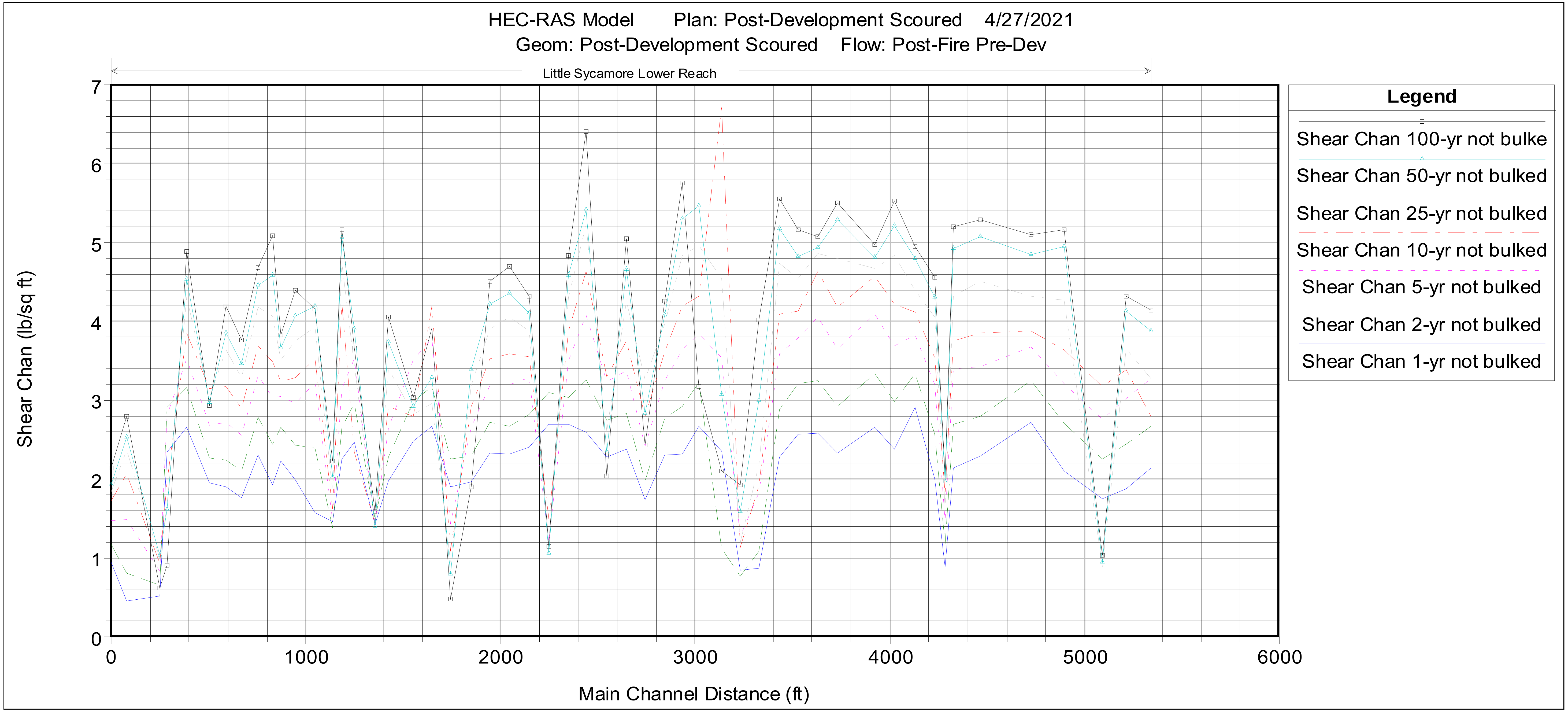
Post-Fire, Post-Development



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.703388453	77.6	1.141696811	77.6	1.368046522	77.6	1.680717111	77.6	1.987666726	77.6	2.314466	77.6	2.439956188
248.94	0.818382263	248.94	1.813119888	248.94	2.181265354	248.94	0.60166049	248.94	0.704857647	248.94	0.815811217	248.94	0.818742573
286.79	1.172142148	286.79	1.734660506	286.79	2.073633909	286.79	1.042935371	286.79	1.05845511	286.79	1.076459289	286.79	1.106020093
387.49	4.589851379	387.49	2.188152552	387.49	2.608703852	387.49	3.072193623	387.49	3.589620113	387.49	4.044895649	387.49	4.253977776
505.31	2.339621305	505.31	1.525794387	505.31	1.724587321	505.31	1.954495549	505.31	2.074371099	505.31	2.182151079	505.31	2.229355335
589.23	4.176728725	589.23	1.88110733	589.23	2.196297884	589.23	2.66608882	589.23	3.118161917	589.23	3.577818394	589.23	3.791172504
668.97	3.530309916	668.97	1.575666308	668.97	1.890519023	668.97	2.311037779	668.97	2.68997097	668.97	3.066508293	668.97	3.214378834
754.27	4.513989449	754.27	2.096242428	754.27	2.541588545	754.27	3.061299086	754.27	3.471279621	754.27	3.936411619	754.27	4.18943119
829.94	5.092406273	829.94	1.533261538	829.94	1.972465038	829.94	2.610453606	829.94	3.166508198	829.94	3.925302744	829.94	4.580565929
870.5	3.695412874	870.5	2.050345421	870.5	2.406298876	870.5	2.730717659	870.5	2.991778374	870.5	3.280050516	870.5	3.52248764
947.99	3.270717382	947.99	1.945144296	947.99	2.400224447	947.99	2.913832426	947.99	3.279509306	947.99	3.721509457	947.99	4.040867329
1044.84	3.341142893	1044.84	2.002196312	1044.84	2.415961504	1044.84	2.891813278	1044.84	3.222553492	1044.84	3.420023203	1044.84	3.322248697
1134.85	3.930010557	1134.85	1.740577579	1134.85	2.159100533	1134.85	2.626650333	1134.85	2.985991478	1134.85	3.412624121	1134.85	3.698951483
1186.13	4.251726151	1186.13	1.941067696	1186.13	2.684263229	1186.13	3.542742014	1186.13	3.997159481	1186.13	4.533449173	1186.13	4.39303875
1251.18	3.296373129	1251.18	2.114600658	1251.18	2.593178272	1251.18	2.605823755	1251.18	3.163478374	1251.18	3.061168432	1251.18	3.17055583
1353.32	3.482430935	1353.32	1.561947346	1353.32	1.918657541	1353.32	2.324704409	1353.32	2.617501497	1353.32	2.954262495	1353.32	3.194576263
1425.6	3.988613605	1425.6	1.7589463	1425.6	2.045609474	1425.6	2.472081423	1425.6	2.896196842	1425.6	3.366747618	1425.6	3.706145287
1551.52	2.842478752	1551.52	1.800990582	1551.52	1.930176497	1551.52	2.118559122	1551.52	2.281148672	1551.52	2.53412509	1551.52	2.646815062
1645.89	3.891829014	1645.89	2.31668067	1645.89	2.827485085	1645.89	2.290580988	1645.89	2.46901226	1645.89	3.024615288	1645.89	3.664481163
1745.34	0.538135886	1745.34	1.701598048	1745.34	2.069151163	1745.34	0.564451039	1745.34	2.674675226	1745.34	1.250567675	1745.34	0.954371393
1846.79	2.179247379	1846.79	1.831426859	1846.79	2.171171427	1846.79	2.547992229	1846.79	2.7947402	1846.79	3.148342133	1846.79	3.360514641
1943.2	4.321713448	1943.2	2.143776417	1943.2	2.509639263	1943.2	2.94651413	1943.2	3.27197504	1943.2	3.733614683	1943.2	4.047966003
2048.51	4.407795429	2048.51	1.950847983	2048.51	2.439461708	2048.51	2.953485489	2048.51	3.357496977	2048.51	3.851572514	2048.51	4.160010815
2147.4	4.109573364	2147.4	2.026242495	2147.4	2.441935301	2147.4	2.872155905	2147.4	3.198229074	2147.4	3.584641695	2147.4	3.837845564
2249.05	1.566898227	2249.05	2.074809313	2249.05	2.529220343	2249.05	3.061310053	2249.05	3.462342262	2249.05	2.075015545	2249.05	1.554825425
2348.05	3.327395201	2348.05	1.969970465	2348.05	2.430294275	2348.05	2.988370657	2348.05	3.350782871	2348.05	2.921376705	2348.05	3.063514948
2441.36	4.232916355	2441.36	2.242810726	2441.36	2.721218348	2441.36	3.26123333	2441.36	4.583899021	2441.36	3.248616695	2441.36	3.784754992
2544.08	3.834454298	2544.08	1.744105816	2544.08	2.133593798	2544.08	2.580547333	2544.08	2.747323513	2544.08	3.386411905	2544.08	3.662545443
2645.8	4.494993687	2645.8	1.878621101	2645.8	2.361494541	2645.8	2.933747768	2645.8	3.352637291	2645.8	3.88863039	2645.8	4.254697323
2742.83	0.757985353	2742.83	0.276474565	2742.83	0.397040039	2742.83	0.507766187	2742.83	0.570455849	2742.83	0.647778332	2742.83	0.709769368
2844.37	3.660311222	2844.37	1.737481475	2844.37	2.142537832	2844.37	2.621665716	2844.37	2.983970881	2844.37	3.307453156	2844.37	3.545269251
2935.8	5.54168272	2935.8	2.178490877	2935.8	2.737053871	2935.8	3.405778408	2935.8	3.942078114	2935.8	4.604347706	2935.8	5.097040176
3020.65	2.909868717	3020.65	2.53184247	3020.65	3.058018446	3020.65	3.681459665	3020.65	4.218832016	3020.65	4.833191395	3020.65	2.858137608
3133.22	2.17925024	3133.22	2.258458614	3133.22	2.817173004	3133.22	5.171425343	3133.22	3.896897793	3133.22	4.520766258	3133.22	3.31910944
3233.79	3.229267597	3233.79	1.96869576	3233.79	2.443116903	3233.79	1.909534216	3233.79	1.404062986	3233.79	1.861769438	3233.79	2.576592445
3327.3	4.746603489	3327.3	1.976385117	3327.3	2.460542917	3327.3	3.023250103	3327.3	3.496150255	3327.3	4.025384903	3327.3	4.359009266
3431.95	4.787042141	3431.95	2.139727116	3431.95	2.648216248	3431.95	3.200370789	3431.95	3.62610817	3431.95	4.133219719	3431.95	4.470973969
3530.69	4.741533756	3530.69	2.091272831	3530.69	2.545295238	3530.69	3.121544361	3530.69	3.533170462	3530.69	4.05039978	3530.69	4.407945633
3627.72	4.452517986	3627.72	2.197816133	3627.72	2.635948896	3627.72	3.128293037	3627.72	3.482616425	3627.72	3.860357046	3627.72	4.131286621
3732.61	4.672281265	3732.61	2.176596165	3732.61	2.68512702	3732.61	3.268046618	3732.61	3.648741007	3732.61	4.108590603	3732.61	4.414248943
3924.45	4.491084576	3924.45	2.32625246	3924.45	2.778359175	3924.45	3.246356487	3924.45	3.574937105	3924.45	3.959542513	3924.45	4.218408108

4025.42	5.100600243	4025.42	2.238582373	4025.42	2.758176565	4025.42	3.350358486	4025.42	3.8073771	4025.42	4.357707024	4025.42	4.731964588
4127.4	4.825512886	4127.4	2.597528934	4127.4	3.105097055	4127.4	3.620461702	4127.4	3.854121447	4127.4	4.230101109	4127.4	4.640548229
4229.91	4.51708889	4229.91	2.010860443	4229.91	2.571186066	4229.91	3.194596529	4229.91	3.536028385	4229.91	4.024029255	4229.91	4.312310696
4284.28	2.017047405	4284.28	0.943041921	4284.28	1.179848909	4284.28	1.355609417	4284.28	1.516325474	4284.28	1.896381497	4284.28	1.971314549
4326.65	5.127000332	4326.65	2.065654039	4326.65	2.671665192	4326.65	3.261983156	4326.65	3.623684168	4326.65	4.260208607	4326.65	4.860124111
4463.44	4.603263855	4463.44	2.031263351	4463.44	2.650016785	4463.44	3.349256992	4463.44	3.748144388	4463.44	4.273152828	4463.44	4.513811588
4726.29	4.968895912	4726.29	2.454773426	4726.29	2.967579603	4726.29	3.421108484	4726.29	3.700984001	4726.29	4.195031643	4726.29	4.746049881
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.74512291	5088.67	2.25167346	5088.67	2.758068085	5088.67	3.167146683	5088.67	0.896869123	5088.67	0.947973013
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

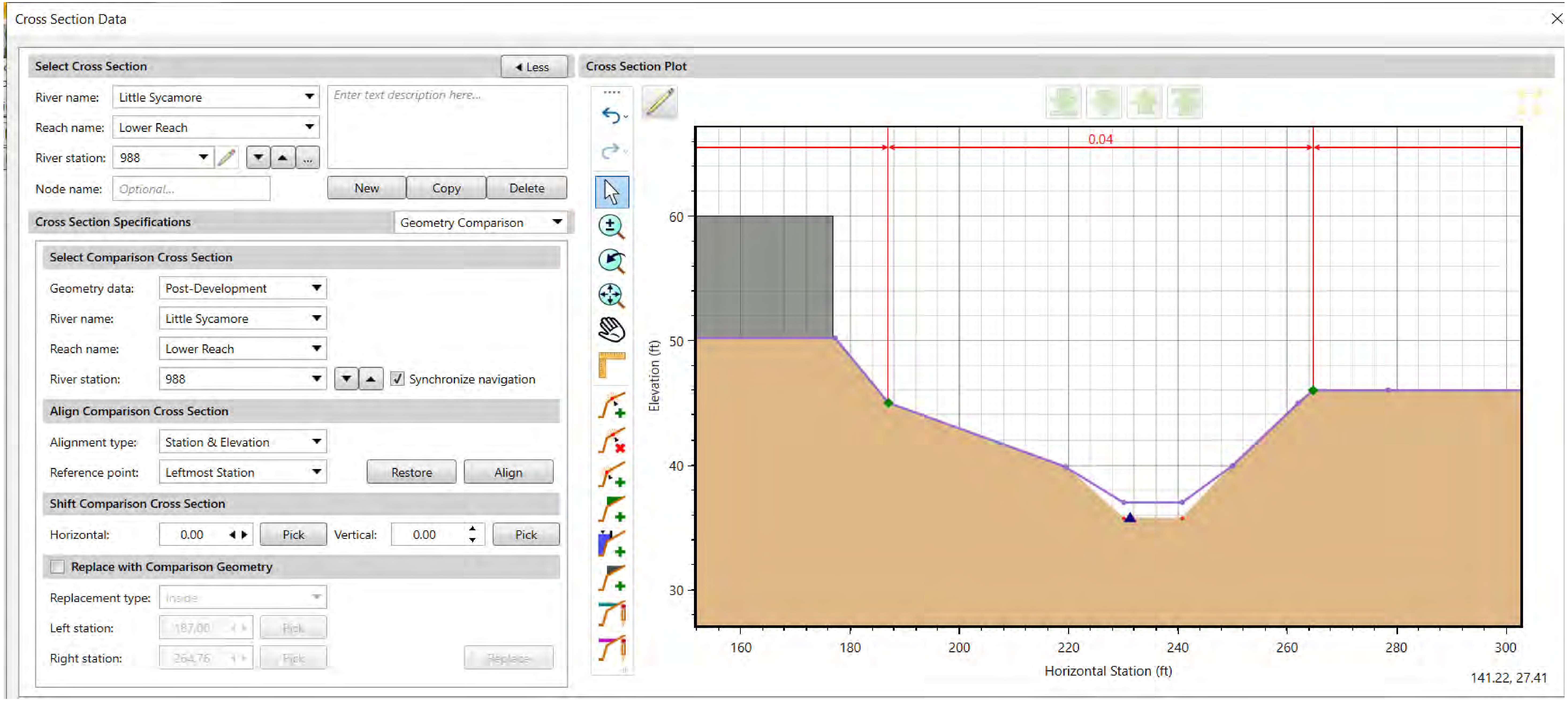
Post Development with Scour



Label	Shear Chan 100-yr	Label	Shear Chan 1-yr	Label	Shear Chan 2-yr	Label	Shear Chan 5-yr	Label	Shear Chan 10-yr	Label	Shear Chan 25-yr	Label	Shear Chan 50-yr
x	y	x	y	x	y	x	y	x	y	x	y	x	y
0	2.134231329	0	0.946107924	0	1.173442125	0	1.467337132	0	1.726856947	0	1.841006279	0	1.929047346
77.6	2.800700665	77.6	0.450432092	77.6	0.810203433	77.6	1.488419414	77.6	2.067630529	77.6	2.361685276	77.6	2.533234119
248.94	0.61399895	248.94	0.510533929	248.94	0.660030603	248.94	0.834961295	248.94	0.930115759	248.94	0.998967588	248.94	1.031199574
286.79	0.90568912	286.79	2.343175888	286.79	2.905864716	286.79	2.806242228	286.79	1.958188772	286.79	1.672083497	286.79	1.610926151
387.49	4.880543232	387.49	2.655575991	387.49	3.162184238	387.49	3.525389433	387.49	3.850014448	387.49	4.304958344	387.49	4.532369614
505.31	2.92975235	505.31	1.955260873	505.31	2.270879984	505.31	2.685689926	505.31	3.142838955	505.31	3.028710365	505.31	2.97584939
589.23	4.19210434	589.23	1.90626514	589.23	2.235415459	589.23	2.714730024	589.23	3.169786692	589.23	3.632832527	589.23	3.847948313
668.97	3.759789467	668.97	1.761220694	668.97	2.108423233	668.97	2.552453995	668.97	2.900464058	668.97	3.285674334	668.97	3.455943346
754.27	4.68725872	754.27	2.299429893	754.27	2.776388407	754.27	3.310473919	754.27	3.694975853	754.27	4.179368019	754.27	4.459667683
829.94	5.088226318	829.94	1.932383657	829.94	2.436626196	829.94	3.040217638	829.94	3.486223221	829.94	4.066179276	829.94	4.586238384
870.5	3.831036329	870.5	2.234609604	870.5	2.656130314	870.5	3.049030781	870.5	3.238527536	870.5	3.511985064	870.5	3.665446281
947.99	4.39464283	947.99	1.986897349	947.99	2.433868408	947.99	2.954331398	947.99	3.288722038	947.99	3.753118515	947.99	4.069470406
1044.84	4.157723904	1044.84	1.57615602	1044.84	2.390345573	1044.84	3.217099667	1044.84	3.528017521	1044.84	3.923645258	1044.84	4.191583633
1134.85	2.228172779	1134.85	1.462739706	1134.85	1.387800932	1134.85	1.47043705	1134.85	1.625304222	1134.85	1.850923419	1134.85	2.029774904
1186.13	5.16698122	1186.13	2.258691788	1186.13	2.657833338	1186.13	3.141887426	1186.13	4.233765125	1186.13	4.73568058	1186.13	5.056593895
1251.18	3.666116714	1251.18	2.462536335	1251.18	2.962927103	1251.18	3.526185036	1251.18	2.346624613	1251.18	3.449034929	1251.18	3.904093504
1353.32	1.581783533	1353.32	1.422588587	1353.32	1.497657537	1353.32	1.448587894	1353.32	1.435178518	1353.32	1.383013606	1353.32	1.402405739
1425.6	4.04879427	1425.6	1.980154753	1425.6	2.274729967	1425.6	2.642222166	1425.6	2.926282883	1425.6	3.405030012	1425.6	3.733216047
1551.52	3.032073021	1551.52	2.480365276	1551.52	2.981884003	1551.52	3.509203434	1551.52	2.797260761	1551.52	2.819491148	1551.52	2.923645735
1645.89	3.916155815	1645.89	2.66700387	1645.89	3.173490763	1645.89	3.771393061	1645.89	4.188324928	1645.89	2.958190918	1645.89	3.283647537
1745.34	0.480857134	1745.34	1.895206094	1745.34	2.251318693	1745.34	1.430911541	1745.34	1.089304209	1745.34	0.941054344	1745.34	0.789856434
1846.79	1.900241733	1846.79	1.968032956	1846.79	2.289981365	1846.79	2.657705545	1846.79	2.920004845	1846.79	3.187879324	1846.79	3.386994839
1943.2	4.502747059	1943.2	2.325224161	1943.2	2.722008228	1943.2	3.179826021	1943.2	3.520637751	1943.2	3.901517153	1943.2	4.219164848
2048.51	4.690546989	2048.51	2.31448555	2048.51	2.673184872	2048.51	3.200976849	2048.51	3.591954231	2048.51	4.05136776	2048.51	4.358943939
2147.4	4.323764801	2147.4	2.406153679	2147.4	2.821618795	2147.4	3.283292294	2147.4	3.544782162	2147.4	3.87608099	2147.4	4.108220577
2249.05	1.139769793	2249.05	2.692094803	2249.05	3.094177485	2249.05	1.201012135	2249.05	1.50047791	2249.05	1.130627394	2249.05	1.053495169
2348.05	4.840378761	2348.05	2.690585375	2348.05	3.031570435	2348.05	3.505358934	2348.05	3.872674227	2348.05	4.302873135	2348.05	4.579888344
2441.36	6.4142313	2441.36	2.594298363	2441.36	3.260054827	2441.36	4.081573486	2441.36	4.636506081	2441.36	5.228922367	2441.36	5.415633678
2544.08	2.044864416	2544.08	2.283827305	2544.08	2.746570587	2544.08	3.239488602	2544.08	3.297921181	2544.08	2.607882261	2544.08	2.34451437
2645.8	5.050286293	2645.8	2.382595062	2645.8	2.837244511	2645.8	3.371741056	2645.8	3.751538515	2645.8	4.256382942	2645.8	4.663995266
2742.83	2.433570862	2742.83	1.732624769	2742.83	1.97764039	2742.83	2.41729641	2742.83	2.793636084	2742.83	3.256540298	2742.83	2.834443808
2844.37	4.255380154	2844.37	2.303130627	2844.37	2.768572569	2844.37	3.245614529	2844.37	3.61186862	2844.37	3.96100378	2844.37	4.074622154
2935.8	5.750124454	2935.8	2.319115162	2935.8	2.9255898	2935.8	3.644037008	2935.8	4.187333584	2935.8	4.830219269	2935.8	5.301642418
3020.65	3.176444054	3020.65	2.67288208	3020.65	3.217249632	3020.65	3.845665455	3020.65	4.312055111	3020.65	4.963970184	3020.65	5.458473682
3133.22	2.098932505	3133.22	2.354814291	3133.22	1.118947625	3133.22	3.532648087	3133.22	6.715595245	3133.22	4.545220375	3133.22	3.065684319
3233.79	1.920098662	3233.79	0.843539596	3233.79	0.763274848	3233.79	1.271697998	3233.79	1.134733915	3233.79	1.193005085	3233.79	1.588521361
3327.3	4.015743732	3327.3	0.868811309	3327.3	1.079763889	3327.3	1.829590678	3327.3	1.916389227	3327.3	2.178752184	3327.3	2.996569633
3431.95	5.548572063	3431.95	2.281148195	3431.95	2.879059553	3431.95	3.589644432	3431.95	4.097111702	3431.95	4.734415054	3431.95	5.173863411
3530.69	5.156169891	3530.69	2.57200098	3530.69	3.204813957	3530.69	3.792361498	3530.69	4.131856918	3530.69	4.541067123	3530.69	4.822448254
3627.72	5.072691917	3627.72	2.574827433	3627.72	3.248927116	3627.72	4.055029869	3627.72	4.627181053	3627.72	4.854703426	3627.72	4.928986549
3732.61	5.503067017	3732.61	2.328924894	3732.61	2.925653219	3732.61	3.645806789	3732.61	4.181595325	3732.61	4.793232441	3732.61	5.292403698
3924.45	4.97595787	3924.45	2.656090736	3924.45	3.331306934	3924.45	4.091975212	3924.45	4.5703969	3924.45	4.668673992	3924.45	4.805522442

4025.42	5.531811237	4025.42	2.383010387	4025.42	2.982164383	4025.42	3.694983959	4025.42	4.22228384	4025.42	4.834305763	4025.42	5.216771126
4127.4	4.953886986	4127.4	2.909204245	4127.4	3.334248543	4127.4	3.829876184	4127.4	4.117008209	4127.4	4.391065598	4127.4	4.796323776
4229.91	4.558244228	4229.91	2.004521608	4229.91	2.570549488	4229.91	3.20115757	4229.91	3.533443689	4229.91	4.056278229	4229.91	4.311732292
4284.28	2.044019222	4284.28	0.882965982	4284.28	1.16843009	4284.28	1.467133522	4284.28	1.819189429	4284.28	1.619704604	4284.28	1.960428238
4326.65	5.198393345	4326.65	2.134659767	4326.65	2.699781656	4326.65	3.394062281	4326.65	3.754738092	4326.65	4.314439297	4326.65	4.927453995
4463.44	5.289433002	4463.44	2.296989441	4463.44	2.793565989	4463.44	3.424823999	4463.44	3.855123997	4463.44	4.50691843	4463.44	5.071501255
4726.29	5.102583408	4726.29	2.724640608	4726.29	3.244042873	4726.29	3.676114321	4726.29	3.883848906	4726.29	4.315837383	4726.29	4.847494125
4892.65	5.157335281	4892.65	2.106929064	4892.65	2.709429502	4892.65	3.208475351	4892.65	3.641065598	4892.65	4.266853809	4892.65	4.945528984
5088.67	1.035732388	5088.67	1.745121121	5088.67	2.251671076	5088.67	2.758066416	5088.67	3.167144537	5088.67	0.896868765	5088.67	0.947972894
5215.89	4.320318699	5215.89	1.881455541	5215.89	2.438338757	5215.89	3.02119112	5215.89	3.390589952	5215.89	3.65149188	5215.89	4.127391338
5341.13	4.142439842	5341.13	2.136454821	5341.13	2.670197248	5341.13	3.278224468	5341.13	2.789589167	5341.13	3.273621798	5341.13	3.876837254

Comparitive Sections



Cross Section Data

River name: Little Sycamore
Reach name: Lower Reach
River station: 988
Node name: Optional...

Cross Section Specifications: Geometry Comparison

Geometry data: Post-Development
River name: Little Sycamore
Reach name: Lower Reach
River station: 988
☑ Synchronize navigation

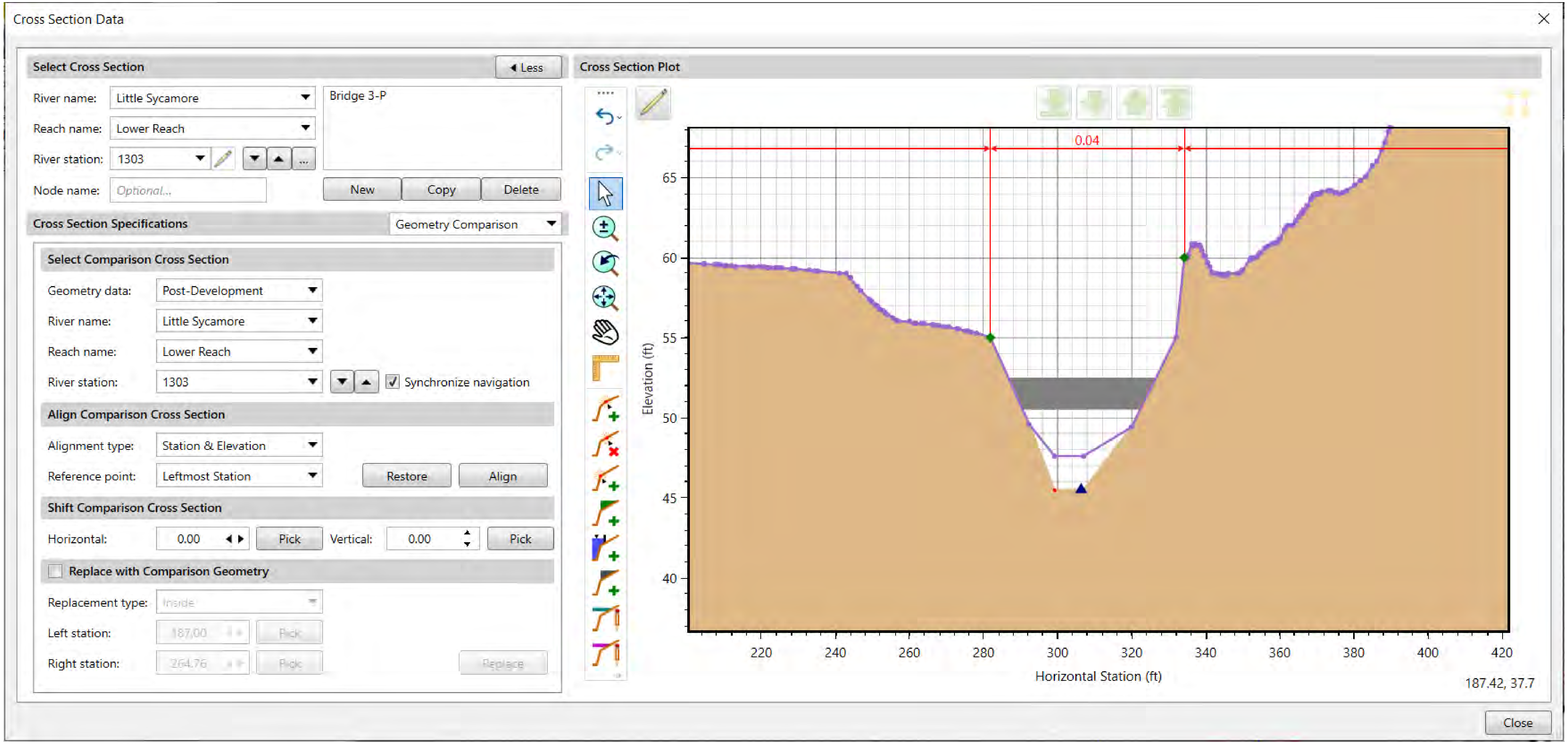
Alignment type: Station & Elevation
Reference point: Leftmost Station

Horizontal: 0.00
Vertical: 0.00

☐ Replace with Comparison Geometry

Replacement type: Inside
Left station: 187.00
Right station: 264.76

Select Cross Section
Less
Enter text description here...
New
Copy
Delete
Select Comparison Cross Section
Align Comparison Cross Section
Restore
Align
Shift Comparison Cross Section
Pick
Pick
Pick
Pick
Replace
Cross Section Plot
0.04
60
50
40
30
Elevation (ft)
160
180
200
220
240
260
280
300
Horizontal Station (ft)
141.22, 27.41



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1303

Bridge 3-P

Node name: Optional...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1303

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 187.00

Right station: 264.76

Cross Section Plot

187.42, 37.7

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
65
60
55
50
45
40
Elevation (ft)
220
240
260
280
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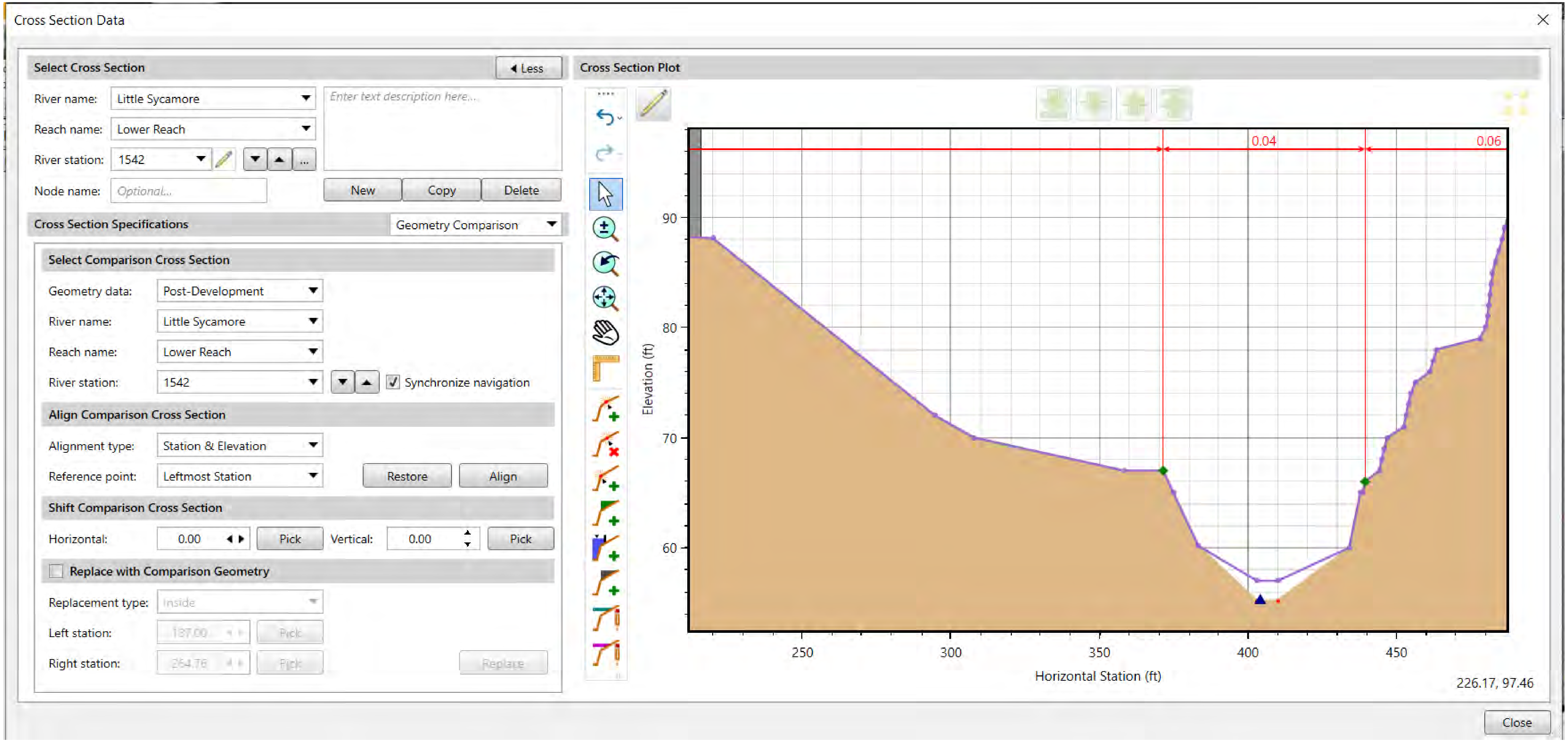
360
380
400
420
Horizontal Station (ft)
Close



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1542

Node name: Optional...

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1542 ☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

Replacement type: Inside

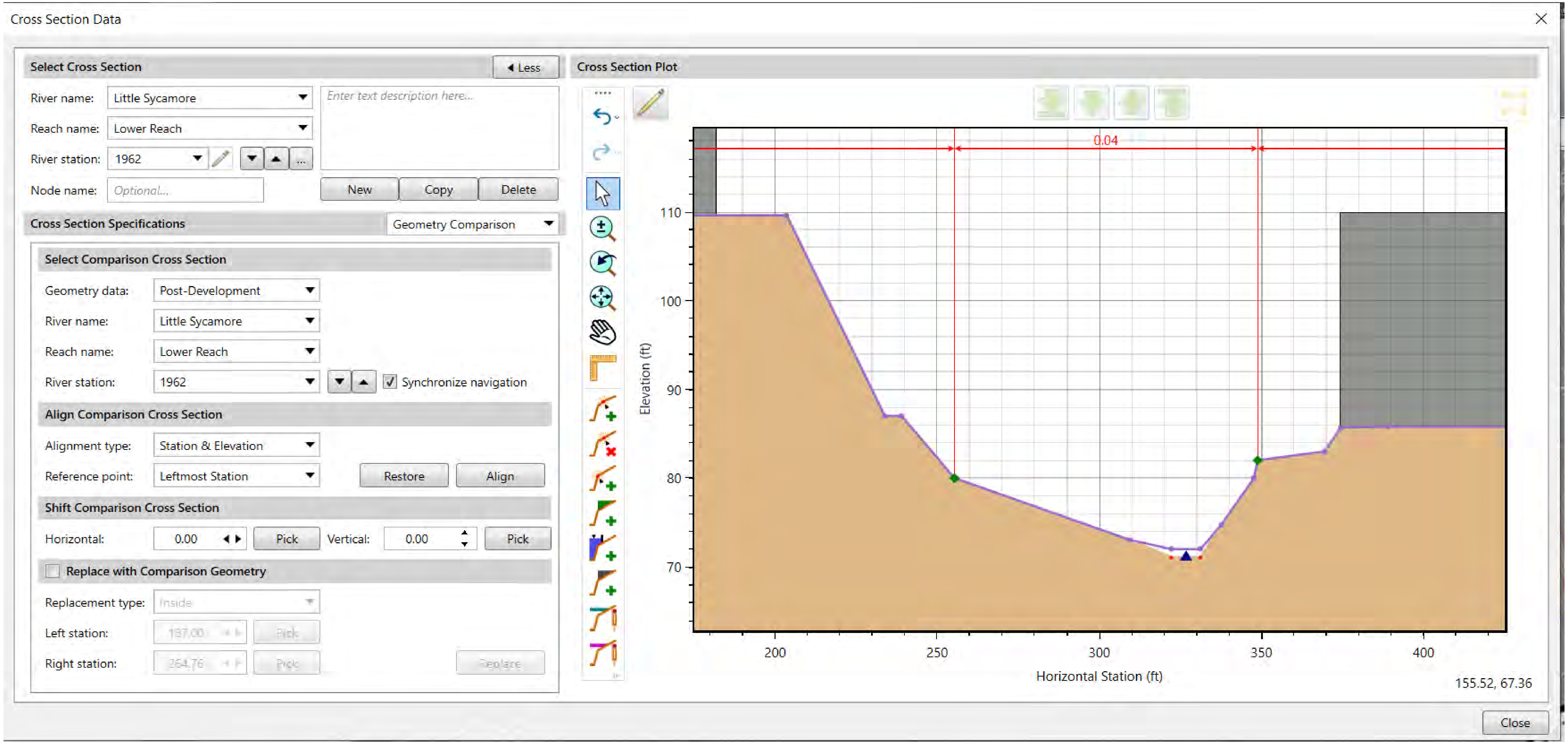
Left station: 187.00

Right station: 264.76

Cross Section Plot

226.17, 97.46

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Close
0.04
0.06
90
80
70
60
Elevation (ft)
250
300
350
400
450
Horizontal Station (ft)



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 1962

Node name: *Optional...*

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 1962

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ **Replace with Comparison Geometry**

Replacement type: Inside

Left station: 187.00

Right station: 264.76

Cross Section Plot

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
110
100
90
80
70
Elevation (ft)
200
250
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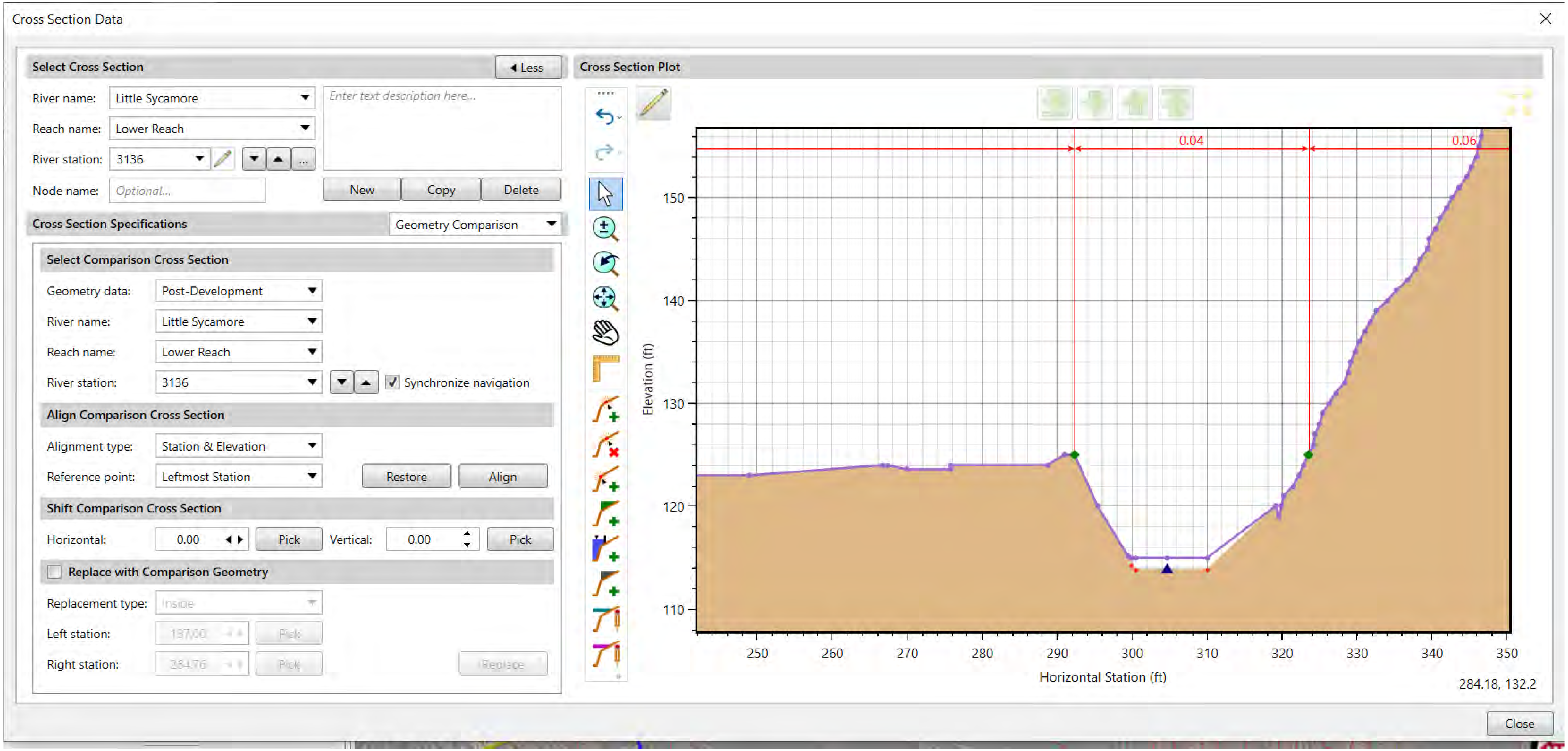
Horizontal Station (ft)
155.52, 67.36
Close



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 3136

Node name: *Optional...*

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 3136

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ **Replace with Comparison Geometry**

Replacement type: Inside

Left station: 137.00

Right station: 284.76

Cross Section Plot

284.18, 132.2

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
Close
0.04
0.06
Elevation (ft)
150
140
130
120
110
Horizontal Station (ft)
250
260
270
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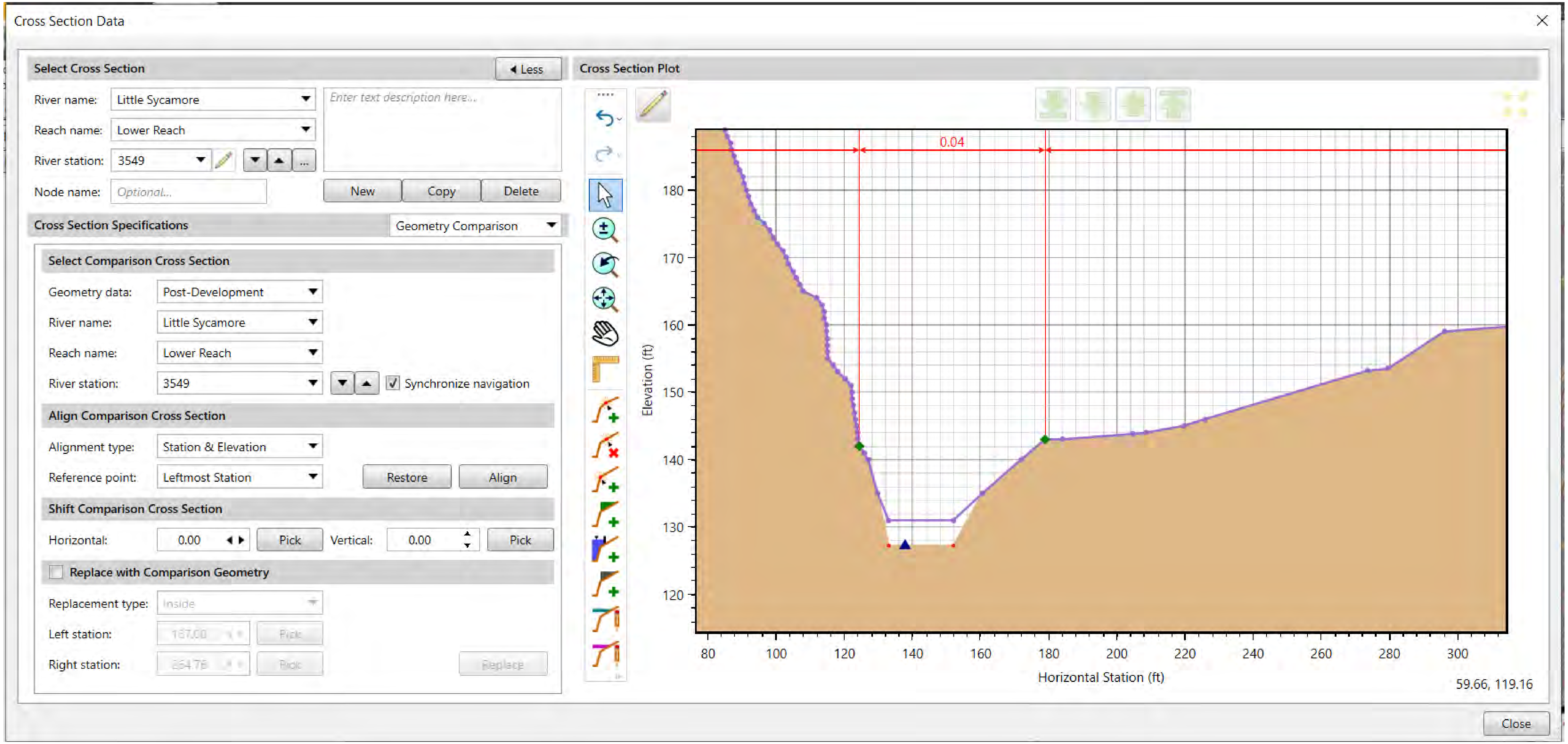
300
310
320
330
340
350



Cross Section Data

Select Cross Section

River name: Little Sycamore

Reach name: Lower Reach

River station: 3549

Node name: Optional...

