Appendix 5.5 (Continued)

Hydrology (Part 9 of 15)

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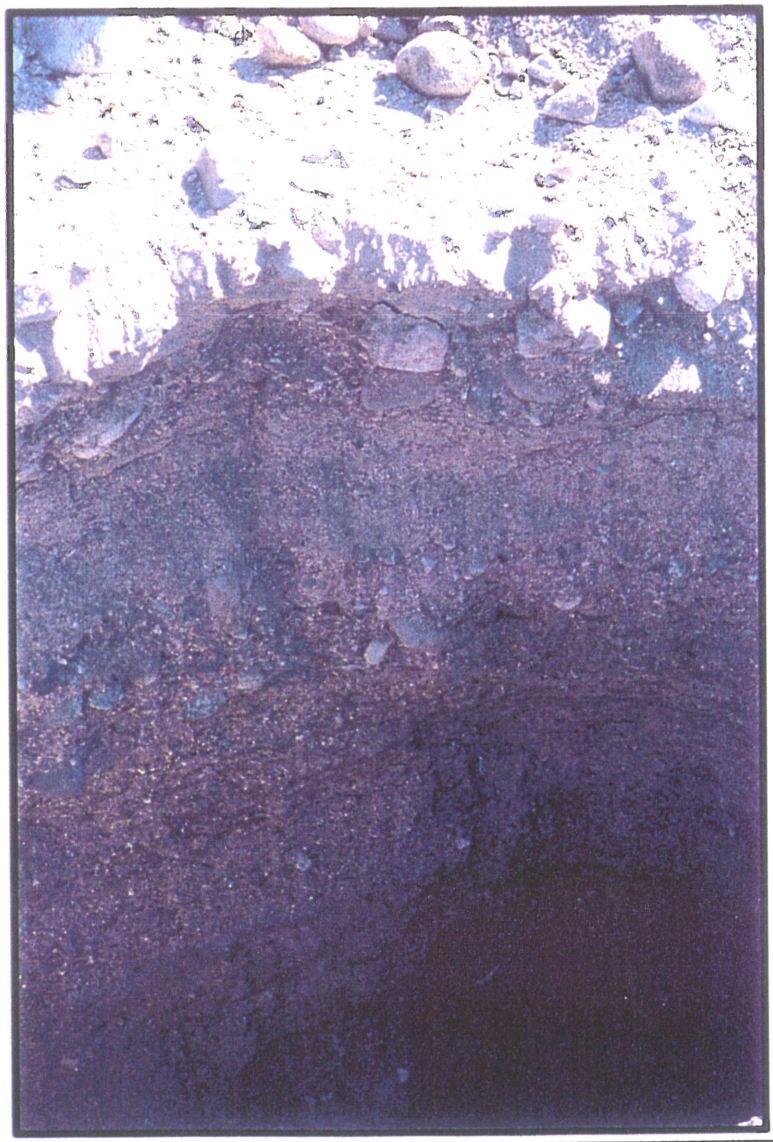
Geological and Geotechnical Consultants

Site: HS-2	*Views:* Upstream with Highway 126 in Background, and of Pit	
Figure: 18	*Job No.:* 05-1155BE-9 (9)	*Date:* 9/15/05



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Site: HS-3	*Views:* Upstream with Highway 126 in Background, and of Pit	
Figure: 19	*Job No.:* 05-1155BE-9 (9)	*Date:* 9/15/05

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Geological and Geotechnical Consultants

Site: CS-1	*Views:* Downstream with Bluffs South of Santa Clara River in Background, and of Pit	
Figure: 20	*Job No.:* 05-1155BE-9 (9)	*Date:* 9/15/05

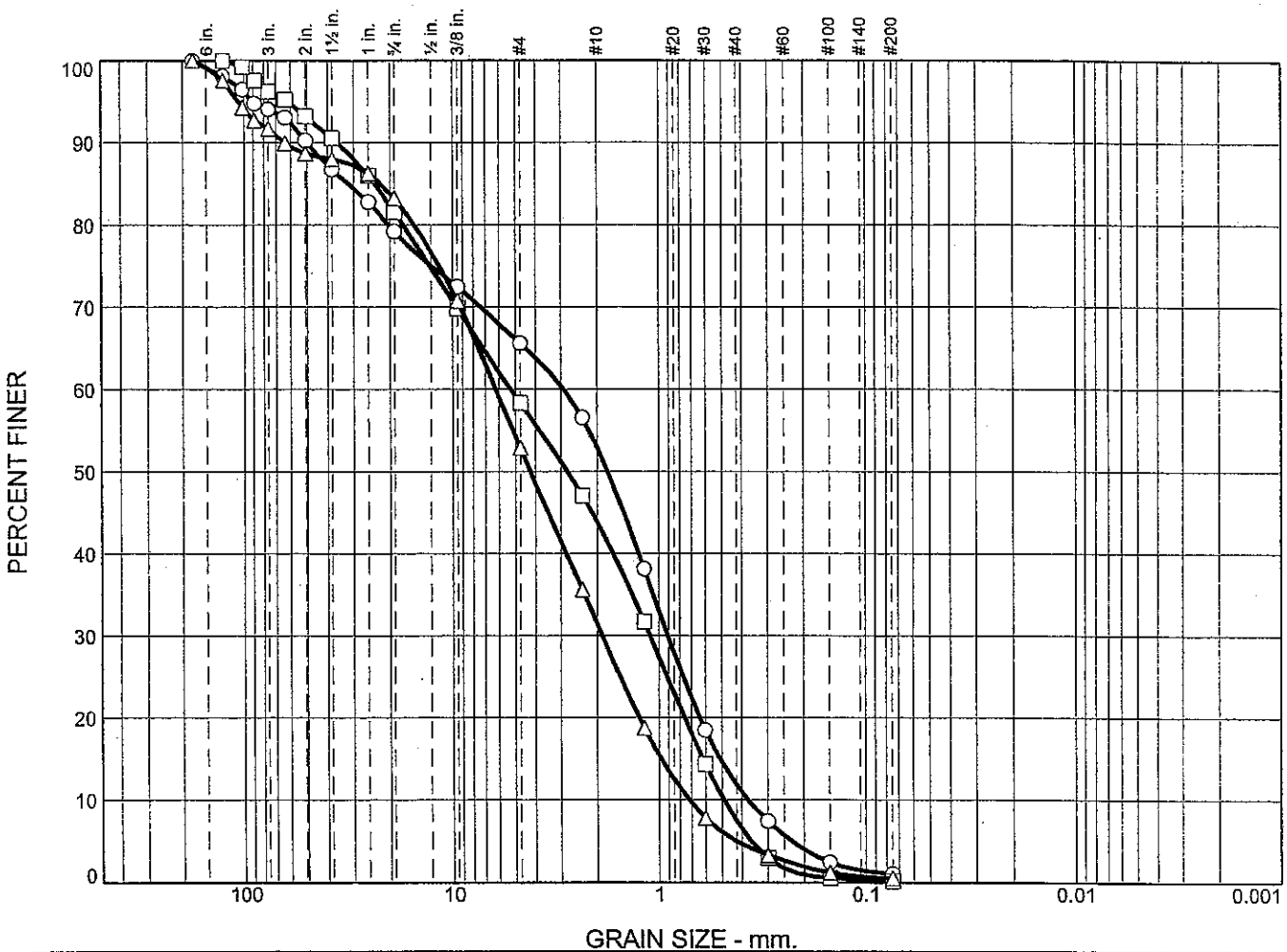
Summary Table of Sediment Sampling and Testing For Castaic Creek

05-1155BE-9

Site (Sheet No.)	Sample No.	Total Dry Sample Wt. (lbs)	% Retained on 2" Sieve	% of Upper 6" sample retained on 2" sieve	dMax*	D_{50} (mm)	D_{90} (mm)	D_{95} (mm)
OLD ROAD (Sheet 2)	OR-1	749.4	9.8	10.5	7" (30.14 lbs)	1.77	49.92	90.75
	OR-2	773.7	6.8	15.9	7" (13.2 lbs)	2.79	35.96	61.49
	OR-3	714.7	11.4	0.0	12.75" (34.52 lbs)	4.24	63.96	106.66
BETWEEN THE OLD ROAD AND COMMERCE CENTER DRIVE (Sheet 3)	OC-1	647.4	1.8	0.0	8" (12.53 lbs)	1.18	19.63	33.29
	OC-2	609.7	1.2	0.0	9" (19.99 lbs)	0.51	14.01	28.55
	OC-3	740.2	4.8	13.2	7" (29.03 lbs)	1.86	22.43	49.49
COMMERECE CENTER DRIVE (Sheet 4)	CC-1	647.6	4.4	4.7	6" (18.95 lbs)	1.24	23.67	48.05
	CC-2	694.5	4.6	17.1	6.5" (8.72 lbs)	1.38	31.26	48.65
	CC-3	736.9	0.5	0.0	5" (5.57 lbs)	2.09	16.24	28.08
HASLEY CANYON (Sheet 4)	HC-1	735.5	4.7	11.0	7" (13.84 lbs)	1.70	30.35	48.22
BETWEEN COMMERECE CENTER DRIVE AND HIGHWAY 126 (Sheet 5)	CH-1	333.8	0.8	3.2	4.5" (3.25 lbs)	0.71	15.98	24.86
	CH-2	659.3	5.3	0.7	6.5" (4.27 lbs)	1.38	29.16	52.90
	CH-3	712.3	5.6	8.2	7.15" (9.95 lbs)	2.64	37.55	54.25
HIGHWAY 126 (Sheet 5)	HW-1	658.6	1.4	0.0	5" (5.08 lbs)	0.46	11.59	24.95
	HW-2	687.8	4.6	17.4	8" (32.64 lbs)	1.22	35.43	49.00
	HW-3	584.2	5.5	13.2	6" (9.27 lbs)	0.55	30.63	53.20
1500' BELOW HIGHWAY 126 (Sheet 6)	HS-1	544.6	5.6	11.2	5" (7.53 lbs)	1.87	36.29	58.52
	HS-2	670.0	4.2	14.8	5.5" (7.12 lbs)	1.41	31.09	47.67
	HS-3	632.4	3.4	2.2	5.75" (6.56 lbs)	1.96	35.20	45.91
2000' BELOW HIGHWAY 126 (Sheet 6)	CS-1	660.6	18.3	9.6	6.5" (20.9 lbs)	4.16	87.80	130.10

* The intermediate dimension (and weight) for the largest rock observed in each excavation (not necessarily part of sample tested)

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	5.9	14.9	13.6	12.6	41.2	10.8	1.0	
□	3.8	14.6	23.3	14.4	36.4	7.3	0.2	
△	8.3	8.5	30.3	21.5	26.4	4.5	0.5	

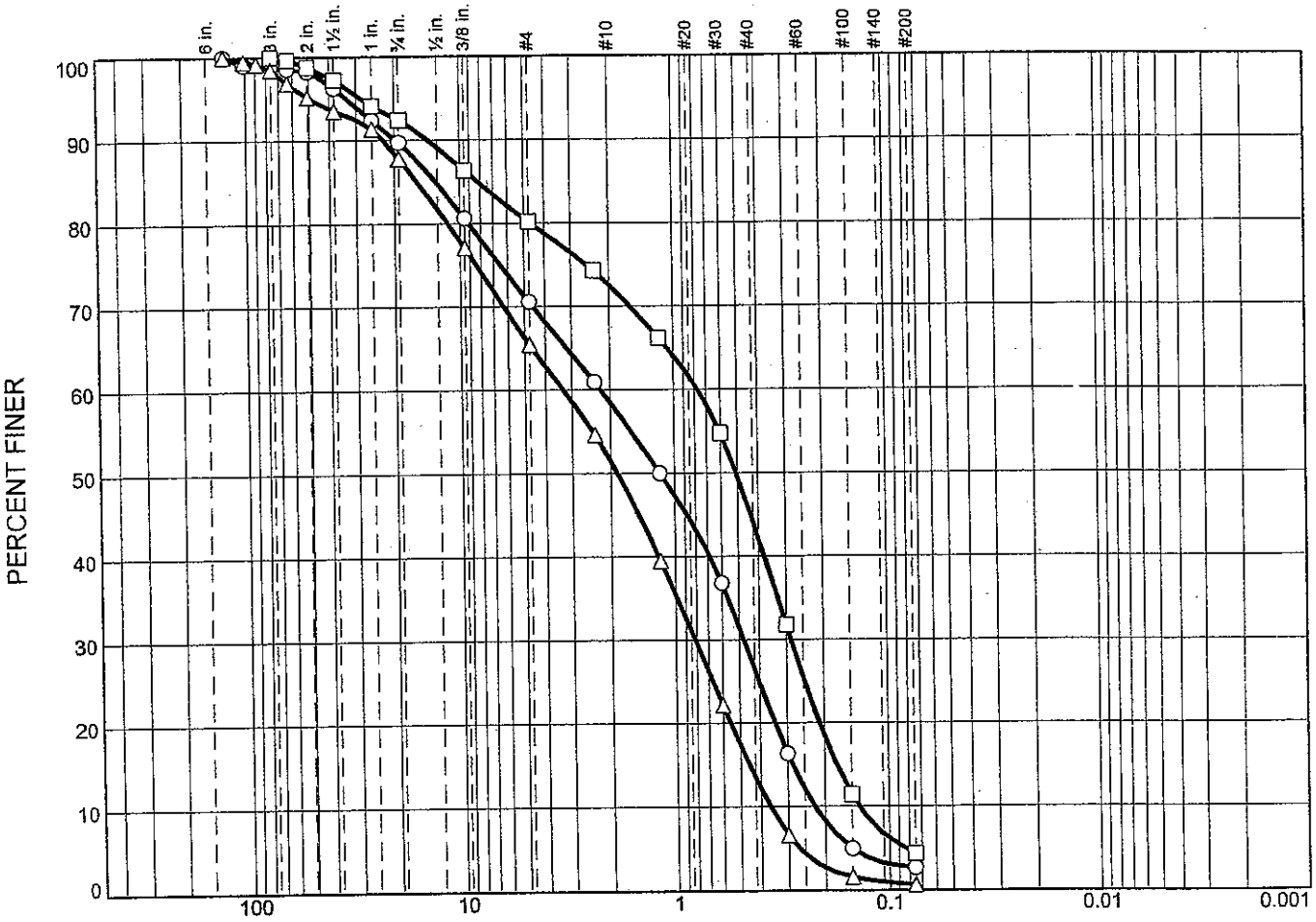
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-OR-1		0-5'	Poorly graded SAND with gravel	SP
□	T-OR-2		0-5'	Poorly graded SAND with gravel	SP
△	T-OR-3		0-4.5'	Poorly graded SAND with gravel	SP

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9)
Figure B1

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	1.2	9.1	19.1	12.2	31.8	23.9	2.7	
□	0.0	7.6	12.2	7.6	28.4	39.8	4.4	
△	1.6	10.6	22.3	14.1	37.9	12.9	0.6	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-OC-1		0-5'	Poorly graded SAND with gravel	SP
□	T-OC-2		0-5'	Poorly graded SAND with gravel	SP
△	T-OC-3		0-5'	Poorly graded SAND with gravel	SP

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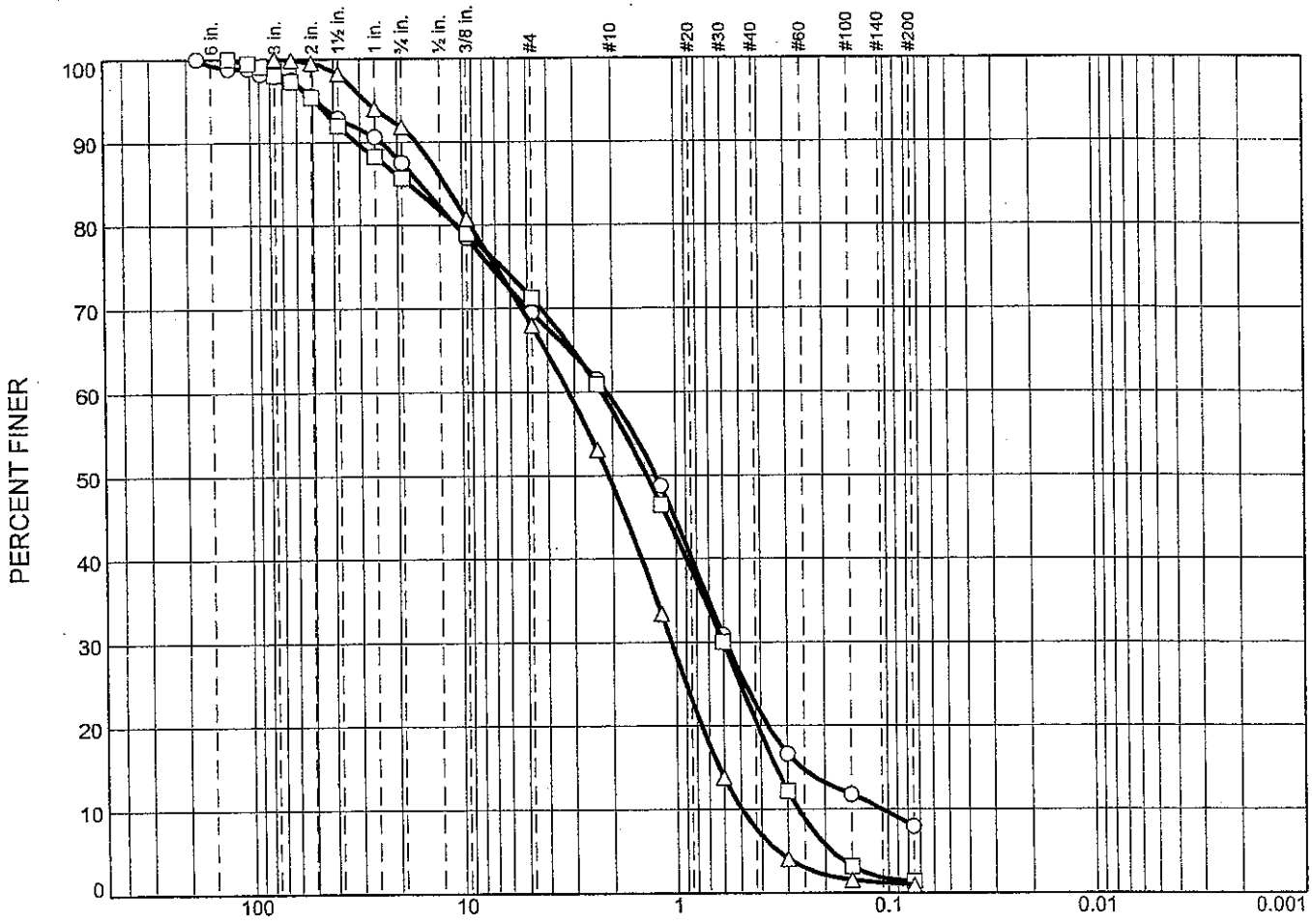
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9)

Figure B2

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	2.1	10.4	18.0	10.4	36.5	14.6	8.0	
□	1.9	12.5	14.3	13.5	37.2	19.2	1.4	
△	0.0	8.2	23.8	19.2	41.2	6.6	1.0	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-CC-1		0-5'	Well-graded SAND with silt and gravel	SW-SM
□	T-CC-2		0-5'	Poorly graded SAND with gravel	SP
△	T-CC-3		0-5'	Poorly graded SAND with gravel	SP

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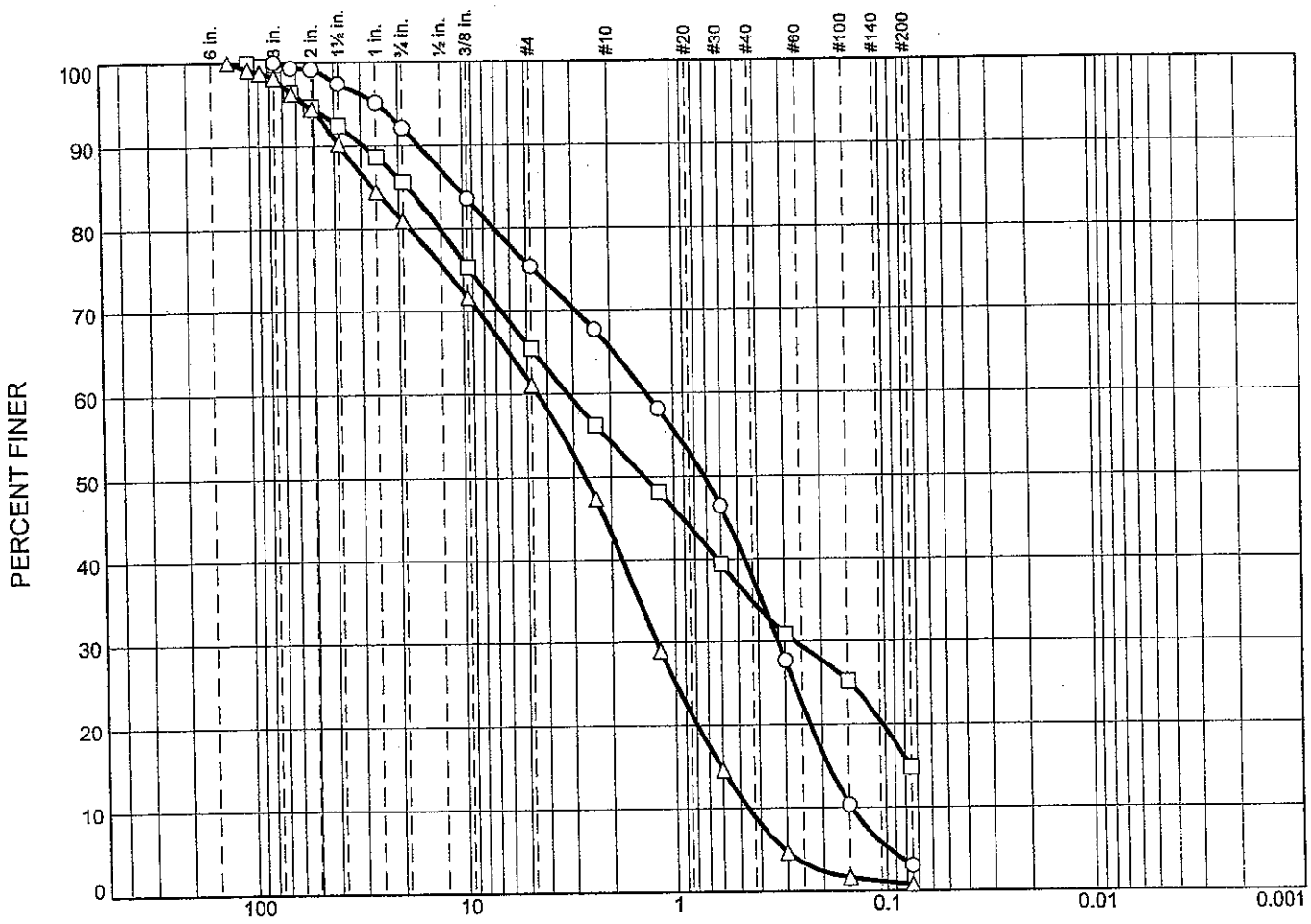
Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9)
Figure B3

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	7.9	16.7	9.8	27.9	34.6	3.1	
□	2.0	12.4	20.2	11.1	19.5	20.0	14.8	
△	1.8	17.3	19.8	17.9	34.3	8.1	0.8	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-CH-1		0-5'	Poorly graded SAND with gravel	SP
□	T-CH-2		0-5'	Silty SAND with gravel	SM
△	T-CH-3		0-5'	Poorly graded SAND with gravel	SP

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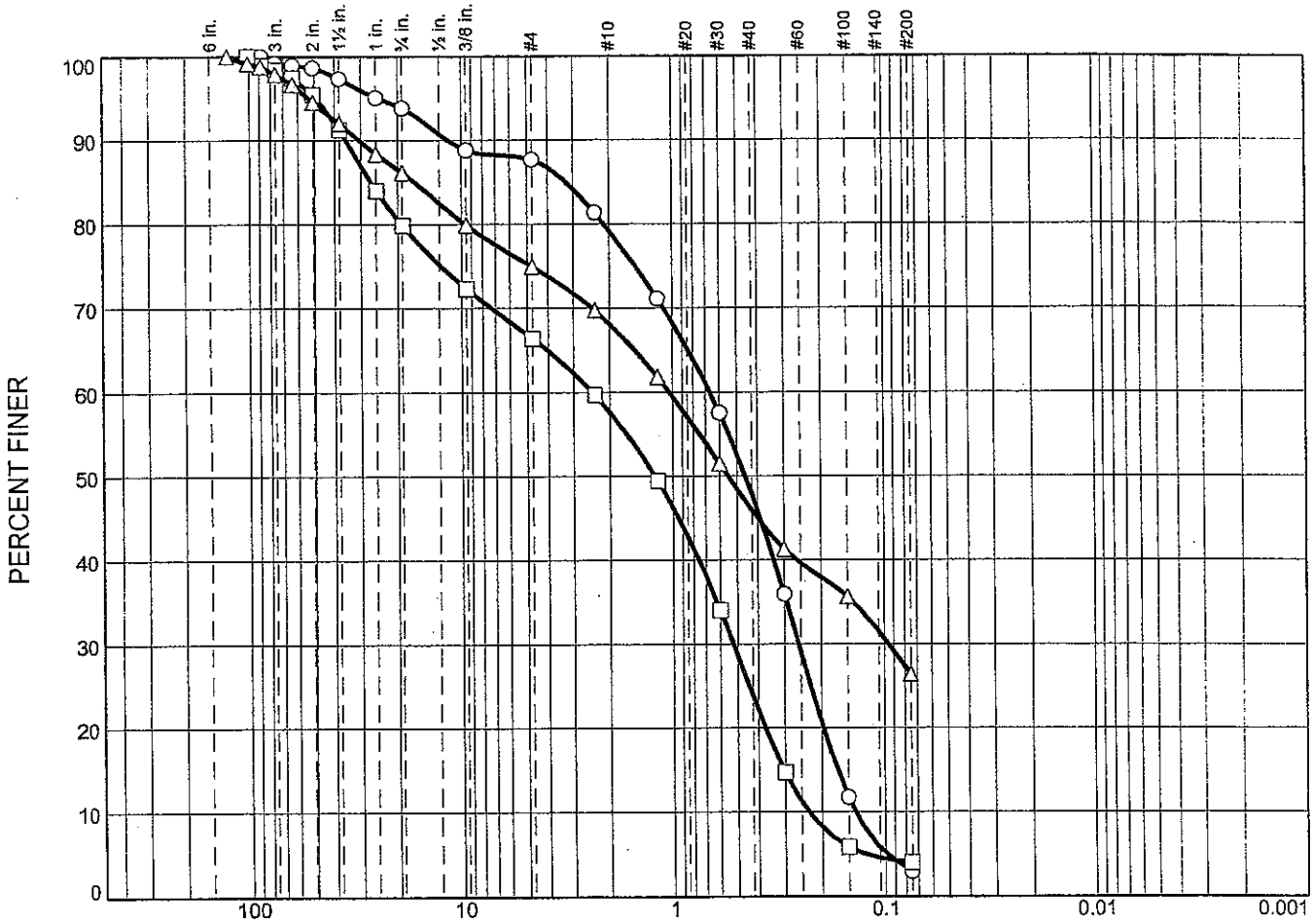
Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9)

Figure B4

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.8	5.4	6.1	8.5	31.3	44.9	3.0	
□	1.6	18.6	13.4	8.8	33.7	19.9	4.0	
△	2.1	11.8	11.1	6.9	22.2	19.5	26.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-HW-1		0-5'	Poorly graded SAND	SP
□	T-HW-2		0-5'	Poorly graded SAND with gravel	SP
△	T-HW-3		0-5'	Silty SAND with gravel	SM

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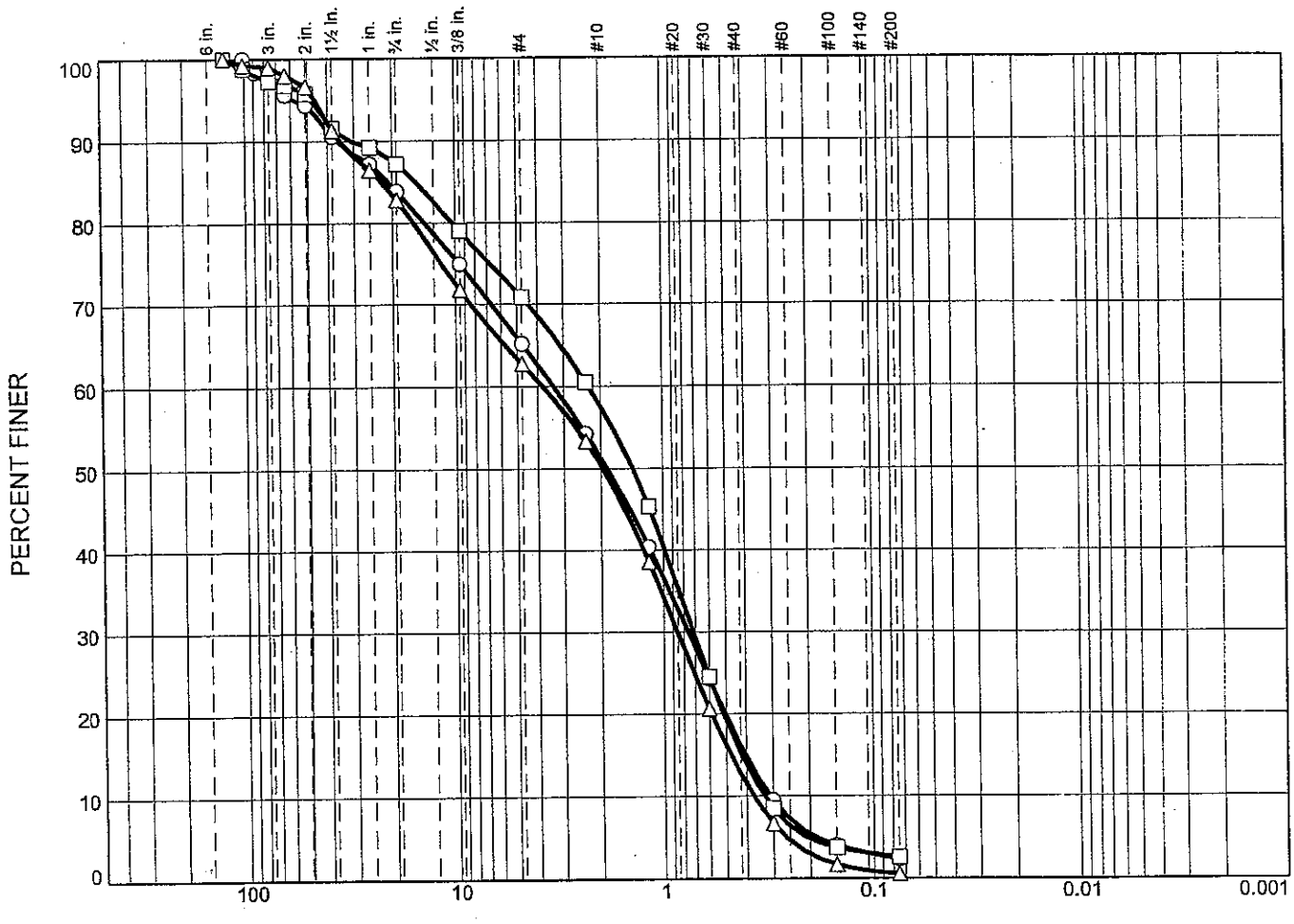
Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9) **Figure** B5

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	1.9	14.2	18.7	13.9	35.2	13.8	2.3	
□	2.7	10.1	16.3	13.4	42.3	12.6	2.6	
△	1.0	16.2	20.0	12.4	37.7	12.2	0.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-HS-1		0-5'	Poorly graded SAND with gravel	SP
□	T-HS-2		0-5'	Poorly graded SAND with gravel	SP
△	T-HS-3		0-5'	Poorly graded SAND with gravel	SP

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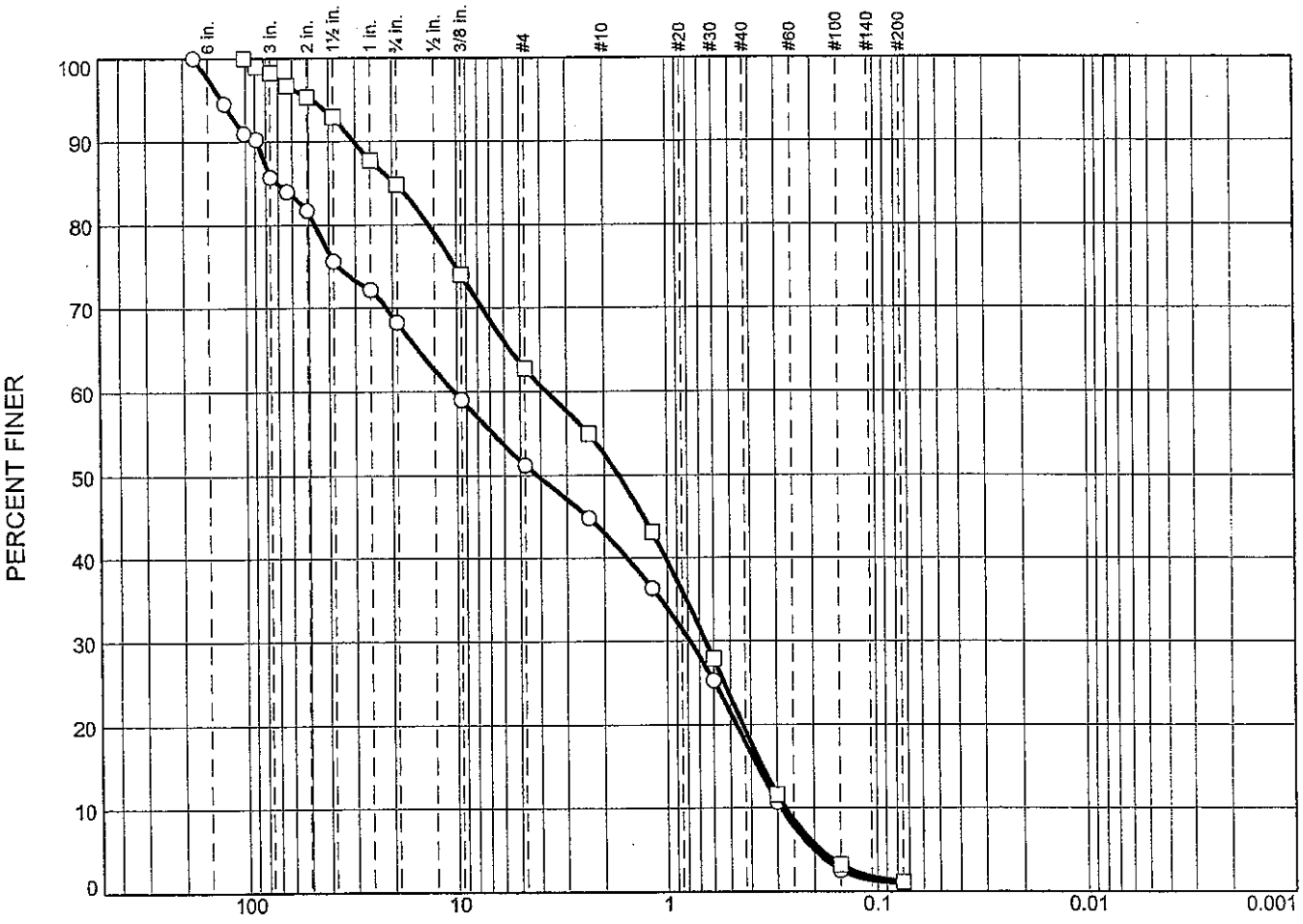
Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9)

Figure B6

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	14.2	17.5	17.1	8.1	25.3	16.8	1.0	
□	1.7	13.5	22.1	10.1	33.3	18.2	1.1	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	T-CS-1		0-5'	Poorly graded SAND with gravel	SP
□	T-HC-1		0-5'	Poorly graded SAND with gravel	SP

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Valencia, California

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project No.: 05-1155BE-9 (9) **Figure** B7

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OR-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
340227.60	0.00	0.00	7"	0.00	100.0
			5"	6405.94	98.1
			4"	12008.30	96.5
			3.5"	17746.86	94.8
			3"	20239.32	94.1
			2.5"	23589.84	93.1
			2"	33196.48	90.2
32461.00	0.00	0.00	1.5"	1271.20	86.7
			1"	2678.60	82.8
			.75"	3967.96	79.2
			.375"	6392.32	72.5
			#4	8862.08	65.6
606.74	0.00	0.00	#8	83.86	56.5
			#16	253.80	38.2
			#30	436.05	18.5
			#50	538.11	7.4
			#100	584.14	2.4
			#200	597.32	1.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
5.9	14.9	13.6	28.5	12.6	41.2	10.8	64.6			1.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3738	0.5103	0.6393	0.9083	1.7747	2.9013	20.2899	31.8210	49.9159	90.7465

Fineness Modulus	C_u	C_c
4.80	7.76	0.76

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OR-2
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
351259.80	0.00	0.00	5"	0.00	100.0
			4"	2660.44	99.2
			3.5"	8566.98	97.6
			3"	13225.02	96.2
			2.5"	16720.82	95.2
			2"	23930.34	93.2
29237.60	0.00	0.00	1.5"	826.28	90.6
			1"	2260.92	86.0
			.75"	3636.54	81.6
			.375"	7323.02	69.8
			#4	10941.14	58.3
599.50	0.00	0.00	#8	115.33	47.1
			#16	273.68	31.7
			#30	452.36	14.3
			#50	568.98	3.0
			#100	593.68	0.6
			#200	597.63	0.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
3.8	14.6	23.3	37.9	. 14.4	36.4	7.3	58.1			0.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.4894	0.6181	0.7566	1.1053	2.7858	5.2856	17.2832	23.7005	35.9565	61.4850

