

DATE: 10/18/2010
TIME: 12: 2

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

1
CARD SECT CHN NO OF AVE PIER HEIGHT 1 BASE ZL ZR INV Y(1) Y(2) Y(3) Y(4) Y(5) Y(6) Y(7) Y(8) Y(9)
Y(10)
CODE NO TYPE PIERS WIDTH DIAMETER WIDTH DROP

CD 48 4 4.50

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

RANCHO PALOS VERDES SAN RAMON ALT 1 TUNNEL ALG SYSTEM HYDRAULICS

HEADING LINE NO 2 IS -

PREPARED ER 06/16/10

HEADING LINE NO 3 IS -

FILENAME: ALT1IN

F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *
U/S DATA STATION INVERT SECT
1051.23 22.78 54
W S ELEV
22.78

ELEMENT NO 2 IS A REACH * * *
U/S DATA STATION INVERT SECT
1325.00 127.53 54
MAN H N
0 0.010
RADIUS ANGLE ANG PT
0.00 0.00 0.00

ELEMENT NO 3 IS A REACH * * *
U/S DATA STATION INVERT SECT
1700.00 223.63 54
MAN H N
0 0.010
RADIUS ANGLE ANG PT
0.00 0.00 0.00

ELEMENT NO	4 IS A REACH U/S DATA	STATION	* INVERT	* SECT	ALT101	4HDPE	RADIUS	ANGLE	ANG PT			
MAN H		1850.00	248.29	54		N	0.00	0.00	0.00			
0						0.010						
ELEMENT NO	5 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		2150.00	286.97	54		0.010	0.00	0.00	0.00			
0												
ELEMENT NO	6 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		2800.00	290.22	54		0.010	0.00	0.00	0.00			
0												
ELEMENT NO	7 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		3035.96	330.46	54		0.010	0.00	0.00	0.00			
1												
ELEMENT NO	8 IS A JUNCTION U/S DATA	STATION	* INVERT	* SECT	* LAT-1	LAT-2	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
		3040.96	331.31	54	0	0	0.0	0.0	0.00	0.00	0.00	0.00
ELEMENT NO	9 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		3050.00	332.85	54		0.010	0.00	0.00	0.00			
0												
ELEMENT NO	10 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		3117.32	341.43	54		0.010	400.00	39.65	0.00			
0												
ELEMENT NO	11 IS A REACH U/S DATA	STATION	* INVERT	* SECT		N	RADIUS	ANGLE	ANG PT			
MAN H		5090.33	592.92	54		0.010	0.00	0.00	0.00			
0												
ELEMENT NO	12 IS A SYSTEM HEADWORKS U/S DATA	STATION	* INVERT	* SECT			W S ELEV					
		5090.33	592.92	48			592.92					

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
 ERROR MESSAGE NO. 2 - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN OTLTUS, W.S.ELEV = INV + DC

F0515P

LICENSEE: HARRIS & ASSOCIATES

STATION AVBPR	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER
L/ELEM	SO	NORM DEPTH ZR											

1051.23 0.00	22.78	1.004	23.784	169.9	64.21	64.021	87.805	0.00	3.796	4.50	0.00	0.00	0
164.49	0.38262					.348213	57.28		0.995			0.00	
1215.72 0.00	85.72	1.037	86.754	169.9	61.31	58.375	145.129	0.00	3.796	4.50	0.00	0.00	0
67.97	0.38262					.305067	20.74		0.995			0.00	
1283.69 0.00	111.72	1.072	112.797	169.9	58.47	53.077	165.874	0.00	3.796	4.50	0.00	0.00	0
41.31	0.38262					.266735	11.02		0.995			0.00	
1325.00 0.00	127.53	1.109	128.639	169.9	55.74	48.247	176.886	0.00	3.796	4.50	0.00	0.00	0
113.78	0.25627					.243596	27.72		1.100			0.00	
1438.78 0.00	156.69	1.121	157.808	169.9	54.88	46.763	204.571	0.00	3.796	4.50	0.00	0.00	0
128.11	0.25627					.223378	28.62		1.100			0.00	
1566.89 0.00	189.52	1.160	190.677	169.9	52.33	42.514	233.191	0.00	3.796	4.50	0.00	0.00	0
62.87	0.25627					.195418	12.29		1.100			0.00	

