



**COUNTY OF RIVERSIDE**

**GILMAN SPRINGS ROAD  
WIDENING AND SAFETY IMPROVEMENT  
PROJECT**

**Riverside County, California  
08-RIV-Gilman Springs Road  
HSIPL-5956(263)**

**LOCATION HYDRAULIC STUDY  
AND  
SUMMARY FLOODPLAIN ENCROACHMENT REPORT**

**PREPARED BY  
NCM ENGINEERING  
4740 GREEN RIVER ROAD, SUITE 218  
CORONA, CA 92880**

**MARCH 2019**

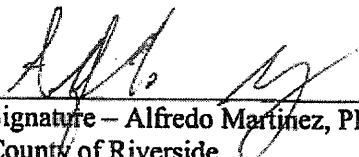
**SUMMARY FLOODPLAIN ENCROACHMENT REPORT\***

Dist. 8 Co. Riverside Rte. Gilman Springs Road P.M. N/A  
 Project No.: HSIP 5956(263) Bridge No. N/A  
 Limits: From 8,900' South of Alessandro Boulevard to 5,100' South of Bridge Street


Floodplain Description: San Jacinto River in Riverside County (Unincorporated Areas)  
FEMA Community Number 06245

- |   | No | Yes |
|---|----|-----|
| 1. Is the proposed action a longitudinal encroachment of the base floodplain?   |    | X   |
| 2. Are the risks associated with the implementation of the proposed action significant?   | X  |     |
| 3. Will the proposed action support probable incompatible floodplain development?   | X  |     |
| 4. Are there any significant impacts on natural and beneficial floodplain values?   | X  |     |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. | X  |     |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  | X  |     |
| 7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  |    | X   |

PREPARED BY:

  
 Signature – Alfredo Martinez, PE  
 County of Riverside

3/28/19  
 Date

*For*   
 Signature – David Lee  
 District 8 Local Assistance Planner

6-13-19  
 Date

\* Same as Figure 804.7B Floodplain Evaluation Report Summary located in Chapter 804 of the Highway Design Manual

County of Riverside

Gilman Springs Road  
Widening and Safety Improvement Project

HEC-RAS Calculations for Minor Floodplain Encroachment

SUMMARY

The proposed Gilman Springs Road Widening and Safety Improvement Project extends for 4.28 miles from 8,900 feet south of Alessandro Boulevard to 5,200 feet south of Bridge Street. Please see the attached Vicinity Map and Alignment Stationing Exhibit. The project would widen the striped median from 0-feet to 2-feet wide and widen the outside shoulders from 4-feet to 8-feet wide. The roadway pavement widening along the south (San Jacinto River) side is generally 6 feet. A limited length, 2,900 feet or 0.55 miles, of the project is within the previously mapped Zone AE of the San Jacinto River floodplain. Within this length the new roadway embankment would encroach from 2-feet to 12-feet into the approximately 9,800-foot wide floodplain. The new roadway embankment area would encroach from 0.71 SF to 27.77 SF into the approximate 68,900 SF river flow area.

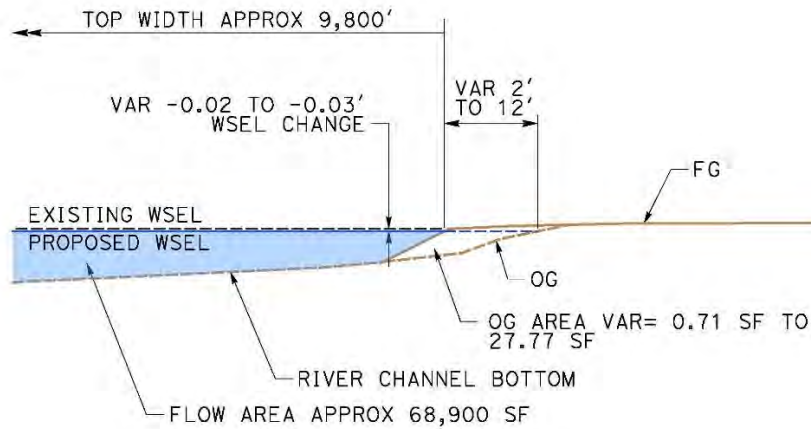


Figure 1 – Typical Embankment Encroachment into the San Jacinto River Floodplain

Please note: four additional cross sections were added to the HEC-RAS model to further define the physical conditions along the widened roadway that is within the floodplain.

A comparison of the HEC-RAS model outputs for the Existing – Before Widening Gilman Springs Road and Proposed – After Widening Gilman Springs Road follows this summary. Please note: the river flow rates (Q Total) listed in the comparison table are not constant but vary. This is because the HEC-RAS model is analyzing the river using unsteady flow data that uses a flow hydrograph as opposed to steady

flow data with a fixed peak discharge. In addition, the model contains very wide and shallow cross sections approaching Mystic Lake that introduce storage effects into the model, that also creates changes in the river flow rates. Even with these sophisticated modeling techniques, the water surface changes are very small (i.e. -0.03' max). Please see the following Exhibits.

In conclusion, these results indicate that this floodplain encroachment can be classified as “Negligible”.

**LOCATION HYDRAULIC STUDY FORM \***

Dist. 8 Co. Riverside Rte. Gilman Springs Road P.M. N/A  
EA \_\_\_\_\_ Bridge No. \_\_\_\_\_

**Floodplain Description:**

The project is in the San Jacinto River Watershed. The project falls within mapped Zone AE floodplain. The applicable FEMA map numbers for the project are 06065C1460H, 06065C0795H, 06065C0790H, and 06065C1455H.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

The proposed Gilman Springs Road Widening and Safety Improvement Project extends for 4.28 miles from 8,900 feet south of Alessandro Boulevard to 5,200 feet south of Bridge Street. Please see the attached Vicinity Map and Alignment Stationing Exhibit. The project would widen the striped median from 0-feet to 2-feet wide and widen the outside shoulders from 4-feet to 8-feet wide. The road widening along the south (San Jacinto River) side is generally 6 feet. A limited length, 2,900 feet or .55 miles, of the project is within the previously mapped Zone AE of the San Jacinto River floodplain. Please note: four additional cross sections were added to the HEC-RAS model to further define the physical conditions along the widened roadway that is within the floodplain. Please see the attached exhibits.

2. ADT: Current 15,000 VPD Projected 15,000 VPD

3. Hydraulic Data: Base Flood Q<sub>100</sub>= 62,068 CFS

Please note: the flow hydrograph contains a peak flow of 62,068 CFS; however, this flow is at a different location than our minor encroachment. The max flow for our location is 34,714.16 CFS.

WSE<sub>100</sub>= N/A The flood of record, if greater than Q<sub>100</sub>:

Q= N/A CFS WSE= N/A

Overtopping flood Q= N/A CFS WSE= N/A

Are NFIP maps and studies available? YES x NO \_\_\_\_\_

4. Is the highway location alternative within a regulatory floodway?

YES x NO \_\_\_\_\_

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Please see the attached:

- Vicinity Map and Alignment Stationing Exhibit
- Flood Mapping Exhibit with Firm Panel Numbers
- HEC-RAS Existing Model Outputs
- HEC-RAS Proposed Model Outputs
- Comparison of HEC-RAS Model Outputs
- Floodplain Limits Map (Sheet 3 of 7 & 4 of 7)
- San Jacinto River Profile Map

Potential Q<sub>100</sub> backwater damages:

- A. Residences? NO x YES \_\_\_\_\_  
B. Other Bldgs? NO x YES \_\_\_\_\_  
C. Crops? NO x YES \_\_\_\_\_  
D. Natural and beneficial  
Floodplain Values? NO x YES \_\_\_\_\_

6. Type of Traffic:

- A. Emergency supply or evacuation route? NO \_\_\_\_\_ YES x \_\_\_\_\_  
B. Emergency vehicle access? NO \_\_\_\_\_ YES x \_\_\_\_\_  
C. Practicable detour available? NO x YES \_\_\_\_\_  
D. School bus or mail route? NO \_\_\_\_\_ YES x \_\_\_\_\_

7. Estimated duration of traffic interruption for 100-year event hours: N/A


8. Estimated value of Q<sub>100</sub> flood damages (if any) – moderate risk level.

- A. Roadway \$ N/A  
B. Property \$ N/A  
Total \$ N/A

9. Assessment of Level of Risk Low x \_\_\_\_\_  
Moderate \_\_\_\_\_  
High \_\_\_\_\_

For High Risk projects, during design phase, additional Design Study Risk Analysis  
May be necessary to determine design alternative.