Enter text description here...

Cross Section Specifications: Geometry Comparison

Select Comparison Cross Section

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 3549

☑ Synchronize navigation

Align Comparison Cross Section

Alignment type: Station & Elevation

Reference point: Leftmost Station

Shift Comparison Cross Section

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

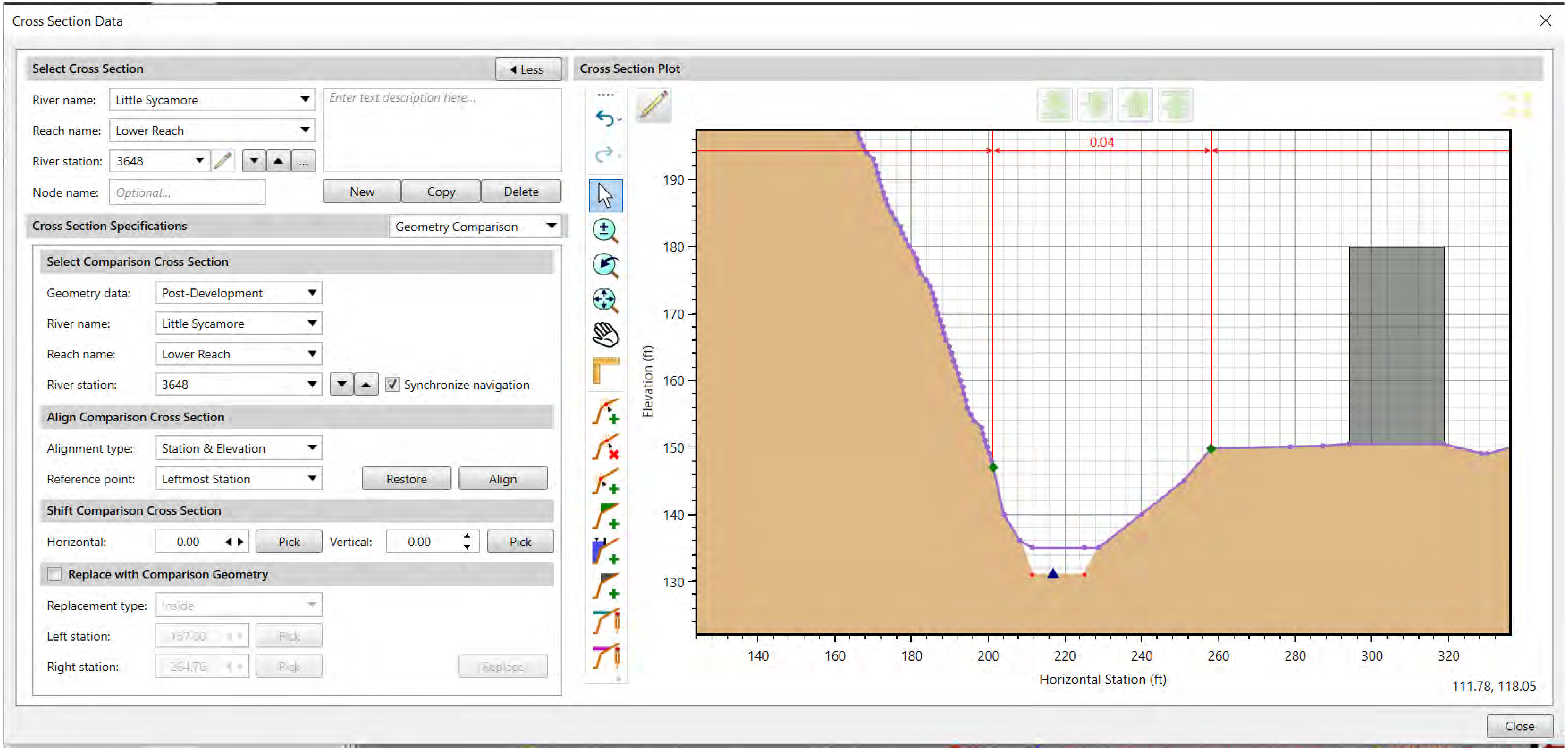
Replacement type: Inside

Left station: 137.00

Right station: 254.76

Cross Section Plot

Less
New
Copy
Delete
Restore
Align
Pick
Pick
Pick
Pick
Replace
0.04
180
170
160
150
140
130
120
Elevation (ft)
80
100
120
140
160
180
200
220
240
260
280
300
Horizontal Station (ft)
59.66, 119.16
Close


Cross Section Data
Select Cross Section
Less
New
Copy
Delete
Cross Section Specifications
Select Comparison Cross Section
Align Comparison Cross Section
Restore
Align
Shift Comparison Cross Section
Pick
Pick
Replace with Comparison Geometry
Pick
Pick
Replace
Cross Section Plot
0.04
190
180
170
160
150
140
130
Elevation (ft)
140
160
180
200
220
240
260
280
300
320
Horizontal Station (ft)
111.78, 118.05
Close

River name: Little Sycamore

Reach name: Lower Reach

River station: 3648

Enter text description here...

Node name: Optional...

Cross Section Specifications: Geometry Comparison

Geometry data: Post-Development

River name: Little Sycamore

Reach name: Lower Reach

River station: 3648

☑ Synchronize navigation

Alignment type: Station & Elevation

Reference point: Leftmost Station

Horizontal: 0.00

Vertical: 0.00

☐ Replace with Comparison Geometry

Replacement type: Inside

Left station: 137.00

Right station: 264.76

Camp Hess Kramer – Little Sycamore Creek

Restoration Project Description

April 2021

The purpose of the proposed restoration project on Little Sycamore Creek is:

1. To address post-flood impacts and conditions in Little Sycamore Creek to enhance and stabilize creek functions such as improved geomorphic processes including channel and bank stability, floodplain connectivity, expansion of the riparian corridor for overall habitat connectivity and resilience, integrated stormwater and water quality protection, flood conveyance capacity and site aesthetics in Little Sycamore Creek at Camp Hess Kramer.

Within Camp Hess Kramer, the Little Sycamore Creek restoration project includes holistic enhancement and stabilization of 4,329 linear feet of creek channel and expansion of the riparian corridor.

1. The three (3) primary objectives of the restoration work in Little Sycamore Creek are to: 1) remove of flood-deposited sediment and debris to restore an open, stable and resilient channel for conveying creek flows and sediment; 2) revegetate the channel corridor to restore riparian ecological functions and enhanced landscape connectivity, and 3) integrate the restored creek channel and riparian corridor with the overall site plan and camp programming.

See the *Geomorphic Conditions Update and Basis of Design for Little Sycamore Creek, Camp Hess Kramer* (ESA, April 2021) report for more detailed discussion of site conditions, basis of design and design recommendations.

Little Sycamore Creek Restoration

The purpose of the creek restoration component of the rebuild of Camp Hess Kramer is to restore the channel functions of Little Sycamore Creek through the removal of flood-deposited sediments and debris to re-establish pre-flood conditions and topography and to implement a suite of channel and bank improvements in order to stabilize the channel and riparian corridor within the camp. The creek has experienced a range of impacts from decades of land-use and maintenance actions including construction of undersized bridges and ad hoc bank and channel stabilization structures. In November 2018 the Woolsey Fire burned much of the Camp and the creek’s watershed. When seasonal rains started in the weeks following the fire, the site experienced destructive flooding in the mainstem and a tributary on the east side of the creek, as well a landslide from Yerba Buena Road, debris flows from the valley sides, and channel erosion. Sediment from these processes deposited in the channel, completely blocking several bridge openings and causing flooding throughout parts of the lower camp. The Camp arranged an emergency response and performed work under emergency permits (Ventura County # PL19-0005 and USACE #SPL-2019-00052-GLH) which included removal of 14,000 (approximately) cubic yards of sediment and debris from the creek channel, as well as actions to temporarily stabilize the creek and reduce the vulnerability of the Camp to further flows, erosion and deposition.

Approximately 4,329 linear feet of Little Sycamore Creek would be restored by excavating and removing remaining flood-deposited sediment and debris from the channel and adjacent areas; re-establishing channel floodplain connections; laying back, stabilizing and revegetating banks; installing a series of channel grade control structures based on natural analogs; preserving mature trees, integrating stormwater measures; replacing undersized bridges and planting native riparian vegetation within the expanded riparian corridor.

APPENDIX C
ESA DOCUMENTS

TABLE 2-1
CONSTRUCTION ACTIVITIES FOR PROPOSED ACTIONS

Location	Construction Activity	Construction Area	Depth of Excavation / Quantity of Excavation and Fill	Construction Duration
CREEK CHANNEL AND RIPARIAN RESTORATION AND ENHANCEMENT (EARTHWORK)				
Lower Camp Little Sycamore Creek Sta. 0+00 to Sta. 25+00	• Excavation and removal of flood-deposited sediment and debris • Clear and grub; remove invasive plant species • Tree protection • Reconstruct 289 linear feet of eroding banks utilizing biotechnical measures • Layback and stabilize 3,468 linear feet of oversteepened banks • Construct 615 linear feet of boulder toe protection (vegetated rock slope) including at bridges • Install 8 boulder weirs • Construct 4 stormwater outlet/energy dissipation structures	Construction Area: 1.92 acres OHW Work Area (estimate): 0.44 acres Total Footprint: 1.92 acres	Depth: 0' to 7' Earthwork: Sediment/Debris Removal (Cut): • 7,029 CY Bank Reconstruction (Fill): • 196 CY Net Cut: 6,833	20 weeks
Middle Camp Little Sycamore Creek Sta. 25+00 to Sta. 43+29	• Excavation and removal of flood-deposited sediment and debris • Clear and grub; remove invasive plant species • Tree protection • Layback and stabilize 1,726 linear feet of oversteepened banks • Construct 410 linear feet of toe protection (vegetated rock slope) including at bridges • Install 4 boulder weirs • Construct 3 stormwater outlet/energy dissipation structures	Construction Area: 0.95 acres OHW Work Area (estimate): 0.22 acres Total Footprint: 0.95 acres	Depth: 0' to 9' Earthwork: Sediment/Debris Removal (Cut): • 5,341 CY Bank Reconstruction (Fill): • 37 CY Net Cut: 5,304	20 weeks
RIPARIAN HABITAT RESTORATION (PLANTING)				
Creek Corridor Little Sycamore Creek Sta. 0+00 to Sta. 43+69	• Remove invasive plant species • 0 trees removed • Plant trees • Plant riparian vegetation	Construction Area: Lower Camp: 1.92 acres Middle Camp: 0.95 acres Total Footprint: 2.87 acres	No excavation or fill would take place for revegetation or tree planting	8 – 10 weeks

Restoration and Enhancement Details

Creek restoration and enhancement activities include removal of flood-deposited sediment and debris from the channel and adjacent areas; channel widening and floodplain grading; laying back, stabilizing and revegetating banks; installing a series of channel grade control structures based on natural analogs; preserving mature trees, integrating stormwater measures; replacing undersized bridges and planting native riparian vegetation within the expanded riparian corridor. Construction of the restored creek channel would require removal of fill, most of which would be transferred and placed at locations within the camp.

The creek restoration design approach uses fundamental concepts in fluvial geomorphology and engineering principles to create a dynamically stable creek. The *Geomorphic Conditions Update and Basis of Design for Little Sycamore Creek, Camp Hess Kramer* (ESA, April 2021) report is provided under a separate attachment. The creek would be restored and stabilized as a cobble/boulder channel characterized by step-pool and plane-bed features that would incorporate a mix of roughened ramps, step-pool and boulder weir structures. The spacing of the in-channel structures is based on the location of previously documented knickpoints and channel incision as well as the slope and hydraulic characteristics of the channel.

The intent of this design is to achieve a stable and self-maintaining creek that requires a low level of adaptive management and maintenance practices. This would allow the creek to exist in a state of dynamic equilibrium, where is it properly transporting both water and sediment in a balanced manner, neither leading to excessive erosion nor deposition throughout the restored creek channel.

The overall creek restoration would include the restoration of approximately 2.87 acres of riparian habitat through channel enhancement and stabilization, grading, and planting. For project creek channel restoration components, including channel and floodplain grading and revegetation, typical excavation depths range from one foot to four feet (1’ – 4’) below the post-flood ground surface, but would extend to approximately nine (9) feet in some locations.

Construction Activities

Creek restoration activities would involve: 1) excavating approximately 11,137 cubic yards (CY) of flood-deposited sediment and debris to reestablish and widen the channel and floodplains; 2) placing excavated material at designated locations on the site; 3) grading and laying back oversteepened banks; 4) constructing in-stream channel grade control structures; and 5) bank reconstruction including installation of biotechnical stabilization measures.

Existing structures and ad hoc construction debris and other deleterious materials encountered within the creek channel would be demolished and removed. Existing structures and materials include approximately 200 linear feet of failed retaining wall (multiple sections), concrete and asphalt rubble, buried fire and flood damaged materials and old tires. In addition, miscellaneous abandoned storm drains and drain inlets would also be demolished and removed from the site.

The graded creek banks would be laid back to more stable profiles ranging from 2:1 to 6:1 (horizontal:vertical) slopes, except where space limitations require a steeper slope. These banks will receive bank stabilization ranging from biotechnical bank stabilization measures to erosion control fabric and seeding depending on hydraulic conditions and geomorphic setting. Biotechnical bank stabilization measures, which include vegetated soil lifts, vegetated rock slope, and brush mats, would be employed in areas where banks are 2:1 or steeper and in bank reconstruction areas. In areas where toe scour and/or active erosion has been identified construction of vegetated rock slope protection will occur in lower bank zones to protect against future erosion and bank failure.

Heavy construction equipment is anticipated to complete the earthwork phases of the creek restoration activities include tracked excavators and small bulldozers, rubber-tired loaders and dump trucks. Construction of channel and bank stabilization structures will include small and large tracked excavators and rubber-tired loaders combined with labor forces using hand tools and light mechanical equipment. Implementation of the creek revegetation plan will involve small tracked excavators, rubber-tired loaders and dump trucks, bobcats, crew trucks combined with labor forces using hand tools and light mechanical equipment.

The creek restoration project will require equipment to access the channel in order to effectively complete the sediment removal, channel and bank grading and construction of channel and bank stabilization structures. A temporary dewatering and water control plan will be developed to support in-channel construction activities. The plan will be submitted for review and approval to appropriate regulatory agencies including California Department of Fish & Wildlife (CDFW), the Regional Water Quality Control Board (RWQCB) and Ventura County.

Vegetation Disturbance during Construction

During the excavation work, plant material containing predominantly non-native plant species would be removed and later replaced with native riparian vegetation. The creek and fill areas would be cleared and grubbed of surface and sub-surface deleterious matter, including vegetation and ad hoc construction materials (concrete, asphalt, etc). These materials would be removed from the site.

The post-flood conditions in Little Sycamore Creek are characterized by highly variable topography (stockpiled sediment and debris, sloughing banks, etc) and disturbed vegetation cover. Trees within the corridor are comprised primarily of native Sycamores and Oaks and non-native Eucalyptus. During the sediment removal, excavation for construction of channel and bank structures plant material containing predominantly non-native plant species would be removed from the project area. Trees within the grading and work areas will be protected.

Construction activities for restoration of Little Sycamore Creek would occur over a 2.87-acre area and would require removal of approximately 1.5 acres of existing vegetation to complete the 4,329 linear feet of restoration work. No trees are anticipated to be removed from the riparian corridor as a result of creek restoration project.

Ground Surface Protection during Construction

During construction, disturbed areas would be protected with specified erosion control measures (e.g., jute, straw, coconut fiber erosion control fabric, coir logs, straw, silt fencing, etc.) throughout the approximately 4,329 linear feet of creek restoration areas.

Riparian Revegetation

The restoration plantings would be installed in two (2) general zones within the expanded and enhanced riparian area: floodplain and riparian bank. The floodplain would be established adjacent to the active channel and include willows (*Salix* sp.) and other instream wetland species such as sedges and rushes. The riparian bank would be planted from the bank toe up to top of bank and would include a variety of riparian and wetland species such as California sycamore (*Platanus racemosa),* Coast live oak (*Quercus agrifolia*), willows (*Salix sp.*), mule fat (*Baccharis salicifolia*), California mugwort (*Artemisia douglasiana*), California blackberry (*Rubus ursinus*) and California wild rose (*Rosa californica*). The provisional plant list is provided in the *Geomorphic Conditions Update and Basis of Design for Little*

Sycamore Creek, Camp Hess Kramer (ESA, April 2021). The revegetation plan is integral to the overall creek restoration plan to support goals for bank stability, habitat complexity and connectivity and fuel modification.

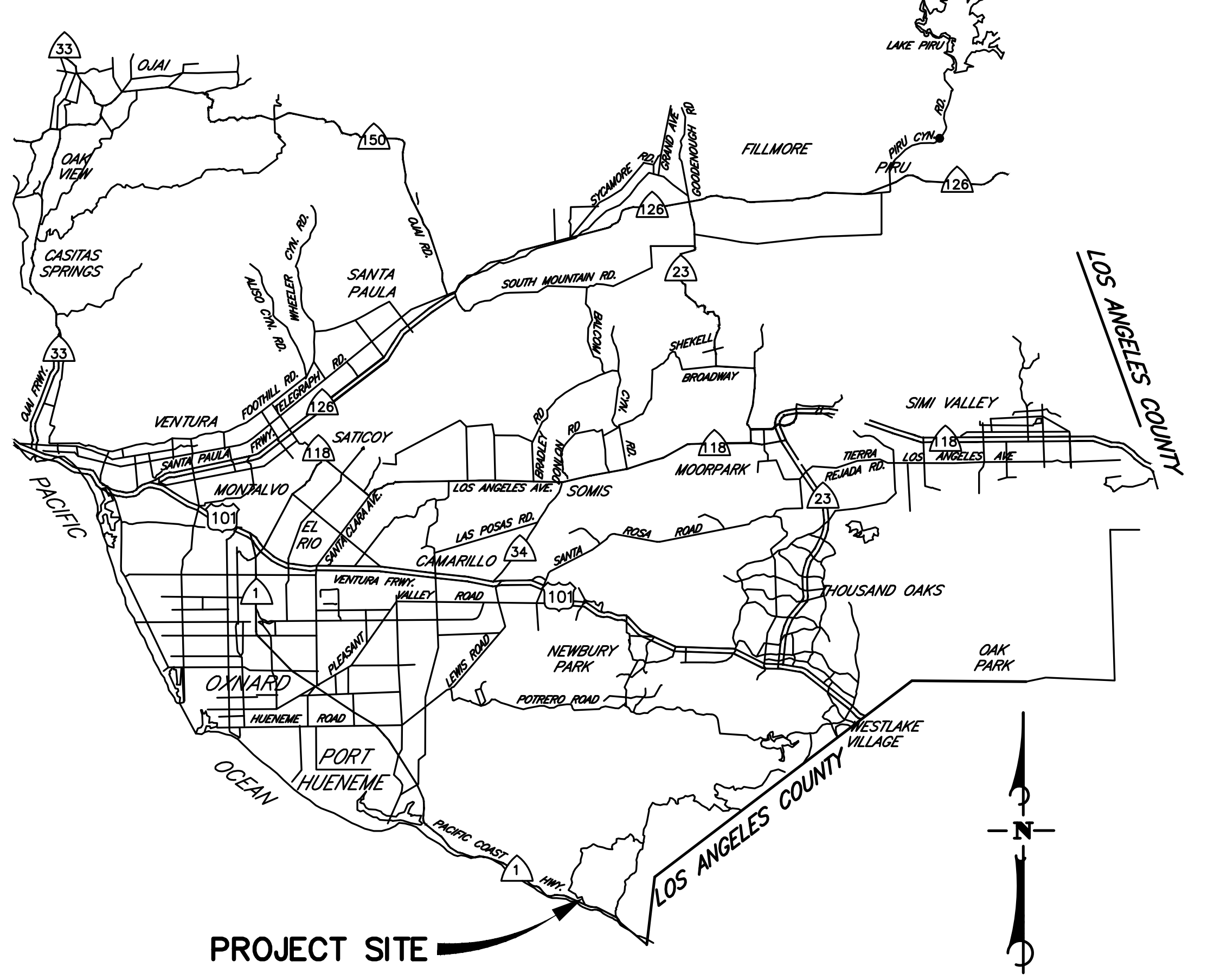
A temporary irrigation system will be installed and maintained over a period of three to five years to support successful establishment of the native riparian plantings.

APPENDIX D

GRADING AND DRAINAGE PLANS

CAMP HESS KRAMER/GINDLING HILLTOP CAMP

WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HIGHWAY
COUNTY OF VENTURA, CALIFORNIA



LOCATION MAP

SCALE: N.T.S.

PROPERTY INFORMATION

PROJECT SITE ADDRESS:
CAMP HESS KRAMER
11495 PACIFIC COAST HIGHWAY (STATE HIGHWAY 1)
MALIBU, CA 92065
T: (310) 457-7861
F: (310) 457-4614

ASSESSOR'S PARCEL NUMBERS	ACREAGE	GENERAL PLAN	ZONE DESIGNATION
APN 700-0-070-450 APN 700-0-060-310 APN 700-0-060-140	55.90 ACRES 43.23 ACRES 80.00 ACRES	DEVELOPED AREAS: RURAL (2 ACRE MIN.) UNDEVELOPED AREAS: OPEN SPACE (10 ACRE MIN.)	DEVELOPED AREAS: COASTAL RESOURCE EXCLUSIVE (CRE-20 AC/M) UNDEVELOPED AREAS COASTAL OPEN SPACE (COS-10 AC SFD/M)
APN 700-0-060-260	8.20 ACRES	OPEN SPACE (10 ACRE MIN.)	COASTAL OPEN SPACE (COS-10 AC SFD/M)
TOTAL	187.33 ACRES		

PROJECT DIRECTORY

PROPERTY OWNER/APPLICANT:
WILSHIRE BOULEVARD TEMPLE CAMPS
ALBERTO VALNER, EXECUTIVE DIRECTOR
DOUG LYNN, CAMP DIRECTOR
RICK WATERS, DIRECTOR OF CONSTRUCTION & FACILITIES
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INTERFACE ENGINEERS
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JOEL CRUZ, PRINCIPAL

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DAVID ORGISH, PRINCIPAL LIGHTING DESIGN

FOOD SERVICE
CINI LITTLE INTERNATIONAL
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KEITH SHORT, DESIGN DIRECTOR

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AQUATIC DESIGN GROUP
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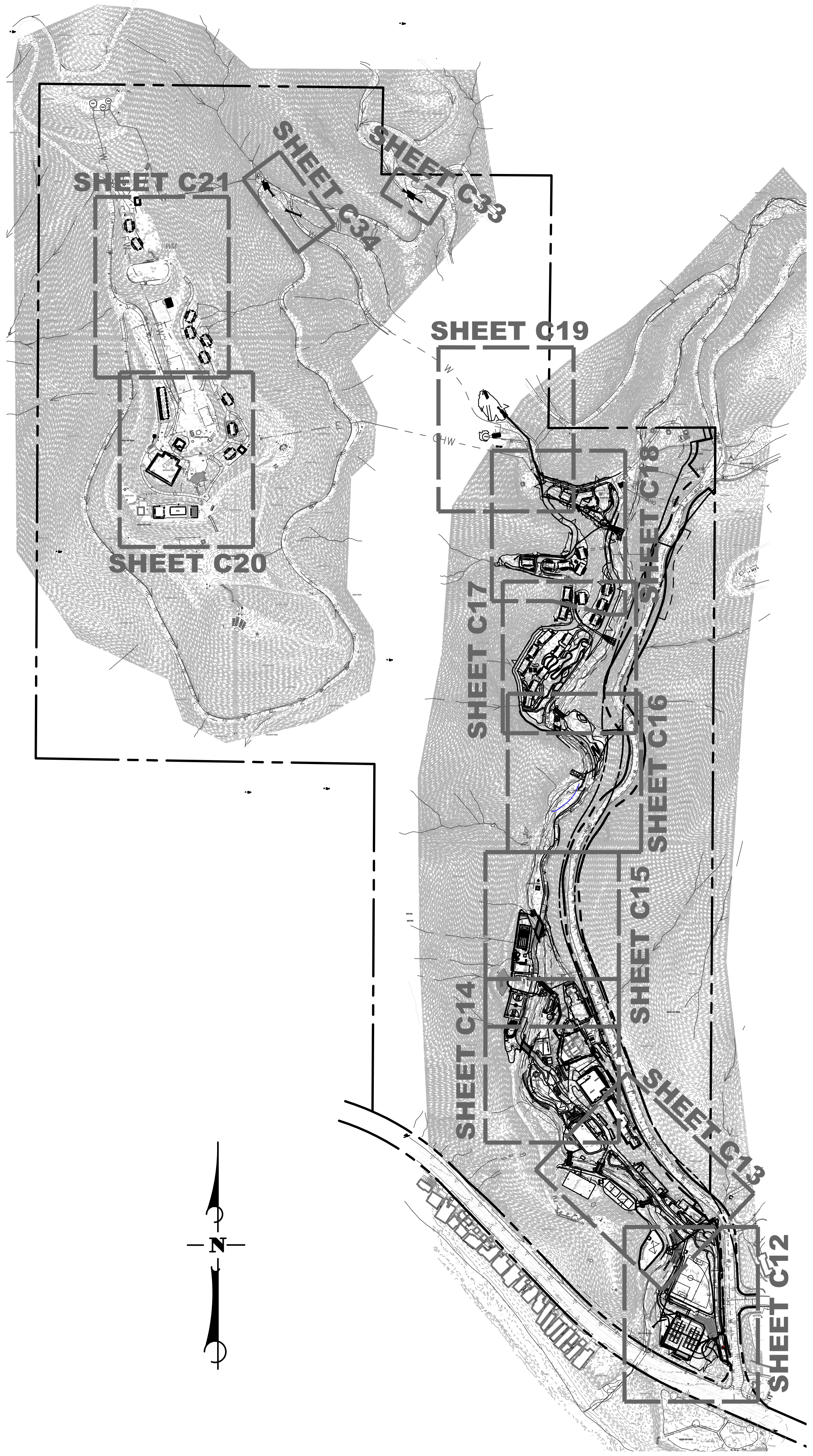
DENNIS BERKSHIRE,PRESIDENT

PARKING
WATRY DESIGN INC.
200 GATEWAY PLACE #550
SAN JOSE, CA 95110
T: (833) 917-7275
GENARO MORALES, DIRECTOR OF ARCH DESIGN



ESTIMATED EARTHWORK QUANTITIES

EARTHWORK QUANTITIES:

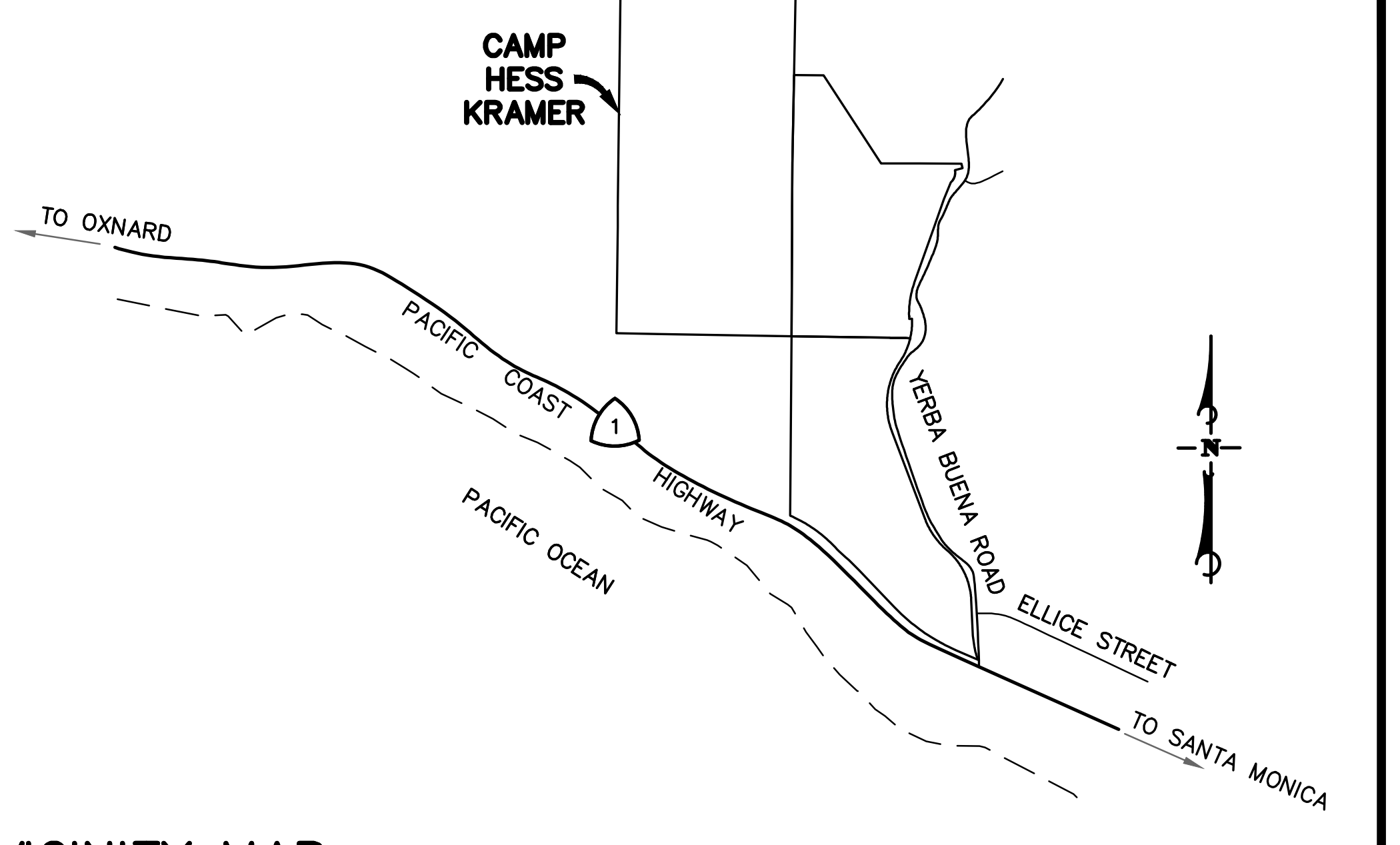
	CUT	FILL
LOWER CAMP (PHASE 1):		
SITE GRADING	16,500 C.Y.	9,500 C.Y.
STOCKPILED MATERIAL	–	3,500 C.Y
ROAD EXPANSION/WIDENING	1,900 C.Y.	–
BRIDGES	900 C.Y.	–
STORM WATER TREATMENT EXCAVATION	1,300 C.Y.	–
CREEK RESTORATION	7,100 C.Y.	200
SUBTOTAL	27,700 C.Y.	13,200 C.Y.
MIDDLE CAMP (PHASE 1):		
SITE GRADING	9,000 C.Y.	12,000 C.Y.
STOCKPILED MATERIAL	–	7,600 C.Y
ROAD EXPANSION/WIDENING	2,000 C.Y.	–
BRIDGES	100 C.Y.	–
STORM WATER TREATMENT EXCAVATION	300 C.Y.	–
CREEK RESTORATION	5,400 C.Y.	100
SUBTOTAL	16,800 C.Y.	19,700 C.Y.
TOTAL PHASE 1:	44,500 C.Y.	32,900 C.Y.
UPPER CAMP (PHASE 2):		
SITE GRADING	2,200 C.Y.	–
TOTAL PHASE 2:	2,200 C.Y.	–

EARTHWORK NOTES:

THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISH GRADE OR SUBGRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. PROPOSED SUBGRADE ELEVATION IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED BENEATH PAVEMENTS OR STRUCTURES.

THE EARTHWORK QUANTITIES ABOVE ARE FOR BUILDING PERMIT PURPOSES ONLY. THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, OVER EXCAVATION AND RE-COMPACTION, TRENCHING, AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING A LUMP SUM BID PRICE FOR EARTHWORK. THE EARTHWORK SHALL BE BALANCED ONSITE.



VICINITY MAP

SCALE: N.T.S.

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C8	TOPOGRAPHIC MAP – MIDDLE CAMP
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C41	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C42	WET UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
C43	WET UTILITY IMPROVEMENT PLAN – UPPER CAMP
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C51	DRY UTILITY IMPROVEMENT PLAN – MIDDLE CAMP
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R20	CREEK RESTORATION REVEGETATION PLAN – MIDDLE CAMP

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

TITLE SHEET
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C1 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 3/1/2022 1:25:40 PM PLOT BY: Silvia, Pete PLOT DATE: 3/1/2022 1:54:50 PM

DRAWING: v:\2042\active\2042586200\drawing\exhibit_files\2042586200_civil_base.dwg

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GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, (GREEN BOOK), 2020 EDITION, PUBLISHED BY BUILDING NEWS, INC., LOS ANGELES AS MODIFIED BY THE VENTURA COUNTY STANDARD PLANS WHERE REFERENCED, AND THE NOTES THAT FOLLOW.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY.
3. WORK DONE IN CONFLICT WITH THESE PLANS WILL BE SUBJECT TO REJECTION.
4. PRIOR TO COMMENCING CONSTRUCTION CALLED FOR BY THESE PLANS, SPECIFICATIONS AND DETAILS, THE CONTRACTOR SHALL ENGAGE A GEOTECHNICAL ENGINEER TO PROVIDE CONSTRUCTION PHASE OBSERVATION AND TESTING SERVICES AND SHALL ALSO ENGAGE THE PROJECT ENGINEER OR ANOTHER QUALIFIED PARTY TO PROVIDE PROJECT CONSTRUCTION OBSERVATION AND ASSURANCES ON CONFORMANCE WITH THE APPROVED PLANS, SPECIFICATIONS AND AGENCY REQUIREMENTS. TESLA SHALL ALSO ASSURE THAT CONTRACTOR(S) ENGAGED TO PROPERLY IMPLEMENT THE CONSTRUCTION CALLED FOR ON THESE PLANS, SPECIFICATIONS AND DETAILS INCLUDING THOSE TASKS CALLED FOR ON THE PROJECT STORM WATER POLLUTION PREVENTION PLAN DOCUMENT OR EROSION CONTROL PLAN SHEETS.
5. CONTRACTOR SHALL POSSESS A CONTRACTOR'S LICENSE OF A TYPE APPROPRIATE FOR THE WORK AND SHALL FURNISH EVIDENCE OF THE SAME AT THE TIME THE CONTRACT IS AWARDED.
6. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT TWO (2) FULL DAYS (48 HOURS) IN ADVANCE OF COMMENCING CONSTRUCTION AT 1–800–227–2600 OR 811.
7. CONTRACTOR SHALL CONTACT VENTURA COUNTY AND ALL UTILITY COMPANIES TWO (2) FULL DAYS, PRIOR TO EXCAVATION WORK.

GENERAL REQUIREMENTS OF CONTRACTOR

1. THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND ACCURATE RECORD OF ALL CHANGES OF CONSTRUCTION FROM THAT SHOWN IN THESE PLANS AND SPECIFICATIONS FOR THE PURPOSE OF PROVIDING A BASIS FOR CONSTRUCTION RECORD DRAWINGS. NO CHANGES SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE PROJECT ENGINEER AND THE AGENCY HAVING JURISDICTION. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL DELIVER THIS RECORD OF ALL CONSTRUCTION CHANGES TO THE ENGINEER ALONG WITH A LETTER WHICH DECLARES THAT THE PROJECT WAS CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS, SPECIFICATIONS AND APPROVED CHANGE ORDERS.

   CAUTION: THE ENGINEER WHO PREPARED THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES OR USES OF THESE PLANS. ALL CHANGES TO THESE PLANS MUST BE APPROVED IN WRITING BY THE PROJECT ENGINEER.
2. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE PROJECT ENGINEER BY PHONE AND IN WRITING UPON DISCOVERY OF, AND BEFORE DISTURBING, ANY PHYSICAL CONDITIONS DIFFERING FROM THOSE REPRESENTED BY APPROVED PLANS AND SPECIFICATIONS.
3. THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONALS HARMLESS FROM ALL LIABILITY AND CLAIMS, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONALS.
4. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR PROTECTION OF PUBLIC AND PRIVATE PROPERTY IN THE VICINITY OF THE JOB SITE AND FURTHER AGREES TO, AT CONTRACTOR'S EXPENSE, REPAIR OR REPLACE TO THE ORIGINAL CONDITION, ALL EXISTING IMPROVEMENTS WITHIN OR IN THE VICINITY OF THE JOB SITE WHICH ARE NOT DESIGNATED FOR REMOVAL AND WHICH ARE DAMAGED OR REMOVED AS A RESULT OF CONTRACTOR'S OPERATIONS.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL AND SAFETY AND SHALL FURNISH, INSTALL, AND MAINTAIN SUCH FENCING, SIGNS, LIGHTS, TRENCH PLATES, BARRICADES, AND/OR OTHER PROTECTION AS IS NECESSARY FOR SAID CONTROL AND SAFETY.
6. EXISTING BURIED CONDUITS AND STRUCTURES KNOWN TO THE ENGINEER ARE SHOWN ON THESE PLANS. HOWEVER, ALL SUCH CONDUITS AND STRUCTURES MAY NOT BE SHOWN AND THE LOCATIONS OF THOSE SHOWN ARE APPROXIMATE ONLY AND HAVE NOT NECESSARILY BEEN INDEPENDENTLY VERIFIED BY THE PREPARER OF THESE PLANS.
7. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY THE PRESENCE OF BURIED CONDUITS AND STRUCTURES. BOTH ACTIVE AND ABANDONED–IN–PLACE AND, BEFORE COMMENCING WORK, CONTRACTOR SHALL DETERMINE THE EXACT LOCATION INCLUDING DEPTHS OF ALL EXISTING UNDERGROUND UTILITIES, CONDUITS AND STRUCTURES, INCLUDING SERVICE CONNECTIONS, WHICH MAY AFFECT OR BE AFFECTED BY HIS OPERATIONS. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR AS A RESULT OF CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, CONDUITS AND STRUCTURES.
8. UPON ENCOUNTERING EXISTING BURIED CONDUITS OR STRUCTURES NOT SHOWN OR LOCATED DIFFERENTLY THAN SHOWN ON THE PLANS, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER AND THE OWNER OF THE CONDUIT OR STRUCTURE BY PHONE AND IN WRITING. IF SUCH CONDUIT OR STRUCTURE AFFECTS OR IS AFFECTED BY THE WORK, CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION AND DIRECTION BEFORE PROCEEDING WITH THE WORK, EXCEPTING THAT IN AN EMERGENCY AFFECTING SAFETY OF LIFE, WORK OR ADJACENT PROPERTY, CONTRACTOR SHALL ACT AT ONCE WITHOUT INSTRUCTIONS TO PREVENT INJURY OR LOSS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATE BRACING AND SHORING FOR EXCAVATIONS, TEMPORARY STRUCTURES, AND ANY AND ALL PARTIALLY COMPLETED PORTIONS OF THE WORK. SHEETING, SHORING, BRACING OR EQUIVALENT PROTECTION FOR ALL EXCAVATIONS SHALL BE PROVIDED AS REQUIRED BY INDUSTRIAL SAFETY LAWS.
10. CONSTRUCTION EQUIPMENT AND MATERIALS ON SITE SHALL BE USED IN SUCH MANNER AS TO AVOID CREATING A PUBLIC NUISANCE. ROADWAYS AND GRADED AREAS SHALL BE SURFACED OR WETTED SUFFICIENTLY TO PREVENT THE GENERATION OF EXCESSIVE DUST AT ALL TIMES.

GENERAL CONSTRUCTION NOTES

1. ALL REFERENCED SPECIFICATIONS, CODES, DRAWINGS AND DETAILS SHALL BE INCORPORATED INTO THESE PLANS AND MADE A PART HEREOF AS IF SPELLED OUT OR DELINEATED IN THEIR ENTIRETY HEREON.
2. GRADING OR OTHER CONSTRUCTION WORK OFFSITE IS NOT PERMITTED WITHOUT PRIOR WRITTEN PERMISSION OF THE AFFECTED OFFSITE PROPERTY OWNERS.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE PROJECT'S CONDITIONS OF APPROVAL AND ABIDE BY THEIR REQUIREMENTS AS APPLICABLE.
4. GEOTECHNICAL REPORTS AND ANY UPDATES SHALL BE INCORPORATED INTO THESE PLANS AND MADE A PART HEREOF AS IF SPELLED OUT IN THEIR ENTIRETY HEREON. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE APPLICABLE REPORTS AND ABIDE BY THEIR RECOMMENDATIONS. IF THE CONTRACTOR DETERMINES THERE IS A CONFLICT BETWEEN THESE PLANS AND THE REPORTS, HE SHALL PHONE AND NOTIFY IN WRITING BOTH THE PREPARER OF THESE PLANS AND THE REPORT PRIOR TO PROCEEDING. HE WILL WAIT FOR A WRITTEN RESPONSE CLARIFYING THE DISCREPANCY.
5. BEFORE BEGINNING WORK, THE CONTRACTOR SHALL CONTACT THE COUNTY INSPECTOR, THE UTILITY COMPANIES, THE GEOTECHNICAL ENGINEER, AND THE PROJECT ENGINEER (STANTEC), AND SHALL DETERMINE FROM EACH: (1) SCOPE OF WORK TO BE OBSERVED AND BY WHOM, (2) SCOPE OF TESTING, AND (3) ADVANCE NOTICE REQUIRED (MINIMUM OF 48 HOURS). DURING THE COURSE OF WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR OBSERVATION AND TESTING AS STIPULATED PURSUANT TO ABOVE DETERMINATIONS. WORK NOT OBSERVED AND TESTED WILL BE SUBJECT TO REJECTION.
6. UPON BEING RETAINED BY THE OWNER AND PRIOR TO CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL RECOMMEND TO THE OWNER AND THE CONTRACTOR THE LEVEL OF OBSERVATION AND TESTING THAT WILL BE PROVIDED DURING CONSTRUCTION. PROVIDED THAT THE CONTRACTOR FULFILLS HIS OR HER RESPONSIBILITY FOR TIMELY REQUESTS FOR THOSE SERVICES DURING CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL PROVIDE OBSERVATION AND TESTING AT THE PROJECT WORK AREA OF EARTHWORK OPERATIONS, INCLUDING TRENCHING AND PAVEMENT SUBGRADE PREPARATION, AS NECESSARY TO HAVE REASONABLE CERTAINTY THAT THE EARTHWORK IS PERFORMED IN GENERAL COMPLIANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS, AND WITH THE REQUIREMENTS OF THE AGENCY.
7. UPON COMPLETION OF EARTHWORK, THE GEOTECHNICAL ENGINEER SHALL, UPON REQUEST, PROVIDE A FINAL REPORT WITH RESULTS OF THEIR OBSERVATION AND TESTING DURING EARTHWORK OPERATIONS. PROVIDED THAT THE WORK IS PERFORMED IN CONFORMANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS, THE REPORT WILL STATE THEIR OPINION THAT THE GRADING WAS COMPLETED IN SUBSTANTIAL COMPLIANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
8. BEFORE BEGINNING WORK, THE CONTRACTOR SHALL DETERMINE OR VERIFY THE LOCATION AND FLOWLINE ELEVATION OF ALL EXISTING WATER, SEWER, AND DRAINAGE STRUCTURES AND/OR CONDUITS TO BE JOINED BY NEW CONSTRUCTION. IF DIFFERENCES ARE OBSERVED THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER BY PHONE AND IN WRITING.
9. EXISTING PERMANENT SURVEY MONUMENTS SHOWN ON THE PLANS, INCLUDING PROPERTY CORNERS AND BENCHMARKS, SHALL BE PRESERVED BY THE CONTRACTOR OR SHALL BE TIED–OUT PRIOR TO CONSTRUCTION AND RE–SET AFTER CONSTRUCTION BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
10. AREAS TO RECEIVE FILL MATERIAL AND AREAS TO RECEIVE BUILDINGS, WALLS, PAVEMENT, SIDEWALKS AND OTHER STRUCTURAL IMPROVEMENTS SHALL BE PREPARED AS RECOMMENDED BY, AND UNDER THE OBSERVATION AND TESTING OF THE GEOTECHNICAL ENGINEER. RECOMMENDATIONS FOR OVER–EXCAVATION, ADDITIONAL SCARIFICATION, BACKFILL AND RECOMPACTION ARE CONTAINED IN THE PROJECT SOILS REPORT.
11. IF NOT DIMENSIONED, LOCATION OF FINISH GRADE ELEVATIONS AND FEATURES SUCH AS SWALES, RIDGE LINES, ETC. SHALL BE DETERMINED BY SCALE FROM KNOWN POINTS SHOWN ON THE PLANS. UNIFORM GRADIENTS OR VERTICAL CURVES, AS APPROPRIATE, SHALL BE ASSUMED BETWEEN CONTROL ELEVATIONS SHOWN ON THE PLANS.

