

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	Kalihi Stream	21.33205	157.88941	2	0.95	3.15	0.85	0.98
2	Keehi Lagoon	21.33048	157.89074	A	0.95	3.15	6.72	20.12
3	Keehi Lagoon	21.31985	157.89052	A	0.95	3.15	5.20	15.55
4	Honolulu Harbor	21.31987	157.88230	A	0.95	3.15	0.32	0.96
5	Kapalama Canal	21.32030	157.87724	2	0.95	3.15	3.55	10.62
6	Kapalama Canal	21.32020	157.87736	2	0.95	3.15	0.44	1.32
7	Kapalama Canal	21.32003	157.87748	2	0.95	3.15	0.85	2.56
8	Kapalama Canal	21.32009	157.87713	2	0.95	3.15	0.25	0.74
9	Kapalama Canal	21.31994	157.87726	2	0.95	3.15	1.82	5.44
10	Honolulu Harbor	21.31683	157.87634	A	0.95	3.15	2.83	8.46
11	Honolulu Harbor	21.31492	157.87716	A	0.95	3.15	5.29	15.82
12	Honolulu Harbor	21.31399	157.86674	A	0.95	3.15	5.80	17.36
13	Honolulu Harbor	21.31396	157.86654	A	0.95	3.15	0.18	0.54
14	Honolulu Harbor	21.31392	157.86627	A	0.95	3.15	1.96	5.87
15	Nuuanu Stream	21.31365	157.86520	2	0.95	3.15	3.16	9.44
16	Nuuanu Stream	21.31304	157.86512	2	0.95	3.15	0.92	2.75
17	Honolulu Harbor	21.31275	157.86530	A	0.95	3.15	0.42	1.25
18	Honolulu Harbor	21.31176	157.86548	A	0.95	3.15	1.33	3.97
19	Honolulu Harbor	21.31096	157.86499	A	0.95	3.15	0.02	0.07
20	Honolulu Harbor	21.31069	157.86490	A	0.95	3.15	0.65	1.95
21	Honolulu Harbor	21.30997	157.86456	A	0.95	3.15	1.31	3.92

22	Honolulu Harbor	21.30917	157.86443	A	0.95	3.15	1.19	3.56
23	Honolulu Harbor	21.30630	157.86473	A	0.95	3.15	0.68	2.05
24	Honolulu Harbor	21.30548	157.86420	A	0.95	3.15	3.61	10.80
25	Honolulu Harbor	21.30511	157.86402	A	0.95	3.15	0.11	0.33
26	Honolulu Harbor	21.30363	157.86363	A	0.95	3.15	0.82	2.45
27	Honolulu Harbor	21.30342	157.86362	A	0.95	3.15	1.53	4.58
28	Honolulu Harbor	21.30358	157.86363	A	0.95	3.15	1.80	5.39
29	Honolulu Harbor	21.30098	157.86603	A	0.95	3.15	2.18	6.52
30	Mamala Bay	21.29448	157.86660	A	0.95	3.15	2.86	8.55
31	Kewalo Basin	21.29397	157.85769	A	0.95	3.15	1.19	5.96
32	Kewalo Basin	21.29401	157.85691	A	0.95	3.15	1.61	4.82
33	Kewalo Basin	21.29339	157.85553	A	0.95	3.15	1.35	4.03
34	Kewalo Basin	21.29262	157.85528	A	0.95	3.15	4.96	14.85
35	Ala Wai Boat Harbor	21.28774	157.84223	A	0.95	3.15	5.36	16.05
36	Ala Wai Boat Harbor	21.28810	157.84134	A	0.95	3.15	1.66	4.97
37	Kalihi Stream	21.33227	157.88941	A	0.95	3.15	0.75	2.23

RUNOFF CALCULATIONS

Given:

C = 0.95 (AC Pavement/Concrete Sidewalk/Concrete Driveways)
C=0.3 (Grassed/Pervious areas)

I = (2-yr, 1-hr event) = 1.40 in./hr.

