Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Saturated Hydraulic Conductivity (Ksat)—Middlesex County, Massachusetts
(KSAT)

Map Scale: 1:2,210 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 10.0000
- > 10.0000 and <= 44.1655
- Not rated or not available

Soil Rating Lines

- <= 10.0000
- > 10.0000 and <= 44.1655
- Not rated or not available

Soil Rating Points

- <= 10.0000
- > 10.0000 and <= 44.1655
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 17, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 29, 2014—Sep 19, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	44.1655	7.6	23.1%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	10.0000	9.3	28.1%
622C	Paxton-Urban land complex, 3 to 15 percent slopes	10.0000	0.1	0.2%
623C	Woodbridge-Urban land complex, 3 to 15 percent slopes	10.0000	15.8	47.9%
656	Udorthents-Urban land complex		0.3	0.8%
Totals for Area of Interest			**33.0**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

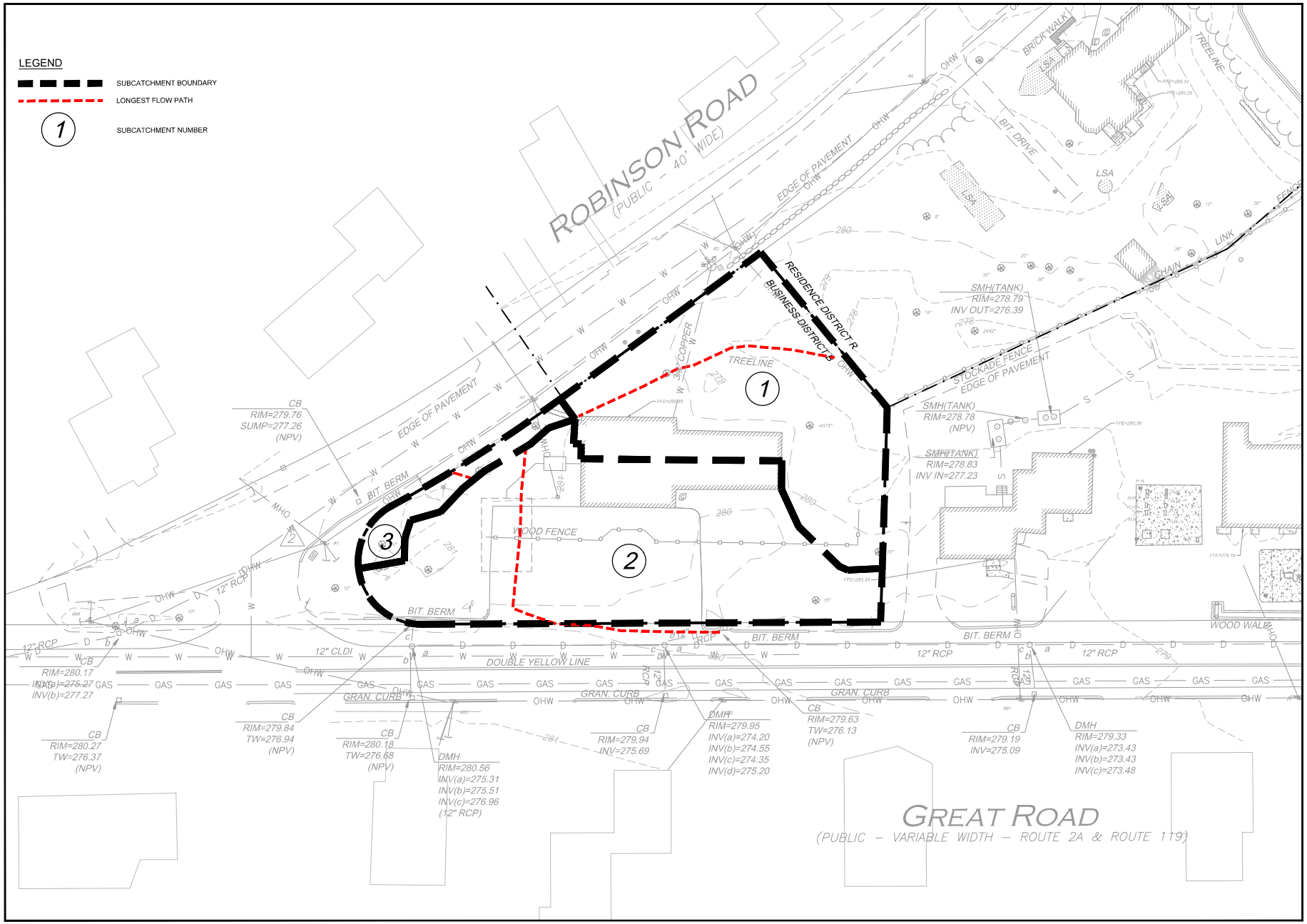
Tie-break Rule: Slowest

Interpret Nulls as Zero: No

APPENDIX D

Pre-development Calculations

Northern Bank
Great Road
Littleton, Massachusetts



Site:
NORTHERN BANK
LITTLETON BRANCH
289 GREAT ROAD
LITTLETON, MASSACHUSETTS

Prepared for:
NORTHERN BANK AND
TRUST COMPANY
275 MISHAWUM ROAD
WOBURN, MASSACHUSETTS

SEAN P MALONE CIVIL No. 46204 REGISTERED PROFESSIONAL ENGINEER

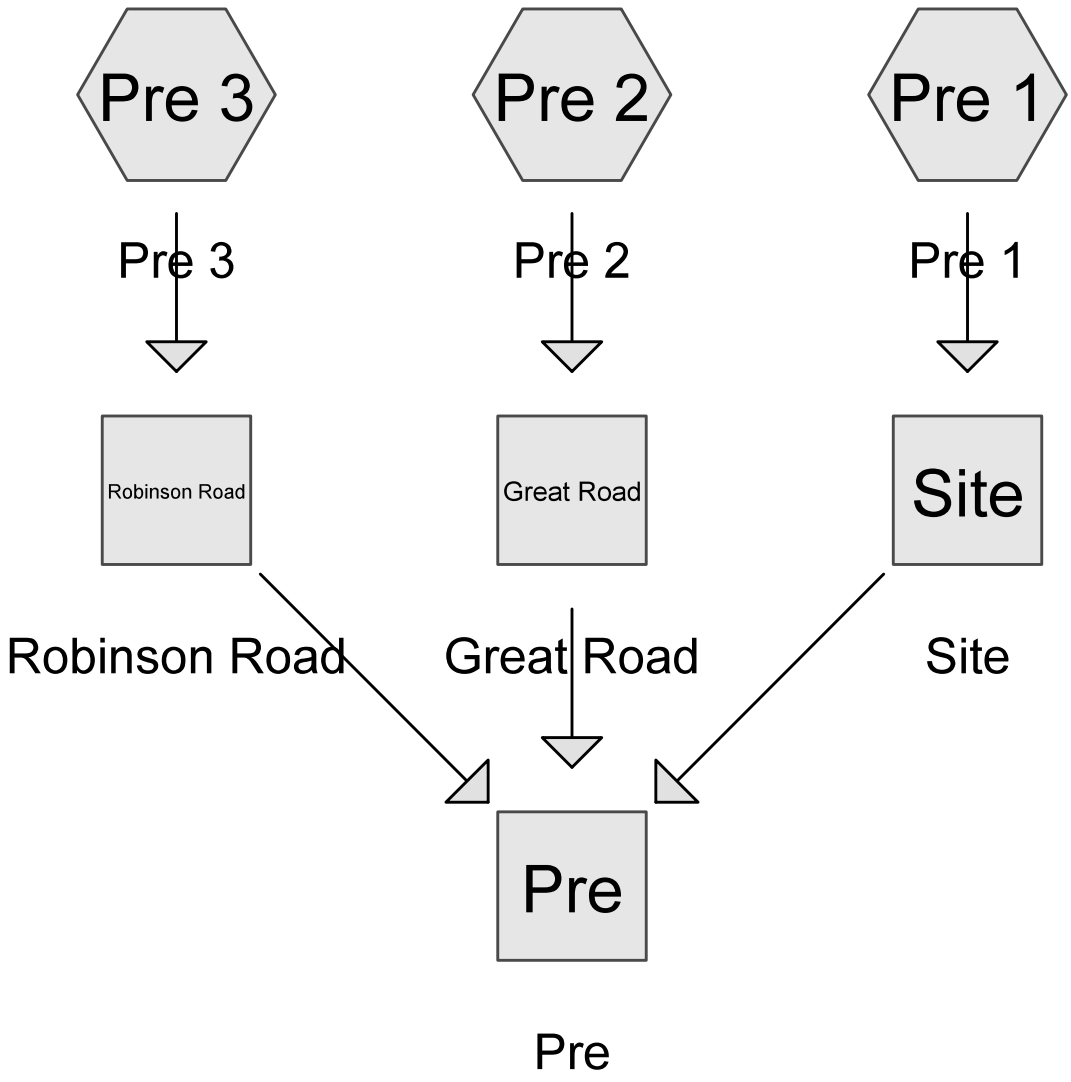
OCG
Oak Consulting Group
P.O. Box 1123
Newburyport, MA 01950
Ph. 978.312.3120

PRE-DEVELOPMENT
SUBCATCHMENT
PLAN

No.	Revision/Issue	Date

Design by:	Checked by:
SPM	SPM
Drawn by:	Approved by:
SPM	SPM
Project:	Date:
18017	February 22, 2021