VENTURA COUNTY GENERAL GRADING NOTES

1. GRADING SHALL REFERENCE THE CALIFORNIA BUILDING CODE/2020 ED. (CBC). THE VENTURA COUNTY STANDARD LAND DEVELOPMENT SPECIFICATIONS (SLDS), THE LAND DEVELOPMENT MANUAL (LDM), AND THE MOST RECENT EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC) SHALL BE APPLICABLE.
2. A PRE–CONSTRUCTION CONFERENCE OF ALL INTERESTED PARTIES SHALL BE HELD PRIOR TO ANY CONSTRUCTION OR GRADING TO ANSWER ANY QUESTIONS OR TO CLARIFY ANY PORTION OF THESE GRADING PLANS.
3. ALL RECOMMENDATIONS MADE BY THE SOILS ENGINEER (AND/OR ENGINEERING GEOLOGIST, WHERE EMPLOYED) CONTAINED IN THE REPORTS REFERENCED HEREON AS APPROVED OR CONDITIONED BY THE CITY SHALL BE A PART OF THIS GRADING PLAN.
4. THE GRADING PLAN SHALL BE DESIGNED UTILIZING BEST MANAGEMENT PRACTICES (BMP'S) FOR THE DISCHARGE OF STORM WATER RUNOFF FROM THE PROJECT IN COMPLIANCE WITH THE REQUIREMENTS OF THE VENTURA COUNTY NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT.
5. ALL GRADED SURFACES SUBJECT TO EROSION SHALL BE PROTECTED AND EROSION CONTROL PLANTING SHALL BE ESTABLISHED AS APPROVED BY THE CITY ENGINEER. STORM DAMAGE PREVENTION MEASURES OR PREVENTATIVE DEVICES REQUIRED BY THE CITY ENGINEER SHALL BE INSTALLED AND FULLY FUNCTIONAL BY OCT. 1.
6. STABILIZATION OF SLOPES SHALL BE IN ACCORDANCE WITH CITY APPROVED METHODS (TAMPING, GRID ROLLING, PLANTING, & IRRIGATION SYSTEM). THE SUBDIVIDER SHALL PLANT EACH AND EVERY SLOPE, BOTH CUT & FILL, FOUR FEET OR MORE IN HEIGHT, WITH SUITABLE GRASSES AND GROUND COVER.
7. ALL DELETERIOUS MATERIAL, SUCH AS LUMBER, LOGS, BRUSH, OR ANY OTHER ORGANIC MATERIALS OR RUBBISH, SHALL BE REMOVED FROM ALL AREAS TO RECEIVE COMPACTED FILL.
8. UNSUITABLE MATERIAL, SUCH AS TOP SOIL, WEATHERED BED ROCK, ETC., SHALL BE REMOVED AS REQUIRED BY THE SOILS ENGINEER (AND/OR ENGINEERING GEOLOGIST, WHERE EMPLOYED) FROM ALL AREAS TO RECEIVE COMPACTED FILL OR DRAINAGE STRUCTURES.
9. ALL AREAS TO RECEIVE COMPACTED FILL SHALL BE INSPECTED AND APPROVED BY THE SOILS ENGINEER (AND/OR ENGINEERING GEOLOGIST, WHERE EMPLOYED) AFTER REMOVAL OF UNSUITABLE MATERIAL AND EXCAVATION OF KEYWAYS AND BENCHES, AND PRIOR TO PLACEMENT OF SUBSURFACE DRAINAGE SYSTEMS OR ANY FILL.
10. ALL SOIL OR ROCK MATERIALS DEEMED UNSUITABLE FOR PLACEMENT IN COMPACTED FILL SHALL BE REMOVED FROM THE SITE. ANY MATERIAL SUCH AS CONCRETE OR IMPORTED MATERIALS SHALL BE APPROVED BY THE SOILS ENGINEER AND CITY ENGINEER PRIOR TO USE IN COMPACTED FILL. WHERE EXCAVATED MATERIAL IS BLOCKY, IT WILL BE BROKEN INTO SUITABLE PARTICLE SIZES, NONE LARGER THAN 8 INCHES IN LARGEST DIMENSION, BEFORE BEING USED AS FILL IN CONFORMANCE WITH SEC. J1D7.3 OF THE CBC.
11. THE SOILS ENGINEER SHALL DIRECT THE REMOVAL OR TREATMENT OF ANY EXISTING UNDERGROUND STRUCTURES SUCH AS IRRIGATION LINES, ETC.
12. ANY WATER WELL LOCATED WITHIN THE SITE SHALL BE REPORTED TO THE DEPARTMENT OF PUBLIC WORKS PRIOR TO ITS MODIFICATION OR DESTRUCTION. SPECIAL PROCEDURES ARE REQUIRED FOR ABANDONMENT.
13. ALL EXCAVATED BACK SLOPES AND KEYS FOR BUTTRESS FILLS MUST BE EXAMINED BY THE SOILS ENGINEER AND ENGINEERING GEOLOGIST TO INSURE THAT ALL POTENTIAL PLANES OF FAILURE HAVE BEEN EXPOSED IN THE EXCAVATION AND WILL BE ADEQUATELY SUPPORTED BY THE PROPOSED BUTTRESS. FIELD CERTIFICATION TO BE SUBMITTED BY THE CONSULTANTS.
14. THE SOILS ENGINEER SHALL SUBMIT RECOMMENDATIONS FOR CORRECTIVE WORK TO INSURE SLOPE STABILITY WHERE UNSTABLE MATERIAL IS EXPOSED AT THE TOP OF CUTS.
15. TERRACE DRAINS, INTERCEPTOR DRAINS AND DOWNDRAINS SHALL ALL BE CONSTRUCTED OF 3" MIN. P.C.C. (OR GUNITE) REINFORCED WITH 6"X6"X10X10 W.W.M. AND SHALL BE OF EITHER SEMI–CIRCULAR OR TRIANGULAR CROSS SECTION, AND SHALL BE INSTALLED PRIOR TO APPROVAL OF ROUGH GRADING BY THE CITY ENGINEER. AT THEIR RESPECTIVE JUNCTIONS, THE INVERT OF DOWNDRAINS SHALL BE ONE FOOT BELOW THE PROJECTION OF THE INVERT OF THE INTERCEPTOR OR TERRACE DRAINS. JUNCTIONS SHALL BE WARPED AND SUFFICIENT PAVEMENT SHALL BE PROVIDED, OR SPLASH WALLS CONSTRUCTED TO PREVENT EROSION BY SPLASHING.
16. MATERIALS FOR INTERCEPTOR DRAINS, TERRACE DRAINS, AND DOWN DRAINS SHALL MEET SUBSECTIONS 201–1 OF THE SSPWC AND SUBSECTION 400 OF THE SLDS, EXCEPT THAT THE CONCRETE LINED SWALES, V–DITCHES, PAVED TERRACE DRAINS, DOWNDRAINS, BERMS, VELOCITY REDUCERS AND OTHER EROSION PROTECTION DEVICES SHALL BE OF CLASS 520–C–2500 UNLESS OTHERWISE SPECIFIED.
17. INTERIM SOILS AND GEOLOGIC REPORTS SHALL BE SUBMITTED TO THE CITY AS REQUIRED BY THE CITY ENGINEER, CITY INSPECTOR, OR DESIGNATED CITY REPRESENTATIVE.
18. PRIOR TO PLACEMENT OF CONCRETE SIDEWALK, GUTTER AND CURB, THE BASE SHALL BE SPRAYED FOR WEED CONTROL WITH PRE–EMERGENT SPRAY.
19. FINAL COMPACTION AND SOILS ENGINEERING (AND, IF APPLICABLE, ENGINEERING GEOLOGY) REPORTS, SUMMARIZING ALL WORK PERFORMED AND CONCLUDING THAT FILLS HAVE BEEN PLACED ACCORDING TO THE APPROVED PLANS AND STATING THAT ALL GEOLOGIC FEATURES ARE GROSSLY STABLE AS GRADED SHALL BE SUBMITTED TO THE CITY PRIOR TO APPROVAL OF THE ROUGH GRADING BY THE CITY ENGINEER.
20. IF IMPORT/EXPORT IS REQUIRED, THE FOLLOWING SHALL BE SUBMITTED TO THE CITY ENGINEER:

A. IF SOIL COMES FROM/OR GOES TO A SITE WITHIN THE COUNTY LIMITS SUBMIT:
1. GRADING PLAN OF SOURCE/DISPOSAL SITE SIGNED BY CIVIL ENGINEER ANO SOILS ENGINEER TO BE APPROVED BY THE COUNTY.
2. GRADING PERMIT AND PAYMENT OF REQUIRED FEES FOR SOURCE/DISPOSAL SITE.
3. GRADING BOND, IF APPLICABLE, FOR SOURCE/DISPOSAL SITE.

B. IF SOIL COMES FROM/OR GOES TO A SITE OUTSIDE THE CCOUNTY, SUBMIT:
1. COPY OF THE APPROVED GRADING PERMIT OR PERMISSION FROM OUTSIDE AGENCY.
2. THE SOURCE OF IMPORT/EXPORT SHALL BE PROPERLY IDENTIFIED WITH AN ASSESSOR'S PARCEL NO.

C. IN EITHER CASE, SUBMIT:
1. A CERTIFICATE OF SUITABILITY OF THE IMPORTED/EXPORTED (IF WITHIN COUNTY) SOIL BY THE SOILS ENGINEER.
2. CLEAN–UP AND REPAIR FUNDS AS DETERMINED BY THE COUNTY.
3. SPECIFIC HAUL ROUTE SHALL BE APPROVED BY THE COUNTY.

GRADING INSPECTION

THE SUPERVISION REQUIREMENTS OF THE COUNTY OF VENTURA SHALL BE COMPLIED WITH AS FOLLOWS:

1. THE ENGINEER SHALL BE A REPRESENTATIVE OF STANTEC.
2. LINE AND GRADE STAKES SHALL BE SET BY SURVEYORS UNDER THE GENERAL SUPERVISION OF THE ENGINEER.
3. THE ENGINEER SHALL PROVIDE GENERAL CONSTRUCTION REVIEW.
4. THE GEOTECHNICAL ENGINEER SHALL PROVIDE GENERAL REVIEW OF THE GRADING AND SUBGRADE PREPARATION AND PERFORM COMPACTION TESTING.
5. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A COPY OF THE "REDLINE" SET OF DRAWINGS, FROM WHICH THE ENGINEER SHALL PREPARE "RECORD DRAWING" PLANS AND SUBMIT A REPORT ATTESTING THAT THE IMPROVEMENTS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.

UNDERGROUND UTILITIES

1. UNDERGROUND UTILITIES AND SUBSTRUCTURES SHOWN HEREON WERE OBTAINED FROM THE BEST AVAILABLE SOURCES AND ARE PRESUMED TO BE ACCURATE AND COMPLETE. HOWEVER, SINCE THE INFORMATION WAS OBTAINED FROM OTHERS, THE OFFICE OF STANTEC CANNOT GUARANTEE SAID INFORMATION AS BEING ACCURATE. IT IS TO BE UNDERSTOOD BY THE CONTRACTOR THAT OTHER ABOVE–GROUND AND UNDERGROUND FACILITIES NOT SHOWN ON THESE DRAWINGS MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK.
2. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY THE PRESENCE OF BURIED CONDUITS AND STRUCTURES. BOTH ACTIVE AND ABANDONED–IN–PLACE AND, BEFORE COMMENCING WORK, CONTRACTOR SHALL DETERMINE THE EXACT LOCATION INCLUDING DEPTHS OF ALL EXISTING UNDERGROUND UTILITIES, CONDUITS AND STRUCTURES, INCLUDING SERVICE CONNECTIONS, WHICH MAY AFFECT OR BE AFFECTED BY HIS OPERATIONS. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR AS A RESULT OF CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, CONDUITS AND STRUCTURES.
3. UPON ENCOUNTERING EXISTING BURIED CONDUITS OR STRUCTURES NOT SHOWN OR LOCATED DIFFERENTLY THAN SHOWN ON THE PLANS, OR NOT PROPERLY MARKED BY THE UTILITY OWNER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OF THE CONDUIT OR STRUCTURE BY PHONE AND IN WRITING. IF SUCH CONDUIT OR STRUCTURE AFFECTS OR IS AFFECTED BY THE WORK, CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION AND DIRECTION BEFORE PROCEEDING WITH THE WORK, EXCEPTING THAT IN AN EMERGENCY AFFECTING SAFETY OF LIFE, WORK OR ADJACENT PROPERTY, CONTRACTOR SHALL ACT AT ONCE WITHOUT INSTRUCTIONS TO PREVENT INJURY OR LOSS.
4. CONTRACTOR SHALL KEEP A RECORD OF ALL UNDERGROUND UTILITIES ENCOUNTERED DURING EXCAVATION. ALL UNDERGROUND UTILITY INFORMATION SHALL BE NOTED ON THE CONSTRUCTION DRAWINGS BY THE CONTRACTOR FOR COMPLETION THE BASIS OF RECORD DRAWINGS.
5. PER SECTION 4216/4217 OF THE CALIFORNIA GOVERNMENT CODE, THE CONTRACTOR IS REQUIRED TO CONTACT "UNDERGROUND SERVICE ALERT" AT 1–800–422–4133 FORTY–EIGHT TO OBTAIN A "DIG ALERT IDENTIFICATION NUMBER" NO LESS THAN TWO WORKING DAYS PRIOR TO ANY EXCAVATION ACTIVITIES. THE PERMITS ARE NOT VALID WITHOUT A DIG ALERT IDENTIFICATION NUMBER.

CAUTION

CONTRACTOR SHALL POTHOLE AND VERIFY ALL EXISTING UTILITIES WITHIN PROJECT SITE PRIOR TO CONSTRUCTION AND REPORT ANY CONFLICTS TO ENGINEER.

TRENCHING AND BACKFILLING NOTES

1. ALL TRENCHING, BEDDING AND BACKFILL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE LATEST EDITION OF THE VENTURA COUNTY CONSTRUCTION STANDARD DETAILS EXCEPT AS MODIFIED BY THESE PLANS AND SPECIFICATIONS.
2. WATER ENCOUNTERED IN TRENCH OR STRUCTURE EXCAVATION SHALL BE REMOVED BY THE CONTRACTOR TO AT LEAST ONE FOOT BELOW THE BOTTOM OF THE TRENCH PRIOR TO EXCAVATION AND THE SATISFACTION OF THE GEOTECHNICAL ENGINEER TO PROVIDE DRY CONDITIONS DURING CONSTRUCTION OF PIPE OF STRUCTURE.
3. TRENCH OR STRUCTURE EXCAVATION SUBGRADE SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF BEDDING MATERIAL OR FORMS. WET OR UNSTABLE SOIL ENCOUNTERED IN THE BOTTOM OF THE EXCAVATION AND DEEMED BY THE GEOTECHNICAL ENGINEER TO BE INCAPABLE OF PROPERLY SUPPORTING THE PIPE OR STRUCTURE BEING CONSTRUCTED, SHALL BE REMOVED TO THE DEPTH RECOMMENDED BY THE GEOTECHNICAL ENGINEER AND THE EXCAVATION BACKFILLED TO THE BOTTOM OF THE PIPE OR STRUCTURE GRADE WITH SUITABLE MATERIAL RECOMMENDED BY THE GEOTECHNICAL ENGINEER. BEDDING MATERIALS SHALL BE PLACED ON UNDISTURBED SUBGRADE. SOILS DISTURBED DURING EXCAVATION SHALL BE REMOVED BY THE CONTRACTOR AND BE REPLACED WITH ADDITIONAL BEDDING MATERIAL AT NO ADDITIONAL COST.
4. BEDDING AND BACKFILL MATERIAL SHALL BE TESTED FOR COMPLIANCE WITH APPLICABLE REQUIREMENTS BY THE GEOTECHNICAL ENGINEER.
5. BACKFILL COMPACTION SHALL BE TESTED IN ACCORDANCE WITH ASTM STANDARD D–1557, LATEST REVISION, AND REPORTED BY THE GEOTECHNICAL ENGINEER.
6. COMPACTION BY FLOODING OR JETTING IS NOT PERMITTED UNLESS SPECIFICALLY APPROVED BY THE GEOTECHNICAL ENGINEER AND THE CITY INSPECTOR.
7. TRENCH BACKFILL SHALL NOT BE PLACED UNTIL BEDDING AND INITIAL (PIPE ZONE) BACKFILL HAVE BEEN OBSERVED, TESTED AND APPROVED.
8. ALL WORK INVOLVING EXCAVATION INCLUDING THAT FOR WATER, STORM DRAIN, AND UTILITY CONDUITS AND ALL SERVICE CONNECTIONS AND METER BOXES SHALL BE COMPLETED, OBSERVED AND APPROVED BY THE AGENCY HAVING JURISDICTION AND THE STRUCTURAL BACKFILL OBSERVED, TESTED FOR COMPACTION AND APPROVED BEFORE AGGREGATE BASE, PAVING OR OTHER PERMANENT SURFACE CONSTRUCTION MAY COMMENCE.
9. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE HEALTH AND SAFETY LAWS, ORDINANCES, REGULATIONS, RULES, AND STANDARDS INCLUDING ALL REQUIREMENTS OF THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY AND OF CAL–OSHA.
10. CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN SUCH SHEETING, SHORING, BRACING AND/OR OTHER PROTECTION AS IS NECESSARY TO PREVENT FAILURE OF TEMPORARY SLOPES, AND AVOID DISTURBANCE TO ADJACENT PAVEMENTS, UTILITIES, STRUCTURES, LANDSCAPING OR PROPERTY

GENERAL STORM DRAIN SPECIFICATIONS

1. STORM DRAINS, DROP INLETS, TRENCHING, BACKFILLING, ETC., SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE COUNTY OF VENTURA STANDARDS & SPECIFICATIONS AND THE STANDARD PLANS/SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SPPWC) EXCEPT AS MODIFIED BY THESE SPECIFICATIONS.
2. MISCELLANEOUS CATCH BASINS AND DRAINAGE FACILITIES SHALL BE CONSTRUCTED AS SHOWN ON TYPICAL DETAILS, SECTIONS AND NOTES ON THESE PLANS.
3. THE TRENCHING, BEDDING AND BACKFILL FOR STORM DRAINS SHALL CONFORM TO COUNTY OF VENTURA STANDARDS & SPECIFICATIONS.

GENERAL SEWER SPECIFICATIONS

1. ALL WORK SHALL BE DONE IN CONFORMANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION (SSPWC – GREENBOOK), THE CALIFORNIA PLUMBING CODE (CPC), THE BUILDING/PLUMBING PERMITS ISSUED FOR THIS PROJECT, AND THE VENTURA COUNTY SANITARY SEWER STANDARDS AND SPECIFICATIONS.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY. CONTRACTOR SHALL HAVE ALL PUMPS, SHORING SHIELDS AND/OR OTHER SAFETY EQUIPMENT, INCLUDING STEEL TRENCH COVER PLATES ON–SITE PRIOR TO CONSTRUCTION.
3. PROPOSED GRAVITY SEWER AND FORCE MAIN ALIGNMENTS SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL MAKE ADJUSTMENTS TO FORCE MAIN ALIGNMENTS TO AVOID EXISTING UTILITIES AND OTHER SITE CONSTRAINTS.
4. IF HAZARDOUS OR CONTAMINATED MATERIALS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND CONFORM TO APPLICABLE VENTURA COUNTY CODES AND PROCEDURES FOR REMOVING THE MATERIAL.
5. COMPACTION TESTS SHALL BE REQUIRED ON ALL WORK UNLESS WAIVED BY THE ENGINEER. THE TESTS SHALL COMPLY WITH ASTM D1557 AND SHALL BE MADE AND CERTIFIED BY THE PROJECT GEOTECHNICAL ENGINEER. ALL SOILS TEST SHALL BE PERFORMED AT THOSE LOCATIONS SPECIFIED BY THE ENGINEER. HOWEVER, AT LEAST ONE (1) TEST SHALL BE PERFORMED EVERY 300 LINEAL FEET OF PIPE INSTALLED AND AT LEAST ONE (1) TEST PER JOB UNLESS WAIVED BY THE ENGINEER.
6. ELEVATIONS INDICATED ON GRAVITY SEWER MAINS ARE INVERT ELEVATIONS MEASURED AT THE INSIDE FACE OF MANHOLES.
7. LENGTHS SHOWN IN THE PROFILE ARE HORIZONTAL FEET MEASURED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.
8. LENGTHS SHOWN IN PLAN ARE HORIZONTAL FEET MEASURE TO CENTER OF MANHOLE.
9. LOCATIONS OF LATERAL CONNECTIONS SHOWN HEREON ARE APPROXIMATE. ACTUAL LOCATION SHALL BE DETERMINED IN THE FIELD.
10. RECORD DRAWINGS (REPRODUCIBLE) SHOWING THE ACTUAL LOCATION OF ALL MAINS, STRUCTURES, WYES, LATERALS, MANHOLES, CLEANOUTS, ETC., SHALL BE FILED WITH THE OWNER BEFORE FINAL ACCEPTANCE OF THE WORK. THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND ACCURATE RECORD OF ALL CHANGES OF CONSTRUCTION SHOWN IN THESE PLANS AND SPECIFICATIONS FOR THE PURPOSE OF PROVIDING A BASIS FOR CONSTRUCTION RECORD DRAWINGS. NO CHANGES SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL DELIVER THIS RECORD OF ALL CONSTRUCTION CHANGES TO THE OWNER ALONG WITH A LETTER WHICH DECLARES THAT THE PROJECT WAS CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS, SPECIFICATIONS AND APPROVED CHANGE ORDERS.

GENERAL WATER AND RECYCLED WATER SPECIFICATIONS

1. WATER LINES, FIRE HYDRANTS, AND SERVICE STUBS SHALL BE INSTALLED AS SHOWN ON THE PLANS UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER IN WRITING. WATER LINES SHALL BE INSTALLED AFTER RECYCLED WATER LINES AND SHALL MEET THE MINIMUM HORIZONTAL AND VERTICAL SEPARATION IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES.
2. ALL MATERIAL SHALL CONFORM TO THE LATEST AWWA AND ASTM STANDARDS AND NSF STANDARDS 60 AND 61.
3. TRENCHES SHALL BE BACKFILLED IN ACCORDANCE WITH THE PROJECT DRAWINGS AND COUNTY OF VENTURA STANDARDS AND SPECIFICATIONS.
4. COMPACTION TESTS SHALL BE REQUIRED ON ALL WORK UNLESS WAIVED BY THE ENGINEER. THE TESTS SHALL COMPLY WITH ASTM D1557 AND SHALL BE MADE AND CERTIFIED BY THE PROJECT GEOTECHNICAL ENGINEER. ALL SOILS TEST SHALL BE PERFORMED AT THOSE LOCATIONS SPECIFIED BY THE ENGINEER. HOWEVER, AT LEAST ONE (1) TEST SHALL BE PERFORMED EVERY 300 LINEAL FEET OF PIPE INSTALLED AND AT LEAST ONE (1) TEST PER JOB UNLESS WAIVED BY THE ENGINEER.
5. DURING CONSTRUCTION, A #12 COPPER INSULATED TRACER WIRE SHALL BE INSTALLED ALONG THE TOP OF ANY NON–METALLIC WATER MAIN AND RECYCLED WATER MAIN AND BROUGHT TO THE FINISHED SURFACE AT EACH VALVE BOX.
6. A FOUR MIL BLUE PLASTIC/METALLIC TAPE MARKED "CAUTION –BURIED POTABLE WATER LINE" SHALL BE INSTALLED 1 FOOT ABOVE TOP OF CONSTRUCTED POTABLE WATER MAIN. A FOUR MIL PURPLE PLASTIC/METALLIC TAPE MARKED "CAUTION – BURIED RECYCLED WATER LINE" SHALL BE INSTALLED ONE FOOT ABOVE CONSTRUCTED RECYCLED WATER MAIN.
7. ALL WATER SYSTEM IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE VENTURA COUNTY WATER WORKS STANDARDS AND SPECIFICATIONS, LATEST EDITION.
8. A MINIMUM COVER FOR WATER AND RECYCLED WATER LINES IS 36 INCHES WHEN A MINIMUM OF 10 FEET OF HORIZONTAL CLEARANCE IS MAINTAINED. IF THE MINIMUM 10 FOOT HORIZONTAL CLEARANCE CAN NOT BE OBTAINED THEN THE RECYCLED WATER LINE MINIMUM COVER IS 60 INCHES OR 12 INCHES BELOW BOTTOM OF POTABLE WATER LINES, WHICHEVER IS GREATER.
9. ALL WATER LINE IMPROVEMENTS AND EXTENSIONS SHALL BE PRESSURE TESTED PER VENTURA COUNTY WATER WORKS STANDARDS AND SPECIFICATIONS AFTER DISINFECTION.
10. ALL POTABLE WATER LINE IMPROVEMENTS AND EXTENSIONS SHALL BE DISINFECTED PER VENTURA COUNTY WATER WORKS STANDARDS AND SPECIFICATIONS BEFORE BEING PLACED IN SERVICE. A VALVE SHALL BE INSTALLED IN THE CLOSED POSITION AT THE CONNECTION POINT TO THE EXISTING WATER SYSTEM.
11. ALL RECYCLED WATER FACILITIES EXPOSED TO ATMOSPHERE SHALL BE PURPLE PER VENTURA COUNTY WATER WORKS STANDARDS AND SPECIFICATIONS.
12. ALL RECYCLED WATER VALVE CANS SHALL HAVE THE WORDS "RW" CAST ON TOP OF VALVE CAN LID. LETTERS SHALL BE A MINIMUM OF 3/4 INCHES HIGH.
13. ALL RECYCLED WATER BLOW–OFF VAULT LIDS AND MANHOLE COVERS SHALL HAVE THE WORDS "RECYCLED WATER" CAST ON TOP OF LID. LETTERS SHALL BE A MINIMUM OF 3/4 INCHES HIGH.
14. VALVE CAN LIDS, BLOW–OFF VAULT LIDS, AND MANHOLE COVERS FOR RECYCLED WATER FACILITIES SHALL BE FACTORY COATED WITH PURPLE COLOR INDUSTRIAL GRADE EPOXY PAINT.

FUGITIVE DUST MITIGATION MEASURES

1. THE AREA DISTURBED BY CLEARING, GRADING, EARTH MOVING, OR EXCAVATION OPERATIONS SHALL BE MINIMIZED TO PREVENT EXCESSIVE AMOUNTS OF DUST.
2. FUGITIVE DUST PRODUCED DURING GRADING, EXCAVATION, AND CONSTRUCTION ACTIVITIES SHALL BE CONTROLLED BY THE FOLLOWING ACTIVITIES:
   - 2.1. ALL TRUCKS SHALL BE REQUIRED TO COVER THEIR LOADS AS REQUIRED BY CALIFORNIA VEHICLE CODE SECTION 23114.
   - 2.2. ALL GRADED AND EXCAVATED MATERIAL, EXPOSED SOIL AREAS, AND ACTIVE PORTIONS OF THE CONSTRUCTION SITE, INCLUDING UNPAVED ON–SITE ROADWAYS, SHALL BE TREATED TO PREVENT FUGITIVE DUST. TREATMENT SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO, PERIODIC WATERING, APPLICATION OF ENVIRONMENTALLY SAFE SOIL STABILIZATION MATERIALS, AND/OR ROLL–COMPACTION AS APPROPRIATE. WATERING SHALL BE DONE AS OFTEN AS NECESSARY AND RECLAIMED WATER SHALL BE USED WHENEVER POSSIBLE.
3. GRADED AND/OR EXCAVATED INACTIVE AREAS OF THE CONSTRUCTION SITE SHALL BE MONITORED AT LEAST WEEKLY FOR DUST STABILIZATION. SOIL STABILIZATION METHODS, SUCH AS WATER AND ROLL–COMPACTION, AND ENVIRONMENTALLY SAFE DUST CONTROL MATERIALS, SHALL BE PERIODICALLY APPLIED TO PORTIONS OF THE CONSTRUCTION SITE THAT ARE INACTIVE FOR OVER FOUR DAYS.
4. DURING PERIODS OF HIGH WINDS (I.E., WIND SPEED SUFFICIENT TO CAUSE FUGITIVE DUST TO IMPACT ADJACENT PROPERTIES), ALL CLEARING, GRADING, EARTH MOVING, AND EXCAVATION OPERATIONS SHALL BE CURTAILED TO THE DEGREE NECESSARY TO PREVENT FUGITIVE DUST CREATED BY ON–SITE ACTIVITIES AND OPERATIONS FROM BEING A NUISANCE OR HAZARD, EITHER OFF–SITE OR ON–SITE.
5. SHAKER PLATES SHALL BE INSTALLED AT ALL TRUCK EXITS FROM THE SITE.

CONSTRUCTION EQUIPMENT CONTROL MEASURES

1. CONSTRUCTION CONTRACTORS SHALL MINIMIZE EQUIPMENT IDLING TIME THROUGHOUT CONSTRUCTION. ENGINES SHALL BE TURNED OFF IF IDLING WOULD BE FOR MORE THAN FIVE MINUTES.
2. EQUIPMENT ENGINES SHALL BE MAINTAINED IN GOOD CONDITION AND IN PROPER TUNE AS PER MANUFACTURER'S SPECIFICATIONS.
3. THE NUMBER OF PIECES OF EQUIPMENT OPERATING SIMULTANEOUSLY SHALL BE MINIMIZED.
4. CONSTRUCTION CONTRACTORS SHALL USE ALTERNATIVELY FUELED CONSTRUCTION EQUIPMENT (SUCH AS COMPRESSED NATURAL GAS, LIQUEFIED NATURAL GAS, OR ELECTRIC) WHEN FEASIBLE.
5. THE ENGINE SIZE OF CONSTRUCTION EQUIPMENT SHALL BE THE MINIMUM PRACTICAL SIZE.
6. HEAVY–DUTY DIESEL–POWERED CONSTRUCTION EQUIPMENT MANUFACTURED AFTER 1996 (WITH FEDERALLY MANDATED CLEAN DIESEL ENGINES) SHALL BE UTILIZED WHEREVER FEASIBLE.
7. DURING THE SMOG SEASON (MAY THROUGH OCTOBER), THE CONSTRUCTION PERIOD SHOULD BE LENGTHENED SO AS TO MINIMIZE THE NUMBER OF VEHICLES AND EQUIPMENT OPERATING AT THE SAME TIME.

GENERAL ROAD NOTES

1. ALL EXCAVATIONS OR TRENCHES IN PAVED AREAS SHALL REQUIRE SAW CUTTING IN A NEAT AND UNIFORM MANNER. ALL MATCH OR JOIN LINES TO EXISTING ASPHALT CONCRETE PAVING SHALL BE SAWCUT.
2. CONTRACTOR TO LOCATE, PROTECT, AND REPAIR AT HIS EXPENSE, ANY UTILITIES DAMAGED BY HIS FORCES.
3. THE CONTRACTOR SHALL HAVE COPIES OF THE APPROVED PLANS AND SPECIFICATIONS FOR THIS PROJECT ON THE SITE AT ALL TIMES, AND THE CONTRACTOR SHALL BE FAMILIAR WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
4. THE CONTRACTOR SHALL EXPOSE AND VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING IMPROVEMENTS PRIOR TO BEGINNING WORK.
5. ALL CURBS AND CROSS GUTTERS SHALL BE STAKED AT 25 FOOT INTERVALS FOR GRADE CONTROL.
6. ASPHALT CONCRETE AND CLASS II AGGREGATE BASE THICKNESS FOR ROADS SHALL BE DETERMINED BY "R" VALUE TAKEN ON THE COMPLETED SUBGRADE BY THE GEOTECHNICAL ENGINEER, BUT IN NO CASE SHALL IT BE LESS THAN THE MINIMUM THICKNESS SHOWN IN GEOTECHNICAL REPORT.
7. COMPACTION OF FILL, SUBGRADE AND BASE COURSES AS WELL AS ALL TRENCH BEDDING AND BACKFILL SHALL BE OBSERVED AND TESTED FOR COMPLIANCE WITH APPLICABLE REQUIREMENTS BY THE GEOTECHNICAL ENGINEER.
8. ALL WORK INVOLVING EXCAVATION INCLUDING THAT FOR WATER, SEWER, STORM DRAIN AND DRY UTILITY CONDUITS AND ALL SERVICE CONNECTIONS AND METER BOXES SHALL BE COMPLETED AND OBSERVED AND APPROVED BY THE AGENCY HAVING JURISDICTION AND THE STRUCTURAL BACKFILL OBSERVED AND TESTED FOR COMPACTION AND APPROVED BEFORE AGGREGATE BASE, PAVING AND OTHER PERMANENT SURFACE CONSTRUCTION MAY COMMENCE.
9. THE CONTRACTOR SHALL COORDINATE WITH DRY UTILITY COMPANIES (SCE, GTE, COX CABLE & SCG) FOR ALL REQUIRED CONDUIT CROSSINGS AND SLEEVES PRIOR TO ROAD PAVING.
10. ASPHALT CONCRETE PAVING MATERIALS (A.C.) AND PROCESSES SHALL COMPLY WITH CALTRANS SPECIFICATIONS SECTION 39.
11. AGGREGATE BASE MATERIALS (A.B.) SHALL COMPLY WITH CALTRANS SPECIFICATIONS SECTION 26.
12. GRADING FOR SUBGRADE SHALL BE COMPLETED TO WITHIN TOLERANCES GIVEN IN CALTRANS SPECIFICATIONS SECTION 19. SOIL SHALL BE TESTED FOR COMPACTION AND R–VALUE AND INSPECTED BEFORE BASE, PAVING, OR ANY OTHER PERMANENT SURFACE CONSTRUCTION MAY COMMENCE.
13. CONCRETE FOR CURBS, GUTTERS, CROSS GUTTERS, DRIVEWAYS, AND WALKS SHALL BE CLASS 520–C–2500. CONCRETE FOR DRAINAGE STRUCTURES SHALL BE CLASS 560–C–3250. HIGHER CLASSES SHOWN ON PLANS OR IN SPECIFICATIONS SHALL GOVERN.

GENERAL BRIDGE CONSTRUCTION NOTES

1. PREFABRICATED BRIDGES SHALL BE SUPPLIED BY THE OWNER AND OFF LOADED, ASSEMBLED AS REQUIRED, AND INSTALLED BY CONTRACTOR IN ACCORDANCE WITH THE PROJECT BRIDGE PLANS AND SPECIFICATIONS.
2. CONTRACTOR SHALL COORDINATE WITH BRIDGE PREFABRICATOR AS REQUIRED FOR THE PROPER CONSTRUCTION OF THE BRIDGES.
3. CONTRACTOR SHALL CONSTRUCT THE CONCRETE BRIDGE FOUNDATIONS IN ACCORDANCE WITH THESE PLANS, THE APPROVED PREFABRICATED BRIDGE PLANS, PROJECT CONDITIONS OF APPROVAL AND IN COORDINATION WITH THE PROJECT GEOTECHNICAL ENGINEER.
4. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE BRIDGE PREFABRICATOR FOR DELIVERY, AND SHALL PROVIDE CRANES TO IMMEDIATELY OFF LOAD PREFABRICATED BRIDGES WHEN IT ARRIVES AND SAFELY STORE AND PROTECT ON–SITE AND INSTALL ONTO THE FOUNDATIONS AND SECURE IN PLACE. CONTRACTOR SHALL ASSEMBLE PREFAB BRIDGE, AS REQUIRED, PRIOR TO PLACEMENT ON ABUTMENTS. BRIDGES MAY BE PLACED ONLY WHEN THE FOUNDATIONS ARE COMPLETE AND ADEQUATELY CURED.
5. AFTER INSTALLATION ONTO THE FOUNDATION, THE CONTRACTOR SHALL SUPPLY AND COMPLETE BRIDGE INSTALLATION WITH PLACEMENT OF ANY REQUIRED SURFACES, RAILINGS, WALLS, FENCES, UTILITIES, ETC. TO THE SATISFACTION OF THE OWNER AND THESE PLANS.

SYMBOL LEGEND

━━ ━ ━ ━━	EXISTING RIGHT–OF–WAY "D1"
━━ ━ ━ ━━	EXISTING PROPERTY LINE
—— – – —— – – ——	EXISTING RIGHT–OF–WAY "D3"
———100———	EXIST. MAJOR CONTOUR
- - - -101- - - -	EXIST. MINOR CONTOUR
— ——→ ——→	EXISTING FLOW LINE
—— — — W — — ——	EXIST. WATER LINE
	EXISTING IRRIGATION LINE
—— — — S — — ——	EXIST. SEWER LINE
——SD — — — ——	EXIST. STORM DRAIN LINE
—— — — G — — ——	EXIST. GAS LINE
—— — — E — — ——	EXIST. ELECTRICAL LINE
—— — — COMM — — ——	EXIST. COMMUNICATION LINE
—— — — OHW — — ——	EXIST. OVERHEAD WIRE LINE
—— — — FOC — — ——	EXIST. FIBER OPTIC CABLE
————————	EXIST. HARDSCAPE
▬▭▬▭▬▭	EXIST. WALL
————×————	EXIST. FENCE LINE
——ılı——ılı——	EXIST. EDGE OF PAVEMENT
	EXIST. ROAD STRIPING
━━ ━━ ━━	EXISTING TOP OF BANK
━━ ━━ ━━	EXISTING TOP OF BANK 100' OFFSET
————————	CRE BOUNDARY
————————	100 YEAR FLOOD INUNDATION POST–PROJECT
▬▭▬▭▬▭	PROPOSED WALL
- - - - - - - -	PROPOSED GRADE BREAKLINE
- - - - - - - -	PROPOSED GARAGE BREAKLINE
——→ ——→ ——	PROPOSED FLOWLINE
——∨——∧——	PROPOSED LIMITS OF GRADING
———— – ————	PROPOSED ROAD CENTERLINE
——∧——∧——	PROPOSED ROAD SAWCUT/DAYLIGHT
════════	PROPOSED CURB
—— — ——	PROPOSED CULVERT CL
———100———	PROPOSED MAJOR CONTOUR
——— 98 ———	PROPOSED MINOR CONTOUR
——— FW ———	PROPOSED FIREWATER LINE
——— W ———	PROPOSED WATER LINE
——— RW ———	PROPOSED RECLAIMED WATER LINE
——— SD ———	PROPOSED STORM DRAIN LINE
——— S ———	PROPOSED SEWER LINE
——— U ———	PROPOSED JOINT UTILITY LINE
———OHW———	PROPOSED OVERHEAD WIRE

HATCH LEGEND

ESHA PER RESTRICTIVE COVENANT	⊠
PROPOSED ASPHALT CONCRETE	▒
PROPOSED CONCRETE	▨
PROPOSED RIP–RAP	▨

BMP LEGEND

INF–1: INFILTRATION BASIN	⊠
INF–2: INFILTRATION TRENCH	▨
INF–3: BIORETENTION	▨
INF–5: PERMEABLE PAVEMENT	▨
BIO–1: BIORETENTION WITH UNDERDRAIN	▨
BIO–2: PLANTER BOX	▨
BIO–3: VEGETATED SWALE	▨
BIO–4: VEGETATED FILTER STRIP	▨

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963–9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

GENERAL NOTES & INFORMATION
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C2 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42–ENG SAVE DATE: 3/1/2022 2:43:19 PM PLOT BY:Brewer, Katie PLOT DATE:3/1/2022 3:00:46 PM

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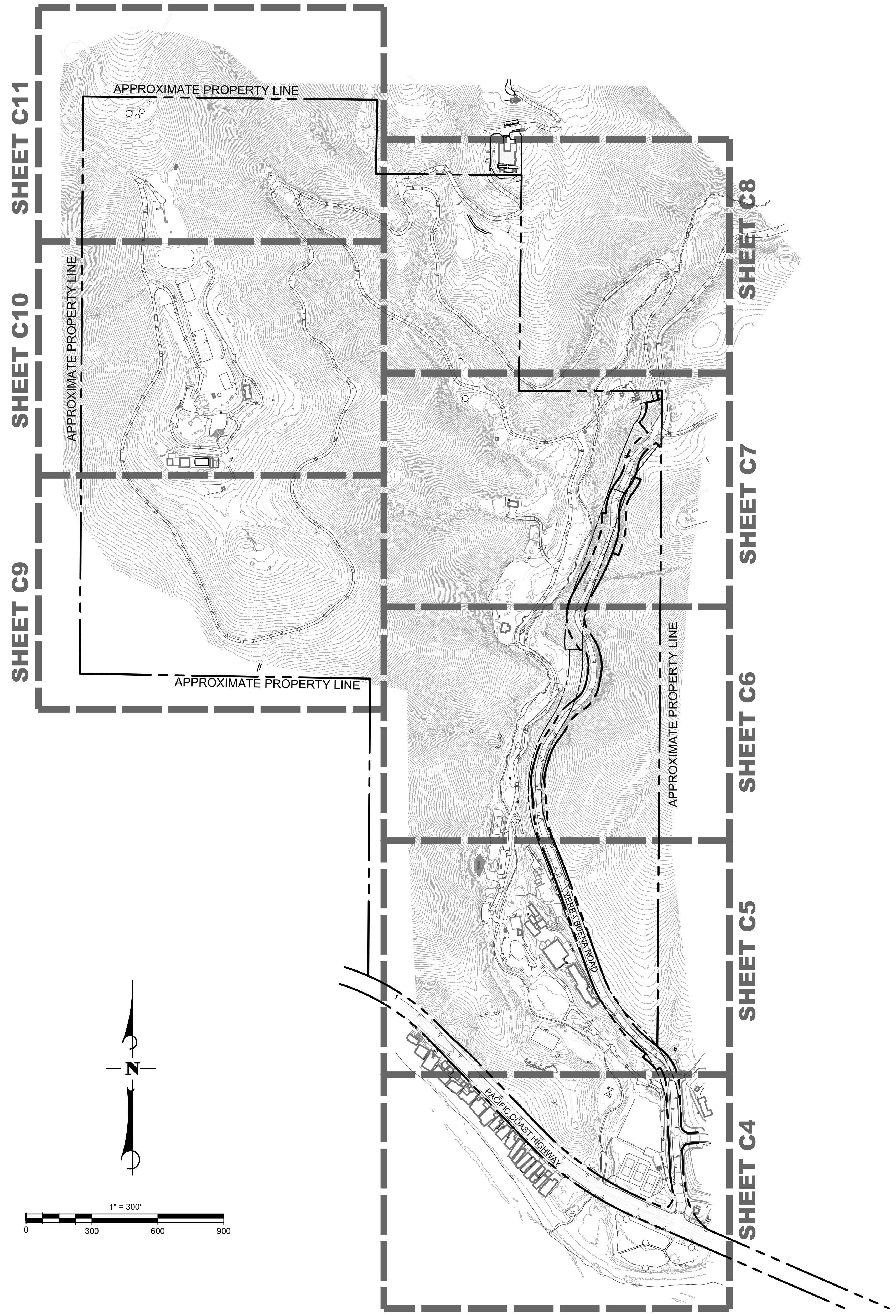

SURVEYOR'S NOTES

1. MAPPING

TOPOGRAPHIC MAPPING WAS COMPILED AT A SCALE OF 1"=20' WITH A 1-FOOT CONTOUR INTERVAL BASED ON AERIAL DATA FLOWN AND COLLECTED IN APRIL 2020. PLANIMETRICS WERE COMPILED BASED ON CONVENTIONAL PHOTOGRAMMETRY WHILE VERTICAL RELIEF WAS DERIVED FROM A LiDAR DATA SET COLLECTED SIMULTANEOUSLY THEREWITH. SUPPLEMENTAL MAPPING DATA WAS COLLECTED FROM A GROUND BASED FIELD SURVEY USING CONVENTIONAL AND GEODETIC EQUIPMENT AND PROCEDURES BY STANTEC (BC:2042 SANTA BARBARA) THROUGHOUT THE 2020 YEAR.

