

COMPOSITE RUNOFF COEFFICIENT (C)

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - EXISTING SITE

DATE: 12/14/2022

TYPE OF AREA (SELECT WITH DROP-DOWN)

☐ DETAINED AREA

☐ MAJOR STORMWATER SYSTEM

☐ UNRESTRICTED AREA

☒ OTHER: SITE

☐ UPSTREAM AREA

CONDITION (SELECT WITH DROP-DOWN)

☐ PROPOSED CONDITION

☒ EXISTING CONDITION

RUNOFF COEFFICIENT

Surface Description	C	Area (acres)	Product (C)(Area)
Impervious (Village C)	0.95	3.71	3.52
Permeable Playground	0.75	0.15	0.11
Pervious (Village C)	0.50	3.68	1.84

TOTALS:

7.54

5.48

COMPOSITE RUNOFF COEFFICIENT

$$\text{Composite C} = \frac{\text{Total Product}}{\text{Total Area}} = \frac{5.48}{7.54} \rightarrow \text{Composite C} = 0.73$$

MODIFIED RATIONAL METHOD: BULLETIN 70 RAINFALL DATA

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - EXISTING SITE

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

7.540

acres

2. Composite Runoff Coefficient

0.730

3. Actual Release Rate

1.360

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

1.963

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	10.92	60.11	58.75	0.405
10 min	10.02	55.15	53.79	0.741
15 min	8.20	45.13	43.77	0.904
20 min	7.05	38.80	37.44	1.032
30 min	5.60	30.82	29.46	1.218
40 min	4.66	25.65	24.29	1.338
50 min	4.00	22.02	20.66	1.423
1 hr	3.56	19.59	18.23	1.507
1.5 hr	2.68	14.75	13.39	1.660
2 hr	2.24	12.33	10.97	1.813
3 hr	1.62	8.92	7.56	1.874
4 hr	1.31	7.21	5.85	1.934
5 hr	1.11	6.11	4.75	1.963
6 hr	0.95	5.23	3.87	1.919
7 hr	0.86	4.73	3.37	1.952
8 hr	0.77	4.24	2.88	1.903
9 hr	0.70	3.85	2.49	1.854
10 hr	0.64	3.52	2.16	1.787
11 hr	0.59	3.25	1.89	1.716
12 hr	0.55	3.03	1.67	1.654
18 hr	0.39	2.15	0.79	1.170
24 hr	0.32	1.76	0.40	0.796

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MODIFIED RATIONAL METHOD: BULLETIN 75 RAINFALL DATA

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - EXISTING SITE

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

7.540

acres

2. Composite Runoff Coefficient

0.730

3. Actual Release Rate

1.360

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

2.281

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	12.36	68.03	66.67	0.459
10 min	10.80	59.45	58.09	0.800
15 min	9.28	51.08	49.72	1.027
20 min	8.04	44.25	42.89	1.182
30 min	6.34	34.90	33.54	1.386
40 min	5.28	29.06	27.70	1.526
50 min	4.55	25.04	23.68	1.631
1 hr	4.03	22.18	20.82	1.721
1.5 hr	3.03	16.68	15.32	1.899
2 hr	2.49	13.71	12.35	2.041
3 hr	1.83	10.07	8.71	2.160
4 hr	1.48	8.15	6.79	2.243
5 hr	1.25	6.88	5.52	2.281
6 hr	1.07	5.89	4.53	2.246
7 hr	0.96	5.28	3.92	2.270
8 hr	0.86	4.73	3.37	2.230
9 hr	0.79	4.35	2.99	2.223
10 hr	0.72	3.96	2.60	2.151
11 hr	0.67	3.69	2.33	2.116
12 hr	0.62	3.42	2.06	2.043
18 hr	0.45	2.46	1.10	1.641
24 hr	0.36	1.97	0.61	1.201

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COMPOSITE RUNOFF COEFFICIENT (C)

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - PROPOSED SITE

DATE: 12/14/2022

TYPE OF AREA (SELECT WITH DROP-DOWN)

☐ DETAINED AREA

☐ MAJOR STORMWATER SYSTEM

☐ UNRESTRICTED AREA

☒ OTHER: SITE

☐ UPSTREAM AREA

CONDITION (SELECT WITH DROP-DOWN)

☒ PROPOSED CONDITION

☐ EXISTING CONDITION

RUNOFF COEFFICIENT

Surface Description	C	Area (acres)	Product (C)(Area)
Impervious (Village C)	0.95	3.78	3.59
Permeable Playground	0.75	0.15	0.11
Pervious (Village C)	0.50	3.61	1.81

TOTALS:

7.54

5.51

COMPOSITE RUNOFF COEFFICIENT

$$\text{Composite C} = \frac{\text{Total Product}}{\text{Total Area}} = \frac{5.51}{7.54} \rightarrow \text{Composite C} = 0.73$$

MODIFIED RATIONAL METHOD: BULLETIN 75 RAINFALL DATA

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - PROPOSED SITE

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

7.540

acres

2. Composite Runoff Coefficient

0.730

3. Actual Release Rate

1.360

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

2.281

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	12.36	68.03	66.67	0.459
10 min	10.80	59.45	58.09	0.800
15 min	9.28	51.08	49.72	1.027
20 min	8.04	44.25	42.89	1.182
30 min	6.34	34.90	33.54	1.386
40 min	5.28	29.06	27.70	1.526
50 min	4.55	25.04	23.68	1.631
1 hr	4.03	22.18	20.82	1.721
1.5 hr	3.03	16.68	15.32	1.899
2 hr	2.49	13.71	12.35	2.041
3 hr	1.83	10.07	8.71	2.160
4 hr	1.48	8.15	6.79	2.243
5 hr	1.25	6.88	5.52	2.281
6 hr	1.07	5.89	4.53	2.246
7 hr	0.96	5.28	3.92	2.270
8 hr	0.86	4.73	3.37	2.230
9 hr	0.79	4.35	2.99	2.223
10 hr	0.72	3.96	2.60	2.151
11 hr	0.67	3.69	2.33	2.116
12 hr	0.62	3.42	2.06	2.043
18 hr	0.45	2.46	1.10	1.641
24 hr	0.36	1.97	0.61	1.201

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COMPOSITE RUNOFF COEFFICIENT (C)

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - AREA 1 EXISTING

DATE: 12/14/2022

TYPE OF AREA (SELECT WITH DROP-DOWN)

☒ DETAINED AREA

☐ MAJOR STORMWATER SYSTEM

☐ UNRESTRICTED AREA

☒ OTHER: AREA 1

☐ UPSTREAM AREA

CONDITION (SELECT WITH DROP-DOWN)

☐ PROPOSED CONDITION

☒ EXISTING CONDITION

RUNOFF COEFFICIENT

Surface Description	C	Area (acres)	Product (C)(Area)
Impervious (Village C)	0.95	0.04	0.04
Pervious (Village C)	0.50	0.18	0.09

TOTALS:

0.22

0.13

COMPOSITE RUNOFF COEFFICIENT

$$\text{Composite C} = \frac{\text{Total Product}}{\text{Total Area}} = \frac{0.13}{0.22} \rightarrow \text{Composite C} = 0.58$$

MODIFIED RATIONAL METHOD: BULLETIN 70 RAINFALL DATA

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LOCATION: WINDSOR ELEMENTARY - AREA 1 EXISTING

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

0.220

acres

2. Composite Runoff Coefficient

0.580

3. Actual Release Rate

0.040

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

0.042

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	10.92	1.39	1.35	0.009
10 min	10.02	1.28	1.24	0.017
15 min	8.20	1.05	1.01	0.021
20 min	7.05	0.90	0.86	0.024
30 min	5.60	0.71	0.67	0.028
40 min	4.66	0.59	0.55	0.031
50 min	4.00	0.51	0.47	0.032
1 hr	3.56	0.45	0.41	0.034
1.5 hr	2.68	0.34	0.30	0.037
2 hr	2.24	0.29	0.25	0.041
3 hr	1.62	0.21	0.17	0.041
4 hr	1.31	0.17	0.13	0.042
5 hr	1.11	0.14	0.10	0.042
6 hr	0.95	0.12	0.08	0.040
7 hr	0.86	0.11	0.07	0.040
8 hr	0.77	0.10	0.06	0.039
9 hr	0.70	0.09	0.05	0.037
10 hr	0.64	0.08	0.04	0.034
11 hr	0.59	0.08	0.04	0.032
12 hr	0.55	0.07	0.03	0.030
18 hr	0.39	0.05	0.01	0.015
24 hr	0.32	0.04	0.00	0.002

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COMPOSITE RUNOFF COEFFICIENT (C)

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - AREA 1 PROPOSED

DATE: 12/14/2022

TYPE OF AREA (SELECT WITH DROP-DOWN)

☒ DETAINED AREA

☐ MAJOR STORMWATER SYSTEM

☐ UNRESTRICTED AREA

☒ OTHER: AREA 1

☐ UPSTREAM AREA

CONDITION (SELECT WITH DROP-DOWN)

☒ PROPOSED CONDITION

☐ EXISTING CONDITION

RUNOFF COEFFICIENT

Surface Description	C	Area (acres)	Product (C)(Area)
Impervious (Village C)	0.95	0.11	0.10
Pervious (Village C)	0.50	0.11	0.06

