Gautho, Julia

From: Eric Coatney <ericcoatney@yahoo.com>
Sent: Thursday, March 27, 2025 2:04 PM
To: City Council
Cc: Luke Coatney
Subject: [PDF] Stockton Bridge - agenda item 8B for today
Attachments: Stockton Bridge report_Capitola agenda item 8B March 27 2025.pdf

The attachment will be presented at the meeting tonight. We'll bring some copies. We understand that you probably won't have time to read it.

Regards,
Eric and Luke Coatney

On Tuesday, March 25, 2025 at 09:50:49 PM PDT, Eric Coatney <ericcoatney@yahoo.com> wrote:

Stockton Bridge has no known log jam that caused flooding since it was opened in 1934. No reason to rebuild it. The footbridge in Perry Park was shaded by two trees in 2023. Those trees were swept out to to the bay under Stockton Bridge. After storms that year, I could count over a 100 logs near the bandstand. Bridge is fine. No need to spend money on a study.

Regards,
Eric Coatney
48th Avenue
Capitola, CA

Stockton Avenue Bridge

BRIDGE PIER DEBRIS MITIGATION FEASIBILITY REPORT

June 28, 2024

The next three pages are pages 35, 54 and 55 of this report with markups. The last page is from a separate reference.
1. Report shows the creek will flood Capitola Village with a new bridge.
2. Report has two significant errors.
3. Report should be revised or rejected. Report as presented has no useful information to make a decision about steps going forward.

CSWST2 | 303 Twin Dolphin Drive, 6th Floor, Redwood City, CA 94065

Hydraulic Analysis

Water surface elevations within Soquel Creek at the Stockton Avenue Bridge were calculated using HEC-RAS version 6.5, the Army Corps of Engineer's Hydrologic Engineering Center's River Analysis System computer program. Use of HEC-RAS to model channel hydraulics for the scenarios provided is considered appropriate as the water in the channel, at the elevations modeled, is flowing in one direction, downstream, toward the ocean during the flow event.

Topography

The source for topographic information in the area of the project is the County of Santa Cruz Geographic Information Systems Department.

Bridge

The source for dimensions of the Stockton Avenue Bridge is the As Built Plans Set from Caltrans, Document No. 40008995 for Capitola Bridge, dated October 1933.

Peak Flow

The peak flow used for the 100-year storm event is 17,500 cfs in accordance with the Federal Emergency Management Agency's (FEMA) Flood Insurance Study (FIS) for Santa Cruz County, CA and Incorporated Areas, FIS No. 06087CV001C.

The peak flow for the lower flow event of 1,200 cfs is pulled from the United States Geological Survey's (USGS) website, "USGS Water Data for the Nation" (waterdata.usgs.gov/nwis). USGS provides data retrieved from a flow monitoring location in Soquel Creek. Between January 2024 and March 2024 four storms produced flows of 1000 cfs or more in Soquel Creek. Large woody debris was observed to be caught below the Stockton Avenue Bridge in February 2024 and in March 2024.

Flooding is least likely at low tide!

Hydrograph for Unsteady Flow Analysis

A simplified hydrograph was developed based upon the flow data for the lower peak flow storm of January 2024. The hydrograph assumes a storm flow duration of 24 hours with peak flow occurring at 9 hours and 15 minutes after the start of the flow event.

Starting Hydraulic Grade Line

In this preliminary analysis, to evaluate the response of hydraulic grade line upstream of the Stockton Avenue Bridge to each of the Countermeasure Alternatives, it is assumed that the tide is low and Soquel Creek flows freely at normal depth conditions toward the Pacific Ocean.