Fineness Modulus	C_u	C_c
5.07	10.80	0.47

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OR-3
Depth: 0-4.5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
324473.80	0.00	0.00	7"	0.00	100.0
			5"	7804.26	97.6
			4"	18614.00	94.3
			3.5"	23753.28	92.7
			3"	26831.40	91.7
			2.5"	32665.30	89.9
			2"	36842.10	88.6
28102.60	0.00	0.00	1.5"	204.30	88.0
			1"	762.72	86.2
			.75"	1716.12	83.2
			.375"	5675.00	70.7
			#4	11340.92	52.9
587.67	0.00	0.00	#8	191.92	35.6
			#16	379.59	18.7
			#30	501.07	7.8
			#50	550.76	3.3
			#100	574.36	1.2
			#200	582.15	0.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
8.3	8.5	30.3	38.8	21.5	26.4	4.5	52.4			0.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.7195	0.9801	1.2511	1.8907	4.2421	6.2268	15.2554	22.1553	63.9561	106.6558

Fineness Modulus	C_u	C_c
5.48	8.65	0.80

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OC-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
293919.60	0.00	0.00	5"	0.00	100.0
			4"	2796.64	99.0
			3"	3541.20	98.8
			2.5"	4172.26	98.6
			2"	5257.32	98.2
25197.00	0.00	0.00	1.5"	499.40	96.3
			1"	1498.20	92.4
			.75"	2183.74	89.7
			.375"	4517.30	80.6
			#4	7096.02	70.6
509.34	0.00	0.00	#8	69.41	60.9
			#16	148.46	50.0
			#30	243.55	36.8
			#50	391.78	16.3
			#100	473.45	5.0
			#200	490.01	2.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.2	9.1	19.1	28.2	12.2	31.8	23.9	67.9			2.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2242	0.2850	0.3430	0.4742	1.1808	2.2151	9.1412	12.9445	19.6305	33.2917

Fineness Modulus	C_u	C_c
3.95	9.88	0.45

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OC-2
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
276803.00	0.00	0.00	3"	0.00	100.0
			2.5"	844.44	99.7
			2"	3395.92	98.8
22109.80	0.00	0.00	1.5"	340.50	97.3
			1"	1039.66	94.1
			.75"	1425.56	92.4
			.375"	2783.02	86.3
			#4	4158.64	80.2
563.13	0.00	0.00	#8	41.51	74.3
			#16	98.20	66.2
			#30	178.77	54.7
			#50	339.92	31.8
			#100	483.00	11.4
			#200	532.30	4.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.6	12.2	19.8	7.6	28.4	39.8	75.8			4.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1386	0.1761	0.2109	0.2853	0.5072	0.7675	4.6367	8.2610	14.0068	28.5451

Fineness Modulus	C_u	C_c
3.05	5.54	0.77

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/20[illegible]

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-OC-3
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
336050.80	0.00	0.00	5"	0.00	100.0
			4"	1806.92	99.5
			3.5"	2796.64	99.2
			3"	5257.32	98.4
			2.5"	10564.58	96.9
			2"	16212.34	95.2
22972.40	0.00	0.00	1.5"	408.60	93.5
			1"	921.62	91.4
			.75"	1788.76	87.8
			.375"	4367.48	77.1
			#4	7173.20	65.5
562.23	0.00	0.00	#8	93.34	54.6
			#16	222.83	39.5
			#30	371.93	22.2
			#50	505.55	6.6
			#100	548.65	1.6
			#200	556.81	0.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.6	10.6	22.3	32.9	14.1	37.9	12.9	64.9			0.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3630	0.4534	0.5525	0.8104	1.8644	3.2962	11.3971	15.7697	22.4312	49.4866

Fineness Modulus	C_u	C_c
4.53	9.08	0.55

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CC-1
Depth: 0-5'
Material Description: Well-graded SAND with silt and gravel
USCS: SW-SM

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
294010.40	0.00	0.00	7"	0.00	100.0
			5"	3441.32	98.8
			4"	3445.86	98.8
			3.5"	5343.58	98.2
			3"	6110.84	97.9
			2.5"	7264.00	97.5
			2"	12975.32	95.6
25106.20	0.00	0.00	1.5"	712.78	92.9
			1"	1302.98	90.6
			.75"	2124.72	87.5
			.375"	4512.76	78.4
			#4	6841.78	69.5
541.69	0.00	0.00	#8	62.38	61.5
			#16	161.92	48.8
			#30	301.28	30.9
			#50	412.36	16.6
			#100	450.00	11.8
			#200	479.55	8.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
2.1	10.4	18.0	28.4	10.4	36.5	14.6	61.5			8.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1063	0.2598	0.3721	0.5804	1.2449	2.1206	10.7288	15.6653	23.6662	48.0515

Fineness Modulus	C_u	C_c
4.05	19.94	1.49

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/20

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CC-2
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
315303.00	0.00	0.00	5"	0.00	100.0
			4"	1625.32	99.5
			3.5"	2778.48	99.1
			3"	6029.12	98.1
			2.5"	8448.94	97.3
			2"	14355.48	95.4
25833.20	0.00	0.00	1.5"	944.32	92.0
			1"	1952.20	88.2
			.75"	2655.90	85.6
			.375"	4467.36	78.9
			#4	6537.60	71.3
558.30	0.00	0.00	#8	81.34	60.9
			#16	194.16	46.5
			#30	323.16	30.0
			#50	463.03	12.2
			#100	533.64	3.1
			#200	547.19	1.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.9	12.5	14.3	26.8	13.5	37.2	19.2	69.9			1.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2684	0.3406	0.4150	0.5994	1.3794	2.2456	10.5898	17.8007	31.2610	48.8615

Fineness Modulus	C_u	C_c
4.21	8.37	0.60

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CC-3
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
334552.60	0.00	0.00	3"	0.00	100.0
			2.5"	444.92	99.9
			2"	1516.36	99.5
24334.40	0.00	0.00	1.5"	326.88	98.2
			1"	1352.92	94.0
			.75"	1884.10	91.8
			.375"	4599.02	80.7
			#4	7708.92	68.0
571.23	0.00	0.00	#8	125.49	53.1
			#16	290.69	33.4
			#30	455.25	13.8
			#50	537.26	4.0
			#100	558.33	1.5
			#200	563.25	1.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	8.2	23.8	32.0	19.2	41.2	6.6	67.0			1.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.4960	0.6312	0.7621	1.0586	2.0928	3.1855	9.1575	11.9618	16.2404	28.0816

Fineness Modulus	C_u	C_c
4.55	6.42	0.71

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/20

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CH-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
151545.20	0.00	0.00	3"	0.00	100.0
			2.5"	971.56	99.4
			2"	1266.66	99.2
22686.38	0.00	0.00	1.5"	390.44	97.5
			1"	912.54	95.2
			.75"	1607.16	92.1
			.375"	3572.98	83.5
			#4	5448.00	75.4
493.78	0.00	0.00	#8	50.47	67.6
			#16	112.91	58.1
			#30	189.38	46.5
			#50	312.17	27.7
			#100	425.97	10.3
			#200	473.78	3.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.9	16.7	24.6	9.8	27.9	34.6	72.3			3.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1470	0.1876	0.2284	0.3245	0.7134	1.3423	7.1202	10.7050	15.9826	24.8643

Fineness Modulus	C_u	C_c
3.41	9.13	0.53

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CH-2
Depth: 0-5'
Material Description: Silty SAND with gravel
USCS: SM

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
299322.20	0.00	0.00	4"	0.00	100.0
			3.5"	1016.96	99.7
			3"	6010.96	98.0
			2.5"	10573.66	96.5
			2"	15944.48	94.7
22109.80	0.00	0.00	1.5"	522.10	92.4
			1"	1407.40	88.6
			.75"	2115.64	85.6
			.375"	4521.84	75.3
			#4	6828.16	65.4
486.48	0.00	0.00	#8	68.45	56.2
			#16	128.47	48.2
			#30	193.34	39.4
			#50	256.90	30.9
			#100	299.13	25.2
			#200	376.22	14.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
2.0	12.4	20.2	32.6	11.1	19.5	20.0	50.6			14.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0757	0.1023	0.2711	1.3808	3.1735	12.8292	18.1252	29.1566	52.9016

Fineness Modulus
3.83

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/20

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CH-3
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
323384.20	0.00	0.00	5"	0.00	100.0
			4"	2901.06	99.1
			3.5"	4054.22	98.7
			3"	5688.62	98.2
			2.5"	12103.64	96.3
			2"	18019.26	94.4
25651.00	0.00	0.00	1.5"	1139.54	90.2
			1"	2705.84	84.5
			.75"	3672.86	80.9
			.375"	6201.64	71.6
			#4	9048.22	61.1
567.06	0.00	0.00	#8	127.35	47.4
			#16	298.36	29.0
			#30	431.76	14.6
			#50	523.61	4.7
			#100	551.80	1.6
			#200	559.93	0.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.8	17.3	19.8	37.1	17.9	34.3	8.1	60.3			0.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.4578	0.6139	0.7955	1.2290	2.6391	4.4402	17.7242	26.4750	37.5484	54.2447

Fineness Modulus	C_u	C_c
5.01	9.70	0.74

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HW-1
Depth: 0-5'
Material Description: Poorly graded SAND
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
299004.40	0.00	0.00	3.5"	0.00	100.0
			3"	2442.52	99.2
			2.5"	3159.84	98.9
			2"	4104.16	98.6
26241.20	0.00	0.00	1.5"	340.50	97.3
			1"	944.32	95.1
			.75"	1271.20	93.8
			.375"	2615.04	88.8
			#4	2904.40	87.7
557.94	0.00	0.00	#8	40.44	81.4
			#16	105.43	71.1
			#30	191.81	57.6
			#50	329.18	36.0
			#100	483.35	11.7
			#200	538.93	3.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.8	5.4	6.1	11.5	8.5	31.3	44.9	84.7			3.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1391	0.1689	0.1965	0.2565	0.4556	0.6643	2.1278	3.2378	11.5882	24.9471

Fineness Modulus	C_u	C_c
2.75	4.78	0.71

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/200

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HW-2
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
312261.20	0.00	0.00	4"	0.00	100.0
			3.5"	3273.34	99.0
			3"	4907.74	98.4
			2.5"	7935.92	97.5
			2"	14273.76	95.4
25741.80	0.00	0.00	1.5"	1121.38	91.3
			1"	3078.12	84.0
			.75"	4204.04	79.8
			.375"	6233.42	72.3
			#4	7817.88	66.4
514.12	0.00	0.00	#8	52.33	59.7
			#16	131.58	49.4
			#30	250.52	34.1
			#50	400.82	14.6
			#100	468.75	5.9
			#200	482.84	4.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.6	18.6	13.4	32.0	8.8	33.7	19.9	62.4			4.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2319	0.3048	0.3710	0.5213	1.2171	2.4254	19.2799	26.9106	35.4314	48.9974

Fineness Modulus	C_u	C_c
4.28	10.46	0.48

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HW-3
Depth: 0-5'
Material Description: Silty SAND with gravel
USCS: SM

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
265226.80	0.00	0.00	5"	0.00	100.0
			4"	2224.60	99.2
			3.5"	3178.00	98.8
			3"	5697.70	97.9
			2.5"	8839.38	96.7
			2"	14478.06	94.5
20248.40	0.00	0.00	1.5"	544.80	92.0
			1"	1325.68	88.4
			.75"	1802.38	86.1
			.375"	3137.14	79.9
			#4	4194.96	75.0
495.04	0.00	0.00	#8	34.43	69.7
			#16	86.79	61.8
			#30	155.03	51.5
			#50	222.33	41.3
			#100	259.59	35.6
			#200	320.74	26.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
2.1	11.8	11.1	22.9	6.9	22.2	19.5	48.6			26.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0954	0.5484	1.0371	9.6453	16.6719	30.6252	53.2018

Fineness Modulus
3.09

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/20[illegible]

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HS-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
247248.40	0.00	0.00	4"	0.00	100.0
			3.5"	4072.38	98.4
			3"	4744.30	98.1
			2.5"	10846.06	95.6
			2"	13915.10	94.4
26150.40	0.00	0.00	1.5"	1053.28	90.6
			1"	1988.52	87.2
			.75"	2910.14	83.9
			.375"	5388.98	74.9
			#4	8094.82	65.2
511.49	0.00	0.00	#8	85.50	54.3
			#16	194.15	40.4
			#30	320.77	24.3
			#50	436.96	9.5
			#100	479.94	4.0
			#200	493.26	2.3

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.9	14.2	18.7	32.9	13.9	35.2	13.8	62.9			2.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3100	0.4042	0.5030	0.7573	1.8696	3.3545	14.0672	20.8194	36.2862	58.5228

Fineness Modulus	C_u	C_c
4.55	10.82	0.55

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HS-2
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
304180.00	0.00	0.00	5"	0.00	100.0
			4"	3618.38	98.8
			3"	8299.12	97.3
			2.5"	9815.48	96.8
			2"	12852.74	95.8
26105.00	0.00	0.00	1.5"	1144.08	91.6
			1"	1779.68	89.2
			.75"	2333.56	87.2
			.375"	4571.78	79.0
			#4	6787.30	70.9
550.60	0.00	0.00	#8	80.31	60.5
			#16	198.17	45.4
			#30	360.20	24.5
			#50	484.48	8.5
			#100	521.55	3.7
			#200	530.36	2.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
2.7	10.1	16.3	26.4	13.4	42.3	12.6	68.3			2.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3297	0.4214	0.5128	0.7165	1.4107	2.2892	10.3245	15.4450	31.0913	47.6742

Fineness Modulus	C_u	C_c
4.31	6.94	0.68

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/20[redacted]

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HS-3
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

[redacted]

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
287109.60	0.00	0.00	5"	0.00	100.0
			4"	2179.20	99.2
			3"	2969.16	99.0
			2.5"	5847.52	98.0
			2"	9715.60	96.6
25015.40	0.00	0.00	1.5"	1384.70	91.3
			1"	2628.66	86.5
			.75"	3577.52	82.8
			.375"	6424.10	71.8
			#4	8766.74	62.8
577.57	0.00	0.00	#8	86.79	53.3
			#16	222.65	38.6
			#30	387.85	20.6
			#50	516.01	6.7
			#100	562.26	1.7
			#200	572.64	0.5

[redacted]

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.0	16.2	20.0	36.2	12.4	37.7	12.2	62.3			0.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3702	0.4742	0.5855	0.8545	1.9630	3.7785	15.8667	22.3917	35.2023	45.9061

Fineness Modulus	C_u	C_c
4.72	10.21	0.52

GRAIN SIZE DISTRIBUTION TEST DATA

9/15/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-CS-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
299912.40	0.00	0.00	7"	0.00	100.0
			5"	16403.02	94.5
			4"	27103.80	91.0
			3.5"	29255.76	90.2
			3"	42703.24	85.8
			2.5"	48015.04	84.0
			2"	54784.18	81.7
26786.00	0.00	0.00	1.5"	2002.14	75.6
			1"	3132.60	72.2
			.75"	4417.42	68.3
			.375"	7445.60	59.0
			#4	9997.08	51.2
520.59	0.00	0.00	#8	64.69	44.9
			#16	151.48	36.3
			#30	263.89	25.3
			#50	412.17	10.7
			#100	495.18	2.5
			#200	510.86	1.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
14.2	17.5	17.1	34.6	8.1	25.3	16.8	50.2			1.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2889	0.3729	0.4686	0.7773	4.1614	10.3246	46.6544	73.3482	87.7994	130.1039

Fineness Modulus	C_u	C_c
5.43	35.73	0.20

GRAIN SIZE DISTRIBUTION TEST DATA

9/14/2005

Client: The Newhall Land & Farming Company
Project: Alluvial Sediment Sampling
Castaic Creek
Project Number: 05-1155BE-9 (9)
Location: T-HC-1
Depth: 0-5'
Material Description: Poorly graded SAND with gravel
USCS: SP

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
333917.00	0.00	0.00	4"	0.00	100.0
			3.5"	3273.34	99.0
			3"	5793.04	98.3
			2.5"	10964.10	96.7
			2"	15590.36	95.3
23971.20	0.00	0.00	1.5"	603.82	92.9
			1"	1911.34	87.7
			.75"	2642.28	84.8
			.375"	5366.28	74.0
			#4	8194.70	62.7
502.91	0.00	0.00	#8	62.35	55.0
			#16	157.15	43.1
			#30	279.33	27.9
			#50	409.82	11.6
			#100	477.33	3.2
			#200	493.70	1.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
1.7	13.5	22.1	35.6	10.1	33.3	18.2	61.6			1.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2743	0.3534	0.4373	0.6541	1.6986	3.7379	13.4631	19.3648	30.3504	48.2170

Fineness Modulus	C_u	C_c
4.46	13.63	0.42

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Sediment Sample Location Index Map

Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05	*Job No.:* 05-1155BE-9
Scale: 1" = 600'	*CAD File:* Sediment Sample Location Map
SHEET 1	*Geology by:* NA
	Drawn by: GSD
	Revised:

Castaic Creek

The Old Road

Interstate 5 Freeway

☒ OR-1

☒ OR-2

☒ OR-3

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Sediment Sample Location Map
Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05	Job No.: 05-1155BE-9
Scale: 1" = 200'	CAD File: Sediment Sample Location Map
SHEET 2	Geology by: NA / Drawn by: GSD
	Revised:

SHEET 3

Hasley Canyon

Castaic Creek

Highway 126

OC-3

OC-2

OC-1

N

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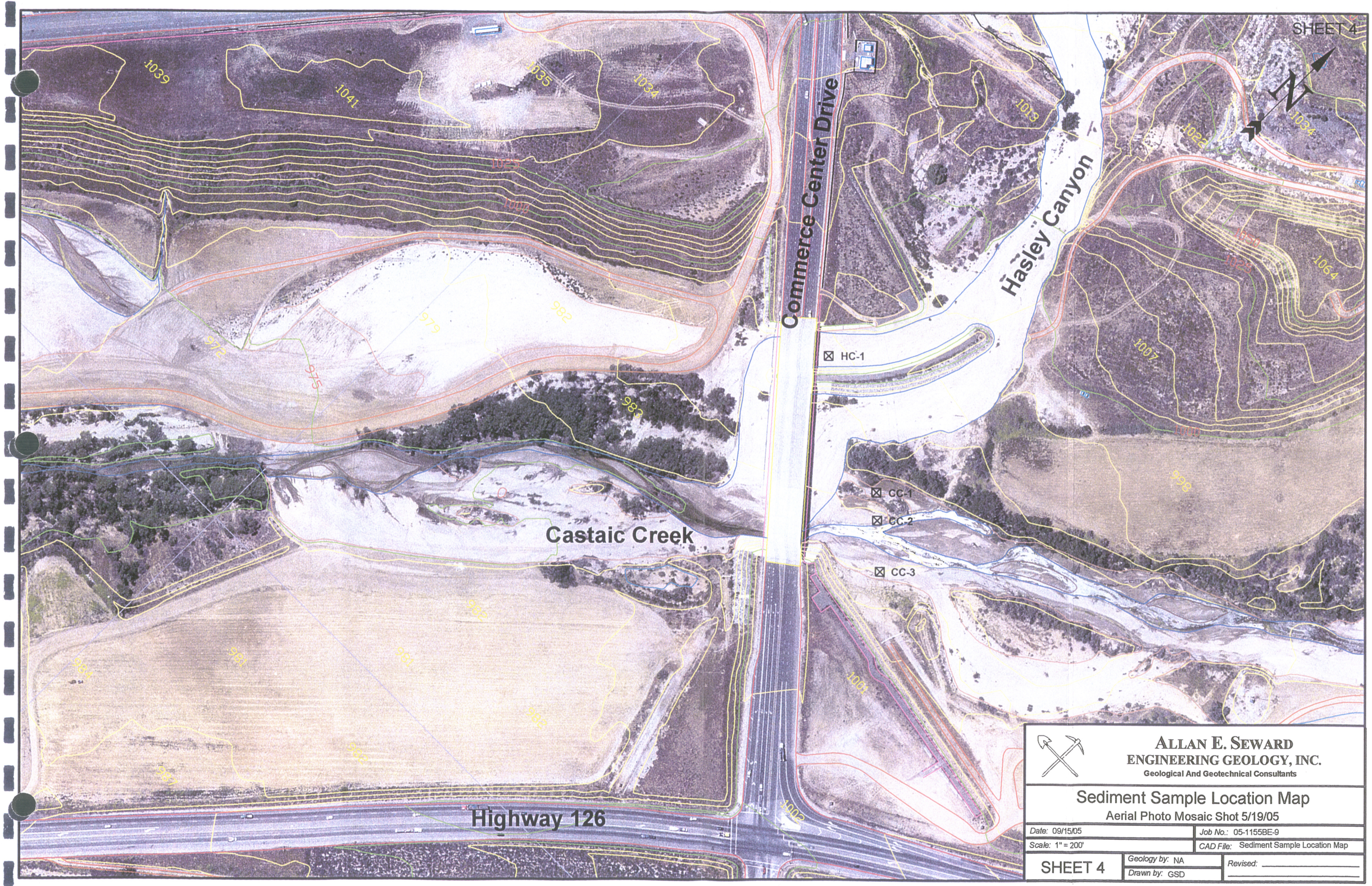
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Sediment Sample Location Map
Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05	Job No.: 05-1155BE-9
Scale: 1" = 200'	CAD File: Sediment Sample Location Map
SHEET 3	Geology by: NA Drawn by: GSD
	Revised:



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Sediment Sample Location Map

Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05	*Job No.:* 05-1155BE-9
Scale: 1" = 200'	*CAD File:* Sediment Sample Location Map
SHEET 4	*Geology by:* NA
	Drawn by: GSD
	Revised: _____

SHEET 5

Castaic Creek

Highway 126

HW-1

HW-2

HW-3

CH-1

CH-2

CH-3

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Geological And Geotechnical Consultants

Sediment Sample Location Map
Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05		Job No.: 05-1155BE-9
Scale: 1" = 200'		CAD File: Sediment Sample Location Map
SHEET 5	Geology by: NA Drawn by: GSD	Revised:

SHEET 6

N

CS-1

HS-3

HS-2

HS-1

Castaic Creek

Santa Clara River

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Geological And Geotechnical Consultants

Sediment Sample Location Map
Aerial Photo Mosaic Shot 5/19/05

Date: 09/15/05	Job No.: 05-1155BE-9
Scale: 1" = 200'	CAD File: Sediment Sample Location Map
SHEET 6	Geology by: NA
	Drawn by: GSD
	Revised:

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 4.1

Existing Condition HEC-RAS Output

Plan	***Description***
Exist025Sh	***Existing Conditions, n=0.025, Cross-Sections 12406 to 1173***
Exist025nb	***Existing Conditions, n=0.025, Cross-Sections 12406 to -977***
Exist085nb	***Existing Conditions, n=0.085, Cross-Sections 12406 to -977***

HEC-RAS model shown in Appendix are modified for fluvial use. See section 4.1.1B for model assembly. For unmodified, mixed flow regimes used in report, refer to HEC-RAS Modeling Report prepared by PACE, concurrently submitted to LACDPW.

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

HEC-RAS Plan: Exist025nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1038.42	1032.29	1038.65	0.000502	3.86	6859.13	1368.99	0.30
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1035.66	1034.12	1038.18	0.002675	12.73	2081.52	235.02	0.75
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1035.15	1033.57	1037.62	0.002640	12.63	2098.40	236.87	0.75
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1035.27	1032.97	1037.31	0.002028	11.48	2308.30	247.49	0.66
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1035.68	1032.19	1037.06	0.001306	9.42	2812.47	302.21	0.54
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1033.07	1033.07	1036.75	0.004731	15.39	1721.85	513.04	1.00
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1030.11	1030.11	1032.24	0.005609	11.72	2260.42	963.90	1.00
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1027.55	1027.55	1029.51	0.005814	11.25	2354.90	971.36	1.00
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1025.76	1025.76	1027.55	0.005985	10.74	2467.04	1086.57	1.00
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1023.84	1023.84	1025.57	0.006098	10.56	2508.95	1099.76	1.00
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1022.55	1022.55	1023.85	0.006532	9.16	2901.56	1134.20	0.99
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1019.85	1019.85	1022.05	0.005674	11.90	2226.32	509.19	1.00
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1017.50	1017.50	1019.30	0.006052	10.77	2461.37	799.78	1.01
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1015.00	1015.00	1016.55	0.006439	9.99	2652.18	870.07	1.01
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1013.35	1012.85	1014.38	0.003806	8.13	3261.40	984.24	0.79
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1011.72	1011.72	1013.49	0.006294	10.66	2486.33	727.60	1.02
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1010.26	1010.26	1012.15	0.005956	11.02	2403.64	640.60	1.00
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1008.25	1008.25	1009.78	0.006590	9.93	2669.18	897.87	1.01
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1005.21	1005.21	1006.50	0.007047	9.08	2917.06	1174.90	1.02
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1001.54	1001.54	1002.73	0.007017	8.76	3024.99	1292.27	1.01
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1000.29	999.47	1000.98	0.002721	6.67	3972.06	1256.22	0.66
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	997.88	997.85	999.48	0.006115	10.14	2614.39	808.56	0.99
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	996.88	995.48	998.05	0.002346	8.71	3041.10	573.01	0.67
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	996.36	995.04	997.09	0.002252	6.88	3854.80	1028.23	0.62
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	982.94	994.12	994.12	995.79	0.006318	10.38	2554.03	774.63	1.01
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	983.02	992.98	991.43	994.21	0.003384	8.92	2973.63	733.08	0.77
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	990.47	990.47	992.77	0.005571	12.16	2178.73	533.74	1.00
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	990.26	987.61	991.44	0.001418	8.74	3031.71	388.44	0.55
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	990.15	987.45	991.33	0.001392	8.73	3037.05	382.81	0.55
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	989.88	987.28	991.14	0.001474	9.00	2943.37	369.94	0.56
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	989.88	987.04	991.10	0.001304	8.86	2989.80	476.58	0.54
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	978.00	988.47	988.47	990.76	0.005667	12.12	2590.17	870.34	1.00
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	986.35	986.35	988.32	0.005853	11.28	2797.03	786.81	0.99
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	985.88	985.17	986.96	0.003919	8.31	3776.68	1100.76	0.79
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	984.95	984.20	985.75	0.003008	7.19	4366.49	1315.19	0.70
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	982.21	982.21	984.22	0.005718	11.36	2764.81	684.77	1.00
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	979.00	979.00	981.04	0.005848	11.46	2740.13	680.96	1.01
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	976.30	976.30	978.33	0.005779	11.43	2747.87	680.37	1.00
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	974.61	974.61	976.40	0.006269	10.74	2923.72	843.40	1.02
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	972.50	972.50	974.38	0.006064	11.02	2850.29	773.57	1.01
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	970.38	970.38	972.09	0.006594	10.49	2992.89	930.94	1.03
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	969.08	968.21	970.10	0.002867	8.11	3870.35	949.40	0.71
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	966.28	966.28	968.69	0.005606	12.47	2517.43	534.68	1.01
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	965.81	963.66	967.26	0.001791	9.68	3244.61	427.48	0.62
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	963.68	963.68	966.78	0.005011	14.12	2223.83	360.19	1.00
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	963.68	961.57	965.11	0.001819	9.60	3271.54	442.58	0.62
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	963.75	960.89	964.98	0.001368	8.91	3525.46	430.64	0.55
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	963.72	960.25	964.80	0.001087	8.33	3770.52	428.15	0.49
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	963.55	961.08	964.59	0.002246	8.19	3835.83	772.27	0.65
Hwy 126 to I-5	1122.93	FP	31400.00	952.11	963.22	961.46	964.46	0.001987	8.94	3512.52	563.93	0.63
Hwy 126 to I-5	1072.93	FP	31400.00	951.08	963.13	961.17	964.36	0.001947	8.92	3518.72	557.09	0.63
Hwy 126 to I-5	1022.93	FP	31400.00	950.11	961.77	961.36	964.11	0.004276	12.28	2556.41	449.76	0.91
Hwy 126 to I-5	972.93	FP	31400.00	950.11	961.77	961.00	963.83	0.003570	11.51	2728.17	463.02	0.84
Hwy 126 to I-5	922.93	FP	31400.00	950.11	961.72	961.11	963.59	0.003669	10.97	2862.91	552.59	0.83
Hwy 126 to I-5	872.93	FP	31400.00	950.11	961.95	960.72	963.27	0.002644	9.19	3416.14	650.39	0.71
Hwy 126 to I-5	822.93	FP	31400.00	950.11	962.15	959.82	963.05	0.001405	7.61	4133.17	813.68	0.53
Hwy 126 to I-5	772.93	FP	31400.00	949.18	962.02	959.65	962.97	0.001606	7.80	4027.06	675.56	0.56
Hwy 126 to I-5	722.93	FP	31400.00	948.11	962.00	959.60	962.85	0.001909	7.40	4244.80	877.24	0.59
Hwy 126 to I-5	672.93	FP	31400.00	948.11	961.98	959.95	962.73	0.001694	6.95	4535.75	986.87	0.56
Hwy 126 to I-5	622.93	FP	31400.00	948.11	961.97	959.77	962.62	0.001689	6.46	4860.53	1125.22	0.55
Hwy 126 to I-5	572.93	FP	31400.00	948.11	961.91	959.52	962.53	0.001487	6.28	5000.21	1097.28	0.52
Hwy 126 to I-5	522.93	FP	31400.00	948.11	961.95	958.60	962.43	0.000862	5.55	5657.22	993.91	0.41
Hwy 126 to I-5	472.93	FP	31400.00	946.95	961.91	958.65	962.39	0.000916	5.56	5648.15	1035.40	0.42
Hwy 126 to I-5	422.93	FP	31400.00	946.11	961.97	957.89	962.31	0.000585	4.70	6686.91	1129.83	0.34
Hwy 126 to I-5	372.93	FP	31400.00	946.11	961.97	957.76	962.27	0.000479	4.36	7207.11	1170.85	0.31
Hwy 126 to I-5	322.93	FP	31400.00	946.11	961.93	957.43	962.24	0.000459	4.46	7045.83	1146.37	0.31
Hwy 126 to I-5	272.93	FP	31400.00	946.11	961.93	957.02	962.21	0.000398	4.30	7294.30	1197.94	0.29
Hwy 126 to I-5	222.93	FP	31400.00	946.08	961.93	956.62	962.19	0.000318	4.07	7717.48	1423.94	0.26
Hwy 126 to I-5	172.93	FP	31400.00	944.62	961.96	955.95	962.15	0.000293	3.48	9014.45	1736.68	0.24
Hwy 126 to I-5	122.93	FP	31400.00	944.11	961.98	955.31	962.13	0.000217	3.14	10008.26	1949.25	0.21
Hwy 126 to I-5	72.93	FP	31400.00	944.11	961.98	955.18	962.11	0.000179	2.94	10673.21	2038.26	0.19
Hwy 126 to I-5	22.93	FP	31400.00	944.11	961.99	955.03	962.10	0.000151	2.58	12190.71	2115.89	0.18
Hwy 126 to I-5	-27.07	FP	31400.00	943.85	962.00	954.71	962.08	0.000116	2.32	13517.29	2943.09	0.16
Hwy 126 to I-5	-77.07	FP	31400.00	943.19	962.01	953.92	962.07	0.000080	1.99	15805.91	2903.45	0.13
Hwy 126 to I-5	-127.07	FP	31400.00	942.36	962.01	953.48	962.07	0.000073	1.93	16309.86	3472.43	0.12
Hwy 126 to I-5	-177.07	FP	31400.00	942.11	962.01	953.20	962.06	0.000059	1.76	17883.07	3489.45	0.11
Hwy 126 to I-5	-227.07	FP	31400.00	942.11	962.01	952.99	962.06	0.000053	1.71	18375.85	4058.67	0.11
Hwy 126 to I-5	-277.07	FP	31400.00	942.11	962.01	953.26	962.05	0.000063	1.58	19815.66	4689.82	0.11
Hwy 126 to I-5	-327.07	FP	31400.00	942.11	962.02	952.92	962.05	0.000051	1.30	24230.01	4768.58	0.10
Hwy 126 to I-5	-377.07	FP	31400.00	942.11	962.02	952.49	962.04	0.000041	1.17	26733.19	4886.58	0.09
Hwy 126 to I-5	-427.07	FP	31400.00	942.11	962.02	951.91	962.04	0.000027	1.04	30262.76	5001.48	0.07
Hwy 126 to I-5	-477.07	FP	31400.00	940.90	962.02	951.76	962.04	0.000025	1.00	31459.29	5098.51	0.07
Hwy 126 to I-5	-527.07	FP	31400.00	940.11	962.02	951.43	962.04	0.000021	0.94	33302.35	5195.07	0.07
Hwy 126 to I-5	-577.07	FP	31400.00	940.11	962.02	951.09	962.03	0.000019	0.91	34462.20	5327.09	0.06
Hwy 126 to I-5	-627.07	FP	31400.00	940.11	962.02	950.86	962.03	0.000018	0.88	35704.11	5632.82	0.06
Hwy 126 to I-5	-677.07	FP	31400.00	940.11	962.02	950.71	962.03	0.000016	1.02	30666.61	5756.24	0.06
Hwy 126 to I-5	-727.07	FP	31400.00	940.11	962.01	950.47	962.03	0.000013	1.01	31169.91	5522.69	0.06
Hwy 126 to I-5	-777.07	FP	31400.00	940.11	962.02	950.16	962.03	0.000010	0.72	43808.24	6010.26	0.05

HEC-RAS Plan: Exist025nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hwy 126 to I-5	-827.07	FP	31400.00	940.11	962.02	950.35	962.03	0.000008	0.68	46230.48	6112.30	0.04
Hwy 126 to I-5	-877.07	FP	31400.00	940.11	962.02	949.39	962.03	0.000007	0.64	49382.46	5946.35	0.04
Hwy 126 to I-5	-927.07	FP	31400.00	940.11	962.02	948.61	962.03	0.000005	0.61	51612.60	5615.44	0.04
Hwy 126 to I-5	-977.07	FP	31400.00	940.11	962.02	947.97	962.03	0.000005	0.60	52005.13	5315.14	0.03

HEC-RAS Plan: Exist025Sh River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1038.42	1032.29	1038.65	0.000502	3.86	6859.13	1368.99	0.30
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1035.66	1034.12	1038.18	0.002675	12.73	2081.52	235.02	0.75
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1035.15	1033.57	1037.62	0.002640	12.63	2098.40	236.87	0.75
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1035.27	1032.97	1037.31	0.002028	11.48	2308.30	247.49	0.66
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1035.68	1032.19	1037.06	0.001306	9.42	2812.47	302.21	0.54
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1033.07	1033.07	1036.75	0.004731	15.39	1721.85	513.04	1.00
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1030.11	1030.11	1032.24	0.005609	11.72	2260.42	963.90	1.00
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1027.55	1027.55	1029.51	0.005814	11.25	2354.90	971.36	1.00
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1025.76	1025.76	1027.55	0.005985	10.74	2467.04	1086.57	1.00
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1023.84	1023.84	1025.57	0.006098	10.56	2508.95	1099.76	1.00
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1022.55	1022.55	1023.85	0.006532	9.16	2901.56	1134.20	0.99
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1019.85	1019.85	1022.05	0.005674	11.90	2226.32	509.19	1.00
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1017.50	1017.50	1019.30	0.006052	10.77	2461.37	799.78	1.01
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1015.00	1015.00	1016.55	0.006439	9.99	2652.18	870.07	1.01
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1013.35	1012.85	1014.38	0.003806	8.13	3261.40	984.24	0.79
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1011.72	1011.72	1013.49	0.006294	10.66	2486.33	727.60	1.02
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1010.26	1010.26	1012.15	0.005956	11.02	2403.64	640.60	1.00
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1008.25	1008.25	1009.78	0.006590	9.93	2669.18	897.87	1.01
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1005.21	1005.21	1006.50	0.007047	9.08	2917.06	1174.90	1.02
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1001.54	1001.54	1002.73	0.007017	8.76	3024.99	1292.27	1.01
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1000.29	999.47	1000.98	0.002721	6.67	3972.06	1256.22	0.66
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	997.88	997.85	999.48	0.006115	10.14	2614.39	808.56	0.99
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	996.88	995.48	998.05	0.002346	8.71	3041.10	573.01	0.67
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	996.36	995.04	997.09	0.002252	6.88	3854.80	1028.23	0.62
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	982.94	994.12	994.12	995.79	0.006318	10.38	2554.03	774.63	1.01
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	983.02	992.98	991.43	994.21	0.003384	8.92	2973.63	733.08	0.77
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	990.47	990.47	992.77	0.005571	12.16	2178.73	533.74	1.00
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	990.26	987.61	991.44	0.001418	8.74	3031.71	388.44	0.55
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	990.15	987.45	991.33	0.001392	8.73	3037.05	382.81	0.55
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	989.88	987.28	991.14	0.001474	9.00	2943.37	369.94	0.56
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	989.88	987.04	991.10	0.001304	8.86	2989.80	476.58	0.54
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	978.00	988.47	988.47	990.76	0.005667	12.12	2590.17	870.34	1.00
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	986.35	986.35	988.32	0.005853	11.28	2797.03	786.81	0.99
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	985.88	985.17	986.96	0.003919	8.31	3776.68	1100.76	0.79
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	984.95	984.20	985.75	0.003008	7.19	4366.49	1315.19	0.70
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	982.21	982.21	984.22	0.005718	11.36	2764.81	684.77	1.00
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	979.00	979.00	981.04	0.005849	11.46	2740.04	680.96	1.01
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	976.30	976.30	978.33	0.005777	11.43	2748.12	680.39	1.00
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	974.61	974.61	976.40	0.006268	10.74	2923.92	843.42	1.02
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	972.50	972.50	974.38	0.006064	11.02	2850.24	773.56	1.01
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	970.38	970.38	972.09	0.006595	10.49	2992.66	930.92	1.03
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	969.08	968.21	970.10	0.002868	8.11	3870.06	949.39	0.71
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	966.28	966.28	968.69	0.005604	12.47	2517.82	534.69	1.01
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	965.81	963.66	967.26	0.001791	9.68	3244.64	427.48	0.62
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	963.68	963.68	966.78	0.005012	14.12	2223.70	360.19	1.00
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	962.81	961.57	964.64	0.002699	10.87	2888.84	436.21	0.74
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	962.93	960.89	964.45	0.001905	9.89	3174.19	424.85	0.64
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	962.89	960.25	964.20	0.001489	9.20	3414.68	423.26	0.57
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	961.11	961.11	963.73	0.005274	12.99	2417.49	461.86	1.00

