

**Stormwater Report
Starboard Drive Estates
Fairhaven, Massachusetts**

**Submitted to:
Town of Fairhaven**

**Applicant:
Starboard Drive Nominee Trust**



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1.0 Introduction

This drainage analysis was prepared for the project located on Sconticut Neck Road in Fairhaven, Massachusetts.

The existing conditions consist of five (5) residential houses, gravel common driveway, woods and wetlands. The project is a redevelopment. Under proposed conditions, the project is a residential subdivision with eight (8) residential houses, driveways, roadway and stormwater management facilities.

2.0 Stormwater Management

2.1 Existing Conditions

The overall hydrologic study area totals 8.25 acres

Under existing conditions, the site is divided into four (4) basins (refer to *Existing Watershed Areas*).

2.2 Proposed Conditions

Under proposed conditions, the stormwater management system will consist of two (2) dry detention ponds with wet forebays and infiltration basin: Detention Pond A and Detention Pond B; and two (2) grassed water quality swales.

Refer to *Proposed Watershed Areas* for the proposed drainage basins.

3.0 Stormwater Management Compliance

The site design incorporates the Town of Fairhaven Appendix A Stormwater Management Systems.

The following waivers are required due to the existing flat topography and location within the velocity zone.

B. (3) (c) [2] [b] – 10-year volume control has not been provided

C. Design Standards

(1) (a) 10-year volume control has not been provided

(2) (k) [d] 4 foot deep forebay has not been provided

(2) (m) [7] 12 inch reinforced concrete drainage pipe has not been provided

Stormwater Treatment

As per MADEP Stormwater Management Standards (Page 1-5) rooftop runoff should be considered uncontaminated for the purposes of these standards and therefore can be infiltrated without water quality treatment.

Table 1 **Land Use**

Land Use	Existing Conditions (acres)	Proposed Conditions acres
Gravel	0.31	0.31
Paved	0.01	0.31
Roof	0.11	0.24
Total	0.43	0.86

cfs – cubic feet per second

MADEP water quality standards of 0.50-inch x impervious area. Since the project is a redevelopment, the impervious area will be the new increase in impervious paved areas (0.30 acres). The required water quality treatment volume is 545 cf. The provided water quality treatment volume in the water quality swales (705 cf), Pond A (148 cf) and Pond B (509 cf) is 1,362 cf. Therefore, the redevelopment project is in substantial compliance with the MADEP water quality standards.

The proposed sediment forebays within the proposed detention ponds were sized for 0.25-inches per impervious acre of impervious acre of contributing drainage.

Peak Discharge Rates

Under existing and proposed conditions, hydrologic/hydraulic analyses were performed utilizing the computer program, HydroCAD[®]. In order to determine the peak rate of discharge for existing and proposed conditions, runoff hydrographs were generated for the 2-, 10-, 25-, and 100-year, 24-hour storm events using the SCS TR-20 Method (refer to *Appendix A*, HydroCAD Input/Output). Under proposed conditions, the post-development runoff hydrographs were flood routed through the proposed stormwater management facilities. The 100-year, 24-hour storm event must be evaluated to demonstrate that there will not be increased flooding impacts off-site.

The following tables summarizes the pre- and post-development discharge rates determined in the hydrologic/hydraulic analyses performed for the project site.

Table 2 Comparison of Peak Runoff Discharge Rates (HydroCAD® Reach, Buzzards Bay)

Storm Event (24-Hour)	Existing Peak Runoff Rate	Proposed Peak Runoff Rate
	cfs	cfs
2-Year	8.22	7.49
10-Year	16.55	15.85
25-Year	22.09	21.23
100-Year	30.87	29.37

cfs – cubic feet per second

Table 3 Comparison of Peak Runoff Discharge Rates (HydroCAD® Reach, Southeast)

Storm Event (24-Hour)	Existing Peak Runoff Rate	Proposed Peak Runoff Rate
	cfs	cfs
2-Year	2.11	1.98
10-Year	4.27	4.04
25-Year	5.70	5.45
100-Year	7.97	7.61

cfs – cubic feet per second

Table 4 Comparison of Peak Runoff Discharge Rates (HydroCAD® Reach, Sconticut Neck Road)

Storm Event (24-Hour)	Existing Peak Runoff Rate	Proposed Peak Runoff Rate
	cfs	cfs
2-Year	0.03	0.01
10-Year	0.04	0.01
25-Year	0.05	0.01
100-Year	0.07	0.01

cfs – cubic feet per second

As shown in tables, under proposed conditions the proposed peak runoff rates are significantly less than the existing peak runoff rates for the 2-, 10-, 25-, and 100-year, 24-hour storm events.

The proposed stormwater management systems will drawdown the 100-year storm event within 72 hours. Refer to the drawdown calculations contained within Appendix A.

Groundwater Recharge

The infiltration rate used in this report was based on the *Massachusetts Stormwater Handbook*, Volume 3, Chapter 1, Page 22, Table 2.3.3. 1982 Rawls Rates. An infiltration rate of 0.52 in/hr for recharge purposes. Total impervious area (roof and pavement) is 0.55 acres, while existing area is 0.12 acres. New impervious area is 0.43 acres.

Based on MADEP Stormwater Management Standards, page 1-5, the required volume to recharge for Hydrologic Soil Group 'C' and Hydrologic Soil Group 'D' are as follows:

- Hydrologic Soil Group 'C': 0.25 inches of runoff times total impervious area (0.34 acres) overlying 'C' soils = 0.007 ac-ft
- Hydrologic Soil Group 'D': 0.10 inches of runoff times total impervious area (0.09 acres) overlying 'D' soils = 0.0007 ac-ft

Per MADEP Recharge volume requirements, the stormwater management system will provide adequate storage volume to meet the required recharge volume of 0.008 ac-ft. Pond A and Pond B will provide 0.006 ac-ft of recharge volume, in addition to the recharge volume provided in the eight (8) roof recharge trenches.

TSS Removal

The stormwater management system has been designed to incorporate BMP measures: dry infiltration ponds with wet forebay (80% TSS removal); and water quality swales (70% TSS removal). These BMPs will meet the TSS removal requirement for the project.

Stormwater Facilities Reporting to Municipal Agencies

An annual Inspection Report will be prepared by the Facility Manager of the property and submitted to the Town of Fairhaven for the first two (2) years. Records (i.e., condition, cleaning, maintenance/repairs, etc.) of each stormwater facility described above will be maintained throughout the year.

OPERATION & MAINTENANCE PLAN - FOREBAYS AND DETENTION PONDS

INSPECT AT LEAST TWICE PER YEAR & AFTER MAJOR STORM EVENTS

CLEAN FOREBAY AND BASIN OF ANY SEDIMENT AND DEBRIS

CLEAN FOREBAY AND BASIN OF ANY LEAVES, PINE NEEDLES AND THE LIKE

EXAMINE THE OUTFALL PIPES & SPILLWAY FOR EVIDENCE OF CLOGGING

CLEAN OUTFALL PIPE AND SPILLWAY

REPAIR ANY AREAS OF EROSION USING EROSION CONTROL FABRIC & REVEGETATE

MOW OR CUT ALL VEGETATION ON THE BOTTOM OF FOREBAY, POND AND SIDESLOPES

OPERATION & MAINTENANCE PLAN - GRASS SWALE

INSPECT AT LEAST TWICE PER YEAR & AFTER MAJOR STORM EVENTS

CLEAN SWALES OF ANY SEDIMENT AND DEBRIS

CLEAN SWALES OF ANY LEAVES, PINE NEEDLES AND THE LIKE

REPAIR ANY AREAS OF EROSION USING EROSION CONTROL FABRIC & REVEGETATE

MOW OR CUT ALL VEGETATION ON THE BOTTOM AND SIDESLOPES

OPERATION & MAINTENANCE PLAN - OUTLET CONTROL STRUCTURE

INSPECT AT LEAST TWICE PER YEAR & AFTER MAJOR STORM EVENTS

EXAMINE INLET AND OUTLET OF PIPES

CLEAN STRUCTURE OF ANY DEBRIS, LEAVES, PINE NEEDLES & THE LIKE

INSPECT FOR PROPER PIPE OUTFLOW DURING HEAVY STORM EVENT

CLEAN DRAINAGE PIPES AS NECESSARY

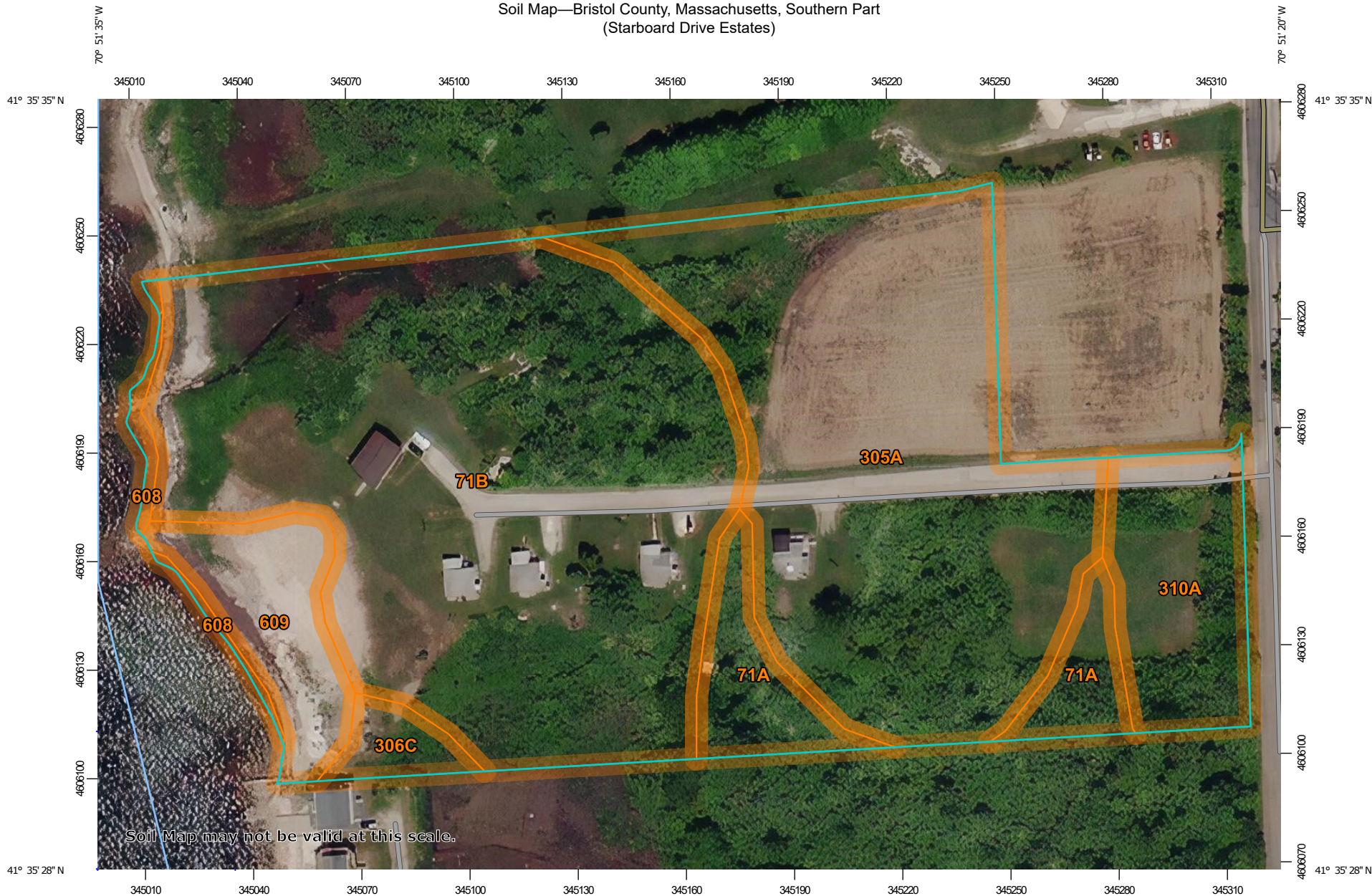
OPERATION & MAINTENANCE PLAN - OWNER & RESPONSIBLE PARTY:

"STARBOARD DRIVE NOMINEE TRUST" HOME OWNERS ASSOCIATION

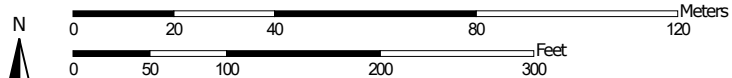
c/o: JOHN P. MATHIEU, TRUSTEE

168 EIGHTH STREET, NEW BEDFORD, MA 02740

Soil Map—Bristol County, Massachusetts, Southern Part
(Starboard Drive Estates)



Map Scale: 1:1,500 if printed on A landscape (11" x 8.5") sheet.




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

Soil Map—Bristol County, Massachusetts, Southern Part
(Starboard Drive Estates)


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 2, 2021

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 3, 2017

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	0.6	6.0%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	4.4	45.9%
305A	Paxton fine sandy loam, 0 to 3 percent slopes	3.1	32.9%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	0.2	1.6%
310A	Woodbridge fine sandy loam, 0 to 3 percent slopes	0.7	7.3%
608	Water, ocean	0.1	0.8%
609	Beaches, Boulders	0.5	5.6%
Totals for Area of Interest		9.5	100.0%

Bristol County, Massachusetts, Southern Part

71A—Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w69b

Elevation: 0 to 1,480 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Drumlins, depressions, ground moraines, hills, drainageways

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 6 inches: fine sandy loam

Bw - 6 to 10 inches: sandy loam

Bg - 10 to 19 inches: gravelly sandy loam

Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: 15 to 35 inches to densic material

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F144AY009CT - Wet Till Depressions

Hydric soil rating: Yes

Minor Components

Woodbridge, extremely stony

Percent of map unit: 7 percent

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Base slope, crest

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Whitman, extremely stony

Percent of map unit: 7 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Paxton, extremely stony

Percent of map unit: 1 percent

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part

Survey Area Data: Version 15, Sep 2, 2021

Bristol County, Massachusetts, Southern Part

71B—Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w69c

Elevation: 0 to 1,290 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Drumlins, depressions, ground moraines, hills, drainageways

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 6 inches: fine sandy loam

Bw - 6 to 10 inches: sandy loam

Bg - 10 to 19 inches: gravelly sandy loam

Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: 15 to 35 inches to densic material

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F144AY009CT - Wet Till Depressions

Hydric soil rating: Yes

Minor Components

Woodbridge, extremely stony

Percent of map unit: 10 percent

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, backslope, footslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Whitman, extremely stony

Percent of map unit: 8 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Paxton, extremely stony

Percent of map unit: 2 percent

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part

Survey Area Data: Version 15, Sep 2, 2021

Bristol County, Massachusetts, Southern Part

305A—Paxton fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t2r1

Elevation: 0 to 810 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 145 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex, linear

Across-slope shape: Convex

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam

Bw1 - 8 to 15 inches: fine sandy loam

Bw2 - 15 to 26 inches: fine sandy loam

Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 18 to 39 inches to densic material

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 5 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton

Percent of map unit: 3 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 2 percent
Landform: Drumlins, depressions, ground moraines, hills,
drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 2, 2021

Bristol County, Massachusetts, Southern Part

306C—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w677

Elevation: 0 to 1,330 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton, very stony, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Very Stony

Setting

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 10 inches: fine sandy loam

Bw1 - 10 to 17 inches: fine sandy loam

Bw2 - 17 to 28 inches: fine sandy loam

Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 43 inches to densic material

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

Minor Components

Woodbridge, very stony

Percent of map unit: 8 percent

Landform: Hills, drumlins, ground moraines

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Charlton, very stony

Percent of map unit: 5 percent

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 2 percent

Landform: Drumlins, depressions, ground moraines, hills, drainageways

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part

Survey Area Data: Version 15, Sep 2, 2021

Bristol County, Massachusetts, Southern Part

310A—Woodbridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w686

Elevation: 0 to 1,420 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam

Bw1 - 7 to 18 inches: fine sandy loam

Bw2 - 18 to 30 inches: fine sandy loam

Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 20 to 39 inches to densic material

Drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D

Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 7 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Depressions, ground moraines, drainageways, drumlins,
hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, extremely stony

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton

Percent of map unit: 1 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 2, 2021



- General Information**
 Homepage
 Progress Reports
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- Precipitation Frequency**
 Data Server
 GIS Grids
 Maps
 Time Series
 Temporals
 Documents

- Probable Maximum Precipitation**
 Documents

- Miscellaneous**
 Publications
 Storm Analysis
 Record Precipitation

- Contact Us**
 Inquiries



NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: MA

Data description

Data type: Units: Time series type:

Select location

1) Manually:

- a) **By location** (decimal degrees, use "-" for S and W): Latitude: Longitude:
- b) **By station (list of MA stations):**
- c) **By address**

2) Use map (if ESRI interactive map is not loading, try adding the host: <https://is.arcgis.com/> to the firewall, or contact us at hdsc.questions@noaa.gov):



- a) **Select location**
 Move crosshair or double click
- b) **Click on station icon**
 Show stations on map

Location information:
 Name: Fairhaven, Massachusetts, USA*
 Latitude: 41.5934°
 Longitude: -70.8552°
 Elevation: 7.66 ft**

* Source: ESRI Maps
 ** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION NOAA Atlas 14, Volume 10, Version 3

PF tabular PF graphical Supplementary information [Print page](#)

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.296 (0.236-0.370)	0.366 (0.292-0.459)	0.481 (0.383-0.605)	0.578 (0.457-0.729)	0.710 (0.543-0.935)	0.808 (0.606-1.09)	0.914 (0.668-1.27)	1.04 (0.711-1.46)	1.24 (0.812-1.78)	1.41 (0.901-2.06)
10-min	0.419 (0.334-0.525)	0.519 (0.414-0.651)	0.683 (0.543-0.858)	0.819 (0.647-1.03)	1.01 (0.770-1.33)	1.14 (0.859-1.54)	1.29 (0.946-1.80)	1.48 (1.01-2.06)	1.76 (1.15-2.53)	2.00 (1.28-2.92)
15-min	0.493 (0.393-0.617)	0.611 (0.487-0.765)	0.804 (0.638-1.01)	0.963 (0.761-1.22)	1.18 (0.906-1.56)	1.35 (1.01-1.81)	1.52 (1.11-2.12)	1.74 (1.19-2.43)	2.07 (1.35-2.97)	2.35 (1.50-3.43)
30-min	0.703 (0.561-0.880)	0.871 (0.695-1.09)	1.15 (0.911-1.44)	1.38 (1.09-1.74)	1.69 (1.29-2.23)	1.92 (1.44-2.58)	2.17 (1.59-3.03)	2.48 (1.69-3.47)	2.95 (1.93-4.24)	3.36 (2.14-4.90)
60-min	0.913 (0.729-1.14)	1.13 (0.903-1.42)	1.49 (1.18-1.87)	1.79 (1.41-2.26)	2.20 (1.68-2.89)	2.50 (1.87-3.36)	2.83 (2.07-3.94)	3.23 (2.20-4.51)	3.84 (2.51-5.51)	4.36 (2.78-6.36)
2-hr	1.24 (0.999-1.55)	1.54 (1.23-1.92)	2.02 (1.61-2.52)	2.42 (1.92-3.03)	2.97 (2.29-3.88)	3.37 (2.55-4.49)	3.81 (2.81-5.26)	4.35 (2.99-6.01)	5.17 (3.41-7.34)	5.87 (3.78-8.46)
3-hr	1.47 (1.19-1.82)	1.81 (1.46-2.25)	2.37 (1.90-2.94)	2.83 (2.25-3.53)	3.46 (2.68-4.50)	3.93 (2.98-5.20)	4.44 (3.28-6.08)	5.05 (3.49-6.94)	5.99 (3.98-8.45)	6.79 (4.41-9.72)
6-hr	1.91 (1.55-2.35)	2.32 (1.88-2.86)	3.00 (2.42-3.71)	3.56 (2.86-4.42)	4.33 (3.37-5.57)	4.90 (3.74-6.42)	5.51 (4.10-7.46)	6.25 (4.36-8.49)	7.36 (4.94-10.3)	8.30 (5.44-11.7)
12-hr	2.40	2.87	3.65	4.29	5.18	5.84	6.55	7.37	8.59	9.61

	(1.96-2.94)	(2.34-3.52)	(2.96-4.48)	(3.47-5.29)	(4.06-6.61)	(4.49-7.57)	(4.90-8.74)	(5.20-9.90)	(5.83-11.8)	(6.37-13.4)
24-hr	2.87 (2.36-3.50)	3.41 (2.80-4.16)	4.30 (3.51-5.24)	5.03 (4.09-6.16)	6.04 (4.76-7.63)	6.80 (5.25-8.71)	7.60 (5.71-10.00)	8.50 (6.05-11.3)	9.81 (6.73-13.3)	10.9 (7.29-15.0)
2-day	3.32 (2.74-4.01)	3.93 (3.25-4.76)	4.93 (4.06-5.98)	5.76 (4.71-7.00)	6.90 (5.47-8.63)	7.76 (6.04-9.84)	8.66 (6.55-11.2)	9.65 (6.94-12.7)	11.1 (7.66-14.9)	12.2 (8.26-16.6)
3-day	3.65 (3.03-4.39)	4.28 (3.55-5.16)	5.32 (4.39-6.42)	6.18 (5.07-7.49)	7.36 (5.86-9.16)	8.26 (6.45-10.4)	9.19 (6.97-11.8)	10.2 (7.38-13.3)	11.6 (8.12-15.5)	12.8 (8.71-17.3)
4-day	3.93 (3.27-4.72)	4.58 (3.80-5.50)	5.63 (4.66-6.78)	6.51 (5.36-7.86)	7.71 (6.16-9.56)	8.63 (6.76-10.8)	9.57 (7.28-12.3)	10.6 (7.70-13.8)	12.0 (8.43-16.0)	13.2 (9.02-17.7)
7-day	4.66 (3.89-5.57)	5.34 (4.45-6.38)	6.44 (5.35-7.71)	7.35 (6.08-8.83)	8.61 (6.91-10.6)	9.57 (7.53-11.9)	10.5 (8.05-13.3)	11.6 (8.47-14.9)	12.9 (9.14-17.0)	14.0 (9.66-18.6)
10-day	5.34 (4.47-6.36)	6.04 (5.05-7.19)	7.18 (5.99-8.57)	8.13 (6.75-9.73)	9.43 (7.59-11.5)	10.4 (8.23-12.9)	11.4 (8.75-14.3)	12.4 (9.18-15.9)	13.8 (9.79-18.0)	14.7 (10.3-19.5)
20-day	7.38 (6.22-8.72)	8.15 (6.87-9.64)	9.41 (7.91-11.2)	10.5 (8.74-12.4)	11.9 (9.64-14.4)	13.0 (10.3-15.9)	14.1 (10.9-17.4)	15.1 (11.3-19.2)	16.4 (11.8-21.1)	17.3 (12.2-22.6)
30-day	9.08 (7.69-10.7)	9.92 (8.39-11.7)	11.3 (9.52-13.3)	12.4 (10.4-14.7)	14.0 (11.4-16.8)	15.2 (12.1-18.4)	16.4 (12.7-20.1)	17.5 (13.1-21.9)	18.8 (13.6-24.0)	19.6 (13.9-25.4)
45-day	11.2 (9.52-13.1)	12.1 (10.3-14.2)	13.7 (11.6-16.1)	14.9 (12.6-17.6)	16.7 (13.6-19.9)	18.1 (14.5-21.7)	19.4 (15.0-23.5)	20.5 (15.5-25.5)	21.8 (15.9-27.7)	22.6 (16.2-29.1)
60-day	13.0 (11.1-15.2)	14.0 (11.9-16.4)	15.7 (13.3-18.4)	17.1 (14.4-20.0)	19.0 (15.5-22.5)	20.5 (16.4-24.5)	21.9 (17.0-26.4)	23.1 (17.5-28.6)	24.4 (17.9-30.9)	25.3 (18.1-32.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

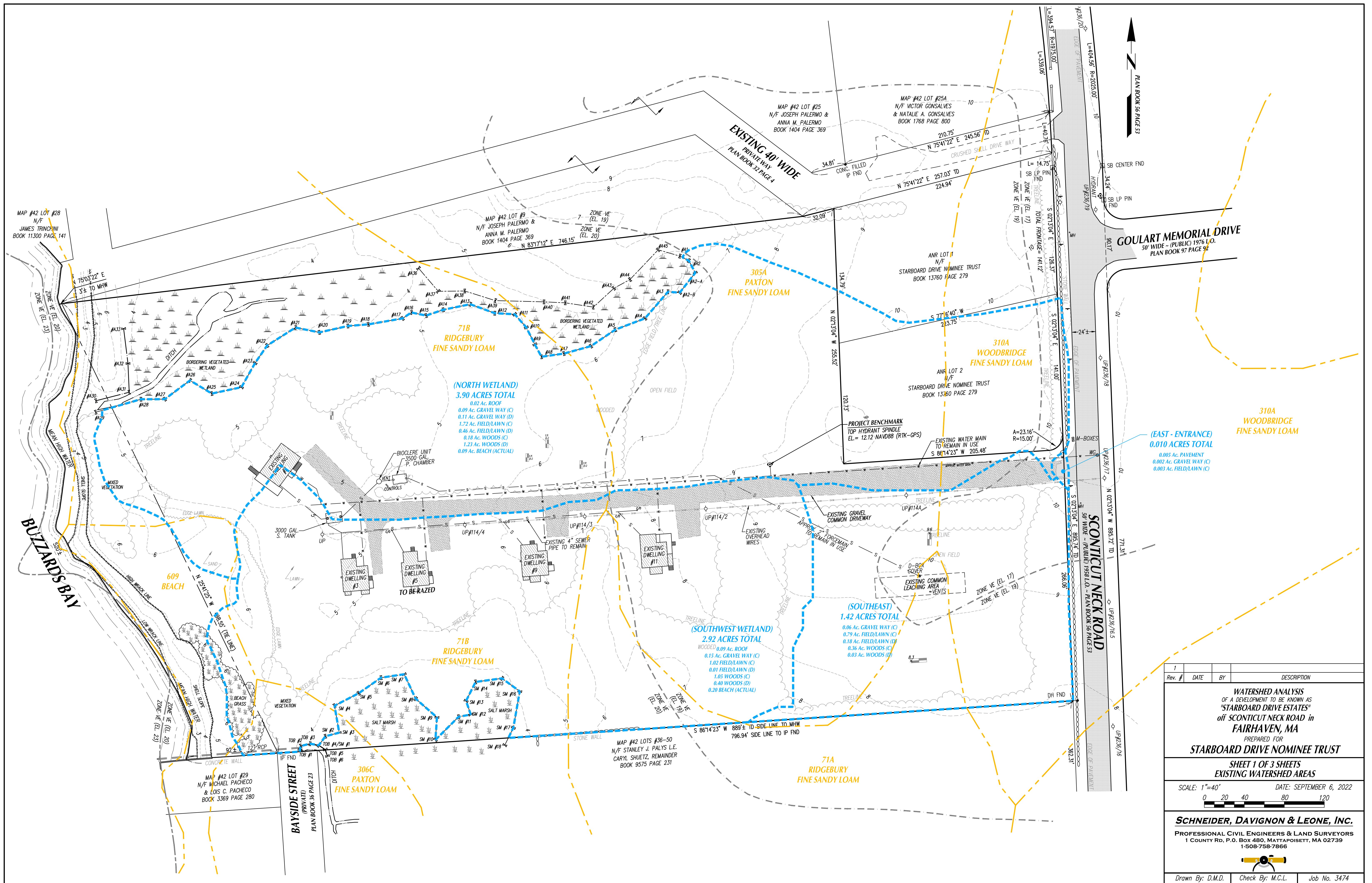
Estimates from the table in CSV format:

Main Link Categories:
[Home](#) | [OWP](#)

Appendix A

HydroCAD Input/Output

Existing Conditions



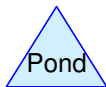
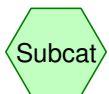
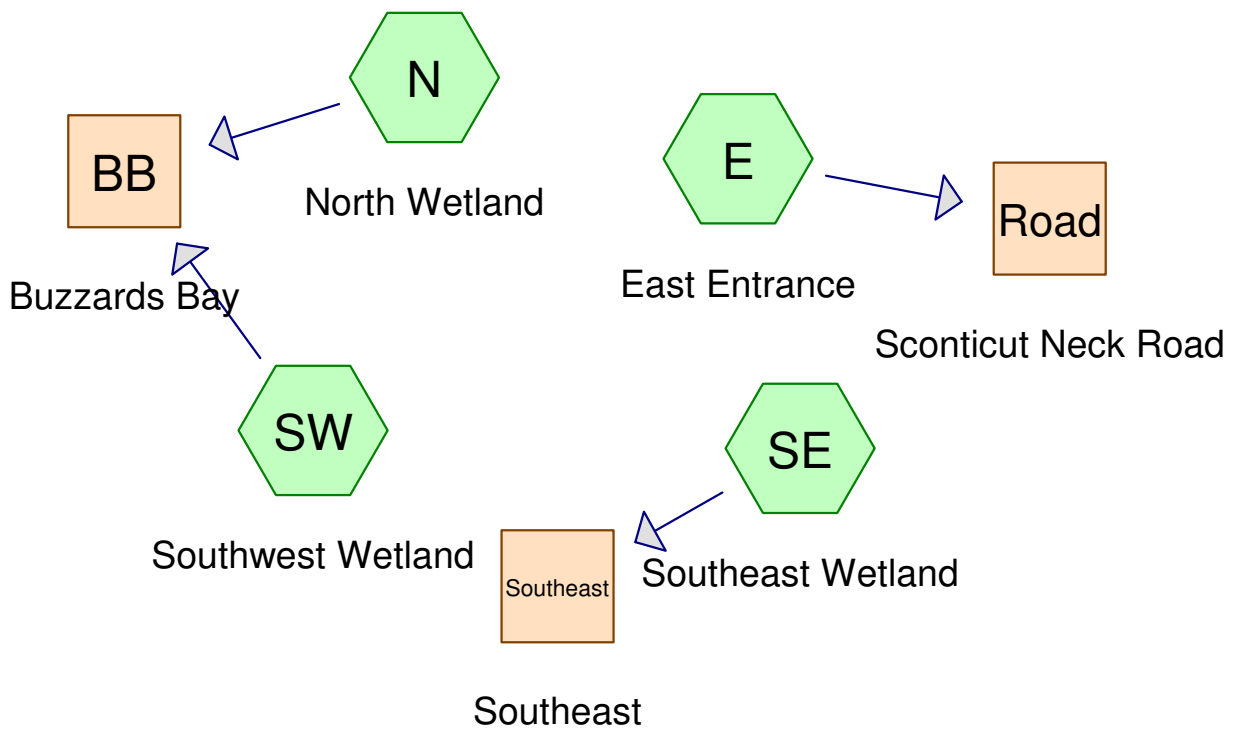
Rev. #	DATE	BY	DESCRIPTION
1			

WATERSHED ANALYSIS
 OF A DEVELOPMENT TO BE KNOWN AS
"STARBOARD DRIVE ESTATES"
 off **SCONTICUT NECK ROAD** in
FAIRHAVEN, MA
 PREPARED FOR
STARBOARD DRIVE NOMINEE TRUST
SHEET 1 OF 3 SHEETS
EXISTING WATERSHED AREAS

SCALE: 1"=40' DATE: SEPTEMBER 6, 2022
 0 20 40 80 120

SCHNEIDER, DAVIGNON & LEONE, INC.
 PROFESSIONAL CIVIL ENGINEERS & LAND SURVEYORS
 1 COUNTY RD. P.O. BOX 480, MATTAPOISETT, MA 02739
 1-508-758-7866

Drawn By: D.M.D. Check By: M.C.L. Job No. 3474



Routing Diagram for Starboard Drive Estates Existing
 Prepared by {enter your company name here}, Printed 9/5/2022
 HydroCAD® 10.10-4a s/n 05280 © 2020 HydroCAD Software Solutions LLC

Starboard Drive Estates Existing

Type III 24-hr 2-Year Rainfall=3.41"

Prepared by {enter your company name here}

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Page 2

Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E: East Entrance Runoff Area=0.010 ac 50.00% Impervious Runoff Depth>2.36"
Tc=6.0 min CN=90 Runoff=0.03 cfs 0.002 af

Subcatchment N: North Wetland Runoff Area=3.900 ac 0.51% Impervious Runoff Depth>1.36"
Tc=6.0 min CN=77 Runoff=6.12 cfs 0.443 af

Subcatchment SE: Southeast Wetland Runoff Area=1.420 ac 0.00% Impervious Runoff Depth>1.30"
Tc=6.0 min CN=76 Runoff=2.11 cfs 0.154 af

Subcatchment SW: Southwest Wetland Runoff Area=2.920 ac 3.08% Impervious Runoff Depth>1.30"
Flow Length=200' Tc=15.7 min CN=76 Runoff=3.21 cfs 0.315 af

Reach BB: Buzzards Bay Inflow=8.22 cfs 0.758 af
Outflow=8.22 cfs 0.758 af

Reach Road: Scoticut Neck Road Inflow=0.03 cfs 0.002 af
Outflow=0.03 cfs 0.002 af

Reach Southeast: Southeast Inflow=2.11 cfs 0.154 af
Outflow=2.11 cfs 0.154 af

Total Runoff Area = 8.250 ac Runoff Volume = 0.913 af Average Runoff Depth = 1.33"
98.61% Pervious = 8.135 ac 1.39% Impervious = 0.115 ac

Starboard Drive Estates Existing

Type III 24-hr 2-Year Rainfall=3.41"

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Page 3

Summary for Subcatchment E: East Entrance

Runoff = 0.03 cfs @ 12.087 hrs, Volume= 0.002 af, Depth> 2.36"

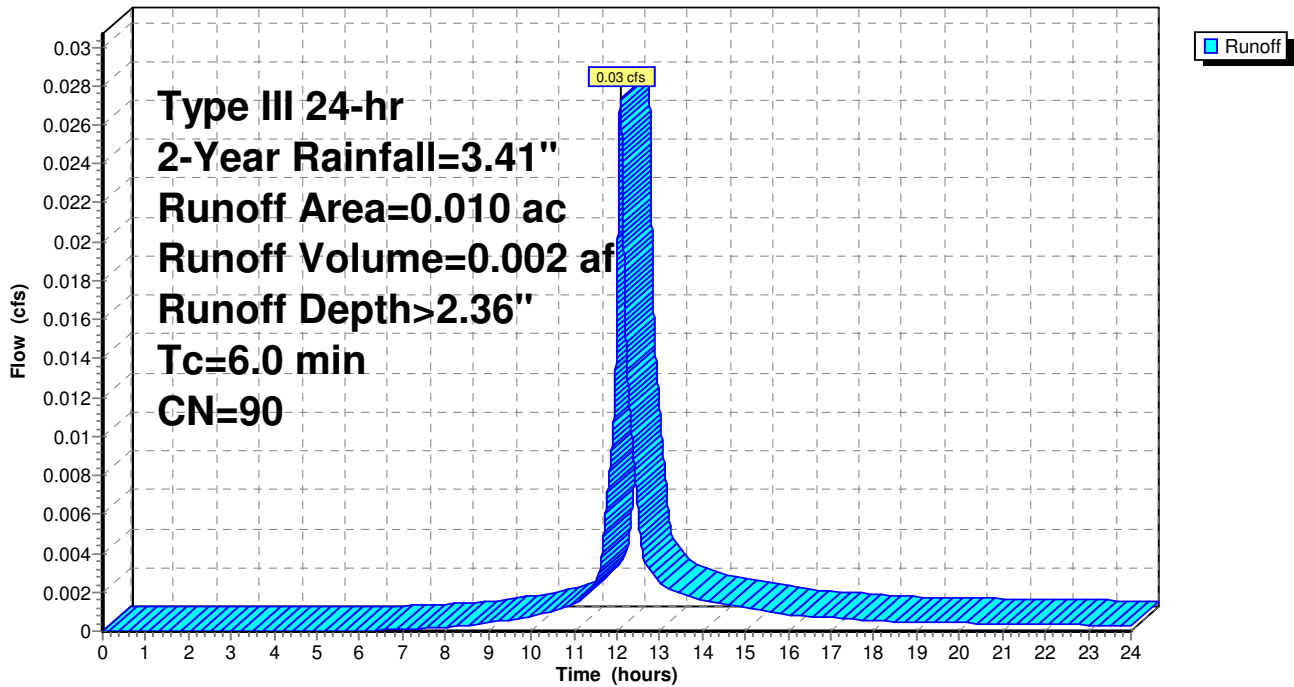
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.005	98	Paved roads
0.002	96	Gravel surface, HSG C
0.003	74	>75% Grass cover, Good, HSG C
0.010	90	Weighted Average
0.005		50.00% Pervious Area
0.005		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 2-Year Rainfall=3.41"

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Page 4

Summary for Subcatchment N: North Wetland

Runoff = 6.12 cfs @ 12.093 hrs, Volume= 0.443 af, Depth> 1.36"

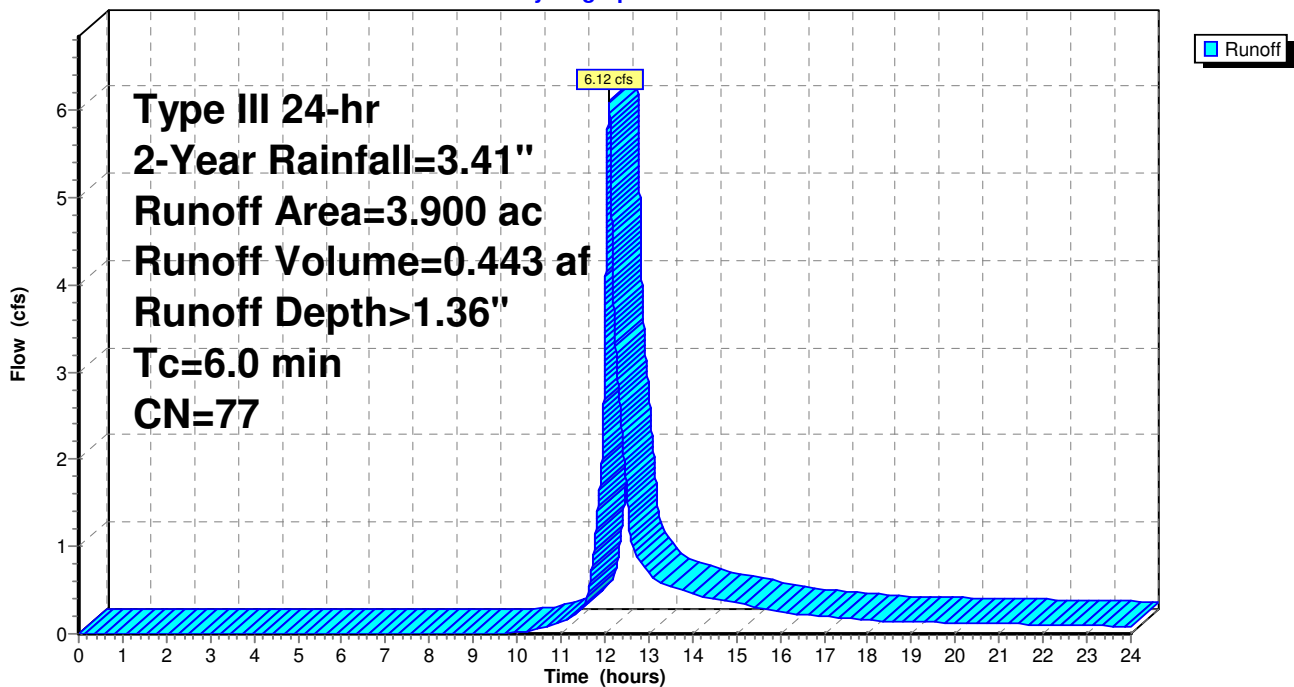
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.020	98	Unconnected roofs
0.090	96	Gravel surface, HSG C
0.110	96	Gravel surface, HSG D
1.720	74	>75% Grass cover, Good, HSG C
0.460	80	>75% Grass cover, Good, HSG D
0.180	73	Woods, Fair, HSG C
1.230	79	Woods, Fair, HSG D
* 0.090	72	Beach
3.900	77	Weighted Average
3.880		99.49% Pervious Area
0.020		0.51% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment SE: Southeast Wetland

Runoff = 2.11 cfs @ 12.093 hrs, Volume= 0.154 af, Depth> 1.30"

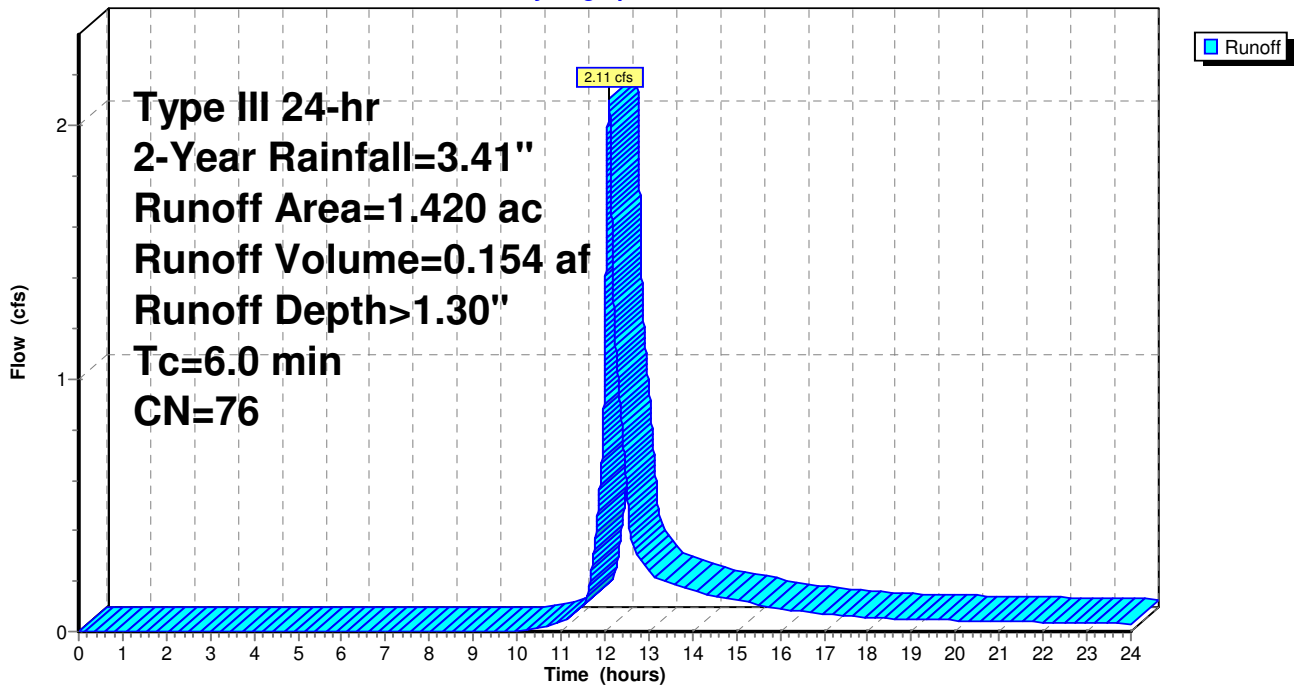
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.060	96	Gravel surface, HSG C
0.790	74	>75% Grass cover, Good, HSG C
0.180	80	>75% Grass cover, Good, HSG D
0.360	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.420	76	Weighted Average
1.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: Southeast Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 3.21 cfs @ 12.229 hrs, Volume= 0.315 af, Depth> 1.30"

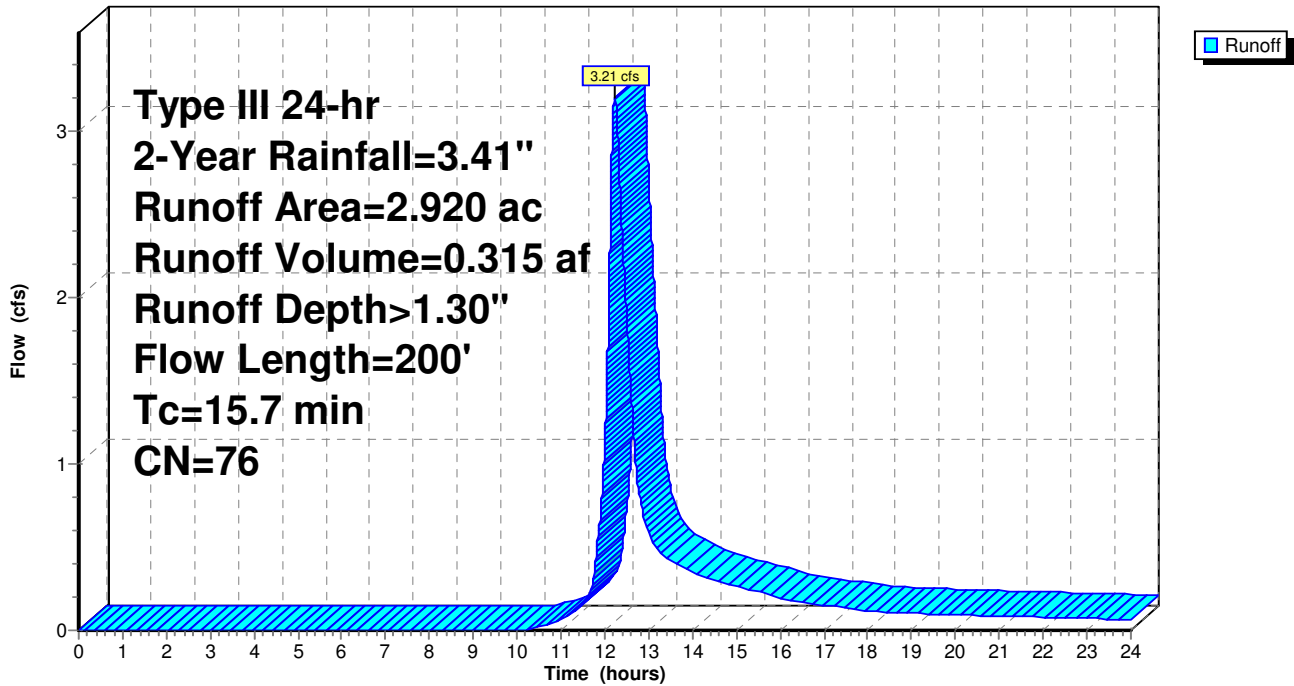
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.090	98	Unconnected roofs
0.150	96	Gravel surface, HSG C
1.020	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
1.050	73	Woods, Fair, HSG C
0.400	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.920	76	Weighted Average
2.830		96.92% Pervious Area
0.090		3.08% Impervious Area
0.090		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



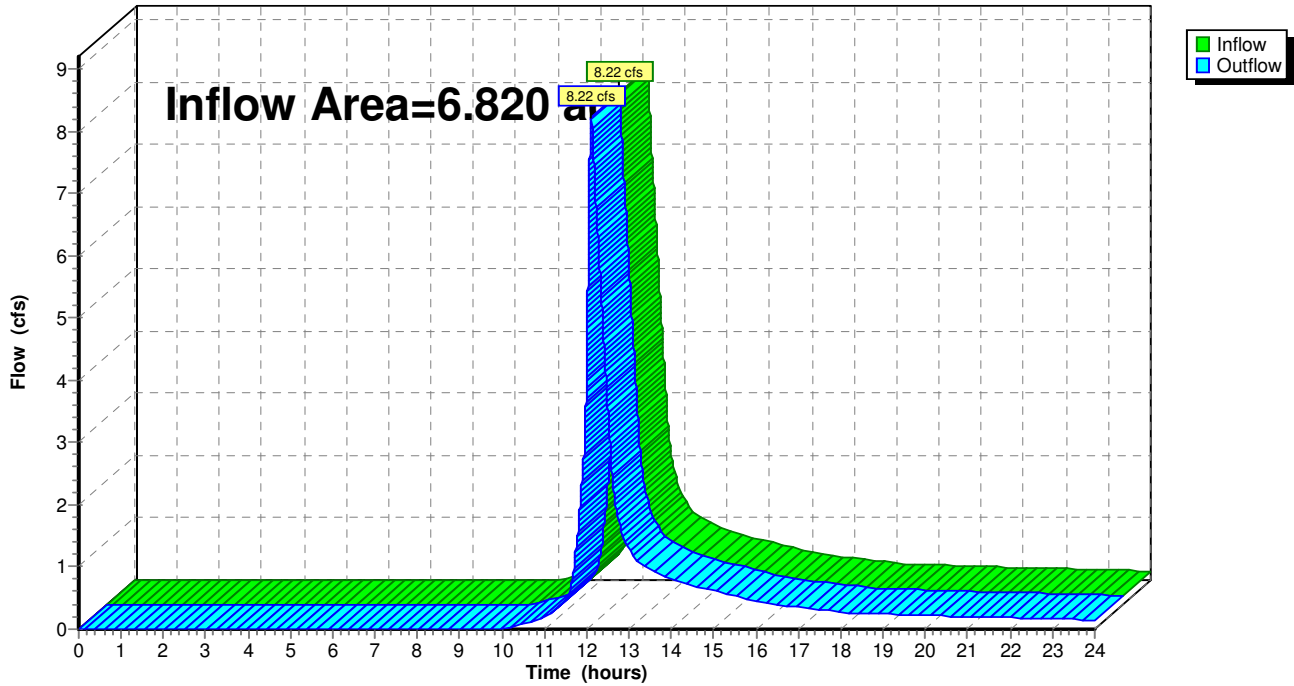
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.820 ac, 1.61% Impervious, Inflow Depth > 1.33" for 2-Year event
Inflow = 8.22 cfs @ 12.113 hrs, Volume= 0.758 af
Outflow = 8.22 cfs @ 12.113 hrs, Volume= 0.758 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



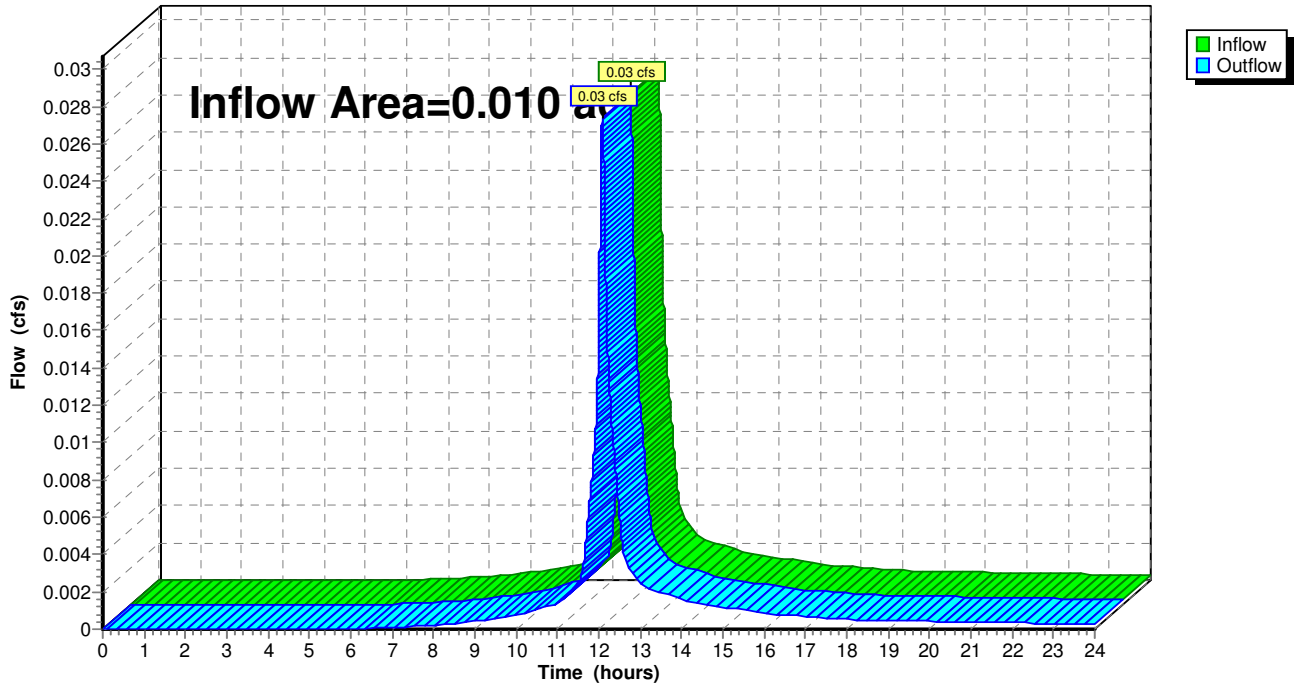
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.010 ac, 50.00% Impervious, Inflow Depth > 2.36" for 2-Year event
Inflow = 0.03 cfs @ 12.087 hrs, Volume= 0.002 af
Outflow = 0.03 cfs @ 12.087 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph

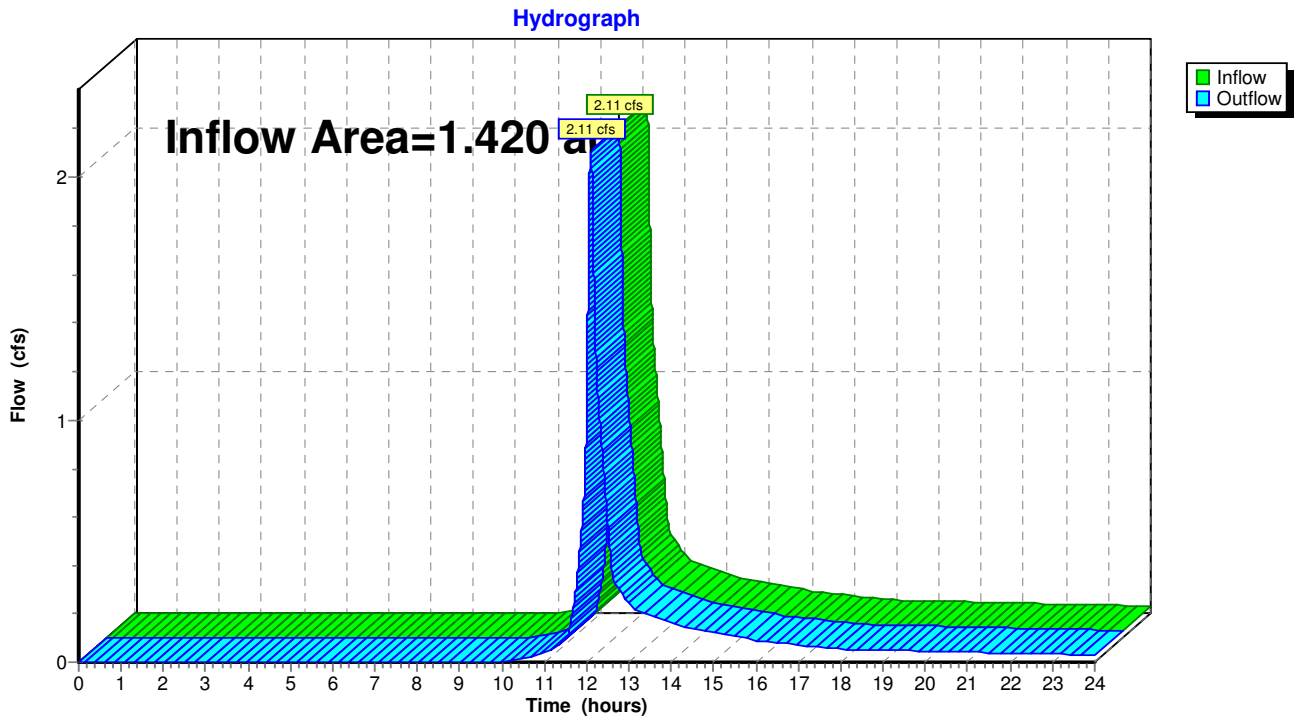


Summary for Reach Southeast: Southeast

Inflow Area = 1.420 ac, 0.00% Impervious, Inflow Depth > 1.30" for 2-Year event
Inflow = 2.11 cfs @ 12.093 hrs, Volume= 0.154 af
Outflow = 2.11 cfs @ 12.093 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Southeast: Southeast



Starboard Drive Estates Existing

Type III 24-hr 10-Year Rainfall=5.03"

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E: East Entrance Runoff Area=0.010 ac 50.00% Impervious Runoff Depth>3.90"
Tc=6.0 min CN=90 Runoff=0.04 cfs 0.003 af

Subcatchment N: North Wetland Runoff Area=3.900 ac 0.51% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=77 Runoff=12.13 cfs 0.860 af

Subcatchment SE: Southeast Wetland Runoff Area=1.420 ac 0.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=76 Runoff=4.27 cfs 0.303 af

Subcatchment SW: Southwest Wetland Runoff Area=2.920 ac 3.08% Impervious Runoff Depth>2.55"
Flow Length=200' Tc=15.7 min CN=76 Runoff=6.50 cfs 0.621 af

Reach BB: Buzzards Bay Inflow=16.55 cfs 1.480 af
Outflow=16.55 cfs 1.480 af

Reach Road: Scoticut Neck Road Inflow=0.04 cfs 0.003 af
Outflow=0.04 cfs 0.003 af

Reach Southeast: Southeast Inflow=4.27 cfs 0.303 af
Outflow=4.27 cfs 0.303 af

Total Runoff Area = 8.250 ac Runoff Volume = 1.786 af Average Runoff Depth = 2.60"
98.61% Pervious = 8.135 ac 1.39% Impervious = 0.115 ac

Starboard Drive Estates Existing

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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment E: East Entrance

Runoff = 0.04 cfs @ 12.087 hrs, Volume= 0.003 af, Depth> 3.90"

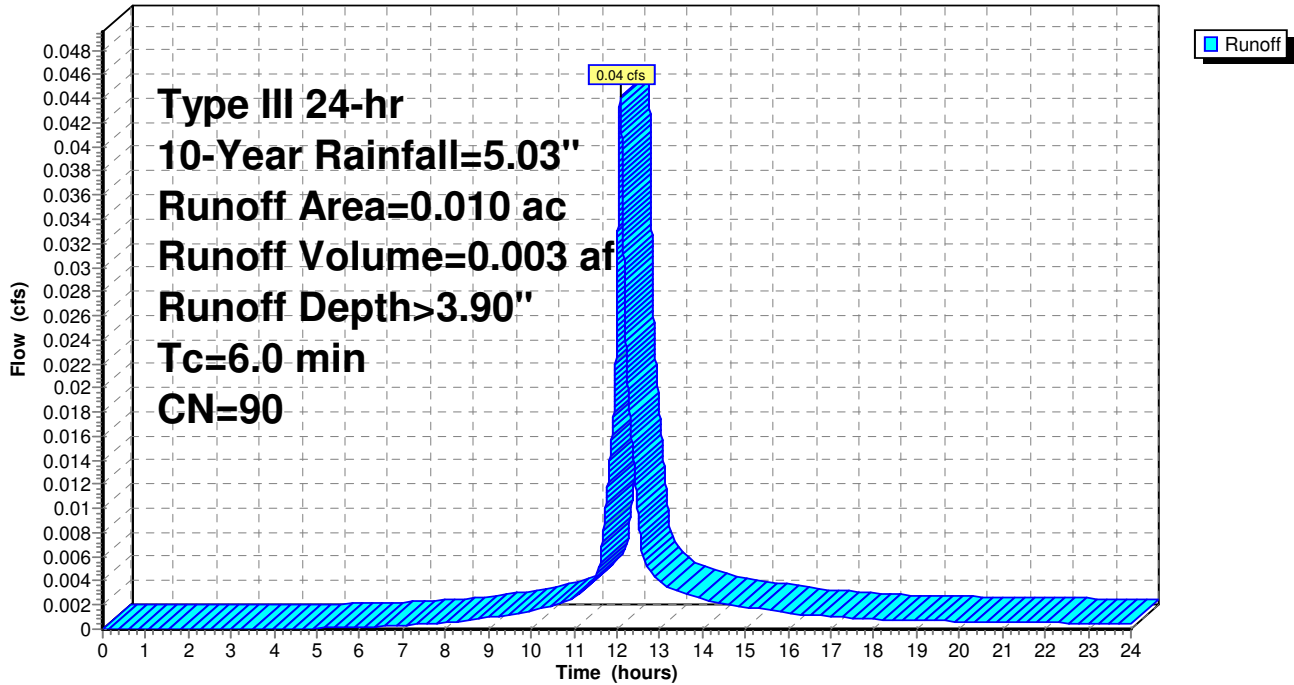
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.005	98	Paved roads
0.002	96	Gravel surface, HSG C
0.003	74	>75% Grass cover, Good, HSG C
0.010	90	Weighted Average
0.005		50.00% Pervious Area
0.005		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Existing

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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment N: North Wetland

Runoff = 12.13 cfs @ 12.087 hrs, Volume= 0.860 af, Depth> 2.64"

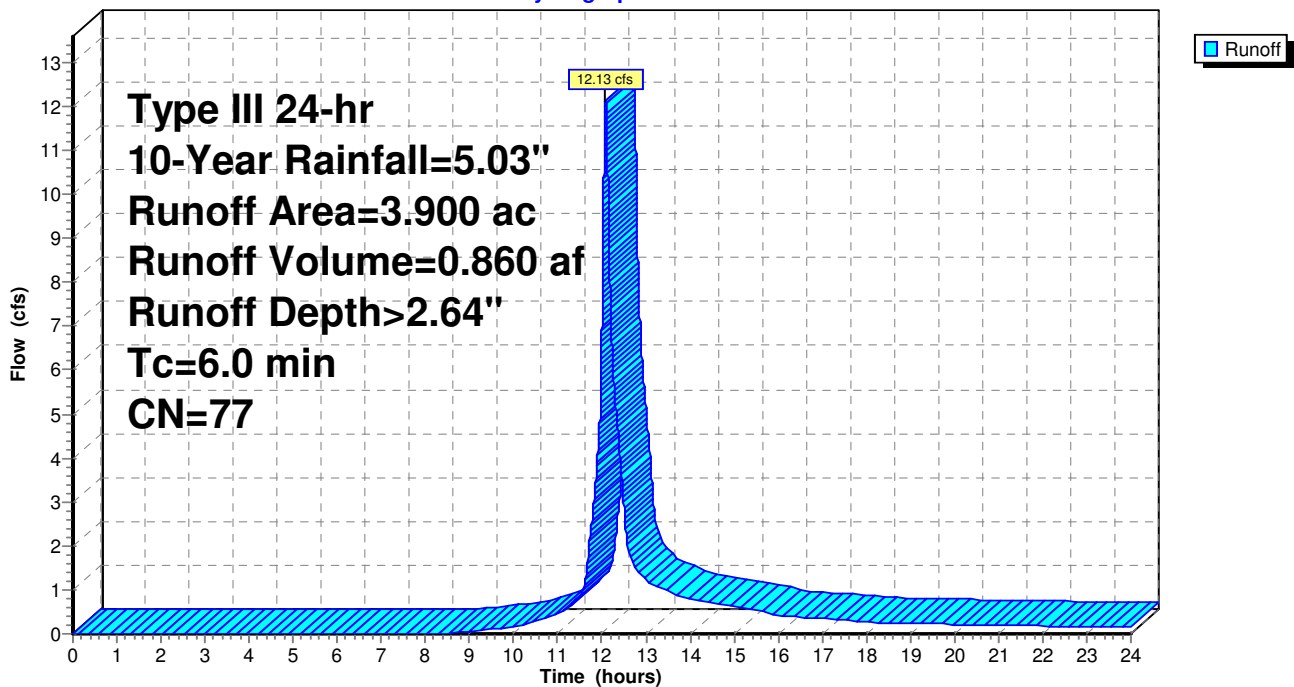
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.020	98	Unconnected roofs
0.090	96	Gravel surface, HSG C
0.110	96	Gravel surface, HSG D
1.720	74	>75% Grass cover, Good, HSG C
0.460	80	>75% Grass cover, Good, HSG D
0.180	73	Woods, Fair, HSG C
1.230	79	Woods, Fair, HSG D
* 0.090	72	Beach
3.900	77	Weighted Average
3.880		99.49% Pervious Area
0.020		0.51% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Existing

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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment SE: Southeast Wetland

Runoff = 4.27 cfs @ 12.087 hrs, Volume= 0.303 af, Depth> 2.56"

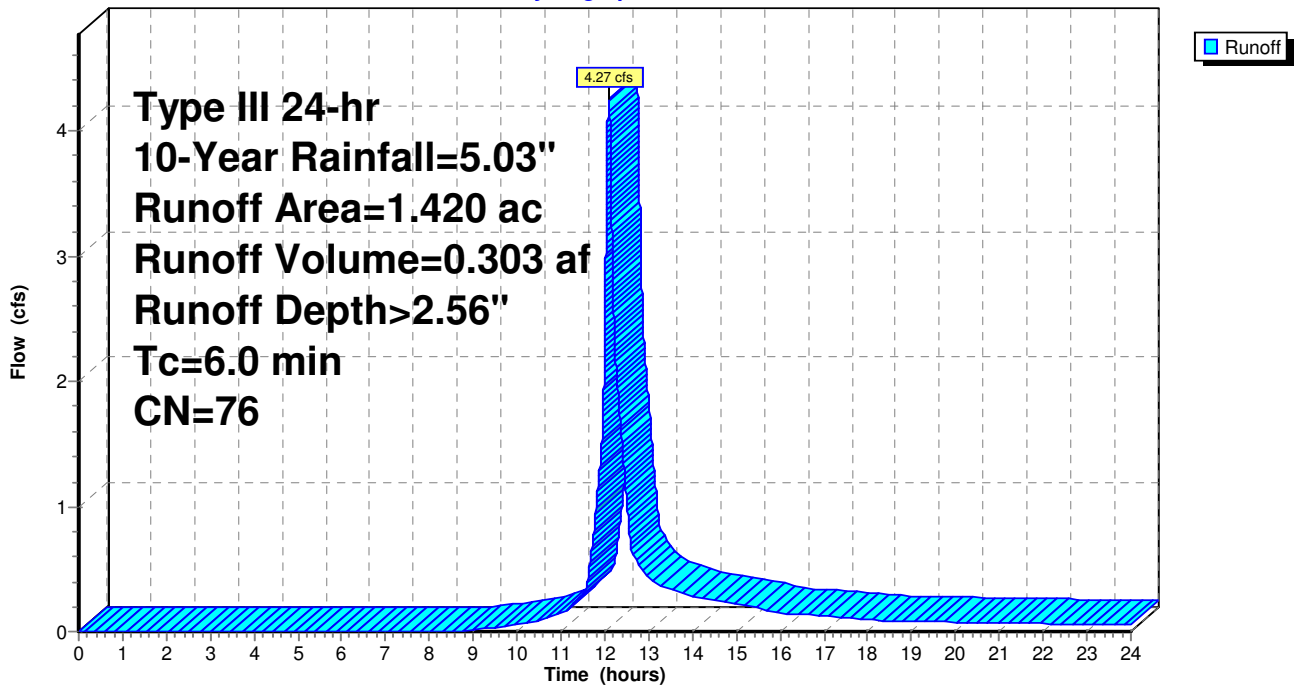
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
0.060	96	Gravel surface, HSG C
0.790	74	>75% Grass cover, Good, HSG C
0.180	80	>75% Grass cover, Good, HSG D
0.360	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.420	76	Weighted Average
1.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: Southeast Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 6.50 cfs @ 12.228 hrs, Volume= 0.621 af, Depth> 2.55"

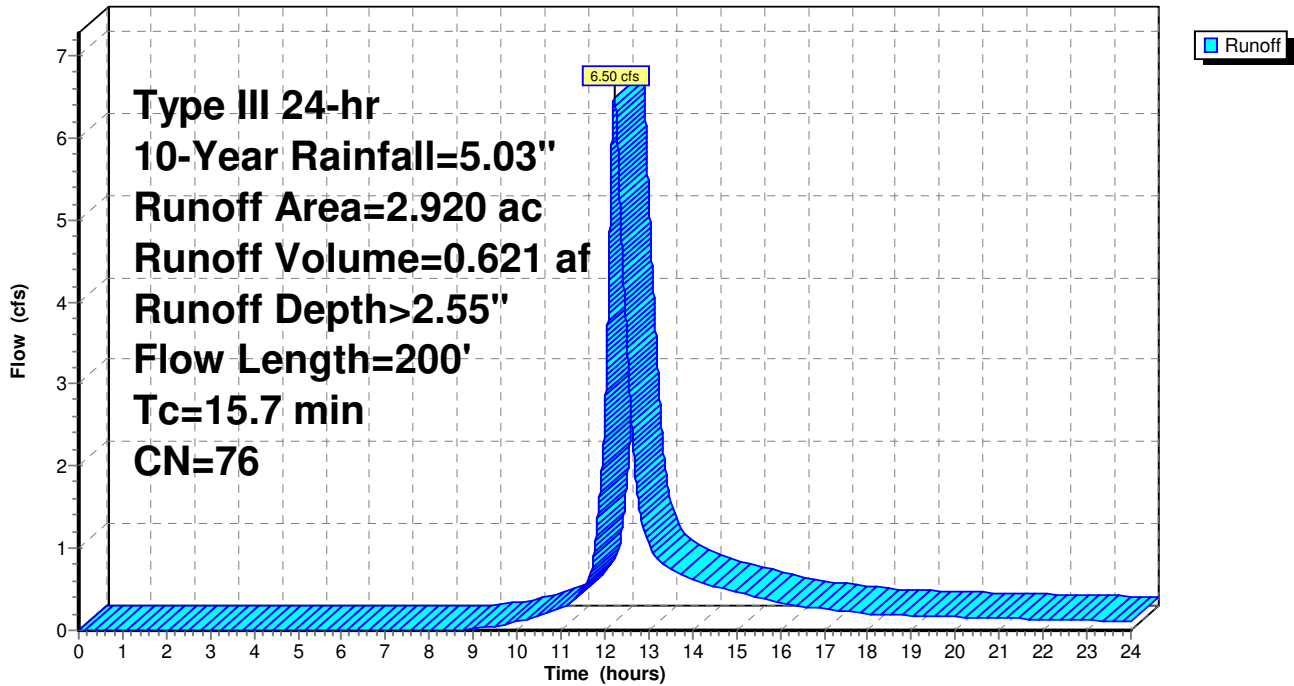
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.090	98	Unconnected roofs
0.150	96	Gravel surface, HSG C
1.020	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
1.050	73	Woods, Fair, HSG C
0.400	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.920	76	Weighted Average
2.830		96.92% Pervious Area
0.090		3.08% Impervious Area
0.090		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



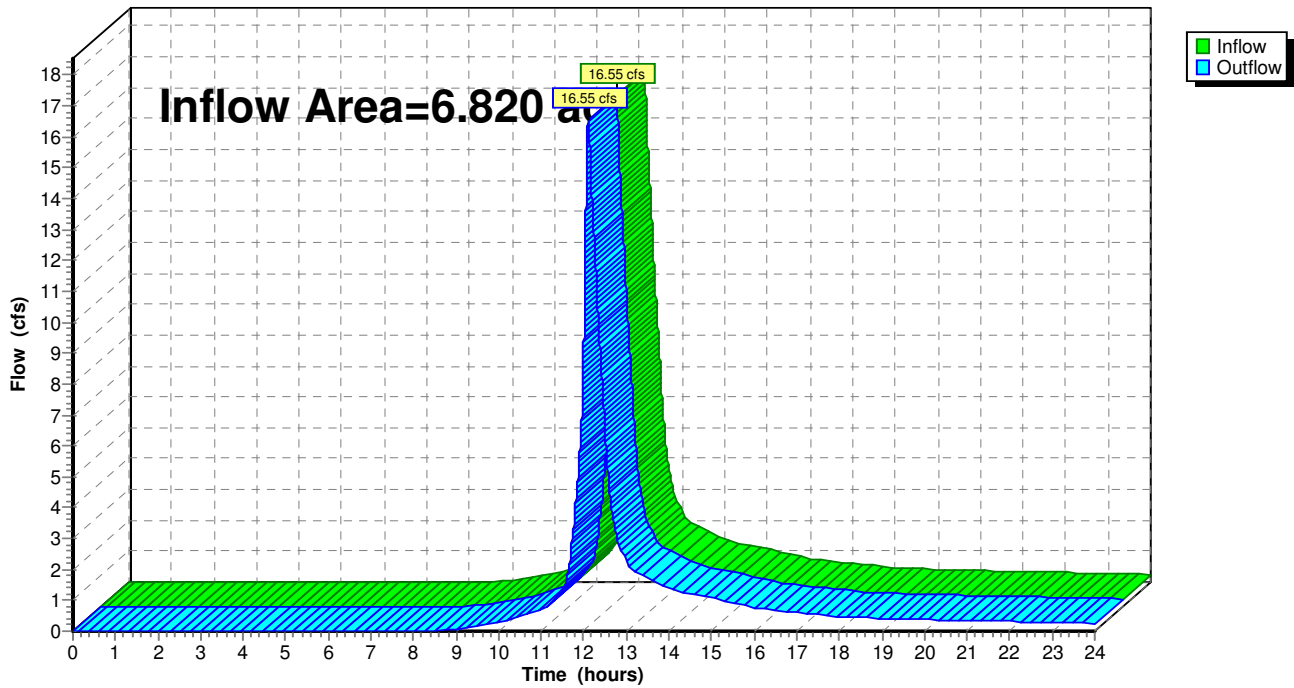
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.820 ac, 1.61% Impervious, Inflow Depth > 2.60" for 10-Year event
Inflow = 16.55 cfs @ 12.100 hrs, Volume= 1.480 af
Outflow = 16.55 cfs @ 12.100 hrs, Volume= 1.480 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



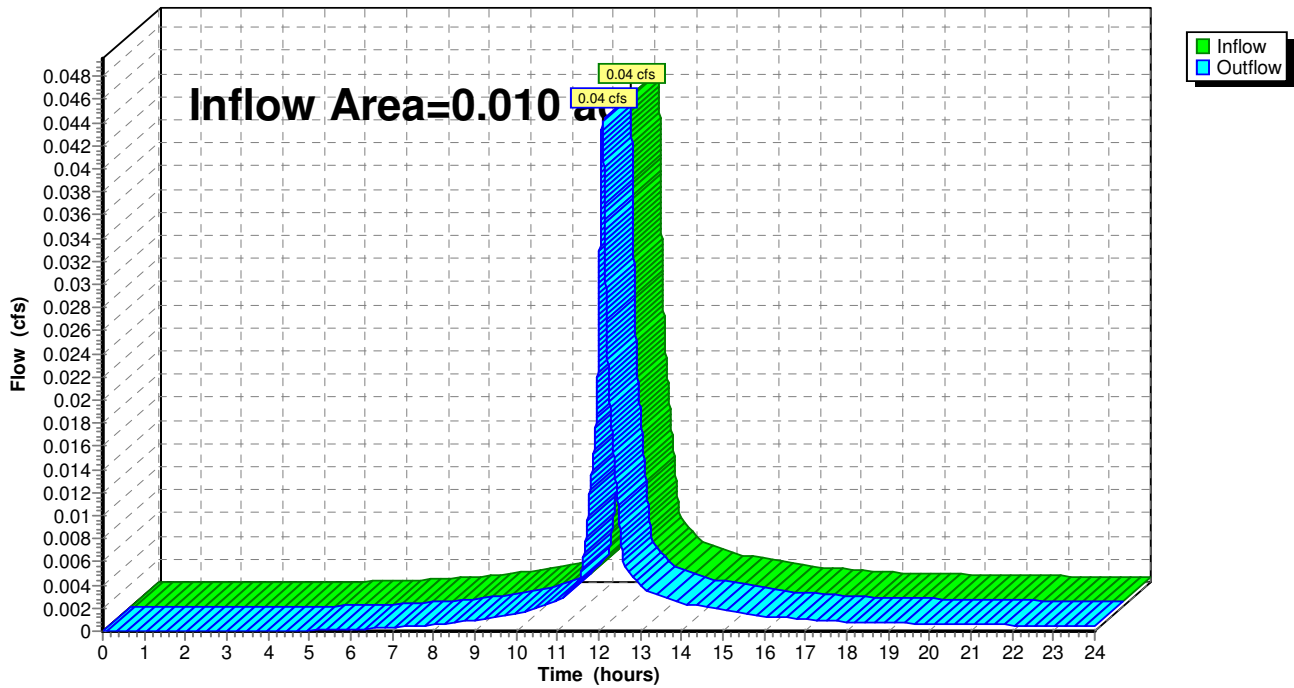
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.010 ac, 50.00% Impervious, Inflow Depth > 3.90" for 10-Year event
Inflow = 0.04 cfs @ 12.087 hrs, Volume= 0.003 af
Outflow = 0.04 cfs @ 12.087 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



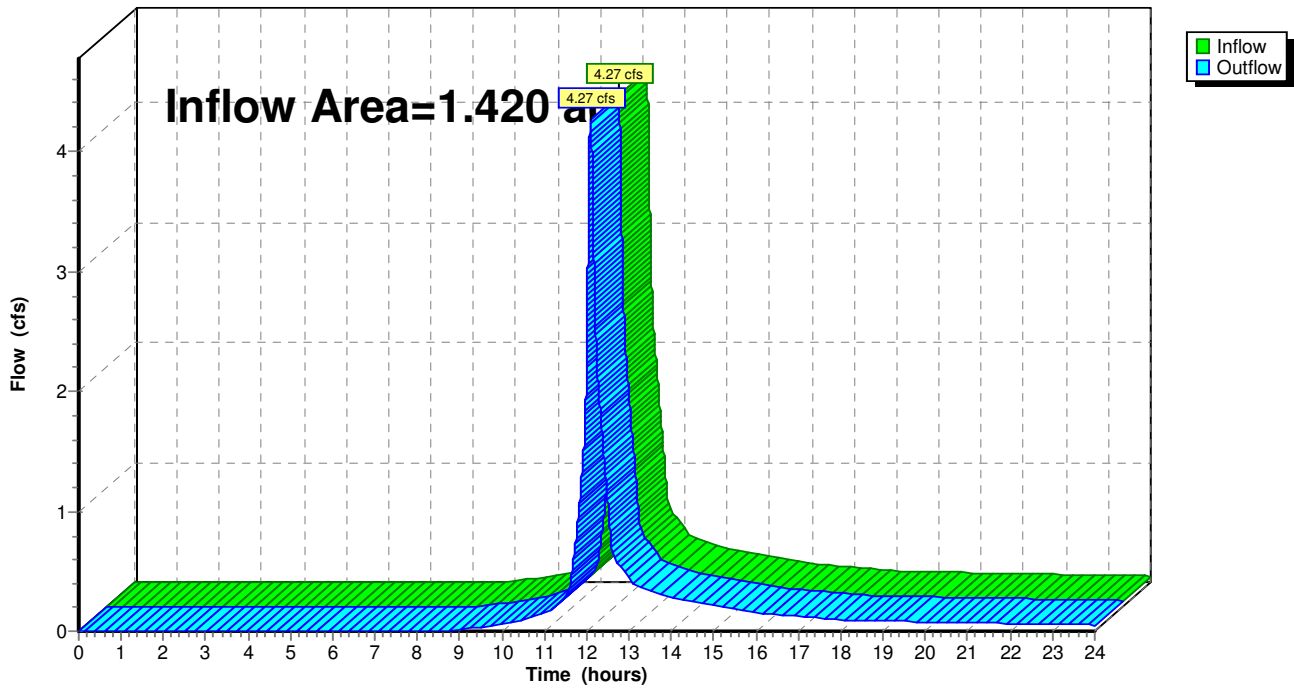
Summary for Reach Southeast: Southeast

Inflow Area = 1.420 ac, 0.00% Impervious, Inflow Depth > 2.56" for 10-Year event
Inflow = 4.27 cfs @ 12.087 hrs, Volume= 0.303 af
Outflow = 4.27 cfs @ 12.087 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Southeast: Southeast