Sheet:
DR-01



Subcat Reach Pond Link

Routing Diagram for 18017 Pre-post

Prepared by {enter your company name here}, Printed 2/22/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPre 1: Pre 1 Runoff Area=11,795 sf 14.07% Impervious Runoff Depth>1.19"
Flow Length=130' Slope=0.0300 '/' Tc=3.9 min CN=WQ Runoff=0.40 cfs 0.027 af

SubcatchmentPre 2: Pre 2 Runoff Area=15,753 sf 46.97% Impervious Runoff Depth>1.79"
Flow Length=173' Slope=0.0150 '/' Tc=5.4 min CN=WQ Runoff=0.73 cfs 0.054 af

SubcatchmentPre 3: Pre 3 Runoff Area=1,439 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=16' Slope=0.0100 '/' Tc=1.4 min CN=WQ Runoff=0.04 cfs 0.003 af

Reach Great Road: Great Road Inflow=0.73 cfs 0.054 af
Outflow=0.73 cfs 0.054 af

Reach Pre: Pre Inflow=1.17 cfs 0.083 af
Outflow=1.17 cfs 0.083 af

Reach Robinson Road: Robinson Road Inflow=0.04 cfs 0.003 af
Outflow=0.04 cfs 0.003 af

Reach Site: Site Inflow=0.40 cfs 0.027 af
Outflow=0.40 cfs 0.027 af

Summary for Subcatchment Pre 1: Pre 1

Runoff = 0.40 cfs @ 12.06 hrs, Volume= 0.027 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
1,660	98	Roofs, HSG C
0	98	Paved parking, HSG C
10,135	74	>75% Grass cover, Good, HSG C
11,795		Weighted Average
10,135	74	85.93% Pervious Area
1,660	98	14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	130	0.0300	0.55		**Lag/CN Method, Pre 1**

Summary for Subcatchment Pre 2: Pre 2

Runoff = 0.73 cfs @ 12.08 hrs, Volume= 0.054 af, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
1,743	98	Roofs, HSG C
5,656	98	Paved parking, HSG C
8,354	74	>75% Grass cover, Good, HSG C
15,753		Weighted Average
8,354	74	53.03% Pervious Area
7,399	98	46.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	173	0.0150	0.53		**Lag/CN Method, Pre 2**

Summary for Subcatchment Pre 3: Pre 3

Runoff = 0.04 cfs @ 12.03 hrs, Volume= 0.003 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,439	74	>75% Grass cover, Good, HSG C
1,439		Weighted Average
1,439	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.0100	0.19		**Lag/CN Method, Pre 3**

Summary for Reach Great Road: Great Road

Inflow Area = 0.362 ac, 46.97% Impervious, Inflow Depth > 1.79" for 2-YR NOAA event
Inflow = 0.73 cfs @ 12.08 hrs, Volume= 0.054 af
Outflow = 0.73 cfs @ 12.08 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Pre: Pre

Inflow Area = 0.665 ac, 31.25% Impervious, Inflow Depth > 1.50" for 2-YR NOAA event
Inflow = 1.17 cfs @ 12.07 hrs, Volume= 0.083 af
Outflow = 1.17 cfs @ 12.07 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Robinson Road: Robinson Road

Inflow Area = 0.033 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2-YR NOAA event
Inflow = 0.04 cfs @ 12.03 hrs, Volume= 0.003 af
Outflow = 0.04 cfs @ 12.03 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: Site

Inflow Area = 0.271 ac, 14.07% Impervious, Inflow Depth > 1.19" for 2-YR NOAA event
Inflow = 0.40 cfs @ 12.06 hrs, Volume= 0.027 af
Outflow = 0.40 cfs @ 12.06 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPre 1: Pre 1 Runoff Area=11,795 sf 14.07% Impervious Runoff Depth>2.44"
Flow Length=130' Slope=0.0300 '/' Tc=3.9 min CN=WQ Runoff=0.85 cfs 0.055 af

SubcatchmentPre 2: Pre 2 Runoff Area=15,753 sf 46.97% Impervious Runoff Depth>3.16"
Flow Length=173' Slope=0.0150 '/' Tc=5.4 min CN=WQ Runoff=1.31 cfs 0.095 af

SubcatchmentPre 3: Pre 3 Runoff Area=1,439 sf 0.00% Impervious Runoff Depth>2.13"
Flow Length=16' Slope=0.0100 '/' Tc=1.4 min CN=WQ Runoff=0.10 cfs 0.006 af

Reach Great Road: Great Road Inflow=1.31 cfs 0.095 af
Outflow=1.31 cfs 0.095 af

Reach Pre: Pre Inflow=2.23 cfs 0.156 af
Outflow=2.23 cfs 0.156 af

Reach Robinson Road: Robinson Road Inflow=0.10 cfs 0.006 af
Outflow=0.10 cfs 0.006 af

Reach Site: Site Inflow=0.85 cfs 0.055 af
Outflow=0.85 cfs 0.055 af

Summary for Subcatchment Pre 1: Pre 1

Runoff = 0.85 cfs @ 12.06 hrs, Volume= 0.055 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
1,660	98	Roofs, HSG C
0	98	Paved parking, HSG C
10,135	74	>75% Grass cover, Good, HSG C
11,795		Weighted Average
10,135	74	85.93% Pervious Area
1,660	98	14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	130	0.0300	0.55		**Lag/CN Method, Pre 1**

Summary for Subcatchment Pre 2: Pre 2

Runoff = 1.31 cfs @ 12.08 hrs, Volume= 0.095 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
1,743	98	Roofs, HSG C
5,656	98	Paved parking, HSG C
8,354	74	>75% Grass cover, Good, HSG C
15,753		Weighted Average
8,354	74	53.03% Pervious Area
7,399	98	46.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	173	0.0150	0.53		**Lag/CN Method, Pre 2**

Summary for Subcatchment Pre 3: Pre 3

Runoff = 0.10 cfs @ 12.03 hrs, Volume= 0.006 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,439	74	>75% Grass cover, Good, HSG C
1,439		Weighted Average
1,439	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.0100	0.19		**Lag/CN Method, Pre 3**

Summary for Reach Great Road: Great Road

Inflow Area = 0.362 ac, 46.97% Impervious, Inflow Depth > 3.16" for 10-YR-NOAA event
Inflow = 1.31 cfs @ 12.08 hrs, Volume= 0.095 af
Outflow = 1.31 cfs @ 12.08 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Pre: Pre

Inflow Area = 0.665 ac, 31.25% Impervious, Inflow Depth > 2.82" for 10-YR-NOAA event
Inflow = 2.23 cfs @ 12.07 hrs, Volume= 0.156 af
Outflow = 2.23 cfs @ 12.07 hrs, Volume= 0.156 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Robinson Road: Robinson Road

Inflow Area = 0.033 ac, 0.00% Impervious, Inflow Depth > 2.13" for 10-YR-NOAA event
Inflow = 0.10 cfs @ 12.03 hrs, Volume= 0.006 af
Outflow = 0.10 cfs @ 12.03 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: Site

Inflow Area = 0.271 ac, 14.07% Impervious, Inflow Depth > 2.44" for 10-YR-NOAA event
Inflow = 0.85 cfs @ 12.06 hrs, Volume= 0.055 af
Outflow = 0.85 cfs @ 12.06 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPre 1: Pre 1 Runoff Area=11,795 sf 14.07% Impervious Runoff Depth>3.29"
Flow Length=130' Slope=0.0300 '/' Tc=3.9 min CN=WQ Runoff=1.15 cfs 0.074 af

SubcatchmentPre 2: Pre 2 Runoff Area=15,753 sf 46.97% Impervious Runoff Depth>4.07"
Flow Length=173' Slope=0.0150 '/' Tc=5.4 min CN=WQ Runoff=1.69 cfs 0.123 af

SubcatchmentPre 3: Pre 3 Runoff Area=1,439 sf 0.00% Impervious Runoff Depth>2.96"
Flow Length=16' Slope=0.0100 '/' Tc=1.4 min CN=WQ Runoff=0.13 cfs 0.008 af

Reach Great Road: Great Road Inflow=1.69 cfs 0.123 af
Outflow=1.69 cfs 0.123 af

Reach Pre: Pre Inflow=2.94 cfs 0.205 af
Outflow=2.94 cfs 0.205 af

Reach Robinson Road: Robinson Road Inflow=0.13 cfs 0.008 af
Outflow=0.13 cfs 0.008 af

Reach Site: Site Inflow=1.15 cfs 0.074 af
Outflow=1.15 cfs 0.074 af

Summary for Subcatchment Pre 1: Pre 1

Runoff = 1.15 cfs @ 12.06 hrs, Volume= 0.074 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
1,660	98	Roofs, HSG C
0	98	Paved parking, HSG C
10,135	74	>75% Grass cover, Good, HSG C
11,795		Weighted Average
10,135	74	85.93% Pervious Area
1,660	98	14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	130	0.0300	0.55		**Lag/CN Method, Pre 1**

Summary for Subcatchment Pre 2: Pre 2

Runoff = 1.69 cfs @ 12.08 hrs, Volume= 0.123 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
1,743	98	Roofs, HSG C
5,656	98	Paved parking, HSG C
8,354	74	>75% Grass cover, Good, HSG C
15,753		Weighted Average
8,354	74	53.03% Pervious Area
7,399	98	46.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	173	0.0150	0.53		**Lag/CN Method, Pre 2**

Summary for Subcatchment Pre 3: Pre 3

Runoff = 0.13 cfs @ 12.03 hrs, Volume= 0.008 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,439	74	>75% Grass cover, Good, HSG C
1,439		Weighted Average
1,439	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.0100	0.19		**Lag/CN Method, Pre 3**