HEC-RAS Plan: Exist085nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1042.14	1032.29	1042.22	0.000930	2.19	12076.09	1425.55	0.13
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1040.59	1034.12	1041.62	0.007426	8.17	3245.29	237.52	0.39
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1038.46	1033.57	1039.77	0.010938	9.18	2886.26	238.72	0.47
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1037.57	1032.98	1038.88	0.011503	9.20	2880.68	249.47	0.48
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1037.49	1032.19	1038.43	0.009640	7.76	3415.04	350.47	0.44
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1036.04	1033.07	1037.90	0.018113	10.95	2420.79	611.55	0.60
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1033.66	1030.11	1034.25	0.009211	6.20	4277.49	1049.70	0.41
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1031.04	1027.55	1031.58	0.008062	5.91	4488.54	993.30	0.38
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1028.92	1025.76	1029.42	0.008477	5.69	4657.15	1118.49	0.39
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1026.91	1023.84	1027.37	0.008181	5.50	4911.31	1273.07	0.38
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1024.60	1022.55	1025.00	0.011243	5.07	5247.18	1587.24	0.42
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1022.51	1019.85	1023.27	0.012995	7.10	4121.45	1160.24	0.48
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1019.86	1017.50	1020.50	0.012950	6.45	4115.66	834.46	0.47
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1017.93	1015.00	1018.32	0.007964	5.02	5282.26	910.07	0.37
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1016.34	1012.85	1016.62	0.005279	4.24	6255.03	1019.98	0.30
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1015.14	1011.72	1015.56	0.007278	5.24	5057.44	762.06	0.36
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1013.25	1010.26	1013.82	0.010147	6.07	4369.05	676.49	0.42
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1010.71	1008.25	1011.16	0.010306	5.42	4891.33	909.65	0.41
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1007.03	1005.21	1007.45	0.013269	5.18	5116.62	1227.35	0.45
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1004.84	1001.54	1005.04	0.004435	3.57	7424.10	1378.11	0.27
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1003.66	999.47	1003.82	0.002820	3.21	8262.09	1285.54	0.22
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	1002.47	997.85	1002.69	0.003378	3.82	7274.55	1187.61	0.25
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	1001.00	995.48	1001.34	0.003772	4.70	6050.55	993.51	0.27
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	999.95	995.04	1000.13	0.002760	3.44	7964.64	1270.92	0.22
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	982.94	998.71	994.10	998.99	0.003986	4.20	6344.29	889.58	0.27
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	983.02	997.47	991.43	997.72	0.003913	4.07	6513.57	979.77	0.27
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	996.03	990.47	996.37	0.004802	4.67	5674.59	919.65	0.30
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	994.15	987.61	994.67	0.004455	5.79	4574.04	404.61	0.30
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	993.76	987.45	994.31	0.004715	5.97	4445.61	399.96	0.31
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	993.00	987.28	993.65	0.005830	6.45	4111.60	380.04	0.35
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	992.87	987.04	993.53	0.005484	6.54	4049.65	509.49	0.34
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	978.00	992.21	988.47	992.84	0.009316	6.37	4930.41	1156.86	0.41
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	990.13	986.35	990.49	0.007150	4.81	6540.52	1254.62	0.35
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	989.35	985.17	989.58	0.004282	3.84	8180.02	1306.67	0.27
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	988.00	984.22	988.22	0.003984	3.74	8409.03	1336.53	0.26
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	985.68	982.21	986.21	0.008549	5.84	5402.20	1246.78	0.39
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	982.56	979.00	983.07	0.009092	5.73	5479.68	855.85	0.40
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	980.30	976.30	980.75	0.007211	5.38	5838.48	842.96	0.36
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	978.39	974.61	978.75	0.006433	4.84	6489.66	1006.66	0.34
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	976.35	972.50	976.74	0.006354	4.97	6318.46	937.47	0.34
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	974.42	970.38	974.72	0.005210	4.39	7149.85	1097.84	0.30
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	973.14	968.21	973.39	0.003347	4.01	7828.77	988.28	0.25
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	971.53	966.28	972.03	0.005126	5.69	5762.33	754.00	0.32
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	969.56	963.66	970.20	0.005626	6.44	4879.39	444.38	0.34
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	968.40	963.68	969.36	0.009153	7.88	3985.97	386.69	0.43
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	968.28	961.57	968.81	0.004422	5.83	5385.19	476.73	0.31
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	968.09	960.89	968.61	0.004045	5.74	5466.75	462.73	0.29
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	967.67	960.25	968.17	0.003830	5.70	5504.62	450.94	0.29
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	967.27	961.08	967.59	0.004144	4.52	6939.53	857.95	0.28
Hwy 126 to I-5	1122.93	FP	31400.00	952.11	966.95	961.46	967.36	0.004562	5.25	6382.63	887.29	0.30
Hwy 126 to I-5	1072.93	FP	31400.00	951.08	966.65	961.17	967.11	0.005200	5.51	5889.28	815.90	0.32
Hwy 126 to I-5	1022.93	FP	31400.00	950.11	966.21	961.36	966.79	0.007627	6.26	5394.70	884.52	0.38
Hwy 126 to I-5	972.93	FP	31400.00	950.11	965.87	961.00	966.41	0.007024	6.02	5664.26	1015.52	0.37
Hwy 126 to I-5	922.93	FP	31400.00	950.11	965.56	961.11	966.07	0.006345	5.89	5766.29	969.80	0.35
Hwy 126 to I-5	872.93	FP	31400.00	950.11	965.32	960.72	965.75	0.005465	5.34	6158.68	915.68	0.32
Hwy 126 to I-5	822.93	FP	31400.00	950.11	965.13	959.82	965.49	0.004151	4.91	6816.92	1039.59	0.29
Hwy 126 to I-5	772.93	FP	31400.00	949.18	964.90	959.65	965.26	0.005341	4.82	6623.35	1541.71	0.31
Hwy 126 to I-5	722.93	FP	31400.00	948.11	964.65	959.60	964.99	0.005249	4.70	6813.83	1452.33	0.31
Hwy 126 to I-5	672.93	FP	31400.00	948.11	964.44	959.95	964.72	0.004644	4.38	7581.19	1418.04	0.29
Hwy 126 to I-5	622.93	FP	31400.00	948.11	964.22	959.77	964.48	0.004786	4.14	7776.31	1506.66	0.29
Hwy 126 to I-5	572.93	FP	31400.00	948.11	963.95	959.52	964.23	0.005157	4.25	7466.82	1346.56	0.30
Hwy 126 to I-5	522.93	FP	31400.00	948.11	963.72	958.60	963.99	0.004328	4.20	7475.55	1132.49	0.28
Hwy 126 to I-5	472.93	FP	31400.00	946.95	963.48	958.65	963.76	0.004919	4.28	7335.05	1352.26	0.29
Hwy 126 to I-5	422.93	FP	31400.00	946.11	963.31	957.89	963.54	0.003559	3.81	8244.62	1498.71	0.25
Hwy 126 to I-5	372.93	FP	31400.00	946.11	963.16	957.76	963.36	0.003245	3.64	8628.16	1507.71	0.24
Hwy 126 to I-5	322.93	FP	31400.00	946.11	962.98	957.43	963.20	0.003204	3.78	8699.38	1735.10	0.24
Hwy 126 to I-5	272.93	FP	31400.00	946.11	962.83	957.02	963.04	0.002990	3.73	8946.40	1944.85	0.24
Hwy 126 to I-5	222.93	FP	31400.00	946.08	962.71	956.62	962.90	0.002515	3.59	9458.97	2108.71	0.22
Hwy 126 to I-5	172.93	FP	31400.00	944.62	962.62	955.95	962.76	0.002347	3.08	10673.94	2014.72	0.21
Hwy 126 to I-5	122.93	FP	31400.00	944.11	962.52	955.31	962.65	0.001939	2.90	10818.58	2067.82	0.19
Hwy 126 to I-5	72.93	FP	31400.00	944.11	962.44	955.18	962.56	0.001684	2.76	11369.12	2143.95	0.18
Hwy 126 to I-5	22.93	FP	31400.00	944.11	962.38	955.03	962.47	0.001449	2.43	12909.80	2329.49	0.16
Hwy 126 to I-5	-27.07	FP	31400.00	943.85	962.33	954.71	962.40	0.001322	2.19	14659.47	3295.51	0.15
Hwy 126 to I-5	-77.07	FP	31400.00	943.19	962.28	953.92	962.34	0.000928	1.91	16441.62	3211.58	0.13
Hwy 126 to I-5	-127.07	FP	31400.00	942.36	962.24	953.48	962.30	0.000766	1.87	16826.24	4067.88	0.12
Hwy 126 to I-5	-177.07	FP	31400.00	942.11	962.21	953.20	962.26	0.000621	1.71	18358.14	4318.38	0.11
Hwy 126 to I-5	-227.07	FP	31400.00	942.11	962.19	952.99	962.23	0.000557	1.65	19971.72	4394.91	0.10
Hwy 126 to I-5	-277.07	FP	31400.00	942.11	962.16	953.26	962.20	0.000635	1.50	22021.48	4723.87	0.11
Hwy 126 to I-5	-327.07	FP	31400.00	942.11	962.14	952.92	962.17	0.000540	1.26	25132.67	4770.04	0.09
Hwy 126 to I-5	-377.07	FP	31400.00	942.11	962.12	952.49	962.14	0.000442	1.15	27215.27	4888.75	0.09
Hwy 126 to I-5	-427.07	FP	31400.00	942.11	962.10	951.91	962.12	0.000298	1.02	30665.10	5008.96	0.07
Hwy 126 to I-5	-477.07	FP	31400.00	940.90	962.09	951.76	962.11	0.000274	0.99	31807.51	5101.72	0.07
Hwy 126 to I-5	-527.07	FP	31400.00	940.11	962.08	951.43	962.09	0.000233	0.93	33596.77	5202.33	0.06
Hwy 126 to I-5	-577.07	FP	31400.00	940.11	962.07	951.09	962.08	0.000215	0.90	34708.89	5329.68	0.06
Hwy 126 to I-5	-627.07	FP	31400.00	940.11	962.06	950.86	962.07	0.000207	0.87	35911.66	5634.92	0.06
Hwy 126 to I-5	-677.07	FP	31400.00	940.11	962.04	950.71	962.06	0.000184	1.02	30765.29	5759.68	0.06

HEC-RAS Plan: Exist085nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hwy 126 to I-5	-727.07	FP	31400.00	940.11	962.04	950.47	962.05	0.000153	1.01	31234.88	5523.78	0.06
Hwy 126 to I-5	-777.07	FP	31400.00	940.11	962.03	950.16	962.04	0.000118	0.72	43897.03	6011.80	0.05
Hwy 126 to I-5	-827.07	FP	31400.00	940.11	962.03	950.35	962.04	0.000097	0.68	46288.75	6112.72	0.04
Hwy 126 to I-5	-877.07	FP	31400.00	940.11	962.03	949.39	962.03	0.000079	0.64	49417.68	5946.48	0.04
Hwy 126 to I-5	-927.07	FP	31400.00	940.11	962.02	948.61	962.03	0.000063	0.61	51628.02	5615.53	0.04
Hwy 126 to I-5	-977.07	FP	31400.00	940.11	962.02	947.97	962.03	0.000057	0.60	52005.13	5315.14	0.03

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 4.2

Proposed Condition HEC-RAS Output

Plan	***Description***
Prop025Sh	***Proposed Conditions, n=0.025, Cross-Sections 12406 to 1173***
Prop025nb	***Proposed Conditions, n=0.025, Cross-Sections 12406 to -977***
Prop085Sh	***Proposed Conditions, n=0.085, Cross-Sections 12406 to 1173***
Prop085	***Proposed Conditions, n=0.085, Cross-Sections 12406 to -977***

HEC-RAS model shown in Appendix are modified for fluvial use. See section 4.1.1B for model assembly. For unmodified, mixed flow regimes used in report, refer to HEC-RAS Modeling Report prepared by PACE, concurrently submitted to LACDPW.

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

HEC-RAS Plan: Prop025Sh River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1038.42	1032.29	1038.65	0.000503	3.87	6854.61	1368.97	0.30
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1035.66	1034.12	1038.18	0.002676	12.73	2081.35	235.02	0.75
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1035.15	1033.57	1037.62	0.002641	12.63	2098.23	236.87	0.75
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1035.26	1032.97	1037.31	0.002029	11.48	2308.12	247.49	0.66
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1035.68	1032.18	1037.06	0.001307	9.42	2812.28	302.20	0.54
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1033.08	1033.08	1036.75	0.004716	15.38	1723.57	237.85	1.00
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1030.11	1030.11	1032.24	0.005607	11.72	2260.74	527.59	1.00
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1027.56	1027.56	1029.51	0.005757	11.22	2362.18	600.98	1.00
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1025.76	1025.76	1027.55	0.005957	10.73	2470.60	688.29	1.00
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1023.85	1023.85	1025.57	0.006037	10.53	2516.59	727.98	1.00
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1022.56	1022.56	1023.85	0.006617	9.10	2913.00	1120.54	0.99
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1019.86	1019.86	1022.05	0.005663	11.90	2227.59	509.20	1.00
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1017.52	1017.52	1019.32	0.005987	10.78	2457.32	790.17	1.00
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1015.06	1015.06	1016.69	0.006299	10.25	2584.29	800.55	1.01
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1013.07	1012.86	1014.48	0.005084	9.53	2782.15	820.13	0.91
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1011.72	1011.72	1013.49	0.006293	10.66	2486.46	727.61	1.02
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1010.26	1010.26	1012.15	0.005958	11.03	2402.90	640.25	1.00
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1008.25	1008.25	1009.78	0.006598	9.93	2668.09	897.86	1.02
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1005.24	1005.24	1006.50	0.006818	8.99	2947.08	1175.93	1.00
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1001.58	1001.58	1002.81	0.006950	8.88	2982.84	1237.68	1.01
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1000.07	999.46	1000.88	0.003385	7.22	3670.87	1214.70	0.73
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	998.90	997.85	999.81	0.002537	7.66	3458.27	841.06	0.67
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	998.51	995.48	999.19	0.001016	6.63	3998.41	604.97	0.45
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	998.11	995.03	998.83	0.000996	6.78	3908.12	562.60	0.45
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	985.20	996.93	994.98	998.29	0.002010	9.38	2826.00	414.90	0.63
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	984.00	994.29	994.29	997.15	0.005416	13.58	1951.51	343.75	1.00
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	992.40	992.40	995.42	0.005301	13.96	1897.90	320.93	1.01
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	993.55	987.62	994.18	0.000471	6.35	4174.65	371.22	0.33
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	993.55	987.45	994.13	0.000441	6.07	4364.00	398.28	0.32
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	993.48	987.28	994.07	0.000439	6.17	4292.92	381.47	0.32
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	993.46	987.04	994.06	0.000401	6.22	4259.08	511.00	0.32
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	980.00	990.55	990.55	993.70	0.005078	14.26	2201.78	480.97	1.00
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	987.73	987.73	990.35	0.005516	12.97	2420.99	478.81	1.00
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	986.63	985.92	988.66	0.003832	11.43	2746.21	469.07	0.83
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	985.37	984.53	987.46	0.003474	11.60	2707.19	428.58	0.81
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	983.14	983.14	985.91	0.005214	13.35	2351.26	423.64	1.00
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	979.38	979.38	982.12	0.005328	13.28	2364.34	436.09	1.01
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	976.68	976.68	979.43	0.005355	13.31	2359.44	435.60	1.01
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	975.06	975.06	977.69	0.005506	13.01	2413.50	469.79	1.01
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	972.20	972.11	974.47	0.005273	12.08	2598.85	551.19	0.98
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	970.47	970.47	972.35	0.006322	10.98	2858.80	802.80	1.03
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	968.89	968.21	970.20	0.003378	9.19	3417.14	784.27	0.78
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	966.28	966.28	968.69	0.005606	12.47	2517.44	534.68	1.01
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	965.81	963.66	967.26	0.001791	9.68	3244.67	427.46	0.62
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	963.68	963.68	966.78	0.005012	14.12	2223.73	360.20	1.00
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	962.81	961.57	964.65	0.002697	10.87	2889.64	436.22	0.74
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	962.93	960.89	964.45	0.001904	9.89	3174.91	424.86	0.64
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	962.89	960.25	964.20	0.001488	9.19	3415.43	423.28	0.57
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	961.11	961.11	963.73	0.005299	13.01	2413.55	461.57	1.00

HEC-RAS Plan: Prop085 River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1047.22	1032.29	1047.25	0.000192	1.37	19503.26	1503.33	0.07
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1046.60	1034.12	1047.09	0.002332	5.66	4681.29	240.57	0.23
Hwy 126 to I-5	12059.65		Bridge									
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1042.81	1033.57	1043.52	0.004093	6.74	3929.79	240.80	0.29
Hwy 126 to I-5	11917.82		Bridge									
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1037.60	1032.98	1038.90	0.011418	9.18	2887.38	249.50	0.48
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1037.52	1032.18	1038.44	0.009853	7.73	3428.99	360.89	0.44
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1036.06	1033.08	1037.91	0.018293	10.92	2426.78	247.52	0.61
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1033.66	1030.11	1034.26	0.009186	6.19	4281.07	604.08	0.41
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1031.05	1027.56	1031.59	0.008089	5.90	4491.13	618.37	0.38
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1028.92	1025.76	1029.42	0.008475	5.69	4657.49	699.28	0.39
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1026.91	1023.85	1027.37	0.008188	5.50	4910.36	820.68	0.38
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1024.59	1022.56	1024.99	0.011293	5.06	5241.91	1165.84	0.42
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1022.55	1019.86	1023.30	0.012520	7.04	4170.72	1166.58	0.47
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1020.04	1017.52	1020.66	0.012204	6.31	4205.14	986.62	0.46
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1018.14	1015.06	1018.56	0.007866	5.18	5112.80	828.19	0.37
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1016.35	1012.86	1016.71	0.006316	4.80	5516.59	848.67	0.33
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1015.14	1011.72	1015.56	0.007280	5.24	5057.11	762.06	0.36
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1013.24	1010.26	1013.81	0.010158	6.07	4362.52	674.32	0.42
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1010.66	1008.25	1011.12	0.010613	5.47	4847.98	909.42	0.42
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1007.24	1005.24	1007.62	0.011307	4.93	5370.37	1228.47	0.42
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1005.68	1001.58	1005.85	0.002965	3.22	8241.10	1318.09	0.23
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1004.99	999.46	1005.10	0.001569	2.73	9694.55	1229.50	0.17
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	1004.39	997.85	1004.53	0.001576	3.05	8880.10	1009.74	0.18
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	1003.75	995.48	1003.93	0.001619	3.45	7882.41	782.91	0.18
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	1003.04	995.03	1003.28	0.001971	3.93	6742.75	580.03	0.20
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	985.20	1001.92	994.98	1002.33	0.003919	5.14	5162.38	493.53	0.28
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	984.00	1000.17	994.28	1000.80	0.005904	6.33	4183.16	389.78	0.34
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	998.01	992.42	998.80	0.006859	7.12	3720.48	328.41	0.37
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	996.96	987.62	997.33	0.002304	4.86	5448.85	375.77	0.23
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	996.81	987.45	997.15	0.002219	4.66	5682.00	411.62	0.22
Hwy 126 to I-5	5500 5500 BR		Bridge									
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	996.17	987.28	996.56	0.002559	4.96	5340.29	394.41	0.24
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	996.10	987.04	996.51	0.002388	5.10	5197.02	544.28	0.23
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	980.00	994.89	990.55	996.00	0.010494	8.44	3720.28	487.93	0.46
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	992.96	987.73	993.61	0.006371	6.45	4864.99	487.10	0.35
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	992.14	985.92	992.67	0.004965	5.85	5369.02	482.86	0.31
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	990.17	984.52	990.83	0.006285	6.54	4798.91	442.13	0.35
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	987.08	983.14	988.02	0.010374	7.74	4054.67	440.24	0.45
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	983.80	979.38	984.62	0.008652	7.27	4318.70	448.59	0.41
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	981.56	976.68	982.30	0.007486	6.93	4533.54	454.85	0.39
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	979.02	975.06	979.84	0.009645	7.27	4318.19	486.01	0.43
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	976.66	972.11	977.25	0.006744	6.18	5080.93	562.07	0.36
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	974.72	970.47	975.06	0.005521	4.73	6635.11	947.64	0.32
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	973.27	968.21	973.59	0.003878	4.57	6874.53	793.89	0.27
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	971.62	966.28	972.12	0.005220	5.64	5609.74	613.41	0.32
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	969.68	963.66	970.31	0.005438	6.37	4931.79	444.91	0.34
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	968.57	963.68	969.50	0.008705	7.75	4053.04	388.27	0.42
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	968.47	961.57	968.99	0.003988	5.77	5476.44	478.92	0.29
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	968.31	960.89	968.80	0.003678	5.66	5565.04	464.54	0.28
Hwy 126 to I-5	1360.55		Bridge									
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	967.63	960.25	968.14	0.003768	5.73	5489.03	450.73	0.29
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	967.24	961.08	967.56	0.004199	4.54	6910.92	857.53	0.28
Hwy 126 to I-5	1122.93	FP	31400.00	952.11	966.90	961.47	967.33	0.004498	5.34	6282.40	851.32	0.30
Hwy 126 to I-5	1072.93	FP	31400.00	951.08	966.65	961.19	967.10	0.004839	5.44	6120.48	831.49	0.31
Hwy 126 to I-5	1022.93	FP	31400.00	950.11	966.19	961.38	966.78	0.007662	6.29	5355.34	855.76	0.38
Hwy 126 to I-5	972.93	FP	31400.00	950.11	965.85	961.03	966.40	0.007105	6.06	5536.29	885.31	0.37
Hwy 126 to I-5	922.93	FP	31400.00	950.11	965.53	961.10	966.04	0.006945	5.87	5712.34	880.44	0.36
Hwy 126 to I-5	872.93	FP	31400.00	950.11	965.27	960.75	965.70	0.005539	5.35	6158.24	905.12	0.33
Hwy 126 to I-5	822.93	FP	31400.00	950.11	965.08	959.84	965.44	0.004200	4.96	6731.74	980.64	0.29
Hwy 126 to I-5	772.93	FP	31400.00	949.18	964.82	959.64	965.22	0.004676	5.14	6494.40	1466.85	0.30
Hwy 126 to I-5	722.93	FP	31400.00	948.11	964.61	959.63	964.96	0.005294	4.73	6715.71	1475.10	0.31
Hwy 126 to I-5	672.93	FP	31400.00	948.11	964.40	959.96	964.69	0.004724	4.40	7481.99	1288.02	0.29
Hwy 126 to I-5	622.93	FP	31400.00	948.11	964.17	959.78	964.44	0.004933	4.18	7618.59	1330.84	0.29
Hwy 126 to I-5	572.93	FP	31400.00	948.11	963.90	959.51	964.19	0.005234	4.31	7348.44	1221.59	0.30
Hwy 126 to I-5	522.93	FP	31400.00	948.11	963.67	958.61	963.95	0.004230	4.26	7380.26	1438.01	0.28
Hwy 126 to I-5	472.93	FP	31400.00	946.95	963.43	958.67	963.73	0.004752	4.34	7242.30	1275.07	0.29
Hwy 126 to I-5	422.93	FP	31400.00	946.11	963.27	957.90	963.51	0.003456	3.87	8106.40	1404.92	0.25
Hwy 126 to I-5	372.93	FP	31400.00	946.11	963.12	957.76	963.33	0.003164	3.69	8511.02	1631.61	0.24
Hwy 126 to I-5	322.93	FP	31400.00	946.11	962.96	957.45	963.18	0.003149	3.80	8706.31	1763.14	0.24
Hwy 126 to I-5	272.93	FP	31400.00	946.11	962.81	957.00	963.02	0.002962	3.74	8921.34	1912.78	0.24
Hwy 126 to I-5	222.93	FP	31400.00	946.08	962.68	956.65	962.88	0.002535	3.61	9416.43	2084.00	0.22
Hwy 126 to I-5	172.93	FP	31400.00	944.62	962.60	955.94	962.74	0.002368	3.09	10654.66	2049.44	0.21
Hwy 126 to I-5	122.93	FP	31400.00	944.11	962.50	955.31	962.63	0.001960	2.91	10796.89	2075.08	0.19
Hwy 126 to I-5	72.93	FP	31400.00	944.11	962.42	955.17	962.54	0.001709	2.77	11327.98	2182.94	0.18
Hwy 126 to I-5	22.93	FP	31400.00	944.11	962.36	955.04	962.45	0.001466	2.44	12861.68	2323.85	0.16
Hwy 126 to I-5	-27.07	FP	31400.00	944.11	962.30	954.71	962.38	0.001134	2.20	14551.60	2324.88	0.14
Hwy 126 to I-5	-77.07	FP	31400.00	943.19	962.27	953.93	962.33	0.000817	1.92	16322.20	2405.06	0.12
Hwy 126 to I-5	-127.07	FP	31400.00	942.36	962.23	953.49	962.29	0.000771	1.88	16683.22	2571.53	0.12
Hwy 126 to I-5	-177.07	FP	31400.00	942.11	962.20	953.21	962.25	0.000625	1.72	18218.35	2569.48	0.11
Hwy 126 to I-5	-227.07	FP	31400.00	942.11	962.17	953.00	962.22	0.000567	1.68	18713.17	2721.23	0.10
Hwy 126 to I-5	-277.07	FP	31400.00	942.11	962.15	953.27	962.19	0.000597	1.61	19542.78	2964.41	0.10
Hwy 126 to I-5	-327.07	FP	31400.00	942.11	962.13	952.94	962.16	0.000457	1.41	22240.05	3019.71	0.09
Hwy 126 to I-5	-377.07	FP	31400.00	942.11	962.11	952.45	962.14	0.000378	1.32	23848.02	3120.41	0.08
Hwy 126 to I-5	-427.07	FP	31400.00	942.11	962.10	952.17	962.12	0.000253	1.16	27112.82	3178.95	0.07
Hwy 126 to I-5	-477.07	FP	31400.00	940.90	962.09	951.79	962.11	0.000238	1.14	27564.88	3168.60	0.07
Hwy 126 to I-5	-527.07	FP	31400.00	940.11	962.08	951.38	962.10	0.000208	1.09	28776.11	3183.20	0.06
Hwy 126 to I-5	-577.07	FP	31400.00	940.11	962.07	951.14	962.08	0.000201	1.07	29298.83	3251.05	0.06

HEC-RAS Plan: Prop085 River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hwy 126 to I-5	-627.07	FP	31400.00	940.11	962.06	950.97	962.07	0.000211	1.05	29824.59	3522.29	0.06
Hwy 126 to I-5	-677.07	FP	31400.00	940.11	962.05	950.68	962.06	0.000185	1.02	30762.00	3541.16	0.06
Hwy 126 to I-5	-727.07	FP	31400.00	940.11	962.04	950.47	962.06	0.000152	1.00	31264.54	3247.36	0.06
Hwy 126 to I-5	-777.07	FP	31400.00	940.11	962.04	950.19	962.05	0.000125	0.89	35352.39	3646.31	0.05
Hwy 126 to I-5	-827.07	FP	31400.00	940.11	962.03	950.25	962.04	0.000106	0.84	37442.92	3704.27	0.05
Hwy 126 to I-5	-877.07	FP	31400.00	940.11	962.03	949.47	962.04	0.000085	0.80	39271.98	3530.85	0.04
Hwy 126 to I-5	-927.07	FP	31400.00	940.11	962.02	948.57	962.03	0.000066	0.77	40844.84	3221.36	0.04
Hwy 126 to I-5	-977.07	FP	31400.00	940.11	962.02	948.00	962.03	0.000061	0.78	40242.10	2938.94	0.04

HEC-RAS Plan: Prop085Sh River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1047.22	1032.29	1047.25	0.000192	1.37	19503.26	1503.33	0.07
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1046.60	1034.12	1047.09	0.002332	5.66	4681.29	240.57	0.23
Hwy 126 to I-5	12059.65		Bridge									
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1042.81	1033.57	1043.52	0.004093	6.74	3929.79	240.80	0.29
Hwy 126 to I-5	11917.82		Bridge									
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1037.60	1032.98	1038.90	0.011418	9.18	2887.38	249.50	0.48
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1037.52	1032.18	1038.44	0.009853	7.73	3428.99	360.89	0.44
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1036.06	1033.08	1037.91	0.018293	10.92	2426.78	247.52	0.61
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1033.66	1030.11	1034.26	0.009186	6.19	4281.07	604.08	0.41
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1031.05	1027.56	1031.59	0.008089	5.90	4491.13	618.37	0.38
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1028.92	1025.76	1029.42	0.008475	5.69	4657.49	699.28	0.39
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1026.91	1023.85	1027.37	0.008188	5.50	4910.36	820.68	0.38
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1024.59	1022.56	1024.99	0.011293	5.06	5241.91	1165.84	0.42
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1022.55	1019.86	1023.30	0.012520	7.04	4170.72	1166.58	0.47
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1020.04	1017.52	1020.66	0.012204	6.31	4205.14	986.62	0.46
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1018.14	1015.06	1018.56	0.007866	5.18	5112.80	828.19	0.37
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1016.35	1012.86	1016.71	0.006316	4.80	5516.59	848.67	0.33
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1015.14	1011.72	1015.56	0.007280	5.24	5057.11	762.06	0.36
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1013.24	1010.26	1013.81	0.010158	6.07	4362.52	674.32	0.42
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1010.66	1008.25	1011.12	0.010613	5.47	4847.98	909.42	0.42
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1007.24	1005.24	1007.62	0.011307	4.93	5370.37	1228.47	0.42
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1005.68	1001.58	1005.85	0.002965	3.22	8241.10	1318.09	0.23
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1004.99	999.46	1005.10	0.001569	2.73	9694.55	1229.50	0.17
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	1004.39	997.85	1004.53	0.001576	3.05	8880.10	1009.74	0.18
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	1003.75	995.48	1003.93	0.001619	3.45	7882.41	782.91	0.18
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	1003.04	995.03	1003.28	0.001971	3.93	6742.75	580.03	0.20
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	985.20	1001.92	994.98	1002.33	0.003919	5.14	5162.38	493.53	0.28
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	984.00	1000.17	994.28	1000.80	0.005904	6.33	4183.16	389.78	0.34
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	998.01	992.42	998.80	0.006859	7.12	3720.48	328.41	0.37
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	996.96	987.62	997.33	0.002304	4.86	5448.85	375.77	0.23
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	996.81	987.45	997.15	0.002219	4.66	5682.00	411.62	0.22
Hwy 126 to I-5	5500 5500 BR		Bridge									
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	996.17	987.28	996.56	0.002559	4.96	5340.29	394.41	0.24
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	996.10	987.04	996.51	0.002388	5.10	5197.02	544.28	0.23
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	980.00	994.89	990.55	996.00	0.010494	8.44	3720.28	487.93	0.46
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	992.96	987.73	993.61	0.006371	6.45	4864.99	487.10	0.35
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	992.14	985.92	992.67	0.004965	5.85	5369.02	482.86	0.31
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	990.17	984.52	990.83	0.006285	6.54	4798.91	442.13	0.35
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	987.08	983.14	988.02	0.010374	7.74	4054.67	440.24	0.45
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	983.80	979.38	984.62	0.008653	7.27	4318.67	448.59	0.41
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	981.56	976.68	982.30	0.007486	6.93	4533.49	454.85	0.39
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	979.02	975.06	979.84	0.009646	7.27	4317.98	486.01	0.43
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	976.66	972.11	977.25	0.006747	6.18	5080.24	562.07	0.36
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	974.71	970.47	975.06	0.005532	4.74	6631.12	947.63	0.32
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	973.26	968.21	973.58	0.003890	4.57	6868.09	793.87	0.27
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	971.61	966.28	972.10	0.005249	5.65	5600.35	613.40	0.32
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	969.65	963.66	970.28	0.005485	6.38	4918.54	444.77	0.34
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	968.53	963.68	969.47	0.008817	7.78	4036.53	388.05	0.43
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	968.43	961.57	968.95	0.004038	5.79	5454.93	478.54	0.30
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	968.26	960.89	968.76	0.003726	5.68	5543.17	464.21	0.28
Hwy 126 to I-5	1360.55		Bridge									
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	967.58	960.25	968.09	0.003826	5.75	5463.56	450.40	0.29
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	967.17	961.11	967.50	0.004316	4.58	6852.27	856.91	0.29