Channel Roughness

Alternative 5
Q1200

HEC-RAS Plan: Opt5QS1200 River: SoquelCreek Reach: SoquelCreekUP Profile: PF 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)	
SoquelCreekUP	457.43	PF 1	1200.00	0.00	4.10		4.22	0.000397	2.78	432.30	105.69	0.24
SoquelCreekUP	447.43	PF 1	1200.00	0.00	4.10		4.22	0.000393	2.76	434.34	106.24	0.24
SoquelCreekUP	433.47	PF 1	1200.00	0.00	4.09		4.21	0.000388	2.74	437.19	107.04	0.24
SoquelCreekUP	423.47	PF 1	1200.00	0.00	4.09		4.21	0.000385	2.73	439.23	107.63	0.24
SoquelCreekUP	413.47	PF 1	1200.00	0.00	4.09		4.20	0.000381	2.72	441.27	108.21	0.24
SoquelCreekUP	393.46	PF 1	1200.00	0.00	4.08		4.19	0.000375	2.69	445.38	109.37	0.24
SoquelCreekUP	373.46	PF 1	1200.00	0.00	4.07		4.18	0.000368	2.67	449.45	110.53	0.23
SoquelCreekUP	353.46	PF 1	1200.00	0.00	4.07		4.18	0.000362	2.65	453.51	111.70	0.23
SoquelCreekUP	333.46	PF 1	1200.00	0.00	4.06		4.17	0.000356	2.62	457.59	112.86	0.23
SoquelCreekUP	313.46	PF 1	1200.00	0.00	4.06		4.16	0.000350	2.60	461.66	114.03	0.23
SoquelCreekUP	293.46	PF 1	1200.00	0.00	4.05		4.15	0.000344	2.58	465.74	115.20	0.23
SoquelCreekUP	273.46	PF 1	1200.00	0.00	4.04		4.15	0.000339	2.55	469.80	116.36	0.22
SoquelCreekUP	253.46	PF 1	1200.00	0.00	4.04		4.14	0.000333	2.53	473.84	117.53	0.22
SoquelCreekUP	245.93	PF 1	1200.00	0.00	4.04		4.14	0.000331	2.52	475.40	117.97	0.22
SoquelCreekUP	228.95	PF 1	1200.00	0.00	4.03		4.13	0.000327	2.51	478.81	118.96	0.22
SoquelCreekUP	218.85	PF 1	1200.00	0.00	4.03		4.13	0.000324	2.50	480.82	119.53	0.22
SoquelCreekUP	211.97	PF 1	1200.00	0.00	4.03		4.12	0.000322	2.49	482.18	119.92	0.22
SoquelCreekUP	203.28	PF 1	1200.00	0.00	4.03		4.12	0.000318	2.47	485.48	120.80	0.22
SoquelCreekUP	195.4	PF 1	1200.00	0.00	4.02	1.45	4.12	0.000304	2.47	486.29	121.46	0.22
SoquelCreekUP	170.36		Bridge									
SoquelCreekUP	145.32	PF 1	1200.00	0.00	4.01		4.10	0.000294	2.38	505.04	126.03	0.21
SoquelCreekUP	140.31	PF 1	1200.00	0.00	4.01		4.10	0.000305	2.42	496.53	124.07	0.21
SoquelCreekUP	130.3	PF 1	1200.00	0.00	4.00		4.09	0.000324	2.48	483.37	121.08	0.22
SoquelCreekUP	120.28	PF 1	1200.00	0.00	3.99		4.09	0.000344	2.55	470.22	118.09	0.23
SoquelCreekUP	110.27	PF 1	1200.00	0.00	3.98		4.08	0.000366	2.62	457.24	115.10	0.23
SoquelCreekUP	103.87	PF 1	1200.00	0.00	3.97		4.08	0.000387	2.69	445.35	112.37	0.24
SoquelCreekUP	86.16	PF 1	1200.00	0.00	3.99		4.07	0.000266	2.26	531.51	133.52	0.20
SoquelCreekUP	76.02	PF 1	1200.00	0.00	4.00		4.06	0.000196	1.95	616.19	154.32	0.17
SoquelCreekUP	65.88	PF 1	1200.00	0.00	4.00		4.05	0.000161	1.77	677.47	169.42	0.16
SoquelCreekUP	59.74	PF 1	1200.00	0.00	4.00		4.05	0.000147	1.70	707.58	176.85	0.15
SoquelCreekUP	49.6	PF 1	1200.00	0.00	4.01		4.05	0.000131	1.61	747.58	186.74	0.14
SoquelCreekUP	38.98	PF 1	1200.00	0.00	4.01		4.04	0.000116	1.51	794.27	198.32	0.13
SoquelCreekUP	28.98	PF 1	1200.00	0.00	4.01		4.04	0.000107	1.46	824.57	206.33	0.13
SoquelCreekUP	18.98	PF 1	1200.00	0.00	4.01		4.04	0.000117	1.49	804.02	206.12	0.13
SoquelCreekUP	10	PF 1	1200.00	0.00	4.00		4.04	0.000123	1.52	791.15	206.16	0.14
SoquelCreekUP	0	PF 1	1200.00	0.00	4.00	.32	4.04	0.000138	1.57	766.39	209.47	0.14

Error: Bottom of creek is below sea level, but it is shown as sea level in this report. Think of the Mississippi River at sea level. It may be 100' deep and a mile across. Top of river is sea level. Bottom of river is 100' below sea level.