Signature – Consultant Hydraulic Engineer,  
(Item numbers 3,4,5,7,9)

  
Date 3/1/2019  
KIRAN K. PALLACHULLA, CFM

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO x YES \_\_\_\_\_

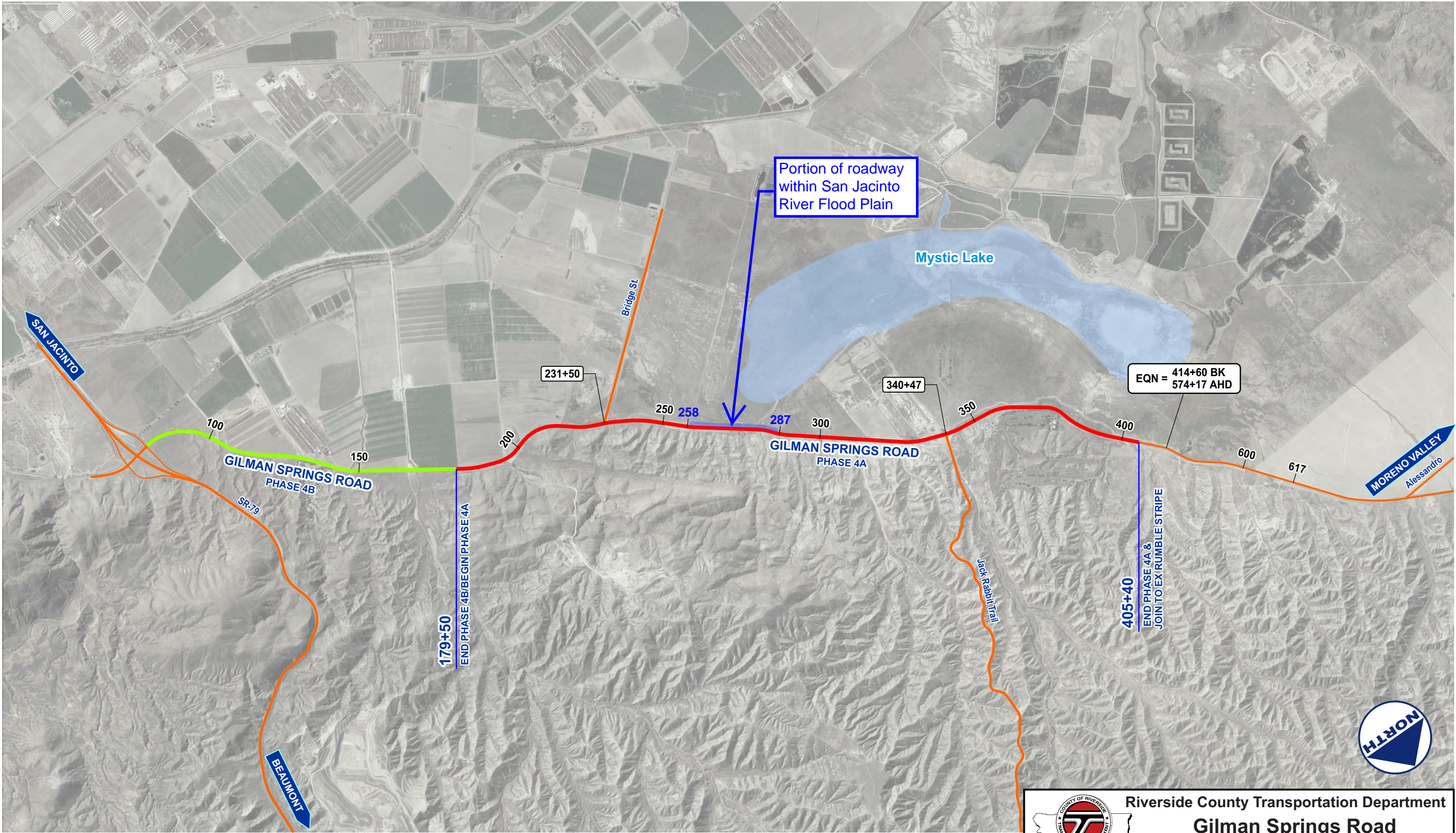
If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – Consultant Project Engineer Michael Crull Date 3.5.19  
(Item numbers 1,2,6,8)

\* Same as Figure 804.7A Technical Information for Location Hydraulic Study located in Chapter 804 of the Highway Design Manual






**Riverside County Transportation Department**  
**Gilman Springs Road**  
 Widening and Safety Improvement Project  
**Vicinity Map & Alignment Stationing**



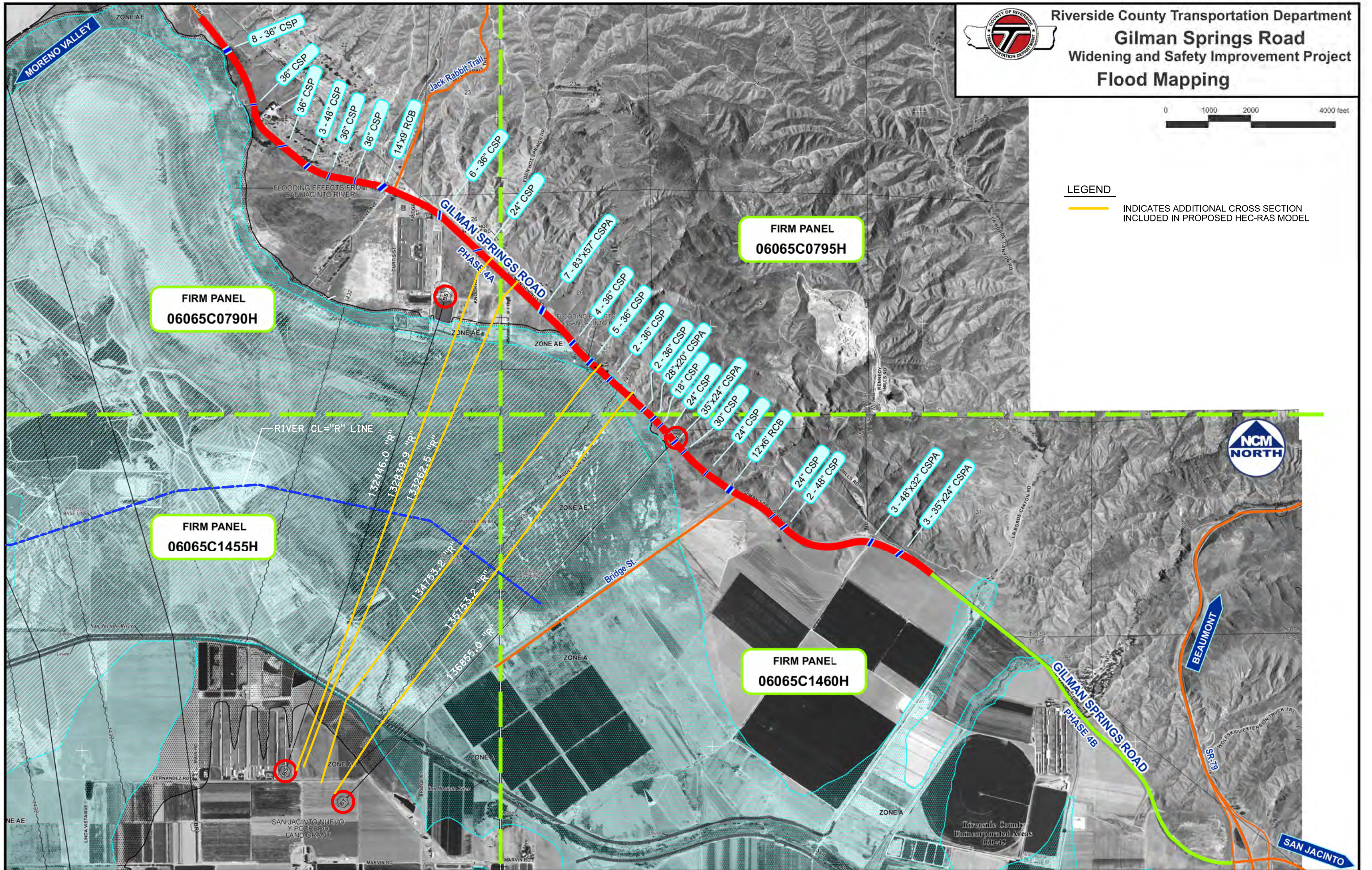


Riverside County Transportation Department  
**Gilman Springs Road**  
 Widening and Safety Improvement Project  
**Flood Mapping**