$t_{cAll} = 10 \text{ min. (minimum)}$

$C_{fAll} = 2.25$

$I = i \times C_f$
 $= 1.40 \times 2.25$
 $= 3.15$

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)	CF	Area	A (Acres)	Q (CFS)
1-1	0.95	1.4	2.25	12,500	0.29	0.86
1-2	0.95	1.4	2.25	4,000	0.09	0.27
1-3	0.95	1.4	2.25	4,000	0.09	0.27
1-4	0.95	1.4	2.25	3,000	0.07	0.21
1-5	0.95	1.4	2.25	2,000	0.05	0.14
1-6	0.95	1.4	2.25	2,500	0.06	0.17
1-7	0.95	1.4	2.25	5,000	0.11	0.34
1-8	0.95	1.4	2.25	4,000	0.09	0.27
Total					0.85	2.54
2-1	0.95	1.4	2.25	7,000	0.16	0.48
2-2	0.95	1.4	2.25	3,500	0.08	0.24
2-3	0.95	1.4	2.25	1,500	0.03	0.10
2-4	0.95	1.4	2.25	4,000	0.09	0.27
2-5	0.95	1.4	2.25	3,500	0.08	0.24
2-6	0.95	1.4	2.25	6,500	0.15	0.45
2-7	0.95	1.4	2.25	3,500	0.08	0.24
2-8	0.95	1.4	2.25	3,500	0.08	0.24
2-9	0.95	1.4	2.25	5,000	0.11	0.34
2-10	0.95	1.4	2.25	5,000	0.11	0.34
2-11	0.95	1.4	2.25	2,500	0.06	0.17
2-12	0.95	1.4	2.25	6,000	0.14	0.41
2-13	0.95	1.4	2.25	89,200	2.05	6.13
2-14	0.95	1.4	2.25	4,800	0.11	0.33
2-15	0.95	1.4	2.25	7,200	0.17	0.49
2-16	0.95	1.4	2.25	7,200	0.17	0.49

2-17	0.95	1.4	2.25	12,000	0.28	0.82
2-18	0.95	1.4	2.25	7,200	0.17	0.49
2-19	0.95	1.4	2.25	11,200	0.26	0.77
2-20	0.95	1.4	2.25	6,400	0.15	0.44
2-21	0.95	1.4	2.25	12,800	0.29	0.88
2-22	0.95	1.4	2.25	54,000	1.24	3.71
2-23	0.95	1.4	2.25	11,200	0.26	0.77
2-24	0.95	1.4	2.25	18,200	0.42	1.25
Total					6.72	20.12
3-1	0.95	1.4	2.25	61,600	1.41	4.23
3-2	0.95	1.4	2.25	8,000	0.18	0.55
3-3	0.95	1.4	2.25	39,000	0.90	2.68
3-4	0.95	1.4	2.25	6,000	0.14	0.41
3-5	0.95	1.4	2.25	56,700	1.30	3.90
3-6	0.95	1.4	2.25	42,000	0.96	2.89
3-7	0.95	1.4	2.25	2,000	0.05	0.14
3-8	0.95	1.4	2.25	5,500	0.13	0.38
3-9	0.95	1.4	2.25	5,500	0.13	0.38
Total					5.20	15.55
4-1	0.95	1.4	2.25	14,000	0.32	0.96
Total					0.32	0.96
5-1	0.95	1.4	2.25	52,500	1.21	3.61
5-2	0.95	1.4	2.25	38,000	0.87	2.61
5-3	0.95	1.4	2.25	43,550	1.00	2.99
5-4	0.95	1.4	2.25	20,500	0.47	1.41
Total					3.55	10.62
6-1	0.95	1.4	2.25	19,200	0.44	1.32
Total					0.44	1.32
7-1	0.95	1.4	2.25	37,200	0.85	2.56
Total					0.85	2.56
8-1	0.95	1.4	2.25	10,800	0.25	0.74
Total					0.25	0.74
9-1	0.95	1.4	2.25	31,600	0.73	2.17
9-2	0.95	1.4	2.25	21,000	0.48	1.44
9-3	0.95	1.4	2.25	21,000	0.48	1.44
9-4	0.95	1.4	2.25	5,600	0.13	0.38
Total					1.82	5.44
10-1	0.95	1.4	2.25	22,800	0.52	1.57
10-2	0.95	1.4	2.25	18,000	0.41	1.24
10-3	0.95	1.4	2.25	29,600	0.68	2.03
10-4	0.95	1.4	2.25	17,400	0.40	1.20

