

APPENDIX A

RUNOFF CALCULATIONS PROPOSED CONDITIONS

Drainage Area	Flow to Inlet #	C	Area		*Tc (min)	I ₁₀ (in/hr)	Q (cfs)	Permitted Feature Identifier	Permitted Feature Name	Permitted Feature Location		Receiving Water Classification
			(SF)	(acres)						Lat.	Long.	
DA 1-1	CB 2-2	0.90	1,683	0.039	5.0	7.26	0.2524495	001	Palolo Stream	21.288318	-157.805456	Class 2 Inland
DA 2-1	CB 2-1	0.90	20,610	0.473	8.6	5.77	2.4570142	002	Palolo Stream	21.28825	-157.805585	Class 2 Inland
DA 2-2	CB 2-4	0.90	817	0.019	5.0	7.26	0.1225498	002	Palolo Stream	21.28825	-157.805585	Class 2 Inland
DA 3-1	CB 1-1	0.90	15,039	0.345	8.3	5.88	1.8270123	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-2	CB 1-9	0.90	36,978	0.849	5.0	7.09	5.4168089	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-3	DI B-1	0.90	951	0.022	5.0	7.13	0.1400954	N/A	Runoff Captured and Retained			
DA 3-4	DI A-1	0.90	951	0.022	5.0	7.13	0.1400954	N/A	Runoff Captured and Retained			
DA 3-5	CB 1-13	0.90	46,837	1.075	7.1	6.32	6.1158948	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-6	CB 1-14	0.90	617	0.014	5.0	7.09	0.0903827	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-7	CB 1-15	0.90	11,690	0.268	5.0	7.09	1.712437	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-8	CB 1-18	0.90	10,743	0.247	5.0	7.09	1.5737135	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-9	CB 1-21	0.90	2,122	0.049	5.0	7.09	0.3108461	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-10	CB 1-19	0.90	1,287	0.030	5.0	7.09	0.1885292	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-11	CB 1-20	0.90	1,276	0.029	5.0	7.09	0.1869178	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 3-12	CB 1-22	0.90	15,218	0.349	5.0	6.92	2.1757928	003	Ala Wai Canal & Harbor (Canal Diamond Head Stn)	21.276122	-157.818388	Class 2 Inland
DA 4-1	CB 4-4	0.90	3,228	0.074	5.0	6.97	0.4648578	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 4-2	CB 4-5	0.90	2,078	0.048	5.0	6.97	0.2992486	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 4-3	CB 4-3	0.90	15,504	0.356	5.0	6.97	2.2327001	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 4-4	DI 4-1A	0.90	8,848	0.203	5.0	6.97	1.2741828	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine

DA 4-5	CB 4-6	0.90	11,673	0.268	5.0	6.97	1.6809608	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 4-6	CB 4-7	0.90	10,106	0.232	5.0	6.97	1.4553449	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 4-7	CB 3-18	0.90	2,192	0.050	5.0	6.92	0.3134011	004	Ka'alawai Beach	21.25705818	-157.7967635	Class AA Marine
DA 5-1	CB 4-1A	0.90	2,346	0.054	5.0	6.97	0.3378428	005	Ka'alawai Beach	21.257013	-157.796747	Class AA Marine
DA 5-2	CB 4-2	0.90	3,985	0.091	5.0	6.97	0.5738719	005	Ka'alawai Beach	21.257013	-157.796747	Class AA Marine
DA 5-3		0.90	19,273	0.442	5.0	6.97	2.7754663	005	Ka'alawai Beach	21.257013	-157.796747	Class AA Marine
DA 6-1	CB 5-2	0.90	43,713	1.004	5.7	6.75	6.0963269	006	Kahala Beach	21.258371	-157.788926	Class A Marine
DA 6-2	DI 5-2	0.90	19,456	0.447	5.0	7.00	2.8138793	006	Kahala Beach	21.258371	-157.788926	Class A Marine
DA 6-3	DI 5-1	0.90	9,747	0.224	5.0	7.00	1.4096876	006	Kahala Beach	21.258371	-157.788926	Class A Marine
DA 7-1	CB 3-1	0.90	4,455	0.102	5.0	6.92	0.6369534	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-2	CB 3-2	0.90	9,199	0.211	5.0	6.92	1.3152266	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-3	CB 3-3	0.90	5,879	0.135	5.0	6.92	0.8405497	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-4	CB 3-4	0.90	6,867	0.158	5.0	6.92	0.981809	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-5	CB 3-6	0.90	12,893	0.296	5.0	6.92	1.843376	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-6	CB 3-5	0.90	3,660	0.084	5.0	6.92	0.5233512	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-7	CB 3-8	0.90	11,518	0.264	5.0	6.92	1.6467855	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-8	CB 3-9	0.90	15,507	0.356	5.0	6.92	2.2171126	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-9	CB 3-7	0.90	20,936	0.481	5.0	6.92	2.9933236	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-10	CB 3-10	0.90	4,820	0.111	5.0	6.92	0.6891393	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-11	CB 3-11	0.90	15,593	0.358	5.0	6.92	2.2294084	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-12	CB 3-12	0.90	13,603	0.312	5.0	6.92	1.9448883	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-13	CB 3-13	0.90	60,797	1.396	8.8	5.59	7.0217897	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
DA 7-14	CB 3-14	0.90	73,507	1.687	8.8	5.59	8.4897395	007	Unnamed Drainage Channel	21.272045	-157.786349	Class 2 Inland
			Totals	13.274	acres		77.811763	cfs				
	Total Permitted Area			13.274	acres							

	Total Impervious Area			13.274	acres							

- Notes:
1. The Rational Method ($Q = CIA$) is used to determine 10-year runoff since drainage areas are < 100 acres.
 2. Refer to Runoff Coefficient Calculations for determination of "C" value.
 3. Refer to Time of Concentration Calculations for determination of "Tc" value.
 4. Rainfall Intensity obtained from NOAA Atlas 14, available online through the NOAA Precipitation Frequency Data Server: <https://hdsc.nws.noaa.gov/hdsc/pfds> (attached in Appendix A)
 5. Runoff volume determined based on triangular Rational Method hydrograph ending at 1-hour. Hydrograph Volume = $(Q \text{ ft}^3/\text{sec}) \times (60 \text{ sec/min}) \times (60 \text{ min/hr}) \times (1/2)$