Summary for Reach Great Road: Great Road

Inflow Area = 0.362 ac, 46.97% Impervious, Inflow Depth > 4.07" for 25-YR NOAA event
Inflow = 1.69 cfs @ 12.08 hrs, Volume= 0.123 af
Outflow = 1.69 cfs @ 12.08 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Pre: Pre

Inflow Area = 0.665 ac, 31.25% Impervious, Inflow Depth > 3.70" for 25-YR NOAA event
Inflow = 2.94 cfs @ 12.07 hrs, Volume= 0.205 af
Outflow = 2.94 cfs @ 12.07 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Robinson Road: Robinson Road

Inflow Area = 0.033 ac, 0.00% Impervious, Inflow Depth > 2.96" for 25-YR NOAA event
Inflow = 0.13 cfs @ 12.03 hrs, Volume= 0.008 af
Outflow = 0.13 cfs @ 12.03 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: Site

Inflow Area = 0.271 ac, 14.07% Impervious, Inflow Depth > 3.29" for 25-YR NOAA event
Inflow = 1.15 cfs @ 12.06 hrs, Volume= 0.074 af
Outflow = 1.15 cfs @ 12.06 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPre 1: Pre 1 Runoff Area=11,795 sf 14.07% Impervious Runoff Depth>4.68"
Flow Length=130' Slope=0.0300 '/' Tc=3.9 min CN=WQ Runoff=1.63 cfs 0.106 af

SubcatchmentPre 2: Pre 2 Runoff Area=15,753 sf 46.97% Impervious Runoff Depth>5.51"
Flow Length=173' Slope=0.0150 '/' Tc=5.4 min CN=WQ Runoff=2.29 cfs 0.166 af

SubcatchmentPre 3: Pre 3 Runoff Area=1,439 sf 0.00% Impervious Runoff Depth>4.33"
Flow Length=16' Slope=0.0100 '/' Tc=1.4 min CN=WQ Runoff=0.20 cfs 0.012 af

Reach Great Road: Great Road Inflow=2.29 cfs 0.166 af
Outflow=2.29 cfs 0.166 af

Reach Pre: Pre Inflow=4.07 cfs 0.283 af
Outflow=4.07 cfs 0.283 af

Reach Robinson Road: Robinson Road Inflow=0.20 cfs 0.012 af
Outflow=0.20 cfs 0.012 af

Reach Site: Site Inflow=1.63 cfs 0.106 af
Outflow=1.63 cfs 0.106 af

Summary for Subcatchment Pre 1: Pre 1

Runoff = 1.63 cfs @ 12.06 hrs, Volume= 0.106 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
1,660	98	Roofs, HSG C
0	98	Paved parking, HSG C
10,135	74	>75% Grass cover, Good, HSG C
11,795		Weighted Average
10,135	74	85.93% Pervious Area
1,660	98	14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	130	0.0300	0.55		**Lag/CN Method, Pre 1**

Summary for Subcatchment Pre 2: Pre 2

Runoff = 2.29 cfs @ 12.08 hrs, Volume= 0.166 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
1,743	98	Roofs, HSG C
5,656	98	Paved parking, HSG C
8,354	74	>75% Grass cover, Good, HSG C
15,753		Weighted Average
8,354	74	53.03% Pervious Area
7,399	98	46.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	173	0.0150	0.53		**Lag/CN Method, Pre 2**

Summary for Subcatchment Pre 3: Pre 3

Runoff = 0.20 cfs @ 12.02 hrs, Volume= 0.012 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,439	74	>75% Grass cover, Good, HSG C
1,439		Weighted Average
1,439	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.0100	0.19		**Lag/CN Method, Pre 3**

Summary for Reach Great Road: Great Road

Inflow Area = 0.362 ac, 46.97% Impervious, Inflow Depth > 5.51" for 100-YR NOAA event
Inflow = 2.29 cfs @ 12.08 hrs, Volume= 0.166 af
Outflow = 2.29 cfs @ 12.08 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Pre: Pre

Inflow Area = 0.665 ac, 31.25% Impervious, Inflow Depth > 5.11" for 100-YR NOAA event
Inflow = 4.07 cfs @ 12.07 hrs, Volume= 0.283 af
Outflow = 4.07 cfs @ 12.07 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Robinson Road: Robinson Road

Inflow Area = 0.033 ac, 0.00% Impervious, Inflow Depth > 4.33" for 100-YR NOAA event
Inflow = 0.20 cfs @ 12.02 hrs, Volume= 0.012 af
Outflow = 0.20 cfs @ 12.02 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Site: Site

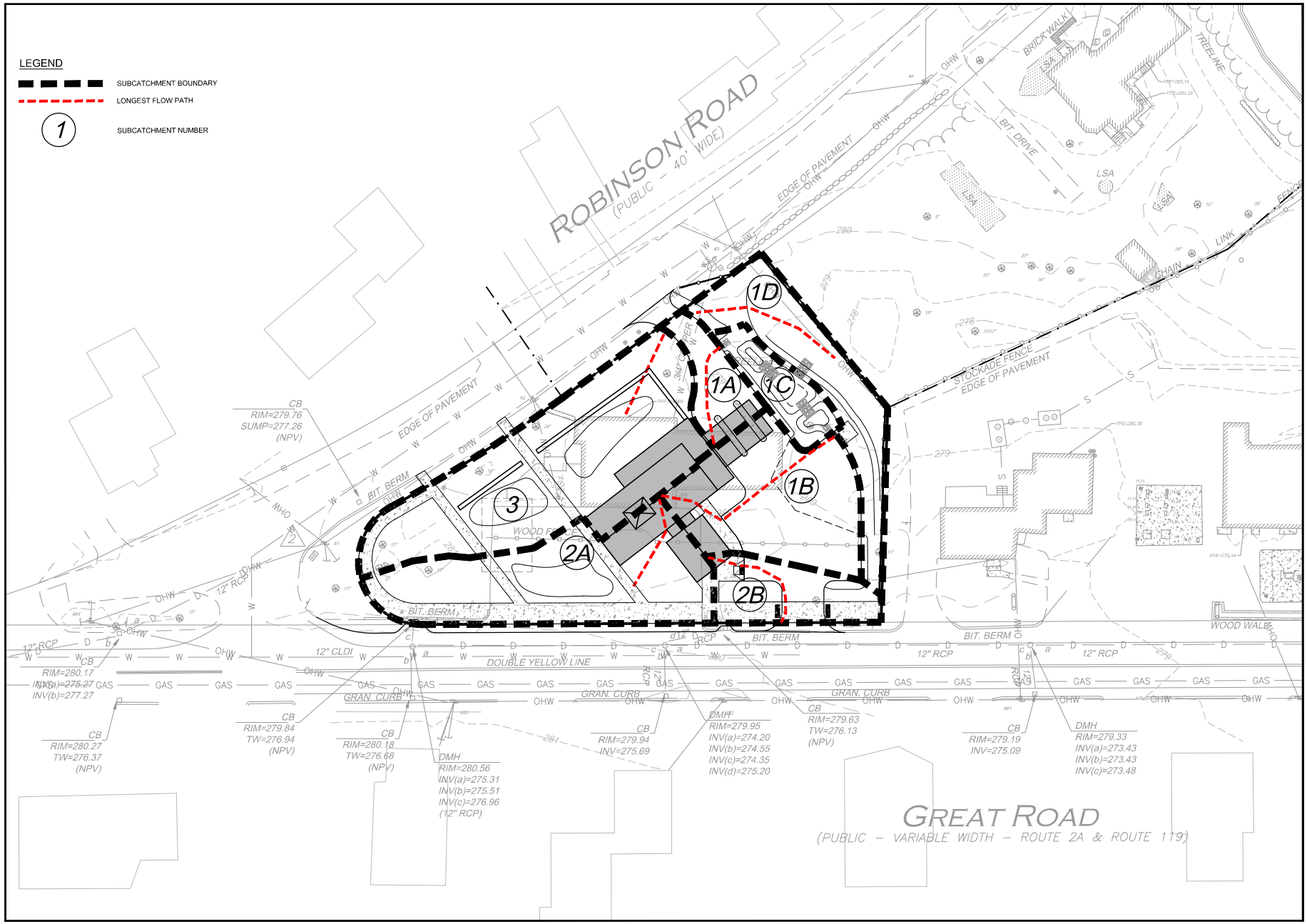
Inflow Area = 0.271 ac, 14.07% Impervious, Inflow Depth > 4.68" for 100-YR NOAA event
Inflow = 1.63 cfs @ 12.06 hrs, Volume= 0.106 af
Outflow = 1.63 cfs @ 12.06 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

APPENDIX E

Post-development Calculations

Northern Bank
Great Road
Littleton, Massachusetts



Site:
NORTHERN BANK
LITTLETON BRANCH
289 GREAT ROAD
LITTLETON, MASSACHUSETTS

Prepared for:
NORTHERN BANK AND TRUST COMPANY
275 MISHAWUM ROAD
WOBURN, MASSACHUSETTS

SCALE in FEET
1"=20'