**LEGEND**

INDICATES ADDITIONAL CROSS SECTION INCLUDED IN PROPOSED HEC-RAS MODEL



## HEC-RAS Existing Model Outputs

HEC-RAS Plan: REMLF US FW River: SJR Stage III Reach: 4 Profile: Max WS

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
4	135810	Max WS	34714.16	1424.00	1432.72		1432.72	0.000009	0.54	68182.44	8837.06	0.03
4	134209	Max WS	34661.21	1424.00	1432.71		1432.71	0.000012	0.59	61198.16	9190.08	0.04
4	132754	Max WS	33179.72	1424.00	1432.69		1432.70	0.000009	0.52	66762.67	9189.08	0.03
4	131400	Max WS	33348.33	1424.00	1432.68		1432.69	0.000009	0.54	65663.92	8579.98	0.03
4	130187	Max WS	33343.98	1424.00	1432.67		1432.68	0.000010	0.56	62619.80	8186.37	0.03
4	128536	Max WS	33306.10	1424.00	1432.66		1432.66	0.000008	0.51	67745.21	8789.55	0.03
4	126682	Max WS	33522.99	1424.00	1432.65		1432.65	0.000003	0.29	116639.70	14697.00	0.02
4	125557	Max WS	32613.08	1424.00	1432.65		1432.65	0.000005	0.36	94638.92	13616.00	0.02
4	124436	Max WS	32652.37	1424.00	1432.64		1432.64	0.000006	0.38	88173.61	12477.00	0.02
4	123556	Max WS	32684.24	1424.00	1432.64		1432.64	0.000007	0.41	80856.99	12030.64	0.03
4	122633	Max WS	32715.36	1424.00	1432.63		1432.63	0.000013	0.55	59370.75	8666.30	0.04
4	122303	Max WS	32721.93	1423.95	1432.61		1432.62	0.000030	0.81	40644.07	6367.00	0.06
4	121725	Max WS	32719.11	1423.90	1432.58		1432.59	0.000052	1.05	31337.48	4980.00	0.07
4	120989	Max WS	32714.76	1423.85	1432.54		1432.55	0.000057	1.07	30735.18	5040.00	0.08
4	120224	Max WS	32705.57	1422.55	1432.50		1432.52	0.000042	0.97	34654.80	5418.00	0.07
4	119523	Max WS	32688.74	1422.55	1432.48		1432.49	0.000031	0.90	37006.77	5131.00	0.06
4	118788	Max WS	32357.21	1423.70	1432.45		1432.46	0.000046	1.02	32265.47	4988.00	0.07
4	118055	Max WS	32360.84	1423.65	1432.42		1432.43	0.000048	1.04	31587.08	4843.00	0.07
4	117245	Max WS	32362.96	1422.55	1432.37		1432.39	0.000057	1.09	29713.44	4801.00	0.08
4	116452	Max WS	32365.29	1423.55	1432.34		1432.36	0.000038	0.97	33832.28	5051.00	0.06
4	116114	Max WS	32362.29	1422.55	1432.32		1432.33	0.000022	0.80	40509.72	5064.00	0.05
4	114881	Max WS	32357.35	1422.55	1432.30		1432.31	0.000016	0.75	43939.21	4880.00	0.04
4	113917	Max WS	32375.77	1422.55	1432.29		1432.30	0.000019	0.83	39668.55	4277.00	0.05
4	112770	Max WS	32396.29	1422.55	1432.27		1432.28	0.000019	0.84	38849.86	4062.00	0.05
4	111443	Max WS	32389.32	1422.55	1432.23		1432.25	0.000027	0.99	32680.95	3379.00	0.06
4	110581	Max WS	32386.06	1422.55	1432.20		1432.22	0.000039	1.20	26956.99	2795.00	0.07
4	110066	Max WS	32384.29	1422.55	1432.17		1432.20	0.000050	1.31	24709.34	2677.00	0.08
4	109540	Max WS	32380.06	1420.55	1432.11		1432.16	0.000102	1.93	19866.29	2741.00	0.11
4	109225	Max WS	32378.59	1418.93	1431.99		1432.10	0.000353	3.81	13816.53	3010.00	0.21
4	109150		Mult Open									
4	109097	Max WS	31834.99	1418.93	1427.91		1427.98	0.000308	2.61	14400.46	2904.10	0.18
4	108755	Max WS	31833.54	1420.00	1427.72		1427.87	0.000476	3.16	10509.24	2840.16	0.22
4	108324	Max WS	31655.44	1420.00	1427.57		1427.67	0.000345	2.59	12708.40	2697.15	0.19
4	107824	Max WS	31655.58	1418.00	1427.47		1427.53	0.000194	2.07	16530.36	2838.21	0.14
4	107324	Max WS	31651.32	1418.00	1427.35		1427.43	0.000240	2.31	15026.49	2674.96	0.16
4	106824	Max WS	31477.32	1416.00	1427.24		1427.31	0.000236	2.35	15253.91	2804.57	0.16
4	106324	Max WS	31475.30	1420.00	1427.12		1427.19	0.000237	2.15	15270.58	2806.29	0.15
4	105824	Max WS	31302.00	1418.00	1426.99		1427.06	0.000274	2.62	14455.69	2759.51	0.17
4	105324	Max WS	31302.46	1418.00	1426.88		1426.94	0.000212	2.12	16189.34	2995.78	0.15
4	104824	Max WS	31132.10	1418.00	1426.74		1426.81	0.000316	2.37	14437.28	3025.17	0.18
4	104324	Max WS	31131.18	1418.00	1426.60		1426.66	0.000278	2.69	15827.11	3467.06	0.17
4	103824	Max WS	31128.29	1418.00	1426.51		1426.56	0.000156	1.85	18943.49	3547.89	0.13
4	103324	Max WS	30973.61	1416.00	1426.44		1426.48	0.000137	1.84	20408.30	3903.84	0.12
4	102823	Max WS	30975.67	1416.00	1426.38		1426.42	0.000132	1.85	20865.13	4003.45	0.12
4	102323	Max WS	31250.73	1416.00	1426.31		1426.35	0.000132	1.89	20340.57	3719.39	0.12
4	101823	Max WS	31248.00	1420.00	1426.23		1426.28	0.000162	1.55	18831.36	3592.53	0.12
4	101323	Max WS	31245.24	1418.00	1426.17		1426.20	0.000131	1.80	20115.11	3533.59	0.12
4	100823	Max WS	31240.64	1416.00	1426.10		1426.14	0.000128	1.80	19689.06	3277.13	0.12
4	100323	Max WS	31120.13	1414.00	1426.04		1426.07	0.000130	1.95	19613.55	3298.00	0.12
4	99823	Max WS	31120.51	1414.00	1425.98		1426.02	0.000103	1.75	20696.19	3178.15	0.11
4	99323	Max WS	31121.88	1416.00	1425.93		1425.96	0.000114	1.79	20729.90	3449.88	0.11
4	98823	Max WS	31122.22	1414.00	1425.87		1425.91	0.000118	1.82	19989.81	3246.91	0.11
4	98323	Max WS	31120.53	1414.00	1425.80		1425.84	0.000133	1.93	19077.22	3145.84	0.12
4	97823	Max WS	31120.15	1414.00	1425.74		1425.78	0.000124	1.88	20117.66	3422.65	0.12
4	97323	Max WS	31119.47	1414.00	1425.68		1425.72	0.000120	1.86	19393.26	3011.63	0.11
4	96823	Max WS	31117.49	1414.00	1425.60		1425.65	0.000152	2.12	17852.90	2972.43	0.13
4	96323	Max WS	31113.52	1414.00	1425.52		1425.57	0.000163	2.28	17716.24	3072.02	0.14
4	95823	Max WS	31044.88	1414.00	1425.45		1425.50	0.000140	2.15	18288.79	2960.80	0.13
4	95323	Max WS	31046.64	1414.00	1425.38		1425.42	0.000150	2.11	17924.30	2956.28	0.13
4	94823	Max WS	31049.32	1414.00	1425.31		1425.36	0.000124	2.05	18675.95	2835.65	0.12
4	94323	Max WS	31052.69	1414.00	1425.25		1425.29	0.000133	2.00	18172.91	2788.88	0.12
4	93823	Max WS	31053.88	1414.00	1425.16		1425.21	0.000177	2.34	16111.74	2570.24	0.14
4	93323	Max WS	31054.74	1414.00	1425.07		1425.13	0.000171	2.37	16201.90	2537.45	0.14
4	92823	Max WS	31055.69	1412.00	1424.99		1425.04	0.000155	2.28	17299.49	2777.43	0.13
4	92323	Max WS	31049.49	1414.00	1424.88		1424.95	0.000226	2.56	15395.70	2802.08	0.16
4	92043	Max WS	31038.92	1413.49	1424.76	1421.84	1424.87	0.000352	3.42	12955.10	2620.26	0.20
4	91967		Bridge									
4	91845	Max WS	31026.20	1413.49	1424.43		1424.56	0.000456	3.82	12034.98	2717.65	0.23
4	91705	Max WS	31041.87	1414.00	1424.41		1424.49	0.000295	2.94	14014.10	2685.00	0.18
4	91309	Max WS	31046.03	1414.00	1424.16		1424.32	0.000656	4.21	10345.65	2421.46	0.27
4	90808	Max WS	31022.20	1414.00	1423.95		1424.07	0.000370	3.04	12312.08	2490.64	0.20
4	90306	Max WS	31023.10	1412.00	1423.63		1423.84	0.000676	4.18	9582.65	2420.79	0.27
4	89805	Max WS	31024.78	1412.00	1423.01		1423.33	0.001386	5.97	7586.42	2439.69	0.39
4	89304	Max WS	30990.39	1412.00	1422.41		1422.74	0.001125	5.64	8190.83	2638.00	0.35
4	88803	Max WS	30932.91	1412.00	1421.70		1422.06	0.001344	5.61	6485.85	1321.33	0.38
4	88301	Max WS	27965.71	1412.00	1421.30		1421.45	0.000778	4.31	9462.73	3071.31	0.29
4	87801	Max WS	25597.71	1412.00	1421.02		1421.12	0.000464	3.28	10681.90	2550.15	0.22
4	87301	Max WS	24332.57	1412.00	1420.87		1420.93	0.000282	2.47	13213.21	3255.20	0.17
4	86801	Max WS	23721.06	1412.00	1420.81		1420.83	0.000094	1.47	20817.06	4526.00	0.10

