Carroll School

STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN

**CARROLL SCHOOL
WALTHAM ROAD
WAYLAND, MASSACHUSETTS**

Prepared for:

Carroll School
Baker Bridge Road
Lincoln, Massachusetts

Prepared by:

Oak Consulting Group, LLC
P.O. Box 1123
Newburyport, Massachusetts 01950
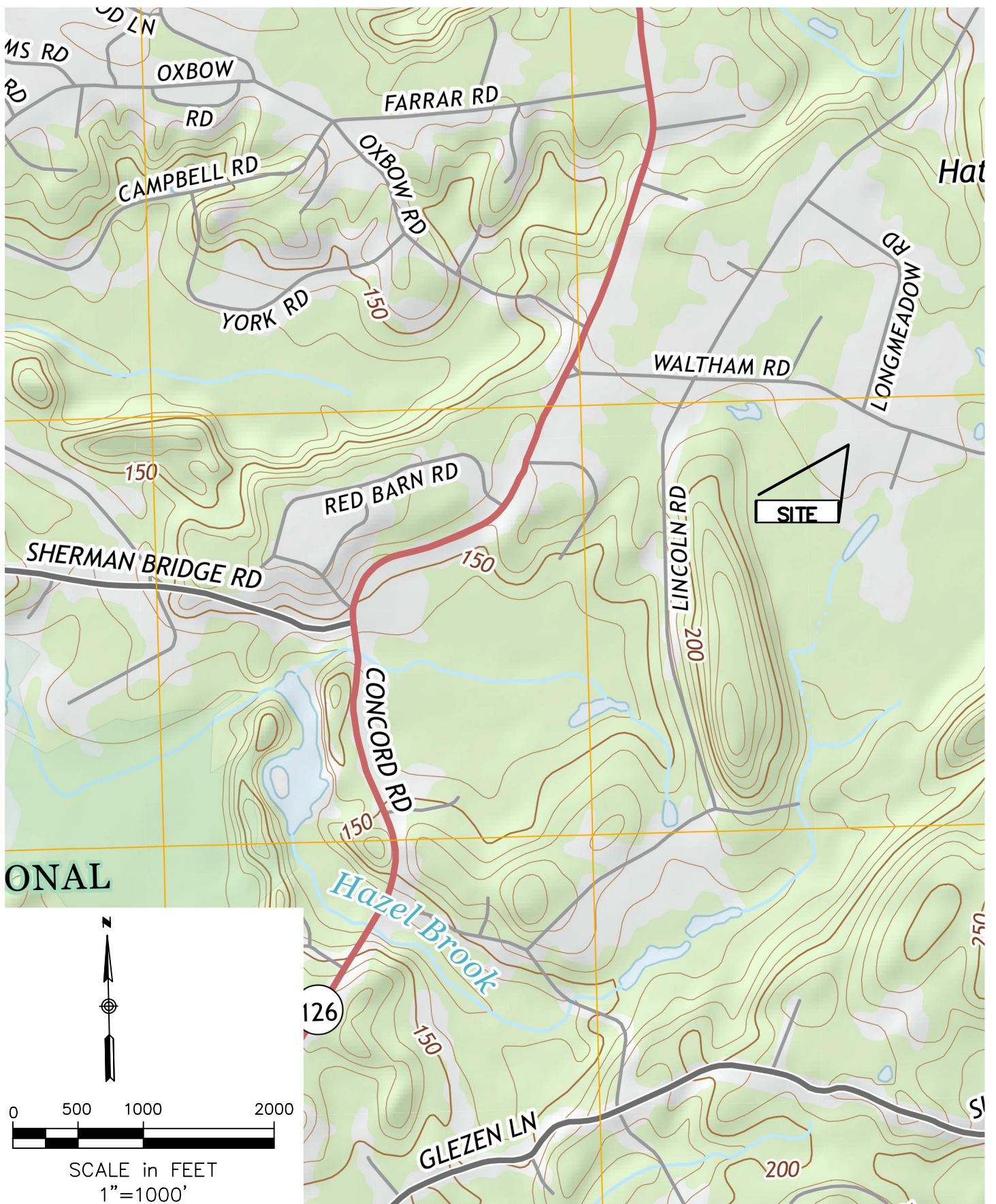978.312.3120

Project 16011
June 2016

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SITE LOCATION USGS MAP — Carroll School, 45 Waltham Road, Wayland, Massachusetts

Map labels:
- OD LN
- MS RD
- OXBOW RD
- FARRAR RD
- OXBOW RD
- CAMPBELL RD
- Hat
- LONGMEADOW RD
- YORK RD
- 150
- WALTHAM RD
- 150
- RED BARN RD
- LINCOLN RD
- SITE
- SHERMAN BRIDGE RD
- 150
- 150
- 200
- CONCORD RD
- ONAL
- 250
- 150
- Hazel Brook
- 126
- 150
- GLEZEN LN
- 200
- S

N

0   500   1000   2000

SCALE in FEET
1"=1000'

Carroll School
45 Waltham Road
Wayland, Massachusetts

SITE LOCATION USGS MAP
2015 Concord Quardrangle
7.5 Minute Series

DRAWN BY:	CHECKED BY:	FIGURE NO.
SPM	SPM	
SCALE:	DATE:	**1**
AS NOTED	6/27/16	

1.0   INTRODUCTION

On behalf of Carroll School (School), Oak Consulting Group, LLC (OCG) has prepared the following Stormwater Management and Pollution Prevention Plan for the School's property at 45 Waltham Road in Wayland, Massachusetts. The purpose of this report is to demonstrate compliance with the Town of Wayland Regulations, the Massachusetts Department of Environmental Protection's (MA DEP's) Stormwater Policy and standard engineering practice.

1.1   Current Conditions

The project site consists of a +/-11-acre parcel bounded to the North by Waltham Road; town conservation wetlands to the west and south; and residential property to the east. There is also a tributary to the Hazel Brook identified as a perennial stream within the wetland area west of the site. The site is relatively flat, sloping generally from Waltham Road in the north to the wetlands in the southwest.

The site is developed with a large main building, and several accessory use buildings including a pool house and barn. The site is also developed with supporting driveways, parking areas, septic system, and other miscellaneous site improvements. The site has most recently been used as a single family residence.

Areas which are not developed with impervious surfaces are generally comprised of grassed pasture areas, or landscaped lawn areas.   Landscaped areas are served by an automatic sprinkler system believed to be connected to two irrigation wells on site.

The site consists of a single watershed that drains to the wetlands to the south and the tributary to Hazel Brook. As shown on Pre-Development Subcatchment Plan DR-001, this watershed area is further divided into smaller subcatchment areas and is described as follows:

Subcatchment 1a

This subcatchment consists of the middle and southern portions of the site. This area is development with the pool house area, the barn and the paved driveway to and around the barn as well as several smaller shed structures. A majority of this subcatchment is open pasture land. This subcatchment is moderately sloped southwesterly draining toward the wetlands along the south and west boundary.

Subcatchment 1b

This subcatchment consists of the roof of the main building. This roof is guttered with downspouts to below grade structures believed to be drywells. There does not appear to be any surface discharge from the roof. For the purpose of this study, the drainage model assumed drywells sized to infiltrate the entire flow from this subcatchment.

Subcatchment 2a

This subcatchment consists of paved parking, walkways, and drive aisles along with landscaped area located in the northeastern portion of the site. This subcatchment is moderately sloped northeasterly flowing to a catchbasin and drainage easement located offsite along the eastern property boundary. This drainage then is piped along the eastern boundary discharging to a pond draining to the wetlands along the south and western boundary.

Subcatchment 2b

This subcatchment consists of paved parking, walkways, and drive aisles along with landscaped area located in the center of the northern portion of the site. This subcatchment is moderately sloped northeasterly flowing to a drain inlet in the existing drive. This drainage is piped underground and believed to be connected to a drywells. There does not appear to be any surface discharge or overflow from this basin. For the purpose of this study, the drainage model assumed drywells sized to infiltrate the entire flow from this subcatchment.

Subcatchment 3

This subcatchment consists of gravel parking, and drive aisles along with landscaped area located in the northwestern portion of the site. This subcatchment is moderately sloped northwesterly flowing overland offsite to the west. This drainage then flows to the wetlands along the south and western boundary.

Subcatchment 4

This subcatchment consists of gravel parking, drive aisles and a sports court, along with landscaped area located in the northwestern portion of the site. This subcatchment is moderately sloped westerly flowing overland offsite to the west. This drainage then flows to the wetlands along the south and western boundary.

1.2   Site Geology and Hydrogeology

According to the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Soil Map for Essex County, the soils within the project area are classified as Haven Silt Loam with a Hydrologic Soil Group (HSG) A designation. Test pits conducted in June 2016 confirmed this soil profile which consists of a thick top soil layer over a fine sandy loam layer over a coarse sand and gravel. The subsoils are considered very well-draining. The soils data is enclosed as Appendix A.

1.3   Proposed Improvements

The Project consists of renovating the main building and pool house building for use as a middle school. To support the school use, new parking, driveways and walkways will be constructed as well as two athletic fields with landscaping and drainage infrastructure.

Under proposed conditions, stormwater patterns will generally replicate existing conditions.   As shown on the Post-Development Subcatchment Plan, sheet DR-002, the site was divided into subcatchment areas substantially similar to the Pre-Development condition. Subcatchments 1 and 2 were divided into several smaller subcatchment areas to evaluate proposed stormwater Best Management Practices (BMP's) to be implemented. The Post-Development subcatchments are described as follows:

Subcatchment 1a

This subcatchment consists of the southern portions of the site. This area included the barn and the paved driveway to and around the barn, portions of the two playing fields as well as land left undisturbed around the perimeter of the site. A majority of this subcatchment remains pervious open space. This subcatchment is moderately sloped southwesterly draining overland toward the wetlands along the south and west boundary.

Subcatchment 1b

This subcatchment consists of the roof of the main building. This roof is guttered with downspouts to below grade structures believed to be drywells. There does not appear to be any surface discharge from the roof. For the purpose of this study, the drainage model assumed drywells sized to infiltrate the entire flow from this subcatchment. This is unchanged from the Pre-development condition.

Subcatchment 1c

This subcatchment consists of the middle portion of the site. This area includes the pool house new walkways, half of the one playing field as well as landscaped lawn area. A majority of this subcatchment remains pervious open space. This subcatchment is moderately sloped southeasterly draining overland to one of three drain inlets adjacent to the playing field. These inlets are interconnected with perforated pipe which is to be constructed in the very permeable sand and gravel soil. Stormwater not infiltrated will be discharged through the wall on the western edge of the property and to the wetlands along the south and western boundary.

Subcatchment 1d

This subcatchment consists of the middle portion of the site. This area includes new walkways, portion of the one playing field as well as landscaped lawn area. A majority of this subcatchment remains pervious open space. This subcatchment is moderately sloped southwesterly draining overland to one of two drain inlets adjacent to the playing field. These inlets are interconnected to the drainage within Subcatchment 1c with perforated pipe which is to be constructed in the very permeable sand and gravel soil.

Subcatchment 1e

This subcatchment consists of the middle eastern portion of the site. This area includes a large portion of the drive to the barn, half of the one playing field as well as landscaped lawn area. This subcatchment is moderately sloped southerly draining overland to a 350 foot french drain adjacent to the playing field. This drain is connected to perforated pipe which is to be constructed in the very permeable sand and gravel soil beneath the field. Stormwater not infiltrated will flow overland to the southern edge of the property and to the wetlands along the south and western boundary.

Subcatchment 2a

This subcatchment consists of paved walkways, and drive aisles along with landscaped area located in the northeastern portion of the site. This subcatchment is moderately sloped northeasterly flowing to a catchbasin and drainage easement located offsite along the eastern property boundary. This drainage then is piped along the eastern boundary discharging to a pond draining to the wetlands along the south and western boundary.

Subcatchment 2b

This subcatchment consists of paved parking, walkways, and drive aisles along with landscaped area located in the center of the northern portion of the site. This subcatchment is moderately sloped northerly flowing overland to a new bioretention basin #1. The basin has a drain inlet to limit the regular ponding depth. This inlet is interconnected to the other 2 basins in the area with perforated pipe which is to be constructed in the very permeable sand and gravel soil to easily infiltrate stormwater.

Subcatchment 2c

This subcatchment consists of paved parking and drive aisles along with landscaped area located in the center of the northern portion of the site. This subcatchment is moderately sloped northerly flowing overland to a new bioretention basin #2. The basin has a drain inlet to limit the regular ponding depth. This inlet is interconnected to the other 2 basins in the area with perforated pipe which is to be constructed in the very permeable sand and gravel soil to easily infiltrate stormwater.

Subcatchment 2d

This subcatchment consists of paved parking and drive aisles along with landscaped area located in the center of the northern portion of the site. This subcatchment is moderately sloped flowing overland to a new bioretention basin #3. The basin has a drain inlet to limit the regular ponding depth. This inlet is interconnected to the other 2 basins in the area with perforated pipe which is to be constructed in the very permeable sand and gravel soil to easily infiltrate stormwater.

Subcatchment 3

This subcatchment consists of a paved driveway along with landscaped area located in the northwestern portion of the site. This subcatchment is moderately sloped northwesterly flowing overland offsite to the west. This drainage then flows to the wetlands along the south and western boundary.

Subcatchment 4

This subcatchment consists of the sports court, along with landscaped area located in the northwestern portion of the site. This subcatchment is moderately sloped westerly flowing overland offsite to the west. This drainage then flows to the wetlands along the south and western boundary.

2.0   STORMWATER MANAGEMENT STANDARDS CONFORMANCE

The measures taken to address each of the performance standards of the MA DEP Stormwater Policy are presented below.

2.1   Untreated Stormwater (Standard 1)

The proposed project will not result in new untreated discharges or outfalls. Existing stormwater runoff patterns will be maintained.

2.2   Post-Expansion Peak Discharge Rates (Standard 2)

Pre- and Post-Development runoff rates were calculated using HydroCAD based on the Cornell Rainfall data. As shown in the table below, peak discharge rates from the site will not increase in the Post-Redevelopment condition for all storm events.

The HydroCAD calculations can be found in Appendix C and D.

Table 2.2.1		Rainfall Events			
	1.0 Inches	**2-Year (3.2 Inches)**	**10-Year (4.8 Inches)**	**25-Year (6 Inches)**	**100-Year (8.5 Inches)**
Site Runoff Rate (cfs)					
Pre-development Pond Elevation	0.35	1.46	2.15	2.97	7.37
Post-development Pond Elevation	0.29	1.02	1.54	1.97	7.32
Change (cfs)	**-0.06 (-17%)**	**-0.44 (-30%)**	**-0.61 (-28%)**	**-1.0 (-34%)**	**-0.05 (-1%)**

Additionally, as shown in the table below, volume of runoff from the site will not increase in the Post-Redevelopment condition.

Table 2.2.2		Rainfall Events			
	1.0 Inches	**2-Year (3.2 Inches)**	**10-Year (4.8 Inches)**	**25-Year (6 Inches)**	**100-Year (8.5 Inches)**
Site Runoff Volume (acft)					
Pre-development Pond Elevation	0.064	0.25	0.48	0.772	1.645
Post-development Pond Elevation	0.030	0.112	0.212	0.36	0.954
Change (acft)	**-0.034(-53%)**	**-0.138(-55%)**	**-0.268(-56%)**	**-0.412(-53%)**	**-0.691 (-42%)**

As shown above, the proposed project will result in a reduction in the rate and volume of runoff from the site over the Pre-development condition.

2.3   Recharge to Groundwater (Standard 3)

The groundwater recharge performance standard requires that the recharge in the Post-development condition shall approximate the annual recharge in the Pre-development condition. As shown in table 2.2.2, the volume of runoff from the site will be reduced for all storm events. This reduction in stormwater volume represents an increase in infiltration and recharge on the site thus meeting the groundwater recharge standard.

2.4   Water Quality (Standard 4)

Runoff from new paved parking areas and drive aisles will flow overland to one of three bio-retention areas to treat and infiltrate stormwater.

2.5   Land Uses with Higher Potential Pollutant Loads (Standard 5)

The project site does not meet the definition of a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined by the MA DEP.

2.6   Protection of Critical Areas (Standard 6)

The site does not contain critical environmental resource areas.

2.7   Redevelopment Project (Standard 7)

Portions of the project constitute a redevelopment project; however the project has been designed to meet the MA DEP Stormwater Standards in full.

2.8   Construction Period Erosion/Sediment Control (Standard 8)

Erosion and sediment control barriers are proposed at the downstream end of the project area as shown on the project plans. In addition, inlet protection will be provided for catch basins receiving runoff from the project site. These measures will be installed prior to the start of work and maintained by the Contractor for the duration of project construction. Additional Erosion control notes and required measures are provided on Sheet C-004.

The project will disturb more than one acre of land and will require a Stormwater Pollution Prevention Plan (SWPPP) under the National Pollution Discharge Elimination System (NPDES) Construction General Permit (CGP).   The SWPPP will be prepared as required by NPDES and be in place prior to the start of construction.

2.9   Operation and Maintenance Plan (Standard 9)

A campus Operation and Maintenance (O&M) Plan is enclosed as Appendix B.

2.10   Prohibition of Illicit Discharges (Standard 10)

The project does not include any illicit discharges.

APPENDIX A

Soils Information

Carroll School
Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Old Sudbury Rd

Longmeadow Rd

251A

52A

Map Scale: 1:2,260 if printed on A portrait (8.5" 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

MAP INFORMATION

Area of Interest (AOI)

☐ Area of Interest (AOI)

Soils

Soil Rating Polygons

■ A

■ A/D

■ B

■ B/D

■ C

■ C/D

■ D

☐ Not rated or not available

Soil Rating Lines

〰 A

〰 A/D

〰 B

〰 B/D

〰 C

〰 C/D

〰 D

〰 Not rated or not available

Soil Rating Points

■ A

■ A/D

■ B

■ B/D

■ C

■ C/D

■ D

☐ Not rated or not available

Water Features

〰 Streams and Canals

Transportation

╫ Rails

⟩ Interstate Highways

⟩ US Routes

⟩ Major Roads

⟩ Local Roads

Background

▨ Aerial Photography

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: http://websoilsurvey.nrcs.usda.gov
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 15, Sep 28, 2015

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 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.

USDA **Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

6/9/2016
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Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Middlesex County, Massachusetts (MA017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
52A	Freetown muck, 0 to 1 percent slopes	B/D	2.0	16.2%
251A	Haven silt loam, 0 to 3 percent slopes	A	10.4	83.8%
Totals for Area of Interest			12.4	100.0%

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

Middlesex County, Massachusetts

251A—Haven silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vqpb
Elevation: 100 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Haven and similar soils: 85 percent
Minor components: 15 percent
*Estimates are based on observations, descriptions, and transects of the
    mapunit.*

Description of Haven

Setting

Landform: Terraces, plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over loose sandy
    glaciofluvial deposits

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 20 inches: silt loam
H3 - 20 to 32 inches: very fine sandy loam
H4 - 32 to 65 inches: stratified coarse sand to sand to fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting
    textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00
    to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: A

Minor Components

Merrimac

Percent of map unit: 9 percent
Landform: Terraces, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex

Scio

Percent of map unit: 5 percent
Landform: Depressions, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Unnamed

Percent of map unit: 1 percent

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 15, Sep 28, 2015

USDA **Natural Resources**
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/9/2016
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TP-1 DEEP OBSERVATION HOLE

45 Waltham Road, Wayland, Massachusetts

Date: 6/17/16

Time: AM   **Weather:** Sunny, 70°s, dry

Vegetation: Grassed Pasture.

Open water body: 200+ feet   **Drainage way:** 50+ feet

Wetlands: 100+ feet   **Property line:** 10+ feet

Drinking water well: NA

Depth from surface (inches)	Soil Layer/ Horizon	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redox features/ mottles	Consistence, grade, size,structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, etc.
0 - 23"	A	Silty Loam	10YR 4/4	ND	Friable
23 - 48"	B	Fine Sandy Loam	2.5Y 6/8	ND	Firm in place, Friable, weak medium-angular blocky
48 - 92"	C	Coarse Sand	2.5Y 6/5	68"	Loose, structureless, stratified, well graded, coarse sand with gravel and cobbles.

ND: none detected

Depth to bedrock: >92"   **Hydric/ Upland Soil:** upland

Drainage Class: VED   **Hydrologic Soil Group**: A   **Soil map unit:** 251A Haven silt loam

DEPTH TO GROUNDWATER

Estimated Seasonal High Groundwater Table: 68"

Depth to stabilized free water: N.O. (inches below grade)   **Apparent water seeping from pit face:** N.O. (inches below grade)

Soil moisture state: damp.

Comments: B layer has varying color with some grays; C layer has varying layers of very coarse sand and gravels

Solid Ground water line around the entire hole at 68"

TP-2 DEEP OBSERVATION HOLE

45 Waltham Road, Wayland, Massachusetts

Date: 6/17/16

Time: AM   **Weather:** Sunny, 70°s, dry

Vegetation: Grassed Pasture.

Open water body: 200+ feet   **Drainage way:** 50+ feet

Wetlands: 100+ feet   **Property line:** 10+ feet

Drinking water well: NA

Depth from surface (inches)	Soil Layer/ Horizon	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redox features/ mottles	Consistence, grade, size,structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, etc.
0 - 17"	A	Silty Loam	10YR 4/4	ND	Friable
17 - 39"	B	Fine Sandy Loam	2.5Y 6/8	ND	Firm in place, Friable, weak medium-angular blocky
39 - 96"	C	Coarse Sand	2.5Y 6/5	42"	Loose, structureless, stratified, well graded, coarse sand with gravel and cobbles.

ND: none detected

Depth to bedrock: >96"   **Hydric/ Upland Soil:** upland

Drainage Class: VED   **Hydrologic Soil Group**: A   **Soil map unit:** 251A Haven silt loam

DEPTH TO GROUNDWATER

Estimated Seasonal High Groundwater Table: 42"

Depth to stabilized free water: N.O. (inches below grade)   **Apparent water seeping from pit face:** N.O. (inches below grade)

Soil moisture state: damp.

 Comments: Roots to 42", Solid Ground water line around the entire hole at 42" , damp at 82"

TP-3 DEEP OBSERVATION HOLE

45 Waltham Road, Wayland, Massachusetts

Date: 6/17/16

Time: AM   **Weather:** Sunny, 70°s, dry

Vegetation: Grassed Pasture.

Open water body: 200+ feet   **Drainage way:** 50+ feet

Wetlands: 50+ feet   **Property line:** 10+ feet

Drinking water well: NA

Depth from surface (inches)	Soil Layer/ Horizon	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redox features/ mottles	Consistence, grade, size,structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, etc.
0 - 8"	A	Silty Loam	10YR 4/4	ND	Friable
8 - 24"	B	Fine Sandy Loam	2.5Y 6/8	ND	Firm in place, Friable, weak medium-angular blocky
24 - 90"	C	Coarse Sand	2.5Y 6/5	24"	Loose, structureless, stratified, well graded, coarse sand with gravel and cobbles.

ND: none detected

Depth to bedrock: >90"   **Hydric/ Upland Soil:** upland

Drainage Class: VED   **Hydrologic Soil Group**: A   **Soil map unit:** 251A Haven silt loam

DEPTH TO GROUNDWATER

Estimated Seasonal High Groundwater Table: 24"

Depth to stabilized free water: N.O. (inches below grade)   **Apparent water seeping from pit face:** N.O. (inches below grade)

Soil moisture state: damp.

 Comments: Solid Ground water rust line around the entire hole at 24" , seepage at 88", clean sand at 70"

TP-4 DEEP OBSERVATION HOLE

45 Waltham Road, Wayland, Massachusetts

Date: 6/17/16

Time: AM   **Weather:** Sunny, 70°s, dry

Vegetation: Grassed Pasture.