2. BASIS OF BEARINGS AND COORDINATES

THE BEARINGS AND DISTANCES SHOWN ON THIS MAP ARE REFERENCED TO THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) AS REALIZED BY THE CALIFORNIA SPATIAL REFERENCE SYSTEM (CSRS), EPOCH 2017.50, NAD83(2011), ZONE 5, DEFINED LOCALLY BY GEODETIC TIES TO STATIONS: "ANA1", "CBHS", "CIRX", "CSCI", AND "TOST".

3. ELEVATIONS (ORTHOMETRIC HEIGHTS)

THE ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND ARE EXPRESSED IN U.S. SURVEY FEET UNITS TIED LOCALLY TO THAT CERTAIN PASSIVE NATIONAL GEODETIC SURVEY (NGS) FIRST ORDER CLASS ONE BENCHMARK (PID: EW4264) "S 583" HAVING A PUBLISHED DATA SHEET ORTHOMETRIC HEIGHT (ELEVATION) OF 32.18 FEET (JUNE 1991 ADJUSTMENT). MAPPING AND LOCAL SITE CONTROL ELEVATIONS WERE COMPUTED VIA INTERPOLATION OF NGS'S "GEOID12B" GEOID MODEL APPLIED TO COMPUTED ELLIPSOID HEIGHTS TIED TO SAID BENCHMARK.

4. BOUNDARY NOTE

THE BOUNDARY LINES SHOWN HEREON ARE PRELIMINARY FOR PLANNING PURPOSES ONLY. THE VENTURA COUNTY SURVEYOR'S OFFICE HAS BEEN NOTIFIED OF THE ONGOING BOUNDARY EFFORT RELATED TO THE SUBJECT PROPERTY/THIS PROJECT AND THAT STANTEC WILL BE SUBMITTING A RECORD OF SURVEY TO PERPETUATE THE BOUNDARY ESTABLISHMENT EFFORT THEREOF AS THE PROJECT PROGRESSES.

5. RIGHT OF WAY NOTES

THE RIGHT OF WAY BOUNDARY OF YERBA BUENA ROAD DEPICTED HEREON IS THE RESULT OF THE ESTABLISHMENT OF THE LOCATION OF THE OUTER EXTENT OF THE FOLLOWING DEEDS:

- D1: YERBA BUENA ROAD RIGHT OF WAY DEED, DATED MAY 12, 1926, PER BOOK 108 PAGE 202 THROUGH 205, INCLUSIVE, VENTURA COUNTY OFFICIAL RECORDS
- D2: YERBA BUENA ROAD EASEMENT DEED, RECORDED DECEMBER 24, 1975, PER BOOK 4513 PAGE 882 THROUGH 886, INCLUSIVE, VENTURA COUNTY OFFICIAL RECORDS
- D3: YERBA BUENA ROAD EASEMENT DEED, RECORDED JANUARY 4, 1991, PER INSTRUMENT No. 91-001207, VENTURA COUNTY OFFICIAL RECORDS

[NOTE THE FOLLOWING AS RELATED THERETO:

1. DESCRIBED GEOMETRY VERSUS STATIONING PER D1 (THIS DOCUMENT) DISAGREE IN THE 21ST, 22ND, AND 27TH CALLS THEREOF (ENDING AT D1 STATION CALLS OF 29+16.23, 30+74.05, & 35+55.41, RESPECTIVELY); DESCRIBED LINE DISTANCE GEOMETRY WAS SUPERCEDED BY STATION SUBTRACTION AT THE 21ST AND 27TH CALLS (22ND CALL IS AN ARC WITH DESCRIBED RADIUS/DELTA/LENGTH HAVING RELATIVE AGREEMENT AND THEREFORE NOT SUPERCEDED BY STATION SUBTRACTION) AS THIS METHODOLOGY FITS THE EXISTING ROAD IMPROVEMENTS, ESTABLISHED BOUNDARIES, AND RELATED FIELD MONUMENTATION GEOMETRY; SHOULDER WIDENINGS PER D1 PARCEL "A" WERE ESTABLISHED HOLDING DESCRIBED STATIONING AT GEOMETRY POINTS PER SAID D1, NOT CALCULATED FROM (CORRECTED) STATIONING
2. THAT PORTION OF D1 LOCATION & RELIANT ADDITIONAL ROAD EASEMENTS THERETO LYING NORTHERLY OF M3331 WERE ESTABLISHED VIA ACCEPTING M3331 & ROTATING DESCRIBED D1 GEOMETRY THEREFROM TO INTERSECT 35TH COURSE THEREOF WITH CENTER OF SECTION LINE AT HELD D1 DISTANCE OF 158.82' ALONG SAID CENTER OF SECTION LINE FROM 1/16 CORNER PER SAME VIA PLACING ALL ERROR IN DELTA/LENGTH OF LAST CALL (35TH).
3. COMBINED SCALE FACTOR (CSF) APPLIED TO D1 PORTION LYING NORTHERLY OF M3331 CALCULATED BASED ON AVERAGE OF MEASURED CSF AT SAID M3331 AND M3200 (CSF AVERAGE = 0.999991590)
4. COMBINED SCALE FACTOR (CSF) APPLIED TO D3 CALCULATED BASED ON AVERAGE OF MEASURED CSF AT SAID M3260 AND M3200 (CSF AVERAGE = 0.999992850).]

SURVEYOR'S STATEMENT

THIS MAP, AND THE SURVEY IT REPRESENTS, WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

DANIEL B. EISENGART, PLS
SURVEYOR, PLS L8961

DATE: 04/20/2021

DANIEL B. EISENGART
NO. 8961

SYMBOL LEGEND

	EXISTING RIGHT-OF-WAY "D1"
	EXISTING PROPERTY LINE
	EXISTING RIGHT-OF-WAY "D3"
100	EXIST. MAJOR CONTOUR
101	EXIST. MINOR CONTOUR
	EXISTING FLOW LINE
W	EXIST. WATER LINE
S	EXIST. SEWER LINE
SD	EXIST. STORM DRAIN LINE
G	EXIST. GAS LINE
E	EXIST. ELECTRICAL LINE
COMM	EXIST. COMMUNICATION LINE
OHW	EXIST. OVERHEAD WIRE LINE
FOC	EXIST. FIBER OPTIC CABLE
	EXIST. HARDSCAPE
	EXIST. WALL
	EXIST. FENCE LINE
	EXIST. EDGE OF PAVEMENT
	EXIST. ROAD STRIPING
	EXISTING MANHOLE
SCO	EXISTING SEWER CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING LIGHT POLE
	EXISTING UTILITY VAULT
59.5	SPOT ELEVATION
	EXISTING BOLLARD
XX"	EXISTING TREE
	APPROX. TREE DRIP LINE

ABBREVIATIONS

AC	ASPHALTIC CONCRETE
ACP	ASBESTOS CEMENT PIPE
AB	AGGREGATE BASE
ANG. PT.	ANGLE POINT
BC	BEGIN CURVE
BCR	BEGIN CURB RETURN
BM	BENCHMARK
BVC	BEGIN VERTICAL CURVE
BW	BACK OR WALK
CIP	CAST IRON PIPE
CJ	CRACK CONTROL JOINT
CL	CLASS
CCL	CONSTRUCTION CENTERLINE
CLF	CHAIN LINK FENCE
CONC.	CONCRETE
C&G	CURB AND GUTTER
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CATV	CABLE TELEVISION
DBL.	DOUBLE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
DW OR DWY	DRIVEWAY
E	ELECTRICAL
EC	END CURVE
ECR	END CURB RETURN
EJ	EXPANSION JOINT
EL OR ELEV.	ELEVATION
EMH	ELECTRICAL MANHOLE-SCE
EOP	EDGE OF PAVEMENT
ESM'T	EASEMENT
EVC	END VERTICAL CURVE
EX. OR EXIST.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FLG	FLANGE
FS	FINISH SURFACE/TOP OF CONCRETE
G	GAS
GM	GAS METER
GB	GRADE BREAK
GSP	GALVINIZED STEEL PIPE
GUT	GUTTER
HP	HIGH POINT
HYD	HYDRANT
INT.	INTERSECTION
INV	INVERT OF PIPE/FLOWLINE
ICV	IRRIGATION CONTROL VALVE
IRR.	IRRIGATION
L	LENGTH
LGTP.	LIGHT POLE
LF	LINEAL FEET
LP	LOW POINT
LT.	LEFT
MH	MANHOLE
MJ	MECHANICAL JOINT
N.I.C.	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CURB
OHW	OVERHEAD WIRE
PB	PULL BOX
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION (CURVE TANGENTS)
PL	PROPERTY LINE
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PROP.	PROPOSED
PSE	PRIVATE STREET EASEMENT
PUE	PUBLIC UTILITIES EASEMENT
PVC	POLY-VINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RCAP	REINFORCED CONCRETE ARCH PIPE
RIM	RIM OF MANHOLE
R/W OR ROW	RIGHT-OF-WAY
RT.	RIGHT
S	SEWER
SB	SUBBASE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SH	SPRINKLER HEAD
SL	STREET LIGHT
SPECS	SPECIFICATIONS
SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
SSPWC	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STA	STATION
STD. DET.	STANDARD DETAIL
SW	SIDEWALK
T	TELEPHONE
TB	THRUST BLOCK
TC	TOP OF CURB
TD	TOP OF DIKE
TF	TOP OF FOOTING
TG	TOP OF GRATE
TI	TRAFFIC INDEX
TL	TRAFFIC LIGHT
TP	TOP OF PAVEMENT
TSP	TUBULAR STEEL POLE
TSPB	TRAFFIC SIGNAL PULL BOX
TYP	TYPICAL
TW	TOP OF WALL
VCP	VITRIFIED CLAY PIPE
VLT.	VAULT
VLV.	VALVE
VPI	VERTICAL POINT OF INTERSECTION (CURVE TANGENTS)
W	WATER
WM	WATER METER
WV	WATER VALVE
©	DELTA (CURVE CENTRAL ANGLE)
±	APPROXIMATELY
%	PERCENT
<	LESS THAN
>	GREATER THAN

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER · GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

DANIEL B. EISENGART
NO. 8961

PRELIMINARY

SURVEY NOTES & SHEET INDEX
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200

SHEET
C3 OF C67

PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/26/2021 5:10:13 PM PLOT BY: Brewer, Katie PLOT DATE: 2/23/2022 3:33:43 PM

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SEE SHEET C5 FOR CONTINUATION
PACIFIC COAST HIGHWAY
PACIFIC OCEAN
LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
ELLICE STREET
"D3" 60.00'
EXISTING ROW
"D1" 60.00'
EXISTING ROW
"D1" 49.00'
EXISTING ROW
"D1" 90.00'
EXISTING ROW
"D1" 80.00'
EXISTING ROW
SCATTERED BRUSH
GROUND NOT VISIBLE
DENSE TREES
SCO
N
SCALE: 1"=40'
0
40
80
120

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:

WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:

Stantec

111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA 70,435 9/30/2022
PROJECT ENGINEER R.C.E. DATE

PROFESSIONAL LAND SURVEYOR
DANIEL B. EISENGART
NO. 8961
STATE OF CALIFORNIA

PRELIMINARY

TOPOGRAHIC MAP – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY

VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200

SHEET
C4 OF C67

PLAN DATE
3/01/2022

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SEE SHEET C6 FOR CONTINUATION

SEE SHEET C10 FOR CONTINUATION

LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
"D1" 60.00' EXISTING ROW
"D3" 60.00' EXISTING ROW
APPROXIMATE PROPERTY LINE
GROUND NOT VISIBLE
SCATTERED BRUSH
DENSE TREES
BUILDING
CONC
AC
PAVERS
DIRT PILE
BRIDGE
SCO
N

SCALE: 1"=40'
0 40 80 120

SEE SHEET C4 FOR CONTINUATION

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PROFESSIONAL LAND SURVEYOR
DANIEL B. EISENGART
NO. 8961
STATE OF CALIFORNIA

PRELIMINARY

TOPOGRAHIC MAP – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C6 OF C67
PLAN DATE
3/01/2022

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42-ENG SAVE DATE: 4/26/2021 5:10:13 PM
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SEE SHEET C7 FOR CONTINUATION

SEE SHEET C9 FOR CONTINUATION

LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
"D1" 80.00'
EXISTING ROW
"D3" 80.00'
EXISTING ROW
"D3" 60.00'
EXISTING ROW
"D1" 60.00'
EXISTING ROW
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
APPROXIMATE PROPERTY LINE
DENSE BRUSH
GROUND NOT VISIBLE
DENSE TREES
SCATTERED BRUSH
SCATTERED BRUSH
GROUND NOT VISIBLE
DENSE TREES
SCATTERED BRUSH
GROUND NOT VISIBLE
SCATTERED BRUSH
DIRT PILE
DIRT PILE
DIRT PILE
DIRT PILE
POOL
CONC
CONC
DENSE TREES
DENSE TREES
OHW
N
SCALE: 1"=40'
0
40
80
120

SEE SHEET C5 FOR CONTINUATION

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER
GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
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111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PROFESSIONAL LAND SURVEYOR
DANIEL B. EISENGART
NO. 8961
STATE OF CALIFORNIA

TOPOGRAHIC MAP – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C6 OF C67

PLAN DATE
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SEE SHEET C8 FOR CONTINUATION

SEE SHEET C9 & C10 FOR CONTINUATION

APPROXIMATE PROPERTY LINE
TANK
DENSE TREES
SCATTERED BRUSH
GROUND NOT VISIBLE
CAMP FIRE ROAD
LITTLE SYCAMORE CREEK
FIRE BREAK ROAD
"D1" VARIES
EXISTING ROW
DENSE BRUSH
APPROXIMATE PROPERTY LINE
"D1" 80.00'
EXISTING ROW
"D2" 30.00'
EXISTING ROW
LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
"D3" 80.00'
EXISTING ROW
"D1" 80.00'
EXISTING ROW
N
SCALE: 1"=40'
0
40
80
120

SEE SHEET C6 FOR CONTINUATION

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:

CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

DANIEL B. EISENGART
NO. 8961

TOPOGRAHIC MAP – MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C7 OF C67

PLAN DATE
3/01/2022

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SEE SHEET C10 & C11 FOR CONTINUATION

SCATTERED BRUSH
DIRT PILE
558.3
552.7
APPROXIMATE PROPERTY LINE
535.2
534.6
DENSE TREES
502.1
460.6
454.6
466.5
468.5
463.5
463.5
463.2
463.8
454.5
467.3
462.2
500.7
499.1
497.6
495.3
YERBA BUENA ROAD
APPROXIMATE PROPERTY LINE
GROUND NOT VISIBLE
CAMP FIRE ROAD
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
YERBA BUENA ROAD
GROUND NOT VISIBLE
N

SCALE: 1"=40'
0 40 80 120

SEE SHEET C7 FOR CONTINUATION

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PROFESSIONAL LAND SURVEYOR
DANIEL B. EISENGART
NO. 8961
STATE OF CALIFORNIA

TOPOGRAHIC MAP – MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C8 OF C67

PLAN DATE
3/01/2022

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42-ENG SAVE DATE: 4/26/2021 5:10:13 PM PLOT BY: Brewer, Katie PLOT DATE: 2/23/2022 3:40:43 PM

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SEE SHEET C10 FOR CONTINUATION
SEE SHEET C6 & C7 FOR CONTINUATION
YERBA BUENA ROAD
YERBA BUENA ROAD
YERBA BUENA ROAD
APPROXIMATE PROPERTY LINE
APPROXIMATE PROPERTY LINE
SCATTERED TREES
SCATTERED BRUSH
GROUND NOT VISIBLE
DENSE TREES
1004
6268041.14
1845493.57
508.68
1005
6268346.64
1845507.76
437.01
N
SCALE: 1"=40'
0
40
80
120

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:

WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:

Stantec

111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

DANIEL B. EISENGART
NO. 8961

TOPOGRAHIC MAP – MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY

VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C9 OF C67

PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI

42-ENG SAVE DATE: 4/26/2021 5:10:13 PM PLOT BY: Brewer, Katie PLOT DATE: 2/23/2022 3:41:39 PM

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SEE SHEET C11 FOR CONTINUATION

CAMP FIRE ROAD
YERBA BUENA ROAD
YERBA BUENA ROAD
YERBA BUENA ROAD
APPROXIMATE PROPERTY LINE
DENSE TREES
SCATTERED BRUSH
SCATTERED TREES
GROUND NOT VISIBLE
POOL
FW
N
SCALE: 1"=40'
0
40
80
120

SEE SHEET C7 & C8 FOR CONTINUATION

SEE SHEET C9 FOR CONTINUATION

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:

WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:

Stantec

111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PROFESSIONAL LAND SURVEYOR
DANIEL B. EISENGART
NO. 8961
STATE OF CALIFORNIA

PRELIMINARY

TOPOGRAHIC MAP – UPPER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200

SHEET
C10 OF C67

PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42–ENG SAVE DATE: 4/26/2021 5:10:13 PM PLOT BY: Brewer, Katie PLOT DATE: 2/23/2022 3:45:10 PM

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YERBA BUENA ROAD
YERBA BUENA ROAD
YERBA BUENA ROAD
SCATTERED TREES
SCATTERED BRUSH
DENSE TREES
APPROXIMATE PROPERTY LINE
APPROXIMATE PROPERTY LINE
APPROXIMATE PROPERTY LINE
TANK
TANK
TANK
N
SCALE: 1"=40'
0
40
80
120

SEE SHEET C8 FOR CONTINUATION

SEE SHEET C10 FOR CONTINUATION

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 4/26/2021 5:10:13 PM PLOT BY: Brewer, Katie PLOT DATE: 2/23/2022 3:46:18 PM

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

DANIEL B. EISENGART
NO. 8961

TOPOGRAHIC MAP – UPPER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C11 OF C67
PLAN DATE
3/01/2022

DRAWING: v:\2042\active\2042586200\drawing\model_files\2042586200_aer-plan&lidar.dwg

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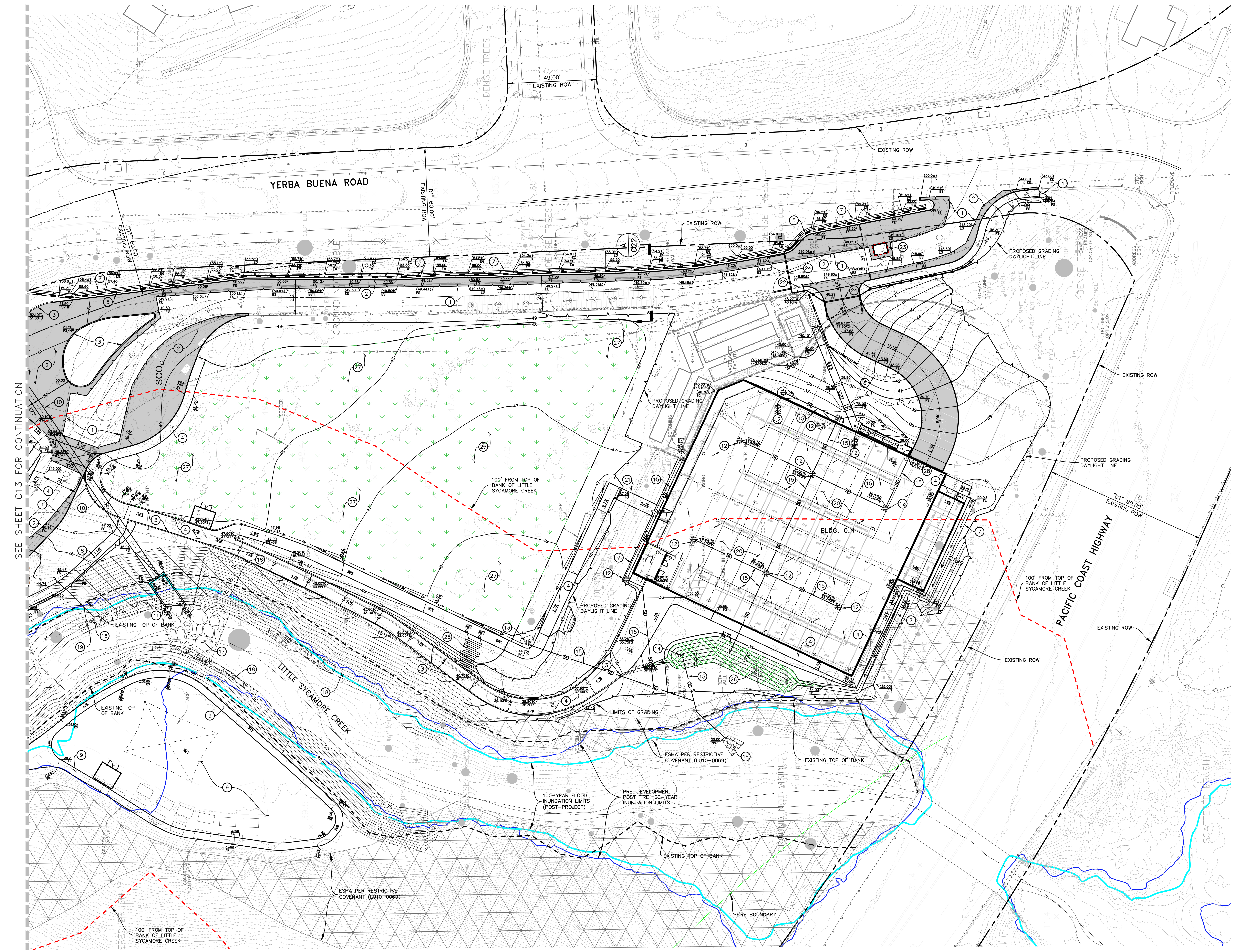
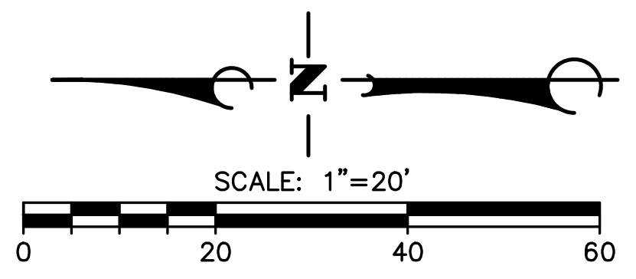

YERBA BUENA ROAD
49.00'
EXISTING ROW
"D1" 60.00'
EXISTING ROW
"D3" 60.00'
EXISTING ROW
SEE SHEET C13 FOR CONTINUATION
PROPOSED GRADING DAYLIGHT LINE
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
BLDG. O.N
EXISTING TOP OF BANK
LITTLE SYCAMORE CREEK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
CRE BOUNDARY
PACIFIC COAST HIGHWAY
"D1" 90.00'
EXISTING ROW
GROUND NOT VISIBLE
DENSE TREES

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED 6" CURB.
4. PROPOSED CONCRETE WALKWAY.
5. PROPOSED CONCRETE SITE RETAINING WALL.
6. PROPOSED STONE CLAD RETAINING WALL.
7. PROPOSED CONCRETE SWALE.
8. PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET C58.
9. PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
10. PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
11. PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
12. PROPOSED 12"X12" STORM DRAIN INLET.
13. PROPOSED 24"X24" STORM DRAIN INLET WITH CONCRETE APRON.
14. PROPOSED STORM DRAIN OUTLET/OVERFLOW; FINAL SIZE TBD.
15. PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
16. PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
17. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
18. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
19. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
20. PROPOSED AT-GRADE PARKING WITH RAISED TENNIS COURTS ABOVE. SEE ARCHITECTURAL PLANS. SEE DETAIL "A", SHEET C58 FOR TENNIS COURT LEVEL FINISH SURFACE ELEVATIONS.
21. PROPOSED 8' WIDE PEDESTRIAN BRIDGE CONNECTING THE FIELD LEVEL TO THE TENNIS COURTS.
22. PROPOSED 8' HIGH PEDESTRIAN GATE. SEE LANDSCAPE PLANS.
23. PROPOSED GATE SHACK. SEE ARCHITECTURAL PLANS.
24. PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
25. PROPOSED TIMBER STEPS.
26. PROPOSED WATER QUALITY TREATMENT AREA (BIO-1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
27. PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.
28. PROPOSED TRENCH DRAIN.



SCALE: 1"=20'

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN – LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY

VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C12 OF C67

PLAN DATE
3/01/2022

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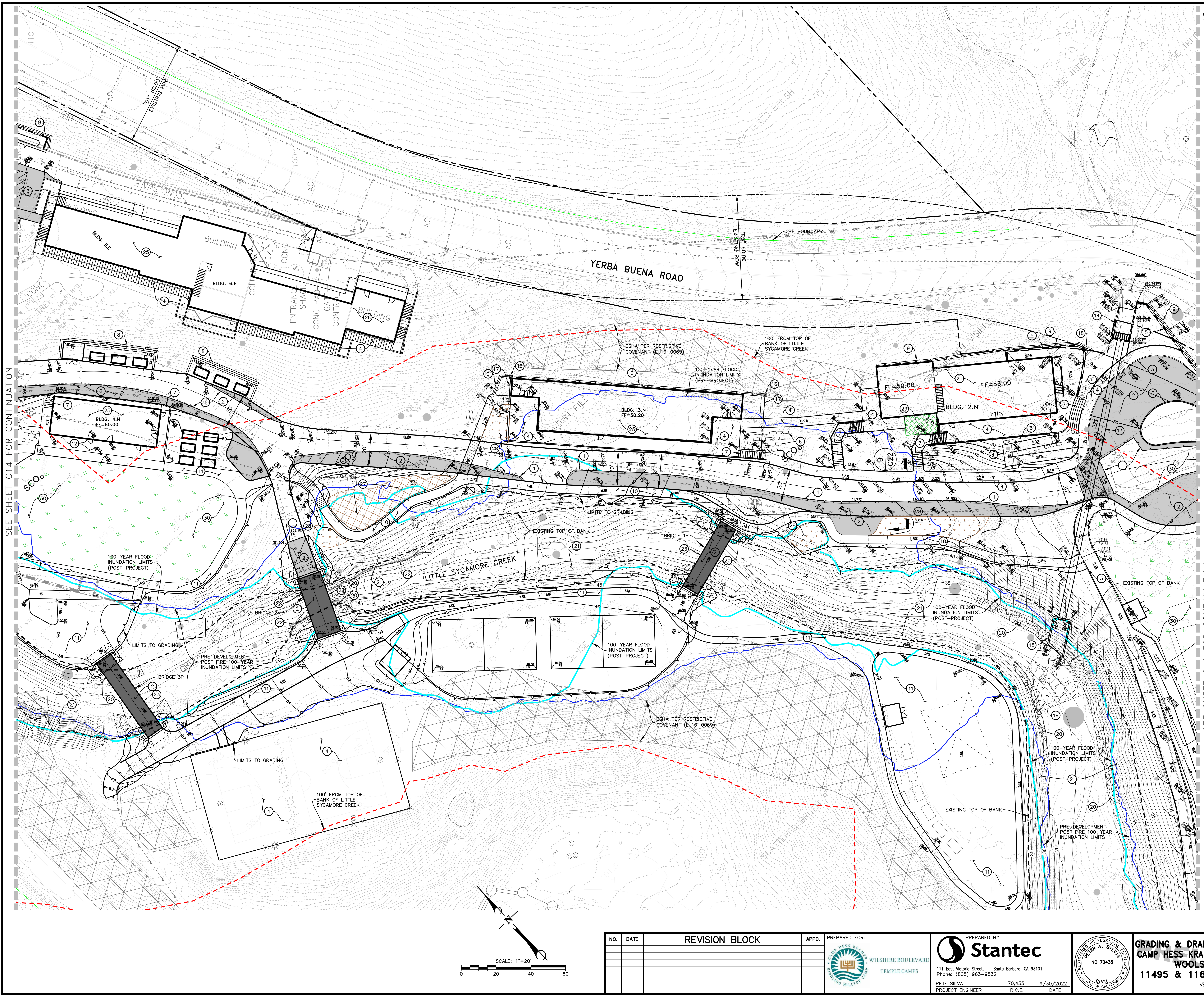
PLOT BY: Silvia, Pete
PLOT DATE: 3/4/2022 9:20:33 AM
DRAWING: \\us0377-ppfss01\workgroup\2042\active\2042586200\drawing\exhibit_files\2042586200_civil_base.dwg


SEE SHEET C14 FOR CONTINUATION
SEE SHEET C12 FOR CONTINUATION
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
"DT" 60.00' EXISTING ROW
CRE BOUNDARY
BLDG. 6.E
BLDG. 6.E
BUILDING
ENTRANCE SHADE
CONC PAD
BLDG. 4.N
FF=60.00
BLDG. 3.N
FF=50.20
BLDG. 2.N
FF=50.00
FF=53.00
DIRT PILE
BRIDGE 2V
BRIDGE 1P
BRIDGE 3P
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (PRE-PROJECT)
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
LIMITS TO GRADING
EXISTING TOP OF BANK
SCATTERED BRUSH
DENSE TREES
CONC SWALE
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED 6" CURB.
4. PROPOSED CONCRETE WALKWAY.
5. PROPOSED CONCRETE SITE RETAINING WALL.
6. PROPOSED STONE BOULDER WALL.
7. PROPOSED CONCRETE STEPS.
8. PROPOSED TIMBER STEPS.
9. PROPOSED CONCRETE SWALE.
10. PROPOSED PERVIOUS DECOMPOSED GRANITE PATH. SEE DETAIL "B", SHEET SHEET C58.
11. PROPOSED STABILIZED STONE GRAVEL. SEE DETAIL "C", SHEET C58.
12. PROPOSED PERMEABLE PAVERS. SEE DETAIL "D", SHEET C58.
13. PROPOSED 60" STORM DRAIN. SEE STORM DRAIN PLANS.
14. PROPOSED STORM DRAIN "LINE A" INLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "J", SHEET C59.
15. PROPOSED STORM DRAIN "LINE A" OUTLET STRUCTURE. SEE STORM DRAIN PLANS. SEE DETAIL "I", SHEET C59.
16. PROPOSED 18"X18" STORM DRAIN INLET.
17. PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
18. PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
19. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
20. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
21. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
22. EXISTING MASONRY ABUTMENTS AND WALLS TO BE REMOVED. SEE CREEK IMPROVEMENT PLANS BY ESA.
23. PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
24. PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
25. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
26. EXISTING BUILDING TO REMAIN.
27. PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
28. PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
29. PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H', SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
30. PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.

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PREPARED FOR:
CAMP HESS KRAMER · GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C13 OF C67

PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 3/4/2022 9:01:49 AM PLOT BY: Silvia, Pete PLOT DATE: 3/4/2022 9:27:53 AM

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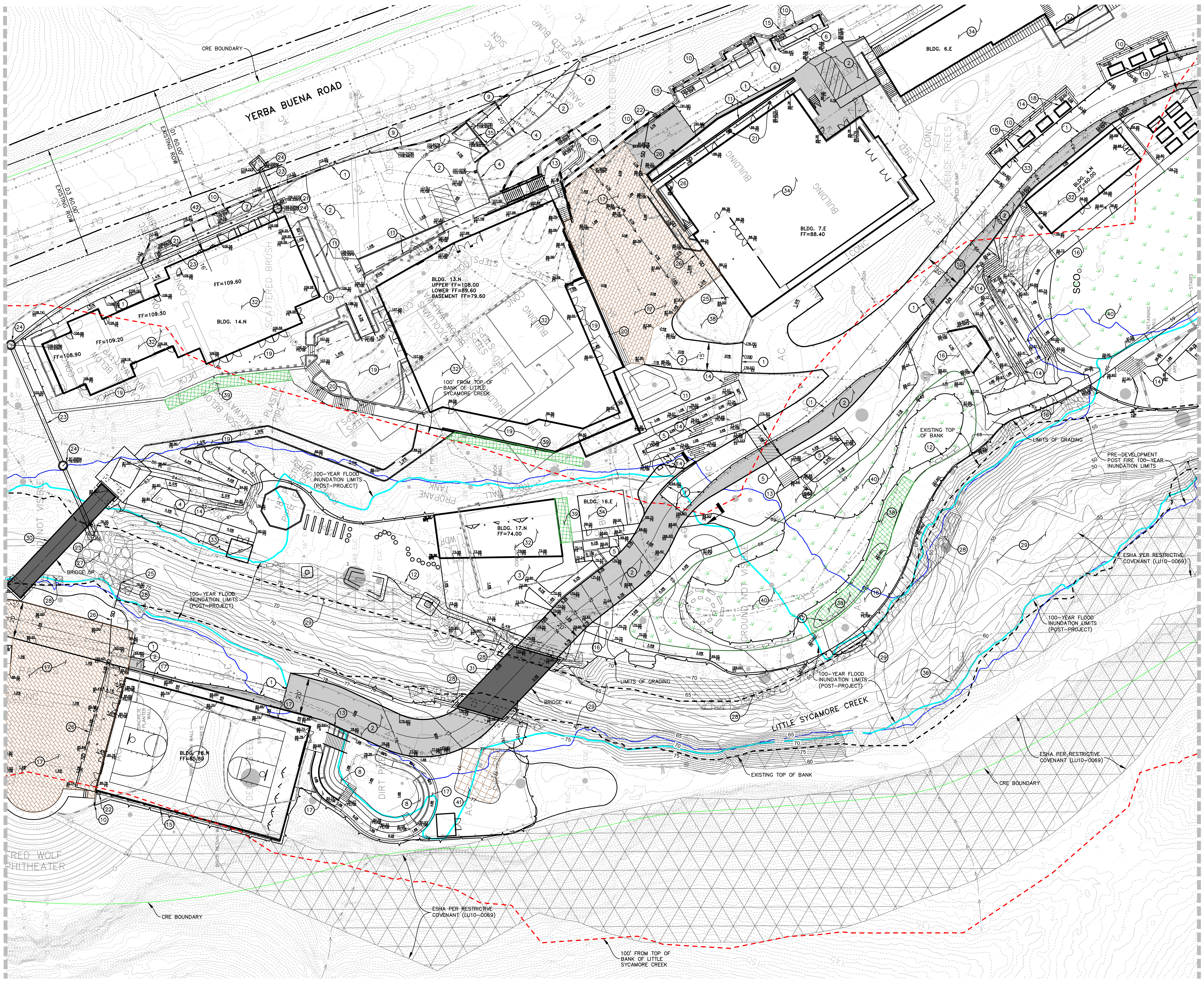
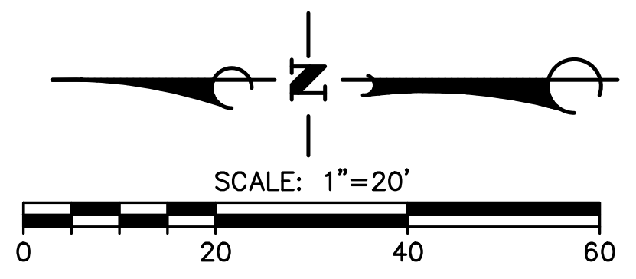

YERBA BUENA ROAD
CRE BOUNDARY
D1 60.00' EXISTING ROW
D3 60.00' EXISTING ROW
BLDG. 14.N
FF=109.60
FF=109.50
FF=109.20
FF=108.90
BLDG. 13.N
UPPER FF=108.00
LOWER FF=89.60
BASEMENT FF=79.60
BLDG. 7.E
FF=88.40
BLDG. 6.E
BLDG. 4.N
FF=60.00
BLDG. 16.E
BLDG. 17.N
FF=74.00
BLDG. 16.N
FF=85.80
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
EXISTING TOP OF BANK
LIMITS OF GRADING
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LITTLE SYCAMORE CREEK
BRIDGE 5P
BRIDGE 4V
PROPANE TANK
FRED WOLF AMPHITHEATER
SEE SHEET C15 FOR CONTINUATION
SEE SHEET C13 FOR CONTINUATION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SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE WALKWAY/RAMP.
⑥ PROPOSED CONCRETE SLABS FOR UTILITY PADS.
⑦ PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
⑧ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
⑨ PROPOSED GRAVITY WALL.
⑩ PROPOSED SITE RETAINING WALL.
⑪ PROPOSED PLANTER WALL. SEE LANDSCAPE PLANS.
⑫ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑬ PROPOSED CONCRETE STEPS.
⑭ PROPOSED TIMBER STEPS.
⑮ PROPOSED CONCRETE SWALE.
⑯ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
⑰ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C59. SEE STORMWATER EXHIBITS AND REPORT.
⑱ PROPOSED PLANTERS. SEE LANDSCAPE PLANS.
⑲ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑳ PROPOSED WOOD DECKING STEPS. SEE LANDSCAPE PLANS.
㉑ PROPOSED 12"X12" STORM DRAIN INLET.
㉒ PROPOSED 18"X18" STORM DRAIN INLET.
㉓ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
㉔ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
㉕ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.
㉖ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
㉗ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉘ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉙ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉚ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉛ PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉜ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉝ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉞ EXISTING BUILDING TO REMAIN.
㉟ PROPOSED VEHICULAR GATE. SEE LANDSCAPE PLANS.
㊱ REMOVE DAMAGED WALL.
㊲ PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
㊳ PROPOSED WATER QUALITY TREATMENT AREA (BIO-1: BIORETENTION WITH UNDERDRAIN). SEE DETAIL "G", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㊴ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H" SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㊵ PROPOSED WATER QUALITY TREATMENT AREA (BIO-4: VEGETATED FILTER STRIP). SEE STORMWATER EXHIBITS AND REPORT.
㊶ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
㊷ PROPOSED 3' WIDE CONCRETE RIBBON GUTTER.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN - LOWER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C14 OF C67
PLAN DATE
3/01/2022

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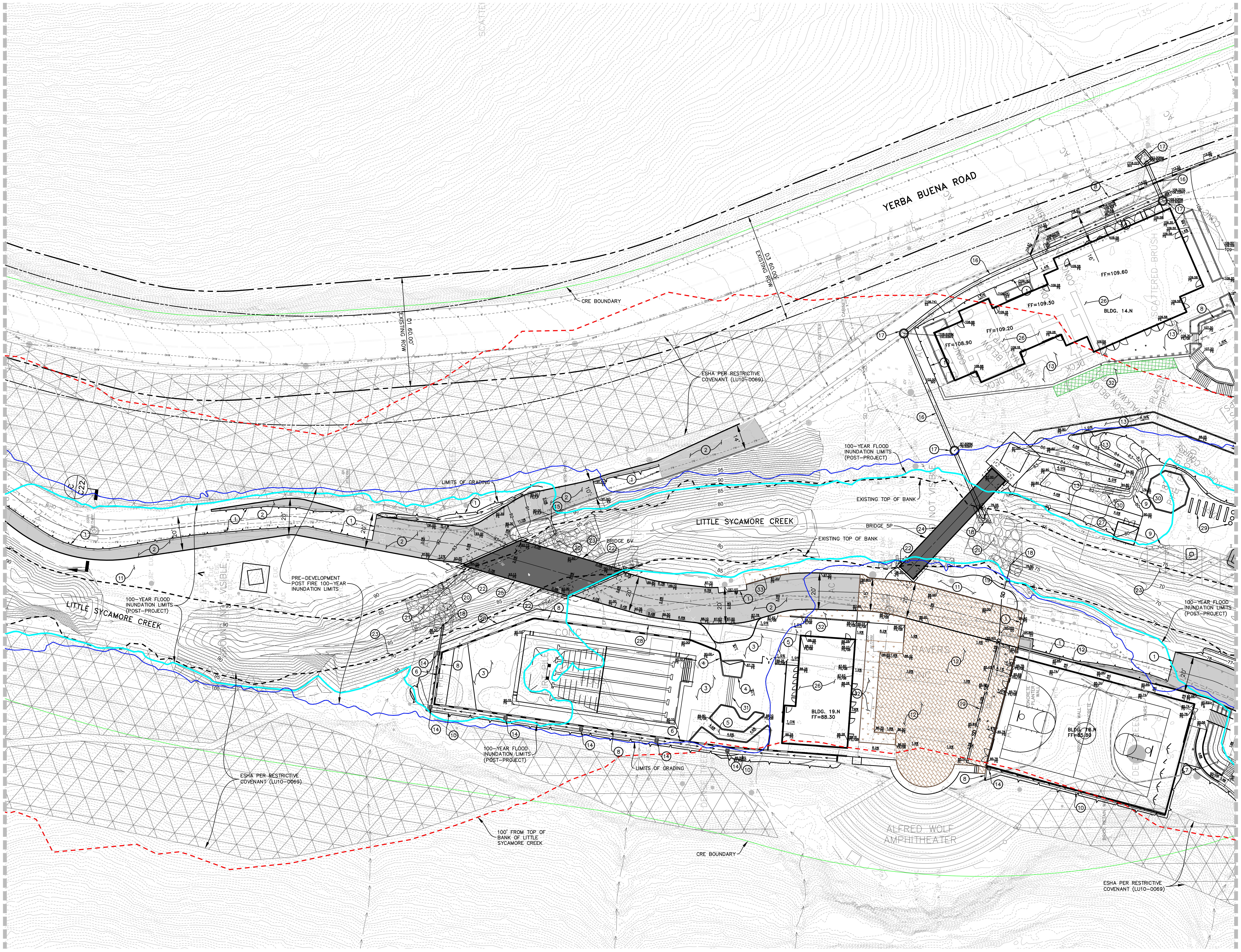
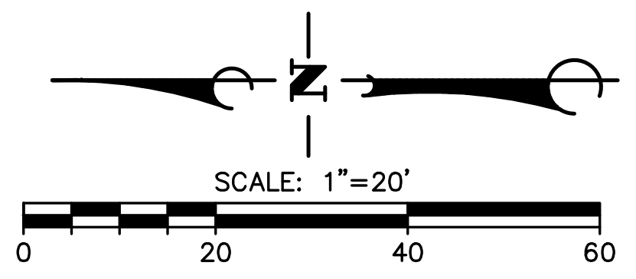

YERBA BUENA ROAD
D3 60.00' EXISTING ROW
D1 60.00' EXISTING ROW
CRE BOUNDARY
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LIMITS OF GRADING
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
BRIDGE 6V
BRIDGE 5P
FF=109.60
FF=109.30
FF=109.20
FF=108.90
BLDG. 14.N
BLDG. 19.N
FF=88.30
BLDG. 18.N
FF=85.80
PAVERS
CONC
POOL
ALFRED WOLF AMPHITHEATER
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
SEE SHEET C16 FOR CONTINUATION
SEE SHEET C14 FOR CONTINUATION
C
C22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SCALE: 1"=20'
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CONSTRUCTION NOTES