## HEC-RAS Existing Model Outputs

HEC-RAS Plan: REMLF US FW River: SJR Stage III Reach: 4 Profile: Max WS (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
4	86301	Max WS	23426.14	1412.00	1420.77		1420.79	0.000078	1.40	22772.29	5052.00	0.09
4	85801	Max WS	23424.78	1412.00	1420.74		1420.75	0.000056	1.13	25827.35	5402.00	0.08
4	85301	Max WS	23135.45	1410.00	1420.72		1420.73	0.000050	1.05	27361.56	5836.00	0.07
4	84801	Max WS	23133.90	1412.00	1420.69		1420.70	0.000048	0.99	28455.40	6253.00	0.07
4	84301	Max WS	22851.39	1412.00	1420.67		1420.68	0.000044	0.98	29631.91	6524.00	0.07
4	83801	Max WS	22851.74	1412.00	1420.65		1420.66	0.000045	0.95	30149.76	6994.00	0.07
4	83301	Max WS	22587.27	1410.00	1420.63		1420.64	0.000039	0.85	31856.68	7344.00	0.06
4	82801	Max WS	22584.85	1410.00	1420.62		1420.62	0.000026	0.73	36099.27	7610.00	0.05
4	82301	Max WS	22585.73	1410.00	1420.60		1420.61	0.000025	0.88	36659.68	7674.00	0.05
4	81801	Max WS	22585.56	1408.00	1420.59		1420.60	0.000026	0.79	37396.23	7986.00	0.05
4	81301	Max WS	22616.84	1410.00	1420.58		1420.59	0.000021	0.75	39891.05	8020.00	0.05
4	80801	Max WS	22650.83	1408.00	1420.57		1420.58	0.000023	0.82	41295.61	9736.00	0.05
4	80300	Max WS	22474.34	1410.00	1420.56		1420.57	0.000015	0.62	45950.97	8924.00	0.04
4	79800	Max WS	22508.59	1408.00	1420.55		1420.56	0.000016	0.68	43658.69	8187.00	0.04
4	79300	Max WS	22547.66	1406.00	1420.54		1420.55	0.000020	0.67	39959.34	7801.00	0.05
4	78800	Max WS	22551.09	1406.00	1420.53		1420.54	0.000031	0.97	33711.70	7214.00	0.06
4	78301	Max WS	22549.76	1406.00	1420.51		1420.52	0.000030	0.89	33018.52	6716.00	0.06
4	77810	Max WS	22545.41	1406.00	1420.50		1420.51	0.000024	1.14	34757.18	6439.00	0.06
4	77700		Mult Open									
4	77477	Max WS	22545.41	1406.00	1420.44		1420.45	0.000020	0.86	37747.16	6849.00	0.05
4	76801	Max WS	22383.40	1406.00	1420.43		1420.44	0.000017	0.70	39182.42	6566.00	0.04
4	76301	Max WS	22379.56	1404.00	1420.42		1420.43	0.000016	0.70	39256.13	6551.00	0.04
4	75801	Max WS	22377.45	1404.00	1420.41		1420.42	0.000018	0.74	37438.36	6311.00	0.05
4	75301	Max WS	22379.82	1406.00	1420.40		1420.41	0.000019	0.82	37134.96	6422.00	0.05
4	74801	Max WS	22381.73	1404.00	1420.39		1420.40	0.000019	0.86	36739.24	6403.00	0.05
4	74251	Max WS	22379.33	1404.00	1420.38		1420.39	0.000024	0.97	34511.52	6357.00	0.05
4	73980	Max WS	22378.14	1406.00	1420.37		1420.38	0.000033	1.03	30573.70	5941.00	0.06
4	73901	Max WS	22378.06	1404.00	1420.37	1416.45	1420.38	0.000032	1.22	30777.89	5941.00	0.06
4	73850		Bridge									
4	73765	Max WS	22378.06	1404.00	1420.37		1420.37	0.000014	0.80	39394.94	5770.00	0.04
4	73357	Max WS	22373.72	1406.00	1420.36		1420.37	0.000022	0.87	34075.71	5888.00	0.05
4	72801	Max WS	22265.17	1406.00	1420.35		1420.35	0.000022	0.87	34823.36	6244.00	0.05
4	72301	Max WS	22266.65	1406.00	1420.34		1420.35	0.000015	0.76	40510.96	6729.00	0.04
4	71801	Max WS	22267.61	1404.00	1420.33		1420.34	0.000012	0.71	43548.59	7084.00	0.04
4	71301	Max WS	22352.82	1404.00	1420.33		1420.33	0.000014	0.72	41123.95	6758.00	0.04
4	70801	Max WS	22271.68	1404.00	1420.32		1420.32	0.000014	0.76	39825.53	6280.00	0.04
4	70301	Max WS	22271.24	1404.00	1420.31		1420.32	0.000014	0.78	40524.27	6304.00	0.04
4	69801	Max WS	22271.49	1404.00	1420.31		1420.31	0.000009	0.75	45143.59	6573.00	0.03
4	69301	Max WS	22275.43	1404.00	1420.30		1420.31	0.000013	0.69	39159.54	6523.00	0.04
4	68801	Max WS	22282.97	1406.00	1420.29		1420.30	0.000018	0.88	34217.48	6237.79	0.05
4	68220	Max WS	22288.48	1404.00	1420.28		1420.29	0.000015	0.86	33517.42	5162.00	0.04
4	67801	Max WS	22290.02	1404.00	1420.26		1420.28	0.000040	1.33	22400.93	3374.00	0.07
4	67301	Max WS	22290.57	1404.00	1420.22		1420.25	0.000071	1.79	17066.64	2644.00	0.09
4	67061	Max WS	22290.83	1404.00	1420.20	1415.20	1420.23	0.000080	1.94	15924.95	2294.83	0.10
4	66960		Bridge									
4	66848	Max WS	22290.83	1404.00	1420.18		1420.21	0.000046	1.65	18759.97	2294.83	0.08
4	66801	Max WS	22290.82	1402.00	1420.18		1420.21	0.000064	1.93	17541.79	2535.00	0.09
4	66311	Max WS	22289.86	1404.00	1420.14		1420.17	0.000064	1.79	15980.39	2274.00	0.09
4	65801	Max WS	22287.98	1404.00	1420.06		1420.13	0.000130	2.48	11393.89	1504.00	0.13
4	65301	Max WS	22287.79	1404.00	1419.99		1420.06	0.000141	2.65	11250.20	1559.00	0.13
4	64802	Max WS	22287.52	1404.00	1419.92		1419.99	0.000139	2.68	11500.97	1659.00	0.13
4	64303	Max WS	22286.66	1406.00	1419.84		1419.92	0.000165	2.81	10963.90	1668.00	0.14
4	63804	Max WS	22285.71	1404.00	1419.75		1419.84	0.000169	2.92	10195.03	1410.00	0.15
4	63304	Max WS	22284.92	1406.00	1419.69		1419.76	0.000120	2.40	11200.10	1299.00	0.12
4	62804	Max WS	22284.46	1404.00	1419.63		1419.70	0.000128	2.47	10685.35	1246.00	0.13
4	62304	Max WS	22283.86	1404.00	1419.55		1419.63	0.000149	2.87	9997.64	1167.00	0.14
4	61805	Max WS	22283.21	1404.00	1419.48		1419.56	0.000138	2.71	10171.18	1204.00	0.13
4	61314	Max WS	22280.89	1404.00	1419.07		1419.46	0.000519	5.63	4666.61	445.07	0.26
4	60808	Max WS	22280.99	1404.00	1418.51		1419.13	0.000934	6.93	3750.48	427.00	0.35
4	60308	Max WS	22281.13	1404.00	1418.18		1418.68	0.000791	6.30	4162.05	482.00	0.32
4	59807	Max WS	22281.13	1404.00	1417.59		1418.19	0.001193	7.81	3757.47	473.00	0.39
4	59314	Max WS	22281.78	1402.00	1416.98		1417.62	0.001354	8.49	3596.78	458.00	0.42
4	58817	Max WS	22281.49	1400.00	1415.32		1416.64	0.002334	11.56	2495.24	271.00	0.55
4	58331	Max WS	22281.50	1400.00	1414.36		1415.51	0.002313	11.14	2939.58	469.11	0.55
4	57845	Max WS	22281.51	1399.20	1412.91		1414.26	0.002928	12.36	2674.44	426.57	0.61
4	57346	Max WS	22281.40	1398.00	1412.17		1412.97	0.001849	9.68	3285.58	479.62	0.48
4	56848	Max WS	22281.09	1397.50	1411.84		1412.25	0.000925	6.56	4663.57	720.96	0.34
4	56349	Max WS	22281.05	1396.00	1410.91		1411.67	0.001523	8.96	3364.98	439.81	0.44
4	55849	Max WS	22281.16	1395.50	1409.77		1410.85	0.002057	10.49	2885.39	387.83	0.51
4	55349	Max WS	22281.12	1395.00	1407.55		1409.35	0.004337	13.89	2250.59	364.67	0.73
4	54849	Max WS	22280.68	1394.00	1407.08		1407.70	0.001481	8.17	3787.97	593.20	0.43
4	54349	Max WS	22280.16	1392.00	1405.96		1406.94	0.001795	9.23	3052.95	429.36	0.47
4	53850	Max WS	22279.86	1390.00	1404.79	1401.28	1405.97	0.002004	9.70	2614.83	283.73	0.49

