

Attachment A-2
Tables and Calculations

TABLE I – DISCHARGE POINT INFORMATION & DISCHARGE QUANTITY

Discharge Point	LOCATION	Latitude	Longitude	Class	C (weighted)	I (in/hr)	A (Acres)	Q (cfs)
1	Kalahopele Gulch	21.6431	158.0634	2	0.95	3.51	0.88	2.94
2	Pacific Ocean	21.6462	158.0635	AA	0.95	3.51	1.92	6.40
3	Pacific Ocean	21.6485	158.0632	AA	0.95	3.51	0.27	0.90
4	Pacific Ocean (Sheetflow)	21.6496 To 21.6504	158.0633 To 158.0626	AA	0.95	3.51	0.16	0.54
5	Pacific Ocean	21.6511	158.0618	AA	0.95	3.51	0.21	0.71
6	Pacific Ocean (Sheetflow)	21.6511 To 21.6515	158.0618 To 158.0617	A	0.95	3.51	0.14	0.46
7	Pacific Ocean	21.6530	158.0615	A	0.95	3.51	1.21	4.05
8	Pacific Ocean	21.6546	158.0611	A	0.95	3.51	1.91	6.35
9	Kalunawaikaala Stream	21.6577	158.0579	2	0.95	3.51	0.13	0.44
10	Kalunawaikaala Stream	21.6576	158.0578	2	0.95	3.51	0.13	0.44
11	Pacific Ocean (Sheetflow)	21.6591 To 21.6603	158.0582 To 158.0571	A	0.95	3.51	0.76	2.54
12	Pakulena Stream	21.6608	158.0547	2	0.95	3.51	0.96	3.21
13	Pakulena Stream	21.6607	158.0546	2	0.95	3.51	2.71	9.02
14	Paumalu Stream	21.67264	158.04159	2	0.95	3.51	1.54	5.14
15	Paumalu Stream	21.6727	158.0416	2	0.95	3.51	0.35	1.18
16	Paumalu Stream	21.6725	158.0415	2	0.95	3.51	0.19	0.65
17	Paumalu Stream	21.6727	158.0415	2	0.95	3.51	0.36	1.19
18	Paumalu Stream	21.67256	158.04145	2	0.95	3.51	0.36	1.19

19	Pacific Ocean (Sheetflow)	21.6739 To 21.6746	158.0408 To 158.0403	A	0.95	3.51	0.14	0.48
20	Pacific Ocean	21.6784	158.0391	A	0.95	3.51	2.74	9.14
21	Kaunala Gulch	21.6804	158.0343	2	0.95	3.51	0.19	0.63
22	Kaunala Gulch	21.6798	158.0340	2	0.95	3.51	0.34	1.15
23	Kaunala Gulch	21.67980	158.03403	2	0.95	3.51	0.15	0.52
24	Kaunala Gulch	21.67986	158.03399	2	0.95	3.51	0.42	1.41
25	Kaunala Gulch	21.6798	158.0339	2	0.95	3.51	0.20	0.65
26	Kaunala Gulch	21.6806	158.0343	2	0.95	3.51	1.08	3.62
27	Unnamed Stream	21.6834	158.0300	2	0.95	3.51	0.40	1.34
28	Unnamed Stream	21.6830	158.0295	2	0.95	3.51	0.20	0.67
29	Unnamed Stream	21.6832	158.0295	2	0.95	3.51	0.22	0.75
30	Pacific Ocean	21.6861	158.0306	A	0.95	3.51	0.28	0.93
31	Pacific Ocean	21.6876	158.0283	A	0.95	3.51	0.24	0.79
32	Pacific Ocean	21.6685	158.0477	A	0.95	3.51	2.65	8.84

RUNOFF CALCULATIONS

Given:

C = 0.95 (AC Pavement/Concrete Sidewalk/Concrete Driveways)

C=0.3 (Grassed/Pervious areas)

I = (2-yr, 1-hr event) = 1.56 in./hr.

tc_{All} = 10 min. (minimum)

Cf_{All} = 2.25

I = i X Cf

Since project area is less than 100 acres, the Rational Formula will be used to calculate potential runoff.

Find: Runoff for a 2-yr 1-hr rainfall event (Q).

Solution: $Q = C \times I \times A$

See Table Below for Calculations

Area	C	I (Inches/Hr)	CF	Area (SF)	A (Acres)	Q (CFS)
1-1	0.95	1.56	2.25	38,400	0.88	2.94
Total					0.88	2.94
2-1	0.95	1.56	2.25	18,500	0.42	1.42
2-2	0.95	1.56	2.25	38,125	0.88	2.92
2-3	0.95	1.56	2.25	1,500	0.03	0.11
2-4	0.95	1.56	2.25	22,500	0.52	1.72
2-5	0.95	1.56	2.25	3,000	0.07	0.23
Total					1.92	6.40
3-1	0.95	1.56	2.25	11,750	0.27	0.90
Total					0.27	0.90
4-1	0.95	1.56	2.25	7,000	0.16	0.54
Total					0.16	0.54
5-1	0.95	1.56	2.25	9,250	0.21	0.71
Total					0.21	0.71