① PROPOSED SAWCUT LINE.
② PROPOSED ASPHALT CONCRETE PAVEMENT.
③ PROPOSED CONCRETE PAVEMENT.
④ PROPOSED 6" CURB.
⑤ PROPOSED CONCRETE WALKWAY/RAMP.
⑥ PROPOSED CONCRETE SLAB FOR TRASH ENCLOSURE.
⑦ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
⑧ PROPOSED RETAINING WALL.
⑨ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
⑩ PROPOSED CONCRETE SWALE.
⑪ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
⑫ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
⑬ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
⑭ PROPOSED 18"X18" STORM DRAIN INLET.
⑮ PROPOSED CALTRANS DOWNDRAIN.
⑯ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
⑰ PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
⑱ PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59.
⑲ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
⑳ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
㉑ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉒ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉓ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
㉔ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
㉕ PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICULAR BRIDGE. SEE BRIDGE PLANS.
㉖ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
㉗ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
㉘ PROPOSED "CONTEMPO" SECURITY FENCE.
㉙ PROPOSED ROPES COURSE. SEE LANDSCAPE PLANS.
㉚ PROPOSED TIMBER STEPS.
㉛ PROPOSED CONCRETE STEPS.
㉜ PROPOSED WATER QUALITY TREATMENT AREA (INF-1: INFILTRATION BASIN). SEE STORMWATER EXHIBITS AND REPORT.
㉝ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
㉞ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

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WILSHIRE BOULEVARD
TEMPLE CAMPS
CAMP HESS KRAMER
GINDLING HILLTOP CAMP

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PRELIMINARY

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PLAN DATE
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DESIGN___PAS___ CHECKED___HI___
42-ENG SAVE DATE: 3/4/2022 9:01:49 AM PLOT BY: Silvia, Pete PLOT DATE: 3/4/2022 9:44:23 AM

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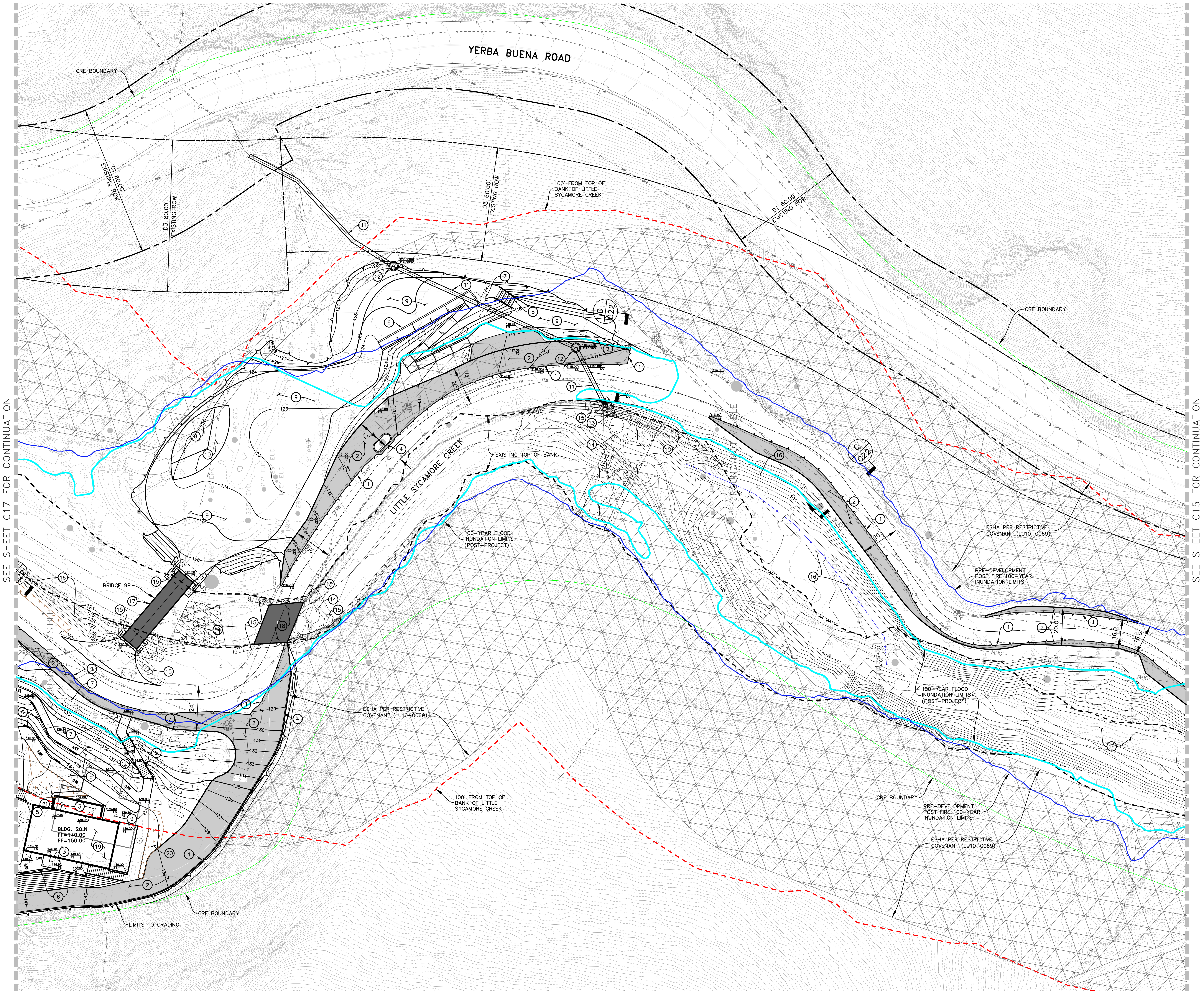
YERBA BUENA ROAD
CRE BOUNDARY
D1 80.00' EXISTING ROW
D3 80.00' EXISTING ROW
D3 60.00' EXISTING ROW
D1 60.00' EXISTING ROW
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
LITTLE SYCAMORE CREEK
EXISTING TOP OF BANK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
BRIDGE 9P
BLDG. 20.N
FF=140.00
FF=150.00
LIMITS TO GRADING
SEE SHEET C17 FOR CONTINUATION
SEE SHEET C15 FOR CONTINUATION
C
C22
D
C22

SCALE: 1"=20'
0 20 40 60

CONSTRUCTION NOTES

1. PROPOSED SAWCUT LINE.
2. PROPOSED ASPHALT CONCRETE PAVEMENT.
3. PROPOSED CONCRETE PAVEMENT.
4. PROPOSED 6" CURB.
5. PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
6. PROPOSED RETAINING WALL.
7. PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
8. PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
9. PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58.
10. PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
11. PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
12. PROPOSED STORM DRAIN MANHOLE/DROP STRUCTURE. SEE STORM DRAIN PLANS.
13. PROPOSED STORM DRAIN OUTLET. SEE DETAIL "K", SHEET C59. SEE STORM DRAIN PLANS.
14. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
15. PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
16. PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
17. PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
18. EXISTING VEHICULAR BRIDGE TO REMAIN.
19. PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
20. PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

NO 70435
PETER A. SILVA

PRELIMINARY

GRADING & DRAINAGE PLAN - MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C16 OF C67
PLAN DATE
3/01/2022

DESIGN: PAS CHECKED: HI
42-ENG SAVE DATE:3/4/2022 9:01:49 AM
PLOT BY: Silvia, Pete PLOT DATE:3/4/2022 9:49:34 AM

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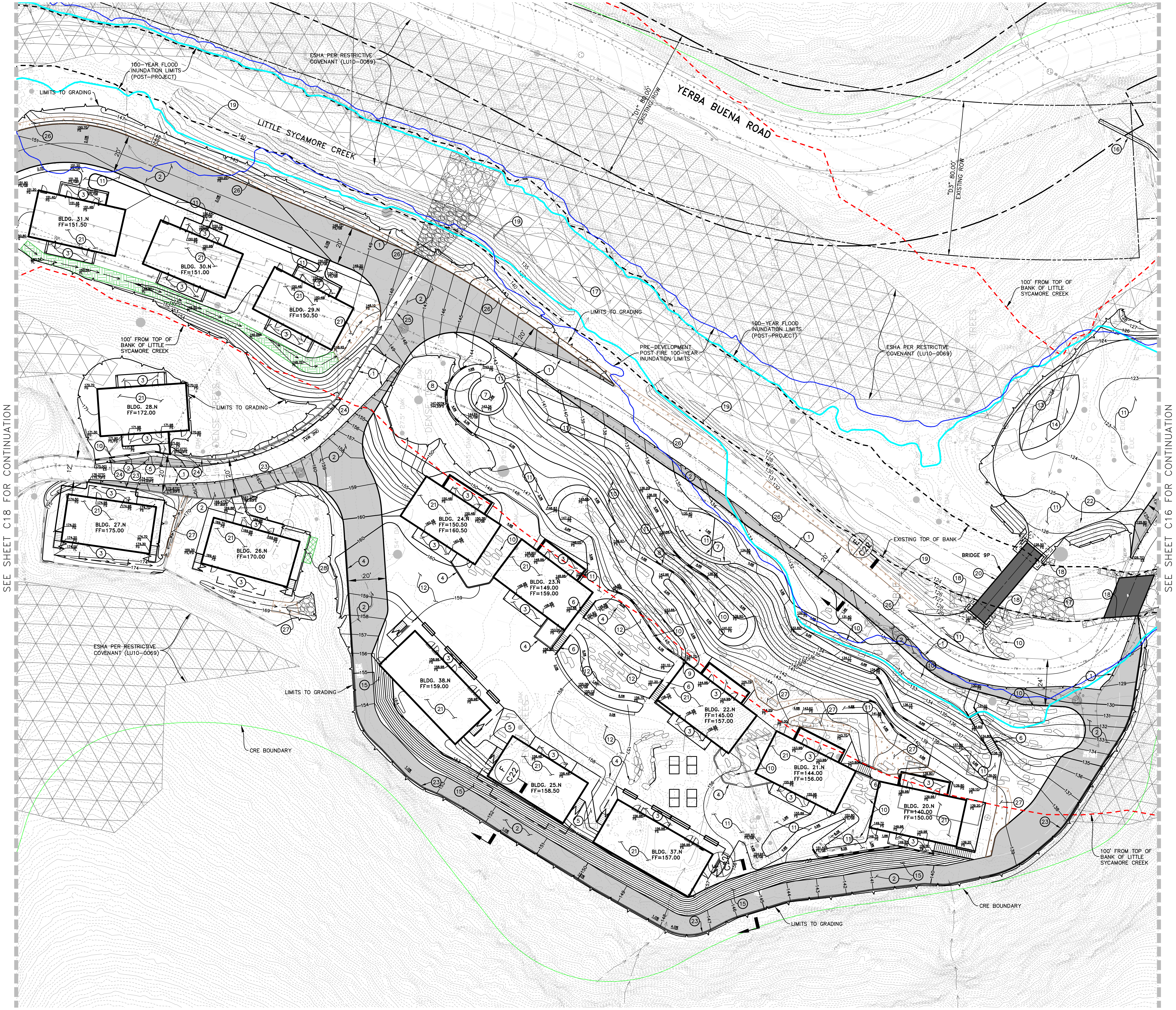
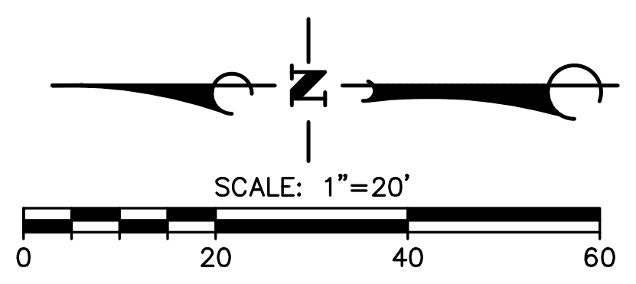

SEE SHEET C18 FOR CONTINUATION
SEE SHEET C16 FOR CONTINUATION
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
"D1" 80.00' EXISTING ROW
"D3" 80.00' EXISTING ROW
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
LIMITS TO GRADING
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
PRE-DEVELOPMENT POST-FIRE 100-YEAR INUNDATION LIMITS
EXISTING TOP OF BANK
BRIDGE 9P
CRE BOUNDARY
BLDG. 31.N FF=151.50
BLDG. 30.N FF=151.00
BLDG. 29.N FF=150.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 26.N FF=170.00
BLDG. 24.N FF=150.50 FF=160.50
BLDG. 23.N FF=149.00 FF=159.00
BLDG. 38.N FF=159.00
BLDG. 22.N FF=145.00 FF=157.00
BLDG. 21.N FF=144.00 FF=156.00
BLDG. 20.N FF=140.00 FF=150.00
BLDG. 25.N FF=158.50
BLDG. 37.N FF=157.00
F C22
E C22


N
SCALE: 1"=20'
0
20
40
60

CONSTRUCTION NOTES

- ① PROPOSED SAWCUT LINE.
- ② PROPOSED ASPHALT CONCRETE PAVEMENT.
- ③ PROPOSED CONCRETE PAVEMENT.
- ④ PROPOSED 6" CURB.
- ⑤ PROPOSED CONCRETE WALKWAY/RAMP.
- ⑥ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
- ⑦ PROPOSED CONCRETE STEPPED SEATING. SEE LANDSCAPE PLANS.
- ⑧ PROPOSED GRAVITY WALL.
- ⑨ PROPOSED RETAINING WALL.
- ⑩ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
- ⑪ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
- ⑫ PROPOSED PERMEABLE DECOMPOSED GRANITE PATH. SEE DETAIL 'B", SHEET C58. SEE LANDSCAPE PLANS.
- ⑬ PROPOSED WATER QUALITY TREATMENT AREA (INF-5: PERMEABLE PAVERS). SEE DETAIL "D", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ⑭ PROPOSED WOOD DECKING. SEE LANDSCAPE PLANS.
- ⑮ PROPOSED CEMENT TREATED BASE 1:1 SLOPE.
- ⑯ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑰ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑱ PROPOSED ROCK TOE PROTECTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑲ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ⑳ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE. SEE BRIDGE PLANS.
- ㉑ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
- ㉒ PROPOSED RECLAIMED LOG BENCH. SEE LANDSCAPE PLANS.
- ㉓ PROPOSED 8" CURB.
- ㉔ PROPOSED 8" CURB AND 24" GUTTER.
- ㉕ PROPOSED 6' CONCRETE RIBBON GUTTER.
- ㉖ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
- ㉗ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ㉘ PROPOSED WATER QUALITY TREATMENT AREA (INF-3: BIORETENTION). SEE DETAIL "E", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ㉙ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN - MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C17 OF C67

PLAN DATE
3/01/2022

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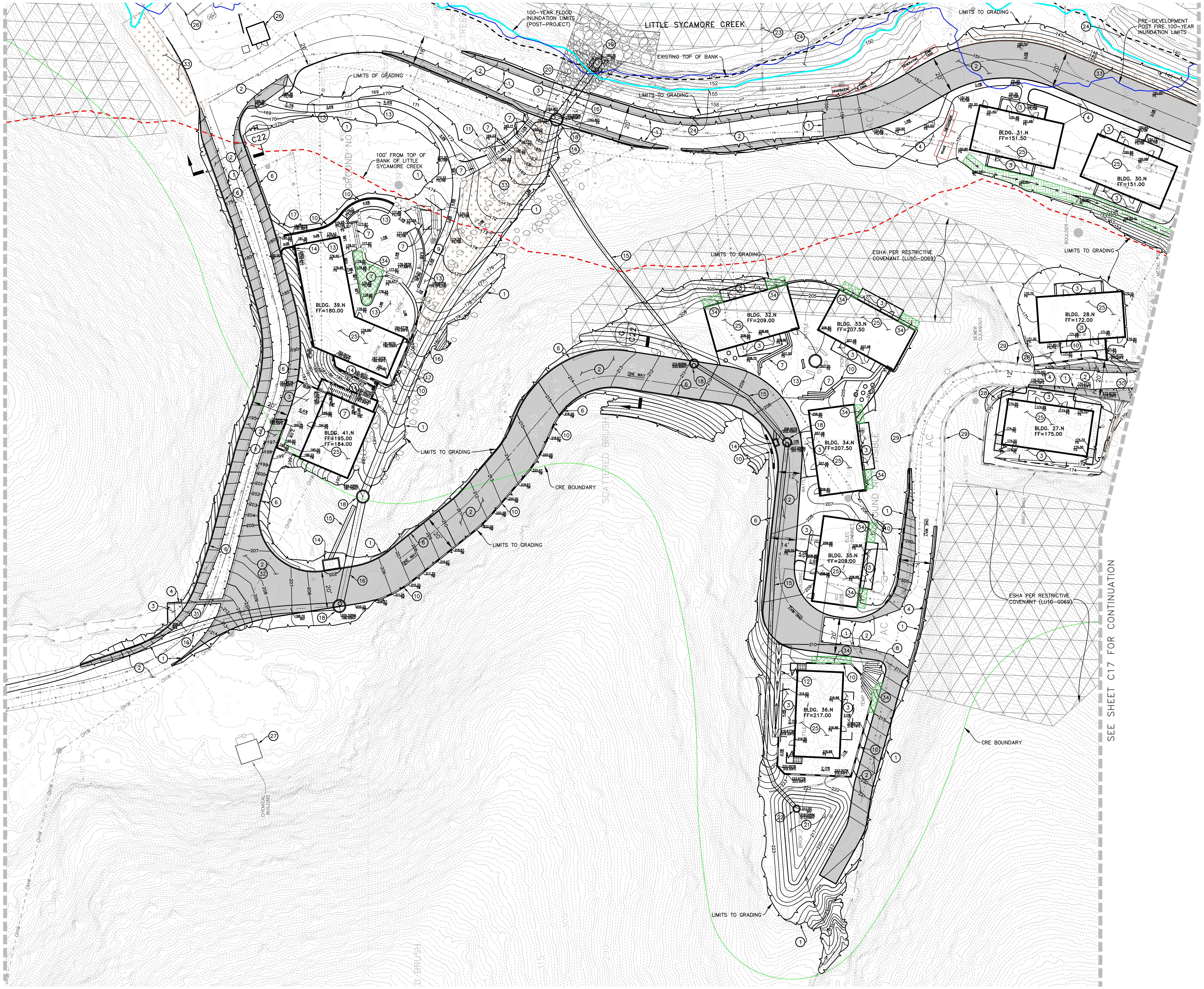
DESIGN__PAS__ CHECKED__HI__
42-ENG SAVE DATE: 3/4/2022 9:01:49 AM
PLOT BY: Silvia, Pete
PLOT DATE: 3/4/2022 9:52:20 AM

DRAWING: \\us0377-ppfss01\workgroup\2042\active\2042586200\drawing\exhibit_files\2042586200_civil_base.dwg


LITTLE SYCAMORE CREEK
100-YEAR FLOOD INUNDATION LIMITS (POST-PROJECT)
EXISTING TOP OF BANK
LIMITS TO GRADING
LIMITS OF GRADING
PRE-DEVELOPMENT POST FIRE 100-YEAR INUNDATION LIMITS
100' FROM TOP OF BANK OF LITTLE SYCAMORE CREEK
ESHA PER RESTRICTIVE COVENANT (LU10-0069)
CRE BOUNDARY
BLDG. 31.N FF=151.50
BLDG. 30.N FF=151.00
BLDG. 39.N FF=180.00
BLDG. 41.N FF=195.00 FF=184.00
BLDG. 32.N FF=209.00
BLDG. 33.N FF=207.50
BLDG. 28.N FF=172.00
BLDG. 27.N FF=175.00
BLDG. 34.N FF=207.50
BLDG. 35.N FF=209.00
BLDG. 36.N FF=217.00
ONE WAY
C22
SEE SHEET C19 FOR CONTINUATION
SEE SHEET C17 FOR CONTINUATION
CHEMICAL BUILDING
SCATTERED BRUSH

SCALE: 1"=20'
0 20 40 60

CONSTRUCTION NOTES

- ① PROPOSED SAWCUT LINE.
- ② PROPOSED ASPHALT CONCRETE PAVEMENT.
- ③ PROPOSED CONCRETE PAVEMENT.
- ④ PROPOSED 8" CURB.
- ⑤ PROPOSED ROLLED CURB.
- ⑥ PROPOSED AC DIKE.
- ⑦ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
- ⑧ PROPOSED TIMBER STEPS. SEE LANDSCAPE PLANS.
- ⑨ PROPOSED GRAVITY WALL.
- ⑩ PROPOSED RETAINING WALL.
- ⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
- ⑫ PROPOSED CONCRETE SWALE.
- ⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
- ⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
- ⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
- ⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
- ⑲ PROPOSED STORM DRAIN OUTLET WITH HEADWALL; FINAL DESIGN TBD. SEE STORM DRAIN PLANS.
- ⑳ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
- ㉑ PROPOSED DEBRIS BASIN.
- ㉒ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
- ㉓ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ㉔ PROPOSED CREEK BANK RECONSTRUCTION. SEE CREEK IMPROVEMENT PLANS BY ESA.
- ㉕ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
- ㉖ PROPOSED SHED. SEE ARCHITECTURAL PLANS.
- ㉗ EXISTING BUILDING TO REMAIN.
- ㉘ PORTION OF EXISTING RETAINING WALL TO BE REMOVED.
- ㉙ EXISTING RETAINING WALL TO REMAIN.
- ㉚ PROPOSED 24" GUTTER.
- ㉛ PROPOSED ASPHALT BERM.
- ㉜ PROPOSED FIRE TRUCK HAMMER HEAD.
- ㉝ PROPOSED WATER QUALITY TREATMENT AREA (INF-2: INFILTRATION TRENCH). SEE DETAIL "F", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.
- ㉞ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435

GRADING & DRAINAGE PLAN – MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C18 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE:3/4/2022 9:01:49 AM
PLOT BY:Silvia, Pete PLOT DATE:3/4/2022 9:56:35 AM

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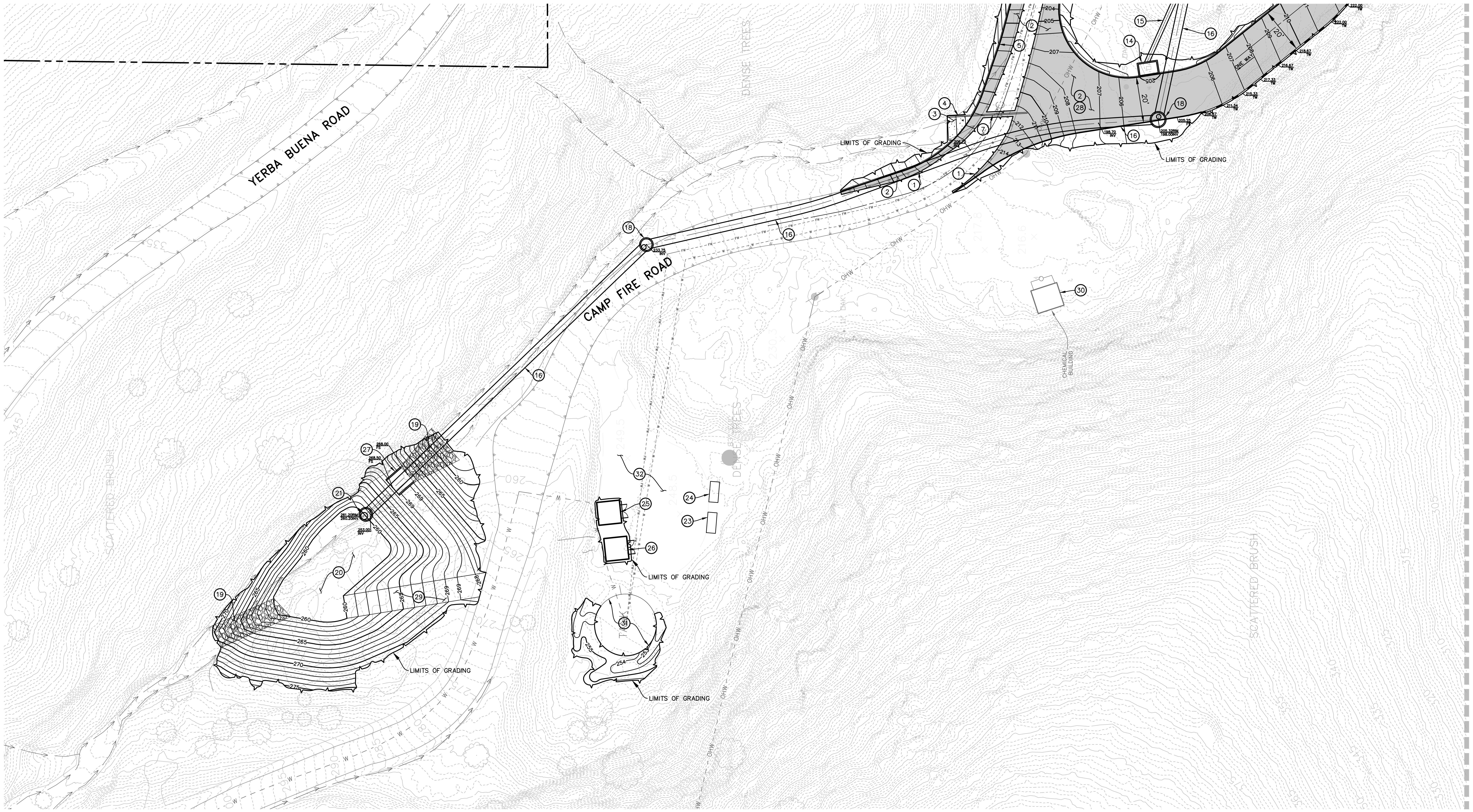
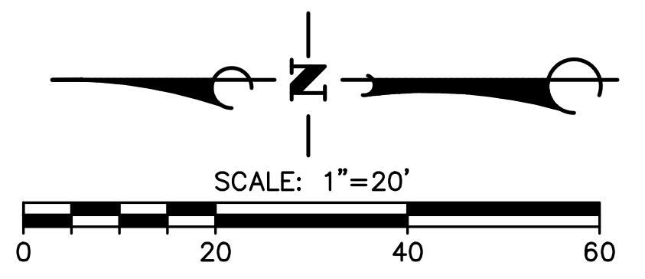


CONSTRUCTION NOTES

- ① PROPOSED SAWCUT LINE.
- ② PROPOSED ASPHALT CONCRETE PAVEMENT.
- ③ PROPOSED CONCRETE PAVEMENT.
- ④ PROPOSED 8" CURB.
- ⑤ PROPOSED ROLLED CURB.
- ⑥ PROPOSED AC DIKE.
- ⑦ PROPOSED ASPHALT BERM.
- ⑧ PROPOSED CONCRETE STEPS. SEE LANDSCAPE PLANS.
- ⑨ PROPOSED GRAVITY WALL.
- ⑩ PROPOSED RETAINING WALL.
- ⑪ PROPOSED STONE/BOULDER WALL. SEE LANDSCAPE PLANS.
- ⑫ PROPOSED CONCRETE SWALE.
- ⑬ PROPOSED STABILIZED STONE GRAVEL PATH. SEE DETAIL "C", SHEET C58. SEE LANDSCAPE PLANS.
- ⑭ PROPOSED STORM DRAIN INLET; FINAL DESIGN TBD.
- ⑮ PROPOSED 24" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑯ PROPOSED 48" STORM DRAIN. SEE STORM DRAIN PLANS.
- ⑰ PROPOSED STORM DRAIN PIPE; FINAL SIZE TBD.
- ⑱ PROPOSED STORM DRAIN MANHOLE. SEE STORM DRAIN PLANS.
- ⑲ PROPOSED ROCK RIP-RAP OUTLET PROTECTION.
- ⑳ PROPOSED DEBRIS BASIN.
- ㉑ PROPOSED PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STANDARD PLAN D93C. SEE STORM DRAIN PLANS.
- ㉒ PROPOSED BUILDING. SEE ARCHITECTURAL PLANS.
- ㉓ PROPOSED GENERATOR PAD.
- ㉔ PROPOSED FUEL TANK PAD.
- ㉕ PROPOSED WATER PUMP STRUCTURE.
- ㉖ PROPOSED FIRE PUMP STRUCTURE.
- ㉗ PROPOSED P.C.C. OVERFLOW STRUCTURE.
- ㉘ PROPOSED FIRE TRUCK HAMMER HEAD.
- ㉙ PROPOSED GRAVEL ACCESS RAMP.
- ㉚ EXISTING BUILDING TO REMAIN.
- ㉛ EXISTING WATER TANK TO REMAIN.
- ㉜ EXISTING GRAVEL SURFACE TO REMAIN.



NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN – MIDDLE CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C19 OF C67
PLAN DATE
3/01/2022

DESIGN: PAS CHECKED: HI
42-ENG SAVE DATE: 3/1/2022 2:43:19 PM PLOT BY: Brewer, Katie PLOT DATE: 3/1/2022 3:07:02 PM

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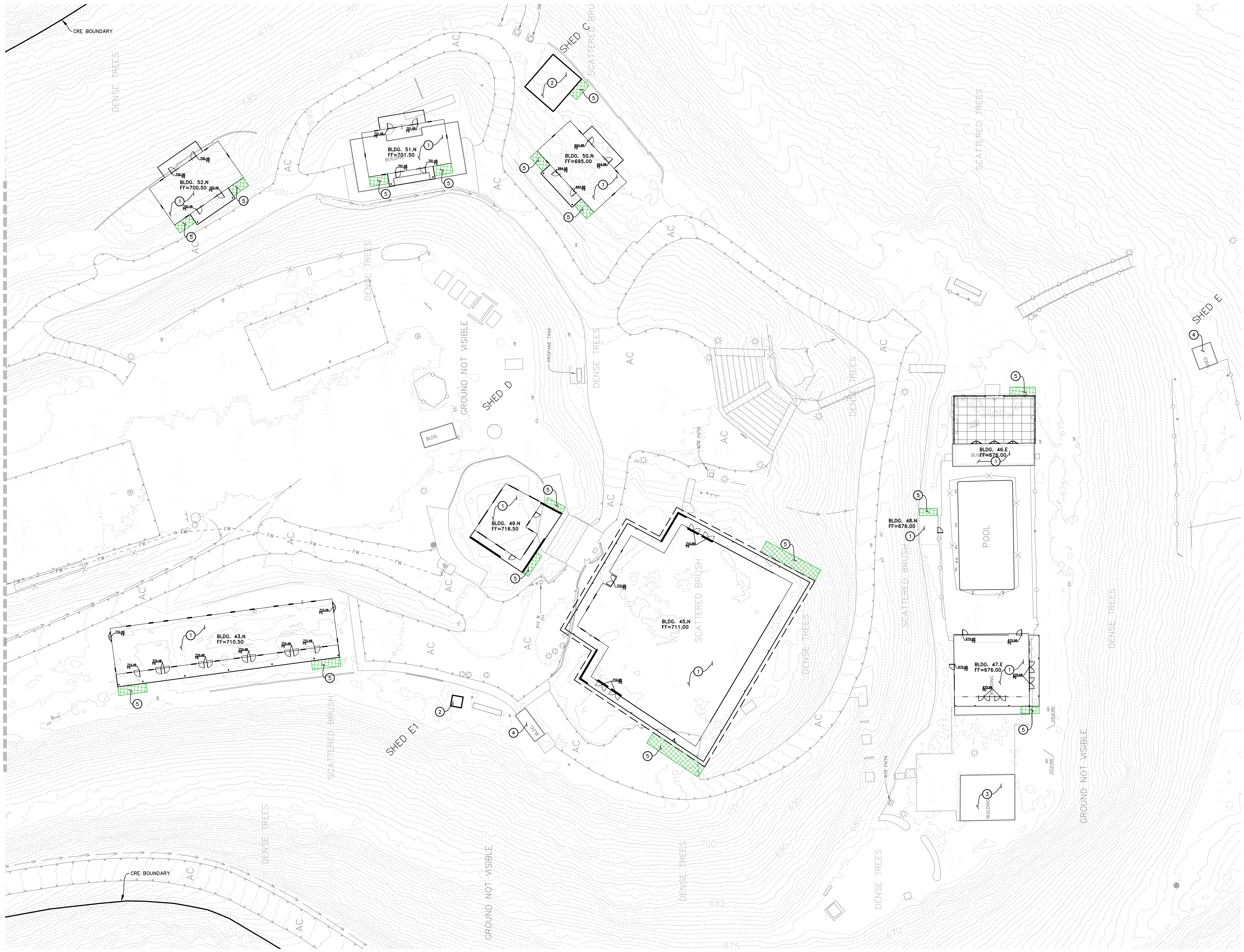
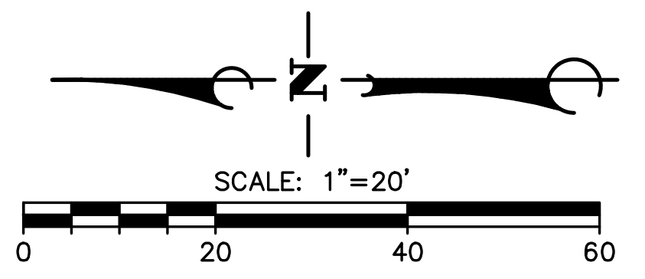

CRE BOUNDARY
SEE SHEET C21 FOR CONTINUATION
BLDG. 52.N
FF=700.50
BLDG. 51.N
FF=701.50
BLDG. 50.N
FF=695.00
SHED C
SCATTERED BRUSH
DENSE TREES
SCATTERED TREES
SHED D
GROUND NOT VISIBLE
PROPANE TANK
SHED E
BLDG. 46.E
FF=676.00
BLDG. 48.N
FF=676.00
POOL
BLDG. 49.N
FF=716.50
BLDG. 45.N
FF=711.00
BLDG. 43.N
FF=710.50
BLDG. 47.E
FF=676.00
SHED E1
WTR FNTN
PIV & FH
AC
FW
BLDG.
CRE BOUNDARY
1
2
3
4
5



SCALE: 1"=20'

CONSTRUCTION NOTES

① PROPOSED BUILDING.
② PROPOSED SHED.
③ EXISTING BUILDING TO REMAIN.
④ EXISTING SHED TO REMAIN.
⑤ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

GRADING & DRAINAGE PLAN – UPPER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C20 OF C67
PLAN DATE
3/01/2022

DESIGN___PAS___ CHECKED___HI___
42-ENG SAVE DATE: 3/1/2022 2:43:19 PM PLOT BY: Brewer, Katie PLOT DATE: 3/1/2022 3:08:01 PM

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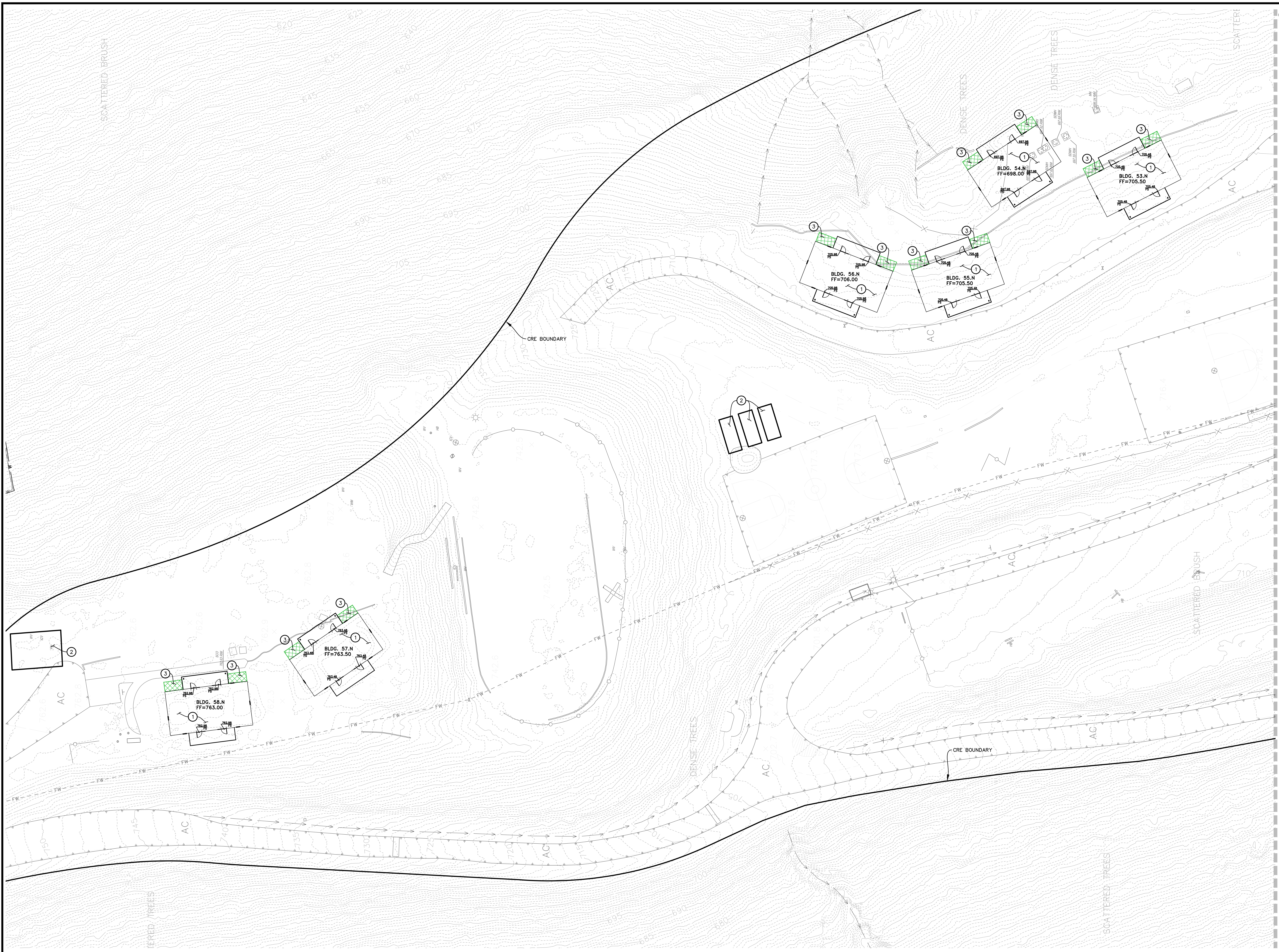
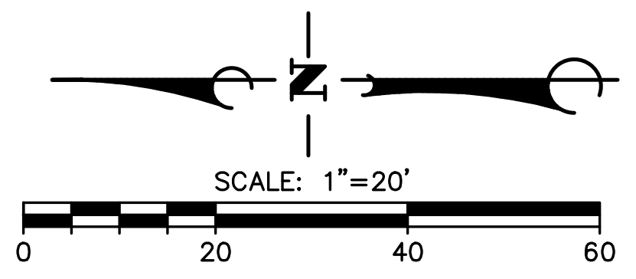

SCATTERED BRUSH
DENSE TREES
DENSE TREES
SCATTERED
CRE BOUNDARY
CRE BOUNDARY
BLDG. 54.N
FF=698.00
BLDG. 53.N
FF=705.50
BLDG. 56.N
FF=706.00
BLDG. 55.N
FF=705.50
BLDG. 57.N
FF=763.50
BLDG. 58.N
FF=763.00
AC
FW
DENSE TREES
SCATTERED BRUSH
SCATTERED TREES
TERED TREES
SEE SHEET C20 FOR CONTINUATION

CONSTRUCTION NOTES

① PROPOSED BUILDING.

② PROPOSED SHED.

③ PROPOSED WATER QUALITY TREATMENT AREA (BIO-2: PLANTER BOX). SEE DETAIL "H", SHEET C58. SEE STORMWATER EXHIBITS AND REPORT.


N
SCALE: 1"=20'
0
20
40
60

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

GRADING & DRAINAGE PLAN – UPPER CAMP
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200

SHEET
C21 OF C67

PLAN DATE
3/01/2022

DESIGN___PAS___ CHECKED___HI___
42-ENG SAVE DATE:3/1/2022 2:43:19 PM
PLOT BY:Brewer, Katie
PLOT DATE:3/1/2022 3:08:58 PM

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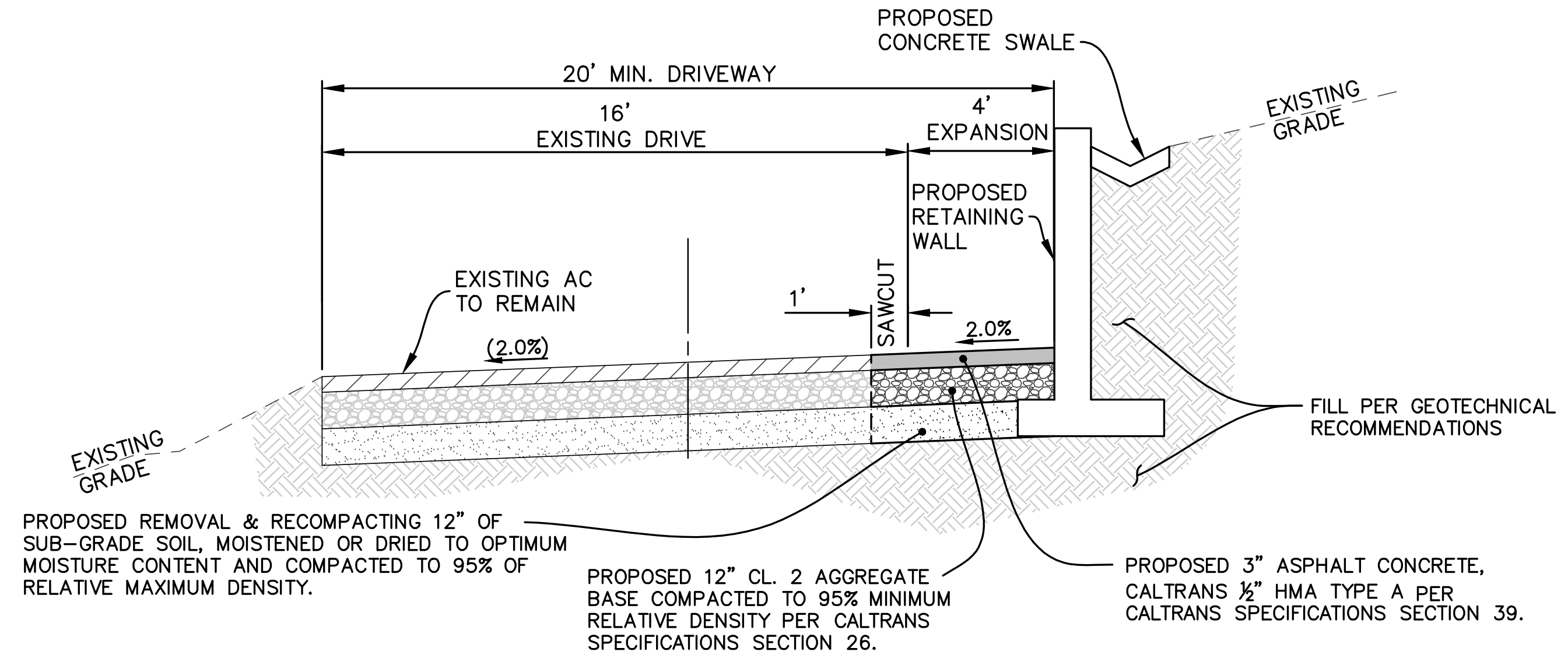
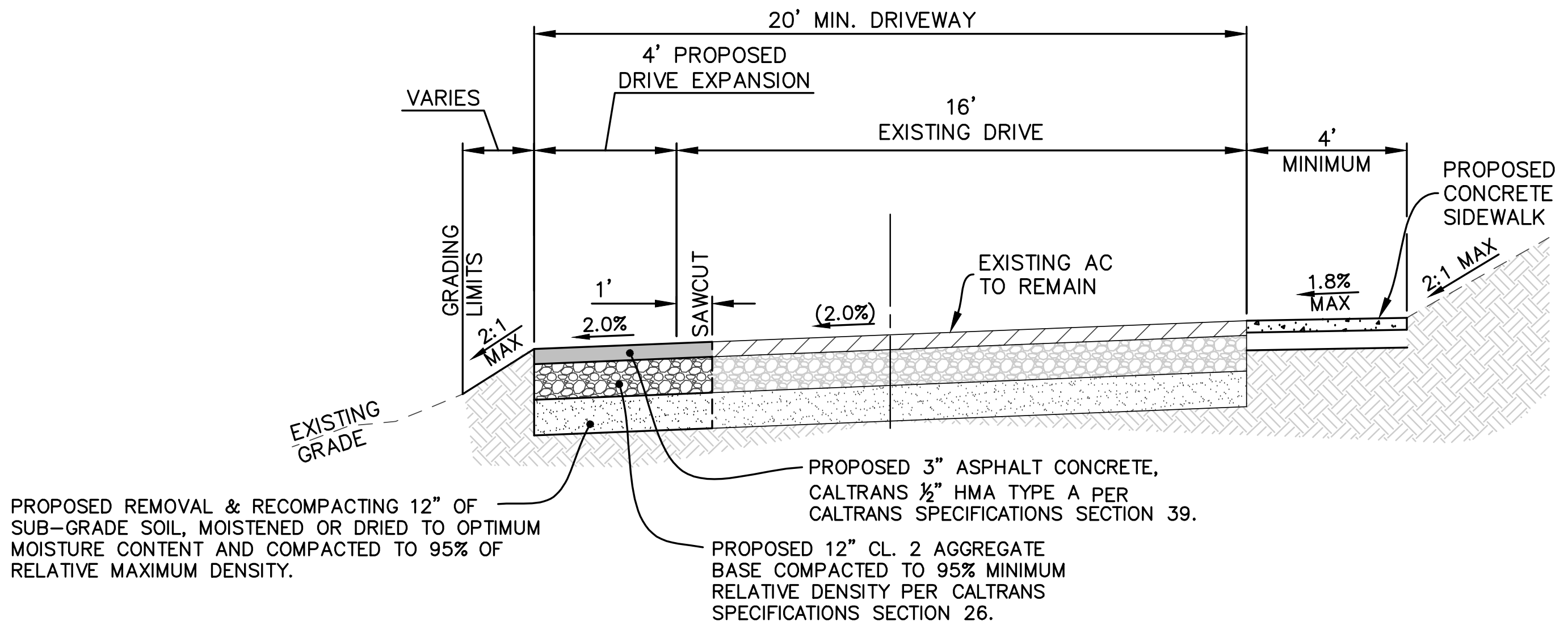
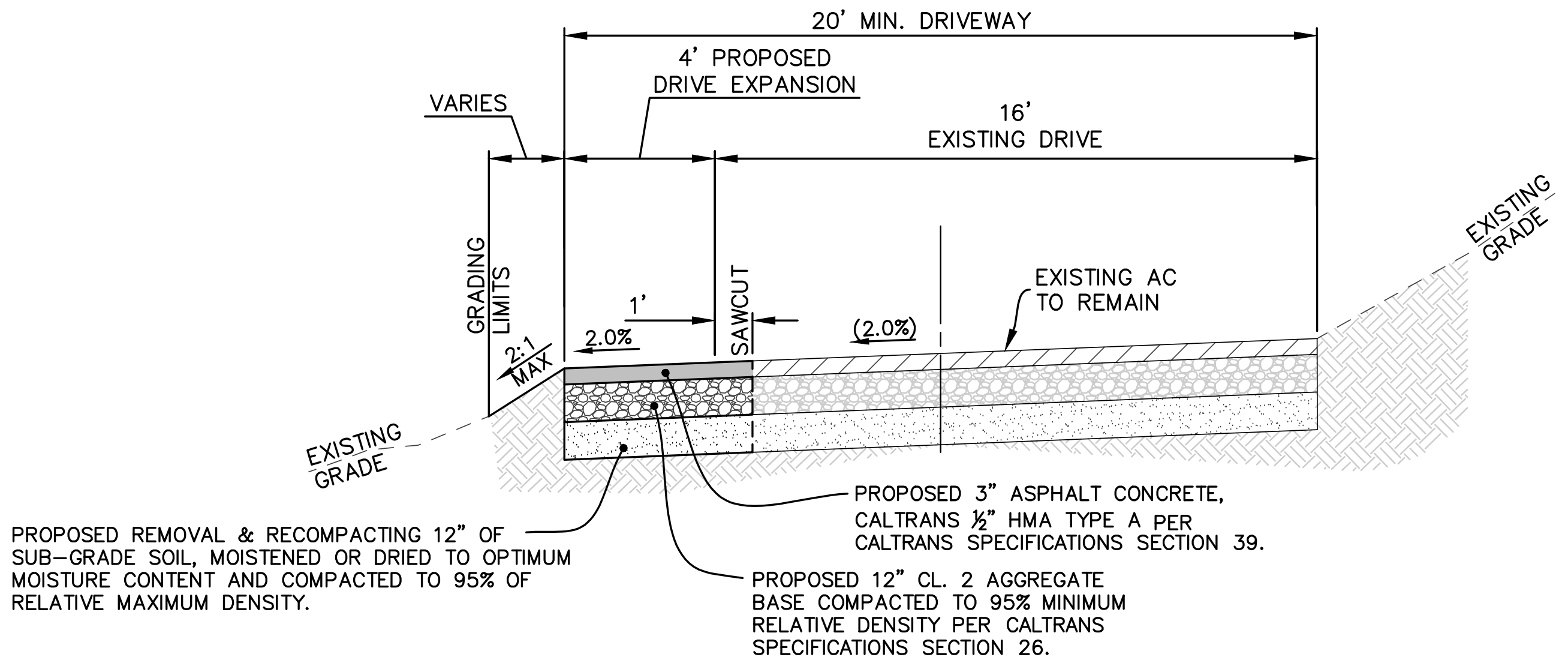

PROPOSED CONCRETE SWALE
20' MIN. DRIVEWAY
16' EXISTING DRIVE
4' EXPANSION
EXISTING GRADE
PROPOSED RETAINING WALL
SAWCUT
1'
EXISTING AC TO REMAIN
(2.0%)
2.0%
EXISTING GRADE
FILL PER GEOTECHNICAL RECOMMENDATIONS
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.