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 25-Year Rainfall=6.04"

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E: East Entrance Runoff Area=0.010 ac 50.00% Impervious Runoff Depth>4.88"
Tc=6.0 min CN=90 Runoff=0.05 cfs 0.004 af

Subcatchment N: North Wetland Runoff Area=3.900 ac 0.51% Impervious Runoff Depth>3.51"
Tc=6.0 min CN=77 Runoff=16.10 cfs 1.141 af

Subcatchment SE: Southeast Wetland Runoff Area=1.420 ac 0.00% Impervious Runoff Depth>3.41"
Tc=6.0 min CN=76 Runoff=5.70 cfs 0.404 af

Subcatchment SW: Southwest Wetland Runoff Area=2.920 ac 3.08% Impervious Runoff Depth>3.40"
Flow Length=200' Tc=15.7 min CN=76 Runoff=8.69 cfs 0.828 af

Reach BB: Buzzards Bay Inflow=22.09 cfs 1.969 af
Outflow=22.09 cfs 1.969 af

Reach Road: Scoticut Neck Road Inflow=0.05 cfs 0.004 af
Outflow=0.05 cfs 0.004 af

Reach Southeast: Southeast Inflow=5.70 cfs 0.404 af
Outflow=5.70 cfs 0.404 af

Total Runoff Area = 8.250 ac Runoff Volume = 2.377 af Average Runoff Depth = 3.46"
98.61% Pervious = 8.135 ac 1.39% Impervious = 0.115 ac

Starboard Drive Estates Existing

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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment E: East Entrance

Runoff = 0.05 cfs @ 12.087 hrs, Volume= 0.004 af, Depth> 4.88"

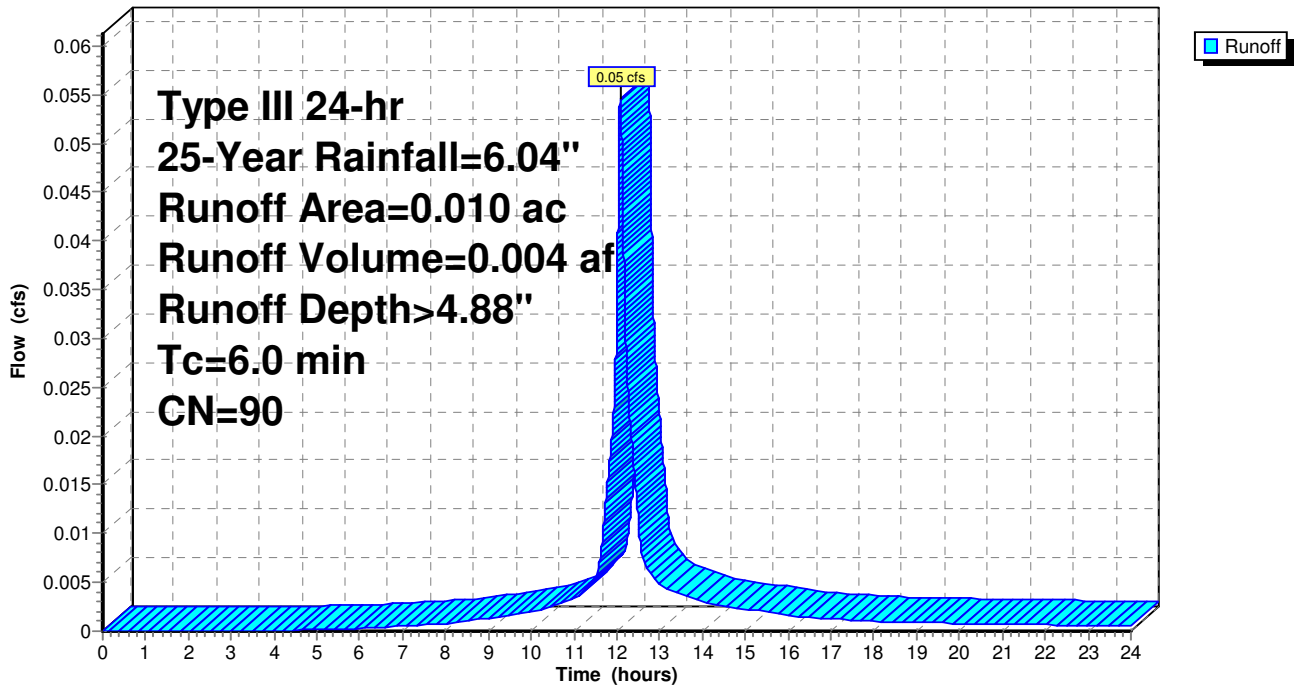
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.005	98	Paved roads
0.002	96	Gravel surface, HSG C
0.003	74	>75% Grass cover, Good, HSG C
0.010	90	Weighted Average
0.005		50.00% Pervious Area
0.005		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Existing

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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment N: North Wetland

Runoff = 16.10 cfs @ 12.087 hrs, Volume= 1.141 af, Depth> 3.51"

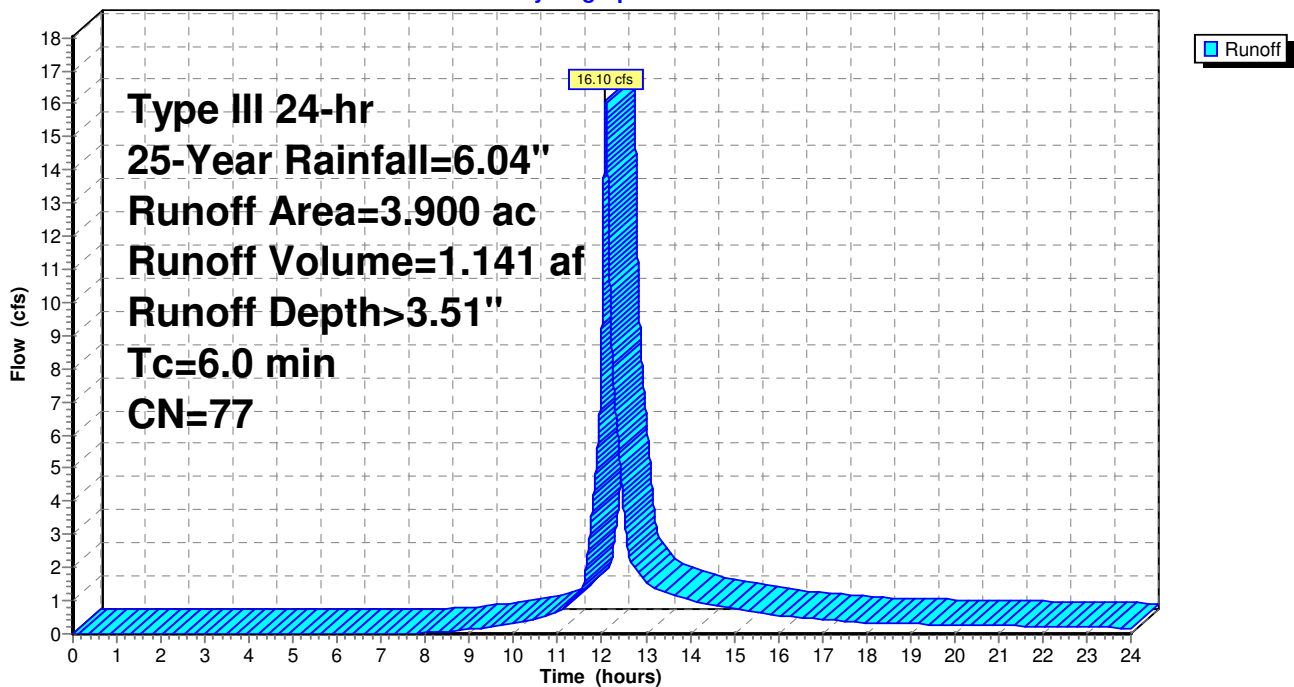
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.020	98	Unconnected roofs
0.090	96	Gravel surface, HSG C
0.110	96	Gravel surface, HSG D
1.720	74	>75% Grass cover, Good, HSG C
0.460	80	>75% Grass cover, Good, HSG D
0.180	73	Woods, Fair, HSG C
1.230	79	Woods, Fair, HSG D
* 0.090	72	Beach
3.900	77	Weighted Average
3.880		99.49% Pervious Area
0.020		0.51% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Existing

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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment SE: Southeast Wetland

Runoff = 5.70 cfs @ 12.087 hrs, Volume= 0.404 af, Depth> 3.41"

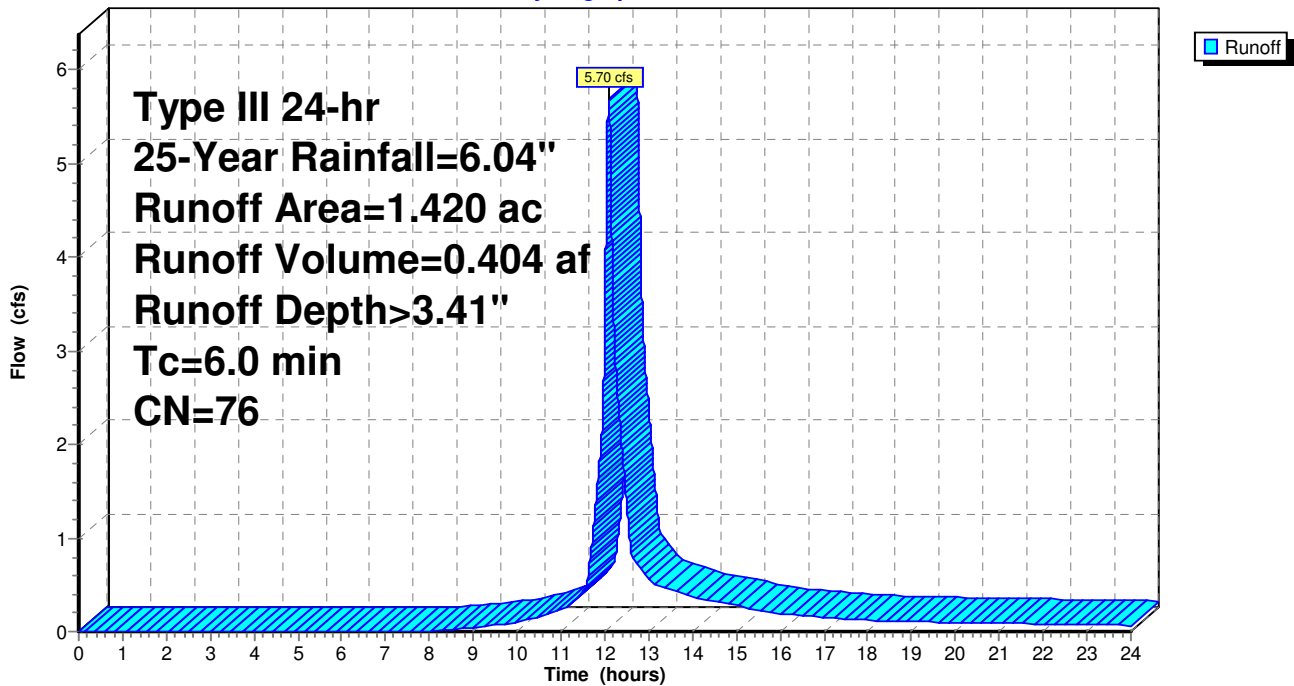
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
0.060	96	Gravel surface, HSG C
0.790	74	>75% Grass cover, Good, HSG C
0.180	80	>75% Grass cover, Good, HSG D
0.360	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.420	76	Weighted Average
1.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: Southeast Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 8.69 cfs @ 12.211 hrs, Volume= 0.828 af, Depth> 3.40"

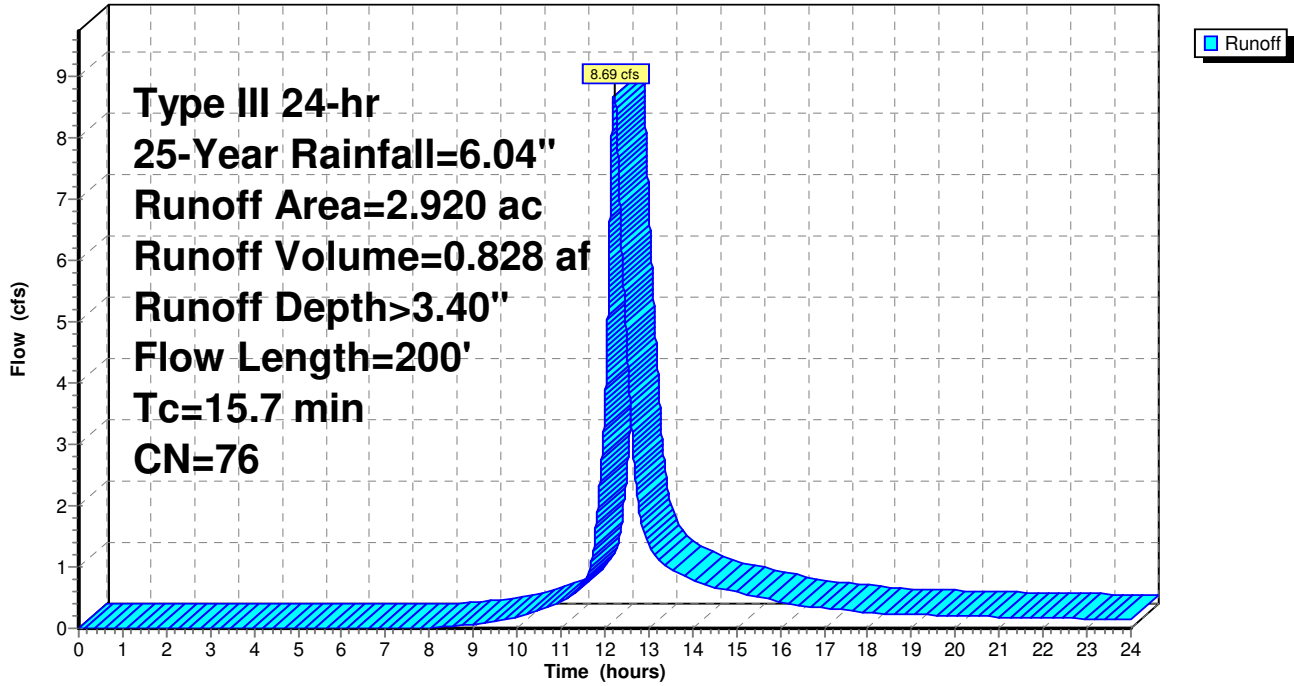
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.090	98	Unconnected roofs
0.150	96	Gravel surface, HSG C
1.020	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
1.050	73	Woods, Fair, HSG C
0.400	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.920	76	Weighted Average
2.830		96.92% Pervious Area
0.090		3.08% Impervious Area
0.090		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



Starboard Drive Estates Existing

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Type III 24-hr 25-Year Rainfall=6.04"

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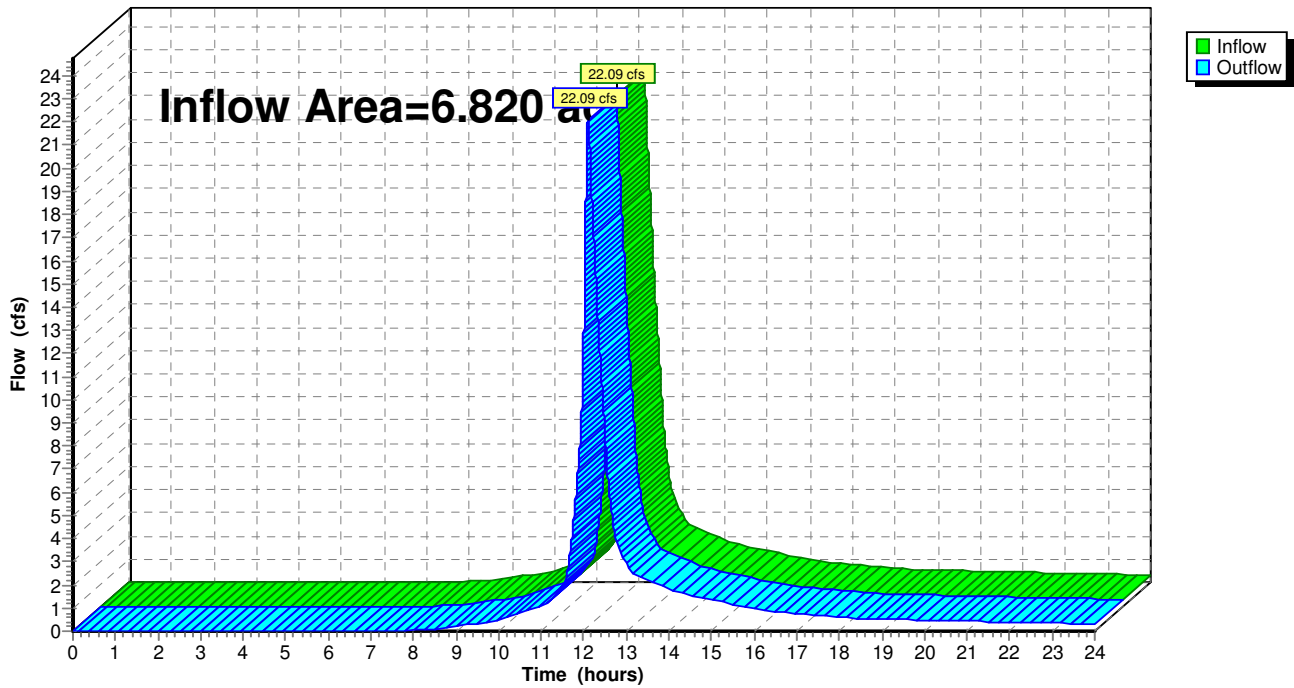
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.820 ac, 1.61% Impervious, Inflow Depth > 3.46" for 25-Year event
Inflow = 22.09 cfs @ 12.100 hrs, Volume= 1.969 af
Outflow = 22.09 cfs @ 12.100 hrs, Volume= 1.969 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



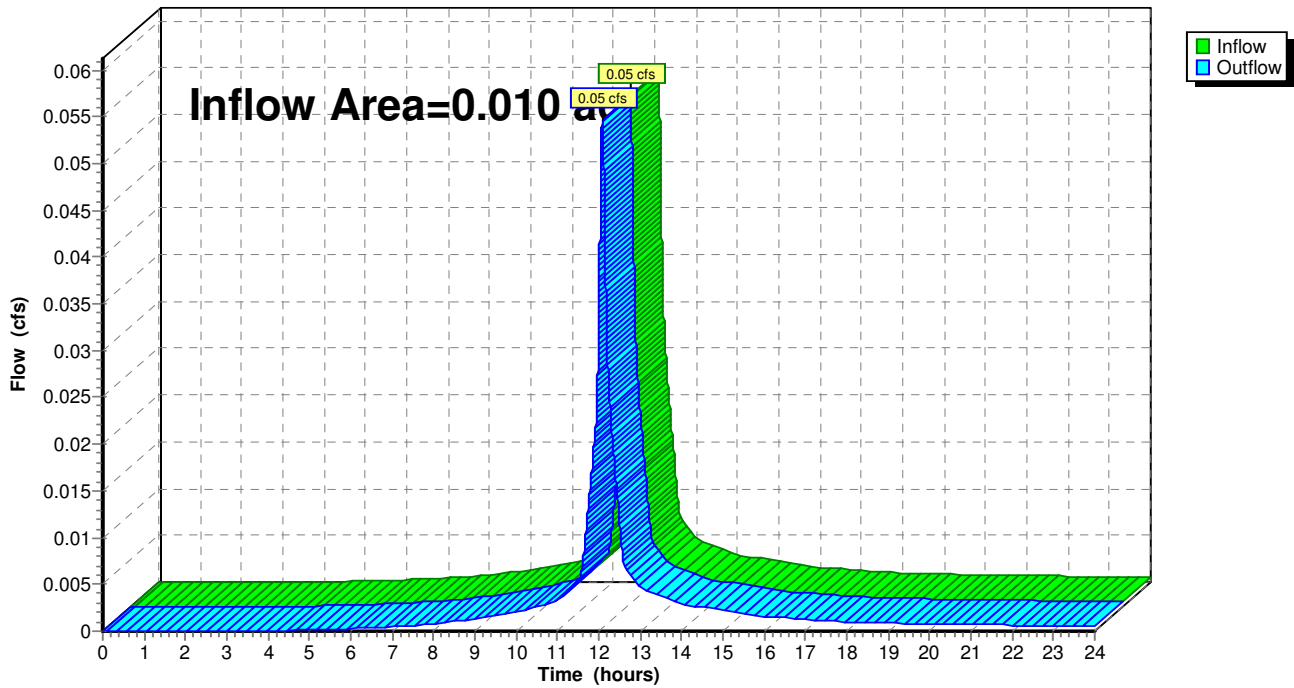
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.010 ac, 50.00% Impervious, Inflow Depth > 4.88" for 25-Year event
Inflow = 0.05 cfs @ 12.087 hrs, Volume= 0.004 af
Outflow = 0.05 cfs @ 12.087 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



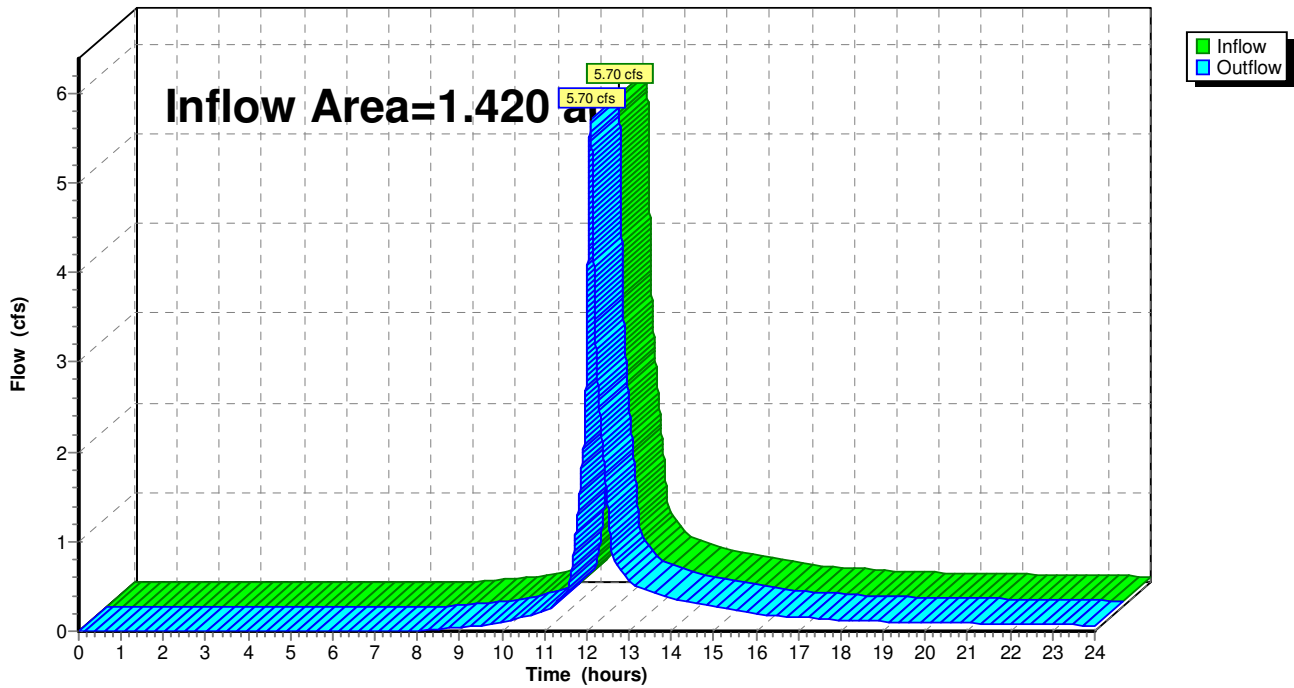
Summary for Reach Southeast: Southeast

Inflow Area = 1.420 ac, 0.00% Impervious, Inflow Depth > 3.41" for 25-Year event
Inflow = 5.70 cfs @ 12.087 hrs, Volume= 0.404 af
Outflow = 5.70 cfs @ 12.087 hrs, Volume= 0.404 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Southeast: Southeast

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 100-Year Rainfall=7.60"

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E: East Entrance Runoff Area=0.010 ac 50.00% Impervious Runoff Depth>6.41"
Tc=6.0 min CN=90 Runoff=0.07 cfs 0.005 af

Subcatchment N: North Wetland Runoff Area=3.900 ac 0.51% Impervious Runoff Depth>4.90"
Tc=6.0 min CN=77 Runoff=22.36 cfs 1.594 af

Subcatchment SE: Southeast Wetland Runoff Area=1.420 ac 0.00% Impervious Runoff Depth>4.79"
Tc=6.0 min CN=76 Runoff=7.97 cfs 0.567 af

Subcatchment SW: Southwest Wetland Runoff Area=2.920 ac 3.08% Impervious Runoff Depth>4.78"
Flow Length=200' Tc=15.7 min CN=76 Runoff=12.17 cfs 1.163 af

Reach BB: Buzzards Bay Inflow=30.87 cfs 2.757 af
Outflow=30.87 cfs 2.757 af

Reach Road: Sconticut Neck Road Inflow=0.07 cfs 0.005 af
Outflow=0.07 cfs 0.005 af

Reach Southeast: Southeast Inflow=7.97 cfs 0.567 af
Outflow=7.97 cfs 0.567 af

Total Runoff Area = 8.250 ac Runoff Volume = 3.329 af Average Runoff Depth = 4.84"
98.61% Pervious = 8.135 ac 1.39% Impervious = 0.115 ac

Starboard Drive Estates Existing

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment E: East Entrance

Runoff = 0.07 cfs @ 12.087 hrs, Volume= 0.005 af, Depth> 6.41"

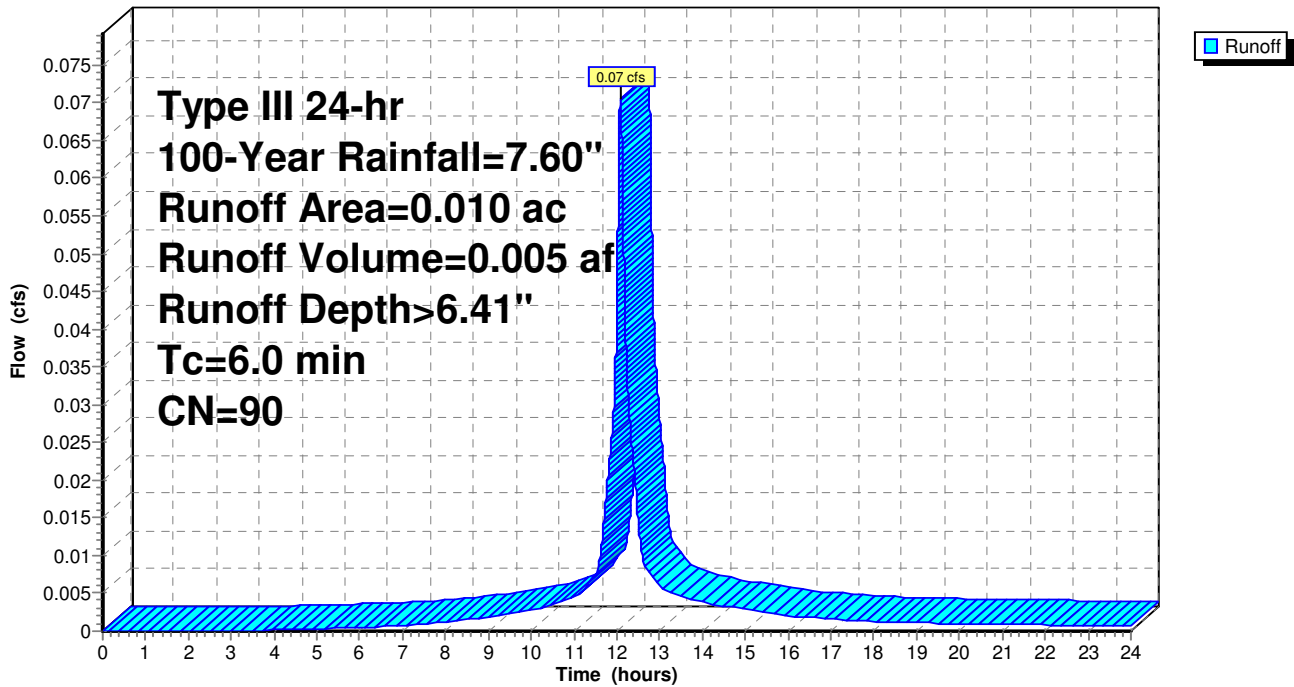
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.005	98	Paved roads
0.002	96	Gravel surface, HSG C
0.003	74	>75% Grass cover, Good, HSG C
0.010	90	Weighted Average
0.005		50.00% Pervious Area
0.005		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment N: North Wetland

Runoff = 22.36 cfs @ 12.087 hrs, Volume= 1.594 af, Depth> 4.90"

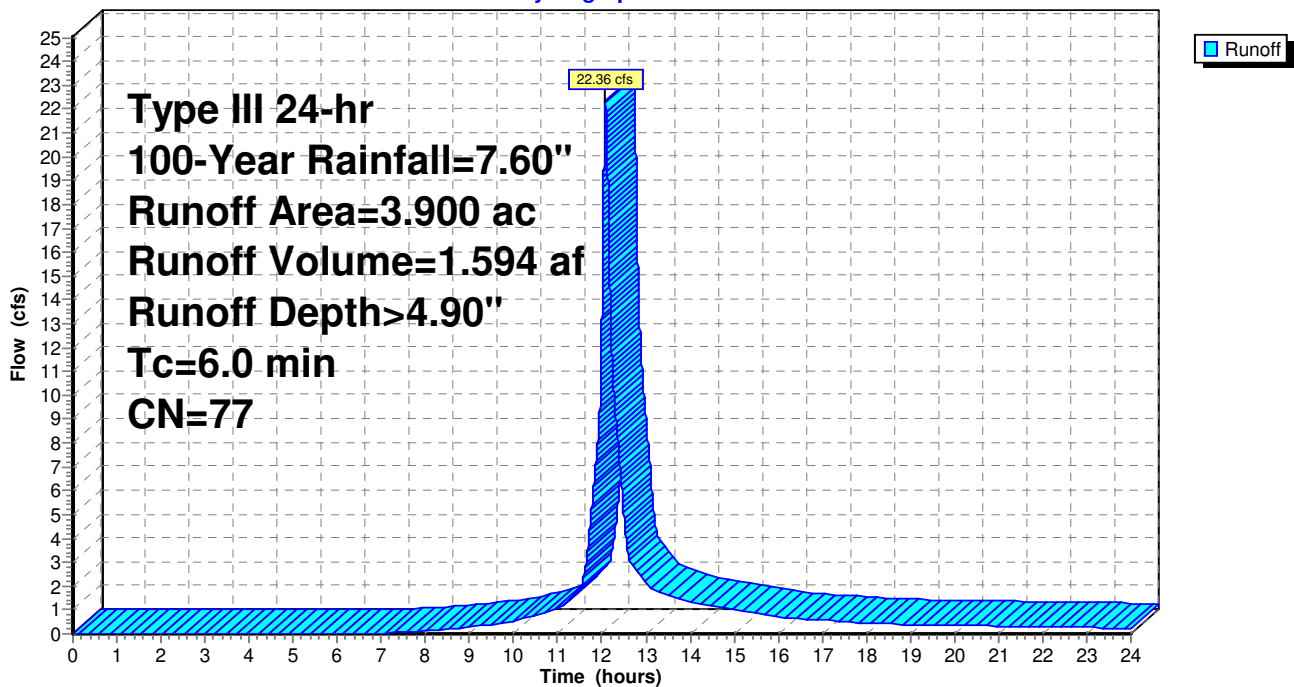
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.020	98	Unconnected roofs
0.090	96	Gravel surface, HSG C
0.110	96	Gravel surface, HSG D
1.720	74	>75% Grass cover, Good, HSG C
0.460	80	>75% Grass cover, Good, HSG D
0.180	73	Woods, Fair, HSG C
1.230	79	Woods, Fair, HSG D
* 0.090	72	Beach
3.900	77	Weighted Average
3.880		99.49% Pervious Area
0.020		0.51% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment SE: Southeast Wetland

Runoff = 7.97 cfs @ 12.087 hrs, Volume= 0.567 af, Depth> 4.79"

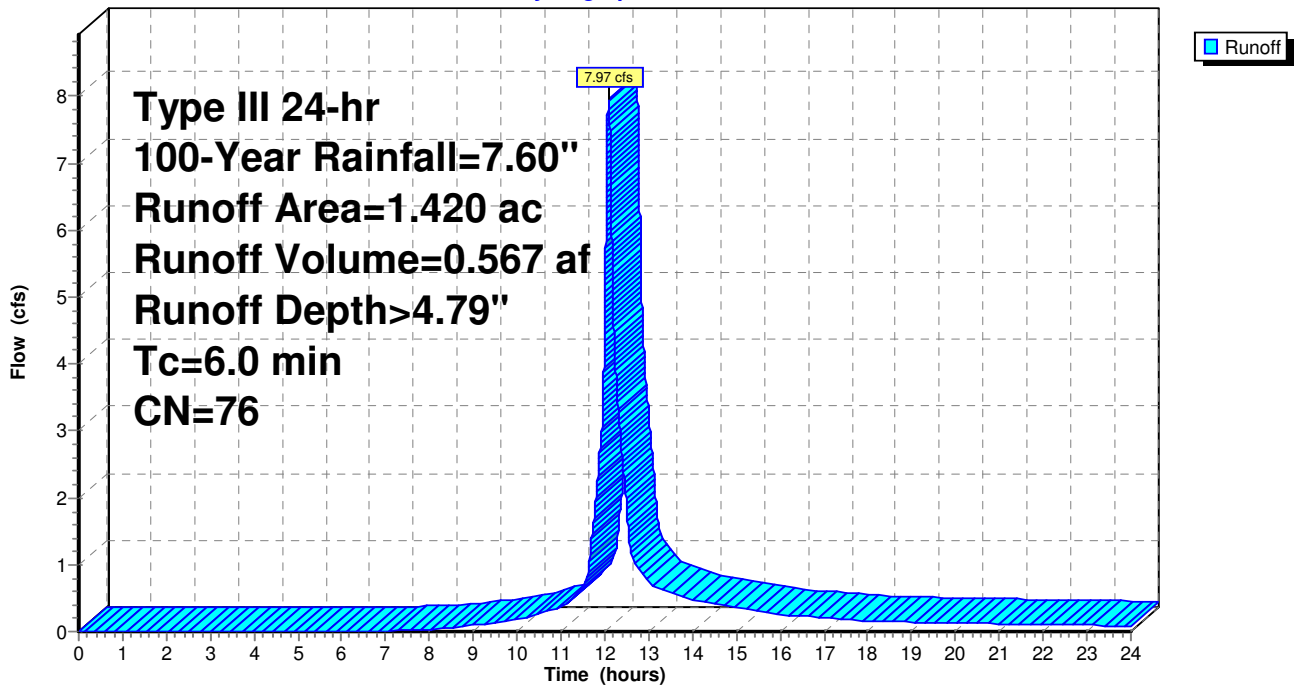
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
0.060	96	Gravel surface, HSG C
0.790	74	>75% Grass cover, Good, HSG C
0.180	80	>75% Grass cover, Good, HSG D
0.360	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.420	76	Weighted Average
1.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: Southeast Wetland

Hydrograph



Starboard Drive Estates Existing

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 12.17 cfs @ 12.211 hrs, Volume= 1.163 af, Depth> 4.78"

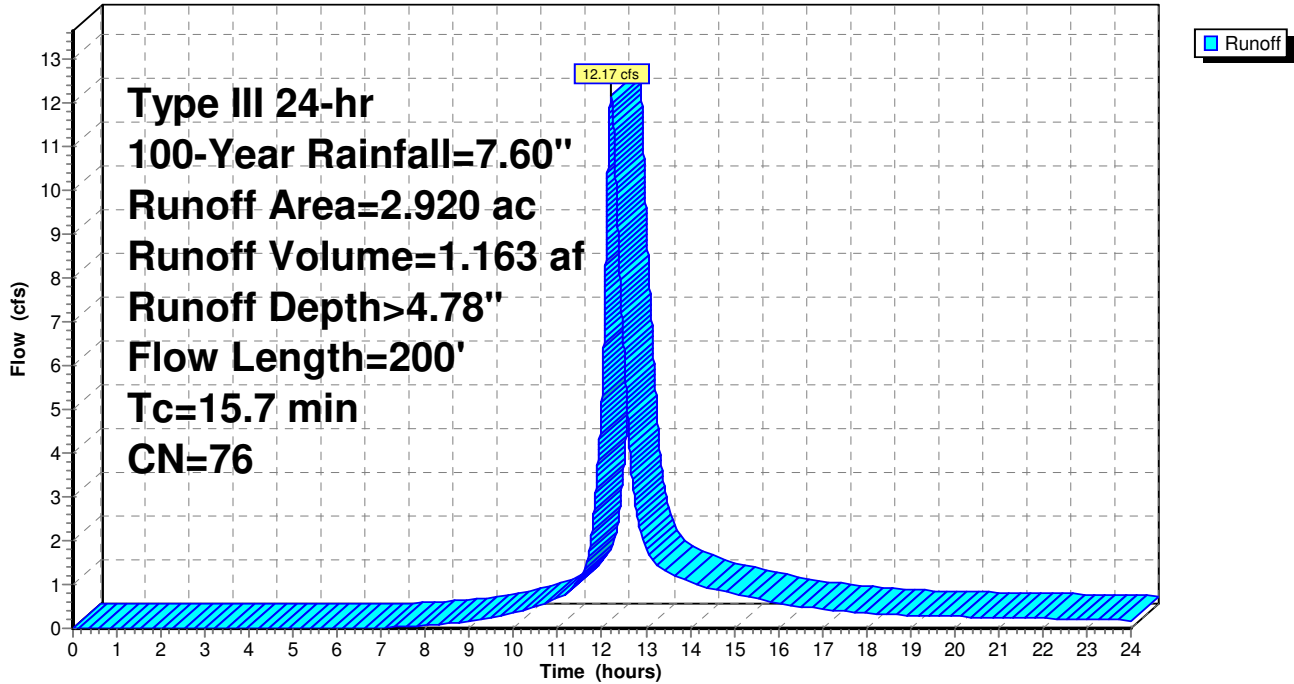
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.090	98	Unconnected roofs
0.150	96	Gravel surface, HSG C
1.020	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
1.050	73	Woods, Fair, HSG C
0.400	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.920	76	Weighted Average
2.830		96.92% Pervious Area
0.090		3.08% Impervious Area
0.090		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



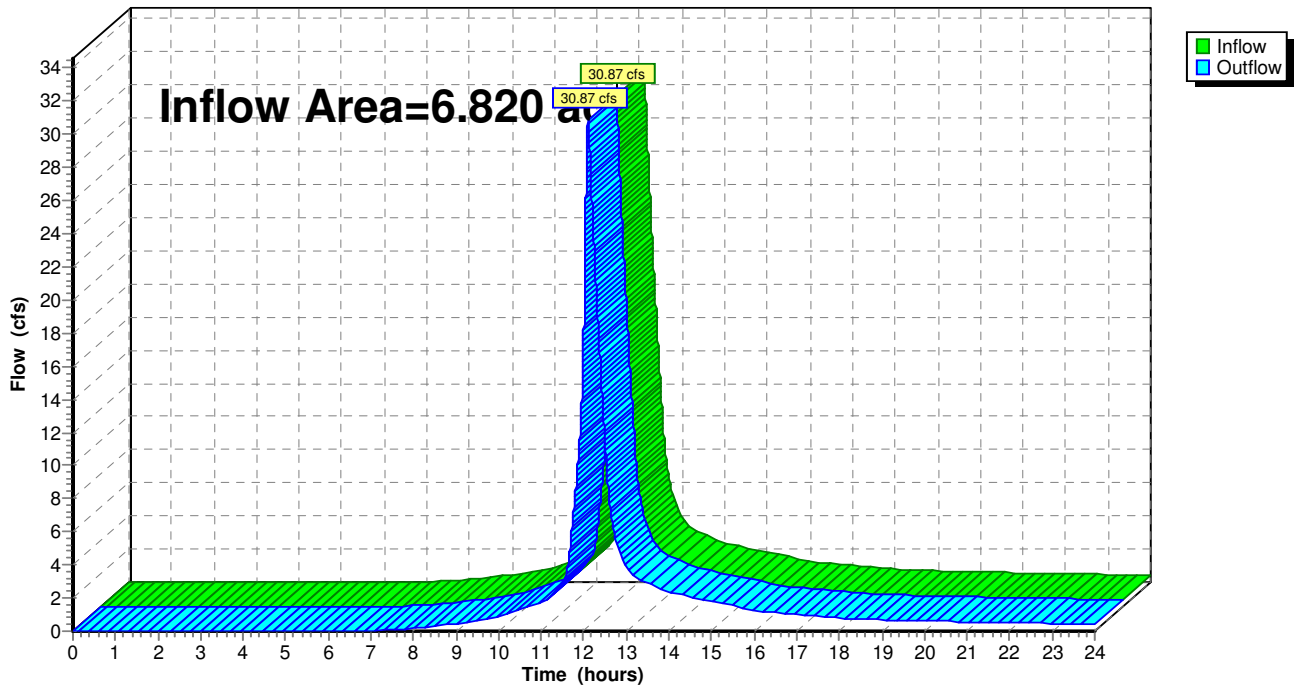
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.820 ac, 1.61% Impervious, Inflow Depth > 4.85" for 100-Year event
Inflow = 30.87 cfs @ 12.100 hrs, Volume= 2.757 af
Outflow = 30.87 cfs @ 12.100 hrs, Volume= 2.757 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



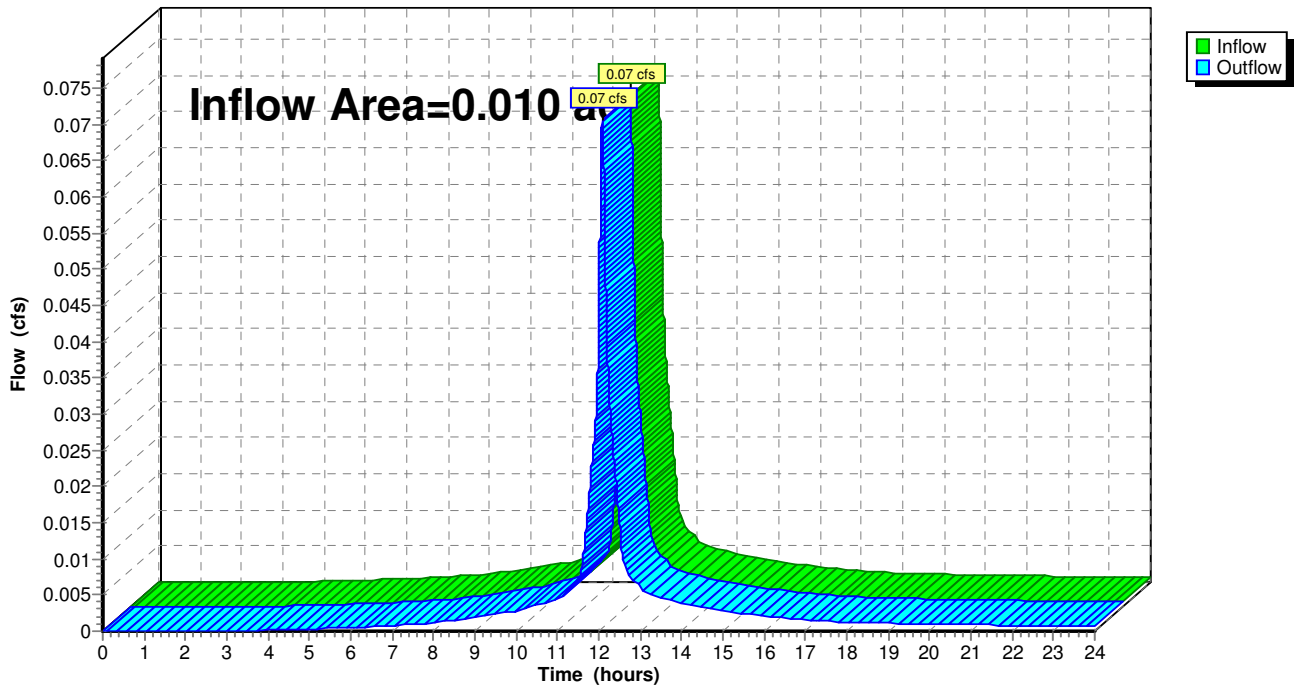
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.010 ac, 50.00% Impervious, Inflow Depth > 6.41" for 100-Year event
Inflow = 0.07 cfs @ 12.087 hrs, Volume= 0.005 af
Outflow = 0.07 cfs @ 12.087 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



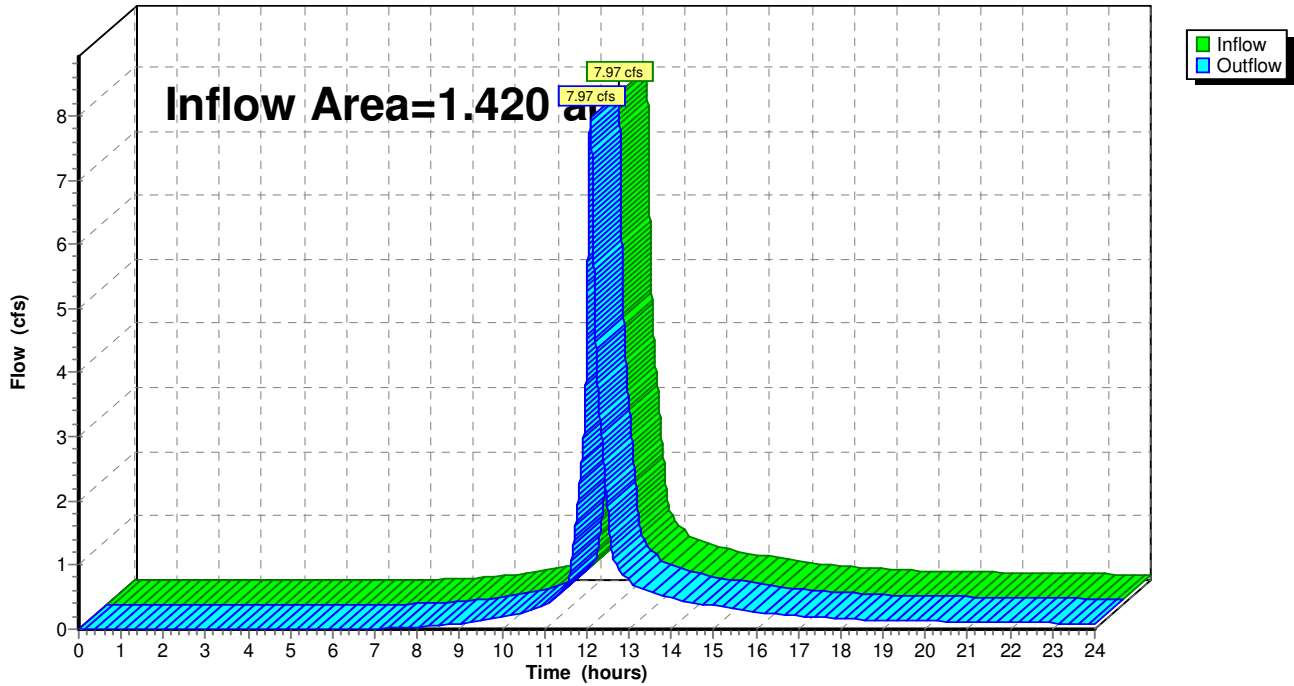
Summary for Reach Southeast: Southeast

Inflow Area = 1.420 ac, 0.00% Impervious, Inflow Depth > 4.79" for 100-Year event
Inflow = 7.97 cfs @ 12.087 hrs, Volume= 0.567 af
Outflow = 7.97 cfs @ 12.087 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Southeast: Southeast

Hydrograph



Proposed Conditions



Rev. #	DATE	BY	DESCRIPTION
1			

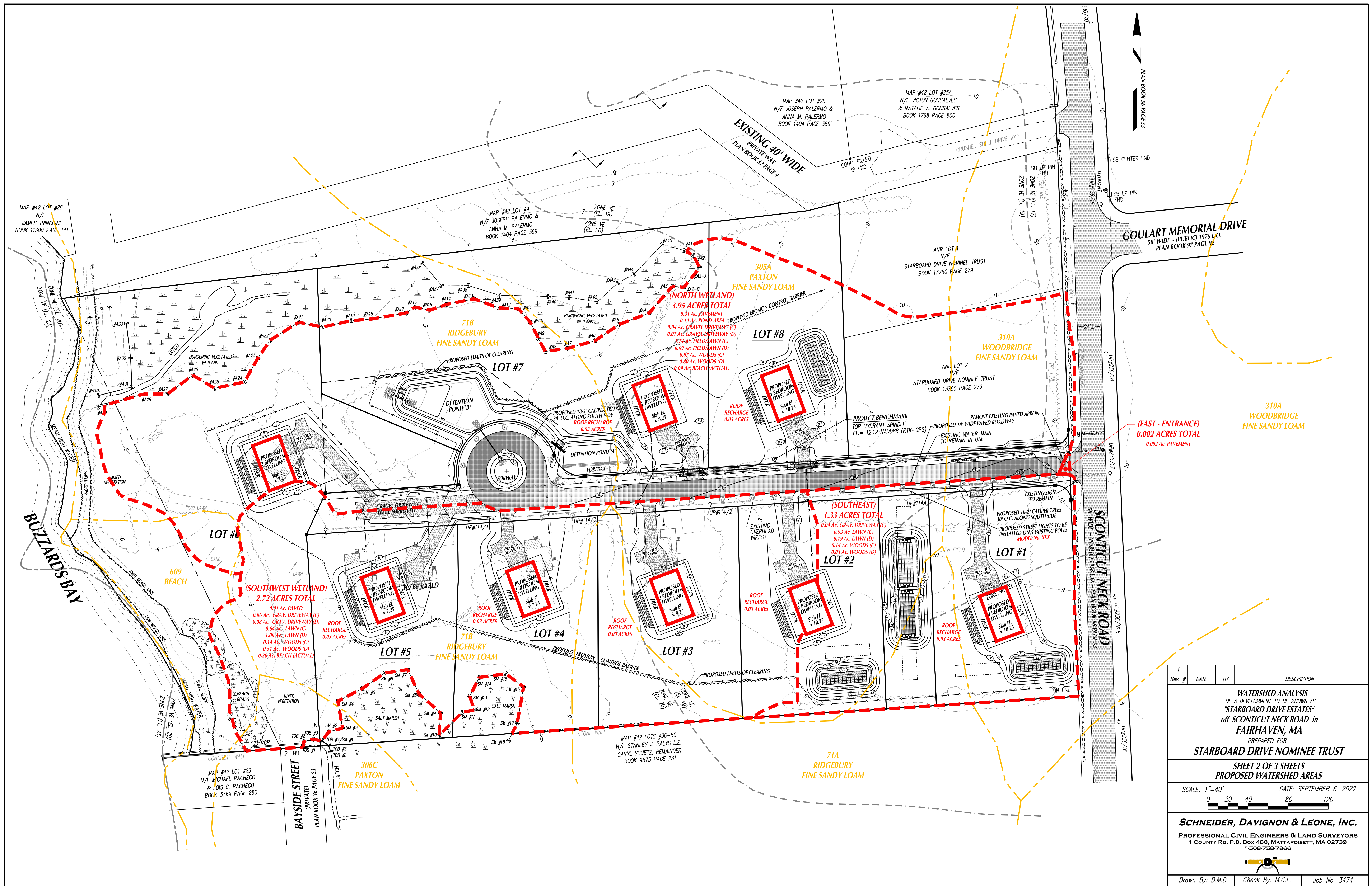
WATERSHED ANALYSIS
OF A DEVELOPMENT TO BE KNOWN AS
"STARBOARD DRIVE ESTATES"
off SCONTICUT NECK ROAD in
FAIRHAVEN, MA
PREPARED FOR
STARBOARD DRIVE NOMINEE TRUST

SHEET 3 OF 3 SHEETS
PROPOSED SUBCATCHMENT AREAS

SCALE: 1"=40' DATE: SEPTEMBER 6, 2022
0 20 40 80 120

SCHNEIDER, DAVIGNON & LEONE, INC.
PROFESSIONAL CIVIL ENGINEERS & LAND SURVEYORS
1 COUNTY RD. P.O. BOX 480, MATTAPOISETT, MA 02739
1-508-758-7866

Drawn By: D.M.D. Check By: M.C.L. Job No. 3474



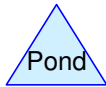
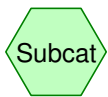
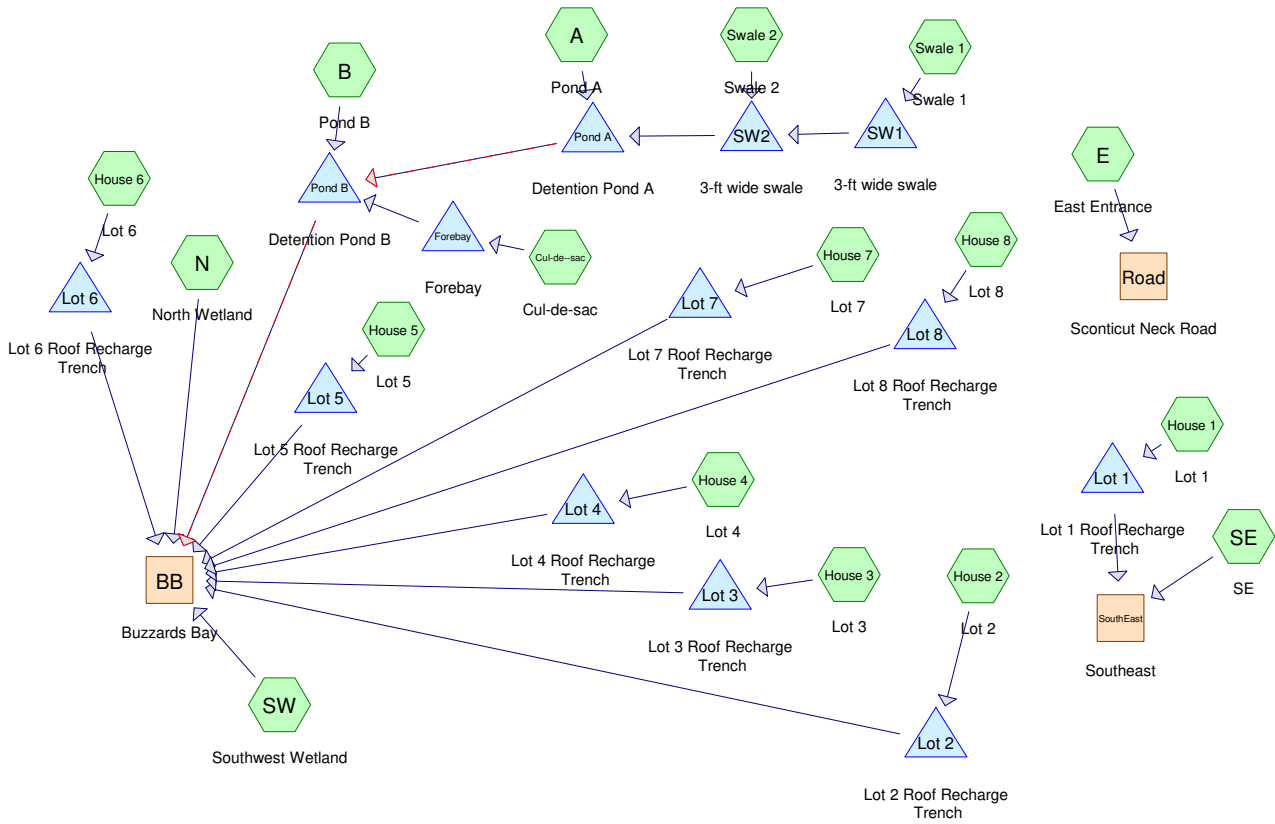
Rev. #	DATE	BY	DESCRIPTION
1			

WATERSHED ANALYSIS
 OF A DEVELOPMENT TO BE KNOWN AS
"STARBOARD DRIVE ESTATES"
 off **SCONTICUT NECK ROAD** in
FAIRHAVEN, MA
 PREPARED FOR
STARBOARD DRIVE NOMINEE TRUST
SHEET 2 OF 3 SHEETS
PROPOSED WATERSHED AREAS

SCALE: 1"=40' DATE: SEPTEMBER 6, 2022
 0 20 40 80 120

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 PROFESSIONAL CIVIL ENGINEERS & LAND SURVEYORS
 1 COUNTY RD. P.O. BOX 480, MATTAPOISETT, MA 02739
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Drawn By: D.M.D. Check By: M.C.L. Job No. 3474



Routing Diagram for Starboard Drive Estates Proposed
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Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Page 2

Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Pond A	Runoff Area=0.200 ac 52.50% Impervious Runoff Depth>2.18" Tc=10.0 min CN=88 Runoff=0.45 cfs 0.036 af
Subcatchment B: Pond B	Runoff Area=0.140 ac 4.29% Impervious Runoff Depth>1.63" Tc=10.0 min CN=81 Runoff=0.23 cfs 0.019 af
Subcatchment Cul-de--sac: Cul-de-sac	Runoff Area=0.120 ac 75.00% Impervious Runoff Depth>2.74" Tc=10.0 min CN=94 Runoff=0.32 cfs 0.027 af
Subcatchment E: East Entrance	Runoff Area=0.002 ac 100.00% Impervious Runoff Depth>3.17" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Subcatchment House 1: Lot 1	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 2: Lot 2	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 3: Lot 3	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 4: Lot 4	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 5: Lot 5	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 6: Lot 6	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 7: Lot 7	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment House 8: Lot 8	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>3.17" Tc=10.0 min CN=98 Runoff=0.09 cfs 0.008 af
Subcatchment N: North Wetland	Runoff Area=3.260 ac 0.00% Impervious Runoff Depth>1.30" Tc=6.0 min CN=76 Runoff=4.84 cfs 0.353 af
Subcatchment SE: SE	Runoff Area=1.330 ac 0.00% Impervious Runoff Depth>1.30" Tc=6.0 min CN=76 Runoff=1.98 cfs 0.144 af
Subcatchment SW: Southwest Wetland	Runoff Area=2.720 ac 0.37% Impervious Runoff Depth>1.42" Flow Length=200' Tc=15.7 min CN=78 Runoff=3.33 cfs 0.323 af
Subcatchment Swale 1: Swale 1	Runoff Area=0.158 ac 67.09% Impervious Runoff Depth>2.36" Tc=6.0 min CN=90 Runoff=0.43 cfs 0.031 af

Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Subcatchment Swale 2: Swale 2 Runoff Area=0.080 ac 50.00% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=86 Runoff=0.19 cfs 0.013 af

Reach BB: Buzzards Bay Inflow=7.49 cfs 0.767 af
Outflow=7.49 cfs 0.767 af

Reach Road: Sconticut Neck Road Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach SouthEast: Southeast Inflow=1.98 cfs 0.146 af
Outflow=1.98 cfs 0.146 af

Pond Forebay: Forebay Peak Elev=5.86' Storage=208 cf Inflow=0.32 cfs 0.027 af
6.0" Round Culvert n=0.016 L=36.0' S=0.0069 1/1" Outflow=0.22 cfs 0.027 af

Pond Lot 1: Lot 1 Roof Recharge Trench Peak Elev=8.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 2: Lot 2 Roof Recharge Trench Peak Elev=8.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 3: Lot 3 Roof Recharge Trench Peak Elev=7.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 4: Lot 4 Roof Recharge Trench Peak Elev=5.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 5: Lot 5 Roof Recharge Trench Peak Elev=5.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 6: Lot 6 Roof Recharge Trench Peak Elev=22.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 7: Lot 7 Roof Recharge Trench Peak Elev=6.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Lot 8: Lot 8 Roof Recharge Trench Peak Elev=8.79' Storage=145 cf Inflow=0.09 cfs 0.008 af
Discarded=0.00 cfs 0.004 af Primary=0.03 cfs 0.002 af Outflow=0.03 cfs 0.005 af

Pond Pond A: Detention Pond A Peak Elev=6.61' Storage=0.020 af Inflow=1.04 cfs 0.081 af
Discarded=0.02 cfs 0.023 af Primary=0.70 cfs 0.050 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 0.072 af

Pond Pond B: Detention Pond B Peak Elev=5.52' Storage=691 cf Inflow=1.11 cfs 0.096 af
Discarded=0.02 cfs 0.014 af Primary=0.87 cfs 0.079 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.093 af

Pond SW1: 3-ft wide swale Peak Elev=8.69' Storage=25 cf Inflow=0.43 cfs 0.031 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=0.43 cfs 0.031 af

Pond SW2: 3-ft wide swale Peak Elev=7.84' Storage=37 cf Inflow=0.62 cfs 0.044 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=0.61 cfs 0.044 af

Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Total Runoff Area = 8.250 ac Runoff Volume = 1.011 af Average Runoff Depth = 1.47"
92.74% Pervious = 7.651 ac 7.26% Impervious = 0.599 ac

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Summary for Subcatchment A: Pond A

Runoff = 0.45 cfs @ 12.144 hrs, Volume= 0.036 af, Depth> 2.18"

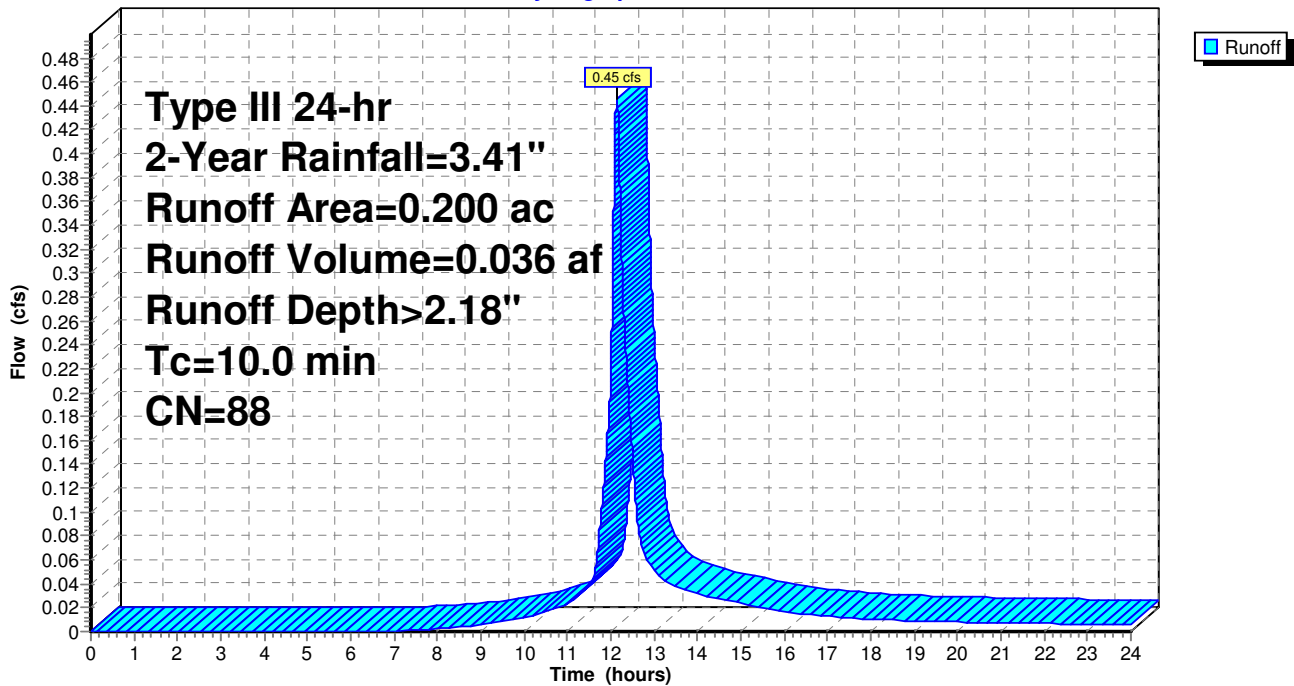
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.080	98	Paved roads
0.040	74	>75% Grass cover, Good, HSG C
0.055	80	>75% Grass cover, Good, HSG D
* 0.025	98	Pond Bottom
0.200	88	Weighted Average
0.095		47.50% Pervious Area
0.105		52.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment A: Pond A

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment B: Pond B

Runoff = 0.23 cfs @ 12.144 hrs, Volume= 0.019 af, Depth> 1.63"

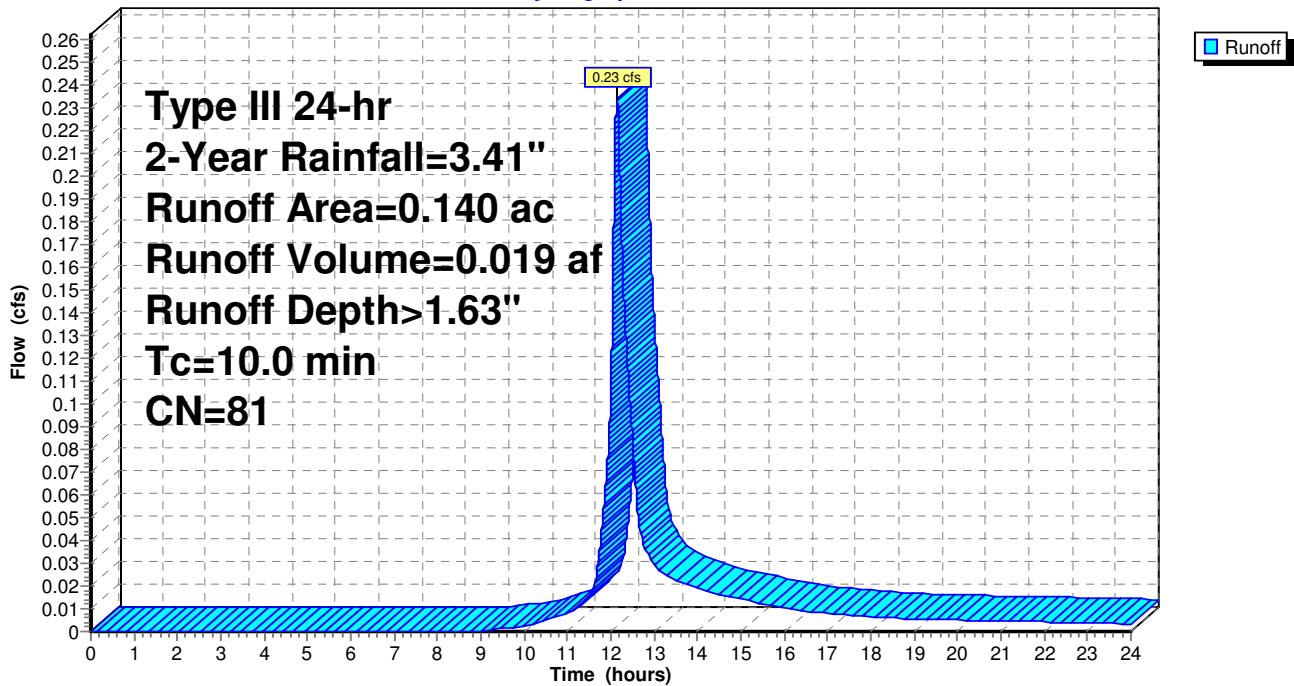
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.134	80	>75% Grass cover, Good, HSG D
* 0.006	98	Pond Bottom
0.140	81	Weighted Average
0.134		95.71% Pervious Area
0.006		4.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment B: Pond B

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment Cul-de--sac: Cul-de-sac

Runoff = 0.32 cfs @ 12.133 hrs, Volume= 0.027 af, Depth> 2.74"

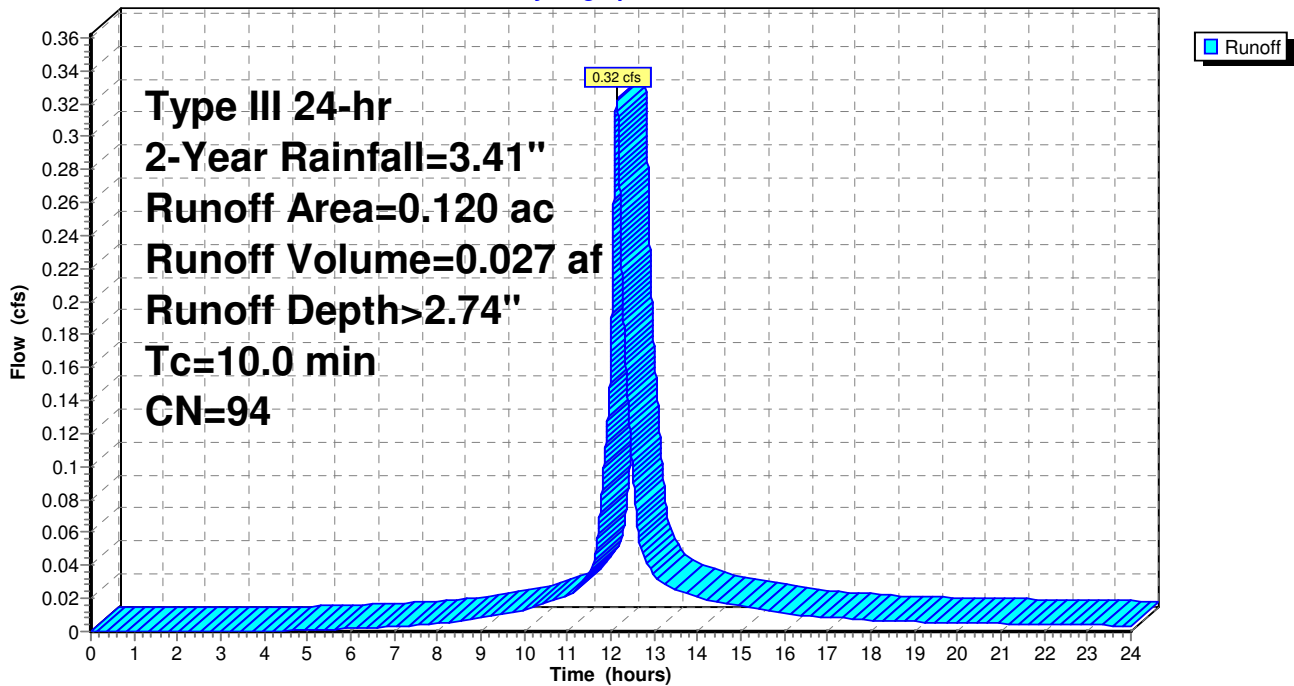
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.090	98	Paved road
0.030	80	>75% Grass cover, Good, HSG D
0.120	94	Weighted Average
0.030		25.00% Pervious Area
0.090		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Cul-de--sac: Cul-de-sac

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment E: East Entrance

Runoff = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Depth> 3.17"

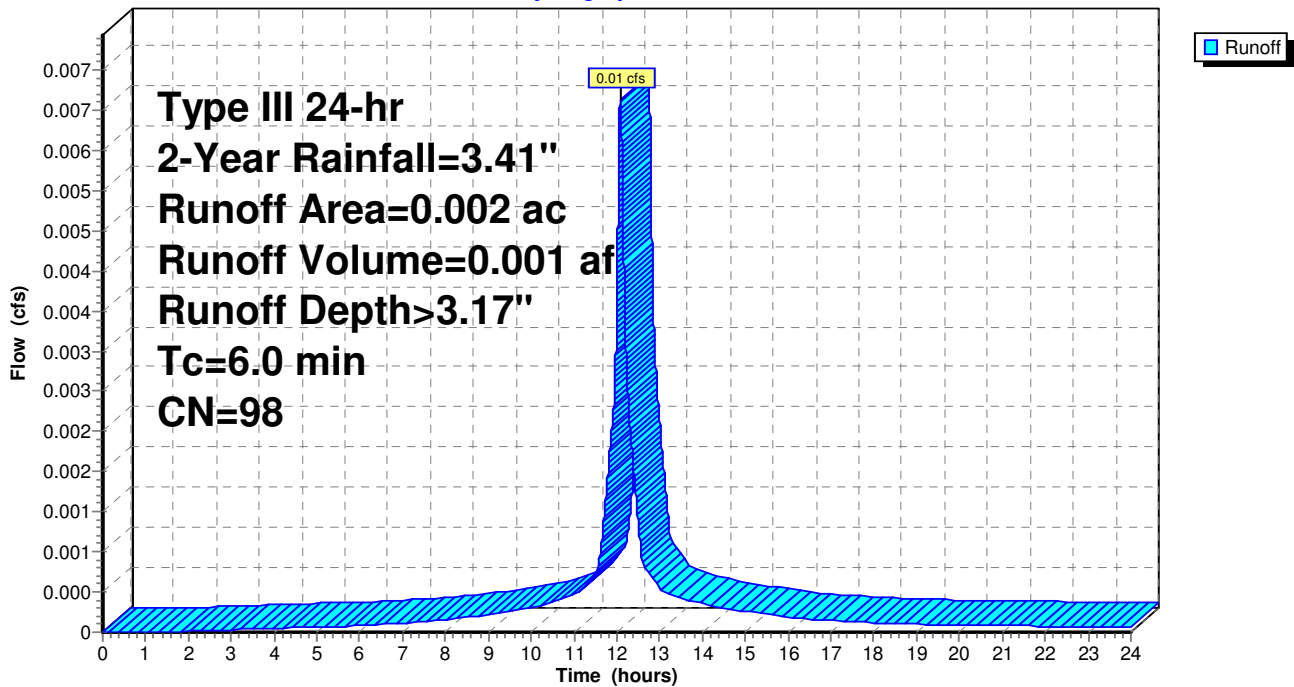
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.002	98	Paved roads
0.002		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 1: Lot 1

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

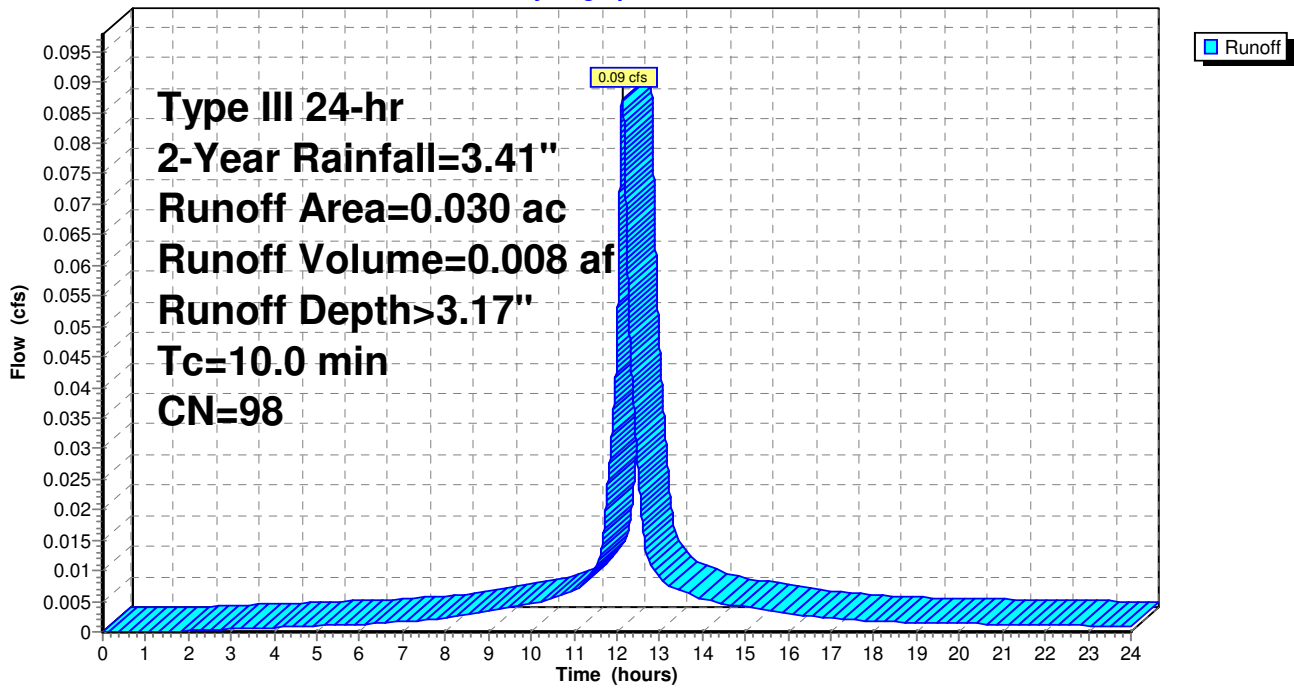
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 1: Lot 1