HEC-RAS Plan: Prop025nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP

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)	
Hwy 126 to I-5	12406.68	FP	26500.00	1023.80	1038.42	1032.29	1038.65	0.000503	3.87	6854.61	1368.97	0.30
Hwy 126 to I-5	12161.99	FP	26500.00	1024.00	1035.66	1034.12	1038.18	0.002676	12.73	2081.35	235.02	0.75
Hwy 126 to I-5	11957.32	FP	26500.00	1024.00	1035.15	1033.57	1037.62	0.002641	12.63	2098.23	236.87	0.75
Hwy 126 to I-5	11878.32	FP	26500.00	1024.00	1035.26	1032.97	1037.31	0.002029	11.48	2308.12	247.49	0.66
Hwy 126 to I-5	11845.64	FP	26500.00	1024.00	1035.68	1032.18	1037.06	0.001307	9.42	2812.28	302.20	0.54
Hwy 126 to I-5	11811.76 11838.47	FP	26500.00	1024.00	1033.08	1033.08	1036.75	0.004716	15.38	1723.57	237.85	1.00
Hwy 126 to I-5	11551.18 11577.89	FP	26500.00	1022.00	1030.11	1030.11	1032.24	0.005607	11.72	2260.74	527.59	1.00
Hwy 126 to I-5	11242.98 11269.69	FP	26500.00	1020.00	1027.56	1027.56	1029.51	0.005757	11.22	2362.18	600.98	1.00
Hwy 126 to I-5	10982.86 11009.57	FP	26500.00	1016.00	1025.76	1025.76	1027.55	0.005957	10.73	2470.60	688.29	1.00
Hwy 126 to I-5	10738.26 10764.97	FP	26500.00	1016.00	1023.85	1023.85	1025.57	0.006037	10.53	2516.59	727.98	1.00
Hwy 126 to I-5	10490.82 10517.53	FP	26500.00	1012.00	1022.56	1022.56	1023.85	0.006617	9.10	2913.00	1120.54	0.99
Hwy 126 to I-5	10351.28 10377.99	FP	26500.00	1012.00	1019.86	1019.86	1022.05	0.005663	11.90	2227.59	509.20	1.00
Hwy 126 to I-5	10141.82 10168.53	FP	26500.00	1010.00	1017.52	1017.52	1019.32	0.005987	10.78	2457.32	790.17	1.00
Hwy 126 to I-5	9931.16 9957.87	FP	26500.00	1008.00	1015.06	1015.06	1016.69	0.006299	10.25	2584.29	800.55	1.01
Hwy 126 to I-5	9670.57 9697.28	FP	26500.00	1004.00	1013.07	1012.86	1014.48	0.005084	9.53	2782.15	820.13	0.91
Hwy 126 to I-5	9501.81 9528.52	FP	26500.00	1004.00	1011.72	1011.72	1013.49	0.006293	10.66	2486.46	727.61	1.02
Hwy 126 to I-5	9298.99 9325.7	FP	26500.00	1003.20	1010.26	1010.26	1012.15	0.005958	11.03	2402.90	640.25	1.00
Hwy 126 to I-5	9042.81 9069.52	FP	26500.00	1000.00	1008.25	1008.25	1009.78	0.006598	9.93	2668.09	897.86	1.02
Hwy 126 to I-5	8724.84 8751.55	FP	26500.00	998.00	1005.24	1005.24	1006.50	0.006818	8.99	2947.08	1175.93	1.00
Hwy 126 to I-5	8396.13 8422.84	FP	26500.00	996.00	1001.58	1001.58	1002.81	0.006950	8.88	2982.84	1237.68	1.01
Hwy 126 to I-5	8049.79 8076.5	FP	26500.00	992.00	1000.07	999.46	1000.88	0.003385	7.22	3670.87	1214.70	0.73
Hwy 126 to I-5	7688.71 7715.42	FP	26500.00	990.00	998.90	997.85	999.81	0.002537	7.66	3458.27	841.06	0.67
Hwy 126 to I-5	7326.46 7353.17	FP	26500.00	988.00	998.51	995.48	999.19	0.001016	6.63	3998.41	604.97	0.45
Hwy 126 to I-5	6966.68 6993.39	FP	26500.00	986.54	998.11	995.03	998.83	0.000996	6.78	3908.12	562.60	0.45
Hwy 126 to I-5	6623.5 6650.21	FP	26500.00	985.20	996.93	994.98	998.29	0.002010	9.38	2826.00	414.90	0.63
Hwy 126 to I-5	6304.52 6331.85	FP	26500.00	984.00	994.29	994.29	997.15	0.005416	13.58	1951.51	343.75	1.00
Hwy 126 to I-5	5992.38 6019.71	FP	26500.00	982.00	992.40	992.40	995.42	0.005301	13.96	1897.90	320.93	1.01
Hwy 126 to I-5	5629.45 5657.05	FP	26500.00	980.13	993.55	987.62	994.18	0.000471	6.35	4174.65	371.22	0.33
Hwy 126 to I-5	5557.68 5579.28	FP	26500.00	980.00	993.55	987.45	994.13	0.000441	6.07	4364.00	398.28	0.32
Hwy 126 to I-5	5453.98 5453.98	FP	26500.00	980.00	993.48	987.28	994.07	0.000439	6.17	4292.92	381.47	0.32
Hwy 126 to I-5	5434.68 5434.68	FP	26500.00	980.00	993.46	987.04	994.06	0.000401	6.22	4259.08	511.00	0.32
Hwy 126 to I-5	5340.04 5340.04	FP	31400.00	980.00	990.55	990.55	993.70	0.005078	14.26	2201.78	480.97	1.00
Hwy 126 to I-5	5060.55 5060.55	FP	31400.00	976.00	987.73	987.73	990.35	0.005516	12.97	2420.99	478.81	1.00
Hwy 126 to I-5	4899.94 4899.94	FP	31400.00	976.00	986.63	985.92	988.66	0.003832	11.43	2746.21	469.07	0.83
Hwy 126 to I-5	4571.63 4571.63	FP	31400.00	976.00	985.37	984.53	987.46	0.003474	11.60	2707.19	428.58	0.81
Hwy 126 to I-5	4220.87 4220.87	FP	31400.00	972.00	983.14	983.14	985.91	0.005214	13.35	2351.26	423.64	1.00
Hwy 126 to I-5	3865.39 3865.39	FP	31400.00	970.00	979.38	979.38	982.12	0.005328	13.28	2364.34	436.09	1.01
Hwy 126 to I-5	3579.81 3579.81	FP	31400.00	966.00	976.68	976.68	979.43	0.005355	13.31	2359.44	435.60	1.01
Hwy 126 to I-5	3289.64 3289.64	FP	31400.00	964.00	975.06	975.06	977.69	0.005506	13.01	2413.50	469.79	1.01
Hwy 126 to I-5	2974.88 2974.88	FP	31400.00	962.00	972.20	972.11	974.47	0.005273	12.08	2598.85	551.19	0.98
Hwy 126 to I-5	2627.11 2627.11	FP	31400.00	960.00	970.47	970.47	972.35	0.006322	10.98	2858.80	802.80	1.03
Hwy 126 to I-5	2307.93 2307.93	FP	31400.00	960.00	968.89	968.21	970.20	0.003378	9.19	3417.14	784.27	0.78
Hwy 126 to I-5	1981.79 1981.79	FP	31400.00	956.27	966.28	966.28	968.69	0.005606	12.47	2517.44	534.68	1.01
Hwy 126 to I-5	1644.89 1644.89	FP	31400.00	956.00	965.81	963.66	967.26	0.001791	9.68	3244.64	427.46	0.62
Hwy 126 to I-5	1530.61 1530.61	FP	31400.00	955.23	963.68	963.68	966.78	0.005011	14.12	2223.80	360.20	1.00
Hwy 126 to I-5	1462.06 1462.06	FP	31400.00	952.69	963.68	961.57	965.11	0.001823	9.60	3269.30	442.54	0.62
Hwy 126 to I-5	1415.17 1415.17	FP	31400.00	952.00	963.74	960.89	964.98	0.001371	8.91	3523.36	430.60	0.55
Hwy 126 to I-5	1305.93 1305.93	FP	31400.00	952.00	963.72	960.25	964.80	0.001089	8.33	3768.40	428.12	0.49
Hwy 126 to I-5	1172.93	FP	31400.00	952.11	963.54	961.08	964.59	0.002251	8.20	3831.57	771.52	0.65
Hwy 126 to I-5	1122.93	FP	31400.00	952.11	963.21	961.47	964.46	0.001994	8.95	3508.48	563.81	0.63
Hwy 126 to I-5	1072.93	FP	31400.00	951.08	963.12	961.19	964.36	0.001956	8.94	3513.54	556.92	0.63
Hwy 126 to I-5	1022.93	FP	31400.00	950.11	961.76	961.38	964.11	0.004292	12.30	2553.24	449.64	0.91
Hwy 126 to I-5	972.93	FP	31400.00	950.11	961.76	961.03	963.83	0.003583	11.52	2724.86	462.85	0.84
Hwy 126 to I-5	922.93	FP	31400.00	950.11	961.71	961.10	963.59	0.003680	10.98	2860.11	542.10	0.84
Hwy 126 to I-5	872.93	FP	31400.00	950.11	961.96	960.75	963.26	0.002614	9.16	3429.13	651.01	0.70
Hwy 126 to I-5	822.93	FP	31400.00	950.11	962.14	959.84	963.04	0.001409	7.61	4130.18	829.82	0.53
Hwy 126 to I-5	772.93	FP	31400.00	949.18	962.02	959.64	962.97	0.001537	7.82	4022.00	675.11	0.55
Hwy 126 to I-5	722.93	FP	31400.00	948.11	962.00	959.63	962.85	0.001916	7.40	4242.08	878.39	0.59
Hwy 126 to I-5	672.93	FP	31400.00	948.11	961.98	959.96	962.73	0.001701	6.94	4537.27	994.78	0.56
Hwy 126 to I-5	622.93	FP	31400.00	948.11	961.96	959.78	962.61	0.001701	6.47	4849.42	1124.59	0.55
Hwy 126 to I-5	572.93	FP	31400.00	948.11	961.91	959.51	962.52	0.001490	6.29	4995.63	1096.21	0.52
Hwy 126 to I-5	522.93	FP	31400.00	948.11	961.95	958.61	962.43	0.000857	5.55	5654.87	988.49	0.41
Hwy 126 to I-5	472.93	FP	31400.00	946.95	961.90	958.67	962.38	0.000916	5.57	5640.50	1032.05	0.42
Hwy 126 to I-5	422.93	FP	31400.00	946.11	961.96	957.90	962.31	0.000562	4.71	6668.81	1088.31	0.34
Hwy 126 to I-5	372.93	FP	31400.00	946.11	961.97	957.76	962.27	0.000464	4.37	7185.33	1135.36	0.31
Hwy 126 to I-5	322.93	FP	31400.00	946.11	961.93	957.45	962.24	0.000451	4.47	7018.37	1119.82	0.30
Hwy 126 to I-5	272.93	FP	31400.00	946.11	961.93	957.00	962.21	0.000394	4.30	7296.93	1183.89	0.29
Hwy 126 to I-5	222.93	FP	31400.00	946.08	961.93	956.65	962.19	0.000318	4.08	7699.75	1437.89	0.26
Hwy 126 to I-5	172.93	FP	31400.00	944.62	961.96	955.94	962.15	0.000295	3.48	9018.79	1749.29	0.24
Hwy 126 to I-5	122.93	FP	31400.00	944.11	961.98	955.31	962.13	0.000215	3.13	10025.30	1970.23	0.21
Hwy 126 to I-5	72.93	FP	31400.00	944.11	961.98	955.17	962.11	0.000180	2.94	10670.07	2069.50	0.19
Hwy 126 to I-5	22.93	FP	31400.00	944.11	961.99	955.04	962.09	0.000151	2.58	12192.46	2165.62	0.18
Hwy 126 to I-5	-27.07	FP	31400.00	944.11	962.00	954.71	962.08	0.000115	2.32	13516.49	2263.80	0.16
Hwy 126 to I-5	-77.07	FP	31400.00	943.19	962.01	953.93	962.07	0.000079	1.99	15765.43	2372.21	0.13
Hwy 126 to I-5	-127.07	FP	31400.00	942.36	962.01	953.49	962.07	0.000073	1.94	16200.66	2457.60	0.12
Hwy 126 to I-5	-177.07	FP	31400.00	942.11	962.01	953.21	962.06	0.000059	1.77	17777.61	2437.29	0.11
Hwy 126 to I-5	-227.07	FP	31400.00	942.11	962.01	953.00	962.06	0.000052	1.71	18337.61	2552.02	0.11
Hwy 126 to I-5	-277.07	FP	31400.00	942.11	962.01	953.27	962.05	0.000055	1.64	19178.45	2958.39	0.11
Hwy 126 to I-5	-327.07	FP	31400.00	942.11	962.02	952.94	962.05	0.000042	1.43	21901.21	3018.76	0.09
Hwy 126 to I-5	-377.07	FP	31400.00	942.11	962.02	952.45	962.04	0.000034	1.33	23557.21	3120.35	0.09
Hwy 126 to I-5	-427.07	FP	31400.00	942.11	962.02	952.17	962.04	0.000023	1.17	26861.37	3178.90	0.07
Hwy 126 to I-5	-477.07	FP	31400.00	940.90	962.02	951.79	962.04	0.000021	1.15	27349.81	3168.56	0.07
Hwy 126 to I-5	-527.07	FP	31400.00	940.11	962.02	951.38	962.04	0.000018	1.10	28592.50	3183.17	0.06
Hwy 126 to I-5	-577.07	FP	31400.00	940.11	962.02	951.14	962.04	0.000018	1.08	29141.68	3251.01	0.06
Hwy 126 to I-5	-627.07	FP	31400.00	940.11	962.02	950.97	962.04	0.000019	1.06	29687.65	3522.27	0.06
Hwy 126 to I-5	-677.07	FP	31400.00	940.11	962.02	950.68	962.03	0.000016	1.02	30659.14	3540.56	0.06
Hwy 126 to I-5	-727.07	FP	31400.00	940.11	962.02	950.47	962.03	0.000013	1.01	31195.59	3246.26	0.06
Hwy 126 to I-5	-777.07	FP	31400.00	940.11	962.02	950.19	962.03	0.000011	0.89	35294.52	3646.30	0.05

HEC-RAS Plan: Prop025nb River: Castaic Creek Reach: Hwy 126 to I-5 Profile: FP (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hwy 126 to I-5	-827.07	FP	31400.00	940.11	962.02	950.25	962.03	0.000009	0.84	37403.58	3704.26	0.05
Hwy 126 to I-5	-877.07	FP	31400.00	940.11	962.02	949.47	962.03	0.000007	0.80	39249.79	3530.85	0.04
Hwy 126 to I-5	-927.07	FP	31400.00	940.11	962.02	948.57	962.03	0.000006	0.77	40835.41	3221.36	0.04
Hwy 126 to I-5	-977.07	FP	31400.00	940.11	962.02	948.00	962.03	0.000005	0.78	40242.10	2938.94	0.04

Castaic Creek Fluvial Study
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APPENDIX CHAPTER 4.3

HEC AND SAM CD-ROM

1) HEC-RAS Existing Conditions In/Out File
2) HEC-RAS Proposed Conditions In/Out File
3) HEC-2 Existing Conditions In/Out File
4) HEC-2 Proposed Conditions In/Out File
5) SAM Existing Conditions In/Out File
10) SAM Proposed Conditions In/Out File
11) WSE at Santa Clara River Confluence Existing
12) WSE at Santa Clara River Confluence Proposed

PACE
PACIFIC ADVANCED
CIVIL ENGINEERING, INC.

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 4.4

Existing & Proposed Conditions HEC-RAS Velocity And Water Surface Elevation

Proposed Conditions HEC-RAS To SAM **Conversion Analysis**

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CIVIL ENGINEERING, INC.

It has been noted in the text that the conversion process from HEC-RAS to SAM is a powerful tool for fluvial analysis. This appendix presents, in part, the proposed conditions HEC-RAS to SAM conversion analysis in table format (Table A4.4B1-2). The tables compare the velocity and water surface elevation for the HEC-RAS mixed flow model, the HEC-RAS subcritical flow model, the HEC-RAS model processed for HEC-2 conversion, the HEC-2 model, and the HEC-2 model imported into HEC-RAS. At most sections the differences between steps in the conversion process is only a few percent. The few locations where the difference between steps is high generally result from the supercritical nature of the flow in the HEC-RAS mixed flow model. Several pertinent points should be addressed here. First, the observed differences are a result of the conversion process itself. The most appropriate use of SAM is to include the available data from the hydraulic modeling. As noted in Section 4.1.1, the T95 file produced by HEC-2 is read directly into the SAM model. This is preferable to attempting to consider each section as hydraulically independent from others in the system. A T95 file is not produced in HEC-RAS so the RAS model that is used for hydraulic analysis is down converted to HEC-2 format, as described above. Second, the supercritical nature of the model is the result of the low Manning's number (n=0.025) used, as required by LACDPW criteria. In the Creek during an actual event a Manning's number this low is not expected for an entire cross-section or an entire reach. In instances where the Manning's number exceeds approximately n=0.035 supercritical flow does not occur in the Creek for the Q_{CAP} discharge, and Manning's values in the Creek are expected to be at least n=0.035 or higher during an actual event. Finally, in the final phase of the analysis HEC-6 numerical modeling will be employed to analyze the fluvial mechanics of the Creek system. The affect of this modeling is to fine tune the SAM analysis presented in the present phase, and HEC-6 modeling will use expected Manning's values as parameters. For these reasons, any differences in water surface elevation or velocity resulting from modeled flow regime presented in Table A4.4B1-2 are not expected to impact analysis or final design.

Table A4.4A: Castaic Creek Existing and Proposed Conditions HEC-RAS Velocity & WSE n =0.025					
Subreach	HEC-RAS Section	Existing (QCAP) Velocity (fps)	WSE (ft)	Proposed (QCAP) Velocity (fps)	WSE (ft)
SRA1	12407	3.9	1038.4	3.9	1038.4
	12162	12.7	1035.7	12.7	1035.7
	11957	12.6	1035.2	12.6	1035.2
	11878	11.5	1035.3	11.5	1035.3
	11846	9.4	1035.7	9.4	1035.7
	11812	15.4	1033.1	15.4	1033.1
	11551	11.7	1030.1	11.7	1030.1
	11243	11.3	1027.6	11.2	1027.6
	10983	10.7	1025.8	10.7	1025.8
SRA2	10738	10.6	1023.8	10.5	1023.9
	10491	9.2	1022.6	9.1	1022.6
	10351	11.9	1019.9	11.9	1019.9
	10142	10.8	1017.5	10.8	1017.5
	9931	10.0	1015.0	10.3	1015.1
	9671	8.1	1013.4	9.5	1013.1
	9502	10.7	1011.7	10.7	1011.7
	9299	11.0	1010.3	11.0	1010.3
SRA3	9043	9.9	1008.3	9.9	1008.3
	8725	9.1	1005.2	9.0	1005.2
	8396	8.8	1001.5	8.9	1001.6
	8050	6.7	1000.3	7.2	1000.1
	7689	10.1	997.9	7.7	998.9
SRA4	7326	8.7	996.9	6.6	998.5
	6967	6.9	996.4	6.8	998.1
	6624	10.4	994.1	9.4	996.9
	6305	8.9	993.0	13.6	994.3
	5992	12.2	990.5	14.0	992.4
	5629	8.7	990.3	6.4	993.6
	5558	8.7	990.2	6.1	993.6
	5454	9.0	989.9	6.2	993.5
	5435	8.9	989.9	6.2	993.5
SRB1	5340	12.1	988.5	14.3	990.6
	5061	11.3	986.4	13.0	987.7
	4900	8.3	985.9	11.4	986.6
	4572	7.2	985.0	11.6	985.4
	4221	11.4	982.2	13.4	983.1
SRB2	3865	11.5	979.0	13.3	979.4
	3580	11.4	976.3	13.3	976.7
	3290	10.7	974.6	13.0	975.1
	2975	11.0	972.5	12.1	972.2
	2627	10.5	970.4	11.0	970.5
SRB3	2308	8.1	969.1	9.2	968.9
	1982	12.5	966.3	12.5	966.3
	1645	9.7	965.8	9.7	965.8
	1531	14.1	963.7	14.1	963.7
	1462	10.9	962.8	10.9	962.8
	1415	9.9	962.9	9.9	962.9
	1306	9.2	962.9	9.2	962.9
	1173	13.0	961.1	13.0	961.1

Table A4.4B1 Castaic Creek Proposed Condition HEC-RAS to HEC-2 Conversion n=0.025											
		HEC-RAS Mixed	HEC-RAS Subcritical	Δ (%)	Fluvial HEC-RAS Subcritical	Δ (%)	Fluvial HEC2	Δ (%)	Fluvial HEC2 IMPORT Subcrtiical	Δ (%)	Δ (%) Total
Subreach	HEC-RAS Section	Depth (ft)	Depth (ft)	Depth (ft %)	Depth (ft)	Depth (ft %)	Depth (ft)	Depth (ft %)	Depth (ft)	Depth (ft %)	Depth (ft %)
SRA1	12406	14.9	14.9	**0%**	14.6	**2%**	14.3	**3%**	14.6	**-3%**	**2%**
	12161	12.2	12.2	**0%**	11.7	**5%**	11.3	**3%**	11.7	**-3%**	**5%**
	11957	11.6	11.6	**0%**	11.2	**4%**	9.5	**15%**	11.2	**-17%**	**4%**
	11878	11.3	11.3	**0%**	11.3	**0%**	10.4	**7%**	11.3	**-8%**	**0%**
	11845	11.7	11.7	**0%**	11.7	**0%**	11.3	**3%**	11.7	**-3%**	**0%**
	11811	9.1	9.1	**0%**	9.1	**0%**	9.0	**0%**	9.1	**0%**	**0%**
	11551	6.5	8.5	**-31%**	8.1	**4%**	8.0	**1%**	8.1	**-1%**	**-26%**
	11242	6.5	7.7	**-20%**	7.6	**2%**	7.5	**1%**	7.5	**0%**	**-17%**
	10982	9.3	10.1	**-9%**	9.8	**4%**	9.7	**1%**	9.8	**-1%**	**-5%**
SRA2	10738	6.5	8.0	**-22%**	7.9	**1%**	7.9	**-1%**	8.0	**-1%**	**-23%**
	10490	9.6	9.7	**-1%**	10.6	**-9%**	10.5	**0%**	10.6	**0%**	**-10%**
	10351	6.7	7.9	**-17%**	7.9	**0%**	7.8	**1%**	7.9	**-1%**	**-17%**
	10141	6.9	7.5	**-10%**	7.5	**0%**	7.5	**1%**	7.5	**-1%**	**-10%**
	9931.1	6.4	7.1	**-10%**	7.1	**0%**	7.0	**1%**	7.0	**-1%**	**-10%**
	9670.5	9.1	9.1	**0%**	9.1	**0%**	9.0	**1%**	9.1	**-1%**	**0%**
	9501.8	7.7	7.7	**0%**	7.7	**0%**	7.7	**0%**	7.7	**0%**	**0%**
	9298.9	6.9	7.0	**-2%**	7.1	**0%**	7.0	**1%**	7.1	**-1%**	**-2%**
SRA3	9042.8	7.8	8.3	**-6%**	8.3	**0%**	8.2	**1%**	8.2	**-1%**	**-6%**
	8724.8	7.0	7.2	**-3%**	7.2	**0%**	7.2	**0%**	7.2	**0%**	**-3%**
	8396.1	5.2	5.6	**-8%**	5.6	**0%**	5.7	**-2%**	5.6	**2%**	**-8%**
	8049.7	8.1	8.1	**0%**	8.1	**0%**	8.0	**0%**	8.1	**0%**	**0%**
	7688.7	8.9	8.9	**0%**	8.9	**0%**	8.7	**2%**	8.9	**-2%**	**0%**
SRA4	7326.4	10.5	10.5	**0%**	10.5	**0%**	10.4	**1%**	10.5	**-1%**	**0%**
	6966.6	11.6	11.6	**0%**	11.6	**0%**	11.4	**1%**	11.6	**-1%**	**0%**
	6623.5	11.7	11.7	**0%**	11.7	**0%**	11.6	**1%**	11.7	**-1%**	**0%**
	6304.5	10.3	10.3	**0%**	10.3	**0%**	10.2	**1%**	10.3	**-1%**	**0%**
	5992.3	10.3	10.5	**-2%**	10.4	**1%**	10.4	**0%**	10.4	**0%**	**-1%**
	5629.4	13.6	13.6	**0%**	13.4	**1%**	13.1	**2%**	13.4	**-2%**	**1%**
	5557.6	13.8	13.8	**0%**	13.6	**1%**	13.3	**2%**	13.6	**-2%**	**1%**
	5453.9	13.5	13.5	**0%**	13.5	**0%**	13.2	**2%**	13.5	**-2%**	**0%**
	5434.6	13.5	13.5	**0%**	13.5	**0%**	13.2	**2%**	13.5	**-2%**	**0%**
SRB1	5340	10.6	10.6	**0%**	10.6	**0%**	10.5	**1%**	10.5	**-1%**	**0%**
	5060.5	10.3	11.7	**-14%**	11.7	**0%**	11.7	**1%**	11.7	**-1%**	**-14%**
	4899.9	9.0	10.6	**-18%**	10.6	**0%**	10.6	**0%**	10.6	**0%**	**-18%**
	4571.6	9.4	9.4	**0%**	9.4	**0%**	9.3	**0%**	9.4	**0%**	**0%**
	4220.8	11.1	11.1	**0%**	11.1	**0%**	11.1	**1%**	11.1	**-1%**	**0%**
SRB2	3865.3	8.0	9.4	**-17%**	9.4	**0%**	9.3	**0%**	9.4	**0%**	**-17%**
	3579.8	10.1	10.7	**-6%**	10.7	**0%**	10.6	**0%**	10.7	**0%**	**-6%**
	3289.6	11.1	11.1	**0%**	11.1	**0%**	11.1	**0%**	11.1	**0%**	**0%**
	2974.8	9.0	10.2	**-14%**	10.2	**0%**	10.1	**1%**	10.2	**-1%**	**-13%**
	2627.1	10.5	10.5	**0%**	10.5	**0%**	10.4	**0%**	10.5	**-1%**	**0%**
SRB3	2307.9	8.9	8.9	**0%**	8.9	**0%**	8.8	**1%**	8.9	**-1%**	**0%**
	1981.7	10.0	10.0	**0%**	10.0	**0%**	10.0	**0%**	10.0	**-1%**	**0%**
	1644.8	9.8	9.8	**0%**	9.8	**0%**	9.6	**2%**	9.8	**-3%**	**0%**
	1530.6	8.4	8.4	**0%**	8.4	**0%**	8.4	**0%**	8.5	**0%**	**0%**
	1462	7.0	10.4	**-48%**	10.1	**3%**	9.5	**6%**	10.1	**-7%**	**-44%**
	1415.1	11.2	11.2	**0%**	10.9	**2%**	10.7	**2%**	10.9	**-3%**	**2%**
	1305.9	10.9	10.9	**0%**	10.9	**0%**	10.7	**2%**	10.9	**-2%**	**0%**
	1172.9	9.0	9.0	**0%**	9.0	**0%**	9.0	**0%**	9.0	**0%**	**0%**

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Table A4.4B2 Castaic Creek Proposed Condition HEC-RAS to HEC-2 Conversion n=0.025											
		HEC-RAS Mixed	HEC-RAS Subcritical	Δ (%)	Fluvial HEC-RAS Subcritical	Δ (%)	Fluvial HEC2	Δ (%)	Fluvial HEC2 IMPORT Subcrtiical	Δ (%)	Δ (%) Total
Subreach	HEC-RAS Section	Vel Chnl (ft/s)	Vel Chnl (ft/s)	Velocity (ft %)	Vel Chnl (ft/s)	Velocity (ft %)	Vel Chnl (ft/s)	Velocity (ft %)	Vel Chnl (ft/s)	Velocity (ft %)	Velocity (ft %)
SRA1	12406	3.7	3.7	**0%**	3.9	**-5%**	4.2	**-8%**	3.9	**7%**	**-5%**
	12161	12.0	12.0	**0%**	12.7	**-6%**	13.3	**-5%**	12.7	**5%**	**-6%**
	11957	12.1	12.1	**0%**	12.6	**-5%**	15.5	**-22%**	12.6	**18%**	**-5%**
	11878	11.5	11.5	**0%**	11.5	**0%**	12.6	**-10%**	11.5	**9%**	**0%**
	11845	9.4	9.4	**0%**	9.4	**0%**	9.8	**-4%**	9.4	**3%**	**0%**
	11811	15.4	15.4	**0%**	15.4	**0%**	15.5	**0%**	15.4	**0%**	**0%**
	11551	20.1	12.7	**37%**	11.7	**8%**	11.9	**-1%**	11.7	**1%**	**42%**
	11242	16.3	11.8	**27%**	11.2	**5%**	11.4	**-2%**	11.3	**1%**	**31%**
	10982	14.4	11.7	**19%**	10.7	**8%**	11.1	**-3%**	10.7	**3%**	**25%**
SRA2	10738	15.7	11.2	**29%**	10.5	**6%**	10.3	**3%**	10.1	**2%**	**36%**
	10490	12.7	12.5	**2%**	9.1	**27%**	9.3	**-2%**	9.1	**1%**	**28%**
	10351	16.1	11.9	**26%**	11.9	**0%**	12.0	**-1%**	11.9	**1%**	**26%**
	10141	13.2	10.8	**18%**	10.8	**0%**	11.0	**-2%**	10.8	**2%**	**18%**
	9931.1	12.7	10.3	**19%**	10.3	**0%**	10.4	**-1%**	10.3	**1%**	**19%**
	9670.5	9.5	9.5	**0%**	9.5	**0%**	9.7	**-2%**	9.5	**2%**	**0%**
	9501.8	10.7	10.7	**0%**	10.7	**0%**	10.6	**0%**	10.7	**0%**	**0%**
	9298.9	11.4	11.1	**3%**	11.0	**0%**	11.2	**-1%**	11.0	**1%**	**3%**
SRA3	9042.8	11.8	9.9	**15%**	9.9	**0%**	10.2	**-2%**	9.9	**2%**	**15%**
	8724.8	9.8	9.0	**8%**	9.0	**0%**	9.1	**-1%**	9.0	**1%**	**8%**
	8396.1	10.8	8.9	**18%**	8.9	**0%**	8.5	**4%**	8.9	**-4%**	**17%**
	8049.7	7.2	7.2	**0%**	7.2	**0%**	7.3	**-1%**	7.2	**1%**	**0%**
	7688.7	7.7	7.7	**0%**	7.7	**0%**	8.1	**-5%**	7.7	**5%**	**0%**
SRA4	7326.4	6.6	6.6	**0%**	6.6	**0%**	6.8	**-2%**	6.6	**2%**	**0%**
	6966.6	6.8	6.8	**0%**	6.8	**0%**	6.9	**-2%**	6.8	**2%**	**0%**
	6623.5	9.4	9.4	**0%**	9.4	**0%**	9.6	**-2%**	9.4	**2%**	**0%**
	6304.5	13.6	13.6	**0%**	13.6	**0%**	13.8	**-1%**	13.6	**1%**	**0%**
	5992.3	14.1	13.6	**4%**	14.0	**-2%**	14.0	**0%**	14.0	**0%**	**1%**
	5629.4	6.2	6.2	**0%**	6.4	**-2%**	6.5	**-3%**	6.4	**3%**	**-2%**
	5557.6	6.0	6.0	**0%**	6.1	**-2%**	6.2	**-3%**	6.1	**3%**	**-2%**
	5453.9	6.2	6.2	**0%**	6.2	**0%**	6.3	**-3%**	6.2	**3%**	**0%**
	5434.6	6.2	6.2	**0%**	6.2	**0%**	6.3	**-1%**	6.2	**2%**	**1%**
SRB1	5340	14.3	14.3	**0%**	14.3	**0%**	14.4	**-1%**	14.3	**1%**	**0%**
	5060.5	17.8	13.0	**27%**	13.0	**0%**	13.0	**0%**	12.8	**1%**	**28%**
	4899.9	15.7	11.4	**27%**	11.4	**0%**	11.5	**0%**	11.4	**0%**	**27%**
	4571.6	11.6	11.6	**0%**	11.6	**0%**	11.7	**0%**	11.6	**0%**	**0%**
	4220.8	13.4	13.4	**0%**	13.4	**0%**	13.6	**-2%**	13.4	**2%**	**0%**
SRB2	3865.3	17.7	13.3	**25%**	13.3	**0%**	13.4	**-1%**	13.3	**1%**	**25%**
	3579.8	15.0	13.3	**12%**	13.3	**0%**	13.4	**-1%**	13.3	**1%**	**11%**
	3289.6	13.0	13.0	**0%**	13.0	**0%**	13.0	**0%**	13.0	**0%**	**0%**
	2974.8	16.2	12.1	**25%**	12.1	**0%**	12.3	**-2%**	12.2	**1%**	**25%**
	2627.1	11.0	11.0	**0%**	11.0	**0%**	11.2	**-2%**	10.8	**3%**	**1%**
SRB3	2307.9	9.2	9.2	**0%**	9.2	**0%**	9.4	**-2%**	9.2	**2%**	**0%**
	1981.7	12.5	12.5	**0%**	12.5	**0%**	12.6	**-1%**	12.4	**1%**	**0%**
	1644.8	9.7	9.7	**0%**	9.7	**0%**	10.0	**-3%**	9.7	**3%**	**0%**
	1530.6	14.1	14.1	**0%**	14.1	**0%**	14.2	**0%**	14.1	**0%**	**0%**
	1462	19.9	10.5	**47%**	10.9	**-4%**	12.0	**-10%**	10.9	**9%**	**45%**
	1415.1	9.6	9.6	**0%**	9.9	**-3%**	10.3	**-4%**	9.9	**4%**	**-3%**
	1305.9	9.3	9.3	**0%**	9.2	**1%**	9.4	**-2%**	9.2	**2%**	**1%**
	1172.9	13.1	13.1	**0%**	13.0	**0%**	13.1	**0%**	13.0	**0%**	**0%**

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APPENDIX CHAPTER 4.5

Existing & Proposed Conditions Sub Reach Convergence Analysis

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Table A4.5D1: Castaic Creek Existing Conditions Convergence Summary		
Reach	Average Subreach Length	Maximum Grade Change
A	1400	-2.5
	1750	-2.3
	2300	-1.8
B	1250	6.0
	1500	3.1
	2100	-0.9

Table A4.5D2: Castaic Creek Proposed Conditions Convergence Summary		
Reach	Average Subreach Length	Maximum Grade Change
A	1400	2.8
	1750	-2.4
	2300	1.9
B	1250	6.5
	1500	-3.3
	2100	-2.5

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Table A4.5A1: Castaic Creek Existing Conditions Bed Stability* (Reach A Length 1400', Reach B Length 1250')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	11242	MPM	65,788	481.5	0.00		-2.5
SRA2	10983	9502	MPM	198,715	813.8	1.33	DEGRADE	-1.3
SRA3	9299	8396	MPM	238,311	1063.7	0.50	DEGRADE	-0.5
SRA4	8050	6967	MPM	99,738	841.8	1.84	AGGRADE	1.8
SRA5	6624	5435	MPM	85,257	560.7	0.26	AGGRADE	0.3
SRB1	5340	4572	MPM	239,072	1101.9	2.20	DEGRADE	-2.2
SRB2	4221	3290	MPM	256,704	710.9	0.32	DEGRADE	-0.3
SRB3	2975	1982	MPM	207,909	843.2	0.70	AGGRADE	0.7
SRB4	1645	1173	MPM	109,904	417.6	6.02	AGGRADE	6.0

Table A4.5A2: Castaic Creek Existing Conditions Bed Stability* (Reach A Length 1750', Reach B Length 1500')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	10983	MPM	76,463	512.1	2.32		-2.3
SRA2	10738	9299	MPM	199,997	815.1	1.27	DEGRADE	-1.3
SRA3	9043	7689	MPM	187,431	1172.0	0.10	AGGRADE	0.1
SRA4	7326	5435	MPM	81,678	669.5	1.01	AGGRADE	1.0
SRB1	5340	4221	MPM	208,746	1070.2	1.28	DEGRADE	-1.3
SRB2	3865	2627	MPM	264,963	786.7	0.70	DEGRADE	-0.7
SRB3	2308	1173	MPM	112,041	529.1	3.08	AGGRADE	3.1

Table A4.5A3: Castaic Creek Existing Conditions Bed Stability* (Reach A Length 2300', Reach B Length 2100')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	10351	MPM	87,956	604.3	0.00		-1.8
SRA2	10142	8050	MPM	199,916	1015.1	0.64	DEGRADE	-0.6
SRA3	7689	5435	MPM	86,439	673.4	0.90	AGGRADE	0.9
SRB1	5340	3580	MPM	210,233	928.9	0.92	DEGRADE	-0.9
SRB2	3290	1173	MPM	134,538	687.0	0.63	AGGRADE	0.6

* Calculations for aggradation/degradation at the A/B reach interface are made at the request ot LACDPW. The discharge increases significantly at this location so it is not clear what this value represents. It is expected that the HEC-6 numerical modeling will show significantly different values.

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Table A4.5B1: Castaic Creek Proposed Conditons Bed Stability* (Reach A Length 1400', Reach B Length 1250')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	11242	MPM	65,940	477.2	0.00		-2.6
SRA2	10983	9502	MPM	214,568	779.1	1.56	DEGRADE	-1.6
SRA3	9299	8396	MPM	241,674	1053.6	0.34	DEGRADE	-0.3
SRA4	8050	6967	MPM	43,525	778.9	2.84	AGGRADE	2.8
SRA5	6624	5435	MPM	57,703	358.2	0.40	DEGRADE	-0.4
SRB1	5340	4572	MPM	177,853	441.2	4.29	DEGRADE	-4.3
SRB2	4221	3290	MPM	241,304	439.8	1.87	DEGRADE	-1.9
SRB3	2975	1982	MPM	215,046	708.1	0.45	AGGRADE	0.5
SRB4	1645	1173	MPM	109,878	417.5	6.46	AGGRADE	6.5

Table A4.5B2: Castaic Creek Proposed Conditons Bed Stability* (Reach A Length 1750', Reach B Length 1500')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	10983	MPM	76,742	507.4	2.36		-2.4
SRA2	10738	9299	MPM	216,910	781.0	1.51	DEGRADE	-1.5
SRA3	9043	7689	MPM	174,631	1150.8	0.33	AGGRADE	0.3
SRA4	7326	5435	MPM	46,272	426.0	1.93	AGGRADE	1.9
SRB1	5340	4221	MPM	179,197	436.6	3.29	DEGRADE	-3.3
SRB2	3865	2627	MPM	233,083	527.8	1.00	DEGRADE	-1.0
SRB3	2308	1173	MPM	120,980	505.7	2.36	AGGRADE	2.4

Table A4.5B3: Castaic Creek Proposed Conditons Bed Stability* (Reach A Length 2300', Reach B Length 2100')								
Subreach	US Section	DS Section	Trans Eq	Transport (ton)	Top Width (ft)	Depth (ft)	A/D	Grade Change (ft)
SRA1	12407	10351	MPM	87,125	602.1	0.00		-1.8
SRA2	10142	8050	MPM	213,398	977.6	0.75	DEGRADE	-0.7
SRA3	7689	5435	MPM	42,973	472.8	1.93	AGGRADE	1.9
SRB1	5340	3580	MPM	199,223	435.1	2.47	DEGRADE	-2.5
SRB2	3290	1173	MPM	150,485	578.2	0.48	AGGRADE	0.5

* Calculations for aggradation/degradation at the A/B reach interface are made at the request ot LACDPW. The discharge increases significantly at this location so it is not clear what this value represents. It is expected that the HEC-6 numerical modeling will show significantly different values.

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Table A4.5C1: Castaic Creek Existing vs Proposed Conditions Bed Stability* (Reach A Length 1400', Reach B Length 1250')				
Subreach	US Section	Existing Conditons Grade Change (ft)	Proposed Conditions Grade Change (ft)	Delta
SRA1	12407	-2.5	-2.6	-0.1
SRA2	10983	-1.3	-1.6	-0.2
SRA3	9502	-0.5	-0.3	0.2
SRA4	8050	1.8	2.8	1.0
SRA5	6624	0.3	-0.4	-0.7
SRB1	5340	-2.2	-4.3	-2.1
SRB2	4221	-0.3	-1.9	-1.6
SRB3	2975	0.7	0.5	-0.3
SRB4	1645	6.0	6.5	0.4

Table A4.5C2: Castaic Creek Existing vs Proposed Conditions Bed Stability* (Reach A Length 1750', Reach B Length 1500')				
Subreach	US Section	Existing Conditons Grade Change (ft)	Proposed Conditions Grade Change (ft)	Delta
SRA1	12407	-2.3	-2.4	0.0
SRA2	10738	-1.3	-1.5	-0.2
SRA3	9043	0.1	0.3	0.2
SRA4	7326	1.0	1.9	0.9
SRB1	5340	-1.3	-3.3	-2.0
SRB2	3865	-0.7	-1.0	-0.3
SRB3	2308	3.1	2.4	-0.7

Table A4.5C3: Castaic Creek Existing vs Proposed Conditions Bed Stability* (Reach A Length 2300', Reach B Length 2100')				
Subreach	US Section	Existing Conditons Grade Change (ft)	Proposed Conditions Grade Change (ft)	Delta
SRA1	12407	-1.8	-1.8	0.0
SRA2	10142	-0.6	-0.7	-0.1
SRA3	7689	0.9	1.9	1.0
SRB1	5340	-0.9	-2.5	-1.6
SRB2	3290	0.6	0.5	-0.1

* Calculations for aggradation/degradation at the A/B reach interface are made at the request ot LACDPW. The discharge increases significantly at this location so it is not clear what this value represents. It is expected that the HEC-6 numerical modeling will show significantly different values.