## HEC-RAS Proposed Model Outputs

HEC-RAS Plan: REMLF US FW River: SJR Stage III Reach: 4 Profile: Max WS

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
4	135810	Max WS	34714.16	1424.00	1432.70		1432.70	0.000009	0.54	67961.30	8837.06	0.03
4	135753.2	Max WS	34693.28	1424.00	1432.69		1432.70	0.000009	0.55	69605.66	10507.28	0.03
4	134753.2	Max WS	34665.93	1424.00	1432.69		1432.69	0.000008	0.52	72843.45	10650.53	0.03
4	134209	Max WS	32920.63	1424.00	1432.68		1432.69	0.000011	0.56	60994.28	9183.05	0.04
4	133262.5	Max WS	32988.22	1424.00	1432.68		1432.68	0.000007	0.48	73510.87	10222.07	0.03
4	132839.9	Max WS	33057.91	1424.00	1432.68		1432.68	0.000008	0.50	70967.78	9963.16	0.03
4	132754	Max WS	33130.73	1424.00	1432.67		1432.68	0.000009	0.52	66578.73	9187.44	0.03
4	131400	Max WS	33299.18	1424.00	1432.66		1432.67	0.000009	0.54	65483.77	8579.76	0.03
4	130187	Max WS	33287.04	1424.00	1432.65		1432.66	0.000010	0.56	62455.93	8186.22	0.03
4	128536	Max WS	32127.19	1424.00	1432.64		1432.64	0.000008	0.49	67559.59	8789.55	0.03
4	126682	Max WS	32486.51	1424.00	1432.63		1432.63	0.000003	0.28	116345.50	14697.00	0.02
4	125557	Max WS	32521.21	1424.00	1432.63		1432.63	0.000005	0.36	94353.04	13616.00	0.02
4	124436	Max WS	32557.24	1424.00	1432.62		1432.62	0.000006	0.38	87923.80	12477.00	0.02
4	123556	Max WS	32574.34	1424.00	1432.62		1432.62	0.000007	0.41	80616.14	12030.64	0.03
4	122633	Max WS	32587.73	1424.00	1432.61		1432.61	0.000013	0.54	59197.25	8666.30	0.04
4	122303	Max WS	32588.88	1423.95	1432.59		1432.60	0.000031	0.81	40516.60	6367.00	0.06
4	121725	Max WS	32582.72	1423.90	1432.55		1432.57	0.000052	1.05	31232.92	4980.00	0.07
4	120989	Max WS	32571.44	1423.85	1432.51		1432.53	0.000057	1.07	30629.36	5040.00	0.08
4	120224	Max WS	32203.28	1422.55	1432.48		1432.50	0.000041	0.96	34546.99	5418.00	0.07
4	119523	Max WS	32208.03	1422.55	1432.46		1432.47	0.000030	0.89	36904.05	5131.00	0.06
4	118788	Max WS	32211.92	1423.70	1432.43		1432.44	0.000046	1.02	32165.61	4988.00	0.07
4	118055	Max WS	32215.42	1423.65	1432.39		1432.41	0.000048	1.04	31485.40	4843.00	0.07
4	117245	Max WS	32215.20	1422.55	1432.35		1432.37	0.000057	1.09	29619.57	4801.00	0.08
4	116452	Max WS	32210.39	1423.55	1432.32		1432.33	0.000038	0.97	33729.77	5051.00	0.06
4	116114	Max WS	32204.36	1422.55	1432.30		1432.31	0.000022	0.80	40408.34	5064.00	0.05
4	114881	Max WS	32199.40	1422.55	1432.28		1432.29	0.000016	0.75	43841.52	4880.00	0.04
4	113917	Max WS	32214.25	1422.55	1432.27		1432.28	0.000019	0.83	39582.93	4277.00	0.05
4	112770	Max WS	32228.22	1422.55	1432.25		1432.26	0.000019	0.84	38768.54	4062.00	0.05
4	111443	Max WS	32217.88	1422.55	1432.21		1432.23	0.000026	0.99	32613.72	3379.00	0.06
4	110581	Max WS	32210.91	1422.55	1432.18		1432.20	0.000039	1.20	26901.38	2795.00	0.07
4	110066	Max WS	32206.11	1422.55	1432.15		1432.17	0.000050	1.31	24655.74	2677.00	0.08
4	109540	Max WS	32202.34	1420.55	1432.09		1432.14	0.000102	1.92	19814.10	2741.00	0.11
4	109225	Max WS	32200.96	1418.93	1431.97		1432.08	0.000354	3.81	13756.27	3010.00	0.21
4	109150		Multi Open									
4	109097	Max WS	31693.92	1418.93	1427.89		1427.97	0.000308	2.61	14356.86	2904.00	0.18
4	108755	Max WS	31518.36	1420.00	1427.70		1427.85	0.000471	3.14	10478.50	2840.07	0.22
4	108324	Max WS	31517.76	1420.00	1427.55		1427.65	0.000346	2.59	12669.93	2697.06	0.19
4	107824	Max WS	31515.82	1418.00	1427.46		1427.51	0.000194	2.07	16482.20	2838.11	0.14
4	107324	Max WS	31343.43	1418.00	1427.34		1427.41	0.000237	2.30	14983.72	2674.89	0.16
4	106824	Max WS	31342.36	1416.00	1427.22		1427.29	0.000236	2.35	15206.32	2804.46	0.16
4	106324	Max WS	31171.84	1420.00	1427.11		1427.17	0.000235	2.14	15225.70	2806.22	0.15
4	105824	Max WS	31171.97	1418.00	1426.97		1427.05	0.000275	2.62	14411.22	2759.44	0.17
4	105324	Max WS	31169.15	1418.00	1426.87		1426.93	0.000212	2.12	16138.51	2995.78	0.15
4	104824	Max WS	31004.34	1418.00	1426.72		1426.79	0.000316	2.37	14388.91	3025.09	0.18
4	104324	Max WS	31002.71	1418.00	1426.58		1426.65	0.000279	2.69	15771.67	3466.98	0.17
4	103824	Max WS	30842.63	1418.00	1426.50		1426.54	0.000155	1.84	18883.29	3547.81	0.13
4	103324	Max WS	30844.86	1416.00	1426.43		1426.47	0.000137	1.84	20345.87	3903.84	0.12
4	102823	Max WS	30845.21	1416.00	1426.36		1426.40	0.000132	1.85	20801.11	4003.35	0.12
4	102323	Max WS	31119.60	1416.00	1426.30		1426.33	0.000132	1.89	20281.09	3719.39	0.12
4	101823	Max WS	31117.11	1420.00	1426.22		1426.26	0.000162	1.55	18773.48	3592.53	0.12
4	101323	Max WS	31112.93	1418.00	1426.15		1426.19	0.000131	1.80	20054.72	3533.43	0.12
4	100823	Max WS	30983.77	1416.00	1426.08		1426.12	0.000127	1.79	19636.66	3277.13	0.12
4	100323	Max WS	30987.53	1414.00	1426.02		1426.06	0.000130	1.95	19560.82	3298.00	0.12
4	99823	Max WS	30988.88	1414.00	1425.97		1426.00	0.000103	1.75	20645.36	3178.08	0.11
4	99323	Max WS	30986.43	1416.00	1425.91		1425.95	0.000114	1.79	20678.11	3449.81	0.11
4	98823	Max WS	30984.09	1414.00	1425.85		1425.89	0.000118	1.82	19937.89	3246.84	0.11
4	98323	Max WS	30981.42	1414.00	1425.79		1425.83	0.000133	1.93	19026.91	3145.77	0.12
4	97823	Max WS	30977.89	1414.00	1425.73		1425.76	0.000124	1.88	20062.92	3422.55	0.12
4	97323	Max WS	30973.83	1414.00	1425.66		1425.70	0.000120	1.86	19345.11	3011.55	0.11
4	96823	Max WS	30969.86	1414.00	1425.59		1425.64	0.000152	2.11	17805.37	2972.36	0.13
4	96323	Max WS	30903.65	1414.00	1425.51		1425.56	0.000162	2.27	17670.11	3071.95	0.14
4	95823	Max WS	30905.48	1414.00	1425.44		1425.48	0.000140	2.15	18244.33	2960.72	0.13
4	95323	Max WS	30907.51	1414.00	1425.36		1425.41	0.000150	2.11	17880.28	2956.18	0.13
4	94823	Max WS	30908.43	1414.00	1425.30		1425.34	0.000124	2.04	18633.38	2835.58	0.12
4	94323	Max WS	30908.10	1414.00	1425.23		1425.28	0.000133	2.00	18133.76	2788.80	0.12
4	93823	Max WS	30907.88	1414.00	1425.14		1425.20	0.000177	2.34	16073.15	2570.17	0.14
4	93323	Max WS	30906.55	1414.00	1425.05		1425.11	0.000171	2.37	16166.28	2537.37	0.14
4	92823	Max WS	30904.51	1412.00	1424.98		1425.03	0.000155	2.28	17260.50	2777.28	0.13
4	92323	Max WS	30898.57	1414.00	1424.87		1424.94	0.000226	2.56	15356.37	2802.08	0.16
4	92043	Max WS	30891.22	1413.49	1424.75	1421.84	1424.85	0.000351	3.42	12918.31	2620.15	0.20
4	91967		Bridge									
4	91845	Max WS	30880.72	1413.49	1424.42		1424.54	0.000456	3.81	11997.16	2717.18	0.23
4	91705	Max WS	30879.03	1414.00	1424.40		1424.48	0.000294	2.93	13979.35	2685.00	0.18
4	91309	Max WS	30876.80	1414.00	1424.15		1424.31	0.000655	4.21	10314.02	2421.46	0.27
4	90808	Max WS	30877.40	1414.00	1423.94		1424.05	0.000370	3.03	12277.11	2490.64	0.20
4	90306	Max WS	30877.91	1412.00	1423.61		1423.82	0.000675	4.18	9551.33	2420.79	0.27
4	89805	Max WS	30877.25	1412.00	1423.00		1423.32	0.001388	5.97	7554.85	2439.63	0.39
4	89304	Max WS	30845.62	1412.00	1422.40		1422.73	0.001126	5.64	8156.70	2638.00	0.35
4	88803	Max WS	30792.12	1412.00	1421.68		1422.04	0.001341	5.60	6471.34	1321.21	0.38