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 2: Lot 2

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

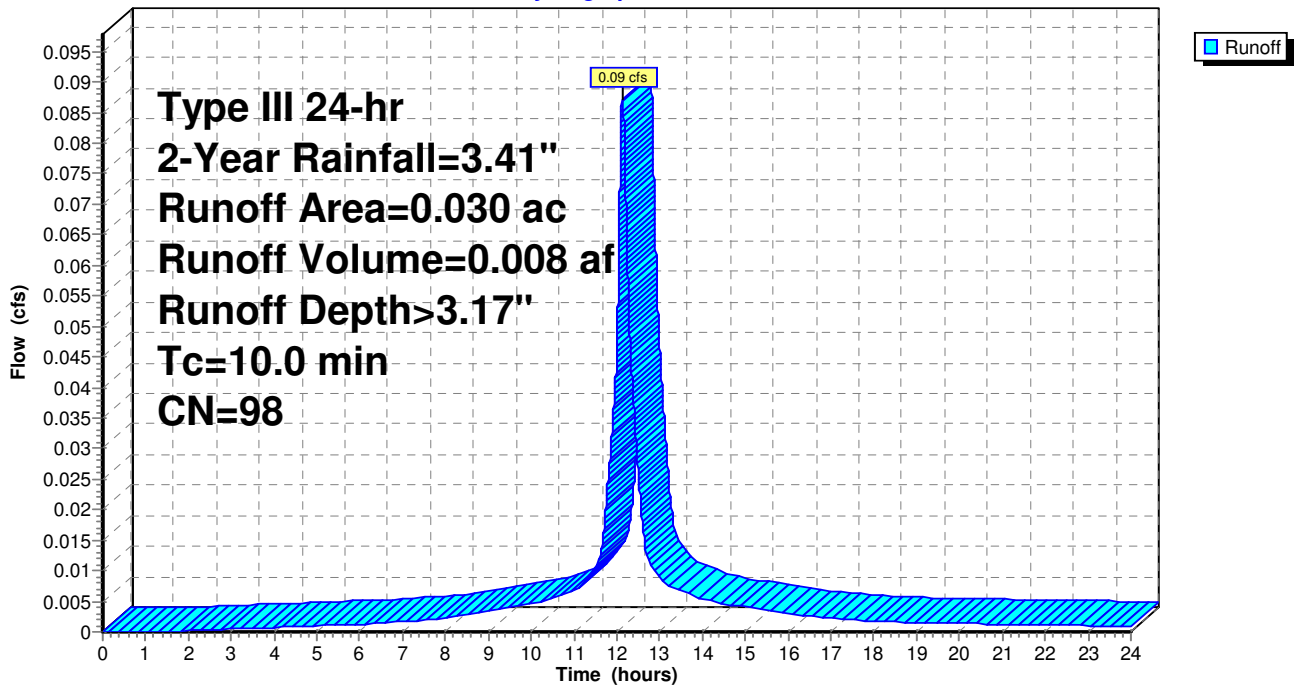
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 2: Lot 2

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 3: Lot 3

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

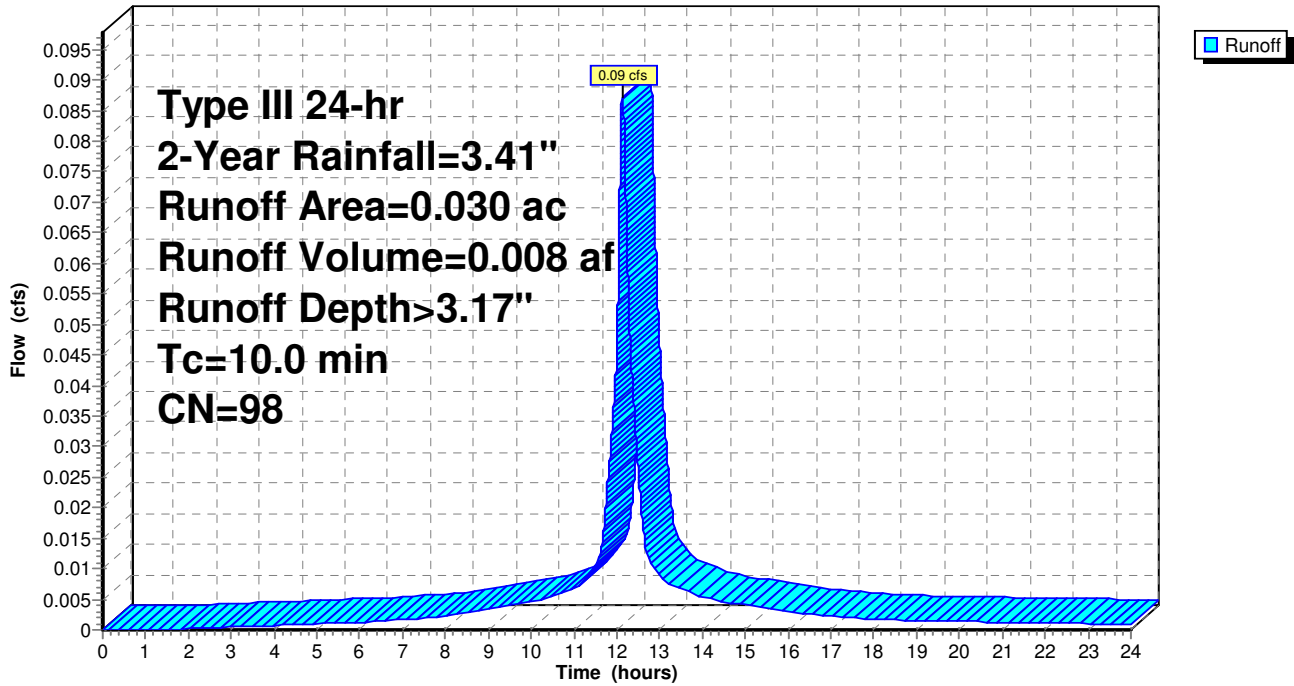
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 3: Lot 3

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 4: Lot 4

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

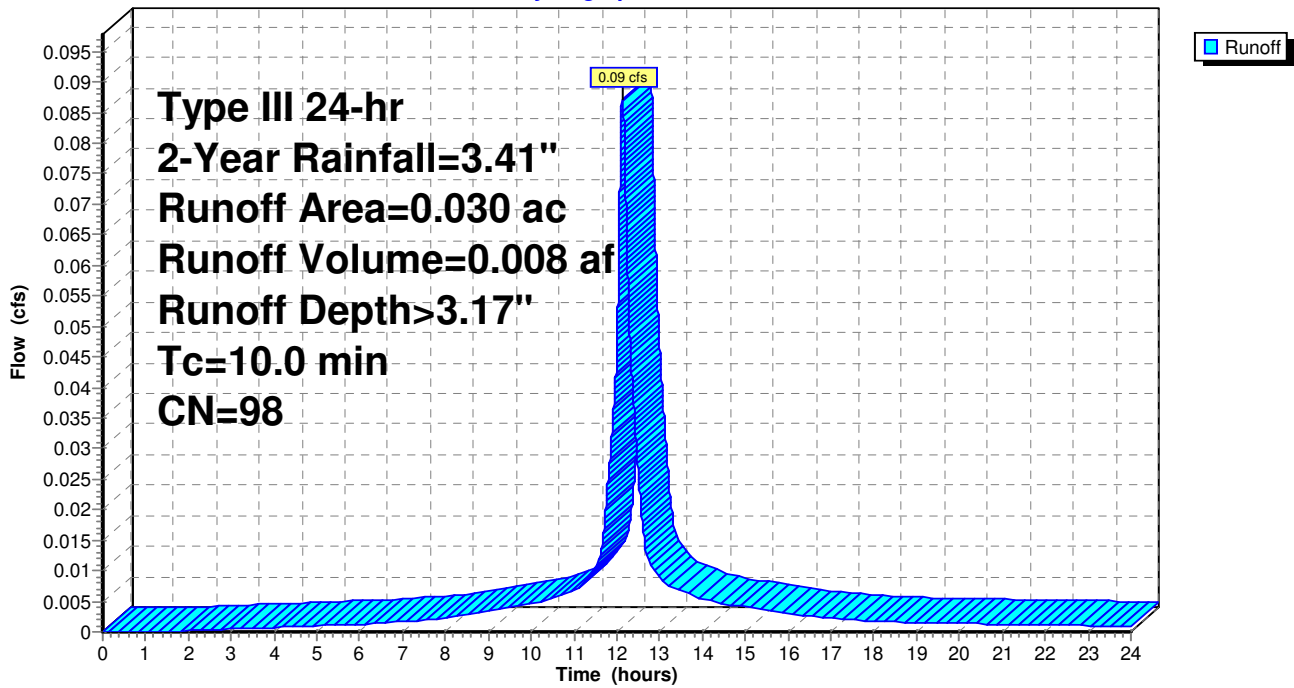
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 4: Lot 4

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 5: Lot 5

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

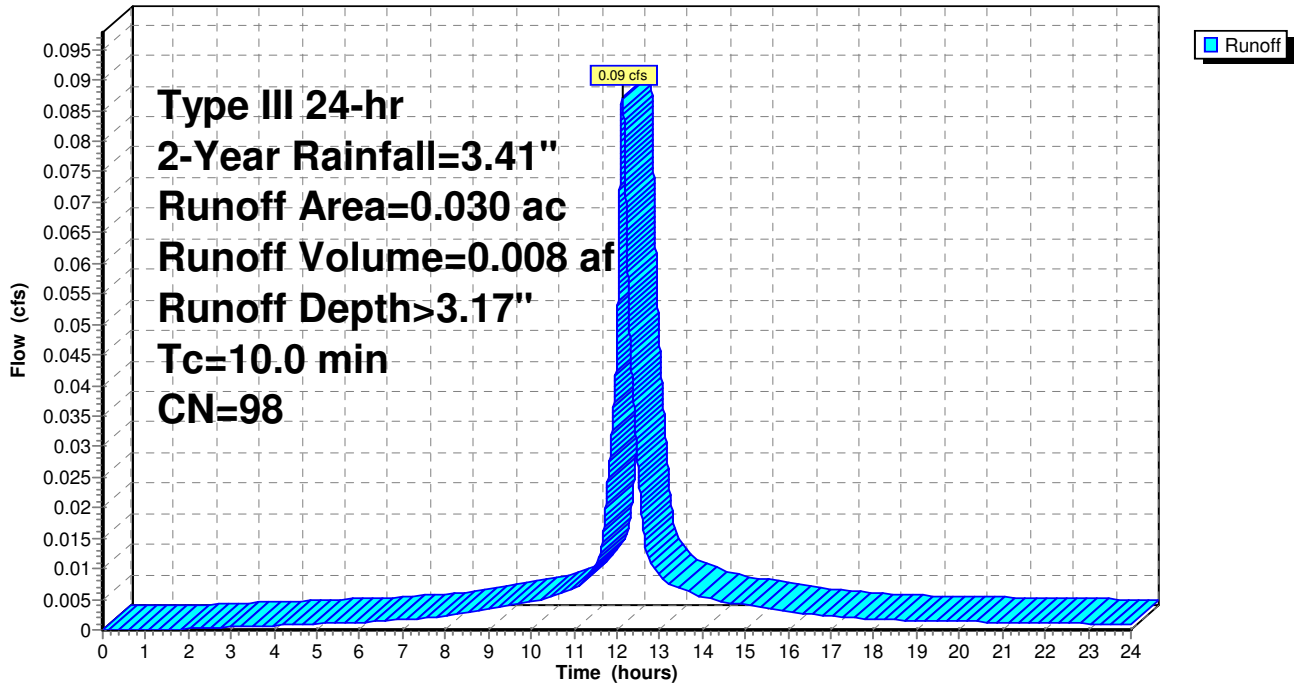
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 5: Lot 5

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 6: Lot 6

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

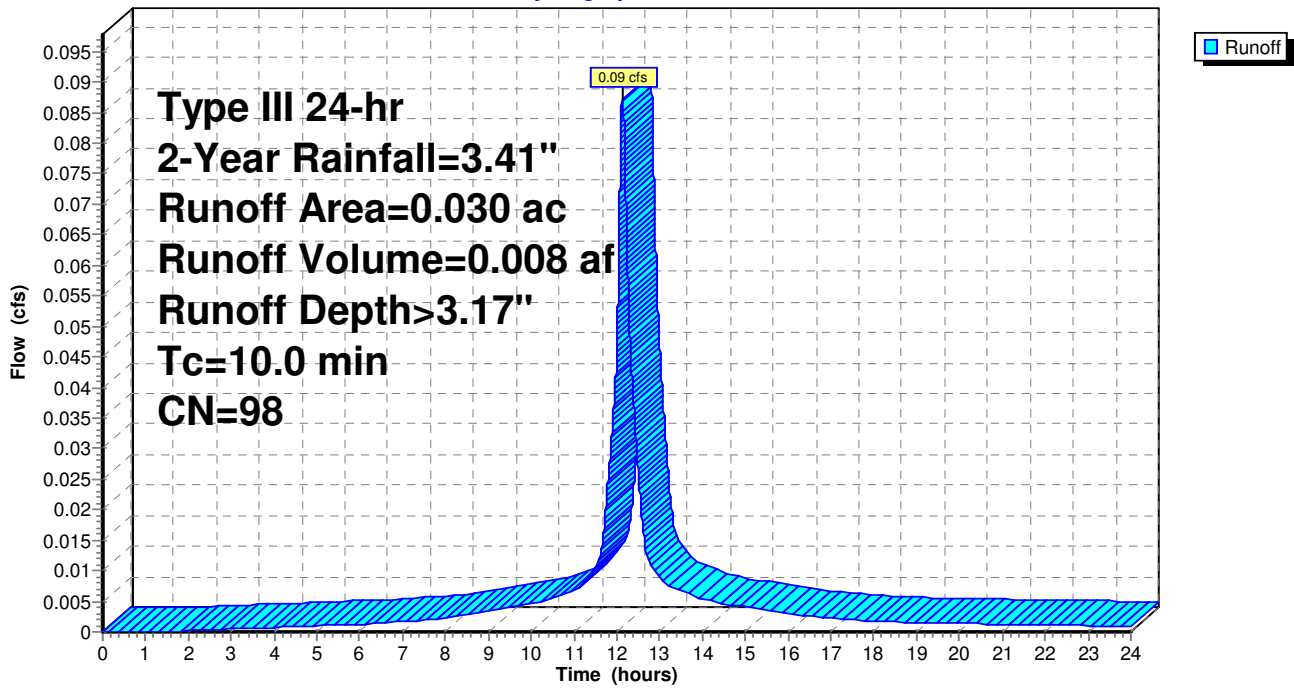
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 6: Lot 6

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 7: Lot 7

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

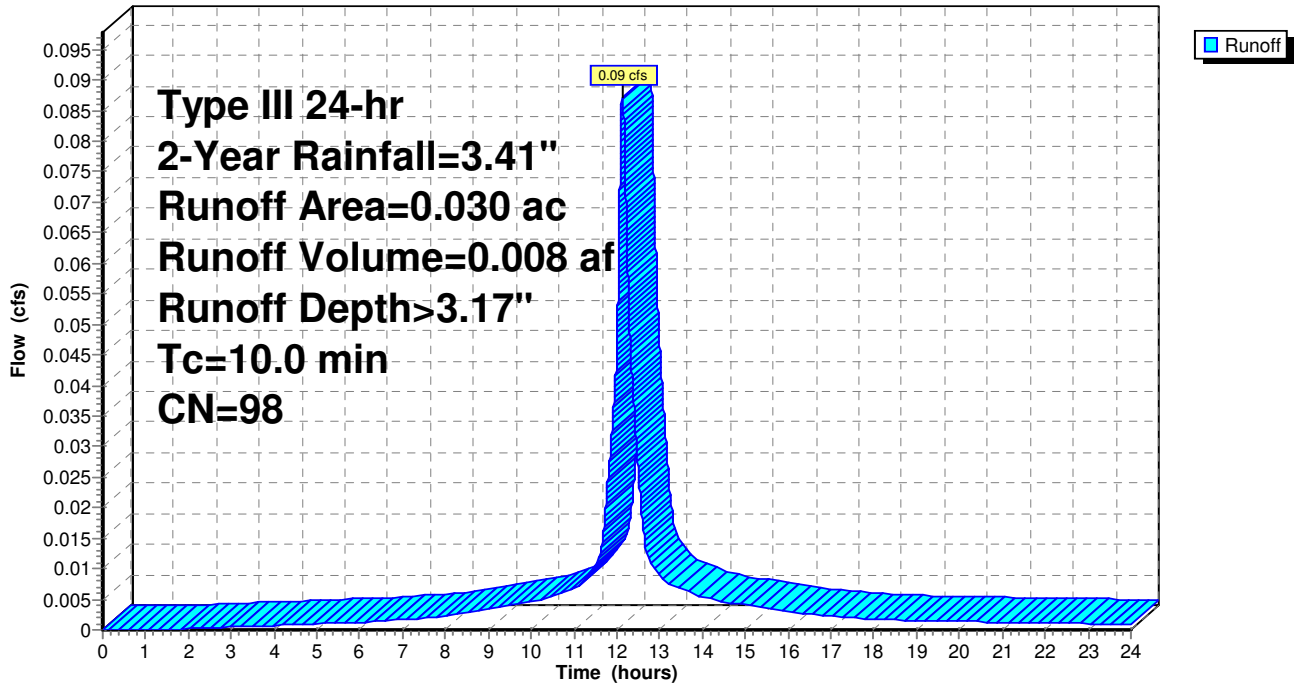
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 7: Lot 7

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment House 8: Lot 8

Runoff = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af, Depth> 3.17"

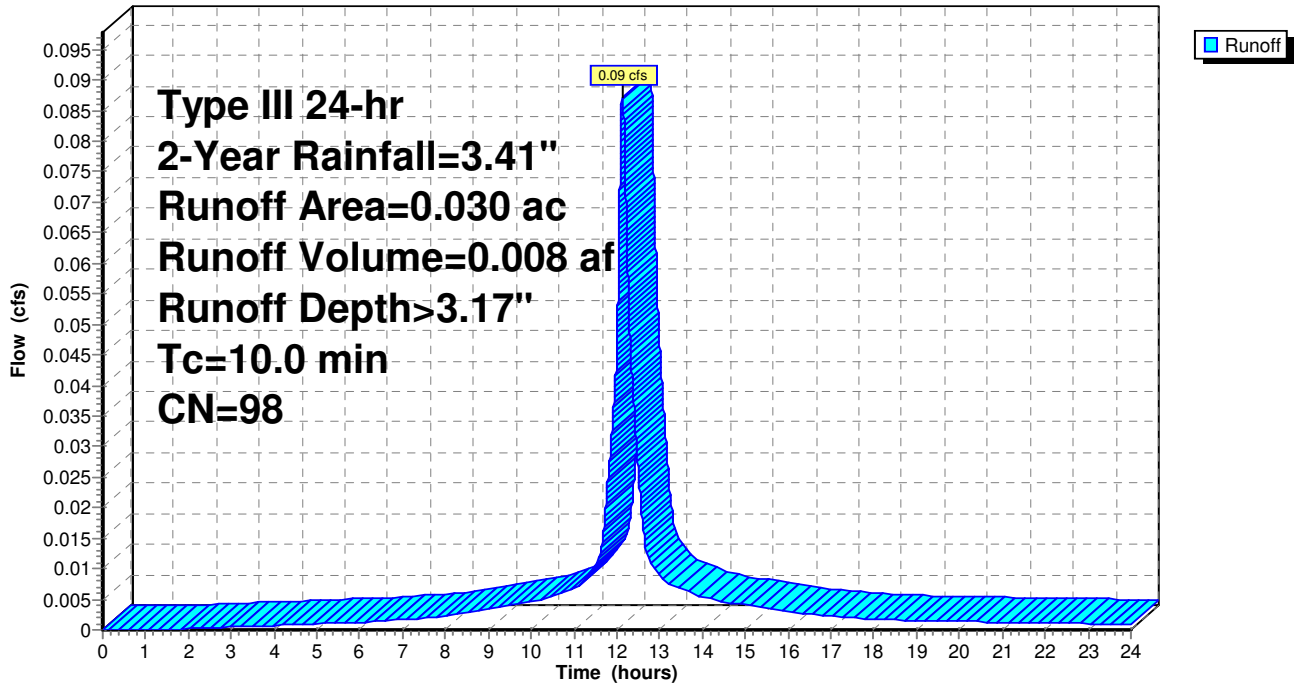
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 8: Lot 8

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment N: North Wetland

Runoff = 4.84 cfs @ 12.093 hrs, Volume= 0.353 af, Depth> 1.30"

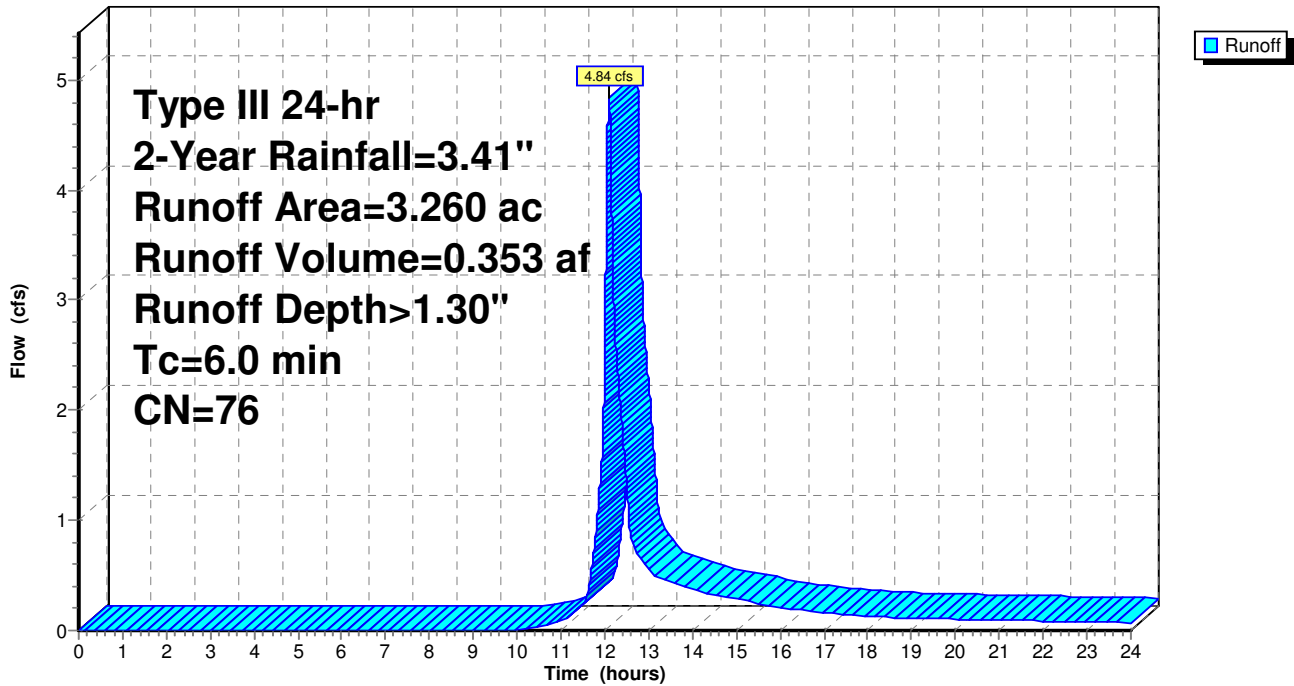
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.070	91	Gravel roads, HSG D
1.610	74	>75% Grass cover, Good, HSG C
0.580	80	>75% Grass cover, Good, HSG D
0.070	70	Woods, Good, HSG C
0.800	77	Woods, Good, HSG D
* 0.090	72	Beach
3.260	76	Weighted Average
3.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment SE: SE

Runoff = 1.98 cfs @ 12.093 hrs, Volume= 0.144 af, Depth> 1.30"

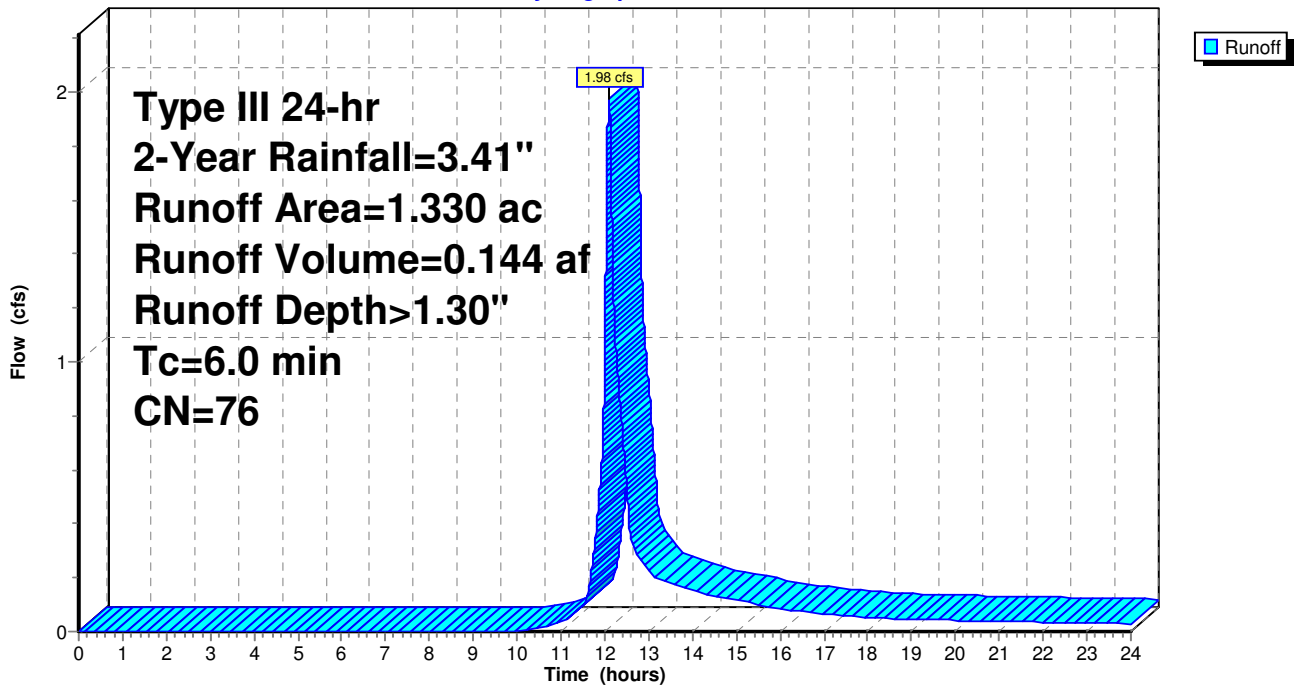
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.040	96	Gravel surface, HSG C
0.930	74	>75% Grass cover, Good, HSG C
0.190	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.330	76	Weighted Average
1.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: SE

Hydrograph



Starboard Drive Estates Proposed

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 3.33 cfs @ 12.229 hrs, Volume= 0.323 af, Depth> 1.42"

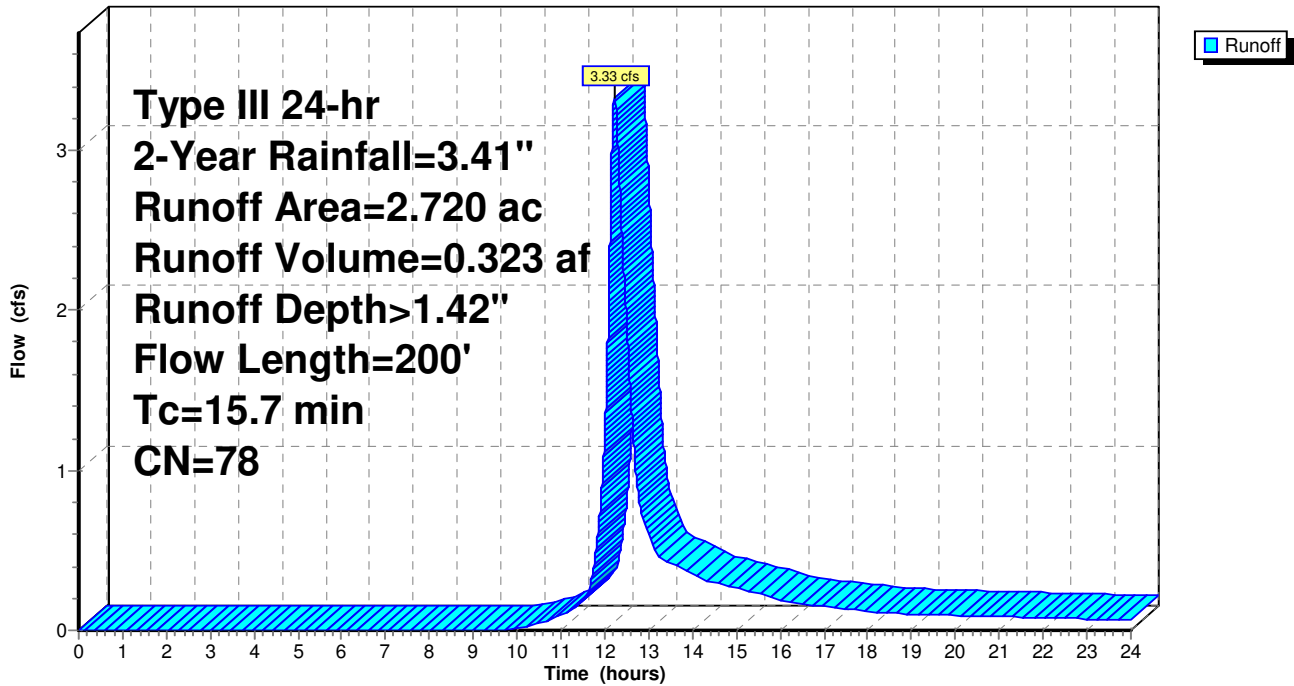
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.010	98	Paved
0.060	96	Gravel surface, HSG C
0.080	96	Gravel surface, HSG D
0.640	74	>75% Grass cover, Good, HSG C
1.080	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.510	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.720	78	Weighted Average
2.710		99.63% Pervious Area
0.010		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



Starboard Drive Estates Proposed

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Summary for Subcatchment Swale 1: Swale 1

Runoff = 0.43 cfs @ 12.087 hrs, Volume= 0.031 af, Depth> 2.36"

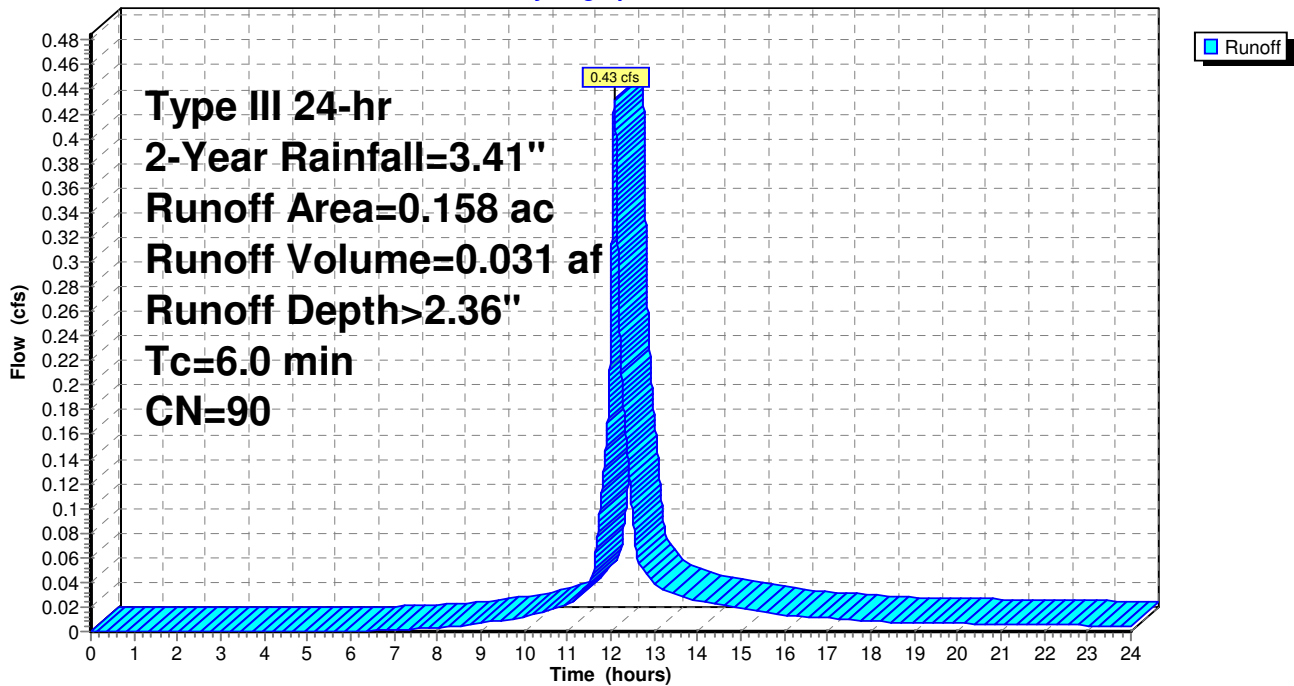
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.106	98	Paved Roadway
0.052	74	>75% Grass cover, Good, HSG C
0.158	90	Weighted Average
0.052		32.91% Pervious Area
0.106		67.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 1: Swale 1

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Subcatchment Swale 2: Swale 2

Runoff = 0.19 cfs @ 12.087 hrs, Volume= 0.013 af, Depth> 2.02"

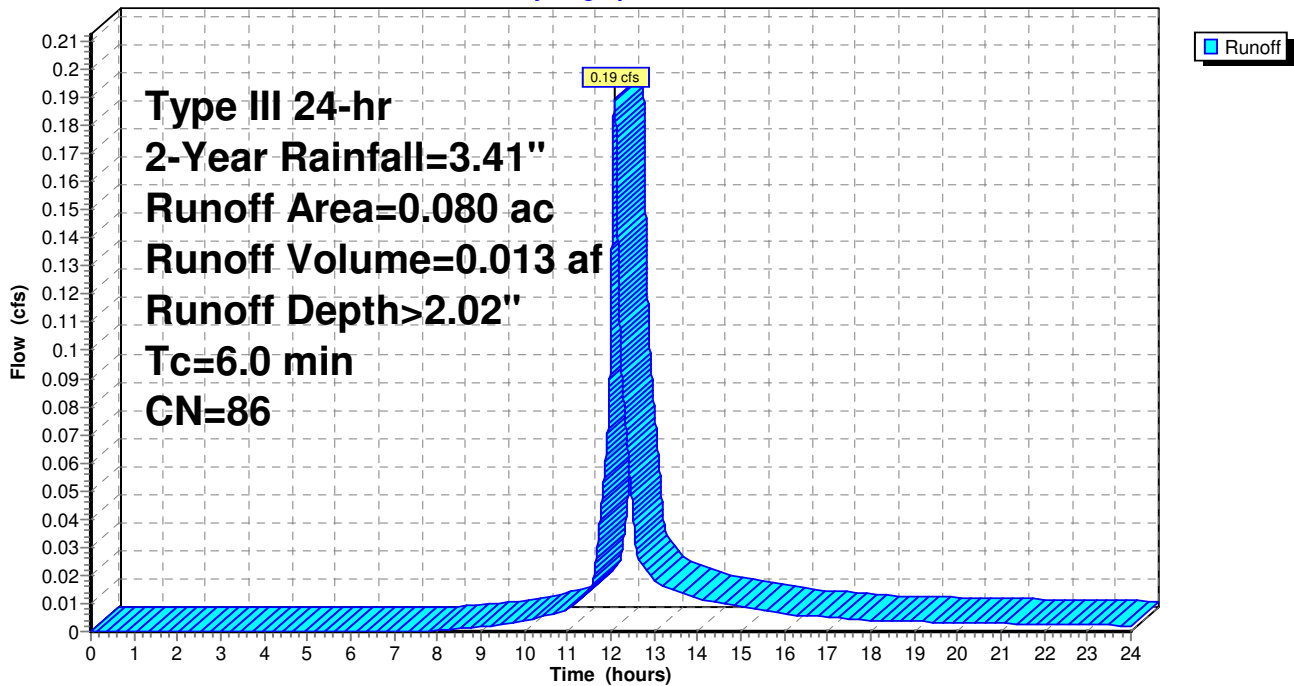
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
* 0.040	98	Paved Roadway
0.040	74	>75% Grass cover, Good, HSG C
0.080	86	Weighted Average
0.040		50.00% Pervious Area
0.040		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 2: Swale 2

Hydrograph



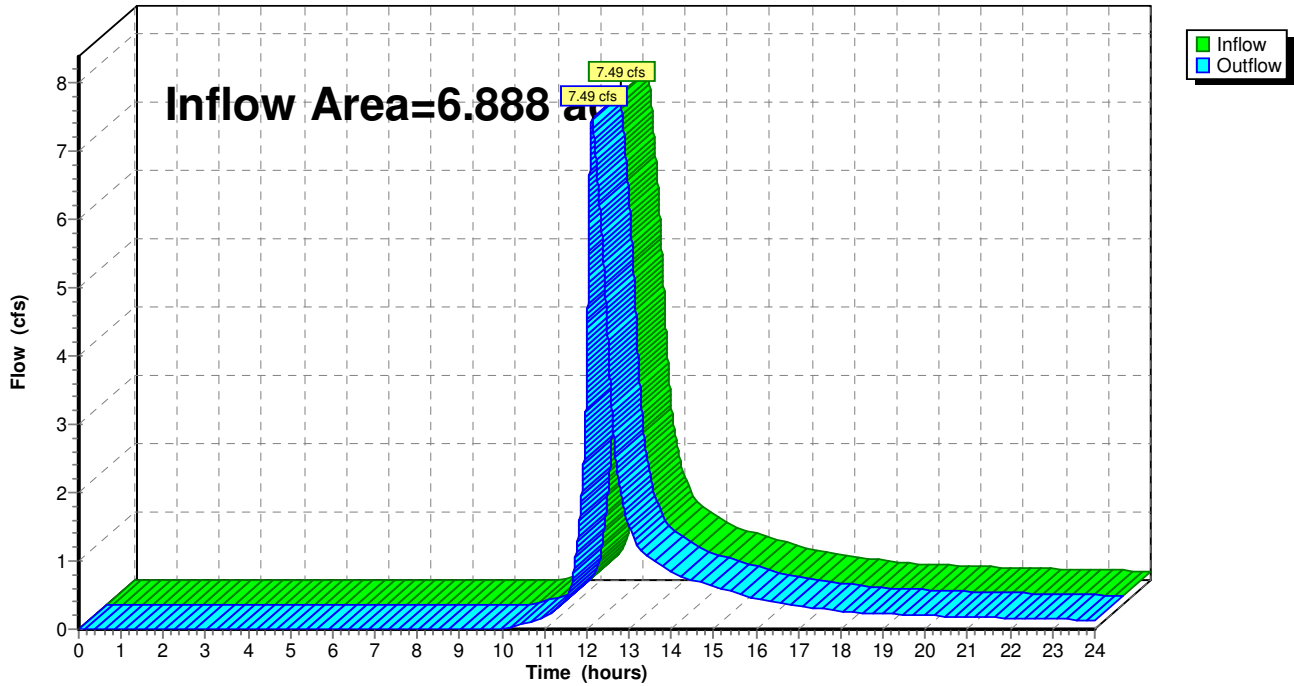
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.888 ac, 8.23% Impervious, Inflow Depth > 1.34" for 2-Year event
Inflow = 7.49 cfs @ 12.124 hrs, Volume= 0.767 af
Outflow = 7.49 cfs @ 12.124 hrs, Volume= 0.767 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



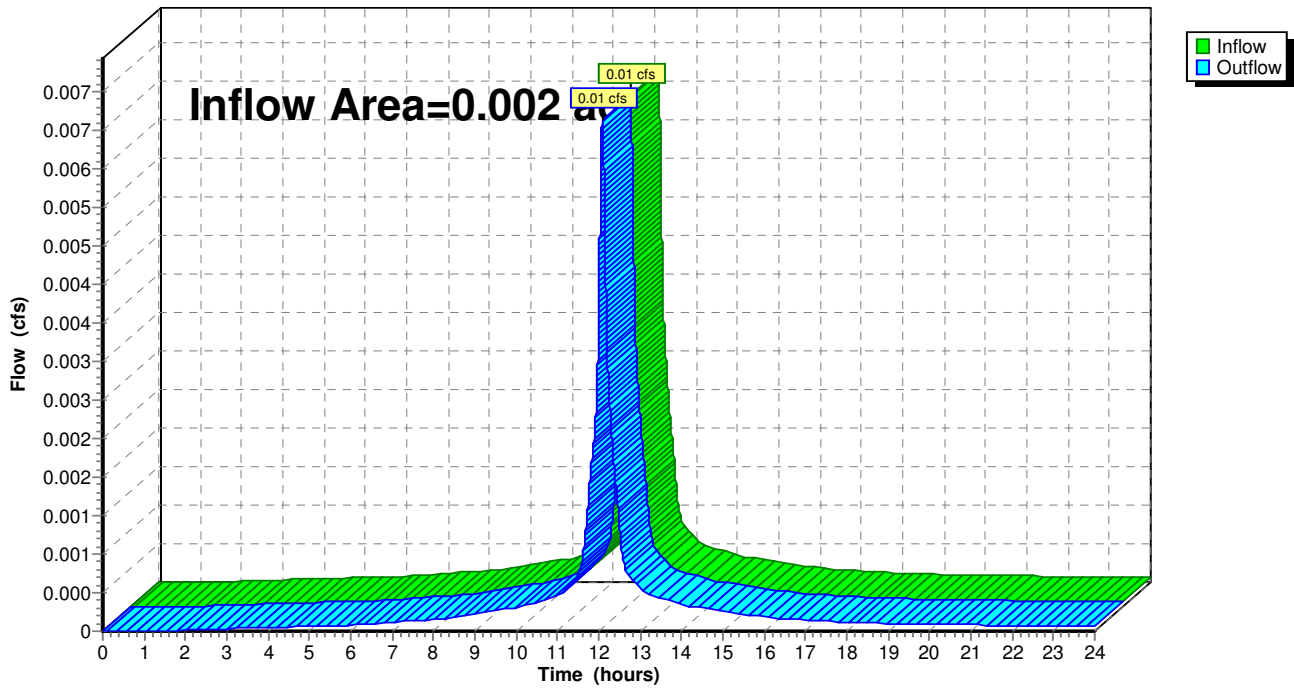
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.002 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
Inflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



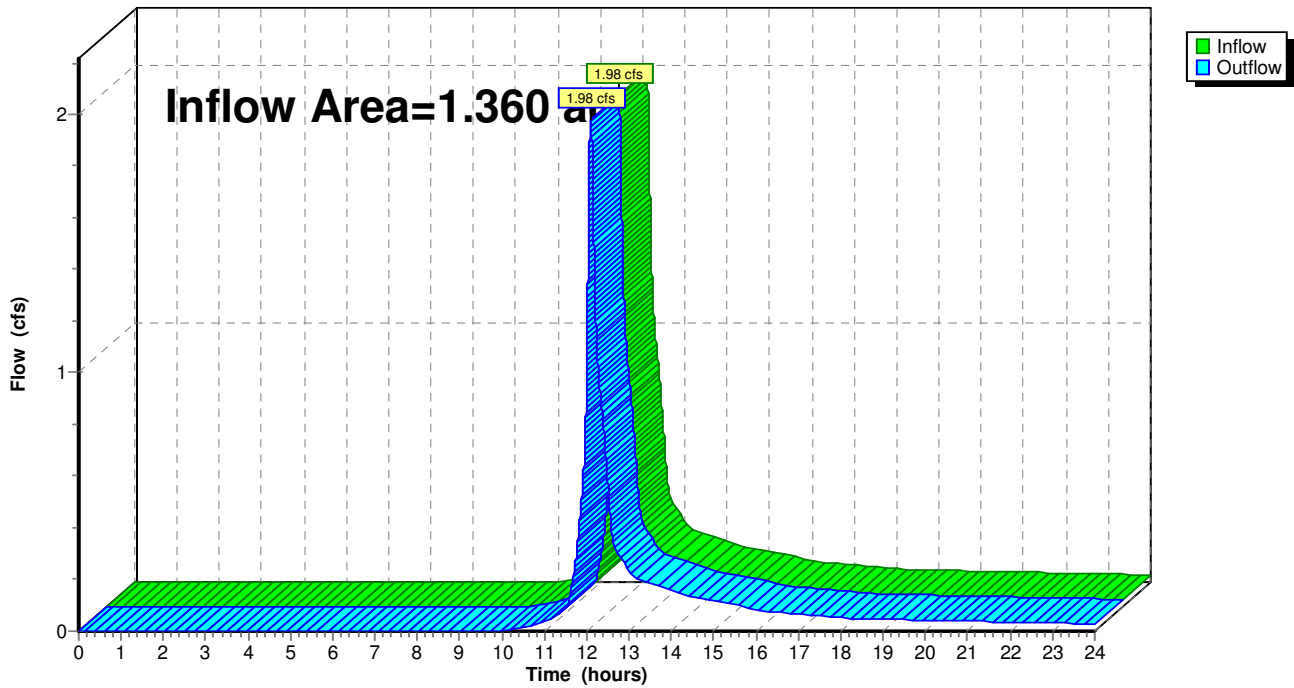
Summary for Reach SouthEast: Southeast

Inflow Area = 1.360 ac, 2.21% Impervious, Inflow Depth > 1.29" for 2-Year event
Inflow = 1.98 cfs @ 12.093 hrs, Volume= 0.146 af
Outflow = 1.98 cfs @ 12.093 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach SouthEast: Southeast

Hydrograph



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Summary for Pond Forebay: Forebay

Inflow Area = 0.120 ac, 75.00% Impervious, Inflow Depth > 2.74" for 2-Year event
 Inflow = 0.32 cfs @ 12.133 hrs, Volume= 0.027 af
 Outflow = 0.22 cfs @ 12.249 hrs, Volume= 0.027 af, Atten= 31%, Lag= 6.9 min
 Primary = 0.22 cfs @ 12.249 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.86' @ 12.249 hrs Surf.Area= 705 sf Storage= 208 cf

Plug-Flow detention time= 36.4 min calculated for 0.027 af (98% of inflow)
 Center-of-Mass det. time= 25.1 min (812.8 - 787.7)

Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	1,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

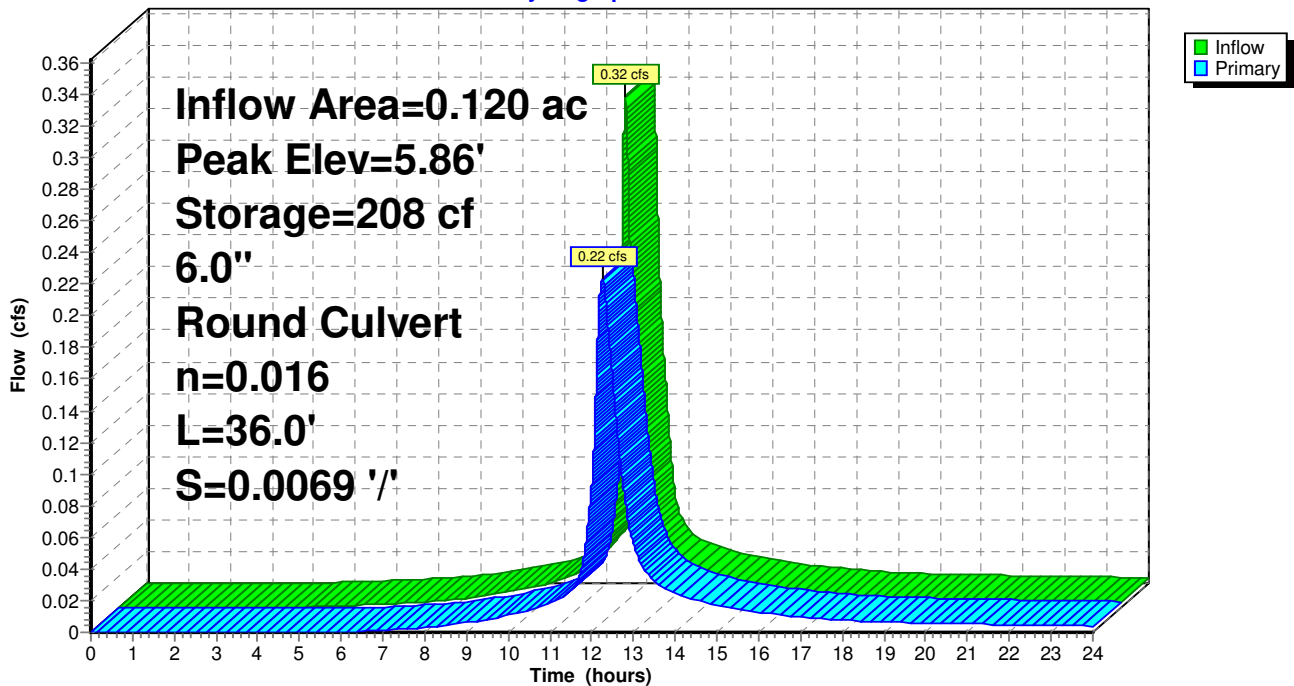
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	451	0	0
6.00	804	314	314
7.00	1,256	1,030	1,344

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	6.0" Round Culvert L= 36.0' Ke= 0.020 Inlet / Outlet Invert= 5.50' / 5.25' S= 0.0069 '/ Cc= 0.900 n= 0.016, Flow Area= 0.20 sf

Primary OutFlow Max=0.22 cfs @ 12.249 hrs HW=5.86' TW=5.49' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 0.22 cfs @ 2.08 fps)

Pond Forebay: Forebay

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond Lot 1: Lot 1 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=8.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

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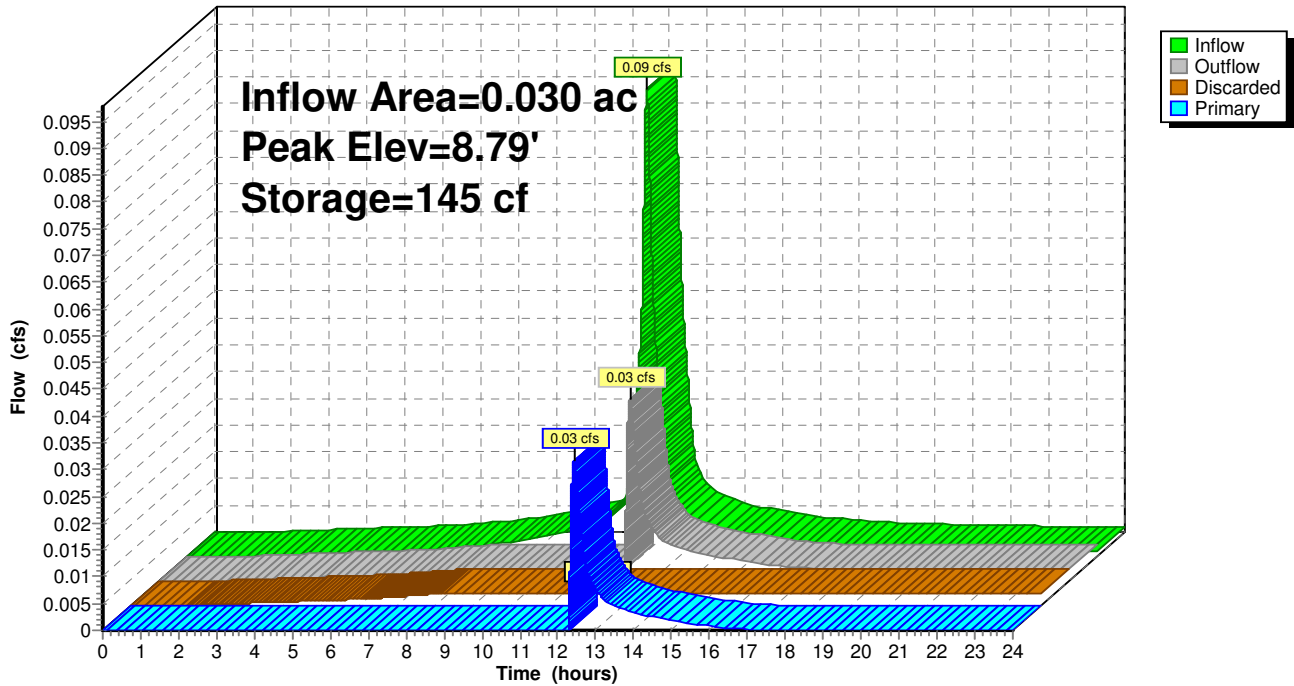
Type III 24-hr 2-Year Rainfall=3.41"

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Pond Lot 1: Lot 1 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

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Summary for Pond Lot 2: Lot 2 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

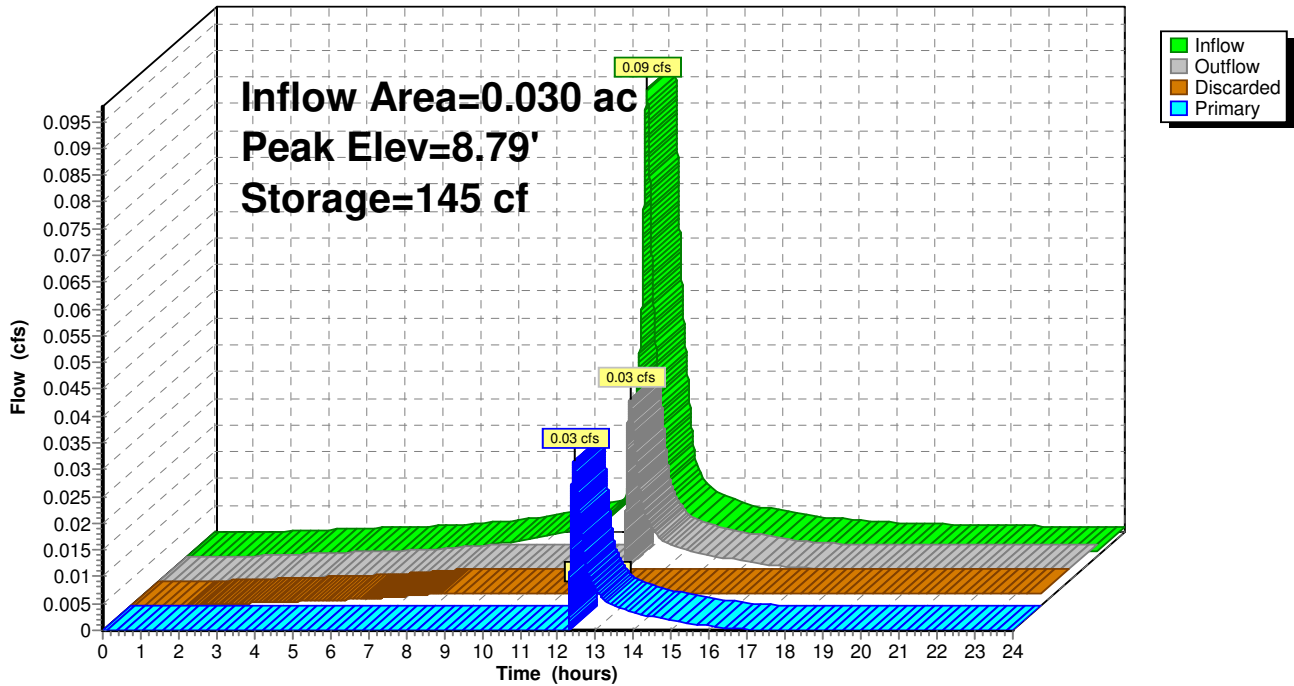
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=8.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 2: Lot 2 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond Lot 3: Lot 3 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	5.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	6.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	7.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.96	196	0	0
8.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
6.96	0
8.00	39

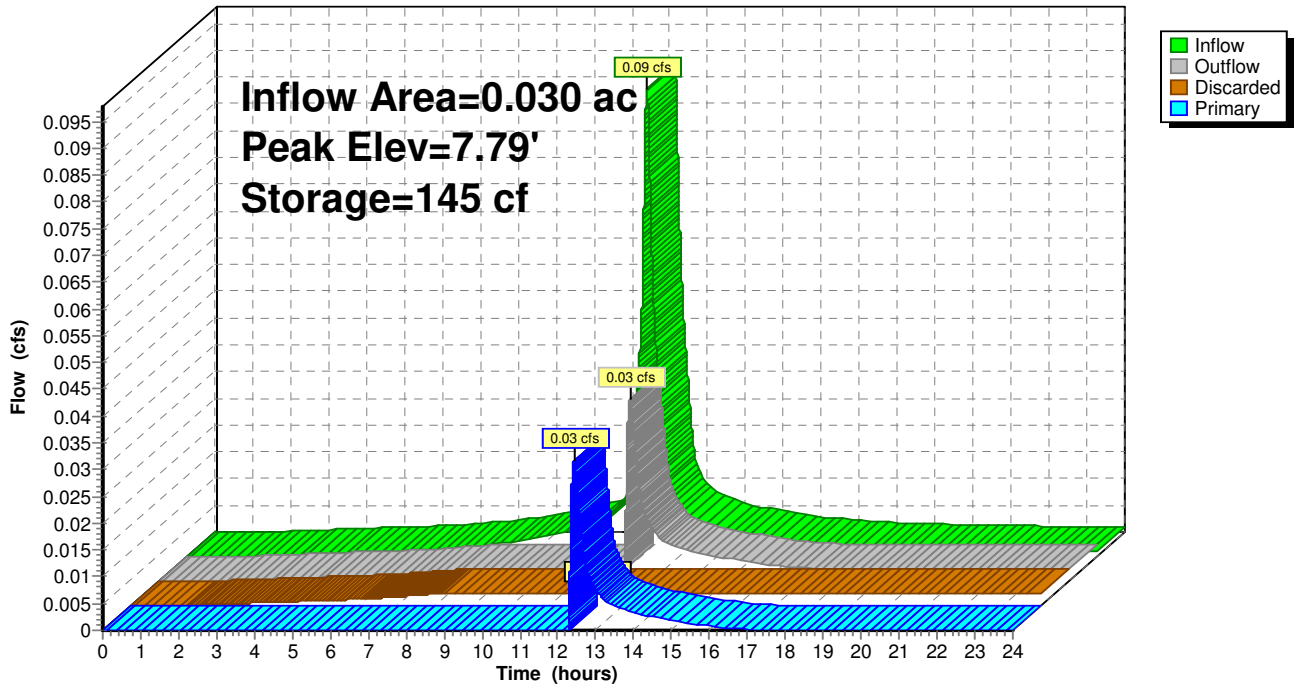
Device	Routing	Invert	Outlet Devices
#1	Primary	7.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	5.96'	0.520 in/hr Exfiltration over Surface area above 5.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=7.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=7.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 3: Lot 3 Roof Recharge Trench

Hydrograph



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Summary for Pond Lot 4: Lot 4 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

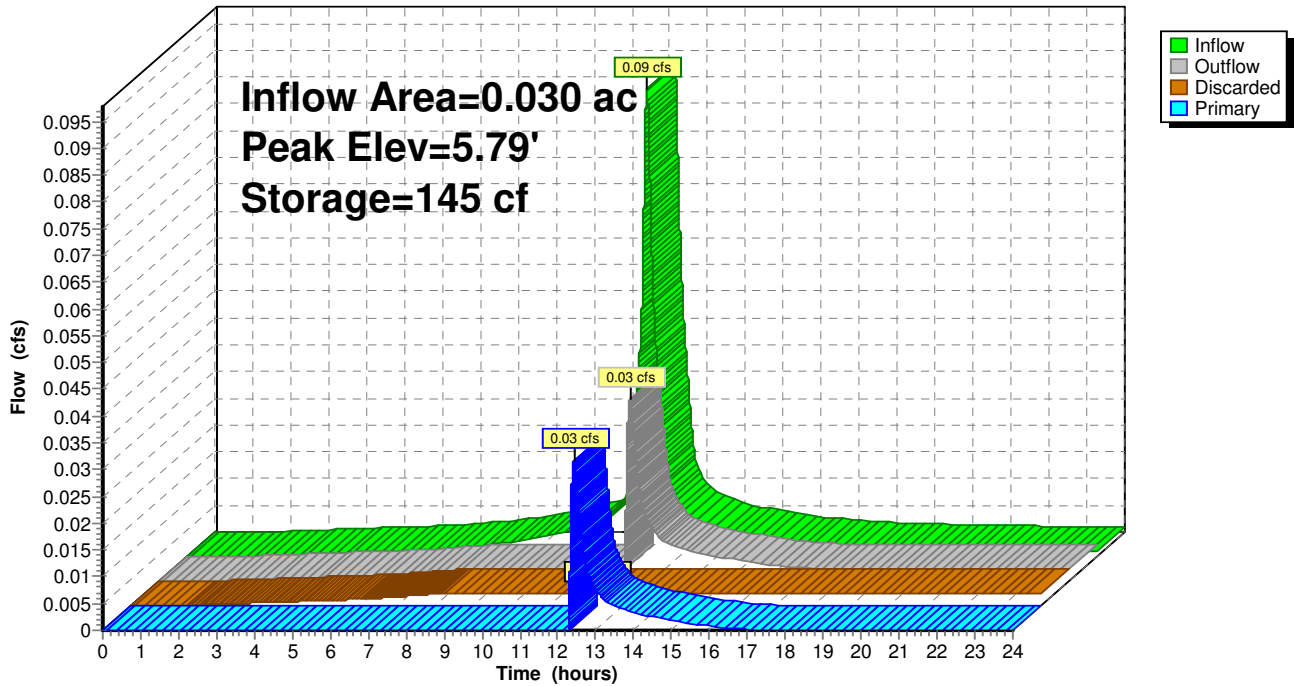
Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=5.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 4: Lot 4 Roof Recharge Trench

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond Lot 5: Lot 5 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

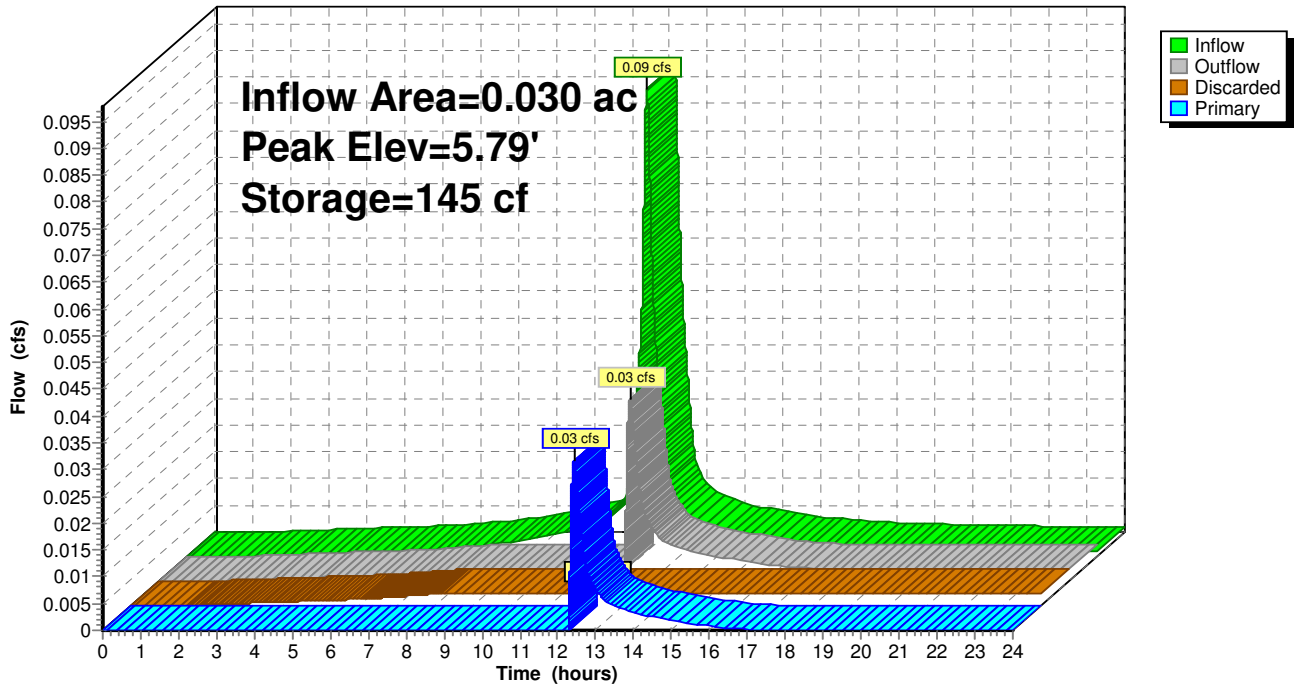
Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=5.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 5: Lot 5 Roof Recharge Trench

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond Lot 6: Lot 6 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 22.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	20.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	21.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	22.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.96	196	0	0
23.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
21.96	0
23.00	39

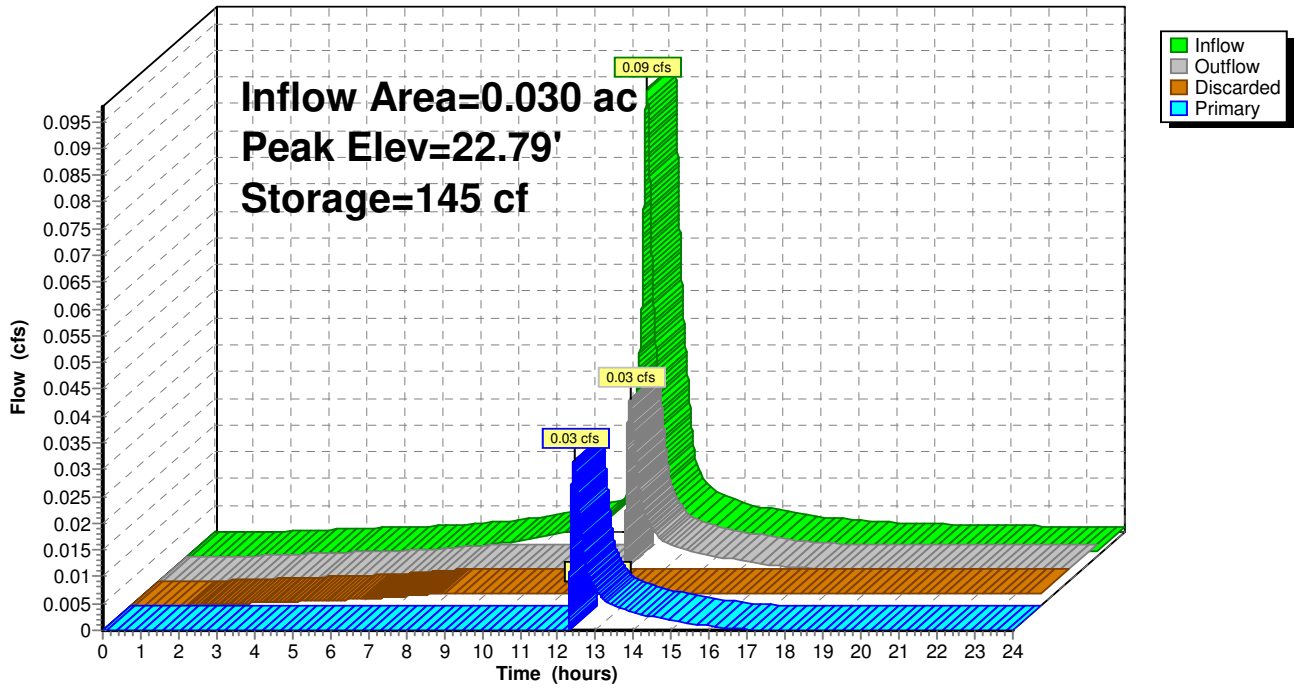
Device	Routing	Invert	Outlet Devices
#1	Primary	22.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	20.96'	0.520 in/hr Exfiltration over Surface area above 20.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=22.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=22.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 6: Lot 6 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond Lot 7: Lot 7 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	4.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	5.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	6.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.96	196	0	0
7.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
5.96	0
7.00	39

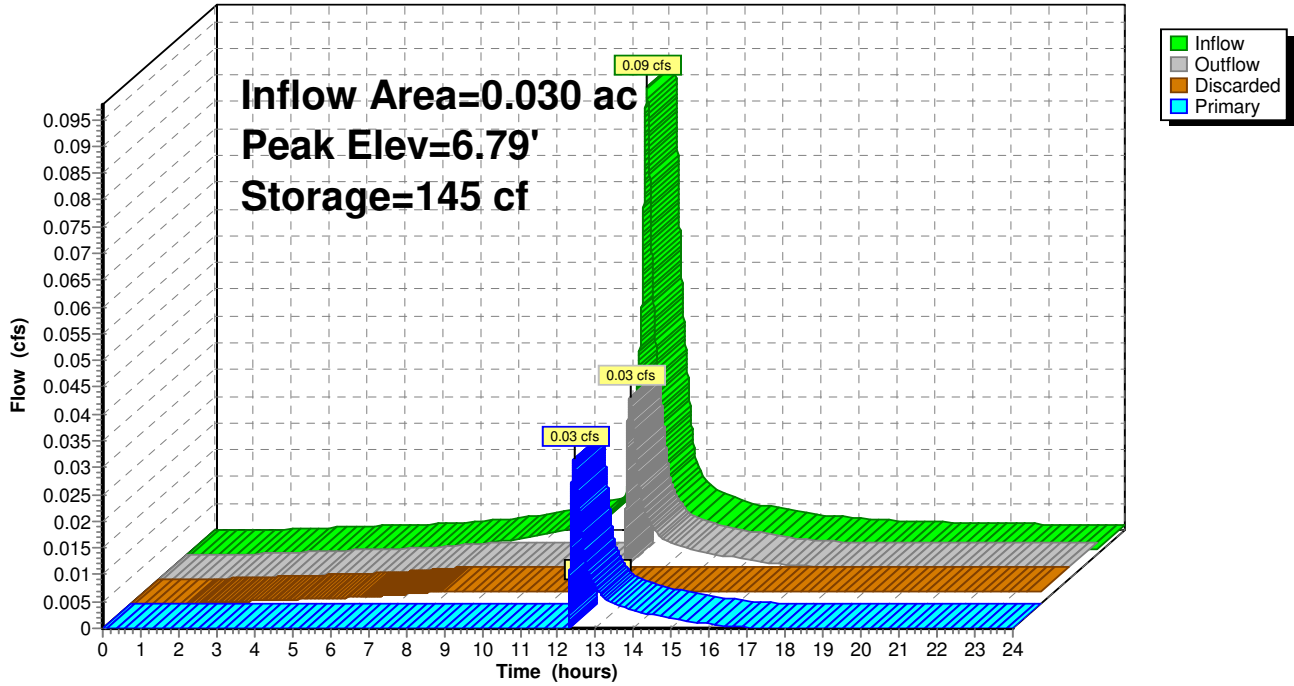
Device	Routing	Invert	Outlet Devices
#1	Primary	6.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	4.96'	0.520 in/hr Exfiltration over Surface area above 4.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=6.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=6.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 7: Lot 7 Roof Recharge Trench

Hydrograph



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Summary for Pond Lot 8: Lot 8 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
 Inflow = 0.09 cfs @ 12.133 hrs, Volume= 0.008 af
 Outflow = 0.03 cfs @ 12.423 hrs, Volume= 0.005 af, Atten= 61%, Lag= 17.4 min
 Discarded = 0.00 cfs @ 12.277 hrs, Volume= 0.004 af
 Primary = 0.03 cfs @ 12.423 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.79' @ 12.423 hrs Surf.Area= 196 sf Storage= 145 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 89.9 min (847.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

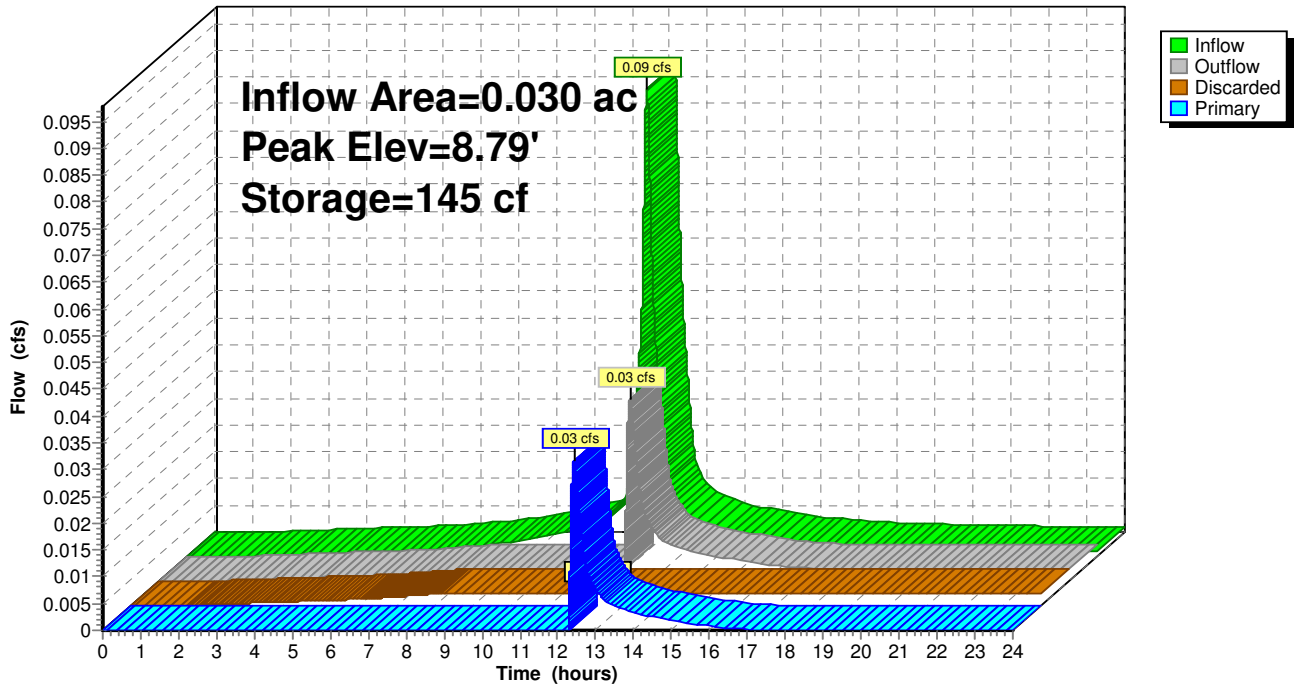
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.277 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.423 hrs HW=8.79' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.16 fps)

Pond Lot 8: Lot 8 Roof Recharge Trench

Hydrograph



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Summary for Pond Pond A: Detention Pond A

Inflow Area = 0.438 ac, 57.31% Impervious, Inflow Depth > 2.21" for 2-Year event
 Inflow = 1.04 cfs @ 12.119 hrs, Volume= 0.081 af
 Outflow = 0.72 cfs @ 12.221 hrs, Volume= 0.072 af, Atten= 31%, Lag= 6.1 min
 Discarded = 0.02 cfs @ 12.221 hrs, Volume= 0.023 af
 Primary = 0.70 cfs @ 12.221 hrs, Volume= 0.050 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.61' @ 12.221 hrs Surf.Area= 0.042 ac Storage= 0.020 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 38.9 min (852.4 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.071 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6.00	0.025	0.000	0.000
7.00	0.053	0.039	0.039
7.50	0.074	0.032	0.071

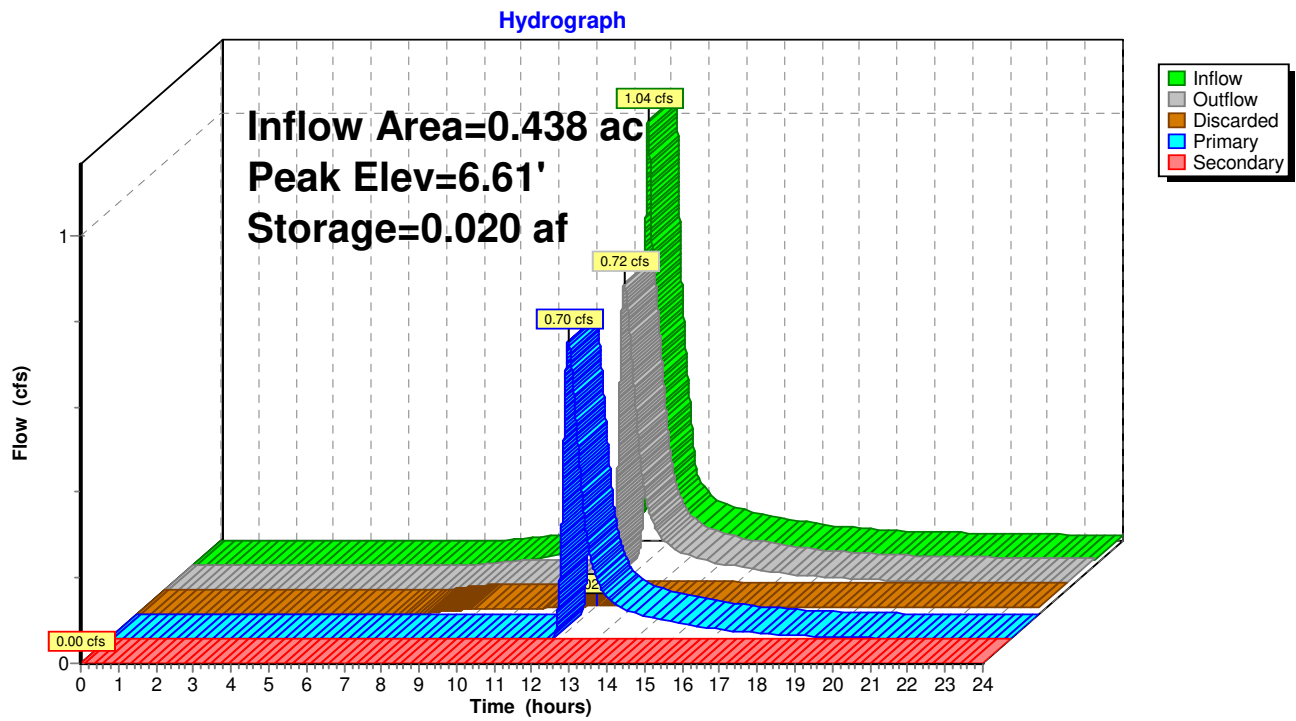
Device	Routing	Invert	Outlet Devices
#1	Secondary	7.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	6.30'	6.0" Round Culvert X 2.00 L= 17.0' Ke= 0.020 Inlet / Outlet Invert= 6.30' / 5.83' S= 0.0276 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Discarded	6.00'	0.520 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 12.221 hrs HW=6.61' (Free Discharge)
 ↑3=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.70 cfs @ 12.221 hrs HW=6.61' TW=5.47' (Dynamic Tailwater)
 ↑2=Culvert (Inlet Controls 0.70 cfs @ 2.77 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=6.00' TW=4.90' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pond A: Detention Pond A



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Summary for Pond Pond B: Detention Pond B

Inflow Area = 0.698 ac, 49.71% Impervious, Inflow Depth > 1.65" for 2-Year event
 Inflow = 1.11 cfs @ 12.205 hrs, Volume= 0.096 af
 Outflow = 0.89 cfs @ 12.372 hrs, Volume= 0.093 af, Atten= 20%, Lag= 10.0 min
 Discarded = 0.02 cfs @ 12.372 hrs, Volume= 0.014 af
 Primary = 0.87 cfs @ 12.372 hrs, Volume= 0.079 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.52' @ 12.372 hrs Surf.Area= 1,975 sf Storage= 691 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 20.4 min (829.1 - 808.7)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	4,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.90	269	0	0
5.00	922	60	60
5.10	843	88	148
5.20	857	85	233
6.00	3,618	1,790	2,023
6.50	4,411	2,007	4,030

Device	Routing	Invert	Outlet Devices
#1	Primary	5.10'	12.0" Round Culvert L= 20.0' Ke= 0.020 Inlet / Outlet Invert= 5.10' / 4.80' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	4.90'	0.520 in/hr Exfiltration over Surface area
#3	Secondary	6.00'	4.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