Useful report would have readings taken at Soquel Creek at different flow rates and different tides. Ideally, there would be two flow rates where the creek is flowing across the whole creek without a sand berm. Readings at a fairly high tide would be best since flooding is most likely then. The two flow rates should be a far apart as can be to get an idea of how the top and bottom of the creek react to different flows. The design flood of 17,500 will have a higher top of creek and a lower bottom of creek than the readings. You'd need to extrapolate and make a best guess.

The tables and graphs look pretty, but give no useful information about flooding of the creek since the starting point for the computer program is not correct. If the bottom of the creek is wrong then the top of the creek is wrong.

Floods Riverview and Village! This is 170' wider than creek width at Q1200. Water will run down street and flood Village. This width is at low tide. Width and depth at high tide will be greater.

New bridge alternate

Alternative 5
Q17500

HEC-RAS Plan: Opt5QS17500 River: SoquelCreek Reach: SoquelCreekUP Profile: PF 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)	
SoquelCreekUP	457.43	PF 1	17500.00	0.00	13.13		15.00	0.001634	11.32	1836.27	283.91	0.57
SoquelCreekUP	447.43	PF 1	17500.00	0.00	13.09		14.98	0.001679	11.39	1817.73	282.83	0.58
SoquelCreekUP	433.47	PF 1	17500.00	0.00	13.11		14.94	0.001713	11.17	1830.46	287.45	0.58
SoquelCreekUP	423.47	PF 1	17500.00	0.00	13.09		14.92	0.001725	11.15	1821.71	285.66	0.58
SoquelCreekUP	413.47	PF 1	17500.00	0.00	12.87		14.89	0.001762	11.71	1769.96	287.16	0.58
SoquelCreekUP	393.46	PF 1	17500.00	0.00	12.97		14.79	0.001780	11.05	1794.74	292.15	0.58
SoquelCreekUP	373.46	PF 1	17500.00	0.00	12.70		14.73	0.001920	11.59	1694.13	294.87	0.60
SoquelCreekUP	353.46	PF 1	17500.00	0.00	12.52	9.23	14.68	0.001986	11.92	1622.94	290.55	0.62
SoquelCreekUP	333.46	PF 1	17500.00	0.00	12.50	9.15	14.63	0.001981	11.82	1619.37	289.58	0.62
SoquelCreekUP	313.46	PF 1	17500.00	0.00	12.33	9.10	14.58	0.001999	12.09	1536.21	254.15	0.62
SoquelCreekUP	293.46	PF 1	17500.00	0.00	12.34		14.52	0.001936	11.86	1532.54	200.49	0.62
SoquelCreekUP	273.46	PF 1	17500.00	0.00	12.31		14.47	0.001912	11.82	1532.60	184.58	0.61
SoquelCreekUP	253.46	PF 1	17500.00	0.00	12.41		14.37	0.002435	11.24	1556.87	179.15	0.67
SoquelCreekUP	245.93	PF 1	17500.00	0.00	12.40		14.34	0.002365	11.19	1563.72	177.11	0.66
SoquelCreekUP	228.95	PF 1	17500.00	0.00	12.32		14.31	0.002315	11.29	1549.77	169.75	0.66
SoquelCreekUP	218.85	PF 1	17500.00	0.00	12.20		14.27	0.002117	11.54	1520.05	161.74	0.64
SoquelCreekUP	211.97	PF 1	17500.00	0.00	12.20		14.26	0.002138	11.52	1519.73	150.45	0.64
SoquelCreekUP	203.28	PF 1	17500.00	0.00	12.14		14.23	0.002074	11.61	1507.90	143.18	0.63
SoquelCreekUP	195.4	PF 1	17500.00	0.00	12.08	8.71	14.21	0.001841	11.71	1494.36	143.82	0.62
SoquelCreekUP	170.36		Bridge									
SoquelCreekUP	145.32	PF 1	17500.00	0.00	11.89		13.93	0.001851	11.45	1528.91	148.64	0.60
SoquelCreekUP	140.31	PF 1	17500.00	0.00	11.87		13.92	0.002036	11.47	1525.11	143.71	0.62
SoquelCreekUP	130.3	PF 1	17500.00	0.00	11.45		13.80	0.002425	12.31	1421.37	137.80	0.68
SoquelCreekUP	120.28	PF 1	17500.00	0.00	10.98		13.67	0.002923	13.16	1331.51	137.93	0.74
SoquelCreekUP	110.27	PF 1	17500.00	0.00	10.88	9.27	13.64	0.003633	13.34	1312.21	156.21	0.81
SoquelCreekUP	103.87	PF 1	17500.00	0.00	9.62	9.62	13.50	0.005676	15.80	1111.51	147.73	1.00
SoquelCreekUP	86.16	PF 1	17500.00	0.00	8.15	8.15	12.16	0.005653	16.06	1090.40	139.30	1.00
SoquelCreekUP	76.02	PF 1	17500.00	0.00	7.37	7.37	11.05	0.005689	15.38	1137.69	154.86	1.00
SoquelCreekUP	65.88	PF 1	17500.00	0.00	6.92	6.92	10.38	0.005723	14.92	1173.01	169.85	1.00
SoquelCreekUP	59.74	PF 1	17500.00	0.00	6.73	6.73	10.09	0.005734	14.70	1190.18	177.25	1.00
SoquelCreekUP	49.6	PF 1	17500.00	0.00	6.97	6.49	9.78	0.004561	13.44	1302.23	187.14	0.90
SoquelCreekUP	38.98	PF 1	17500.00	0.00	7.30		9.57	0.003460	12.08	1448.60	198.82	0.79
SoquelCreekUP	28.98	PF 1	17500.00	0.00	7.44		9.46	0.003134	11.41	1533.92	206.96	0.74
SoquelCreekUP	18.98	PF 1	17500.00	0.00	7.23		9.41	0.003478	11.86	1475.24	211.82	0.79
SoquelCreekUP	10	PF 1	17500.00	0.00	7.16	6.26	9.38	0.003730	11.96	1462.96	219.52	0.82
SoquelCreekUP	0	PF 1	17500.00	0.00	6.41	6.41	9.27	0.005792	13.56	1290.64	226.00	1.00