Open water body: 200+ feet   **Drainage way:** 50+ feet

Wetlands: 100+ feet   **Property line:** 10+ feet

Drinking water well: NA

Depth from surface (inches)	Soil Layer/ Horizon	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redox features/ mottles	Consistence, grade, size,structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, etc.
0 - 14”	A	Silty Loam	10YR 4/4	ND	Friable
14 - 28”	B	Fine Sandy Loam	2.5Y 6/8	ND	Firm in place, Friable, weak medium-angular blocky
28 - 40”	C	Coarse Sand	2.5Y 6/5	ND	Loose, structureless, stratified, well graded, coarse sand with gravel and cobbles.

ND: none detected

Depth to bedrock: >40”   **Hydric/ Upland Soil:** upland

Drainage Class: VED   **Hydrologic Soil Group**: A   **Soil map unit:** 251A Haven silt loam

DEPTH TO GROUNDWATER

Estimated Seasonal High Groundwater Table: N.O.

Depth to stabilized free water: N.O. (inches below grade)   **Apparent water seeping from pit face:** N.O. (inches below grade)

Soil moisture state: damp.

TP-5 DEEP OBSERVATION HOLE

45 Waltham Road, Wayland, Massachusetts

Date: 6/17/16

Time: AM   **Weather:** Sunny, 70°s, dry

Vegetation: Grassed Pasture.

Open water body: 200+ feet   **Drainage way:** 50+ feet

Wetlands: 100+ feet   **Property line:** 10+ feet

Drinking water well: NA

Depth from surface (inches)	Soil Layer/ Horizon	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redox features/ mottles	Consistence, grade, size,structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, etc.
0 - 15"	A	Silty Loam	10YR 4/4	ND	Friable
15 - 38"	B	Fine Sandy Loam	2.5Y 6/8	ND	Firm in place, Friable, weak medium-angular blocky
38 - 72"	C	Coarse Sand	2.5Y 6/5	52"	Loose, structureless, stratified, well graded, coarse sand with gravel and cobbles.

ND: none detected

Depth to bedrock: >72"   **Hydric/ Upland Soil:** upland

Drainage Class: VED   **Hydrologic Soil Group**: A   **Soil map unit:** 251A Haven silt loam

DEPTH TO GROUNDWATER

Estimated Seasonal High Groundwater Table: 52"

Depth to stabilized free water: N.O. (inches below grade)   **Apparent water seeping from pit face:** N.O. (inches below grade)

Soil moisture state: damp.

Comments: **Solid Ground water rust line around the entire hole at 52"**

APPENDIX B

Pollution Prevention and Stormwater
Operation and Maintenance Plan
Carroll School
Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Carroll School

Pollution Prevention and
Stormwater Operation and Maintenance Plan

For

Carroll School
Waltham Road
Wayland, Massachusetts

Prepared by:

OCG
Oak Consulting Group

P.O. Box 1123
Newburyport, Massachusetts
(978) 312-3120

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APPENDICES:

        Appendix A: Stormwater System O&M Inspection Report

1.0   INTRODUCTION

This Pollution Prevention and Operation and Maintenance (O&M) Plan has been prepared to implement procedures for the Carroll School at 45 Waltham Road in Wayland (Project). The purpose of the plan is to help minimize the potential for stormwater pollution and adverse impacts to resource areas subject to protection under the Massachusetts Wetlands Protections Act and Town of Wayland Wetlands Bylaw. This plan has been prepared to identify pollution prevention measures which are implemented as part of daily operations as well as O&M practices and procedures for stormwater Best Management Practices (BMPs).

The Project encompasses approximately 11 acres located at 45 Waltham Road in Wayland, Massachusetts. Wetlands resource areas associated with a tributary to Hazel Brook include bordering vegetated wetlands (BVW) and riverfront area.   A plan showing the configuration of the Project stormwater systems and wetlands resource areas is provided on Sheet C-003, Site Grading, Drainage & Erosion Control Plan.   Inspection forms for Stormwater BMPs are enclosed in Appendix A.

1.1   Roles and Responsibilities

Owner

Carroll School (The School)

Implementation

The School

This plan shall be maintained by the School and distributed to all relevant staff and outside contractors on an annual basis.

2.0 **POLLUTION PREVENTION**

The following section presents methods and procedures implemented by the Project as part of daily operations to minimize potential stormwater pollution. The procedures presented below have been developed to be practical to implement and sufficiently protective of nearby resource areas and the environment in general.

2.1   Equipment and Material Storage

Seasonal equipment, generally limited to snow plows, lawn mowers and other miscellaneous equipment used by the personnel or companies conducting routine maintenance at the Project, will be regularly stored in the barn or similar structure. Equipment used at the Project shall be generally clean and free of oil leaks and/or hazardous material which could potentially impact storm water quality.

Supplies such as sand, grass seed, fertilizers, and other materials which may be affected by weather or become airborne stored on site, shall be stored in the barn or similar structure.

2.2   Fuel Storage

There is no proposed significant fuel storage at the Project. Any fuel storage would be limited to small containers of 5 gallons or less and stored in the barn or similar structure. Any fueling on site of maintenance equipment shall be conducted on paved areas at least 100' away from any resource area.

2.3   Trash and Recyclables Collection

Trash and recyclables will be picked up from the Project on a routine basis by an outside, licensed hauler. Trash and recyclable containers shall be stored within the designated enclosure or within the building until they are picked up.

2.4   General Housekeeping

Cleanup to remove accumulated trash and debris shall be performed on both an as-needed and scheduled basis. Routine cleanup activities include the following:

2.4.1   Trash and Debris Pickup

Trash and debris pickup shall be performed continuously as needed. School personnel as well as landscape and maintenance contractors shall be responsible for removing litter from the grounds. Students, staff and visitors are prohibited from littering and are encouraged to pickup miscellaneous debris which they may encounter.

2.4.2   Sweeping

Sweeping of driveways, walkways and parking areas shall be performed on an annual basis during the early spring to remove salt and sand applied to these surfaces during the winter months. Should the need arise; selected areas of the Project may be swept more frequently. Sweeping will be performed by school personnel and outside contractors using suitable

equipment. Recovered sweepings shall be disposed with other yard waste off-site in accordance with all applicable state, local and federal laws.

2.4.3   Spring and Fall Cleanup

Spring and fall cleanups shall be performed once per year following snow melt and tree defoliation, respectively. The majority of the spring and fall cleanup efforts shall focus on landscaped and lawn areas throughout the Project. Yard waste, including leaves, grass cuttings, nuisance vegetation, branches, stumps, rocks, etc., shall be disposed of off-site in accordance with all applicable state, local and federal laws.

2.5   Snow Plowing/Deicing

Snow and ice removal operations shall be performed on an as-needed basis. Snow from driveways, parking areas and walkways shall be plowed to the sides of the paved surfaces in accordance with customary snow plowing procedures. Snow shall be plowed into wetlands resource areas or the buffer zones. Snow stockpiles shall be located beyond wetlands buffer zones and in designated locations throughout the Project. Snow banks or piles may be removed from parking lots or other critical areas as needed. Snow which may be removed in this manner shall be disposed of off-site in accordance with applicable state, local and federal laws. Snow shall not be dumped or pushed into drainage bioretention basins.

Deicing operations consist of applying sand or salt to walkways and other paved surfaces as needed for vehicle and pedestrian safety. Salt shall be applied at the minimal acceptable rates to provide safe vehicle and pedestrian safety.

2.6   Landscape Maintenance

Lawn and landscape areas shall be regularly maintained by a school personnel or a landscape contractor. School personnel or a landscape contractor shall be responsible for the maintenance and upkeep of the stormwater bio-retention including by not limited to replacement of dead or dying vegetation, removal of sediment and replacement of mulch.

The use of fertilizers, pesticides, and herbicides shall be minimized and in no case shall they be used within 100' of a wetland resource area.

3.0   OPERATION AND MAINTENANCE

School personnel or an outside contractor shall inspect the stormwater management systems on a routine basis. Refer to the Site Grading, Drainage & Erosion Control Plans (Plans) for drainage structure locations. Inspection and maintenance shall be performed as follows:

3.1   Drain inlets

Drain inlets shall be inspected for accumulation of silt, sediment, or debris on a semi-annual basis. Cleaning will be performed at least once per year or more frequently if the sediment level rises 2 feet above the bottom of the sump. Removed sediment will be disposed off site by a qualified waste disposal contractor in accordance with local, state and federal regulations.

3.2   Stormwater Basins

Three bio-retention areas are located in the area of the parking and drives in the north end of the site. Inspection will include identifying and repairing eroded areas. Eroded areas will be re-mulched as necessary. The maintenance schedule for the bioretention basins is as follows:

Activity	Time of Year	Frequency
Inspect and Remove Trash	Year round	Monthly
Mulch	Spring	Annually
Remove Dead Vegetation	Fall or Spring	Annually
Replace Dead Vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace Entire Media and All Vegetation	Late Spring/early Summer	As needed

3.3   Record Keeping

The School shall complete the Stormwater System Inspection Report (Appendix A) as part of routine inspections. Copies of completed reports shall be kept for at least 5 years. Receipts of catch basin cleaning and other O&M activities which require contracted services shall also kept on file for a minimum of 5 years.

APPENDIX A

Stormwater System O&M Inspection Report

Carroll School
45 Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Stormwater System Inspection Report

General Information	
Location: Carroll School, 45 Waltham Road, Wayland, MA	

Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Purpose of Inspection			

Weather Information
Has it rained since the last inspection?   ❑Yes   ❑No
Weather at time of this inspection?

Site-Specific Stormwater Devices

	Description	Installed and Operating Properly?	Corrective Action Needed	Date for Corrective Action/Responsible Person
1		❑Yes ❑No		
2		❑Yes ❑No		
3		❑Yes ❑No		
4		❑Yes ❑No		
5		❑Yes ❑No		
6		❑Yes ❑No		
7		❑Yes ❑No		
8		❑Yes ❑No		
9		❑Yes ❑No		

	Description	Installed and Operating Properly?	Corrective Action Needed	Date for Corrective Action/Responsible Person
10		❑Yes ❑No		
11		❑Yes ❑No		
12		❑Yes ❑No		
13		❑Yes ❑No		
14		❑Yes ❑No		
15		❑Yes ❑No		
16		❑Yes ❑No		
17		❑Yes ❑No		
18		❑Yes ❑No		
19		❑Yes ❑No		
20		❑Yes ❑No		

Overall Site Issues

	Description		Corrective Action	Date for Corrective Action/Responsible Person
1	Are all slopes properly stabilized?	❑Yes ❑No		
2	Are natural resource areas (e.g., streams, wetlands, etc.) being subjected to erosion?	❑Yes ❑No		
3	Are discharge points free of sediment deposits?	❑Yes ❑No		

Certification Statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name: _____

Signature: _____ Date: _____

Oak Consulting Group, LLC
Project 16011

APPENDIX C

Pre-development Calculations
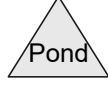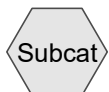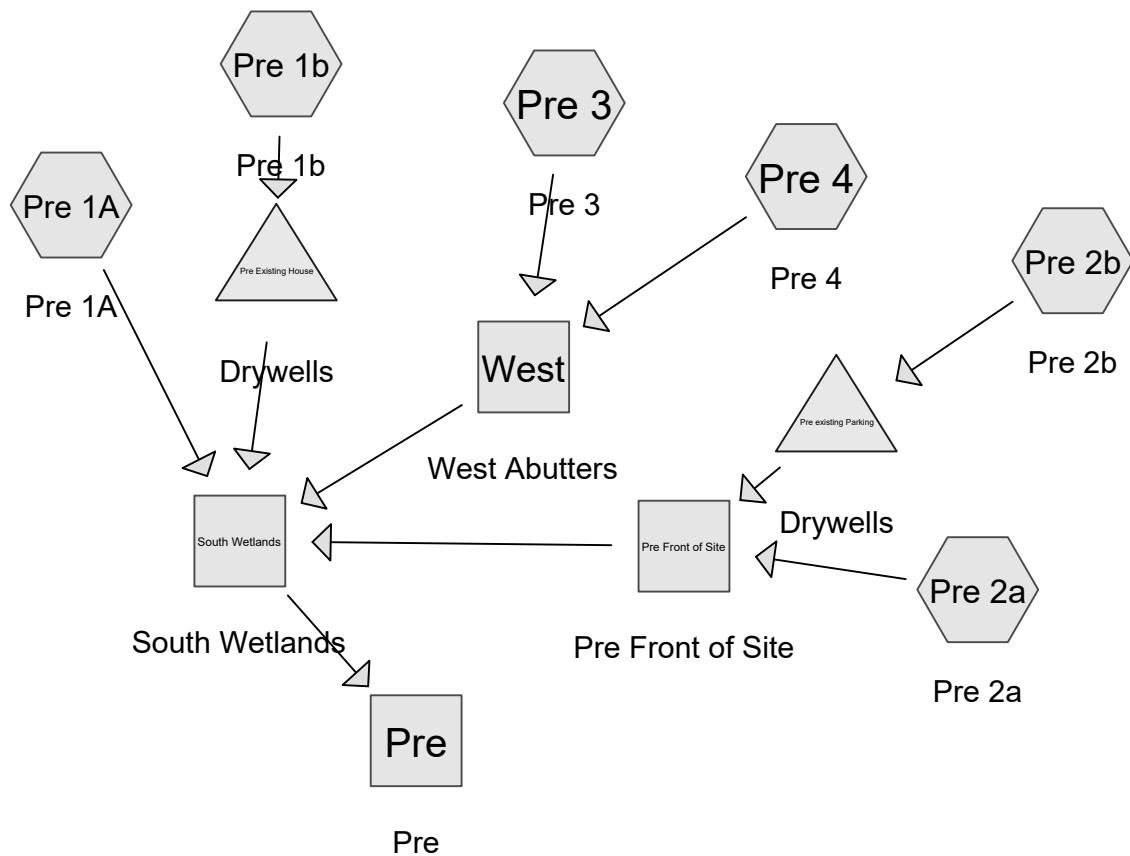
Carroll School
Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Pre 1b

Pre 1b

Pre 3

Pre 4

Pre 1A

Pre Existing House

Pre 1A

Pre 2b

Pre 2b

Drywells

West

Pre 4

West Abutters

Pre existing Parking

Drywells

South Wetlands

Pre Front of Site

Pre 2a

South Wetlands

Pre Front of Site

Pre 2a

Pre

Pre

Subcat   Reach   Pond   Link

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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

Subcatchment Pre 1A: Pre 1A   Runoff Area=376,941 sf 7.80% Impervious Runoff Depth>0.06"
             Flow Length=885' Slope=0.0210 '/' Tc=53.1 min CN=43 Runoff=0.26 cfs 0.042 af

Subcatchment Pre 1b: Pre 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>0.75"
             Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=0.21 cfs 0.015 af

Subcatchment Pre 2a: Pre 2a   Runoff Area=46,100 sf 19.87% Impervious Runoff Depth>0.15"
             Flow Length=250' Slope=0.0110 '/' Tc=22.9 min CN=49 Runoff=0.12 cfs 0.013 af

Subcatchment Pre 2b: Pre 2b   Runoff Area=9,282 sf 51.13% Impervious Runoff Depth>0.38"
             Flow Length=150' Slope=0.0100 '/' Tc=9.5 min CN=69 Runoff=0.08 cfs 0.007 af

Subcatchment Pre 3: Pre 3   Runoff Area=19,806 sf 2.91% Impervious Runoff Depth>0.05"
             Flow Length=181' Slope=0.0300 '/' Tc=12.8 min CN=42 Runoff=0.02 cfs 0.002 af

Subcatchment Pre 4: Pre 4   Runoff Area=33,991 sf 9.71% Impervious Runoff Depth>0.10"
             Flow Length=216' Slope=0.0900 '/' Tc=7.9 min CN=45 Runoff=0.09 cfs 0.007 af

Reach Pre: Pre   Inflow=0.35 cfs 0.064 af
                             Outflow=0.35 cfs 0.064 af

Reach Pre Front of Site: Pre Front of Site   Inflow=0.12 cfs 0.013 af
                             Outflow=0.12 cfs 0.013 af

Reach South Wetlands: South Wetlands   Inflow=0.35 cfs 0.064 af
                             Outflow=0.35 cfs 0.064 af

Reach West: West Abutters   Inflow=0.11 cfs 0.009 af
                             Outflow=0.11 cfs 0.009 af

Pond Pre Existing House: Drywells   Peak Elev=178.16' Storage=0.002 af Inflow=0.21 cfs 0.015 af
                             Outflow=0.09 cfs 0.015 af

Pond Pre existing Parking: Drywells   Peak Elev=180.19' Storage=0.003 af Inflow=0.08 cfs 0.007 af
             Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.086 af   Average Runoff Depth = 0.09"
88.41% Pervious = 10.076 ac   11.59% Impervious = 1.321 ac

Summary for Subcatchment Pre 1A: Pre 1A

Runoff   =   0.26 cfs @ 12.70 hrs, Volume=   0.042 af, Depth> 0.06"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
29,409	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
328,021	39	>75% Grass cover, Good, HSG A
18,957	30	Woods, Good, HSG A
376,941	43	Weighted Average
347,532	39	92.20% Pervious Area
29,409	98	7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	885	0.0210	0.28		**Lag/CN Method, Pre 1A**

Summary for Subcatchment Pre 1b: Pre 1b

Runoff   =   0.21 cfs @ 12.07 hrs, Volume=   0.015 af, Depth> 0.75"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Pre 1b**
0.1	25		Total,	Increased to minimum Tc = 5.0 min	

Summary for Subcatchment Pre 2a: Pre 2a

Runoff   =   0.12 cfs @ 12.31 hrs, Volume=   0.013 af, Depth> 0.15"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
9,158	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
30,230	39	>75% Grass cover, Good, HSG A
6,712	30	Woods, Good, HSG A
46,100	49	Weighted Average
36,942	37	80.13% Pervious Area
9,158	98	19.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	250	0.0110	0.18		**Lag/CN Method, Pre 2a**

Summary for Subcatchment Pre 2b: Pre 2b

Runoff   =   0.08 cfs @ 12.13 hrs, Volume=   0.007 af, Depth> 0.38"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
4,746	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,536	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
9,282	69	Weighted Average
4,536	39	48.87% Pervious Area
4,746	98	51.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	150	0.0100	0.26		**Lag/CN Method, Pre 2b**

Summary for Subcatchment Pre 3: Pre 3

Runoff   =   0.02 cfs @ 12.17 hrs, Volume=   0.002 af, Depth> 0.05"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
577	98	Paved parking, HSG A
1,015	96	Gravel surface, HSG A
15,608	39	>75% Grass cover, Good, HSG A
2,606	30	Woods, Good, HSG A
19,806	42	Weighted Average
19,229	41	97.09% Pervious Area
577	98	2.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	181	0.0300	0.24		**Lag/CN Method, Pre 3**

Summary for Subcatchment Pre 4: Pre 4

Runoff   =   0.09 cfs @ 12.11 hrs, Volume=   0.007 af, Depth> 0.10"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
3,301	98	Paved parking, HSG A
1,823	96	Gravel surface, HSG A
20,190	39	>75% Grass cover, Good, HSG A
8,677	30	Woods, Good, HSG A
33,991	45	Weighted Average
30,690	40	90.29% Pervious Area
3,301	98	9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	216	0.0900	0.46		**Lag/CN Method, Pre 4**

Summary for Reach Pre: Pre

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.07"   for 1" Storm event
Inflow   =   0.35 cfs @ 12.50 hrs, Volume=   0.064 af
Outflow   =   0.35 cfs @ 12.50 hrs, Volume=   0.064 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 Front of Site: Pre Front of Site

Inflow Area =   1.271 ac, 25.11% Impervious, Inflow Depth > 0.12"   for 1" Storm event
Inflow   =   0.12 cfs @ 12.31 hrs, Volume=   0.013 af
Outflow   =   0.12 cfs @ 12.31 hrs, Volume=   0.013 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 South Wetlands: South Wetlands

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.07"   for 1" Storm event
Inflow   =   0.35 cfs @ 12.50 hrs, Volume=   0.064 af
Outflow   =   0.35 cfs @ 12.50 hrs, Volume=   0.064 af, Atten= 0%, Lag= 0.0 min

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

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Summary for Reach West: West Abutters

Inflow Area =   1.235 ac,   7.21% Impervious, Inflow Depth > 0.08"   for 1" Storm event
Inflow   =   0.11 cfs @ 12.12 hrs, Volume=   0.009 af
Outflow   =   0.11 cfs @ 12.12 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 Pond Pre Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 0.75"   for 1" Storm event
Inflow   =   0.21 cfs @ 12.07 hrs, Volume=   0.015 af
Outflow   =   0.09 cfs @ 12.10 hrs, Volume=   0.015 af, Atten= 59%, Lag= 1.7 min
Discarded =   0.09 cfs @ 12.10 hrs, Volume=   0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 178.16' @ 12.28 hrs   Surf.Area= 0.010 ac   Storage= 0.002 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.5 min (761.2 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.09 cfs @ 12.10 hrs HW=178.10'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond Pre existing Parking: Drywells

Inflow Area =   0.213 ac, 51.13% Impervious, Inflow Depth > 0.38"   for 1" Storm event
Inflow   =   0.08 cfs @ 12.13 hrs, Volume=   0.007 af
Outflow   =   0.01 cfs @ 11.80 hrs, Volume=   0.007 af, Atten= 89%, Lag= 0.0 min
Discarded =   0.01 cfs @ 11.80 hrs, Volume=   0.007 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= 180.19' @ 12.94 hrs   Surf.Area= 0.001 ac   Storage= 0.003 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 87.4 min (848.8 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.007 af	**8.00'D x 6.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**6.0" Vert. Orifice/Grate** C= 0.600

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Discarded OutFlow Max=0.01 cfs @ 11.80 hrs HW=178.10'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

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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 1A: Pre 1A   Runoff Area=376,941 sf 7.80% Impervious Runoff Depth>0.22"
          Flow Length=885' Slope=0.0210 '/' Tc=53.1 min CN=43 Runoff=0.92 cfs 0.158 af

SubcatchmentPre 1b: Pre 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>2.77"
          Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=0.74 cfs 0.055 af

SubcatchmentPre 2a: Pre 2a   Runoff Area=46,100 sf 19.87% Impervious Runoff Depth>0.55"
          Flow Length=250' Slope=0.0110 '/' Tc=22.9 min CN=49 Runoff=0.42 cfs 0.049 af

SubcatchmentPre 2b: Pre 2b   Runoff Area=9,282 sf 51.13% Impervious Runoff Depth>1.42"
          Flow Length=150' Slope=0.0100 '/' Tc=9.5 min CN=69 Runoff=0.30 cfs 0.025 af

SubcatchmentPre 3: Pre 3   Runoff Area=19,806 sf 2.91% Impervious Runoff Depth>0.21"
          Flow Length=181' Slope=0.0300 '/' Tc=12.8 min CN=42 Runoff=0.09 cfs 0.008 af

SubcatchmentPre 4: Pre 4   Runoff Area=33,991 sf 9.71% Impervious Runoff Depth>0.41"
          Flow Length=216' Slope=0.0900 '/' Tc=7.9 min CN=45 Runoff=0.33 cfs 0.027 af

Reach Pre: Pre   Inflow=1.46 cfs 0.250 af
          Outflow=1.46 cfs 0.250 af

Reach Pre Front of Site: Pre Front of Site   Inflow=0.71 cfs 0.057 af
          Outflow=0.71 cfs 0.057 af