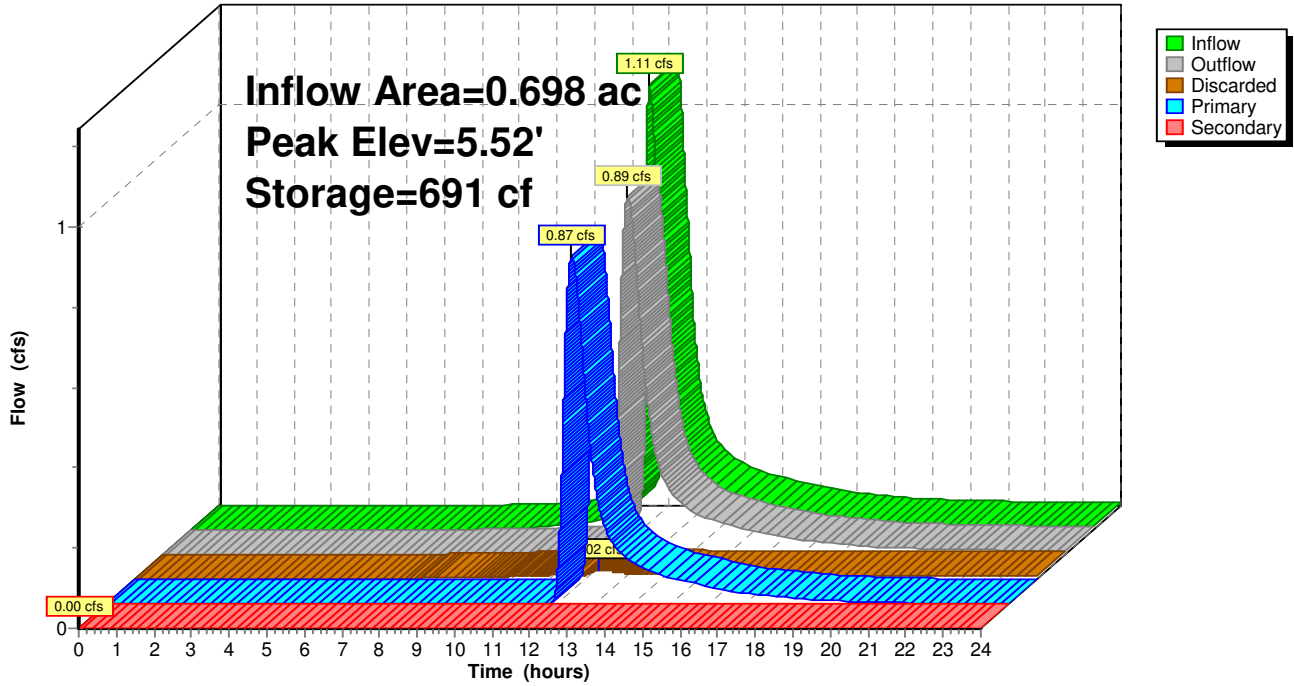
Discarded OutFlow Max=0.02 cfs @ 12.372 hrs HW=5.52' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.87 cfs @ 12.372 hrs HW=5.52' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 0.87 cfs @ 4.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=4.90' TW=0.00' (Dynamic Tailwater)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond B: Detention Pond B

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond SW1: 3-ft wide swale

Inflow Area = 0.158 ac, 67.09% Impervious, Inflow Depth > 2.36" for 2-Year event
 Inflow = 0.43 cfs @ 12.087 hrs, Volume= 0.031 af
 Outflow = 0.43 cfs @ 12.097 hrs, Volume= 0.031 af, Atten= 1%, Lag= 0.6 min
 Primary = 0.43 cfs @ 12.097 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.69' @ 12.097 hrs Surf.Area= 146 sf Storage= 25 cf

Plug-Flow detention time= 4.9 min calculated for 0.031 af (100% of inflow)
 Center-of-Mass det. time= 2.5 min (806.3 - 803.8)

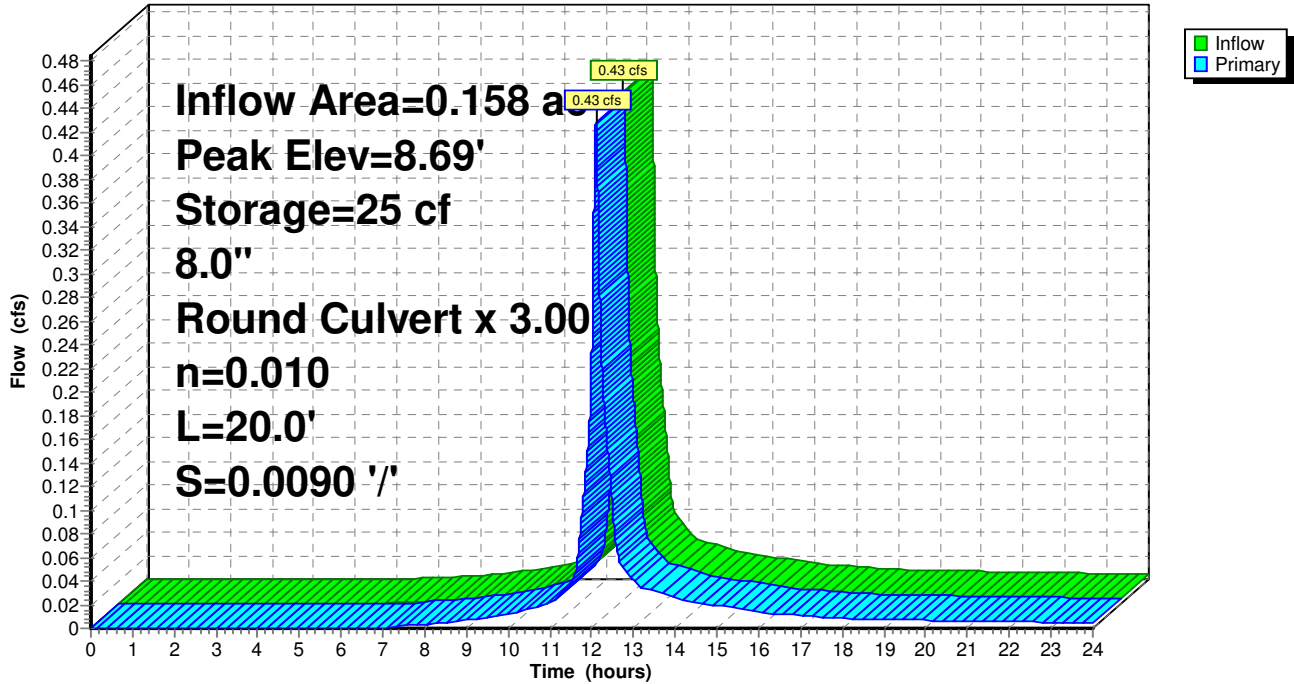
Volume	Invert	Avail.Storage	Storage Description
#1	8.40'	630 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.40	30	0	0
9.00	270	90	90
10.00	810	540	630

Device	Routing	Invert	Outlet Devices
#1	Primary	8.48'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 8.48' / 8.30' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.43 cfs @ 12.097 hrs HW=8.69' TW=7.83' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 0.43 cfs @ 2.27 fps)

Pond SW1: 3-ft wide swale

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.41"

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Summary for Pond SW2: 3-ft wide swale

Inflow Area = 0.238 ac, 61.34% Impervious, Inflow Depth > 2.24" for 2-Year event
 Inflow = 0.62 cfs @ 12.094 hrs, Volume= 0.044 af
 Outflow = 0.61 cfs @ 12.107 hrs, Volume= 0.044 af, Atten= 1%, Lag= 0.8 min
 Primary = 0.61 cfs @ 12.107 hrs, Volume= 0.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.84' @ 12.107 hrs Surf.Area= 191 sf Storage= 37 cf

Plug-Flow detention time= 4.0 min calculated for 0.044 af (100% of inflow)
 Center-of-Mass det. time= 2.1 min (812.3 - 810.2)

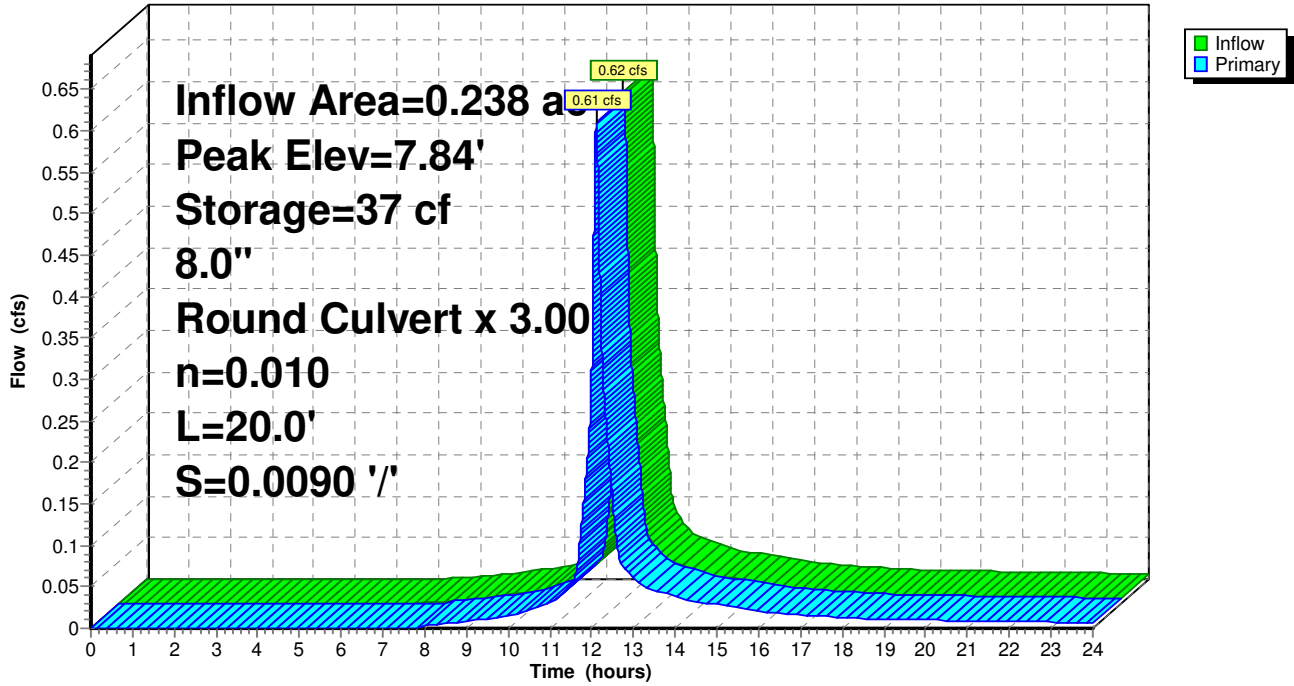
Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	615 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7.50	30	0	0
8.00	270	75	75
9.00	810	540	615

Device	Routing	Invert	Outlet Devices
#1	Primary	7.58'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 7.58' / 7.40' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.61 cfs @ 12.107 hrs HW=7.84' TW=6.54' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 0.61 cfs @ 2.45 fps)

Pond SW2: 3-ft wide swale

Hydrograph



Starboard Drive Estates Proposed

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Pond A	Runoff Area=0.200 ac 52.50% Impervious Runoff Depth>3.69" Tc=10.0 min CN=88 Runoff=0.74 cfs 0.062 af
Subcatchment B: Pond B	Runoff Area=0.140 ac 4.29% Impervious Runoff Depth>3.01" Tc=10.0 min CN=81 Runoff=0.43 cfs 0.035 af
Subcatchment Cul-de--sac: Cul-de-sac	Runoff Area=0.120 ac 75.00% Impervious Runoff Depth>4.33" Tc=10.0 min CN=94 Runoff=0.50 cfs 0.043 af
Subcatchment E: East Entrance	Runoff Area=0.002 ac 100.00% Impervious Runoff Depth>4.79" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Subcatchment House 1: Lot 1	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 2: Lot 2	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 3: Lot 3	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 4: Lot 4	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 5: Lot 5	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 6: Lot 6	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 7: Lot 7	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment House 8: Lot 8	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>4.79" Tc=10.0 min CN=98 Runoff=0.13 cfs 0.012 af
Subcatchment N: North Wetland	Runoff Area=3.260 ac 0.00% Impervious Runoff Depth>2.56" Tc=6.0 min CN=76 Runoff=9.79 cfs 0.695 af
Subcatchment SE: SE	Runoff Area=1.330 ac 0.00% Impervious Runoff Depth>2.56" Tc=6.0 min CN=76 Runoff=4.00 cfs 0.283 af
Subcatchment SW: Southwest Wetland	Runoff Area=2.720 ac 0.37% Impervious Runoff Depth>2.73" Flow Length=200' Tc=15.7 min CN=78 Runoff=6.48 cfs 0.618 af
Subcatchment Swale 1: Swale 1	Runoff Area=0.158 ac 67.09% Impervious Runoff Depth>3.90" Tc=6.0 min CN=90 Runoff=0.70 cfs 0.051 af

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Subcatchment Swale 2: Swale 2	Runoff Area=0.080 ac 50.00% Impervious Runoff Depth>3.49" Tc=6.0 min CN=86 Runoff=0.32 cfs 0.023 af
Reach BB: Buzzards Bay	Inflow=15.85 cfs 1.508 af Outflow=15.85 cfs 1.508 af
Reach Road: Sconticut Neck Road	Inflow=0.01 cfs 0.001 af Outflow=0.01 cfs 0.001 af
Reach SouthEast: Southeast	Inflow=4.04 cfs 0.289 af Outflow=4.04 cfs 0.289 af
Pond Forebay: Forebay	Peak Elev=5.98' Storage=301 cf Inflow=0.50 cfs 0.043 af 6.0" Round Culvert n=0.016 L=36.0' S=0.0069 1/1" Outflow=0.32 cfs 0.043 af
Pond Lot 1: Lot 1 Roof Recharge Trench	Peak Elev=8.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 2: Lot 2 Roof Recharge Trench	Peak Elev=8.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 3: Lot 3 Roof Recharge Trench	Peak Elev=7.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 4: Lot 4 Roof Recharge Trench	Peak Elev=5.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 5: Lot 5 Roof Recharge Trench	Peak Elev=5.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 6: Lot 6 Roof Recharge Trench	Peak Elev=22.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 7: Lot 7 Roof Recharge Trench	Peak Elev=6.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Lot 8: Lot 8 Roof Recharge Trench	Peak Elev=8.91' Storage=157 cf Inflow=0.13 cfs 0.012 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.005 af Outflow=0.12 cfs 0.009 af
Pond Pond A: Detention Pond A	Peak Elev=6.75' Storage=0.027 af Inflow=1.72 cfs 0.136 af Discarded=0.02 cfs 0.025 af Primary=1.25 cfs 0.101 af Secondary=0.00 cfs 0.000 af Outflow=1.27 cfs 0.127 af
Pond Pond B: Detention Pond B	Peak Elev=5.70' Storage=1,097 cf Inflow=1.95 cfs 0.179 af Discarded=0.03 cfs 0.016 af Primary=1.55 cfs 0.159 af Secondary=0.00 cfs 0.000 af Outflow=1.58 cfs 0.175 af
Pond SW1: 3-ft wide swale	Peak Elev=8.75' Storage=36 cf Inflow=0.70 cfs 0.051 af 8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=0.69 cfs 0.051 af
Pond SW2: 3-ft wide swale	Peak Elev=7.92' Storage=55 cf Inflow=1.01 cfs 0.075 af 8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=1.00 cfs 0.074 af

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Total Runoff Area = 8.250 ac Runoff Volume = 1.907 af Average Runoff Depth = 2.77"
92.74% Pervious = 7.651 ac 7.26% Impervious = 0.599 ac

Starboard Drive Estates Proposed

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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment A: Pond A

Runoff = 0.74 cfs @ 12.133 hrs, Volume= 0.062 af, Depth> 3.69"

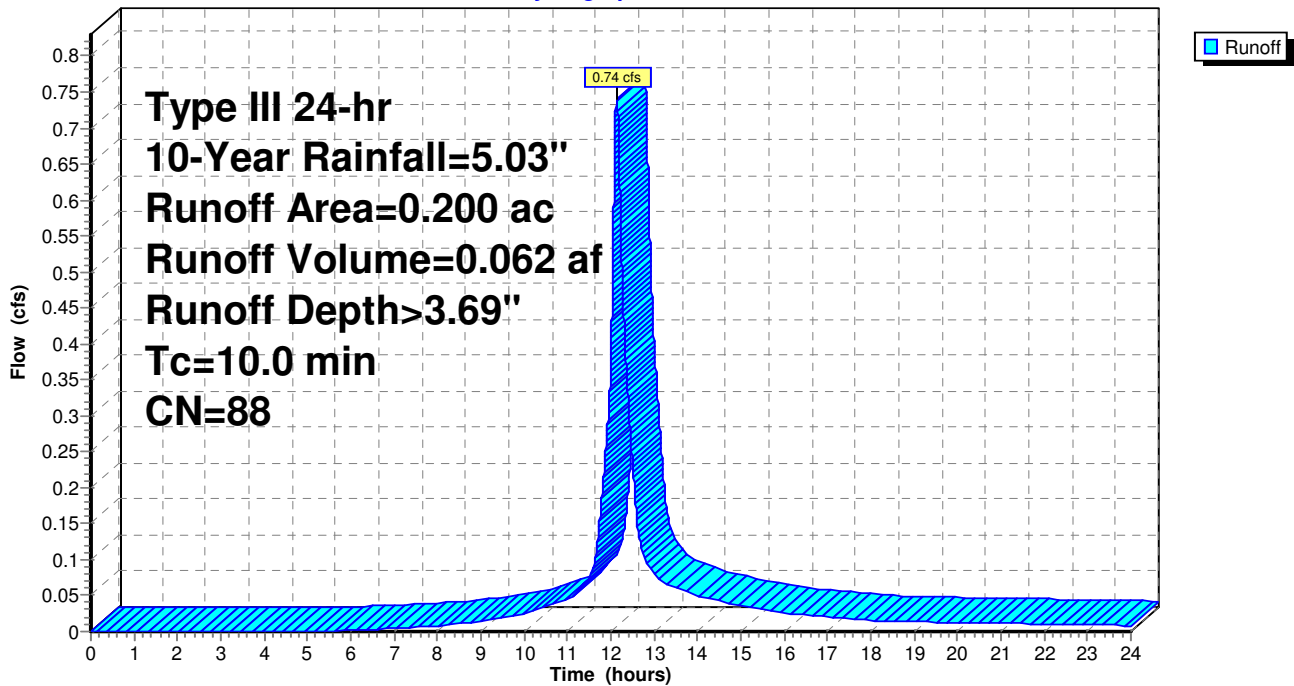
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.080	98	Paved roads
0.040	74	>75% Grass cover, Good, HSG C
0.055	80	>75% Grass cover, Good, HSG D
* 0.025	98	Pond Bottom
0.200	88	Weighted Average
0.095		47.50% Pervious Area
0.105		52.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment A: Pond A

Hydrograph



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Summary for Subcatchment B: Pond B

Runoff = 0.43 cfs @ 12.144 hrs, Volume= 0.035 af, Depth> 3.01"

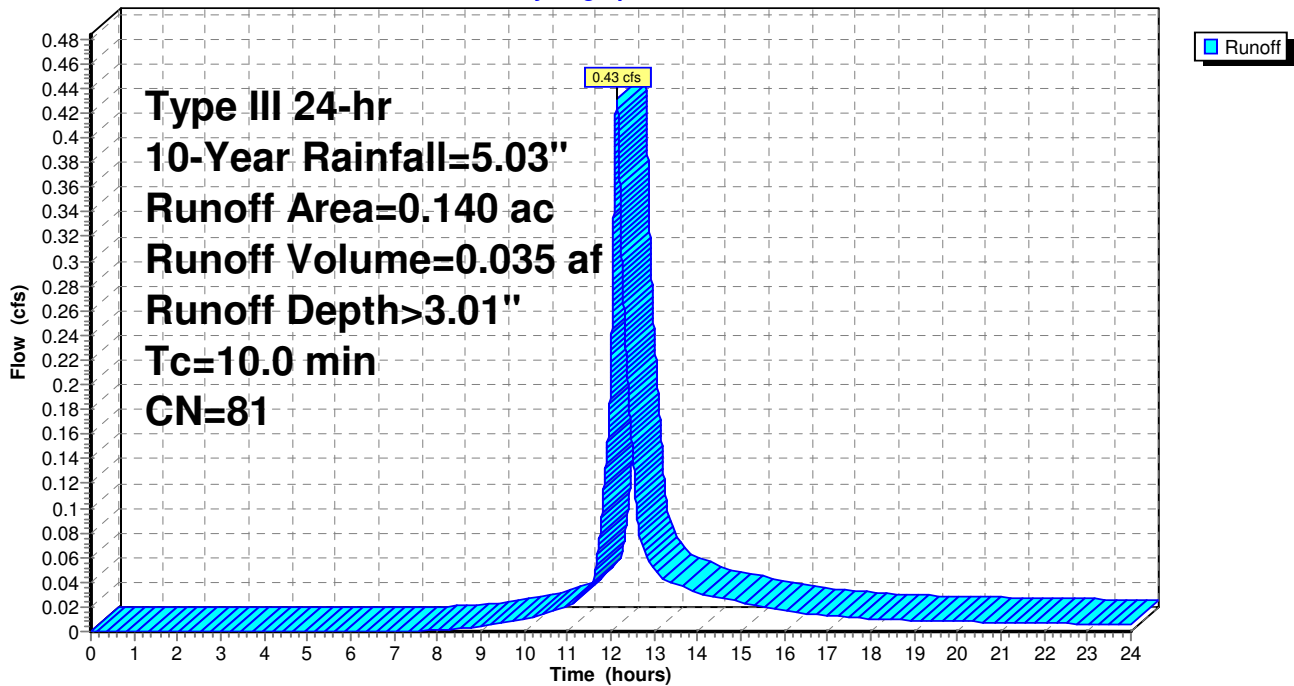
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
0.134	80	>75% Grass cover, Good, HSG D
* 0.006	98	Pond Bottom
0.140	81	Weighted Average
0.134		95.71% Pervious Area
0.006		4.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment B: Pond B

Hydrograph



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Summary for Subcatchment Cul-de--sac: Cul-de-sac

Runoff = 0.50 cfs @ 12.133 hrs, Volume= 0.043 af, Depth> 4.33"

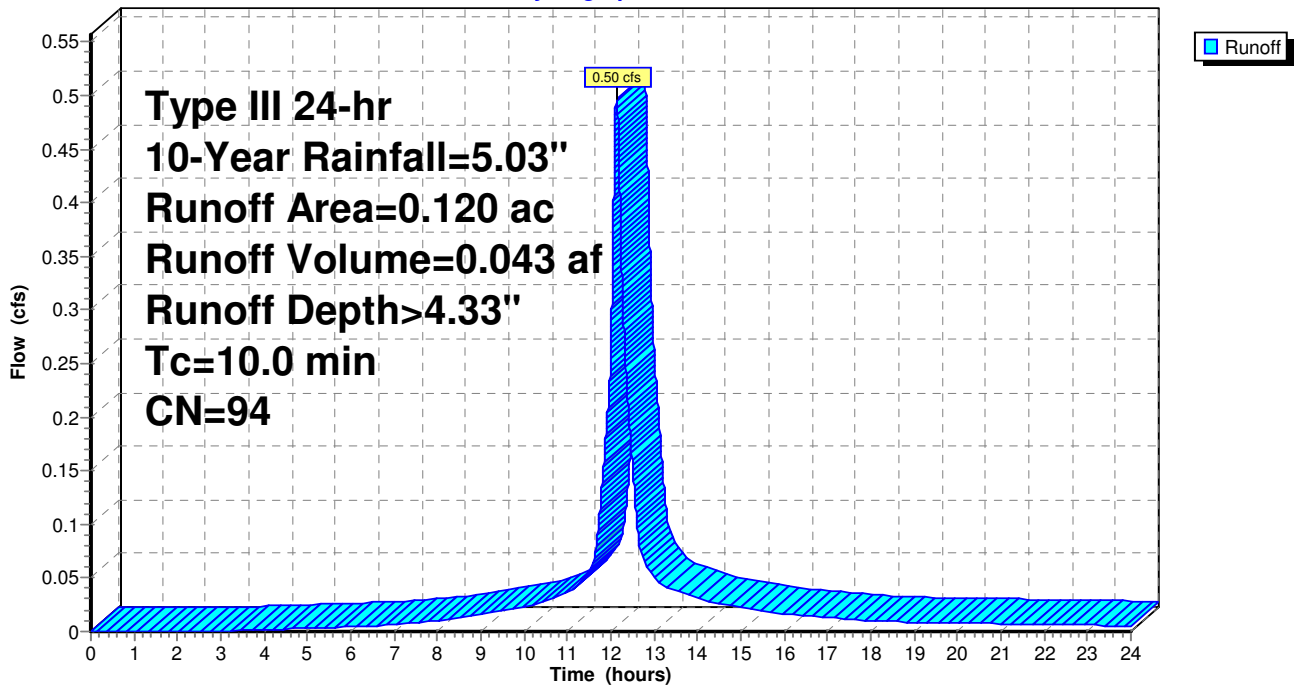
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
0.090	98	Paved road
0.030	80	>75% Grass cover, Good, HSG D
0.120	94	Weighted Average
0.030		25.00% Pervious Area
0.090		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Cul-de--sac: Cul-de-sac

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment E: East Entrance

Runoff = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Depth> 4.79"

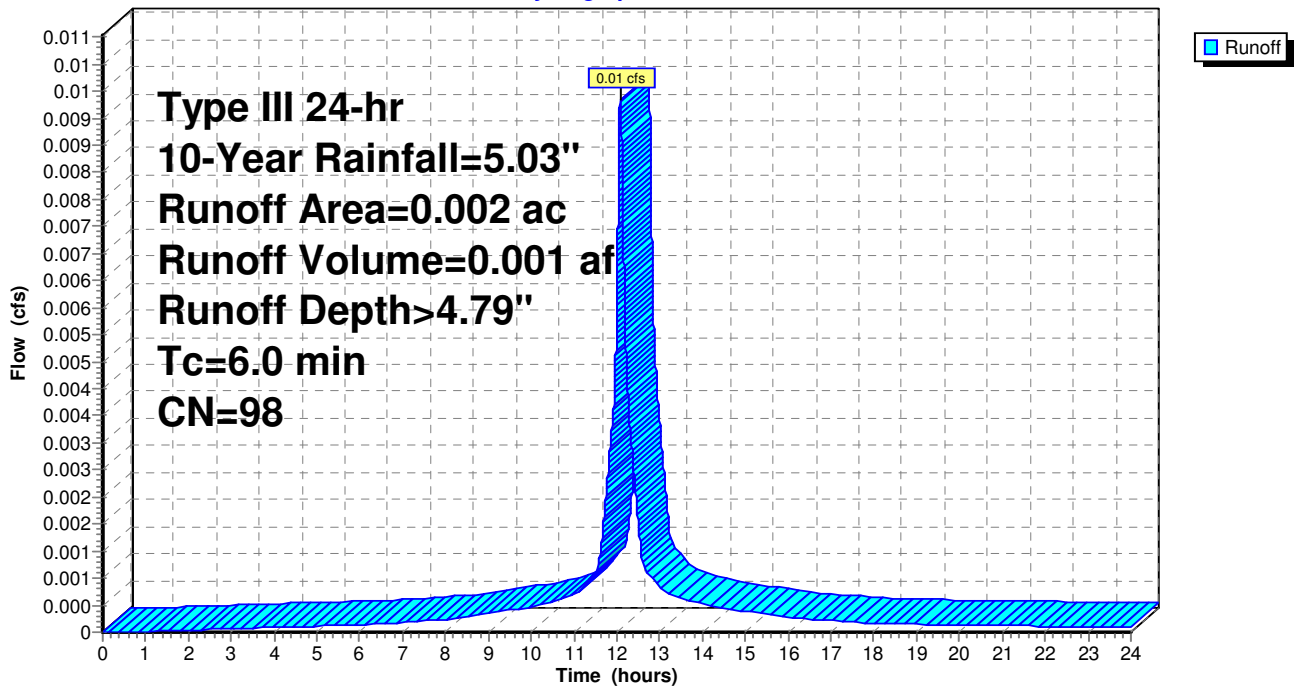
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.002	98	Paved roads
0.002		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 1: Lot 1

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

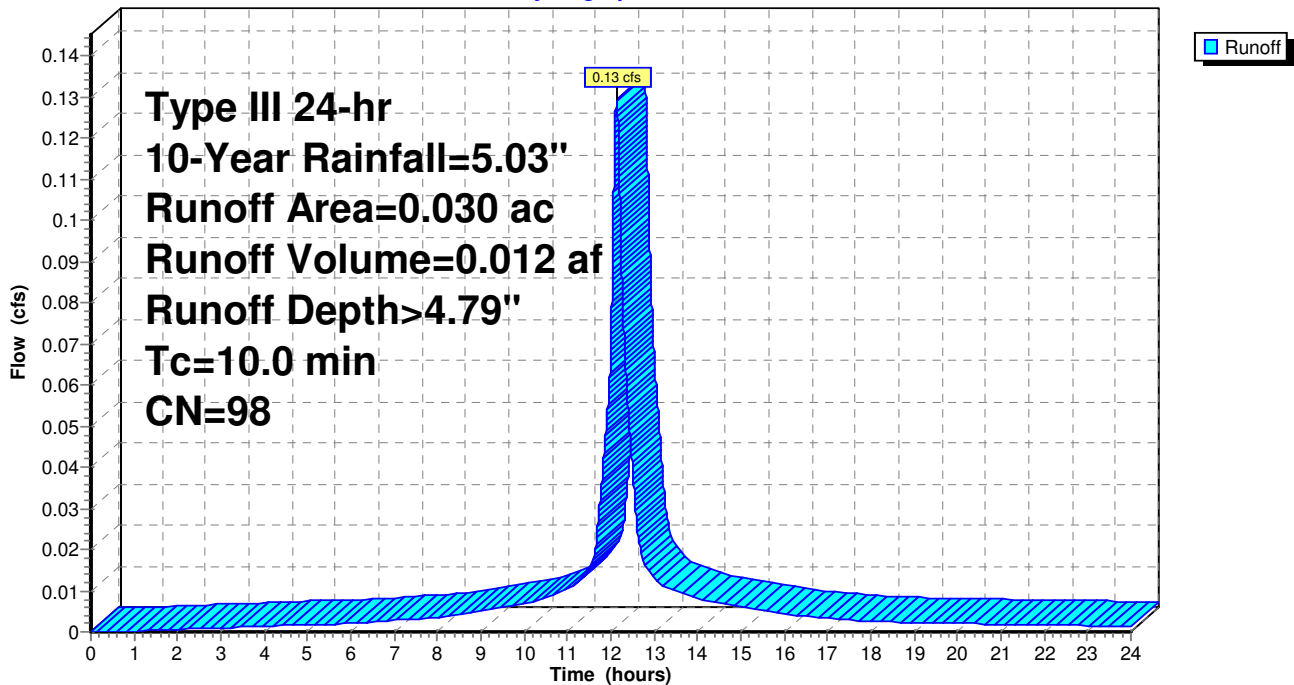
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 1: Lot 1

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 2: Lot 2

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

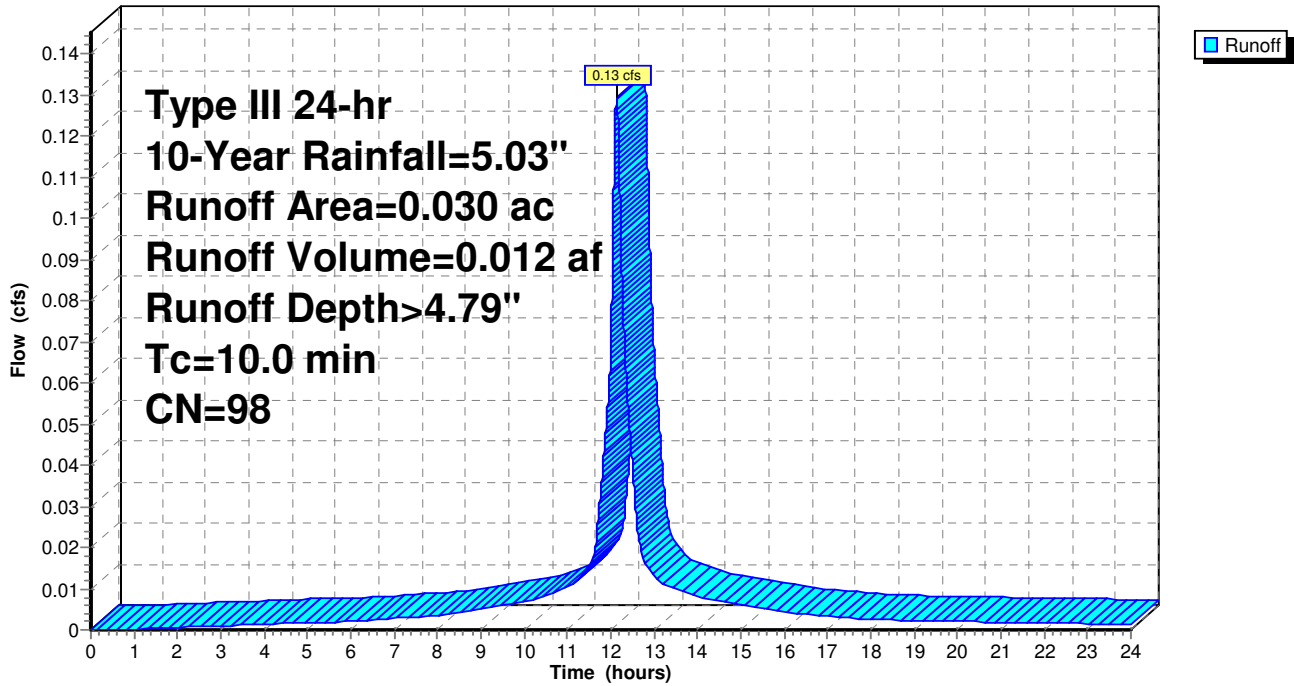
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 2: Lot 2

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 3: Lot 3

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

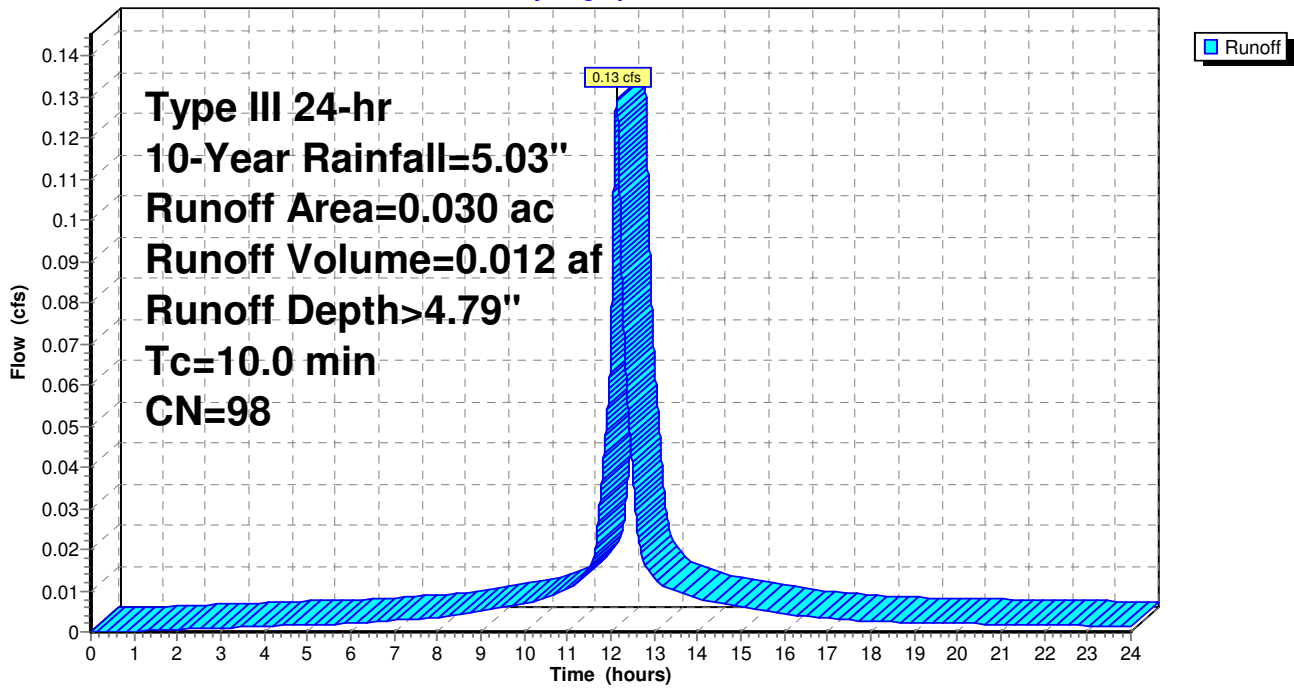
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 3: Lot 3

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 4: Lot 4

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

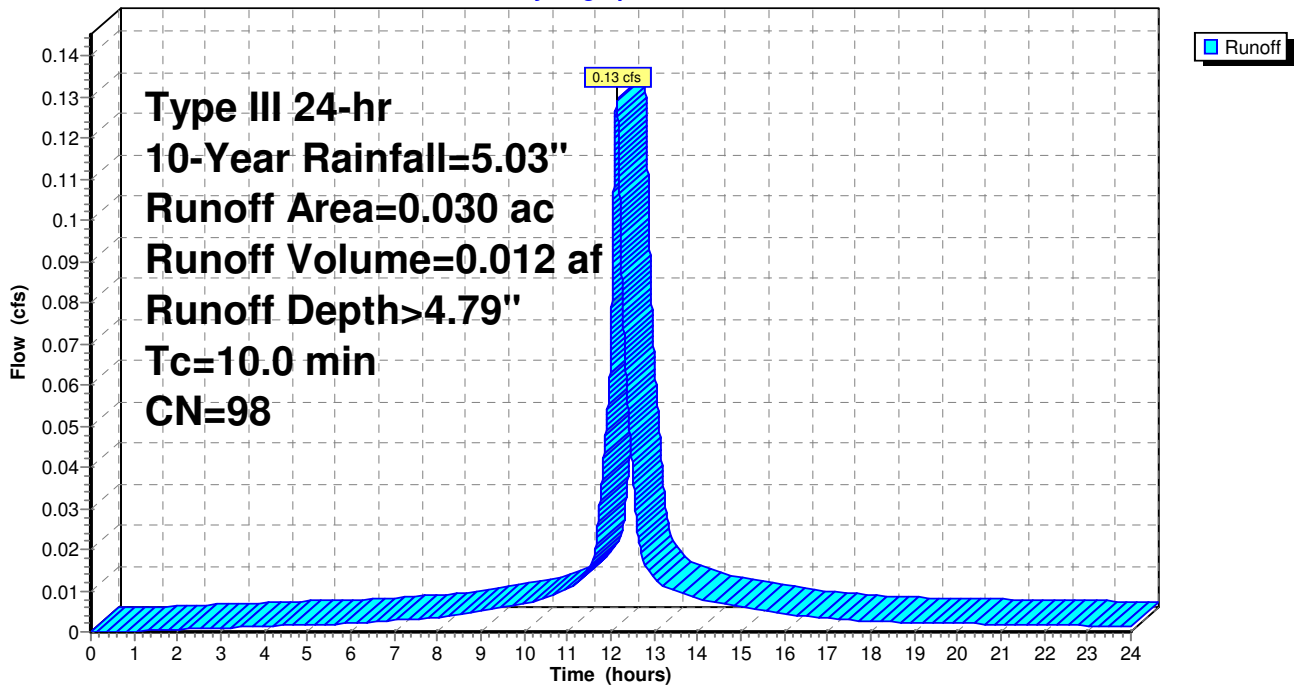
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 4: Lot 4

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 5: Lot 5

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

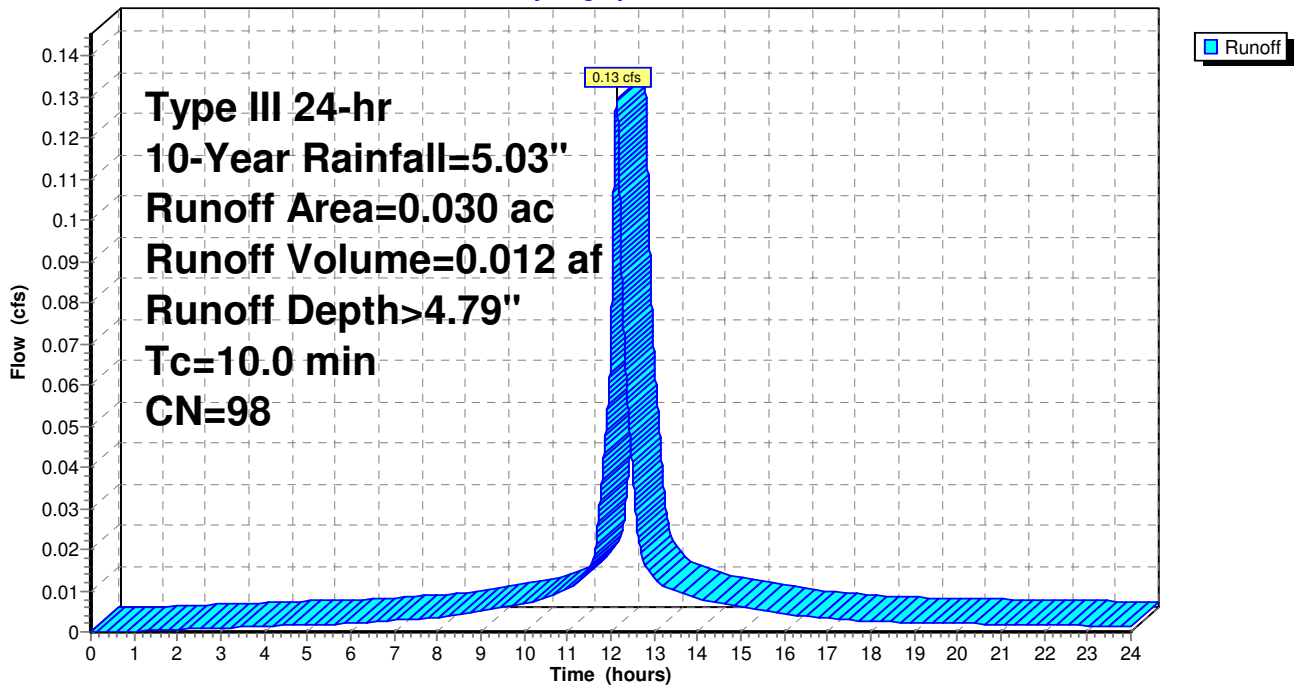
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 5: Lot 5

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 6: Lot 6

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

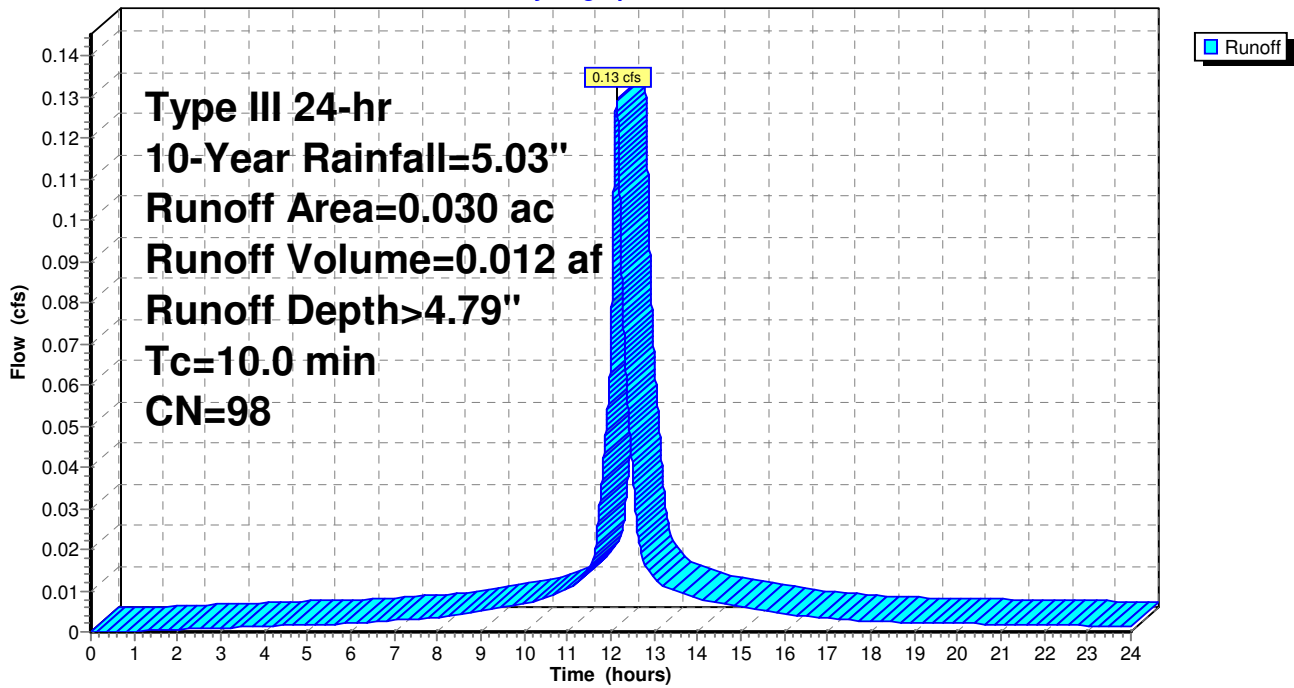
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 6: Lot 6

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 7: Lot 7

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

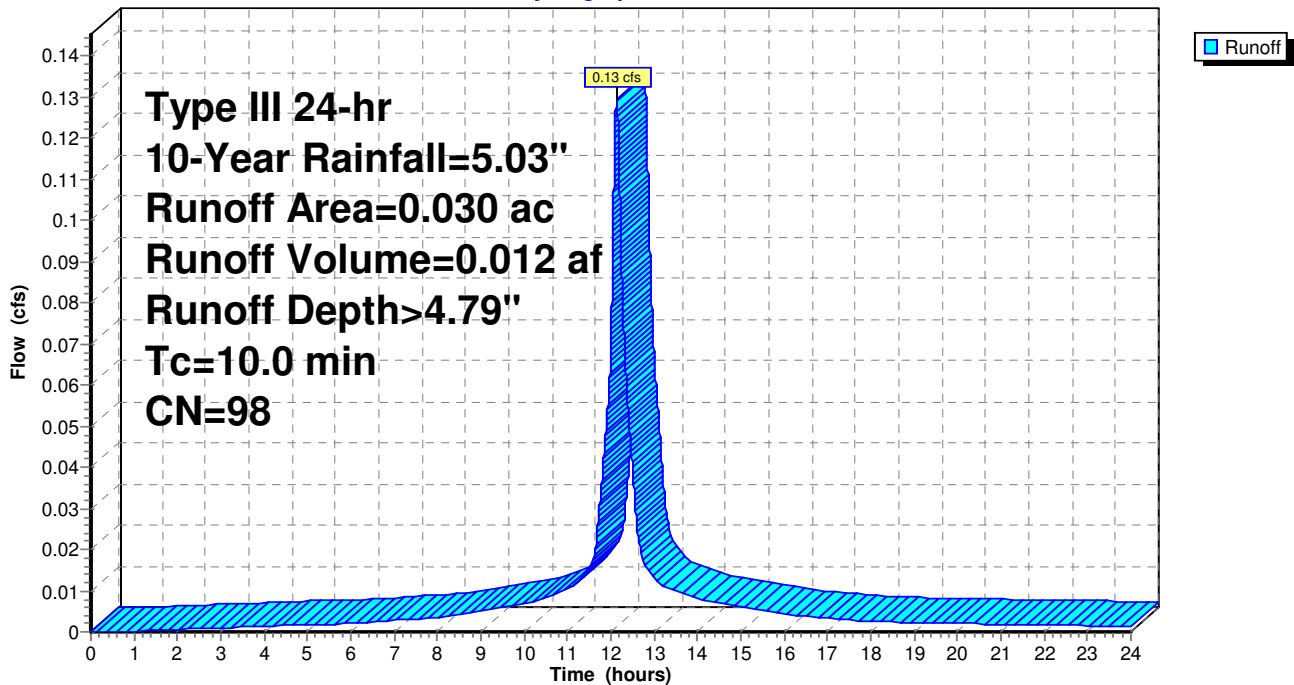
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 7: Lot 7

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment House 8: Lot 8

Runoff = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af, Depth> 4.79"

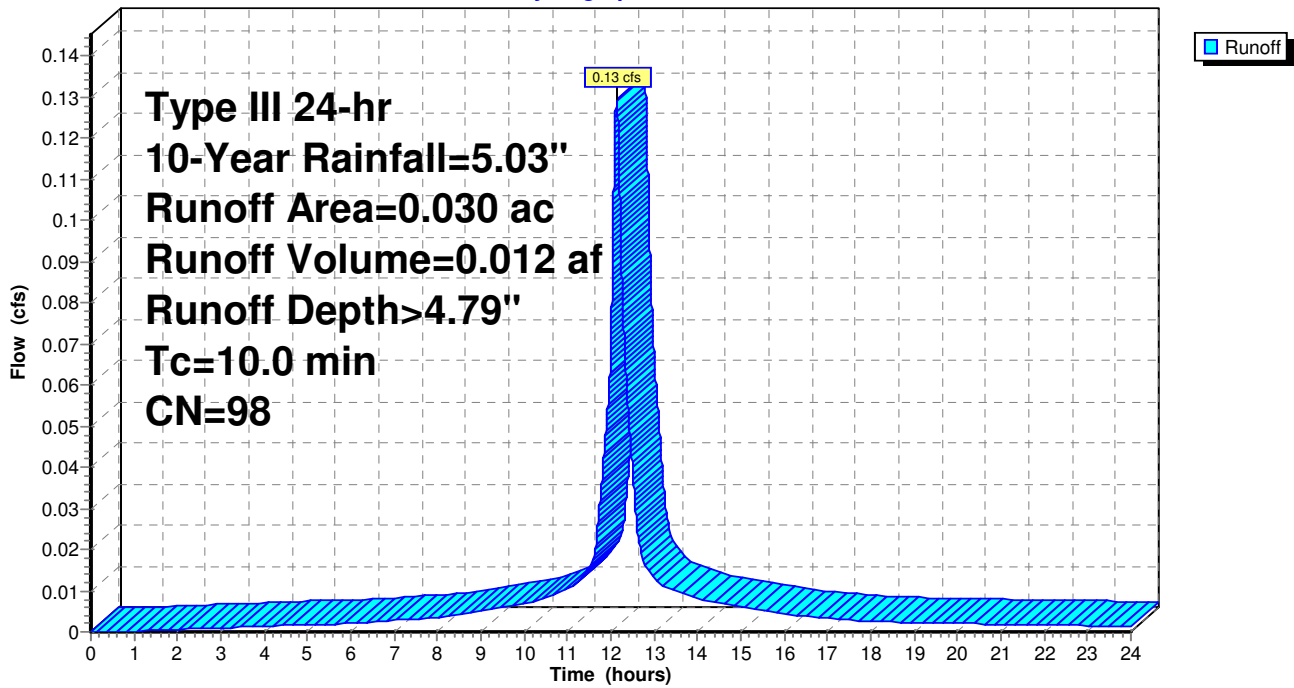
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 8: Lot 8

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment N: North Wetland

Runoff = 9.79 cfs @ 12.087 hrs, Volume= 0.695 af, Depth> 2.56"

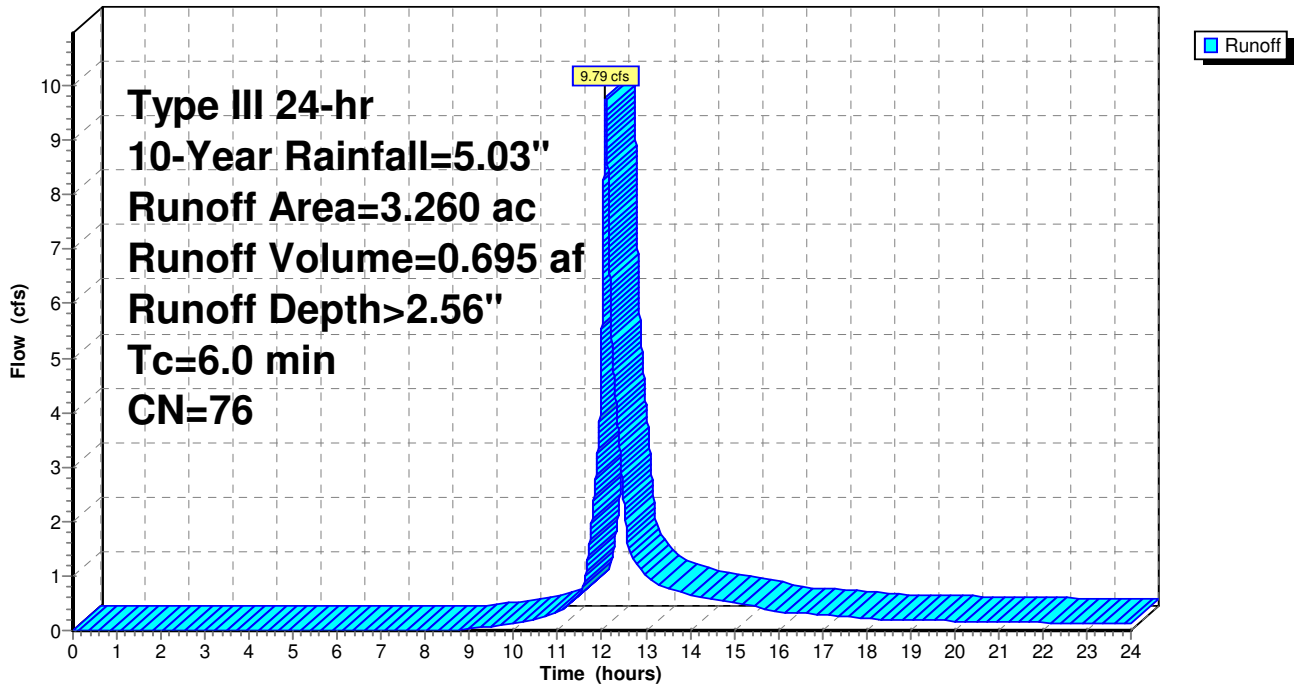
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.070	91	Gravel roads, HSG D
1.610	74	>75% Grass cover, Good, HSG C
0.580	80	>75% Grass cover, Good, HSG D
0.070	70	Woods, Good, HSG C
0.800	77	Woods, Good, HSG D
* 0.090	72	Beach
3.260	76	Weighted Average
3.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment SE: SE

Runoff = 4.00 cfs @ 12.087 hrs, Volume= 0.283 af, Depth> 2.56"

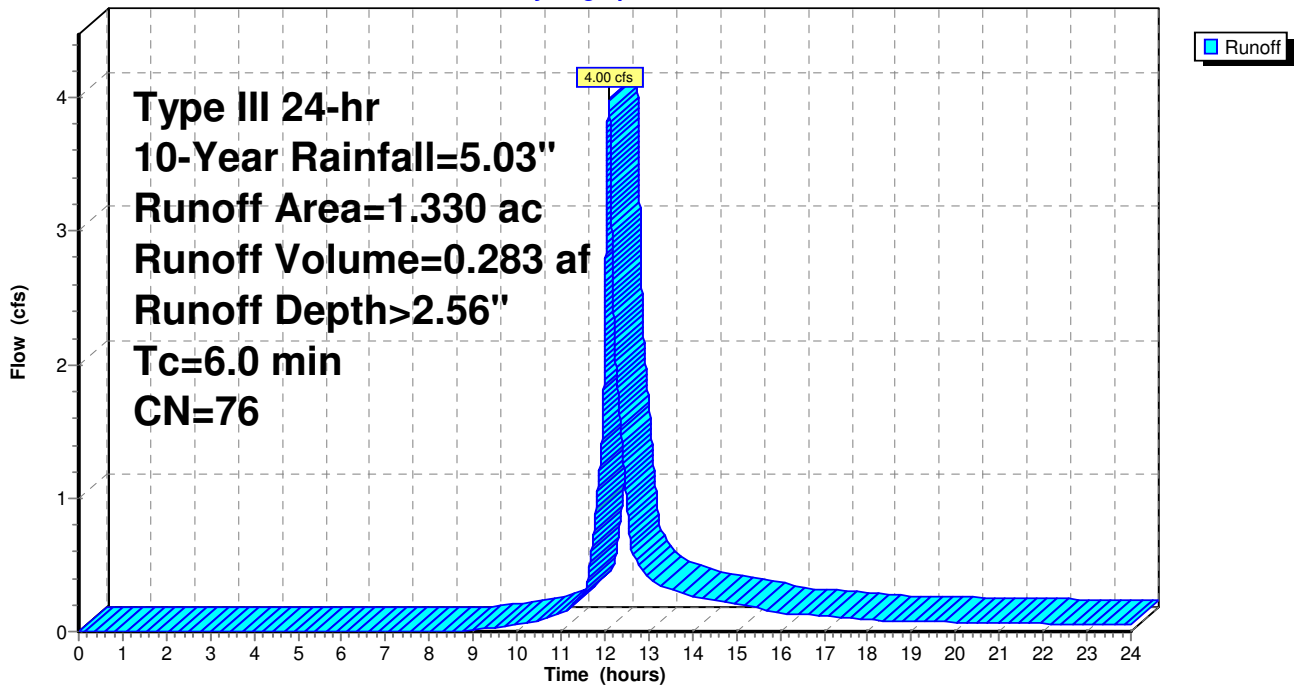
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
0.040	96	Gravel surface, HSG C
0.930	74	>75% Grass cover, Good, HSG C
0.190	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.330	76	Weighted Average
1.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: SE

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 6.48 cfs @ 12.211 hrs, Volume= 0.618 af, Depth> 2.73"

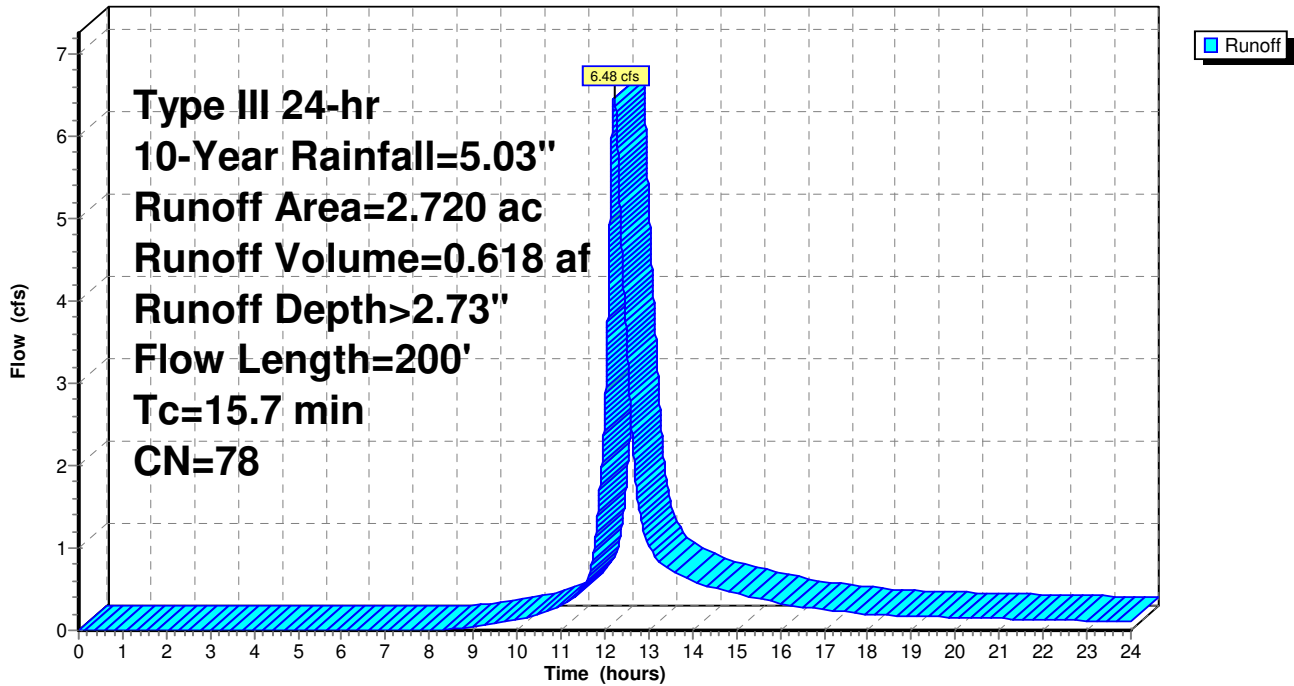
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.010	98	Paved
0.060	96	Gravel surface, HSG C
0.080	96	Gravel surface, HSG D
0.640	74	>75% Grass cover, Good, HSG C
1.080	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.510	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.720	78	Weighted Average
2.710		99.63% Pervious Area
0.010		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment Swale 1: Swale 1

Runoff = 0.70 cfs @ 12.087 hrs, Volume= 0.051 af, Depth> 3.90"

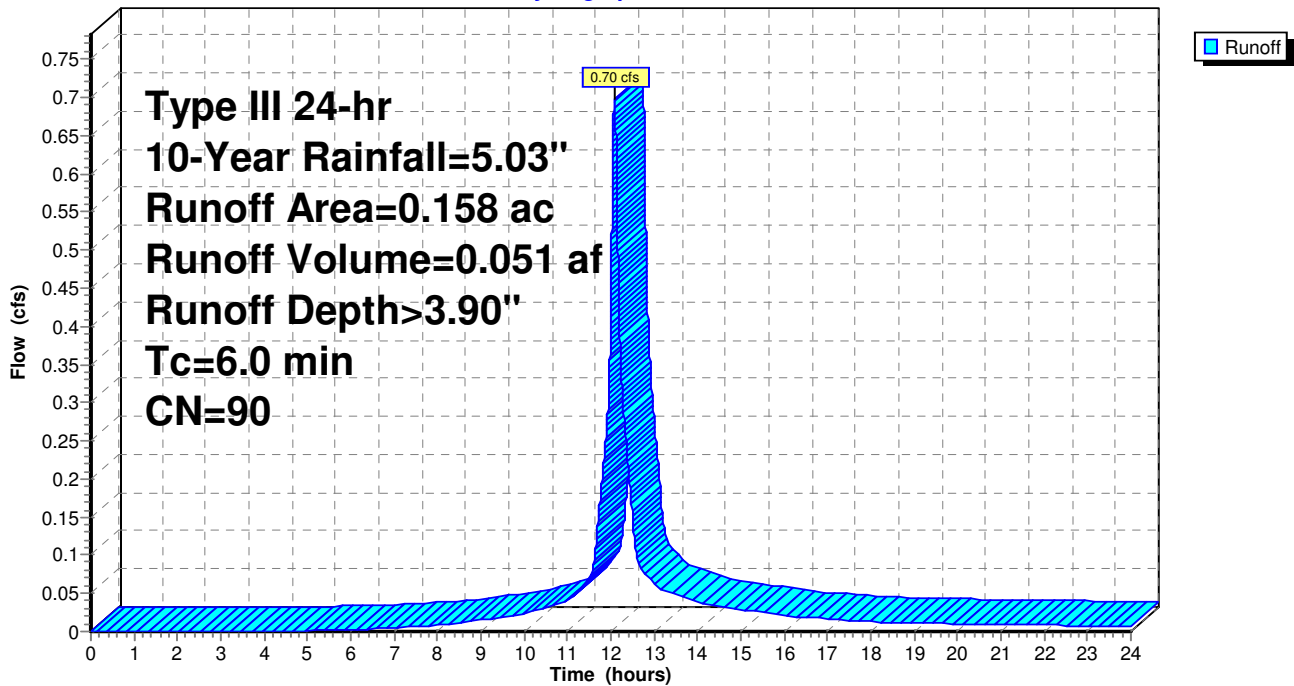
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.106	98	Paved Roadway
0.052	74	>75% Grass cover, Good, HSG C
0.158	90	Weighted Average
0.052		32.91% Pervious Area
0.106		67.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 1: Swale 1

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Subcatchment Swale 2: Swale 2

Runoff = 0.32 cfs @ 12.087 hrs, Volume= 0.023 af, Depth> 3.49"

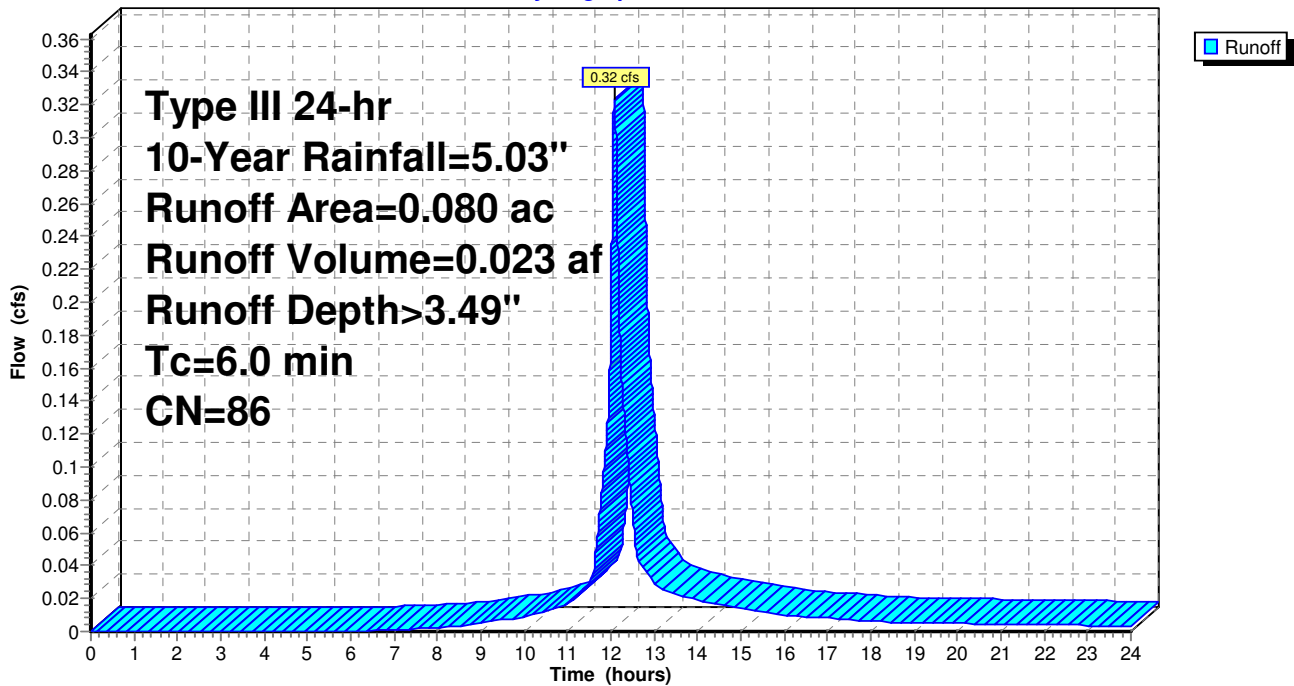
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 10-Year Rainfall=5.03"

Area (ac)	CN	Description
* 0.040	98	Paved Roadway
0.040	74	>75% Grass cover, Good, HSG C
0.080	86	Weighted Average
0.040		50.00% Pervious Area
0.040		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 2: Swale 2

Hydrograph



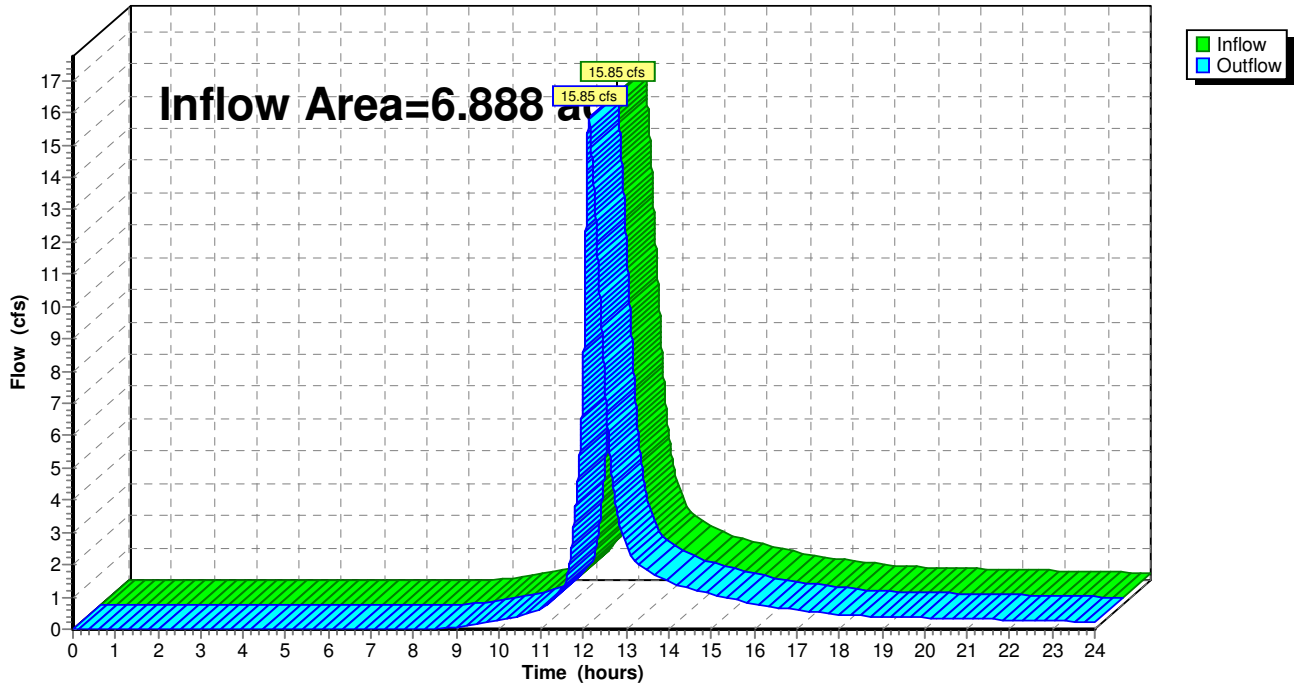
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.888 ac, 8.23% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 15.85 cfs @ 12.124 hrs, Volume= 1.508 af
Outflow = 15.85 cfs @ 12.124 hrs, Volume= 1.508 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



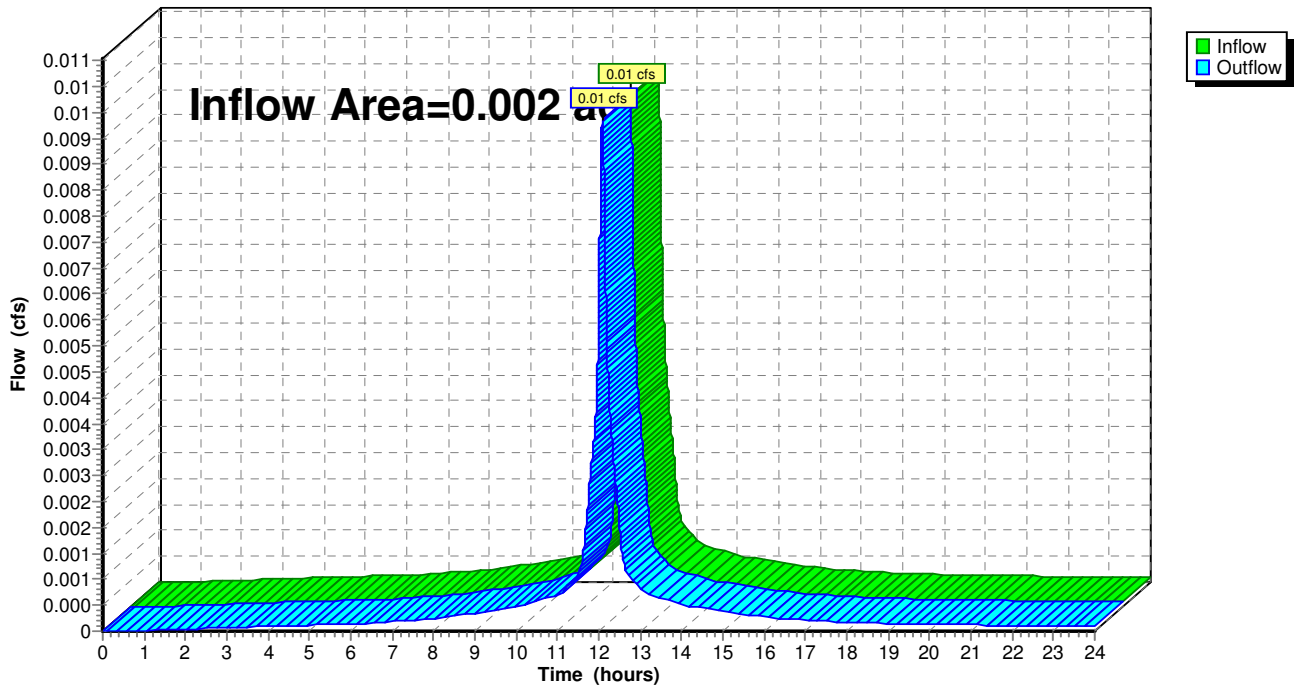
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.002 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
Inflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



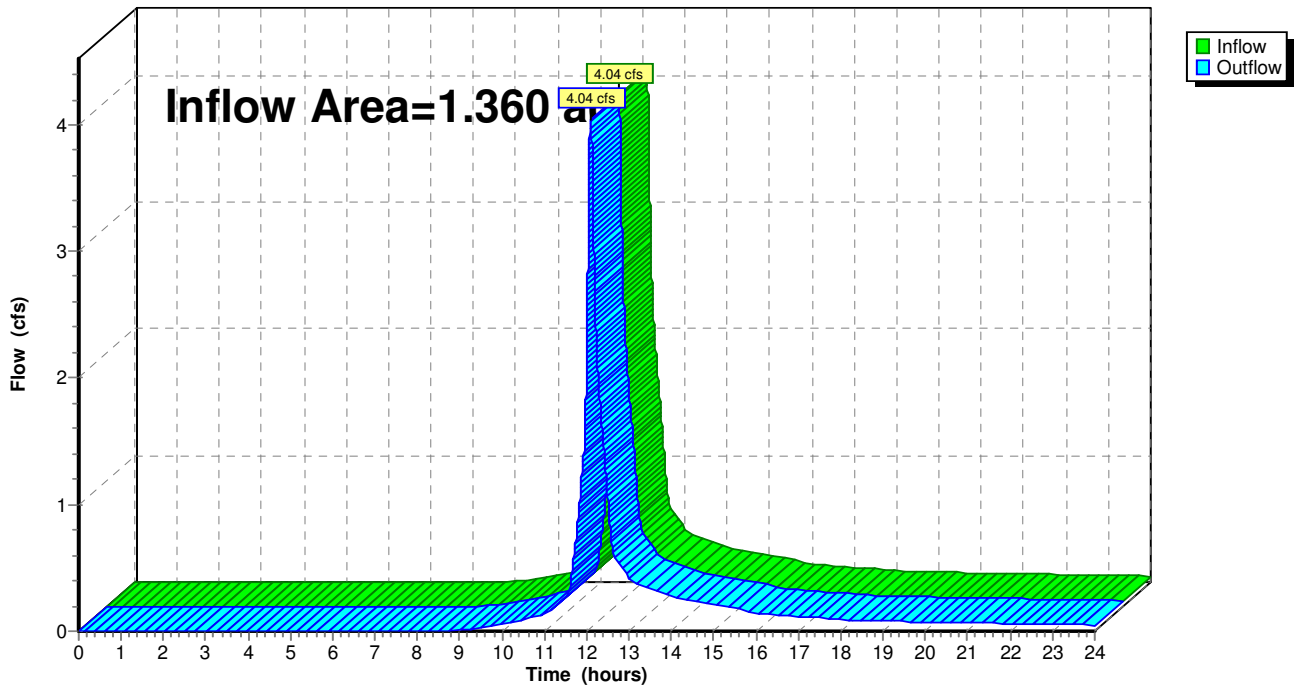
Summary for Reach SouthEast: Southeast

Inflow Area = 1.360 ac, 2.21% Impervious, Inflow Depth > 2.55" for 10-Year event
Inflow = 4.04 cfs @ 12.093 hrs, Volume= 0.289 af
Outflow = 4.04 cfs @ 12.093 hrs, Volume= 0.289 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach SouthEast: Southeast

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond Forebay: Forebay

Inflow Area = 0.120 ac, 75.00% Impervious, Inflow Depth > 4.33" for 10-Year event
 Inflow = 0.50 cfs @ 12.133 hrs, Volume= 0.043 af
 Outflow = 0.32 cfs @ 12.225 hrs, Volume= 0.043 af, Atten= 35%, Lag= 5.5 min
 Primary = 0.32 cfs @ 12.225 hrs, Volume= 0.043 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.98' @ 12.269 hrs Surf.Area= 792 sf Storage= 301 cf

Plug-Flow detention time= 31.2 min calculated for 0.043 af (99% of inflow)
 Center-of-Mass det. time= 22.3 min (798.3 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	1,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

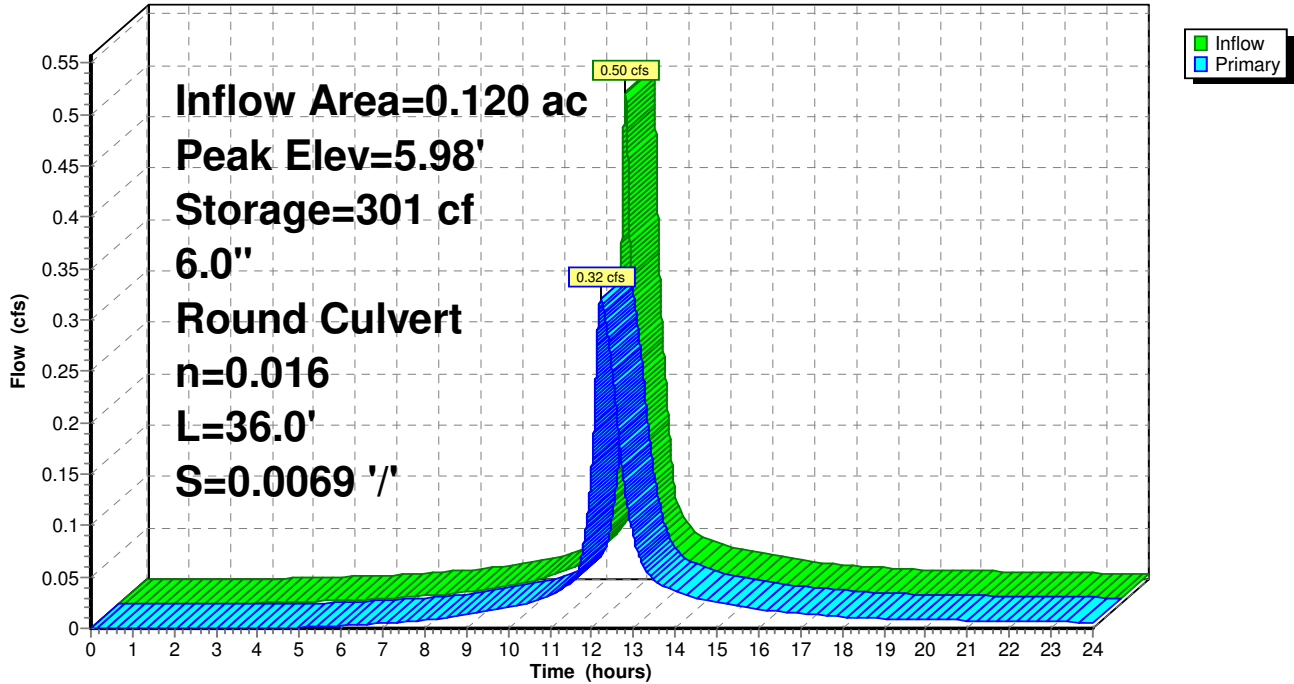
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	451	0	0
6.00	804	314	314
7.00	1,256	1,030	1,344

