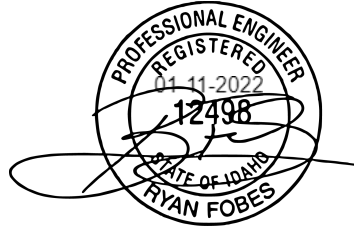




FORESITE
ENGINEERING

THE APARTMENTS AT THE RETREAT AT BAY TRAIL

STORMWATER CALCULATIONS
TUESDAY, JANUARY 11, 2022



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FORESITE ENGINEERING, PLLC

BASIN LOT 1 Stormwater Calculation

Pre-Developed Condition

Area (acres)	0.44
Pre-Developed "C" Factor	0.50
Design Storm Intensity (in/hr)	2.85
Pre-Developed Outflow (c.f.s.)	0.63

Developed Condition

Time Increment (min)	5.00
# of 600 Gallon Dry Wells	0
# of 1000 Gallon Dry Wells	0
Post-Developed Outflow (cfs)	0.99
Design Year Flow (yr)	25.00
Area (acres)	0.44
Developed "C" Factor	0.78
Area x "C"	0.35
Soil infiltration rate (in/hr)	0.32

Flow Calcs:

Q _{INFILTRATE}	0.32	CFS
Q _{DRYWELL}	0.00	CFS

#1 Time Inc. (min.)	#2 t Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q _{dev} (cfs)	#5 V _{in} (1) (ft ³)	#6 V _{out} (ft ³)	Required Storage Volume (ft ³)
			(see below)	(see below)		
0	0.00	0	0	0	0	0
5	300.00	2.85	0.67	268	190	78
10	600.00	2.21	0.45	358	295	63
15	900.00	1.87	0.33	393	373	19
20	1,200.00	1.68	0.26	417	447	0
25	1,500.00	1.49	0.19	371	495	0
30	1,800.00	1.29	0.13	281	517	0
35	2,100.00	1.22	0.10	249	567	0
40	2,400.00	1.14	0.07	201	605	0
45	2,700.00	1.06	0.04	136	634	0
50	3,000.00	0.98	0.02	55	651	0
55	3,300.00	0.90	0.00	0	658	0
60	3,600.00	0.82	0.00	0	655	0
65	3,900.00	0.79	0.00	0	686	0
70	4,200.00	0.77	0.00	0	714	0
75	4,500.00	0.74	0.00	0	737	0
80	4,800.00	0.71	0.00	0	758	0
85	5,100.00	0.68	0.00	0	775	0
90	5,400.00	0.66	0.00	0	788	0
95	5,700.00	0.63	0.00	0	797	0
100	6,000.00	0.60	0.00	0	803	0
105	6,300.00	0.58	0.00	0	805	0
110	6,600.00	0.55	0.00	0	804	0
115	6,900.00	0.52	0.00	0	799	0
120	7,200.00	0.49	0.00	0	791	0

(1) $V_{in} = 1.34 * Q_{Dev} * t$ for $t < T_c$

$V_{in} = (Q_{Dev} * t) + (.34 * Q_{Dev} * T_c)$ for $t > T_c$

$Q_{dev} = CIA - Q_{DRYWELL} - Q_{INFILTRATE}$

Pre-Development:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Trees/Brush	0.00	0.00	55	0.15
Gravel	0.00	0.00	76	0.55
Pavement	0.00	0.00	98	0.9
Grass	19,340.00	0.44	50	0.5
0	0.00	0.00	0	0
Totals:	19,340.00	0.44	50	0.5

Post-Development:

Tributary Area:

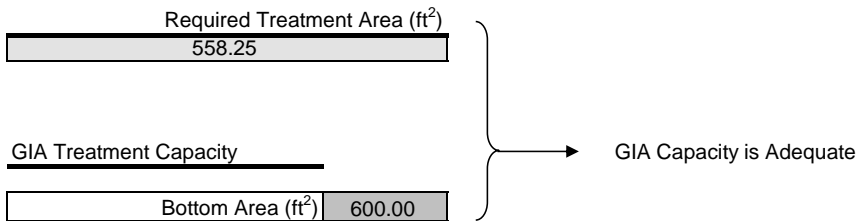
Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Driveway / Parking	6,699.00	0.15	98	0.9
Grass	7,532.00	0.17	50	0.6
Roof	3,480.00	0.08	98	0.9
Concrete	1,629.00	0.04	98	0.9
0	0.00	0.00	0	0
0	0.00	0.00	0	0
Totals:	19,340.00	0.44	71	0.78

Impervious Area:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)
Driveway / Parking	6,699.00	0.15
0.00	0.00	0.00
Totals:	6,699.00	0.15

Required treatment volume calculated for treatment of first 1/2" of a rain event



Storm Attenuation:

Stormwater Detention Basin Area (ft ²)	600.00
Detention Basin Depth (ft)	1.00
Detention Basin Storage Volume (ft ³)	600.00

Pre-Developed Flow (cfs)	0.63
Post-Developed Flow (cfs)	0.99
Required Storage Volume (ft ³)	78.44
Storage Volume (ft ³)	600.00

Capacity is Adequate

EAST BASIN LOT 26, 27 Stormwater Calculation

Pre-Developed Condition

Area (acres)	0.18
Pre-Developed "C" Factor	0.50
Design Storm Intensity (in/hr)	2.85
Pre-Developed Outflow (c.f.s.)	0.26

Developed Condition

Time Increment (min)	5.00
# of 600 Gallon Dry Wells	0
# of 1000 Gallon Dry Wells	0
Post-Developed Outflow (cfs)	0.41
Design Year Flow (yr)	25.00
Area (acres)	0.18
Developed "C" Factor	0.79
Area x "C"	0.14
Soil infiltration rate (in/hr)	0.32

Flow Calcs:

Q _{INFILTRATE}	0.32	CFS
Q _{DRYWELL}	0.00	CFS

#1 Time Inc. (min.)	#2 t Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q _{dev} (cfs)	#5 V _{in} (1) (ft ³)	#6 V _{out} (ft ³)	Required Storage Volume (ft ³)
			(see below)	(see below)		
0	0.00	0	0	0	0	0
5	300.00	2.85	0.09	34	77	0
10	600.00	2.21	0.00	0	120	0
15	900.00	1.87	0.00	0	152	0
20	1,200.00	1.68	0.00	0	182	0
25	1,500.00	1.49	0.00	0	202	0
30	1,800.00	1.29	0.00	0	211	0
35	2,100.00	1.22	0.00	0	231	0
40	2,400.00	1.14	0.00	0	247	0
45	2,700.00	1.06	0.00	0	258	0
50	3,000.00	0.98	0.00	0	265	0
55	3,300.00	0.90	0.00	0	268	0
60	3,600.00	0.82	0.00	0	267	0
65	3,900.00	0.79	0.00	0	280	0
70	4,200.00	0.77	0.00	0	291	0
75	4,500.00	0.74	0.00	0	301	0
80	4,800.00	0.71	0.00	0	309	0
85	5,100.00	0.68	0.00	0	316	0
90	5,400.00	0.66	0.00	0	321	0
95	5,700.00	0.63	0.00	0	325	0
100	6,000.00	0.60	0.00	0	327	0
105	6,300.00	0.58	0.00	0	328	0
110	6,600.00	0.55	0.00	0	328	0
115	6,900.00	0.52	0.00	0	326	0
120	7,200.00	0.49	0.00	0	322	0

(1) $V_{in} = 1.34 * Q_{Dev} * t$ for $t < T_c$

$V_{in} = (Q_{Dev} * t) + (.34 * Q_{Dev} * T_c)$ for $t > T_c$

$Q_{dev} = CIA - Q_{DRYWELL} - Q_{INFILTRATE}$

Pre-Development:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Trees/Brush	0.00	0.00	55	0.15
Gravel	0.00	0.00	76	0.55
Pavement	0.00	0.00	98	0.9
Grass	7,884.40	0.18	50	0.5
0	0.00	0.00	0	0
Totals:	7,884.40	0.18	50	0.5

Post-Development:

Tributary Area:

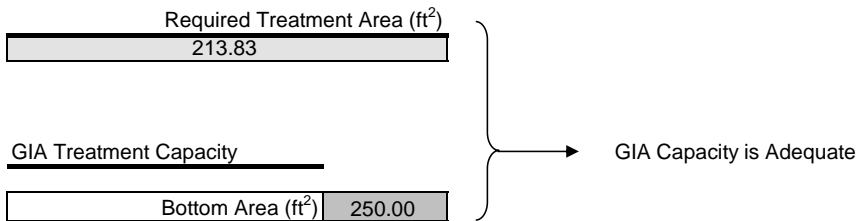
Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Driveway / Parking	2,566.00	0.06	98	0.9
Grass	2,795.40	0.06	50	0.6
Roof	1,740.00	0.04	98	0.9
Concrete	783.00	0.02	98	0.9
0	0.00	0.00	0	0
0	0.00	0.00	0	0
Totals:	7,884.40	0.18	71	0.79

Impervious Area:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)
Driveway / Parking	2,566.00	0.06
0.00	0.00	0.00
Totals:	2,566.00	0.06

Required treatment volume calculated for treatment of first 1/2" of a rain event



Storm Attenuation:

Stormwater Detention Basin Area (ft ²)	250.00
Detention Basin Depth (ft)	1.00
Detention Basin Storage Volume (ft ³)	250.00