SEAN P MALONE CIVIL No. 46204 REGISTERED PROFESSIONAL ENGINEER

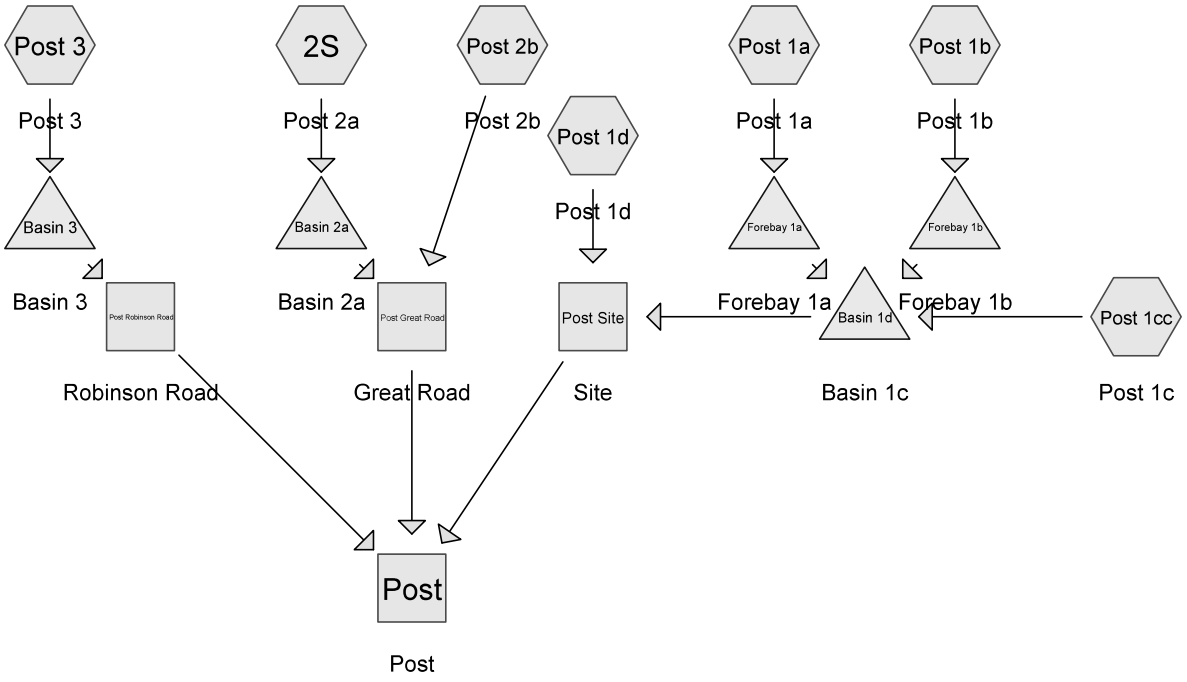
OCG
Oak Consulting Group
P.O. Box 1123
Newburyport, MA 01950
Ph. 978.312.3120

POST-DEVELOPMENT SUBCATCHMENT PLAN

No.	Revision/Issue	Date

Design by:	Checked by:
SPM	SPM
Drawn by:	Approved by:
SPM	SPM
Project:	Date:
18017	February 24, 2021

Sheet:
DR-02



Subcat Reach Pond Link

Routing Diagram for 18017 Pre-post

Prepared by {enter your company name here}, Printed 2/22/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment2S: Post 2a Runoff Area=6,348 sf 30.23% Impervious Runoff Depth>1.49"
Flow Length=45' Slope=0.0200 '/' Tc=1.8 min CN=WQ Runoff=0.27 cfs 0.018 af

SubcatchmentPost 1a: Post 1a Runoff Area=1,377 sf 100.00% Impervious Runoff Depth>2.76"
Flow Length=49' Slope=0.0150 '/' Tc=1.1 min CN=WQ Runoff=0.11 cfs 0.007 af

SubcatchmentPost 1b: Post 1b Runoff Area=5,012 sf 95.09% Impervious Runoff Depth>2.67"
Flow Length=99' Slope=0.0150 '/' Tc=2.0 min CN=WQ Runoff=0.37 cfs 0.026 af

SubcatchmentPost 1cc: Post 1c Runoff Area=1,425 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=20' Slope=0.1500 '/' Tc=0.4 min CN=WQ Runoff=0.04 cfs 0.003 af

SubcatchmentPost 1d: Post 1d Runoff Area=3,748 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=73' Slope=0.0300 '/' Tc=2.7 min CN=WQ Runoff=0.11 cfs 0.007 af

SubcatchmentPost 2b: Post 2b Runoff Area=2,132 sf 64.17% Impervious Runoff Depth>2.10"
Flow Length=58' Slope=0.0200 '/' Tc=1.7 min CN=WQ Runoff=0.13 cfs 0.009 af

SubcatchmentPost 3: Post 3 Runoff Area=8,945 sf 16.78% Impervious Runoff Depth>1.24"
Flow Length=42' Slope=0.0100 '/' Tc=2.7 min CN=WQ Runoff=0.33 cfs 0.021 af

Reach Post: Post Inflow=0.69 cfs 0.038 af
Outflow=0.69 cfs 0.038 af

Reach Post Great Road: Great Road Inflow=0.13 cfs 0.009 af
Outflow=0.13 cfs 0.009 af

Reach Post Robinson Road: Robinson Road Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach Post Site: Site Inflow=0.57 cfs 0.029 af
Outflow=0.57 cfs 0.029 af

Pond Basin 1d: Basin 1c Peak Elev=279.86' Storage=309 cf Inflow=0.47 cfs 0.032 af
Discarded=0.00 cfs 0.003 af Primary=0.46 cfs 0.022 af Outflow=0.46 cfs 0.026 af

Pond Basin 2a: Basin 2a Peak Elev=280.26' Storage=341 cf Inflow=0.27 cfs 0.018 af
Discarded=0.02 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.015 af

Pond Basin 3: Basin 3 Peak Elev=280.21' Storage=384 cf Inflow=0.33 cfs 0.021 af
Discarded=0.03 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.019 af

Pond Forebay 1a: Forebay 1a Peak Elev=279.86' Storage=68 cf Inflow=0.11 cfs 0.007 af
Outflow=0.09 cfs 0.006 af

Pond Forebay 1b: Forebay 1b Peak Elev=279.86' Storage=107 cf Inflow=0.37 cfs 0.026 af
Outflow=0.35 cfs 0.024 af

Summary for Subcatchment 2S: Post 2a

Runoff = 0.27 cfs @ 12.04 hrs, Volume= 0.018 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
786	98	Roofs, HSG C
1,133	98	Paved parking, HSG C
4,429	74	>75% Grass cover, Good, HSG C
6,348		Weighted Average
4,429	74	69.77% Pervious Area
1,919	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	45	0.0200	0.41		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 1a: Post 1a

Runoff = 0.11 cfs @ 12.01 hrs, Volume= 0.007 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
0	98	Roofs, HSG C
1,377	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
1,377		Weighted Average
1,377	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	49	0.0150	0.74		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff = 0.37 cfs @ 12.03 hrs, Volume= 0.026 af, Depth> 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
751	98	Roofs, HSG C
4,015	98	Paved parking, HSG C
246	74	>75% Grass cover, Good, HSG C
5,012		Weighted Average
246	74	4.91% Pervious Area
4,766	98	95.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	99	0.0150	0.81		**Lag/CN Method, Post 1b**

Summary for Subcatchment Post 1cc: Post 1c

Runoff = 0.04 cfs @ 12.01 hrs, Volume= 0.003 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,425	74	>75% Grass cover, Good, HSG C
1,425		Weighted Average
1,425	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.1500	0.78		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1d: Post 1d

Runoff = 0.11 cfs @ 12.05 hrs, Volume= 0.007 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
3,748	74	>75% Grass cover, Good, HSG C
3,748		Weighted Average
3,748	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	73	0.0300	0.45		**Lag/CN Method, Post 1c**

Summary for Subcatchment Post 2b: Post 2b

Runoff = 0.13 cfs @ 12.03 hrs, Volume= 0.009 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
33	98	Roofs, HSG C
1,335	98	Paved parking, HSG C
764	74	>75% Grass cover, Good, HSG C
2,132		Weighted Average
764	74	35.83% Pervious Area
1,368	98	64.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	58	0.0200	0.57		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 3: Post 3

Runoff = 0.33 cfs @ 12.05 hrs, Volume= 0.021 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR NOAA Rainfall=3.18"

Area (sf)	CN	Description
1,306	98	Roofs, HSG C
195	98	Paved parking, HSG C
7,444	74	>75% Grass cover, Good, HSG C
8,945		Weighted Average
7,444	74	83.22% Pervious Area
1,501	98	16.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	42	0.0100	0.26		**Lag/CN Method, Post 3**

Summary for Reach Post: Post

Inflow Area = 0.665 ac, 37.71% Impervious, Inflow Depth > 0.68" for 2-YR NOAA event
Inflow = 0.69 cfs @ 12.04 hrs, Volume= 0.038 af
Outflow = 0.69 cfs @ 12.04 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Great Road: Great Road

Inflow Area = 0.195 ac, 38.76% Impervious, Inflow Depth > 0.53" for 2-YR NOAA event
Inflow = 0.13 cfs @ 12.03 hrs, Volume= 0.009 af
Outflow = 0.13 cfs @ 12.03 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Robinson Road: Robinson Road

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth = 0.00" for 2-YR NOAA event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Site: Site

Inflow Area = 0.265 ac, 53.13% Impervious, Inflow Depth > 1.32" for 2-YR NOAA event
Inflow = 0.57 cfs @ 12.05 hrs, Volume= 0.029 af
Outflow = 0.57 cfs @ 12.05 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1d: Basin 1c

Inflow Area = 0.179 ac, 78.62% Impervious, Inflow Depth > 2.15" for 2-YR NOAA event
Inflow = 0.47 cfs @ 12.03 hrs, Volume= 0.032 af
Outflow = 0.46 cfs @ 12.05 hrs, Volume= 0.026 af, Atten= 1%, Lag= 0.9 min
Discarded = 0.00 cfs @ 12.05 hrs, Volume= 0.003 af
Primary = 0.46 cfs @ 12.05 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.86' @ 12.05 hrs Surf.Area= 310 sf Storage= 309 cf

