

STORMWATER MANAGEMENT REPORT

481 Depot Street

Assessors' Map 35, Parcel B1
Harwich, MA

APRIL 10, 2024

PREPARED FOR:

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481 DEPOT STREET
HARWICH, MA 02645

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1. Property Description

<u>Lot Area:</u>	34,890 SF+/-
<u>Wetlands:</u>	There are no wetland resources on site.
<u>Soils:</u>	The NRCS Soil Survey places the parcel within the soil unit <u>252B Soil</u> , Carver coarse sand, 3 to 8 percent.
<u>Groundwater:</u>	Groundwater elevation was determined to be at approximately EL=10, based on the 2' high groundwater contours shown on the Cape Cod Commission's Groundwater Data Viewer Map.
<u>Zone II:</u>	The parcel is not located within a Zone II Groundwater Recharge mapped area.
<u>Topography:</u>	The site topography is gently sloped from front to back of the parcel.
<u>Site Conditions:</u>	The existing lot is developed by a single-family dwelling with a detached barn. There are also two sheds, a carport and two parking areas.
<u>Parcel Improvements:</u>	The project proposes a new storage/office building along the rear of the property, along with changes to the driveway areas and conversion of the existing single-family dwelling into (4) apartments.

2. Stormwater Management Plan Overview

Stormwater management controls are proposed for the portion of the property that is to be developed. The proposed post-development stormwater management plan consists of two dry water quality swales to provide initial treatment of driveway runoff. Each swale is preceded by a sediment forebay. The swales are then connected to a leaching facility. Two separate smaller leaching facilities are also provided to handle the roof runoff portion.

As shown in the HydroCAD Modeling report, the proposed stormwater controls will reduce the site-wide peak discharge rate for the 2-, 10-, 25- and 100-year storms. The site-wide post-development 100-year storm peak discharge rate relative to pre-development conditions has decreased from 2.47 CFS to 1.80 CFS. The discharge rates for each of the three individual discharge points have also decreased relative to pre-development conditions, as shown in Table 1 below.

Table 1: Peak Discharge Comparison

Storm Event (year)	Discharge Point	
	Pre-Dev. (ft ³ /sec)	Post-Dev. (ft ³ /sec)
2	0.08	0.00
10	0.94	0.00
25	1.50	0.00
100	2.47	1.39

For HydroCAD modeling analysis of the stormwater systems, the following methods and assumptions were used:

- Simple Dynamic
- Rawls Rate of 8.27 in/hr for sands within the subsoil layers for subsurface leaching galleys and bottom of dry water quality swales.

3. Erosion Control Plan - Temporary Siltation Barrier & Silt Socks

Prior to start of construction, the following steps shall be taken to address erosion:

- Contractor shall coordinate the driveway access curb cut with the Harwich Department of Public Works.
- The erosion controls shall include a row of staked 9-inch straw wattles surrounding the down gradient areas to be disturbed (limit of work). Erosion controls shall be installed around all areas of disturbance.
- Once the driveway stormwater systems are installed, a row of staked 9-inch straw wattles shall be set surrounding each of the swales, to prevent silt and debris from clogging and/or damaging the dry water quality swales and subsurface leaching facilities.
- The erosion controls shall be monitored and corrected during the entire construction phase and until the site has been stabilized with ground cover and/or landscape mulch.
- Contractor shall be required to provide extra siltation controls in case a repair is needed to the straw wattles.

The Stormwater Operations and Maintenance Plan is included as a separate document in order to address the long-term maintenance of the stormwater systems.

4. Massachusetts Stormwater Management Design Standards

The following is a description of how the proposed project meets the Massachusetts Stormwater Handbook design standards.

Standard 1: No new untreated discharges:

This standard is met since there are no new untreated stormwater discharges proposed. See Standards 4-6 calculations.

Standard 2: Maintain Pre-development peak discharge rate:

This standard has been met. As shown in the HydroCAD Modeling report, the proposed stormwater controls will reduce the site-wide peak discharge rate for the 2-, 10-, 25- and 100-year storms. The site-wide post-development 100-year storm peak discharge rate relative to pre-development conditions has decreased from 2.47 CFS to 1.39 CFS, as shown on Table 1 in the Stormwater Management Plan Overview section.

Standard 3: Groundwater Recharge:

This standard is met. The proposed stormwater management system is sized so that the total recharge volume provided exceeds the minimum groundwater recharge volume specified in the handbook and the proposed stormwater recharge galleys will drawdown within 72 hours of a storm event. In accordance with the MA Stormwater Manual, the required recharge volume factor (F) required across the impervious area (A) is 0.6 inches per hour for hydraulic soil group A soils. Coarse Sand (Rawls Rate: 8.27 inches per hour) has been used in the sizing of the stormwater recharge galleys. Refer to the HydroCAD Stormwater Modeling Report in Appendix. The required recharge volume is calculated based on the total pavement and roof areas on site.

- Required Recharge Volume $R_v = F \times A = (0.6 \text{ in})(1 \text{ ft}/12 \text{ in})(18,988 \text{ sf}) = 949 \text{ cf}$ (driveway and roofs)
- Recharge Storage Provided (Subsurface leaching facility) = 1,750 cf > 949 cf
- The drawdown for the subsurface leaching facilities for the driveway/patio and roof runoff is 24 hours < 72 hour maximum allowance.

Standard 4: Water Quality:

This standard has been met. The roof runoff stormwater system will remove 80% of the annual load of Total Suspended Solids (TSS) via the subsurface leaching facility. Driveway area stormwater controls will remove 94% of TSS with the dry water quality swales followed by leaching facilities. Per MA Stormwater handbook requirements, each water quality swale is preceded by a sediment forebay. TSS removal calculation tables for roadway and roof runoff are included in the Appendix. In accordance with the MA Stormwater Manual, the required water quality depth (D_{wq}) across the impervious area (A) is 1.0 inches per hour in areas containing soils with rapid infiltration rate greater than 2.4 in/hr. The required water quality volume is based on the total pavement area on site.

- Required Water Quality Volume $V_{wq} = D_{wq} \times A = (1.0 \text{ in})(1 \text{ ft}/12 \text{ in})(11,931 \text{ sf}) = 994 \text{ cf}$ (driveway)
- Water Quality Storage Provided (Two dry water quality swales) = 1,100 cf > 994 cf

Standard 5: Land uses with higher potential pollutant loads:

This standard has been met. The proposed use does not meet the Standard 5 criteria for land uses with higher potential pollutant loads.