CFS will be lower since some water in village!

Error: Bottom of creek will be lower in at high flow than elevation shown on previous page. High flow will scour creek bed.

Fluvial Processes in Geomorphology, 2nd edition by Luna Leopold, Gordon Wolman and John Miller

For more than $100,000, should there be graph like this for Soquel Creek? How much will the flow scour the creek bed?

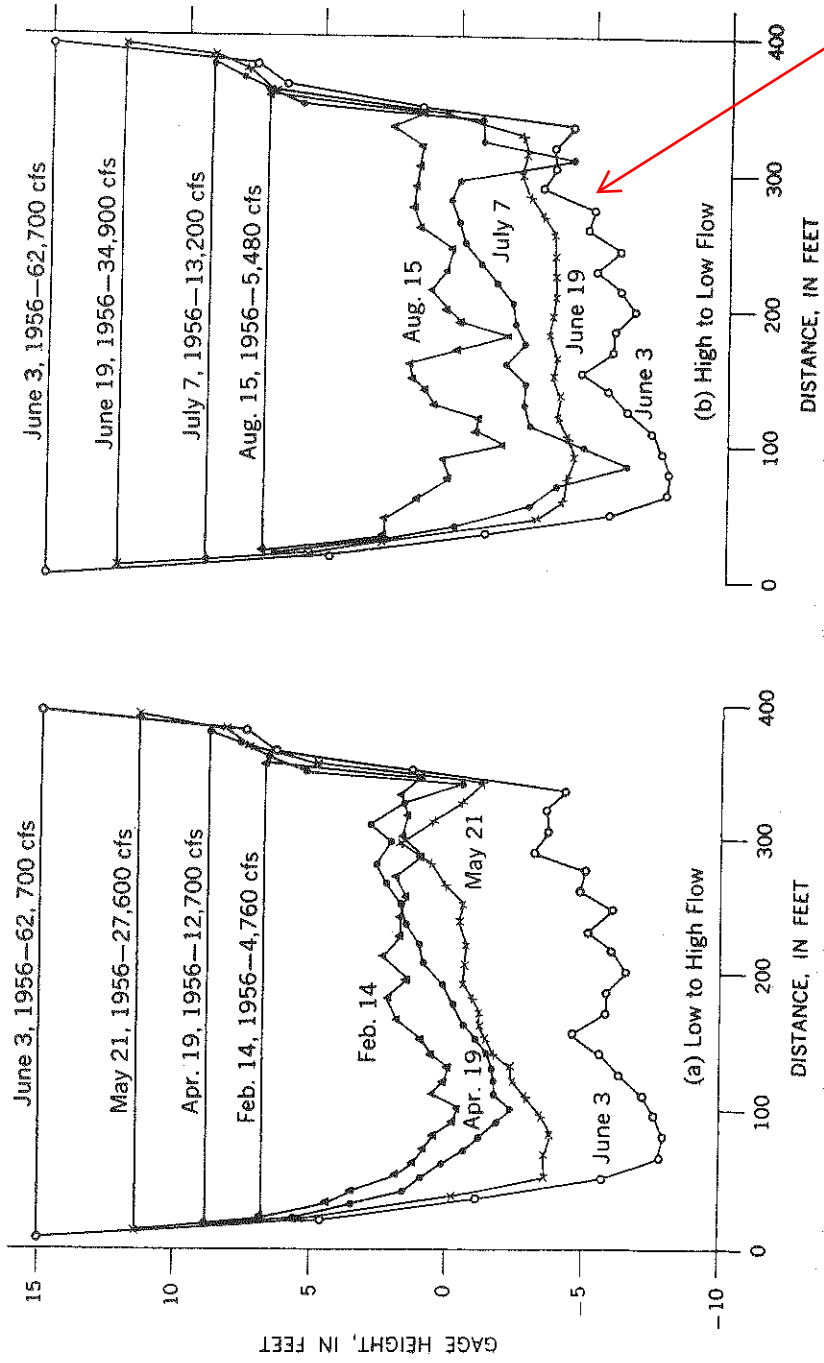

Figure 7-13. *Scour and subsequent fill during flood passage, Colorado River at Lees Ferry, Arizona, water year 1956.* **A.** *Low to high flow.* **B.** *High to low flow.*

served change with time of the relation of river stage to discharge. Such a change often seen in gaging-station records is, in stream-gaging parlance, a "shift in rating."

Figure 7-13 presents an example of bed scour, using data for the Colorado River at Lees Ferry, Arizona, showing cross sections at various discharges during the passage of a spring snowmelt. It can be seen that the whole width of the bed tends progressively to cut as the stage rises, and fills again during the falling stage. This phenomenon is characteristic of ephemeral streams and apparently of large rivers in semiarid climates. It is less typical of rivers in humid areas or those in high mountains, presumably because perennial flow tends to winnow away the fine material