Plug-Flow detention time= 88.1 min calculated for 0.026 af (80% of inflow)
Center-of-Mass det. time= 34.7 min (798.5 - 763.8)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	353 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
278.50	143	0	0
280.00	327	353	353

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.50'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	279.75'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.05 hrs HW=279.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.45 cfs @ 12.05 hrs HW=279.86' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.45 cfs @ 0.81 fps)

Summary for Pond Basin 2a: Basin 2a

Inflow Area = 0.146 ac, 30.23% Impervious, Inflow Depth > 1.49" for 2-YR NOAA event
Inflow = 0.27 cfs @ 12.04 hrs, Volume= 0.018 af
Outflow = 0.02 cfs @ 13.52 hrs, Volume= 0.015 af, Atten= 93%, Lag= 89.4 min
Discarded = 0.02 cfs @ 13.52 hrs, Volume= 0.015 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.26' @ 13.52 hrs Surf.Area= 1,640 sf Storage= 341 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 109.6 min (880.2 - 770.6)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	2,253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	972	0	0
281.00	3,534	2,253	2,253

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	280.75'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.02 cfs @ 13.52 hrs HW=280.26' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth > 1.24" for 2-YR NOAA event
Inflow = 0.33 cfs @ 12.05 hrs, Volume= 0.021 af
Outflow = 0.03 cfs @ 13.46 hrs, Volume= 0.019 af, Atten= 92%, Lag= 84.8 min
Discarded = 0.03 cfs @ 13.46 hrs, Volume= 0.019 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.21' @ 13.46 hrs Surf.Area= 2,172 sf Storage= 384 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 113.8 min (900.1 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	3,100 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	1,509	0	0
281.00	4,690	3,100	3,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	281.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.03 cfs @ 13.46 hrs HW=280.21' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1a: Forebay 1a

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 2.76" for 2-YR NOAA event
Inflow = 0.11 cfs @ 12.01 hrs, Volume= 0.007 af
Outflow = 0.09 cfs @ 12.01 hrs, Volume= 0.006 af, Atten= 19%, Lag= 0.0 min
Primary = 0.09 cfs @ 12.01 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.86' @ 12.10 hrs Surf.Area= 129 sf Storage= 68 cf

Plug-Flow detention time= 89.0 min calculated for 0.006 af (82% of inflow)
Center-of-Mass det. time= 38.0 min (773.0 - 735.0)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	87 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	29	0	0
280.00	145	87	87

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=279.83' TW=279.85' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1b: Forebay 1b

Inflow Area = 0.115 ac, 95.09% Impervious, Inflow Depth > 2.67" for 2-YR NOAA event
Inflow = 0.37 cfs @ 12.03 hrs, Volume= 0.026 af
Outflow = 0.35 cfs @ 12.04 hrs, Volume= 0.024 af, Atten= 8%, Lag= 0.3 min
Primary = 0.35 cfs @ 12.04 hrs, Volume= 0.024 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.86' @ 12.09 hrs Surf.Area= 188 sf Storage= 107 cf

Plug-Flow detention time= 47.8 min calculated for 0.024 af (92% of inflow)
Center-of-Mass det. time= 18.9 min (756.0 - 737.0)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	60	0	0
280.00	208	134	134

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.85' TW=279.86' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment2S: Post 2a Runoff Area=6,348 sf 30.23% Impervious Runoff Depth>2.79"
Flow Length=45' Slope=0.0200 '/' Tc=1.8 min CN=WQ Runoff=0.53 cfs 0.034 af

SubcatchmentPost 1a: Post 1a Runoff Area=1,377 sf 100.00% Impervious Runoff Depth>4.34"
Flow Length=49' Slope=0.0150 '/' Tc=1.1 min CN=WQ Runoff=0.17 cfs 0.011 af

SubcatchmentPost 1b: Post 1b Runoff Area=5,012 sf 95.09% Impervious Runoff Depth>4.23"
Flow Length=99' Slope=0.0150 '/' Tc=2.0 min CN=WQ Runoff=0.59 cfs 0.041 af

SubcatchmentPost 1cc: Post 1c Runoff Area=1,425 sf 0.00% Impervious Runoff Depth>2.13"
Flow Length=20' Slope=0.1500 '/' Tc=0.4 min CN=WQ Runoff=0.10 cfs 0.006 af

SubcatchmentPost 1d: Post 1d Runoff Area=3,748 sf 0.00% Impervious Runoff Depth>2.13"
Flow Length=73' Slope=0.0300 '/' Tc=2.7 min CN=WQ Runoff=0.25 cfs 0.015 af

SubcatchmentPost 2b: Post 2b Runoff Area=2,132 sf 64.17% Impervious Runoff Depth>3.55"
Flow Length=58' Slope=0.0200 '/' Tc=1.7 min CN=WQ Runoff=0.21 cfs 0.014 af

SubcatchmentPost 3: Post 3 Runoff Area=8,945 sf 16.78% Impervious Runoff Depth>2.50"
Flow Length=42' Slope=0.0100 '/' Tc=2.7 min CN=WQ Runoff=0.68 cfs 0.043 af

Reach Post: Post Inflow=1.23 cfs 0.074 af
Outflow=1.23 cfs 0.074 af

Reach Post Great Road: Great Road Inflow=0.21 cfs 0.014 af
Outflow=0.21 cfs 0.014 af

Reach Post Robinson Road: Robinson Road Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach Post Site: Site Inflow=1.02 cfs 0.060 af
Outflow=1.02 cfs 0.060 af

Pond Basin 1d: Basin 1c Peak Elev=279.91' Storage=323 cf Inflow=0.78 cfs 0.054 af
Discarded=0.00 cfs 0.004 af Primary=0.77 cfs 0.045 af Outflow=0.77 cfs 0.048 af

Pond Basin 2a: Basin 2a Peak Elev=280.49' Storage=784 cf Inflow=0.53 cfs 0.034 af
Discarded=0.03 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.021 af

Pond Basin 3: Basin 3 Peak Elev=280.44' Storage=978 cf Inflow=0.68 cfs 0.043 af
Discarded=0.04 cfs 0.027 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.027 af

Pond Forebay 1a: Forebay 1a Peak Elev=279.91' Storage=74 cf Inflow=0.17 cfs 0.011 af
Outflow=0.15 cfs 0.010 af

Pond Forebay 1b: Forebay 1b Peak Elev=279.91' Storage=116 cf Inflow=0.59 cfs 0.041 af
Outflow=0.55 cfs 0.039 af

Summary for Subcatchment 2S: Post 2a

Runoff = 0.53 cfs @ 12.03 hrs, Volume= 0.034 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
786	98	Roofs, HSG C
1,133	98	Paved parking, HSG C
4,429	74	>75% Grass cover, Good, HSG C
6,348		Weighted Average
4,429	74	69.77% Pervious Area
1,919	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	45	0.0200	0.41		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 1a: Post 1a

Runoff = 0.17 cfs @ 12.01 hrs, Volume= 0.011 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
0	98	Roofs, HSG C
1,377	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
1,377		Weighted Average
1,377	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	49	0.0150	0.74		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff = 0.59 cfs @ 12.03 hrs, Volume= 0.041 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
751	98	Roofs, HSG C
4,015	98	Paved parking, HSG C
246	74	>75% Grass cover, Good, HSG C
5,012		Weighted Average
246	74	4.91% Pervious Area
4,766	98	95.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	99	0.0150	0.81		**Lag/CN Method, Post 1b**

Summary for Subcatchment Post 1cc: Post 1c

Runoff = 0.10 cfs @ 12.01 hrs, Volume= 0.006 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,425	74	>75% Grass cover, Good, HSG C
1,425		Weighted Average
1,425	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.1500	0.78		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1d: Post 1d

Runoff = 0.25 cfs @ 12.05 hrs, Volume= 0.015 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
3,748	74	>75% Grass cover, Good, HSG C
3,748		Weighted Average
3,748	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	73	0.0300	0.45		**Lag/CN Method, Post 1c**

Summary for Subcatchment Post 2b: Post 2b

Runoff = 0.21 cfs @ 12.03 hrs, Volume= 0.014 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
33	98	Roofs, HSG C
1,335	98	Paved parking, HSG C
764	74	>75% Grass cover, Good, HSG C
2,132		Weighted Average
764	74	35.83% Pervious Area
1,368	98	64.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	58	0.0200	0.57		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 3: Post 3

Runoff = 0.68 cfs @ 12.05 hrs, Volume= 0.043 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR-NOAA Rainfall=4.91"

Area (sf)	CN	Description
1,306	98	Roofs, HSG C
195	98	Paved parking, HSG C
7,444	74	>75% Grass cover, Good, HSG C
8,945		Weighted Average
7,444	74	83.22% Pervious Area
1,501	98	16.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	42	0.0100	0.26		**Lag/CN Method, Post 3**

Summary for Reach Post: Post

Inflow Area = 0.665 ac, 37.71% Impervious, Inflow Depth > 1.34" for 10-YR-NOAA event
Inflow = 1.23 cfs @ 12.04 hrs, Volume= 0.074 af
Outflow = 1.23 cfs @ 12.04 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Great Road: Great Road

Inflow Area = 0.195 ac, 38.76% Impervious, Inflow Depth > 0.89" for 10-YR-NOAA event
Inflow = 0.21 cfs @ 12.03 hrs, Volume= 0.014 af
Outflow = 0.21 cfs @ 12.03 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Robinson Road: Robinson Road