# HEC-RAS Proposed Model Outputs

HEC-RAS Plan: REMLF US FW River: SJR Stage III Reach: 4 Profile: Max WS (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
4	88301	Max WS	27904.26	1412.00	1421.29		1421.44	0.000782	4.32	9428.98	3071.00	0.29
4	87801	Max WS	25570.95	1412.00	1421.01		1421.10	0.000468	3.29	10651.40	2550.11	0.22
4	87301	Max WS	24317.15	1412.00	1420.86		1420.91	0.000284	2.48	13174.27	3254.90	0.17
4	86801	Max WS	23711.99	1412.00	1420.80		1420.82	0.000094	1.48	20758.50	4526.00	0.10
4	86301	Max WS	23418.98	1412.00	1420.76		1420.77	0.000079	1.41	22706.31	5052.00	0.09
4	85801	Max WS	23414.75	1412.00	1420.73		1420.74	0.000057	1.14	25757.45	5402.00	0.08
4	85301	Max WS	23129.68	1410.00	1420.70		1420.71	0.000051	1.05	27286.05	5836.00	0.07
4	84801	Max WS	23123.80	1412.00	1420.68		1420.69	0.000049	0.99	28367.62	6253.00	0.07
4	84301	Max WS	22842.87	1412.00	1420.66		1420.67	0.000044	0.99	29540.32	6524.00	0.07
4	83801	Max WS	22841.54	1412.00	1420.64		1420.64	0.000045	0.96	30044.75	6994.00	0.07
4	83301	Max WS	22840.17	1410.00	1420.62		1420.62	0.000040	0.86	31753.59	7344.00	0.06
4	82801	Max WS	22574.77	1410.00	1420.60		1420.61	0.000027	0.73	35985.01	7610.00	0.05
4	82301	Max WS	22579.43	1410.00	1420.59		1420.60	0.000025	0.89	36551.95	7674.00	0.05
4	81801	Max WS	22577.05	1408.00	1420.58		1420.58	0.000026	0.79	37285.09	7986.00	0.05
4	81301	Max WS	22605.00	1410.00	1420.57		1420.57	0.000021	0.75	39779.44	8020.00	0.05
4	80801	Max WS	22415.18	1408.00	1420.56		1420.56	0.000023	0.82	41150.62	9736.00	0.05
4	80300	Max WS	22448.59	1410.00	1420.55		1420.55	0.000015	0.62	45825.70	8924.00	0.04
4	79800	Max WS	22487.18	1408.00	1420.54		1420.54	0.000016	0.68	43543.76	8187.00	0.04
4	79300	Max WS	22527.17	1406.00	1420.53		1420.53	0.000020	0.67	39843.17	7801.00	0.05
4	78800	Max WS	22526.37	1406.00	1420.52		1420.52	0.000031	0.97	33610.43	7214.00	0.06
4	78301	Max WS	22522.86	1406.00	1420.50		1420.51	0.000030	0.89	32917.69	6716.00	0.06
4	77810	Max WS	22524.54	1406.00	1420.49		1420.49	0.000024	1.14	34667.57	6439.00	0.06
4	77700		Mult Open									
4	77477	Max WS	22352.06	1406.00	1420.43		1420.43	0.000020	0.86	37637.64	6849.00	0.05
4	76801	Max WS	22350.34	1406.00	1420.42		1420.42	0.000017	0.70	39083.83	6566.00	0.04
4	76301	Max WS	22349.07	1404.00	1420.41		1420.41	0.000016	0.70	39157.77	6551.00	0.04
4	75801	Max WS	22350.46	1404.00	1420.40		1420.40	0.000018	0.74	37337.44	6311.00	0.05
4	75301	Max WS	22352.90	1406.00	1420.39		1420.39	0.000019	0.82	37031.48	6422.00	0.05
4	74801	Max WS	22351.89	1404.00	1420.38		1420.39	0.000020	0.87	36643.10	6403.00	0.05
4	74251	Max WS	22218.77	1404.00	1420.37		1420.37	0.000024	0.97	34409.87	6357.00	0.05
4	73980	Max WS	22343.24	1406.00	1420.36		1420.37	0.000033	1.04	30484.50	5941.00	0.06
4	73901	Max WS	22342.42	1404.00	1420.36	1416.44	1420.36	0.000032	1.22	30682.88	5941.00	0.06
4	73850		Bridge									
4	73765	Max WS	22221.14	1404.00	1420.35		1420.36	0.000014	0.80	39302.67	5770.00	0.04
4	73357	Max WS	22337.17	1406.00	1420.34		1420.35	0.000022	0.87	33981.56	5888.00	0.05
4	72801	Max WS	22227.10	1406.00	1420.33		1420.34	0.000022	0.87	34729.60	6244.00	0.05
4	72301	Max WS	22225.94	1406.00	1420.32		1420.33	0.000015	0.76	40403.35	6729.00	0.04
4	71801	Max WS	22226.00	1404.00	1420.32		1420.32	0.000013	0.71	43435.30	7084.00	0.04
4	71301	Max WS	22230.83	1404.00	1420.31		1420.32	0.000014	0.72	41015.88	6758.00	0.04
4	70801	Max WS	22233.36	1404.00	1420.30		1420.31	0.000014	0.76	39725.10	6280.00	0.04
4	70301	Max WS	22230.18	1404.00	1420.30		1420.30	0.000014	0.78	40423.46	6304.00	0.04
4	69801	Max WS	22231.41	1404.00	1420.29		1420.30	0.000009	0.75	45046.24	6573.00	0.03
4	69301	Max WS	22234.95	1404.00	1420.29		1420.29	0.000013	0.69	39070.22	6523.00	0.04
4	68801	Max WS	22234.19	1406.00	1420.28		1420.28	0.000018	0.88	34136.33	6237.69	0.05
4	68220	Max WS	22231.37	1404.00	1420.27		1420.27	0.000015	0.86	33451.13	5162.00	0.04