Table 7-3. Selected data on amounts of scour observed in various rivers.

Maximum Depth of Scour Below Normal Bed Elevation (ft.)	Particle Size in River Bed, or Material Encountered	Flow Depth (ft.)	Location and Source of Data
10 to 15	silt, gravel	20	Pacolet River
22	sand, gravel	24 stage	Colorado River, U. S. Bureau of Reclamation, 1950
75	sand, gravel, cobbles	50 stage	Black Canyon, Colorado River (freq. = 1/50 yrs)
126	sand to gravel (cobbles)	35	Black Canyon
55	2″ × 6″ plank embedded in sand, gravel, in gorge 100–150 ft. wide		Black Canyon
32	cobbles moved, boulders smoothed to bedrock	? 12 to 20	Canadian River at Eufaula Dam
40	bank pilings in sand		Rio Grande
60	bridge pier in silt, sand		Lane and Borland (1954)
12 to 15	scoured to bedrock		Yellow River $w \approx 600$ ft. annual flood
0	fine sand	10 to 12	Colorado River, cable at Imperial Dam
20	very fine sand	10	Colorado River, Yuma, Lane and Borland (1954)
1.75 to 2 × regime depth	sand, silt	"regime" depth	Lacey in Blench (1957, p. 103)
$0.5y_1$	width constricted to ½ that upstream	y_1 = upstream depth	bridge piers, Laursen (1960)