									ALTIOL j4HDPE .097530 6.14				
63.00	0.12893									1.311			0.00
1913.00 0.00	256.41	1.431	257.844	169.9	39.06	23.688	281.532	0.00	3.796		4.50	0.00	0.00
49.34	0.12893					.086291	4.26			1.311		0.00	
1962.34 0.00	262.77	1.481	264.255	169.9	37.24	21.537	285.792	0.00	3.796		4.50	0.00	0.00
35.72	0.12893					.075578	2.70			1.311		0.00	
1998.06 0.00	267.38	1.533	268.913	169.9	35.51	19.577	288.490	0.00	3.796		4.50	0.00	0.00
27.51	0.12893					.066228	1.82			1.311		0.00	
2025.57 0.00	270.93	1.588	272.514	169.9	33.86	17.801	290.315	0.00	3.796		4.50	0.00	0.00
22.02	0.12893					.058064	1.28			1.311		0.00	
2047.59 0.00	273.77	1.645	275.411	169.9	32.28	16.182	291.593	0.00	3.796		4.50	0.00	0.00
18.10	0.12893					.050916	0.92			1.311		0.00	
2065.69 0.00	276.10	1.704	277.804	169.9	30.78	14.710	292.514	0.00	3.796		4.50	0.00	0.00
15.14	0.12893					.044654	0.68			1.311		0.00	
2080.83 0.00	278.05	1.765	279.817	169.9	29.34	13.370	293.187	0.00	3.796		4.50	0.00	0.00
12.84	0.12893					.039177	0.50			1.311		0.00	
2093.67 0.00	279.71	1.829	281.536	169.9	27.98	12.157	293.693	0.00	3.796		4.50	0.00	0.00
10.98	0.12893					.034391	0.38			1.311		0.00	
2104.65 0.00	281.12	1.896	283.018	169.9	26.68	11.050	294.068	0.00	3.796		4.50	0.00	0.00
9.46	0.12893					.030205	0.29			1.311		0.00	

ALTIQ J4HDPE									
4.13	0.12893					.014031	0.06	1.311	0.00
2150.00	286.97	2.459	289.429	169.9	19.11	5.671	295.100	0.00	3.796
0.00									
14.19	0.00500					.013371	0.19	3.466	0.00
2164.19	287.04	2.434	289.475	169.9	19.35	5.814	295.289	0.00	3.796
0.00									
51.62	0.00500					.014500	0.75	3.466	0.00
2215.81	287.30	2.343	289.642	169.9	20.29	6.395	296.037	0.00	3.796
0.00									
48.26	0.00500					.016449	0.79	3.466	0.00
2264.07	287.54	2.256	289.796	169.9	21.29	7.035	296.831	0.00	3.796
0.00									
45.44	0.00500					.018679	0.85	3.466	0.00
2309.51	287.77	2.174	289.942	169.9	22.32	7.738	297.680	0.00	3.796
0.00									
42.82	0.00500					.021226	0.91	3.466	0.00
2352.33	287.98	2.095	290.077	169.9	23.42	8.513	298.590	0.00	3.796
0.00									
40.53	0.00500					.024129	0.98	3.466	0.00
F0515P									
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STATION AVBPR	INVERT	DEPTH	W.S.	Q	VEL	VEL	ENERGY	SUPER	CRITICAL	HGT/ BASE/	ZL	NO
	ELEV	OF FLOW	ELEV		HEAD	GRD. EL.	ELEV	DEPTH	DIA	ID NO.	PIER	