4	67801	Max WS	22232.46	1404.00	1420.25		1420.26	0.000040	1.33	22349.15	3374.00	0.07
4	67301	Max WS	22232.05	1404.00	1420.21		1420.24	0.000071	1.79	17024.36	2644.00	0.09
4	67061	Max WS	22231.14	1404.00	1420.19	1415.20	1420.22	0.000080	1.94	15888.25	2294.83	0.10
4	66960		Bridge									
4	66848	Max WS	22231.14	1404.00	1420.17		1420.19	0.000046	1.65	18723.27	2294.83	0.08
4	66801	Max WS	22231.06	1402.00	1420.16		1420.19	0.000064	1.93	17501.25	2535.00	0.09
4	66311	Max WS	22229.63	1404.00	1420.13		1420.16	0.000064	1.79	15948.92	2274.00	0.09
4	65801	Max WS	22228.48	1404.00	1420.05		1420.11	0.000130	2.48	11370.12	1504.00	0.13
4	65301	Max WS	22214.91	1404.00	1419.98		1420.05	0.000141	2.65	11223.75	1559.00	0.13
4	64802	Max WS	22215.16	1404.00	1419.91		1419.98	0.000139	2.68	11472.83	1659.00	0.13
4	64303	Max WS	22215.45	1406.00	1419.82		1419.90	0.000166	2.81	10935.60	1668.00	0.14
4	63804	Max WS	22216.36	1404.00	1419.73		1419.82	0.000169	2.92	10172.48	1410.00	0.15
4	63304	Max WS	22216.74	1406.00	1419.68		1419.74	0.000120	2.40	11179.33	1299.00	0.12
4	62804	Max WS	22216.27	1404.00	1419.61		1419.68	0.000128	2.47	10665.42	1246.00	0.13
4	62304	Max WS	22221.42	1404.00	1419.53		1419.61	0.000149	2.87	9977.84	1167.00	0.14
4	61805	Max WS	22217.43	1404.00	1419.46		1419.54	0.000138	2.71	10150.75	1204.00	0.13
4	61314	Max WS	22217.90	1404.00	1419.05		1419.44	0.000518	5.62	4659.50	445.00	0.26
4	60808	Max WS	22218.08	1404.00	1418.49		1419.11	0.000934	6.92	3743.65	427.00	0.35
4	60308	Max WS	22218.19	1404.00	1418.17		1418.67	0.000791	6.30	4154.81	482.00	0.32
4	59807	Max WS	22218.18	1404.00	1417.57		1418.17	0.001194	7.81	3750.37	473.00	0.39
4	59314	Max WS	22218.10	1402.00	1416.97		1417.61	0.001355	8.49	3589.90	458.00	0.42
4	58817	Max WS	22218.02	1400.00	1415.31		1416.62	0.002330	11.55	2492.00	271.00	0.54
4	58331	Max WS	22218.06	1400.00	1414.35		1415.50	0.002312	11.13	2933.00	468.40	0.54
4	57845	Max WS	22217.93	1399.20	1412.89		1414.24	0.002930	12.35	2668.04	426.16	0.61
4	57346	Max WS	22217.65	1398.00	1412.15		1412.95	0.001849	9.68	3278.38	479.12	0.48
4	56848	Max WS	22217.29	1397.50	1411.82		1412.23	0.000926	6.56	4652.05	720.16	0.34
4	56349	Max WS	22215.94	1396.00	1410.89		1411.65	0.001523	8.96	3358.38	439.65	0.44
4	55849	Max WS	22216.84	1395.50	1409.75		1410.84	0.002056	10.47	2880.00	387.50	0.51
4	55349	Max WS	22216.16	1395.00	1407.53		1409.34	0.004342	13.89	2245.11	364.45	0.73
4	54849	Max WS	22216.30	1394.00	1407.06		1407.68	0.001485	8.17	3777.26	592.62	0.43
4	54349	Max WS	22216.42	1392.00	1405.94		1406.92	0.001797	9.22	3045.67	429.04	0.47
4	53850	Max WS	22216.43	1390.00	1404.77	1401.27	1405.95	0.002005	9.69	2609.98	283.69	0.49

*County of Riverside*  
**Gilman Springs Road Widening and Safety Improvement Project**  
 Comparison of HEC-RAS Model Outputs

Reach	River Sta.	Gilman Springs Rd Sta.	Profile	Proposed - After Widening Gilman Springs Road								
				Q Total	Min Ch El	WS Elev	EG Elev	EG Slope	Vel Chnl	Flow Area	Top Width	Froude
				(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(Ft/s)	(sq ft)	(ft)	# Chl
* BT	136855	250+64.65	Max WS	-	-	-	-	-	-	-	-	-
4	135810	-	Max WS	** 34714.16	1,424.00	1,432.70	1,432.70	0.000009	0.54	67,961.30	8,837.06	0.03
4	135753.2	265+47.96	Max WS	34,693.28	1,424.00	1,432.69	1,432.70	0.000009	0.55	69,605.66	10,507.28	0.03
4	134753.2	275+51.57	Max WS	34,665.93	1,424.00	1,432.69	1,432.69	0.000008	0.52	72,843.45	10,650.53	0.03
4	134209	-	Max WS	32,920.63	1,424.00	1,432.68	1,432.69	0.000011	0.56	60,994.28	9,183.05	0.04
4	133262.5	303+28.00	Max WS	32,988.22	1,424.00	1,432.68	1,432.68	0.000007	0.48	73,510.87	10,222.07	0.03
4	132839.9	311+46.14	Max WS	33,057.91	1,424.00	1,432.68	1,432.68	0.000008	0.50	70,967.78	9,963.16	0.03
4	132754	-	Max WS	33,130.73	1,424.00	1,432.67	1,432.68	0.000009	0.52	66,578.73	9,187.44	0.03
* BS	132446	319+17.67	Max WS	-	-	-	-	-	-	-	-	-
Average										68,900.00	9,800.00	