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth = 0.00" for 10-YR-NOAA event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Site: Site

Inflow Area = 0.265 ac, 53.13% Impervious, Inflow Depth > 2.70" for 10-YR-NOAA event
Inflow = 1.02 cfs @ 12.05 hrs, Volume= 0.060 af
Outflow = 1.02 cfs @ 12.05 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1d: Basin 1c

Inflow Area = 0.179 ac, 78.62% Impervious, Inflow Depth > 3.64" for 10-YR-NOAA event
Inflow = 0.78 cfs @ 12.02 hrs, Volume= 0.054 af
Outflow = 0.77 cfs @ 12.04 hrs, Volume= 0.048 af, Atten= 1%, Lag= 1.3 min
Discarded = 0.00 cfs @ 12.04 hrs, Volume= 0.004 af
Primary = 0.77 cfs @ 12.04 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.91' @ 12.04 hrs Surf.Area= 316 sf Storage= 323 cf

Plug-Flow detention time= 65.0 min calculated for 0.048 af (88% of inflow)
Center-of-Mass det. time= 27.4 min (783.2 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	353 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
278.50	143	0	0
280.00	327	353	353

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.50'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	279.75'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.91' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.76 cfs @ 12.04 hrs HW=279.91' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.76 cfs @ 0.97 fps)

Summary for Pond Basin 2a: Basin 2a

Inflow Area = 0.146 ac, 30.23% Impervious, Inflow Depth > 2.79" for 10-YR-NOAA event
Inflow = 0.53 cfs @ 12.03 hrs, Volume= 0.034 af
Outflow = 0.03 cfs @ 14.33 hrs, Volume= 0.021 af, Atten= 95%, Lag= 137.8 min
Discarded = 0.03 cfs @ 14.33 hrs, Volume= 0.021 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.49' @ 14.33 hrs Surf.Area= 2,228 sf Storage= 784 cf

Plug-Flow detention time= 189.0 min calculated for 0.021 af (63% of inflow)
Center-of-Mass det. time= 111.9 min (878.5 - 766.5)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	2,253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	972	0	0
281.00	3,534	2,253	2,253

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	280.75'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.03 cfs @ 14.33 hrs HW=280.49' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth > 2.50" for 10-YR-NOAA event
Inflow = 0.68 cfs @ 12.05 hrs, Volume= 0.043 af
Outflow = 0.04 cfs @ 14.47 hrs, Volume= 0.027 af, Atten= 95%, Lag= 145.4 min
Discarded = 0.04 cfs @ 14.47 hrs, Volume= 0.027 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.44' @ 14.47 hrs Surf.Area= 2,915 sf Storage= 978 cf

Plug-Flow detention time= 190.9 min calculated for 0.027 af (63% of inflow)
Center-of-Mass det. time= 114.9 min (893.6 - 778.8)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	3,100 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	1,509	0	0
281.00	4,690	3,100	3,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	281.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.04 cfs @ 14.47 hrs HW=280.44' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1a: Forebay 1a

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 4.34" for 10-YR-NOAA event
Inflow = 0.17 cfs @ 12.01 hrs, Volume= 0.011 af
Outflow = 0.15 cfs @ 12.01 hrs, Volume= 0.010 af, Atten= 11%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.01 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.91' @ 12.09 hrs Surf.Area= 134 sf Storage= 74 cf

Plug-Flow detention time= 67.5 min calculated for 0.010 af (89% of inflow)
Center-of-Mass det. time= 29.8 min (761.4 - 731.6)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	87 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	29	0	0
280.00	145	87	87

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=279.86' TW=279.90' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1b: Forebay 1b

Inflow Area = 0.115 ac, 95.09% Impervious, Inflow Depth > 4.23" for 10-YR-NOAA event
Inflow = 0.59 cfs @ 12.03 hrs, Volume= 0.041 af
Outflow = 0.55 cfs @ 12.04 hrs, Volume= 0.039 af, Atten= 7%, Lag= 0.2 min
Primary = 0.55 cfs @ 12.04 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.91' @ 12.09 hrs Surf.Area= 195 sf Storage= 116 cf

Plug-Flow detention time= 34.0 min calculated for 0.038 af (95% of inflow)
Center-of-Mass det. time= 14.4 min (748.3 - 733.9)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	60	0	0
280.00	208	134	134

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.89' TW=279.90' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment2S: Post 2a Runoff Area=6,348 sf 30.23% Impervious Runoff Depth>3.67"
Flow Length=45' Slope=0.0200 '/' Tc=1.8 min CN=WQ Runoff=0.69 cfs 0.045 af

SubcatchmentPost 1a: Post 1a Runoff Area=1,377 sf 100.00% Impervious Runoff Depth>5.32"
Flow Length=49' Slope=0.0150 '/' Tc=1.1 min CN=WQ Runoff=0.21 cfs 0.014 af

SubcatchmentPost 1b: Post 1b Runoff Area=5,012 sf 95.09% Impervious Runoff Depth>5.20"
Flow Length=99' Slope=0.0150 '/' Tc=2.0 min CN=WQ Runoff=0.72 cfs 0.050 af

SubcatchmentPost 1cc: Post 1c Runoff Area=1,425 sf 0.00% Impervious Runoff Depth>2.96"
Flow Length=20' Slope=0.1500 '/' Tc=0.4 min CN=WQ Runoff=0.14 cfs 0.008 af

SubcatchmentPost 1d: Post 1d Runoff Area=3,748 sf 0.00% Impervious Runoff Depth>2.96"
Flow Length=73' Slope=0.0300 '/' Tc=2.7 min CN=WQ Runoff=0.35 cfs 0.021 af

SubcatchmentPost 2b: Post 2b Runoff Area=2,132 sf 64.17% Impervious Runoff Depth>4.47"
Flow Length=58' Slope=0.0200 '/' Tc=1.7 min CN=WQ Runoff=0.27 cfs 0.018 af

SubcatchmentPost 3: Post 3 Runoff Area=8,945 sf 16.78% Impervious Runoff Depth>3.36"
Flow Length=42' Slope=0.0100 '/' Tc=2.7 min CN=WQ Runoff=0.92 cfs 0.057 af

Reach Post: Post Inflow=1.58 cfs 0.098 af
Outflow=1.58 cfs 0.098 af

Reach Post Great Road: Great Road Inflow=0.27 cfs 0.018 af
Outflow=0.27 cfs 0.018 af

Reach Post Robinson Road: Robinson Road Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach Post Site: Site Inflow=1.31 cfs 0.080 af
Outflow=1.31 cfs 0.080 af

Pond Basin 1d: Basin 1c Peak Elev=279.93' Storage=331 cf Inflow=0.96 cfs 0.069 af
Discarded=0.00 cfs 0.004 af Primary=0.96 cfs 0.059 af Outflow=0.96 cfs 0.062 af

Pond Basin 2a: Basin 2a Peak Elev=280.63' Storage=1,109 cf Inflow=0.69 cfs 0.045 af
Discarded=0.03 cfs 0.025 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.025 af

Pond Basin 3: Basin 3 Peak Elev=280.58' Storage=1,423 cf Inflow=0.92 cfs 0.057 af
Discarded=0.04 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.032 af

Pond Forebay 1a: Forebay 1a Peak Elev=279.93' Storage=78 cf Inflow=0.21 cfs 0.014 af
Outflow=0.18 cfs 0.013 af

Pond Forebay 1b: Forebay 1b Peak Elev=279.94' Storage=122 cf Inflow=0.72 cfs 0.050 af
Outflow=0.68 cfs 0.048 af

Summary for Subcatchment 2S: Post 2a

Runoff = 0.69 cfs @ 12.03 hrs, Volume= 0.045 af, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
786	98	Roofs, HSG C
1,133	98	Paved parking, HSG C
4,429	74	>75% Grass cover, Good, HSG C
6,348		Weighted Average
4,429	74	69.77% Pervious Area
1,919	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	45	0.0200	0.41		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 1a: Post 1a

Runoff = 0.21 cfs @ 12.01 hrs, Volume= 0.014 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
0	98	Roofs, HSG C
1,377	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
1,377		Weighted Average
1,377	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	49	0.0150	0.74		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff = 0.72 cfs @ 12.03 hrs, Volume= 0.050 af, Depth> 5.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
751	98	Roofs, HSG C
4,015	98	Paved parking, HSG C
246	74	>75% Grass cover, Good, HSG C
5,012		Weighted Average
246	74	4.91% Pervious Area
4,766	98	95.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	99	0.0150	0.81		**Lag/CN Method, Post 1b**

Summary for Subcatchment Post 1cc: Post 1c

Runoff = 0.14 cfs @ 12.01 hrs, Volume= 0.008 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,425	74	>75% Grass cover, Good, HSG C
1,425		Weighted Average
1,425	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.1500	0.78		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1d: Post 1d

Runoff = 0.35 cfs @ 12.05 hrs, Volume= 0.021 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
3,748	74	>75% Grass cover, Good, HSG C
3,748		Weighted Average
3,748	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	73	0.0300	0.45		**Lag/CN Method, Post 1c**

Summary for Subcatchment Post 2b: Post 2b

Runoff = 0.27 cfs @ 12.03 hrs, Volume= 0.018 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
33	98	Roofs, HSG C
1,335	98	Paved parking, HSG C
764	74	>75% Grass cover, Good, HSG C
2,132		Weighted Average
764	74	35.83% Pervious Area
1,368	98	64.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	58	0.0200	0.57		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 3: Post 3