TOTALS:

0.22

0.16

COMPOSITE RUNOFF COEFFICIENT

$$\text{Composite C} = \frac{\text{Total Product}}{\text{Total Area}} = \frac{0.16}{0.22} \rightarrow \text{Composite C} = 0.73$$

MODIFIED RATIONAL METHOD: BULLETIN 75 RAINFALL DATA

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - AREA 1 PROPOSED

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

0.220

acres

2. Composite Runoff Coefficient

0.730

3. Actual Release Rate

0.040

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

0.066

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	12.36	1.99	1.95	0.013
10 min	10.80	1.73	1.69	0.023
15 min	9.28	1.49	1.45	0.030
20 min	8.04	1.29	1.25	0.034
30 min	6.34	1.02	0.98	0.040
40 min	5.28	0.85	0.81	0.045
50 min	4.55	0.73	0.69	0.048
1 hr	4.03	0.65	0.61	0.050
1.5 hr	3.03	0.49	0.45	0.055
2 hr	2.49	0.40	0.36	0.059
3 hr	1.83	0.29	0.25	0.063
4 hr	1.48	0.24	0.20	0.065
5 hr	1.25	0.20	0.16	0.066
6 hr	1.07	0.17	0.13	0.065
7 hr	0.96	0.15	0.11	0.066
8 hr	0.86	0.14	0.10	0.065
9 hr	0.79	0.13	0.09	0.065
10 hr	0.72	0.12	0.08	0.063
11 hr	0.67	0.11	0.07	0.061
12 hr	0.62	0.10	0.06	0.059
18 hr	0.45	0.07	0.03	0.047
24 hr	0.36	0.06	0.02	0.034

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COMPOSITE RUNOFF COEFFICIENT (C)

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER:

LOCATION: WINDSOR ELEMENTARY - AREA 2 PROPOSED

DATE: 12/14/2022

TYPE OF AREA (SELECT WITH DROP-DOWN)

☒ DETAINED AREA

☐ MAJOR STORMWATER SYSTEM

☐ UNRESTRICTED AREA

☒ OTHER: AREA 2

☐ UPSTREAM AREA

CONDITION (SELECT WITH DROP-DOWN)

☒ PROPOSED CONDITION

☐ EXISTING CONDITION

RUNOFF COEFFICIENT

Surface Description	C	Area (acres)	Product (C)(Area)
Impervious (Village C)	0.95	0.55	0.52

TOTALS:

0.55

0.52

COMPOSITE RUNOFF COEFFICIENT

$$\text{Composite C} = \frac{\text{Total Product}}{\text{Total Area}} = \frac{0.52}{0.55} \rightarrow \text{Composite C} = 0.95$$

MODIFIED RATIONAL METHOD: BULLETIN 75 RAINFALL DATA

PROJECT: AHSD 25 KINDERGARTEN ADDITIONS

PERMIT NUMBER: _____

LOCATION: WINDSOR ELEMENTARY - AREA 2 PROPOSED

DATE: 12/14/2022

DEVELOPMENT INFORMATION

1. Detained Area

0.550

acres

2. Composite Runoff Coefficient

0.950

3. Actual Release Rate

0.100

cfs

REQUIRED DETENTION VOLUME

4. Required Detention Volume

0.233

ac-ft

CALCULATION TABLE

Storm Duration	Rainfall Intensity (in/hr)	Inflow Rate (cfs)	Stored Rate (cfs)	Required Storage (ac-ft)
5 min	12.36	6.46	6.36	0.044
10 min	10.80	5.64	5.54	0.076
15 min	9.28	4.85	4.75	0.098
20 min	8.04	4.20	4.10	0.113
30 min	6.34	3.31	3.21	0.133
40 min	5.28	2.76	2.66	0.146
50 min	4.55	2.38	2.28	0.157
1 hr	4.03	2.11	2.01	0.166
1.5 hr	3.03	1.58	1.48	0.184
2 hr	2.49	1.30	1.20	0.199
3 hr	1.83	0.96	0.86	0.212
4 hr	1.48	0.77	0.67	0.223
5 hr	1.25	0.65	0.55	0.229
6 hr	1.07	0.56	0.46	0.228
7 hr	0.96	0.50	0.40	0.232
8 hr	0.86	0.45	0.35	0.231
9 hr	0.79	0.41	0.31	0.233
10 hr	0.72	0.38	0.28	0.228
11 hr	0.67	0.35	0.25	0.227
12 hr	0.62	0.32	0.22	0.223
18 hr	0.45	0.23	0.13	0.199
24 hr	0.36	0.19	0.09	0.172

←