Reach South Wetlands: South Wetlands   Inflow=1.46 cfs 0.250 af
          Outflow=1.46 cfs 0.250 af

Reach West: West Abutters   Inflow=0.41 cfs 0.035 af
          Outflow=0.41 cfs 0.035 af

Pond Pre Existing House: Drywells   Peak Elev=179.74' Storage=0.018 af Inflow=0.74 cfs 0.055 af
          Outflow=0.09 cfs 0.055 af

Pond Pre existing Parking: Drywells   Peak Elev=185.93' Storage=0.007 af Inflow=0.30 cfs 0.025 af
          Discarded=0.01 cfs 0.011 af Primary=0.40 cfs 0.009 af Outflow=0.41 cfs 0.019 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.321 af   Average Runoff Depth = 0.34"
88.41% Pervious = 10.076 ac   11.59% Impervious = 1.321 ac

Summary for Subcatchment Pre 1A: Pre 1A

Runoff   =   0.92 cfs @ 12.69 hrs, Volume=   0.158 af, Depth> 0.22"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
29,409	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
328,021	39	>75% Grass cover, Good, HSG A
18,957	30	Woods, Good, HSG A
376,941	43	Weighted Average
347,532	39	92.20% Pervious Area
29,409	98	7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	885	0.0210	0.28		**Lag/CN Method, Pre 1A**

Summary for Subcatchment Pre 1b: Pre 1b

Runoff   =   0.74 cfs @ 12.07 hrs, Volume=   0.055 af, Depth> 2.77"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Pre 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Pre 2a: Pre 2a

Runoff   =   0.42 cfs @ 12.30 hrs, Volume=   0.049 af, Depth> 0.55"

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 2-YR Cornell Rainfall=3.20"

Area (sf)	CN	Description
9,158	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
30,230	39	>75% Grass cover, Good, HSG A
6,712	30	Woods, Good, HSG A
46,100	49	Weighted Average
36,942	37	80.13% Pervious Area
9,158	98	19.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	250	0.0110	0.18		**Lag/CN Method, Pre 2a**

Summary for Subcatchment Pre 2b: Pre 2b

Runoff   =   0.30 cfs @ 12.13 hrs, Volume=   0.025 af, Depth> 1.42"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
4,746	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,536	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
9,282	69	Weighted Average
4,536	39	48.87% Pervious Area
4,746	98	51.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	150	0.0100	0.26		**Lag/CN Method, Pre 2b**

Summary for Subcatchment Pre 3: Pre 3

Runoff   =   0.09 cfs @ 12.17 hrs, Volume=   0.008 af, Depth> 0.21"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
577	98	Paved parking, HSG A
1,015	96	Gravel surface, HSG A
15,608	39	>75% Grass cover, Good, HSG A
2,606	30	Woods, Good, HSG A
19,806	42	Weighted Average
19,229	41	97.09% Pervious Area
577	98	2.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	181	0.0300	0.24		**Lag/CN Method, Pre 3**

Summary for Subcatchment Pre 4: Pre 4

Runoff   =   0.33 cfs @ 12.11 hrs, Volume=   0.027 af, Depth> 0.41"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
3,301	98	Paved parking, HSG A
1,823	96	Gravel surface, HSG A
20,190	39	>75% Grass cover, Good, HSG A
8,677	30	Woods, Good, HSG A
33,991	45	Weighted Average
30,690	40	90.29% Pervious Area
3,301	98	9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	216	0.0900	0.46		**Lag/CN Method, Pre 4**

Summary for Reach Pre: Pre

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.26"   for 2-YR Cornell event
Inflow   =   1.46 cfs @ 12.15 hrs, Volume=   0.250 af
Outflow   =   1.46 cfs @ 12.15 hrs, Volume=   0.250 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 Front of Site: Pre Front of Site

Inflow Area =   1.271 ac, 25.11% Impervious, Inflow Depth > 0.54"   for 2-YR Cornell event
Inflow   =   0.71 cfs @ 12.15 hrs, Volume=   0.057 af
Outflow   =   0.71 cfs @ 12.15 hrs, Volume=   0.057 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 South Wetlands: South Wetlands

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.26"   for 2-YR Cornell event
Inflow   =   1.46 cfs @ 12.15 hrs, Volume=   0.250 af
Outflow   =   1.46 cfs @ 12.15 hrs, Volume=   0.250 af, Atten= 0%, Lag= 0.0 min

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

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Type III 24-hr 2-YR Cornell Rainfall=3.20"
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Summary for Reach West: West Abutters

Inflow Area =   1.235 ac,   7.21% Impervious, Inflow Depth > 0.34"   for 2-YR Cornell event
Inflow   =   0.41 cfs @ 12.12 hrs, Volume=   0.035 af
Outflow   =   0.41 cfs @ 12.12 hrs, Volume=   0.035 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 Pre Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 2.77"   for 2-YR Cornell event
Inflow   =   0.74 cfs @ 12.07 hrs, Volume=   0.055 af
Outflow   =   0.09 cfs @ 11.75 hrs, Volume=   0.055 af, Atten= 88%, Lag= 0.0 min
Discarded =   0.09 cfs @ 11.75 hrs, Volume=   0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 179.74' @ 12.66 hrs   Surf.Area= 0.010 ac   Storage= 0.018 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 60.8 min (798.7 - 737.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.09 cfs @ 11.75 hrs HW=178.09'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond Pre existing Parking: Drywells

Inflow Area =   0.213 ac, 51.13% Impervious, Inflow Depth > 1.42"   for 2-YR Cornell event
Inflow   =   0.30 cfs @ 12.13 hrs, Volume=   0.025 af
Outflow   =   0.41 cfs @ 12.15 hrs, Volume=   0.019 af, Atten= 0%, Lag= 1.5 min
Discarded =   0.01 cfs @   9.35 hrs, Volume=   0.011 af
Primary   =   0.40 cfs @ 12.15 hrs, Volume=   0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 185.93' @ 12.15 hrs   Surf.Area= 0.001 ac   Storage= 0.007 af

Plug-Flow detention time= 95.1 min calculated for 0.019 af (77% of inflow)
Center-of-Mass det. time= 37.1 min (778.2 - 741.2)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.007 af	**8.00'D x 6.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.01 cfs @ 9.35 hrs HW=178.08'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.37 cfs @ 12.15 hrs HW=185.91' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.37 cfs @ 2.17 fps)

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

Subcatchment Pre 1A: Pre 1A   Runoff Area=376,941 sf 7.80% Impervious Runoff Depth>0.44"
                Flow Length=885' Slope=0.0210 '/' Tc=53.1 min CN=43 Runoff=1.41 cfs 0.315 af

Subcatchment Pre 1b: Pre 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>4.24"
                Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=1.12 cfs 0.084 af

Subcatchment Pre 2a: Pre 2a   Runoff Area=46,100 sf 19.87% Impervious Runoff Depth>0.92"
                Flow Length=250' Slope=0.0110 '/' Tc=22.9 min CN=49 Runoff=0.64 cfs 0.081 af

Subcatchment Pre 2b: Pre 2b   Runoff Area=9,282 sf 51.13% Impervious Runoff Depth>2.23"
                Flow Length=150' Slope=0.0100 '/' Tc=9.5 min CN=69 Runoff=0.45 cfs 0.040 af

Subcatchment Pre 3: Pre 3   Runoff Area=19,806 sf 2.91% Impervious Runoff Depth>0.43"
                Flow Length=181' Slope=0.0300 '/' Tc=12.8 min CN=42 Runoff=0.14 cfs 0.016 af

Subcatchment Pre 4: Pre 4   Runoff Area=33,991 sf 9.71% Impervious Runoff Depth>0.70"
                Flow Length=216' Slope=0.0900 '/' Tc=7.9 min CN=45 Runoff=0.51 cfs 0.046 af

Reach Pre: Pre   Inflow=2.15 cfs 0.480 af
                                                Outflow=2.15 cfs 0.480 af

Reach Pre Front of Site: Pre Front of Site   Inflow=1.02 cfs 0.102 af
                                                Outflow=1.02 cfs 0.102 af

Reach South Wetlands: South Wetlands   Inflow=2.15 cfs 0.480 af
                                                Outflow=2.15 cfs 0.480 af

Reach West: West Abutters   Inflow=0.63 cfs 0.062 af
                                                Outflow=0.63 cfs 0.062 af

Pond Pre Existing House: Drywells   Peak Elev=181.17' Storage=0.033 af Inflow=1.12 cfs 0.084 af
                                                Outflow=0.09 cfs 0.081 af

Pond Pre existing Parking: Drywells   Peak Elev=186.06' Storage=0.007 af Inflow=0.45 cfs 0.040 af
            Discarded=0.01 cfs 0.012 af Primary=0.53 cfs 0.021 af Outflow=0.54 cfs 0.033 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.582 af   Average Runoff Depth = 0.61"
88.41% Pervious = 10.076 ac   11.59% Impervious = 1.321 ac

Summary for Subcatchment Pre 1A: Pre 1A

Runoff   =   1.41 cfs @   12.70 hrs, Volume=   0.315 af, Depth> 0.44"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
29,409	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
328,021	39	>75% Grass cover, Good, HSG A
18,957	30	Woods, Good, HSG A
376,941	43	Weighted Average
347,532	39	92.20% Pervious Area
29,409	98	7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	885	0.0210	0.28		**Lag/CN Method, Pre 1A**

Summary for Subcatchment Pre 1b: Pre 1b

Runoff   =   1.12 cfs @   12.07 hrs, Volume=   0.084 af, Depth> 4.24"

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 10-YR-Cornell Rainfall=4.80"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Pre 1b**
0.1	25		Total, Increased to minimum Tc = 5.0 min		

Summary for Subcatchment Pre 2a: Pre 2a

Runoff   =   0.64 cfs @   12.30 hrs, Volume=   0.081 af, Depth> 0.92"

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-Cornell Rainfall=4.80"

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Type III 24-hr 10-YR-Cornell Rainfall=4.80"
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Area (sf)	CN	Description
9,158	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
30,230	39	>75% Grass cover, Good, HSG A
6,712	30	Woods, Good, HSG A
46,100	49	Weighted Average
36,942	37	80.13% Pervious Area
9,158	98	19.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	250	0.0110	0.18		**Lag/CN Method, Pre 2a**

Summary for Subcatchment Pre 2b: Pre 2b

Runoff = 0.45 cfs @ 12.13 hrs, Volume= 0.040 af, Depth> 2.23"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
4,746	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,536	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
9,282	69	Weighted Average
4,536	39	48.87% Pervious Area
4,746	98	51.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	150	0.0100	0.26		**Lag/CN Method, Pre 2b**

Summary for Subcatchment Pre 3: Pre 3

Runoff = 0.14 cfs @ 12.17 hrs, Volume= 0.016 af, Depth> 0.43"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
577	98	Paved parking, HSG A
1,015	96	Gravel surface, HSG A
15,608	39	>75% Grass cover, Good, HSG A
2,606	30	Woods, Good, HSG A
19,806	42	Weighted Average
19,229	41	97.09% Pervious Area
577	98	2.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	181	0.0300	0.24		**Lag/CN Method, Pre 3**

Summary for Subcatchment Pre 4: Pre 4

Runoff = 0.51 cfs @ 12.11 hrs, Volume= 0.046 af, Depth> 0.70"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
3,301	98	Paved parking, HSG A
1,823	96	Gravel surface, HSG A
20,190	39	>75% Grass cover, Good, HSG A
8,677	30	Woods, Good, HSG A
33,991	45	Weighted Average
30,690	40	90.29% Pervious Area
3,301	98	9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	216	0.0900	0.46		**Lag/CN Method, Pre 4**

Summary for Reach Pre: Pre

Inflow Area = 11.398 ac, 11.59% Impervious, Inflow Depth > 0.51" for 10-YR-Cornell event
Inflow = 2.15 cfs @ 12.40 hrs, Volume= 0.480 af
Outflow = 2.15 cfs @ 12.40 hrs, Volume= 0.480 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 Front of Site: Pre Front of Site

Inflow Area = 1.271 ac, 25.11% Impervious, Inflow Depth > 0.97" for 10-YR-Cornell event
Inflow = 1.02 cfs @ 12.20 hrs, Volume= 0.102 af
Outflow = 1.02 cfs @ 12.20 hrs, Volume= 0.102 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 South Wetlands: South Wetlands

Inflow Area = 11.398 ac, 11.59% Impervious, Inflow Depth > 0.51" for 10-YR-Cornell event
Inflow = 2.15 cfs @ 12.40 hrs, Volume= 0.480 af
Outflow = 2.15 cfs @ 12.40 hrs, Volume= 0.480 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 West: West Abutters

Inflow Area =   1.235 ac,   7.21% Impervious, Inflow Depth > 0.60"   for 10-YR-Cornell event
Inflow   =   0.63 cfs @ 12.12 hrs, Volume=   0.062 af
Outflow   =   0.63 cfs @ 12.12 hrs, Volume=   0.062 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 Pre Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 4.24"   for 10-YR-Cornell event
Inflow   =   1.12 cfs @ 12.07 hrs, Volume=   0.084 af
Outflow   =   0.09 cfs @ 11.60 hrs, Volume=   0.081 af, Atten= 92%, Lag= 0.0 min
Discarded   =   0.09 cfs @ 11.60 hrs, Volume=   0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.17' @ 13.06 hrs   Surf.Area= 0.010 ac   Storage= 0.033 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 114.8 min (849.4 - 734.6)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.09 cfs @ 11.60 hrs HW=178.10'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond Pre existing Parking: Drywells

Inflow Area =   0.213 ac, 51.13% Impervious, Inflow Depth > 2.23"   for 10-YR-Cornell event
Inflow   =   0.45 cfs @ 12.13 hrs, Volume=   0.040 af
Outflow   =   0.54 cfs @ 12.11 hrs, Volume=   0.033 af, Atten= 0%, Lag= 0.0 min
Discarded   =   0.01 cfs @   8.00 hrs, Volume=   0.012 af
Primary   =   0.53 cfs @ 12.11 hrs, Volume=   0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.06' @ 12.10 hrs   Surf.Area= 0.001 ac   Storage= 0.007 af

Plug-Flow detention time= 72.0 min calculated for 0.033 af (83% of inflow)
Center-of-Mass det. time= 21.6 min (765.1 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.007 af	**8.00'D x 6.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.01 cfs @ 8.00 hrs HW=178.08' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.51 cfs @ 12.11 hrs HW=186.04' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.51 cfs @ 2.60 fps)

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 1A: Pre 1A   Runoff Area=376,941 sf 7.80% Impervious   Runoff Depth>0.74"
         Flow Length=885' Slope=0.0210 '/' Tc=53.1 min CN=43 Runoff=2.27 cfs 0.530 af

SubcatchmentPre 1b: Pre 1b   Runoff Area=10,363 sf 100.00% Impervious   Runoff Depth>5.33"
          Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=1.41 cfs 0.106 af

SubcatchmentPre 2a: Pre 2a   Runoff Area=46,100 sf 19.87% Impervious   Runoff Depth>1.31"
         Flow Length=250' Slope=0.0110 '/' Tc=22.9 min CN=49 Runoff=0.83 cfs 0.115 af

SubcatchmentPre 2b: Pre 2b   Runoff Area=9,282 sf 51.13% Impervious   Runoff Depth>2.91"
         Flow Length=150' Slope=0.0100 '/' Tc=9.5 min CN=69 Runoff=0.56 cfs 0.052 af

SubcatchmentPre 3: Pre 3   Runoff Area=19,806 sf 2.91% Impervious   Runoff Depth>0.72"
         Flow Length=181' Slope=0.0300 '/' Tc=12.8 min CN=42 Runoff=0.19 cfs 0.027 af

SubcatchmentPre 4: Pre 4   Runoff Area=33,991 sf 9.71% Impervious   Runoff Depth>1.03"
         Flow Length=216' Slope=0.0900 '/' Tc=7.9 min CN=45 Runoff=0.65 cfs 0.067 af

Reach Pre: Pre   Inflow=2.97 cfs 0.772 af
                                                          Outflow=2.97 cfs 0.772 af

Reach Pre Front of Site: Pre Front of Site   Inflow=1.21 cfs 0.148 af
                                                          Outflow=1.21 cfs 0.148 af

Reach South Wetlands: South Wetlands   Inflow=2.97 cfs 0.772 af
                                                          Outflow=2.97 cfs 0.772 af

Reach West: West Abutters   Inflow=0.81 cfs 0.094 af
                                                          Outflow=0.81 cfs 0.094 af

Pond Pre Existing House: Drywells   Peak Elev=182.39' Storage=0.046 af Inflow=1.41 cfs 0.106 af
                                                          Outflow=0.09 cfs 0.086 af

Pond Pre existing Parking: Drywells   Peak Elev=186.12' Storage=0.007 af Inflow=0.56 cfs 0.052 af
          Discarded=0.01 cfs 0.012 af Primary=0.58 cfs 0.033 af Outflow=0.58 cfs 0.045 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.897 af   Average Runoff Depth = 0.94"
88.41% Pervious = 10.076 ac   11.59% Impervious = 1.321 ac

Summary for Subcatchment Pre 1A: Pre 1A

Runoff   =   2.27 cfs @ 12.81 hrs, Volume=   0.530 af, Depth> 0.74"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
29,409	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
328,021	39	>75% Grass cover, Good, HSG A
18,957	30	Woods, Good, HSG A
376,941	43	Weighted Average
347,532	39	92.20% Pervious Area
29,409	98	7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	885	0.0210	0.28		**Lag/CN Method, Pre 1A**

Summary for Subcatchment Pre 1b: Pre 1b

Runoff   =   1.41 cfs @ 12.07 hrs, Volume=   0.106 af, Depth> 5.33"

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 25-YR Cornell Rainfall=6.00"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Pre 1b**
0.1	25		Total, Increased to minimum Tc = 5.0 min		

Summary for Subcatchment Pre 2a: Pre 2a

Runoff   =   0.83 cfs @ 12.32 hrs, Volume=   0.115 af, Depth> 1.31"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
9,158	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
30,230	39	>75% Grass cover, Good, HSG A
6,712	30	Woods, Good, HSG A
46,100	49	Weighted Average
36,942	37	80.13% Pervious Area
9,158	98	19.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	250	0.0110	0.18		**Lag/CN Method, Pre 2a**

Summary for Subcatchment Pre 2b: Pre 2b

Runoff   =   0.56 cfs @ 12.13 hrs, Volume=   0.052 af, Depth> 2.91"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
4,746	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,536	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
9,282	69	Weighted Average
4,536	39	48.87% Pervious Area
4,746	98	51.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	150	0.0100	0.26		**Lag/CN Method, Pre 2b**

Summary for Subcatchment Pre 3: Pre 3

Runoff   =   0.19 cfs @ 12.20 hrs, Volume=   0.027 af, Depth> 0.72"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
577	98	Paved parking, HSG A
1,015	96	Gravel surface, HSG A
15,608	39	>75% Grass cover, Good, HSG A
2,606	30	Woods, Good, HSG A
19,806	42	Weighted Average
19,229	41	97.09% Pervious Area
577	98	2.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	181	0.0300	0.24		**Lag/CN Method, Pre 3**

Summary for Subcatchment Pre 4: Pre 4

Runoff   =   0.65 cfs @ 12.11 hrs, Volume=   0.067 af, Depth> 1.03"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
3,301	98	Paved parking, HSG A
1,823	96	Gravel surface, HSG A
20,190	39	>75% Grass cover, Good, HSG A
8,677	30	Woods, Good, HSG A
33,991	45	Weighted Average
30,690	40	90.29% Pervious Area
3,301	98	9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	216	0.0900	0.46		**Lag/CN Method, Pre 4**

Summary for Reach Pre: Pre

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.81"   for 25-YR Cornell event
Inflow   =   2.97 cfs @ 12.50 hrs, Volume=   0.772 af
Outflow   =   2.97 cfs @ 12.50 hrs, Volume=   0.772 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 Front of Site: Pre Front of Site

Inflow Area =   1.271 ac, 25.11% Impervious, Inflow Depth > 1.40"   for 25-YR Cornell event
Inflow   =   1.21 cfs @ 12.20 hrs, Volume=   0.148 af
Outflow   =   1.21 cfs @ 12.20 hrs, Volume=   0.148 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 South Wetlands: South Wetlands

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 0.81"   for 25-YR Cornell event
Inflow   =   2.97 cfs @ 12.50 hrs, Volume=   0.772 af
Outflow   =   2.97 cfs @ 12.50 hrs, Volume=   0.772 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 West: West Abutters

Inflow Area =   1.235 ac,   7.21% Impervious, Inflow Depth > 0.91"   for 25-YR Cornell event
Inflow   =   0.81 cfs @   12.12 hrs, Volume=   0.094 af
Outflow   =   0.81 cfs @   12.12 hrs, Volume=   0.094 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 Pre Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 5.33"   for 25-YR Cornell event
Inflow   =   1.41 cfs @   12.07 hrs, Volume=   0.106 af
Outflow   =   0.09 cfs @   11.30 hrs, Volume=   0.086 af, Atten= 94%, Lag= 0.0 min
Discarded   =   0.09 cfs @   11.30 hrs, Volume=   0.086 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 182.39' @ 13.61 hrs   Surf.Area= 0.010 ac   Storage= 0.046 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 99.0 min (832.4 - 733.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.09 cfs @ 11.30 hrs HW=178.09'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond Pre existing Parking: Drywells

Inflow Area =   0.213 ac, 51.13% Impervious, Inflow Depth > 2.91"   for 25-YR Cornell event
Inflow   =   0.56 cfs @   12.13 hrs, Volume=   0.052 af
Outflow   =   0.58 cfs @   12.11 hrs, Volume=   0.045 af, Atten= 0%, Lag= 0.0 min
Discarded   =   0.01 cfs @   7.05 hrs, Volume=   0.012 af
Primary   =   0.58 cfs @   12.11 hrs, Volume=   0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.12' @ 12.11 hrs   Surf.Area= 0.001 ac   Storage= 0.007 af

Plug-Flow detention time= 64.8 min calculated for 0.045 af (87% of inflow)
Center-of-Mass det. time= 21.3 min (767.8 - 746.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.007 af	**8.00'D x 6.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**6.0" Vert. Orifice/Grate** C= 0.600

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Type III 24-hr 25-YR Cornell Rainfall=6.00"
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Discarded OutFlow Max=0.01 cfs @ 7.05 hrs HW=178.08'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.55 cfs @ 12.11 hrs HW=186.09' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.55 cfs @ 2.81 fps)

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Type III 24-hr 100-YR-Cornell Rainfall=8.50"
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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

Subcatchment Pre 1A: Pre 1A   Runoff Area=376,941 sf   7.80% Impervious   Runoff Depth>1.65"
Flow Length=885'   Slope=0.0210 '/'   Tc=53.1 min   CN=43   Runoff=6.14 cfs 1.187 af

Subcatchment Pre 1b: Pre 1b   Runoff Area=10,363 sf   100.00% Impervious   Runoff Depth>7.60"
Flow Length=25'   Slope=0.3000 '/'   Tc=5.0 min   CN=98   Runoff=2.00 cfs 0.151 af

Subcatchment Pre 2a: Pre 2a   Runoff Area=46,100 sf   19.87% Impervious   Runoff Depth>2.36"
Flow Length=250'   Slope=0.0110 '/'   Tc=22.9 min   CN=49   Runoff=1.60 cfs 0.208 af

Subcatchment Pre 2b: Pre 2b   Runoff Area=9,282 sf   51.13% Impervious   Runoff Depth>4.48"
Flow Length=150'   Slope=0.0100 '/'   Tc=9.5 min   CN=69   Runoff=0.89 cfs 0.079 af