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APPENDIX CHAPTER 4.6

SAM.AID Transport Equation Summary Existing & Proposed Conditions

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Table A4.6A: Castaic Creek Existing Conditions SAM Transport Potential Summary, CAP									
Subreach	US Section	DS Section	Width (ft)	Yang	Ackers-White	MPM	Brownlie, d50	Laursen-Copeland	Yang, d50
SRA1	12407	10983	512.1	338,980		76,463		3,632,026	255,121
SRA2	10738	9299	815.1	963,866	6,024,042	199,997	495,358	12,414,180	513,548
SRA3	9043	7689	1172.0	773,421	3,666,039	187,431	359,850	9,684,333	430,878
SRA4	7326	5435	669.5	332,835	1,547,996	81,678	162,453	3,591,294	247,043
SRB1	5340	4221	1070.2	1,316,453	9,695,767	208,746	588,707	20,901,926	556,527
SRB2	3865	2627	786.7	2,018,673	20,599,168.00	264,963	958,260	33,892,872	763,210
SRB3	2308	1173	529.1	764,268	6,848,300	112,041	430,978	11,198,314	394,353

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Table A4.6B: Castaic Creek Proposed Conditions SAM Transport Potential Summary, CAP									
Subreach	US Section	DS Section	Width (ft)	Yang	Ackers-White	MPM	Brownlie, d50	Laursen-Copeland	Yang, d50
SRA1	12407	10983	507.4	341,762		76,742		3,665,662	256,651
SRA2	10738	9299	781.0	1,081,232	7,239,144	216,910	561,807	14,261,873	556,335
SRA3	9043	7689	1150.8	712,024	3,304,895	174,631	333,755	8,790,392	407,197
SRA4	7326	5435	426.0	190,592		46,272		1,874,718	170,383
SRB1	5340	4221	436.6	1,514,277	19,370,392	179,197	863,641	24,434,904	645,806
SRB2	3865	2627	527.8	1,985,249	25,340,786	233,083	1,059,216	33,346,232	771,175
SRB3	2308	1173	505.7	861,160	8,247,424	120,980	487,305	12,775,591	430,770

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APPENDIX CHAPTER 5.1

Historical Topographic Maps

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P:\8197E\Engineering\GlobalExhibits\8197 Castaic Creek Fig B1 rev1 – 1930 Topography.dwg – Tab: Figure B1 By: enarvaez on Feb. 21, 2008 at 08:06 am

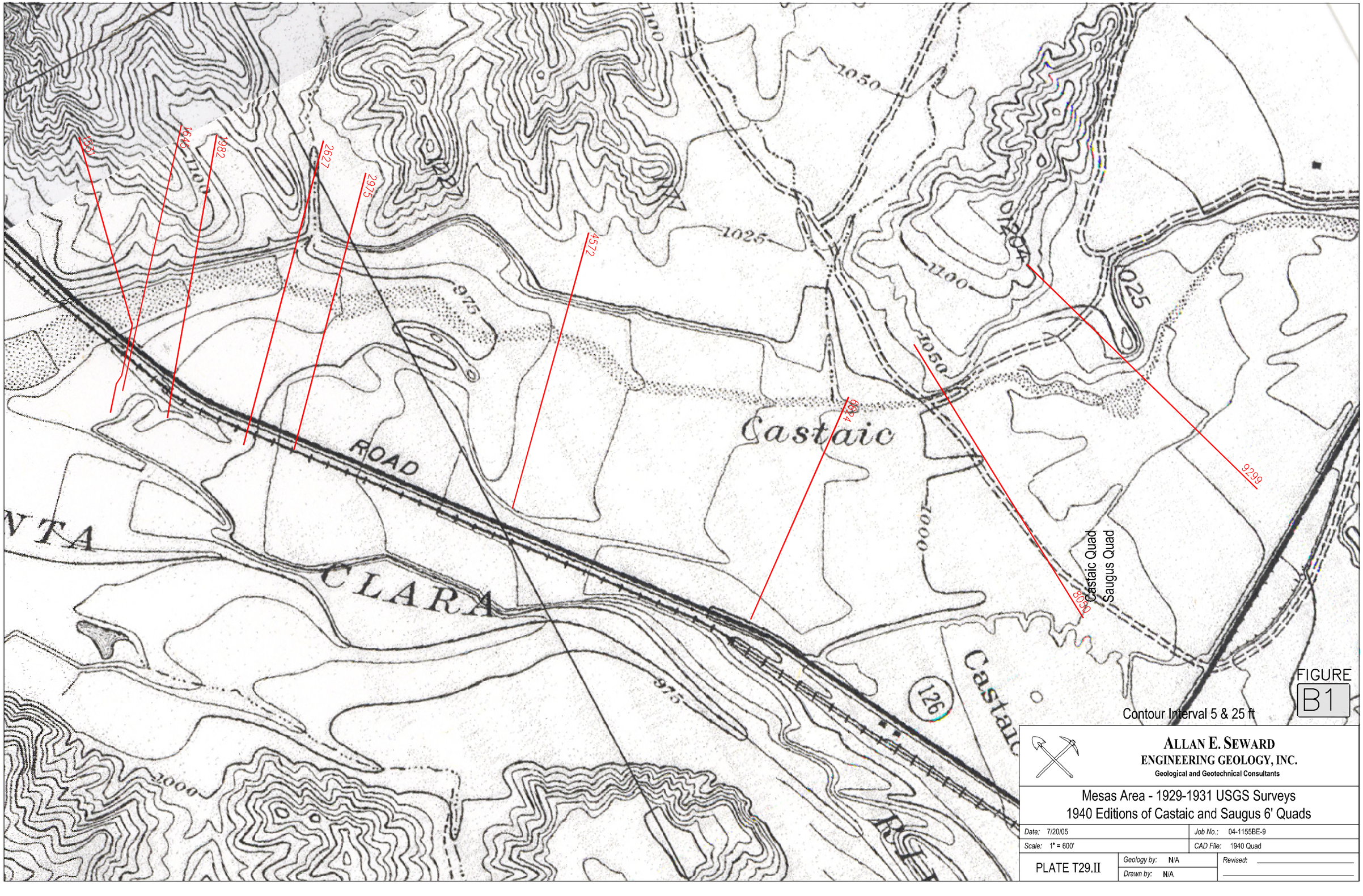

FIGURE B1

Contour Interval 5 & 25 ft

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Geological and Geotechnical Consultants

Mesas Area - 1929-1931 USGS Surveys
1940 Editions of Castaic and Saugus 6' Quads

Date: 7/20/05		Job No.: 04-1155BE-9
Scale: 1" = 600'		CAD File: 1940 Quad
PLATE T29.II	Geology by: N/A Drawn by: N/A	Revised:

P:\8197E\Engineering\GlobalExhibits\8197 Castaic Creek Fig B2 rev1 – 1947 Topography.dwg – Tab: Figure B2 By: enarvaez on Feb. 21, 2008 at 08:29 am

1502
1534
1645
1982
2927
2975
4572
6624
9299
8050
1203
1046
Canyon
Creek
Gagine Sta
970
126
Castaic
SAUGUS
VENTURA
ROAD
Oil Well
Valencia
1000
N

FIGURE
B2

ALLAN E. SEWARD
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Geological and Geotechnical Consultants

Mesas Area - 1947 USGS Survey
1969 Edition of Val Verde and Newhall 7.5' Quads

Date: 7/20/05		Job No.: 04-1155BE-9	
Scale: 1" = 600'		CAD File: 1969 Quad	
PLATE T47.II	Geology by: N/A	Revised:	
	Drawn by: N/A		

P:\8197E\Engineering\GlobalExhibits\8197 Castaic Creek FigureB3 rev1 – 1963 Topography.dwg – Tab: Figure B3 By: enarvaez on Feb. 21, 2008 at 08:32 am

1571
1645
1683
2627
2925
4572
9299
8050

TRAVEL VILLAGE
SAN JOSE FLAT
RIVER

FIGURE
B3

Contour Interval 2' & 10'

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

11/63 and 1/64 Horizon Survey from 8/15/90
Mapsheets by Sikand

Date: 7/20/05		Job No.: 04-1155BE-9	
Scale: 1" = 600'		CAD File: Sikand-Central	
PLATE T.63II	Geology by: N/A	Revised:	
	Drawn by: N/A		

FIGURE B4

DIGITAL TOPOGRAPHY BY PSOMAS ENGINEERING
from Data Generated approx.1999

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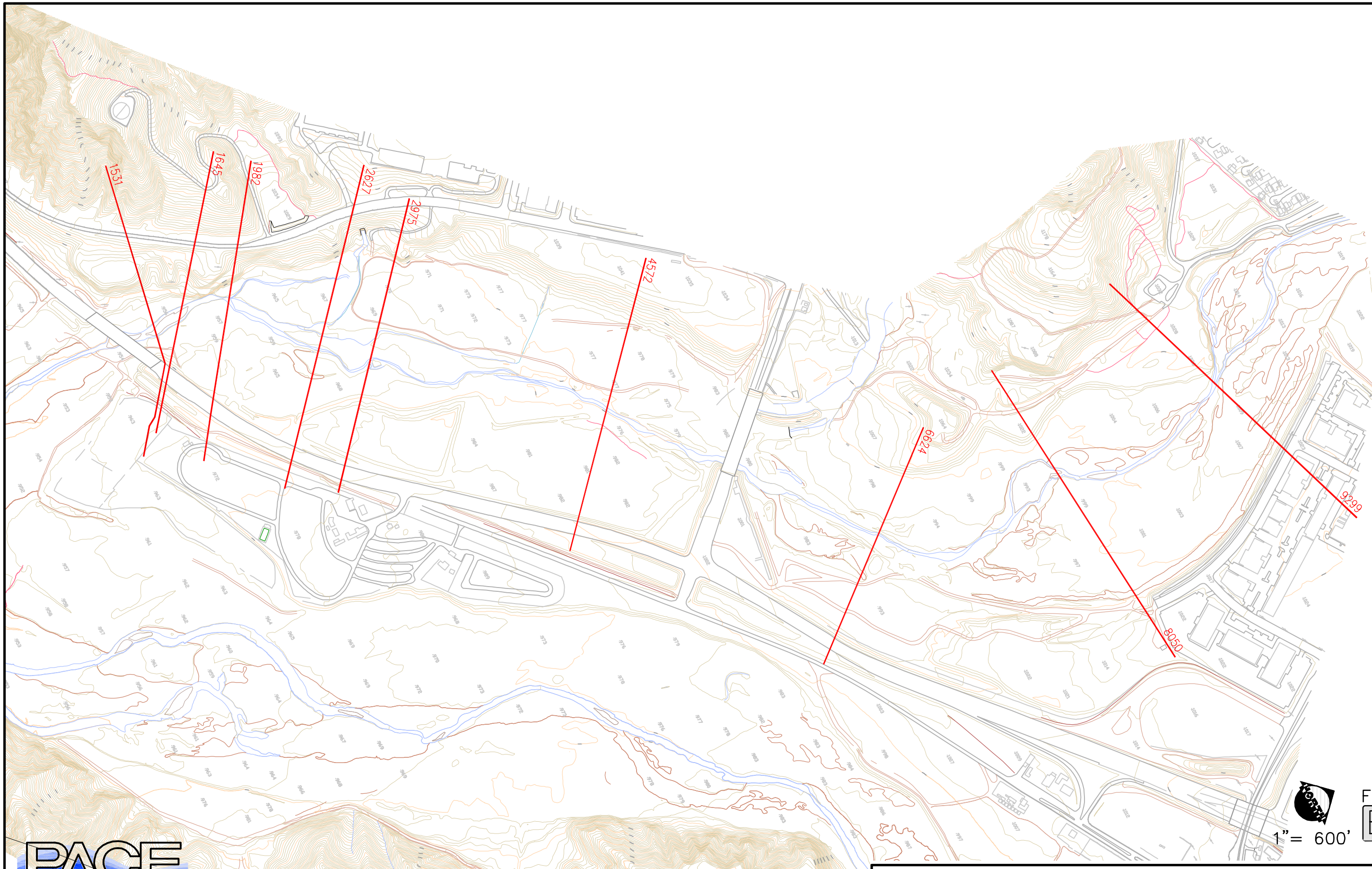

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NORTH

1"= 600'

FIGURE
B5

DIGITAL TOPOGRAPHY BY McElhanney
from Data Generated ©2004

P:\8197E\Engineering\GlobalExhibits\8197 Castaic Creek FigureB5 rev1 - 2004 Topography.dwg - Tab: Figure B5 By: enarvaez on Feb. 21, 2008 at 08:39 am

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NORTH
1"= 600'

FIGURE
B6

DIGITAL TOPOGRAPHY BY McElhanney
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APPENDIX CHAPTER 5.2

Allan Seward Saugus Formation Memo

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TRANSMITTAL

To:	PACE 17520 Newhope Street Suite 120 Fountain Valley, CA 92708 **Attn: Mr. David Jaffe**	**Date:**	October 20, 2005
		Job No:	05-1155BE-9
		Re:	Castaic Creek Bank Mapping Newhall Ranch Area
From:	Brian Swanson		

We Are Transmitting:

- ☒ Per Your Request
- ☐ Enclosed
- ☐ Under separate cover
- ☐ Prints
- ☐ Transparencies
- ☐ Specifications
- ☐ CD/Diskettes

Via:

- ☐ Mail
- ☒ Overnight
- ☐ UPS
- ☐ Messenger
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- ☐ Pick-up

For Your:

- ☐ Approval
- ☐ Review and Comment
- ☐ Distribution
- ☒ Information/Files
- ☐ Signature

Enclosures: (*If enclosures are not as noted, please inform us immediately*)

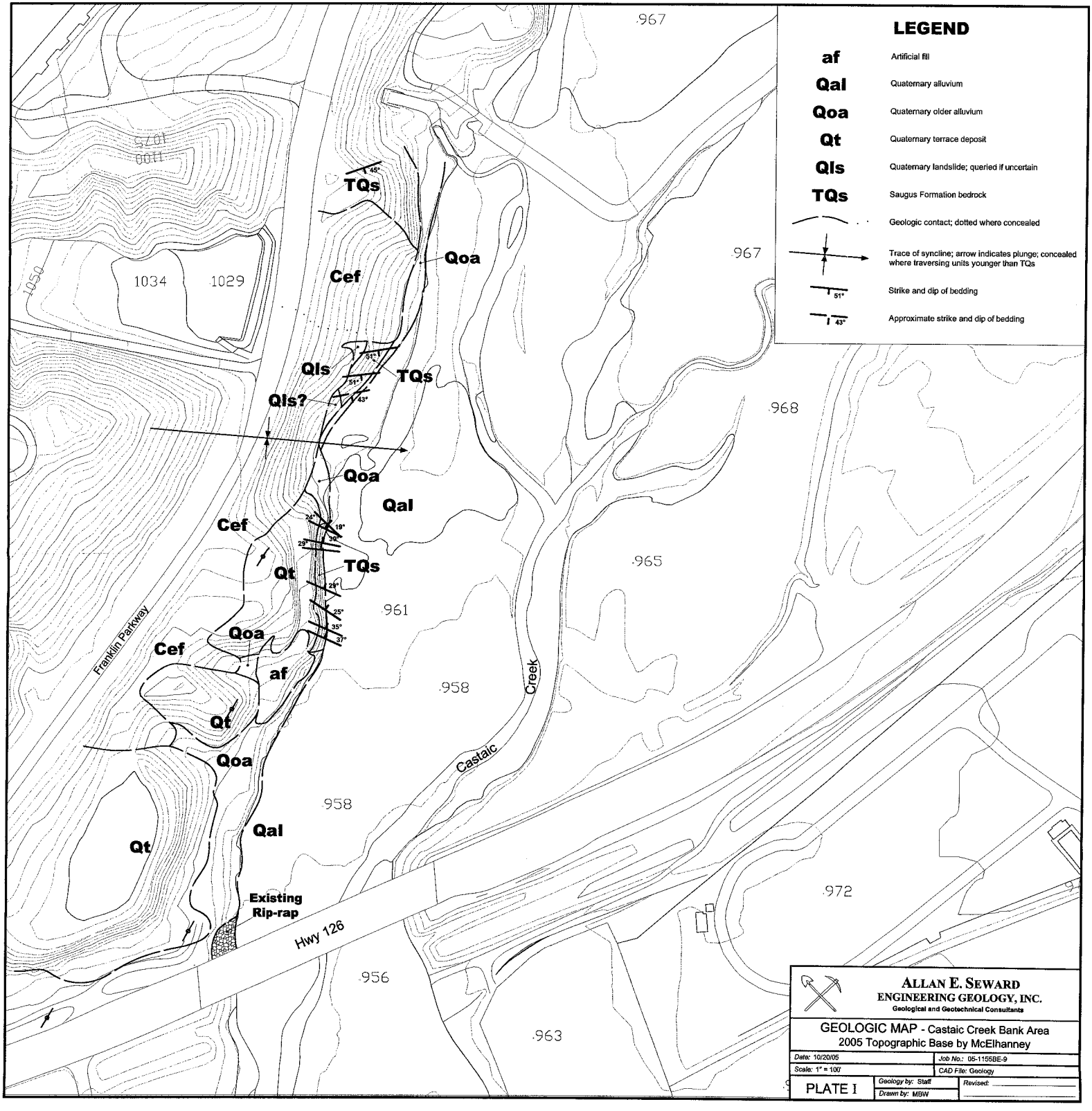
Qty:	Description:	Date:
1	Geologic Map of Castaic Creek Bank Area (1"=100')	10/20/05

Comments:

Per your request, we have reviewed our geologic data from the grading of Franklin Parkway and completed field mapping of the geologic units exposed on the west bank of Castaic Creek for 1500 feet north of Highway 126. The attached Geologic Map illustrates the distribution of geologic units along the bank based on this data. The observed TQs bedrock consists primarily of resistant, moderately cemented sandstone and conglomerate. This unit likely underlies the terrace deposits mapped behind the older alluvium north of the riprap. However, the extent of the bedrock concealed below the terrace deposits and older alluvium would need to be verified with subsurface investigations, if critical. Let me now if you have any questions.

Cc: The Newhall Land and Farming Company
Attn Mr. Glenn Adamick

27825 Smyth Drive, Valencia, California 91355 • (661) 294-0065 • FAX (661) 294-0833



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Geological and Geotechnical Consultants

GEOLOGIC MAP - Castaic Creek Bank Area
2005 Topographic Base by McElhanney

Date: 10/20/05	Job No.: 05-1155BE-9
Scale: 1" = 100'	CAD File: Geology
PLATE I	Geology by: Staff
	Drawn by: MBW
	Revised:

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 5.3

Historical Thalweg Analysis

Previous drafts of this report calculated long-term trends based on an analysis of historic thalweg data. Analysis of long-term data based on cross-sections has been found to more clearly portray the historic trends of the creek bed. The historic analysis is included here for completeness.

The thalwegs and an additional alignment were digitized from the historic topography shown in Chapter 5, and these alignments were overlain in every digitized data set. That is, the 1930 thalweg was overlain in the 1930, 1947, 1963, 1999, 2004 and 2005 topographies. This was repeated for the other thalwegs as well. Thalwegs were chosen because they served as a reference and generally represent the lowest portion of the river bed cross-section for a given year. The additional alignment was positioned so that an even distribution of alignments was achieved over the width of the channel for the study reach. The alignments are shown in Figure A5.3.1. The bed elevations along all alignments for all years were determined and compared, and a historic mean bed elevation was determined. Calculations of the minimum and mean bed elevation for all stations for all years examined is presented in Table A5.3.1. The historic bed elevation data, as well as historic mean bed elevation, is presented in Figure 5.2A-B. The figure illustrates variation in bed elevations throughout the period of record. The data set shows that the 2004 bed of the river bed is generally the lowest for the study reach. It appears that the constant degradation is the effect of the construction of the dam upstream of Interstate 5, which was completed in 1971.

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Xrefs: 8197-Castaic-Profiles.dwg; 8197-11x17Exh-Tblk.dwg
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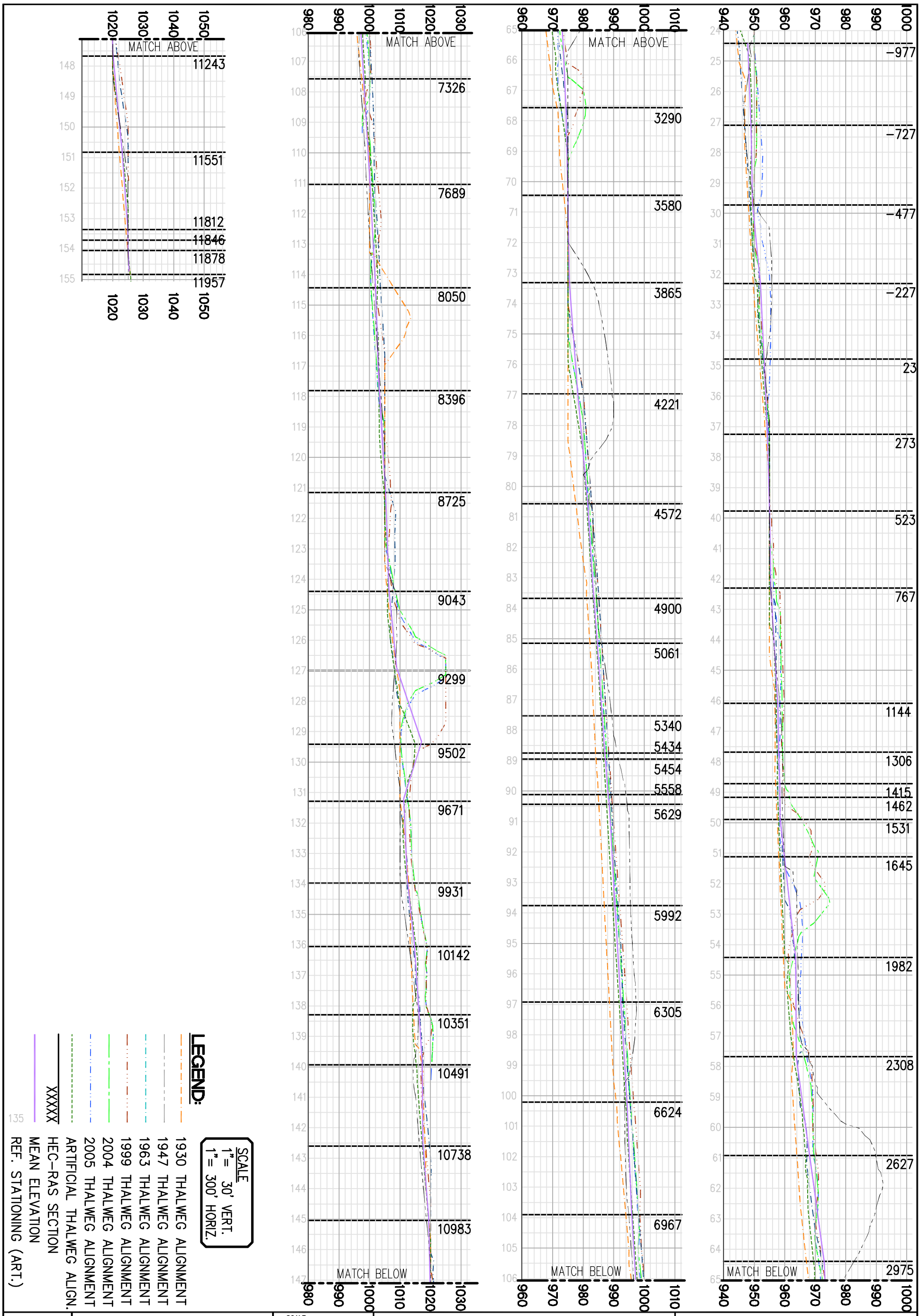

FIGURE A5.8.1A

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DRAWN	DAD
CHECKED	MEK
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LOS ANGELES COUNTY CA

TITLE
CASTAIC CREEK HISTORIC BED PROFILES (1930 TOPO)

P:\8197E\Engineering\GlobalExhibits\8197 Historic Profiles - Castaic.dwg - Tab: A By: enarvaez on Feb. 21, 2008 at 08:17 am

Xrefs: 8197-Castaic-Profiles.dwg; 8197-11x17Exh-Tblk.dwg
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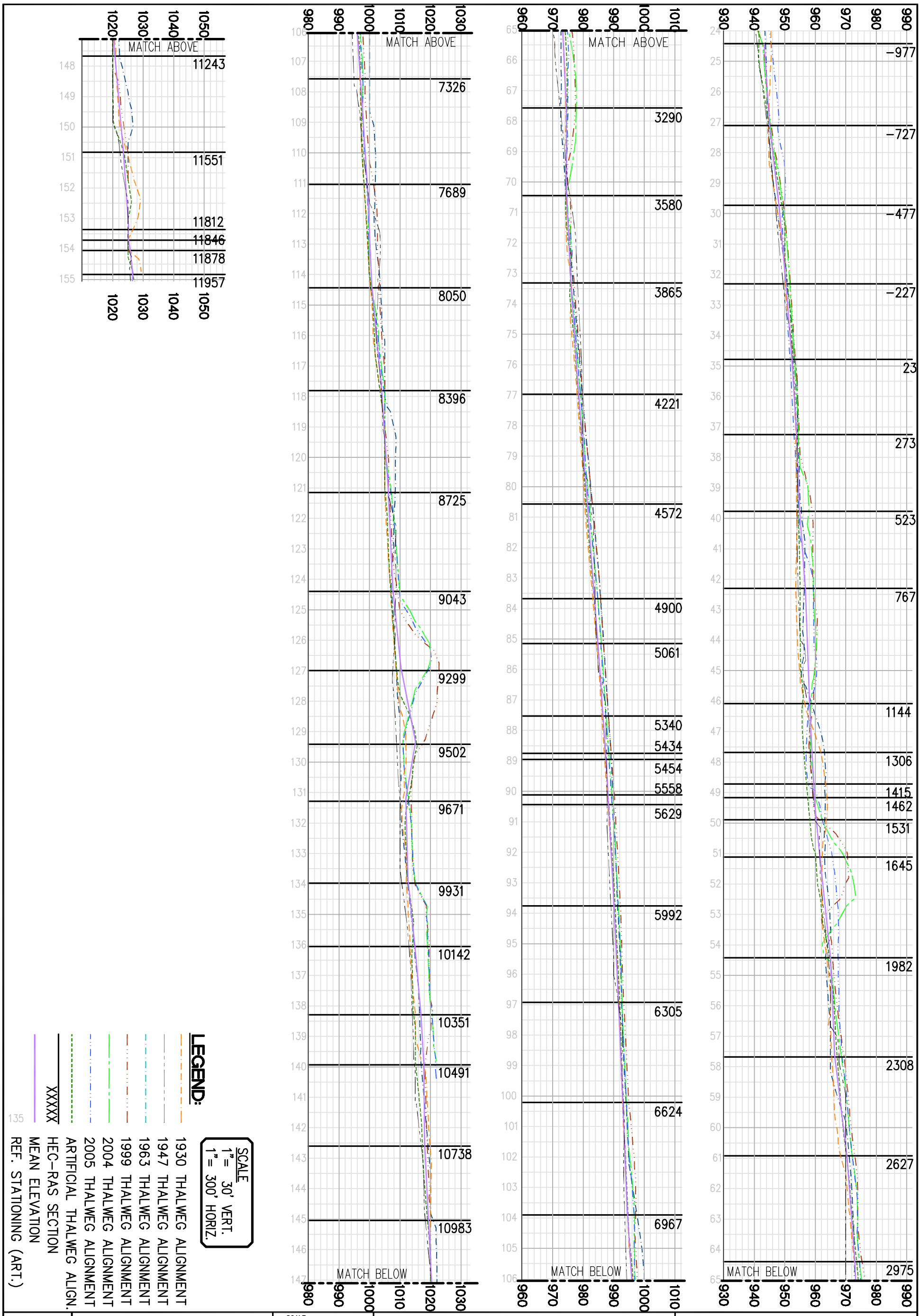

FIGURE A5.3.1B

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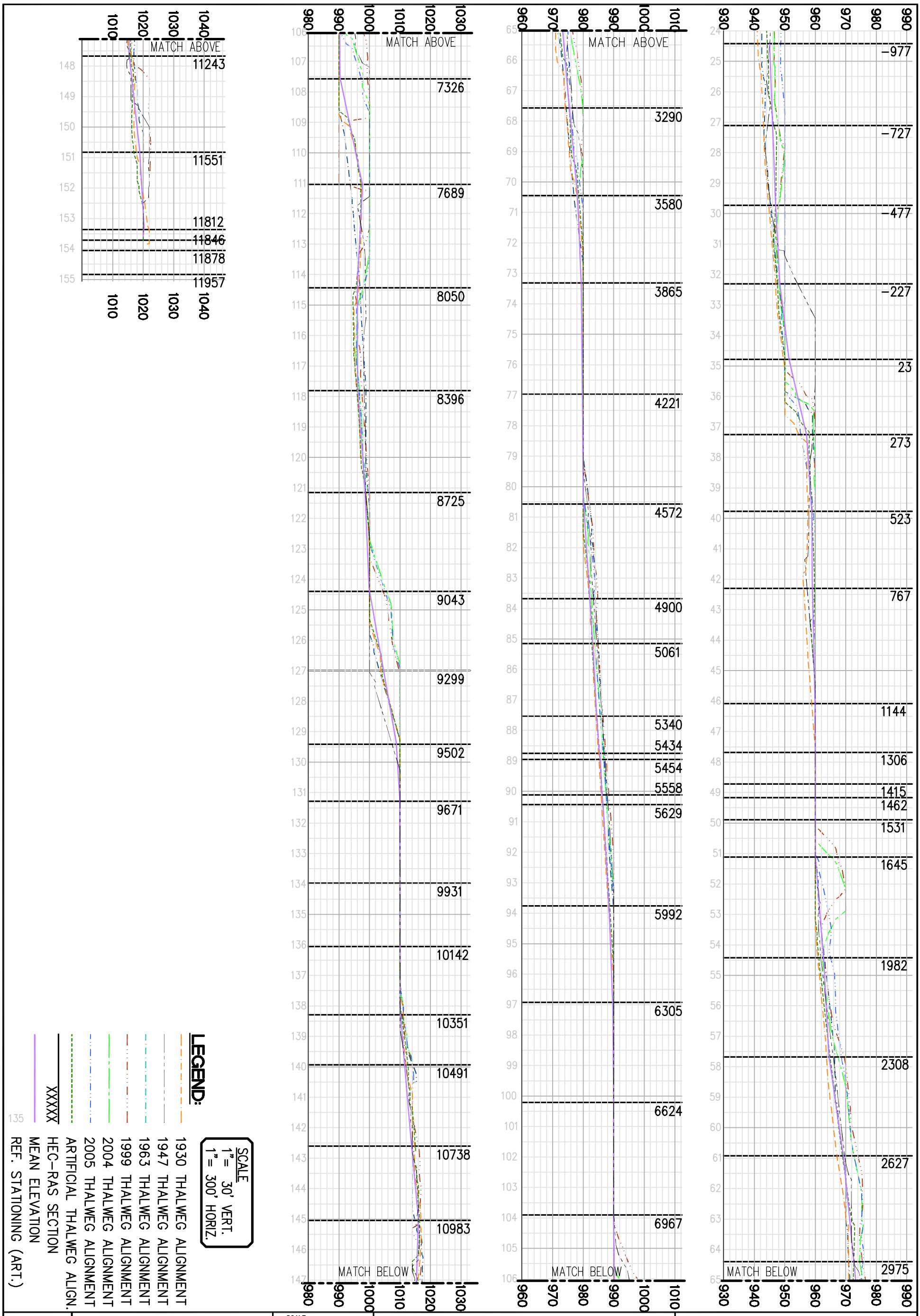

FIGURE
A5.3.1C

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CASTAIC CREEK HISTORIC BED PROFILES (1963 TOPO)

P:\8197E\Engineering\GlobalExhibits\8197 Historic Profiles - Castaic.dwg - Tab: C By: enarvaez on Feb. 21, 2008 at 08:19 am

Xrefs: 8197-Castaic-Profiles.dwg; 8197-11x17Exh-Tblk.dwg
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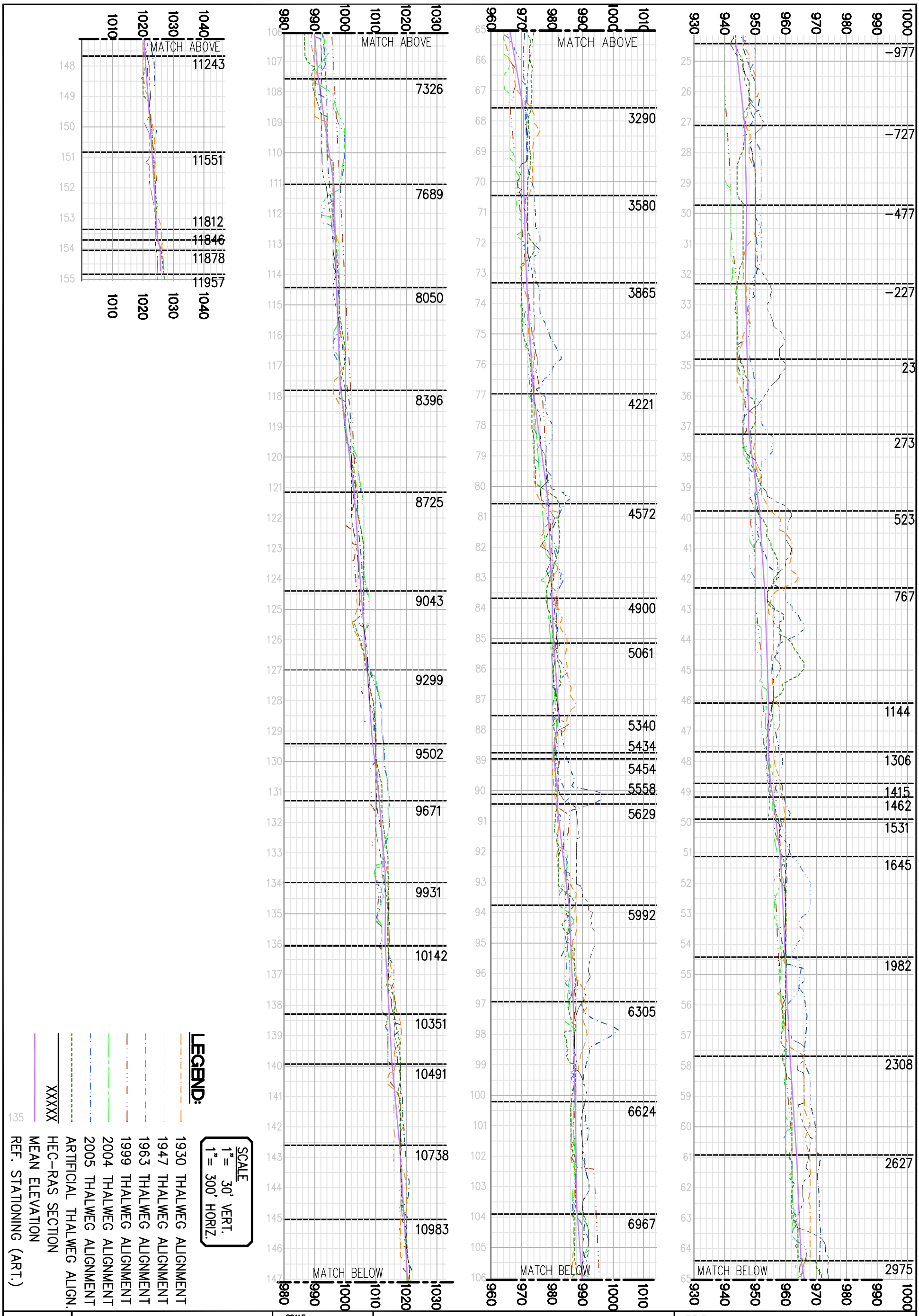

FIGURE A5.3.1D

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TITLE
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P:\8197E\Engineering\GlobalExhibits\8197 Historic Profiles - Castaic.dwg - Tab: D By: enarvaez on Feb. 21, 2008 at 08:22 am

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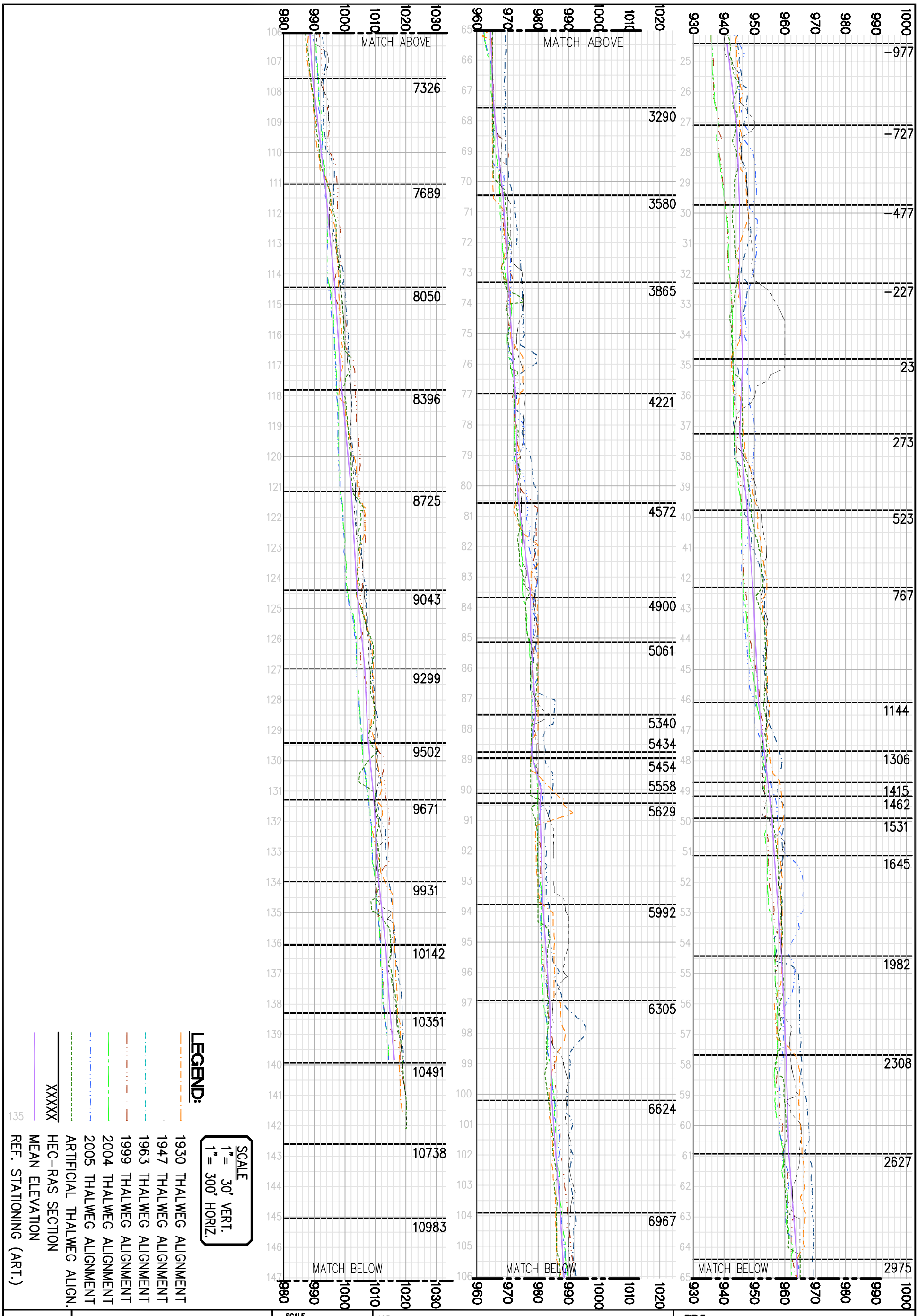