Runoff = 0.92 cfs @ 12.05 hrs, Volume= 0.057 af, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR NOAA Rainfall=5.99"

Area (sf)	CN	Description
1,306	98	Roofs, HSG C
195	98	Paved parking, HSG C
7,444	74	>75% Grass cover, Good, HSG C
8,945		Weighted Average
7,444	74	83.22% Pervious Area
1,501	98	16.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	42	0.0100	0.26		**Lag/CN Method, Post 3**

Summary for Reach Post: Post

Inflow Area = 0.665 ac, 37.71% Impervious, Inflow Depth > 1.77" for 25-YR NOAA event
Inflow = 1.58 cfs @ 12.04 hrs, Volume= 0.098 af
Outflow = 1.58 cfs @ 12.04 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Great Road: Great Road

Inflow Area = 0.195 ac, 38.76% Impervious, Inflow Depth > 1.13" for 25-YR NOAA event
Inflow = 0.27 cfs @ 12.03 hrs, Volume= 0.018 af
Outflow = 0.27 cfs @ 12.03 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Robinson Road: Robinson Road

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth = 0.00" for 25-YR NOAA event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Site: Site

Inflow Area = 0.265 ac, 53.13% Impervious, Inflow Depth > 3.61" for 25-YR NOAA event
Inflow = 1.31 cfs @ 12.04 hrs, Volume= 0.080 af
Outflow = 1.31 cfs @ 12.04 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1d: Basin 1c

Inflow Area = 0.179 ac, 78.62% Impervious, Inflow Depth > 4.59" for 25-YR NOAA event
Inflow = 0.96 cfs @ 12.03 hrs, Volume= 0.069 af
Outflow = 0.96 cfs @ 12.04 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.9 min
Discarded = 0.00 cfs @ 12.04 hrs, Volume= 0.004 af
Primary = 0.96 cfs @ 12.04 hrs, Volume= 0.059 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.93' @ 12.04 hrs Surf.Area= 319 sf Storage= 331 cf

Plug-Flow detention time= 56.1 min calculated for 0.062 af (91% of inflow)
Center-of-Mass det. time= 24.3 min (777.1 - 752.7)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	353 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
278.50	143	0	0
280.00	327	353	353

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.50'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	279.75'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.94 cfs @ 12.04 hrs HW=279.93' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.94 cfs @ 1.04 fps)

Summary for Pond Basin 2a: Basin 2a

Inflow Area = 0.146 ac, 30.23% Impervious, Inflow Depth > 3.67" for 25-YR NOAA event
Inflow = 0.69 cfs @ 12.03 hrs, Volume= 0.045 af
Outflow = 0.03 cfs @ 14.73 hrs, Volume= 0.025 af, Atten= 96%, Lag= 161.8 min
Discarded = 0.03 cfs @ 14.73 hrs, Volume= 0.025 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.63' @ 14.73 hrs Surf.Area= 2,574 sf Storage= 1,109 cf

Plug-Flow detention time= 197.7 min calculated for 0.025 af (56% of inflow)
Center-of-Mass det. time= 114.1 min (878.0 - 763.9)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	2,253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	972	0	0
281.00	3,534	2,253	2,253

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	280.75'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.03 cfs @ 14.73 hrs HW=280.63' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth > 3.36" for 25-YR NOAA event
Inflow = 0.92 cfs @ 12.05 hrs, Volume= 0.057 af
Outflow = 0.04 cfs @ 14.90 hrs, Volume= 0.032 af, Atten= 96%, Lag= 171.2 min
Discarded = 0.04 cfs @ 14.90 hrs, Volume= 0.032 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.58' @ 14.90 hrs Surf.Area= 3,366 sf Storage= 1,423 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 115.7 min (890.3 - 774.6)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	3,100 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	1,509	0	0
281.00	4,690	3,100	3,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	281.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.04 cfs @ 14.90 hrs HW=280.58' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1a: Forebay 1a

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 5.32" for 25-YR NOAA event
Inflow = 0.21 cfs @ 12.01 hrs, Volume= 0.014 af
Outflow = 0.18 cfs @ 12.01 hrs, Volume= 0.013 af, Atten= 15%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.01 hrs, Volume= 0.013 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.93' @ 12.09 hrs Surf.Area= 137 sf Storage= 78 cf

Plug-Flow detention time= 58.6 min calculated for 0.013 af (90% of inflow)
Center-of-Mass det. time= 26.4 min (756.9 - 730.6)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	87 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	29	0	0
280.00	145	87	87

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=279.89' TW=279.92' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1b: Forebay 1b

Inflow Area = 0.115 ac, 95.09% Impervious, Inflow Depth > 5.20" for 25-YR NOAA event
Inflow = 0.72 cfs @ 12.03 hrs, Volume= 0.050 af
Outflow = 0.68 cfs @ 12.04 hrs, Volume= 0.048 af, Atten= 6%, Lag= 0.3 min
Primary = 0.68 cfs @ 12.04 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.94' @ 12.09 hrs Surf.Area= 199 sf Storage= 122 cf

Plug-Flow detention time= 29.6 min calculated for 0.048 af (96% of inflow)
Center-of-Mass det. time= 12.7 min (745.6 - 732.9)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	60	0	0
280.00	208	134	134

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.92' TW=279.93' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment2S: Post 2a Runoff Area=6,348 sf 30.23% Impervious Runoff Depth>5.09"
Flow Length=45' Slope=0.0200 '/' Tc=1.8 min CN=WQ Runoff=0.96 cfs 0.062 af

SubcatchmentPost 1a: Post 1a Runoff Area=1,377 sf 100.00% Impervious Runoff Depth>6.84"
Flow Length=49' Slope=0.0150 '/' Tc=1.1 min CN=WQ Runoff=0.26 cfs 0.018 af

SubcatchmentPost 1b: Post 1b Runoff Area=5,012 sf 95.09% Impervious Runoff Depth>6.71"
Flow Length=99' Slope=0.0150 '/' Tc=2.0 min CN=WQ Runoff=0.93 cfs 0.064 af

SubcatchmentPost 1cc: Post 1c Runoff Area=1,425 sf 0.00% Impervious Runoff Depth>4.33"
Flow Length=20' Slope=0.1500 '/' Tc=0.4 min CN=WQ Runoff=0.20 cfs 0.012 af

SubcatchmentPost 1d: Post 1d Runoff Area=3,748 sf 0.00% Impervious Runoff Depth>4.33"
Flow Length=73' Slope=0.0300 '/' Tc=2.7 min CN=WQ Runoff=0.51 cfs 0.031 af

SubcatchmentPost 2b: Post 2b Runoff Area=2,132 sf 64.17% Impervious Runoff Depth>5.94"
Flow Length=58' Slope=0.0200 '/' Tc=1.7 min CN=WQ Runoff=0.36 cfs 0.024 af

SubcatchmentPost 3: Post 3 Runoff Area=8,945 sf 16.78% Impervious Runoff Depth>4.75"
Flow Length=42' Slope=0.0100 '/' Tc=2.7 min CN=WQ Runoff=1.29 cfs 0.081 af

Reach Post: Post Inflow=2.13 cfs 0.141 af
Outflow=2.13 cfs 0.141 af

Reach Post Great Road: Great Road Inflow=0.36 cfs 0.029 af
Outflow=0.36 cfs 0.029 af

Reach Post Robinson Road: Robinson Road Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach Post Site: Site Inflow=1.77 cfs 0.112 af
Outflow=1.77 cfs 0.112 af

Pond Basin 1d: Basin 1c Peak Elev=279.97' Storage=343 cf Inflow=1.26 cfs 0.091 af
Discarded=0.00 cfs 0.004 af Primary=1.26 cfs 0.081 af Outflow=1.27 cfs 0.084 af

Pond Basin 2a: Basin 2a Peak Elev=280.77' Storage=1,507 cf Inflow=0.96 cfs 0.062 af
Discarded=0.04 cfs 0.029 af Primary=0.04 cfs 0.005 af Outflow=0.07 cfs 0.034 af

Pond Basin 3: Basin 3 Peak Elev=280.79' Storage=2,183 cf Inflow=1.29 cfs 0.081 af
Discarded=0.05 cfs 0.039 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.039 af

Pond Forebay 1a: Forebay 1a Peak Elev=279.97' Storage=83 cf Inflow=0.26 cfs 0.018 af
Outflow=0.23 cfs 0.017 af

Pond Forebay 1b: Forebay 1b Peak Elev=279.98' Storage=130 cf Inflow=0.93 cfs 0.064 af
Outflow=0.88 cfs 0.062 af

Summary for Subcatchment 2S: Post 2a

Runoff = 0.96 cfs @ 12.03 hrs, Volume= 0.062 af, Depth> 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
786	98	Roofs, HSG C
1,133	98	Paved parking, HSG C
4,429	74	>75% Grass cover, Good, HSG C
6,348		Weighted Average
4,429	74	69.77% Pervious Area
1,919	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	45	0.0200	0.41		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 1a: Post 1a

Runoff = 0.26 cfs @ 12.01 hrs, Volume= 0.018 af, Depth> 6.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
0	98	Roofs, HSG C
1,377	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
1,377		Weighted Average
1,377	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	49	0.0150	0.74		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff = 0.93 cfs @ 12.03 hrs, Volume= 0.064 af, Depth> 6.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
751	98	Roofs, HSG C
4,015	98	Paved parking, HSG C
246	74	>75% Grass cover, Good, HSG C
5,012		Weighted Average
246	74	4.91% Pervious Area
4,766	98	95.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	99	0.0150	0.81		**Lag/CN Method, Post 1b**