Subcatchment Pre 3: Pre 3   Runoff Area=19,806 sf   2.91% Impervious   Runoff Depth>1.61"
Flow Length=181'   Slope=0.0300 '/'   Tc=12.8 min   CN=42   Runoff=0.56 cfs 0.061 af

Subcatchment Pre 4: Pre 4   Runoff Area=33,991 sf   9.71% Impervious   Runoff Depth>1.97"
Flow Length=216'   Slope=0.0900 '/'   Tc=7.9 min   CN=45   Runoff=1.37 cfs 0.128 af

Reach Pre: Pre   Inflow=7.37 cfs 1.645 af
Outflow=7.37 cfs 1.645 af

Reach Pre Front of Site: Pre Front of Site   Inflow=2.11 cfs 0.269 af
Outflow=2.11 cfs 0.269 af

Reach South Wetlands: South Wetlands   Inflow=7.37 cfs 1.645 af
Outflow=7.37 cfs 1.645 af

Reach West: West Abutters   Inflow=1.83 cfs 0.189 af
Outflow=1.83 cfs 0.189 af

Pond Pre Existing House: Drywells   Peak Elev=185.36' Storage=0.076 af   Inflow=2.00 cfs 0.151 af
Outflow=0.09 cfs 0.093 af

Pond Pre existing Parking: Drywells   Peak Elev=186.63' Storage=0.007 af   Inflow=0.89 cfs 0.079 af
Discarded=0.01 cfs 0.012 af   Primary=0.89 cfs 0.061 af   Outflow=0.90 cfs 0.073 af

Total Runoff Area = 11.398 ac   Runoff Volume = 1.815 af   Average Runoff Depth = 1.91"
88.41% Pervious = 10.076 ac   11.59% Impervious = 1.321 ac

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Type III 24-hr 100-YR-Cornell Rainfall=8.50"
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Summary for Subcatchment Pre 1A: Pre 1A

Runoff   =   6.14 cfs @ 12.81 hrs, Volume=   1.187 af, Depth> 1.65"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
29,409	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
328,021	39	>75% Grass cover, Good, HSG A
18,957	30	Woods, Good, HSG A
376,941	43	Weighted Average
347,532	39	92.20% Pervious Area
29,409	98	7.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.1	885	0.0210	0.28		**Lag/CN Method, Pre 1A**

Summary for Subcatchment Pre 1b: Pre 1b

Runoff   =   2.00 cfs @ 12.07 hrs, Volume=   0.151 af, Depth> 7.60"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Pre 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Pre 2a: Pre 2a

Runoff   =   1.60 cfs @ 12.34 hrs, Volume=   0.208 af, Depth> 2.36"

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 100-YR-Cornell Rainfall=8.50"

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Type III 24-hr 100-YR-Cornell Rainfall=8.50"
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Area (sf)	CN	Description
9,158	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
30,230	39	>75% Grass cover, Good, HSG A
6,712	30	Woods, Good, HSG A
46,100	49	Weighted Average
36,942	37	80.13% Pervious Area
9,158	98	19.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	250	0.0110	0.18		**Lag/CN Method, Pre 2a**

Summary for Subcatchment Pre 2b: Pre 2b

Runoff   =   0.89 cfs @ 12.14 hrs, Volume=   0.079 af, Depth> 4.48"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
4,746	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,536	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
9,282	69	Weighted Average
4,536	39	48.87% Pervious Area
4,746	98	51.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	150	0.0100	0.26		**Lag/CN Method, Pre 2b**

Summary for Subcatchment Pre 3: Pre 3

Runoff   =   0.56 cfs @ 12.21 hrs, Volume=   0.061 af, Depth> 1.61"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
577	98	Paved parking, HSG A
1,015	96	Gravel surface, HSG A
15,608	39	>75% Grass cover, Good, HSG A
2,606	30	Woods, Good, HSG A
19,806	42	Weighted Average
19,229	41	97.09% Pervious Area
577	98	2.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	181	0.0300	0.24		**Lag/CN Method, Pre 3**

Summary for Subcatchment Pre 4: Pre 4

Runoff   =   1.37 cfs @ 12.12 hrs, Volume=   0.128 af, Depth> 1.97"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
3,301	98	Paved parking, HSG A
1,823	96	Gravel surface, HSG A
20,190	39	>75% Grass cover, Good, HSG A
8,677	30	Woods, Good, HSG A
33,991	45	Weighted Average
30,690	40	90.29% Pervious Area
3,301	98	9.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	216	0.0900	0.46		**Lag/CN Method, Pre 4**

Summary for Reach Pre: Pre

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 1.73"   for 100-YR-Cornell event
Inflow   =   7.37 cfs @ 12.72 hrs, Volume=   1.645 af
Outflow   =   7.37 cfs @ 12.72 hrs, Volume=   1.645 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 Front of Site: Pre Front of Site

Inflow Area =   1.271 ac, 25.11% Impervious, Inflow Depth > 2.54"   for 100-YR-Cornell event
Inflow   =   2.11 cfs @ 12.29 hrs, Volume=   0.269 af
Outflow   =   2.11 cfs @ 12.29 hrs, Volume=   0.269 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 South Wetlands: South Wetlands

Inflow Area =   11.398 ac, 11.59% Impervious, Inflow Depth > 1.73"   for 100-YR-Cornell event
Inflow   =   7.37 cfs @ 12.72 hrs, Volume=   1.645 af
Outflow   =   7.37 cfs @ 12.72 hrs, Volume=   1.645 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 West: West Abutters

Inflow Area =   1.235 ac,   7.21% Impervious, Inflow Depth > 1.84"   for 100-YR-Cornell event
Inflow   =   1.83 cfs @ 12.14 hrs, Volume=   0.189 af
Outflow   =   1.83 cfs @ 12.14 hrs, Volume=   0.189 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 Pre Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 7.60"   for 100-YR-Cornell event
Inflow   =   2.00 cfs @ 12.07 hrs, Volume=   0.151 af
Outflow   =   0.09 cfs @ 10.45 hrs, Volume=   0.093 af, Atten= 96%, Lag= 0.0 min
Discarded =   0.09 cfs @ 10.45 hrs, Volume=   0.093 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 185.36' @ 14.64 hrs   Surf.Area= 0.010 ac   Storage= 0.076 af

Plug-Flow detention time= 154.0 min calculated for 0.093 af (61% of inflow)
Center-of-Mass det. time= 74.4 min (806.6 - 732.2)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.09 cfs @ 10.45 hrs HW=178.09'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Summary for Pond Pre existing Parking: Drywells

Inflow Area =   0.213 ac, 51.13% Impervious, Inflow Depth > 4.48"   for 100-YR-Cornell event
Inflow   =   0.89 cfs @ 12.14 hrs, Volume=   0.079 af
Outflow   =   0.90 cfs @ 12.12 hrs, Volume=   0.073 af, Atten= 0%, Lag= 0.0 min
Discarded =   0.01 cfs @   5.40 hrs, Volume=   0.012 af
Primary   =   0.89 cfs @ 12.12 hrs, Volume=   0.061 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 186.63' @ 12.12 hrs   Surf.Area= 0.001 ac   Storage= 0.007 af

Plug-Flow detention time= 51.8 min calculated for 0.072 af (91% of inflow)
Center-of-Mass det. time= 21.1 min (771.9 - 750.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.007 af	**8.00'D x 6.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	185.50'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.01 cfs @ 5.40 hrs HW=178.08'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.86 cfs @ 12.12 hrs HW=186.58' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.86 cfs @ 4.38 fps)

APPENDIX D

Post-development Calculations
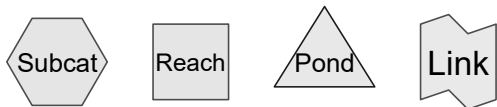
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Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Post 3

Post 3

Post 4

Post 4

Post 1c

Post 1c

Post 1b

Post 1b

Post 2d

Post 2d

Post 1d

Post 1d

AD's 1&2

Basin 3

Post 2c

Post 2c

Post 1e

AD's 3&4

AD's 1&2

Post West

West Abutters

Basin 3

Post 1e

Post Existing House

Basin 2

AD's 3&4

Drywells

AD 6 & Trench

Western Reach thru Post 1a

Perforated Pipe

Basin 2

Post 2b

1R

Western Reach thru Post 1a

Post Front of Site

12" Perforated Pipe

Post 2b

AD 6 & Trench

Post South

Post Front of Site

Basin 1

Eastern Reach around barn

South Wetlands

Post 1a

Post 2a

Basin 1

Post 1a

Post

Post 2a

Post

Subcat   Reach   Pond   Link

Routing Diagram for 16011 Pre-Post
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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

SubcatchmentPost 1a: Post 1a   Runoff Area=168,490 sf 3.95% Impervious Runoff Depth>0.03"
Flow Length=408' Slope=0.0210 '/' Tc=30.2 min CN=41 Runoff=0.08 cfs 0.010 af

SubcatchmentPost 1b: Post 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>0.75"
Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=0.21 cfs 0.015 af

SubcatchmentPost 1c: Post 1c   Runoff Area=96,215 sf 8.76% Impervious Runoff Depth>0.07"
Flow Length=507' Slope=0.0330 '/' Tc=26.4 min CN=44 Runoff=0.10 cfs 0.012 af

SubcatchmentPost 1d: Post 1d   Runoff Area=37,714 sf 3.16% Impervious Runoff Depth>0.02"
Flow Length=199' Slope=0.0120 '/' Tc=22.5 min CN=41 Runoff=0.02 cfs 0.002 af

SubcatchmentPost 1e: Post 1e   Runoff Area=74,143 sf 14.39% Impervious Runoff Depth>0.11"
Flow Length=216' Slope=0.0120 '/' Tc=20.5 min CN=47 Runoff=0.15 cfs 0.015 af

SubcatchmentPost 2a: Post 2a   Runoff Area=18,911 sf 43.46% Impervious Runoff Depth>0.32"
Flow Length=198' Slope=0.0170 '/' Tc=10.4 min CN=64 Runoff=0.14 cfs 0.012 af

SubcatchmentPost 2b: Post 2b   Runoff Area=19,943 sf 33.14% Impervious Runoff Depth>0.25"
Flow Length=200' Slope=0.0200 '/' Tc=11.6 min CN=57 Runoff=0.11 cfs 0.009 af

SubcatchmentPost 2c: Post 2c   Runoff Area=17,310 sf 45.70% Impervious Runoff Depth>0.34"
Flow Length=102' Slope=0.0150 '/' Tc=6.4 min CN=65 Runoff=0.16 cfs 0.011 af

SubcatchmentPost 2d: Post 2d   Runoff Area=15,537 sf 68.69% Impervious Runoff Depth>0.51"
Flow Length=204' Slope=0.0150 '/' Tc=7.3 min CN=80 Runoff=0.21 cfs 0.015 af

SubcatchmentPost 3: Post 3   Runoff Area=10,681 sf 23.03% Impervious Runoff Depth>0.17"
Flow Length=174' Slope=0.0200 '/' Tc=12.1 min CN=51 Runoff=0.04 cfs 0.004 af

SubcatchmentPost 4: Post 4   Runoff Area=27,176 sf 11.78% Impervious Runoff Depth>0.09"
Flow Length=201' Slope=0.0900 '/' Tc=7.8 min CN=43 Runoff=0.06 cfs 0.005 af

Reach 1R: Eastern Reach around barn Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=167.0' S=0.0299 '/' Capacity=35.30 cfs Outflow=0.00 cfs 0.000 af

Reach Post: Post   Inflow=0.29 cfs 0.030 af
Outflow=0.29 cfs 0.030 af

Reach Post Front of Site: Post Front of Site   Inflow=0.14 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Reach Post South: South Wetlands   Inflow=0.29 cfs 0.030 af
Outflow=0.29 cfs 0.030 af

Reach Post West: West Abutters   Inflow=0.10 cfs 0.008 af
Outflow=0.10 cfs 0.008 af

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Reach Western Reach thru Post 1a: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=269.0' S=0.0223 '/' Capacity=60.96 cfs Outflow=0.00 cfs 0.000 af

Pond AD 6 & Trench: AD 6 & Trench   Peak Elev=177.50' Storage=0 cf Inflow=0.15 cfs 0.015 af
Discarded=0.15 cfs 0.015 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.015 af

Pond AD's 1&2: AD's 1&2   Peak Elev=177.50' Storage=0 cf Inflow=0.10 cfs 0.012 af
Discarded=0.10 cfs 0.012 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.012 af

Pond AD's 3&4: AD's 3&4   Peak Elev=177.40' Storage=0 cf Inflow=0.02 cfs 0.002 af
Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Pond Basin 1: Basin 1   Peak Elev=184.05' Storage=20 cf Inflow=0.11 cfs 0.009 af
Discarded=0.08 cfs 0.009 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.009 af

Pond Basin 2: Basin 2   Peak Elev=185.01' Storage=6 cf Inflow=0.16 cfs 0.011 af
Discarded=0.13 cfs 0.011 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.011 af

Pond Basin 3: Basin 3   Peak Elev=185.62' Storage=59 cf Inflow=0.21 cfs 0.015 af
Discarded=0.12 cfs 0.015 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.015 af

Pond Perforated Pipe: 12" Perforated Pipe   Peak Elev=181.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond Post Existing House: Drywells   Peak Elev=178.16' Storage=0.002 af Inflow=0.21 cfs 0.015 af
Discarded=0.09 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.015 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.110 af   Average Runoff Depth = 0.12"
84.62% Pervious = 9.644 ac   15.38% Impervious = 1.753 ac

Summary for Subcatchment Post 1a: Post 1a

Runoff   =   0.08 cfs @ 12.40 hrs, Volume=   0.010 af, Depth> 0.03"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
6,649	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
146,589	39	>75% Grass cover, Good, HSG A
14,698	30	Woods, Good, HSG A
168,490	41	Weighted Average
161,841	38	96.05% Pervious Area
6,649	98	3.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	408	0.0210	0.23		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff   =   0.21 cfs @ 12.07 hrs, Volume=   0.015 af, Depth> 0.75"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Post 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Post 1c: Post 1c

Runoff   =   0.10 cfs @ 12.35 hrs, Volume=   0.012 af, Depth> 0.07"

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 1" Storm Rainfall=1.00"

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Area (sf)	CN	Description
8,429	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
87,097	39	>75% Grass cover, Good, HSG A
689	30	Woods, Good, HSG A
96,215	44	Weighted Average
87,786	39	91.24% Pervious Area
8,429	98	8.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	507	0.0330	0.32		**Lag/CN Method, Post c**

Summary for Subcatchment Post 1d: Post 1d

Runoff   =   0.02 cfs @ 12.30 hrs, Volume=   0.002 af, Depth> 0.02"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
1,190	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
36,524	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
37,714	41	Weighted Average
36,524	39	96.84% Pervious Area
1,190	98	3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	199	0.0120	0.15		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1e: Post 1e

Runoff   =   0.15 cfs @ 12.27 hrs, Volume=   0.015 af, Depth> 0.11"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
10,669	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
63,474	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
74,143	47	Weighted Average
63,474	39	85.61% Pervious Area
10,669	98	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	216	0.0120	0.18		**Lag/CN Method, Post 1e**

Summary for Subcatchment Post 2a: Post 2a

Runoff   =   0.14 cfs @ 12.14 hrs, Volume=   0.012 af, Depth> 0.32"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
8,219	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
8,852	39	>75% Grass cover, Good, HSG A
1,840	30	Woods, Good, HSG A
18,911	64	Weighted Average
10,692	37	56.54% Pervious Area
8,219	98	43.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	198	0.0170	0.32		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 2b: Post 2b

Runoff   =   0.11 cfs @ 12.16 hrs, Volume=   0.009 af, Depth> 0.25"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
6,610	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
10,148	39	>75% Grass cover, Good, HSG A
3,185	30	Woods, Good, HSG A
19,943	57	Weighted Average
13,333	37	66.86% Pervious Area
6,610	98	33.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	200	0.0200	0.29		**Lag/CN Method, Post 2b**

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Summary for Subcatchment Post 2c: Post 2c

Runoff   =   0.16 cfs @ 12.09 hrs, Volume=   0.011 af, Depth> 0.34"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
7,910	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,910	39	>75% Grass cover, Good, HSG A
2,490	30	Woods, Good, HSG A
17,310	65	Weighted Average
9,400	37	54.30% Pervious Area
7,910	98	45.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	102	0.0150	0.27		**Lag/CN Method, Post 2c**

Summary for Subcatchment Post 2d: Post 2d

Runoff   =   0.21 cfs @ 12.10 hrs, Volume=   0.015 af, Depth> 0.51"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
10,672	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,865	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
15,537	80	Weighted Average
4,865	39	31.31% Pervious Area
10,672	98	68.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	204	0.0150	0.47		**Lag/CN Method, Post 2d**

Summary for Subcatchment Post 3: Post 3

Runoff   =   0.04 cfs @ 12.16 hrs, Volume=   0.004 af, Depth> 0.17"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
2,460	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,420	39	>75% Grass cover, Good, HSG A
1,801	30	Woods, Good, HSG A
10,681	51	Weighted Average
8,221	37	76.97% Pervious Area
2,460	98	23.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	174	0.0200	0.24		**Lag/CN Method, Post 3**

Summary for Subcatchment Post 4: Post 4

Runoff   =   0.06 cfs @   12.11 hrs, Volume=   0.005 af, Depth> 0.09"

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 1" Storm Rainfall=1.00"

Area (sf)	CN	Description
3,200	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
15,762	39	>75% Grass cover, Good, HSG A
8,214	30	Woods, Good, HSG A
27,176	43	Weighted Average
23,976	36	88.22% Pervious Area
3,200	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	201	0.0900	0.43		**Lag/CN Method, Post 4**

Summary for Reach 1R: Eastern Reach around barn

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth = 0.00"   for 1" Storm 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
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 35.30 cfs

30.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 167.0'   Slope= 0.0299 '/'
Inlet Invert= 180.00', Outlet Invert= 175.00'

‡

Summary for Reach Post: Post

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.03"   for 1" Storm event
Inflow   =   0.29 cfs @ 12.15 hrs, Volume=   0.030 af
Outflow   =   0.29 cfs @ 12.15 hrs, Volume=   0.030 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 Front of Site: Post Front of Site

Inflow Area =   1.646 ac, 46.60% Impervious, Inflow Depth > 0.09"   for 1" Storm event
Inflow   =   0.14 cfs @ 12.14 hrs, Volume=   0.012 af
Outflow   =   0.14 cfs @ 12.14 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 Post South: South Wetlands

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.03"   for 1" Storm event
Inflow   =   0.29 cfs @ 12.15 hrs, Volume=   0.030 af
Outflow   =   0.29 cfs @ 12.15 hrs, Volume=   0.030 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 West: West Abutters

Inflow Area =   0.869 ac, 14.95% Impervious, Inflow Depth > 0.11"   for 1" Storm event
Inflow   =   0.10 cfs @ 12.13 hrs, Volume=   0.008 af
Outflow   =   0.10 cfs @ 12.13 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 Western Reach thru Post 1a: Western Reach thru Post 1a

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

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Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 20.0 sf, Capacity= 60.96 cfs

60.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 269.0'   Slope= 0.0223 '/'
Inlet Invert= 181.00', Outlet Invert= 175.00'

‡

Summary for Pond AD 6 & Trench: AD 6 & Trench

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth > 0.11"   for 1" Storm event
Inflow   =   0.15 cfs @   12.27 hrs, Volume=   0.015 af
Outflow   =   0.15 cfs @   12.27 hrs, Volume=   0.015 af, Atten= 0%, Lag= 0.0 min
Discarded =   0.15 cfs @   12.27 hrs, Volume=   0.015 af
Secondary =   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= 177.50' @ 12.27 hrs   Surf.Area= 1,200 sf   Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (770.1 - 770.1)

Volume	Invert	Avail.Storage	Storage Description
#1	178.50'	322 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			1,440 cf Overall - 636 cf Embedded = 804 cf x 40.0% Voids
#2	179.00'	636 cf	**18.0" Round Pipe Storage** Inside #1
			L= 360.0'
#3	178.00'	1,060 cf	**18.0" Round Pipe Storage** Inside #4
			L= 600.0'
#4	177.50'	776 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			3,000 cf Overall - 1,060 cf Embedded = 1,940 cf x 40.0% Voids
		2,794 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.50	720	0	0
180.50	720	1,440	1,440

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	1,200	0	0
180.00	1,200	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	180.30'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.23 cfs @ 12.27 hrs HW=177.50' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=180.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 1&2: AD's 1&2

Inflow Area =   3.075 ac,   7.18% Impervious, Inflow Depth > 0.05"   for 1" Storm event
Inflow   =   0.10 cfs @ 12.35 hrs, Volume=   0.012 af
Outflow   =   0.10 cfs @ 12.35 hrs, Volume=   0.012 af, Atten= 0%, Lag= 0.0 min
Discarded =   0.10 cfs @ 12.35 hrs, Volume=   0.012 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 177.50' @ 12.35 hrs   Surf.Area= 985 sf   Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (774.8 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	141 cf	**12.0" Round Pipe Storage** L= 180.0'
#2	177.50'	288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 720 cf Overall x 40.0% Voids
#3	178.00'	2 cf	**1.00'D x 2.60'H Vertical Cone/Cylinder**
#4	180.60'	618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#5	178.00'	442 cf	**18.0" Round Pipe Storage** L= 250.0'
#6	177.50'	500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,250 cf Overall x 40.0% Voids
		1,991 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	360	0	0
179.50	360	720	720

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	2,462	618	618

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	625	0	0
179.50	625	1,250	1,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**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=0.19 cfs @ 12.35 hrs HW=177.50' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=181.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 3&4: AD's 3&4

Inflow Area = 0.866 ac, 3.16% Impervious, Inflow Depth > 0.02" for 1" Storm event
Inflow = 0.02 cfs @ 12.30 hrs, Volume= 0.002 af
Outflow = 0.02 cfs @ 12.30 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.02 cfs @ 12.30 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Secondary = 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= 177.40' @ 12.30 hrs Surf.Area= 92 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	177.90'	36 cf	**12.0" Round Pipe Storage**
			L= 46.0'
#2	177.40'	74 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			184 cf Overall x 40.0% Voids
#3	180.60'	397 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		507 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.40	92	0	0
179.40	92	184	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	1,579	397	397

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.40'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.40'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**5.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.02 cfs @ 12.30 hrs HW=177.40'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=177.50'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=181.00'   (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 1: Basin 1

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth > 0.09"   for 1" Storm event
Inflow   =   0.11 cfs @ 12.16 hrs, Volume=   0.009 af
Outflow   =   0.08 cfs @ 12.29 hrs, Volume=   0.009 af, Atten= 30%, Lag= 7.9 min
Discarded =   0.08 cfs @ 12.29 hrs, Volume=   0.009 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 184.05' @ 12.29 hrs   Surf.Area= 409 sf   Storage= 20 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.0 min (764.0 - 763.0)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.00	359	0	0
185.50	1,811	1,628	1,628

Device	Routing	Invert	Outlet Devices
#1	Discarded	184.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	184.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	185.30'	**30.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.08 cfs @ 12.29 hrs HW=184.05' (Free Discharge)
⌐**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=181.50' (Dynamic Tailwater)
⌐**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=0.00' (Dynamic Tailwater)
⌐**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area =   0.754 ac, 56.57% Impervious, Inflow Depth > 0.18"   for 1" Storm event
Inflow   =   0.16 cfs @ 12.09 hrs, Volume=   0.011 af
Outflow   =   0.13 cfs @ 12.15 hrs, Volume=   0.011 af, Atten= 15%, Lag= 3.4 min
Discarded   =   0.13 cfs @ 12.15 hrs, Volume=   0.011 af
Primary   =   0.00 cfs @ 5.00 hrs, Volume=   0.000 af
Secondary   =   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= 185.01' @ 12.14 hrs   Surf.Area= 696 sf   Storage= 6 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.5 min (759.4 - 758.9)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	1,874 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	685	0	0
186.25	2,313	1,874	1,874