FIGURE A5.3.1E

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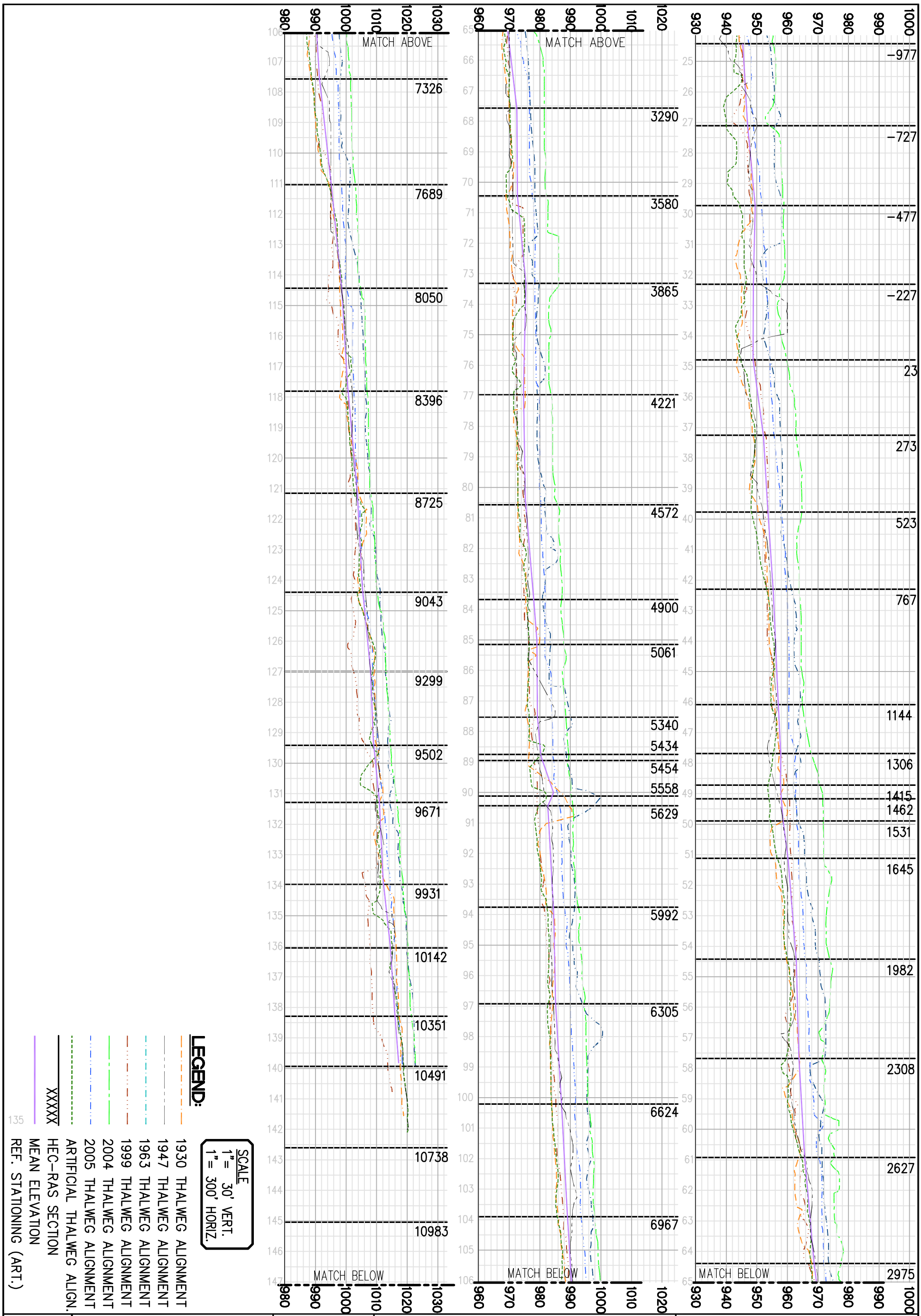

FIGURE A5.3.1F

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Table A5.3.1 Castaic Creek Thalweg Analysis Calculation of Long Term Aggradation/Degradation Based on Historical Bed Analysis

Subreach	HEC-RAS Section	1930		1947		1963		1999		2004		2005		99 to 05 MINIMUM	99 to 05 MEAN	99 MEAN-MEAN 99-05[1]
		Topo Mean	Topo Min	Topo Mean	Topo Min	Topo Mean	Topo Min	Topo Mean	Topo Min	Topo Mean	Topo Min	Topo Mean	Topo Min			
SRA1	12407															
	12162			1026.5	1026.5											
	11957	1025.4	1025.0	1026.5	1026.4			1025.7	1024.7					**1024.7**	**1025.7**	**0.0**
	11878	1025.0	1025.0	1025.6	1025.0			1025.5	1024.1					**1024.1**	**1025.5**	**0.0**
	11846	1025.0	1024.8	1025.0	1025.0	1020.0	1020.0	1024.6	1024.0					**1024.0**	**1024.6**	**0.0**
	11812	1024.9	1024.5	1025.2	1025.0	1020.3	1017.5	1024.4	1023.7					**1023.7**	**1024.4**	**0.0**
	11551	1023.0	1022.2	1023.4	1022.4	1018.8	1015.5	1022.9	1022.0					**1022.0**	**1022.9**	**0.0**
	11243	1020.0	1020.0	1020.6	1020.0	1015.3	1014.0	1020.6	1020.0					**1020.0**	**1020.6**	**0.0**
	10983	1019.4	1019.2	1019.3	1019.0	1016.0	1014.0	1019.3	1017.9					**1017.9**	**1019.3**	**0.0**
SRA2	10738	1017.5	1017.1	1018.1	1017.3	1013.7	1010.6	1017.7	1016.0					**1016.0**	**1017.7**	**0.0**
	10491	1017.3	1014.9	1017.8	1015.1	1011.4	1010.0	1015.2	1012.4	1016.2	1012.9	1017.2	1008.9	**1008.9**	**1016.2**	**-1.0**
	10351	1016.2	1014.0	1016.8	1014.5	1010.1	1010.0	1014.3	1012.0	1014.7	1011.6	1015.9	1007.8	**1007.8**	**1015.0**	**-0.7**
	10142	1014.7	1013.1	1014.8	1013.1	1010.0	1010.0	1013.0	1011.1	1013.2	1009.9	1014.4	1006.5	**1006.5**	**1013.6**	**-0.6**
	9931	1012.4	1012.0	1012.6	1011.7	1010.0	1010.0	1013.2	1010.0	1010.9	1007.6	1012.1	1007.6	**1007.6**	**1012.1**	**1.1**
	9671	1011.2	1010.0	1011.9	1010.0	1009.9	1009.3	1011.0	1010.0	1009.5	1005.0	1010.8	1005.1	**1005.0**	**1010.4**	**0.6**
	9502	1017.1	1010.0	1015.1	1010.0	1008.7	1002.7	1008.9	1005.3	1007.6	1003.9	1009.0	1003.5	**1003.5**	**1008.5**	**0.4**
	9299	1008.9	1007.9	1010.3	1008.7	1004.4	1000.0	1007.1	1004.0	1006.5	1002.4	1008.0	1002.4	**1002.4**	**1007.2**	**-0.1**
SRA3	9043	1006.3	1005.0	1007.6	1006.9	999.9	999.2	1005.1	1001.0	1003.9	999.8	1005.4	999.8	**999.8**	**1004.8**	**0.3**
	8725	1005.2	1004.7	1006.1	1005.0	998.5	997.9	1002.8	1002.0	1002.0	997.8	1003.6	997.8	**997.8**	**1002.8**	**0.0**
	8396	1003.1	1001.9	1003.8	1003.3	996.1	995.6	998.3	996.2	998.8	996.6	1000.5	994.8	**994.8**	**999.2**	**-0.9**
	8050	1002.0	1000.0	1000.8	999.6	996.0	990.0	997.1	996.0	996.7	994.2	998.5	993.6	**993.6**	**997.4**	**-0.3**
	7689	1000.2	999.2	999.3	998.1	997.7	990.0	996.3	992.3	993.5	992.3	995.2	990.2	**990.2**	**995.0**	**1.3**
SRA4	7326	998.1	997.1	997.0	995.7	990.3	990.0	991.1	989.0	989.4	988.7	991.3	987.0	**987.0**	**990.6**	**0.5**
	6967	995.8	994.3	994.4	993.4	990.0	990.0	988.1	987.0	987.2	985.7	989.0	984.5	**984.5**	**988.1**	**0.0**
	6624	994.3	993.1	993.0	992.8	990.0	990.0	987.5	986.2	984.5	983.0	987.1	983.1	**983.0**	**986.4**	**1.2**
	6305	992.4	991.6	991.6	989.7	989.7	988.1	986.9	984.4	983.8	981.2	985.2	980.7	**980.7**	**985.3**	**1.6**
	5992	990.5	989.4	990.2	988.2	988.5	986.4	985.6	983.8	981.6	980.0	984.5	979.4	**979.4**	**983.9**	**1.7**
	5629	988.6	987.2	988.3	987.8	986.5	986.1	981.5	980.7	980.6	977.8	982.6	977.7	**977.7**	**981.6**	**0.0**
	5558	988.1	986.7	988.1	987.7	986.1	985.5	981.7	981.1	981.0	977.5	984.5	977.4	**977.4**	**982.4**	**-0.7**
	5454	987.2	986.1	987.4	987.3	985.5	985.4	980.5	980.0	978.0	977.5	980.5	976.5	**976.5**	**979.7**	**0.9**
	5434	987.0	986.0	987.3	987.2	985.2	984.8	980.5	980.2	977.9	977.5	980.2	976.4	**976.4**	**979.5**	**1.0**
SRB1	5340	986.2	985.5	986.5	986.4	984.4	983.7	982.1	980.1	979.2	977.6	979.2	976.5	**976.5**	**980.2**	**1.9**
	5061	984.5	983.7	984.7	984.6	983.0	982.6	980.5	978.3	977.7	974.7	979.0	974.2	**974.2**	**979.1**	**1.4**
	4900	983.3	982.9	983.5	983.4	982.0	980.0	979.9	977.9	977.5	974.5	977.9	973.8	**973.8**	**978.4**	**1.5**
	4572	981.3	980.9	981.2	980.7	980.0	980.0	978.6	975.6	973.5	972.6	975.3	972.6	**972.6**	**975.8**	**2.8**
	4221	978.2	976.1	978.5	977.9	979.7	978.2	973.8	972.0	972.4	970.8	974.7	971.4	**970.8**	**973.6**	**0.2**
SRB2	3865	975.5	975.0	976.0	975.1	979.3	975.4	971.6	970.0	970.3	968.6	975.5	971.1	**968.6**	**972.5**	**-0.9**
	3580	975.0	974.9	974.6	972.9	978.2	973.1	970.7	967.2	968.5	966.9	972.7	969.4	**966.9**	**970.6**	**0.0**
	3290	974.4	972.2	974.5	970.0	975.5	970.0	970.5	964.0	965.5	964.6	972.5	969.2	**964.0**	**969.5**	**1.0**
	2975	972.9	969.1	973.0	970.0	972.7	967.8	965.1	962.0	964.0	961.4	968.8	963.9	**961.4**	**965.9**	**-0.8**
	2627	968.1	965.2	970.4	969.4	969.2	965.2	963.6	960.0	961.3	957.3	965.7	961.8	**957.3**	**963.6**	**0.0**
SRB3	2308	963.8	962.7	966.4	964.8	964.5	961.1	961.4	958.7	960.4	957.4	963.8	958.8	**957.4**	**961.9**	**-0.4**
	1982	963.6	960.3	965.0	961.8	962.7	960.0	959.9	956.9	958.9	956.0	962.9	956.7	**956.0**	**960.6**	**-0.7**
	1645	959.9	958.3	961.5	959.1	960.0	960.0	958.3	956.0	956.5	953.3	960.2	954.9	**953.3**	**958.3**	**0.0**
	1531	958.5	957.9	960.3	958.1	960.0	960.0	956.7	954.9	955.7	953.0	958.6	954.2	**953.0**	**957.0**	**-0.3**
	1462	958.4	957.7	959.6	957.4	960.0	960.0	955.8	954.0	955.1	952.1	958.0	954.0	**952.1**	**956.3**	**-0.5**
	1415	958.4	957.6	959.5	957.0	960.0	960.0	955.0	952.2	954.4	951.7	957.7	953.5	**951.7**	**955.7**	**-0.7**
	1306	958.0	957.0	958.9	956.3	960.0	960.0	954.3	952.0	953.2	950.3	957.8	951.6	**950.3**	**955.1**	**-0.8**
	1123	957.7	956.3	958.1	955.5	959.9	959.3	954.4	951.3	951.4	948.3	957.0	951.7	**948.3**	**954.3**	**0.1**

[1] 99 MEAN-MEAN 99-05 IS USED IN PLACE OF 99 MIN-MEAN 99-05 SINCE MIN-MEAN CALCULATES NO AGGRADATION WHEN AGGRADATION IS PRESENT

PACE
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Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 6.1

Radius Analysis

PACE
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CIVIL ENGINEERING, INC.

CASTAIC CREEK

PROP. CONDITION CURVE RADIUS

EX. CONDITION CURVE RADIUS

372
4221
3865
3580
3290
2975
2627
2308
1982
1645
1531
1415
1462
1173
5454
5434
R: 2677'
R: 848'

TITLE
CURVED & PROPOSED
CONDITION CHANNEL
CENTER LINE

JOB
CASTAIC CREEK
FLUVIAL STUDY

LA. COUNTY

GA

SCALE AS SHOWN
DESIGNED D.J.
DRAWN T.M.C.
CHECKED D.J.
DATE 11/21/05
JOB NO. 8065E

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17520 NEWHOPE STREET, SUITE 200
FOUNTAIN VALLEY, CA 92708
PH (714) 481-7300 FAX (714) 481-7299

FIGURE
A6.1

Xrefs: 8197-HEC-SECS.dwg; 8197-XTopo.dwg; 8197-Topo-1999.dwg; 8065-Lining.dwg
Dimscale = 40; LTscale = 0.5; PSltscale = 1; Acad Ver. = 17.1s (LMS Tech); Visretain = 1
P:\8065E\Engineering\GlobalExhibits\8065E-FLUVIALARC.dwg - Tab: Layout1 By: enarvaez on Feb. 21, 2008 at 08:53 am

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 6.2A

LACH&SM Toe
Existing & Proposed Conditions
Curved & Straight Reaches

PACE
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CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM -- CASTAIC CREEK EXISTING CONDITIONS OUTSIDE CURVED REACH, Q_P n=0.025

SECTION	Z_{MAX}=	Z_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Z_{DEG}+[1]	Z_{GS}+	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS}+	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS}+	Z_I+	H/2	Z_{DM}=
12407	13.9	13.9	3.7	14.8	**2.0**	0.5	0	0.0	1	0.0	0	0.0	1	5.2	0.000	1383	1313	9.2	2.0	0.2	9.0
12162	22.2	22.2	12.0	12.2	**2.0**	2.7	0.9	1.5	1	0.0	0	11.6	1	9.4	0.002	235	1313	2.0	2.0	1.9	15.0
11957	15.0	10.7	12.1	11.6	**2.0**	2.8	0	0.0	1	0.0	0	0.0	1	9.3	0.002	237	1313	1.9	2.0	2.0	15.0
11878	22.8	22.8	11.5	11.3	**2.0**	2.6	0.9	2.5	1	0.0	0	12.5	1	9.3	0.002	247	1313	2.0	2.0	1.8	15.0
11846	12.0	9.8	9.4	11.7	**2.0**	1.9	0	0.0	1	0.0	0	0.0	1	9.3	0.001	302	1313	2.7	2.0	1.2	12.0
11812	18.0	14.5	15.4	9.1	**2.0**	4.1	0	0.0	1	0.0	0	0.0	1	7.4	0.005	416	1313	3.3	2.0	3.2	18.0
11551	21.0	19.3	20.1	6.5	**2.0**	6.3	0	0.0	1	0.0	0	0.0	1	2.9	0.012	928	1313	5.8	2.0	3.2	21.0
11243	18.0	16.9	16.3	6.5	**2.0**	4.5	0	0.0	1	0.0	0	0.0	1	2.9	0.010	955	1313	5.2	2.0	3.2	18.0
10983	18.8	18.8	14.4	9.3	**2.0**	3.6	0	0.0	1	0.0	0	0.0	1	3.2	0.006	1059	1313	8.4	2.0	2.8	15.0
10738	18.0	14.6	15.7	6.5	**2.0**	4.2	0	0.0	1	0.0	0	0.0	1	4.1	0.010	567	1313	3.2	2.0	3.3	18.0
10491	15.0	12.7	12.7	9.6	**2.0**	3.0	0	0.0	1	0.0	0	0.0	1	4.8	0.006	436	1313	3.5	2.0	2.2	15.0
10351	18.0	14.6	16.1	6.7	**2.0**	4.4	0	0.0	1	0.0	0	0.0	1	3.3	0.015	505	1313	2.9	2.0	3.4	18.0
10142	10.0	9.5	13.2	6.9	**2.0**	3.2	0	0.0	1	0.0	0	0.0	0	2.9	0.012	794	0	0.0	2.0	2.3	10.0
9931	10.0	9.1	12.6	6.4	**2.0**	2.9	0	0.0	1	0.0	0	0.0	0	2.5	0.014	860	0	0.0	2.0	2.1	10.0
9671	8.0	6.4	8.1	9.4	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.3	0.004	984	0	0.0	2.0	0.9	8.0
9502	10.0	7.8	10.7	7.7	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	8.3	11.4	6.9	**2.0**	2.6	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	8.5	11.7	7.8	**2.0**	2.7	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	12.0	11.2	9.8	7.0	**2.0**	2.0	0	0.0	1	0.0	0	0.0	1	2.3	0.009	1168	1894	3.9	2.0	1.3	12.0
8396	15.0	11.0	10.8	5.1	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	1.9	0.014	1285	1894	3.1	2.0	1.6	15.0
8050	12.0	10.3	6.7	8.3	**2.0**	1.2	0	0.0	1	0.0	0	0.0	1	3.2	0.003	1256	1894	4.5	2.0	0.6	12.0
7689	15.0	10.9	10.2	7.9	**2.0**	2.2	0	0.0	1	0.0	0	0.0	1	3.2	0.006	808	1894	3.4	2.0	1.4	15.0
7326	12.0	9.5	8.9	8.8	**2.0**	1.7	0	0.0	1	0.0	0	0.0	1	5.3	0.002	570	1894	2.7	2.0	1.1	12.0
6967	12.0	11.0	7.3	9.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	1	3.7	0.002	1019	1894	5.0	2.0	0.7	12.0
6624	15.0	13.5	10.8	11.3	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	3.5	0.004	780	1894	5.5	2.0	1.6	15.0
6305	15.0	11.3	10.9	9.2	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	4.3	0.004	581	1894	3.3	2.0	1.6	15.0
5992	15.0	11.0	11.1	8.9	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	4.7	0.004	568	1894	2.9	2.0	1.7	15.0
5629	12.0	8.5	8.2	10.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	1	8.3	0.001	390	1894	2.1	2.0	0.9	12.0
5558	26.1	26.1	8.1	10.8	**2.0**	1.5	0.9	10.0	1	0.0	0	17.6	1	8.5	0.001	385	1894	2.0	2.0	0.9	12.0
5454	12.0	11.5	9.0	9.9	**2.0**	1.8	0	0.0	1	0.0	0	0.0	1	8.0	0.001	370	747	4.6	2.0	1.1	12.0
5435	12.3	12.3	8.9	9.9	**2.0**	1.7	0	0.0	1	0.0	0	0.0	1	8.4	0.001	475	747	5.5	2.0	1.1	12.0
5340	17.5	17.5	12.2	10.5	*2.1*	2.8	0	0.0	1	0.0	0	0.0	1	4.6	0.006	867	747	8.7	2.0	2.0	15.0
5061	10.3	10.3	14.1	9.6	*2.1*	3.5	0	0.0	1	0.0	0	0.0	0	3.4	0.010	707	0	0.0	2.0	2.7	10.0
4900	10.0	9.2	12.7	8.7	*2.1*	3.0	0	0.0	1	0.0	0	0.0	0	3.1	0.007	867	0	0.0	2.0	2.2	10.0
4572	8.0	7.2	9.4	8.6	*2.1*	1.9	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1313	0	0.0	2.0	1.2	8.0
4221	10.0	8.9	12.2	10.3	*2.1*	2.8	0	0.0	1	0.0	0	0.0	0	4.1	0.005	689	0	0.0	2.0	2.0	10.0
3865	18.0	14.5	15.8	8.1	2.7	4.2	0	0.0	1	0.0	0	0.0	1	3.4	0.011	630	2677	2.3	2.0	3.4	18.0
3580	15.0	14.4	14.9	9.6	2.7	3.9	0	0.0	1	0.0	0	0.0	1	3.6	0.008	636	2677	2.8	2.0	3.0	15.0
3290	15.0	13.5	12.1	10.6	2.7	2.8	0	0.0	1	0.0	0	0.0	1	3.5	0.005	843	2677	4.1	2.0	2.0	15.0
2975	15.0	12.6	13.6	9.7	2.7	3.4	0	0.0	1	0.0	0	0.0	1	4.2	0.008	553	2677	2.1	2.0	2.5	15.0
2627	15.0	12.5	10.5	10.5	2.8	2.2	0	0.0	1	0.0	0	0.0	1	3.3	0.006	936	2677	4.0	2.0	1.5	15.0
2308	12.0	10.0	8.6	9.0	**2.0**	1.7	0	0.0	1	0.0	0	0.0	1	4.0	0.003	947	2677	3.3	2.0	1.0	12.0
1982	15.0	11.0	12.5	10.0	**2.0**	2.9	0	0.0	1	0.0	0	0.0	1	4.7	0.006	535	2677	2.0	2.0	2.1	15.0
1645	12.0	8.5	9.7	9.8	**2.0**	2.0	0	0.0	1	0.0	0	0.0	1	7.6	0.002	427	2677	1.2	2.0	1.3	12.0
1531	15.0	11.0	14.1	8.4	**2.0**	3.5	0	0.0	1	0.0	0	0.0	1	6.2	0.005	360	2677	0.7	2.0	2.7	15.0
1462	14.0	13.7	19.9	7.0	**2.0**	6.2	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	7.2	9.6	11.2	**2.0**	2.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	21.1	21.1	9.3	10.9	**2.0**	1.9	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	9.4	13.1	9.0	**2.0**	3.1	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	26.1	26.1			2.8	6.3						17.6						9.2		3.5	21.0
MINIMUM=	8.0	6.4			2.0	0.5						0.0						0.0		0.2	8.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE=PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0=SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE=VERT WALL FACTOR; IF VERT=**2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH=HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH=CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION
BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8
APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS,
VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP
AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERA
TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS
ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981).
EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SE
CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUAT
APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CU
ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUA
DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TA
THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BR
WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE A
FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM -- CASTAIC CREEK EXISTING CONDITIONS STRAIGHT-INSIDE CURVED REACH Q_{CAP} n=0.025

SECTION	Z_{MAX} =	Z_{TOT} =	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} ± [1]	Z_{GS} ±	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} ±	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} ±	Z_L ±	H/2	Z_{DM} =
12407	6.0	4.7	3.7	14.8	**2.0**	0.5	0	0.0	1	0.0	0	0.0	0	5.2	0.000	1383	1313	0.0	2.0	0.2	6.0
12162	20.2	20.2	12.0	12.2	**2.0**	2.7	0.9	1.5	1	0.0	0	11.6	0	9.4	0.002	235	1313	0.0	2.0	1.9	10.0
11957	10.0	8.7	12.1	11.6	**2.0**	2.8	0	0.0	1	0.0	0	0.0	0	9.3	0.002	237	1313	0.0	2.0	2.0	10.0
11878	20.9	20.9	11.5	11.3	**2.0**	2.6	0.9	2.5	1	0.0	0	12.5	0	9.3	0.002	247	1313	0.0	2.0	1.8	10.0
11846	8.0	7.1	9.4	11.7	**2.0**	1.9	0	0.0	1	0.0	0	0.0	0	9.3	0.001	302	1313	0.0	2.0	1.2	8.0
11812	12.5	11.2	15.4	9.1	**2.0**	4.1	0	0.0	1	0.0	0	0.0	0	7.4	0.005	416	1313	0.0	2.0	3.2	12.5
11551	14.0	13.5	20.1	6.5	**2.0**	6.3	0	0.0	1	0.0	0	0.0	0	2.9	0.012	928	1313	0.0	2.0	3.2	14.0
11243	12.5	11.7	16.3	6.5	**2.0**	4.5	0	0.0	1	0.0	0	0.0	0	2.9	0.010	955	1313	0.0	2.0	3.2	12.5
10983	10.4	10.4	14.4	9.3	**2.0**	3.6	0	0.0	1	0.0	0	0.0	0	3.2	0.006	1059	1313	0.0	2.0	2.8	10.0
10738	12.5	11.5	15.7	6.5	**2.0**	4.2	0	0.0	1	0.0	0	0.0	0	4.1	0.010	567	1313	0.0	2.0	3.3	12.5
10491	10.0	9.2	12.7	9.6	**2.0**	3.0	0	0.0	1	0.0	0	0.0	0	4.8	0.006	436	1313	0.0	2.0	2.2	10.0
10351	12.5	11.7	16.1	6.7	**2.0**	4.4	0	0.0	1	0.0	0	0.0	0	3.3	0.015	505	1313	0.0	2.0	3.4	12.5
10142	10.0	9.5	13.2	6.9	**2.0**	3.2	0	0.0	1	0.0	0	0.0	0	2.9	0.012	794	0	0.0	2.0	2.3	10.0
9931	10.0	9.1	12.6	6.4	**2.0**	2.9	0	0.0	1	0.0	0	0.0	0	2.5	0.014	860	0	0.0	2.0	2.1	10.0
9671	8.0	6.4	8.1	9.4	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.3	0.004	984	0	0.0	2.0	0.9	8.0
9502	10.0	7.8	10.7	7.7	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	8.3	11.4	6.9	**2.0**	2.6	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	8.5	11.7	7.8	**2.0**	2.7	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	8.0	7.3	9.8	7.0	**2.0**	2.0	0	0.0	1	0.0	0	0.0	0	2.3	0.009	1168	1894	0.0	2.0	1.3	8.0
8396	10.0	7.9	10.8	5.1	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	1.9	0.014	1285	1894	0.0	2.0	1.6	10.0
8050	8.0	5.8	6.7	8.3	**2.0**	1.2	0	0.0	1	0.0	0	0.0	0	3.2	0.003	1256	1894	0.0	2.0	0.6	8.0
7689	10.0	7.6	10.2	7.9	**2.0**	2.2	0	0.0	1	0.0	0	0.0	0	3.2	0.006	808	1894	0.0	2.0	1.4	10.0
7326	8.0	6.8	8.9	8.8	**2.0**	1.7	0	0.0	1	0.0	0	0.0	0	5.3	0.002	570	1894	0.0	2.0	1.1	8.0
6967	8.0	6.0	7.3	9.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.7	0.002	1019	1894	0.0	2.0	0.7	8.0
6624	10.0	7.9	10.8	11.3	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	3.5	0.004	780	1894	0.0	2.0	1.6	10.0
6305	10.0	8.0	10.9	9.2	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	4.3	0.004	581	1894	0.0	2.0	1.6	10.0
5992	10.0	8.1	11.1	8.9	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	4.7	0.004	568	1894	0.0	2.0	1.7	10.0
5629	8.0	6.4	8.2	10.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	8.3	0.001	390	1894	0.0	2.0	0.9	8.0
5558	24.0	24.0	8.1	10.8	**2.0**	1.5	0.9	10.0	1	0.0	0	17.6	0	8.5	0.001	385	1894	0.0	2.0	0.9	8.0
5454	8.0	6.9	9.0	9.9	**2.0**	1.8	0	0.0	1	0.0	0	0.0	0	8.0	0.001	370	747	0.0	2.0	1.1	8.0
5435	8.0	6.8	8.9	9.9	**2.0**	1.7	0	0.0	1	0.0	0	0.0	0	8.4	0.001	475	747	0.0	2.0	1.1	8.0
5340	10.0	8.9	12.2	10.5	*2.1*	2.8	0	0.0	1	0.0	0	0.0	0	4.6	0.006	867	747	0.0	2.0	2.0	10.0
5061	10.3	10.3	14.1	9.6	*2.1*	3.5	0	0.0	1	0.0	0	0.0	0	3.4	0.010	707	0	0.0	2.0	2.7	10.0
4900	10.0	9.2	12.7	8.7	*2.1*	3.0	0	0.0	1	0.0	0	0.0	0	3.1	0.007	867	0	0.0	2.0	2.2	10.0
4572	8.0	7.2	9.4	8.6	*2.1*	1.9	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1313	0	0.0	2.0	1.2	8.0
4221	10.0	8.9	12.2	10.3	*2.1*	2.8	0	0.0	1	0.0	0	0.0	0	4.1	0.005	689	0	0.0	2.0	2.0	10.0
3865	12.5	12.3	15.8	8.1	*2.7*	4.2	0	0.0	1	0.0	0	0.0	0	3.4	0.011	630	2677	0.0	2.0	3.4	12.5
3580	11.6	11.6	14.9	9.6	*2.7*	3.9	0	0.0	1	0.0	0	0.0	0	3.6	0.008	636	2677	0.0	2.0	3.0	10.0
3290	10.0	9.4	12.1	10.6	*2.7*	2.8	0	0.0	1	0.0	0	0.0	0	3.5	0.005	843	2677	0.0	2.0	2.0	10.0
2975	10.5	10.5	13.6	9.7	*2.7*	3.4	0	0.0	1	0.0	0	0.0	0	4.2	0.008	553	2677	0.0	2.0	2.5	10.0
2627	10.0	8.5	10.5	10.5	*2.8*	2.2	0	0.0	1	0.0	0	0.0	0	3.3	0.006	936	2677	0.0	2.0	1.5	10.0
2308	8.0	6.7	8.6	9.0	**2.0**	1.7	0	0.0	1	0.0	0	0.0	0	4.0	0.003	947	2677	0.0	2.0	1.0	8.0
1982	10.0	9.0	12.5	10.0	**2.0**	2.9	0	0.0	1	0.0	0	0.0	0	4.7	0.006	535	2677	0.0	2.0	2.1	10.0
1645	8.0	7.3	9.7	9.8	**2.0**	2.0	0	0.0	1	0.0	0	0.0	0	7.6	0.002	427	2677	0.0	2.0	1.3	8.0
1531	10.2	10.2	14.1	8.4	**2.0**	3.5	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	2677	0.0	2.0	2.7	10.0
1462	14.0	13.7	19.9	7.0	**2.0**	6.2	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	7.2	9.6	11.2	**2.0**	2.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	21.1	21.1	9.3	10.9	**2.0**	1.9	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	9.4	13.1	9.0	**2.0**	3.1	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	24.0	24.0			2.8	6.3						17.6						0.0		3.5	14.0
MINIMUM=	6.0	4.7			2.0	0.5						0.0						0.0		0.2	6.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

2.2 **DEFINITIONS**
V(FPS) =VELOCITY IN FEET PER SECOND
4.0 Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
3.2 Z_{GS}=GENERAL SCOUR IN FEET
5.2 Z_{LS}=LOCAL SCOUR IN FEET
5.2 **PIER TYPE** =PIER SHAPE FACTOR; IF NO PIERS=**0**
5.2 **1.0** =SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
4.8 **0.8** SHARP NOSE; **0.9** GROUP OF CYLINDERS
5.3 **FLOW DEPTH** =WATER DEPTH IN CHANNEL IN FEET
4.2 **B**=WIDTH OF PIERS IN FEET; NO PIER=0
5.4 **ABUT TYPE** =VERT WALL FACTOR; IF VERT= **2**; NON VERT=**1**
4.3 **A**=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
4.1 **SOFT** = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
2.9 **0** = HARD BOTTOM; **1** = SOFT BOTTOM
3.5 Z_{BS}=BEND SCOUR IN FEET
3.8 **BEND COEFF** =BEND COEFFICIENT; IF NO BEND=0, BEND=1
3.9 **HYD DEPTH** =HYDRAULIC DEPTH IN FEET
3.3 **E SLOPE**=ENERGY SLOPE, UNITLESS
3.6 **TOP WIDTH** =CHANNEL TOP WIDTH IN FEET
2.6 **RADIUS**=RADIUS OF CURVATURE TO CENTERLINE IN FEET
3.4 Z_L=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
3.1 **H**=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
2.7 Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM
3.6
3.6 **GENERAL**
3.7 THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION (TOE DOWN)
2.9 BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8 AND ASSOCIATED
APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH A MAXIMUM
3.1 VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP TO 50 VELOCITIES
3.1 AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERAL SCOUR IS
4.0 TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS AND ABUTMENTS
4.7 ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981). BEND SCOUR IS BASED ON
4.2 EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SECONDARY
3.2 CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUATIONS IN
4.0 APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CUT OFF DEPTH BASED
5.4 ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL. THE CALCULATION
5.0 DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TABLE F-06
4.0 THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BRIDGES/ABUTMENTS
4.5 WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE APPLICATION OF EQ 5-4
3.5 FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.
3.0
4.1 **COLOR CODES**
3.3 OUTPUT
4.7 DATA FROM HEC-RAS
5.5 USER SUPPLIED DATA
3.2 INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)
###
4.3

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM -- CASTAIC CREEK PROPOSED CONDITIONS OUTSIDE CURVED REACH, Q_{100} n=0.025

SECTION	Z_{MAX}=	Z_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} +[1]	Z_{GS} +	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} +	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} +	Z_I +	H/2	Z_{DM}=
12407	13.9	13.9	3.7	14.9	**2.0**	0.5	0	0.0	1	0.0	0	0.0	1	5.2	0.000	1383	1313	9.2	2.0	0.2	9.0
12162	22.2	22.2	12.0	12.2	**2.0**	2.7	0.9	1.5	1	0.0	0	11.6	1	9.4	0.002	235	1313	2.0	2.0	1.9	15.0
11957	15.0	10.7	12.1	11.6	**2.0**	2.8	0	0.0	1	0.0	0	0.0	1	9.3	0.002	237	1313	1.9	2.0	2.0	15.0
11878	22.9	22.9	11.5	11.3	**2.0**	2.6	0.9	2.5	1	0.0	0	12.5	1	9.3	0.002	248	1313	2.0	2.0	1.8	15.0
11846	12.0	9.8	9.4	11.7	**2.0**	1.9	0	0.0	1	0.0	0	0.0	1	9.3	0.001	302	1313	2.7	2.0	1.2	12.0
11812	18.0	12.9	15.4	9.1	**2.0**	4.1	0	0.0	1	0.0	0	0.0	1	7.4	0.005	238	1313	1.6	2.0	3.2	18.0
11551	21.0	17.2	20.1	6.5	**2.0**	6.3	0	0.0	1	0.0	0	0.0	1	2.9	0.012	494	1313	3.7	2.0	3.2	21.0
11243	18.0	15.4	16.3	6.5	**2.0**	4.5	0	0.0	1	0.0	0	0.0	1	2.9	0.010	585	1313	3.7	2.0	3.2	18.0
10983	16.7	16.7	14.4	9.3	**2.0**	3.6	0	0.0	1	0.0	0	0.0	1	3.2	0.006	683	1313	6.3	2.0	2.8	15.0
10738	18.0	13.9	15.7	6.5	**2.0**	4.2	0	0.0	1	0.0	0	0.0	1	4.1	0.010	412	1313	2.4	2.0	3.3	18.0
10491	15.0	12.7	12.7	9.6	**2.0**	3.0	0	0.0	1	0.0	0	0.0	1	4.8	0.006	436	1313	3.5	2.0	2.2	15.0
10351	18.0	14.6	16.1	6.7	**2.0**	4.4	0	0.0	1	0.0	0	0.0	1	3.3	0.015	505	1313	2.9	2.0	3.4	18.0
10142	10.0	9.5	13.2	6.9	**2.0**	3.2	0	0.0	1	0.0	0	0.0	0	3.0	0.012	785	0	0.0	2.0	2.3	10.0
9931	10.0	9.2	12.7	6.4	**2.0**	3.0	0	0.0	1	0.0	0	0.0	0	2.6	0.013	795	0	0.0	2.0	2.2	10.0
9671	8.0	7.2	9.5	9.1	**2.0**	1.9	0	0.0	1	0.0	0	0.0	0	3.4	0.005	820	0	0.0	2.0	1.2	8.0
9502	10.0	7.8	10.7	7.7	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	8.3	11.4	6.9	**2.0**	2.6	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	8.5	11.8	7.8	**2.0**	2.7	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	12.0	11.2	9.8	7.0	**2.0**	2.0	0	0.0	1	0.0	0	0.0	1	2.3	0.009	1168	1894	3.9	2.0	1.3	12.0
8396	15.0	10.9	10.8	5.2	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	2.0	0.013	1235	1894	3.0	2.0	1.6	15.0
8050	12.0	10.3	7.2	8.1	**2.0**	1.3	0	0.0	1	0.0	0	0.0	1	3.0	0.003	1215	1894	4.3	2.0	0.7	12.0
7689	12.0	9.9	7.7	8.9	**2.0**	1.4	0	0.0	1	0.0	0	0.0	1	4.1	0.003	841	1894	3.7	2.0	0.8	12.0
7326	12.0	9.0	6.6	10.5	**2.0**	1.1	0	0.0	1	0.0	0	0.0	1	6.6	0.001	605	1894	3.2	2.0	0.6	12.0
6967	12.0	9.1	6.8	11.6	**2.0**	1.2	0	0.0	1	0.0	0	0.0	1	7.0	0.001	563	1894	3.3	2.0	0.6	12.0
6624	12.0	9.6	9.4	11.7	**2.0**	1.9	0	0.0	1	0.0	0	0.0	1	6.8	0.002	415	1894	2.5	2.0	1.2	12.0
6305	15.0	11.6	13.6	10.3	**2.0**	3.3	0	0.0	1	0.0	0	0.0	1	5.7	0.005	344	1894	1.8	2.0	2.5	15.0
5992	15.0	11.8	14.1	10.3	**2.0**	3.5	0	0.0	1	0.0	0	0.0	1	5.9	0.006	321	1894	1.6	2.0	2.7	15.0
5629	12.0	7.9	6.2	13.6	**2.0**	1.1	0	0.0	1	0.0	0	0.0	1	11.4	0.000	371	1894	2.3	2.0	0.5	12.0
5558	24.0	24.0	6.0	13.8	**2.0**	1.0	0.9	10.0	1	0.0	0	16.0	1	11.1	0.000	400	1894	2.6	2.0	0.5	9.0
5454	12.0	11.5	6.2	13.5	**2.0**	1.0	0	0.0	1	0.0	0	0.0	1	11.3	0.000	381	747	6.0	2.0	0.5	12.0
5435	12.9	12.9	6.2	13.5	**2.0**	1.0	0	0.0	1	0.0	0	0.0	1	12.0	0.000	511	747	7.3	2.0	0.5	12.0
5340	16.8	16.8	14.3	10.6	*2.1*	3.6	0	0.0	1	0.0	0	0.0	1	6.4	0.005	481	747	6.4	2.0	2.7	15.0
5061	13.4	13.4	17.8	10.3	*2.1*	5.1	0	0.0	1	0.0	0	0.0	0	3.8	0.016	475	0	0.0	2.0	4.3	12.5
4900	12.5	11.6	15.7	9.0	*2.1*	4.2	0	0.0	1	0.0	0	0.0	0	4.3	0.011	461	0	0.0	2.0	3.3	12.5
4572	10.0	8.5	11.6	9.4	*2.1*	2.6	0	0.0	1	0.0	0	0.0	0	6.3	0.003	429	0	0.0	2.0	1.8	10.0
4221	10.0	9.7	13.4	11.1	*2.1*	3.2	0	0.0	1	0.0	0	0.0	0	5.6	0.005	424	0	0.0	2.0	2.4	10.0
3865	13.8	13.8	17.7	8.0	2.7	5.1	0	0.0	1	0.0	0	0.0	0	4.1	0.014	432	0	0.0	2.0	4.0	12.5
3580	12.5	11.6	15.0	10.1	2.7	3.9	0	0.0	1	0.0	0	0.0	0	4.8	0.008	433	0	0.0	2.0	3.0	12.5
3290	10.1	10.1	13.0	11.1	2.7	3.1	0	0.0	1	0.0	0	0.0	0	5.1	0.006	470	0	0.0	2.0	2.3	10.0
2975	12.6	12.6	16.2	9.0	2.7	4.4	0	0.0	1	0.0	0	0.0	0	3.8	0.012	507	0	0.0	2.0	3.5	12.5
2627	10.0	8.8	11.0	10.5	2.8	2.4	0	0.0	1	0.0	0	0.0	0	3.6	0.006	803	0	0.0	2.0	1.6	10.0
2308	8.0	7.0	9.2	8.9	**2.0**	1.8	0	0.0	1	0.0	0	0.0	0	4.4	0.003	784	0	0.0	2.0	1.1	8.0
1982	15.0	14.9	12.5	10.0	**2.0**	2.9	0	0.0	1	0.0	0	0.0	1	4.7	0.006	535	848	5.9	2.0	2.1	15.0
1645	12.0	12.0	9.7	9.8	**2.0**	2.0	0	0.0	1	0.0	0	0.0	1	7.6	0.002	427	848	4.7	2.0	1.3	12.0
1531	10.2	10.2	14.1	8.4	**2.0**	3.5	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	0	0.0	2.0	2.7	10.0
1462	14.0	13.7	19.9	7.0	**2.0**	6.2	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	7.2	9.6	11.2	**2.0**	2.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	21.1	21.1	9.3	10.9	**2.0**	1.9	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	9.4	13.1	9.0	**2.0**	3.1	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	24.0	24.0			2.8	6.3						16.0						9.2		4.3	21.0
MINIMUM=	8.0	7.0			2.0	0.5						0.0						0.0		0.2	8.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE=PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0=SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE=VERT WALL FACTOR; IF VERT=**2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH=HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH=CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION
BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8
APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS,
VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP
AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERA
TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS
ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981).
EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SE
CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUAT
APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CU
ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUA
DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TA
THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BR
WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE A
FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM -- CASTAIC CREEK PROPOSED CONDITIONS STRAIGHT-INSIDE CURVED REACH Q $_{CAP}$ n=0.025