Pre-Developed Flow (cfs)	0.26
Post-Developed Flow (cfs)	0.41
Required Storage Volume (ft ³)	0.00
Storage Volume (ft ³)	250.00

Capacity is Adequate

WEST BASIN LOT 26, 27 Stormwater Calculation

Pre-Developed Condition

Area (acres)	0.27
Pre-Developed "C" Factor	0.50
Design Storm Intensity (in/hr)	2.85
Pre-Developed Outflow (c.f.s.)	0.39

Developed Condition

Time Increment (min)	5.00
# of 600 Gallon Dry Wells	0
# of 1000 Gallon Dry Wells	0
Post-Developed Outflow (cfs)	0.59
Design Year Flow (yr)	25.00
Area (acres)	0.27
Developed "C" Factor	0.77
Area x "C"	0.21
Soil infiltration rate (in/hr)	0.32

Flow Calcs:

Q _{INFILTRATE}	0.32	CFS
Q _{DRYWELL}	0.00	CFS

#1 Time Inc. (min.)	#2 t Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q _{dev} (cfs)	#5 V _{in} (1) (ft ³)	#6 V _{out} (ft ³)	Required Storage Volume (ft ³)
			(see below)	(see below)		
0	0.00	0	0	0	0	0
5	300.00	2.85	0.27	108	116	0
10	600.00	2.21	0.14	109	180	0
15	900.00	1.87	0.06	77	228	0
20	1,200.00	1.68	0.02	39	273	0
25	1,500.00	1.49	0.00	0	303	0
30	1,800.00	1.29	0.00	0	316	0
35	2,100.00	1.22	0.00	0	346	0
40	2,400.00	1.14	0.00	0	370	0
45	2,700.00	1.06	0.00	0	387	0
50	3,000.00	0.98	0.00	0	398	0
55	3,300.00	0.90	0.00	0	403	0
60	3,600.00	0.82	0.00	0	400	0
65	3,900.00	0.79	0.00	0	419	0
70	4,200.00	0.77	0.00	0	436	0
75	4,500.00	0.74	0.00	0	451	0
80	4,800.00	0.71	0.00	0	463	0
85	5,100.00	0.68	0.00	0	474	0
90	5,400.00	0.66	0.00	0	482	0
95	5,700.00	0.63	0.00	0	488	0
100	6,000.00	0.60	0.00	0	491	0
105	6,300.00	0.58	0.00	0	493	0
110	6,600.00	0.55	0.00	0	492	0
115	6,900.00	0.52	0.00	0	489	0
120	7,200.00	0.49	0.00	0	484	0

(1) $V_{in} = 1.34 * Q_{Dev} * t$ for $t < T_c$

$V_{in} = (Q_{Dev} * t) + (.34 * Q_{Dev} * T_c)$ for $t > T_c$

$Q_{dev} = CIA - Q_{DRYWELL} - Q_{INFILTRATE}$

Pre-Development:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Trees/Brush	0.00	0.00	55	0.15
Gravel	0.00	0.00	76	0.55
Pavement	0.00	0.00	98	0.9
Grass	11,826.60	0.27	50	0.5
0	0.00	0.00	0	0
Totals:	11,826.60	0.27	50	0.5

Post-Development:

Tributary Area:

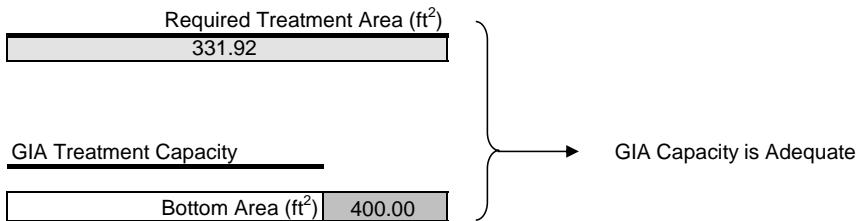
Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Driveway / Parking	3,983.00	0.09	98	0.9
Grass	5,320.60	0.12	50	0.6
Roof	1,740.00	0.04	98	0.9
Concrete	783.00	0.02	98	0.9
0	0.00	0.00	0	0
0	0.00	0.00	0	0
Totals:	11,826.60	0.27	70	0.77

Impervious Area:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)
Driveway / Parking	3,983.00	0.09
0.00	0.00	0.00
Totals:	3,983.00	0.09

Required treatment volume calculated for treatment of first 1/2" of a rain event



Storm Attenuation:

Stormwater Detention Basin Area (ft ²)	400.00
Detention Basin Depth (ft)	1.00
Detention Basin Storage Volume (ft ³)	400.00

Pre-Developed Flow (cfs)	0.39
Post-Developed Flow (cfs)	0.59
Required Storage Volume (ft ³)	0.00
Storage Volume (ft ³)	400.00

Capacity is Adequate