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Type III 24-hr 1" Storm Rainfall=1.00"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	185.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	186.20'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.13 cfs @ 12.15 hrs HW=185.01' (Free Discharge)
⌐**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00' (Dynamic Tailwater)
⌐**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00' (Dynamic Tailwater)
⌐**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area =   0.357 ac, 68.69% Impervious, Inflow Depth > 0.51"   for 1" Storm event

Inflow	=	0.21 cfs @ 12.10 hrs, Volume=	0.015 af	
Outflow	=	0.12 cfs @ 12.23 hrs, Volume=	0.015 af,	Atten= 41%, Lag= 7.9 min
Discarded	=	0.12 cfs @ 12.23 hrs, Volume=	0.015 af	
Primary	=	0.00 cfs @ 5.00 hrs, Volume=	0.000 af	
Secondary	=	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= 185.62' @ 12.23 hrs   Surf.Area= 634 sf   Storage= 59 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.3 min (761.8 - 759.6)

Volume	Invert	Avail.Storage	Storage Description
#1	185.50'	5,939 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.50	377	0	0
186.51	2,605	1,506	1,506
187.30	8,618	4,433	5,939

Device	Routing	Invert	Outlet Devices
#1	Primary	186.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	185.50'	**8.270 in/hr Exfiltration over Surface area**
#3	Secondary	187.25'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.12 cfs @ 12.23 hrs HW=185.62'   (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=185.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Perforated Pipe: 12" Perforated Pipe

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth = 0.00"   for 1" Storm 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
Discarded =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 181.50' @ 5.00 hrs   Surf.Area= 361 sf   Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	141 cf	**12.0" Round Pipe Storage** Inside #2
			L= 180.0'
#2	181.50'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			720 cf Overall - 141 cf Embedded = 579 cf x 40.0% Voids
#3	181.50'	3 cf	**1.00'D x 3.75'H Vertical Cone/Cylinder**
		376 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.50	360	0	0
183.50	360	720	720

Device	Routing	Invert	Outlet Devices
#1	Discarded	181.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	185.20'	**40.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50'   (Free Discharge)
└─**1=Exfiltration** (Passes 0.00 cfs of 0.07 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50' TW=0.00'   (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Post Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 0.75"   for 1" Storm event
Inflow   =   0.21 cfs @   12.07 hrs, Volume=   0.015 af
Outflow   =   0.09 cfs @   12.10 hrs, Volume=   0.015 af, Atten= 59%, Lag= 1.7 min
Discarded =   0.09 cfs @   12.10 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= 178.16' @ 12.28 hrs   Surf.Area= 0.010 ac   Storage= 0.002 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.5 min (761.2 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 12.10 hrs HW=178.10'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (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

SubcatchmentPost 1a: Post 1a   Runoff Area=168,490 sf 3.95% Impervious Runoff Depth>0.12"
        Flow Length=408' Slope=0.0210 '/' Tc=30.2 min CN=41 Runoff=0.29 cfs 0.038 af

SubcatchmentPost 1b: Post 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>2.77"
        Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=0.74 cfs 0.055 af

SubcatchmentPost 1c: Post 1c   Runoff Area=96,215 sf 8.76% Impervious Runoff Depth>0.24"
        Flow Length=507' Slope=0.0330 '/' Tc=26.4 min CN=44 Runoff=0.36 cfs 0.045 af

SubcatchmentPost 1d: Post 1d   Runoff Area=37,714 sf 3.16% Impervious Runoff Depth>0.09"
        Flow Length=199' Slope=0.0120 '/' Tc=22.5 min CN=41 Runoff=0.05 cfs 0.006 af

SubcatchmentPost 1e: Post 1e   Runoff Area=74,143 sf 14.39% Impervious Runoff Depth>0.40"
        Flow Length=216' Slope=0.0120 '/' Tc=20.5 min CN=47 Runoff=0.51 cfs 0.057 af

SubcatchmentPost 2a: Post 2a   Runoff Area=18,911 sf 43.46% Impervious Runoff Depth>1.21"
        Flow Length=198' Slope=0.0170 '/' Tc=10.4 min CN=64 Runoff=0.50 cfs 0.044 af

SubcatchmentPost 2b: Post 2b   Runoff Area=19,943 sf 33.14% Impervious Runoff Depth>0.92"
        Flow Length=200' Slope=0.0200 '/' Tc=11.6 min CN=57 Runoff=0.39 cfs 0.035 af

SubcatchmentPost 2c: Post 2c   Runoff Area=17,310 sf 45.70% Impervious Runoff Depth>1.27"
        Flow Length=102' Slope=0.0150 '/' Tc=6.4 min CN=65 Runoff=0.55 cfs 0.042 af

SubcatchmentPost 2d: Post 2d   Runoff Area=15,537 sf 68.69% Impervious Runoff Depth>1.90"
        Flow Length=204' Slope=0.0150 '/' Tc=7.3 min CN=80 Runoff=0.72 cfs 0.057 af

SubcatchmentPost 3: Post 3   Runoff Area=10,681 sf 23.03% Impervious Runoff Depth>0.64"
        Flow Length=174' Slope=0.0200 '/' Tc=12.1 min CN=51 Runoff=0.14 cfs 0.013 af

SubcatchmentPost 4: Post 4   Runoff Area=27,176 sf 11.78% Impervious Runoff Depth>0.33"
        Flow Length=201' Slope=0.0900 '/' Tc=7.8 min CN=43 Runoff=0.21 cfs 0.017 af

Reach 1R: Eastern Reach around barn   Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
        n=0.035 L=167.0' S=0.0299 '/' Capacity=35.30 cfs Outflow=0.00 cfs 0.000 af

Reach Post: Post   Inflow=1.02 cfs 0.112 af
                                                   Outflow=1.02 cfs 0.112 af

Reach Post Front of Site: Post Front of Site   Inflow=0.50 cfs 0.044 af
                                                   Outflow=0.50 cfs 0.044 af

Reach Post South: South Wetlands   Inflow=1.02 cfs 0.112 af
                                                   Outflow=1.02 cfs 0.112 af

Reach Post West: West Abutters   Inflow=0.35 cfs 0.030 af
                                                   Outflow=0.35 cfs 0.030 af

Reach Western Reach thru Post 1a: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035   L=269.0'   S=0.0223 '/'   Capacity=60.96 cfs   Outflow=0.00 cfs 0.000 af

Pond AD 6 & Trench: AD 6 & Trench   Peak Elev=178.15' Storage=345 cf Inflow=0.51 cfs 0.057 af
Discarded=0.23 cfs 0.057 af   Secondary=0.00 cfs 0.000 af   Outflow=0.23 cfs 0.057 af

Pond AD's 1&2: AD's 1&2   Peak Elev=178.03' Storage=215 cf Inflow=0.36 cfs 0.045 af
Discarded=0.22 cfs 0.045 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.22 cfs 0.045 af

Pond AD's 3&4: AD's 3&4   Peak Elev=178.29' Storage=46 cf Inflow=0.05 cfs 0.006 af
Discarded=0.03 cfs 0.006 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.03 cfs 0.006 af

Pond Basin 1: Basin 1   Peak Elev=184.49' Storage=292 cf Inflow=0.39 cfs 0.035 af
Discarded=0.16 cfs 0.035 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.16 cfs 0.035 af

Pond Basin 2: Basin 2   Peak Elev=185.32' Storage=288 cf Inflow=0.55 cfs 0.042 af
Discarded=0.21 cfs 0.042 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.21 cfs 0.042 af

Pond Basin 3: Basin 3   Peak Elev=186.01' Storage=473 cf Inflow=0.72 cfs 0.057 af
Discarded=0.29 cfs 0.057 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.29 cfs 0.057 af

Pond Perforated Pipe: 12" Perforated Pipe   Peak Elev=181.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.00 cfs 0.000 af

Pond Post Existing House: Drywells   Peak Elev=179.74' Storage=0.018 af Inflow=0.74 cfs 0.055 af
Discarded=0.09 cfs 0.055 af   Primary=0.00 cfs 0.000 af   Outflow=0.09 cfs 0.055 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.408 af   Average Runoff Depth = 0.43"
84.62% Pervious = 9.644 ac   15.38% Impervious = 1.753 ac

Summary for Subcatchment Post 1a: Post 1a

Runoff   =   0.29 cfs @ 12.40 hrs, Volume=   0.038 af, Depth> 0.12"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
6,649	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
146,589	39	>75% Grass cover, Good, HSG A
14,698	30	Woods, Good, HSG A
168,490	41	Weighted Average
161,841	38	96.05% Pervious Area
6,649	98	3.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	408	0.0210	0.23		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff   =   0.74 cfs @ 12.07 hrs, Volume=   0.055 af, Depth> 2.77"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Post 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Post 1c: Post 1c

Runoff   =   0.36 cfs @ 12.35 hrs, Volume=   0.045 af, Depth> 0.24"

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 Cornell Rainfall=3.20"

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Area (sf)	CN	Description
8,429	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
87,097	39	>75% Grass cover, Good, HSG A
689	30	Woods, Good, HSG A
96,215	44	Weighted Average
87,786	39	91.24% Pervious Area
8,429	98	8.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	507	0.0330	0.32		**Lag/CN Method, Post c**

Summary for Subcatchment Post 1d: Post 1d

Runoff   =   0.05 cfs @ 12.30 hrs, Volume=   0.006 af, Depth> 0.09"

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 2-YR Cornell Rainfall=3.20"

Area (sf)	CN	Description
1,190	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
36,524	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
37,714	41	Weighted Average
36,524	39	96.84% Pervious Area
1,190	98	3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	199	0.0120	0.15		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1e: Post 1e

Runoff   =   0.51 cfs @ 12.27 hrs, Volume=   0.057 af, Depth> 0.40"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
10,669	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
63,474	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
74,143	47	Weighted Average
63,474	39	85.61% Pervious Area
10,669	98	14.39% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	216	0.0120	0.18		**Lag/CN Method, Post 1e**

Summary for Subcatchment Post 2a: Post 2a

Runoff   =   0.50 cfs @ 12.14 hrs, Volume=   0.044 af, Depth> 1.21"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
8,219	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
8,852	39	>75% Grass cover, Good, HSG A
1,840	30	Woods, Good, HSG A
18,911	64	Weighted Average
10,692	37	56.54% Pervious Area
8,219	98	43.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	198	0.0170	0.32		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 2b: Post 2b

Runoff   =   0.39 cfs @ 12.16 hrs, Volume=   0.035 af, Depth> 0.92"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
6,610	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
10,148	39	>75% Grass cover, Good, HSG A
3,185	30	Woods, Good, HSG A
19,943	57	Weighted Average
13,333	37	66.86% Pervious Area
6,610	98	33.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	200	0.0200	0.29		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 2c: Post 2c

Runoff   =   0.55 cfs @ 12.09 hrs, Volume=   0.042 af, Depth> 1.27"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
7,910	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,910	39	>75% Grass cover, Good, HSG A
2,490	30	Woods, Good, HSG A
17,310	65	Weighted Average
9,400	37	54.30% Pervious Area
7,910	98	45.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	102	0.0150	0.27		**Lag/CN Method, Post 2c**

Summary for Subcatchment Post 2d: Post 2d

Runoff   =   0.72 cfs @ 12.10 hrs, Volume=   0.057 af, Depth> 1.90"

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 Cornell Rainfall=3.20"

Area (sf)	CN	Description
10,672	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,865	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
15,537	80	Weighted Average
4,865	39	31.31% Pervious Area
10,672	98	68.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	204	0.0150	0.47		**Lag/CN Method, Post 2d**

Summary for Subcatchment Post 3: Post 3

Runoff   =   0.14 cfs @ 12.16 hrs, Volume=   0.013 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
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Area (sf)	CN	Description
2,460	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,420	39	>75% Grass cover, Good, HSG A
1,801	30	Woods, Good, HSG A
10,681	51	Weighted Average
8,221	37	76.97% Pervious Area
2,460	98	23.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	174	0.0200	0.24		**Lag/CN Method, Post 3**

Summary for Subcatchment Post 4: Post 4

Runoff   =   0.21 cfs @ 12.11 hrs, Volume=   0.017 af, Depth> 0.33"

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 2-YR Cornell Rainfall=3.20"

Area (sf)	CN	Description
3,200	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
15,762	39	>75% Grass cover, Good, HSG A
8,214	30	Woods, Good, HSG A
27,176	43	Weighted Average
23,976	36	88.22% Pervious Area
3,200	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	201	0.0900	0.43		**Lag/CN Method, Post 4**

Summary for Reach 1R: Eastern Reach around barn

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth = 0.00"   for 2-YR Cornell 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
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 35.30 cfs

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30.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 167.0'   Slope= 0.0299 '/'
Inlet Invert= 180.00', Outlet Invert= 175.00'

‡

Summary for Reach Post: Post

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.12"   for 2-YR Cornell event
Inflow   =   1.02 cfs @   12.15 hrs, Volume=   0.112 af
Outflow   =   1.02 cfs @   12.15 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 Reach Post Front of Site: Post Front of Site

Inflow Area =   1.646 ac, 46.60% Impervious, Inflow Depth > 0.32"   for 2-YR Cornell event
Inflow   =   0.50 cfs @   12.14 hrs, Volume=   0.044 af
Outflow   =   0.50 cfs @   12.14 hrs, Volume=   0.044 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 South: South Wetlands

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.12"   for 2-YR Cornell event
Inflow   =   1.02 cfs @   12.15 hrs, Volume=   0.112 af
Outflow   =   1.02 cfs @   12.15 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 Reach Post West: West Abutters

Inflow Area =   0.869 ac, 14.95% Impervious, Inflow Depth > 0.41"   for 2-YR Cornell event
Inflow   =   0.35 cfs @   12.12 hrs, Volume=   0.030 af
Outflow   =   0.35 cfs @   12.12 hrs, Volume=   0.030 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 Western Reach thru Post 1a: Western Reach thru Post 1a

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

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Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min
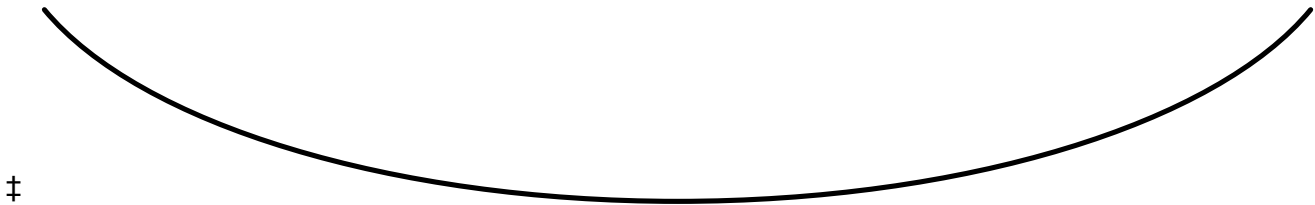
Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 20.0 sf, Capacity= 60.96 cfs

60.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 269.0'   Slope= 0.0223 '/'
Inlet Invert= 181.00', Outlet Invert= 175.00'

‡

Summary for Pond AD 6 & Trench: AD 6 & Trench

Inflow Area =	1.702 ac,	14.39% Impervious,	Inflow Depth > 0.40"	for 2-YR Cornell event	
Inflow =	0.51 cfs @	12.27 hrs,	Volume=	0.057 af	
Outflow =	0.23 cfs @	12.10 hrs,	Volume=	0.057 af,	Atten= 55%, Lag= 0.0 min
Discarded =	0.23 cfs @	12.10 hrs,	Volume=	0.057 af	
Secondary =	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= 178.15' @ 12.63 hrs   Surf.Area= 1,200 sf   Storage= 345 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.3 min (756.7 - 749.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.50'	322 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			1,440 cf Overall - 636 cf Embedded = 804 cf x 40.0% Voids
#2	179.00'	636 cf	**18.0" Round Pipe Storage** Inside #1
			L= 360.0'
#3	178.00'	1,060 cf	**18.0" Round Pipe Storage** Inside #4
			L= 600.0'
#4	177.50'	776 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			3,000 cf Overall - 1,060 cf Embedded = 1,940 cf x 40.0% Voids
		2,794 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.50	720	0	0
180.50	720	1,440	1,440

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	1,200	0	0
180.00	1,200	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	180.30'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.23 cfs @ 12.10 hrs HW=177.54'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=180.00'   (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 1&2: AD's 1&2

Inflow Area =   3.075 ac,   7.18% Impervious, Inflow Depth > 0.17"   for 2-YR Cornell event
Inflow   =   0.36 cfs @   12.35 hrs, Volume=   0.045 af
Outflow   =   0.22 cfs @   12.65 hrs, Volume=   0.045 af, Atten= 39%, Lag= 18.1 min
Discarded =   0.22 cfs @   12.65 hrs, Volume=   0.045 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 178.03' @ 12.65 hrs   Surf.Area= 1,163 sf   Storage= 215 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.9 min (758.8 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	141 cf	**12.0" Round Pipe Storage** L= 180.0'
#2	177.50'	288 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 720 cf Overall x 40.0% Voids
#3	178.00'	2 cf	**1.00'D x 2.60'H Vertical Cone/Cylinder**
#4	180.60'	618 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#5	178.00'	442 cf	**18.0" Round Pipe Storage** L= 250.0'
#6	177.50'	500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,250 cf Overall x 40.0% Voids
		1,991 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	360	0	0
179.50	360	720	720

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	2,462	618	618

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	625	0	0
179.50	625	1,250	1,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**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=0.22 cfs @ 12.65 hrs HW=178.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=181.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 3&4: AD's 3&4

Inflow Area =   0.866 ac,   3.16% Impervious, Inflow Depth > 0.09"   for 2-YR Cornell event
Inflow   =   0.05 cfs @ 12.30 hrs, Volume=   0.006 af
Outflow   =   0.03 cfs @ 12.66 hrs, Volume=   0.006 af, Atten= 52%, Lag= 21.8 min
Discarded   =   0.03 cfs @ 12.66 hrs, Volume=   0.006 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary   =   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= 178.29' @ 12.66 hrs Surf.Area= 137 sf Storage= 46 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.7 min (760.6 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1	177.90'	36 cf	**12.0" Round Pipe Storage** L= 46.0'
#2	177.40'	74 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 184 cf Overall x 40.0% Voids
#3	180.60'	397 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		507 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.40	92	0	0
179.40	92	184	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	1,579	397	397

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.40'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.40'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**5.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.66 hrs HW=178.29'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=177.50' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=181.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Basin 1: Basin 1

Inflow Area =	1.212 ac, 47.72% Impervious, Inflow Depth > 0.35" for 2-YR Cornell event	
Inflow =	0.39 cfs @ 12.16 hrs, Volume= 0.035 af	
Outflow =	0.16 cfs @ 12.46 hrs, Volume= 0.035 af, Atten= 59%, Lag= 18.0 min	
Discarded =	0.16 cfs @ 12.46 hrs, Volume= 0.035 af	
Primary =	0.00 cfs @ 5.00 hrs, Volume= 0.000 af	
Secondary =	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= 184.49' @ 12.46 hrs   Surf.Area= 833 sf   Storage= 292 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.3 min (754.0 - 742.8)

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Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.00	359	0	0
185.50	1,811	1,628	1,628

Device	Routing	Invert	Outlet Devices
#1	Discarded	184.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	184.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	185.30'	**30.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.16 cfs @ 12.46 hrs HW=184.49' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=181.50' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area =	0.754 ac, 56.57% Impervious, Inflow Depth > 0.67" for 2-YR Cornell event	
Inflow =	0.55 cfs @ 12.09 hrs, Volume=	0.042 af
Outflow =	0.21 cfs @ 12.33 hrs, Volume=	0.042 af, Atten= 61%, Lag= 14.2 min
Discarded =	0.21 cfs @ 12.33 hrs, Volume=	0.042 af
Primary =	0.00 cfs @ 5.00 hrs, Volume=	0.000 af
Secondary =	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= 185.32' @ 12.33 hrs Surf.Area= 1,104 sf Storage= 288 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 6.9 min (745.8 - 738.9)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	1,874 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	685	0	0
186.25	2,313	1,874	1,874

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Device	Routing	Invert	Outlet Devices
#1	Discarded	185.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	186.20'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.21 cfs @ 12.33 hrs HW=185.32'   (Free Discharge)
┕━**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00'   (Dynamic Tailwater)
┕━**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00'   (Dynamic Tailwater)
┕━**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area =   0.357 ac, 68.69% Impervious, Inflow Depth > 1.90"   for 2-YR Cornell event
Inflow   =   0.72 cfs @   12.10 hrs, Volume=   0.057 af
Outflow   =   0.29 cfs @   12.34 hrs, Volume=   0.057 af, Atten= 60%, Lag= 14.6 min
Discarded =   0.29 cfs @   12.34 hrs, Volume=   0.057 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 186.01' @ 12.34 hrs Surf.Area= 1,493 sf Storage= 473 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 10.5 min (750.1 - 739.5)

Volume	Invert	Avail.Storage	Storage Description
#1	185.50'	5,939 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.50	377	0	0
186.51	2,605	1,506	1,506
187.30	8,618	4,433	5,939

Device	Routing	Invert	Outlet Devices
#1	Primary	186.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	185.50'	**8.270 in/hr Exfiltration over Surface area**
#3	Secondary	187.25'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.29 cfs @ 12.34 hrs HW=186.01'   (Free Discharge)
⌐—**2=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=185.00'   (Dynamic Tailwater)
⌐—**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=184.00'   (Dynamic Tailwater)
⌐—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Perforated Pipe: 12" Perforated Pipe

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth = 0.00"   for 2-YR Cornell 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
Discarded =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 181.50' @ 5.00 hrs   Surf.Area= 361 sf   Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	141 cf	**12.0" Round Pipe Storage** Inside #2 L= 180.0'
#2	181.50'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 720 cf Overall - 141 cf Embedded = 579 cf x 40.0% Voids
#3	181.50'	3 cf	**1.00'D x 3.75'H Vertical Cone/Cylinder**
		376 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.50	360	0	0
183.50	360	720	720

Device	Routing	Invert	Outlet Devices
#1	Discarded	181.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	185.20'	**40.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50'   (Free Discharge)
⌐—**1=Exfiltration** (Passes 0.00 cfs of 0.07 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50' TW=0.00'   (Dynamic Tailwater)
⌐—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

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Summary for Pond Post Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 2.77"   for 2-YR Cornell event
Inflow   =   0.74 cfs @ 12.07 hrs, Volume=   0.055 af
Outflow   =   0.09 cfs @ 11.80 hrs, Volume=   0.055 af, Atten= 88%, Lag= 0.0 min
Discarded =   0.09 cfs @ 11.80 hrs, Volume=   0.055 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= 179.74' @ 12.66 hrs   Surf.Area= 0.010 ac   Storage= 0.018 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 60.8 min (798.7 - 737.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 11.80 hrs HW=178.14'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (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

SubcatchmentPost 1a: Post 1a   Runoff Area=168,490 sf   3.95% Impervious   Runoff Depth>0.29"
          Flow Length=408'   Slope=0.0210 '/'   Tc=30.2 min   CN=41   Runoff=0.44 cfs 0.092 af

SubcatchmentPost 1b: Post 1b   Runoff Area=10,363 sf   100.00% Impervious   Runoff Depth>4.24"
          Flow Length=25'   Slope=0.3000 '/'   Tc=5.0 min   CN=98   Runoff=1.12 cfs 0.084 af