SECTION	Z_{MAX} =	Z_{TOT} =	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} + [1]	Z_{GS} +	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} +	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} +	Z_I +	H/2	Z_{DM} =
12407	6.0	4.7	3.7	14.9	2.0	0.5	0	0.0	1	0.0	0	0.0	0	5.2	0.000	1383	1313	0.0	2.0	0.2	6.0
12162	20.2	20.2	12.0	12.2	2.0	2.7	0.9	1.5	1	0.0	0	11.6	0	9.4	0.002	235	1313	0.0	2.0	1.9	10.0
11957	10.0	8.7	12.1	11.6	2.0	2.8	0	0.0	1	0.0	0	0.0	0	9.3	0.002	237	1313	0.0	2.0	2.0	10.0
11878	20.9	20.9	11.5	11.3	2.0	2.6	0.9	2.5	1	0.0	0	12.5	0	9.3	0.002	248	1313	0.0	2.0	1.8	10.0
11846	8.0	7.1	9.4	11.7	2.0	1.9	0	0.0	1	0.0	0	0.0	0	9.3	0.001	302	1313	0.0	2.0	1.2	8.0
11812	12.5	11.3	15.4	9.1	2.0	4.1	0	0.0	1	0.0	0	0.0	0	7.4	0.005	238	1313	0.0	2.0	3.2	12.5
11551	14.0	13.5	20.1	6.5	2.0	6.3	0	0.0	1	0.0	0	0.0	0	2.9	0.012	494	1313	0.0	2.0	3.2	14.0
11243	12.5	11.7	16.3	6.5	2.0	4.5	0	0.0	1	0.0	0	0.0	0	2.9	0.010	585	1313	0.0	2.0	3.2	12.5
10983	10.4	10.4	14.4	9.3	2.0	3.6	0	0.0	1	0.0	0	0.0	0	3.2	0.006	683	1313	0.0	2.0	2.8	10.0
10738	12.5	11.5	15.7	6.5	2.0	4.2	0	0.0	1	0.0	0	0.0	0	4.1	0.010	412	1313	0.0	2.0	3.3	12.5
10491	10.0	9.2	12.7	9.6	2.0	3.0	0	0.0	1	0.0	0	0.0	0	4.8	0.006	436	1313	0.0	2.0	2.2	10.0
10351	12.5	11.7	16.1	6.7	2.0	4.4	0	0.0	1	0.0	0	0.0	0	3.3	0.015	505	1313	0.0	2.0	3.4	12.5
10142	10.0	9.5	13.2	6.9	2.0	3.2	0	0.0	1	0.0	0	0.0	0	3.0	0.012	785	0	0.0	2.0	2.3	10.0
9931	10.0	9.2	12.7	6.4	2.0	3.0	0	0.0	1	0.0	0	0.0	0	2.6	0.013	795	0	0.0	2.0	2.2	10.0
9671	8.0	7.2	9.5	9.1	2.0	1.9	0	0.0	1	0.0	0	0.0	0	3.4	0.005	820	0	0.0	2.0	1.2	8.0
9502	10.0	7.8	10.7	7.7	2.0	2.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	8.3	11.4	6.9	2.0	2.6	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	8.5	11.8	7.8	2.0	2.7	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	8.0	7.3	9.8	7.0	2.0	2.0	0	0.0	1	0.0	0	0.0	0	2.3	0.009	1168	1894	0.0	2.0	1.3	8.0
8396	10.0	7.9	10.8	5.2	2.0	2.3	0	0.0	1	0.0	0	0.0	0	2.0	0.013	1235	1894	0.0	2.0	1.6	10.0
8050	8.0	6.0	7.2	8.1	2.0	1.3	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1215	1894	0.0	2.0	0.7	8.0
7689	8.0	6.2	7.7	8.9	2.0	1.4	0	0.0	1	0.0	0	0.0	0	4.1	0.003	841	1894	0.0	2.0	0.8	8.0
7326	8.0	5.7	6.6	10.5	2.0	1.1	0	0.0	1	0.0	0	0.0	0	6.6	0.001	605	1894	0.0	2.0	0.6	8.0
6967	8.0	5.8	6.8	11.6	2.0	1.2	0	0.0	1	0.0	0	0.0	0	7.0	0.001	563	1894	0.0	2.0	0.6	8.0
6624	8.0	7.1	9.4	11.7	2.0	1.9	0	0.0	1	0.0	0	0.0	0	6.8	0.002	415	1894	0.0	2.0	1.2	8.0
6305	10.0	9.8	13.6	10.3	2.0	3.3	0	0.0	1	0.0	0	0.0	0	5.7	0.005	344	1894	0.0	2.0	2.5	10.0
5992	10.2	10.2	14.1	10.3	2.0	3.5	0	0.0	1	0.0	0	0.0	0	5.9	0.006	321	1894	0.0	2.0	2.7	10.0
5629	8.0	5.6	6.2	13.6	2.0	1.1	0	0.0	1	0.0	0	0.0	0	11.4	0.000	371	1894	0.0	2.0	0.5	8.0
5558	21.4	21.4	6.0	13.8	2.0	1.0	0.9	10.0	1	0.0	0	16.0	0	11.1	0.000	400	1894	0.0	2.0	0.5	6.0
5454	8.0	5.6	6.2	13.5	2.0	1.0	0	0.0	1	0.0	0	0.0	0	11.3	0.000	381	747	0.0	2.0	0.5	8.0
5435	8.0	5.6	6.2	13.5	2.0	1.0	0	0.0	1	0.0	0	0.0	0	12.0	0.000	511	747	0.0	2.0	0.5	8.0
5340	10.4	10.4	14.3	10.6	2.1	3.6	0	0.0	1	0.0	0	0.0	0	6.4	0.005	481	747	0.0	2.0	2.7	10.0
5061	13.4	13.4	17.8	10.3	2.1	5.1	0	0.0	1	0.0	0	0.0	0	3.8	0.016	475	0	0.0	2.0	4.3	12.5
4900	12.5	11.6	15.7	9.0	2.1	4.2	0	0.0	1	0.0	0	0.0	0	4.3	0.011	461	0	0.0	2.0	3.3	12.5
4572	10.0	8.5	11.6	9.4	2.1	2.6	0	0.0	1	0.0	0	0.0	0	6.3	0.003	429	0	0.0	2.0	1.8	10.0
4221	10.0	9.7	13.4	11.1	2.1	3.2	0	0.0	1	0.0	0	0.0	0	5.6	0.005	424	0	0.0	2.0	2.4	10.0
3865	13.8	13.8	17.7	8.0	2.7	5.1	0	0.0	1	0.0	0	0.0	0	4.1	0.014	432	0	0.0	2.0	4.0	12.5
3580	12.5	11.6	15.0	10.1	2.7	3.9	0	0.0	1	0.0	0	0.0	0	4.8	0.008	433	0	0.0	2.0	3.0	12.5
3290	10.1	10.1	13.0	11.1	2.7	3.1	0	0.0	1	0.0	0	0.0	0	5.1	0.006	470	0	0.0	2.0	2.3	10.0
2975	12.6	12.6	16.2	9.0	2.7	4.4	0	0.0	1	0.0	0	0.0	0	3.8	0.012	507	0	0.0	2.0	3.5	12.5
2627	10.0	8.8	11.0	10.5	2.8	2.4	0	0.0	1	0.0	0	0.0	0	3.6	0.006	803	0	0.0	2.0	1.6	10.0
2308	8.0	7.0	9.2	8.9	2.0	1.8	0	0.0	1	0.0	0	0.0	0	4.4	0.003	784	0	0.0	2.0	1.1	8.0
1982	10.0	9.0	12.5	10.0	2.0	2.9	0	0.0	1	0.0	0	0.0	0	4.7	0.006	535	848	0.0	2.0	2.1	10.0
1645	8.0	7.3	9.7	9.8	2.0	2.0	0	0.0	1	0.0	0	0.0	0	7.6	0.002	427	848	0.0	2.0	1.3	8.0
1531	10.2	10.2	14.1	8.4	2.0	3.5	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	0	0.0	2.0	2.7	10.0
1462	14.0	13.7	19.9	7.0	2.0	6.2	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	7.2	9.6	11.2	2.0	2.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	21.1	21.1	9.3	10.9	2.0	1.9	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	9.4	13.1	9.0	2.0	3.1	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	21.4	21.4			2.8	6.3						16.0						0.0		4.3	14.0
MINIMUM=	6.0	4.7			2.0	0.5						0.0						0.0		0.2	6.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE =PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0 =SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH =WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE =VERT WALL FACTOR; IF VERT= **2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF =BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH =HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH =CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION (TOE DOWN) BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8 AND ASSOCIATED APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH A MAXIMUM VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP TO 50 VELOCITIES AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERAL SCOUR IS TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS AND ABUTMENTS ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981). BEND SCOUR IS BASED ON EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SECONDARY CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUATIONS IN APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CUT OFF DEPTH BASED ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL. THE CALCULATION DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TABLE F-06 THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BRIDGES/ABUTMENTS WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE APPLICATION OF EQ 5-4 FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 6.2B

LACH&SM with SAM Toe
Existing & Proposed Conditions
Curved & Straight Reaches

PACIFIC ADVANCED
CIVIL ENGINEERING, INC.

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM WITH SAM -- CASTAIC CREEK EXISTING CONDITIONS OUTSIDE CURVED REACH, Q_{100} n=0.025

SECTION	Z_{MAX}=	Z_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Z_{DEG}+[1]	Z_{GS}+	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS}+	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS}+	Z_I+	H/2	Z_{DM}=
12407	15.7	15.7	3.7	14.8	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	5.2	0.000	1383	1313	9.2	2.0	0.2	9.0
12162	21.8	21.8	12.0	12.2	**2.0**	2.3	0.9	1.5	1	0.0	0	11.6	1	9.4	0.002	235	1313	2.0	2.0	1.9	15.0
11957	15.0	10.2	12.1	11.6	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	9.3	0.002	237	1313	1.9	2.0	2.0	15.0
11878	22.6	22.6	11.5	11.3	**2.0**	2.3	0.9	2.5	1	0.0	0	12.5	1	9.3	0.002	247	1313	2.0	2.0	1.8	15.0
11846	12.0	10.2	9.4	11.7	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	9.3	0.001	302	1313	2.7	2.0	1.2	12.0
11812	18.0	12.8	15.4	9.1	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	7.4	0.005	416	1313	3.3	2.0	3.2	18.0
11551	21.0	15.3	20.1	6.5	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	2.9	0.012	928	1313	5.8	2.0	3.2	21.0
11243	18.0	14.7	16.3	6.5	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	2.9	0.010	955	1313	5.2	2.0	3.2	18.0
10983	17.5	17.5	14.4	9.3	**2.0**	2.3	0	0.0	1	0.0	0	0.0	1	3.2	0.006	1059	1313	8.4	2.0	2.8	15.0
10738	18.0	11.7	15.7	6.5	**2.0**	1.3	0	0.0	1	0.0	0	0.0	1	4.1	0.010	567	1313	3.2	2.0	3.3	18.0
10491	15.0	11.0	12.7	9.6	**2.0**	1.3	0	0.0	1	0.0	0	0.0	1	4.8	0.006	436	1313	3.5	2.0	2.2	15.0
10351	18.0	11.5	16.1	6.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	1	3.3	0.015	505	1313	2.9	2.0	3.4	18.0
10142	10.0	7.6	13.2	6.9	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	2.9	0.012	794	0	0.0	2.0	2.3	10.0
9931	10.0	7.4	12.6	6.4	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	2.5	0.014	860	0	0.0	2.0	2.1	10.0
9671	8.0	6.2	8.1	9.4	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.3	0.004	984	0	0.0	2.0	0.9	8.0
9502	10.0	6.8	10.7	7.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	7.1	11.4	6.9	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	5.9	11.7	7.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	12.0	9.2	9.8	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	2.3	0.009	1168	1894	3.9	2.0	1.3	12.0
8396	15.0	8.7	10.8	5.1	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	1.9	0.014	1285	1894	3.1	2.0	1.6	15.0
8050	12.0	9.1	6.7	8.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	3.2	0.003	1256	1894	4.5	2.0	0.6	12.0
7689	15.0	8.8	10.2	7.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	3.2	0.006	808	1894	3.4	2.0	1.4	15.0
7326	12.0	7.8	8.9	8.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	5.3	0.002	570	1894	2.7	2.0	1.1	12.0
6967	12.0	9.7	7.3	9.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	3.7	0.002	1019	1894	5.0	2.0	0.7	12.0
6624	15.0	11.1	10.8	11.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	3.5	0.004	780	1894	5.5	2.0	1.6	15.0
6305	15.0	8.9	10.9	9.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.3	0.004	581	1894	3.3	2.0	1.6	15.0
5992	15.0	8.5	11.1	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.7	0.004	568	1894	2.9	2.0	1.7	15.0
5629	12.0	7.0	8.2	10.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	8.3	0.001	390	1894	2.1	2.0	0.9	12.0
5558	24.5	24.5	8.1	10.8	**2.0**	0.0	0.9	10.0	1	0.0	0	17.6	1	8.5	0.001	385	1894	2.0	2.0	0.9	12.0
5454	12.0	9.7	9.0	9.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	8.0	0.001	370	747	4.6	2.0	1.1	12.0
5435	12.0	10.5	8.9	9.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	8.4	0.001	475	747	5.5	2.0	1.1	12.0
5340	16.0	16.0	12.2	10.5	*2.1*	1.3	0	0.0	1	0.0	0	0.0	1	4.6	0.006	867	747	8.7	2.0	2.0	15.0
5061	10.0	8.0	14.1	9.6	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.4	0.010	707	0	0.0	2.0	2.7	10.0
4900	10.0	7.5	12.7	8.7	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.1	0.007	867	0	0.0	2.0	2.2	10.0
4572	8.0	6.6	9.4	8.6	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1313	0	0.0	2.0	1.2	8.0
4221	10.0	7.4	12.2	10.3	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	4.1	0.005	689	0	0.0	2.0	2.0	10.0
3865	18.0	11.0	15.8	8.1	2.7	0.7	0	0.0	1	0.0	0	0.0	1	3.4	0.011	630	2677	2.3	2.0	3.4	18.0
3580	15.0	11.2	14.9	9.6	2.7	0.7	0	0.0	1	0.0	0	0.0	1	3.6	0.008	636	2677	2.8	2.0	3.0	15.0
3290	15.0	11.5	12.1	10.6	2.7	0.7	0	0.0	1	0.0	0	0.0	1	3.5	0.005	843	2677	4.1	2.0	2.0	15.0
2975	15.0	10.0	13.6	9.7	2.7	0.7	0	0.0	1	0.0	0	0.0	1	4.2	0.008	553	2677	2.1	2.0	2.5	15.0
2627	15.0	10.9	10.5	10.5	2.8	0.7	0	0.0	1	0.0	0	0.0	1	3.3	0.006	936	2677	4.0	2.0	1.5	15.0
2308	12.0	8.3	8.6	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.0	0.003	947	2677	3.3	2.0	1.0	12.0
1982	15.0	8.1	12.5	10.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.7	0.006	535	2677	2.0	2.0	2.1	15.0
1645	12.0	6.5	9.7	9.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	7.6	0.002	427	2677	1.2	2.0	1.3	12.0
1531	15.0	7.4	14.1	8.4	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	6.2	0.005	360	2677	0.7	2.0	2.7	15.0
1462	14.0	7.5	19.9	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	5.2	9.6	11.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	19.2	19.2	9.3	10.9	**2.0**	0.0	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	6.3	13.1	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	24.5	24.5			2.8	2.3						17.6						9.2		3.5	21.0
MINIMUM=	8.0	5.2			2.0	0.0						0.0						0.0		0.2	8.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET FROM SAM
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE=PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0=SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE=VERT WALL FACTOR; IF VERT=**2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH=HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH=CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION
BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8
APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS,
VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP
AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERA
TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS
ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981).
EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SE
CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUAT
APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CU
ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUA
DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TA
THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BR
WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE A
FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM WITH SAM -- CASTAIC CREEK EXISTING CONDITIONS STRAIGHT-INSIDE CURVED REACH Q_{AP} n=0.025

SECTION	Z_{MAX} =	Z_{TOT} =	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} + [1]	Z_{GS} +	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} +	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} +	Z_I +	H/2	Z_{DM} =
12407	6.5	6.5	3.7	14.8	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	5.2	0.000	1383	1313	0.0	2.0	0.2	6.0
12162	19.8	19.8	12.0	12.2	**2.0**	2.3	0.9	1.5	1	0.0	0	11.6	0	9.4	0.002	235	1313	0.0	2.0	1.9	10.0
11957	10.0	8.3	12.1	11.6	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	9.3	0.002	237	1313	0.0	2.0	2.0	10.0
11878	20.6	20.6	11.5	11.3	**2.0**	2.3	0.9	2.5	1	0.0	0	12.5	0	9.3	0.002	247	1313	0.0	2.0	1.8	10.0
11846	8.0	7.5	9.4	11.7	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	9.3	0.001	302	1313	0.0	2.0	1.2	8.0
11812	12.5	9.5	15.4	9.1	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	7.4	0.005	416	1313	0.0	2.0	3.2	12.5
11551	14.0	9.5	20.1	6.5	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	2.9	0.012	928	1313	0.0	2.0	3.2	14.0
11243	12.5	9.5	16.3	6.5	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	2.9	0.010	955	1313	0.0	2.0	3.2	12.5
10983	10.0	9.1	14.4	9.3	**2.0**	2.3	0	0.0	1	0.0	0	0.0	0	3.2	0.006	1059	1313	0.0	2.0	2.8	10.0
10738	12.5	8.6	15.7	6.5	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	4.1	0.010	567	1313	0.0	2.0	3.3	12.5
10491	10.0	7.5	12.7	9.6	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	4.8	0.006	436	1313	0.0	2.0	2.2	10.0
10351	12.5	8.7	16.1	6.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.3	0.015	505	1313	0.0	2.0	3.4	12.5
10142	10.0	7.6	13.2	6.9	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	2.9	0.012	794	0	0.0	2.0	2.3	10.0
9931	10.0	7.4	12.6	6.4	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	2.5	0.014	860	0	0.0	2.0	2.1	10.0
9671	8.0	6.2	8.1	9.4	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.3	0.004	984	0	0.0	2.0	0.9	8.0
9502	10.0	6.8	10.7	7.7	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	7.1	11.4	6.9	**2.0**	1.3	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	5.9	11.7	7.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	8.0	5.3	9.8	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.3	0.009	1168	1894	0.0	2.0	1.3	8.0
8396	10.0	5.6	10.8	5.1	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	1.9	0.014	1285	1894	0.0	2.0	1.6	10.0
8050	8.0	4.6	6.7	8.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.2	0.003	1256	1894	0.0	2.0	0.6	8.0
7689	10.0	5.4	10.2	7.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.2	0.006	808	1894	0.0	2.0	1.4	10.0
7326	8.0	5.1	8.9	8.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.3	0.002	570	1894	0.0	2.0	1.1	8.0
6967	8.0	4.7	7.3	9.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.7	0.002	1019	1894	0.0	2.0	0.7	8.0
6624	10.0	5.6	10.8	11.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.5	0.004	780	1894	0.0	2.0	1.6	10.0
6305	10.0	5.6	10.9	9.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.3	0.004	581	1894	0.0	2.0	1.6	10.0
5992	10.0	5.7	11.1	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.7	0.004	568	1894	0.0	2.0	1.7	10.0
5629	8.0	4.9	8.2	10.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	8.3	0.001	390	1894	0.0	2.0	0.9	8.0
5558	22.5	22.5	8.1	10.8	**2.0**	0.0	0.9	10.0	1	0.0	0	17.6	0	8.5	0.001	385	1894	0.0	2.0	0.9	8.0
5454	8.0	5.1	9.0	9.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	8.0	0.001	370	747	0.0	2.0	1.1	8.0
5435	8.0	5.1	8.9	9.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	8.4	0.001	475	747	0.0	2.0	1.1	8.0
5340	10.0	7.4	12.2	10.5	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	4.6	0.006	867	747	0.0	2.0	2.0	10.0
5061	10.0	8.0	14.1	9.6	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.4	0.010	707	0	0.0	2.0	2.7	10.0
4900	10.0	7.5	12.7	8.7	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.1	0.007	867	0	0.0	2.0	2.2	10.0
4572	8.0	6.6	9.4	8.6	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1313	0	0.0	2.0	1.2	8.0
4221	10.0	7.4	12.2	10.3	*2.1*	1.3	0	0.0	1	0.0	0	0.0	0	4.1	0.005	689	0	0.0	2.0	2.0	10.0
3865	12.5	8.7	15.8	8.1	2.7	0.7	0	0.0	1	0.0	0	0.0	0	3.4	0.011	630	2677	0.0	2.0	3.4	12.5
3580	10.0	8.4	14.9	9.6	2.7	0.7	0	0.0	1	0.0	0	0.0	0	3.6	0.008	636	2677	0.0	2.0	3.0	10.0
3290	10.0	7.4	12.1	10.6	2.7	0.7	0	0.0	1	0.0	0	0.0	0	3.5	0.005	843	2677	0.0	2.0	2.0	10.0
2975	10.0	7.9	13.6	9.7	2.7	0.7	0	0.0	1	0.0	0	0.0	0	4.2	0.008	553	2677	0.0	2.0	2.5	10.0
2627	10.0	7.0	10.5	10.5	2.8	0.7	0	0.0	1	0.0	0	0.0	0	3.3	0.006	936	2677	0.0	2.0	1.5	10.0
2308	8.0	5.0	8.6	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.0	0.003	947	2677	0.0	2.0	1.0	8.0
1982	10.0	6.1	12.5	10.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.7	0.006	535	2677	0.0	2.0	2.1	10.0
1645	8.0	5.3	9.7	9.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.6	0.002	427	2677	0.0	2.0	1.3	8.0
1531	10.0	6.7	14.1	8.4	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	2677	0.0	2.0	2.7	10.0
1462	14.0	7.5	19.9	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	5.2	9.6	11.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	19.2	19.2	9.3	10.9	**2.0**	0.0	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	6.3	13.1	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	22.5	22.5			2.8	2.3						17.6						0.0		3.5	14.0
MINIMUM=	6.5	4.6			2.0	0.0						0.0						0.0		0.2	6.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET FROM SAM
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE=PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0=SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE=VERT WALL FACTOR; IF VERT=**2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH=HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH=CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION (TOE DOWN) BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8 AND ASSOCIATED APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH A MAXIMUM VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP TO 50 VELOCITIES AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERAL SCOUR IS TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS AND ABUTMENTS ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981). BEND SCOUR IS BASED ON EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SECONDARY CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUATIONS IN APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CUT OFF DEPTH BASED ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL. THE CALCULATION DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TABLE F-06 THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BRIDGES/ABUTMENTS WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE APPLICATION OF EQ 5-4 FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM WITH SAM -- CASTAIC CREEK PROPOSED CONDITIONS OUTSIDE CURVED REACH Q_{100} n=0.025

SECTION	Z_{MAX}=	Z_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} +[1]	Z_{GS} +	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} +	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} +	Z_I +	H/2	Z_{DM}=
12407	15.8	15.8	3.7	14.9	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	5.2	0.000	1383	1313	9.2	2.0	0.2	9.0
12162	21.9	21.9	12.0	12.2	**2.0**	2.4	0.9	1.5	1	0.0	0	11.6	1	9.4	0.002	235	1313	2.0	2.0	1.9	15.0
11957	15.0	10.3	12.1	11.6	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	9.3	0.002	237	1313	1.9	2.0	2.0	15.0
11878	22.7	22.7	11.5	11.3	**2.0**	2.4	0.9	2.5	1	0.0	0	12.5	1	9.3	0.002	248	1313	2.0	2.0	1.8	15.0
11846	12.0	10.3	9.4	11.7	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	9.3	0.001	302	1313	2.7	2.0	1.2	12.0
11812	18.0	11.2	15.4	9.1	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	7.4	0.005	238	1313	1.6	2.0	3.2	18.0
11551	21.0	13.3	20.1	6.5	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	2.9	0.012	494	1313	3.7	2.0	3.2	21.0
11243	18.0	13.4	16.3	6.5	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	2.9	0.010	585	1313	3.7	2.0	3.2	18.0
10983	15.5	15.5	14.4	9.3	**2.0**	2.4	0	0.0	1	0.0	0	0.0	1	3.2	0.006	683	1313	6.3	2.0	2.8	15.0
10738	18.0	11.2	15.7	6.5	**2.0**	1.5	0	0.0	1	0.0	0	0.0	1	4.1	0.010	412	1313	2.4	2.0	3.3	18.0
10491	15.0	11.2	12.7	9.6	**2.0**	1.5	0	0.0	1	0.0	0	0.0	1	4.8	0.006	436	1313	3.5	2.0	2.2	15.0
10351	18.0	11.7	16.1	6.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	1	3.3	0.015	505	1313	2.9	2.0	3.4	18.0
10142	10.0	7.8	13.2	6.9	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.0	0.012	785	0	0.0	2.0	2.3	10.0
9931	10.0	7.7	12.7	6.4	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	2.6	0.013	795	0	0.0	2.0	2.2	10.0
9671	8.0	6.7	9.5	9.1	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.4	0.005	820	0	0.0	2.0	1.2	8.0
9502	10.0	7.0	10.7	7.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	7.3	11.4	6.9	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	5.9	11.8	7.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	12.0	9.2	9.8	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	2.3	0.009	1168	1894	3.9	2.0	1.3	12.0
8396	15.0	8.6	10.8	5.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	2.0	0.013	1235	1894	3.0	2.0	1.6	15.0
8050	12.0	9.0	7.2	8.1	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	3.0	0.003	1215	1894	4.3	2.0	0.7	12.0
7689	12.0	8.5	7.7	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.1	0.003	841	1894	3.7	2.0	0.8	12.0
7326	12.0	7.8	6.6	10.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	6.6	0.001	605	1894	3.2	2.0	0.6	12.0
6967	12.0	7.9	6.8	11.6	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	7.0	0.001	563	1894	3.3	2.0	0.6	12.0
6624	12.0	7.7	9.4	11.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	6.8	0.002	415	1894	2.5	2.0	1.2	12.0
6305	15.0	8.3	13.6	10.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	5.7	0.005	344	1894	1.8	2.0	2.5	15.0
5992	15.0	8.3	14.1	10.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	5.9	0.006	321	1894	1.6	2.0	2.7	15.0
5629	12.0	6.8	6.2	13.6	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	11.4	0.000	371	1894	2.3	2.0	0.5	12.0
5558	23.0	23.0	6.0	13.8	**2.0**	0.0	0.9	10.0	1	0.0	0	16.0	1	11.1	0.000	400	1894	2.6	2.0	0.5	9.0
5454	12.0	10.5	6.2	13.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	11.3	0.000	381	747	6.0	2.0	0.5	12.0
5435	12.0	11.8	6.2	13.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	12.0	0.000	511	747	7.3	2.0	0.5	12.0
5340	16.5	16.5	14.3	10.6	*2.1*	3.3	0	0.0	1	0.0	0	0.0	1	6.4	0.005	481	747	6.4	2.0	2.7	15.0
5061	12.5	11.6	17.8	10.3	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	3.8	0.016	475	0	0.0	2.0	4.3	12.5
4900	12.5	10.7	15.7	9.0	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	4.3	0.011	461	0	0.0	2.0	3.3	12.5
4572	10.0	9.2	11.6	9.4	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	6.3	0.003	429	0	0.0	2.0	1.8	10.0
4221	10.0	9.8	13.4	11.1	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	5.6	0.005	424	0	0.0	2.0	2.4	10.0
3865	12.5	9.7	17.7	8.0	2.7	1.0	0	0.0	1	0.0	0	0.0	0	4.1	0.014	432	0	0.0	2.0	4.0	12.5
3580	12.5	8.7	15.0	10.1	2.7	1.0	0	0.0	1	0.0	0	0.0	0	4.8	0.008	433	0	0.0	2.0	3.0	12.5
3290	10.0	8.0	13.0	11.1	2.7	1.0	0	0.0	1	0.0	0	0.0	0	5.1	0.006	470	0	0.0	2.0	2.3	10.0
2975	12.5	9.2	16.2	9.0	2.7	1.0	0	0.0	1	0.0	0	0.0	0	3.8	0.012	507	0	0.0	2.0	3.5	12.5
2627	10.0	7.4	11.0	10.5	2.8	1.0	0	0.0	1	0.0	0	0.0	0	3.6	0.006	803	0	0.0	2.0	1.6	10.0
2308	8.0	5.1	9.2	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.4	0.003	784	0	0.0	2.0	1.1	8.0
1982	15.0	12.0	12.5	10.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	4.7	0.006	535	848	5.9	2.0	2.1	15.0
1645	12.0	10.0	9.7	9.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	1	7.6	0.002	427	848	4.7	2.0	1.3	12.0
1531	10.0	6.7	14.1	8.4	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	0	0.0	2.0	2.7	10.0
1462	14.0	7.5	19.9	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	5.2	9.6	11.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	19.2	19.2	9.3	10.9	**2.0**	0.0	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	6.3	13.1	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	23.0	23.0			2.8	3.3						16.0						9.2		4.3	21.0
MINIMUM=	8.0	5.1			2.0	0.0						0.0						0.0		0.2	8.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET FROM SAM
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE=PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0=SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE=VERT WALL FACTOR; IF VERT=**2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH=HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH=CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION
BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8
APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS,
VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP
AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERA
TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS
ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981).
EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SE
CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUAT
APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CU
ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUA
DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TA
THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BF
WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE A
FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

CALCULATIONS FOR TOTAL TOE-DOWN BY INDIVIDUAL ADJUSTMENT COMPONENT BASED ON LACH&SM WITH SAM -- CASTAIC CREEK PROPOSED CONDITIONS STRAIGHT-INSIDE CURVED REACH Q_{CAP} n=0.025

SECTION	Z_{MAX} =	Z_{TOT} =	V (FPS)	FLOW DEPTH (FT)	Z_{DEG} ± [1]	Z_{GS} ±	PIER TYPE	B	ABUT TYPE	A	SOFT	Z_{LS} ±	BEND COEFF	HYD DEPTH	E SLOPE	TOP WIDTH	RADIUS	Z_{BS} ±	Z_I ±	H/2	Z_{DM} =
12407	6.6	6.6	3.7	14.9	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	5.2	0.000	1383	1313	0.0	2.0	0.2	6.0
12162	19.9	19.9	12.0	12.2	**2.0**	2.4	0.9	1.5	1	0.0	0	11.6	0	9.4	0.002	235	1313	0.0	2.0	1.9	10.0
11957	10.0	8.4	12.1	11.6	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	9.3	0.002	237	1313	0.0	2.0	2.0	10.0
11878	20.7	20.7	11.5	11.3	**2.0**	2.4	0.9	2.5	1	0.0	0	12.5	0	9.3	0.002	248	1313	0.0	2.0	1.8	10.0
11846	8.0	7.6	9.4	11.7	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	9.3	0.001	302	1313	0.0	2.0	1.2	8.0
11812	12.5	9.6	15.4	9.1	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	7.4	0.005	238	1313	0.0	2.0	3.2	12.5
11551	14.0	9.6	20.1	6.5	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	2.9	0.012	494	1313	0.0	2.0	3.2	14.0
11243	12.5	9.6	16.3	6.5	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	2.9	0.010	585	1313	0.0	2.0	3.2	12.5
10983	10.0	9.2	14.4	9.3	**2.0**	2.4	0	0.0	1	0.0	0	0.0	0	3.2	0.006	683	1313	0.0	2.0	2.8	10.0
10738	12.5	8.8	15.7	6.5	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	4.1	0.010	412	1313	0.0	2.0	3.3	12.5
10491	10.0	7.7	12.7	9.6	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	4.8	0.006	436	1313	0.0	2.0	2.2	10.0
10351	12.5	8.9	16.1	6.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.3	0.015	505	1313	0.0	2.0	3.4	12.5
10142	10.0	7.8	13.2	6.9	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.0	0.012	785	0	0.0	2.0	2.3	10.0
9931	10.0	7.7	12.7	6.4	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	2.6	0.013	795	0	0.0	2.0	2.2	10.0
9671	8.0	6.7	9.5	9.1	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.4	0.005	820	0	0.0	2.0	1.2	8.0
9502	10.0	7.0	10.7	7.7	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.4	0.006	728	0	0.0	2.0	1.5	10.0
9299	10.0	7.3	11.4	6.9	**2.0**	1.5	0	0.0	1	0.0	0	0.0	0	3.6	0.007	639	0	0.0	2.0	1.8	10.0
9043	10.0	5.9	11.8	7.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.5	0.011	896	0	0.0	2.0	1.9	10.0
8725	8.0	5.3	9.8	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.3	0.009	1168	1894	0.0	2.0	1.3	8.0
8396	10.0	5.6	10.8	5.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	2.0	0.013	1235	1894	0.0	2.0	1.6	10.0
8050	8.0	4.7	7.2	8.1	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.0	0.003	1215	1894	0.0	2.0	0.7	8.0
7689	8.0	4.8	7.7	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.1	0.003	841	1894	0.0	2.0	0.8	8.0
7326	8.0	4.6	6.6	10.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	6.6	0.001	605	1894	0.0	2.0	0.6	8.0
6967	8.0	4.6	6.8	11.6	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.0	0.001	563	1894	0.0	2.0	0.6	8.0
6624	8.0	5.2	9.4	11.7	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	6.8	0.002	415	1894	0.0	2.0	1.2	8.0
6305	10.0	6.5	13.6	10.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.7	0.005	344	1894	0.0	2.0	2.5	10.0
5992	10.0	6.7	14.1	10.3	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.9	0.006	321	1894	0.0	2.0	2.7	10.0
5629	8.0	4.5	6.2	13.6	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	11.4	0.000	371	1894	0.0	2.0	0.5	8.0
5558	20.4	20.4	6.0	13.8	**2.0**	0.0	0.9	10.0	1	0.0	0	16.0	0	11.1	0.000	400	1894	0.0	2.0	0.5	6.0
5454	8.0	4.5	6.2	13.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	11.3	0.000	381	747	0.0	2.0	0.5	8.0
5435	8.0	4.5	6.2	13.5	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	12.0	0.000	511	747	0.0	2.0	0.5	8.0
5340	10.1	10.1	14.3	10.6	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	6.4	0.005	481	747	0.0	2.0	2.7	10.0
5061	12.5	11.6	17.8	10.3	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	3.8	0.016	475	0	0.0	2.0	4.3	12.5
4900	12.5	10.7	15.7	9.0	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	4.3	0.011	461	0	0.0	2.0	3.3	12.5
4572	10.0	9.2	11.6	9.4	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	6.3	0.003	429	0	0.0	2.0	1.8	10.0
4221	10.0	9.8	13.4	11.1	*2.1*	3.3	0	0.0	1	0.0	0	0.0	0	5.6	0.005	424	0	0.0	2.0	2.4	10.0
3865	12.5	9.7	17.7	8.0	2.7	1.0	0	0.0	1	0.0	0	0.0	0	4.1	0.014	432	0	0.0	2.0	4.0	12.5
3580	12.5	8.7	15.0	10.1	2.7	1.0	0	0.0	1	0.0	0	0.0	0	4.8	0.008	433	0	0.0	2.0	3.0	12.5
3290	10.0	8.0	13.0	11.1	2.7	1.0	0	0.0	1	0.0	0	0.0	0	5.1	0.006	470	0	0.0	2.0	2.3	10.0
2975	12.5	9.2	16.2	9.0	2.7	1.0	0	0.0	1	0.0	0	0.0	0	3.8	0.012	507	0	0.0	2.0	3.5	12.5
2627	10.0	7.4	11.0	10.5	2.8	1.0	0	0.0	1	0.0	0	0.0	0	3.6	0.006	803	0	0.0	2.0	1.6	10.0
2308	8.0	5.1	9.2	8.9	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.4	0.003	784	0	0.0	2.0	1.1	8.0
1982	10.0	6.1	12.5	10.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	4.7	0.006	535	848	0.0	2.0	2.1	10.0
1645	8.0	5.3	9.7	9.8	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.6	0.002	427	848	0.0	2.0	1.3	8.0
1531	10.0	6.7	14.1	8.4	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	6.2	0.005	360	0	0.0	2.0	2.7	10.0
1462	14.0	7.5	19.9	7.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	3.9	0.019	407	0	0.0	2.0	3.5	14.0
1415	8.0	5.2	9.6	11.2	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	7.7	0.002	427	0	0.0	2.0	1.2	8.0
1306	19.2	19.2	9.3	10.9	**2.0**	0.0	0.9	5.0	1	0.0	0	14.0	0	8.1	0.001	423	0	0.0	2.0	1.2	8.0
1173	10.0	6.3	13.1	9.0	**2.0**	0.0	0	0.0	1	0.0	0	0.0	0	5.2	0.005	461	0	0.0	2.0	2.3	10.0
MAXIMUM=	20.7	20.7			2.8	3.3						16.0						0.0		4.3	14.0
MINIMUM=	6.6	4.5			2.0	0.0						0.0						0.0		0.2	6.0

[1] Long-term degradation values are taken to be the greater of cross-sectional analysis and 2 feet (bolded). Non-bolded values are from cross-sectional analysis as shown in Table 5.x.