ALTILOI 34HDPE

L/ELEM	SO	SF AVE				HF	NORM DEPTH			ZR		
*****											*****	
2392.86 0.00	288.18	2.019	290.203	169.9	24.56	9.363	299.566	0.00	3.796	4.50	0.00	0
38.51	0.00500					.027447	1.06		3.466		0.00	
2431.37 0.00	288.38	1.947	290.324	169.9	25.75	10.299	300.623	0.00	3.796	4.50	0.00	0
36.62	0.00500					.031242	1.14		3.466		0.00	
2467.99 0.00	288.56	1.878	290.438	169.9	27.01	11.329	301.767	0.00	3.796	4.50	0.00	0
34.90	0.00500					.035579	1.24		3.466		0.00	
2502.89 0.00	288.73	1.812	290.546	169.9	28.33	12.463	303.009	0.00	3.796	4.50	0.00	0
33.29	0.00500					.040541	1.35		3.466		0.00	
2536.18 0.00	288.90	1.749	290.650	169.9	29.71	13.709	304.359	0.00	3.796	4.50	0.00	0
31.79	0.00500					.046208	1.47		3.466		0.00	
2567.97 0.00	289.06	1.688	290.748	169.9	31.16	15.080	305.828	0.00	3.796	4.50	0.00	0
30.41	0.00500					.052690	1.60		3.466		0.00	
2598.38 0.00	289.21	1.630	290.842	169.9	32.69	16.589	307.431	0.00	3.796	4.50	0.00	0
29.08	0.00500					.060088	1.75		3.466		0.00	
2627.46 0.00	289.36	1.573	290.930	169.9	34.28	18.249	309.179	0.00	3.796	4.50	0.00	0
27.86	0.00500					.068542	1.91		3.466		0.00	
2655.32	289.50	1.519	291.016	169.9	35.95	20.068	311.084	0.00	3.796	4.50	0.00	0

AL T101 54HDPE

0.00

26.71 0.00500

2.09

3.466	0.00
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[illegible]

	0.00	2.29	3.466	- .089335	0.00500	25.59
0.00						
2.29						
3.466						
- .089335						
0.00500						
25.59						

[illegible]

	0.00	3.466	2.50	.102007	0.00500	24.54	24.54
0.00							
3.466							
2.50							
.102007							
0.00500							
24.54							
24.54							

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F0515P

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WATER SURFACE PROFILE LISTING

RANCHO PALOS VERDES SAN RAMON ALT 1 TUNNEL ALG SYSTEM HYDRAULICS

PREPARED ER 06/16/10

FILENAME: ALT11IN

STATION AVBPR	INVERT	DEPTH	W.S.	Q	VEL	VEL	ENERGY	SUPER	CRITICAL	HGT/ BASE/	ZL	NO
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[illegible]

L/ELEM SO

SF AVE

44

NORM DEPTH

ZR

[illegible]

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
2000	23.55	0.00500	.116480	2.74	3.466	0.00																																																																																															

[illegible]

22.60	0.00500	3.01	3.466	0.00
22.60	0.00500	3.01	3.466	0.00

[illegible]

21.69	0.00500	.152070	3.30	3.466	0.00
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4HDPE

2800.00	290.22	1.236	291.456	169.9	47.86	35.567	327.023	0.00	3.796	4.50	0.00	0.00	0
0.00													
136.42	0.17054					.155932	21.27			1.220		0.00	
2936.42	313.49	1.262	314.747	169.9	46.50	33.571	348.318	0.00	3.796	4.50	0.00	0.00	0
0.00													
99.54	0.17054					.140317	13.97			1.220		0.00	
3035.96	330.46	1.306	331.766	169.9	44.34	30.525	362.291	0.00	3.796	4.50	0.00	0.00	0
0.00													
JUNCT STR	0.17000					.130341	0.65					0.00	
3040.96	331.31	1.309	332.619	169.9	44.18	30.303	362.922	0.00	3.796	4.50	0.00	0.00	0
0.00													
9.04	0.17035					.128616	1.16			1.220		0.00	
3050.00	332.85	1.315	334.165	169.9	43.91	29.944	364.109	0.00	3.796	4.50	0.00	0.00	0
0.00													
67.32	0.12745					.127530	8.59			1.315		0.00	
3117.32	341.43	1.315	342.745	169.9	43.91	29.944	372.689	0.00	3.796	4.50	0.00	0.00	0
0.00													
1119.12	0.12746					.127530	*****			1.315		0.00	
4236.44	484.08	1.315	485.394	169.9	43.91	29.944	515.338	0.00	3.796	4.50	0.00	0.00	0
0.00													
338.88	0.12746					.123835	41.97			1.315		0.00	
4575.32	527.27	1.335	528.609	169.9	42.99	28.699	557.308	0.00	3.796	4.50	0.00	0.00	0
0.00													
173.14	0.12746					.112671	19.51			1.315		0.00	