6-1	0.95	1.56	2.25	6,000	0.14	0.46
Total					0.14	0.46
7-1	0.95	1.56	2.25	18,500	0.42	1.42
7-2	0.95	1.56	2.25	34,375	0.79	2.63
Total					1.21	4.05
8-1	0.95	1.56	2.25	16,750	0.38	1.28
8-2	0.95	1.56	2.25	10,000	0.23	0.77
8-3	0.95	1.56	2.25	31,250	0.72	2.39
8-4	0.95	1.56	2.25	25,000	0.57	1.91
Total					1.91	6.35
9-1	0.95	1.56	2.25	5,750	0.13	0.44
Total					0.13	0.44
10-1	0.95	1.56	2.25	5,750	0.13	0.44
Total					0.13	0.44
11-1	0.95	1.56	2.25	9,500	0.22	0.73
11-2	0.95	1.56	2.25	23,650	0.54	1.81
Total					0.76	2.54
12-1	0.95	1.56	2.25	41,960	0.96	3.21
Total					0.96	3.21
13-1	0.95	1.56	2.25	13,750	0.32	1.05
13-2	0.95	1.56	2.25	24,200	0.56	1.85
13-3	0.95	1.56	2.25	4,125	0.09	0.32
13-4	0.95	1.56	2.25	8,250	0.19	0.63
13-5	0.95	1.56	2.25	4,400	0.10	0.34
13-6	0.95	1.56	2.25	4,950	0.11	0.38
13-7	0.95	1.56	2.25	3,300	0.08	0.25
13-8	0.95	1.56	2.25	6,738	0.15	0.52
13-9	0.95	1.56	2.25	8,250	0.19	0.63
13-10	0.95	1.56	2.25	15,125	0.35	1.16
13-11	0.95	1.56	2.25	12,375	0.28	0.95
13-12	0.95	1.56	2.25	12,375	0.28	0.95
Total					2.71	9.02
14-1	0.95	1.56	2.25	15,400	0.35	1.18
14-2	0.95	1.56	2.25	15,400	0.35	1.18
14-3	0.95	1.56	2.25	8,250	0.19	0.63
14-4	0.95	1.56	2.25	15,000	0.34	1.15
14-5	0.95	1.56	2.25	13,100	0.30	1.00
Total					1.54	5.14
15-1	0.95	1.56	2.25	6,800	0.16	0.52

15-2	0.95	1.56	2.25	4,300	0.10	0.33
15-3	0.95	1.56	2.25	4,250	0.10	0.33
Total					0.35	1.18
16-1	0.95	1.56	2.25	8,450	0.19	0.65
Total					0.19	0.65
17-1	0.95	1.56	2.25	15,500	0.36	1.19
Total					0.36	1.19
18-1	0.95	1.56	2.25	15,500	0.36	1.19
Total					0.36	1.19
19-1	0.95	1.56	2.25	6,250	0.14	0.48
Total					0.14	0.48
20-1	0.95	1.56	2.25	56,250	1.29	4.31
20-2	0.95	1.56	2.25	46,250	1.06	3.54
20-3	0.95	1.56	2.25	16,875	0.39	1.29
Total					2.74	9.14
21-1	0.95	1.56	2.25	4,000	0.09	0.31
21-2	0.95	1.56	2.25	4,250	0.10	0.33
Total					0.19	0.63
22-1	0.95	1.56	2.25	4,000	0.09	0.31
22-2	0.95	1.56	2.25	11,000	0.25	0.84
Total					0.34	1.15
23-1	0.95	1.56	2.25	6,750	0.15	0.52
Total					0.15	0.52
24-1	0.95	1.56	2.25	7,000	0.16	0.54
24-2	0.95	1.56	2.25	2,000	0.05	0.15
24-3	0.95	1.56	2.25	875	0.02	0.07
24-4	0.95	1.56	2.25	8,500	0.20	0.65
Total					0.42	1.41
25-1	0.95	1.56	2.25	4,000	0.09	0.31
25-2	0.95	1.56	2.25	4,500	0.10	0.34
Total					0.20	0.65
26-1	0.95	1.56	2.25	5,500	0.13	0.42
26-2	0.95	1.56	2.25	2,000	0.05	0.15
26-3	0.95	1.56	2.25	10,250	0.24	0.78
26-4	0.95	1.56	2.25	29,500	0.68	2.26
Total					1.08	3.62

27-1	0.95	1.56	2.25	10,500	0.24	0.80
27-2	0.95	1.56	2.25	7,000	0.16	0.54
Total					0.40	1.34
28-1	0.95	1.56	2.25	8,750	0.20	0.67
Total					0.20	0.67
29-1	0.95	1.56	2.25	9,750	0.22	0.75
Total					0.22	0.75
30-1	0.95	1.56	2.25	11,250	0.26	0.86
30-2	0.95	1.56	2.25	875	0.02	0.07
Total					0.28	0.93
31-1	0.95	1.56	2.25	10,375	0.24	0.79
Total					0.24	0.79
32-1	0.95	1.56	2.25	57,750	1.33	4.42
32-2	0.95	1.56	2.25	57,750	1.33	4.42
Total					2.65	8.84