Standard 6: Stormwater discharges within Zone II or Interim Wellhead protection area of a public water supply and stormwater discharges near or to any critical area.

This standard has been met. Not applicable as the site is not within a Zone 2 contributory area, however the 1 inch Required Water Quality Volume for discharges within an area with a rapid percolation rate (>2.4 in/hr) has been met, see Standard 4 calculations.

Standard 7: Redevelopment:

As a redevelopment, the project has demonstrated that it meets Standards 1-6 as applicable to the maximum extent practicable, per MA Stormwater handbook requirements.

Standard 8: Construction Erosion Control Plan:

The project is subject to the proposed Erosion Control Plan as described in this report. Straw wattles and erosion control blankets shall be implemented as required to mitigate soil erosion.

Standard 9: Long Term Operation and Maintenance Plan:

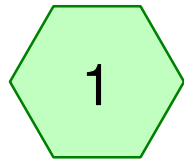
A long-term O&M plan has been submitted with this report, refer to Stormwater Operation and Maintenance Manual. The property owners will operate and maintain the stormwater systems.

Standard 10: Illicit Discharges:

This standard is met since there are no illicit discharges at this site and no illicit discharges proposed.

APPENDICES

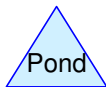
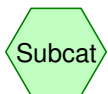
Pre-Development



Watershed



Total Site Runoff



Routing Diagram for 8601.PRE-DEV

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	2.78	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.76	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.68	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.10	2

8601.PRE-DEV

Type III 24-hr 2-Year Rainfall=2.78"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=36,885 sf 26.08% Impervious Runoff Depth=0.23"
Tc=6.0 min CN=59 Runoff=0.08 cfs 0.016 af

Link TSR: Total Site Runoff

Inflow=0.08 cfs 0.016 af
Primary=0.08 cfs 0.016 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.016 af Average Runoff Depth = 0.23"
73.92% Pervious = 0.626 ac 26.08% Impervious = 0.221 ac

Summary for Subcatchment 1: Watershed

Runoff = 0.08 cfs @ 12.32 hrs, Volume= 0.016 af, Depth= 0.23"
 Routed to Link TSR : Total Site Runoff

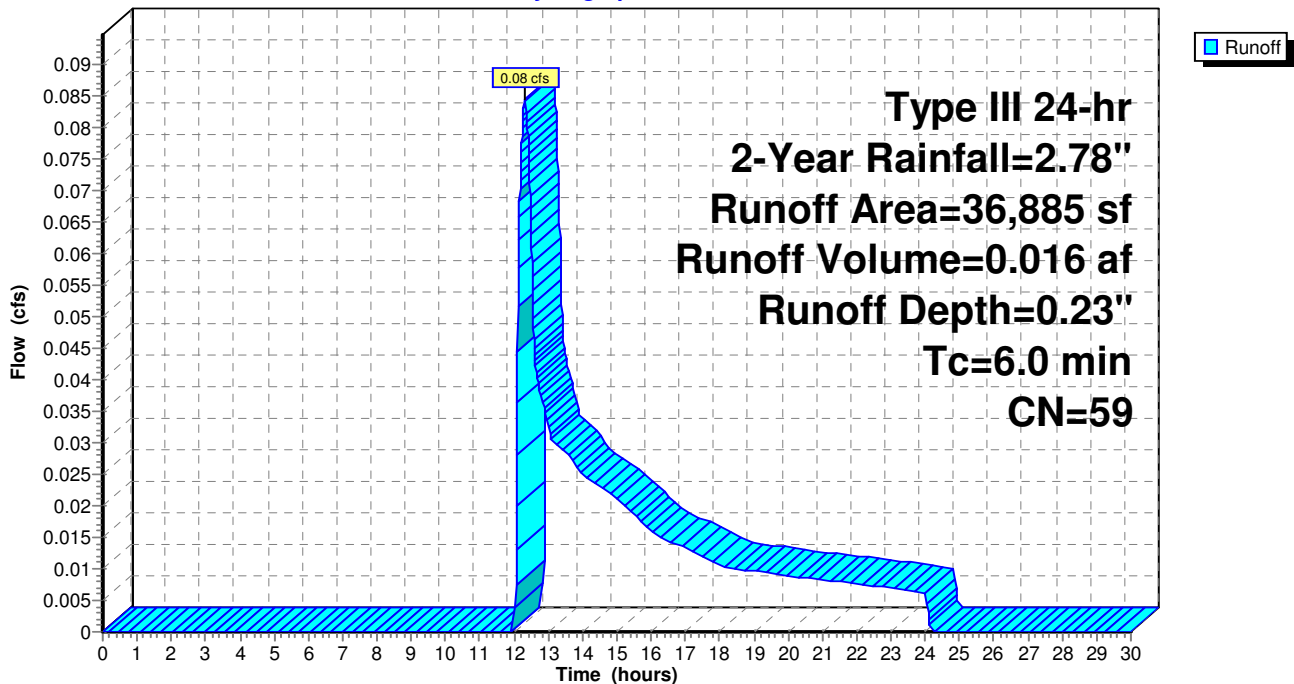
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=2.78"

Area (sf)	CN	Description
3,967	98	Roofs, HSG A
* 5,651	98	Gravel parking, HSG A
9,000	49	50-75% Grass cover, Fair, HSG A
18,267	43	Woods/grass comb., Fair, HSG A
36,885	59	Weighted Average
27,267		73.92% Pervious Area
9,618		26.08% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph