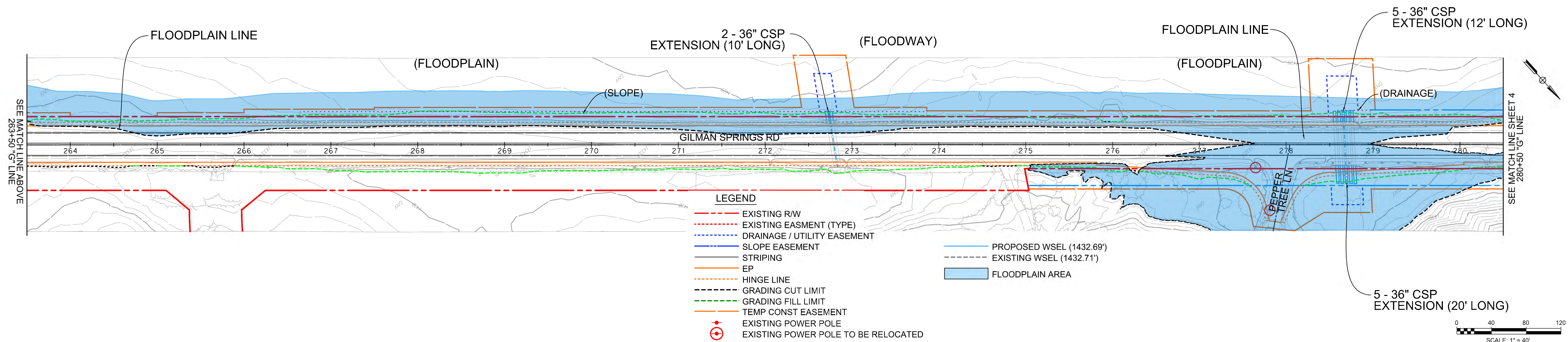
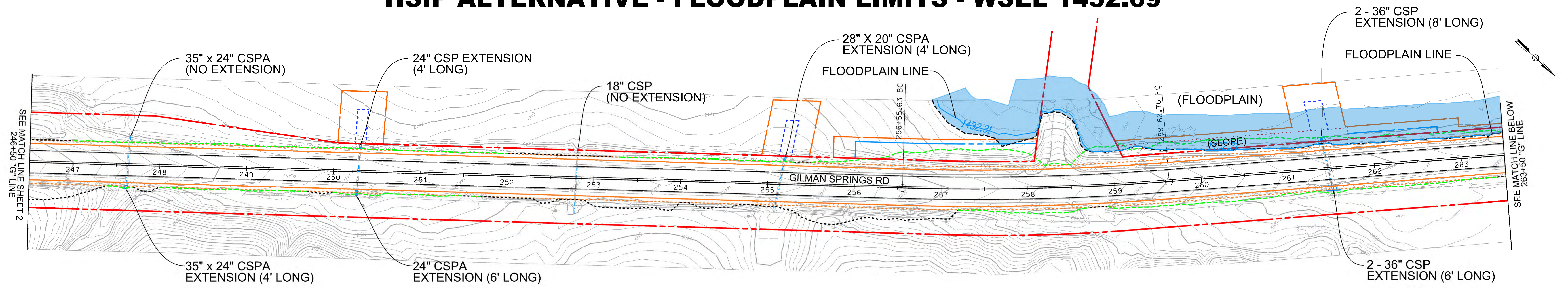
Reach	River Sta.	Gilman Springs Rd Sta.	Profile	Existing - Before Widening Gilman Springs Road								
				Q Total	Min Ch El	WS Elev	EG Elev	EG Slope	Vel Chnl	Flow Area	Top Width	Froude
				(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(Ft/s)	(sq ft)	(ft)	# Chl
* BT	136855	250+64.65	Max WS	-	-	-	-	-	-	-	-	-
4	135810	-	Max WS	** 34714.16	1,424.00	1,432.72	1,432.72	0.000009	0.54	68,182.44	8,837.06	0.03
4	135753.2	265+47.96	Max WS	-	-	-	-	-	-	-	-	-
4	134753.2	275+51.57	Max WS	-	-	-	-	-	-	-	-	-
4	134209	-	Max WS	34,661.21	1,424.00	1,432.71	1,432.71	0.000012	0.59	61,198.16	9,190.08	0.04
4	133262.5	303+28.00	Max WS	-	-	-	-	-	-	-	-	-
4	132839.9	311+46.14	Max WS	-	-	-	-	-	-	-	-	-
4	132754	-	Max WS	33,179.72	1,424.00	1,432.69	1,432.70	0.000009	0.52	66,762.67	9,189.08	0.03
* BS	132446	319+17.67	Max WS	-	-	-	-	-	-	-	-	-

Reach	River Sta.	Gilman Springs Rd Sta.	Profile	Difference (Proposed-Existing)								
				Q Total	Min Ch El	WS Elev	EG Elev	EG Slope	Vel Chnl	Flow Area	Top Width	Froude
				(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(Ft/s)	(sq ft)	(ft)	# Chl
* BT	136855	250+64.65	Max WS	-	-	-	-	-	-	-	-	-
4	135810	-	Max WS	** 0.00	0.00	-0.02	-0.02	0.000000	0.00	-221.14	0.00	0.00
4	135753.2	265+47.96	Max WS	-	-	-	-	-	-	-	-	-
4	134753.2	275+51.57	Max WS	-	-	-	-	-	-	-	-	-
4	134209	-	Max WS	-1,740.58	0.00	-0.03	-0.02	-0.000001	-0.03	-203.88	-7.03	0.00
4	133262.5	303+28.00	Max WS	-	-	-	-	-	-	-	-	-
4	132839.9	311+46.14	Max WS	-	-	-	-	-	-	-	-	-
4	132754	-	Max WS	-48.99	0.00	-0.02	-0.02	0.000000	0.00	-183.94	-1.64	0.00
* BS	132446	319+17.67	Max WS	-	-	-	-	-	-	-	-	-

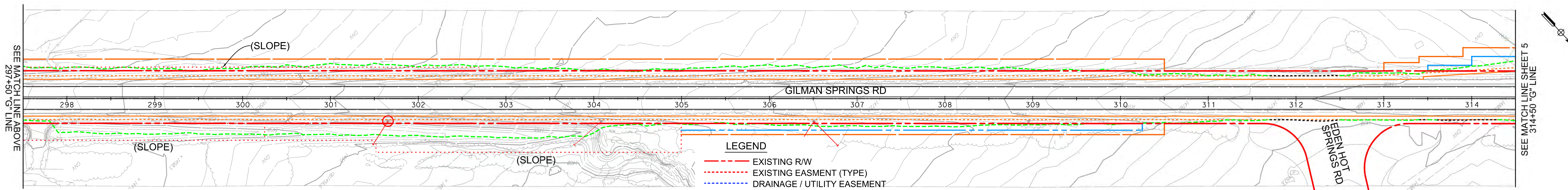
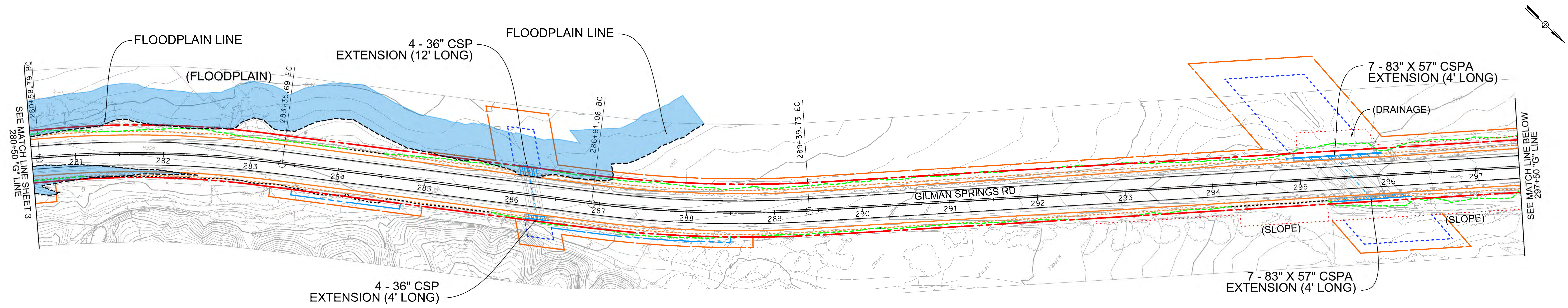
\* Indicates Cross Section Identified on FIRM Panel Maps

\*\* Please note: the river flow rates (Q Total) listed above are not constant but vary. This is because this HEC-RAS model is analyzing the river using unsteady flow that uses a hydrograph as opposed to steady flow. In addition, the model contains very wide and shallow cross sections approaching Mystic Lake that introduce storage effects into the model, that also creates changes in the river flow rates. Even with these sophisticated modeling techniques, the water surface changes are very small (i.e. -0.03' max). Please see the following Floodplain Limits and River Profile Maps.

# HSIP ALTERNATIVE - FLOODPLAIN LIMITS - WSEL 1432.69'



# HSIP ALTERNATIVE - FLOODPLAIN LIMITS - WSEL 1432.69'



- LEGEND**
- EXISTING RW
  - - - EXISTING EASEMENT (TYPE)
  - · - · - DRAINAGE / UTILITY EASEMENT
  - · - · - SLOPE EASEMENT
  - STRIPING
  - EP
  - · - · - HINGE LINE
  - - - GRADING CUT LIMIT
  - · - · - GRADING FILL LIMIT
  - · - · - TEMP CONST EASEMENT
  - EXISTING POWER POLE
  - ⊕ EXISTING POWER POLE TO BE RELOCATED
  - PROPOSED WSEL (1432.69')
  - - - EXISTING WSEL (1432.71')
  - FLOODPLAIN AREA

