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	21^20’09”	157^52’39”	2	0.95	3.915	2.30	8.56
2	Kapalama Stream	21^20’02”	157^52’04”	2	0.95	3.915	4.23	15.74
3	Kalihi Stream	21^20’24”	157^52’14”	2	0.95	3.915	2.36	8.79
4	Kalihi Stream	21^20’32”	157^52’09”	2	0.95	3.915	0.09	0.34
5	Kalihi Stream	21^20’36”	157^52’04”	2	0.95	3.915	1.09	4.05
6	Kalihi Stream	21^20’37” to 21^20’36”	157^52’03” to 157^52’04”	2	0.95	3.915	0.40	1.50
7	Kalihi Stream	21^20’37”	157^52’03”	2	0.95	3.915	0.53	1.96
8	Kalihi Stream	21^20’37”	157^52’03”	2	0.95	3.915	6.60	24.54
9	Kalihi Stream	21^20’51”	157^51’44”	2	0.95	3.915	2.65	9.86
10	Kalihi Stream	21^20’53”	157^51’41”	2	0.95	3.915	1.51	5.62
11	Kalihi Stream	21^21’01”	157^51’37”	2	0.95	3.915	0.28	1.03
12	Kalihi Stream	21^21’10”	157^51’33”	2	0.95	3.915	0.49	1.81
13	Kalihi Stream	21^21’11”	157^51’33”	2	0.95	3.915	0.74	2.74
14	Kapalama Stream	21^20’02”	157^52’04”	2	0.95	3.915	0.28	1.02
15	Kalihi Stream	21^21’08”	157^51’34”	2	0.95	3.915	0.22	0.83
16	Kalihi Stream	21^20’51”	157^51’44”	2	0.95	3.915	0.07	0.26
17	Kalihi Stream	21^21’14”	157^51’31”	2	0.95	3.915	0.05	0.17

RUNOFF CALCULATIONS

Given:

Area Disturbed 1-1 = 0.06 Acres
Area Disturbed 1-2 = 0.18 Acres
Area Disturbed 1-3 = 0.18 Acres
Area Disturbed 1-4 = 0.21 Acres
Area Disturbed 1-5 = 0.41 Acres
Area Disturbed 1-6 = 0.29 Acres
Area Disturbed 1-7 = 0.42 Acres
Area Disturbed 1-8 = 0.55 Acres

Area Disturbed 2-1 = 0.17 Acres
Area Disturbed 2-2 = 0.25 Acres
Area Disturbed 2-3 = 0.93 Acres
Area Disturbed 2-4 = 0.55 Acres
Area Disturbed 2-5 = 0.53 Acres
Area Disturbed 2-6 = 0.33 Acres
Area Disturbed 2-7 = 0.74 Acres
Area Disturbed 2-8 = 0.51 Acres
Area Disturbed 2-9 = 0.23 Acres

Area Disturbed 3-1 = 0.30 Acres
Area Disturbed 3-2 = 0.52 Acres
Area Disturbed 3-3 = 0.58 Acres
Area Disturbed 3-4 = 0.58 Acres
Area Disturbed 3-5 = 0.06 Acres
Area Disturbed 3-6 = 0.32 Acres

Area Disturbed 4-1 = 0.09 Acres

Area Disturbed 5-1 = 0.48 Acres
Area Disturbed 5-2 = 0.61 Acres

Area Disturbed 6-1 = 0.23 Acres
Area Disturbed 6-2 = 0.17 Acres

Area Disturbed 7-1 = 0.53 Acres

Area Disturbed 8-1 = 0.48 Acres
Area Disturbed 8-2 = 0.24 Acres
Area Disturbed 8-3 = 0.05 Acres
Area Disturbed 8-4 = 0.04 Acres
Area Disturbed 8-5 = 0.98 Acres
Area Disturbed 8-6 = 0.89 Acres

Area Disturbed 8-7 = 0.02 Acres
Area Disturbed 8-8 = 0.26 Acres
Area Disturbed 8-9 = 1.19 Acres
Area Disturbed 8-10 = 0.31 Acres
Area Disturbed 8-11= 0.73 Acres
Area Disturbed 8-12 = 0.40 Acres
Area Disturbed 8-13 = 0.42 Acres
Area Disturbed 8-14 = 0.58 Acres

Area Disturbed 9-1 = 0.50 Acres
Area Disturbed 9-2 = 0.13 Acres
Area Disturbed 9-3 = 0.00 Acres
Area Disturbed 9-4 = 0.36 Acres
Area Disturbed 9-5 = 0.76 Acres
Area Disturbed 9-6 = 0.90 Acres

Area Disturbed 10-1 = 0.06 Acres
Area Disturbed 10-2 = 0.93 Acres
Area Disturbed 10-3 = 0.51 Acres

Area Disturbed 11-1 = 0.28 Acres

Area Disturbed 12-1 = 0.49 Acres

Area Disturbed 13-1 = 0.10 Acres
Area Disturbed 13-2 = 0.57 Acres
Area Disturbed 13-3 = 0.07 Acres

Area Disturbed 14-1 = 0.28 Acres

Area Disturbed 15-1 = 0.12 Acres
Area Disturbed 15-2 = 0.10 Acres

Area Disturbed 16-1 = 0.07 Acres

Area Disturbed 17-1 = 0.05 Acres

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

i = (2-yr, 1-hr event) = 1.74 in./hr.