10-5	0.95	1.4	2.25	35,300	0.81	2.43
Total					2.83	8.46
11-1	0.95	1.4	2.25	18,600	0.43	1.28
11-2	0.95	1.4	2.25	57,300	1.32	3.94
11-3	0.95	1.4	2.25	91,700	2.11	6.30
11-4	0.95	1.4	2.25	5,000	0.11	0.34
11-5	0.95	1.4	2.25	12,150	0.28	0.83
11-6	0.95	1.4	2.25	45,500	1.04	3.13
Total					5.29	15.82
12-1	0.95	1.4	2.25	120,750	2.77	8.30
12-2	0.95	1.4	2.25	5,250	0.12	0.36
12-3	0.95	1.4	2.25	5,250	0.12	0.36
12-4	0.95	1.4	2.25	19,350	0.44	1.33
12-5	0.95	1.4	2.25	8,000	0.18	0.55
12-6	0.95	1.4	2.25	30,100	0.69	2.07
12-7	0.95	1.4	2.25	18,200	0.42	1.25
12-8	0.95	1.4	2.25	8,400	0.19	0.58
12-9	0.95	1.4	2.25	3,000	0.07	0.21
12-10	0.95	1.4	2.25	21,750	0.50	1.49
12-11	0.95	1.4	2.25	9,000	0.21	0.62
12-12	0.95	1.4	2.25	1,800	0.04	0.12
12-13	0.95	1.4	2.25	1,800	0.04	0.12
Total					5.80	17.36
13-1	0.95	1.4	2.25	7,800	0.18	0.54
Total					0.18	0.54
14-1	0.95	1.4	2.25	9,600	0.22	0.66
14-2	0.95	1.4	2.25	13,650	0.31	0.94
14-3	0.95	1.4	2.25	6,300	0.14	0.43
14-4	0.95	1.4	2.25	7,500	0.17	0.52
14-5	0.95	1.4	2.25	39,000	0.90	2.68
14-6	0.95	1.4	2.25	9,400	0.22	0.65
Total					1.96	5.87
15-1	0.95	1.4	2.25	23,800	0.55	1.64
15-2	0.95	1.4	2.25	53,400	1.23	3.67
15-3	0.95	1.4	2.25	18,600	0.43	1.28
15-4	0.95	1.4	2.25	9,300	0.21	0.64
15-5	0.95	1.4	2.25	15,000	0.34	1.03
15-6	0.95	1.4	2.25	17,350	0.40	1.19
Total					3.16	9.44
16-1	0.95	1.4	2.25	34,400	0.79	2.36
16-2	0.95	1.4	2.25	5,600	0.13	0.38
Total					0.92	2.75

17-1	0.95	1.4	2.25	18,200	0.42	1.25
Total					0.42	1.25
18-1	0.95	1.4	2.25	21,000	0.48	1.44
18-2	0.95	1.4	2.25	11,200	0.26	0.77
18-3	0.95	1.4	2.25	25,600	0.59	1.76
Total					1.33	3.97
19-1	0.95	1.4	2.25	1,050	0.02	0.07
Total					0.02	0.07
20-1	0.95	1.4	2.25	14,000	0.32	0.96
20-2	0.95	1.4	2.25	14,400	0.33	0.99
Total					0.65	1.95
21-1	0.95	1.4	2.25	16,800	0.39	1.15
21-2	0.95	1.4	2.25	1,350	0.03	0.09
21-3	0.95	1.4	2.25	1,350	0.03	0.09
21-4	0.95	1.4	2.25	37,500	0.86	2.58
Total					1.31	3.92
22-1	0.95	1.4	2.25	41,200	0.95	2.83
22-2	0.95	1.4	2.25	3,600	0.08	0.25
22-3	0.95	1.4	2.25	3,000	0.07	0.21
22-4	0.95	1.4	2.25	4,000	0.09	0.27
Total					1.19	3.56
23-1	0.95	1.4	2.25	29,800	0.68	2.05
Total					0.68	2.05
24-1	0.95	1.4	2.25	5,400	0.12	0.37
24-2	0.95	1.4	2.25	13,650	0.31	0.94
24-3	0.95	1.4	2.25	33,600	0.77	2.31
24-4	0.95	1.4	2.25	7,000	0.16	0.48
24-5	0.95	1.4	2.25	22,500	0.52	1.55
24-6	0.95	1.4	2.25	1,500	0.03	0.10
24-7	0.95	1.4	2.25	13,300	0.31	0.91
24-8	0.95	1.4	2.25	3,600	0.08	0.25
24-9	0.95	1.4	2.25	20,600	0.47	1.42
24-10	0.95	1.4	2.25	36,000	0.83	2.47
Total					3.61	10.80
25-1	0.95	1.4	2.25	4,800	0.11	0.33
Total					0.11	0.33
26-1	0.95	1.4	2.25	10,600	0.24	0.73
26-2	0.95	1.4	2.25	10,500	0.24	0.72
26-3	0.95	1.4	2.25	14,500	0.34	1.00
Total					0.82	2.45