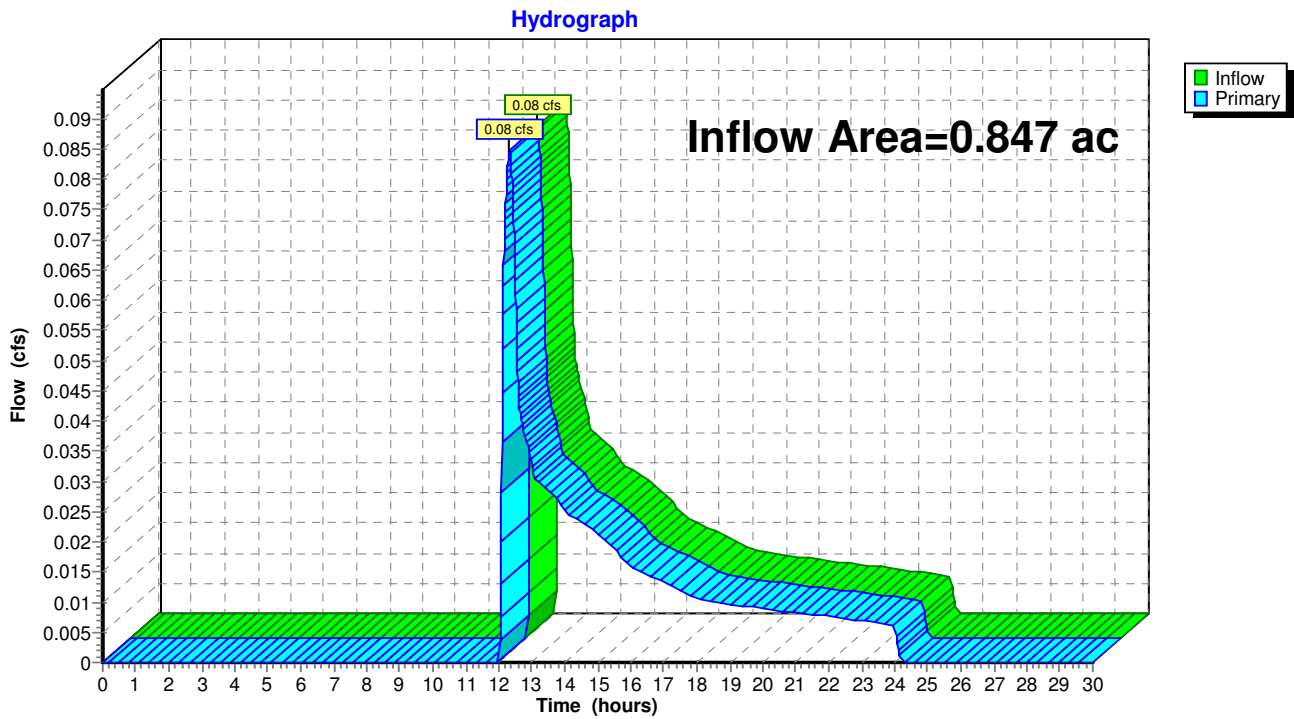


Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 26.08% Impervious, Inflow Depth = 0.23" for 2-Year event
Inflow = 0.08 cfs @ 12.32 hrs, Volume= 0.016 af
Primary = 0.08 cfs @ 12.32 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



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Type III 24-hr 10-Year Rainfall=4.76"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=36,885 sf 26.08% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=59 Runoff=0.94 cfs 0.078 af

Link TSR: Total Site Runoff

Inflow=0.94 cfs 0.078 af
Primary=0.94 cfs 0.078 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.078 af Average Runoff Depth = 1.10"
73.92% Pervious = 0.626 ac 26.08% Impervious = 0.221 ac

Summary for Subcatchment 1: Watershed

Runoff = 0.94 cfs @ 12.10 hrs, Volume= 0.078 af, Depth= 1.10"
 Routed to Link TSR : Total Site Runoff

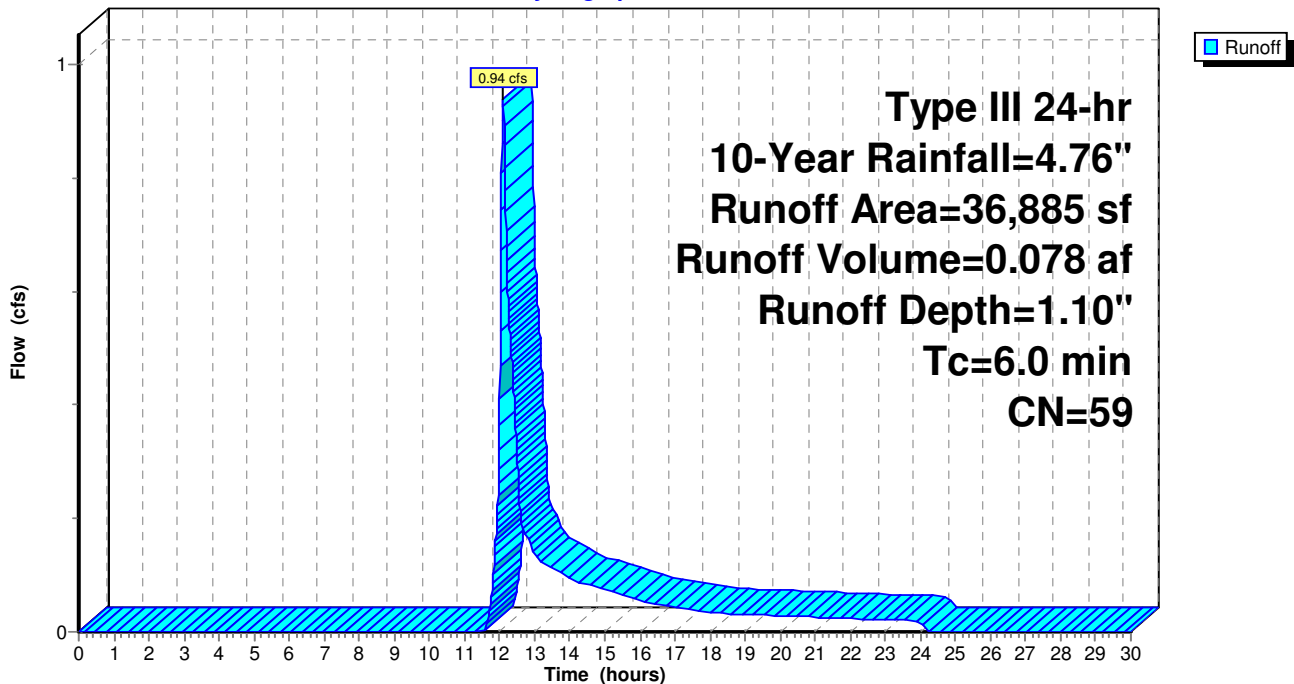
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.76"

Area (sf)	CN	Description
3,967	98	Roofs, HSG A
* 5,651	98	Gravel parking, HSG A
9,000	49	50-75% Grass cover, Fair, HSG A
18,267	43	Woods/grass comb., Fair, HSG A
36,885	59	Weighted Average
27,267		73.92% Pervious Area
9,618		26.08% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph

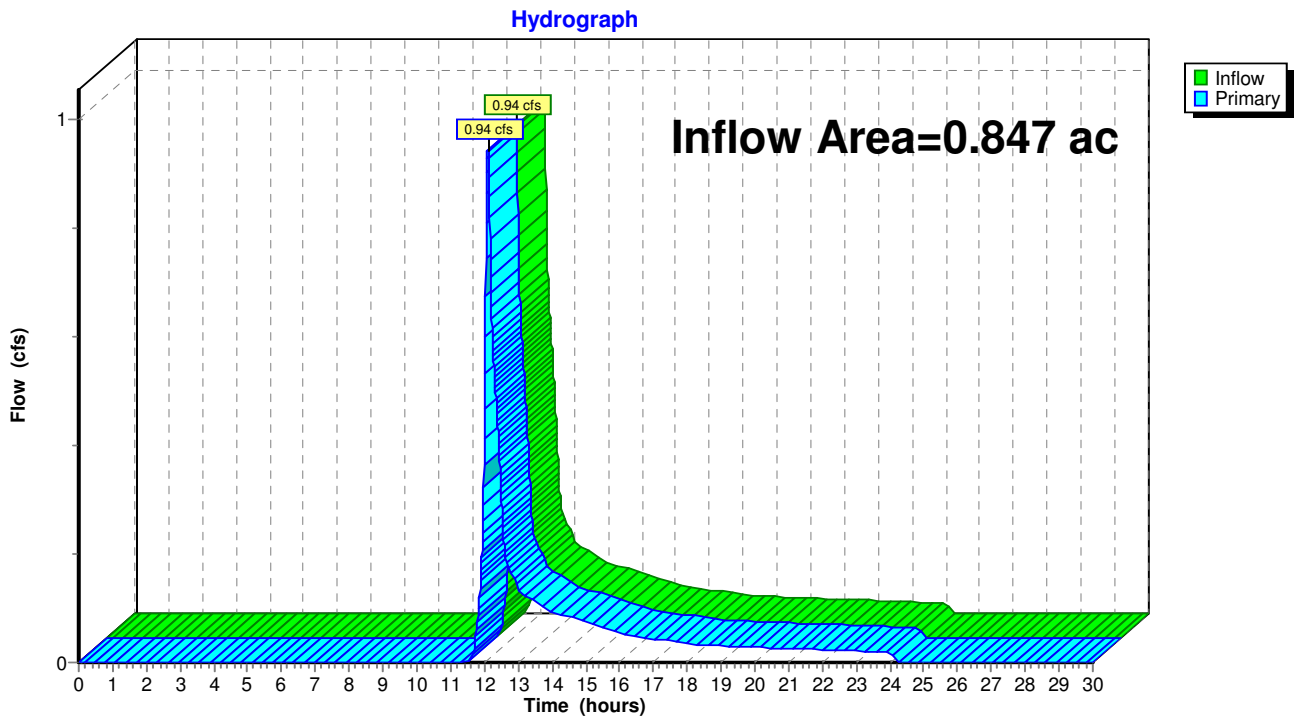


Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 26.08% Impervious, Inflow Depth = 1.10" for 10-Year event
Inflow = 0.94 cfs @ 12.10 hrs, Volume= 0.078 af
Primary = 0.94 cfs @ 12.10 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



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Type III 24-hr 25-Year Rainfall=5.68"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=36,885 sf 26.08% Impervious Runoff Depth=1.64"
Tc=6.0 min CN=59 Runoff=1.50 cfs 0.116 af

Link TSR: Total Site Runoff

Inflow=1.50 cfs 0.116 af
Primary=1.50 cfs 0.116 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.116 af Average Runoff Depth = 1.64"
73.92% Pervious = 0.626 ac 26.08% Impervious = 0.221 ac

Summary for Subcatchment 1: Watershed

Runoff = 1.50 cfs @ 12.10 hrs, Volume= 0.116 af, Depth= 1.64"
 Routed to Link TSR : Total Site Runoff

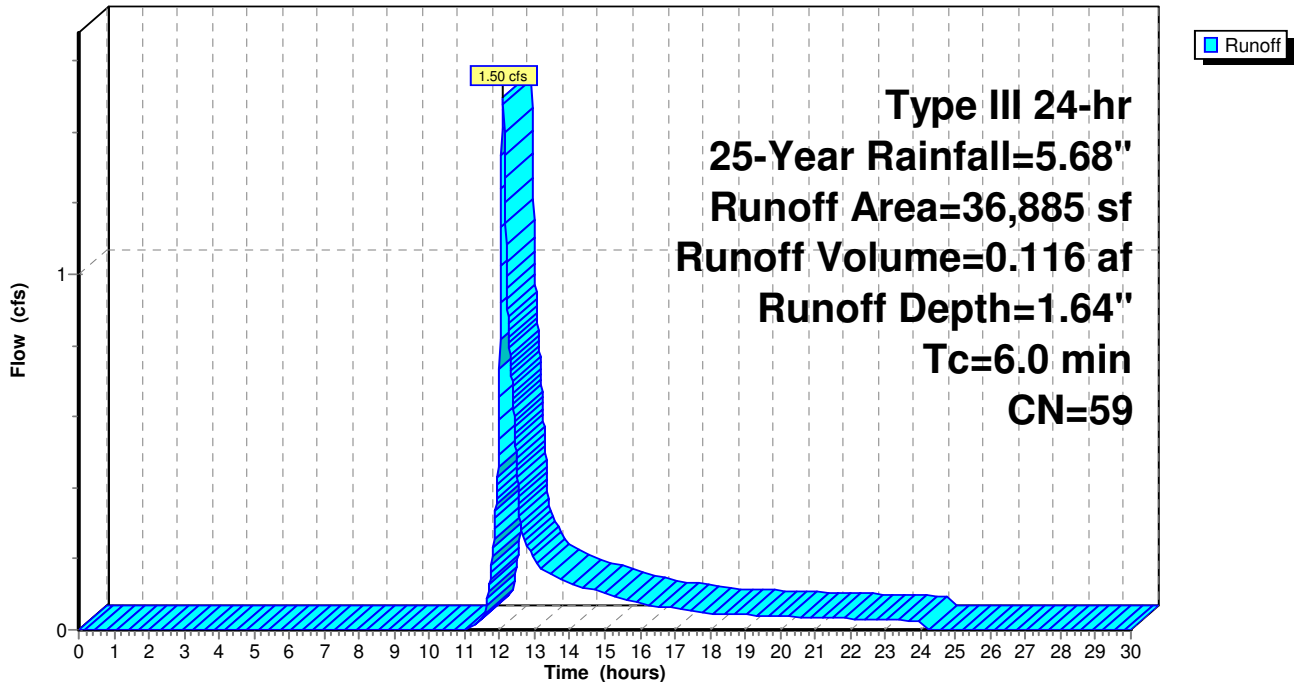
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.68"