SubcatchmentPost 1c: Post 1c   Runoff Area=96,215 sf   8.76% Impervious   Runoff Depth>0.48"
          Flow Length=507'   Slope=0.0330 '/'   Tc=26.4 min   CN=44   Runoff=0.55 cfs 0.088 af

SubcatchmentPost 1d: Post 1d   Runoff Area=37,714 sf   3.16% Impervious   Runoff Depth>0.25"
          Flow Length=199'   Slope=0.0120 '/'   Tc=22.5 min   CN=41   Runoff=0.08 cfs 0.018 af

SubcatchmentPost 1e: Post 1e   Runoff Area=74,143 sf   14.39% Impervious   Runoff Depth>0.71"
          Flow Length=216'   Slope=0.0120 '/'   Tc=20.5 min   CN=47   Runoff=0.78 cfs 0.101 af

SubcatchmentPost 2a: Post 2a   Runoff Area=18,911 sf   43.46% Impervious   Runoff Depth>1.90"
          Flow Length=198'   Slope=0.0170 '/'   Tc=10.4 min   CN=64   Runoff=0.76 cfs 0.069 af

SubcatchmentPost 2b: Post 2b   Runoff Area=19,943 sf   33.14% Impervious   Runoff Depth>1.47"
          Flow Length=200'   Slope=0.0200 '/'   Tc=11.6 min   CN=57   Runoff=0.59 cfs 0.056 af

SubcatchmentPost 2c: Post 2c   Runoff Area=17,310 sf   45.70% Impervious   Runoff Depth>1.99"
          Flow Length=102'   Slope=0.0150 '/'   Tc=6.4 min   CN=65   Runoff=0.82 cfs 0.066 af

SubcatchmentPost 2d: Post 2d   Runoff Area=15,537 sf   68.69% Impervious   Runoff Depth>2.95"
          Flow Length=204'   Slope=0.0150 '/'   Tc=7.3 min   CN=80   Runoff=1.09 cfs 0.088 af

SubcatchmentPost 3: Post 3   Runoff Area=10,681 sf   23.03% Impervious   Runoff Depth>1.05"
          Flow Length=174'   Slope=0.0200 '/'   Tc=12.1 min   CN=51   Runoff=0.22 cfs 0.021 af

SubcatchmentPost 4: Post 4   Runoff Area=27,176 sf   11.78% Impervious   Runoff Depth>0.57"
          Flow Length=201'   Slope=0.0900 '/'   Tc=7.8 min   CN=43   Runoff=0.32 cfs 0.030 af

Reach 1R: Eastern Reach around barn   Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
          n=0.035   L=167.0'   S=0.0299 '/'   Capacity=35.30 cfs   Outflow=0.00 cfs 0.000 af

Reach Post: Post   Inflow=1.54 cfs 0.212 af
                               Outflow=1.54 cfs 0.212 af

Reach Post Front of Site: Post Front of Site   Inflow=0.76 cfs 0.069 af
                               Outflow=0.76 cfs 0.069 af

Reach Post South: South Wetlands   Inflow=1.54 cfs 0.212 af
                               Outflow=1.54 cfs 0.212 af

Reach Post West: West Abutters   Inflow=0.52 cfs 0.051 af
                               Outflow=0.52 cfs 0.051 af

Reach Western Reach thru Post 1a: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035   L=269.0'   S=0.0223 '/'   Capacity=60.96 cfs   Outflow=0.00 cfs 0.000 af

Pond AD 6 & Trench: AD 6 & Trench   Peak Elev=178.56' Storage=739 cf Inflow=0.78 cfs 0.101 af
Discarded=0.37 cfs 0.101 af   Secondary=0.00 cfs 0.000 af   Outflow=0.37 cfs 0.101 af

Pond AD's 1&2: AD's 1&2   Peak Elev=178.42' Storage=521 cf Inflow=0.58 cfs 0.090 af
Discarded=0.29 cfs 0.090 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.29 cfs 0.090 af

Pond AD's 3&4: AD's 3&4   Peak Elev=178.52' Storage=65 cf Inflow=0.08 cfs 0.018 af
Discarded=0.03 cfs 0.017 af   Primary=0.04 cfs 0.002 af   Secondary=0.00 cfs 0.000 af   Outflow=0.07 cfs 0.018 af

Pond Basin 1: Basin 1   Peak Elev=184.75' Storage=538 cf Inflow=0.59 cfs 0.056 af
Discarded=0.21 cfs 0.056 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.21 cfs 0.056 af

Pond Basin 2: Basin 2   Peak Elev=185.55' Storage=571 cf Inflow=0.82 cfs 0.066 af
Discarded=0.27 cfs 0.066 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.27 cfs 0.066 af

Pond Basin 3: Basin 3   Peak Elev=186.22' Storage=845 cf Inflow=1.09 cfs 0.088 af
Discarded=0.38 cfs 0.088 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.38 cfs 0.088 af

Pond Perforated Pipe: 12" Perforated Pipe   Peak Elev=181.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.00 cfs 0.000 af

Pond Post Existing House: Drywells   Peak Elev=181.17' Storage=0.033 af Inflow=1.12 cfs 0.084 af
Discarded=0.09 cfs 0.081 af   Primary=0.00 cfs 0.000 af   Outflow=0.09 cfs 0.081 af

Total Runoff Area = 11.398 ac   Runoff Volume = 0.713 af   Average Runoff Depth = 0.75"
84.62% Pervious = 9.644 ac   15.38% Impervious = 1.753 ac

Summary for Subcatchment Post 1a: Post 1a

Runoff   =   0.44 cfs @ 12.40 hrs, Volume=   0.092 af, Depth> 0.29"

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 10-YR-Cornell Rainfall=4.80"

Area (sf)	CN	Description
6,649	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
146,589	39	>75% Grass cover, Good, HSG A
14,698	30	Woods, Good, HSG A
168,490	41	Weighted Average
161,841	38	96.05% Pervious Area
6,649	98	3.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	408	0.0210	0.23		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff   =   1.12 cfs @ 12.07 hrs, Volume=   0.084 af, Depth> 4.24"

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 10-YR-Cornell Rainfall=4.80"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Post 1b**
0.1	25		Total, Increased to minimum Tc = 5.0 min		

Summary for Subcatchment Post 1c: Post 1c

Runoff   =   0.55 cfs @ 12.35 hrs, Volume=   0.088 af, Depth> 0.48"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
8,429	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
87,097	39	>75% Grass cover, Good, HSG A
689	30	Woods, Good, HSG A
96,215	44	Weighted Average
87,786	39	91.24% Pervious Area
8,429	98	8.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	507	0.0330	0.32		**Lag/CN Method, Post c**

Summary for Subcatchment Post 1d: Post 1d

Runoff   =   0.08 cfs @ 12.29 hrs, Volume=   0.018 af, Depth> 0.25"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
1,190	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
36,524	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
37,714	41	Weighted Average
36,524	39	96.84% Pervious Area
1,190	98	3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	199	0.0120	0.15		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1e: Post 1e

Runoff   =   0.78 cfs @ 12.27 hrs, Volume=   0.101 af, Depth> 0.71"

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 10-YR-Cornell Rainfall=4.80"

Area (sf)	CN	Description
10,669	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
63,474	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
74,143	47	Weighted Average
63,474	39	85.61% Pervious Area
10,669	98	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	216	0.0120	0.18		**Lag/CN Method, Post 1e**

Summary for Subcatchment Post 2a: Post 2a

Runoff   =   0.76 cfs @ 12.14 hrs, Volume=   0.069 af, Depth> 1.90"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
8,219	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
8,852	39	>75% Grass cover, Good, HSG A
1,840	30	Woods, Good, HSG A
18,911	64	Weighted Average
10,692	37	56.54% Pervious Area
8,219	98	43.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	198	0.0170	0.32		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 2b: Post 2b

Runoff   =   0.59 cfs @ 12.16 hrs, Volume=   0.056 af, Depth> 1.47"

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 10-YR-Cornell Rainfall=4.80"

Area (sf)	CN	Description
6,610	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
10,148	39	>75% Grass cover, Good, HSG A
3,185	30	Woods, Good, HSG A
19,943	57	Weighted Average
13,333	37	66.86% Pervious Area
6,610	98	33.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	200	0.0200	0.29		**Lag/CN Method, Post 2b**

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Summary for Subcatchment Post 2c: Post 2c

Runoff   =   0.82 cfs @ 12.09 hrs, Volume=   0.066 af, Depth> 1.99"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
7,910	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,910	39	>75% Grass cover, Good, HSG A
2,490	30	Woods, Good, HSG A
17,310	65	Weighted Average
9,400	37	54.30% Pervious Area
7,910	98	45.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	102	0.0150	0.27		**Lag/CN Method, Post 2c**

Summary for Subcatchment Post 2d: Post 2d

Runoff   =   1.09 cfs @ 12.10 hrs, Volume=   0.088 af, Depth> 2.95"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
10,672	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,865	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
15,537	80	Weighted Average
4,865	39	31.31% Pervious Area
10,672	98	68.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	204	0.0150	0.47		**Lag/CN Method, Post 2d**

Summary for Subcatchment Post 3: Post 3

Runoff   =   0.22 cfs @ 12.16 hrs, Volume=   0.021 af, Depth> 1.05"

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-Cornell Rainfall=4.80"

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Area (sf)	CN	Description
2,460	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,420	39	>75% Grass cover, Good, HSG A
1,801	30	Woods, Good, HSG A
10,681	51	Weighted Average
8,221	37	76.97% Pervious Area
2,460	98	23.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	174	0.0200	0.24		**Lag/CN Method, Post 3**

Summary for Subcatchment Post 4: Post 4

Runoff   =   0.32 cfs @   12.11 hrs, Volume=   0.030 af, Depth> 0.57"

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-Cornell Rainfall=4.80"

Area (sf)	CN	Description
3,200	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
15,762	39	>75% Grass cover, Good, HSG A
8,214	30	Woods, Good, HSG A
27,176	43	Weighted Average
23,976	36	88.22% Pervious Area
3,200	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	201	0.0900	0.43		**Lag/CN Method, Post 4**

Summary for Reach 1R: Eastern Reach around barn

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth = 0.00"   for 10-YR-Cornell 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
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 35.30 cfs

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30.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 167.0'   Slope= 0.0299 '/'
Inlet Invert= 180.00', Outlet Invert= 175.00'

‡

Summary for Reach Post: Post

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.22"   for 10-YR-Cornell event
Inflow   =   1.54 cfs @   12.15 hrs, Volume=   0.212 af
Outflow   =   1.54 cfs @   12.15 hrs, Volume=   0.212 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 Front of Site: Post Front of Site

Inflow Area =   1.646 ac, 46.60% Impervious, Inflow Depth > 0.50"   for 10-YR-Cornell event
Inflow   =   0.76 cfs @   12.14 hrs, Volume=   0.069 af
Outflow   =   0.76 cfs @   12.14 hrs, Volume=   0.069 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 South: South Wetlands

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.22"   for 10-YR-Cornell event
Inflow   =   1.54 cfs @   12.15 hrs, Volume=   0.212 af
Outflow   =   1.54 cfs @   12.15 hrs, Volume=   0.212 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 West: West Abutters

Inflow Area =   0.869 ac, 14.95% Impervious, Inflow Depth > 0.71"   for 10-YR-Cornell event
Inflow   =   0.52 cfs @   12.12 hrs, Volume=   0.051 af
Outflow   =   0.52 cfs @   12.12 hrs, Volume=   0.051 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 Western Reach thru Post 1a: Western Reach thru Post 1a

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

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Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 20.0 sf, Capacity= 60.96 cfs

60.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 269.0' Slope= 0.0223 '/'
Inlet Invert= 181.00', Outlet Invert= 175.00'

‡

Summary for Pond AD 6 & Trench: AD 6 & Trench

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth > 0.71"   for 10-YR-Cornell event
Inflow   =   0.78 cfs @   12.27 hrs, Volume=   0.101 af
Outflow   =   0.37 cfs @   12.50 hrs, Volume=   0.101 af, Atten= 53%, Lag= 13.9 min
Discarded =   0.37 cfs @   12.50 hrs, Volume=   0.101 af
Secondary =   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= 178.56' @ 12.63 hrs   Surf.Area= 1,920 sf   Storage= 739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.9 min (789.7 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.50'	322 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			1,440 cf Overall - 636 cf Embedded = 804 cf x 40.0% Voids
#2	179.00'	636 cf	**18.0" Round Pipe Storage** Inside #1
			L= 360.0'
#3	178.00'	1,060 cf	**18.0" Round Pipe Storage** Inside #4
			L= 600.0'
#4	177.50'	776 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			3,000 cf Overall - 1,060 cf Embedded = 1,940 cf x 40.0% Voids
		2,794 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.50	720	0	0
180.50	720	1,440	1,440

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	1,200	0	0
180.00	1,200	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	180.30'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.37 cfs @ 12.50 hrs HW=178.53'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=180.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 1&2: AD's 1&2

Inflow Area =   3.075 ac,   7.18% Impervious, Inflow Depth > 0.35"   for 10-YR-Cornell event
Inflow   =   0.58 cfs @   12.39 hrs, Volume=   0.090 af
Outflow   =   0.29 cfs @   12.77 hrs, Volume=   0.090 af, Atten= 50%, Lag= 22.4 min
Discarded =   0.29 cfs @   12.77 hrs, Volume=   0.090 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 178.42' @ 12.77 hrs   Surf.Area= 1,500 sf   Storage= 521 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 9.1 min (805.0 - 795.9)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	141 cf	**12.0" Round Pipe Storage** L= 180.0'
#2	177.50'	288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 720 cf Overall x 40.0% Voids
#3	178.00'	2 cf	**1.00'D x 2.60'H Vertical Cone/Cylinder**
#4	180.60'	618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#5	178.00'	442 cf	**18.0" Round Pipe Storage** L= 250.0'
#6	177.50'	500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,250 cf Overall x 40.0% Voids
		1,991 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	360	0	0
179.50	360	720	720

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	2,462	618	618

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	625	0	0
179.50	625	1,250	1,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**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=0.29 cfs @ 12.77 hrs HW=178.42' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=181.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 3&4: AD's 3&4

Inflow Area = 0.866 ac, 3.16% Impervious, Inflow Depth > 0.25" for 10-YR-Cornell event
Inflow = 0.08 cfs @ 12.29 hrs, Volume= 0.018 af
Outflow = 0.07 cfs @ 12.45 hrs, Volume= 0.018 af, Atten= 15%, Lag= 9.4 min
Discarded = 0.03 cfs @ 14.30 hrs, Volume= 0.017 af
Primary = 0.04 cfs @ 12.45 hrs, Volume= 0.002 af
Secondary = 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= 178.52' @ 12.45 hrs Surf.Area= 137 sf Storage= 65 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.3 min (860.8 - 842.5)

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Volume	Invert	Avail.Storage	Storage Description
#1	177.90'	36 cf	**12.0" Round Pipe Storage**
			L= 46.0'
#2	177.40'	74 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			184 cf Overall x 40.0% Voids
#3	180.60'	397 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		507 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.40	92	0	0
179.40	92	184	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	1,579	397	397

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.40'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.40'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**5.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 14.30 hrs HW=178.40' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.04 cfs @ 12.45 hrs HW=178.52' TW=178.25' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.19 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=181.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 1: Basin 1

Inflow Area =	1.212 ac, 47.72% Impervious, Inflow Depth > 0.55" for 10-YR-Cornell event	
Inflow =	0.59 cfs @ 12.16 hrs, Volume=	0.056 af
Outflow =	0.21 cfs @ 12.51 hrs, Volume=	0.056 af, Atten= 65%, Lag= 21.0 min
Discarded =	0.21 cfs @ 12.51 hrs, Volume=	0.056 af
Primary =	0.00 cfs @ 5.00 hrs, Volume=	0.000 af
Secondary =	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= 184.75' @ 12.51 hrs   Surf.Area= 1,081 sf   Storage= 538 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 17.1 min (765.3 - 748.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.00	359	0	0
185.50	1,811	1,628	1,628

Device	Routing	Invert	Outlet Devices
#1	Discarded	184.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	184.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	185.30'	**30.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.21 cfs @ 12.51 hrs HW=184.75'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=181.50' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area =	0.754 ac,	56.57% Impervious,	Inflow Depth > 1.05"	for 10-YR-Cornell event
Inflow =	0.82 cfs @	12.09 hrs,	Volume=	0.066 af
Outflow =	0.27 cfs @	12.39 hrs,	Volume=	0.066 af, Atten= 68%, Lag= 17.9 min
Discarded =	0.27 cfs @	12.39 hrs,	Volume=	0.066 af
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Secondary =	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= 185.55' @ 12.39 hrs   Surf.Area= 1,398 sf   Storage= 571 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 12.0 min (752.8 - 740.8)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	1,874 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	685	0	0
186.25	2,313	1,874	1,874

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Device	Routing	Invert	Outlet Devices
#1	Discarded	185.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	186.20'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Discarded OutFlow Max=0.27 cfs @ 12.39 hrs HW=185.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area =   0.357 ac, 68.69% Impervious, Inflow Depth > 2.95"   for 10-YR-Cornell event
Inflow   =   1.09 cfs @ 12.10 hrs, Volume=   0.088 af
Outflow   =   0.38 cfs @ 12.39 hrs, Volume=   0.088 af, Atten= 65%, Lag= 17.3 min
Discarded =   0.38 cfs @ 12.39 hrs, Volume=   0.088 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 186.22' @ 12.39 hrs Surf.Area= 1,968 sf Storage= 845 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.3 min (754.3 - 739.0)

Volume	Invert	Avail.Storage	Storage Description
#1	185.50'	5,939 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.50	377	0	0
186.51	2,605	1,506	1,506
187.30	8,618	4,433	5,939

Device	Routing	Invert	Outlet Devices
#1	Primary	186.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	185.50'	**8.270 in/hr Exfiltration over Surface area**
#3	Secondary	187.25'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Discarded OutFlow Max=0.38 cfs @ 12.39 hrs HW=186.22' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.38 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=185.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Perforated Pipe: 12" Perforated Pipe

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth = 0.00"   for 10-YR-Cornell 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
Discarded =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 181.50' @ 5.00 hrs   Surf.Area= 361 sf   Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	141 cf	**12.0" Round Pipe Storage** Inside #2 L= 180.0'
#2	181.50'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 720 cf Overall - 141 cf Embedded = 579 cf x 40.0% Voids
#3	181.50'	3 cf	**1.00'D x 3.75'H Vertical Cone/Cylinder**
		376 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.50	360	0	0
183.50	360	720	720

Device	Routing	Invert	Outlet Devices
#1	Discarded	181.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	185.20'	**40.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50' (Free Discharge)
└─**1=Exfiltration** (Passes 0.00 cfs of 0.07 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Post Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 4.24"   for 10-YR-Cornell event
Inflow   =   1.12 cfs @ 12.07 hrs, Volume=   0.084 af
Outflow   =   0.09 cfs @ 11.60 hrs, Volume=   0.081 af, Atten= 92%, Lag= 0.0 min
Discarded =   0.09 cfs @ 11.60 hrs, Volume=   0.081 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= 181.17' @ 13.06 hrs   Surf.Area= 0.010 ac   Storage= 0.033 af

Plug-Flow detention time= 128.5 min calculated for 0.081 af (96% of inflow)
Center-of-Mass det. time= 114.8 min (849.4 - 734.6)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 11.60 hrs HW=178.10'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (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

SubcatchmentPost 1a: Post 1a   Runoff Area=168,490 sf 3.95% Impervious Runoff Depth>0.55"
                Flow Length=408' Slope=0.0210 '/' Tc=30.2 min CN=41 Runoff=0.84 cfs 0.177 af

SubcatchmentPost 1b: Post 1b   Runoff Area=10,363 sf 100.00% Impervious Runoff Depth>5.33"
                Flow Length=25' Slope=0.3000 '/' Tc=5.0 min CN=98 Runoff=1.41 cfs 0.106 af

SubcatchmentPost 1c: Post 1c   Runoff Area=96,215 sf 8.76% Impervious Runoff Depth>0.80"
                Flow Length=507' Slope=0.0330 '/' Tc=26.4 min CN=44 Runoff=0.82 cfs 0.147 af

SubcatchmentPost 1d: Post 1d   Runoff Area=37,714 sf 3.16% Impervious Runoff Depth>0.52"
                Flow Length=199' Slope=0.0120 '/' Tc=22.5 min CN=41 Runoff=0.19 cfs 0.038 af

SubcatchmentPost 1e: Post 1e   Runoff Area=74,143 sf 14.39% Impervious Runoff Depth>1.08"
                Flow Length=216' Slope=0.0120 '/' Tc=20.5 min CN=47 Runoff=1.05 cfs 0.153 af

SubcatchmentPost 2a: Post 2a   Runoff Area=18,911 sf 43.46% Impervious Runoff Depth>2.49"
                Flow Length=198' Slope=0.0170 '/' Tc=10.4 min CN=64 Runoff=0.96 cfs 0.090 af

SubcatchmentPost 2b: Post 2b   Runoff Area=19,943 sf 33.14% Impervious Runoff Depth>1.96"
                Flow Length=200' Slope=0.0200 '/' Tc=11.6 min CN=57 Runoff=0.75 cfs 0.075 af

SubcatchmentPost 2c: Post 2c   Runoff Area=17,310 sf 45.70% Impervious Runoff Depth>2.59"
                Flow Length=102' Slope=0.0150 '/' Tc=6.4 min CN=65 Runoff=1.04 cfs 0.086 af

SubcatchmentPost 2d: Post 2d   Runoff Area=15,537 sf 68.69% Impervious Runoff Depth>3.78"
                Flow Length=204' Slope=0.0150 '/' Tc=7.3 min CN=80 Runoff=1.36 cfs 0.112 af

SubcatchmentPost 3: Post 3   Runoff Area=10,681 sf 23.03% Impervious Runoff Depth>1.46"
                Flow Length=174' Slope=0.0200 '/' Tc=12.1 min CN=51 Runoff=0.28 cfs 0.030 af

SubcatchmentPost 4: Post 4   Runoff Area=27,176 sf 11.78% Impervious Runoff Depth>0.86"
                Flow Length=201' Slope=0.0900 '/' Tc=7.8 min CN=43 Runoff=0.41 cfs 0.045 af

Reach 1R: Eastern Reach around barn   Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
                n=0.035 L=167.0' S=0.0299 '/' Capacity=35.30 cfs Outflow=0.00 cfs 0.000 af

Reach Post: Post   Inflow=1.97 cfs 0.360 af
                                                        Outflow=1.97 cfs 0.360 af

Reach Post Front of Site: Post Front of Site   Inflow=0.96 cfs 0.090 af
                                                        Outflow=0.96 cfs 0.090 af

Reach Post South: South Wetlands   Inflow=1.97 cfs 0.360 af
                                                        Outflow=1.97 cfs 0.360 af

Reach Post West: West Abutters   Inflow=0.67 cfs 0.074 af
                                                        Outflow=0.67 cfs 0.074 af

Reach Western Reach thru Post 1a: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035   L=269.0'   S=0.0223 '/'   Capacity=60.96 cfs   Outflow=0.00 cfs 0.000 af

Pond AD 6 & Trench: AD 6 & Trench   Peak Elev=179.04' Storage=1,372 cf Inflow=1.05 cfs 0.153 af
Discarded=0.37 cfs 0.153 af   Secondary=0.00 cfs 0.000 af   Outflow=0.37 cfs 0.153 af

Pond AD's 1&2: AD's 1&2   Peak Elev=179.16' Storage=1,161 cf   Inflow=0.98 cfs 0.164 af
Discarded=0.29 cfs 0.145 af   Primary=0.37 cfs 0.019 af   Secondary=0.00 cfs 0.000 af   Outflow=0.62 cfs 0.164 af