27-1	0.95	1.4	2.25	47,000	1.08	3.23
27-2	0.95	1.4	2.25	19,600	0.45	1.35
Total					1.53	4.58
28-1	0.95	1.4	2.25	18,000	0.41	1.24
28-2	0.95	1.4	2.25	4,000	0.09	0.27
28-3	0.95	1.4	2.25	2,700	0.06	0.19
28-4	0.95	1.4	2.25	17,000	0.39	1.17
28-5	0.95	1.4	2.25	26,500	0.61	1.82
28-6	0.95	1.4	2.25	9,000	0.21	0.62
28-7	0.95	1.4	2.25	1,250	0.03	0.09
Total					1.80	5.39
29-1	0.95	1.4	2.25	7,700	0.18	0.53
29-2	0.95	1.4	2.25	21,450	0.49	1.47
29-3	0.95	1.4	2.25	34,100	0.78	2.34
29-4	0.95	1.4	2.25	5,200	0.12	0.36
29-5	0.95	1.4	2.25	26,400	0.61	1.81
Total					2.18	6.52
30-1	0.95	1.4	2.25	12,800	0.29	0.88
30-2	0.95	1.4	2.25	18,800	0.43	1.29
30-3	0.95	1.4	2.25	3,600	0.08	0.25
30-4	0.95	1.4	2.25	22,200	0.51	1.53
30-5	0.95	1.4	2.25	18,900	0.43	1.30
30-6	0.95	1.4	2.25	5,700	0.13	0.39
30-7	0.95	1.4	2.25	14,400	0.33	0.99
30-8	0.95	1.4	2.25	3,250	0.07	0.22
30-9	0.95	1.4	2.25	3,250	0.07	0.22
30-10	0.95	1.4	2.25	21,600	0.50	1.48
Total					2.86	8.55
31-1	0.95	1.4	2.25	14,400	0.33	0.99
31-2	0.95	1.4	2.25	28,200	0.65	1.94
31-3	0.95	1.4	2.25	18,800	0.43	1.29
31-4	0.95	1.4	2.25	16,800	0.39	1.15
31-5	0.95	1.4	2.25	1,400	0.03	0.10
31-6	0.95	1.4	2.25	7,200	0.17	0.49
Total					1.99	5.96
32-1	0.95	1.4	2.25	30,000	0.69	2.06
32-2	0.95	1.4	2.25	31,800	0.73	2.18
32-3	0.95	1.4	2.25	8,400	0.19	0.58
Total					1.61	4.82
33-1	0.95	1.4	2.25	3,000	0.07	0.21
33-2	0.95	1.4	2.25	32,400	0.74	2.23
33-3	0.95	1.4	2.25	23,200	0.53	1.59

Total					1.35	4.03
34-1	0.95	1.4	2.25	35,400	0.81	2.43
34-2	0.95	1.4	2.25	23,600	0.54	1.62
34-3	0.95	1.4	2.25	10,200	0.23	0.70
34-4	0.95	1.4	2.25	37,800	0.87	2.60
34-5	0.95	1.4	2.25	32,400	0.74	2.23
34-6	0.95	1.4	2.25	4,550	0.10	0.31
34-7	0.95	1.4	2.25	30,000	0.69	2.06
34-8	0.95	1.4	2.25	6,600	0.15	0.45
34-9	0.95	1.4	2.25	35,650	0.82	2.45
Total					4.96	14.85
35-1	0.95	1.4	2.25	50,650	1.16	3.48
35-2	0.95	1.4	2.25	29,200	0.67	2.01
35-3	0.95	1.4	2.25	44,200	1.01	3.04
35-4	0.95	1.4	2.25	27,600	0.63	1.90
35-5	0.95	1.4	2.25	5,600	0.13	0.38
35-6	0.95	1.4	2.25	46,200	1.06	3.17
35-7	0.95	1.4	2.25	30,200	0.69	2.07
Total					5.36	16.05
36-1	0.95	1.4	2.25	50,650	1.16	3.48
36-2	0.95	1.4	2.25	20,000	0.46	1.37
36-3	0.95	1.4	2.25	1,750	0.04	0.12
Total					1.66	4.97
37-1	0.95	1.4	2.25	12,000	0.28	0.82
37-2	0.95	1.4	2.25	20,500	0.47	1.41
Total					0.75	2.23