$tc_{(All\ Areas)}$ = 10 min. (minimum)

$Cf_{(All\ Areas)}$ = 2.25

I = i X Cf

I=1.74 in/hour x 2.25 = 3.915 in/hour

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 x I x A

Q_{1-1} = (0.95) x (3.915 in/hr) x (0.06 Acs)
Q_{1-1} = 0.24 cfs

Q_{1-2} = (0.95) x (3.915 in/hr) x (0.18 Acs)
Q_{1-2} = 0.68 cfs

Q_{1-3} = (0.95) x (3.915 in/hr) x (0.18 Acs)
Q_{1-3} = 0.67 cfs

Q_{1-4} = (0.95) x (3.915 in/hr) x (0.21 Acs)
Q_{1-4} = 0.77 cfs

Q_{1-5} = (0.95) x (3.915 in/hr) x (0.41 Acs)
Q_{1-5} = 1.54 cfs

Q_{1-6} = (0.95) x (3.915 in/hr) x (0.29 Acs)
Q_{1-6} = 1.08 cfs

Q_{1-7} = (0.95) x (3.915 in/hr) x (0.42 Acs)
Q_{1-7} = 1.55 cfs

Q_{1-8} = (0.95) x (3.915 in/hr) x (0.55 Acs)
Q_{1-8} = 2.03 cfs

Q_{2-1} = (0.95) x (3.915 in/hr) x (0.17 Acs)
Q_{2-1} = 0.64 cfs

Q_{2-2} = (0.95) x (3.915 in/hr) x (0.25 Acs)
Q_{2-2} = 0.93 cfs

Q_{2-3} = (0.95) x (3.915 in/hr) x (0.93 Acs)
Q_{2-3} = 3.45 cfs

Q_{2-4} = (0.95) x (3.915 in/hr) x (0.55 Acs)
Q_{2-4} = 2.05 cfs

Q_{2-5} = (0.95) x (3.915 in/hr) x (0.53 Acs)

Q_{2-5} = 1.96 cfs

Q_{2-6} = (0.95) x (3.915 in/hr) x (0.33 Acs)
Q_{2-6} = 1.22 cfs

Q_{2-7} = (0.95) x (3.915 in/hr) x (0.74 Acs)
Q_{2-7} = 2.75 cfs

Q_{2-8} = (0.95) x (3.915 in/hr) x (0.51 Acs)
Q_{2-8} = 1.88 cfs

Q_{2-9} = (0.95) x (3.915 in/hr) x (0.23 Acs)
Q_{2-9} = 0.85 cfs

Q_{3-1} = (0.95) x (3.915 in/hr) x (0.30 Acs)
Q_{3-1} = 1.11 cfs

Q_{3-2} = (0.95) x (3.915 in/hr) x (0.52 Acs)
Q_{3-2} = 1.95 cfs

Q_{3-3} = (0.95) x (3.915 in/hr) x (0.58 Acs)
Q_{3-3} = 2.15 cfs

Q_{3-4} = (0.95) x (3.915 in/hr) x (0.58 Acs)
Q_{3-4} = 2.15 cfs

Q_{3-5} = (0.95) x (3.915 in/hr) x (0.06 Acs)
Q_{3-5} = 0.23 cfs

Q_{3-6} = (0.95) x (3.915 in/hr) x (0.32 Acs)
Q_{3-6} = 1.20 cfs

Q_{4-1} = (0.95) x (3.915 in/hr) x (0.09 Acs)
Q_{4-1} = 0.34 cfs

Q_{5-1} = (0.95) x (3.915 in/hr) x (0.48 Acs)
Q_{5-1} = 1.79 cfs

Q_{5-2} = (0.95) x (3.915 in/hr) x (0.61 Acs)
Q_{5-2} = 2.25 cfs

$Q_{6\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.23 Acs)
$Q_{6\text{-}1}$ = 0.85 cfs

$Q_{6\text{-}2}$ = (0.95) x (3.915 in/hr) x (0.17 Acs)
$Q_{6\text{-}2}$ = 0.65 cfs

$Q_{7\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.53 Acs)
$Q_{7\text{-}1}$ = 1.96 cfs

$Q_{8\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.48 Acs)
$Q_{8\text{-}1}$ = 1.78 cfs