Area (sf)	CN	Description
3,967	98	Roofs, HSG A
* 5,651	98	Gravel parking, HSG A
9,000	49	50-75% Grass cover, Fair, HSG A
18,267	43	Woods/grass comb., Fair, HSG A
36,885	59	Weighted Average
27,267		73.92% Pervious Area
9,618		26.08% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph

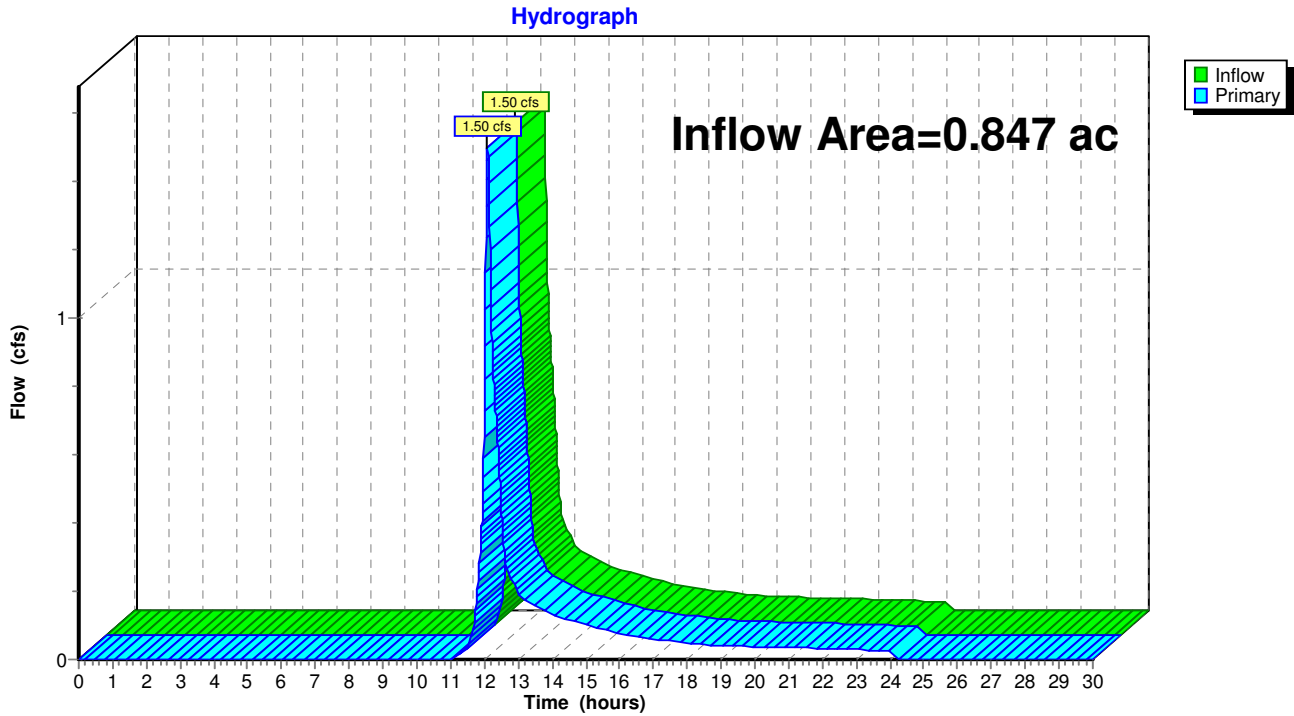


Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 26.08% Impervious, Inflow Depth = 1.64" for 25-Year event
Inflow = 1.50 cfs @ 12.10 hrs, Volume= 0.116 af
Primary = 1.50 cfs @ 12.10 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



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Type III 24-hr 100-Year Rainfall=7.10"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=36,885 sf 26.08% Impervious Runoff Depth=2.58"
Tc=6.0 min CN=59 Runoff=2.47 cfs 0.182 af

Link TSR: Total Site Runoff

Inflow=2.47 cfs 0.182 af
Primary=2.47 cfs 0.182 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.182 af Average Runoff Depth = 2.58"
73.92% Pervious = 0.626 ac 26.08% Impervious = 0.221 ac

Summary for Subcatchment 1: Watershed

Runoff = 2.47 cfs @ 12.09 hrs, Volume= 0.182 af, Depth= 2.58"
 Routed to Link TSR : Total Site Runoff

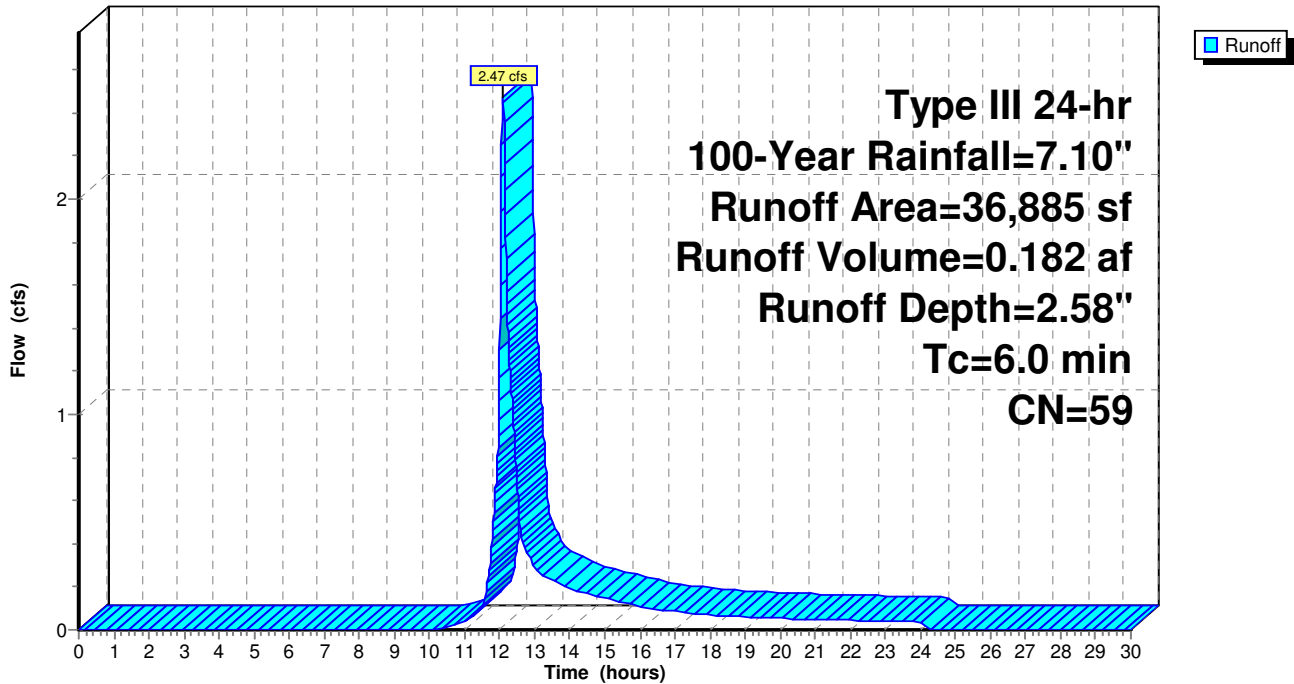
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
3,967	98	Roofs, HSG A
* 5,651	98	Gravel parking, HSG A
9,000	49	50-75% Grass cover, Fair, HSG A
18,267	43	Woods/grass comb., Fair, HSG A
36,885	59	Weighted Average
27,267		73.92% Pervious Area
9,618		26.08% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph

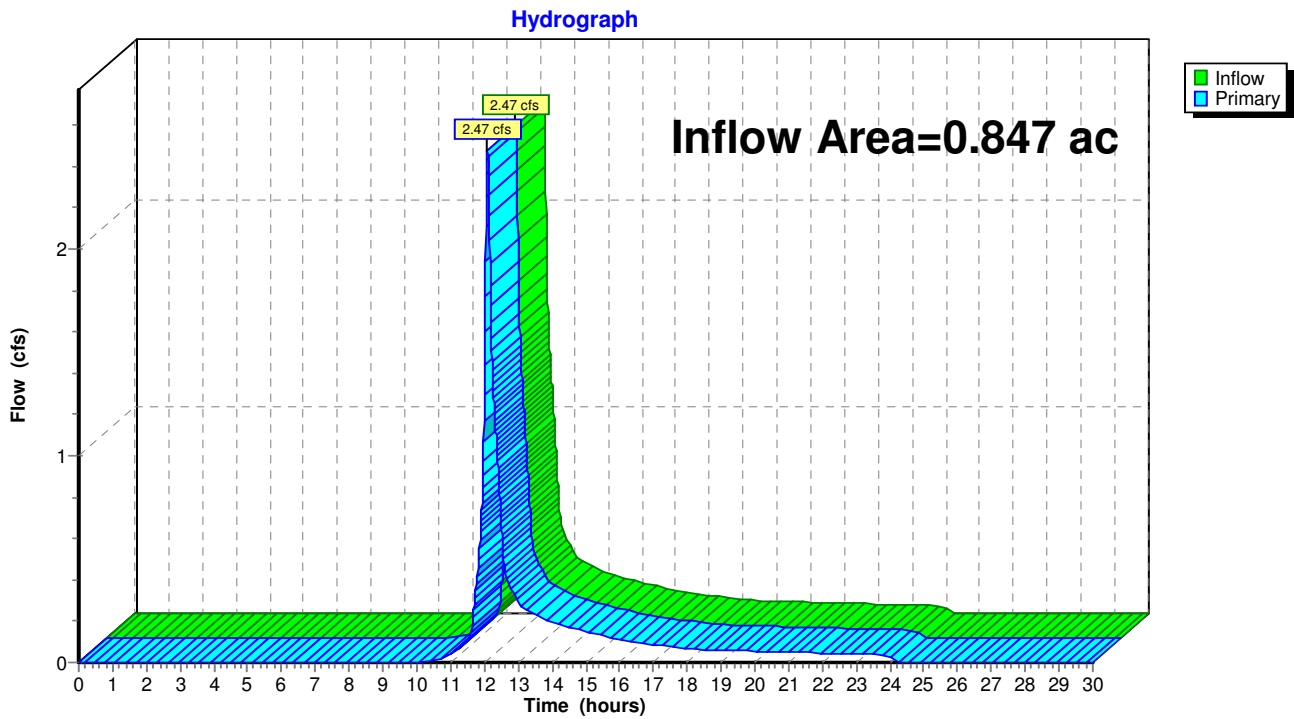


Summary for Link TSR: Total Site Runoff

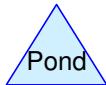
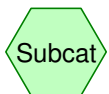
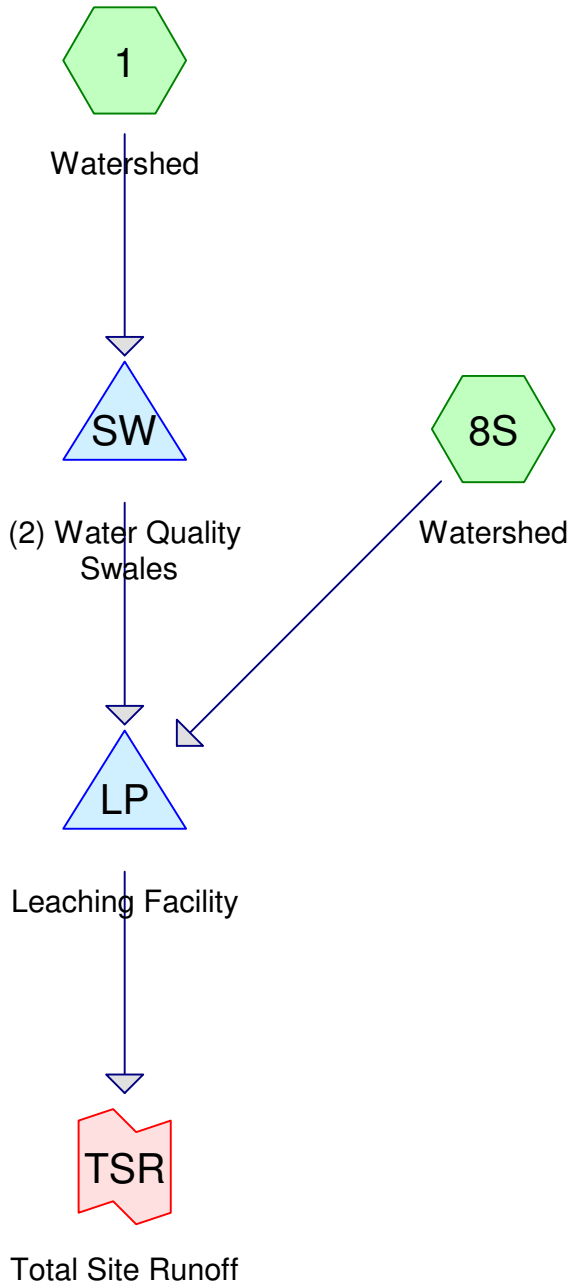
Inflow Area = 0.847 ac, 26.08% Impervious, Inflow Depth = 2.58" for 100-Year event
Inflow = 2.47 cfs @ 12.09 hrs, Volume= 0.182 af
Primary = 2.47 cfs @ 12.09 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