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	6.0" Round Culvert L= 36.0' Ke= 0.020 Inlet / Outlet Invert= 5.50' / 5.25' S= 0.0069 '/' Cc= 0.900 n= 0.016, Flow Area= 0.20 sf

Primary OutFlow Max=0.32 cfs @ 12.225 hrs HW=5.98' TW=5.67' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 0.32 cfs @ 2.13 fps)

Pond Forebay: Forebay

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond Lot 1: Lot 1 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

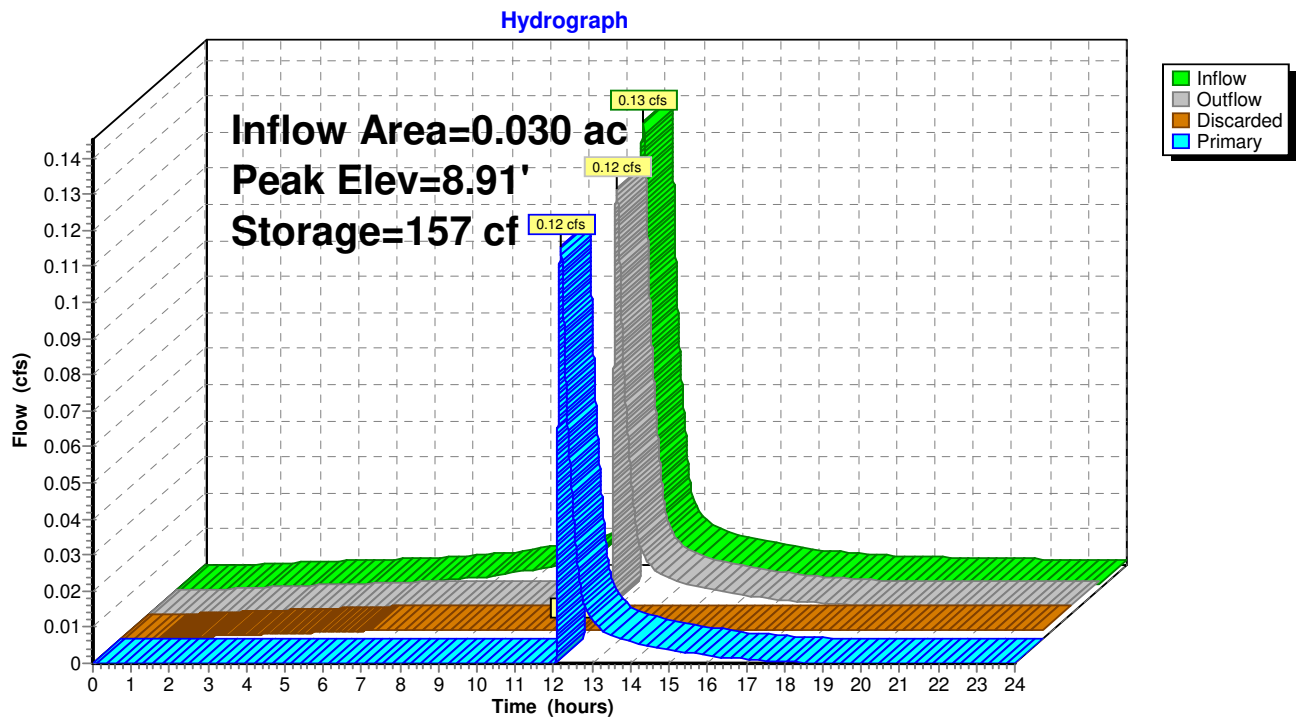
Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=8.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 1: Lot 1 Roof Recharge Trench



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond Lot 2: Lot 2 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

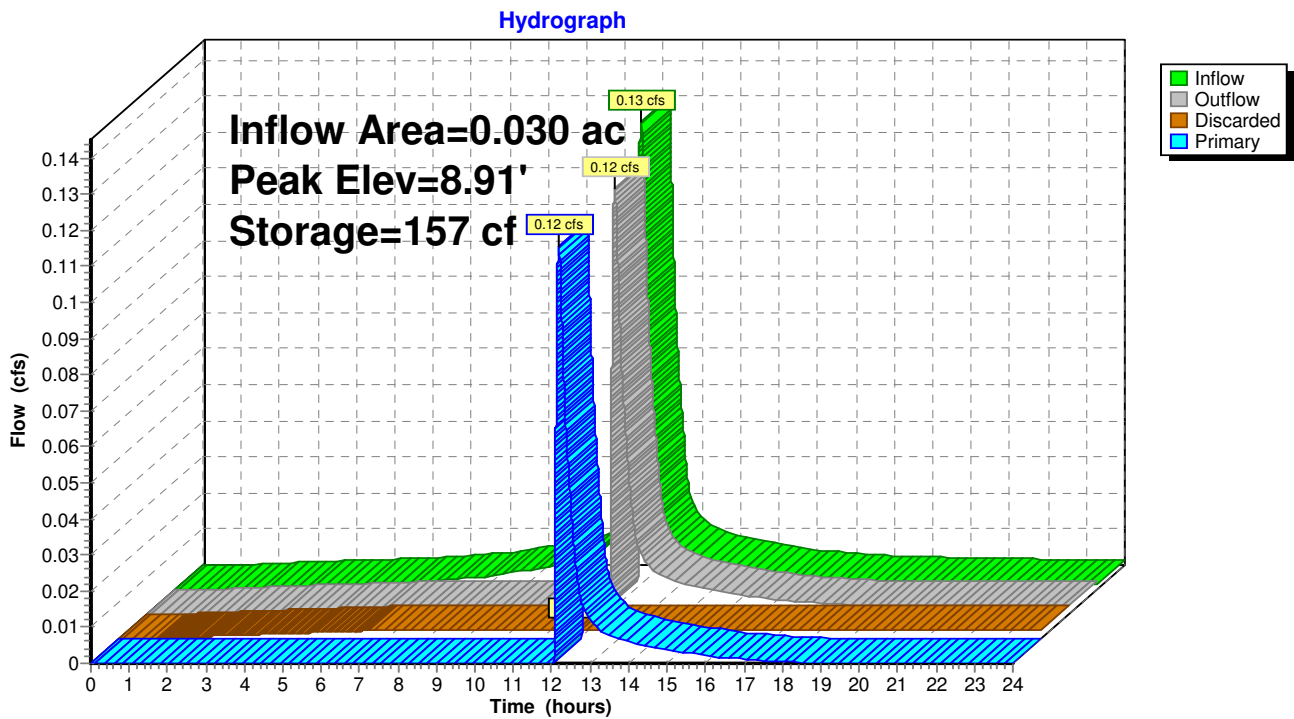
Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=8.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 2: Lot 2 Roof Recharge Trench



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Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond Lot 3: Lot 3 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	5.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	6.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	7.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.96	196	0	0
8.00	196	400	400

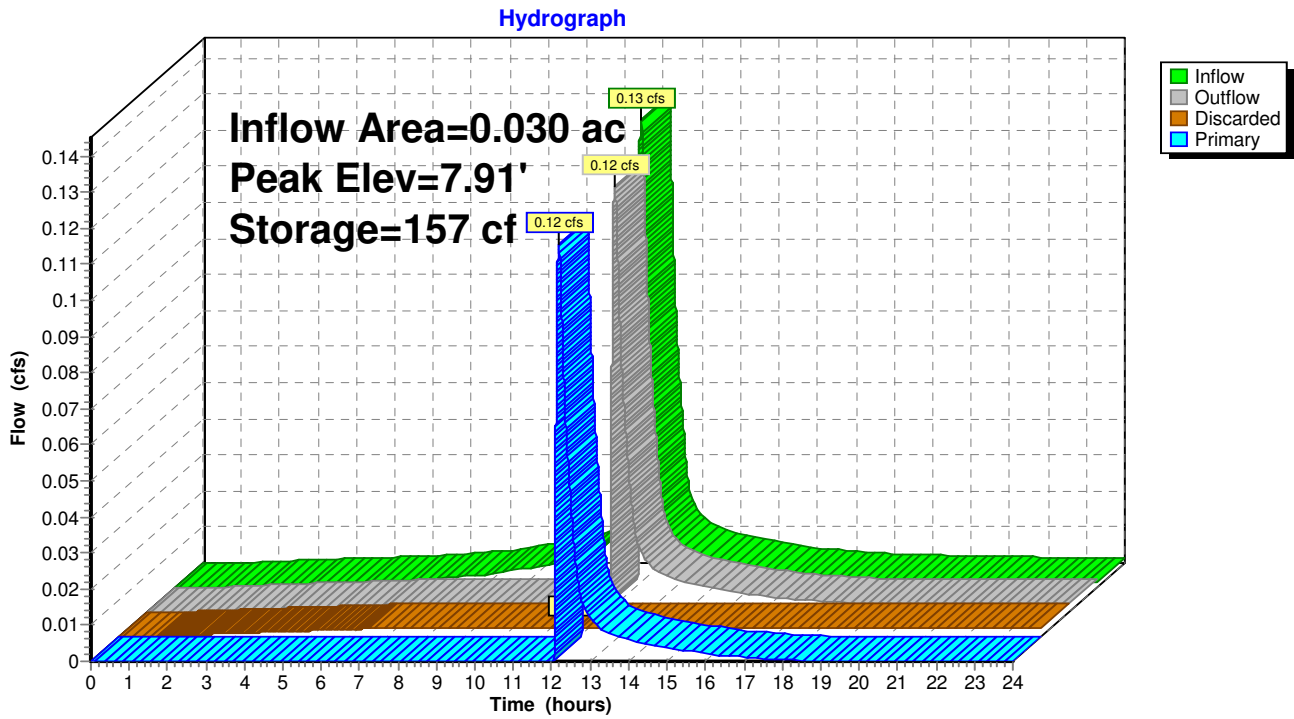
Elevation (feet)	Cum.Store (cubic-feet)
6.96	0
8.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	7.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	5.96'	0.520 in/hr Exfiltration over Surface area above 5.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=7.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=7.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 3: Lot 3 Roof Recharge Trench



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Summary for Pond Lot 4: Lot 4 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

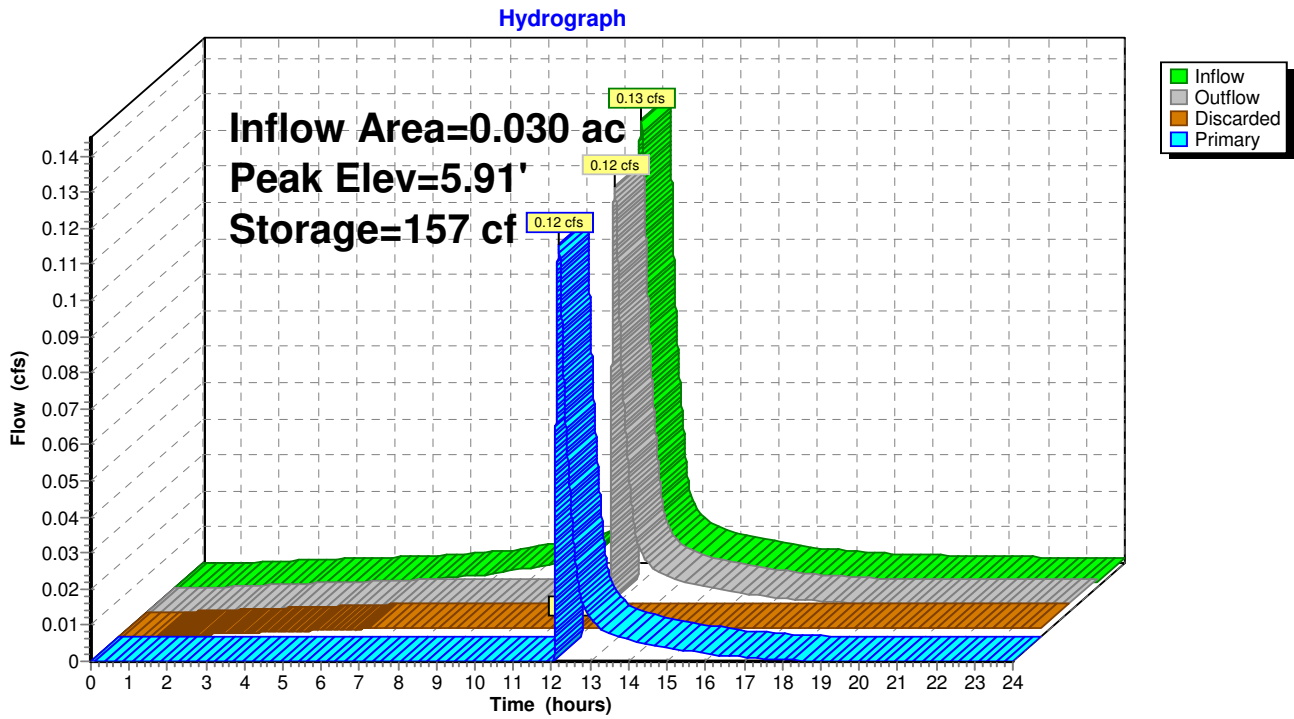
Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=5.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 4: Lot 4 Roof Recharge Trench



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Summary for Pond Lot 5: Lot 5 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

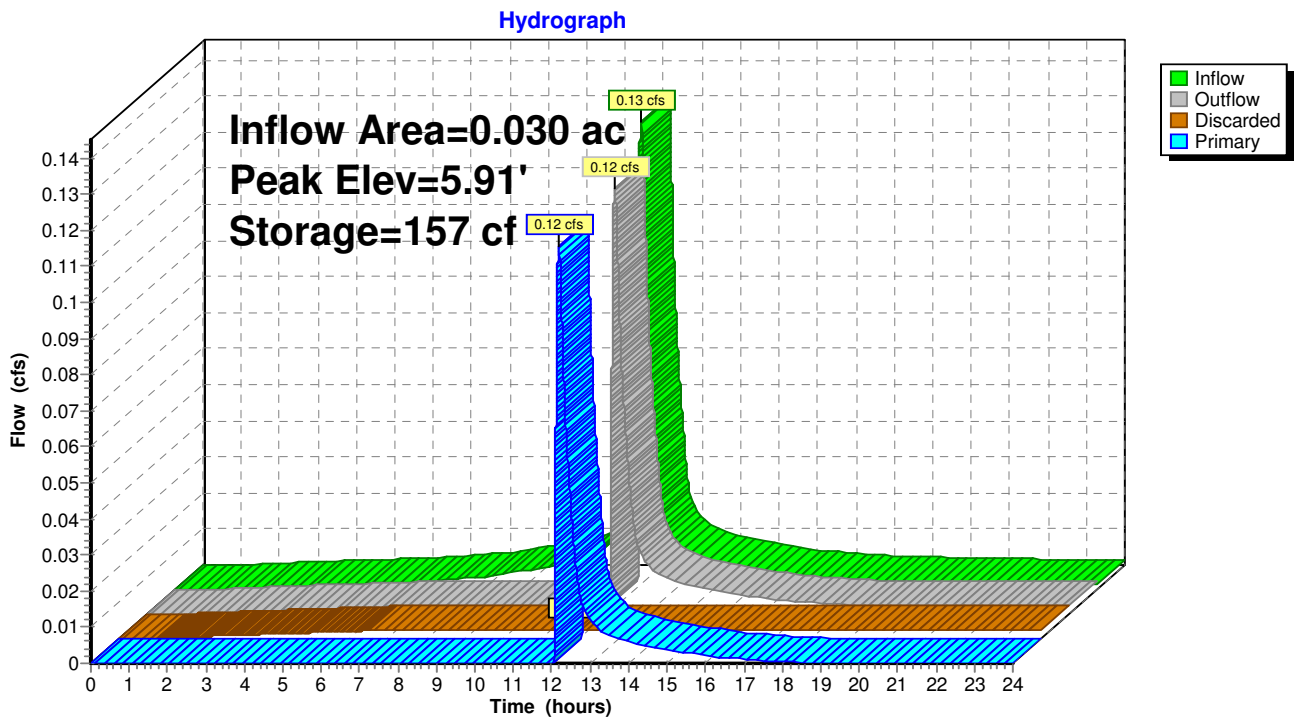
Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=5.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 5: Lot 5 Roof Recharge Trench



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Summary for Pond Lot 6: Lot 6 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 22.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	20.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	21.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	22.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.96	196	0	0
23.00	196	400	400

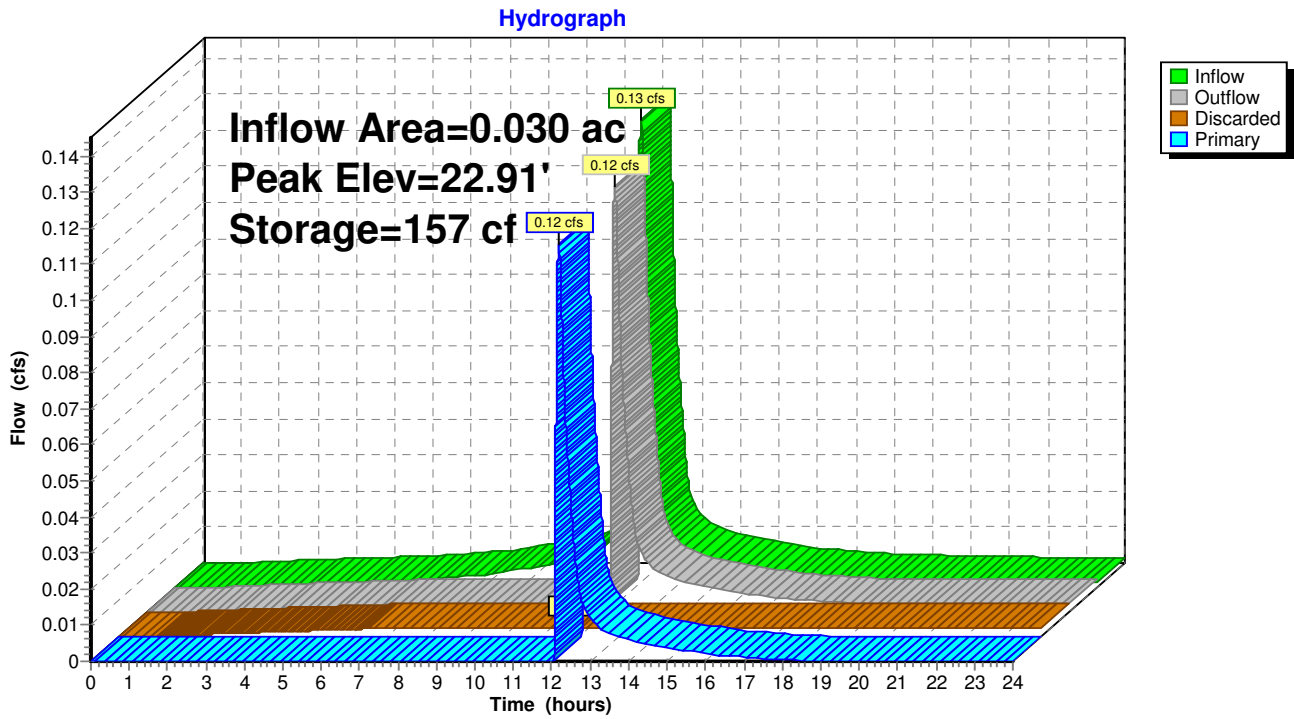
Elevation (feet)	Cum.Store (cubic-feet)
21.96	0
23.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	22.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	20.96'	0.520 in/hr Exfiltration over Surface area above 20.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=22.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=22.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 6: Lot 6 Roof Recharge Trench



Starboard Drive Estates Proposed

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Summary for Pond Lot 7: Lot 7 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	4.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	5.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	6.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.96	196	0	0
7.00	196	400	400

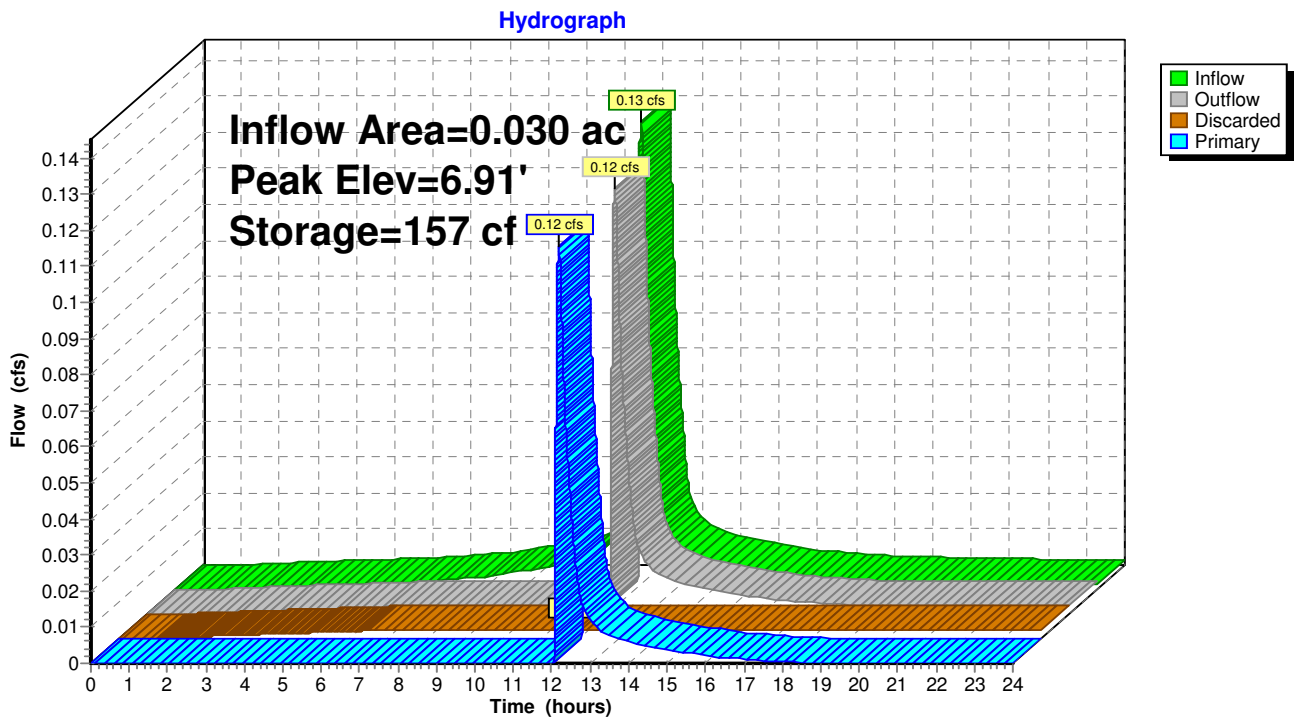
Elevation (feet)	Cum.Store (cubic-feet)
5.96	0
7.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	6.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	4.96'	0.520 in/hr Exfiltration over Surface area above 4.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=6.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=6.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 7: Lot 7 Roof Recharge Trench



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Summary for Pond Lot 8: Lot 8 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.79" for 10-Year event
 Inflow = 0.13 cfs @ 12.133 hrs, Volume= 0.012 af
 Outflow = 0.12 cfs @ 12.180 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.8 min
 Discarded = 0.00 cfs @ 12.049 hrs, Volume= 0.004 af
 Primary = 0.12 cfs @ 12.180 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.91' @ 12.180 hrs Surf.Area= 196 sf Storage= 157 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 49.2 min (799.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

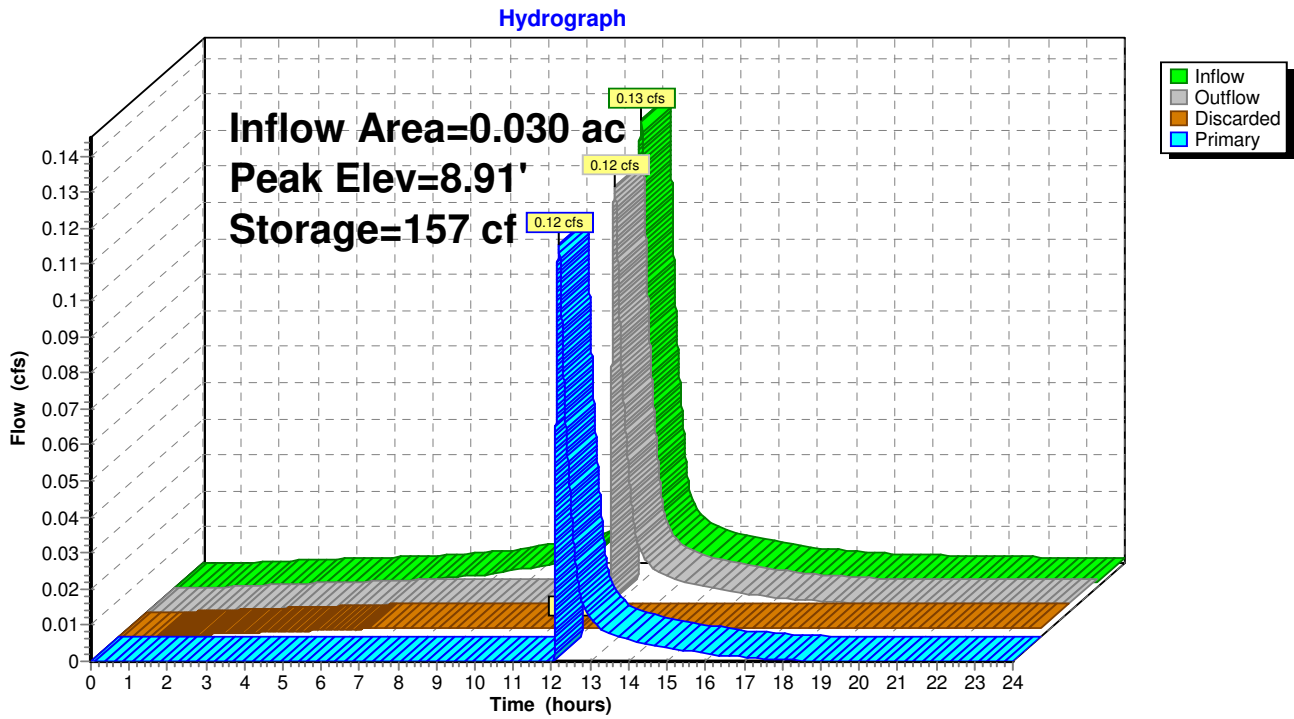
Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 12.049 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 12.180 hrs HW=8.91' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 1.68 fps)

Pond Lot 8: Lot 8 Roof Recharge Trench



Starboard Drive Estates Proposed

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Summary for Pond Pond A: Detention Pond A

Inflow Area = 0.438 ac, 57.31% Impervious, Inflow Depth > 3.72" for 10-Year event
 Inflow = 1.72 cfs @ 12.117 hrs, Volume= 0.136 af
 Outflow = 1.27 cfs @ 12.203 hrs, Volume= 0.127 af, Atten= 26%, Lag= 5.2 min
 Discarded = 0.02 cfs @ 12.203 hrs, Volume= 0.025 af
 Primary = 1.25 cfs @ 12.203 hrs, Volume= 0.101 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.75' @ 12.203 hrs Surf.Area= 0.046 ac Storage= 0.027 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 28.0 min (826.7 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.071 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6.00	0.025	0.000	0.000
7.00	0.053	0.039	0.039
7.50	0.074	0.032	0.071

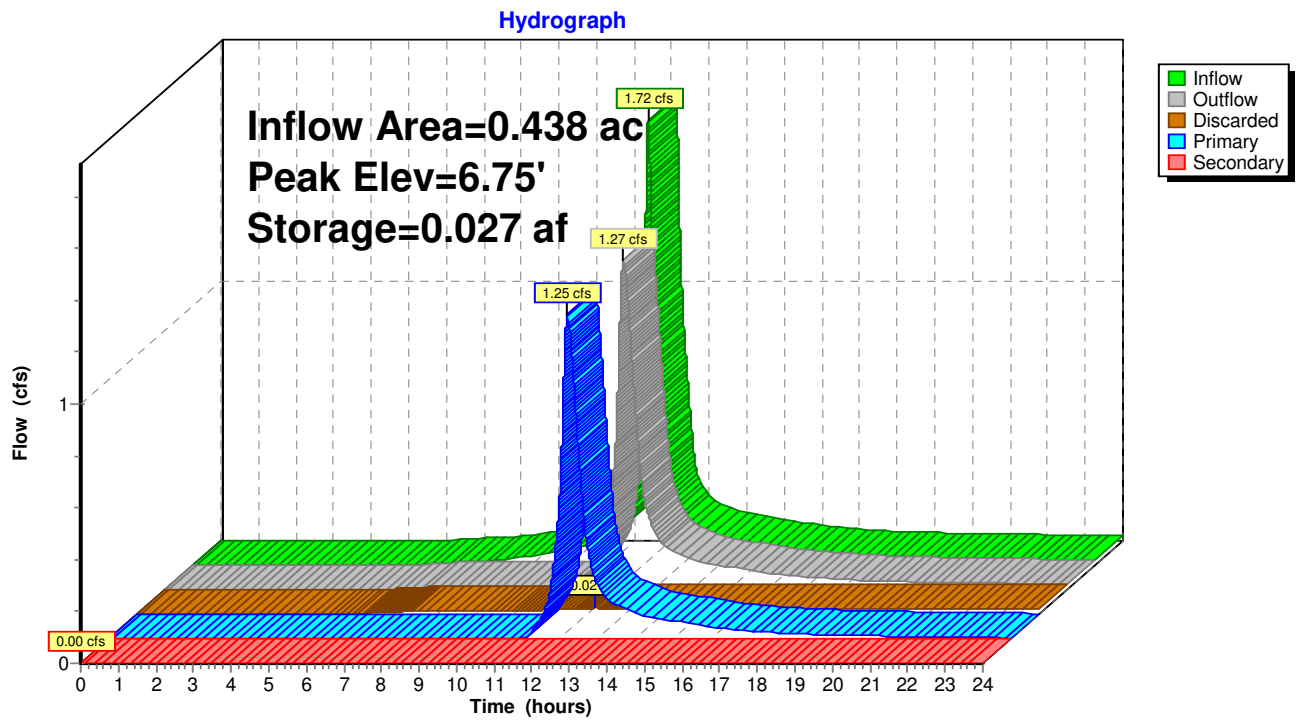
Device	Routing	Invert	Outlet Devices
#1	Secondary	7.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	6.30'	6.0" Round Culvert X 2.00 L= 17.0' Ke= 0.020 Inlet / Outlet Invert= 6.30' / 5.83' S= 0.0276 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Discarded	6.00'	0.520 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 12.203 hrs HW=6.75' (Free Discharge)
 ↑**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.25 cfs @ 12.203 hrs HW=6.75' TW=5.65' (Dynamic Tailwater)
 ↑**2=Culvert** (Inlet Controls 1.25 cfs @ 3.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=6.00' TW=4.90' (Dynamic Tailwater)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond A: Detention Pond A



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond Pond B: Detention Pond B

Inflow Area = 0.698 ac, 49.71% Impervious, Inflow Depth > 3.08" for 10-Year event
 Inflow = 1.95 cfs @ 12.183 hrs, Volume= 0.179 af
 Outflow = 1.58 cfs @ 12.339 hrs, Volume= 0.175 af, Atten= 19%, Lag= 9.4 min
 Discarded = 0.03 cfs @ 12.339 hrs, Volume= 0.016 af
 Primary = 1.55 cfs @ 12.339 hrs, Volume= 0.159 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.70' @ 12.339 hrs Surf.Area= 2,588 sf Storage= 1,097 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 15.4 min (819.0 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	4,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.90	269	0	0
5.00	922	60	60
5.10	843	88	148
5.20	857	85	233
6.00	3,618	1,790	2,023
6.50	4,411	2,007	4,030

Device	Routing	Invert	Outlet Devices
#1	Primary	5.10'	12.0" Round Culvert L= 20.0' Ke= 0.020 Inlet / Outlet Invert= 5.10' / 4.80' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	4.90'	0.520 in/hr Exfiltration over Surface area
#3	Secondary	6.00'	4.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

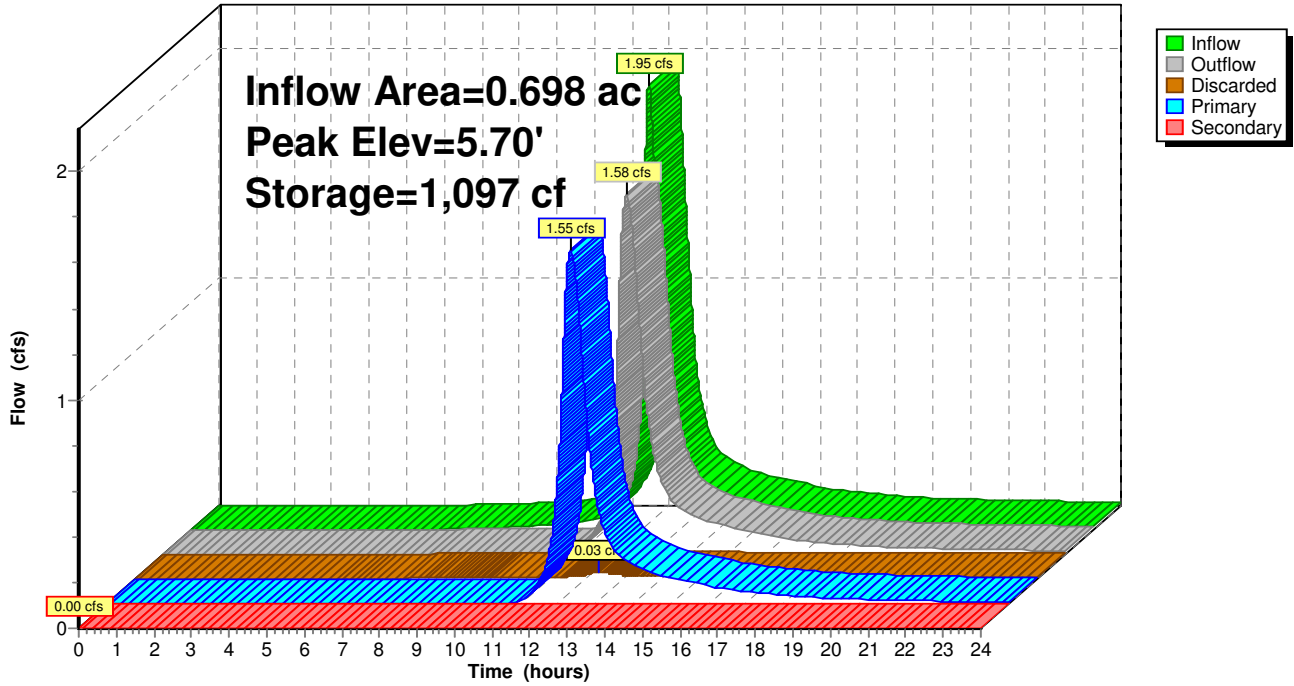
Discarded OutFlow Max=0.03 cfs @ 12.339 hrs HW=5.70' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.55 cfs @ 12.339 hrs HW=5.70' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.55 cfs @ 4.51 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=4.90' TW=0.00' (Dynamic Tailwater)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond B: Detention Pond B

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 10-Year Rainfall=5.03"

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Summary for Pond SW1: 3-ft wide swale

Inflow Area = 0.158 ac, 67.09% Impervious, Inflow Depth > 3.90" for 10-Year event
 Inflow = 0.70 cfs @ 12.087 hrs, Volume= 0.051 af
 Outflow = 0.69 cfs @ 12.095 hrs, Volume= 0.051 af, Atten= 1%, Lag= 0.5 min
 Primary = 0.69 cfs @ 12.095 hrs, Volume= 0.051 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.75' @ 12.095 hrs Surf.Area= 172 sf Storage= 36 cf

Plug-Flow detention time= 3.6 min calculated for 0.051 af (100% of inflow)
 Center-of-Mass det. time= 2.1 min (791.9 - 789.9)

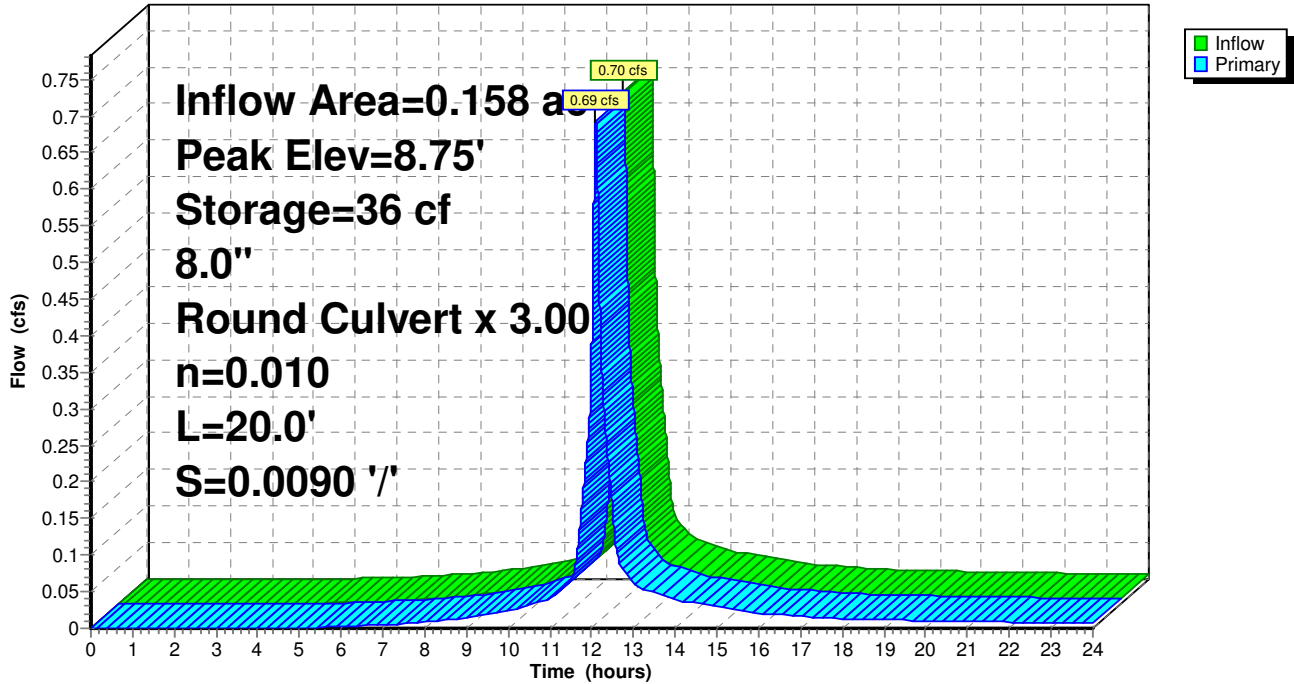
Volume	Invert	Avail.Storage	Storage Description
#1	8.40'	630 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.40	30	0	0
9.00	270	90	90
10.00	810	540	630

Device	Routing	Invert	Outlet Devices
#1	Primary	8.48'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 8.48' / 8.30' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.69 cfs @ 12.095 hrs HW=8.75' TW=7.92' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 0.69 cfs @ 2.52 fps)

Pond SW1: 3-ft wide swale

Hydrograph



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Summary for Pond SW2: 3-ft wide swale

Inflow Area = 0.238 ac, 61.34% Impervious, Inflow Depth > 3.76" for 10-Year event
 Inflow = 1.01 cfs @ 12.093 hrs, Volume= 0.075 af
 Outflow = 1.00 cfs @ 12.105 hrs, Volume= 0.074 af, Atten= 1%, Lag= 0.8 min
 Primary = 1.00 cfs @ 12.105 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.92' @ 12.105 hrs Surf.Area= 232 sf Storage= 55 cf

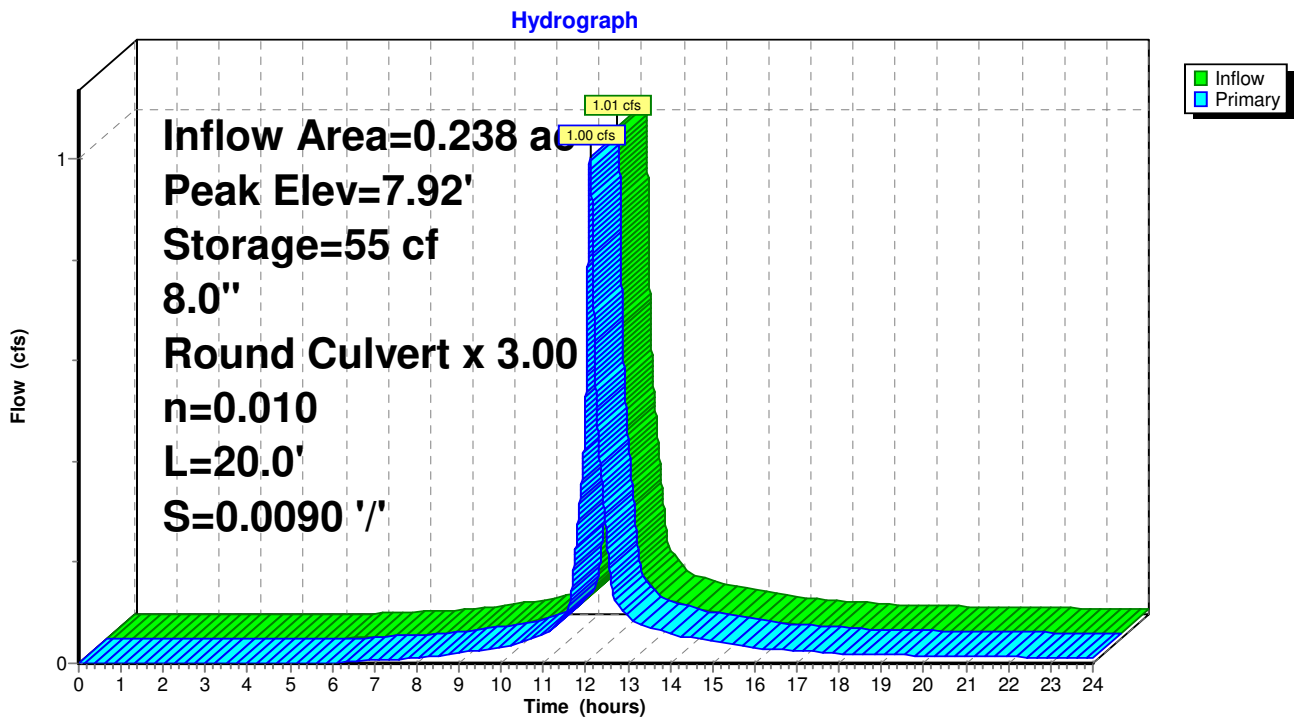
Plug-Flow detention time= 3.0 min calculated for 0.074 af (100% of inflow)
 Center-of-Mass det. time= 1.8 min (797.3 - 795.6)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	615 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7.50	30	0	0
8.00	270	75	75
9.00	810	540	615

Device	Routing	Invert	Outlet Devices
#1	Primary	7.58'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 7.58' / 7.40' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.00 cfs @ 12.105 hrs HW=7.92' TW=6.68' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 1.00 cfs @ 2.71 fps)

Pond SW2: 3-ft wide swale



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Type III 24-hr 25-Year Rainfall=6.04"

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Pond A	Runoff Area=0.200 ac 52.50% Impervious Runoff Depth>4.66" Tc=10.0 min CN=88 Runoff=0.93 cfs 0.078 af
Subcatchment B: Pond B	Runoff Area=0.140 ac 4.29% Impervious Runoff Depth>3.91" Tc=10.0 min CN=81 Runoff=0.56 cfs 0.046 af
Subcatchment Cul-de--sac: Cul-de-sac	Runoff Area=0.120 ac 75.00% Impervious Runoff Depth>5.33" Tc=10.0 min CN=94 Runoff=0.61 cfs 0.053 af
Subcatchment E: East Entrance	Runoff Area=0.002 ac 100.00% Impervious Runoff Depth>5.80" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Subcatchment House 1: Lot 1	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 2: Lot 2	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 3: Lot 3	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 4: Lot 4	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 5: Lot 5	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 6: Lot 6	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 7: Lot 7	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment House 8: Lot 8	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>5.79" Tc=10.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment N: North Wetland	Runoff Area=3.260 ac 0.00% Impervious Runoff Depth>3.41" Tc=6.0 min CN=76 Runoff=13.08 cfs 0.927 af
Subcatchment SE: SE	Runoff Area=1.330 ac 0.00% Impervious Runoff Depth>3.41" Tc=6.0 min CN=76 Runoff=5.34 cfs 0.378 af
Subcatchment SW: Southwest Wetland	Runoff Area=2.720 ac 0.37% Impervious Runoff Depth>3.60" Flow Length=200' Tc=15.7 min CN=78 Runoff=8.56 cfs 0.817 af
Subcatchment Swale 1: Swale 1	Runoff Area=0.158 ac 67.09% Impervious Runoff Depth>4.88" Tc=6.0 min CN=90 Runoff=0.86 cfs 0.064 af

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Type III 24-hr 25-Year Rainfall=6.04"

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Subcatchment Swale 2: Swale 2 Runoff Area=0.080 ac 50.00% Impervious Runoff Depth>4.44"
Tc=6.0 min CN=86 Runoff=0.41 cfs 0.030 af

Reach BB: Buzzards Bay Inflow=21.23 cfs 2.006 af
Outflow=21.23 cfs 2.006 af

Reach Road: Sconticut Neck Road Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach SouthEast: Southeast Inflow=5.45 cfs 0.385 af
Outflow=5.45 cfs 0.385 af

Pond Forebay: Forebay Peak Elev=6.06' Storage=365 cf Inflow=0.61 cfs 0.053 af
6.0" Round Culvert n=0.016 L=36.0' S=0.0069 1/1" Outflow=0.37 cfs 0.053 af

Pond Lot 1: Lot 1 Roof Recharge Trench Peak Elev=8.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 2: Lot 2 Roof Recharge Trench Peak Elev=8.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 3: Lot 3 Roof Recharge Trench Peak Elev=7.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 4: Lot 4 Roof Recharge Trench Peak Elev=5.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 5: Lot 5 Roof Recharge Trench Peak Elev=5.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 6: Lot 6 Roof Recharge Trench Peak Elev=22.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 7: Lot 7 Roof Recharge Trench Peak Elev=6.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Lot 8: Lot 8 Roof Recharge Trench Peak Elev=8.96' Storage=161 cf Inflow=0.16 cfs 0.014 af
Discarded=0.00 cfs 0.004 af Primary=0.15 cfs 0.007 af Outflow=0.15 cfs 0.012 af

Pond Pond A: Detention Pond A Peak Elev=6.84' Storage=0.031 af Inflow=2.14 cfs 0.171 af
Discarded=0.03 cfs 0.027 af Primary=1.49 cfs 0.135 af Secondary=0.00 cfs 0.000 af Outflow=1.52 cfs 0.162 af

Pond Pond B: Detention Pond B Peak Elev=5.78' Storage=1,324 cf Inflow=2.36 cfs 0.233 af
Discarded=0.03 cfs 0.018 af Primary=1.90 cfs 0.211 af Secondary=0.00 cfs 0.000 af Outflow=1.94 cfs 0.229 af

Pond SW1: 3-ft wide swale Peak Elev=8.79' Storage=42 cf Inflow=0.86 cfs 0.064 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=0.85 cfs 0.064 af

Pond SW2: 3-ft wide swale Peak Elev=7.97' Storage=67 cf Inflow=1.26 cfs 0.094 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 1/1" Outflow=1.24 cfs 0.094 af

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Total Runoff Area = 8.250 ac Runoff Volume = 2.508 af Average Runoff Depth = 3.65"
92.74% Pervious = 7.651 ac 7.26% Impervious = 0.599 ac

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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment A: Pond A

Runoff = 0.93 cfs @ 12.133 hrs, Volume= 0.078 af, Depth> 4.66"

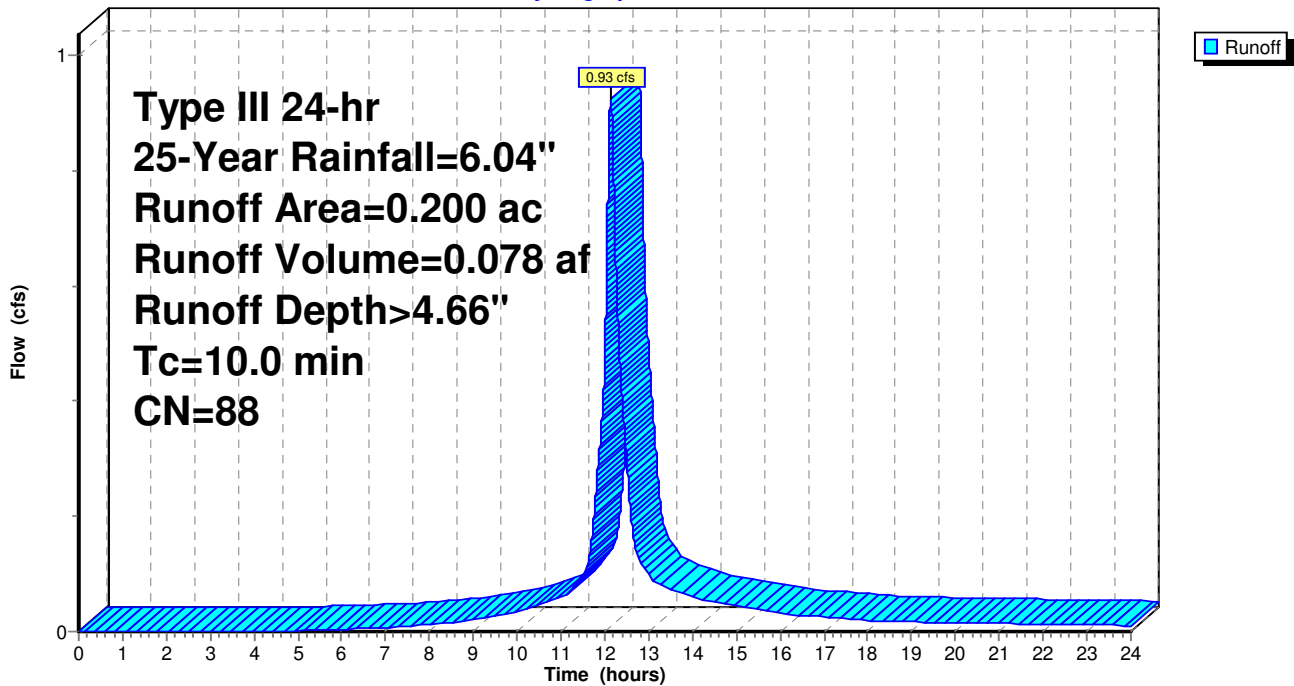
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.080	98	Paved roads
0.040	74	>75% Grass cover, Good, HSG C
0.055	80	>75% Grass cover, Good, HSG D
* 0.025	98	Pond Bottom
0.200	88	Weighted Average
0.095		47.50% Pervious Area
0.105		52.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment A: Pond A

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment B: Pond B

Runoff = 0.56 cfs @ 12.144 hrs, Volume= 0.046 af, Depth> 3.91"

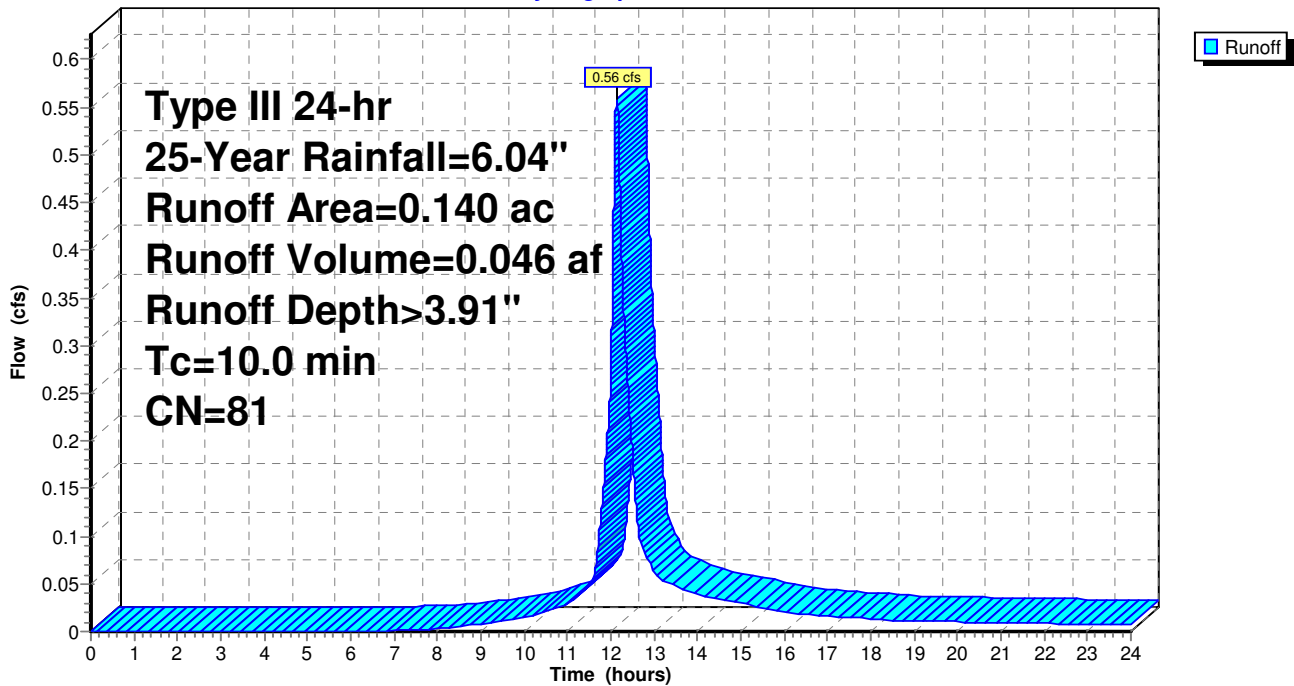
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
0.134	80	>75% Grass cover, Good, HSG D
* 0.006	98	Pond Bottom
0.140	81	Weighted Average
0.134		95.71% Pervious Area
0.006		4.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment B: Pond B

Hydrograph



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Summary for Subcatchment Cul-de--sac: Cul-de-sac

Runoff = 0.61 cfs @ 12.133 hrs, Volume= 0.053 af, Depth> 5.33"

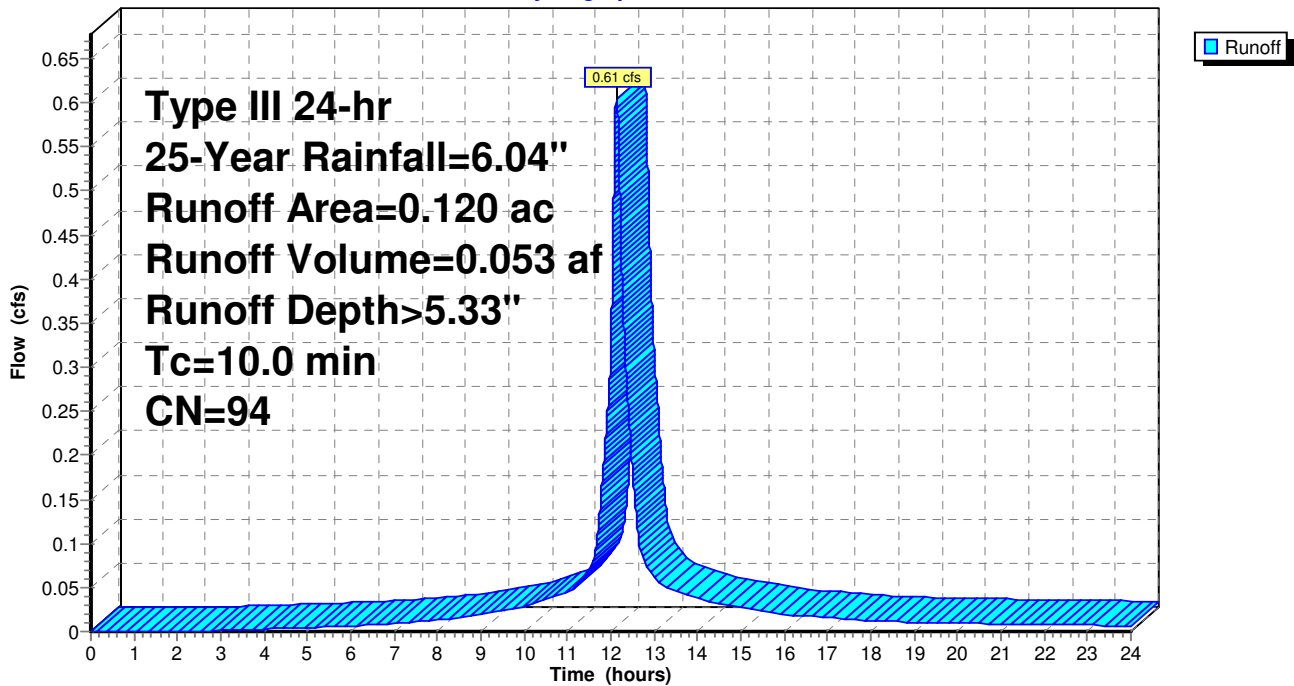
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
0.090	98	Paved road
0.030	80	>75% Grass cover, Good, HSG D
0.120	94	Weighted Average
0.030		25.00% Pervious Area
0.090		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Cul-de--sac: Cul-de-sac

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment E: East Entrance

Runoff = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Depth> 5.80"

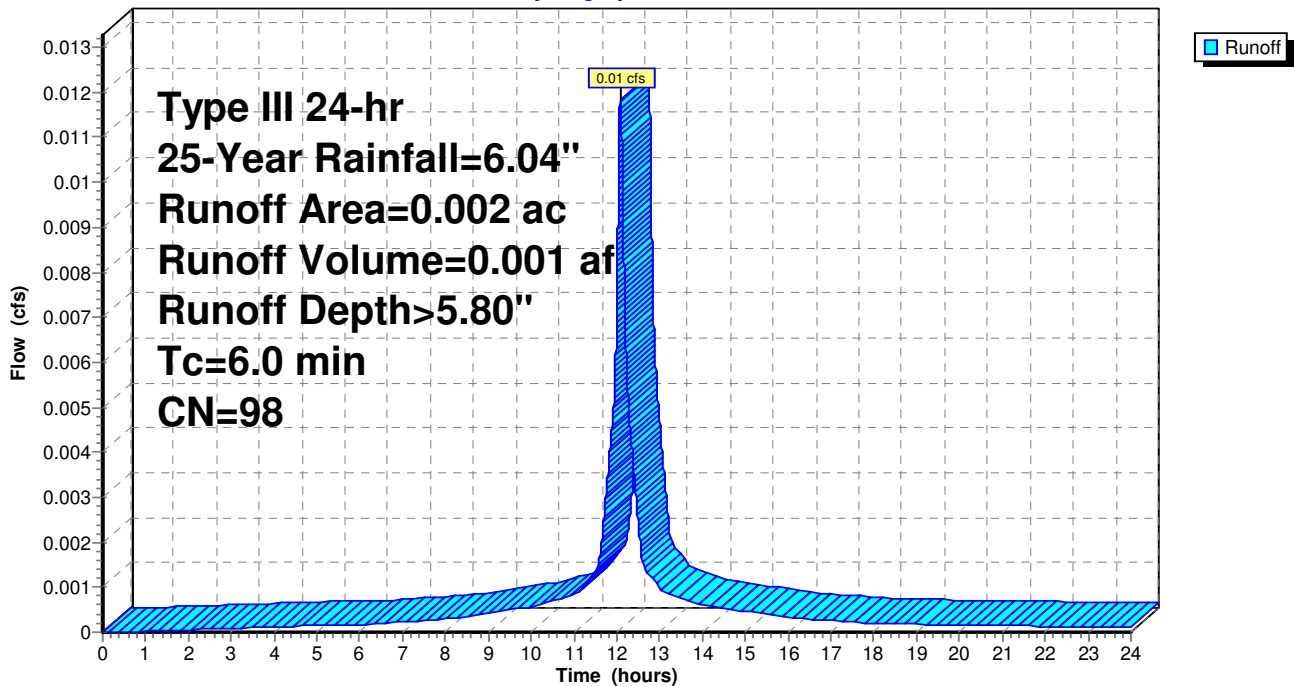
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.002	98	Paved roads
0.002		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 1: Lot 1

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

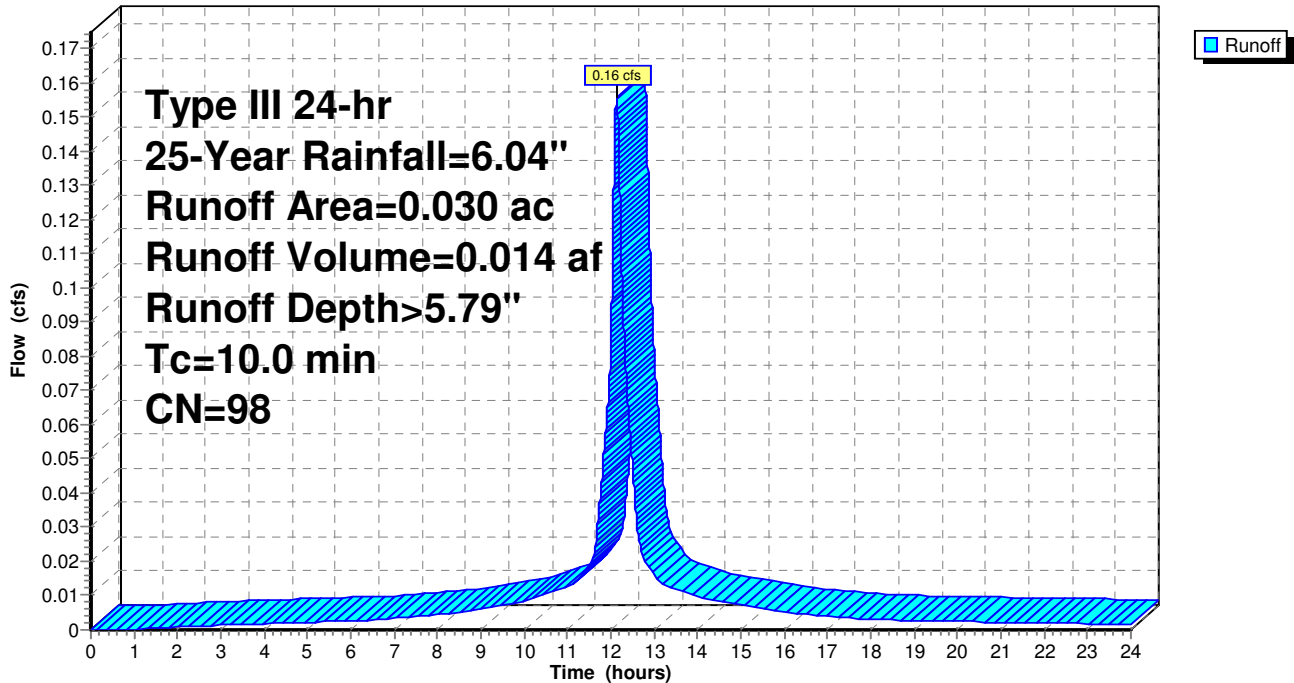
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 1: Lot 1

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 2: Lot 2

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

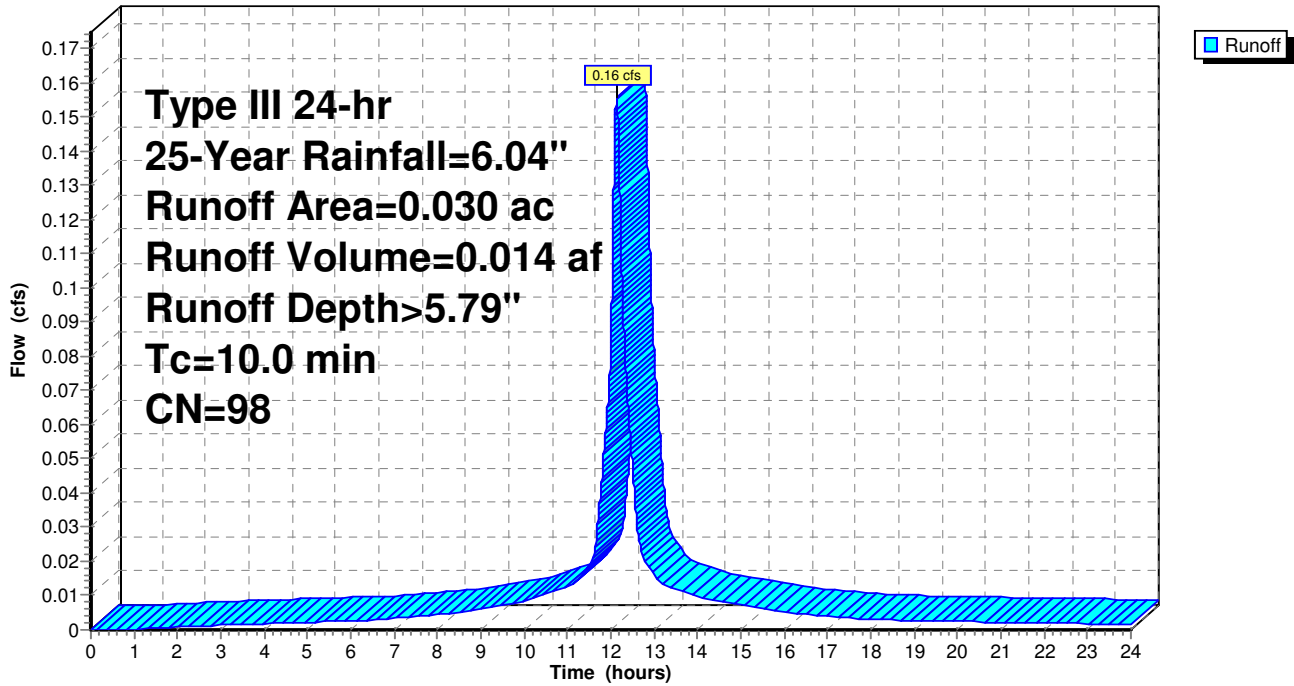
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 2: Lot 2

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 3: Lot 3

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

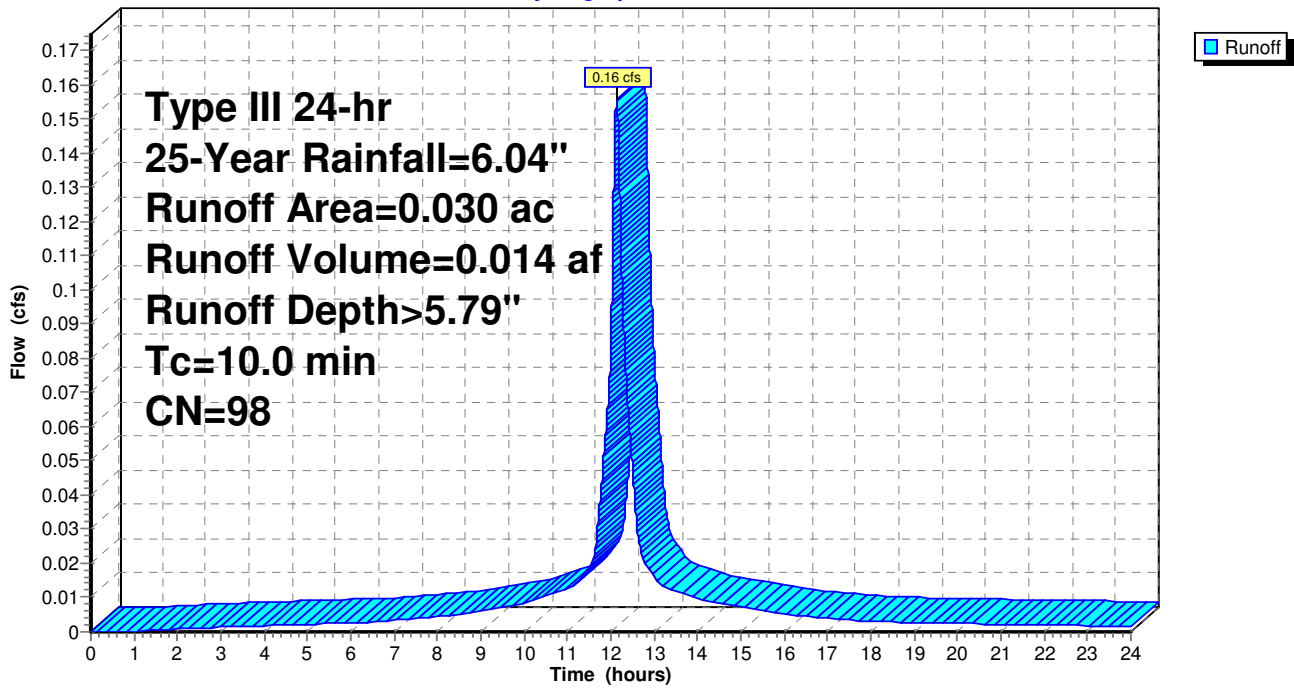
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 3: Lot 3

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 4: Lot 4

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

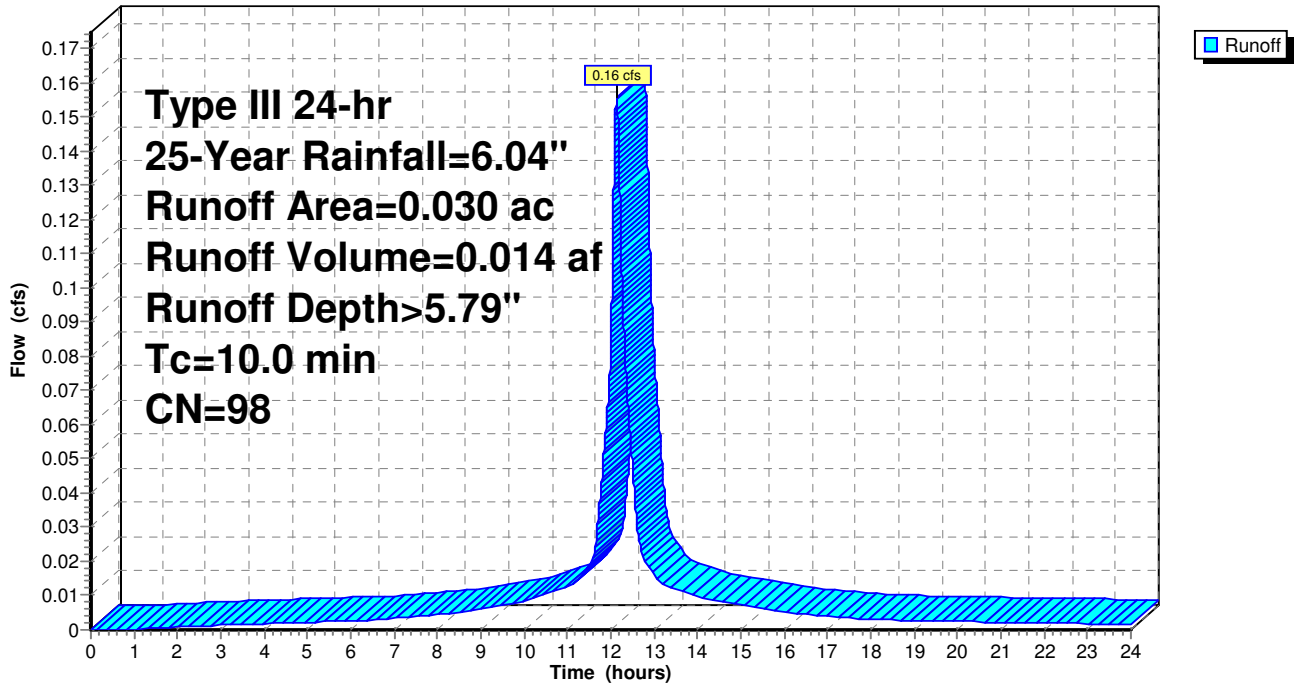
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 4: Lot 4

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 5: Lot 5

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

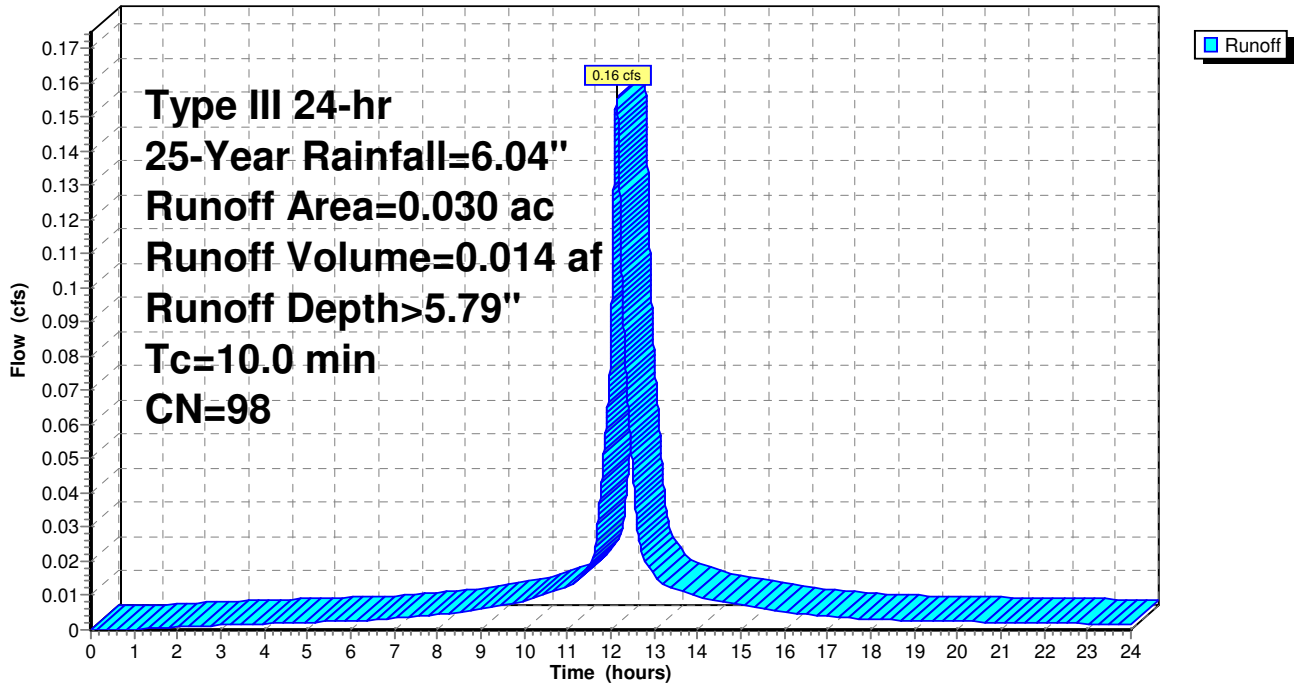
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 5: Lot 5

Hydrograph



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Summary for Subcatchment House 6: Lot 6

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

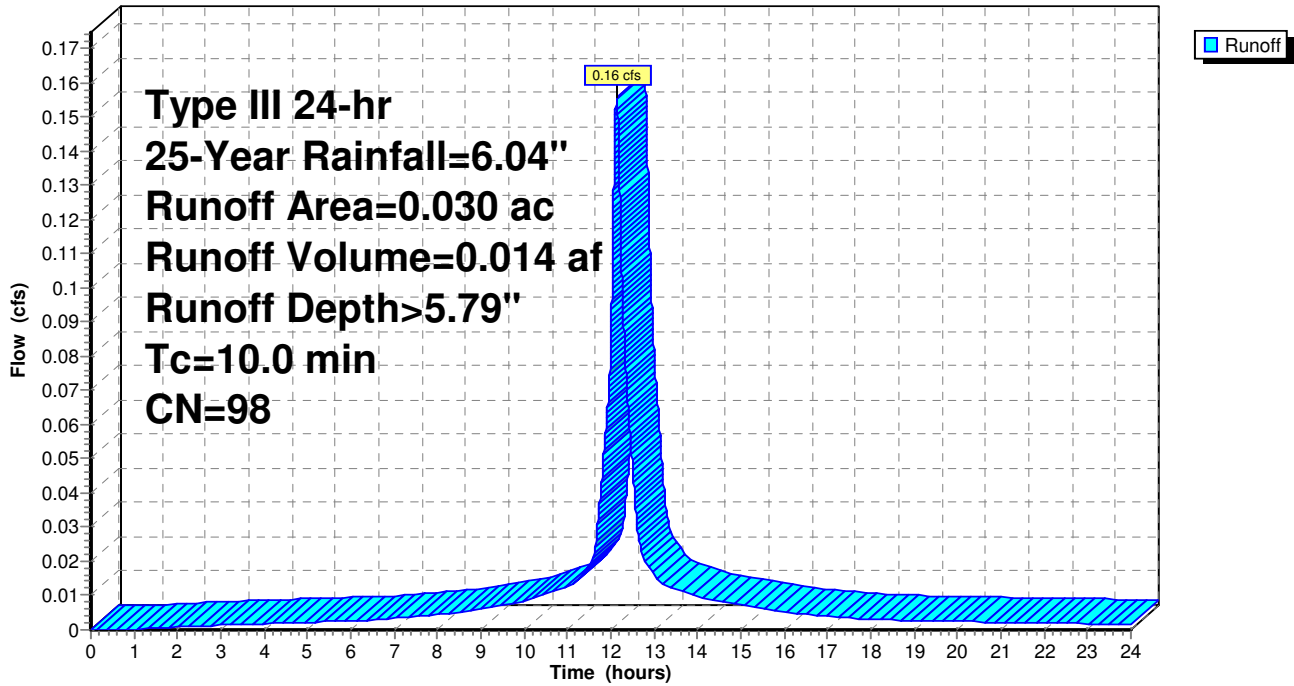
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 6: Lot 6