$Q_{8\text{-}2}$ = (0.95) x (3.915 in/hr) x (0.24 Acs)
$Q_{8\text{-}2}$ = 0.89 cfs

$Q_{8\text{-}3}$ = (0.95) x (3.915 in/hr) x (0.05 Acs)
$Q_{8\text{-}3}$ = 0.17 cfs

$Q_{8\text{-}4}$ = (0.95) x (3.915 in/hr) x (0.04 Acs)
$Q_{8\text{-}4}$ = 0.14 cfs

$Q_{8\text{-}5}$ = (0.95) x (3.915 in/hr) x (0.98 Acs)
$Q_{8\text{-}5}$ = 3.65 cfs

$Q_{8\text{-}6}$ = (0.95) x (3.915 in/hr) x (0.89 Acs)
$Q_{8\text{-}6}$ = 3.32 cfs

$Q_{8\text{-}7}$ = (0.95) x (3.915 in/hr) x (0.02 Acs)
$Q_{8\text{-}7}$ = 0.09 cfs

$Q_{8\text{-}8}$ = (0.95) x (3.915 in/hr) x (0.26 Acs)
$Q_{8\text{-}8}$ = 0.98 cfs

$Q_{8\text{-}9}$ = (0.95) x (3.915 in/hr) x (1.19 Acs)
$Q_{8\text{-}9}$ = 4.42 cfs

$Q_{8\text{-}10}$ = (0.95) x (3.915 in/hr) x (0.31 Acs)
$Q_{8\text{-}10}$ = 1.15 cfs

$Q_{8\text{-}11}$ = (0.95) x (3.915 in/hr) x (0.73 Acs)
$Q_{8\text{-}11}$ = 2.73 cfs

$Q_{8\text{-}12}$ = (0.95) x (3.915 in/hr) x (0.40 Acs)

Q_{8-12} = 1.49 cfs

Q_{8-13} = (0.95) x (3.915 in/hr) x (0.42 Acs)
Q_{8-13} = 1.58 cfs

Q_{8-14} = (0.95) x (3.915 in/hr) x (0.58 Acs)
Q_{8-14} = 2.15 cfs

Q_{9-1} = (0.95) x (3.915 in/hr) x (0.50 Acs)
Q_{9-1} = 1.85 cfs

Q_{9-2} = (0.95) x (3.915 in/hr) x (0.13 Acs)
Q_{9-2} = 0.49 cfs

Q_{9-3} = (0.95) x (3.915 in/hr) x (0.00 Acs)
Q_{9-3} = 0.00 cfs

Q_{9-4} = (0.95) x (3.915 in/hr) x (0.36 Acs)
Q_{9-4} = 1.34 cfs

Q_{9-5} = (0.95) x (3.915 in/hr) x (0.76 Acs)
Q_{9-5} = 2.84 cfs

Q_{9-6} = (0.95) x (3.915 in/hr) x (0.90 Acs)
Q_{9-6} = 3.35 cfs

Q_{10-1} = (0.95) x (3.915 in/hr) x (0.06 Acs)
Q_{10-1} = 0.24 cfs

Q_{10-2} = (0.95) x (3.915 in/hr) x (0.93 Acs)
Q_{10-2} = 3.47 cfs

Q_{10-3} = (0.95) x (3.915 in/hr) x (0.51 Acs)
Q_{10-3} = 1.91 cfs

Q_{11-1} = (0.95) x (3.915 in/hr) x (0.28 Acs)
Q_{11-1} = 1.03 cfs

Q_{12-1} = (0.95) x (3.915 in/hr) x (0.49 Acs)
Q_{12-1} = 1.81 cfs

Q_{13-1} = (0.95) x (3.915 in/hr) x (0.10 Acs)

$Q_{13\text{-}1}$ = 0.36 cfs

$Q_{13\text{-}2}$ = (0.95) x (3.915 in/hr) x (0.57 Acs)
$Q_{13\text{-}2}$ = 2.11 cfs

$Q_{13\text{-}3}$ = (0.95) x (3.915 in/hr) x (0.07 Acs)
$Q_{13\text{-}3}$ = 0.27 cfs

$Q_{14\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.28 Acs)
$Q_{14\text{-}1}$ = 1.02 cfs

$Q_{15\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.12 Acs)
$Q_{15\text{-}1}$ = 0.45 cfs

$Q_{15\text{-}2}$ = (0.95) x (3.915 in/hr) x (0.10 Acs)
$Q_{15\text{-}2}$ = 0.38 cfs

$Q_{16\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.07 Acs)
$Q_{16\text{-}1}$ = 0.26 cfs

$Q_{17\text{-}1}$ = (0.95) x (3.915 in/hr) x (0.05 Acs)
$Q_{17\text{-}1}$ = 0.17 cfs