DEFINITIONS

V(FPS) =VELOCITY IN FEET PER SECOND
Z_{TOT}=TOTAL POTENTIAL VERTICAL ADJUSTMENT IN FEET
Z_{DEG}=LONG TERM DEGRADATION IN FEET
Z_{GS}=GENERAL SCOUR IN FEET FROM SAM
Z_{LS}=LOCAL SCOUR IN FEET
PIER TYPE =PIER SHAPE FACTOR; IF NO PIERS=**0**
1.0 =SQUARE NOSE; **0.9** ROUND NOSE; **0.9** CYLINDER;
0.8 SHARP NOSE; **0.9** GROUP OF CYLINDERS
FLOW DEPTH =WATER DEPTH IN CHANNEL IN FEET
B=WIDTH OF PIERS IN FEET; NO PIER=0
ABUT TYPE =VERT WALL FACTOR; IF VERT= **2**; NON VERT=**1**
A=ABUTMENT PROTRUSION INTO FLOW PATH IN FEET
SOFT = SOFT BOTTOM AT A BRIDGE OR AN ABUTMENT
0 = HARD BOTTOM; **1** = SOFT BOTTOM
Z_{BS}=BEND SCOUR IN FEET
BEND COEFF =BEND COEFFICIENT; IF NO BEND=0, BEND=1
HYD DEPTH =HYDRAULIC DEPTH IN FEET
E SLOPE=ENERGY SLOPE, UNITLESS
TOP WIDTH =CHANNEL TOP WIDTH IN FEET
RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET
Z_I=LOW-FLOW INCISEMENT IN FEET, MEASURED OR 2'; VALUE **NOT LESS THAN 2'**
H=BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963)
Z_{DM}=CUT OFF DEPTH REQUIRED BY LACFCDDM

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE SCOUR PROTECTION (TOE DOWN) BASED ON LADWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.2-5.8 AND ASSOCIATED APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH A MAXIMUM VALUE OF 20 FPS. THE PRESENT VERSION (10/04) WILL CALCULATE UP TO 50 VELOCITIES AT ONE TIME. LONG TERM DEGRADATION IS USER SUPPLIED. GENERAL SCOUR IS TAKEN FROM APPENDIX Q3, INTERPOLATED. LOCAL SCOUR AT BENDS AND ABUTMENTS ARE BASED ON LADWP EQUATIONS FOUND IN APP Q12, ZELLER (1981). BEND SCOUR IS BASED ON EQUATIONS IN APPENDIX Q12. A LONGITUDINAL EXTENT BASED ON SECONDARY CURRENTS IS NOT INCLUDED. BEDFORM HEIGHT IS BASED ON EQUATIONS IN APPENDIX Q13. JULY 2005 REVISION INCLUDES CALCULATION FOR CUT OFF DEPTH BASED ON LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL. THE CALCULATION DOES NOT CONSIDER ADJUSTMENTS TO CUT OFF DEPTH BASED ON TABLE F-06 THE OCTOBER 2005 REVISION INCLUDES ADDITIONAL TOEDOWN AT BRIDGES/ABUTMENTS WITH SOFT BOTTOMS. THE NOVEMBER 2005 REVISION INCLUDES THE APPLICATION OF EQ 5-4 FROM LACH&SM TO ACCOUNT FOR DEBRIS BLOCKAGE AT PIERS.

COLOR CODES

OUTPUT
DATA FROM HEC-RAS
USER SUPPLIED DATA
INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED
NOVEMBER 2005, REVISED

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 6.3

LACH&SM Freeboard Proposed Conditions Curved & Straight Reaches

PACIFIC ADVANCED
CIVIL ENGINEERING, INC.

CALCULATIONS FOR TOTAL FREEBOARD BY ON INDIVIDUAL ADJUSTMENT BASED ON LACH&SM FROM SAM - CASTAIC CREEK PROPOSED CONDITIONS OUTSIDE CURVED REACH Q_{AP} n=0.085

SECTION	Y_{MAX}	Y_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Y_{AGG}+[1]	Y_{GA}+[2]	CHANNEL TYPE	BOTTOM WIDTH (FT)	TOP WIDTH (FT)	Y_{SE}+	BEND COEFF	SIDE SLOPE	RADIUS	H/2	Y_{DM}
12407	2.5	1.0	1.4	23.3	1.0	0.0	2	429	1497	0.0	1	1.5	1313	0.0	2.5
12162	2.5	1.6	5.7	22.5	1.0	0.0	2	233	241	0.1	1	1.5	1313	0.4	2.5
11957	2.5	1.8	6.8	18.7	1.0	0.0	2	234	241	0.2	1	1.5	1313	0.6	2.5
11878	2.5	2.5	9.3	13.5	1.0	0.0	2	243	249	0.3	1	1.5	1313	1.2	2.5
11846	2.5	2.1	7.9	13.4	1.0	0.0	2	259	360	0.3	1	1.5	1313	0.8	2.5
11812	3.1	3.1	11.2	11.8	1.0	0.0	2	225	246	0.4	1	1.5	1313	1.7	2.5
11551	2.5	2.0	7.6	11.4	1.0	0.0	2	234	604	0.2	1	1.5	1313	0.8	2.5
11243	2.5	1.8	6.7	10.9	1.0	0.0	2	302	618	0.2	1	1.5	1313	0.6	2.5
10983	2.5	1.9	6.9	12.7	1.0	0.0	2	278	699	0.2	1	1.5	1313	0.6	2.5
10738	2.5	1.8	6.4	10.7	1.0	0.0	2	353	820	0.2	1	1.5	1313	0.6	2.5
10491	2.5	1.8	6.6	12.3	1.0	0.0	2	412	1165	0.3	1	1.5	1313	0.6	2.5
10351	2.5	2.0	7.1	10.5	1.0	0.0	2	494	1162	0.4	1	1.5	1313	0.7	2.5
10142	2.5	1.5	6.4	10.0	1.0	0.0	2	764	980	0.0	0	1.5	0	0.5	2.5
9931	2.5	1.4	5.2	10.1	1.0	0.0	2	616	828	0.0	0	1.5	0	0.4	2.5
9671	2.5	1.3	4.8	12.3	1.0	0.0	2	548	848	0.0	0	1.5	0	0.3	2.5
9502	2.5	1.4	5.3	11.1	1.0	0.0	2	716	762	0.0	0	1.5	0	0.4	2.5
9299	2.5	1.5	6.1	10.0	1.0	0.0	2	620	674	0.0	0	1.5	0	0.5	2.5
9043	2.5	1.7	5.5	10.7	1.0	0.3	2	892	909	0.0	0	1.5	0	0.4	2.5
8725	2.5	1.9	5.0	9.2	1.0	0.3	2	952	1228	0.2	1	1.5	1894	0.3	2.5
8396	2.5	1.6	3.2	9.6	1.0	0.3	2	1147	1318	0.1	1	1.5	1894	0.1	2.5
8050	2.5	1.5	2.8	13.0	1.0	0.3	2	1161	1229	0.1	1	1.5	1894	0.1	2.5
7689	2.5	1.5	3.1	14.3	1.0	0.3	2	770	1010	0.1	1	1.5	1894	0.1	2.5
7326	3.1	3.1	3.5	15.7	1.0	1.9	2	527	783	0.1	1	1.5	1894	0.2	2.5
6967	3.2	3.2	4.0	16.4	1.0	1.9	2	512	580	0.1	1	1.5	1894	0.2	2.5
6624	3.4	3.4	5.3	16.7	1.0	1.9	2	354	493	0.1	1	1.5	1894	0.4	2.5
6305	3.6	3.6	6.3	16.2	1.0	1.9	2	257	390	0.1	1	1.5	1894	0.5	2.5
5992	3.7	3.7	7.1	16.0	1.0	1.9	2	264	328	0.1	1	1.5	1894	0.7	2.5
5629	3.3	3.3	4.9	16.8	1.0	1.9	2	364	376	0.1	1	1.5	1894	0.3	2.5
5558	3.3	3.3	4.7	16.8	1.0	1.9	2	377	414	0.1	1	1.5	1894	0.3	2.5
5454	3.5	3.5	5.0	16.2	1.0	1.9	2	364	395	0.2	1	1.5	747	0.3	2.5
5435	3.6	3.6	5.1	16.1	1.0	1.9	2	458	562	0.3	1	1.5	747	0.4	2.5
5340	2.8	2.8	8.4	14.9	1.0	0.0	2	452	488	0.8	1	1.5	747	1.0	2.5
5061	2.5	1.6	6.5	17.0	1.0	0.0	2	442	487	0.0	0	1.5	0	0.6	2.5
4900	2.5	1.5	5.9	16.1	1.0	0.0	2	457	483	0.0	0	1.5	0	0.5	2.5
4572	2.5	1.6	6.5	14.2	1.0	0.0	2	393	442	0.0	0	1.5	0	0.6	2.5
4221	2.5	1.8	7.8	15.1	1.0	0.0	2	272	440	0.0	0	1.5	0	0.8	2.5
3865	2.5	1.7	7.3	13.8	1.0	0.0	2	351	449	0.0	0	1.5	0	0.7	2.5
3580	2.5	1.7	7.0	15.5	1.0	0.0	2	427	455	0.0	0	1.5	0	0.7	2.5
3290	2.5	1.7	7.3	15.0	1.0	0.0	2	423	486	0.0	0	1.5	0	0.7	2.5
2975	2.5	1.5	6.2	14.6	1.0	0.0	2	457	562	0.0	0	1.5	0	0.5	2.5
2627	2.5	1.3	4.9	14.6	1.0	0.0	2	597	947	0.0	0	1.5	0	0.3	2.5
2308	3.7	3.7	4.6	13.2	1.0	2.4	2	278	794	0.0	0	1.5	0	0.3	2.5
1982	4.1	4.1	5.8	15.3	1.0	2.4	2	360	613	0.3	1	1.5	848	0.4	2.5
1645	4.3	4.3	6.4	13.6	1.0	2.4	2	400	445	0.4	1	1.5	848	0.6	2.5
1531	4.2	4.2	7.8	13.2	1.0	2.4	2	334	388	0.0	0	1.5	0	0.8	2.5
1462	3.9	3.9	5.9	15.7	1.0	2.4	2	396	477	0.0	0	1.5	0	0.5	2.5
1415	3.9	3.9	5.8	16.2	1.0	2.4	2	393	464	0.0	0	1.5	0	0.5	2.5
1306	3.9	3.9	5.9	15.5	1.0	2.4	2	391	450	0.0	0	1.5	0	0.5	2.5
1173	3.7	3.7	5.1	15.1	1.0	2.4	2	323	857	0.0	0	1.5	0	0.3	2.5
MAX=	4.3	4.3			1.0					0.8				1.7	2.5
MIN=	2.5	1.0			1.0					0.0				0.0	2.5

[1] CROSS-SECTIONAL ANALYSIS SHOWED LITTLE OR NO AGGRADATION, HOWEVER A 1 FT MINIMUM WAS USED FOR LOCAL DEPOSITS OF FINES WITHIN CROSS-SECTION

[2] GENERAL AGGRADATION VALUES ARE FROM TABLE 4.3 FROM SAM ANALYSIS

DEFINITIONS

Y_{MAX} = GREATER OF THE DM AND S&H HEIGHTS

Y_{TOT}=TOTAL EMBANKMENT PROTECTION IN FEET BASED ON THE H&S

V(FPS) =VELOCITY IN FEET PER SECOND

FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET

Y_{AGG}=LONG TERM AGGRADATION IN FEET

Y_{GA}=GENERAL AGGRADATION IN FEET FROM SAM

CHANNEL TYPE=CHANNEL SHAPE/FLOW FACTOR:
IF Fr<1, RECTANGULAR = 0; IF Fr>1, RECTANGULAR = 1;
IF Fr<1, TRAPEZOIDAL = 2; IF Fr>1, TRAPEZOIDAL = 3.

Y_{SE}=SUPER ELEVATION IN FEET

BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1

SIDE SLOPE=CHANNEL SIDE SLOPE (H:V), UNITLESS

BOTTOM WIDTH=CHANNEL BOTTOM WIDTH IN FEET, 2-YEAR WATER SURFACE

RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET

H/2=HALF BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH,
AFTER KENNEDY (1963)

Y_{DM} = EMBANKMENT PROTECTION REQUIRED BY THE LACFCDDM IN FEET

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE TOP PROTECTION (FREE BOARD) BASED ON LACDWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.8-5.9 AND ASSOCIATED APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH NO MAXIMUM VALUE. THE USER SHOULD CONSIDER A PRACTICAL MAXIMUM OF APPROXIMATELY 20-30 FPS. THE PRESENT VERSION (8/05) WILL CALCULATE UP TO 100 VELOCITIES AT ONE TIME. LONG TERM AGGRADATION IS USER SUPPLIED. GENERAL AGGRADATION IS ALSO USER SUPPLIED. SUPER ELEVATION AT BENDS IS BASED ON LACFCDDM EQUATIONS FOUND IN C-3.1. BEDFORM HEIGHT, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963), IS BASED ON EQUATIONS IN APPENDIX Q13. IF FLOW IS SUPERCRITICAL SPREADSHEET REPORTS LACFCDDM TOTAL WALL HEIGHT INSTEAD OF FREEBOARD. LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL (LACFCDDM) VALUES ARE PRESENTED AS A PART OF LACH&SM CALCULATIONS. THE SPREADSHEET CALCULATES THE GREATER OF THE TWO METHODOLOGIES. BOTTOM WIDTH IS BASED ON THE 2-YEAR WATER SURFACE AFTER ACOE PROCEDURES.

COLOR CODES

OUTPUT

DATA FROM HEC-RAS

USER SUPPLIED DATA

INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED CIVIL ENGINEERING, INC
AUGUST, 2005

PACE
PACIFIC ADVANCED CIVIL ENGINEERING, INC.

CALCULATIONS FOR TOTAL FREEBOARD BY ON INDIVIDUAL ADJUSTMENT BASED ON LACH&SM FROM SAM - CASTAIC CREEK PROPOSED CONDITIONS STRAIGHT-INSIDE CURVED REACH Q_{SP} n=0.085

SECTION	Y_{MAX}	Y_{TOT}=	V (FPS)	FLOW DEPTH (FT)	Y_{AGG}+[1]	Y_{GA}+[2]	CHANNEL TYPE	BOTTOM WIDTH (FT)	TOP WIDTH (FT)	Y_{SE}+	BEND COEFF	SIDE SLOPE	RADIUS	H/2	Y_{DM}
12407	2.5	1.0	1.4	23.3	1.0	0.0	2	429	1497	0.0	0	1.5	1313	0.0	2.5
12162	2.5	1.4	5.7	22.5	1.0	0.0	2	233	241	0.0	0	1.5	1313	0.4	2.5
11957	2.5	1.6	6.8	18.7	1.0	0.0	2	234	241	0.0	0	1.5	1313	0.6	2.5
11878	2.5	2.2	9.3	13.5	1.0	0.0	2	243	249	0.0	0	1.5	1313	1.2	2.5
11846	2.5	1.8	7.9	13.4	1.0	0.0	2	259	360	0.0	0	1.5	1313	0.8	2.5
11812	2.7	2.7	11.2	11.8	1.0	0.0	2	225	246	0.0	0	1.5	1313	1.7	2.5
11551	2.5	1.8	7.6	11.4	1.0	0.0	2	234	604	0.0	0	1.5	1313	0.8	2.5
11243	2.5	1.6	6.7	10.9	1.0	0.0	2	302	618	0.0	0	1.5	1313	0.6	2.5
10983	2.5	1.6	6.9	12.7	1.0	0.0	2	278	699	0.0	0	1.5	1313	0.6	2.5
10738	2.5	1.6	6.4	10.7	1.0	0.0	2	353	820	0.0	0	1.5	1313	0.6	2.5
10491	2.5	1.6	6.6	12.3	1.0	0.0	2	412	1165	0.0	0	1.5	1313	0.6	2.5
10351	2.5	1.7	7.1	10.5	1.0	0.0	2	494	1162	0.0	0	1.5	1313	0.7	2.5
10142	2.5	1.5	6.4	10.0	1.0	0.0	2	764	980	0.0	0	1.5	0	0.5	2.5
9931	2.5	1.4	5.2	10.1	1.0	0.0	2	616	828	0.0	0	1.5	0	0.4	2.5
9671	2.5	1.3	4.8	12.3	1.0	0.0	2	548	848	0.0	0	1.5	0	0.3	2.5
9502	2.5	1.4	5.3	11.1	1.0	0.0	2	716	762	0.0	0	1.5	0	0.4	2.5
9299	2.5	1.5	6.1	10.0	1.0	0.0	2	620	674	0.0	0	1.5	0	0.5	2.5
9043	2.5	1.7	5.5	10.7	1.0	0.3	2	892	909	0.0	0	1.5	0	0.4	2.5
8725	2.5	1.6	5.0	9.2	1.0	0.3	2	952	1228	0.0	0	1.5	1894	0.3	2.5
8396	2.5	1.4	3.2	9.6	1.0	0.3	2	1147	1318	0.0	0	1.5	1894	0.1	2.5
8050	2.5	1.4	2.8	13.0	1.0	0.3	2	1161	1229	0.0	0	1.5	1894	0.1	2.5
7689	2.5	1.4	3.1	14.3	1.0	0.3	2	770	1010	0.0	0	1.5	1894	0.1	2.5
7326	3.1	3.1	3.5	15.7	1.0	1.9	2	527	783	0.0	0	1.5	1894	0.2	2.5
6967	3.1	3.1	4.0	16.4	1.0	1.9	2	512	580	0.0	0	1.5	1894	0.2	2.5
6624	3.3	3.3	5.3	16.7	1.0	1.9	2	354	493	0.0	0	1.5	1894	0.4	2.5
6305	3.4	3.4	6.3	16.2	1.0	1.9	2	257	390	0.0	0	1.5	1894	0.5	2.5
5992	3.6	3.6	7.1	16.0	1.0	1.9	2	264	328	0.0	0	1.5	1894	0.7	2.5
5629	3.2	3.2	4.9	16.8	1.0	1.9	2	364	376	0.0	0	1.5	1894	0.3	2.5
5558	3.2	3.2	4.7	16.8	1.0	1.9	2	377	414	0.0	0	1.5	1894	0.3	2.5
5454	3.2	3.2	5.0	16.2	1.0	1.9	2	364	395	0.0	0	1.5	747	0.3	2.5
5435	3.3	3.3	5.1	16.1	1.0	1.9	2	458	562	0.0	0	1.5	747	0.4	2.5
5340	2.5	2.0	8.4	14.9	1.0	0.0	2	452	488	0.0	0	1.5	747	1.0	2.5
5061	2.5	1.6	6.5	17.0	1.0	0.0	2	442	487	0.0	0	1.5	0	0.6	2.5
4900	2.5	1.5	5.9	16.1	1.0	0.0	2	457	483	0.0	0	1.5	0	0.5	2.5
4572	2.5	1.6	6.5	14.2	1.0	0.0	2	393	442	0.0	0	1.5	0	0.6	2.5
4221	2.5	1.8	7.8	15.1	1.0	0.0	2	272	440	0.0	0	1.5	0	0.8	2.5
3865	2.5	1.7	7.3	13.8	1.0	0.0	2	351	449	0.0	0	1.5	0	0.7	2.5
3580	2.5	1.7	7.0	15.5	1.0	0.0	2	427	455	0.0	0	1.5	0	0.7	2.5
3290	2.5	1.7	7.3	15.0	1.0	0.0	2	423	486	0.0	0	1.5	0	0.7	2.5
2975	2.5	1.5	6.2	14.6	1.0	0.0	2	457	562	0.0	0	1.5	0	0.5	2.5
2627	2.5	1.3	4.9	14.6	1.0	0.0	2	597	947	0.0	0	1.5	0	0.3	2.5
2308	3.7	3.7	4.6	13.2	1.0	2.4	2	278	794	0.0	0	1.5	0	0.3	2.5
1982	3.8	3.8	5.8	15.3	1.0	2.4	2	360	613	0.0	0	1.5	848	0.4	2.5
1645	4.0	4.0	6.4	13.6	1.0	2.4	2	400	445	0.0	0	1.5	848	0.6	2.5
1531	4.2	4.2	7.8	13.2	1.0	2.4	2	334	388	0.0	0	1.5	0	0.8	2.5
1462	3.9	3.9	5.9	15.7	1.0	2.4	2	396	477	0.0	0	1.5	0	0.5	2.5
1415	3.9	3.9	5.8	16.2	1.0	2.4	2	393	464	0.0	0	1.5	0	0.5	2.5
1306	3.9	3.9	5.9	15.5	1.0	2.4	2	391	450	0.0	0	1.5	0	0.5	2.5
1173	3.7	3.7	5.1	15.1	1.0	2.4	2	323	857	0.0	0	1.5	0	0.3	2.5
MAX=	4.2	4.2			1.0					0.0				1.7	2.5
MIN=	2.5	1.0			1.0					0.0				0.0	2.5

[1] CROSS-SECTIONAL ANALYSIS SHOWED LITTLE OR NO AGGRADATION, HOWEVER A 1 FT MINIMUM WAS USED FOR LOCAL DEPOSITS OF FINES WITHIN CROSS-SECTION

[2] GENERAL AGGRADATION VALUES ARE FROM TABLE 4.3 FROM SAM ANALYSIS

DEFINITIONS

Y_{MAX} = GREATER OF THE DM AND S&H HEIGHTS

Y_{TOT}=TOTAL EMBANKMENT PROTECTION IN FEET BASED ON THE H&S

V(FPS) =VELOCITY IN FEET PER SECOND

FLOW DEPTH=WATER DEPTH IN CHANNEL IN FEET

Y_{AGG}=LONG TERM AGGRADATION IN FEET

Y_{GA}=GENERAL AGGRADATION IN FEET FROM SAM

CHANNEL TYPE=CHANNEL SHAPE/FLOW FACTOR:
IF Fr<1, RECTANGULAR = 0; IF Fr>1, RECTANGULAR = 1;
IF Fr<1, TRAPEZOIDAL = 2; IF Fr>1, TRAPEZOIDAL = 3.

Y_{SE}=SUPER ELEVATION IN FEET

BEND COEFF=BEND COEFFICIENT; IF NO BEND=0, BEND=1

SIDE SLOPE=CHANNEL SIDE SLOPE (H:V), UNITLESS

BOTTOM WIDTH=CHANNEL BOTTOM WIDTH IN FEET, 2-YEAR WATER SURFACE

RADIUS=RADIUS OF CURVATURE TO CENTERLINE IN FEET

H/2=HALF BEDFORM HEIGHT IN FEET, LIMITED TO FLOW DEPTH,
AFTER KENNEDY (1963)

Y_{DM} = EMBANKMENT PROTECTION REQUIRED BY THE LACFCDDM IN FEET

GENERAL

THIS SPREADSHEET IS DESIGNED TO CALCULATE TOP PROTECTION (FREE BOARD) BASED ON LACDWP COUNTY HYDROLOGY MANUAL (1991) PAGES 5.8-5.9 AND ASSOCIATED APPENDICES (SEDIMENTATION MANUAL). ALL VELOCITIES ARE IN FPS, WITH NO MAXIMUM VALUE. THE USER SHOULD CONSIDER A PRACTICAL MAXIMUM OF APPROXIMATELY 20-30 FPS. THE PRESENT VERSION (8/05) WILL CALCULATE UP TO 100 VELOCITIES AT ONE TIME. LONG TERM AGGRADATION IS USER SUPPLIED. GENERAL AGGRADATION IS ALSO USER SUPPLIED. SUPER ELEVATION AT BENDS IS BASED ON LACFCDDM EQUATIONS FOUND IN C-3.1. BEDFORM HEIGHT, LIMITED TO FLOW DEPTH AFTER KENNEDY (1963), IS BASED ON EQUATIONS IN APPENDIX Q13. IF FLOW IS SUPERCRITICAL SPREADSHEET REPORTS LACFCDDM TOTAL WALL HEIGHT INSTEAD OF FREEBOARD. LOS ANGELES COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL (LACFCDDM) VALUES ARE PRESENTED AS A PART OF LACH&SM CALCULATIONS. THE SPREADSHEET CALCULATES THE GREATER OF THE TWO METHODOLOGIES. BOTTOM WIDTH IS BASED ON THE 2-YEAR WATER SURFACE AFTER ACOE PROCEDURES.

COLOR CODES

OUTPUT

DATA FROM HEC-RAS

USER SUPPLIED DATA

INTERMEDIATE CALCULATIONS (INDIVIDUAL SHEETS ONLY)

DESIGNED BY DAVID A JAFFE, PHD, PE
PACIFIC ADVANCED CIVIL ENGINEERING, INC
AUGUST, 2005

Castaic Creek Fluvial Study
Phase 1 Final Draft

APPENDIX CHAPTER 6.4

Summary of Appendix 6 Toedown & Freeboard Proposed Condition

PACIFIC ADVANCED CIVIL ENGINEERING, INC.

Figure A6.4: Castaic Creek Appendix 6 Summary of Toe-down & Freeboard for Proposed Conditions Outside Curved Reach

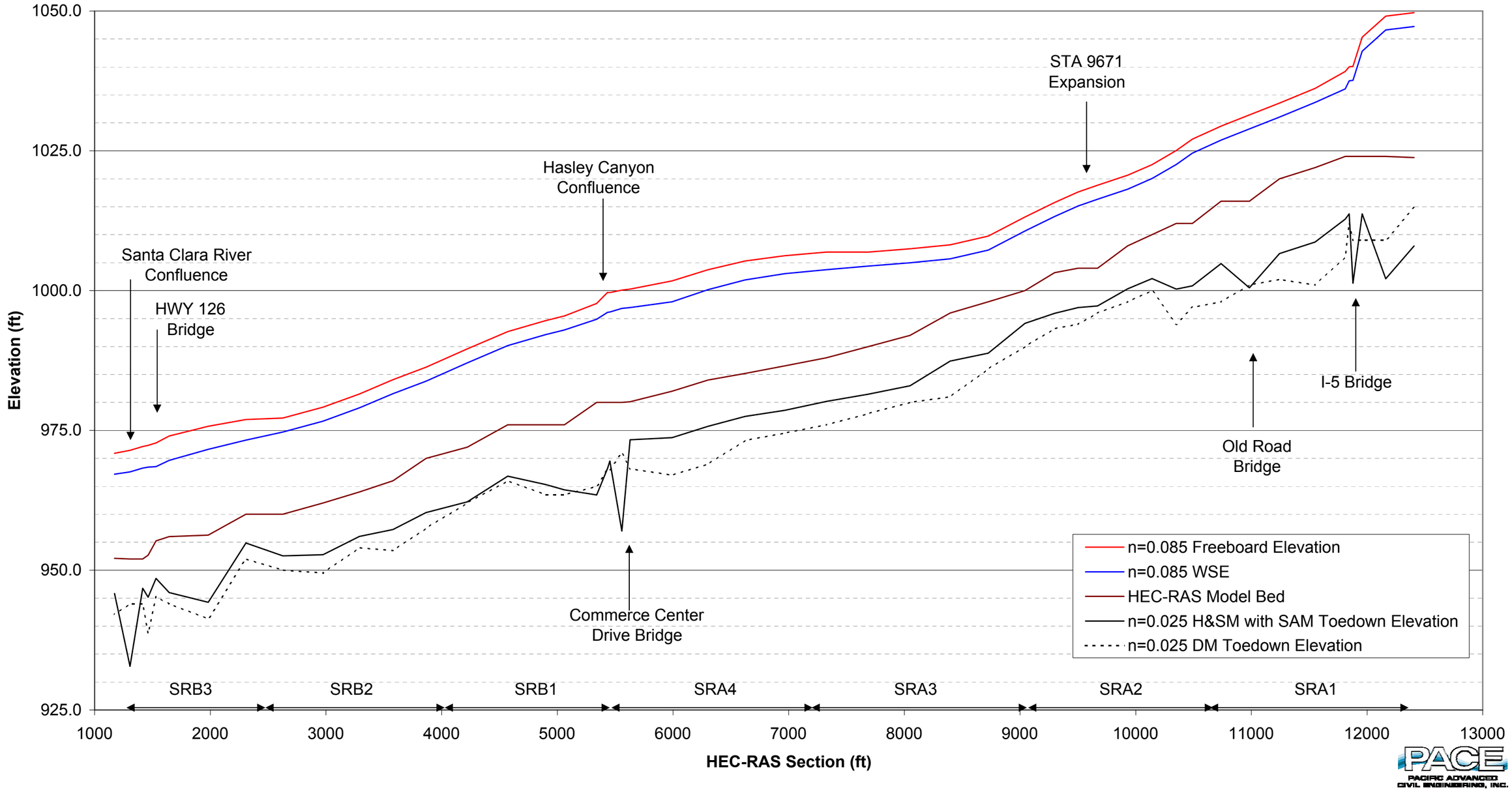

Table A6.4: Castaic Creek Appendix 6 Summary of Proposed Toe-down & Freeboard (ft)											
Subreach	HEC-RAS Section	Z_{99} [3]	Outside Curved Reach		Straight-Inside Curved Reach		WSE	Outside Curved Reach		Straight-Inside Curved Reach	
			Total Degradation (H&S w/ SAM) [4]	Proposed Toe-down Elevation [2, 5]	Total Degradation (H&S w/ SAM) [4]	Proposed Toe-down Elevation [2, 5]		Total Freeboard (H&S w/ SAM) [4]	Proposed Top of Levee Elevation [2]	Total Freeboard (H&S w/ SAM) [4]	Proposed Top of Levee Elevation [2]
SRA1	12407	1023.8	15.8	1008.0	6.6	1017.2	1047.2	2.5	1049.7	2.5	1049.7
	12162	1024.0	21.9	1002.1	19.9	1004.1	1046.6	2.5	1049.1	2.5	1049.1
	11957	1024.0	10.3	1013.7	8.4	1015.6	1042.8	2.5	1045.3	2.5	1045.3
	11878	1024.0	22.7	1001.3	20.7	1003.3	1037.6	2.5	1040.1	2.5	1040.1
	11846	1024.0	10.3	1013.7	7.6	1016.4	1037.5	2.5	1040.0	2.5	1040.0
	11812	1024.0	11.2	1012.8	9.6	1014.4	1036.1	3.1	1039.2	2.7	1038.7
	11551	1022.0	13.3	1008.7	9.6	1012.4	1033.7	2.5	1036.2	2.5	1036.2
	11243	1020.0	13.4	1006.6	9.6	1010.4	1031.1	2.5	1033.6	2.5	1033.6
	10983	1016.0	15.5	1000.5	9.2	1006.8	1028.9	2.5	1031.4	2.5	1031.4
SRA2	10738	1016.0	11.2	1004.8	8.8	1007.2	1026.9	2.5	1029.4	2.5	1029.4
	10491	1012.0	11.2	1000.8	7.7	1004.3	1024.6	2.5	1027.1	2.5	1027.1
	10351	1012.0	11.7	1000.3	8.9	1003.1	1022.6	2.5	1025.1	2.5	1025.1
	10142	1010.0	7.8	1002.2	7.8	1002.2	1020.0	2.5	1022.5	2.5	1022.5
	9931	1008.0	7.7	1000.3	7.7	1000.3	1018.1	2.5	1020.6	2.5	1020.6
	9671	1004.0	6.7	997.3	6.7	997.3	1016.4	2.5	1018.9	2.5	1018.9
	9502	1004.0	7.0	997.0	7.0	997.0	1015.1	2.5	1017.6	2.5	1017.6
	9299	1003.2	7.3	995.9	7.3	995.9	1013.2	2.5	1015.7	2.5	1015.7
SRA3	9043	1000.0	5.9	994.1	5.9	994.1	1010.7	2.5	1013.2	2.5	1013.2
	8725	998.0	9.2	988.8	5.3	992.7	1007.2	2.5	1009.7	2.5	1009.7
	8396	996.0	8.6	987.4	5.6	990.4	1005.7	2.5	1008.2	2.5	1008.2
	8050	992.0	9.0	983.0	4.7	987.3	1005.0	2.5	1007.5	2.5	1007.5
	7689	990.0	8.5	981.5	4.8	985.2	1004.4	2.5	1006.9	2.5	1006.9
SRA4	7326	988.0	7.8	980.2	4.6	983.4	1003.8	3.1	1006.9	3.1	1006.8
	6967	986.5	7.9	978.6	4.6	981.9	1003.0	3.2	1006.2	3.1	1006.2
	6624	985.2	7.7	977.5	5.2	980.0	1001.9	3.4	1005.3	3.3	1005.2
	6305	984.0	8.3	975.7	6.5	977.5	1000.2	3.6	1003.7	3.4	1003.6
	5992	982.0	8.3	973.7	6.7	975.3	998.0	3.7	1001.7	3.6	1001.6
	5629	980.1	6.8	973.3	4.5	975.6	997.0	3.3	1000.3	3.2	1000.2
	5558	980.0	23.0	957.0	20.4	959.6	996.8	3.3	1000.1	3.2	1000.0
	5454	980.0	10.5	969.5	4.5	975.5	996.2	3.5	999.6	3.2	999.4
	5434	980.0	11.8	968.2	4.5	975.5	996.1	3.6	999.7	3.3	999.4
SRB1	5340	980.0	16.5	963.5	10.1	969.9	994.9	2.8	997.7	2.5	997.4
	5061	976.0	11.6	964.4	11.6	964.4	993.0	2.5	995.5	2.5	995.5
	4900	976.0	10.7	965.3	10.7	965.3	992.1	2.5	994.6	2.5	994.6
	4572	976.0	9.2	966.8	9.2	966.8	990.2	2.5	992.7	2.5	992.7
	4221	972.0	9.8	962.2	9.8	962.2	987.1	2.5	989.6	2.5	989.6
SRB2	3865	970.0	9.7	960.3	9.7	960.3	983.8	2.5	986.3	2.5	986.3
	3580	966.0	8.7	957.3	8.7	957.3	981.6	2.5	984.1	2.5	984.1
	3290	964.0	8.0	956.0	8.0	956.0	979.0	2.5	981.5	2.5	981.5
	2975	962.0	9.2	952.8	9.2	952.8	976.7	2.5	979.2	2.5	979.2
	2627	960.0	7.4	952.6	7.4	952.6	974.7	2.5	977.2	2.5	977.2
SRB3	2308	960.0	5.1	954.9	5.1	954.9	973.3	3.7	976.9	3.7	976.9
	1982	956.3	12.0	944.3	6.1	950.2	971.6	4.1	975.7	3.8	975.5
	1645	956.0	10.0	946.0	5.3	950.7	969.7	4.3	974.0	4.0	973.6
	1531	955.2	6.7	948.5	6.7	948.5	968.5	4.2	972.8	4.2	972.8
	1462	952.7	7.5	945.2	7.5	945.2	968.4	3.9	972.3	3.9	972.3
	1415	952.0	5.2	946.8	5.2	946.8	968.3	3.9	972.1	3.9	972.1
	1306	952.0	19.2	932.8	19.2	932.8	967.6	3.9	971.4	3.9	971.4
	1123 [1]	952.1	6.3	945.8	6.3	945.8	967.2	3.7	970.9	3.7	970.9

1 - Historical topo provides data for cross-section 1123 but not 1173. However, WSE from HEC-RAS modeling contains 1173, not 1123.

2 - Phase 1 Analysis

3 - Minimum 1999 Bed Elevation

4 - Toe-down based on LA County Hydrology & Sedimentation Manual; Freeboard based on max of LA County Hydrology & Sedimentation Manual and LA County Design Manual, as per Hydrology & Sedimentation Manual

5 - Final design of levee will include detailed bridge analysis