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 7: Lot 7

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

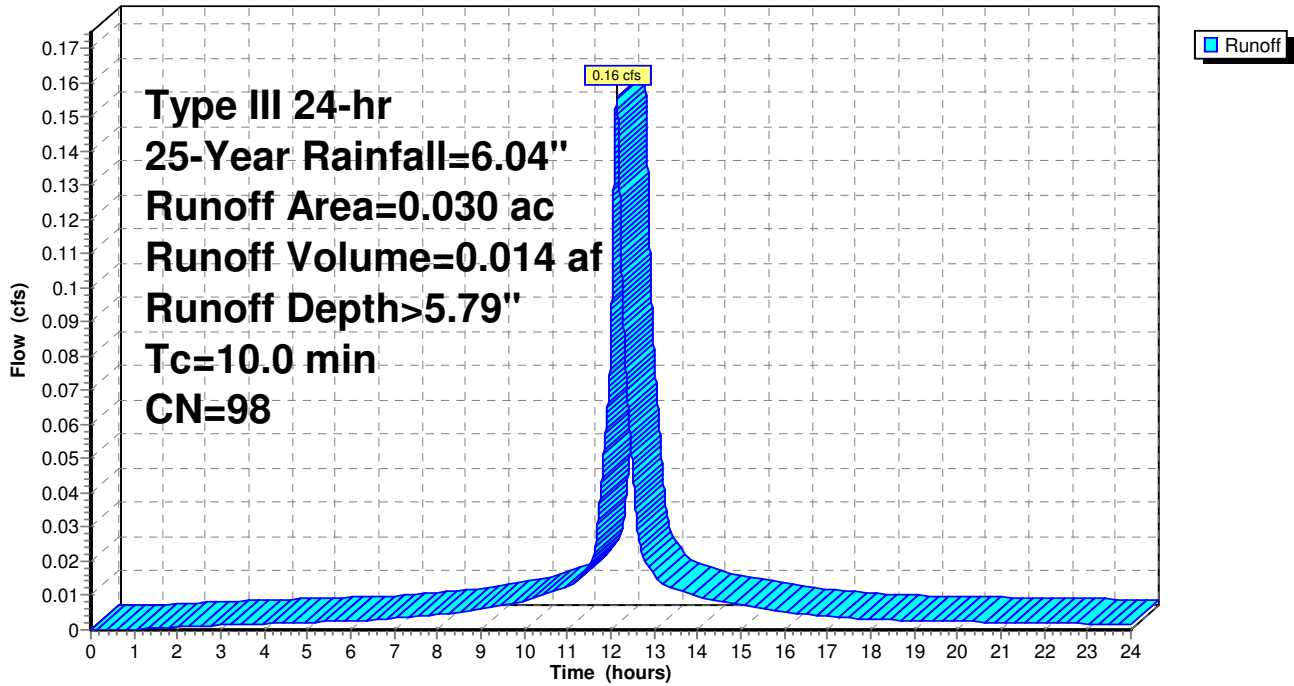
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 7: Lot 7

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment House 8: Lot 8

Runoff = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af, Depth> 5.79"

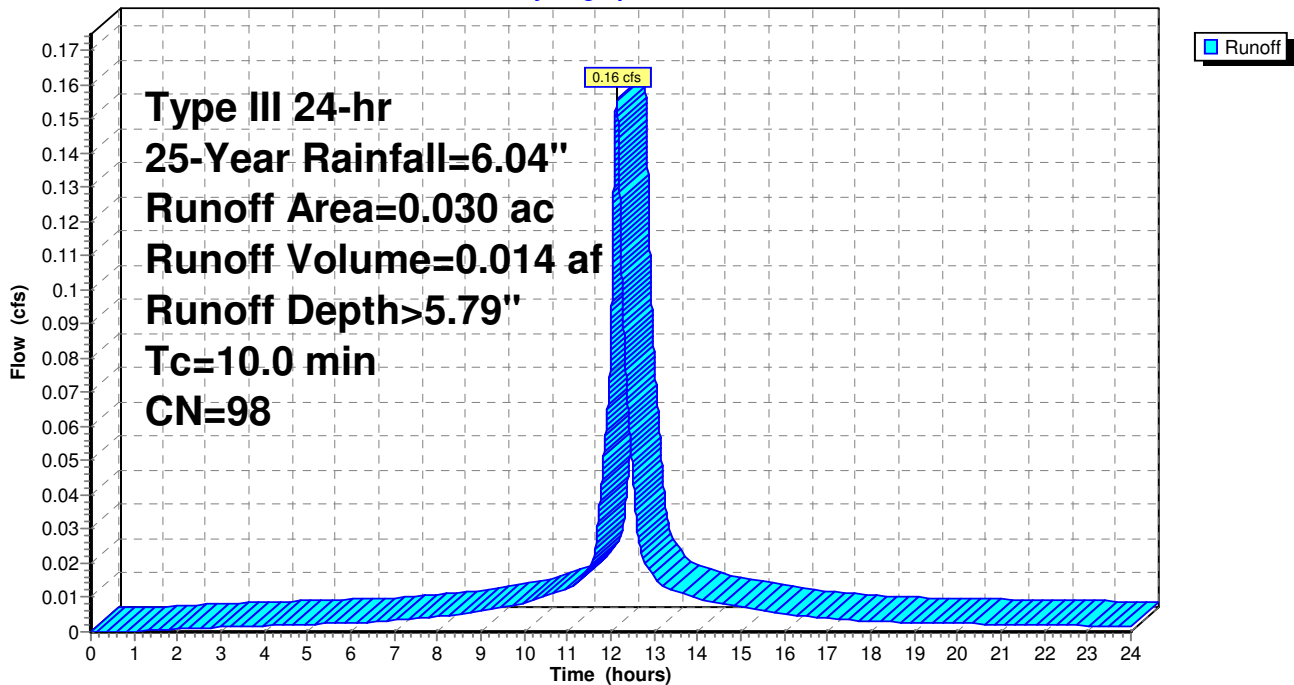
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 8: Lot 8

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment N: North Wetland

Runoff = 13.08 cfs @ 12.087 hrs, Volume= 0.927 af, Depth> 3.41"

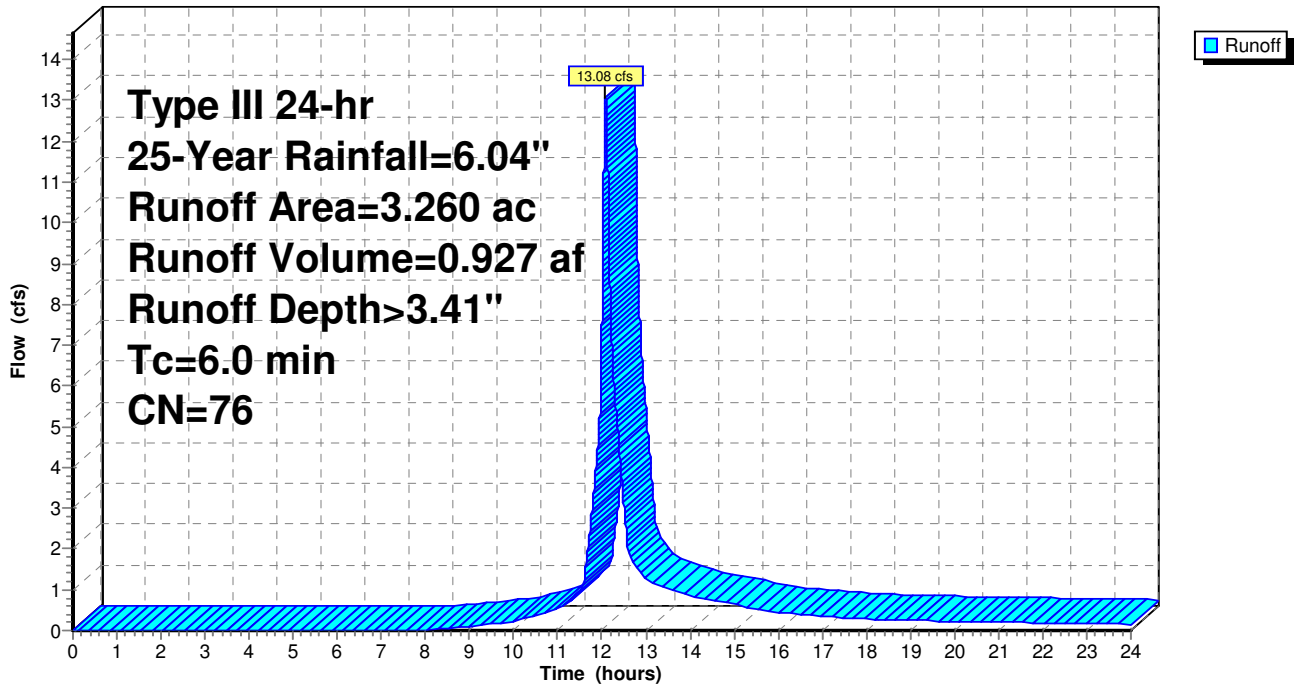
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.070	91	Gravel roads, HSG D
1.610	74	>75% Grass cover, Good, HSG C
0.580	80	>75% Grass cover, Good, HSG D
0.070	70	Woods, Good, HSG C
0.800	77	Woods, Good, HSG D
* 0.090	72	Beach
3.260	76	Weighted Average
3.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment SE: SE

Runoff = 5.34 cfs @ 12.087 hrs, Volume= 0.378 af, Depth> 3.41"

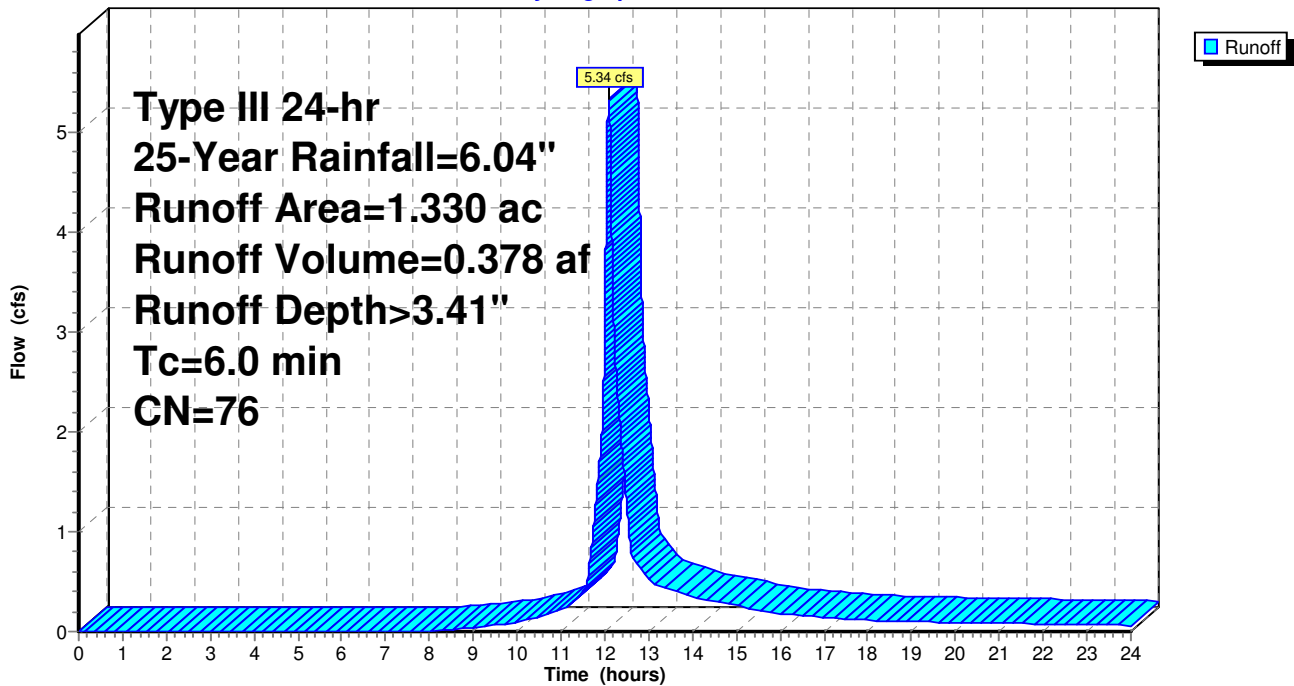
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
0.040	96	Gravel surface, HSG C
0.930	74	>75% Grass cover, Good, HSG C
0.190	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.330	76	Weighted Average
1.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: SE

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment SW: Southwest Wetland

Runoff = 8.56 cfs @ 12.211 hrs, Volume= 0.817 af, Depth> 3.60"

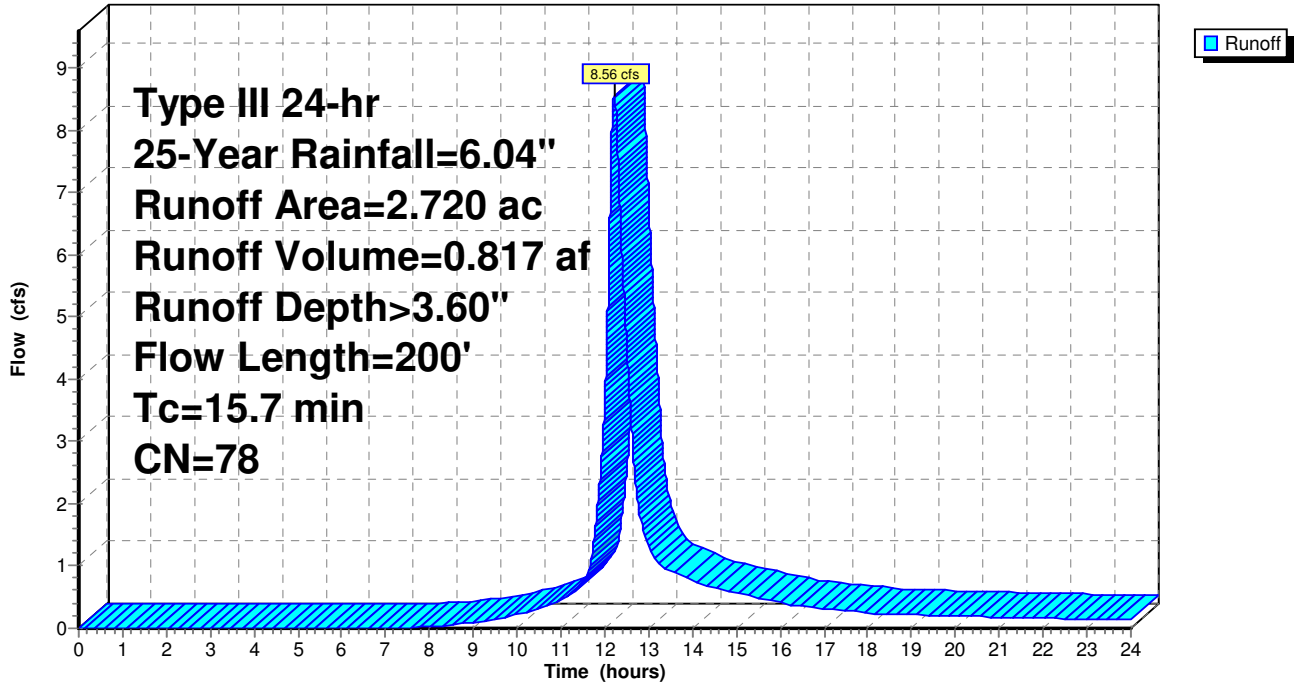
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.010	98	Paved
0.060	96	Gravel surface, HSG C
0.080	96	Gravel surface, HSG D
0.640	74	>75% Grass cover, Good, HSG C
1.080	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.510	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.720	78	Weighted Average
2.710		99.63% Pervious Area
0.010		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment Swale 1: Swale 1

Runoff = 0.86 cfs @ 12.087 hrs, Volume= 0.064 af, Depth> 4.88"

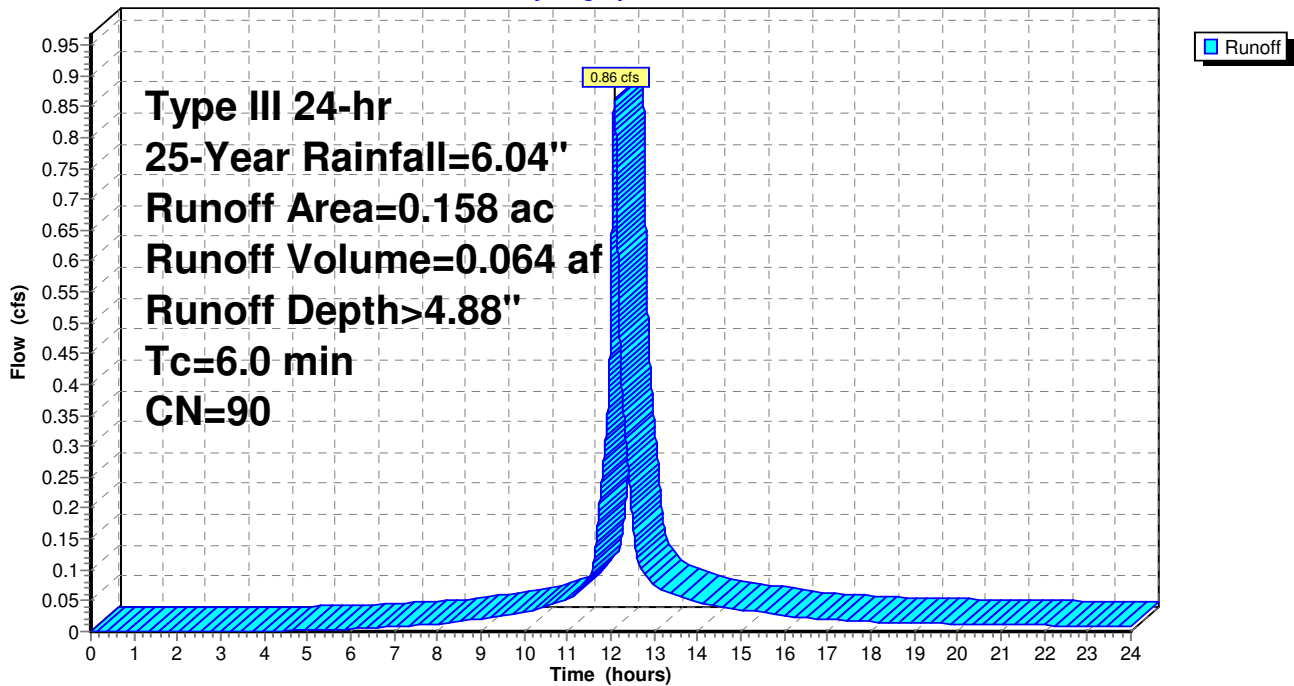
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.106	98	Paved Roadway
0.052	74	>75% Grass cover, Good, HSG C
0.158	90	Weighted Average
0.052		32.91% Pervious Area
0.106		67.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 1: Swale 1

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Subcatchment Swale 2: Swale 2

Runoff = 0.41 cfs @ 12.087 hrs, Volume= 0.030 af, Depth> 4.44"

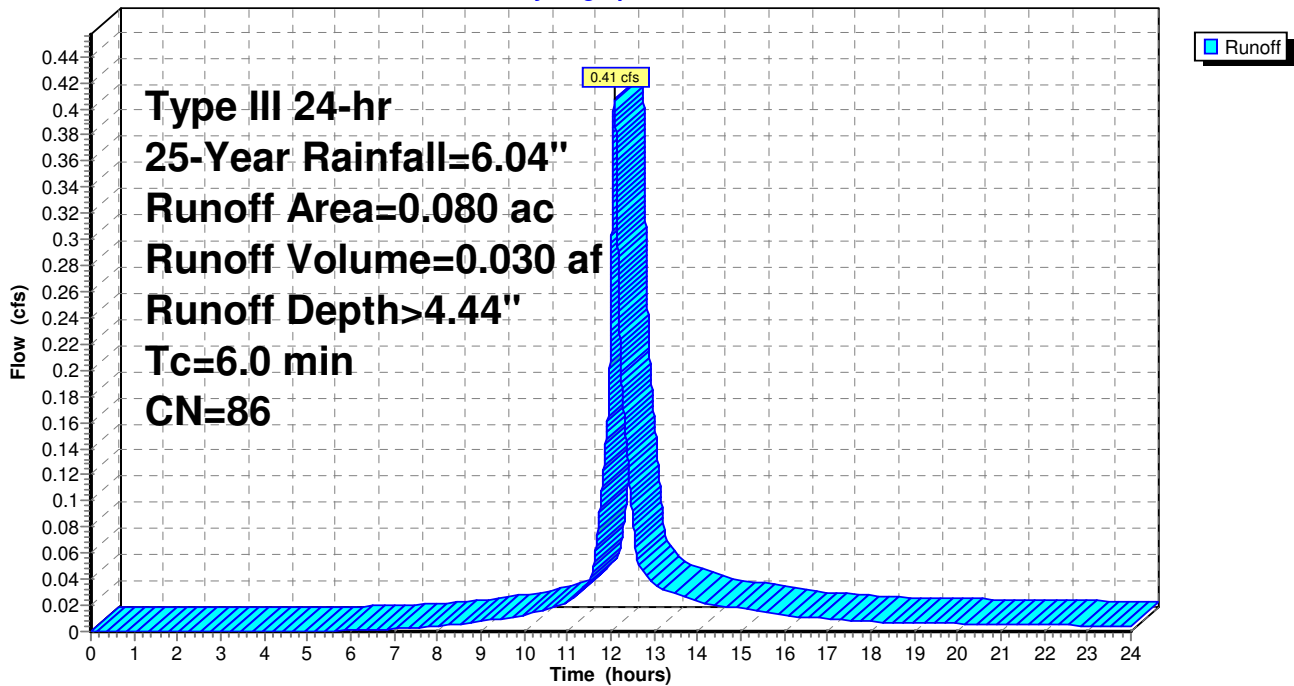
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 25-Year Rainfall=6.04"

Area (ac)	CN	Description
* 0.040	98	Paved Roadway
0.040	74	>75% Grass cover, Good, HSG C
0.080	86	Weighted Average
0.040		50.00% Pervious Area
0.040		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 2: Swale 2

Hydrograph



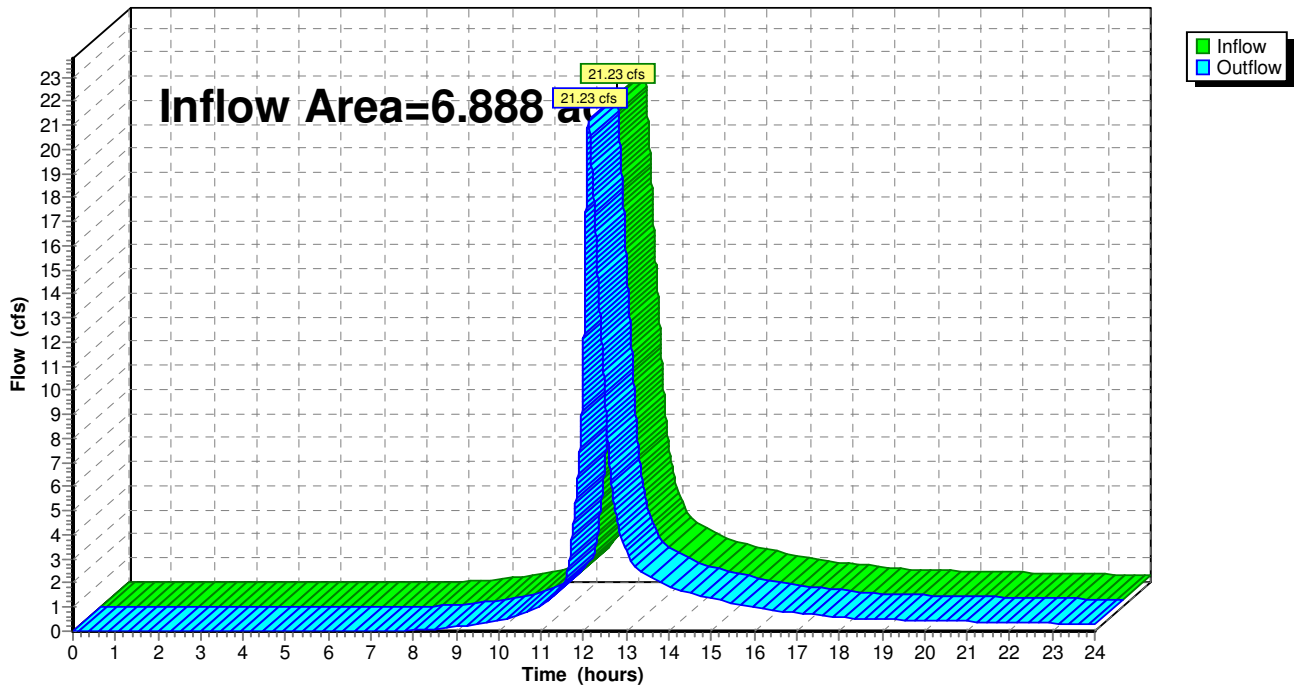
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.888 ac, 8.23% Impervious, Inflow Depth > 3.49" for 25-Year event
Inflow = 21.23 cfs @ 12.113 hrs, Volume= 2.006 af
Outflow = 21.23 cfs @ 12.113 hrs, Volume= 2.006 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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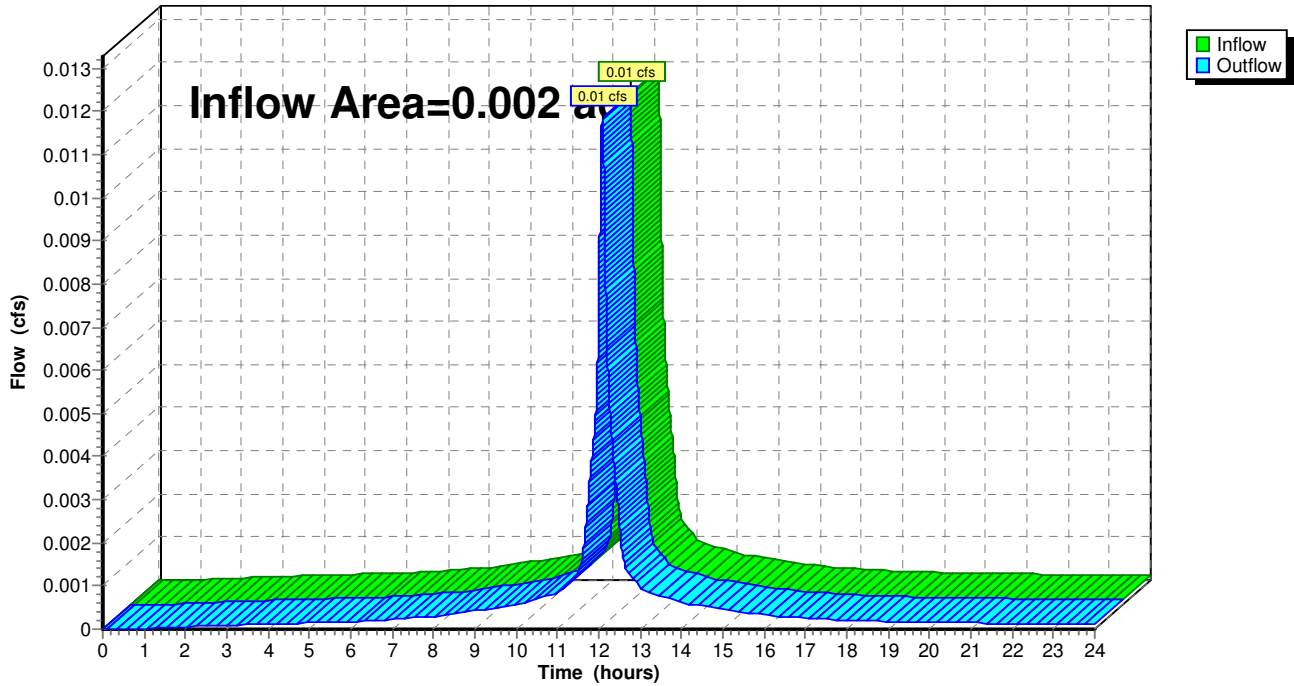
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.002 ac, 100.00% Impervious, Inflow Depth > 5.80" for 25-Year event
Inflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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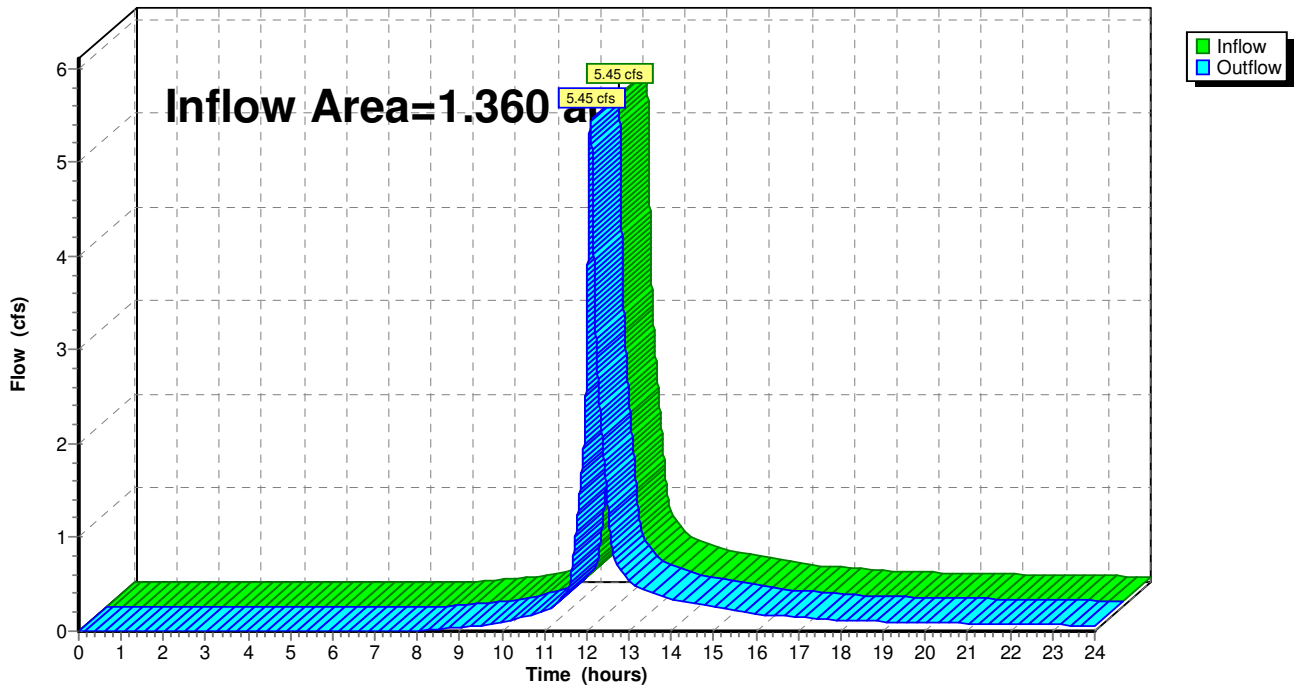
Summary for Reach SouthEast: Southeast

Inflow Area = 1.360 ac, 2.21% Impervious, Inflow Depth > 3.40" for 25-Year event
Inflow = 5.45 cfs @ 12.087 hrs, Volume= 0.385 af
Outflow = 5.45 cfs @ 12.087 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach SouthEast: Southeast

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Forebay: Forebay

Inflow Area = 0.120 ac, 75.00% Impervious, Inflow Depth > 5.33" for 25-Year event
 Inflow = 0.61 cfs @ 12.133 hrs, Volume= 0.053 af
 Outflow = 0.37 cfs @ 12.227 hrs, Volume= 0.053 af, Atten= 38%, Lag= 5.6 min
 Primary = 0.37 cfs @ 12.227 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.06' @ 12.281 hrs Surf.Area= 833 sf Storage= 365 cf

Plug-Flow detention time= 29.3 min calculated for 0.053 af (99% of inflow)
 Center-of-Mass det. time= 21.3 min (792.3 - 771.0)

Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	1,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

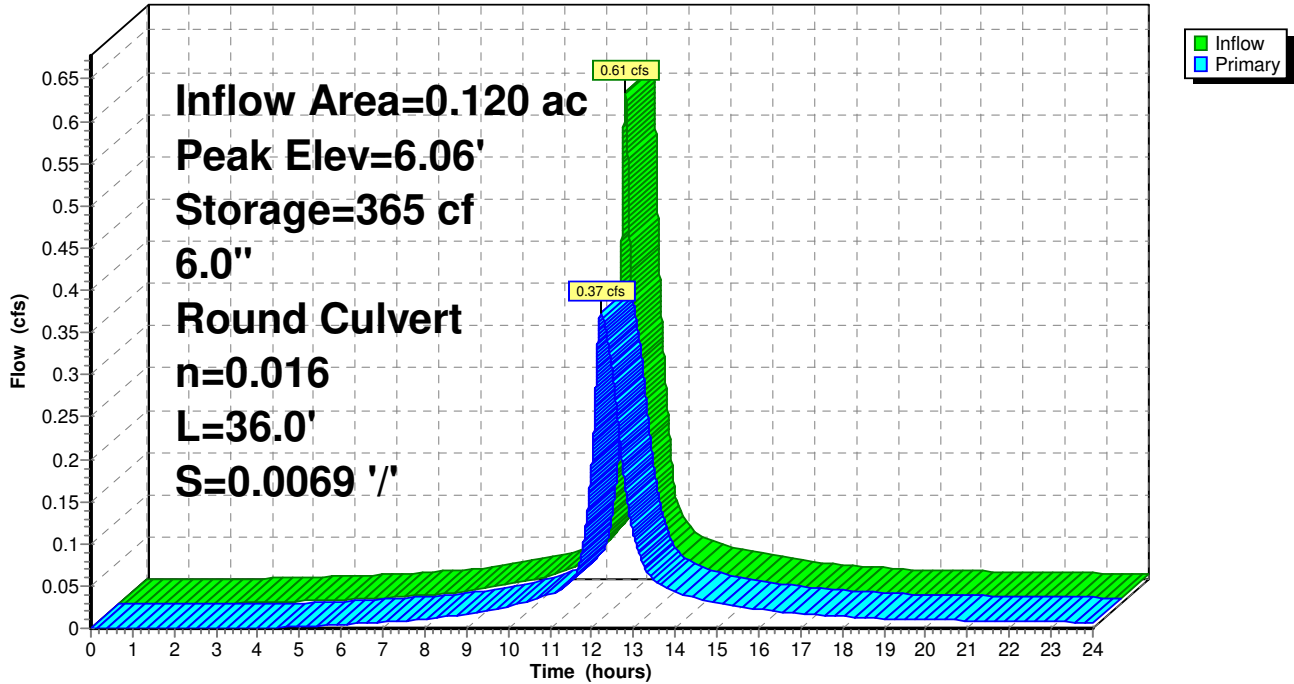
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	451	0	0
6.00	804	314	314
7.00	1,256	1,030	1,344

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	6.0" Round Culvert L= 36.0' Ke= 0.020 Inlet / Outlet Invert= 5.50' / 5.25' S= 0.0069 '/' Cc= 0.900 n= 0.016, Flow Area= 0.20 sf

Primary OutFlow Max=0.37 cfs @ 12.227 hrs HW=6.05' TW=5.74' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 0.37 cfs @ 2.14 fps)

Pond Forebay: Forebay

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 1: Lot 1 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

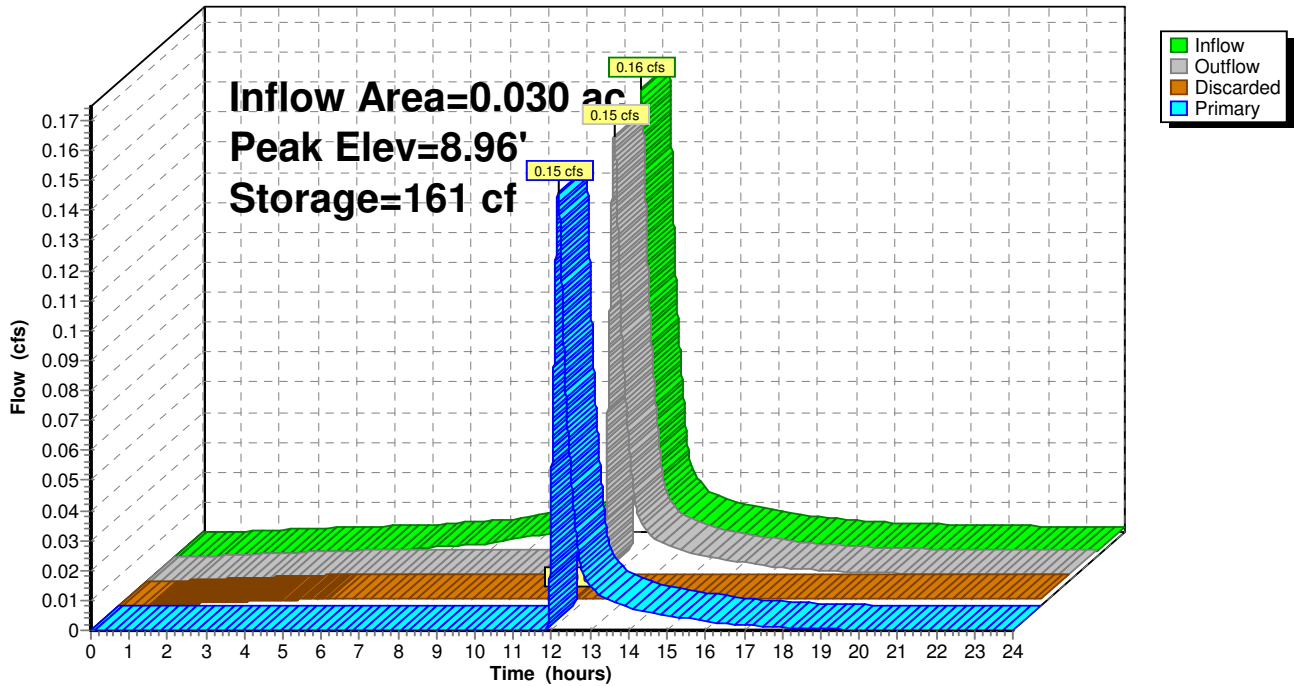
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=8.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 1: Lot 1 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 2: Lot 2 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

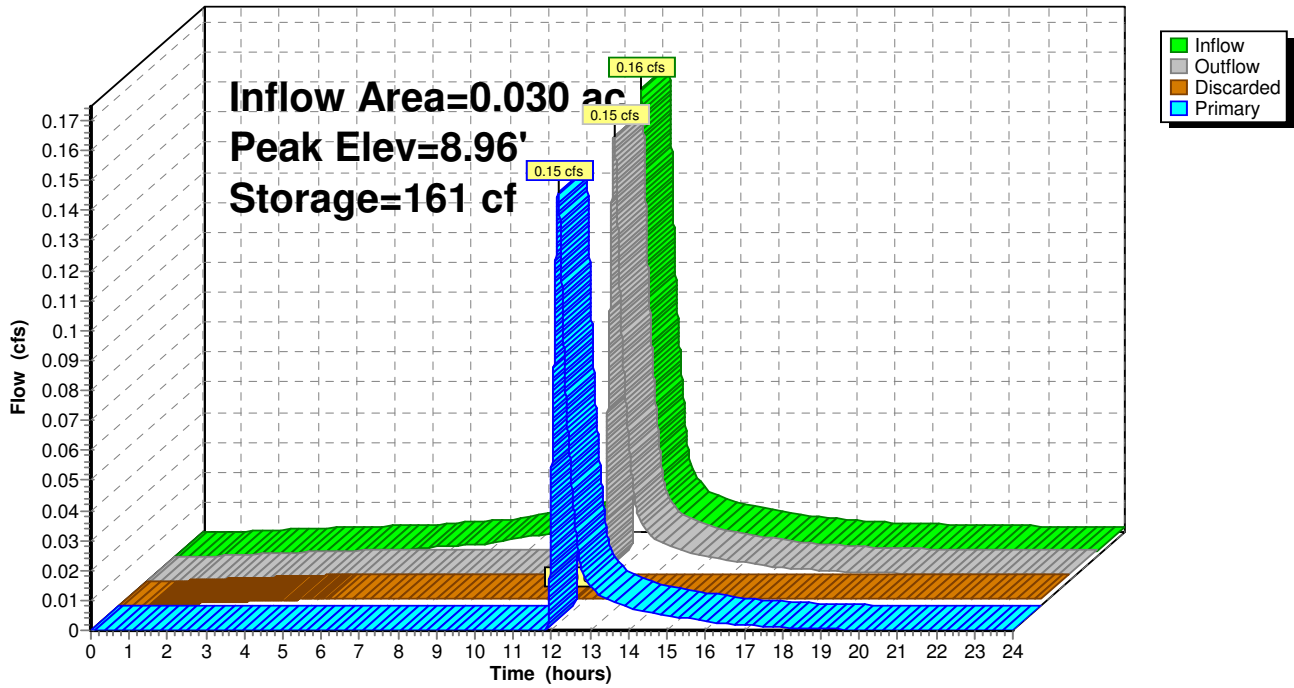
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=8.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 2: Lot 2 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 3: Lot 3 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	5.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	6.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	7.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.96	196	0	0
8.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
6.96	0
8.00	39

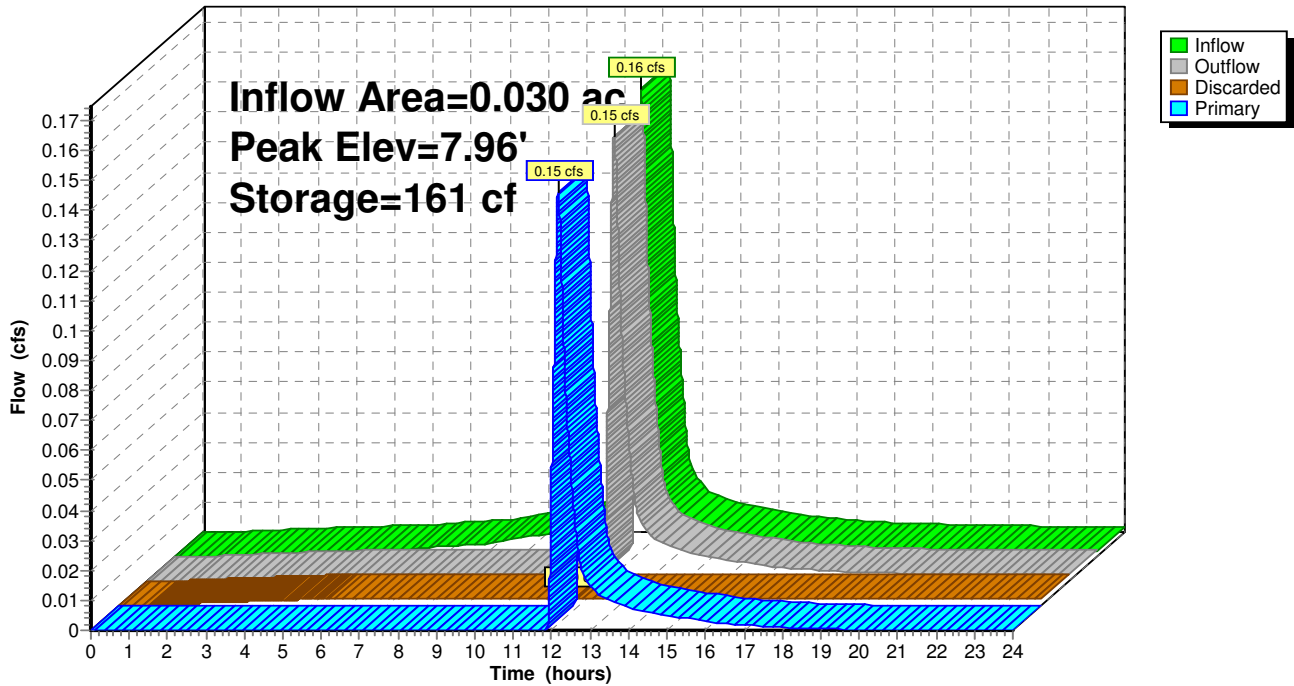
Device	Routing	Invert	Outlet Devices
#1	Primary	7.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	5.96'	0.520 in/hr Exfiltration over Surface area above 5.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=7.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=7.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 3: Lot 3 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 4: Lot 4 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

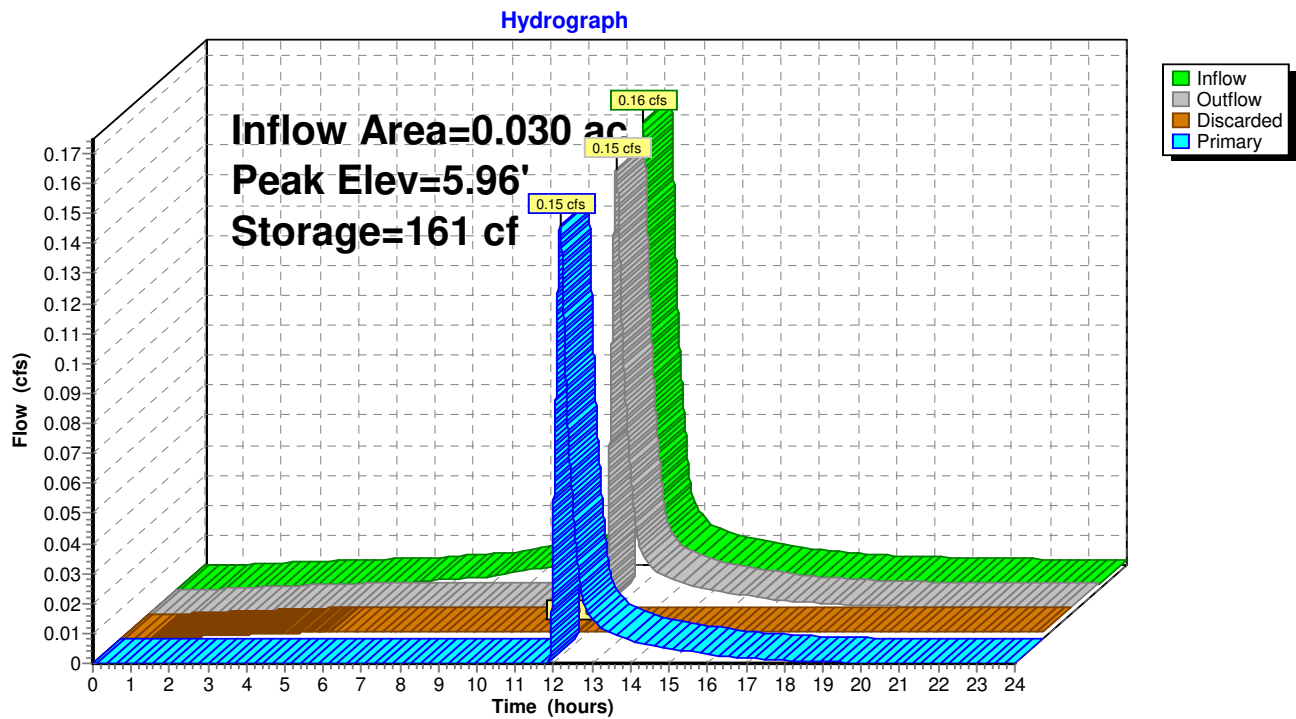
Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=5.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 4: Lot 4 Roof Recharge Trench



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 5: Lot 5 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

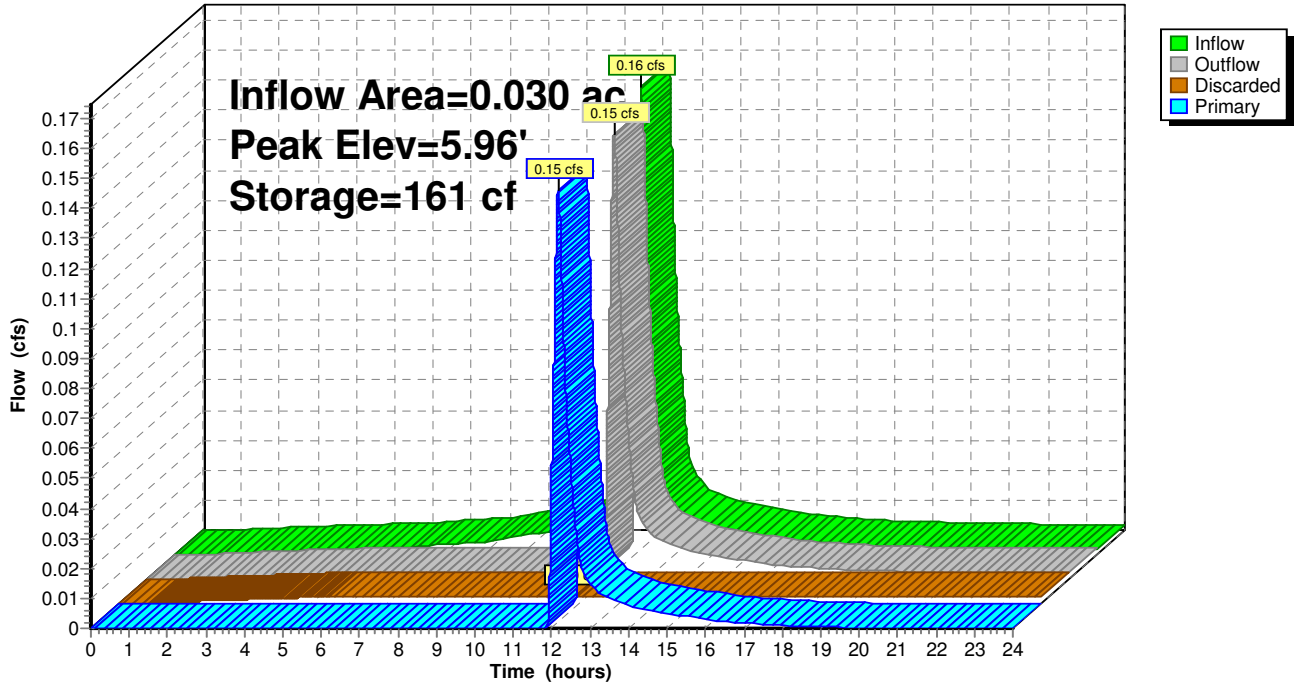
Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=5.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 5: Lot 5 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 6: Lot 6 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 22.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	20.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	21.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	22.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.96	196	0	0
23.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
21.96	0
23.00	39

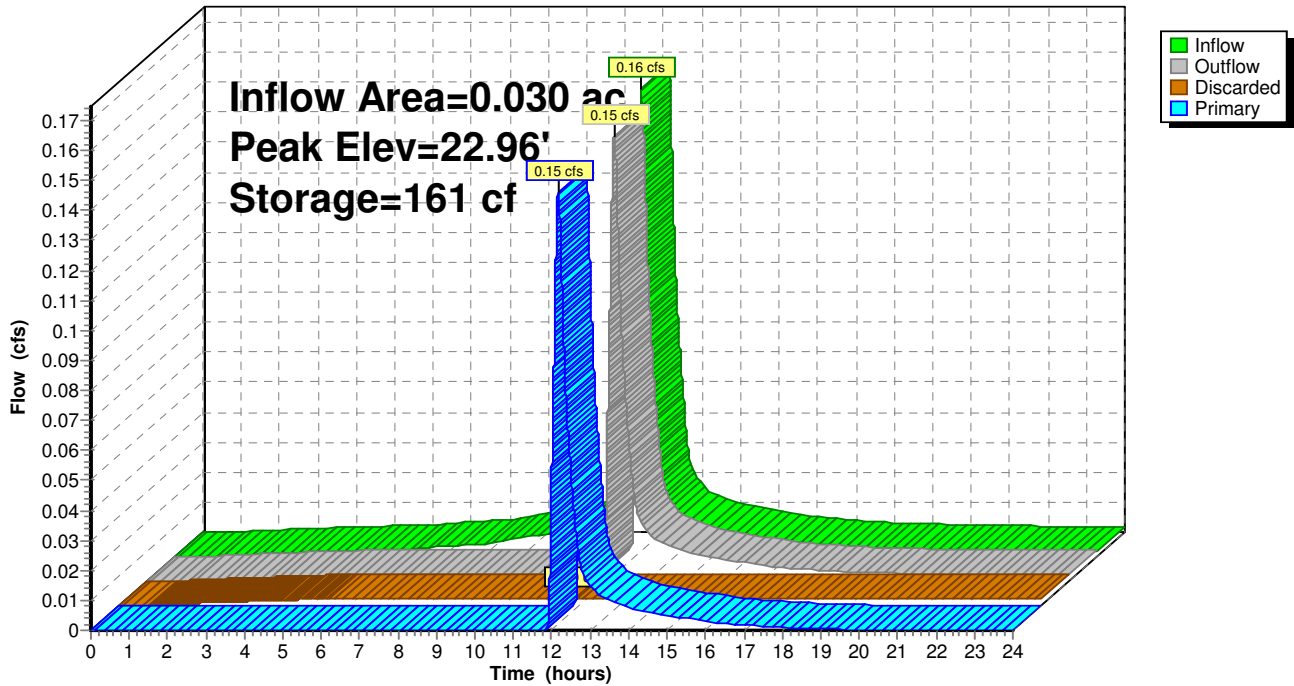
Device	Routing	Invert	Outlet Devices
#1	Primary	22.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	20.96'	0.520 in/hr Exfiltration over Surface area above 20.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=22.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=22.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 6: Lot 6 Roof Recharge Trench

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 7: Lot 7 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	4.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	5.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	6.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.96	196	0	0
7.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
5.96	0
7.00	39

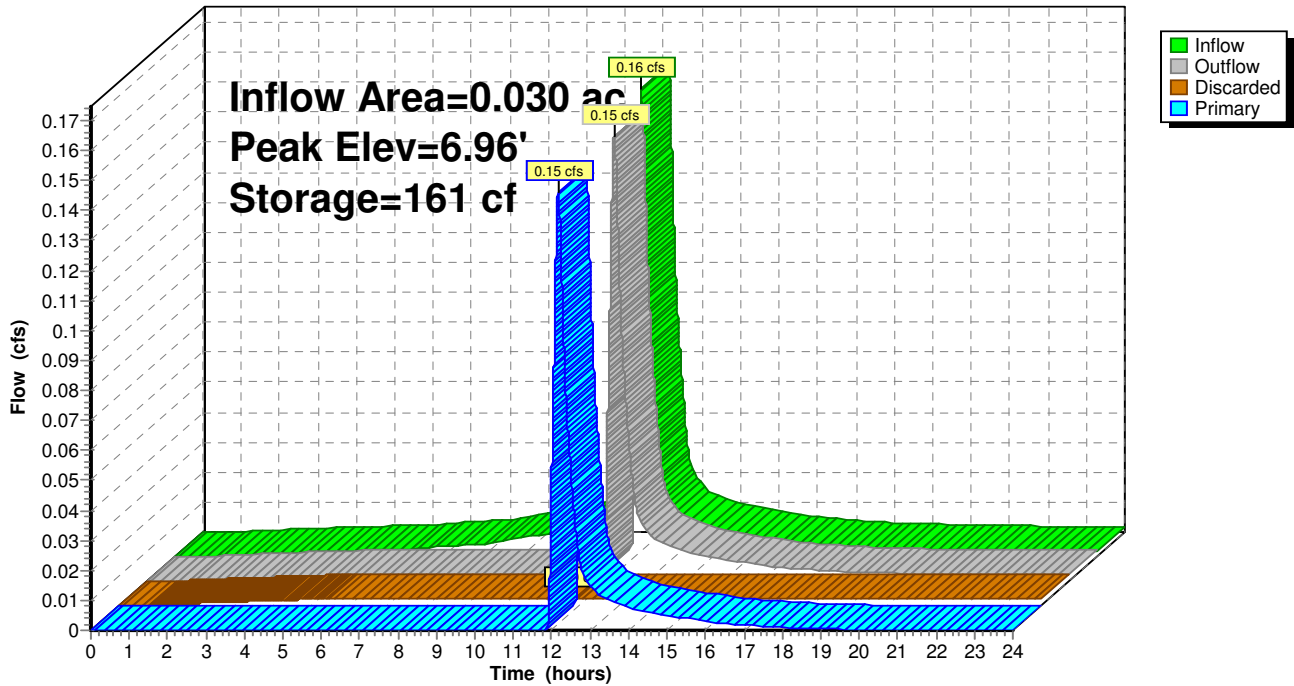
Device	Routing	Invert	Outlet Devices
#1	Primary	6.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	4.96'	0.520 in/hr Exfiltration over Surface area above 4.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=6.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=6.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 7: Lot 7 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Lot 8: Lot 8 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
 Inflow = 0.16 cfs @ 12.133 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.167 hrs, Volume= 0.012 af, Atten= 5%, Lag= 2.0 min
 Discarded = 0.00 cfs @ 11.909 hrs, Volume= 0.004 af
 Primary = 0.15 cfs @ 12.167 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.96' @ 12.167 hrs Surf.Area= 196 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 40.2 min (788.0 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

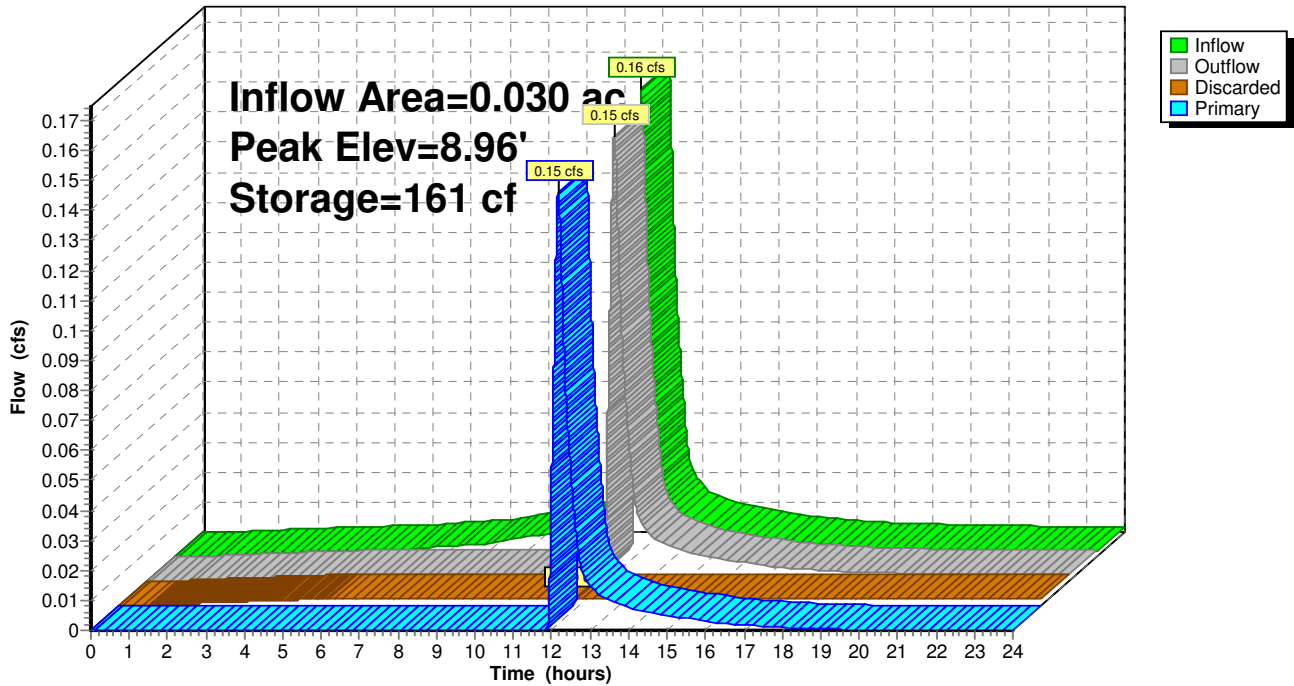
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.909 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.167 hrs HW=8.96' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.83 fps)

Pond Lot 8: Lot 8 Roof Recharge Trench

Hydrograph



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Summary for Pond Pond A: Detention Pond A

Inflow Area = 0.438 ac, 57.31% Impervious, Inflow Depth > 4.69" for 25-Year event
 Inflow = 2.14 cfs @ 12.116 hrs, Volume= 0.171 af
 Outflow = 1.52 cfs @ 12.211 hrs, Volume= 0.162 af, Atten= 29%, Lag= 5.7 min
 Discarded = 0.03 cfs @ 12.211 hrs, Volume= 0.027 af
 Primary = 1.49 cfs @ 12.211 hrs, Volume= 0.135 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.84' @ 12.211 hrs Surf.Area= 0.048 ac Storage= 0.031 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 25.9 min (818.1 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.071 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6.00	0.025	0.000	0.000
7.00	0.053	0.039	0.039
7.50	0.074	0.032	0.071

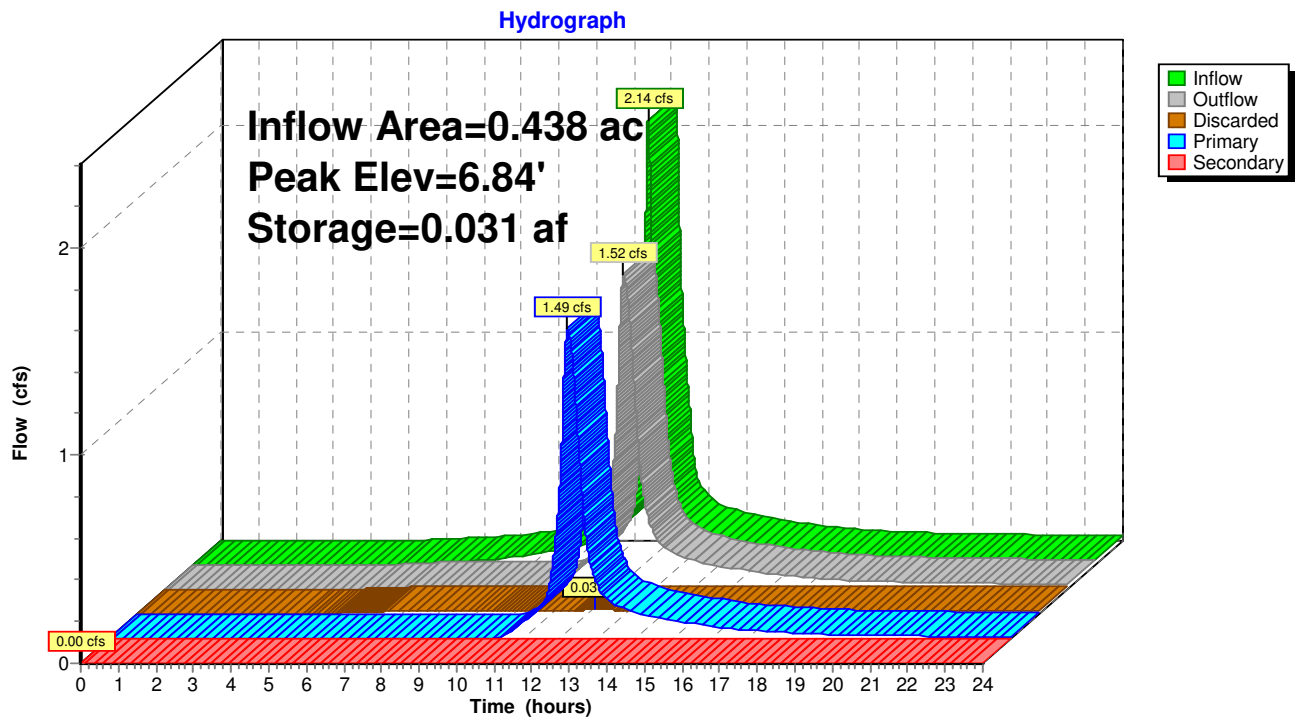
Device	Routing	Invert	Outlet Devices
#1	Secondary	7.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	6.30'	6.0" Round Culvert X 2.00 L= 17.0' Ke= 0.020 Inlet / Outlet Invert= 6.30' / 5.83' S= 0.0276 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Discarded	6.00'	0.520 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 12.211 hrs HW=6.84' (Free Discharge)
 ↑3=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.49 cfs @ 12.211 hrs HW=6.84' TW=5.73' (Dynamic Tailwater)
 ↑2=Culvert (Inlet Controls 1.49 cfs @ 3.80 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=6.00' TW=4.90' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pond A: Detention Pond A



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond Pond B: Detention Pond B

Inflow Area = 0.698 ac, 49.71% Impervious, Inflow Depth > 4.01" for 25-Year event
 Inflow = 2.36 cfs @ 12.181 hrs, Volume= 0.233 af
 Outflow = 1.94 cfs @ 12.355 hrs, Volume= 0.229 af, Atten= 18%, Lag= 10.5 min
 Discarded = 0.03 cfs @ 12.355 hrs, Volume= 0.018 af
 Primary = 1.90 cfs @ 12.355 hrs, Volume= 0.211 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.78' @ 12.355 hrs Surf.Area= 2,875 sf Storage= 1,324 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 14.3 min (815.0 - 800.7)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	4,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.90	269	0	0
5.00	922	60	60
5.10	843	88	148
5.20	857	85	233
6.00	3,618	1,790	2,023
6.50	4,411	2,007	4,030

Device	Routing	Invert	Outlet Devices
#1	Primary	5.10'	12.0" Round Culvert L= 20.0' Ke= 0.020 Inlet / Outlet Invert= 5.10' / 4.80' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	4.90'	0.520 in/hr Exfiltration over Surface area
#3	Secondary	6.00'	4.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

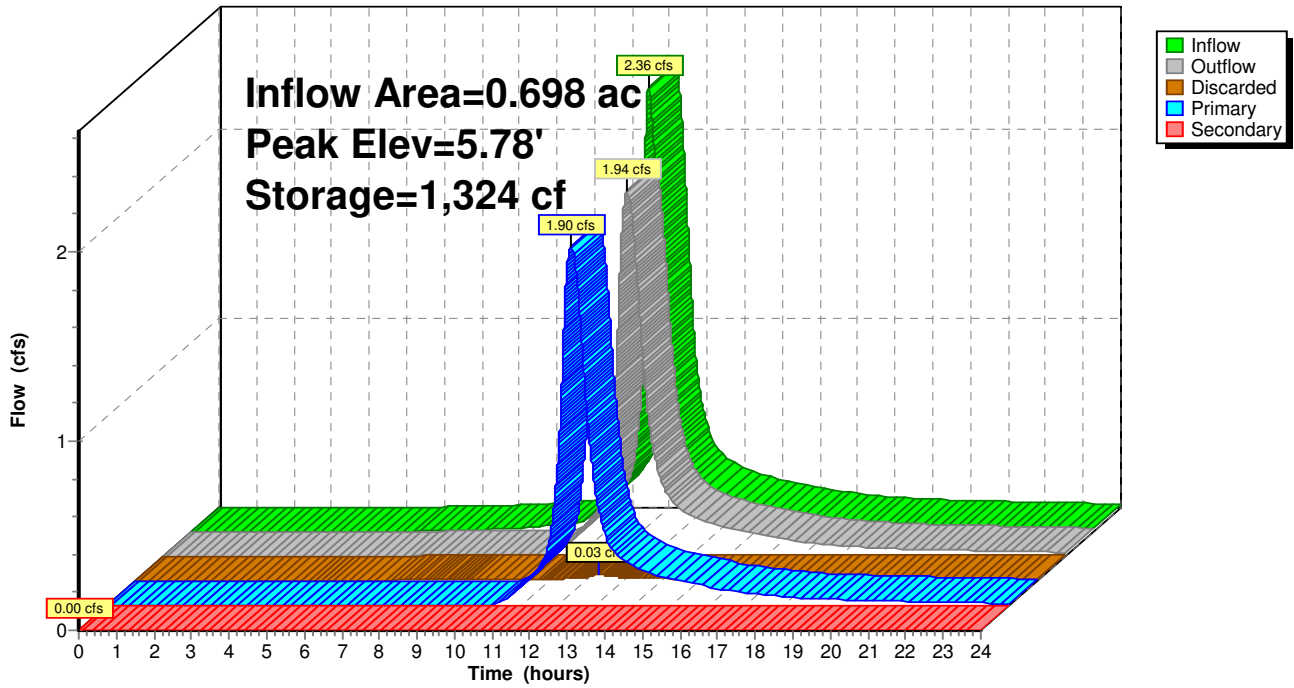
Discarded OutFlow Max=0.03 cfs @ 12.355 hrs HW=5.78' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.90 cfs @ 12.355 hrs HW=5.78' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.90 cfs @ 4.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=4.90' TW=0.00' (Dynamic Tailwater)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond B: Detention Pond B

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond SW1: 3-ft wide swale

Inflow Area = 0.158 ac, 67.09% Impervious, Inflow Depth > 4.88" for 25-Year event
 Inflow = 0.86 cfs @ 12.087 hrs, Volume= 0.064 af
 Outflow = 0.85 cfs @ 12.095 hrs, Volume= 0.064 af, Atten= 1%, Lag= 0.5 min
 Primary = 0.85 cfs @ 12.095 hrs, Volume= 0.064 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.79' @ 12.095 hrs Surf.Area= 186 sf Storage= 42 cf

Plug-Flow detention time= 3.2 min calculated for 0.064 af (100% of inflow)
 Center-of-Mass det. time= 1.9 min (785.7 - 783.9)

Volume	Invert	Avail.Storage	Storage Description
#1	8.40'	630 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

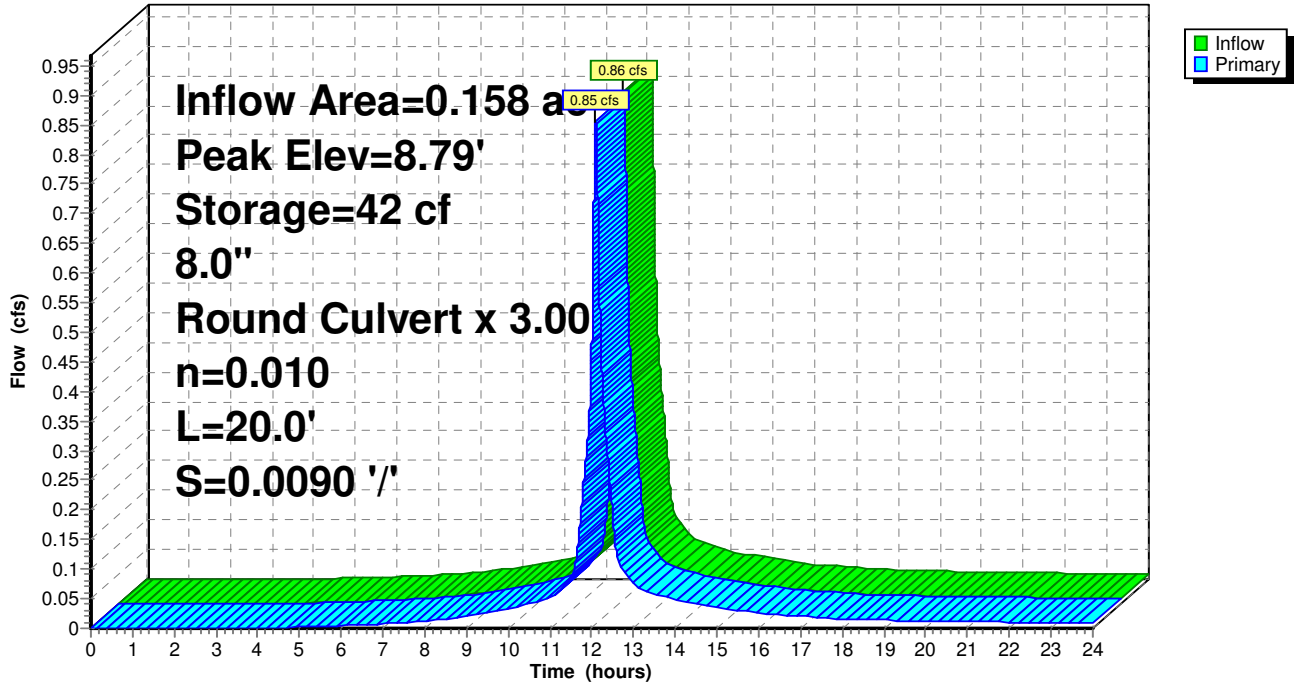
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.40	30	0	0
9.00	270	90	90
10.00	810	540	630

Device	Routing	Invert	Outlet Devices
#1	Primary	8.48'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 8.48' / 8.30' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.85 cfs @ 12.095 hrs HW=8.79' TW=7.97' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 0.85 cfs @ 2.63 fps)

Pond SW1: 3-ft wide swale

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 25-Year Rainfall=6.04"

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Summary for Pond SW2: 3-ft wide swale

Inflow Area = 0.238 ac, 61.34% Impervious, Inflow Depth > 4.73" for 25-Year event
 Inflow = 1.26 cfs @ 12.092 hrs, Volume= 0.094 af
 Outflow = 1.24 cfs @ 12.105 hrs, Volume= 0.094 af, Atten= 1%, Lag= 0.8 min
 Primary = 1.24 cfs @ 12.105 hrs, Volume= 0.094 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.97' @ 12.105 hrs Surf.Area= 255 sf Storage= 67 cf

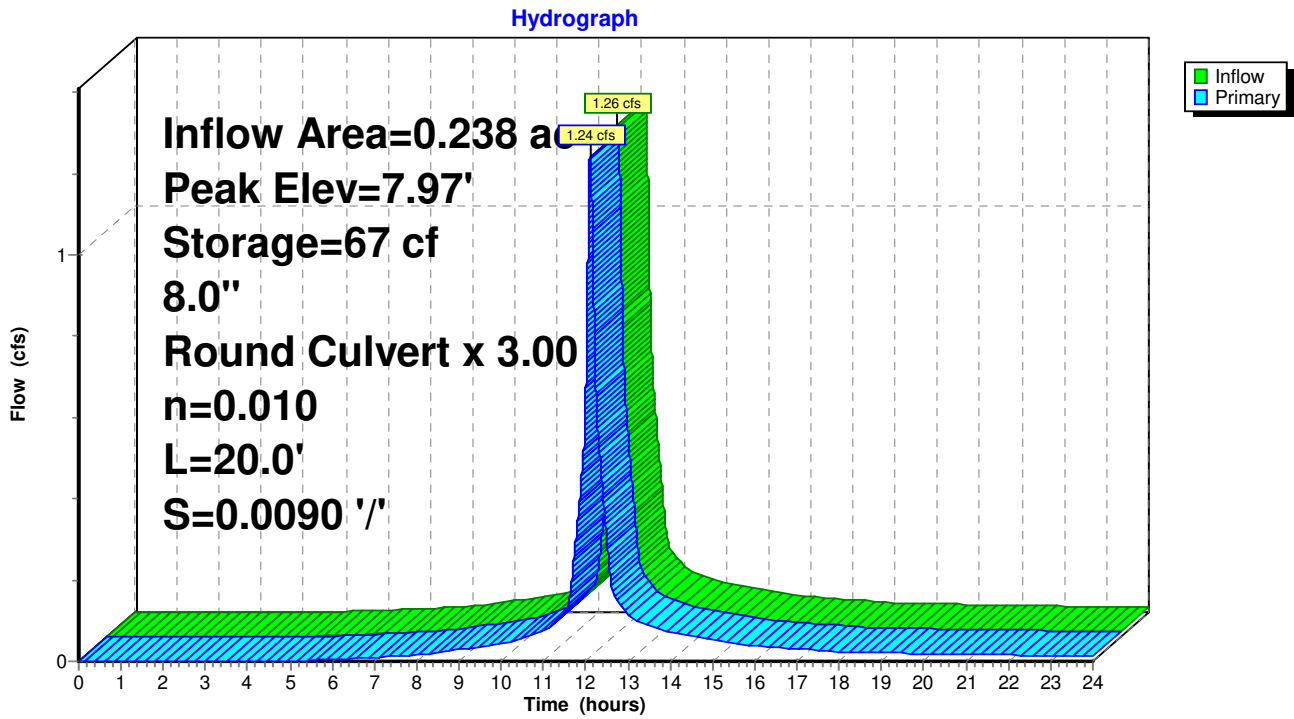
Plug-Flow detention time= 2.7 min calculated for 0.094 af (100% of inflow)
 Center-of-Mass det. time= 1.6 min (790.8 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	615 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7.50	30	0	0
8.00	270	75	75
9.00	810	540	615

Device	Routing	Invert	Outlet Devices
#1	Primary	7.58'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 7.58' / 7.40' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.24 cfs @ 12.105 hrs HW=7.97' TW=6.75' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 1.24 cfs @ 2.83 fps)

Pond SW2: 3-ft wide swale



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Time span=0.000-24.000 hrs, dt=0.0001 hrs, 240001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: Pond A	Runoff Area=0.200 ac 52.50% Impervious Runoff Depth>6.17" Tc=10.0 min CN=88 Runoff=1.21 cfs 0.103 af
Subcatchment B: Pond B	Runoff Area=0.140 ac 4.29% Impervious Runoff Depth>5.36" Tc=10.0 min CN=81 Runoff=0.76 cfs 0.062 af
Subcatchment Cul-de--sac: Cul-de-sac	Runoff Area=0.120 ac 75.00% Impervious Runoff Depth>6.87" Tc=10.0 min CN=94 Runoff=0.77 cfs 0.069 af
Subcatchment E: East Entrance	Runoff Area=0.002 ac 100.00% Impervious Runoff Depth>7.35" Tc=6.0 min CN=98 Runoff=0.01 cfs 0.001 af
Subcatchment House 1: Lot 1	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 2: Lot 2	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 3: Lot 3	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 4: Lot 4	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 5: Lot 5	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 6: Lot 6	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 7: Lot 7	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment House 8: Lot 8	Runoff Area=0.030 ac 100.00% Impervious Runoff Depth>7.35" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.018 af
Subcatchment N: North Wetland	Runoff Area=3.260 ac 0.00% Impervious Runoff Depth>4.79" Tc=6.0 min CN=76 Runoff=18.30 cfs 1.301 af
Subcatchment SE: SE	Runoff Area=1.330 ac 0.00% Impervious Runoff Depth>4.79" Tc=6.0 min CN=76 Runoff=7.46 cfs 0.531 af
Subcatchment SW: Southwest Wetland	Runoff Area=2.720 ac 0.37% Impervious Runoff Depth>5.01" Flow Length=200' Tc=15.7 min CN=78 Runoff=11.84 cfs 1.135 af
Subcatchment Swale 1: Swale 1	Runoff Area=0.158 ac 67.09% Impervious Runoff Depth>6.41" Tc=6.0 min CN=90 Runoff=1.12 cfs 0.084 af

Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Subcatchment Swale 2: Swale 2 Runoff Area=0.080 ac 50.00% Impervious Runoff Depth>5.94"
Tc=6.0 min CN=86 Runoff=0.54 cfs 0.040 af

Reach BB: Buzzards Bay Inflow=29.37 cfs 2.808 af
Outflow=29.37 cfs 2.808 af

Reach Road: Sconticut Neck Road Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach SouthEast: Southeast Inflow=7.61 cfs 0.542 af
Outflow=7.61 cfs 0.542 af

