Attachment A-2
Tables and Calculations

Discharge Point Information and Discharge Quantity (Table 1)

Discharge Point	Location	Latitude	Longitude	Contributary Outlet(s)	Q(cfs)	Class
1	Waimea River Tributary	22D02'55"	159D39'42"	I-14, S-1	0.68	2
2	Waimea River Tributary	22D02'38"	159D39'28"	I-12, I-13, S-2	5.33	2
3	Kapue Valley Stream	Start: 22D02'56" End: 22D02'22"	Start:159D39'50" End: 159D40'15"	I-6, I-7, I-8, I-9, I-10, I-11, S-3	12.97	2
4	Kaohe Valley Stream	Start: 22D02'22" End: 22D02'11"	Start: 159D40'15" End: 159D40'18"	I-5, S-4	1.49	2
5	Waimea River Tributary	22D02'11"	159D39'31"	S-5	2.40	2
6	Kaohe Valley Stream	Start: 22D02'11" End: 22D02'06"	Start: 159D40'02" End: 159D40'11"	I-2, I-3, I-4, S-6	6.81	2
7	Waimea River Tributary	22D01'59"	159D40'00"	S-7	1.34	2
8	Waimea River Tributary	22D01'51"	159D40'07"	S-8	1.63	2
9	Waimea River Tributary	22D01'40"	159D40'10"	S-9	2.16	2
10	Waimea River Tributary	Start: 22D01'44" End: 22D01'12"	Start: 159D40'20" End: 159D40'20"	S-10, I-1	11.91	2
11	Waipao Valley Stream	22D01'32"	159D40'34"	S-11	1.49	2

***Q = ΣContributary Outlets**

Quantity of Storm Water Discharge

The main disturbance during construction comes mainly from the reconstruction of weakened pavement areas, cold planing and resurfacing.

Use the **Rational Method** in calculating the quantity of storm water runoff from Maximum Area of disturbance:

$$\mathbf{Q = CIA}$$

where:
Q = quantity of storm water runoff in cu.ft./sec.
C = runoff coefficient
I = rainfall intensity in inches for the duration equal to time of concentration, Tc (use Tc = 10 min.)
A = drainage area in acres

For this project:
C = 0.87 for paved streets
I = 2.00 (see calculations below)
A = varies (see table below)

$$\mathbf{I = i \times Cf}$$

where:
i = 2.0 (intensity of a 2-yr., 1-hr rainfall)
Cf = 2.30 (correction factor)

$$I = i \times Cf = 2.0 \times 2.3 = 5.52$$

For design parameters, refer to County of Kauai Storm Water Runoff System Manual 2001.
See attachment "X" for Quantity of Storm Water Discharges.

Quantity of Storm Water Discharge (Table 2)
Runoff Calculations

TABLE 1- QUANTITY OF STORM WATER DISCHARGE							
OUTLET NO.	**RECEIVING STATE WATER**	**LOCATION**	**i (in./hr)**	**C (const.)**	**I (in./hr)**	**A (Acre)**	**Q (cfs)**
I-1	Waimea River Tributary	Route 550, BL Sta. 324+50	2.0	0.87	5.52	1.00	4.80
I-2	Waimea River Tributary	Route 550, BL Sta. 357+35	2.0	0.87	5.52	0.10	0.48
I-3	Kapue Valley Stream	Route 550, BL Sta. 360+60	2.0	0.87	5.52	0.28	1.34
I-4	Kaohe Valley Stream	Route 550, BL Sta. 368+60	2.0	0.87	5.52	0.21	1.00
I-5	Kaohe Valley Stream	Route 550, BL Sta. 374+50	2.0	0.87	5.52	0.10	0.48
I-6	Kapue Valley Stream	Route 550, BL Sta. 391+40	2.0	0.87	5.52	0.10	0.48
I-7	Kapue Valley Stream	Route 550, BL Sta. 394+50	2.0	0.87	5.52	0.05	0.24
I-8	Kapue Valley Stream	Route 550, BL Sta. 395+50	2.0	0.87	5.52	0.07	0.34
I-9	Kapue Valley Stream	Route 550, BL Sta. 408+15	2.0	0.87	5.52	0.38	1.82
I-10	Kapue Valley Stream	Route 550, BL Sta. 419+30	2.0	0.87	5.52	0.24	1.15
I-11	Kapue Valley Stream	Route 550, BL Sta. 426+20	2.0	0.87	5.52	0.17	0.82
I-12	Waimea River Tributary	Route 550, BL Sta. 434+80	2.0	0.87	5.52	0.14	0.67
I-13	Waimea River Tributary	Route 550, BL Sta. 440+50	2.0	0.87	5.52	0.14	0.67
I-14	Waimea River Tributary	Route 550, BL Sta. 443+90	2.0	0.87	5.52	0.07	0.34
S-1	Waimea River Tributary	Route 550, BL Sta. 443+90 to BL Sta. 448+00	2.0	0.87	5.52	0.07	0.34
S-2	Waimea River Tributary	Route 550, BL Sta. 448+00 to BL Sta. 408+15	2.0	0.87	5.52	0.83	3.99
S-3	Kapue Valley Stream	Route 550, BL Sta. 434+50 to BL Sta. 376+00	2.0	0.87	5.52	1.69	8.12

TABLE 1- QUANTITY OF STORM WATER DISCHARGE (CON'T.)							
OUTLET NO.	**RECEIVING STATE WATER**	**LOCATION**	**i (in./hr)**	**C (const.)**	**I (in./hr)**	**A (Acre)**	**Q (cfs)**
S-4	Kaohe Valley Stream	Route 550, BL Sta. 370+00 to BL Sta. 375+50	2.0	0.87	5.52	0.21	1.01
S-5	Waimea River Tributary	Route 550, BL Sta. 391+40 to BL Sta. 377+00	2.0	0.87	5.52	0.50	2.40
S-6	Kapue/Kaohe Valley Streams	Route 550, BL Sta. 369+00 to BL Sta. 351+00	2.0	0.87	5.52	0.83	3.99
S-7	Waimea River Tributary	Route 550, BL Sta. 357+35 to BL Sta. 349+60	2.0	0.87	5.52	0.28	1.34
S-8	Waimea River Tributary	Route 550, BL Sta. 349+60 to BL Sta. 339+50	2.0	0.87	5.52	0.34	1.63
S-9	Waimea River Tributary	Route 550, BL Sta. 339+50 to BL Sta. 327+50	2.0	0.87	5.52	0.45	2.16
S-10	Waimea River Tributary	Route 550, BL Sta. 349+60 to BL Sta. 312+84.36	2.0	0.87	5.52	1.48	7.11
S-11	Waipao Valley Stream	Route 550, BL Sta. 320+80 to BL Sta. 312+84.36	2.0	0.87	5.52	0.31	1.49

***I-1 to I-14: Drain Inlets 1 through 14**

***S-1 to S-11: Contributary Sheet Flow for Dishcharge Points 1 through 11**

Q(total)= ΣQ x (7.48 Gallons / 1 cu. ft.) x (1 Gallon/10^{-6} Million Gallons) x (86400 sec. / Day)
= (48.21 cu. ft. / sec.) x (7.48 x 10^{-6} Million Gallons / cu. ft.) x (86400 sec. / Day)
= **31.16 Million Gallons / Day**