LICENSEE: HARRIS & ASSOCIATES

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PREPARED ER 06/16/10

FILENAME: ALTLIN

STATION AVBPR	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	

4748.46 0.00	549.34	1.382	550.725	169.9	40.99	26.089	576.814	0.00	3.796	4.50	0.00	0.00	0
80.63	0.12746					.098652	7.95		1.315			0.00	
4829.09 0.00	559.62	1.430	561.051	169.9	39.08	23.709	584.760	0.00	3.796	4.50	0.00	0.00	0
51.25	0.12746					.086380	4.43		1.315			0.00	
4880.34 0.00	566.15	1.480	567.634	169.9	37.26	21.556	589.190	0.00	3.796	4.50	0.00	0.00	0
36.82	0.12746					.075676	2.79		1.315			0.00	
4917.16 0.00	570.85	1.533	572.380	169.9	35.52	19.593	591.973	0.00	3.796	4.50	0.00	0.00	0
28.25	0.12746					.066318	1.87		1.315			0.00	
4945.41 0.00	574.45	1.587	576.035	169.9	33.87	17.815	593.850	0.00	3.796	4.50	0.00	0.00	0
22.54	0.12746					.058127	1.31		1.315			0.00	
4967.95 0.00	577.32	1.644	578.964	169.9	32.29	16.194	595.158	0.00	3.796	4.50	0.00	0.00	0
18.47	0.12746					.050972	0.94		1.315			0.00	
4986.42 0.00	579.67	1.703	581.378	169.9	30.79	14.721	596.099	0.00	3.796	4.50	0.00	0.00	0
15.43	0.12746					.044714	0.69		1.315			0.00	

ALT10L J4HDPE

5001.85 0.00	581.64	1.765	583.407	169.9	29.36	13.384	596.791	0.00	3.796	4.50	0.00	0.00	0
13.07	0.12746					.039239	0.51			1.315		0.00	
5014.92 0.00	583.31	1.829	585.136	169.9	27.99	12.169	597.305	0.00	3.796	4.50	0.00	0.00	0
11.18	0.12746					.034438	0.39			1.315		0.00	
5026.10 0.00	584.73	1.895	586.628	169.9	26.69	11.060	597.688	0.00	3.796	4.50	0.00	0.00	0
9.62	0.12746					.030241	0.29			1.315		0.00	
5035.72 0.00	585.96	1.965	587.924	169.9	25.45	10.057	597.981	0.00	3.796	4.50	0.00	0.00	0
8.34	0.12746					.026573	0.22			1.315		0.00	

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WATER SURFACE PROFILE LISTING

RANCHO PALOS VERDES SAN RAMON ALT 1 TUNNEL ALG SYSTEM HYDRAULICS

PREPARED ER 06/16/10

FILENAME: ALT1IN

STATION AVBPR	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	

5044.06 0.00	587.02	2.038	589.060	169.9	24.26	9.142	598.202	0.00	3.796	4.50	0.00	0.00	0
7.25	0.12746					.023361	0.17			1.315		0.00	
5051.31 0.00	587.95	2.114	590.061	169.9	23.13	8.311	598.372	0.00	3.796	4.50	0.00	0.00	0

1.57 J.12746

LICENSEE: HARRIS & ASSOCIATES

ALT101 4HDPE
.0067,4 0.01

1.315 0.00

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WATER SURFACE PROFILE LISTING