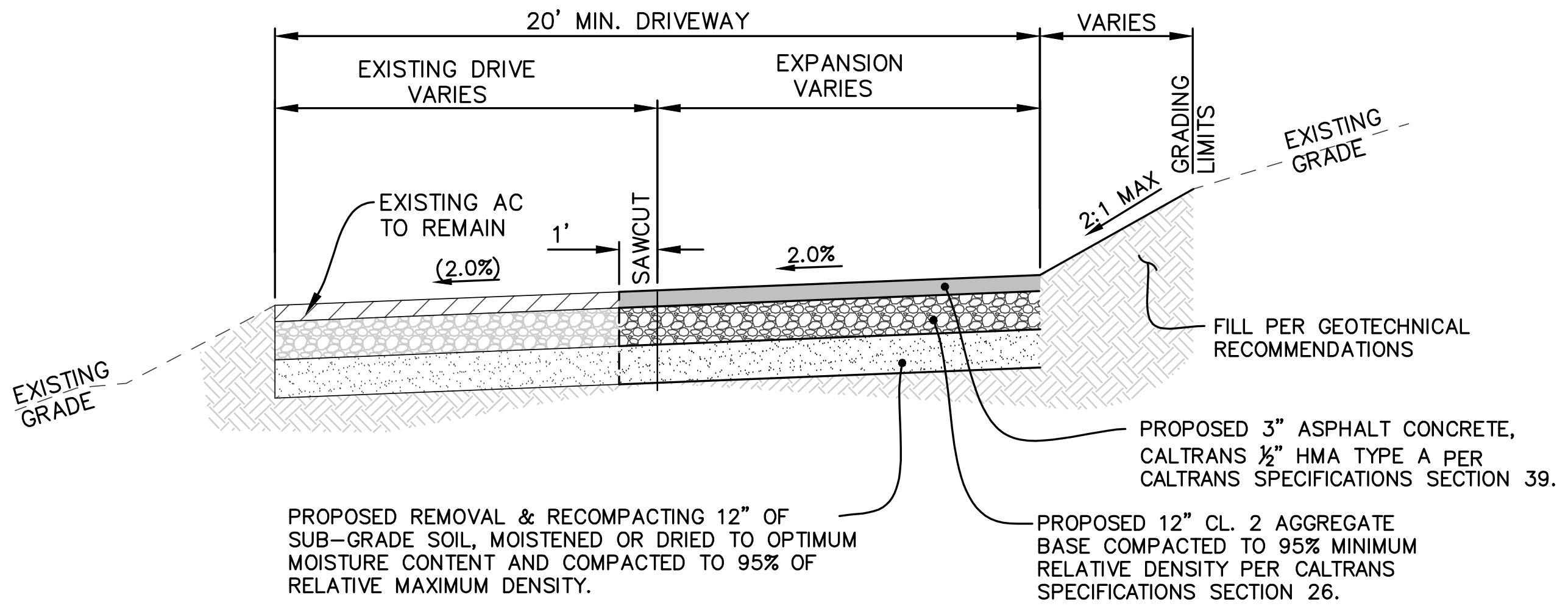
TYPICAL SECTION A – PROPOSED DRIVEWAY – 4' EXPANSION
SCALE: N.T.S.
A
C22


20' MIN. DRIVEWAY
4' PROPOSED DRIVE EXPANSION
16' EXISTING DRIVE
VARIES
4' MINIMUM
PROPOSED CONCRETE SIDEWALK
GRADING LIMITS
SAWCUT
EXISTING AC TO REMAIN
1'
2.0%
(2.0%)
1.8% MAX
2:1 MAX
2:1 MAX
EXISTING GRADE
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.

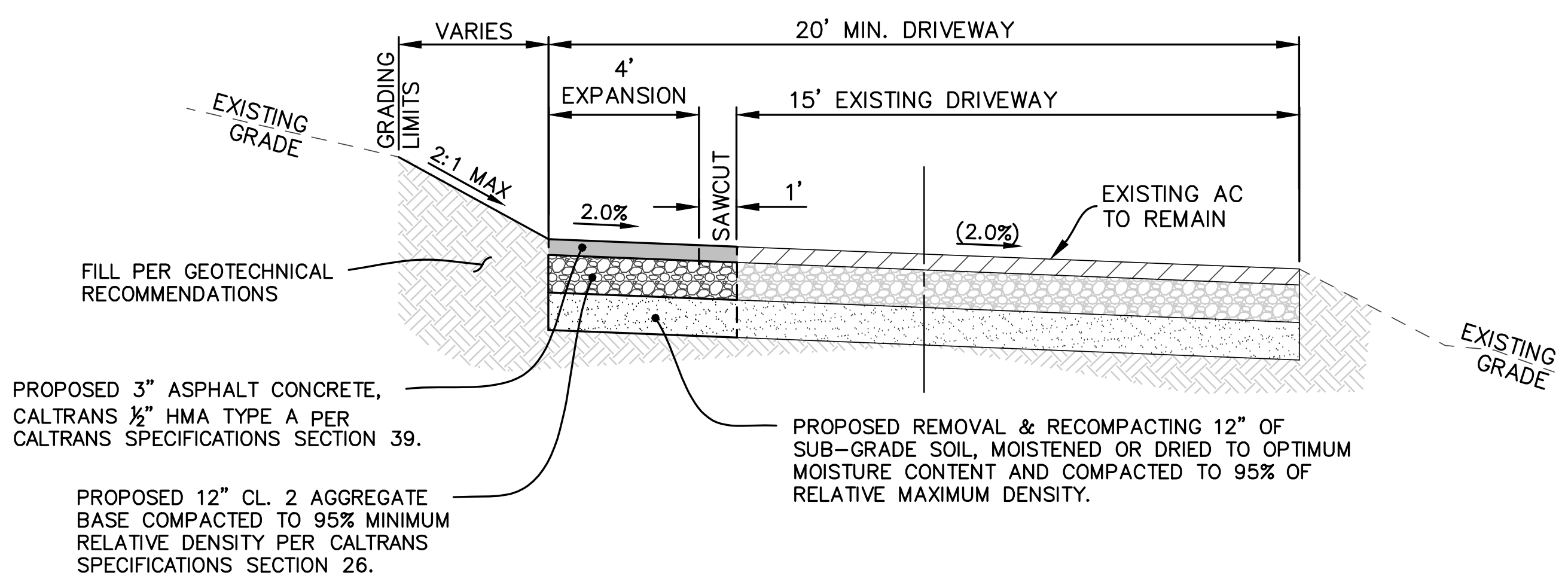
TYPICAL SECTION B – PROPOSED DRIVEWAY – 4' EXPANSION
SCALE: N.T.S.
B
C22


20' MIN. DRIVEWAY
4' PROPOSED DRIVE EXPANSION
16' EXISTING DRIVE
VARIES
EXISTING GRADE
GRADING LIMITS
SAWCUT
EXISTING AC TO REMAIN
1'
2.0%
(2.0%)
2:1 MAX
EXISTING GRADE
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.

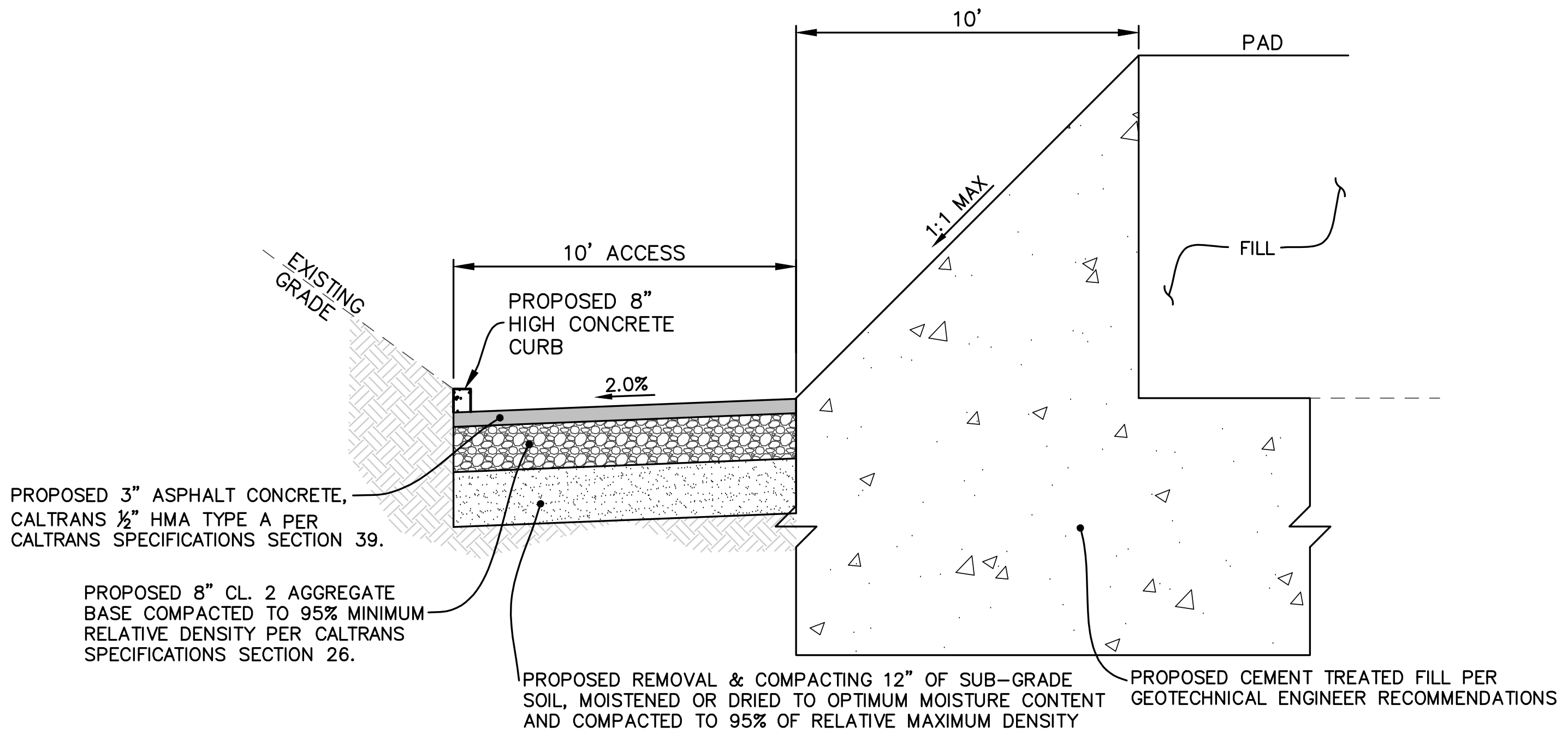
TYPICAL SECTION C – PROPOSED DRIVEWAY – 4' EXPANSION
SCALE: N.T.S.
C
C22


20' MIN. DRIVEWAY
VARIES
EXISTING DRIVE VARIES
EXPANSION VARIES
GRADING LIMITS
EXISTING GRADE
2:1 MAX
EXISTING AC TO REMAIN
1'
(2.0%)
SAWCUT
2.0%
EXISTING GRADE
FILL PER GEOTECHNICAL RECOMMENDATIONS
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.

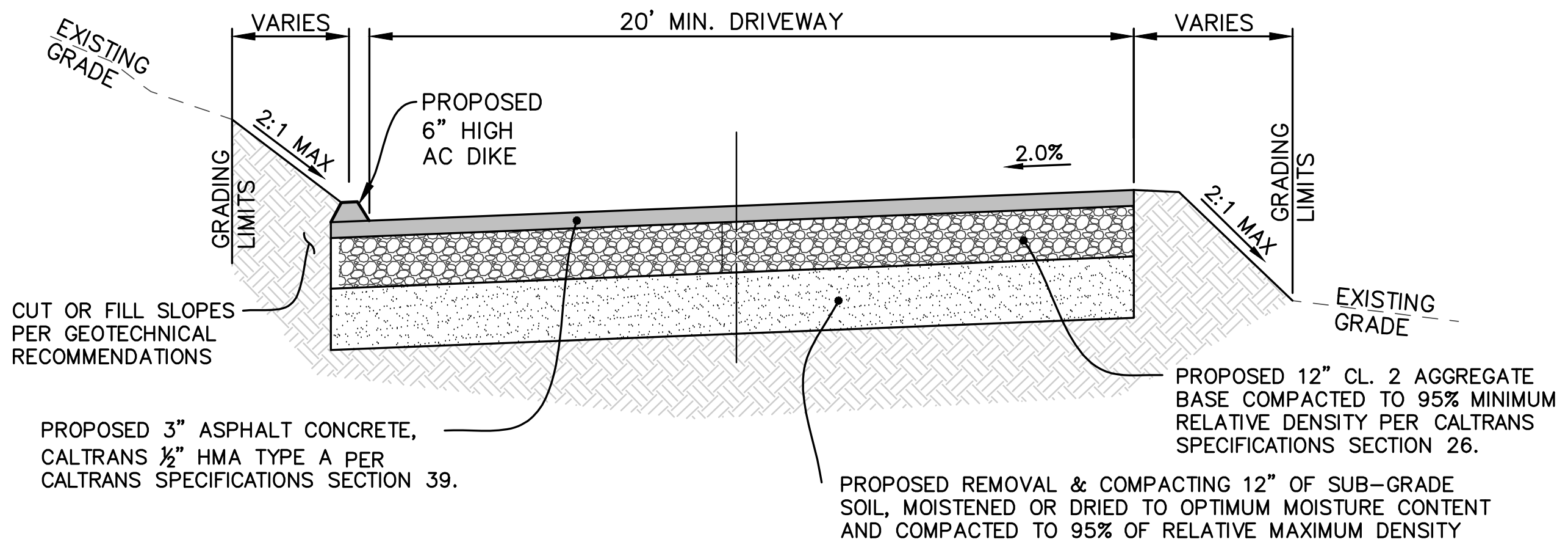
TYPICAL SECTION D – PROPOSED DRIVEWAY – EXPANSION
SCALE: N.T.S.
D
C22


VARIES
20' MIN. DRIVEWAY
GRADING LIMITS
4' EXPANSION
15' EXISTING DRIVEWAY
EXISTING GRADE
2:1 MAX
SAWCUT
1'
2.0%
(2.0%)
EXISTING AC TO REMAIN
FILL PER GEOTECHNICAL RECOMMENDATIONS
EXISTING GRADE
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.

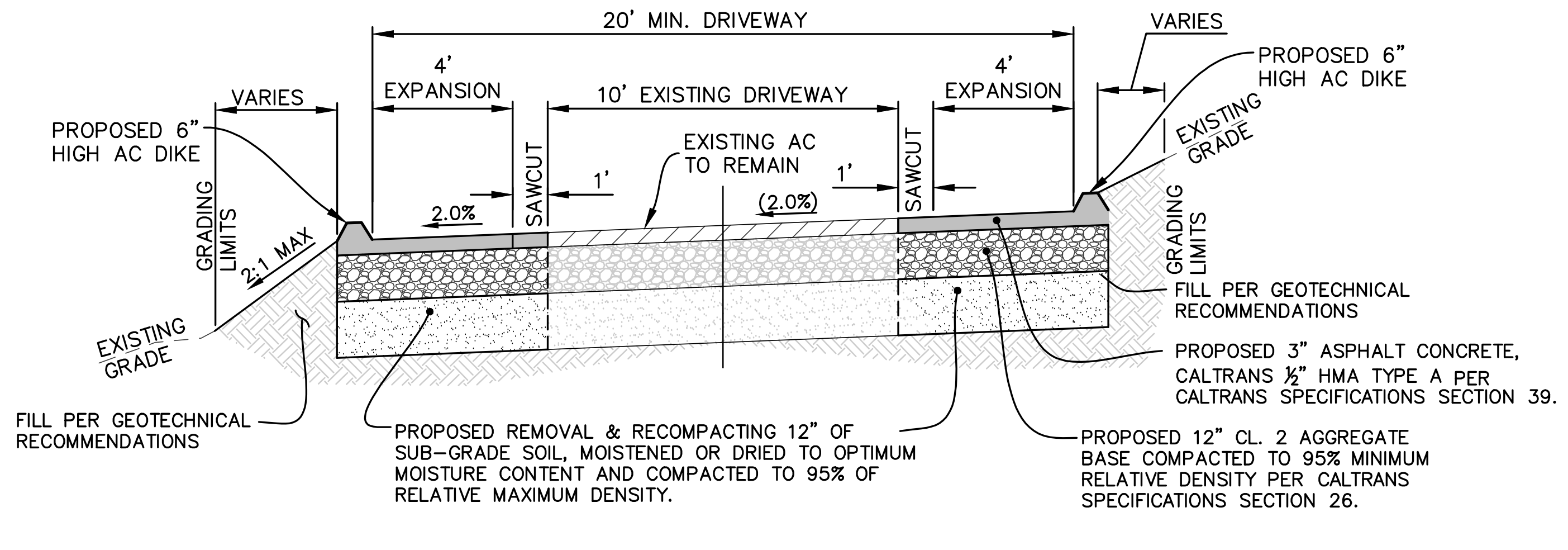
TYPICAL SECTION E – PROPOSED DRIVEWAY – 4' EXPANSION
SCALE: N.T.S.
E
C22


10'
PAD
1:1 MAX
EXISTING GRADE
10' ACCESS
PROPOSED 8" HIGH CONCRETE CURB
2.0%
FILL
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED 8" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.
PROPOSED REMOVAL & COMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY
PROPOSED CEMENT TREATED FILL PER GEOTECHNICAL ENGINEER RECOMMENDATIONS

TYPICAL SECTION F – PROPOSED DRIVEWAY
SCALE: N.T.S.
F
C22


EXISTING GRADE
VARIES
20' MIN. DRIVEWAY
VARIES
PROPOSED 6" HIGH AC DIKE
2:1 MAX
2.0%
GRADING LIMITS
GRADING LIMITS
2:1 MAX
EXISTING GRADE
CUT OR FILL SLOPES PER GEOTECHNICAL RECOMMENDATIONS
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
PROPOSED REMOVAL & COMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY

TYPICAL SECTION G – PROPOSED DRIVEWAY
SCALE: N.T.S.
G
C22


20' MIN. DRIVEWAY
VARIES
PROPOSED 6" HIGH AC DIKE
VARIES
4' EXPANSION
10' EXISTING DRIVEWAY
4' EXPANSION
PROPOSED 6" HIGH AC DIKE
EXISTING GRADE
EXISTING AC TO REMAIN
SAWCUT
SAWCUT
1'
1'
2.0%
(2.0%)
GRADING LIMITS
GRADING LIMITS
2:1 MAX
EXISTING GRADE
FILL PER GEOTECHNICAL RECOMMENDATIONS
PROPOSED 3" ASPHALT CONCRETE, CALTRANS ½" HMA TYPE A PER CALTRANS SPECIFICATIONS SECTION 39.
FILL PER GEOTECHNICAL RECOMMENDATIONS
PROPOSED REMOVAL & RECOMPACTING 12" OF SUB-GRADE SOIL, MOISTENED OR DRIED TO OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF RELATIVE MAXIMUM DENSITY.
PROPOSED 12" CL. 2 AGGREGATE BASE COMPACTED TO 95% MINIMUM RELATIVE DENSITY PER CALTRANS SPECIFICATIONS SECTION 26.

TYPICAL SECTION H – PROPOSED DRIVEWAY – 4' EXPANSION (BOTH SIDES)
SCALE: N.T.S.
H
C22

GENERAL NOTES:

1. PROPOSED PAVEMENT SHALL MATCH EXISTING PAVEMENT WITH CLEAN SAW CUT AT MATCH LINE.
2. PAVEMENT SECTIONS SHALL BE UPDATED ONCE GEOTECHNICAL ENGINGEERING REPORT RECOMMENDATIONS ARE AVAILABLE.
3. CUT AND FILL SLOPES SHALL BE CONSTRUCTED PER GEOTECHNICAL RECOMMENDATIONS.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

ROAD SECTIONS
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C22 OF C67
PLAN DATE
3/01/2022

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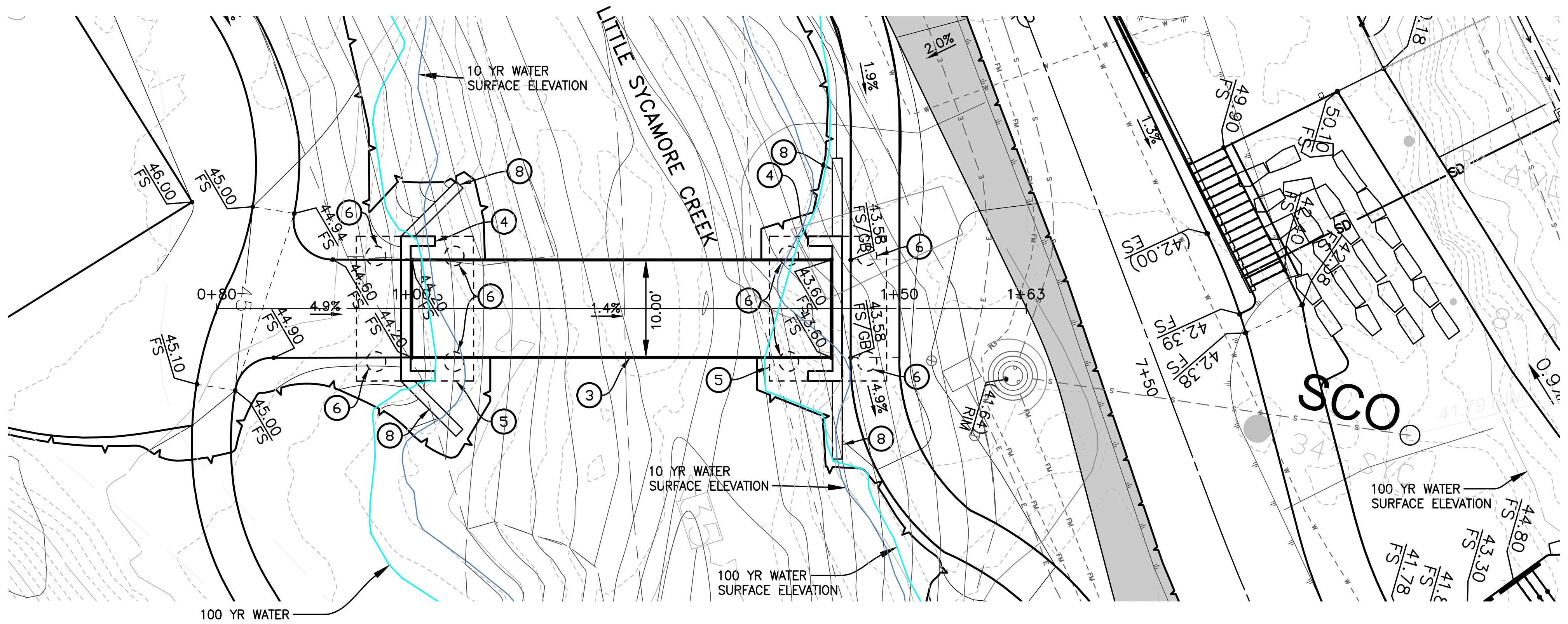
2022/03/01 3:18 PM By: Brewer, Katie

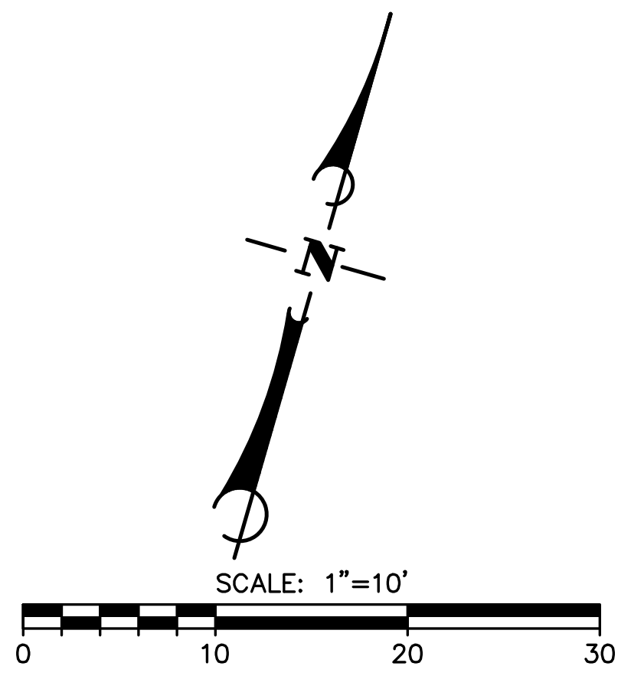
DESIGN__PAS__ CHECKED__HI__

42-ENG SAVE DATE: 3/1/2022 2:43:19 PM PLOT BY: Brewer, Katie PLOT DATE: 3/1/2022 3:18:37 PM

50
45
40
35
30
25
20
60
55
50
45
40
35
30
43.00'
PROPOSED BRIDGE SPAN
44.20
FS\GB
43.60
FS\GB
S=0.014
PROPOSED FINISHED SURFACE
PROPOSED FINISHED GRADE
100 YR WSEL
10 YR WSEL
ABUTMENT SEAT
EXISTING SURFACE
PROPOSED STEM WALL
PROPOSED FINISH GRADE
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. FINAL SIZE AND DEPTH TBD.
BRIDGE 1P
36.00'
PROPOSED BRIDGE SPAN
52.50
FS\GB
S=0.000
BRIDGE 2V
SCALE: HORIZ. 1"=10' VERT. 1"=4'
1+00
1+50
1+00
1+50


LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
0+80
1+00
1+50
1+63
2.0%
4.9%
SCO

BRIDGE 1P


N
SCALE: 1"=10'
0
10
20
30

CONSTRUCTION NOTES

① PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

② PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

③ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE.

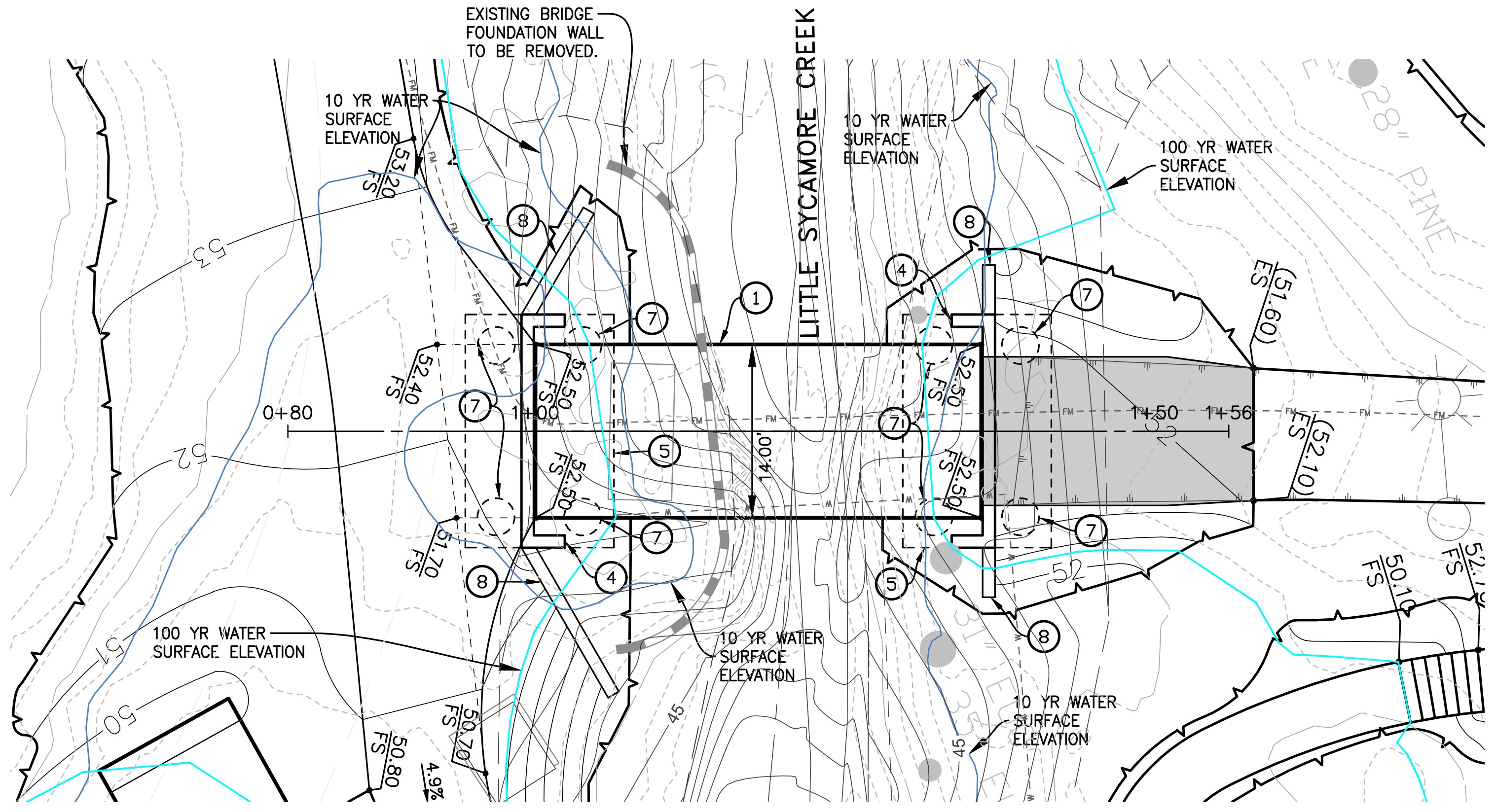
④ PROPOSED BRIDGE ABUTMENT.

⑤ PROPOSED PILE CAP.

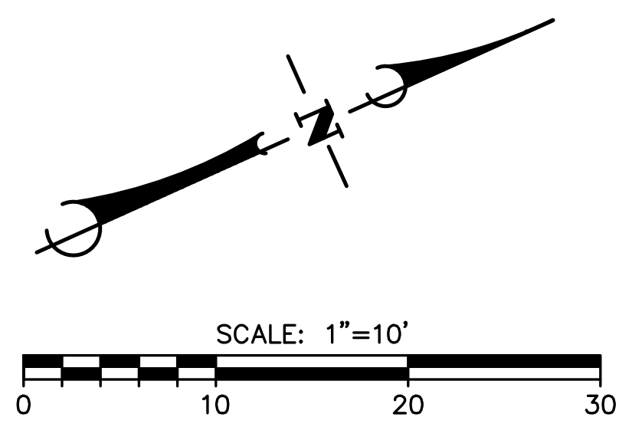
⑥ PROPOSED 24" CONCRETE PILE.

⑦ PROPOSED 36" CONCRETE PILE.

⑧ PROPOSED WING WALL.


EXISTING BRIDGE FOUNDATION WALL TO BE REMOVED.
LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
0+80
1+00
1+50
1+56
14.00'

BRIDGE 2V


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

BRIDGE 1P & 2V PLAN & PROFILE
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C23 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 3/4/2022 11:03:20 AM PLOT BY: Silvia, Pete PLOT DATE: 3/4/2022 11:39:33 AM

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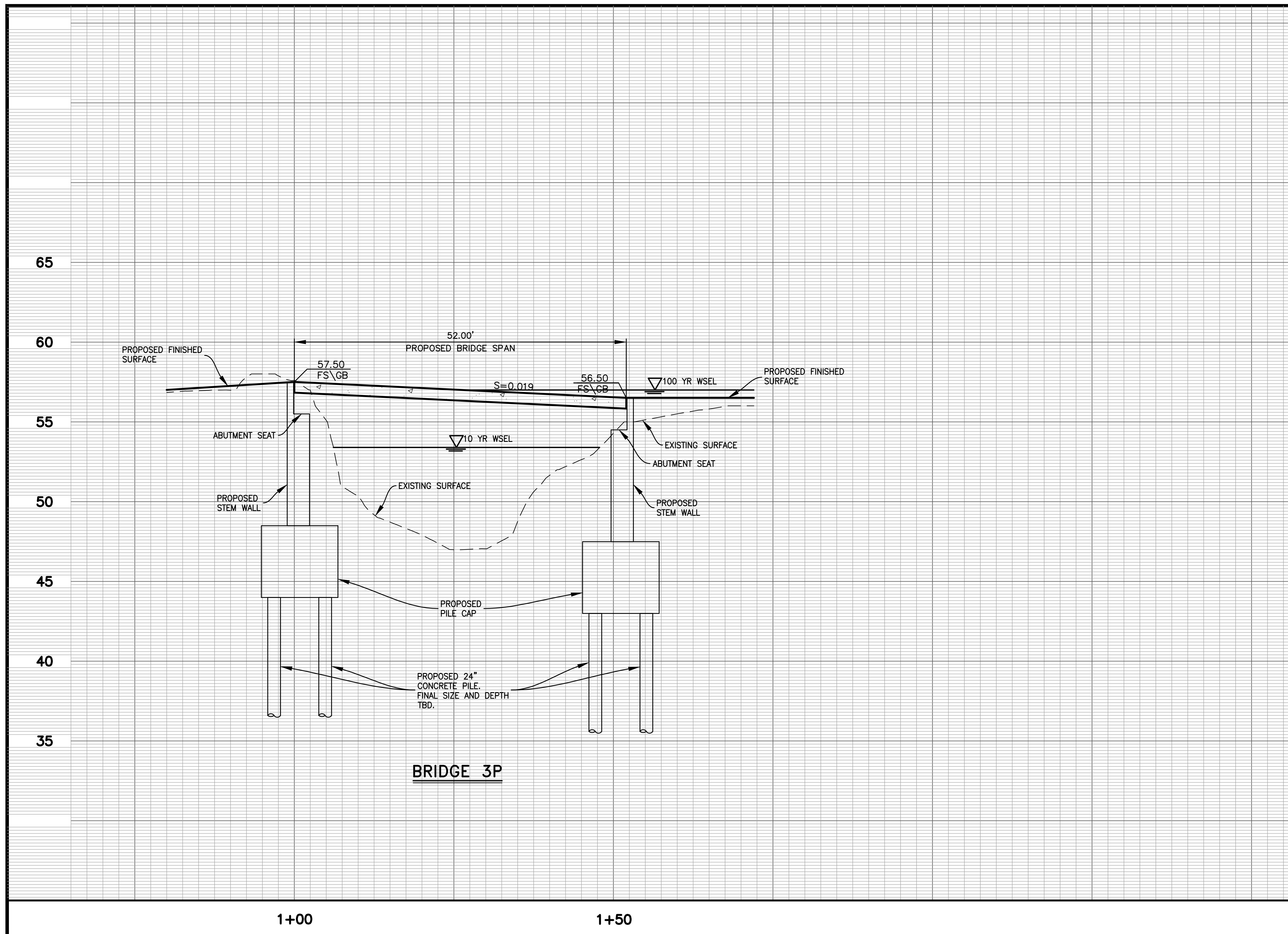
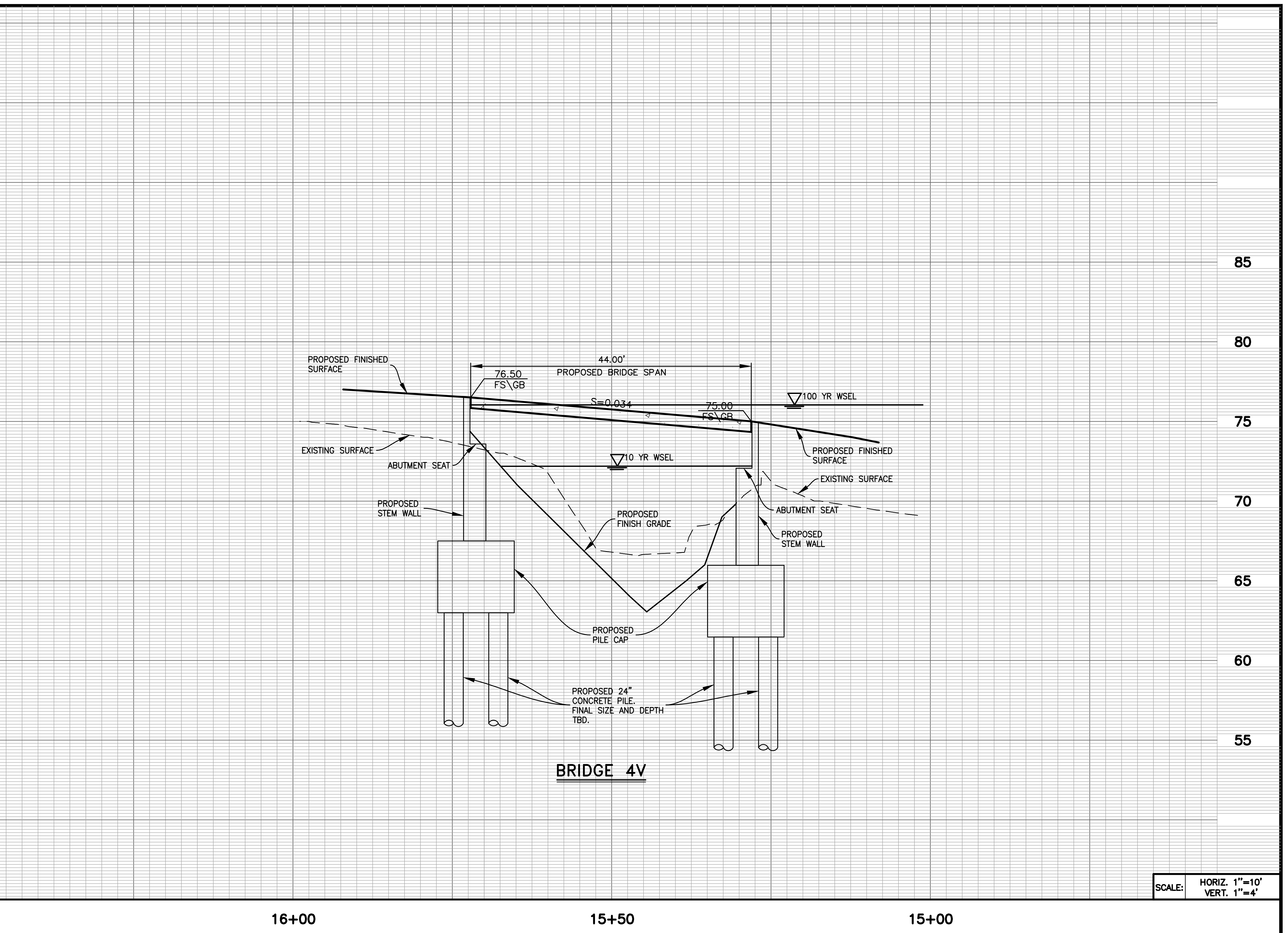
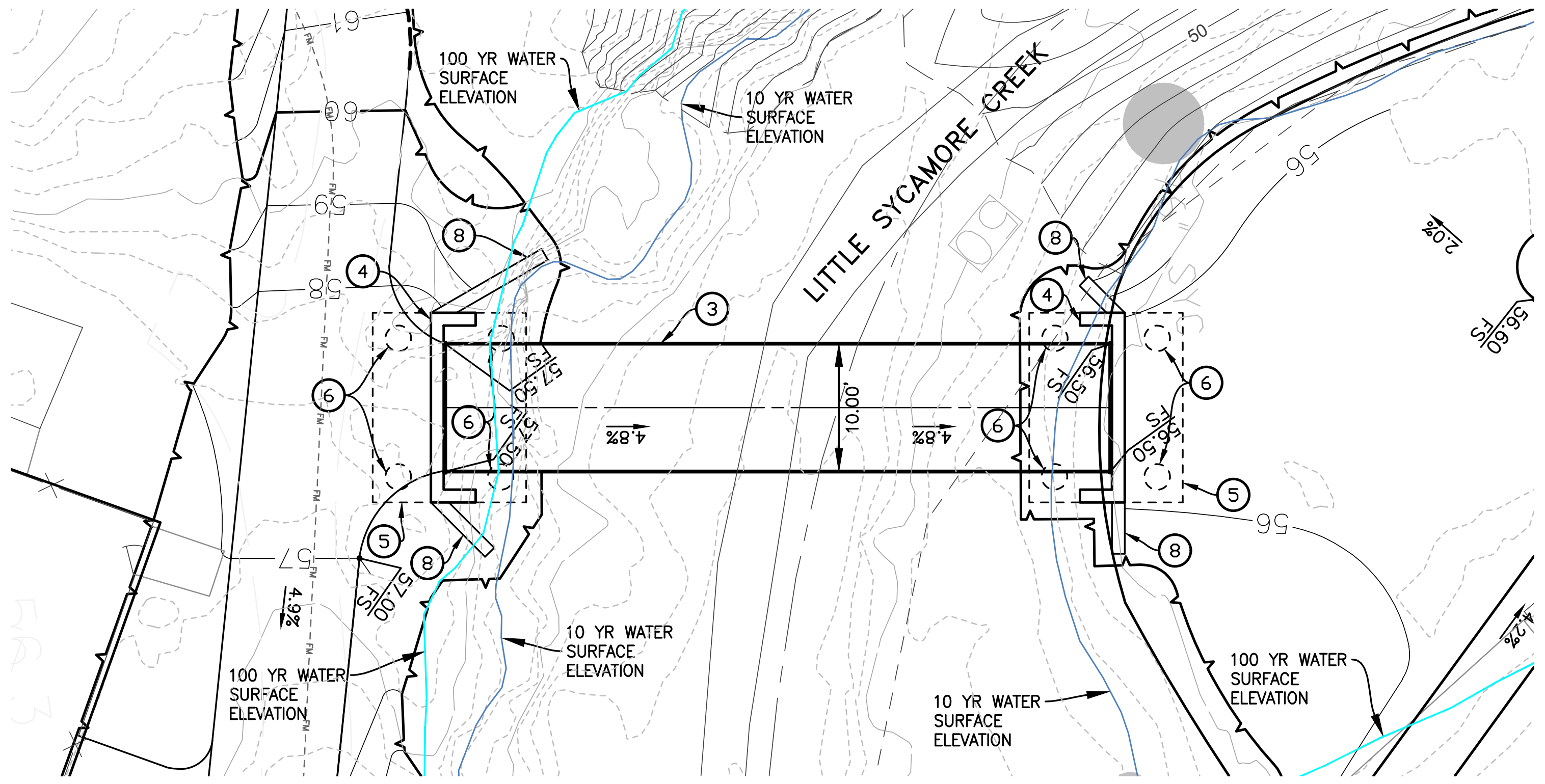

65
60
55
50
45
40
35
52.00'
PROPOSED BRIDGE SPAN
PROPOSED FINISHED SURFACE
57.50
FS\GB
56.50
FS\CB
S=0.019
100 YR WSEL
PROPOSED FINISHED SURFACE
ABUTMENT SEAT
10 YR WSEL
EXISTING SURFACE
ABUTMENT SEAT
EXISTING SURFACE
PROPOSED STEM WALL
PROPOSED STEM WALL
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. FINAL SIZE AND DEPTH TBD.
1+00
1+50

BRIDGE 3P


85
80
75
70
65
60
55
44.00'
PROPOSED BRIDGE SPAN
PROPOSED FINISHED SURFACE
76.50
FS\GB
S=0.034
75.00
FS\GB
100 YR WSEL
EXISTING SURFACE
ABUTMENT SEAT
10 YR WSEL
PROPOSED FINISHED SURFACE
EXISTING SURFACE
PROPOSED STEM WALL
PROPOSED FINISH GRADE
ABUTMENT SEAT
PROPOSED STEM WALL
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. FINAL SIZE AND DEPTH TBD.
SCALE: HORIZ. 1"=10' VERT. 1"=4'
16+00
15+50
15+00

BRIDGE 4V


100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
LITTLE SYCAMORE CREEK
10.00'
4.8%
4.8%
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
3
4
5
6
8

BRIDGE 3P

CONSTRUCTION NOTES

① PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

② PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

③ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE.