Pond Forebay: Forebay Peak Elev=6.22' Storage=497 cf Inflow=0.77 cfs 0.069 af
6.0" Round Culvert n=0.016 L=36.0' S=0.0069 '/' Outflow=0.42 cfs 0.068 af

Pond Lot 1: Lot 1 Roof Recharge Trench Peak Elev=9.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 2: Lot 2 Roof Recharge Trench Peak Elev=9.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 3: Lot 3 Roof Recharge Trench Peak Elev=8.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 4: Lot 4 Roof Recharge Trench Peak Elev=6.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 5: Lot 5 Roof Recharge Trench Peak Elev=6.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 6: Lot 6 Roof Recharge Trench Peak Elev=23.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 7: Lot 7 Roof Recharge Trench Peak Elev=7.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Lot 8: Lot 8 Roof Recharge Trench Peak Elev=9.05' Storage=165 cf Inflow=0.20 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.19 cfs 0.011 af Outflow=0.20 cfs 0.015 af

Pond Pond A: Detention Pond A Peak Elev=6.98' Storage=0.038 af Inflow=2.79 cfs 0.226 af
Discarded=0.03 cfs 0.029 af Primary=1.83 cfs 0.188 af Secondary=0.00 cfs 0.000 af Outflow=1.85 cfs 0.216 af

Pond Pond B: Detention Pond B Peak Elev=5.89' Storage=1,638 cf Inflow=2.91 cfs 0.318 af
Discarded=0.04 cfs 0.020 af Primary=2.35 cfs 0.294 af Secondary=0.00 cfs 0.000 af Outflow=2.39 cfs 0.314 af

Pond SW1: 3-ft wide swale Peak Elev=8.84' Storage=52 cf Inflow=1.12 cfs 0.084 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 '/' Outflow=1.10 cfs 0.084 af

Pond SW2: 3-ft wide swale Peak Elev=8.04' Storage=85 cf Inflow=1.64 cfs 0.124 af
8.0" Round Culvert x 3.00 n=0.010 L=20.0' S=0.0090 '/' Outflow=1.62 cfs 0.124 af

Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Total Runoff Area = 8.250 ac Runoff Volume = 3.473 af Average Runoff Depth = 5.05"
92.74% Pervious = 7.651 ac 7.26% Impervious = 0.599 ac

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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment A: Pond A

Runoff = 1.21 cfs @ 12.133 hrs, Volume= 0.103 af, Depth> 6.17"

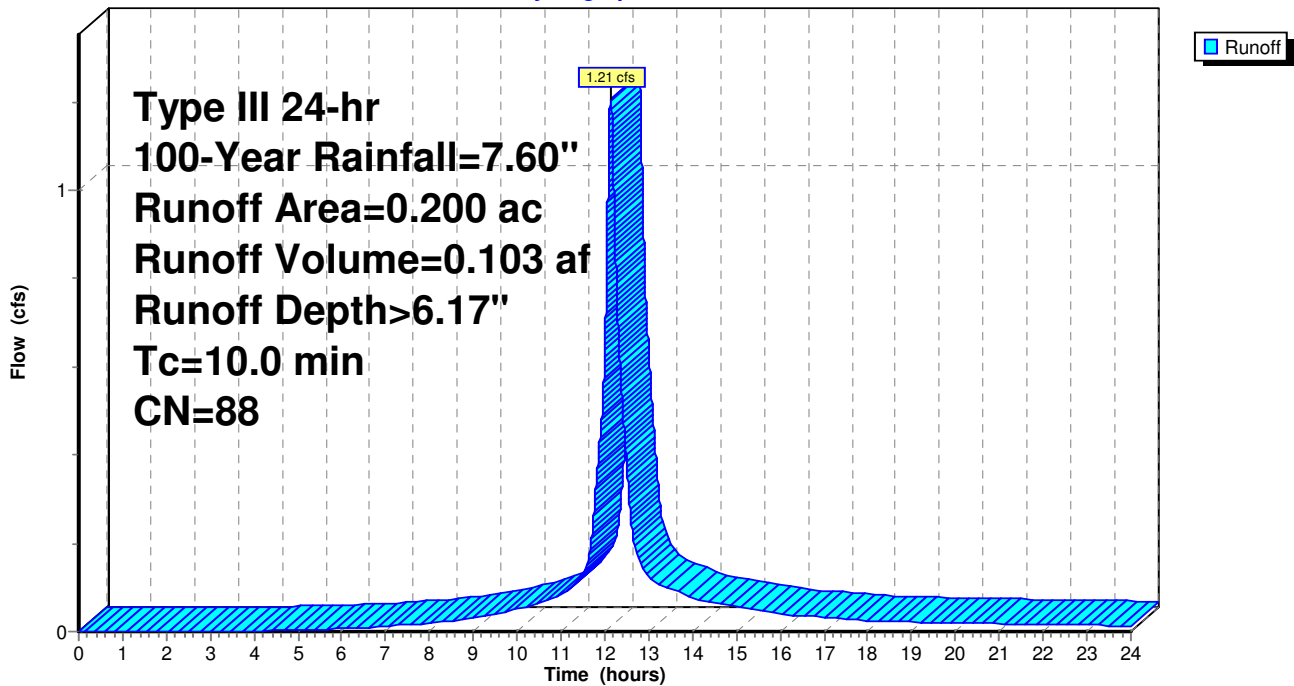
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.080	98	Paved roads
0.040	74	>75% Grass cover, Good, HSG C
0.055	80	>75% Grass cover, Good, HSG D
* 0.025	98	Pond Bottom
0.200	88	Weighted Average
0.095		47.50% Pervious Area
0.105		52.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment A: Pond A

Hydrograph



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment B: Pond B

Runoff = 0.76 cfs @ 12.133 hrs, Volume= 0.062 af, Depth> 5.36"

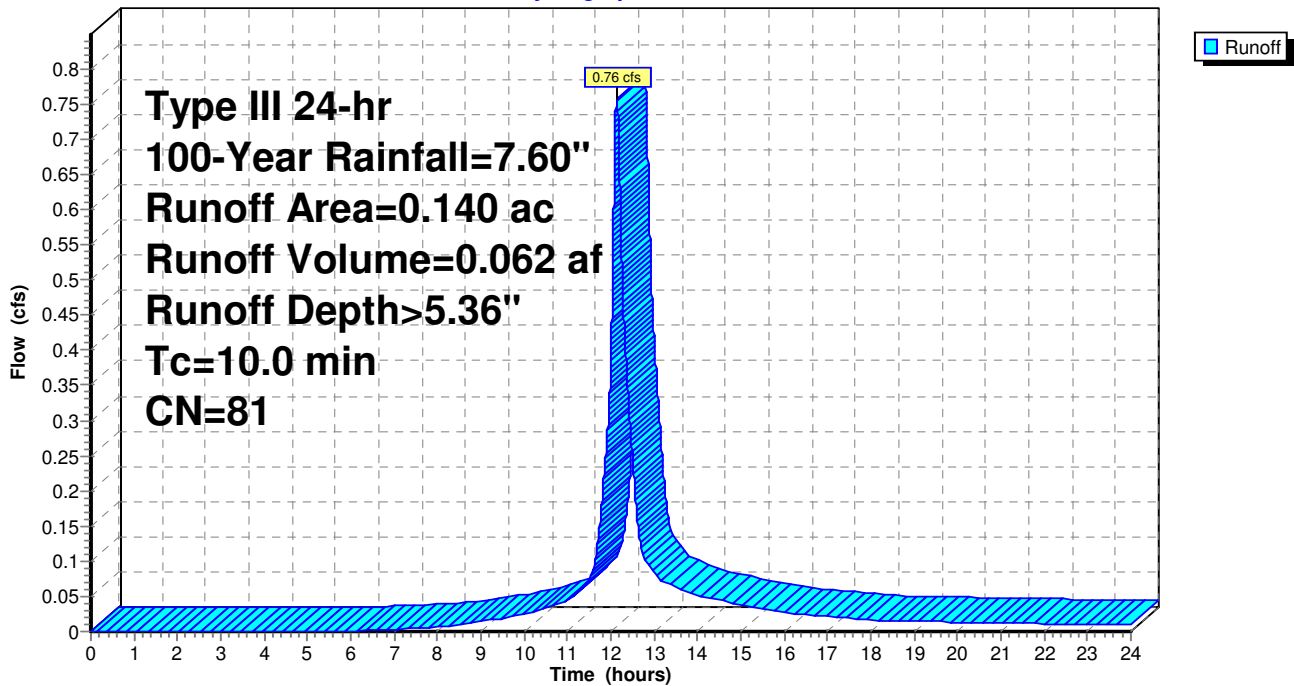
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
0.134	80	>75% Grass cover, Good, HSG D
* 0.006	98	Pond Bottom
0.140	81	Weighted Average
0.134		95.71% Pervious Area
0.006		4.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment B: Pond B

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment Cul-de--sac: Cul-de-sac

Runoff = 0.77 cfs @ 12.133 hrs, Volume= 0.069 af, Depth> 6.87"

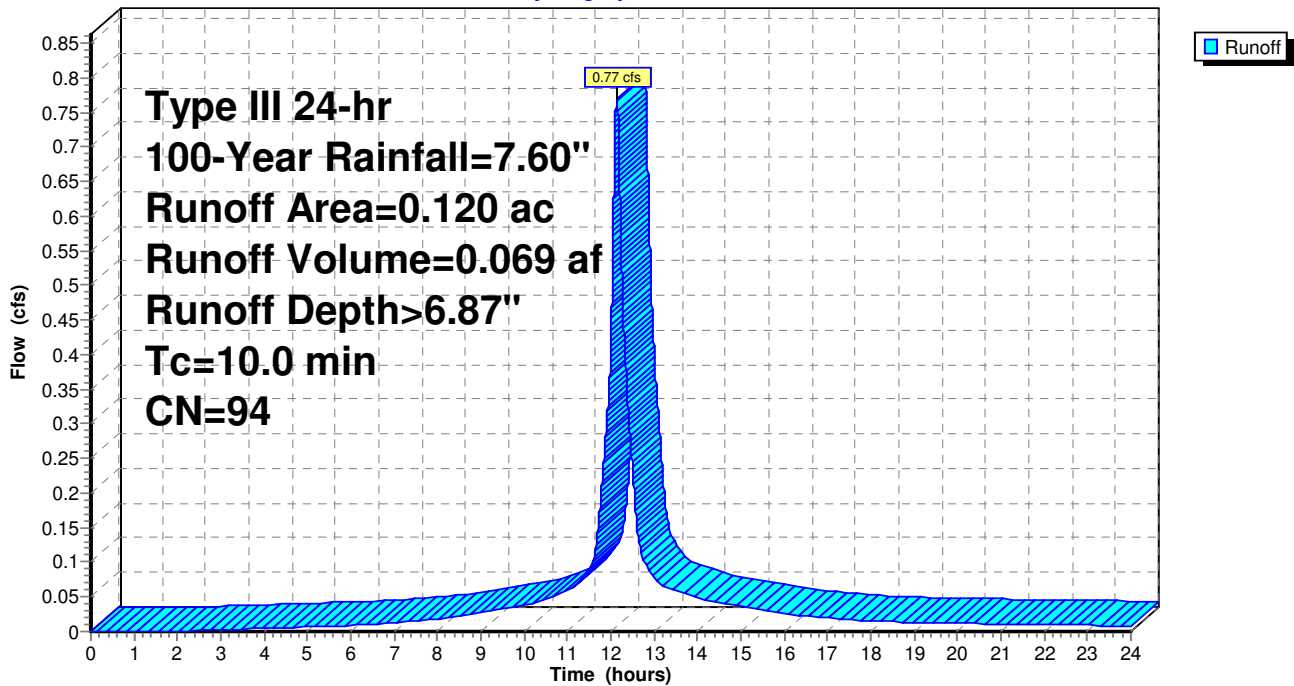
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
0.090	98	Paved road
0.030	80	>75% Grass cover, Good, HSG D
0.120	94	Weighted Average
0.030		25.00% Pervious Area
0.090		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment Cul-de--sac: Cul-de-sac

Hydrograph



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment E: East Entrance

Runoff = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Depth> 7.35"

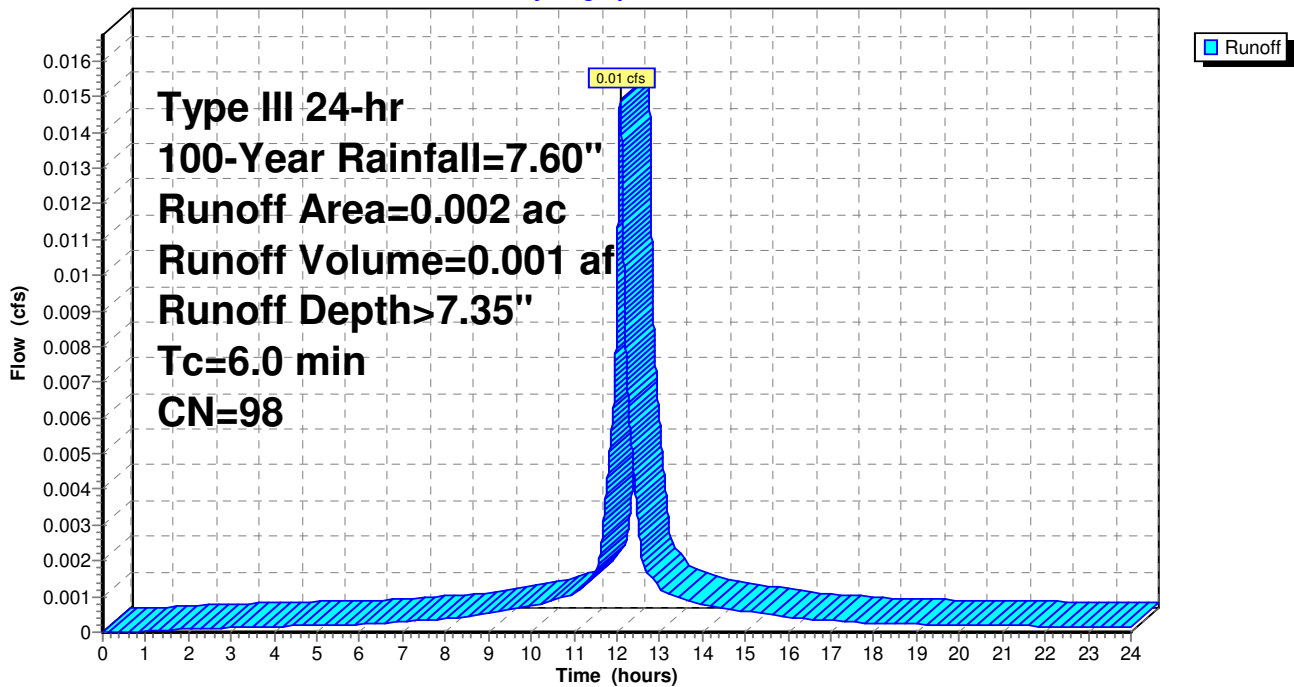
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.002	98	Paved roads
0.002		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment E: East Entrance

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 1: Lot 1

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

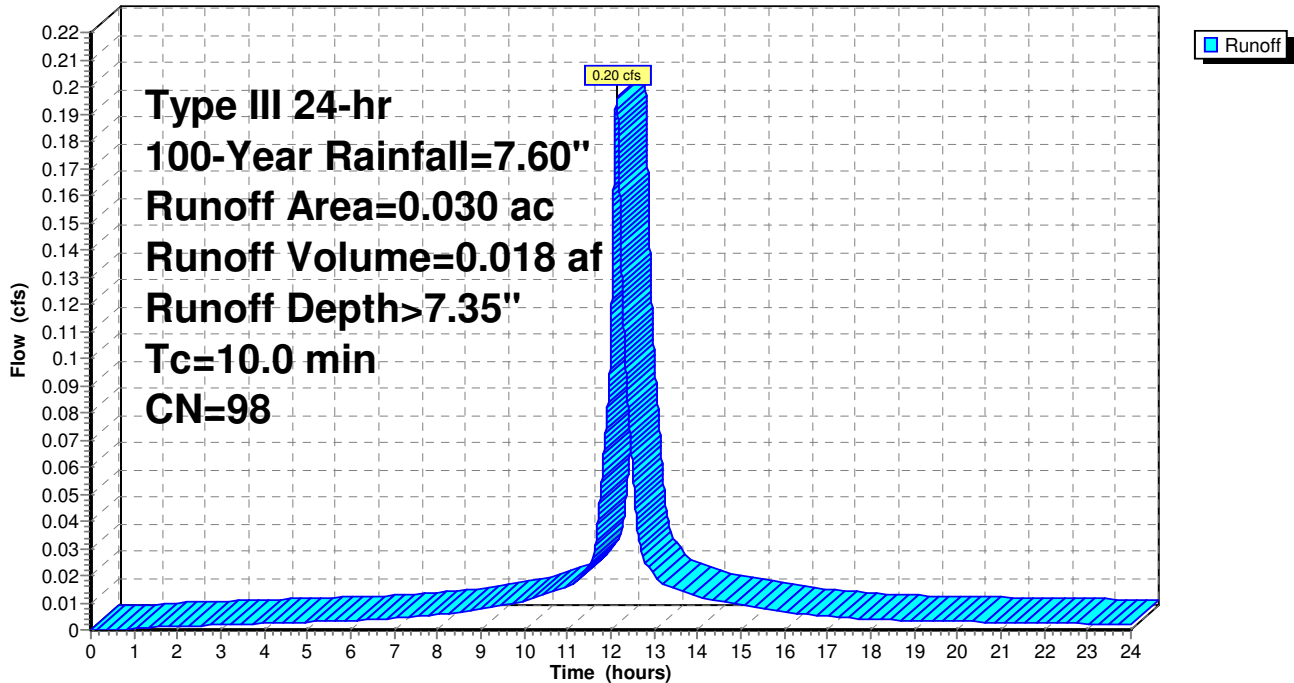
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 1: Lot 1

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 2: Lot 2

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

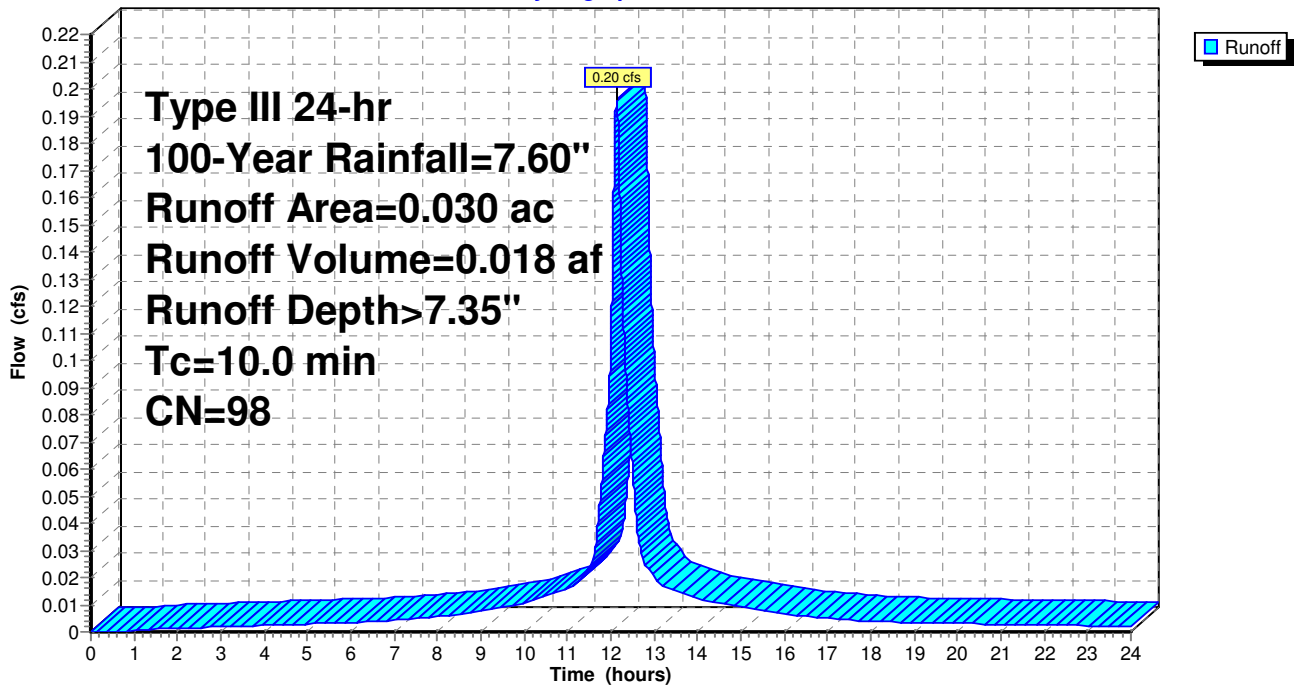
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 2: Lot 2

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 3: Lot 3

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

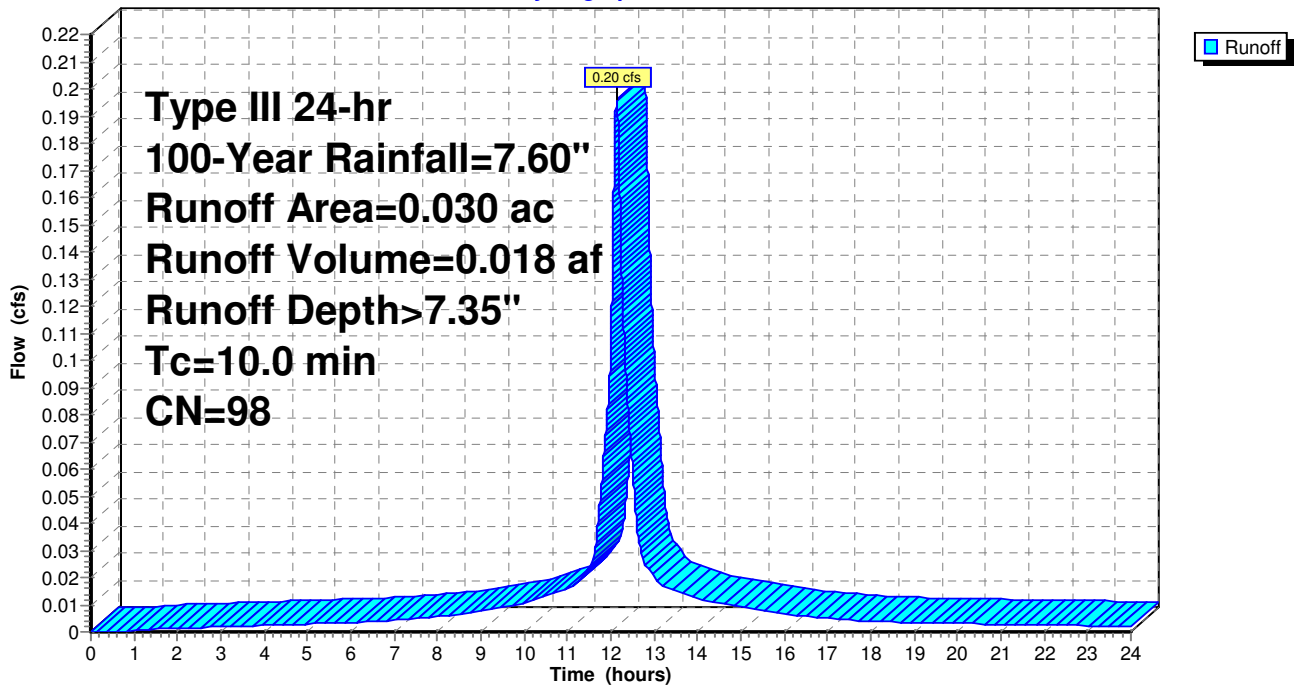
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 3: Lot 3

Hydrograph



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 4: Lot 4

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

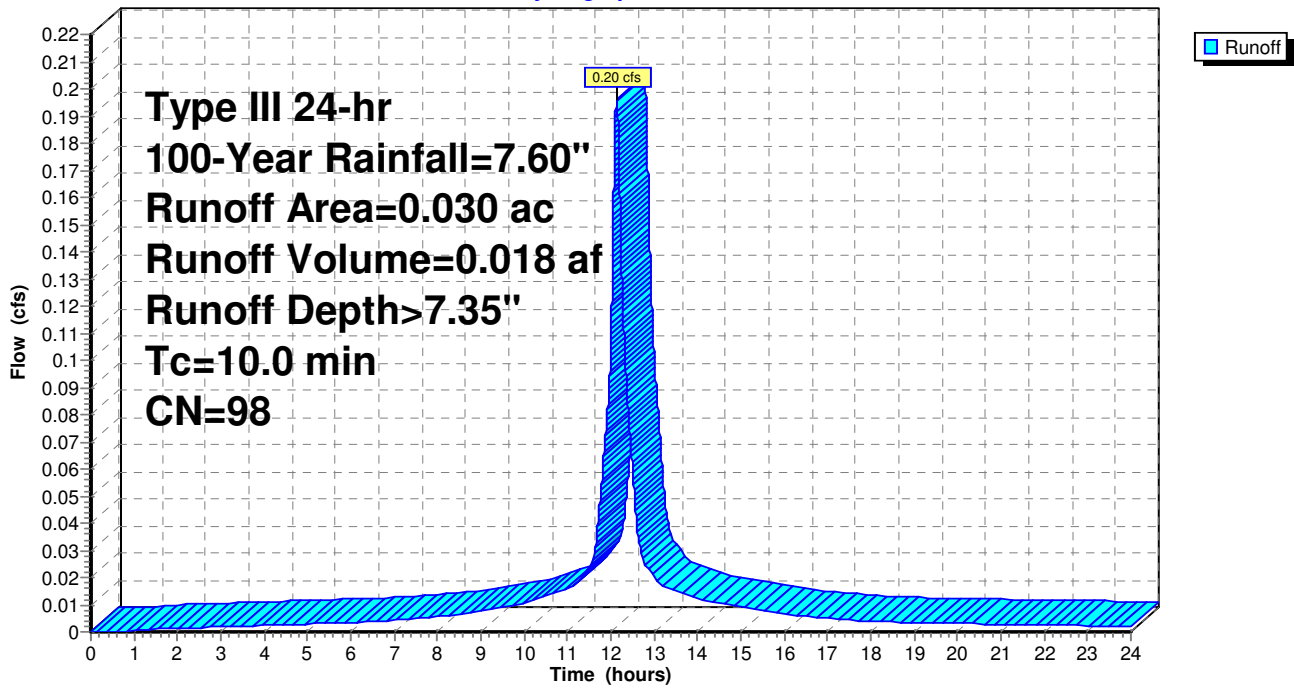
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 4: Lot 4

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 5: Lot 5

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

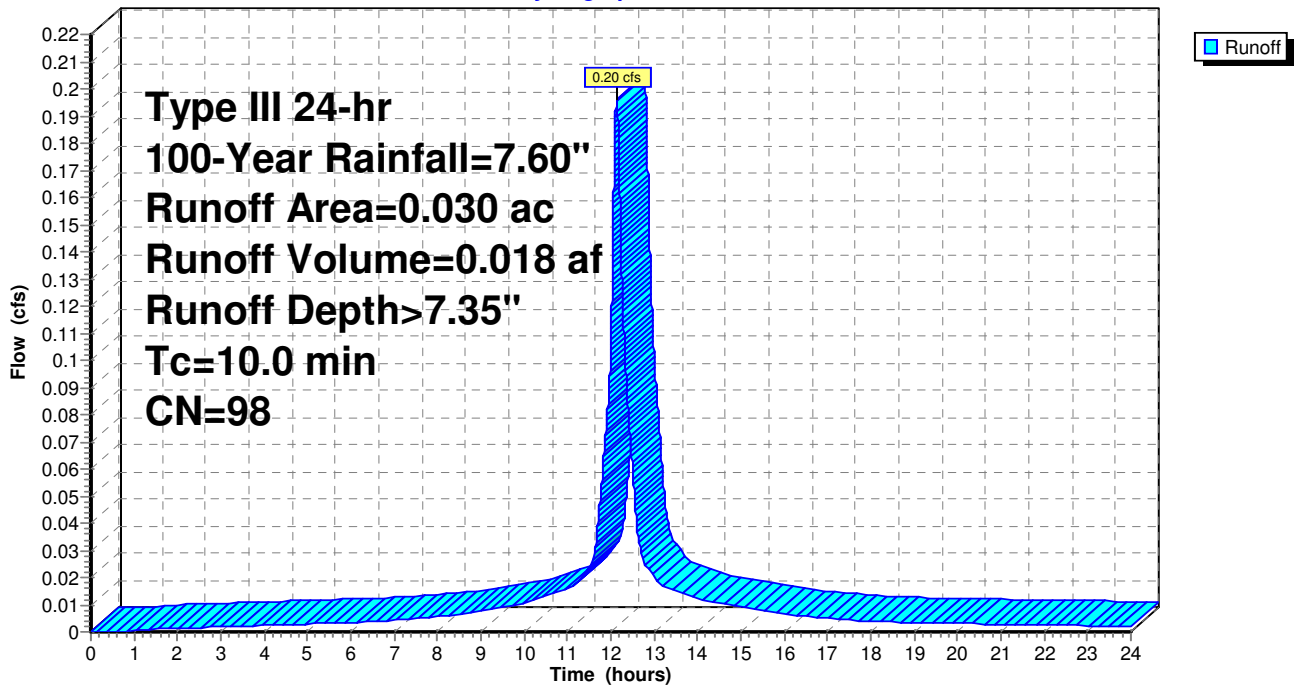
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 5: Lot 5

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 6: Lot 6

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

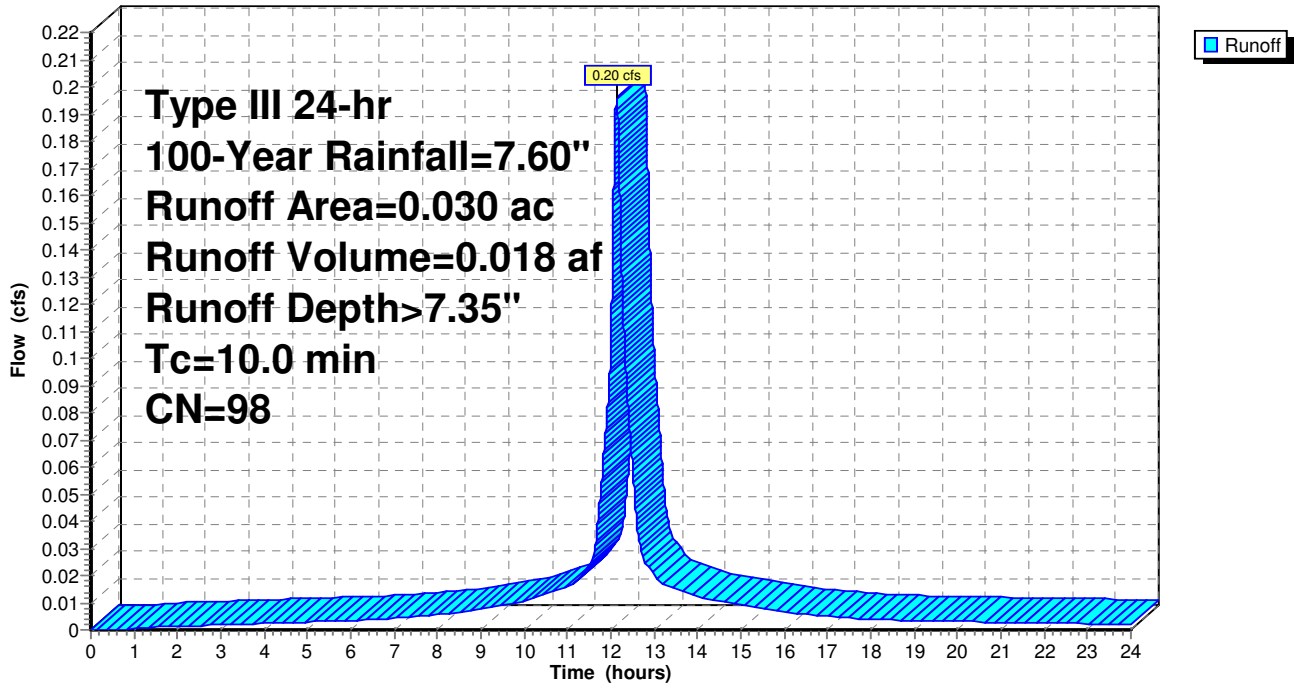
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 6: Lot 6

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 7: Lot 7

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

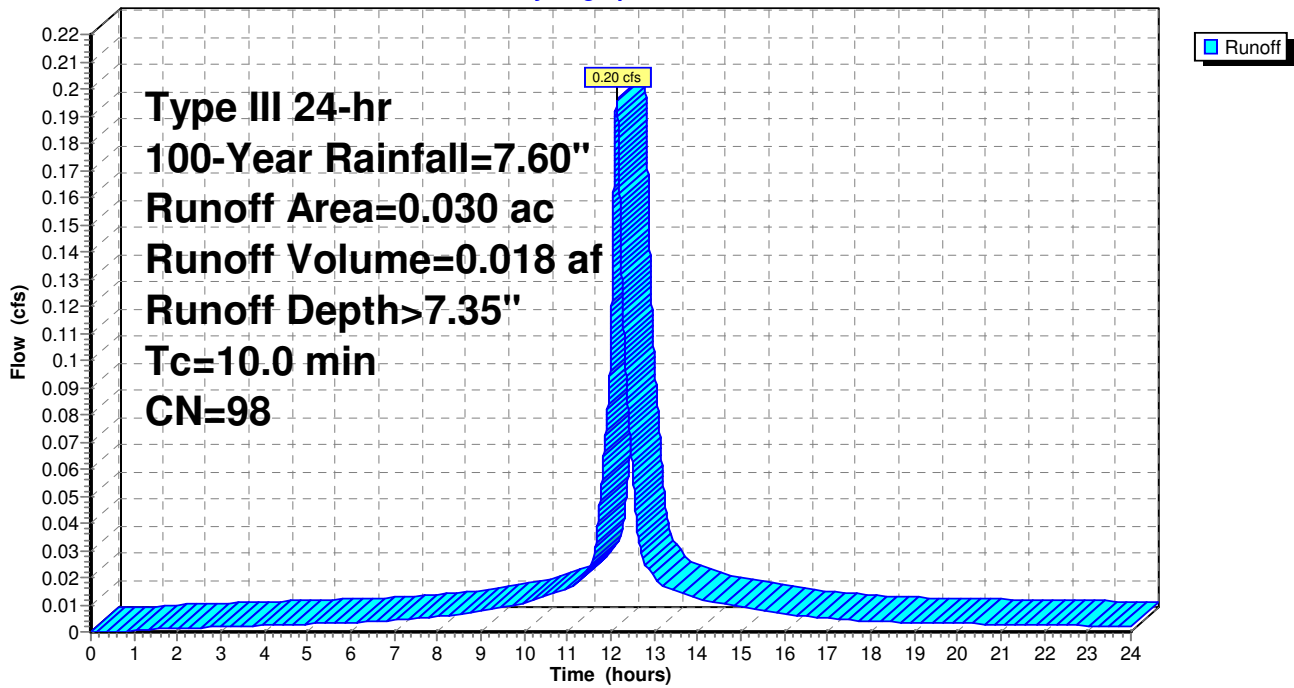
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 7: Lot 7

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment House 8: Lot 8

Runoff = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af, Depth> 7.35"

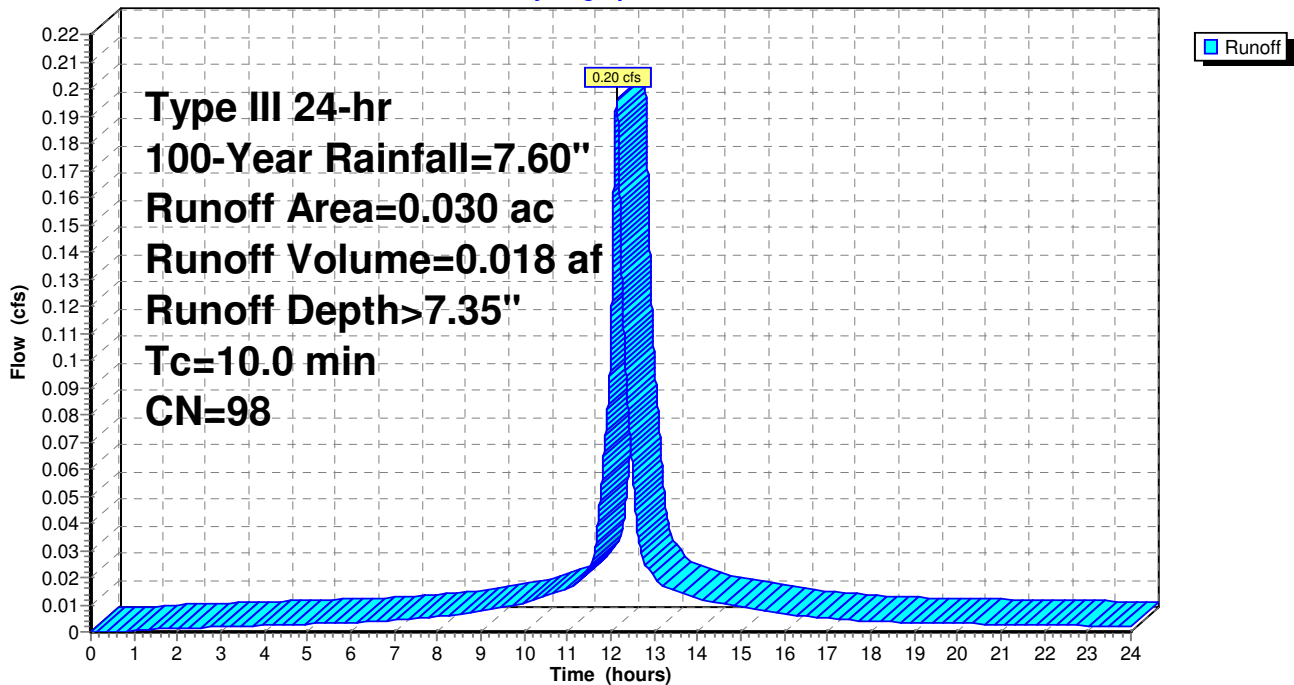
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.030	98	Unconnected roofs
0.030		100.00% Impervious Area
0.030		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment House 8: Lot 8

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment N: North Wetland

Runoff = 18.30 cfs @ 12.087 hrs, Volume= 1.301 af, Depth> 4.79"

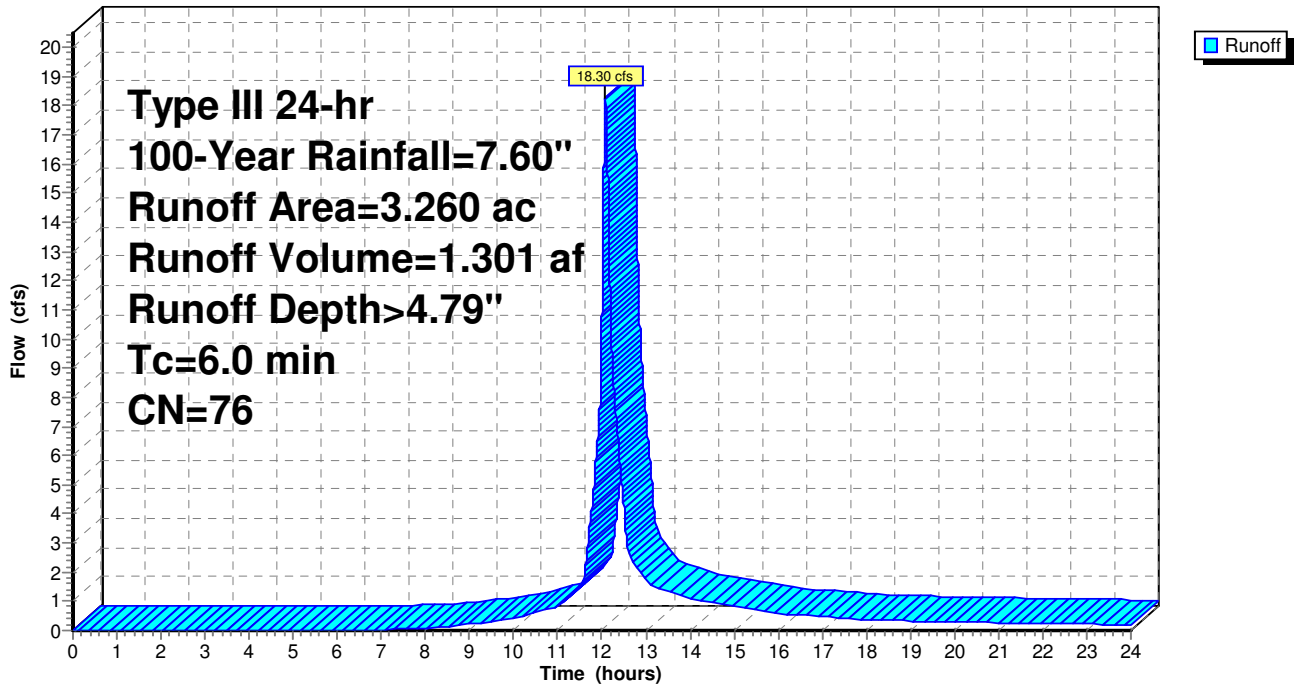
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
0.040	89	Gravel roads, HSG C
0.070	91	Gravel roads, HSG D
1.610	74	>75% Grass cover, Good, HSG C
0.580	80	>75% Grass cover, Good, HSG D
0.070	70	Woods, Good, HSG C
0.800	77	Woods, Good, HSG D
* 0.090	72	Beach
3.260	76	Weighted Average
3.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment N: North Wetland

Hydrograph



Starboard Drive Estates Proposed

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Summary for Subcatchment SE: SE

Runoff = 7.46 cfs @ 12.087 hrs, Volume= 0.531 af, Depth> 4.79"

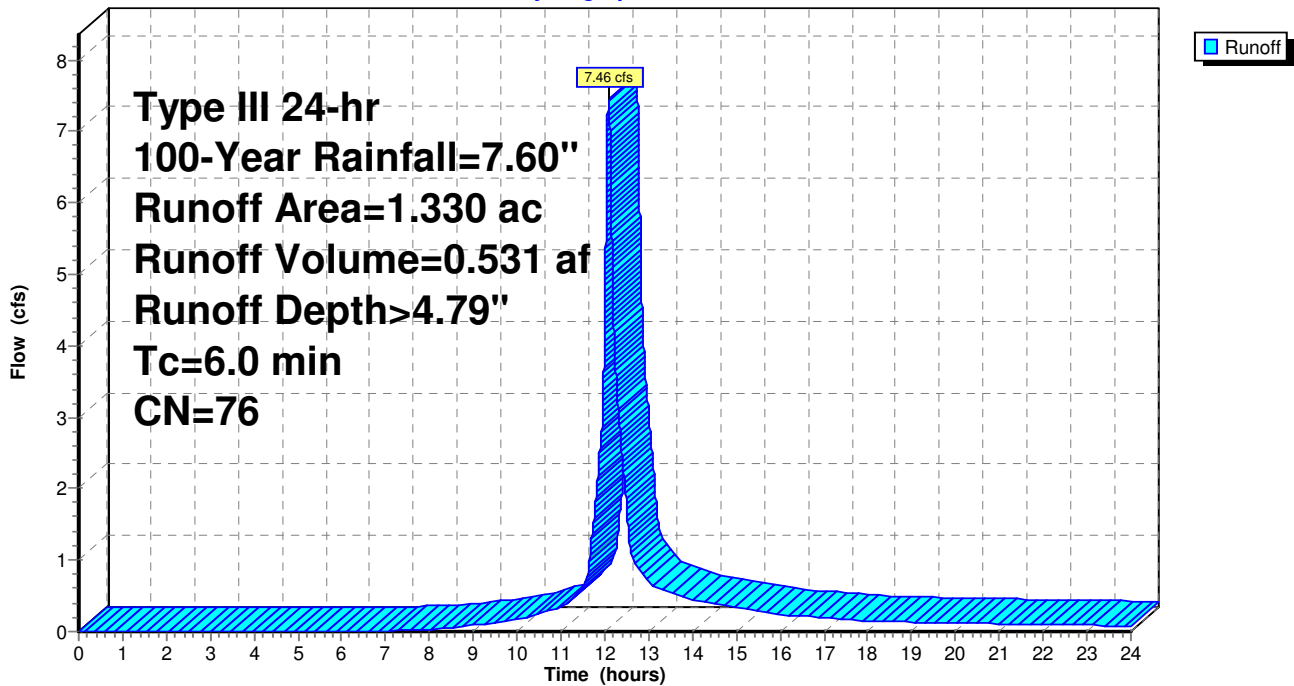
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
0.040	96	Gravel surface, HSG C
0.930	74	>75% Grass cover, Good, HSG C
0.190	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.030	79	Woods, Fair, HSG D
1.330	76	Weighted Average
1.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment SE: SE

Hydrograph



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Summary for Subcatchment SW: Southwest Wetland

Runoff = 11.84 cfs @ 12.211 hrs, Volume= 1.135 af, Depth> 5.01"

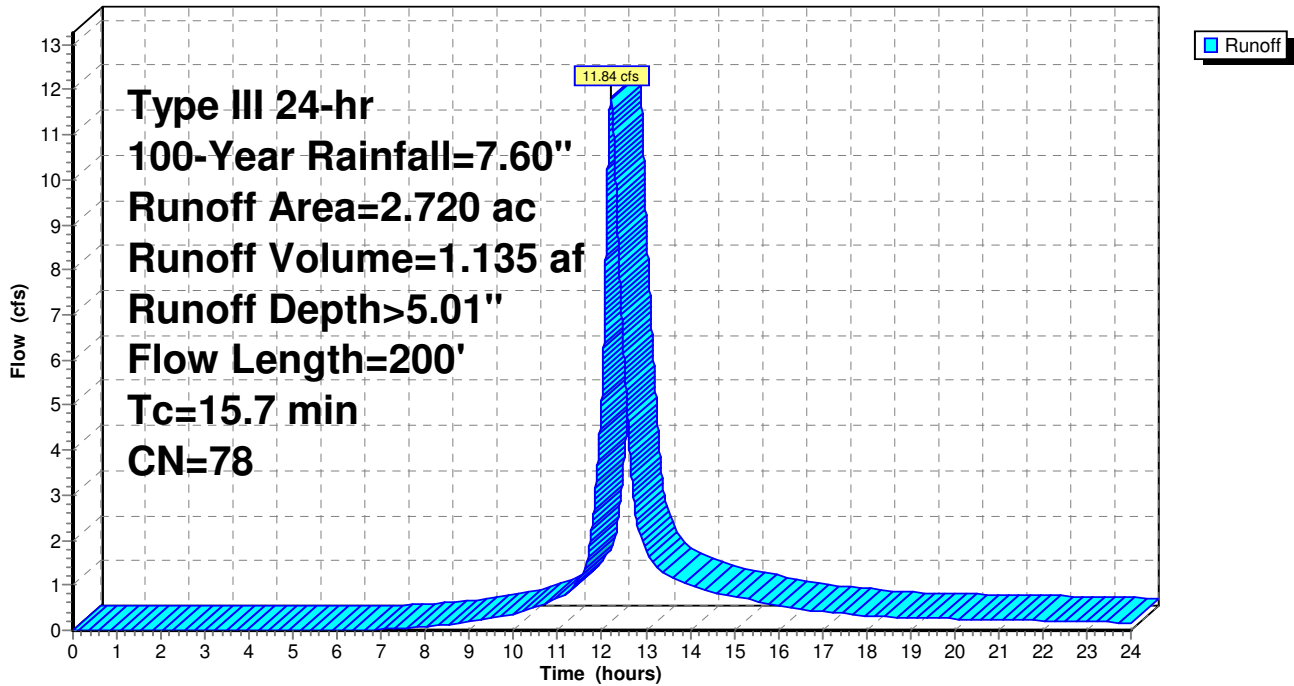
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.010	98	Paved
0.060	96	Gravel surface, HSG C
0.080	96	Gravel surface, HSG D
0.640	74	>75% Grass cover, Good, HSG C
1.080	80	>75% Grass cover, Good, HSG D
0.140	73	Woods, Fair, HSG C
0.510	79	Woods, Fair, HSG D
* 0.200	72	Beach
2.720	78	Weighted Average
2.710		99.63% Pervious Area
0.010		0.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	50	0.0120	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.1	150	0.0200	2.28		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.7	200	Total			

Subcatchment SW: Southwest Wetland

Hydrograph



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment Swale 1: Swale 1

Runoff = 1.12 cfs @ 12.087 hrs, Volume= 0.084 af, Depth> 6.41"

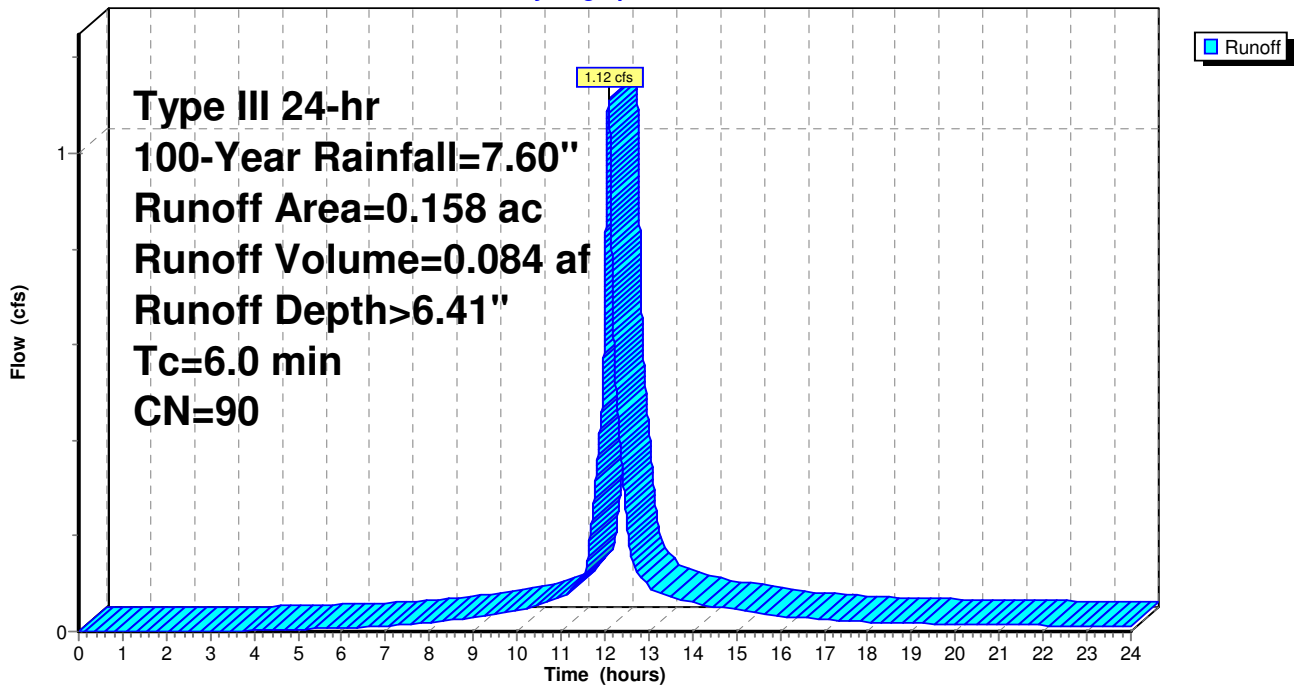
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.106	98	Paved Roadway
0.052	74	>75% Grass cover, Good, HSG C
0.158	90	Weighted Average
0.052		32.91% Pervious Area
0.106		67.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 1: Swale 1

Hydrograph



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Subcatchment Swale 2: Swale 2

Runoff = 0.54 cfs @ 12.087 hrs, Volume= 0.040 af, Depth> 5.94"

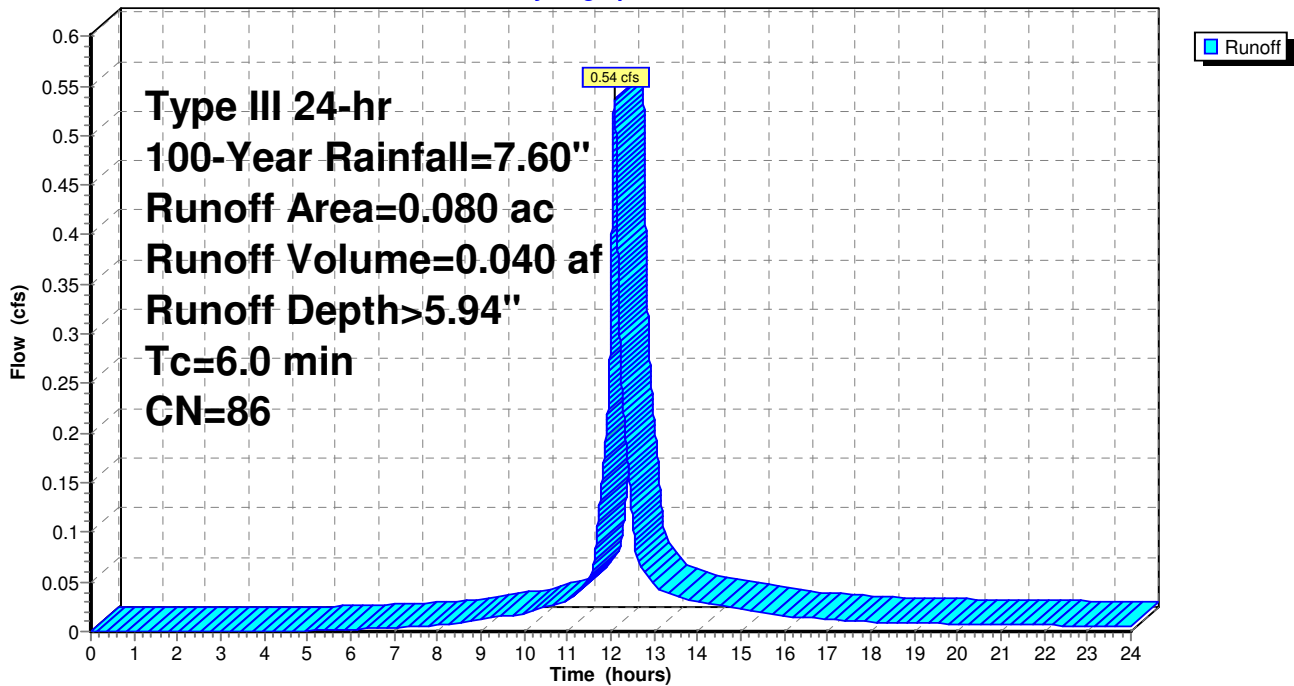
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
Type III 24-hr 100-Year Rainfall=7.60"

Area (ac)	CN	Description
* 0.040	98	Paved Roadway
0.040	74	>75% Grass cover, Good, HSG C
0.080	86	Weighted Average
0.040		50.00% Pervious Area
0.040		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment Swale 2: Swale 2

Hydrograph



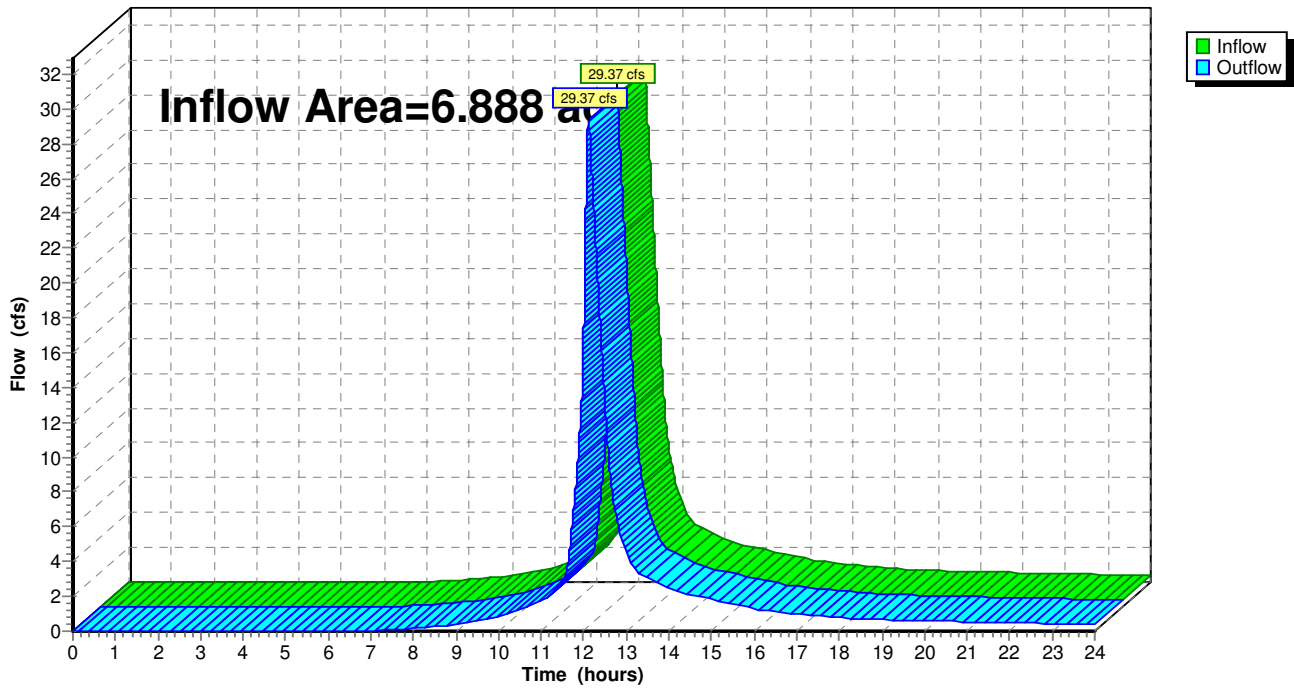
Summary for Reach BB: Buzzards Bay

Inflow Area = 6.888 ac, 8.23% Impervious, Inflow Depth > 4.89" for 100-Year event
Inflow = 29.37 cfs @ 12.113 hrs, Volume= 2.808 af
Outflow = 29.37 cfs @ 12.113 hrs, Volume= 2.808 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach BB: Buzzards Bay

Hydrograph



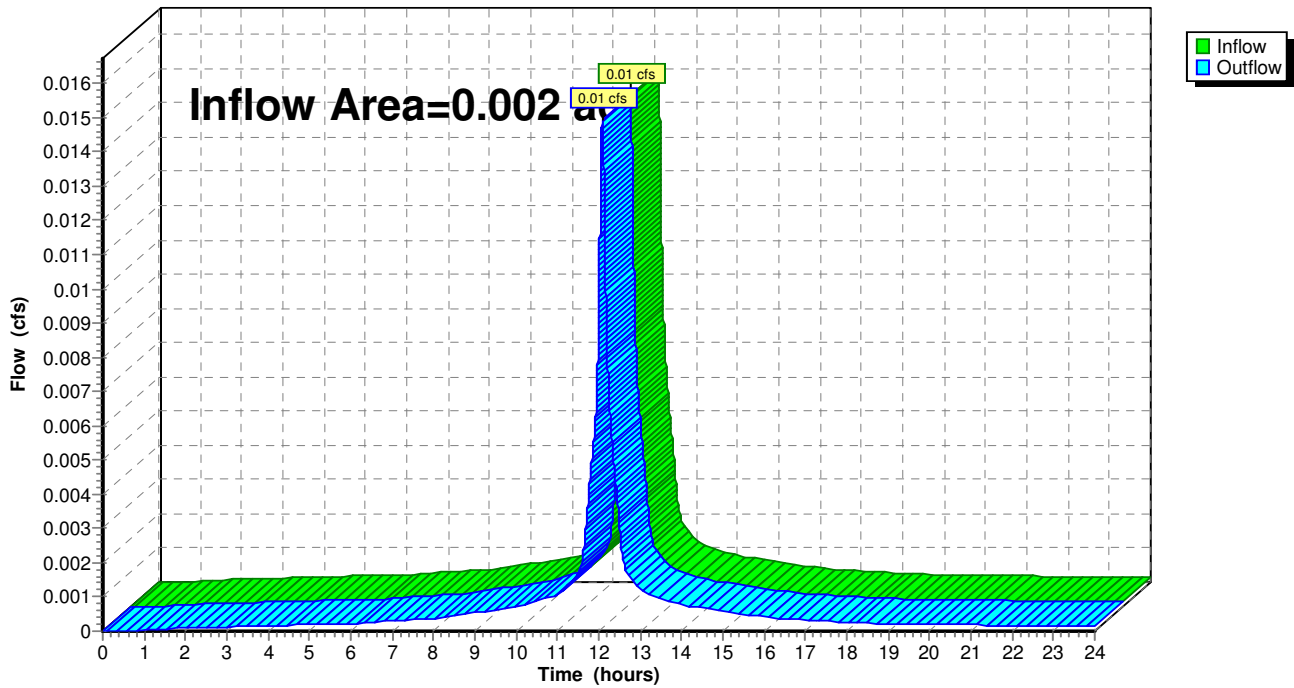
Summary for Reach Road: Sconticut Neck Road

Inflow Area = 0.002 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
Inflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.087 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach Road: Sconticut Neck Road

Hydrograph



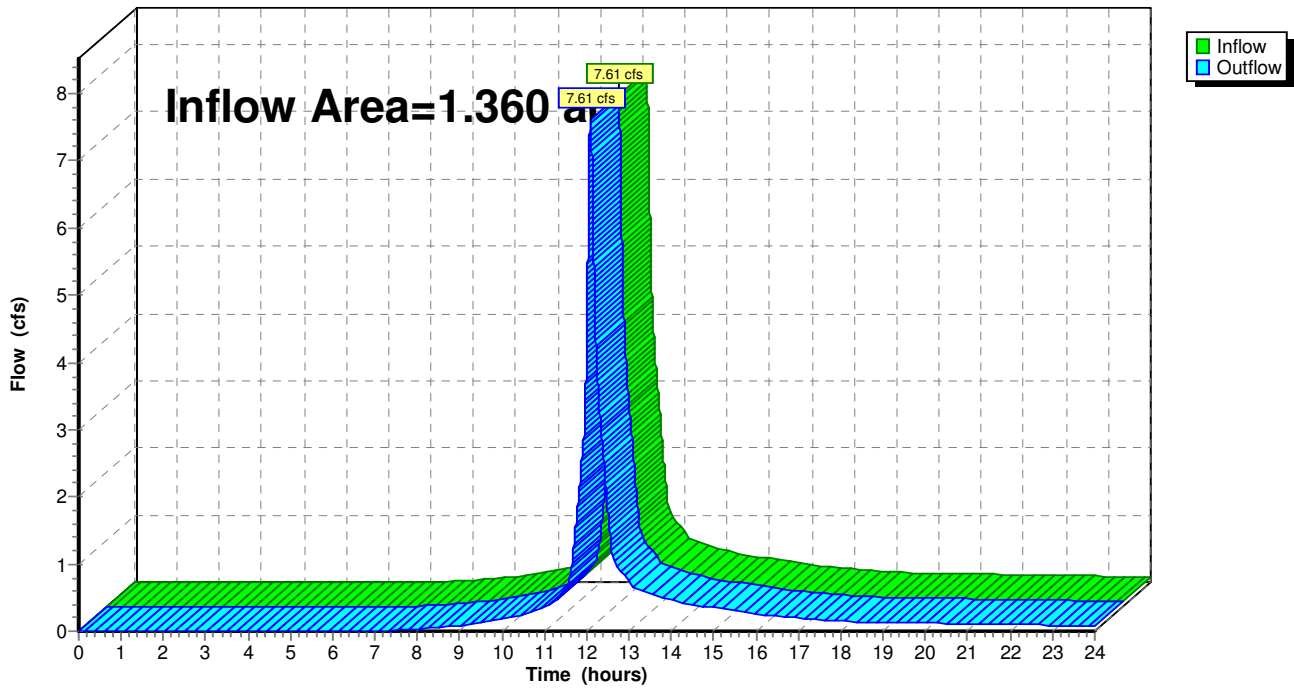
Summary for Reach SouthEast: Southeast

Inflow Area = 1.360 ac, 2.21% Impervious, Inflow Depth > 4.78" for 100-Year event
Inflow = 7.61 cfs @ 12.087 hrs, Volume= 0.542 af
Outflow = 7.61 cfs @ 12.087 hrs, Volume= 0.542 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs

Reach SouthEast: Southeast

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Forebay: Forebay

Inflow Area = 0.120 ac, 75.00% Impervious, Inflow Depth > 6.87" for 100-Year event
 Inflow = 0.77 cfs @ 12.133 hrs, Volume= 0.069 af
 Outflow = 0.42 cfs @ 12.178 hrs, Volume= 0.068 af, Atten= 46%, Lag= 2.7 min
 Primary = 0.42 cfs @ 12.178 hrs, Volume= 0.068 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.22' @ 12.333 hrs Surf.Area= 901 sf Storage= 497 cf

Plug-Flow detention time= 27.6 min calculated for 0.068 af (99% of inflow)
 Center-of-Mass det. time= 20.6 min (785.9 - 765.3)

Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	1,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	451	0	0
6.00	804	314	314
7.00	1,256	1,030	1,344

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	6.0" Round Culvert L= 36.0' Ke= 0.020 Inlet / Outlet Invert= 5.50' / 5.25' S= 0.0069 '/' Cc= 0.900 n= 0.016, Flow Area= 0.20 sf

Primary OutFlow Max=0.42 cfs @ 12.178 hrs HW=6.13' TW=5.80' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 0.42 cfs @ 2.17 fps)

Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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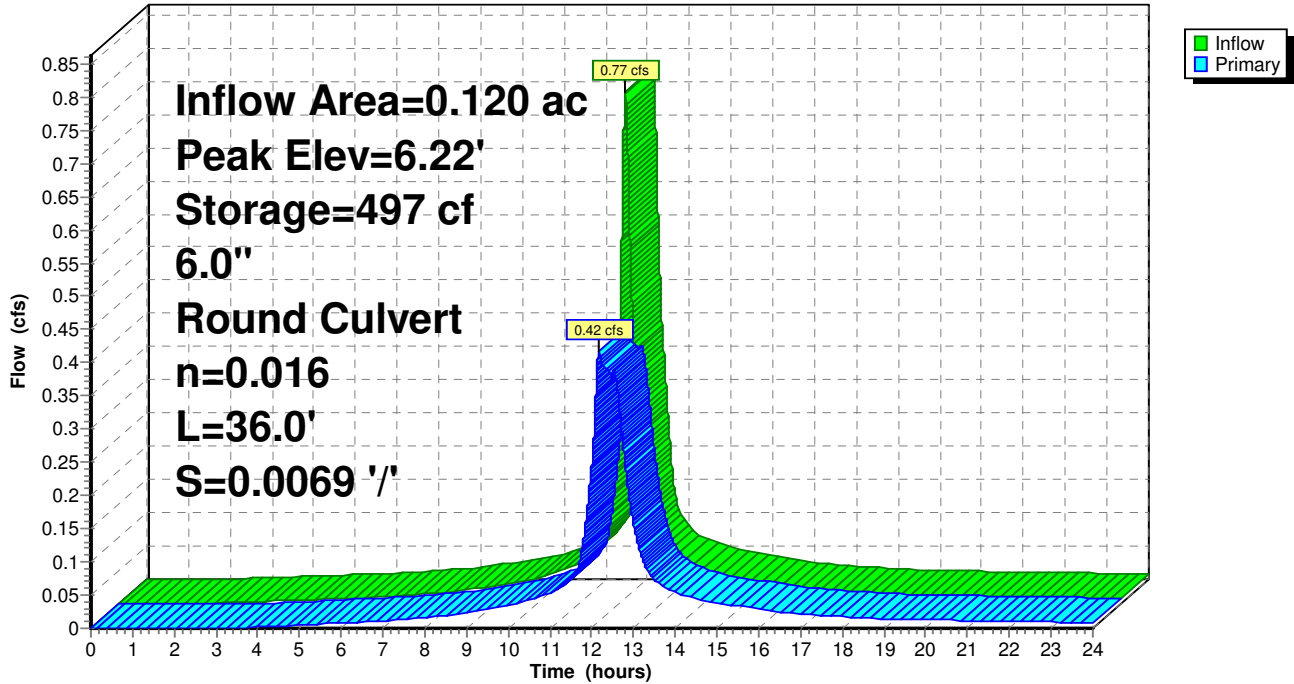
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Pond Forebay: Forebay

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 1: Lot 1 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 9.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

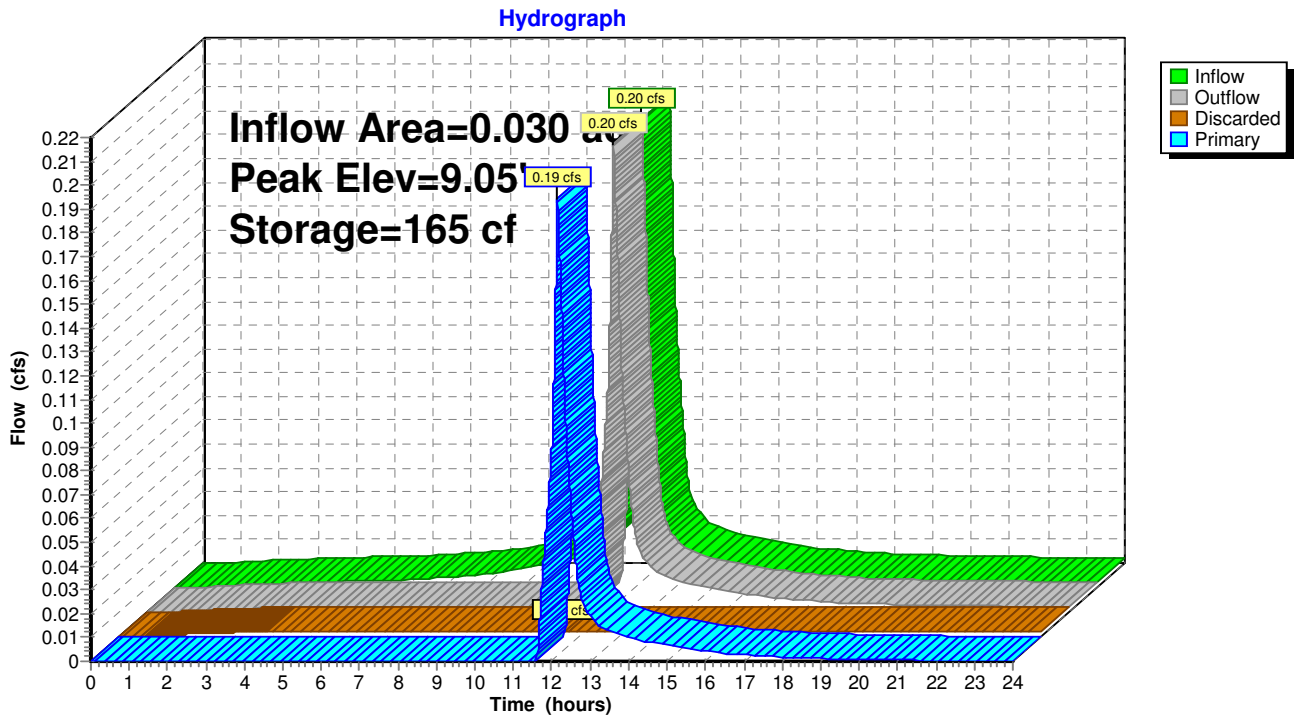
Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=9.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 1: Lot 1 Roof Recharge Trench



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 2: Lot 2 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 9.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

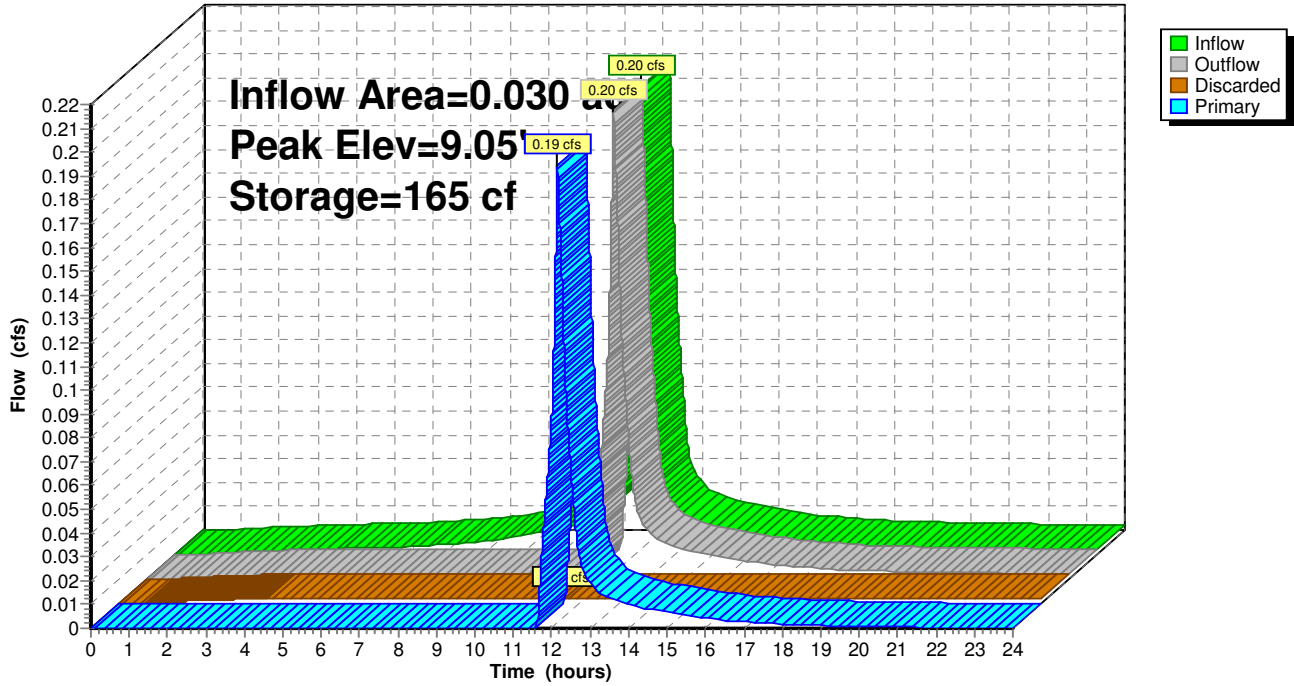
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=9.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 2: Lot 2 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 3: Lot 3 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	5.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	6.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	7.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.96	196	0	0
8.00	196	400	400

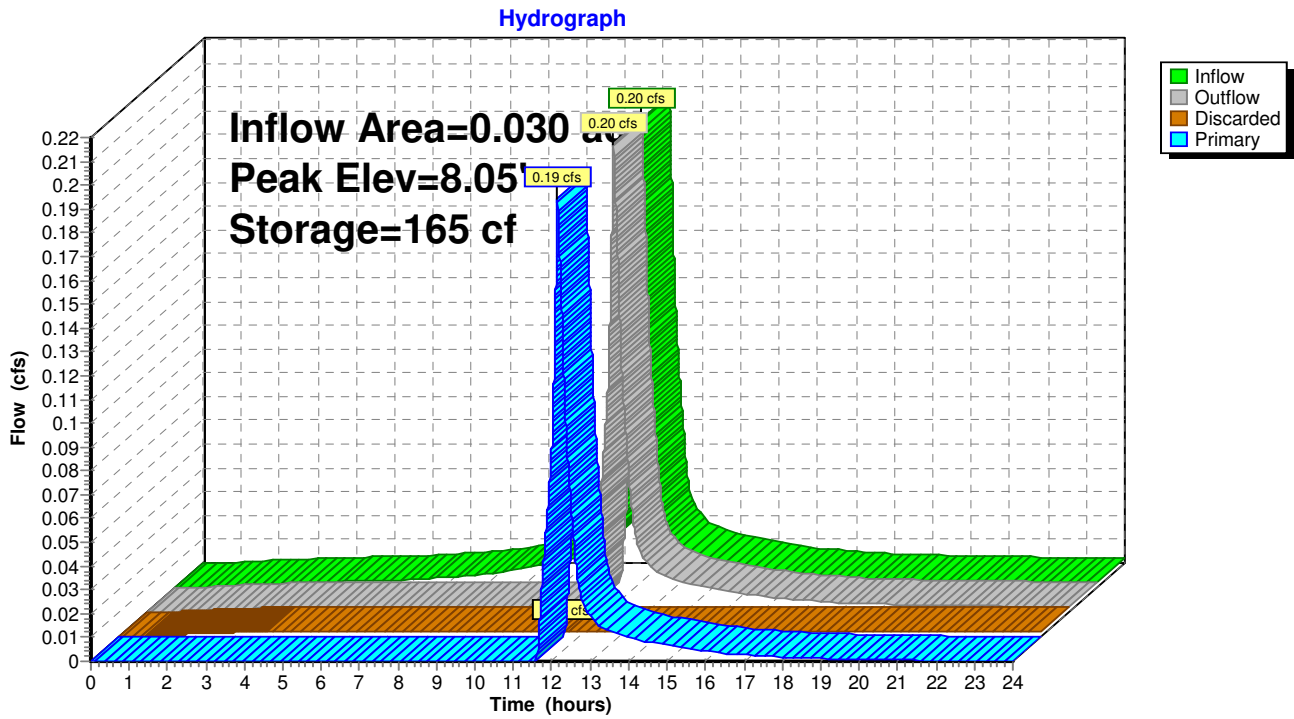
Elevation (feet)	Cum.Store (cubic-feet)
6.96	0
8.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	7.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	5.96'	0.520 in/hr Exfiltration over Surface area above 5.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=7.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=8.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 3: Lot 3 Roof Recharge Trench



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 4: Lot 4 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