Pond AD's 3&4: AD's 3&4   Peak Elev=179.17' Storage=101 cf   Inflow=0.19 cfs 0.038 af
Discarded=0.03 cfs 0.020 af   Primary=0.16 cfs 0.017 af   Secondary=0.00 cfs 0.000 af   Outflow=0.18 cfs 0.037 af

Pond Basin 1: Basin 1   Peak Elev=184.91' Storage=727 cf   Inflow=0.75 cfs 0.075 af
Discarded=0.24 cfs 0.073 af   Primary=0.07 cfs 0.002 af   Secondary=0.00 cfs 0.000 af   Outflow=0.31 cfs 0.075 af

Pond Basin 2: Basin 2   Peak Elev=185.72' Storage=823 cf   Inflow=1.04 cfs 0.086 af
Discarded=0.31 cfs 0.086 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.31 cfs 0.086 af

Pond Basin 3: Basin 3   Peak Elev=186.37' Storage=1,164 cf   Inflow=1.36 cfs 0.112 af
Discarded=0.44 cfs 0.112 af   Primary=0.00 cfs 0.000 af   Secondary=0.00 cfs 0.000 af   Outflow=0.44 cfs 0.112 af

Pond Perforated Pipe: 12" Perforated Pipe   Peak Elev=181.51' Storage=2 cf Inflow=0.07 cfs 0.002 af
Discarded=0.07 cfs 0.002 af   Secondary=0.00 cfs 0.000 af   Outflow=0.07 cfs 0.002 af

Pond Post Existing House: Drywells   Peak Elev=182.39' Storage=0.046 af Inflow=1.41 cfs 0.106 af
Discarded=0.09 cfs 0.086 af   Primary=0.00 cfs 0.000 af   Outflow=0.09 cfs 0.086 af

Total Runoff Area = 11.398 ac   Runoff Volume = 1.058 af   Average Runoff Depth = 1.11"
84.62% Pervious = 9.644 ac   15.38% Impervious = 1.753 ac

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Summary for Subcatchment Post 1a: Post 1a

Runoff   =   0.84 cfs @ 12.56 hrs, Volume=   0.177 af, Depth> 0.55"

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 25-YR Cornell Rainfall=6.00"

Area (sf)	CN	Description
6,649	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
146,589	39	>75% Grass cover, Good, HSG A
14,698	30	Woods, Good, HSG A
168,490	41	Weighted Average
161,841	38	96.05% Pervious Area
6,649	98	3.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	408	0.0210	0.23		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff   =   1.41 cfs @ 12.07 hrs, Volume=   0.106 af, Depth> 5.33"

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 25-YR Cornell Rainfall=6.00"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Post 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Post 1c: Post 1c

Runoff   =   0.82 cfs @ 12.43 hrs, Volume=   0.147 af, Depth> 0.80"

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 Cornell Rainfall=6.00"

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Area (sf)	CN	Description
8,429	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
87,097	39	>75% Grass cover, Good, HSG A
689	30	Woods, Good, HSG A
96,215	44	Weighted Average
87,786	39	91.24% Pervious Area
8,429	98	8.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	507	0.0330	0.32		**Lag/CN Method, Post c**

Summary for Subcatchment Post 1d: Post 1d

Runoff   =   0.19 cfs @ 12.50 hrs, Volume=   0.038 af, Depth> 0.52"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
1,190	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
36,524	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
37,714	41	Weighted Average
36,524	39	96.84% Pervious Area
1,190	98	3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	199	0.0120	0.15		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1e: Post 1e

Runoff   =   1.05 cfs @ 12.30 hrs, Volume=   0.153 af, Depth> 1.08"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
10,669	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
63,474	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
74,143	47	Weighted Average
63,474	39	85.61% Pervious Area
10,669	98	14.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	216	0.0120	0.18		**Lag/CN Method, Post 1e**

Summary for Subcatchment Post 2a: Post 2a

Runoff   =   0.96 cfs @ 12.14 hrs, Volume=   0.090 af, Depth> 2.49"

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 25-YR Cornell Rainfall=6.00"

Area (sf)	CN	Description
8,219	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
8,852	39	>75% Grass cover, Good, HSG A
1,840	30	Woods, Good, HSG A
18,911	64	Weighted Average
10,692	37	56.54% Pervious Area
8,219	98	43.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	198	0.0170	0.32		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 2b: Post 2b

Runoff   =   0.75 cfs @ 12.16 hrs, Volume=   0.075 af, Depth> 1.96"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
6,610	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
10,148	39	>75% Grass cover, Good, HSG A
3,185	30	Woods, Good, HSG A
19,943	57	Weighted Average
13,333	37	66.86% Pervious Area
6,610	98	33.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	200	0.0200	0.29		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 2c: Post 2c

Runoff   =   1.04 cfs @ 12.09 hrs, Volume=   0.086 af, Depth> 2.59"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
7,910	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,910	39	>75% Grass cover, Good, HSG A
2,490	30	Woods, Good, HSG A
17,310	65	Weighted Average
9,400	37	54.30% Pervious Area
7,910	98	45.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	102	0.0150	0.27		**Lag/CN Method, Post 2c**

Summary for Subcatchment Post 2d: Post 2d

Runoff   =   1.36 cfs @ 12.10 hrs, Volume=   0.112 af, Depth> 3.78"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
10,672	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,865	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
15,537	80	Weighted Average
4,865	39	31.31% Pervious Area
10,672	98	68.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	204	0.0150	0.47		**Lag/CN Method, Post 2d**

Summary for Subcatchment Post 3: Post 3

Runoff   =   0.28 cfs @ 12.17 hrs, Volume=   0.030 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
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Area (sf)	CN	Description
2,460	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,420	39	>75% Grass cover, Good, HSG A
1,801	30	Woods, Good, HSG A
10,681	51	Weighted Average
8,221	37	76.97% Pervious Area
2,460	98	23.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	174	0.0200	0.24		**Lag/CN Method, Post 3**

Summary for Subcatchment Post 4: Post 4

Runoff   =   0.41 cfs @   12.11 hrs, Volume=   0.045 af, Depth> 0.86"

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 Cornell Rainfall=6.00"

Area (sf)	CN	Description
3,200	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
15,762	39	>75% Grass cover, Good, HSG A
8,214	30	Woods, Good, HSG A
27,176	43	Weighted Average
23,976	36	88.22% Pervious Area
3,200	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	201	0.0900	0.43		**Lag/CN Method, Post 4**

Summary for Reach 1R: Eastern Reach around barn

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth = 0.00"   for 25-YR Cornell 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
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 35.30 cfs

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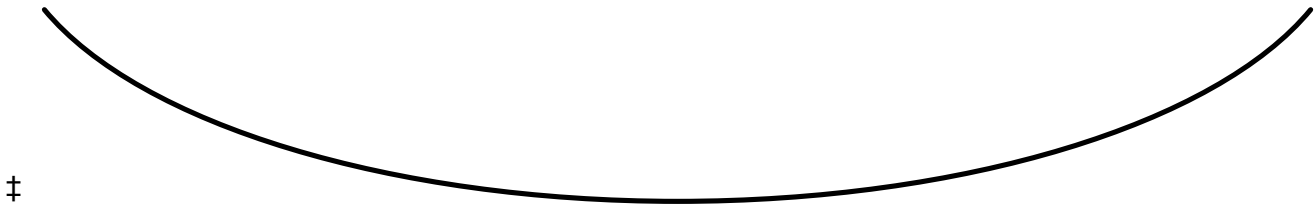
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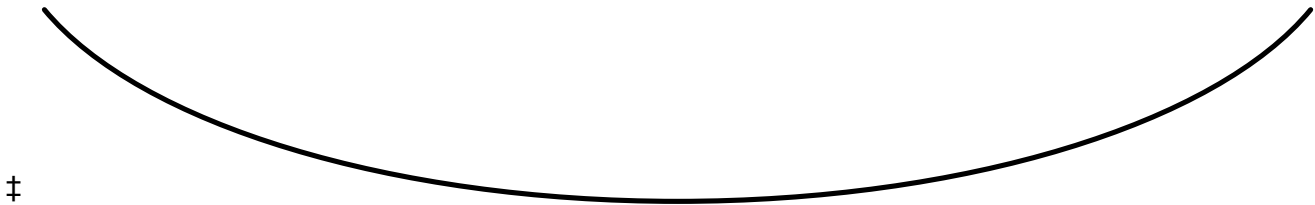Page 57

30.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 167.0'   Slope= 0.0299 '/'
Inlet Invert= 180.00', Outlet Invert= 175.00'

‡

Summary for Reach Post: Post

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.38"   for 25-YR Cornell event
Inflow   =   1.97 cfs @ 12.15 hrs, Volume=   0.360 af
Outflow   =   1.97 cfs @ 12.15 hrs, Volume=   0.360 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 Front of Site: Post Front of Site

Inflow Area =   1.646 ac, 46.60% Impervious, Inflow Depth > 0.66"   for 25-YR Cornell event
Inflow   =   0.96 cfs @ 12.14 hrs, Volume=   0.090 af
Outflow   =   0.96 cfs @ 12.14 hrs, Volume=   0.090 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 South: South Wetlands

Inflow Area =   11.398 ac, 15.38% Impervious, Inflow Depth > 0.38"   for 25-YR Cornell event
Inflow   =   1.97 cfs @ 12.15 hrs, Volume=   0.360 af
Outflow   =   1.97 cfs @ 12.15 hrs, Volume=   0.360 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 West: West Abutters

Inflow Area =   0.869 ac, 14.95% Impervious, Inflow Depth > 1.03"   for 25-YR Cornell event
Inflow   =   0.67 cfs @ 12.13 hrs, Volume=   0.074 af
Outflow   =   0.67 cfs @ 12.13 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 Western Reach thru Post 1a: Western Reach thru Post 1a

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

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Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 20.0 sf, Capacity= 60.96 cfs

60.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 269.0' Slope= 0.0223 '/'
Inlet Invert= 181.00', Outlet Invert= 175.00'

‡

Summary for Pond AD 6 & Trench: AD 6 & Trench

Inflow Area =		1.702 ac, 14.39% Impervious, Inflow Depth > 1.08" for 25-YR Cornell event			
Inflow	=	1.05 cfs @ 12.30 hrs, Volume=	0.153 af		
Outflow	=	0.37 cfs @ 12.35 hrs, Volume=	0.153 af, Atten= 65%, Lag= 3.0 min		
Discarded	=	0.37 cfs @ 12.35 hrs, Volume=	0.153 af		
Secondary	=	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= 179.04' @ 12.87 hrs Surf.Area= 1,920 sf Storage= 1,372 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.6 min (815.5 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.50'	322 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			1,440 cf Overall - 636 cf Embedded = 804 cf x 40.0% Voids
#2	179.00'	636 cf	**18.0" Round Pipe Storage** Inside #1
			L= 360.0'
#3	178.00'	1,060 cf	**18.0" Round Pipe Storage** Inside #4
			L= 600.0'
#4	177.50'	776 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
			3,000 cf Overall - 1,060 cf Embedded = 1,940 cf x 40.0% Voids
		2,794 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.50	720	0	0
180.50	720	1,440	1,440

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	1,200	0	0
180.00	1,200	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	180.30'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.37 cfs @ 12.35 hrs HW=178.60' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=180.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 1&2: AD's 1&2

Inflow Area =   3.075 ac,   7.18% Impervious, Inflow Depth > 0.64"   for 25-YR Cornell event
Inflow   =   0.98 cfs @ 12.44 hrs, Volume=   0.164 af
Outflow   =   0.62 cfs @ 12.81 hrs, Volume=   0.164 af, Atten= 36%, Lag= 22.3 min
Discarded =   0.29 cfs @ 14.60 hrs, Volume=   0.145 af
Primary   =   0.37 cfs @ 12.81 hrs, Volume=   0.019 af
Secondary =   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= 179.16' @ 12.81 hrs   Surf.Area= 1,300 sf   Storage= 1,161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.8 min (837.6 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	141 cf	**12.0" Round Pipe Storage** L= 180.0'
#2	177.50'	288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 720 cf Overall x 40.0% Voids
#3	178.00'	2 cf	**1.00'D x 2.60'H Vertical Cone/Cylinder**
#4	180.60'	618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#5	178.00'	442 cf	**18.0" Round Pipe Storage** L= 250.0'
#6	177.50'	500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,250 cf Overall x 40.0% Voids
		1,991 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	360	0	0
179.50	360	720	720

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	2,462	618	618

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	625	0	0
179.50	625	1,250	1,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**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=0.29 cfs @ 14.60 hrs HW=178.62'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.37 cfs @ 12.81 hrs HW=179.16' TW=0.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.37 cfs @ 2.17 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.50' TW=181.00'   (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 3&4: AD's 3&4

Inflow Area =   0.866 ac,   3.16% Impervious, Inflow Depth > 0.52"   for 25-YR Cornell event
Inflow   =   0.19 cfs @   12.50 hrs, Volume=   0.038 af
Outflow   =   0.18 cfs @   12.44 hrs, Volume=   0.037 af, Atten= 3%, Lag= 0.0 min
Discarded =   0.03 cfs @   18.12 hrs, Volume=   0.020 af
Primary   =   0.16 cfs @   12.44 hrs, Volume=   0.017 af
Secondary =   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= 179.17' @ 12.85 hrs Surf.Area= 92 sf Storage= 101 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 12.7 min (863.9 - 851.2)

Volume	Invert	Avail.Storage	Storage Description
#1	177.90'	36 cf	**12.0" Round Pipe Storage** L= 46.0'
#2	177.40'	74 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 184 cf Overall x 40.0% Voids
#3	180.60'	397 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		507 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.40	92	0	0
179.40	92	184	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	1,579	397	397

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.40'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.40'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**5.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 18.12 hrs HW=178.40'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.10 cfs @ 12.44 hrs HW=178.64' TW=178.58'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 1.13 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=177.40' TW=181.00'   (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 1: Basin 1

Inflow Area =	1.212 ac, 47.72% Impervious, Inflow Depth > 0.74" for 25-YR Cornell event		
Inflow =	0.75 cfs @ 12.16 hrs, Volume=	0.075 af	
Outflow =	0.31 cfs @ 12.49 hrs, Volume=	0.075 af,	Atten= 59%, Lag= 19.7 min
Discarded =	0.24 cfs @ 12.49 hrs, Volume=	0.073 af	
Primary =	0.07 cfs @ 12.49 hrs, Volume=	0.002 af	
Secondary =	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= 184.91' @ 12.49 hrs   Surf.Area= 1,240 sf Storage= 727 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.1 min (774.4 - 754.3)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.00	359	0	0
185.50	1,811	1,628	1,628

Device	Routing	Invert	Outlet Devices
#1	Discarded	184.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	184.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	185.30'	**30.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.24 cfs @ 12.49 hrs HW=184.91'   (Free Discharge)
└—**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.07 cfs @ 12.49 hrs HW=184.91' TW=181.51'   (Dynamic Tailwater)
└—**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.36 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=0.00'   (Dynamic Tailwater)
└—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area =   0.754 ac, 56.57% Impervious, Inflow Depth > 1.37"   for 25-YR Cornell event
Inflow   =   1.04 cfs @ 12.09 hrs, Volume=   0.086 af
Outflow   =   0.31 cfs @ 12.44 hrs, Volume=   0.086 af, Atten= 70%, Lag= 20.9 min
Discarded =   0.31 cfs @ 12.44 hrs, Volume=   0.086 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 185.72' @ 12.44 hrs   Surf.Area= 1,617 sf   Storage= 823 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.5 min (760.7 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	1,874 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	685	0	0
186.25	2,313	1,874	1,874

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Device	Routing	Invert	Outlet Devices
#1	Discarded	185.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	186.20'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Discarded OutFlow Max=0.31 cfs @ 12.44 hrs HW=185.71'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00'   (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area =   0.357 ac, 68.69% Impervious, Inflow Depth > 3.78"   for 25-YR Cornell event
Inflow   =   1.36 cfs @ 12.10 hrs, Volume=   0.112 af
Outflow   =   0.44 cfs @ 12.43 hrs, Volume=   0.112 af, Atten= 68%, Lag= 19.4 min
Discarded = 0.44 cfs @ 12.43 hrs, Volume=   0.112 af
Primary   =   0.00 cfs @   5.00 hrs, Volume=   0.000 af
Secondary =   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= 186.37' @ 12.43 hrs   Surf.Area= 2,297 sf   Storage= 1,164 cf

Plug-Flow detention time= 19.3 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 19.2 min (759.1 - 739.9)

Volume	Invert	Avail.Storage	Storage Description
#1	185.50'	5,939 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.50	377	0	0
186.51	2,605	1,506	1,506
187.30	8,618	4,433	5,939

Device	Routing	Invert	Outlet Devices
#1	Primary	186.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	185.50'	**8.270 in/hr Exfiltration over Surface area**
#3	Secondary	187.25'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Discarded OutFlow Max=0.44 cfs @ 12.43 hrs HW=186.37'   (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=185.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Perforated Pipe: 12" Perforated Pipe

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth = 0.02"   for 25-YR Cornell event
Inflow   =   0.07 cfs @   12.49 hrs, Volume=   0.002 af
Outflow   =   0.07 cfs @   12.55 hrs, Volume=   0.002 af, Atten= 6%, Lag= 3.8 min
Discarded =   0.07 cfs @   12.55 hrs, Volume=   0.002 af
Secondary =   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= 181.51' @ 12.54 hrs   Surf.Area= 361 sf   Storage= 2 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.2 min (752.1 - 751.9)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	141 cf	**12.0" Round Pipe Storage** Inside #2
			L= 180.0'
#2	181.50'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			720 cf Overall - 141 cf Embedded = 579 cf x 40.0% Voids
#3	181.50'	3 cf	**1.00'D x 3.75'H Vertical Cone/Cylinder**
		376 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.50	360	0	0
183.50	360	720	720

Device	Routing	Invert	Outlet Devices
#1	Discarded	181.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	185.20'	**40.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32

Discarded OutFlow Max=0.07 cfs @ 12.55 hrs HW=181.51'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=181.50' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Post Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 5.33"   for 25-YR Cornell event
Inflow   =   1.41 cfs @ 12.07 hrs, Volume=   0.106 af
Outflow   =   0.09 cfs @ 11.30 hrs, Volume=   0.086 af, Atten= 94%, Lag= 0.0 min
Discarded =   0.09 cfs @ 11.30 hrs, Volume=   0.086 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= 182.39' @ 13.61 hrs   Surf.Area= 0.010 ac   Storage= 0.046 af

Plug-Flow detention time= 151.2 min calculated for 0.085 af (81% of inflow)
Center-of-Mass det. time= 99.0 min (832.4 - 733.4)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 11.30 hrs HW=178.09' (Free Discharge)
└—**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00' (Dynamic Tailwater)
└—**2=Orifice/Grate** (Controls 0.00 cfs)

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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

SubcatchmentPost 1a: Post 1a   Runoff Area=168,490 sf   3.95% Impervious   Runoff Depth>1.40"
              Flow Length=408'   Slope=0.0210 '/'   Tc=30.2 min   CN=41   Runoff=3.00 cfs 0.451 af

SubcatchmentPost 1b: Post 1b   Runoff Area=10,363 sf   100.00% Impervious   Runoff Depth>7.60"
              Flow Length=25'   Slope=0.3000 '/'   Tc=5.0 min   CN=98   Runoff=2.00 cfs 0.151 af

SubcatchmentPost 1c: Post 1c   Runoff Area=96,215 sf   8.76% Impervious   Runoff Depth>1.75"
              Flow Length=507'   Slope=0.0330 '/'   Tc=26.4 min   CN=44   Runoff=2.32 cfs 0.322 af

SubcatchmentPost 1d: Post 1d   Runoff Area=37,714 sf   3.16% Impervious   Runoff Depth>1.40"
              Flow Length=199'   Slope=0.0120 '/'   Tc=22.5 min   CN=41   Runoff=0.76 cfs 0.101 af

SubcatchmentPost 1e: Post 1e   Runoff Area=74,143 sf   14.39% Impervious   Runoff Depth>2.12"
              Flow Length=216'   Slope=0.0120 '/'   Tc=20.5 min   CN=47   Runoff=2.42 cfs 0.301 af

SubcatchmentPost 2a: Post 2a   Runoff Area=18,911 sf   43.46% Impervious   Runoff Depth>3.91"
              Flow Length=198'   Slope=0.0170 '/'   Tc=10.4 min   CN=64   Runoff=1.53 cfs 0.141 af

SubcatchmentPost 2b: Post 2b   Runoff Area=19,943 sf   33.14% Impervious   Runoff Depth>3.20"
              Flow Length=200'   Slope=0.0200 '/'   Tc=11.6 min   CN=57   Runoff=1.26 cfs 0.122 af

SubcatchmentPost 2c: Post 2c   Runoff Area=17,310 sf   45.70% Impervious   Runoff Depth>4.02"
              Flow Length=102'   Slope=0.0150 '/'   Tc=6.4 min   CN=65   Runoff=1.63 cfs 0.133 af

SubcatchmentPost 2d: Post 2d   Runoff Area=15,537 sf   68.69% Impervious   Runoff Depth>5.60"
              Flow Length=204'   Slope=0.0150 '/'   Tc=7.3 min   CN=80   Runoff=2.04 cfs 0.166 af

SubcatchmentPost 3: Post 3   Runoff Area=10,681 sf   23.03% Impervious   Runoff Depth>2.55"
              Flow Length=174'   Slope=0.0200 '/'   Tc=12.1 min   CN=51   Runoff=0.51 cfs 0.052 af

SubcatchmentPost 4: Post 4   Runoff Area=27,176 sf   11.78% Impervious   Runoff Depth>1.73"
              Flow Length=201'   Slope=0.0900 '/'   Tc=7.8 min   CN=43   Runoff=0.93 cfs 0.090 af

Reach 1R: Eastern Reach around barn   Avg. Flow Depth=0.12'   Max Vel=1.32 fps   Inflow=1.73 cfs 0.044 af
              n=0.035   L=167.0'   S=0.0299 '/'   Capacity=35.30 cfs   Outflow=1.53 cfs 0.044 af

Reach Post: Post   Inflow=7.32 cfs 0.954 af
                                                            Outflow=7.32 cfs 0.954 af

Reach Post Front of Site: Post Front of Site   Inflow=1.53 cfs 0.147 af
                                                            Outflow=1.53 cfs 0.147 af

Reach Post South: South Wetlands   Inflow=7.32 cfs 0.954 af
                                                            Outflow=7.32 cfs 0.954 af

Reach Post West: West Abutters   Inflow=1.41 cfs 0.142 af
                                                            Outflow=1.41 cfs 0.142 af

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Reach Western Reach thru Post 1a: Avg. Flow Depth=0.04' Max Vel=0.53 fps Inflow=0.49 cfs 0.005 af
n=0.035   L=269.0'   S=0.0223 '/' Capacity=60.96 cfs Outflow=0.21 cfs 0.005 af

Pond AD 6 & Trench: AD 6 & Trench   Peak Elev=180.45' Storage=2,776 cf Inflow=2.42 cfs 0.301 af
Discarded=0.37 cfs 0.257 af   Secondary=1.73 cfs 0.044 af Outflow=2.10 cfs 0.301 af

Pond AD's 1&2: AD's 1&2   Peak Elev=181.03' Storage=1,838 cf Inflow=2.95 cfs 0.386 af
Discarded=0.60 cfs 0.219 af Primary=1.35 cfs 0.164 af Secondary=0.27 cfs 0.002 af Outflow=2.20 cfs 0.384 af

Pond AD's 3&4: AD's 3&4   Peak Elev=181.04' Storage=416 cf Inflow=0.76 cfs 0.101 af
Discarded=0.28 cfs 0.033 af Primary=0.79 cfs 0.064 af Secondary=0.27 cfs 0.003 af Outflow=0.79 cfs 0.100 af