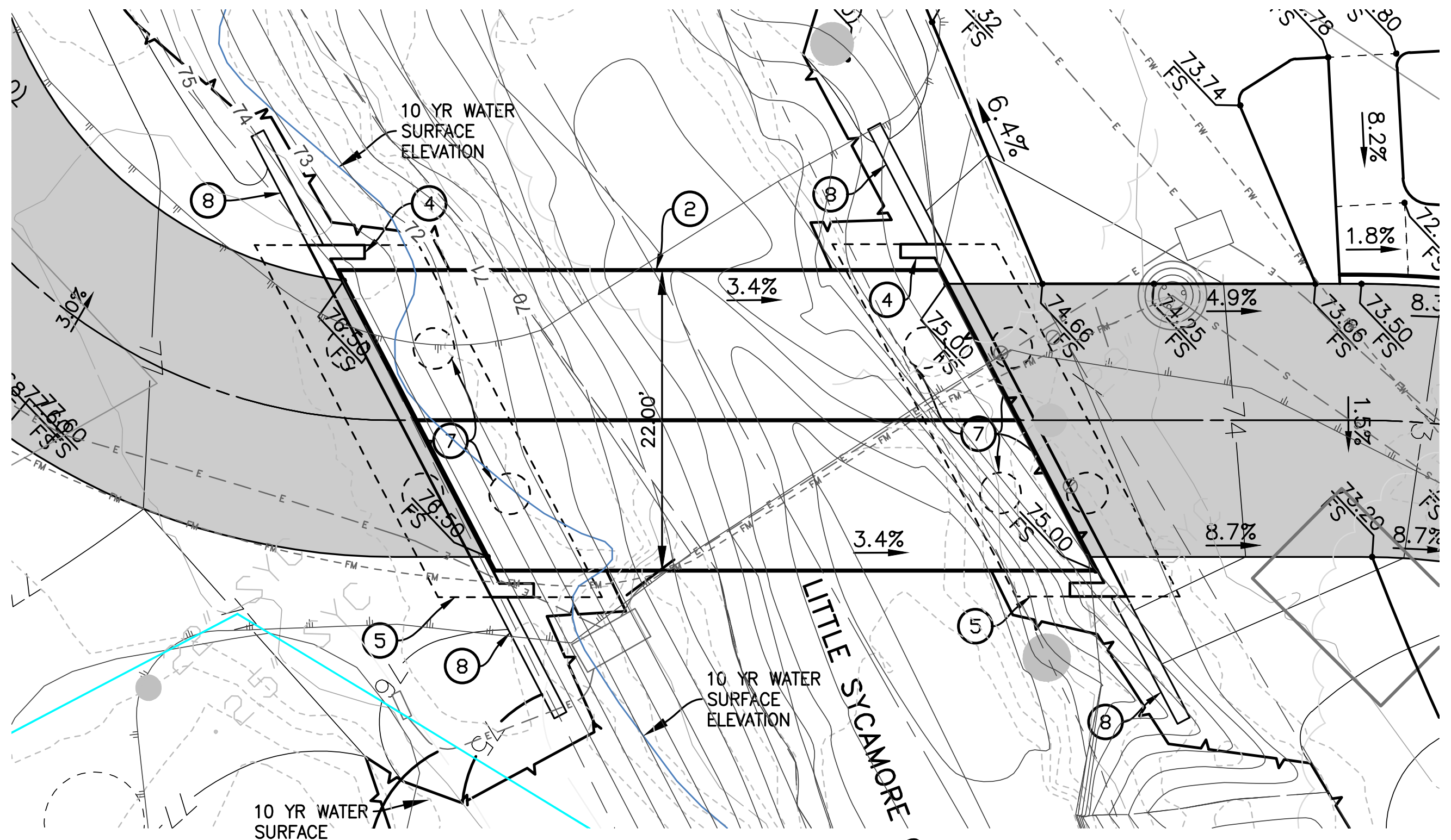
④ PROPOSED BRIDGE ABUTMENT.

⑤ PROPOSED PILE CAP.

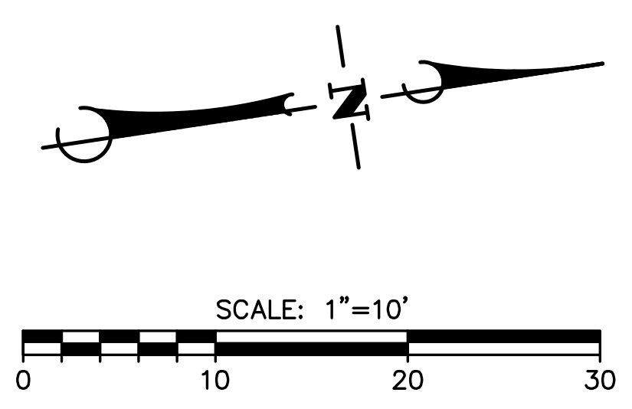
⑥ PROPOSED 24" CONCRETE PILE.

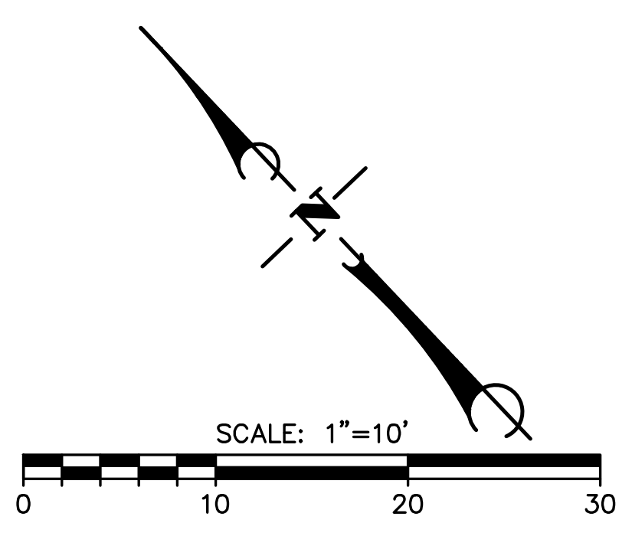
⑦ PROPOSED 36" CONCRETE PILE.

⑧ PROPOSED WING WALL.


10 YR WATER SURFACE ELEVATION
3.4%
3.4%
22.00'
4.9%
8.7%
1.8%
8.2%
6.4%
LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
2
4
5
7
8

BRIDGE 4V


N
SCALE: 1"=10'
0
10
20
30


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

BRIDGE 3P & 4V PLAN & PROFILE
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C24 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 3/4/2022 11:03:20 AM PLOT BY:Silvia, Pete PLOT DATE:3/4/2022 11:31:04 AM

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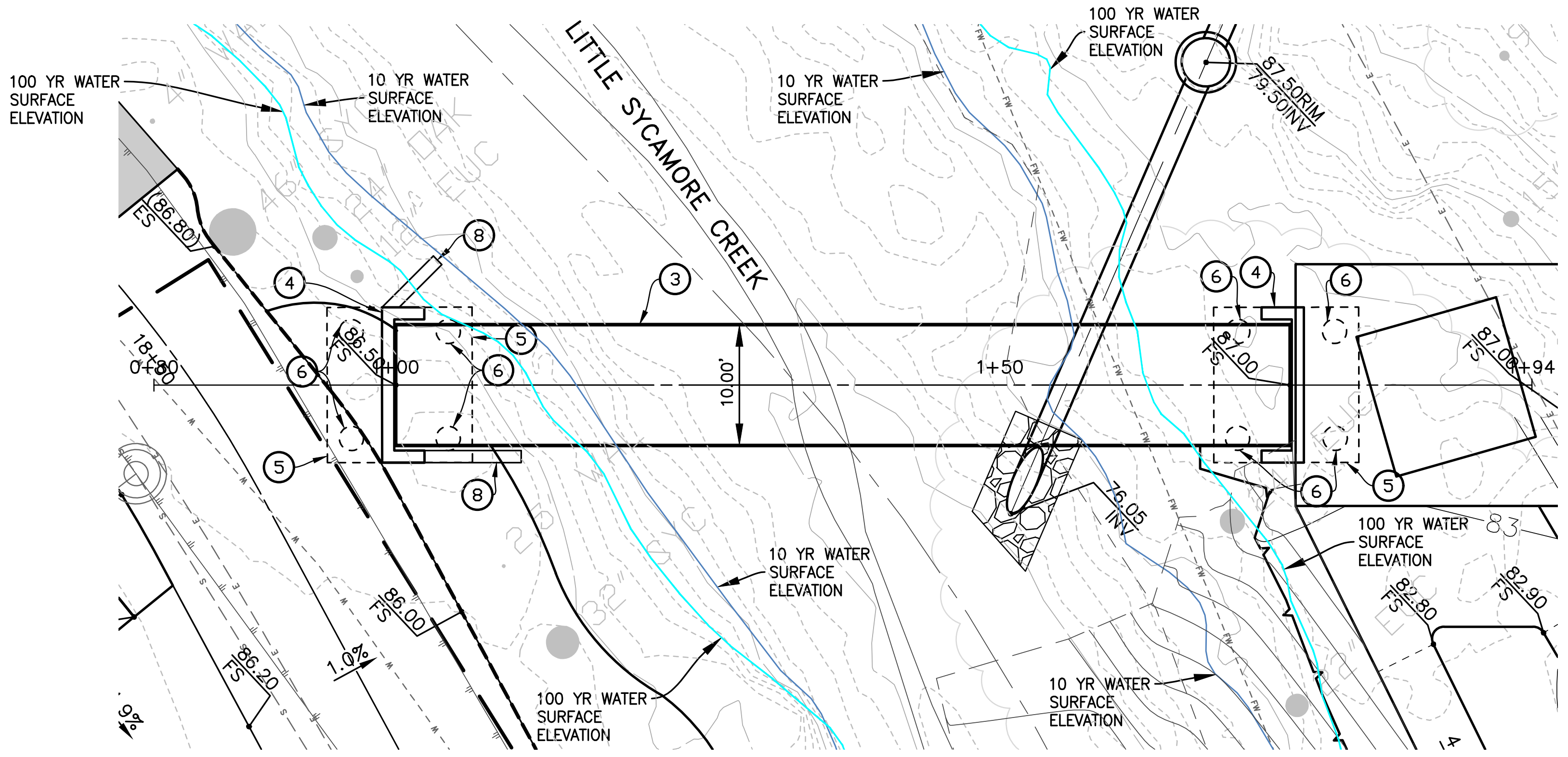
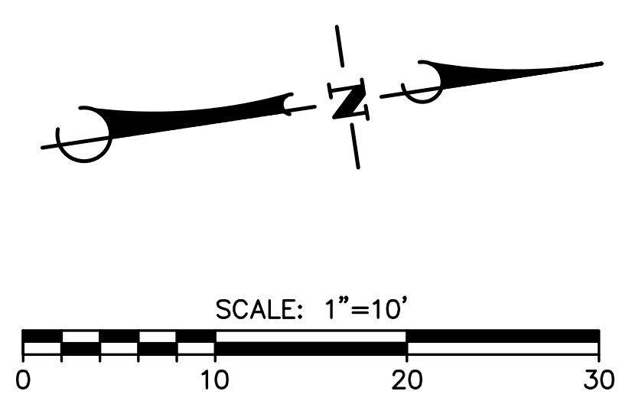
95
90
85
80
75
70
65
100
95
90
85
80
75
70
74.00'
PROPOSED BRIDGE SPAN
PROPOSED FINISHED SURFACE
86.50
FS\GB
S=0.007
87.00
FS\GB
PROPOSED FINISHED SURFACE
100 YR WSEL
ABUTMENT SEAT
ABUTMENT SEAT
EXISTING SURFACE
10 YR WSEL
EXISTING SURFACE
PROPOSED STEM WALL
PROPOSED STEM WALL
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. FINAL SIZE AND DEPTH TBD.
BRIDGE 5P
60.00'
PROPOSED BRIDGE SPAN
PROPOSED FINISHED SURFACE
93.21
FS\GB
100 YR WSEL
S=0.030
91.39
FS\GB
PROPOSED FINISHED SURFACE
ABUTMENT SEAT
EXISTING SURFACE
10 YR WSEL
EXISTING SURFACE
ABUTMENT SEAT
PROPOSED STEM WALL
PROPOSED FINISH GRADE
PROPOSED STEM WALL
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. FINAL SIZE AND DEPTH TBD.
BRIDGE 6V
SCALE: HORIZ. 1"=10' VERT. 1"=4'
1+00
1+50
2+00
21+00
20+50
20+00


100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
87.50RIM
FS JOINT
8
4
3
6
5
6
1+00
1+50
10.00'
6
4
6
87.00
6
5
8
5
76.05
INV
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
85.80
FS
82.90
FS
95.00
FS
96.50
FS
1.0%
100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION

BRIDGE 5P


N
SCALE: 1"=10'
0
10
20
30

CONSTRUCTION NOTES

① PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

② PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

③ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE.

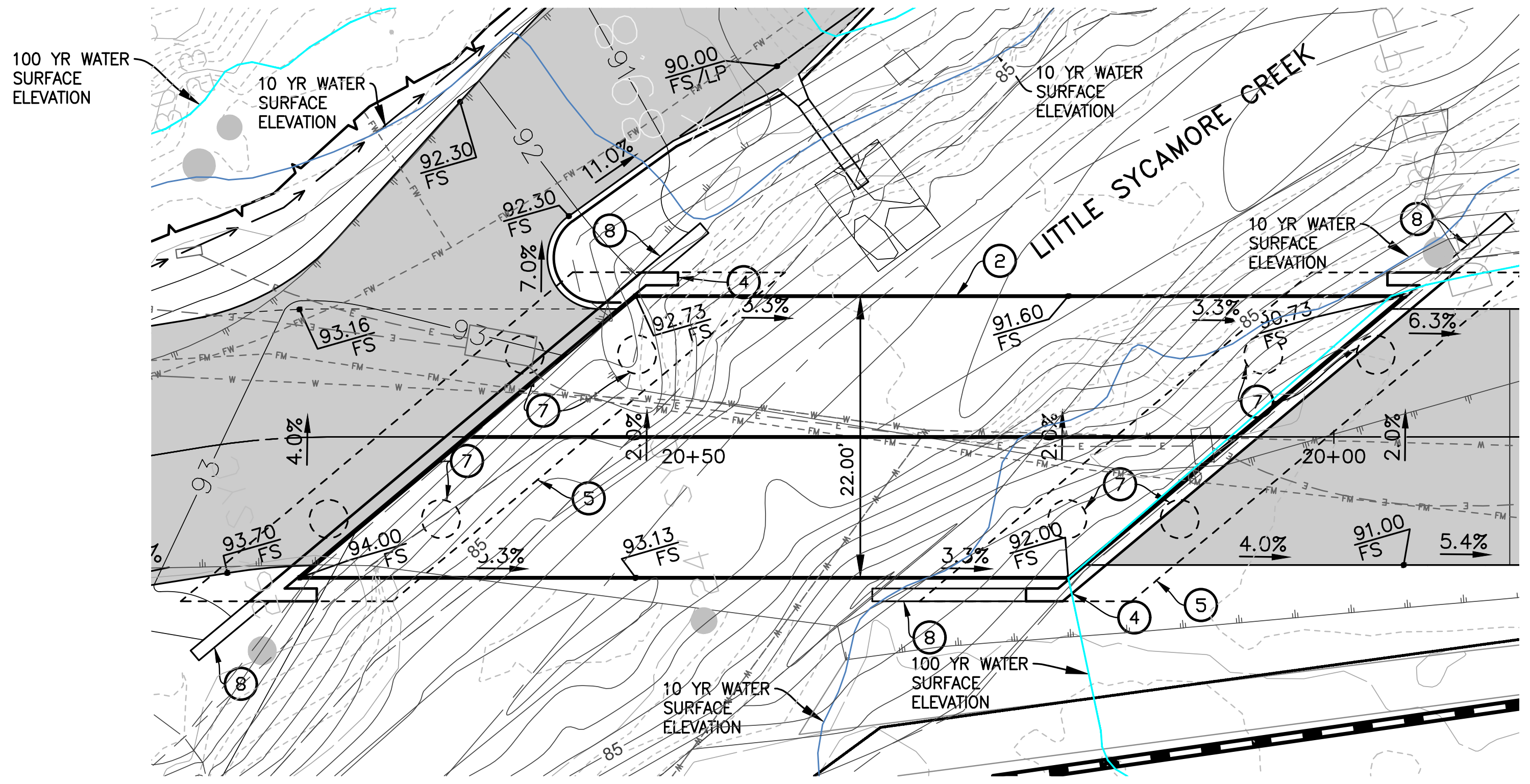
④ PROPOSED BRIDGE ABUTMENT.

⑤ PROPOSED PILE CAP.

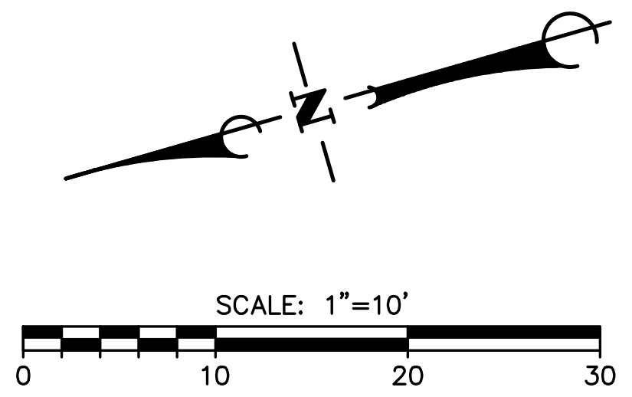
⑥ PROPOSED 24" CONCRETE PILE.

⑦ PROPOSED 36" CONCRETE PILE.

⑧ PROPOSED WING WALL.


100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
90.00
FS/LP
92.30
FS
92.30
FS
11.0%
10 YR WATER SURFACE ELEVATION
LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATION
8
8
4
2
3.3%
92.73
FS
91.60
FS
3.3%
90.73
FS
6.3%
93.16
FS
4.0%
7
7
20+50
22.00'
20+00
2.0%
5
7
93.70
FS
94.00
FS
3.3%
93.13
FS
3.3%
92.00
FS
4.0%
91.00
FS
5.4%
8
4
5
8
100 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION

BRIDGE 6V


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: 3/4/2022 11:44:44 AM PLOT BY: Silvia, Pete PLOT DATE: 3/4/2022 11:49:55 AM

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

NO 70435
CIVIL

PRELIMINARY

BRIDGE 5P & 6V PLAN & PROFILE
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C25 OF C67
PLAN DATE
3/01/2022

DRAWING: \\us0377-ppfss01\workgroup\2042\active\2042586200\drawing\sheet_files\bridge-sections_cac.dwg

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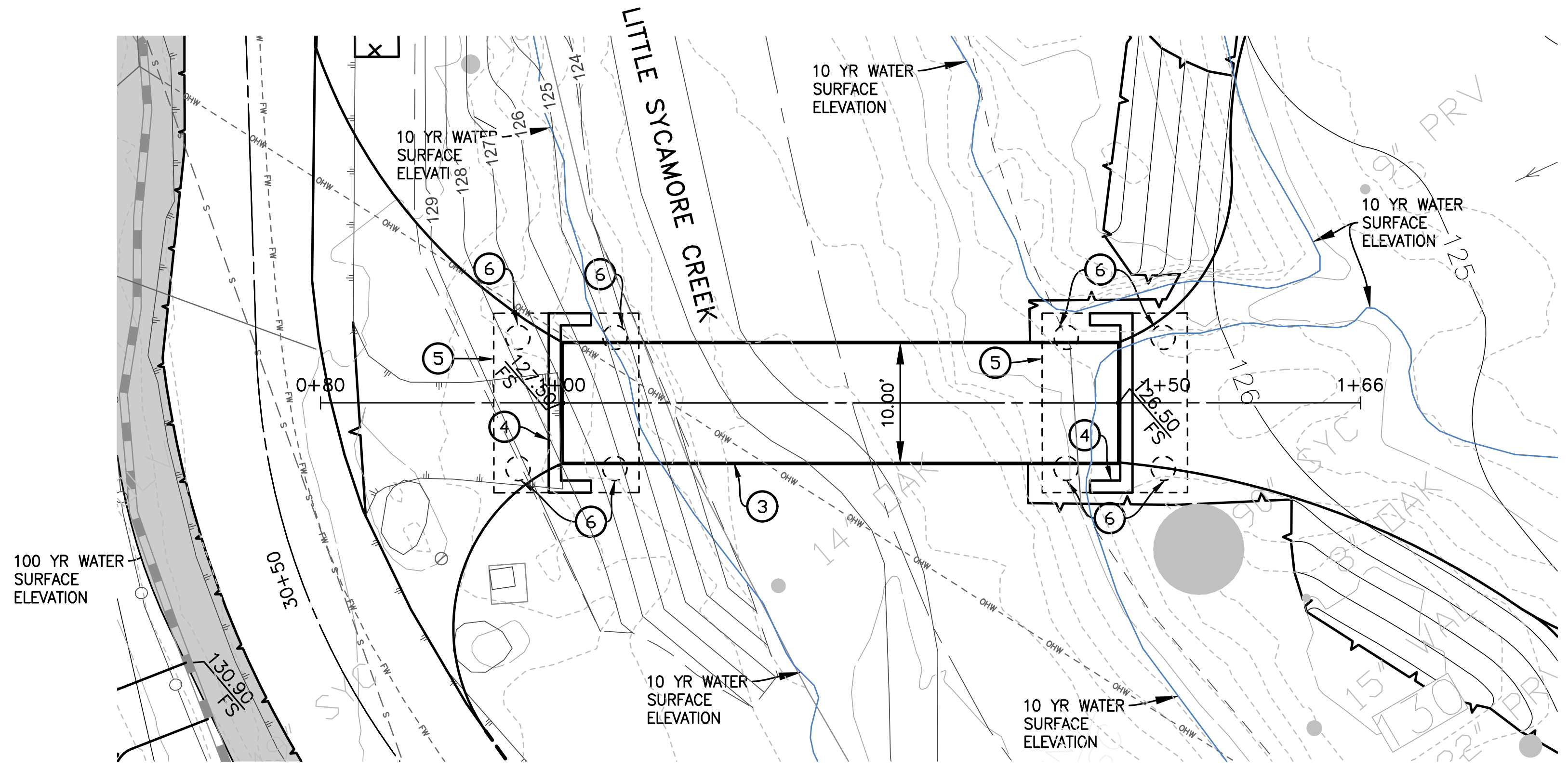
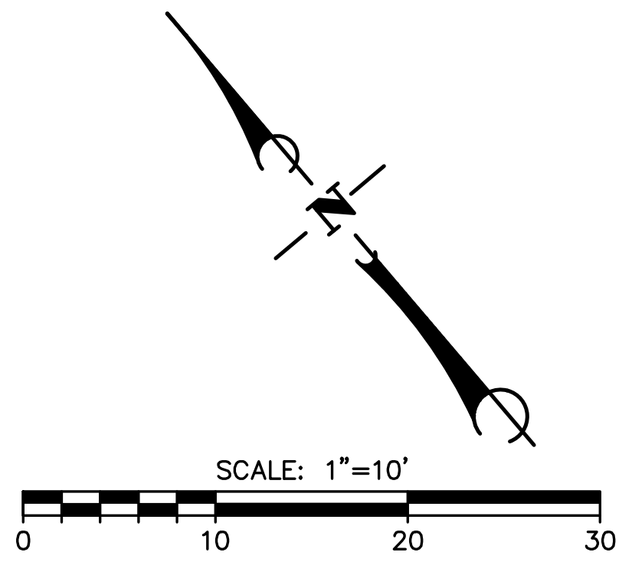
135
130
125
120
115
110
100 YR WSEL
EXISTING SURFACE
46.00'
PROPOSED BRIDGE SPAN
127.50
FS\GB
126.50
FS\GB
S=0.022
10 YR WSEL
EXISTING SURFACE
PROPOSED FINISHED SURFACE
ABUTMENT SEAT
PROPOSED STEM WALL
PROPOSED FINISHED SURFACE
ABUTMENT SEAT
PROPOSED STEM WALL
PROPOSED PILE CAP
PROPOSED PILE CAP
PROPOSED 24" CONCRETE PILE. DEPTH IS ASSUMED TO BE 30'. FINAL DESIGN TBD.
SCALE: HORIZ. 1"=10' VERT. 1"=4'
1+00
1+50

BRIDGE 9P


LITTLE SYCAMORE CREEK
10 YR WATER SURFACE ELEVATI
10 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
10 YR WATER SURFACE ELEVATION
100 YR WATER SURFACE ELEVATION
129
128
127
126
125
124
125
126
0+80
1+00
127.50 FS
10.00'
1+50
126.50 FS
1+66
30+50
130.90 FS
1
2
3
4
5
6

BRIDGE 9P


N
SCALE: 1"=10'
0
10
20
30

CONSTRUCTION NOTES

① PROPOSED 14' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

② PROPOSED 22' WIDE PREFABRICATED MODULAR STEEL VEHICLE BRIDGE.

③ PROPOSED 10' WIDE PREFABRICATED MODULAR STEEL PEDESTRIAN BRIDGE.

④ PROPOSED BRIDGE ABUTMENT.

⑤ PROPOSED PILE CAP.

⑥ PROPOSED 24" CONCRETE PILE.

⑦ PROPOSED 36" CONCRETE PILE.

⑧ PROPOSED WING WALL.

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

DESIGN__PAS___ CHECKED___HI___
42-ENG SAVE DATE: 3/4/2022 11:44:44 AM PLOT BY:Silvia, Pete PLOT DATE:3/4/2022 11:53:59 AM

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD TEMPLE CAMPS
CAMP HESS KRAMER GINDLING HILLTOP CAMP

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

BRIDGE 9P PLAN & PROFILE
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C26 OF C67
PLAN DATE
3/01/2022

DRAWING: \\us0377-ppfss01\workgroup\2042\active\2042586200\drawing\sheet_files\bridge-sections_cac.dwg

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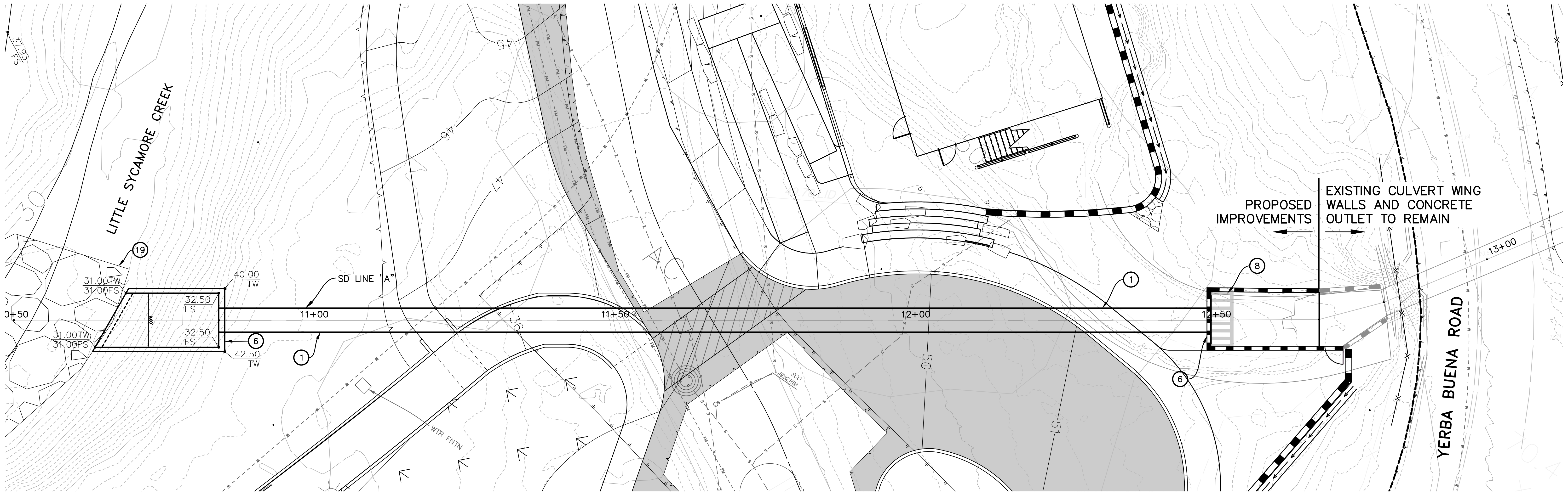
YERBA BUENA ROAD
LITTLE SYCAMORE CREEK
65
60
55
50
45
40
35
30
25
STA. 10+84.07 HEADWALL
40.00 NORTH
SEE DETAIL "I", SHEET 59
STA. 10+84.07 HEADWALL
42.50 SOUTH
SEE DETAIL "I", SHEET 59
STA. 11+17.83
(E) WATER
DEPTH TO BE POTHOLED
STA. 11+53.84
(E) FORCE MAIN
DEPTH TO BE POTHOLED
STA. 11+56.17
(E) FORCE MAIN
DEPTH TO BE POTHOLED
STA. 11+61.01
(E) ELECTRIC CONDUIT
DEPTH TO BE POTHOLED
STA. 11+75.93
(E) SEWER LATERAL
DEPTH TO BE POTHOLED
STA. 11+98.19
(E) SEWER LATERAL
DEPTH TO BE POTHOLED
EXISTING GRADE
PROPOSED FINISHED GRADE
STA. 12+48.07 HEADWALL
53.50 TW
SEE DETAIL "J", SHEET 59
STA. 12+48.07 HEADWALL
56.50 NORTH WALL
SEE DETAIL "J", SHEET 59
STA. 12+67.07
(59.34) TW NORTH
ATTACH OPEN CHANNEL
STRUCTURE TO
EXISTING WINGWALL
SEE DEAIL "J", SHEET 59
STA. 12+67.08
59.76 TW SOUTH
SEE DEAIL "J", SHEET 59
STA. 12+70.82
59.76 TW SOUTH
SEE DEAIL "J", SHEET
EXISTING BOX CULVERT
UNDER YERBA BUENA ROAD
STA. 11+69.07
ANGLE PT
S=1.048
S=0.090
S=0.009
42.00 INV
31.00 INV
32.50 INV
34.00 INV
34.80 INV
EXISTING GRADE CHANNEL
STA. 10+84.07
BEG. PIPE
PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS.
ROCK SHALL CONSIST OF 1/2 TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.
85.16'
60-IN RCP
OR APPROVED EQUAL
78.84'
60-IN RCP
OR APPROVED EQUAL
164.00'
60-IN RCP
OR APPROVED EQUAL
SCALE: HORIZ. 1"=10'
VERT. 1"=4'
10+50
11+00
11+50
12+00
12+50
13+00

STORM DRAIN A


LITTLE SYCAMORE CREEK
19
31.00TW
31.00FS
31.00TW
31.00FS
40.00
TW
32.50
FS
32.50
FS
42.50
TW
6
1
SD LINE "A"
10+50
11+00
11+50
12+00
12+50
13+00
WTR FNTN
AC
46
47
50
51
30
36
1
8
6
PROPOSED IMPROVEMENTS
EXISTING CULVERT WING WALLS AND CONCRETE OUTLET TO REMAIN
YERBA BUENA ROAD

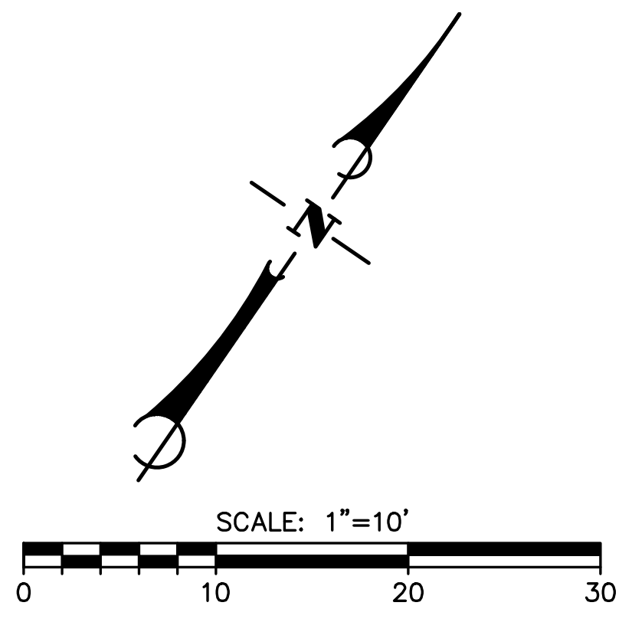
GENERAL NOTES

1. SEE STORM DRAIN LINE "A" INLET AND OUTLET DETAILS ON SHEET 59 FOR ADDITIONAL DETAIL.

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.
② PROPOSED 48" RCP STORM DRAIN.
③ PROPOSED 30" RCP STORM DRAIN
④ PROPOSED 24" RCP STORM DRAIN.
⑤ PROPOSED 24" HDPE STORM DRAIN.
⑥ PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.
⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
⑩ PROPOSED 6' PRE-CAST MANHOLE.
⑪ PROPOSED 5' PRE-CAST MANHOLE.
⑫ PROPOSED 4' PRE-CAST MANHOLE.
⑬ PROPOSED 3' PRE-CAST MANHOLE.
⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
⑮ PROPOSED DRAINAGE INLET.
⑯ PROPOSED DEBRIS BASIN.
⑰ PROPOSED CONCRETE ARIZONA CROSSING.
⑱ PROPOSED ASPHALT CONCRETE PAVEMENT.
⑲ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS.
ROCK SHALL CONSIST OF 1/2 TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.

STORM DRAIN A


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

PLOT DATE:
PLOT BY:
DESIGN __PAS__ CHECKED __HI__
42-ENG SAVE DATE:

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

STORM DRAIN PLAN & PROFILE - LINE A
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C27 OF C67
PLAN DATE
3/01/2022

DRAWING:

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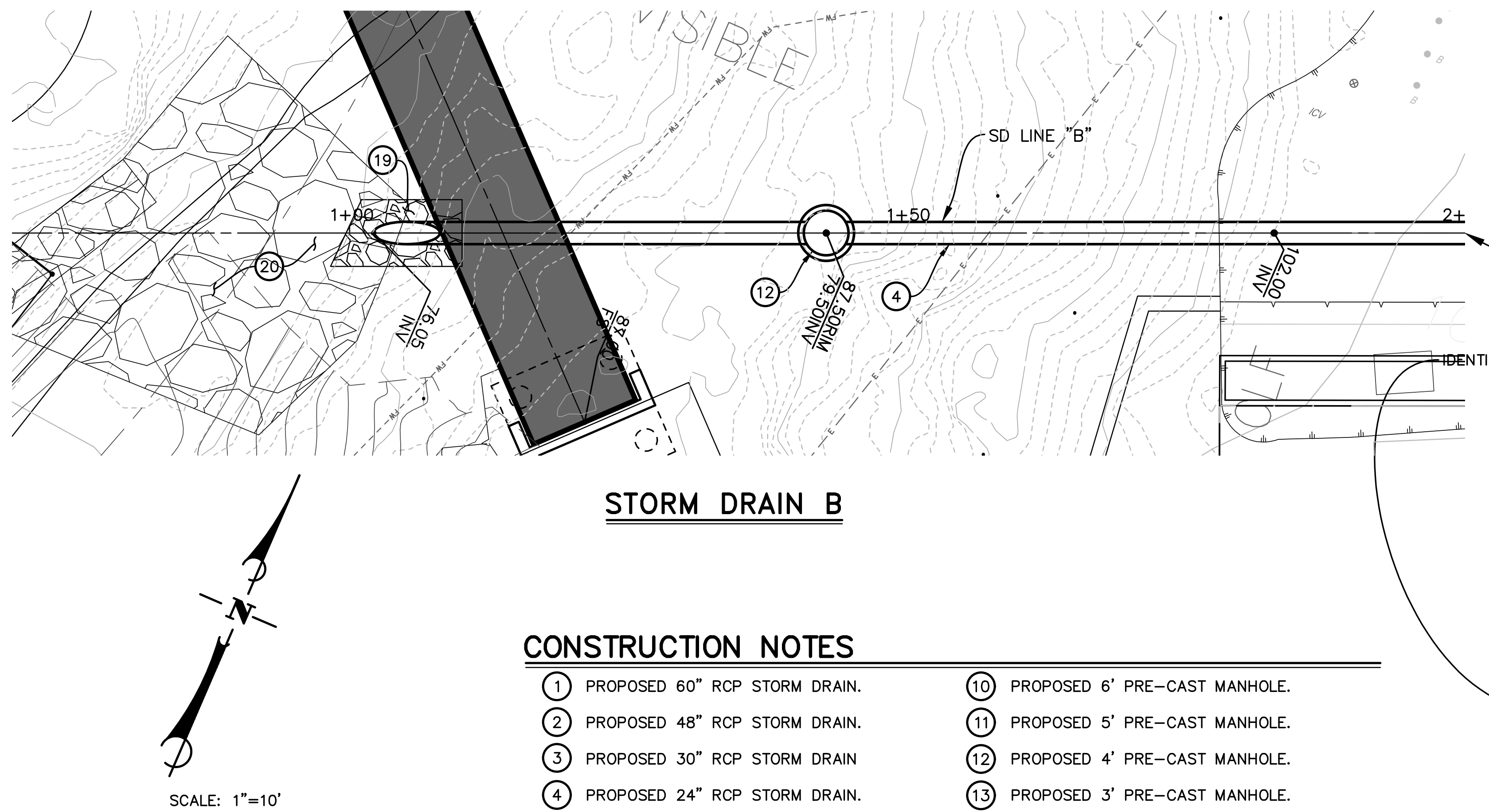
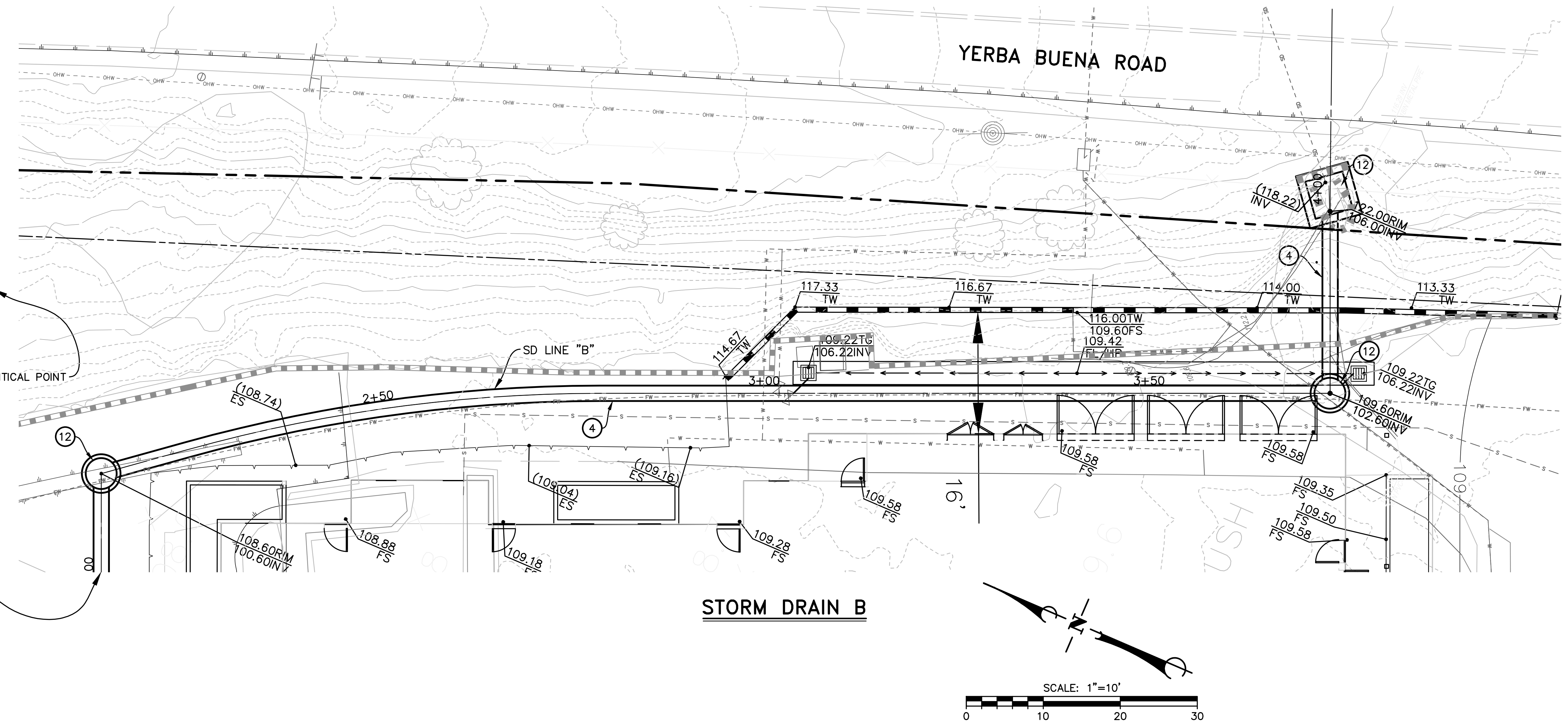
115
110
105
100
95
90
85
80
75
70
65
130
125
120
115
110
105
100
95
EXISTING GRADE
STA. 1+07.87
78.82 GROUTED ROCK HEADWALL
WITH ROCK RIP RAP
STA. 1+42.60
87.50 M.H. RIM
S=0.481
IDENTICAL POINT
PROPOSED GROUTED ROCK
HEADWALL/APRON PER
DETAIL "K", SHEET C59
S=0.087
INV 79.40
79.60 INV
76.05 INV
38.25'
24-IN RCP
OR APPROVED EQUAL
38.67'
24-IN RCP
OR APPROVED EQUAL
PROPOSED STORMWATER OUTLET
BOULDER DISSIPATION STRUCTURE
PER ESA DETAILS. ROCK SHALL
CONSIST OF ½ TON (40%), 200 LB
(20%), 75 LB (20%), 25 LB (20%)
WITH NATIVE ALLUVIUM (VOID FILL.
STA. 1+82.85
98.00 VERT. BEND
S=0.089
98.00 INV
INV 100.50
28.00'
24-IN RCP
OR APPROVED EQUAL
STA. 2+12.85
108.60 M.H. RIM
EXISTING GRADE
STA. 2+24.49
103.06 HOR. BEND
100.70 INV
100.81 INV
STA. 2+78.74
103.67 HOR. BEND
S=0.011
101.43 INV
156.65'
24-IN RCP
OR APPROVED EQUAL
EXISTING GRADE
STA. 3+73.50
109.60 M.H. RIM
INV 102.50
102.70 INV
S=0.153
INV 106.00
21.62'
24-IN RCP
OR APPROVED EQUAL
STA. 3+99.12
122.00 M.H. RIM
ADDITIONAL TOPO TO BE SHOT
FOR NEW CURB INLET RECENTLY
CONSTRUCTED BY THE COUNTY.
FINAL DESIGN ON CONNECTION
TO EXISTING STORM DRAIN
SYSTEM TBD.
EXISTING 18" STORM
DRAIN TO REMAIN
SCALE: HORIZ. 1"=10'
VERT. 1"=4'
1+00
1+50
2+00
2+50
3+00
3+50
4+00