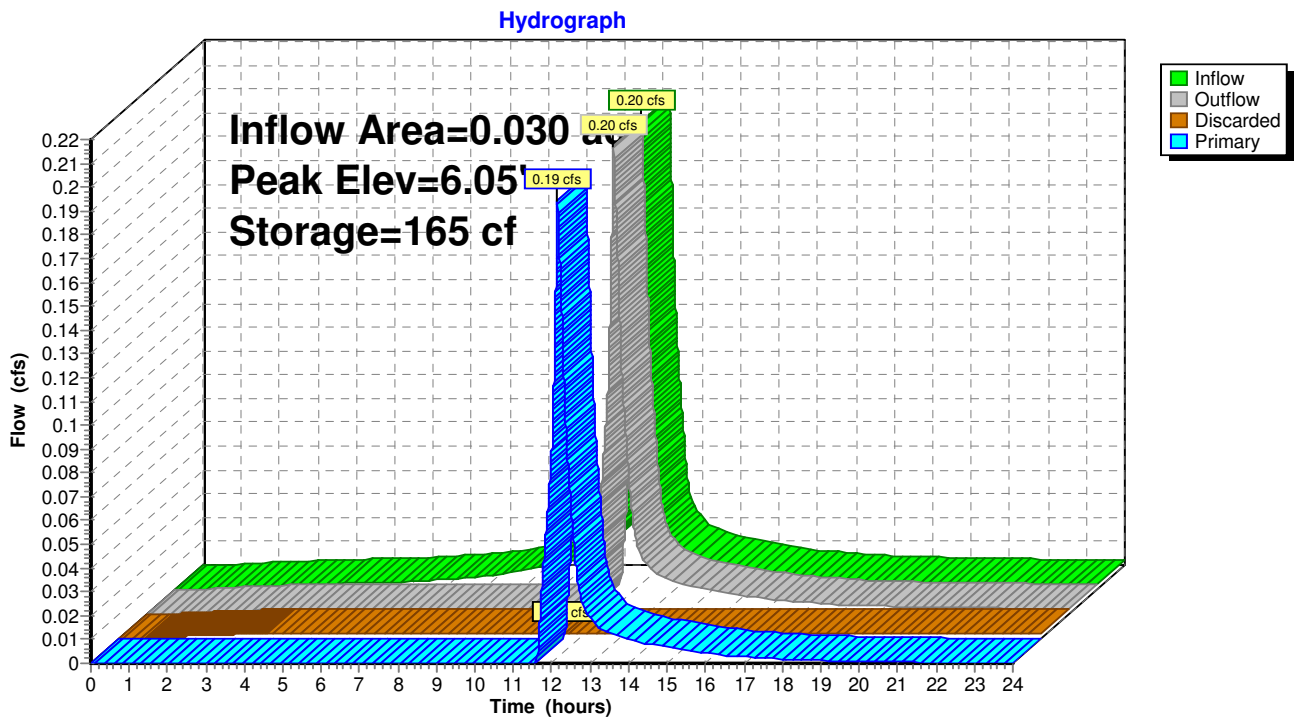
Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=6.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 4: Lot 4 Roof Recharge Trench



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 5: Lot 5 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	3.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	4.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	5.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
3.96	196	0	0
6.00	196	400	400

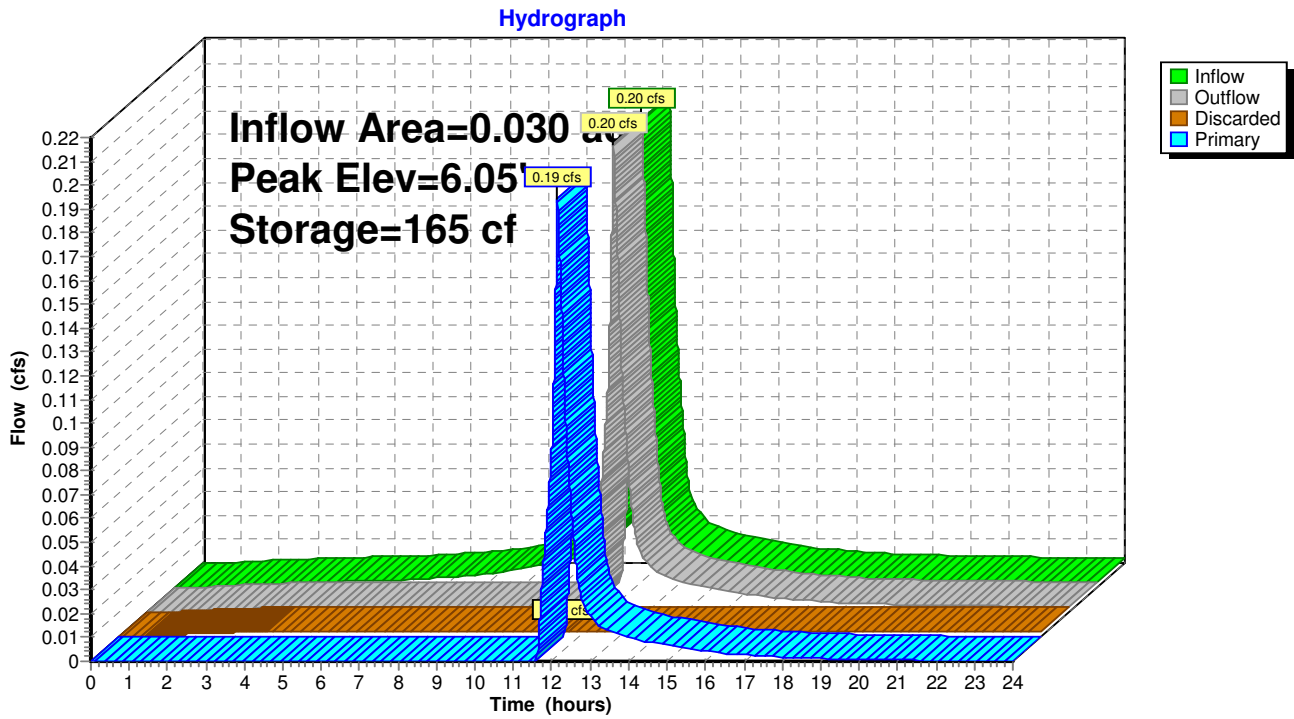
Elevation (feet)	Cum.Store (cubic-feet)
4.96	0
6.00	39

Device	Routing	Invert	Outlet Devices
#1	Primary	5.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	3.96'	0.520 in/hr Exfiltration over Surface area above 3.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=5.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=6.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 5: Lot 5 Roof Recharge Trench



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Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Lot 6: Lot 6 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 23.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	20.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	21.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	22.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
20.96	196	0	0
23.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
21.96	0
23.00	39

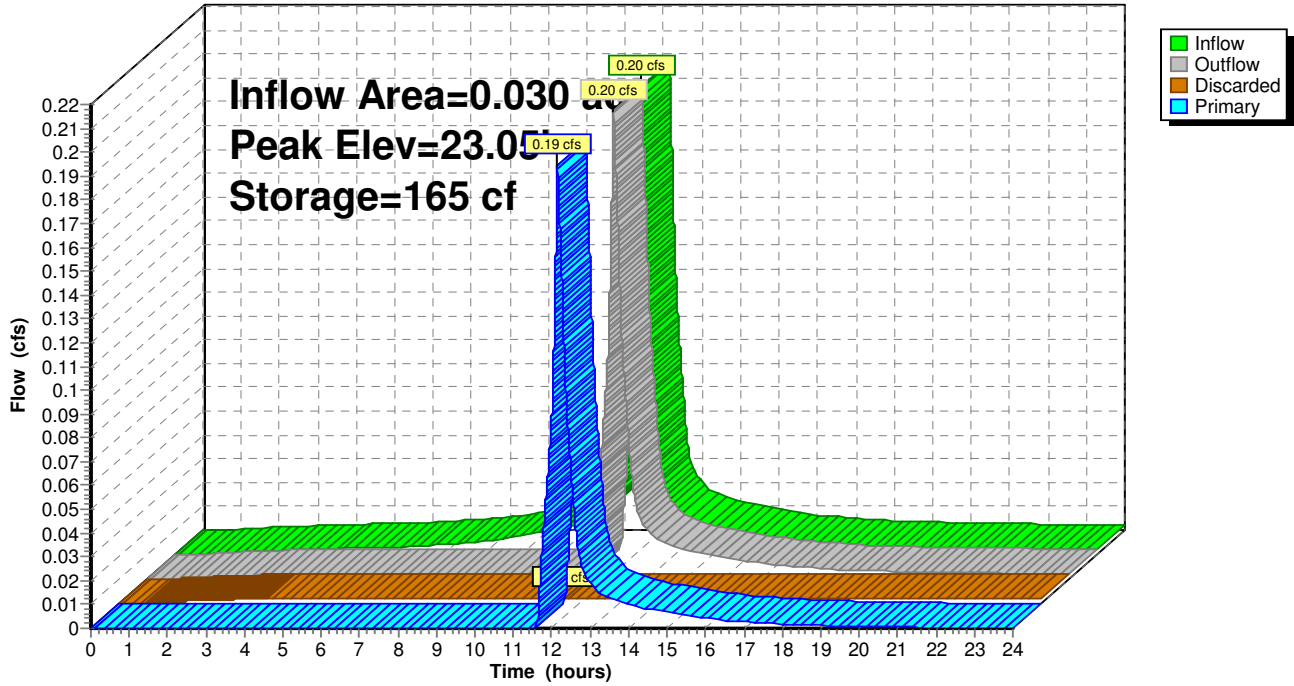
Device	Routing	Invert	Outlet Devices
#1	Primary	22.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	20.96'	0.520 in/hr Exfiltration over Surface area above 20.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=22.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=23.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 6: Lot 6 Roof Recharge Trench

Hydrograph



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Summary for Pond Lot 7: Lot 7 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 7.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	4.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	5.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	6.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.96	196	0	0
7.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
5.96	0
7.00	39

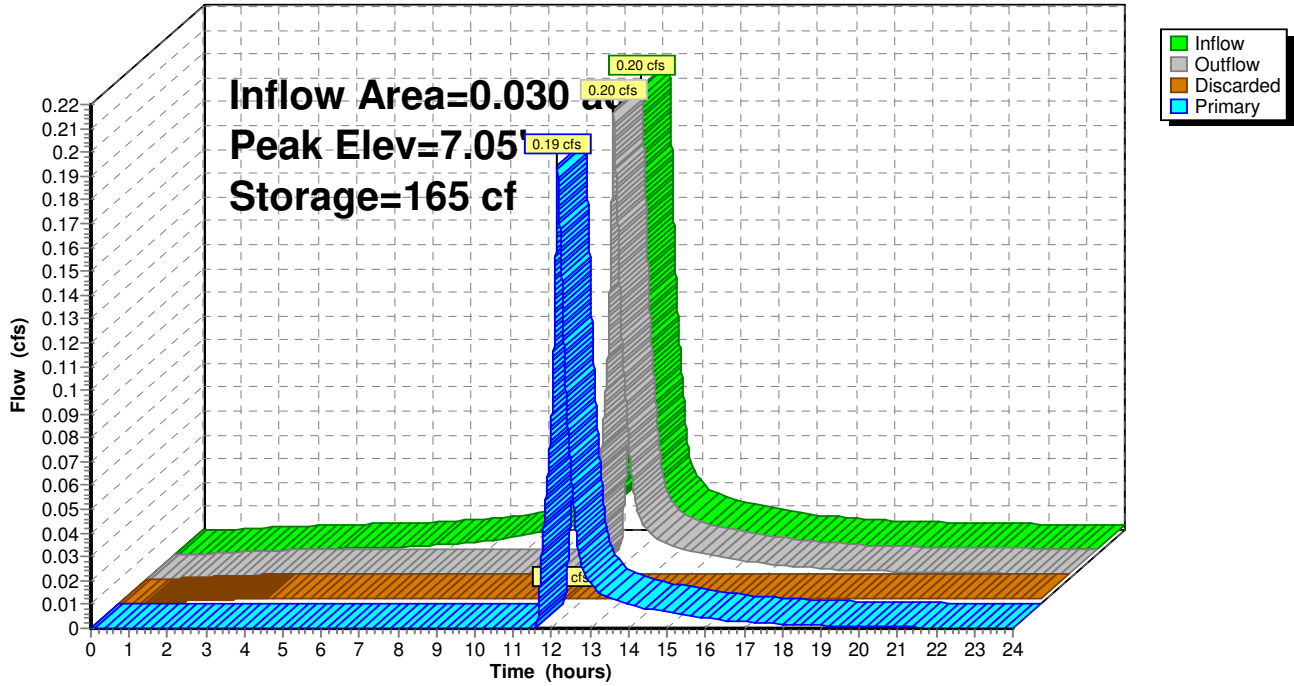
Device	Routing	Invert	Outlet Devices
#1	Primary	6.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	4.96'	0.520 in/hr Exfiltration over Surface area above 4.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=6.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=7.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 7: Lot 7 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

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Summary for Pond Lot 8: Lot 8 Roof Recharge Trench

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 7.35" for 100-Year event
 Inflow = 0.20 cfs @ 12.133 hrs, Volume= 0.018 af
 Outflow = 0.20 cfs @ 12.133 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 11.590 hrs, Volume= 0.004 af
 Primary = 0.19 cfs @ 12.133 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 9.05' @ 12.133 hrs Surf.Area= 196 sf Storage= 165 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.4 min (781.0 - 744.6)

Volume	Invert	Avail.Storage	Storage Description
#1	6.96'	126 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 400 cf Overall - 39 cf Embedded = 361 cf x 35.0% Voids
#2	7.96'	39 cf	Custom Stage Data Listed below Inside #1
#3	8.67'	0 cf	0.50'D x 1.40'H Vertical Cone/Cylinder
		166 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.96	196	0	0
9.00	196	400	400

Elevation (feet)	Cum.Store (cubic-feet)
7.96	0
9.00	39

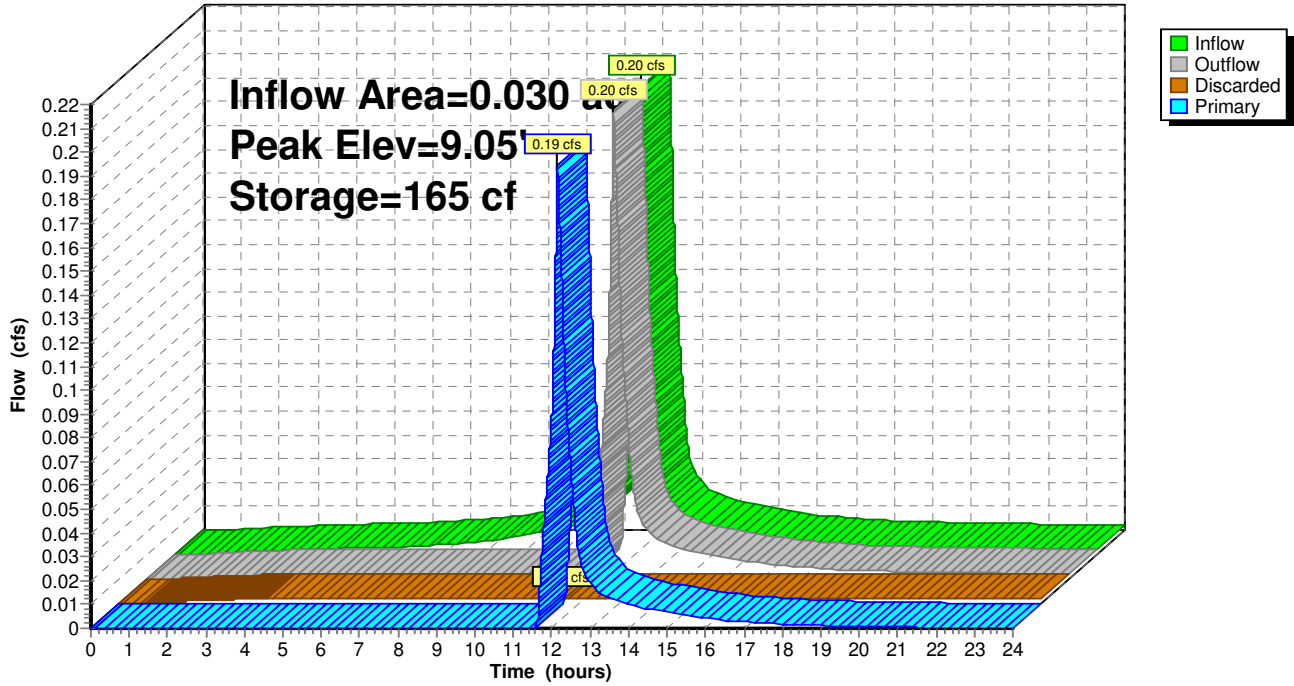
Device	Routing	Invert	Outlet Devices
#1	Primary	8.67'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	6.96'	0.520 in/hr Exfiltration over Surface area above 6.50' Excluded Surface area = 0 sf

Discarded OutFlow Max=0.00 cfs @ 11.590 hrs HW=8.67' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.19 cfs @ 12.133 hrs HW=9.05' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.23 fps)

Pond Lot 8: Lot 8 Roof Recharge Trench

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Pond A: Detention Pond A

Inflow Area = 0.438 ac, 57.31% Impervious, Inflow Depth > 6.20" for 100-Year event
 Inflow = 2.79 cfs @ 12.116 hrs, Volume= 0.226 af
 Outflow = 1.85 cfs @ 12.224 hrs, Volume= 0.216 af, Atten= 34%, Lag= 6.4 min
 Discarded = 0.03 cfs @ 12.224 hrs, Volume= 0.029 af
 Primary = 1.83 cfs @ 12.224 hrs, Volume= 0.188 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.98' @ 12.224 hrs Surf.Area= 0.052 ac Storage= 0.038 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 23.9 min (808.6 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.071 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6.00	0.025	0.000	0.000
7.00	0.053	0.039	0.039
7.50	0.074	0.032	0.071

Device	Routing	Invert	Outlet Devices
#1	Secondary	7.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	6.30'	6.0" Round Culvert X 2.00 L= 17.0' Ke= 0.020 Inlet / Outlet Invert= 6.30' / 5.83' S= 0.0276 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Discarded	6.00'	0.520 in/hr Exfiltration over Surface area

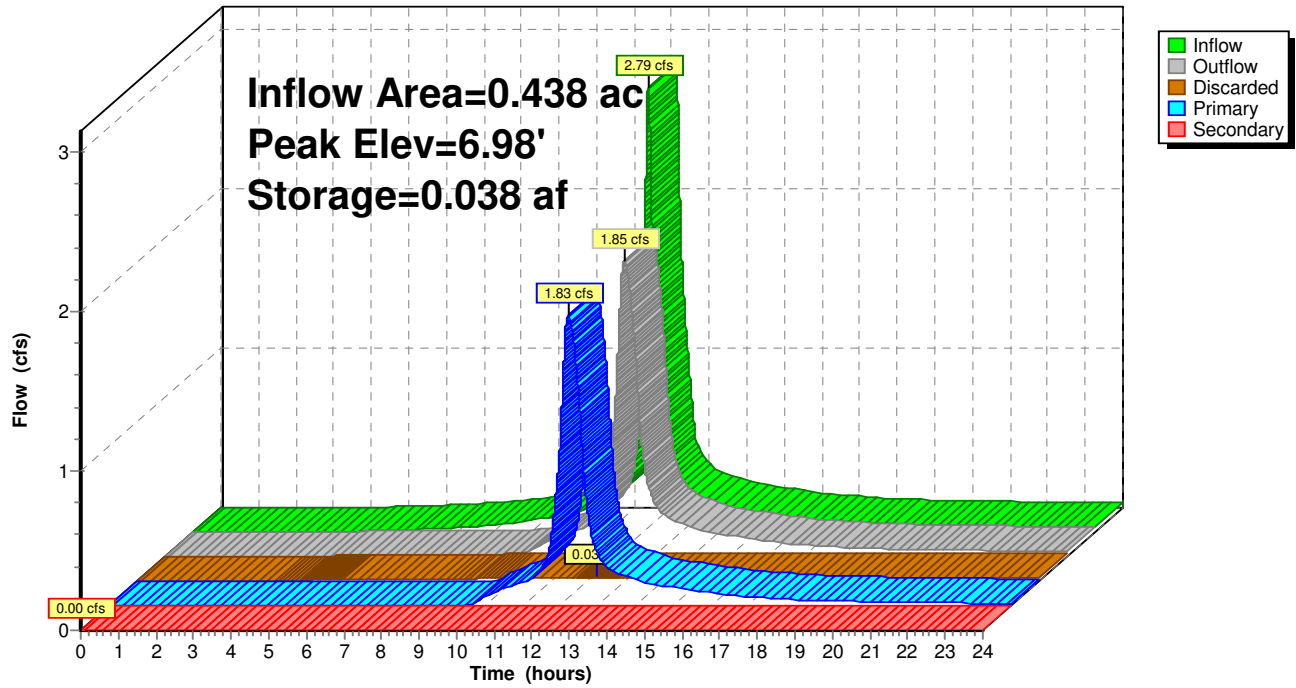
Discarded OutFlow Max=0.03 cfs @ 12.224 hrs HW=6.98' (Free Discharge)
 ↑**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.83 cfs @ 12.224 hrs HW=6.98' TW=5.84' (Dynamic Tailwater)
 ↑**2=Culvert** (Inlet Controls 1.83 cfs @ 4.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=6.00' TW=4.90' (Dynamic Tailwater)
 ↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond A: Detention Pond A

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond Pond B: Detention Pond B

Inflow Area = 0.698 ac, 49.71% Impervious, Inflow Depth > 5.47" for 100-Year event
 Inflow = 2.91 cfs @ 12.172 hrs, Volume= 0.318 af
 Outflow = 2.39 cfs @ 12.370 hrs, Volume= 0.314 af, Atten= 18%, Lag= 11.9 min
 Discarded = 0.04 cfs @ 12.370 hrs, Volume= 0.020 af
 Primary = 2.35 cfs @ 12.370 hrs, Volume= 0.294 af
 Secondary = 0.00 cfs @ 0.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.89' @ 12.370 hrs Surf.Area= 3,230 sf Storage= 1,638 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 13.4 min (809.7 - 796.3)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	4,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.90	269	0	0
5.00	922	60	60
5.10	843	88	148
5.20	857	85	233
6.00	3,618	1,790	2,023
6.50	4,411	2,007	4,030

Device	Routing	Invert	Outlet Devices
#1	Primary	5.10'	12.0" Round Culvert L= 20.0' Ke= 0.020 Inlet / Outlet Invert= 5.10' / 4.80' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	4.90'	0.520 in/hr Exfiltration over Surface area
#3	Secondary	6.00'	4.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

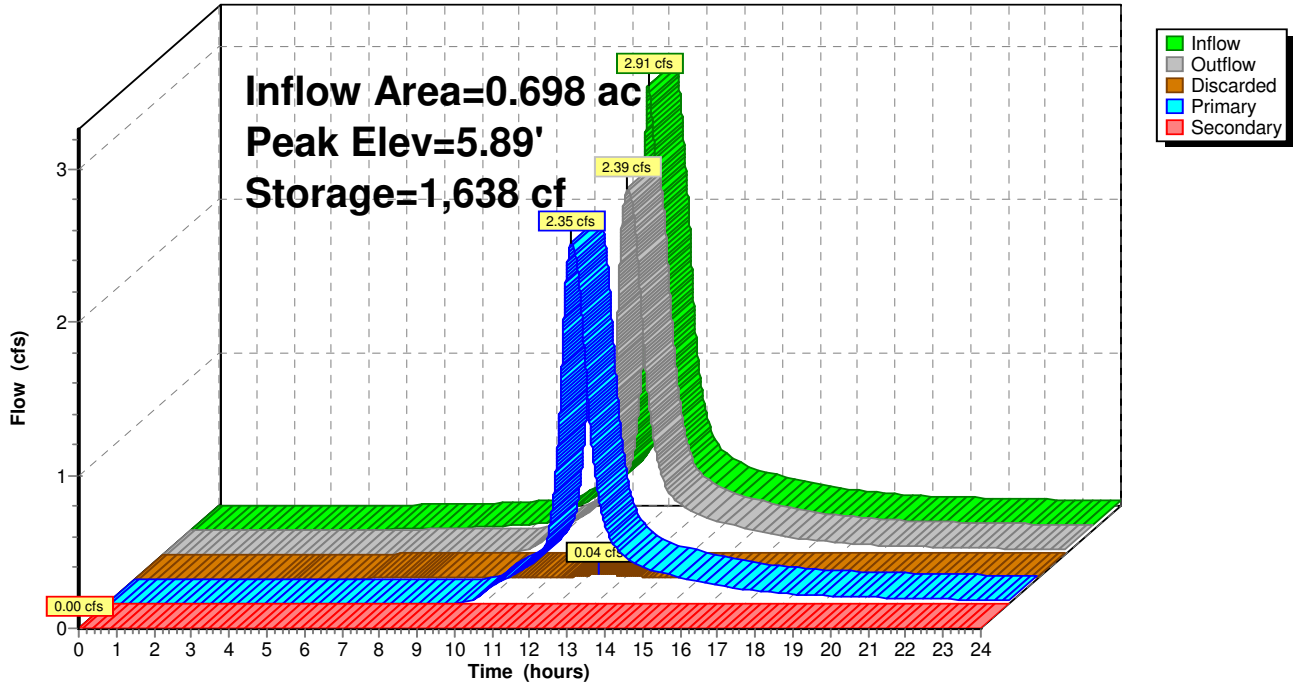
Discarded OutFlow Max=0.04 cfs @ 12.370 hrs HW=5.89' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.35 cfs @ 12.370 hrs HW=5.89' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 2.35 cfs @ 4.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.000 hrs HW=4.90' TW=0.00' (Dynamic Tailwater)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pond B: Detention Pond B

Hydrograph



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

Prepared by {enter your company name here}

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Summary for Pond SW1: 3-ft wide swale

Inflow Area = 0.158 ac, 67.09% Impervious, Inflow Depth > 6.41" for 100-Year event
 Inflow = 1.12 cfs @ 12.087 hrs, Volume= 0.084 af
 Outflow = 1.10 cfs @ 12.095 hrs, Volume= 0.084 af, Atten= 1%, Lag= 0.5 min
 Primary = 1.10 cfs @ 12.095 hrs, Volume= 0.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.84' @ 12.095 hrs Surf.Area= 206 sf Storage= 52 cf

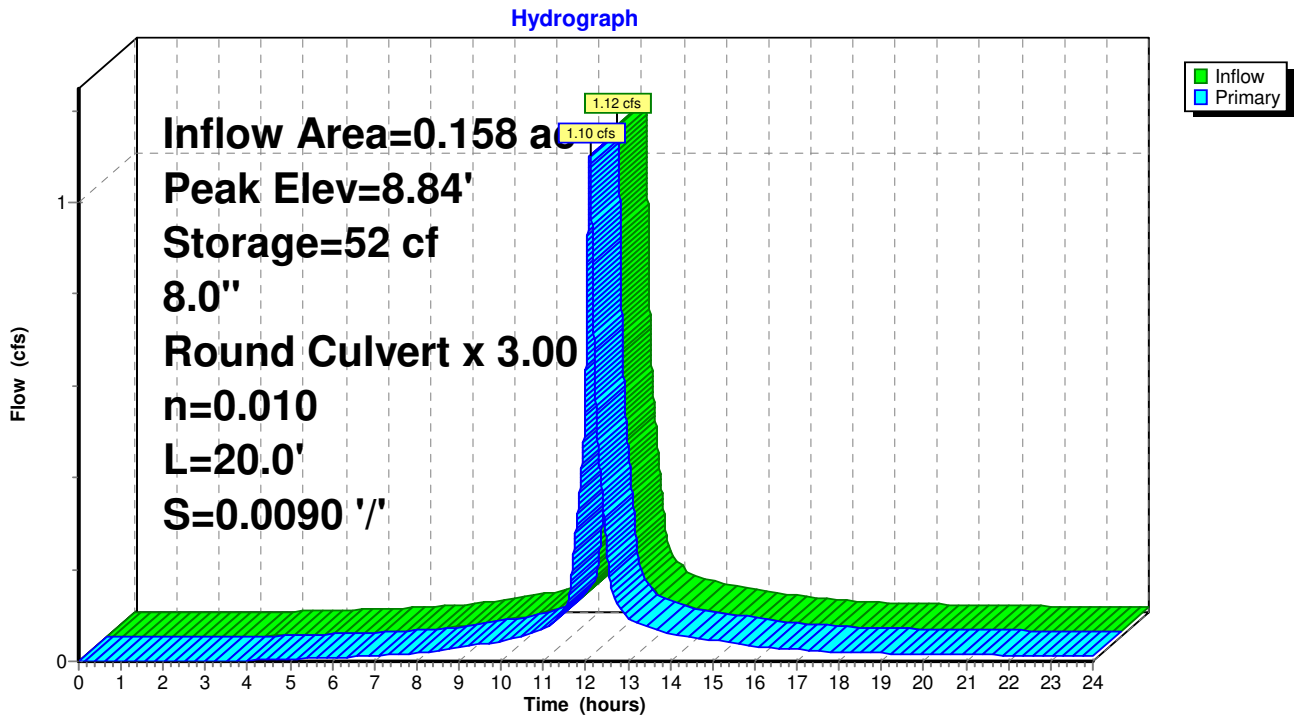
Plug-Flow detention time= 2.7 min calculated for 0.084 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (778.5 - 776.8)

Volume	Invert	Avail.Storage	Storage Description
#1	8.40'	630 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.40	30	0	0
9.00	270	90	90
10.00	810	540	630

Device	Routing	Invert	Outlet Devices
#1	Primary	8.48'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 8.48' / 8.30' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.10 cfs @ 12.095 hrs HW=8.84' TW=8.03' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 1.10 cfs @ 2.77 fps)

Pond SW1: 3-ft wide swale



Starboard Drive Estates Proposed

Type III 24-hr 100-Year Rainfall=7.60"

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Summary for Pond SW2: 3-ft wide swale

Inflow Area = 0.238 ac, 61.34% Impervious, Inflow Depth > 6.24" for 100-Year event
 Inflow = 1.64 cfs @ 12.091 hrs, Volume= 0.124 af
 Outflow = 1.62 cfs @ 12.106 hrs, Volume= 0.124 af, Atten= 1%, Lag= 0.9 min
 Primary = 1.62 cfs @ 12.106 hrs, Volume= 0.124 af

Routing by Dyn-Stor-Ind method, Time Span= 0.000-24.000 hrs, dt= 0.0001 hrs
 Peak Elev= 8.04' @ 12.106 hrs Surf.Area= 290 sf Storage= 85 cf

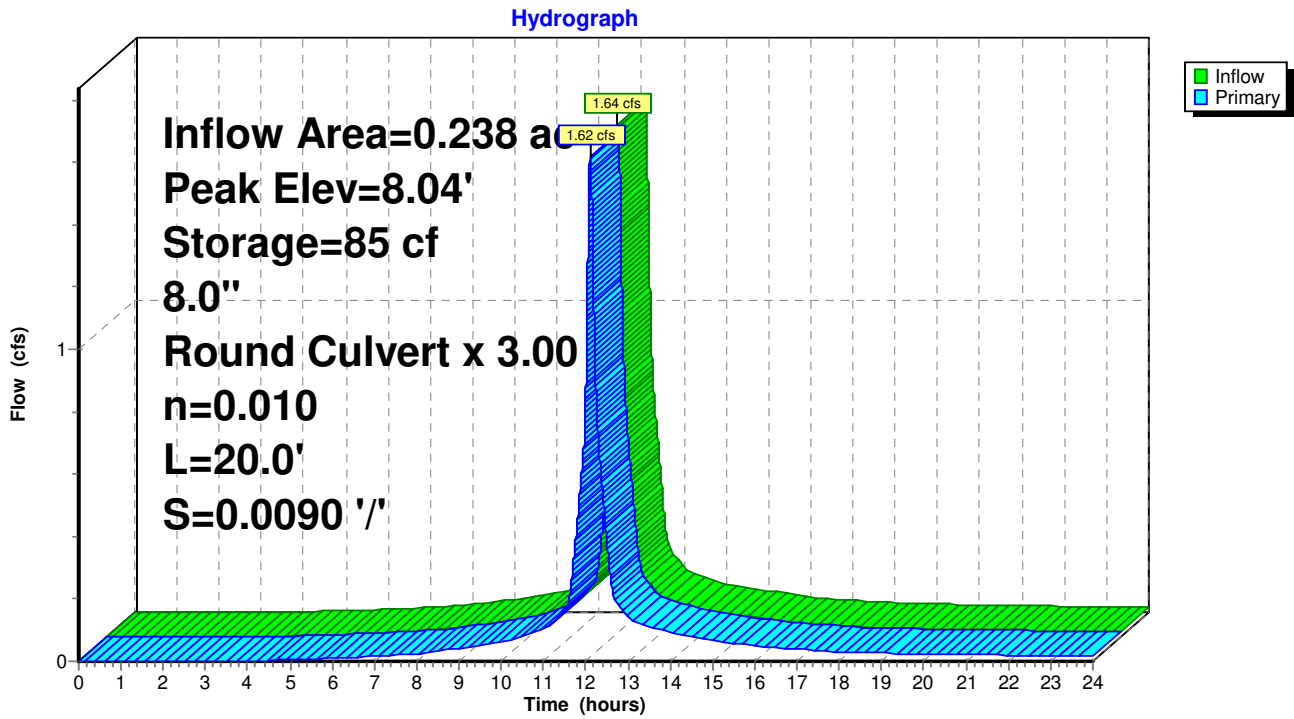
Plug-Flow detention time= 2.3 min calculated for 0.124 af (100% of inflow)
 Center-of-Mass det. time= 1.5 min (783.2 - 781.8)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	615 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7.50	30	0	0
8.00	270	75	75
9.00	810	540	615

Device	Routing	Invert	Outlet Devices
#1	Primary	7.58'	8.0" Round Culvert X 3.00 L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 7.58' / 7.40' S= 0.0090 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.62 cfs @ 12.106 hrs HW=8.04' TW=6.85' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 1.62 cfs @ 2.99 fps)

Pond SW2: 3-ft wide swale



Drawdown Calculations

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Pond A: Detention Pond A

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
24.000	0.01	0.000	6.00	0.01	0.01	0.00	0.00
26.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
28.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
30.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
32.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
34.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
36.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
38.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
40.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
42.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
44.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
46.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
48.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
50.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
52.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
54.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
56.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
58.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
60.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
62.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
64.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
66.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
68.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
70.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
72.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
74.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
76.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
78.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
80.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
82.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
84.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
86.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
88.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
90.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
92.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
94.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00
96.000	0.00	0.000	6.00	0.00	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Pond B: Detention Pond B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
24.000	0.01	0	4.90	0.00	0.00	0.00	0.00
26.000	0.00	0	4.90	0.00	0.00	0.00	0.00
28.000	0.00	0	4.90	0.00	0.00	0.00	0.00
30.000	0.00	0	4.90	0.00	0.00	0.00	0.00
32.000	0.00	0	4.90	0.00	0.00	0.00	0.00
34.000	0.00	0	4.90	0.00	0.00	0.00	0.00
36.000	0.00	0	4.90	0.00	0.00	0.00	0.00
38.000	0.00	0	4.90	0.00	0.00	0.00	0.00
40.000	0.00	0	4.90	0.00	0.00	0.00	0.00
42.000	0.00	0	4.90	0.00	0.00	0.00	0.00
44.000	0.00	0	4.90	0.00	0.00	0.00	0.00
46.000	0.00	0	4.90	0.00	0.00	0.00	0.00
48.000	0.00	0	4.90	0.00	0.00	0.00	0.00
50.000	0.00	0	4.90	0.00	0.00	0.00	0.00
52.000	0.00	0	4.90	0.00	0.00	0.00	0.00
54.000	0.00	0	4.90	0.00	0.00	0.00	0.00
56.000	0.00	0	4.90	0.00	0.00	0.00	0.00
58.000	0.00	0	4.90	0.00	0.00	0.00	0.00
60.000	0.00	0	4.90	0.00	0.00	0.00	0.00
62.000	0.00	0	4.90	0.00	0.00	0.00	0.00
64.000	0.00	0	4.90	0.00	0.00	0.00	0.00
66.000	0.00	0	4.90	0.00	0.00	0.00	0.00
68.000	0.00	0	4.90	0.00	0.00	0.00	0.00
70.000	0.00	0	4.90	0.00	0.00	0.00	0.00
72.000	0.00	0	4.90	0.00	0.00	0.00	0.00
74.000	0.00	0	4.90	0.00	0.00	0.00	0.00
76.000	0.00	0	4.90	0.00	0.00	0.00	0.00
78.000	0.00	0	4.90	0.00	0.00	0.00	0.00
80.000	0.00	0	4.90	0.00	0.00	0.00	0.00
82.000	0.00	0	4.90	0.00	0.00	0.00	0.00
84.000	0.00	0	4.90	0.00	0.00	0.00	0.00
86.000	0.00	0	4.90	0.00	0.00	0.00	0.00
88.000	0.00	0	4.90	0.00	0.00	0.00	0.00
90.000	0.00	0	4.90	0.00	0.00	0.00	0.00
92.000	0.00	0	4.90	0.00	0.00	0.00	0.00
94.000	0.00	0	4.90	0.00	0.00	0.00	0.00
96.000	0.00	0	4.90	0.00	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Forebay: Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
24.000	0.01	0	5.50	0.00
26.000	0.00	4	5.51	0.00
28.000	0.00	3	5.51	0.00
30.000	0.00	3	5.51	0.00
32.000	0.00	2	5.51	0.00
34.000	0.00	2	5.50	0.00
36.000	0.00	2	5.50	0.00
38.000	0.00	2	5.50	0.00
40.000	0.00	2	5.50	0.00
42.000	0.00	2	5.50	0.00
44.000	0.00	2	5.50	0.00
46.000	0.00	1	5.50	0.00
48.000	0.00	1	5.50	0.00
50.000	0.00	1	5.50	0.00
52.000	0.00	1	5.50	0.00
54.000	0.00	1	5.50	0.00
56.000	0.00	1	5.50	0.00
58.000	0.00	1	5.50	0.00
60.000	0.00	1	5.50	0.00
62.000	0.00	1	5.50	0.00
64.000	0.00	1	5.50	0.00
66.000	0.00	1	5.50	0.00
68.000	0.00	1	5.50	0.00
70.000	0.00	1	5.50	0.00
72.000	0.00	1	5.50	0.00
74.000	0.00	1	5.50	0.00
76.000	0.00	1	5.50	0.00
78.000	0.00	1	5.50	0.00
80.000	0.00	1	5.50	0.00
82.000	0.00	1	5.50	0.00
84.000	0.00	1	5.50	0.00
86.000	0.00	1	5.50	0.00
88.000	0.00	1	5.50	0.00
90.000	0.00	1	5.50	0.00
92.000	0.00	1	5.50	0.00
94.000	0.00	1	5.50	0.00
96.000	0.00	1	5.50	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 1: Lot 1 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	6.96	0.00	0.00	0.00
26.000	0.00	0	6.96	0.00	0.00	0.00
28.000	0.00	0	6.96	0.00	0.00	0.00
30.000	0.00	0	6.96	0.00	0.00	0.00
32.000	0.00	0	6.96	0.00	0.00	0.00
34.000	0.00	0	6.96	0.00	0.00	0.00
36.000	0.00	0	6.96	0.00	0.00	0.00
38.000	0.00	0	6.96	0.00	0.00	0.00
40.000	0.00	0	6.96	0.00	0.00	0.00
42.000	0.00	0	6.96	0.00	0.00	0.00
44.000	0.00	0	6.96	0.00	0.00	0.00
46.000	0.00	0	6.96	0.00	0.00	0.00
48.000	0.00	0	6.96	0.00	0.00	0.00
50.000	0.00	0	6.96	0.00	0.00	0.00
52.000	0.00	0	6.96	0.00	0.00	0.00
54.000	0.00	0	6.96	0.00	0.00	0.00
56.000	0.00	0	6.96	0.00	0.00	0.00
58.000	0.00	0	6.96	0.00	0.00	0.00
60.000	0.00	0	6.96	0.00	0.00	0.00
62.000	0.00	0	6.96	0.00	0.00	0.00
64.000	0.00	0	6.96	0.00	0.00	0.00
66.000	0.00	0	6.96	0.00	0.00	0.00
68.000	0.00	0	6.96	0.00	0.00	0.00
70.000	0.00	0	6.96	0.00	0.00	0.00
72.000	0.00	0	6.96	0.00	0.00	0.00
74.000	0.00	0	6.96	0.00	0.00	0.00
76.000	0.00	0	6.96	0.00	0.00	0.00
78.000	0.00	0	6.96	0.00	0.00	0.00
80.000	0.00	0	6.96	0.00	0.00	0.00
82.000	0.00	0	6.96	0.00	0.00	0.00
84.000	0.00	0	6.96	0.00	0.00	0.00
86.000	0.00	0	6.96	0.00	0.00	0.00
88.000	0.00	0	6.96	0.00	0.00	0.00
90.000	0.00	0	6.96	0.00	0.00	0.00
92.000	0.00	0	6.96	0.00	0.00	0.00
94.000	0.00	0	6.96	0.00	0.00	0.00
96.000	0.00	0	6.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown

Type III 24-hr 100-Year Rainfall=7.60"

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Hydrograph for Pond Lot 2: Lot 2 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	6.96	0.00	0.00	0.00
26.000	0.00	0	6.96	0.00	0.00	0.00
28.000	0.00	0	6.96	0.00	0.00	0.00
30.000	0.00	0	6.96	0.00	0.00	0.00
32.000	0.00	0	6.96	0.00	0.00	0.00
34.000	0.00	0	6.96	0.00	0.00	0.00
36.000	0.00	0	6.96	0.00	0.00	0.00
38.000	0.00	0	6.96	0.00	0.00	0.00
40.000	0.00	0	6.96	0.00	0.00	0.00
42.000	0.00	0	6.96	0.00	0.00	0.00
44.000	0.00	0	6.96	0.00	0.00	0.00
46.000	0.00	0	6.96	0.00	0.00	0.00
48.000	0.00	0	6.96	0.00	0.00	0.00
50.000	0.00	0	6.96	0.00	0.00	0.00
52.000	0.00	0	6.96	0.00	0.00	0.00
54.000	0.00	0	6.96	0.00	0.00	0.00
56.000	0.00	0	6.96	0.00	0.00	0.00
58.000	0.00	0	6.96	0.00	0.00	0.00
60.000	0.00	0	6.96	0.00	0.00	0.00
62.000	0.00	0	6.96	0.00	0.00	0.00
64.000	0.00	0	6.96	0.00	0.00	0.00
66.000	0.00	0	6.96	0.00	0.00	0.00
68.000	0.00	0	6.96	0.00	0.00	0.00
70.000	0.00	0	6.96	0.00	0.00	0.00
72.000	0.00	0	6.96	0.00	0.00	0.00
74.000	0.00	0	6.96	0.00	0.00	0.00
76.000	0.00	0	6.96	0.00	0.00	0.00
78.000	0.00	0	6.96	0.00	0.00	0.00
80.000	0.00	0	6.96	0.00	0.00	0.00
82.000	0.00	0	6.96	0.00	0.00	0.00
84.000	0.00	0	6.96	0.00	0.00	0.00
86.000	0.00	0	6.96	0.00	0.00	0.00
88.000	0.00	0	6.96	0.00	0.00	0.00
90.000	0.00	0	6.96	0.00	0.00	0.00
92.000	0.00	0	6.96	0.00	0.00	0.00
94.000	0.00	0	6.96	0.00	0.00	0.00
96.000	0.00	0	6.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown

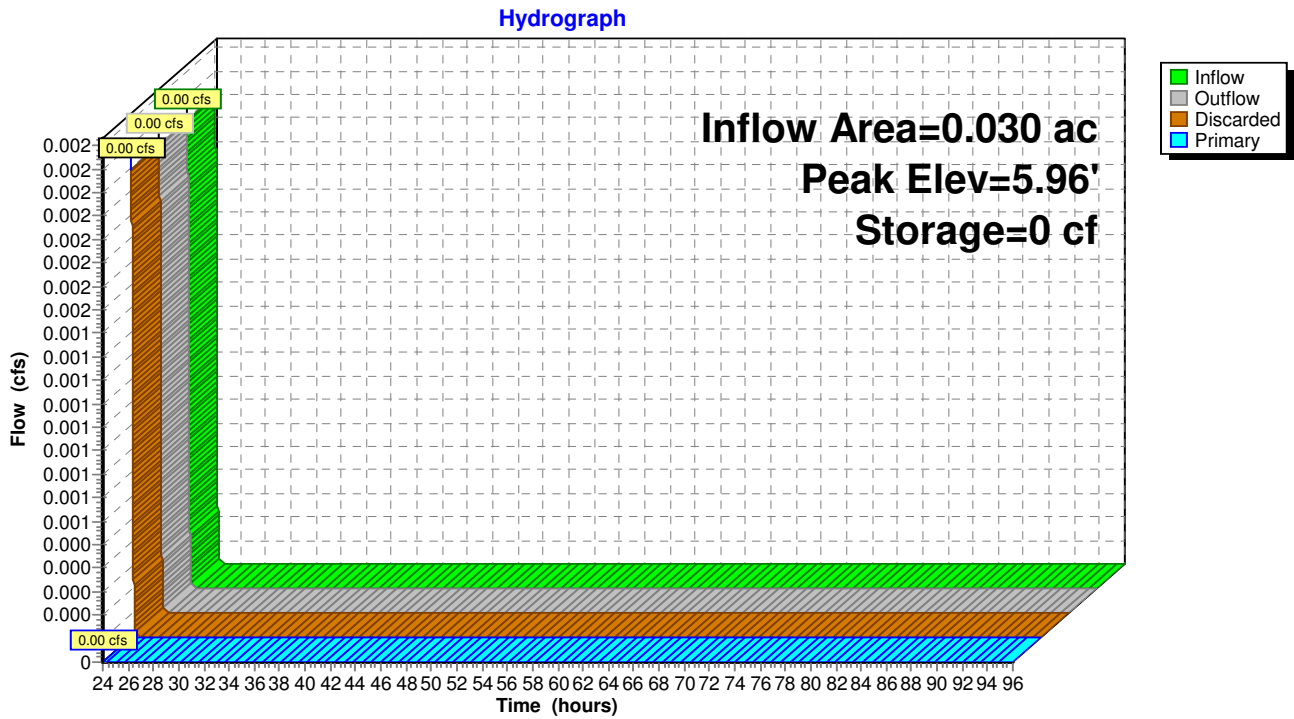
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Type III 24-hr 100-Year Rainfall=7.60"

Printed 9/8/2022

Pond Lot 3: Lot 3 Roof Recharge Trench



Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 4: Lot 4 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	3.96	0.00	0.00	0.00
26.000	0.00	0	3.96	0.00	0.00	0.00
28.000	0.00	0	3.96	0.00	0.00	0.00
30.000	0.00	0	3.96	0.00	0.00	0.00
32.000	0.00	0	3.96	0.00	0.00	0.00
34.000	0.00	0	3.96	0.00	0.00	0.00
36.000	0.00	0	3.96	0.00	0.00	0.00
38.000	0.00	0	3.96	0.00	0.00	0.00
40.000	0.00	0	3.96	0.00	0.00	0.00
42.000	0.00	0	3.96	0.00	0.00	0.00
44.000	0.00	0	3.96	0.00	0.00	0.00
46.000	0.00	0	3.96	0.00	0.00	0.00
48.000	0.00	0	3.96	0.00	0.00	0.00
50.000	0.00	0	3.96	0.00	0.00	0.00
52.000	0.00	0	3.96	0.00	0.00	0.00
54.000	0.00	0	3.96	0.00	0.00	0.00
56.000	0.00	0	3.96	0.00	0.00	0.00
58.000	0.00	0	3.96	0.00	0.00	0.00
60.000	0.00	0	3.96	0.00	0.00	0.00
62.000	0.00	0	3.96	0.00	0.00	0.00
64.000	0.00	0	3.96	0.00	0.00	0.00
66.000	0.00	0	3.96	0.00	0.00	0.00
68.000	0.00	0	3.96	0.00	0.00	0.00
70.000	0.00	0	3.96	0.00	0.00	0.00
72.000	0.00	0	3.96	0.00	0.00	0.00
74.000	0.00	0	3.96	0.00	0.00	0.00
76.000	0.00	0	3.96	0.00	0.00	0.00
78.000	0.00	0	3.96	0.00	0.00	0.00
80.000	0.00	0	3.96	0.00	0.00	0.00
82.000	0.00	0	3.96	0.00	0.00	0.00
84.000	0.00	0	3.96	0.00	0.00	0.00
86.000	0.00	0	3.96	0.00	0.00	0.00
88.000	0.00	0	3.96	0.00	0.00	0.00
90.000	0.00	0	3.96	0.00	0.00	0.00
92.000	0.00	0	3.96	0.00	0.00	0.00
94.000	0.00	0	3.96	0.00	0.00	0.00
96.000	0.00	0	3.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 5: Lot 5 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	3.96	0.00	0.00	0.00
26.000	0.00	0	3.96	0.00	0.00	0.00
28.000	0.00	0	3.96	0.00	0.00	0.00
30.000	0.00	0	3.96	0.00	0.00	0.00
32.000	0.00	0	3.96	0.00	0.00	0.00
34.000	0.00	0	3.96	0.00	0.00	0.00
36.000	0.00	0	3.96	0.00	0.00	0.00
38.000	0.00	0	3.96	0.00	0.00	0.00
40.000	0.00	0	3.96	0.00	0.00	0.00
42.000	0.00	0	3.96	0.00	0.00	0.00
44.000	0.00	0	3.96	0.00	0.00	0.00
46.000	0.00	0	3.96	0.00	0.00	0.00
48.000	0.00	0	3.96	0.00	0.00	0.00
50.000	0.00	0	3.96	0.00	0.00	0.00
52.000	0.00	0	3.96	0.00	0.00	0.00
54.000	0.00	0	3.96	0.00	0.00	0.00
56.000	0.00	0	3.96	0.00	0.00	0.00
58.000	0.00	0	3.96	0.00	0.00	0.00
60.000	0.00	0	3.96	0.00	0.00	0.00
62.000	0.00	0	3.96	0.00	0.00	0.00
64.000	0.00	0	3.96	0.00	0.00	0.00
66.000	0.00	0	3.96	0.00	0.00	0.00
68.000	0.00	0	3.96	0.00	0.00	0.00
70.000	0.00	0	3.96	0.00	0.00	0.00
72.000	0.00	0	3.96	0.00	0.00	0.00
74.000	0.00	0	3.96	0.00	0.00	0.00
76.000	0.00	0	3.96	0.00	0.00	0.00
78.000	0.00	0	3.96	0.00	0.00	0.00
80.000	0.00	0	3.96	0.00	0.00	0.00
82.000	0.00	0	3.96	0.00	0.00	0.00
84.000	0.00	0	3.96	0.00	0.00	0.00
86.000	0.00	0	3.96	0.00	0.00	0.00
88.000	0.00	0	3.96	0.00	0.00	0.00
90.000	0.00	0	3.96	0.00	0.00	0.00
92.000	0.00	0	3.96	0.00	0.00	0.00
94.000	0.00	0	3.96	0.00	0.00	0.00
96.000	0.00	0	3.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 6: Lot 6 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	20.96	0.00	0.00	0.00
26.000	0.00	0	20.96	0.00	0.00	0.00
28.000	0.00	0	20.96	0.00	0.00	0.00
30.000	0.00	0	20.96	0.00	0.00	0.00
32.000	0.00	0	20.96	0.00	0.00	0.00
34.000	0.00	0	20.96	0.00	0.00	0.00
36.000	0.00	0	20.96	0.00	0.00	0.00
38.000	0.00	0	20.96	0.00	0.00	0.00
40.000	0.00	0	20.96	0.00	0.00	0.00
42.000	0.00	0	20.96	0.00	0.00	0.00
44.000	0.00	0	20.96	0.00	0.00	0.00
46.000	0.00	0	20.96	0.00	0.00	0.00
48.000	0.00	0	20.96	0.00	0.00	0.00
50.000	0.00	0	20.96	0.00	0.00	0.00
52.000	0.00	0	20.96	0.00	0.00	0.00
54.000	0.00	0	20.96	0.00	0.00	0.00
56.000	0.00	0	20.96	0.00	0.00	0.00
58.000	0.00	0	20.96	0.00	0.00	0.00
60.000	0.00	0	20.96	0.00	0.00	0.00
62.000	0.00	0	20.96	0.00	0.00	0.00
64.000	0.00	0	20.96	0.00	0.00	0.00
66.000	0.00	0	20.96	0.00	0.00	0.00
68.000	0.00	0	20.96	0.00	0.00	0.00
70.000	0.00	0	20.96	0.00	0.00	0.00
72.000	0.00	0	20.96	0.00	0.00	0.00
74.000	0.00	0	20.96	0.00	0.00	0.00
76.000	0.00	0	20.96	0.00	0.00	0.00
78.000	0.00	0	20.96	0.00	0.00	0.00
80.000	0.00	0	20.96	0.00	0.00	0.00
82.000	0.00	0	20.96	0.00	0.00	0.00
84.000	0.00	0	20.96	0.00	0.00	0.00
86.000	0.00	0	20.96	0.00	0.00	0.00
88.000	0.00	0	20.96	0.00	0.00	0.00
90.000	0.00	0	20.96	0.00	0.00	0.00
92.000	0.00	0	20.96	0.00	0.00	0.00
94.000	0.00	0	20.96	0.00	0.00	0.00
96.000	0.00	0	20.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 7: Lot 7 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	4.96	0.00	0.00	0.00
26.000	0.00	0	4.96	0.00	0.00	0.00
28.000	0.00	0	4.96	0.00	0.00	0.00
30.000	0.00	0	4.96	0.00	0.00	0.00
32.000	0.00	0	4.96	0.00	0.00	0.00
34.000	0.00	0	4.96	0.00	0.00	0.00
36.000	0.00	0	4.96	0.00	0.00	0.00
38.000	0.00	0	4.96	0.00	0.00	0.00
40.000	0.00	0	4.96	0.00	0.00	0.00
42.000	0.00	0	4.96	0.00	0.00	0.00
44.000	0.00	0	4.96	0.00	0.00	0.00
46.000	0.00	0	4.96	0.00	0.00	0.00
48.000	0.00	0	4.96	0.00	0.00	0.00
50.000	0.00	0	4.96	0.00	0.00	0.00
52.000	0.00	0	4.96	0.00	0.00	0.00
54.000	0.00	0	4.96	0.00	0.00	0.00
56.000	0.00	0	4.96	0.00	0.00	0.00
58.000	0.00	0	4.96	0.00	0.00	0.00
60.000	0.00	0	4.96	0.00	0.00	0.00
62.000	0.00	0	4.96	0.00	0.00	0.00
64.000	0.00	0	4.96	0.00	0.00	0.00
66.000	0.00	0	4.96	0.00	0.00	0.00
68.000	0.00	0	4.96	0.00	0.00	0.00
70.000	0.00	0	4.96	0.00	0.00	0.00
72.000	0.00	0	4.96	0.00	0.00	0.00
74.000	0.00	0	4.96	0.00	0.00	0.00
76.000	0.00	0	4.96	0.00	0.00	0.00
78.000	0.00	0	4.96	0.00	0.00	0.00
80.000	0.00	0	4.96	0.00	0.00	0.00
82.000	0.00	0	4.96	0.00	0.00	0.00
84.000	0.00	0	4.96	0.00	0.00	0.00
86.000	0.00	0	4.96	0.00	0.00	0.00
88.000	0.00	0	4.96	0.00	0.00	0.00
90.000	0.00	0	4.96	0.00	0.00	0.00
92.000	0.00	0	4.96	0.00	0.00	0.00
94.000	0.00	0	4.96	0.00	0.00	0.00
96.000	0.00	0	4.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown*Type III 24-hr 100-Year Rainfall=7.60"*

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Hydrograph for Pond Lot 8: Lot 8 Roof Recharge Trench

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
24.000	0.00	0	6.96	0.00	0.00	0.00
26.000	0.00	0	6.96	0.00	0.00	0.00
28.000	0.00	0	6.96	0.00	0.00	0.00
30.000	0.00	0	6.96	0.00	0.00	0.00
32.000	0.00	0	6.96	0.00	0.00	0.00
34.000	0.00	0	6.96	0.00	0.00	0.00
36.000	0.00	0	6.96	0.00	0.00	0.00
38.000	0.00	0	6.96	0.00	0.00	0.00
40.000	0.00	0	6.96	0.00	0.00	0.00
42.000	0.00	0	6.96	0.00	0.00	0.00
44.000	0.00	0	6.96	0.00	0.00	0.00
46.000	0.00	0	6.96	0.00	0.00	0.00
48.000	0.00	0	6.96	0.00	0.00	0.00
50.000	0.00	0	6.96	0.00	0.00	0.00
52.000	0.00	0	6.96	0.00	0.00	0.00
54.000	0.00	0	6.96	0.00	0.00	0.00
56.000	0.00	0	6.96	0.00	0.00	0.00
58.000	0.00	0	6.96	0.00	0.00	0.00
60.000	0.00	0	6.96	0.00	0.00	0.00
62.000	0.00	0	6.96	0.00	0.00	0.00
64.000	0.00	0	6.96	0.00	0.00	0.00
66.000	0.00	0	6.96	0.00	0.00	0.00
68.000	0.00	0	6.96	0.00	0.00	0.00
70.000	0.00	0	6.96	0.00	0.00	0.00
72.000	0.00	0	6.96	0.00	0.00	0.00
74.000	0.00	0	6.96	0.00	0.00	0.00
76.000	0.00	0	6.96	0.00	0.00	0.00
78.000	0.00	0	6.96	0.00	0.00	0.00
80.000	0.00	0	6.96	0.00	0.00	0.00
82.000	0.00	0	6.96	0.00	0.00	0.00
84.000	0.00	0	6.96	0.00	0.00	0.00
86.000	0.00	0	6.96	0.00	0.00	0.00
88.000	0.00	0	6.96	0.00	0.00	0.00
90.000	0.00	0	6.96	0.00	0.00	0.00
92.000	0.00	0	6.96	0.00	0.00	0.00
94.000	0.00	0	6.96	0.00	0.00	0.00
96.000	0.00	0	6.96	0.00	0.00	0.00

Starboard Drive Estates Drawdown

Type III 24-hr 100-Year Rainfall=7.60"

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Hydrograph for Pond SW1: 3-ft wide swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
24.000	0.01	0	8.40	0.00
26.000	0.00	3	8.48	0.00
28.000	0.00	3	8.48	0.00
30.000	0.00	3	8.48	0.00
32.000	0.00	3	8.48	0.00
34.000	0.00	3	8.48	0.00
36.000	0.00	3	8.48	0.00
38.000	0.00	3	8.48	0.00
40.000	0.00	3	8.48	0.00
42.000	0.00	3	8.48	0.00
44.000	0.00	3	8.48	0.00
46.000	0.00	3	8.48	0.00
48.000	0.00	3	8.48	0.00
50.000	0.00	3	8.48	0.00
52.000	0.00	3	8.48	0.00
54.000	0.00	3	8.48	0.00
56.000	0.00	3	8.48	0.00
58.000	0.00	3	8.48	0.00
60.000	0.00	3	8.48	0.00
62.000	0.00	3	8.48	0.00
64.000	0.00	3	8.48	0.00
66.000	0.00	3	8.48	0.00
68.000	0.00	3	8.48	0.00
70.000	0.00	3	8.48	0.00
72.000	0.00	3	8.48	0.00
74.000	0.00	3	8.48	0.00
76.000	0.00	3	8.48	0.00
78.000	0.00	3	8.48	0.00
80.000	0.00	3	8.48	0.00
82.000	0.00	3	8.48	0.00
84.000	0.00	3	8.48	0.00
86.000	0.00	3	8.48	0.00
88.000	0.00	3	8.48	0.00
90.000	0.00	3	8.48	0.00
92.000	0.00	3	8.48	0.00
94.000	0.00	3	8.48	0.00
96.000	0.00	3	8.48	0.00

Starboard Drive Estates Drawdown

Type III 24-hr 100-Year Rainfall=7.60"

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Hydrograph for Pond SW2: 3-ft wide swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
24.000	0.01	0	7.50	0.00
26.000	0.00	2	7.54	0.00
28.000	0.00	2	7.54	0.00
30.000	0.00	2	7.54	0.00
32.000	0.00	2	7.54	0.00
34.000	0.00	2	7.54	0.00
36.000	0.00	2	7.54	0.00
38.000	0.00	2	7.54	0.00
40.000	0.00	2	7.54	0.00
42.000	0.00	2	7.54	0.00
44.000	0.00	2	7.54	0.00
46.000	0.00	2	7.54	0.00
48.000	0.00	2	7.54	0.00
50.000	0.00	2	7.54	0.00
52.000	0.00	2	7.54	0.00
54.000	0.00	2	7.54	0.00
56.000	0.00	2	7.54	0.00
58.000	0.00	2	7.54	0.00
60.000	0.00	2	7.54	0.00
62.000	0.00	2	7.54	0.00
64.000	0.00	2	7.54	0.00
66.000	0.00	2	7.54	0.00
68.000	0.00	2	7.54	0.00
70.000	0.00	2	7.54	0.00
72.000	0.00	2	7.54	0.00
74.000	0.00	2	7.54	0.00
76.000	0.00	2	7.54	0.00
78.000	0.00	2	7.54	0.00
80.000	0.00	2	7.54	0.00
82.000	0.00	2	7.54	0.00
84.000	0.00	2	7.54	0.00
86.000	0.00	2	7.54	0.00
88.000	0.00	2	7.54	0.00
90.000	0.00	2	7.54	0.00
92.000	0.00	2	7.54	0.00
94.000	0.00	2	7.54	0.00
96.000	0.00	2	7.54	0.00

Appendix B

Groundwater Recharge and Mounding Calculations

GROUNDWATER MOUND UNDER A RECTANGULAR RECHARGE AREA Using the Hantush (1967) Derivation

The equation representing the groundwater mound beneath a rectangular recharge area is given by:

$$h_m^2 - h_i^2 = (2w/K)vtS^* \left(\left(\frac{0.5L}{\sqrt{4vt}} \right), \left(\frac{0.5W}{\sqrt{4vt}} \right) \right)$$

where:

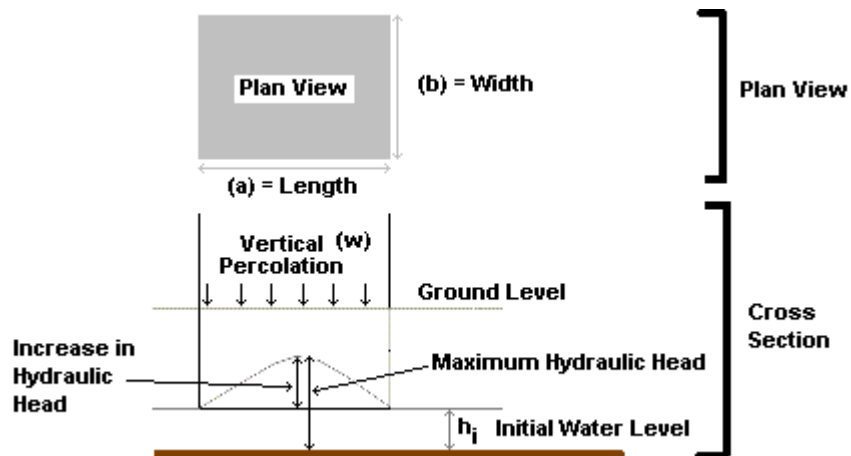
$$v = Kb/\epsilon$$

$$\bar{b} = 0.5(h_i(0) - h(t))$$

where h_m is the maximum height of the mound; h_i is the initial height of the water table; w is the recharge or percolation rate; K is the hydraulic conductivity; t is the time of interest; L and W are the length and width of the rectangular recharge area, and ϵ is the specific yield of the aquifer. S^* is an integral equation given by:

$$S^*(\alpha, \beta) = \int_0^1 \operatorname{erf}\left(\frac{\alpha}{\sqrt{t}}\right) \cdot \operatorname{erf}\left(\frac{\beta}{\sqrt{t}}\right) dt$$

This equation is estimated in the calculator by using a table of values given by



[Hantush \(1967\).](#)

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

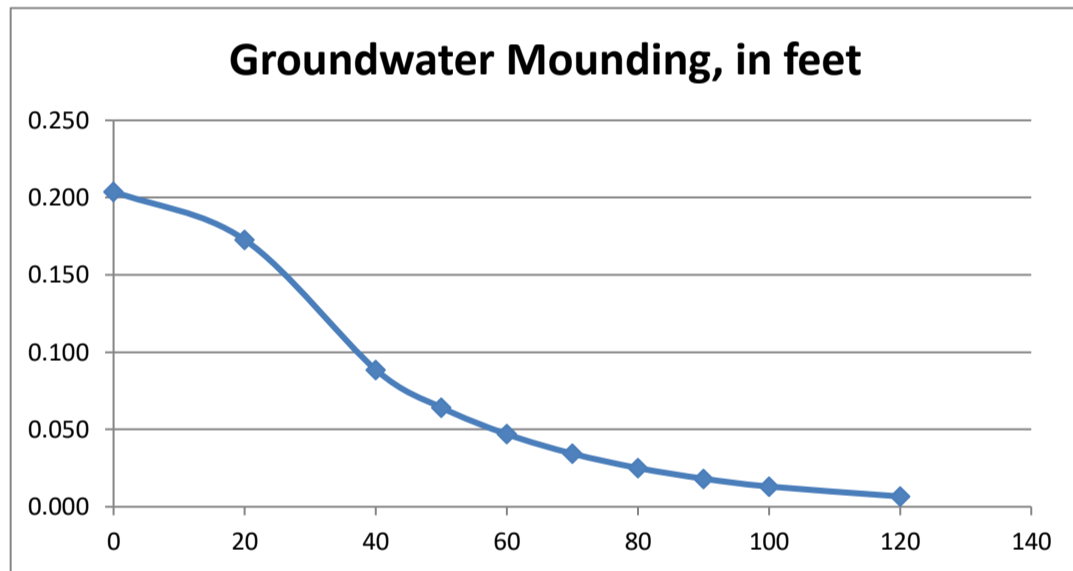
The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. **The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed** otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

Input Values		use consistent units (e.g. feet & days or inches & hours)	Conversion Table	
			inch/hour	feet/day
1.0400	R	Recharge (infiltration) rate (feet/day)	0.67	1.33
0.200	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
55.00	K	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00
27.000	x	1/2 length of basin (x direction, in feet)		
9.000	y	1/2 width of basin (y direction, in feet)	hours	days
0.333	t	duration of infiltration period (days)	36	1.50
25.000	hi(0)	initial thickness of saturated zone (feet)		
25.204	h(max)	maximum thickness of saturated zone (beneath center of basin at end of infiltration period)		
0.204	Δh(max)	maximum groundwater mounding (beneath center of basin at end of infiltration period)		

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.204	0
0.173	20
0.089	40
0.064	50
0.047	60
0.034	70
0.025	80
0.018	90
0.013	100
0.007	120



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

POND B

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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Input Values		use consistent units (e.g. feet & days or inches & hours)	Conversion Table	
			inch/hour	feet/day
1.0400	R	Recharge (infiltration) rate (feet/day)	0.67	1.33
0.200	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
55.00	K	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00
7.500	x	1/2 length of basin (x direction, in feet)		
7.500	y	1/2 width of basin (y direction, in feet)	hours	days
0.333	t	duration of infiltration period (days)	36	1.50
25.000	hi(0)	initial thickness of saturated zone (feet)		

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

25.071	h(max)	maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
0.071	Δh(max)	maximum groundwater mounding (beneath center of basin at end of infiltration period)

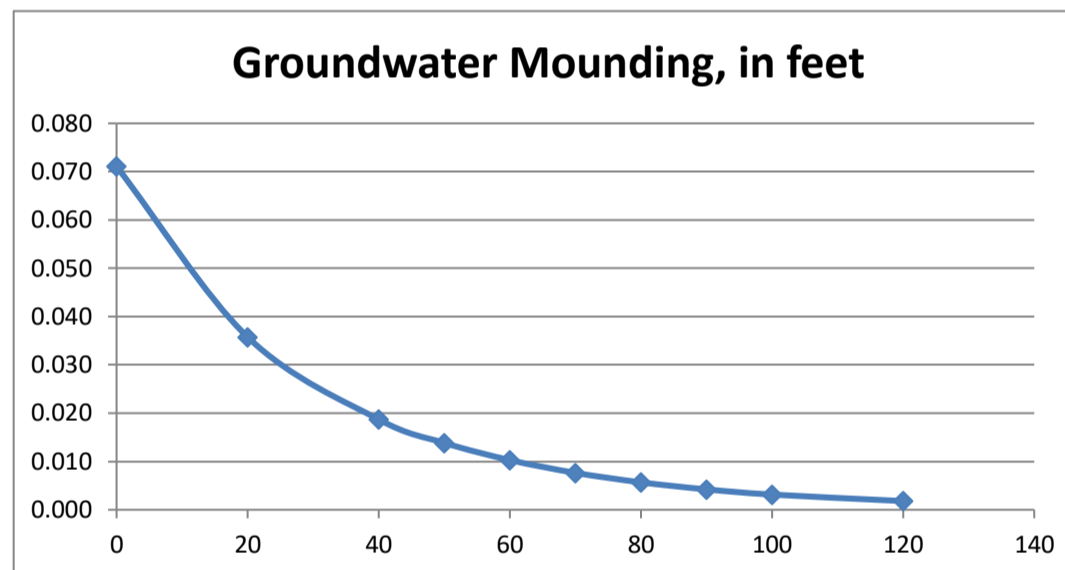
Ground-water Mounding, in feet

Distance from center of basin in x direction, in feet

0.071	0
0.036	20
0.019	40
0.014	50
0.010	60
0.008	70
0.006	80
0.004	90
0.003	100
0.002	120



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

ROOF RECHARGE TRENCHES

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. **The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed** otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

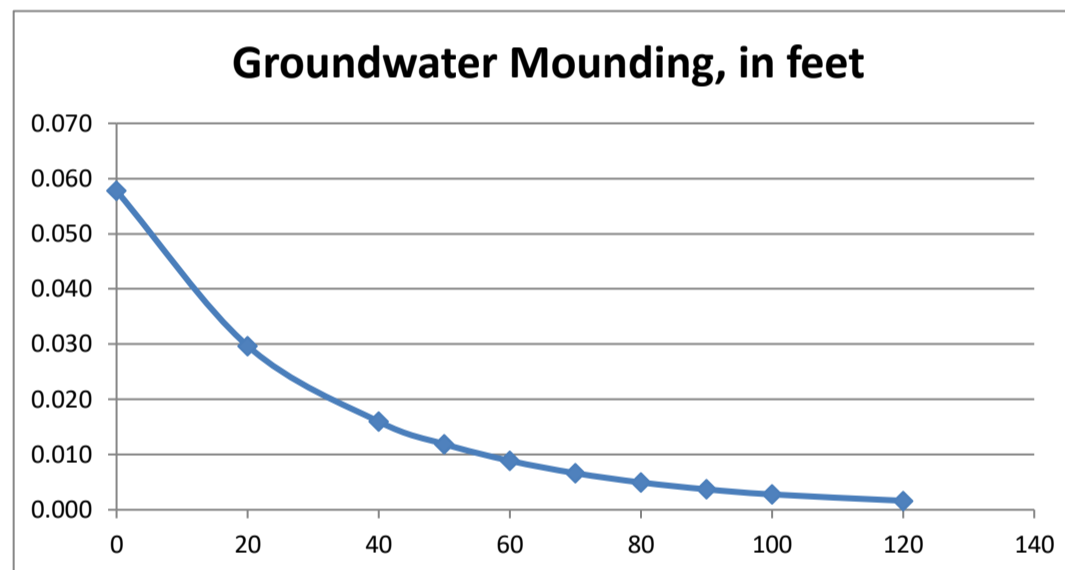
Input Values		use consistent units (e.g. feet & days or inches & hours)	Conversion Table	
			inch/hour	feet/day
1.0400	R	Recharge (infiltration) rate (feet/day)	0.67	1.33
0.200	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
55.00	K	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00
3.500	x	1/2 length of basin (x direction, in feet)		
14.000	y	1/2 width of basin (y direction, in feet)	hours	days
0.333	t	duration of infiltration period (days)	36	1.50
25.000	hi(0)	initial thickness of saturated zone (feet)		
25.058	h(max)	maximum thickness of saturated zone (beneath center of basin at end of infiltration period)		
0.058	Δh(max)	maximum groundwater mounding (beneath center of basin at end of infiltration period)		

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.058	0
0.030	20
0.016	40
0.012	50
0.009	60
0.007	70
0.005	80
0.004	90
0.003	100
0.002	120



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Starboard Drive Estates Recharge

Type III 24-hr Custom Rainfall=4.20"

Prepared by {enter your company name here}

Printed 9/8/2022

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Summary for Pond Pond A: Detention Pond A

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.438 ac, 57.31% Impervious, Inflow Depth > 1.66" for Custom event
 Inflow = 1.37 cfs @ 12.117 hrs, Volume= 0.061 af
 Outflow = 0.97 cfs @ 12.213 hrs, Volume= 0.047 af, Atten= 29%, Lag= 5.7 min
 Discarded = 0.02 cfs @ 12.213 hrs, Volume= 0.003 af
 Primary = 0.95 cfs @ 12.213 hrs, Volume= 0.044 af
 Secondary = 0.00 cfs @ 11.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 11.000-13.000 hrs, dt= 0.0001 hrs
 Peak Elev= 6.67' @ 12.213 hrs Surf.Area= 0.044 ac Storage= 0.023 af

Plug-Flow detention time= 21.8 min calculated for 0.047 af (77% of inflow)
 Center-of-Mass det. time= 13.5 min (741.8 - 728.3)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	0.071 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
6.00	0.025	0.000	0.000
7.00	0.053	0.039	0.039
7.50	0.074	0.032	0.071

Device	Routing	Invert	Outlet Devices
#1	Secondary	7.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	6.30'	6.0" Round Culvert X 2.00 L= 17.0' Ke= 0.020 Inlet / Outlet Invert= 6.30' / 5.83' S= 0.0276 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Discarded	6.00'	0.520 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 12.213 hrs HW=6.67' (Free Discharge)
 ↳3=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.95 cfs @ 12.213 hrs HW=6.67' TW=5.55' (Dynamic Tailwater)
 ↳2=Culvert (Inlet Controls 0.95 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 11.000 hrs HW=6.00' TW=4.90' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Starboard Drive EstatesRecharge

Type III 24-hr Custom Rainfall=4.20"

Prepared by {enter your company name here}

Printed 9/8/2022

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Summary for Pond Pond B: Detention Pond B

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.698 ac, 49.71% Impervious, Inflow Depth > 1.30" for Custom event
 Inflow = 1.51 cfs @ 12.195 hrs, Volume= 0.076 af
 Outflow = 1.19 cfs @ 12.362 hrs, Volume= 0.066 af, Atten= 21%, Lag= 10.0 min
 Discarded = 0.03 cfs @ 12.362 hrs, Volume= 0.003 af
 Primary = 1.16 cfs @ 12.362 hrs, Volume= 0.064 af
 Secondary = 0.00 cfs @ 11.000 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 11.000-13.000 hrs, dt= 0.0001 hrs
 Peak Elev= 5.60' @ 12.362 hrs Surf.Area= 2,253 sf Storage= 862 cf

Plug-Flow detention time= 13.0 min calculated for 0.066 af (87% of inflow)
 Center-of-Mass det. time= 8.6 min (748.3 - 739.7)

Volume	Invert	Avail.Storage	Storage Description
#1	4.90'	4,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
4.90	269	0	0
5.00	922	60	60
5.10	843	88	148
5.20	857	85	233
6.00	3,618	1,790	2,023
6.50	4,411	2,007	4,030

Device	Routing	Invert	Outlet Devices
#1	Primary	5.10'	12.0" Round Culvert L= 20.0' Ke= 0.020 Inlet / Outlet Invert= 5.10' / 4.80' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	4.90'	0.520 in/hr Exfiltration over Surface area
#3	Secondary	6.00'	4.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Discarded OutFlow Max=0.03 cfs @ 12.362 hrs HW=5.60' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.16 cfs @ 12.362 hrs HW=5.60' TW=0.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 1.16 cfs @ 4.27 fps)

Secondary OutFlow Max=0.00 cfs @ 11.000 hrs HW=4.90' TW=0.00' (Dynamic Tailwater)
 ↳ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Starboard Drive Estates, Sciticut Neck Road, Fairhaven, MA
09/05/22

Groundwater Recharge Volume and Drawdown Analysis

Detention Pond A

Since WQ and Recharge are required, volume below outlet structure (509 cf) is required to drawdown within 72 hours

$$\begin{aligned}\text{Time to drawdown} &= \frac{Rv}{(K)(\text{Bottom Area})} \\ &= \frac{509 \text{ cf}}{(0.52 \text{ in/hr})(1 \text{ ft} / 12 \text{ in})(1,089 \text{ sf})} \\ &= \frac{509 \text{ cf}}{47.19 \text{ cf/hour}} \\ &= 10.79 \text{ hours}\end{aligned}$$

Roof Recharge Trench (House) - Lots 1, 2, 3, 7 and 8

Bottom area of roof recharge trenches = 196 sf each system

$$\begin{aligned}\text{Required Recharge } Rv &= (0.25\text{-inches} / 12)(0.03 \text{ acres impervious area}) \\ &= 27.22 \text{ cf}\end{aligned}$$

$$\begin{aligned}\text{Time to drawdown} &= \frac{Rv}{(K)(\text{Bottom Area})} \\ &= \frac{27.22 \text{ cf}}{(0.52 \text{ in/hr})(1 \text{ ft} / 12 \text{ in})(196 \text{ sf})} \\ &= \frac{27.22 \text{ cf}}{8.49 \text{ cf/hour}} \\ &= 3.21 \text{ hours}\end{aligned}$$

Detention Pond B

Since WQ and Recharge are required, volume below outlet structure (148 cf) is required to drawdown within 72 hours

$$\begin{aligned}\text{Time to drawdown} &= \frac{Rv}{(K)(\text{Bottom Area})} \\ &= \frac{148 \text{ cf}}{(0.52 \text{ in/hr})(1 \text{ ft} / 12 \text{ in})(269 \text{ sf})} \\ &= \frac{148 \text{ cf}}{11.66 \text{ cf/hour}} \\ &= 12.69 \text{ hours}\end{aligned}$$

Roof Recharge Trench (House) - (Lots 4, 5 and 6)

Bottom area of roof recharge trenches = 196 sf each system

$$\begin{aligned}\text{Required Recharge } Rv &= (0.10\text{-inches} / 12)(0.03 \text{ acres impervious area}) \\ &= 10.89 \text{ cf}\end{aligned}$$

$$\begin{aligned}\text{Time to drawdown} &= \frac{Rv}{(K)(\text{Bottom Area})} \\ &= \frac{10.89 \text{ cf}}{(0.52 \text{ in/hr})(1 \text{ ft} / 12 \text{ in})(196 \text{ sf})} \\ &= \frac{10.89 \text{ cf}}{8.49 \text{ cf/hour}} \\ &= 1.28 \text{ hours}\end{aligned}$$

Appendix C

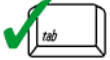
MADEP Stormwater Checklist



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



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 8²
- Operation and Maintenance Plan required by Standard 9

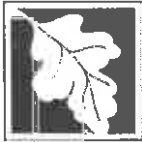
In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans 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.

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.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

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



Keri Williams 9/7/22
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 for Stormwater Report

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): Detention Ponds (wet forebays and infiltration basin)

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 for Stormwater Report

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 Field¹
- 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.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

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 for Stormwater Report

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 for 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 for 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.