Post-Development



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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	2.78	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.76	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.68	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.10	2

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Type III 24-hr 2-Year Rainfall=2.78"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=32,235 sf 44.48% Impervious Runoff Depth=0.44"
Tc=6.0 min CN=66 Runoff=0.27 cfs 0.027 af

Subcatchment 8S: Watershed

Runoff Area=4,650 sf 100.00% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.023 af

Pond LP: Leaching Facility

Peak Elev=35.43' Storage=126 cf Inflow=0.29 cfs 0.023 af
Discarded=0.11 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.023 af

Pond SW: (2) Water Quality Swales

Peak Elev=39.67' Storage=124 cf Inflow=0.27 cfs 0.027 af
Discarded=0.13 cfs 0.027 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.027 af

Link TSR: Total Site Runoff

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.050 af Average Runoff Depth = 0.71"
48.52% Pervious = 0.411 ac 51.48% Impervious = 0.436 ac

Summary for Subcatchment 1: Watershed

Runoff = 0.27 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 0.44"

Routed to Pond SW : (2) Water Quality Swales

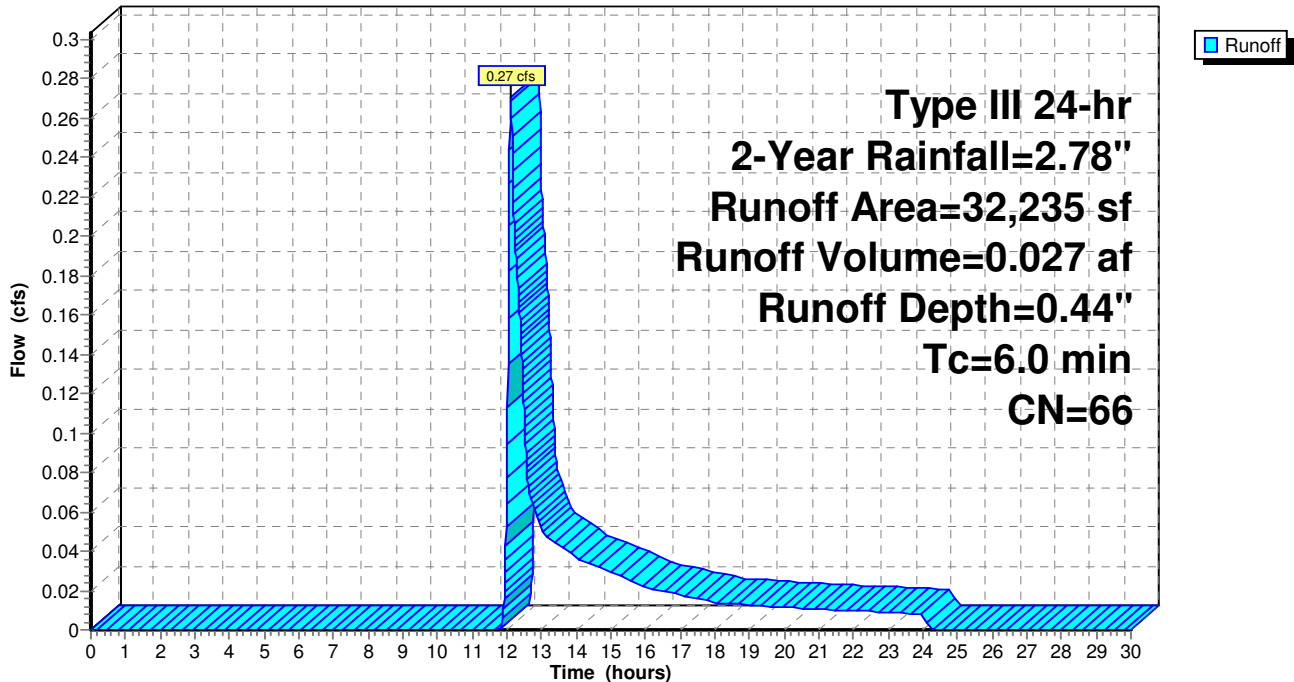
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=2.78"

Area (sf)	CN	Description
2,407	98	Roofs, HSG A
11,931	98	Paved parking, HSG A
15,000	39	>75% Grass cover, Good, HSG A
2,897	43	Woods/grass comb., Fair, HSG A
32,235	66	Weighted Average
17,897		55.52% Pervious Area
14,338		44.48% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph



Summary for Subcatchment 8S: Watershed

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 0.023 af, Depth= 2.55"

Routed to Pond LP : Leaching Facility

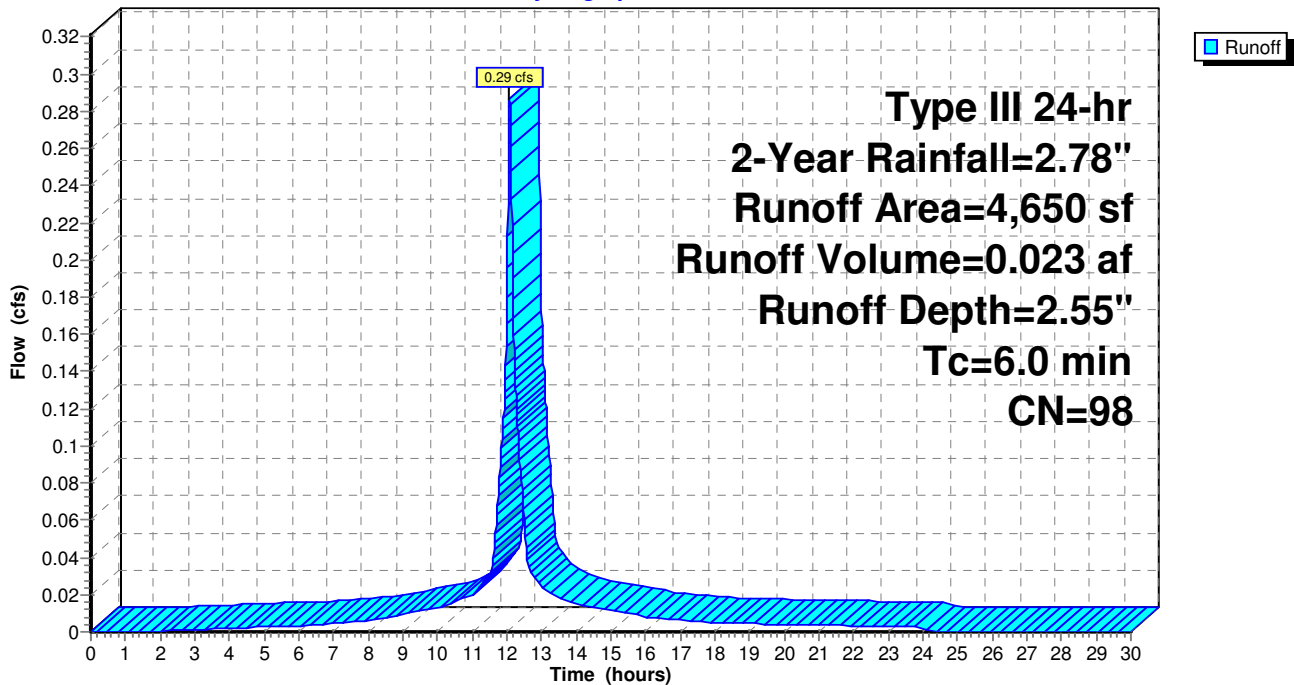
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=2.78"