STORM DRAIN B


VISIBLE
SD LINE "B"
1+00
1+50
2+
19
20
12
4
76.05 INV
87.50RIM
79.50INV
102.00 INV
8x8
IDENTICAL POINT
N
SCALE: 1"=10'
0
10
20
30

STORM DRAIN B


YERBA BUENA ROAD
OHW
IDENTICAL POINT
SD LINE "B"
2+50
3+00
3+50
4+00
12
4
(118.22) INV
122.00RIM
106.00INV
117.33 TW
116.67 TW
114.00 TW
113.33 TW
114.67 TW
116.00TW
109.60FS
109.42
FL/HP
109.22TG
106.22INV
109.22TG
106.22INV
109.60RIM
102.60INV
(108.74) ES
(109.16) ES
(109.04) ES
108.60RIM
100.60INV
108.88 FS
109.18 FS
109.28 FS
109.58 FS
109.58 FS
109.58 FS
109.35 FS
109.50 FS
109.58 FS
16'
109
N
SCALE: 1"=10'
0
10
20
30

STORM DRAIN B

CONSTRUCTION NOTES

1. PROPOSED 60" RCP STORM DRAIN.
2. PROPOSED 48" RCP STORM DRAIN.
3. PROPOSED 30" RCP STORM DRAIN
4. PROPOSED 24" RCP STORM DRAIN.
5. PROPOSED 24" HDPE STORM DRAIN.
6. PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
7. PROPOSED P.C.C. OVERFLOW STRUCTURE.
8. PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
9. PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
10. PROPOSED 6' PRE-CAST MANHOLE.
11. PROPOSED 5' PRE-CAST MANHOLE.
12. PROPOSED 4' PRE-CAST MANHOLE.
13. PROPOSED 3' PRE-CAST MANHOLE.
14. PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
15. PROPOSED DRAINAGE INLET.
16. PROPOSED DEBRIS BASIN.
17. PROPOSED CONCRETE ARIZONA CROSSING.
18. PROPOSED ASPHALT CONCRETE PAVEMENT.
19. PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59.
20. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER
GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

PRELIMINARY

STORM DRAIN PLAN & PROFILE – LINE B
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

STANTEC PROJECT NO.
2042586200
SHEET
C28 OF C67
PLAN DATE
3/01/2022

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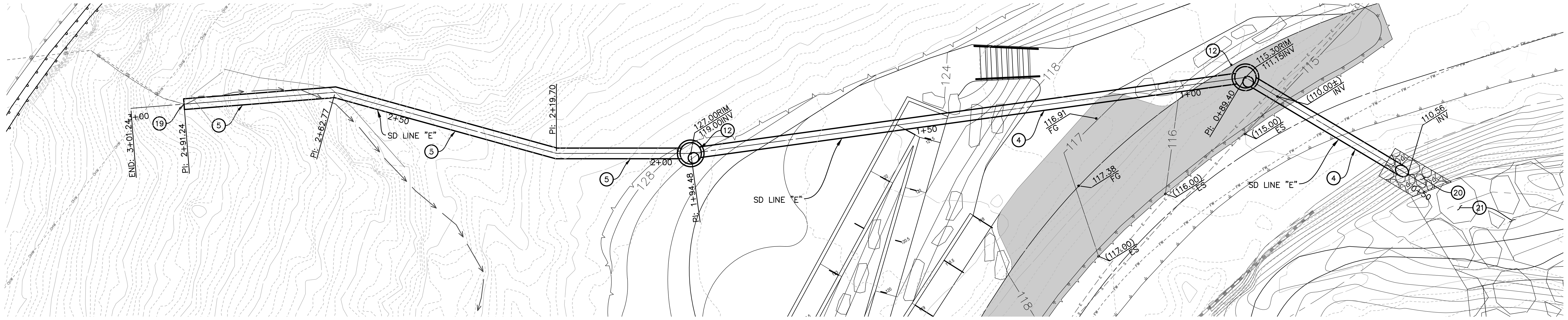
PLOT DATE:3/2/2022 9:26:06 PM
PLOT BY:Silvia, Pete
DESIGN PAS CHECKED HI
42-ENG SAVE DATE: ----
DRAWING: v:\2042\active\2042586200\drawing\exhibit_files\2042586200_drainage_offsite.dwg

175
170
165
160
155
150
145
140
135
130
125
140
135
130
125
120
115
110
105
EXISTING STORM DRAIN LINE TO REMAIN. SIZE TO BE CONFIRMED.
PROPOSED CONCRETE COLLAR TIE-IN CONNECTION TO EXISTING STORM DRAIN LINE.
INV 169.87
S=0.629
STA 2+62.77 151.97 HOR. BEND
EXISTING GRADE
INV 151.97
S=0.628
IDENTICAL POINT
28.47' 24-IN HDPE OR APPROVED EQUAL
43.07' 24-IN HDPE OR APPROVED EQUAL
STA 2+19.70 124.88 HOR. BEND VERT. BEND
INV 124.88
S=0.249
119.10 INV
118.90 INV
43.07' 24-IN HDPE OR APPROVED EQUAL
23.22' 24-IN HDPE OR APPROVED EQUAL
PROPOSED FINISH GRADE
S=0.113
60.09' 24-IN RCP OR APPROVED EQUAL
EXISTING GRADE
STA 1+32.39 112.09 VERT. BEND
EXISTING SEWER ±110' INV.
112.09 INV
S=0.021
40.99' 24-IN RCP OR APPROVED EQUAL
STA 0+89.40 115.72 M.H. RIM
111.25 INV
STA 0+82.40 114.95 (E) SEWER
111.05 INV
S=0.015
33.28' 24-IN RCP OR APPROVED EQUAL
110.56 INV
STA 0+56.44 112.86 GROUTED ROCK HEADWALL WITH ROCK RIP RAP
PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59
PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.
PROPOSED FINISH GRADE
SCALE: HORIZ. 1"=10' VERT. 1"=4'
3+50
3+00
2+50
2+00
1+50
1+00

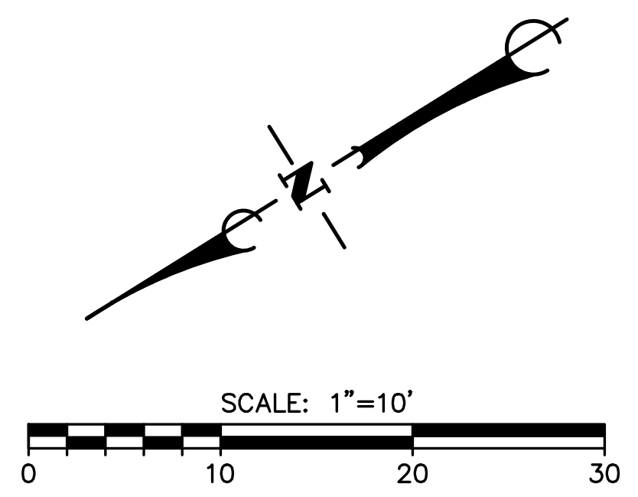
STORM DRAIN E


END: 3+01.24
3+00
19
PI: 2+91.24
5
PI: 2+62.77
2+50
SD LINE "E"
5
PI: 2+19.70
5
2+00
127.00RIM
119.00INV
12
PI: 1+94.48
SD LINE "E"
1+50
124
118
4
116.91 FG
117
117.38 FG
116
(116.00) ES
(112.00) ES
118
1+00
PI: 0+89.40
12
115.30RIM
111.15INV
115
(110.00±) INV
(115.00) ES
SD LINE "E"
4
110.56 INV
20
21

STORM DRAIN E

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.
② PROPOSED 48" RCP STORM DRAIN.
③ PROPOSED 30" RCP STORM DRAIN
④ PROPOSED 24" RCP STORM DRAIN.
⑤ PROPOSED 24" HDPE STORM DRAIN.
⑥ PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.
⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
⑩ PROPOSED 6' PRE-CAST MANHOLE.
⑪ PROPOSED 5' PRE-CAST MANHOLE.
⑫ PROPOSED 4' PRE-CAST MANHOLE.
⑬ PROPOSED 3' PRE-CAST MANHOLE.
⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
⑮ PROPOSED DRAINAGE INLET.
⑯ PROPOSED DEBRIS BASIN.
⑰ PROPOSED CONCRETE ARIZONA CROSSING.
⑱ PROPOSED ASPHALT CONCRETE PAVEMENT.
⑲ PROPOSED CONCRETE COLLAR TIE-IN CONNECTION TO EXISTING STORM DRAIN LINE. SIZE TO BE CONFIRMED.
⑳ PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59.
㉑ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

STORM DRAIN PLAN & PROFILE - LINE E
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C29 OF C67
PLAN DATE
3/01/2022

PLOT DATE:3/2/2022 9:19:38 PM
PLOT BY:Silvia, Pete
DESIGN PAS CHECKED HI
42-ENG SAVE DATE:

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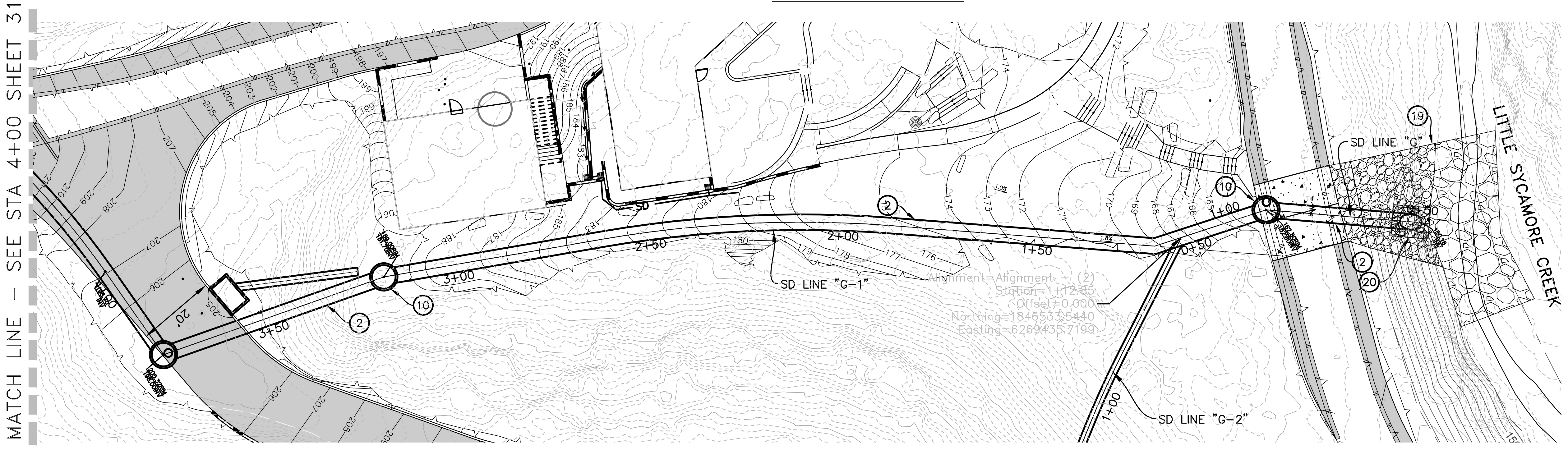
210
200
190
180
170
160
150
MATCH LINE - SEE STA 4+00 SHEET 31
STA. 3+78.92
205.32 M.H. RIM
S=0.026
197.42
INV
23.06'
48-IN RCP
OR
APPROVED
EQUAL
197.22
INV
S=0.336
54.04'
48-IN RCP
OR APPROVED EQUAL
STA. 3+18.88
189.00 M.H. RIM
179.10
INV
178.90
INV
STA. 2+62.26
177.06 HOR. BEND
172.64
INV
EXISTING GRADE
STA. 1+87.66
168.36 HOR. BEND
PROPOSED
FINISH GRADE
S=0.117
163.94
INV
222.88'
48-IN RCP
OR APPROVED EQUAL
STA. 1+20.00
160.47 HOR. BEND
STA. 1+12.85
159.22 24-IN RCP LINE G-2
156.06
INV
157.22
INV
152.90
INV
STA. 0+90.00
163.00 M.H. RIM
PROPOSED
FINISH GRADE
S=0.068
152.70
INV
150.18
INV
36.88'
48-IN RCP
OR APPROVED EQUAL
STA. 0+55.56
154.97 GROUTED ROCK HEADWALL
WITH ROCK RIP RAP
PROPOSED GROUTED ROCK
HEADWALL/APRON PER
DETAIL "K", SHEET C59
PROPOSED STORMWATER OUTLET
BOULDER DISSIPATION STRUCTURE
PER ESA DETAILS. ROCK SHALL
CONSIST OF ½ TON (40%), 200 LB
(20%), 75 LB (20%), 25 LB (20%)
WITH NATIVE ALLUVIUM (VOID FILL.
SCALE: HORIZ. 1"=20' VERT. 1"=4'
4+00
3+50
3+00
2+50
2+00
1+50
1+00
0+50

STORM DRAIN G-1


MATCH LINE - SEE STA 4+00 SHEET 31
3+50
3+00
2+50
2+00
1+50
1+00
2
10
19
20
SD LINE "G-1"
SD LINE "G"
SD LINE "G-2"
LITTLE SYCAMORE CREEK

STORM DRAIN G-1

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.

② PROPOSED 48" RCP STORM DRAIN.

③ PROPOSED 30" RCP STORM DRAIN

④ PROPOSED 24" RCP STORM DRAIN.

⑤ PROPOSED 24" HDPE STORM DRAIN.

⑥ PROPOSED P.C.C. OUTLET WITH HEADWALL.

⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.

⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.

⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.

⑩ PROPOSED 6' PRE-CAST MANHOLE.

⑪ PROPOSED 5' PRE-CAST MANHOLE.

⑫ PROPOSED 4' PRE-CAST MANHOLE.

⑬ PROPOSED 3' PRE-CAST MANHOLE.

⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.

⑮ PROPOSED DRAINAGE INLET.

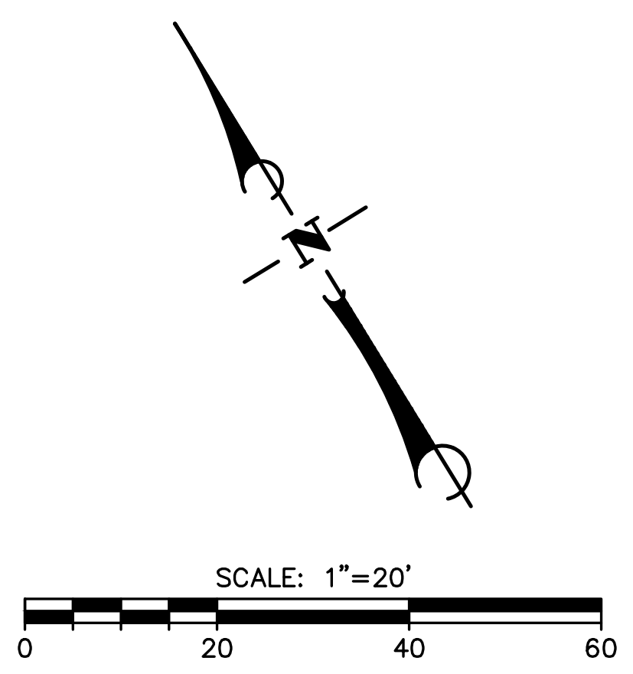
⑯ PROPOSED DEBRIS BASIN.

⑰ PROPOSED CONCRETE ARIZONA CROSSING.

⑱ PROPOSED ASPHALT CONCRETE PAVEMENT.

⑲ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS.
ROCK SHALL CONSIST OF $\frac{1}{2}$ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.

⑳ PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59.


N
SCALE: 1"=20'
0
20
40
60

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

STORM DRAIN PLAN & PROFILE - LINE G-1
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C30 OF C67
PLAN DATE
3/01/2022

DESIGN: PAS CHECKED: HI
42-ENG SAVE DATE: ----
PLOT BY: Silvia, Pete PLOT DATE: 3/2/2022 9:08:31 PM
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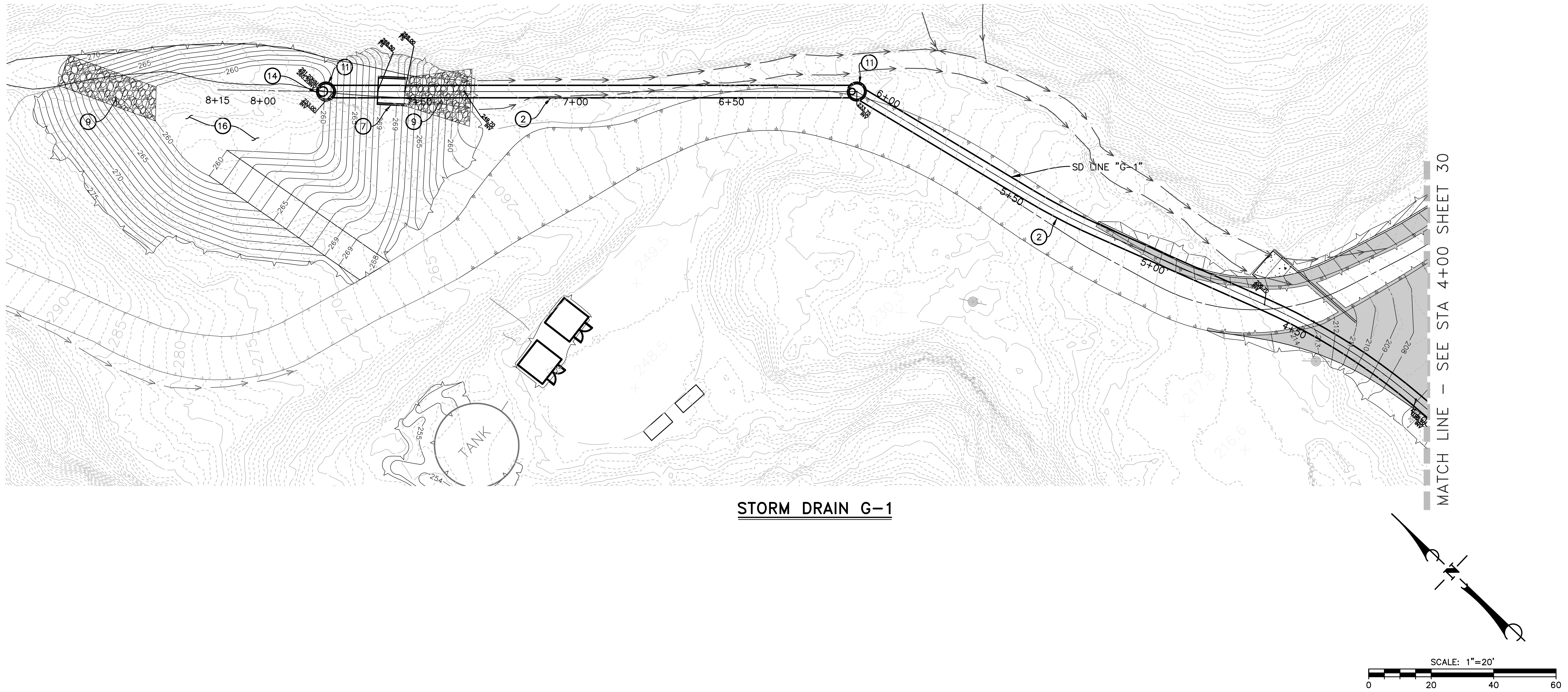
280
270
260
250
240
230
220
210
200
190
PROPOSED FINISHED GRADE
STA. 7+80.03
261.20 M.H. RIM
PROPOSED FINISHED GRADE
STA. 7+35.79
249.70 VERT. BEND
S=0.079
253.00 INV
249.70 INV
41.74'
48-IN RCP
OR APPROVED EQUAL
EXISTING GRADE
STA. 6+10.03
242.39 M.H. RIM
S=0.140
INV 232.49
232.29 INV
123.26'
48-IN RCP
OR APPROVED EQUAL
STA. 5+45.62
226.80 HOR. BEND
STA. 5+20.77
222.24 HOR. BEND
S=0.181
222.15 INV
217.53 INV
STA. 4+62.48
206.00 VERT. BEND
EXISTING GRADE
STA. 4+04.98
198.02 VERT. BEND
206.00 INV
S=0.139
145.05'
48-IN RCP
OR APPROVED EQUAL
INV 198.02
57.50'
48-IN RCP
OR APPROVED EQUAL
SCALE: HORIZ. 1"=20' VERT. 1"=4'
8+00
7+50
7+00
6+50
6+00
5+50
5+00
4+50
4+00
3+50

STORM DRAIN G-1

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.
② PROPOSED 48" RCP STORM DRAIN.
③ PROPOSED 30" RCP STORM DRAIN
④ PROPOSED 24" RCP STORM DRAIN.
⑤ PROPOSED 24" HDPE STORM DRAIN.
⑥ PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.
⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
⑩ PROPOSED 6' PRE-CAST MANHOLE.
⑪ PROPOSED 5' PRE-CAST MANHOLE.
⑫ PROPOSED 4' PRE-CAST MANHOLE.
⑬ PROPOSED 3' PRE-CAST MANHOLE.
⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
⑮ PROPOSED DRAINAGE INLET.
⑯ PROPOSED DEBRIS BASIN.
⑰ PROPOSED CONCRETE ARIZONA CROSSING.
⑱ PROPOSED ASPHALT CONCRETE PAVEMENT.


8+15
8+00
7+50
7+00
6+50
6+00
5+50
5+00
4+50
SD LINE "G-1"
TANK
14
11
9
16
7
9
2
11
2
MATCH LINE - SEE STA 4+00 SHEET 30
SCALE: 1"=20'
0
20
40
60

STORM DRAIN G-1

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

DESIGN ___PAS___ CHECKED ___HI___
42-ENG SAVE DATE: ____
PLOT BY:Silva, Pete
PLOT DATE:3/2/2022 8:59:17 PM

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532
PETE SILVA 70,435 9/30/2022
PROJECT ENGINEER R.C.E. DATE

PETER A. SILVIA
NO 70435
CIVIL

STORM DRAIN PLAN & PROFILE - LINE G-1
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C31 OF C67
PLAN DATE
3/01/2022

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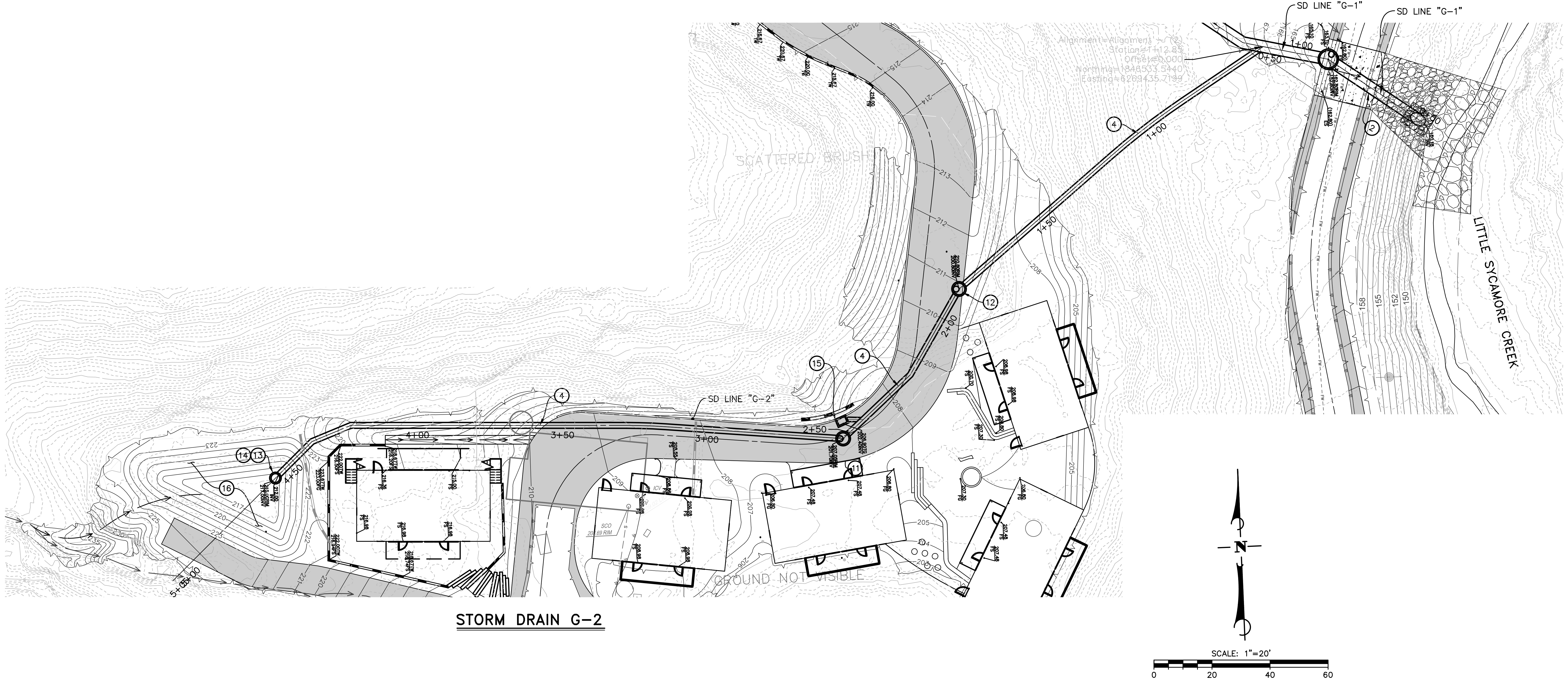
235
225
215
205
195
185
175
165
155
EXISTING SURFACE
PROPOSED GRADE
217.00 INV
STA. 4+55.21 218.00 M.H. RIM
STA. 4+37.37 213.09 HOR. BEND
STA. 4+22.88 212.03 HOR. BEND
212.00 INV
210.80 INV
209.74 INV
S=0.073
STA. 3+34.56 205.56 VERT. BEND
STA. 3+27.87 205.40 END HORIZ. CURVE
STA. 3+14.43 205.15 BEG. HORIZ. CURVE
203.27 INV
203.15 INV
202.90 INV
S=0.019
198.59' 24-IN RCP OR APPROVED EQUAL
STA. 2+53.13 207.05 M.H. RIM
STA. 2+43.67 206.90 INLET
STA. 2+21.21 203.51 HOR. BEND
STA. 1+87.21 210.86 M.H. RIM
INV 201.80
201.60 INV
202.40 INV
S=0.011
201.26 INV
INV 200.90
200.70 INV
61.91' 24-IN RCP OR APPROVED EQUAL
S=0.397
STA. 1+18.69 176.55 VERT. BEND END HORIZ. CURVE
INV 174.30
S=0.364
STA. 0+86.27 164.76 VERT. BEND BEG. HORZ. CURVE
INV 162.50
S=0.159
STA. 0+53.00 157.22 INV AT LINE "G-1"
STA 1+12.85 SD G-1 = STA 0+53 SD G-2
157.22 INV
98.94' 24-IN RCP OR APPROVED EQUAL
31.29' 24-IN RCP OR APPROVED EQUAL
SCALE: HORIZ. 1"=20' VERT. 1"=4'
5+00
4+50
4+00
3+50
3+00
2+50
2+00
1+50
1+00
0+50

STORM DRAIN G-2

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.
② PROPOSED 48" RCP STORM DRAIN.
③ PROPOSED 30" RCP STORM DRAIN
④ PROPOSED 24" RCP STORM DRAIN.
⑤ PROPOSED 24" HDPE STORM DRAIN.
⑥ PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.
⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
⑩ PROPOSED 6' PRE-CAST MANHOLE.
⑪ PROPOSED 5' PRE-CAST MANHOLE.
⑫ PROPOSED 4' PRE-CAST MANHOLE.
⑬ PROPOSED 3' PRE-CAST MANHOLE.
⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
⑮ PROPOSED DRAINAGE INLET.
⑯ PROPOSED DEBRIS BASIN.
⑰ PROPOSED CONCRETE ARIZONA CROSSING.
⑱ PROPOSED ASPHALT CONCRETE PAVEMENT.
⑲ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF $\frac{1}{2}$ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.


SD LINE "G-1"
SD LINE "G-1"
SD LINE "G-2"
LITTLE SYCAMORE CREEK
SCATTERED BRUSH
GROUND NOT VISIBLE
0+50
1+00
1+50
2+00
2+50
3+00
3+50
4+00
4+50
5+00
4
12
15
4
4
13
14
16
9
N
SCALE: 1"=20'
0
20
40
60

STORM DRAIN G-2

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

STORM DRAIN PLAN & PROFILE – LINE G-2
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C32 OF C67
PLAN DATE
3/01/2022

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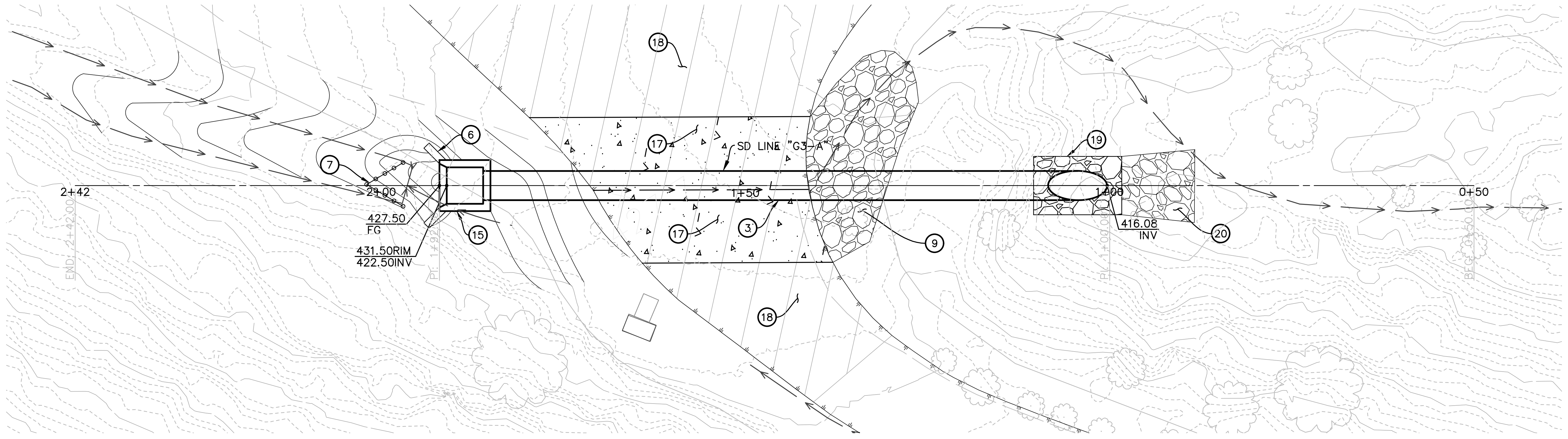
PLOT DATE: 3/2/2022 8:52:46 PM
DRAWING: v: \2042\active\2042586200\drawing\exhibit_files\2042586200_drainage_offsite.dwg

435
430
425
420
415
410
405
PROPOSED
FINISHED GRADE
STA. 1+88.50
431.50 5'X5' DROP INLET
STRUCTURE WITH WINGWALL
PROPOSED FINISHED
GRADE
EXISTING GRADE
427.50
FG
422.50
INV
S=0.071
90.89'
30-IN RCP
OR APPROVED EQUAL
STA. 1+08.45
419.44 GROUTED ROCK HEADWALL
WITH ROCK RIP RAP
PROPOSED GROUTED ROCK
HEADWALL/APRON PER
DETAIL "K", SHEET C59
PROPOSED STORMWATER OUTLET
BOULDER DISSIPATION STRUCTURE
PER ESA DETAILS. ROCK SHALL
CONSIST OF ½ TON (40%), 200 LB
(20%), 75 LB (20%), 25 LB (20%)
WITH NATIVE ALLUVIUM (VOID FILL.
416.08
INV
SCALE: HORIZ. 1"=10'
VERT. 1"=4'
2+50
2+00
1+50
1+00

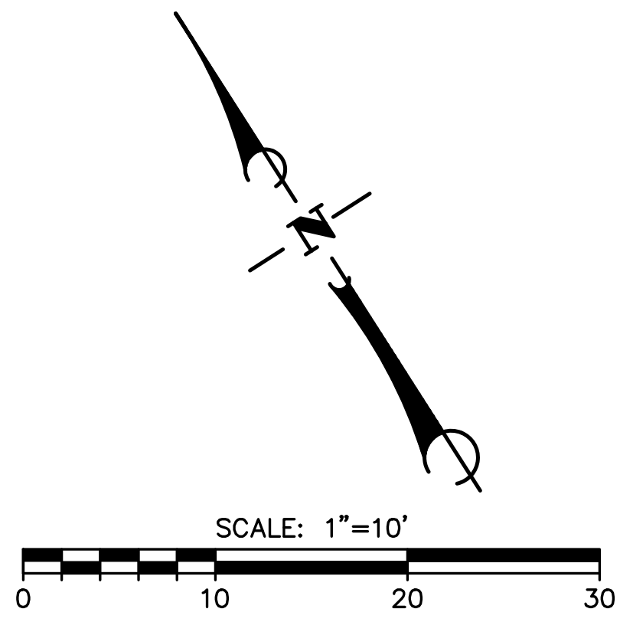
STORM DRAIN G3–A


18
17
SD LINE "G3-A"
6
7
2+42
2+00
1+50
1+00
0+50
427.50
FG
431.50RIM
422.50INV
15
17
3
9
19
416.08
INV
20
18
END. 2+42.00
PI. 1+92
PI. 1+00.00
BEG. 0+50.00

STORM DRAIN G3–A

CONSTRUCTION NOTES

① PROPOSED 60" RCP STORM DRAIN.
② PROPOSED 48" RCP STORM DRAIN.
③ PROPOSED 30" RCP STORM DRAIN
④ PROPOSED 24" RCP STORM DRAIN.
⑤ PROPOSED 24" HDPE STORM DRAIN.
⑥ PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
⑦ PROPOSED P.C.C. OVERFLOW STRUCTURE.
⑧ PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
⑨ PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
⑩ PROPOSED 6' PRE-CAST MANHOLE.
⑪ PROPOSED 5' PRE-CAST MANHOLE.
⑫ PROPOSED 4' PRE-CAST MANHOLE.
⑬ PROPOSED 3' PRE-CAST MANHOLE.
⑭ PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
⑮ PROPOSED DRAINAGE INLET.
⑯ PROPOSED DEBRIS BASIN.
⑰ PROPOSED CONCRETE ARIZONA CROSSING.
⑱ PROPOSED ASPHALT CONCRETE PAVEMENT MODIFICATIONS ON APPROACHES TO ARIZONA CROSSING.
⑲ PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59.
⑳ PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.


N
SCALE: 1"=10'
0
10
20
30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: ----
PLOT BY: Silvia, Pete
PLOT DATE: 3/2/2022 8:47:30 PM

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER · GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

REGISTERED PROFESSIONAL ENGINEER
PETER A. SILVIA
NO 70435
CIVIL
STATE OF CALIFORNIA

STORM DRAIN PLAN & PROFILE – LINE G3
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C33 OF C67
PLAN DATE
3/01/2022

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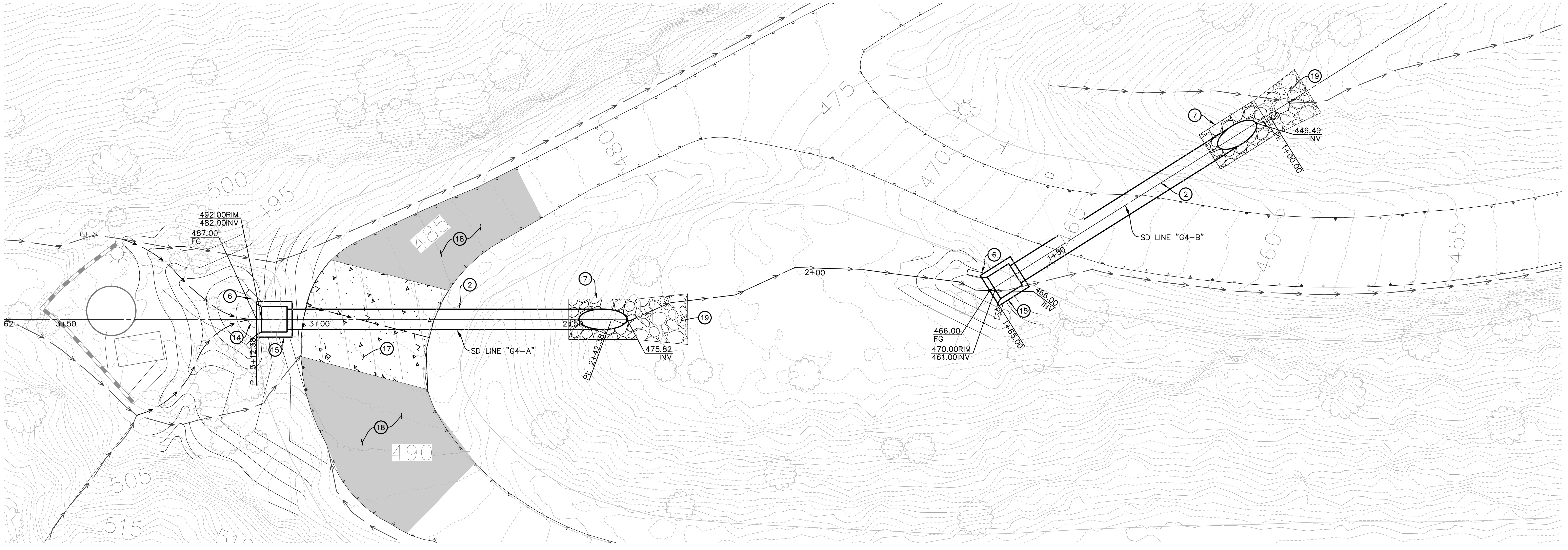
495
490
485
480
475
470
465
460
455
450
445
STA. 3+08.88
492.00 5'X5' DROP INLET
STRUCTURE WITH WINGWALL
PROPOSED FINISHED GRADE
EXISTING GRADE
487.00 FG
481.50 INV
S=0.080
STA. 2+48.84
481.00 GROUTED ROCK HEADWALL
WITH ROCK RIP RAP
PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59
475.82 INV
PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.
72.21'
48-IN RCP
OR APPROVED EQUAL
STA. 1+61.50
470.00 5'X5' DROP INLET
STRUCTURE WITH WINGWALL
PROPOSED GRADE
EXISTING GRADE
466.00 FG
460.00 INV
S=0.246
STA. 1+26.06
450.67 VERT. BEND
450.67 INV
STA. 1+11.70
454.14 GROUTED ROCK HEADWALL
WITH ROCK RIP RAP
PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59
S=0.051
INV 449.49
PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.
61.98'
48-IN RCP
OR APPROVED EQUAL
STORM DRAIN G4-A
STORM DRAIN G4-B
SCALE: HORIZ. 1"=10' VERT. 1"=4'
3+50
3+00
2+50
2+00
1+50
1+00
0+50


500
495
505
515
485
490
480
475
470
465
460
455
492.00RIM
482.00INV
487.00 FG
3+50
3+00
2+50
2+00
1+50
1+00
PI: 3+12.38
PI: 2+42.38
475.82 INV
SD LINE "G4-A"
SD LINE "G4-B"
466.00 INV
466.00 FG
470.00RIM
461.00INV
1+63.00
449.49 INV
2
6
7
14
15
17
18
19
62

STORM DRAIN G4-A

STORM DRAIN G4-B

CONSTRUCTION NOTES

1. PROPOSED 60" RCP STORM DRAIN.
2. PROPOSED 48" RCP STORM DRAIN.
3. PROPOSED 30" RCP STORM DRAIN
4. PROPOSED 24" RCP STORM DRAIN.
5. PROPOSED 24" HDPE STORM DRAIN.
6. PROPOSED P.C.C. HEADWALL WITH ROCK RACK.
7. PROPOSED GROUTED ROCK HEADWALL/APRON PER DETAIL "K", SHEET C59.
8. PROPOSED 6" SHD. 80 GALVANIZED PIPE TRASH RACK.
9. PROPOSED RIP-RAP OVER NON-WOVEN GEOTEXTILE.
10. PROPOSED 6' PRE-CAST MANHOLE.
11. PROPOSED 5' PRE-CAST MANHOLE.
12. PROPOSED 4' PRE-CAST MANHOLE.
13. PROPOSED 3' PRE-CAST MANHOLE.
14. PROPOSED D93C PIPE RISER WITH DEBRIS RACK CAGE PER CALTRANS STD. PLAN.
15. PROPOSED DRAINAGE INLET.
16. PROPOSED DEBRIS BASIN.
17. PROPOSED CONCRETE ARIZONA CROSSING.
18. PROPOSED ASPHALT CONCRETE PAVEMENT MODIFICATIONS ON APPROACHES TO ARIZONA CROSSING.
19. PROPOSED STORMWATER OUTLET BOULDER DISSIPATION STRUCTURE PER ESA DETAILS. ROCK SHALL CONSIST OF ½ TON (40%), 200 LB (20%), 75 LB (20%), 25 LB (20%) WITH NATIVE ALLUVIUM (VOID FILL.

SCALE: 1"=10'
0 10 20 30

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISION BLOCK	APPD.

PREPARED FOR:
CAMP HESS KRAMER · GINDLING HILLTOP CAMP
WILSHIRE BOULEVARD
TEMPLE CAMPS

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532

PETE SILVA	70,435	9/30/2022
PROJECT ENGINEER	R.C.E.	DATE

PETER A. SILVIA
NO 70435
CIVIL

STORM DRAIN PLAN & PROFILE – LINE G4
CAMP HESS KRAMER/GINDLING HILLTOP CAMP
WOOLSEY FIRE REBUILD
11495 & 11677 PACIFIC COAST HWY
VENTURA COUNTY, CA

PRELIMINARY

STANTEC PROJECT NO.
2042586200
SHEET
C34 OF C67
PLAN DATE
3/01/2022

DESIGN PAS CHECKED HI
42-ENG SAVE DATE: -----
PLOT BY: Silvia, Pete
PLOT DATE: 3/2/2022 8:49:36 PM

DRAWING: v:\2042\active\2042586200\drawing\exhibit_files\2042586200_drainage_offsite.dwg

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