Summary for Subcatchment Post 1cc: Post 1c

Runoff = 0.20 cfs @ 12.01 hrs, Volume= 0.012 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
1,425	74	>75% Grass cover, Good, HSG C
1,425		Weighted Average
1,425	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.1500	0.78		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1d: Post 1d

Runoff = 0.51 cfs @ 12.05 hrs, Volume= 0.031 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
0	98	Roofs, HSG C
0	98	Paved parking, HSG C
3,748	74	>75% Grass cover, Good, HSG C
3,748		Weighted Average
3,748	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	73	0.0300	0.45		**Lag/CN Method, Post 1c**

Summary for Subcatchment Post 2b: Post 2b

Runoff = 0.36 cfs @ 12.03 hrs, Volume= 0.024 af, Depth> 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
33	98	Roofs, HSG C
1,335	98	Paved parking, HSG C
764	74	>75% Grass cover, Good, HSG C
2,132		Weighted Average
764	74	35.83% Pervious Area
1,368	98	64.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	58	0.0200	0.57		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 3: Post 3

Runoff = 1.29 cfs @ 12.05 hrs, Volume= 0.081 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR NOAA Rainfall=7.66"

Area (sf)	CN	Description
1,306	98	Roofs, HSG C
195	98	Paved parking, HSG C
7,444	74	>75% Grass cover, Good, HSG C
8,945		Weighted Average
7,444	74	83.22% Pervious Area
1,501	98	16.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	42	0.0100	0.26		**Lag/CN Method, Post 3**

Summary for Reach Post: Post

Inflow Area = 0.665 ac, 37.71% Impervious, Inflow Depth > 2.54" for 100-YR NOAA event
Inflow = 2.13 cfs @ 12.04 hrs, Volume= 0.141 af
Outflow = 2.13 cfs @ 12.04 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Great Road: Great Road

Inflow Area = 0.195 ac, 38.76% Impervious, Inflow Depth > 1.78" for 100-YR NOAA event
Inflow = 0.36 cfs @ 12.03 hrs, Volume= 0.029 af
Outflow = 0.36 cfs @ 12.03 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Robinson Road: Robinson Road

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth = 0.00" for 100-YR NOAA event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach Post Site: Site

Inflow Area = 0.265 ac, 53.13% Impervious, Inflow Depth > 5.05" for 100-YR NOAA event
Inflow = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af
Outflow = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond Basin 1d: Basin 1c

Inflow Area = 0.179 ac, 78.62% Impervious, Inflow Depth > 6.08" for 100-YR NOAA event
Inflow = 1.26 cfs @ 12.03 hrs, Volume= 0.091 af
Outflow = 1.27 cfs @ 12.04 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.9 min
Discarded = 0.00 cfs @ 12.04 hrs, Volume= 0.004 af
Primary = 1.26 cfs @ 12.04 hrs, Volume= 0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.97' @ 12.04 hrs Surf.Area= 323 sf Storage= 343 cf

Plug-Flow detention time= 45.9 min calculated for 0.084 af (93% of inflow)
Center-of-Mass det. time= 20.7 min (770.0 - 749.3)

Volume	Invert	Avail.Storage	Storage Description
#1	278.50'	353 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
278.50	143	0	0
280.00	327	353	353

Device	Routing	Invert	Outlet Devices
#1	Discarded	278.50'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	279.75'	**5.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.97' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.24 cfs @ 12.04 hrs HW=279.97' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.24 cfs @ 1.14 fps)

Summary for Pond Basin 2a: Basin 2a

Inflow Area = 0.146 ac, 30.23% Impervious, Inflow Depth > 5.09" for 100-YR NOAA event
Inflow = 0.96 cfs @ 12.03 hrs, Volume= 0.062 af
Outflow = 0.07 cfs @ 13.11 hrs, Volume= 0.034 af, Atten= 93%, Lag= 64.5 min
Discarded = 0.04 cfs @ 13.11 hrs, Volume= 0.029 af
Primary = 0.04 cfs @ 13.11 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.77' @ 13.11 hrs Surf.Area= 2,944 sf Storage= 1,507 cf

Plug-Flow detention time= 189.2 min calculated for 0.034 af (54% of inflow)
Center-of-Mass det. time= 106.0 min (866.1 - 760.1)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	2,253 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	972	0	0
281.00	3,534	2,253	2,253

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	280.75'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.04 cfs @ 13.11 hrs HW=280.77' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.04 cfs @ 13.11 hrs HW=280.77' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.36 fps)

Summary for Pond Basin 3: Basin 3

Inflow Area = 0.205 ac, 16.78% Impervious, Inflow Depth > 4.75" for 100-YR NOAA event
Inflow = 1.29 cfs @ 12.05 hrs, Volume= 0.081 af
Outflow = 0.05 cfs @ 15.30 hrs, Volume= 0.039 af, Atten= 96%, Lag= 195.4 min
Discarded = 0.05 cfs @ 15.30 hrs, Volume= 0.039 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 280.79' @ 15.30 hrs Surf.Area= 4,021 sf Storage= 2,183 cf

Plug-Flow detention time= 206.2 min calculated for 0.039 af (48% of inflow)
Center-of-Mass det. time= 117.4 min (886.6 - 769.2)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	3,100 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	1,509	0	0
281.00	4,690	3,100	3,100

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	281.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.05 cfs @ 15.30 hrs HW=280.79' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=280.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1a: Forebay 1a

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 6.84" for 100-YR NOAA event
Inflow = 0.26 cfs @ 12.01 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.01 hrs, Volume= 0.017 af, Atten= 14%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.01 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.97' @ 12.09 hrs Surf.Area= 142 sf Storage= 83 cf

Plug-Flow detention time= 49.7 min calculated for 0.017 af (92% of inflow)
Center-of-Mass det. time= 23.1 min (752.7 - 729.6)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	87 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	29	0	0
280.00	145	87	87

Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=279.91' TW=279.96' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Forebay 1b: Forebay 1b

Inflow Area = 0.115 ac, 95.09% Impervious, Inflow Depth > 6.71" for 100-YR NOAA event
Inflow = 0.93 cfs @ 12.03 hrs, Volume= 0.064 af
Outflow = 0.88 cfs @ 12.04 hrs, Volume= 0.062 af, Atten= 5%, Lag= 0.3 min
Primary = 0.88 cfs @ 12.04 hrs, Volume= 0.062 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 279.98' @ 12.08 hrs Surf.Area= 205 sf Storage= 130 cf

Plug-Flow detention time= 24.4 min calculated for 0.062 af (97% of inflow)
Center-of-Mass det. time= 10.8 min (742.6 - 731.9)

Volume	Invert	Avail.Storage	Storage Description
#1	279.00'	134 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
279.00	60	0	0
280.00	208	134	134

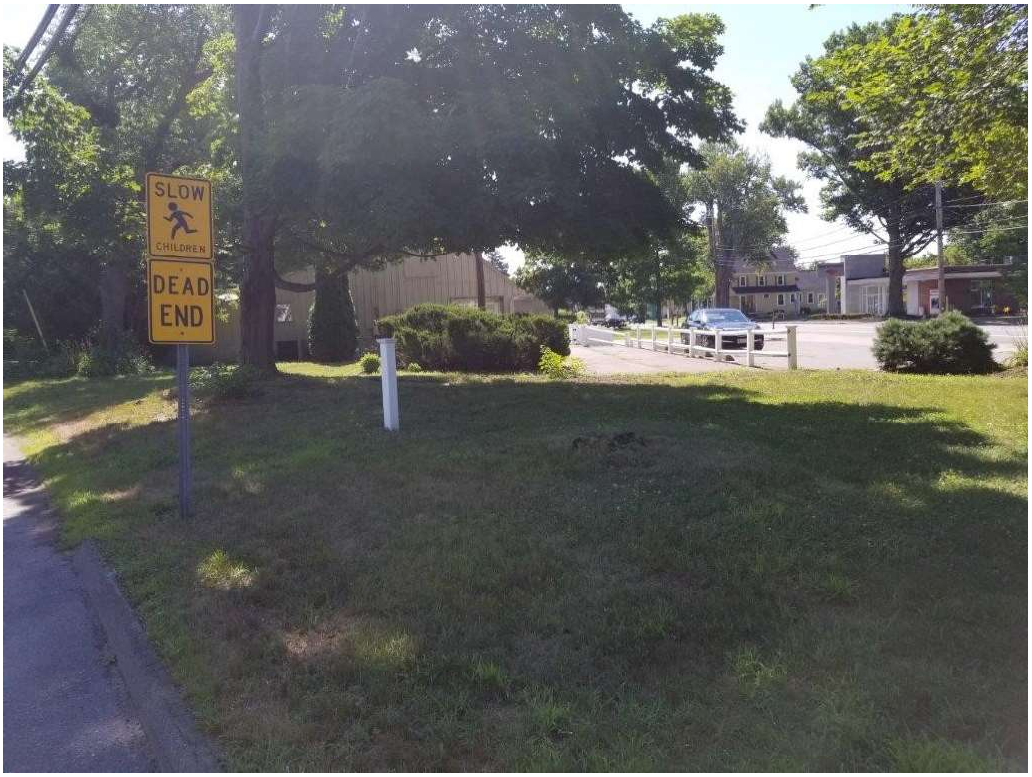
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**3.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=279.96' TW=279.97' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Application Fees Submitted

Existing Conditions Photos


NORTHERN BANK & TRUST COMPANY


SLOW
CHILDREN
DEAD
END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