Pond Basin 1: Basin 1   Peak Elev=185.22' Storage=1,162 cf Inflow=1.26 cfs 0.128 af
Discarded=0.30 cfs 0.106 af Primary=0.45 cfs 0.021 af Secondary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.128 af

Pond Basin 2: Basin 2   Peak Elev=186.12' Storage=1,584 cf Inflow=1.63 cfs 0.139 af
Discarded=0.41 cfs 0.133 af Primary=0.21 cfs 0.006 af Secondary=0.00 cfs 0.000 af Outflow=0.62 cfs 0.139 af

Pond Basin 3: Basin 3   Peak Elev=186.60' Storage=1,764 cf Inflow=2.04 cfs 0.166 af
Discarded=0.63 cfs 0.161 af Primary=0.21 cfs 0.006 af Secondary=0.00 cfs 0.000 af Outflow=0.84 cfs 0.166 af

Pond Perforated Pipe: 12" Perforated Pipe   Peak Elev=185.23' Storage=376 cf Inflow=0.45 cfs 0.021 af
Discarded=0.07 cfs 0.016 af Secondary=0.54 cfs 0.006 af Outflow=0.61 cfs 0.021 af

Pond Post Existing House: Drywells   Peak Elev=185.36' Storage=0.076 af Inflow=2.00 cfs 0.151 af
Discarded=0.09 cfs 0.093 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.093 af

Total Runoff Area = 11.398 ac   Runoff Volume = 2.031 af   Average Runoff Depth = 2.14"
84.62% Pervious = 9.644 ac   15.38% Impervious = 1.753 ac

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Summary for Subcatchment Post 1a: Post 1a

Runoff   =   3.00 cfs @ 12.51 hrs, Volume=   0.451 af, Depth> 1.40"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
6,649	98	Paved parking, HSG A
554	96	Gravel surface, HSG A
146,589	39	>75% Grass cover, Good, HSG A
14,698	30	Woods, Good, HSG A
168,490	41	Weighted Average
161,841	38	96.05% Pervious Area
6,649	98	3.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	408	0.0210	0.23		**Lag/CN Method, Post 1a**

Summary for Subcatchment Post 1b: Post 1b

Runoff   =   2.00 cfs @ 12.07 hrs, Volume=   0.151 af, Depth> 7.60"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
10,363	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
0	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
10,363	98	Weighted Average
10,363	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	25	0.3000	2.90		**Lag/CN Method, Post 1b**
0.1	25				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment Post 1c: Post 1c

Runoff   =   2.32 cfs @ 12.43 hrs, Volume=   0.322 af, Depth> 1.75"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
8,429	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
87,097	39	>75% Grass cover, Good, HSG A
689	30	Woods, Good, HSG A
96,215	44	Weighted Average
87,786	39	91.24% Pervious Area
8,429	98	8.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.4	507	0.0330	0.32		**Lag/CN Method, Post c**

Summary for Subcatchment Post 1d: Post 1d

Runoff   =   0.76 cfs @ 12.39 hrs, Volume=   0.101 af, Depth> 1.40"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
1,190	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
36,524	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
37,714	41	Weighted Average
36,524	39	96.84% Pervious Area
1,190	98	3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.5	199	0.0120	0.15		**Lag/CN Method, Post 1d**

Summary for Subcatchment Post 1e: Post 1e

Runoff   =   2.42 cfs @ 12.32 hrs, Volume=   0.301 af, Depth> 2.12"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
10,669	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
63,474	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
74,143	47	Weighted Average
63,474	39	85.61% Pervious Area
10,669	98	14.39% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
20.5	216	0.0120	0.18		**Lag/CN Method, Post 1e**

Summary for Subcatchment Post 2a: Post 2a

Runoff   =   1.53 cfs @ 12.15 hrs, Volume=   0.141 af, Depth> 3.91"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
8,219	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
8,852	39	>75% Grass cover, Good, HSG A
1,840	30	Woods, Good, HSG A
18,911	64	Weighted Average
10,692	37	56.54% Pervious Area
8,219	98	43.46% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
10.4	198	0.0170	0.32		**Lag/CN Method, Post 2a**

Summary for Subcatchment Post 2b: Post 2b

Runoff   =   1.26 cfs @ 12.16 hrs, Volume=   0.122 af, Depth> 3.20"

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 100-YR-Cornell Rainfall=8.50"

Area (sf)	CN	Description
6,610	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
10,148	39	>75% Grass cover, Good, HSG A
3,185	30	Woods, Good, HSG A
19,943	57	Weighted Average
13,333	37	66.86% Pervious Area
6,610	98	33.14% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
11.6	200	0.0200	0.29		**Lag/CN Method, Post 2b**

Summary for Subcatchment Post 2c: Post 2c

Runoff   =   1.63 cfs @ 12.10 hrs, Volume=   0.133 af, Depth> 4.02"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
7,910	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,910	39	>75% Grass cover, Good, HSG A
2,490	30	Woods, Good, HSG A
17,310	65	Weighted Average
9,400	37	54.30% Pervious Area
7,910	98	45.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	102	0.0150	0.27		**Lag/CN Method, Post 2c**

Summary for Subcatchment Post 2d: Post 2d

Runoff   =   2.04 cfs @ 12.10 hrs, Volume=   0.166 af, Depth> 5.60"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
10,672	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
4,865	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
15,537	80	Weighted Average
4,865	39	31.31% Pervious Area
10,672	98	68.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	204	0.0150	0.47		**Lag/CN Method, Post 2d**

Summary for Subcatchment Post 3: Post 3

Runoff   =   0.51 cfs @ 12.17 hrs, Volume=   0.052 af, Depth> 2.55"

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 100-YR-Cornell Rainfall=8.50"

Area (sf)	CN	Description
2,460	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
6,420	39	>75% Grass cover, Good, HSG A
1,801	30	Woods, Good, HSG A
10,681	51	Weighted Average
8,221	37	76.97% Pervious Area
2,460	98	23.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	174	0.0200	0.24		**Lag/CN Method, Post 3**

Summary for Subcatchment Post 4: Post 4

Runoff   =   0.93 cfs @ 12.12 hrs, Volume=   0.090 af, Depth> 1.73"

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-Cornell Rainfall=8.50"

Area (sf)	CN	Description
3,200	98	Paved parking, HSG A
0	96	Gravel surface, HSG A
15,762	39	>75% Grass cover, Good, HSG A
8,214	30	Woods, Good, HSG A
27,176	43	Weighted Average
23,976	36	88.22% Pervious Area
3,200	98	11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	201	0.0900	0.43		**Lag/CN Method, Post 4**

Summary for Reach 1R: Eastern Reach around barn

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth = 0.31"   for 100-YR-Cornell event
Inflow   =   1.73 cfs @ 12.52 hrs, Volume=   0.044 af
Outflow   =   1.53 cfs @ 12.57 hrs, Volume=   0.044 af, Atten= 12%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 6.2 min

Peak Storage= 191 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 35.30 cfs

30.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 167.0' Slope= 0.0299 '/'
Inlet Invert= 180.00', Outlet Invert= 175.00'

‡

Summary for Reach Post: Post

Inflow Area = 11.398 ac, 15.38% Impervious, Inflow Depth > 1.00" for 100-YR-Cornell event
Inflow = 7.32 cfs @ 12.56 hrs, Volume= 0.954 af
Outflow = 7.32 cfs @ 12.56 hrs, Volume= 0.954 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 Front of Site: Post Front of Site
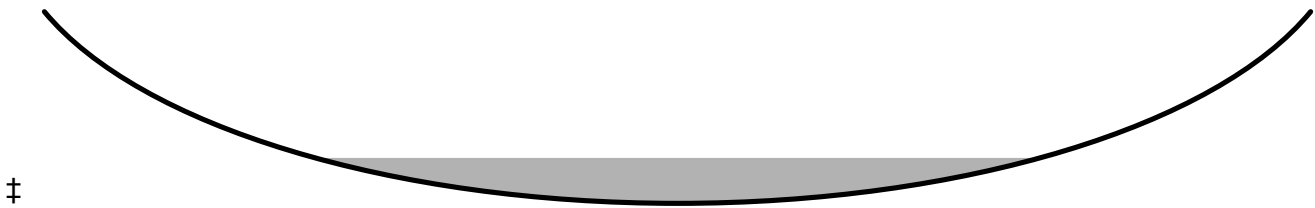
Inflow Area = 1.646 ac, 46.60% Impervious, Inflow Depth > 1.07" for 100-YR-Cornell event
Inflow = 1.53 cfs @ 12.15 hrs, Volume= 0.147 af
Outflow = 1.53 cfs @ 12.15 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach Post South: South Wetlands

Inflow Area = 11.398 ac, 15.38% Impervious, Inflow Depth > 1.00" for 100-YR-Cornell event
Inflow = 7.32 cfs @ 12.56 hrs, Volume= 0.954 af
Outflow = 7.32 cfs @ 12.56 hrs, Volume= 0.954 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 West: West Abutters

Inflow Area = 0.869 ac, 14.95% Impervious, Inflow Depth > 1.96" for 100-YR-Cornell event
Inflow = 1.41 cfs @ 12.14 hrs, Volume= 0.142 af
Outflow = 1.41 cfs @ 12.14 hrs, Volume= 0.142 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 Western Reach thru Post 1a: Western Reach thru Post 1a

Inflow = 0.49 cfs @ 12.55 hrs, Volume= 0.005 af
Outflow = 0.21 cfs @ 12.62 hrs, Volume= 0.005 af, Atten= 58%, Lag= 4.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.53 fps, Min. Travel Time= 8.5 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 23.8 min

Peak Storage= 105 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.50' Flow Area= 20.0 sf, Capacity= 60.96 cfs

60.00' x 0.50' deep Parabolic Channel, n= 0.035 High grass
Length= 269.0'   Slope= 0.0223 '/'
Inlet Invert= 181.00', Outlet Invert= 175.00'

‡

Summary for Pond AD 6 & Trench: AD 6 & Trench

Inflow Area =   1.702 ac, 14.39% Impervious, Inflow Depth > 2.12"   for 100-YR-Cornell event
Inflow   =   2.42 cfs @   12.32 hrs, Volume=   0.301 af
Outflow   =   2.10 cfs @   12.52 hrs, Volume=   0.301 af, Atten= 13%, Lag= 12.3 min
Discarded =   0.37 cfs @   12.20 hrs, Volume=   0.257 af
Secondary =   1.73 cfs @   12.52 hrs, Volume=   0.044 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 180.45' @ 12.50 hrs   Surf.Area= 1,920 sf   Storage= 2,776 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 58.9 min (858.8 - 799.9)

Volume	Invert	Avail.Storage	Storage Description
#1	178.50'	322 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			1,440 cf Overall - 636 cf Embedded = 804 cf x 40.0% Voids
#2	179.00'	636 cf	**18.0" Round Pipe Storage** Inside #1
			L= 360.0'
#3	178.00'	1,060 cf	**18.0" Round Pipe Storage** Inside #4
			L= 600.0'
#4	177.50'	776 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			3,000 cf Overall - 1,060 cf Embedded = 1,940 cf x 40.0% Voids
		2,794 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
178.50	720	0	0
180.50	720	1,440	1,440

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	1,200	0	0
180.00	1,200	3,000	3,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	180.30'	**10.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.37 cfs @ 12.20 hrs HW=178.68' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Secondary OutFlow Max=1.52 cfs @ 12.52 hrs HW=180.45' TW=180.09' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Weir Controls 1.52 cfs @ 1.03 fps)

Summary for Pond AD's 1&2: AD's 1&2

Inflow Area =   3.075 ac,   7.18% Impervious, Inflow Depth > 1.51"   for 100-YR-Cornell event
Inflow   =   2.95 cfs @   12.34 hrs, Volume=   0.386 af
Outflow   =   2.20 cfs @   12.52 hrs, Volume=   0.384 af, Atten= 25%, Lag= 10.9 min
Discarded =   0.60 cfs @   12.64 hrs, Volume=   0.219 af
Primary   =   1.35 cfs @   12.64 hrs, Volume=   0.164 af
Secondary =   0.27 cfs @   12.52 hrs, Volume=   0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.03' @ 12.64 hrs   Surf.Area= 3,120 sf   Storage= 1,838 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.5 min (850.3 - 826.8)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	141 cf	**12.0" Round Pipe Storage** L= 180.0'
#2	177.50'	288 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 720 cf Overall x 40.0% Voids
#3	178.00'	2 cf	**1.00'D x 2.60'H Vertical Cone/Cylinder**
#4	180.60'	618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#5	178.00'	442 cf	**18.0" Round Pipe Storage** L= 250.0'
#6	177.50'	500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 1,250 cf Overall x 40.0% Voids
		1,991 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	360	0	0
179.50	360	720	720

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	2,462	618	618

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.50	625	0	0
179.50	625	1,250	1,250

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**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=0.60 cfs @ 12.64 hrs HW=181.03'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=1.35 cfs @ 12.64 hrs HW=181.03' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 1.35 cfs @ 6.86 fps)

Secondary OutFlow Max=0.00 cfs @ 12.52 hrs HW=181.02' TW=181.02' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond AD's 3&4: AD's 3&4

Inflow Area =   0.866 ac,   3.16% Impervious, Inflow Depth > 1.40"   for 100-YR-Cornell event
Inflow   =   0.76 cfs @ 12.39 hrs, Volume=   0.101 af
Outflow   =   0.79 cfs @ 12.33 hrs, Volume=   0.100 af, Atten= 0%, Lag= 0.0 min
Discarded   =   0.28 cfs @ 12.67 hrs, Volume=   0.033 af
Primary   =   0.79 cfs @ 12.33 hrs, Volume=   0.064 af
Secondary   =   0.27 cfs @ 12.56 hrs, Volume=   0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.04' @ 12.67 hrs   Surf.Area= 1,479 sf   Storage= 416 cf

Plug-Flow detention time= 11.8 min calculated for 0.100 af (99% of inflow)
Center-of-Mass det. time= 6.9 min (848.3 - 841.4)

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Volume	Invert	Avail.Storage	Storage Description
#1	177.90'	36 cf	**12.0" Round Pipe Storage** L= 46.0'
#2	177.40'	74 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 184 cf Overall x 40.0% Voids
#3	180.60'	397 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		507 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
177.40	92	0	0
179.40	92	184	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
180.60	10	0	0
181.10	1,579	397	397

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.40'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	178.40'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	180.90'	**5.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.28 cfs @ 12.67 hrs HW=181.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 12.33 hrs HW=179.63' TW=180.26' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.56 hrs HW=181.02' TW=181.03' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 1: Basin 1

Inflow Area =   1.212 ac, 47.72% Impervious, Inflow Depth > 1.26"   for 100-YR-Cornell event
Inflow   =   1.26 cfs @ 12.16 hrs, Volume=   0.128 af
Outflow   =   0.74 cfs @ 12.50 hrs, Volume=   0.128 af, Atten= 41%, Lag= 20.2 min
Discarded =   0.30 cfs @ 12.49 hrs, Volume=   0.106 af
Primary   =   0.45 cfs @ 12.50 hrs, Volume=   0.021 af
Secondary =   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= 185.22' @ 12.49 hrs   Surf.Area= 1,542 sf   Storage= 1,162 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.4 min (785.9 - 762.4)

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Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	1,628 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.00	359	0	0
185.50	1,811	1,628	1,628

Device	Routing	Invert	Outlet Devices
#1	Discarded	184.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	184.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	185.30'	**30.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.30 cfs @ 12.49 hrs HW=185.22'   (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.45 cfs @ 12.50 hrs HW=185.22' TW=183.32'   (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 2.34 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' TW=0.00'   (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 2: Basin 2

Inflow Area =   0.754 ac, 56.57% Impervious, Inflow Depth > 2.21"   for 100-YR-Cornell event
Inflow   =   1.63 cfs @   12.10 hrs, Volume=   0.139 af
Outflow   =   0.62 cfs @   12.47 hrs, Volume=   0.139 af, Atten= 62%, Lag= 22.4 min
Discarded =   0.41 cfs @   12.47 hrs, Volume=   0.133 af
Primary   =   0.21 cfs @   12.47 hrs, Volume=   0.006 af
Secondary =   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= 186.12' @ 12.47 hrs   Surf.Area= 2,144 sf   Storage= 1,584 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 26.0 min (775.7 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	1,874 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	685	0	0
186.25	2,313	1,874	1,874

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Device	Routing	Invert	Outlet Devices
#1	Discarded	185.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	186.20'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Discarded OutFlow Max=0.41 cfs @ 12.47 hrs HW=186.12' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.41 cfs)

Primary OutFlow Max=0.21 cfs @ 12.47 hrs HW=186.12' TW=185.22' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 0.21 cfs @ 1.13 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.00' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Basin 3: Basin 3

Inflow Area =   0.357 ac, 68.69% Impervious, Inflow Depth > 5.60"   for 100-YR-Cornell event
Inflow   =   2.04 cfs @ 12.10 hrs, Volume=   0.166 af
Outflow   =   0.84 cfs @ 12.35 hrs, Volume=   0.166 af, Atten= 59%, Lag= 14.9 min
Discarded =   0.63 cfs @ 12.35 hrs, Volume=   0.161 af
Primary   =   0.21 cfs @ 12.35 hrs, Volume=   0.006 af
Secondary =   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= 186.60' @ 12.35 hrs Surf.Area= 3,274 sf Storage= 1,764 cf

Plug-Flow detention time= 23.7 min calculated for 0.166 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (765.4 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1	185.50'	5,939 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.50	377	0	0
186.51	2,605	1,506	1,506
187.30	8,618	4,433	5,939

Device	Routing	Invert	Outlet Devices
#1	Primary	186.50'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	185.50'	**8.270 in/hr Exfiltration over Surface area**
#3	Secondary	187.25'	**10.0' long x 1.0' 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
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

16011 Pre-Post

Type III 24-hr 100-YR-Cornell Rainfall=8.50"

Prepared by {enter your company name here}

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Discarded OutFlow Max=0.63 cfs @ 12.35 hrs HW=186.60' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.63 cfs)

Primary OutFlow Max=0.21 cfs @ 12.35 hrs HW=186.60' TW=186.09' (Dynamic Tailwater)
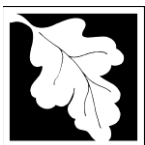└─**1=Orifice/Grate** (Weir Controls 0.21 cfs @ 1.02 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=185.50' TW=184.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond Perforated Pipe: 12" Perforated Pipe

Inflow Area = 1.212 ac, 47.72% Impervious, Inflow Depth = 0.21" for 100-YR-Cornell event
Inflow = 0.45 cfs @ 12.50 hrs, Volume= 0.021 af
Outflow = 0.61 cfs @ 12.85 hrs, Volume= 0.021 af, Atten= 0%, Lag= 21.0 min
Discarded = 0.07 cfs @ 12.20 hrs, Volume= 0.016 af
Secondary = 0.54 cfs @ 12.85 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 185.23' @ 12.85 hrs Surf.Area= 361 sf Storage= 376 cf

Plug-Flow detention time= 41.6 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 41.8 min (797.7 - 755.9)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	141 cf	**12.0" Round Pipe Storage** Inside #2
			L= 180.0'
#2	181.50'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			720 cf Overall - 141 cf Embedded = 579 cf x 40.0% Voids
#3	181.50'	3 cf	**1.00'D x 3.75'H Vertical Cone/Cylinder**
		376 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
181.50	360	0	0
183.50	360	720	720

Device	Routing	Invert	Outlet Devices
#1	Discarded	181.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	185.20'	**40.0' long x 1.0' 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
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.07 cfs @ 12.20 hrs HW=181.59' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Secondary OutFlow Max=0.54 cfs @ 12.85 hrs HW=185.23' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Weir Controls 0.54 cfs @ 0.46 fps)

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Type III 24-hr 100-YR-Cornell Rainfall=8.50"
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Summary for Pond Post Existing House: Drywells

Inflow Area =   0.238 ac,100.00% Impervious, Inflow Depth > 7.60"   for 100-YR-Cornell event
Inflow   =   2.00 cfs @ 12.07 hrs, Volume=   0.151 af
Outflow   =   0.09 cfs @ 10.50 hrs, Volume=   0.093 af, Atten= 96%, Lag= 0.0 min
Discarded =   0.09 cfs @ 10.50 hrs, Volume=   0.093 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= 185.36' @ 14.64 hrs   Surf.Area= 0.010 ac   Storage= 0.076 af

Plug-Flow detention time= 154.0 min calculated for 0.093 af (61% of inflow)
Center-of-Mass det. time= 74.4 min (806.6 - 732.2)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	0.083 af	**8.00'D x 8.00'H Vertical Cone/Cylinder**x 9

Device	Routing	Invert	Outlet Devices
#1	Discarded	178.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	186.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 10.50 hrs HW=178.10' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=178.00' TW=0.00' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

APPENDIX E

Stormwater Checklist

Carroll School
Waltham Road
Wayland, Massachusetts

Oak Consulting Group, LLC
Project 16011

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program
Checklist for Stormwater Report

A. Introduction

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:
- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

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[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.
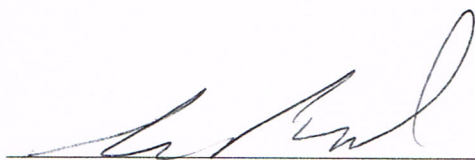
A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

SEAN P.
MALONE
CIVIL
No. 48204
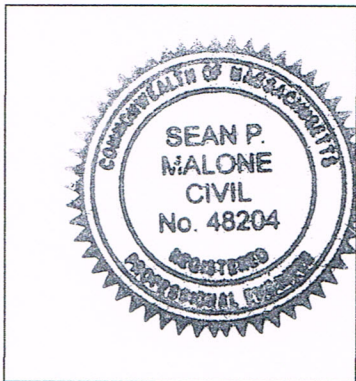
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Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment
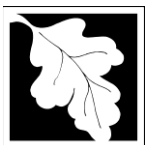
Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☐ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

    ☐ Credit 1

    ☐ Credit 2

    ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.
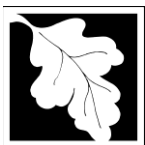
Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

    ☐ Static   ☐ Simple Dynamic   ☒ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

    ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

    ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

    ☐ Solid Waste Landfill pursuant to 310 CMR 19.000

    ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.
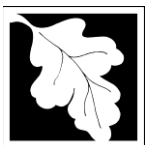
Checklist (continued)

**Standard 3: Recharge** (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:
- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

    ☐ is within the Zone II or Interim Wellhead Protection Area

    ☐ is near or to other critical areas

    ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

    ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.
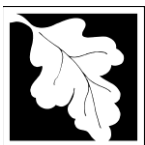
Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

    ☒ The ½" or 1" Water Quality Volume or

    ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does **not** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.
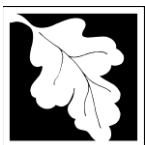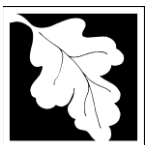

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

  ☐ Limited Project

  ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

  ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

  ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

  ☐ Bike Path and/or Foot Path

  ☐ Redevelopment Project

  ☒ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☒ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.

☐ The project is **not** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

    ☒ Name of the stormwater management system owners;

    ☒ Party responsible for operation and maintenance;

    ☒ Schedule for implementation of routine and non-routine maintenance tasks;

    ☒ Plan showing the location of all stormwater BMPs maintenance access areas;

    ☒ Description and delineation of public safety features;

    ☐ Estimated operation and maintenance budget; and

    ☒ Operation and Maintenance Log Form.

☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

    ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;

    ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

APPENDIX F

Plans

Carroll School
Waltham Road
Wayland, Massachusetts