RANCHO PALOS VERDES SAN RAMON ALT 1 TUNNEL ALG SYSTEM HYDRAULICS

PREPARED ER 06/16/10

FILENAME: ALT1IN

STATION AVBPR	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO
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L/ELEM	SO	SF	AVE	HF	NORM DEPTH				ZR
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5087.42	592.55	3.134	595.683	169.9	14.37	3.204	598.887	0.00	3.796	4.50	0.00	0.00	0
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1.23	0.12746					.006042	0.01			1.315		0.00	
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5088.65	592.71	3.276	595.982	169.9	13.70	2.913	598.895	0.00	3.796	4.50	0.00	0.00	0
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0.91	0.12746					.005409	0.00			1.315		0.00	
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5089.56	592.82	3.430	596.252	169.9	13.06	2.648	598.900	0.00	3.796	4.50	0.00	0.00	0
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0.57	0.12746					.004868	0.00			1.315		0.00	
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5090.13	592.89	3.601	596.495	169.9	12.45	2.407	598.902	0.00	3.796	4.50	0.00	0.00	0
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0.20	0.12746					.004413	0.00			1.315		0.00	
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5090.33	592.92	3.796	596.716	169.9	11.87	2.188	598.904	0.00	3.796	4.50	0.00	0.00	0
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0.00

ALT1IN_54hdpe

0

T1 RANCHO PALOS VERDES SAN RAMON ALT 1 TUNNEL ALG SYSTEM HYDRAULICS

T2 PREPARED ER 06/16/10

T3 FILENAME: ALT1IN

^	1051.23	22.78	54		22.78	
	1325.00	127.53	54	.010		
R	1700.00	223.63	54	.010		
R	1850.00	248.29	54	.010		
R	2150.00	286.97	54	.010		
R	2800.00	290.22	54	.010		
R	3035.96	330.46	54	.010		1
JX	3040.96	331.31	54	.010		
R	3050.00	332.85	54	.010		
R	3117.32	341.43	54	.010	400.00	39.65
R	5090.33	592.92	54	.010		
SH	5090.33	592.92	54		592.92	
CD	54	4		4.50		

169.9

```
File name: H:\RanchopV\San Ramon SD\A-Hydrology\WMS\50-YEAR\ALT 1\Alt1Burn.lac
Run date: wed Jun 16 08:33:08 2010
```

PCT	LOCATION	SUBAREA		TOTAL	TOTAL		Q	VOLUME	TYPE	CONV	CONV	SLOPE	SIZE	CONV	CONTROL	SOIL	RAIN
		AREA	Q		AREA	Q											
IMPV	1A	41.7	44.16	41.7	44.16	8.303	0	0	0.00000	0.00	0.00	0	2	28	4.93		
	1B	0.0	0.00	41.7	44.16	8.305	3	1982	0.16414	64-8	0.00	0	2	0	4.93		
	1C	25.8	42.19	67.5	75.92	14.263	0	0	0.00000	0.00	0.00	0	2	12	4.81		
	1D	0.0	0.00	67.5	75.92	14.262	2	2393	0.14323	0.00	0.00	0	2	0	4.81		
	1E	56.2	75.12	123.7	144.37	27.044	0	0	0.00000	0.00	0.00	0	202	18	4.66		
	1F	0.0	0.00	123.7	144.37	27.046	4	3608	0.14450	2.50	0.00	0	202	0	4.66		
	1G	0.0	0.00	123.7	143.36	27.046	0	0	0.00000	0.00	0.00	0	202	15	4.66		
	1H	0.0	0.00	123.7	143.36	27.046	0	0	0.00000	0.00	0.00	0	202	0	4.66		

Page 1

1.out

File name: H:\RanchopV\San Ramon SD\A-Hydrology\WMS\100-YEAR\ALT 1\Alt1Burn.tac
Run date: Wed Jun 16 08:41:23 2010

Los Angeles County Flood Control District
Modified Rational Method Hydrology[illegible]

Normal End of MODRAT