Area (sf)	CN	Description
4,650	98	Roofs, HSG A
4,650		100.00% Impervious Area

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

Subcatchment 8S: Watershed

Hydrograph



Summary for Pond LP: Leaching Facility

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.32" for 2-Year event
 Inflow = 0.29 cfs @ 12.08 hrs, Volume= 0.023 af
 Outflow = 0.11 cfs @ 12.33 hrs, Volume= 0.023 af, Atten= 63%, Lag= 14.5 min
 Discarded = 0.11 cfs @ 12.33 hrs, Volume= 0.023 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link TSR : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 35.43' @ 12.33 hrs Surf.Area= 500 sf Storage= 126 cf

Plug-Flow detention time= 5.1 min calculated for 0.023 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (764.5 - 759.5)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	902 cf	10.00'W x 50.00'L x 6.00'H Stone 3,000 cf Overall - 995 cf Embedded = 2,005 cf x 45.0% Voids
#2	35.00'	848 cf	6.00'D x 6.00'H Vertical Cone/Cylinder x 5 Inside #1 995 cf Overall - 3.0" Wall Thickness = 848 cf
		1,750 cf	Total Available Storage

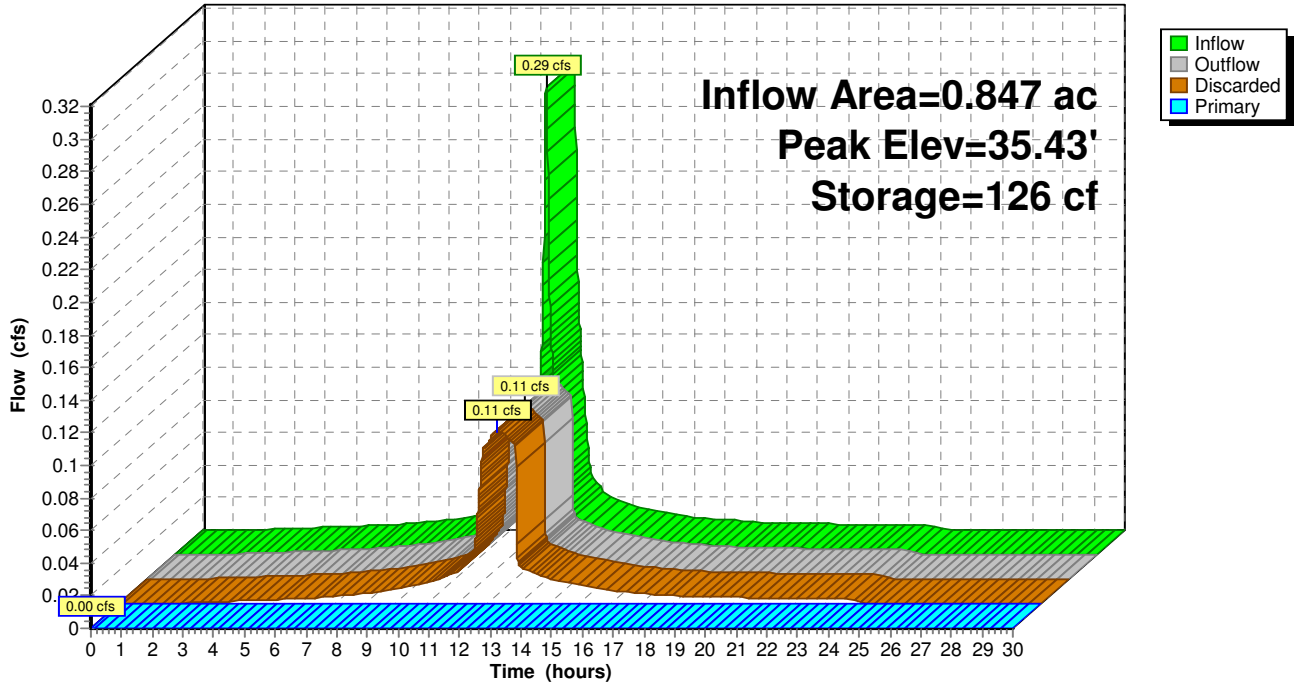
Device	Routing	Invert	Outlet Devices
#1	Discarded	35.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'
#2	Primary	40.90'	24.0" Horiz. Orifice/Grate X 4.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.11 cfs @ 12.33 hrs HW=35.43' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

Pond LP: Leaching Facility

Hydrograph



Summary for Pond SW: (2) Water Quality Swales

Inflow Area = 0.740 ac, 44.48% Impervious, Inflow Depth = 0.44" for 2-Year event
 Inflow = 0.27 cfs @ 12.11 hrs, Volume= 0.027 af
 Outflow = 0.13 cfs @ 12.46 hrs, Volume= 0.027 af, Atten= 53%, Lag= 21.0 min
 Discarded = 0.13 cfs @ 12.46 hrs, Volume= 0.027 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond LP : Leaching Facility

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 39.67' @ 12.46 hrs Surf.Area= 530 sf Storage= 124 cf

Plug-Flow detention time= 4.4 min calculated for 0.027 af (100% of inflow)
 Center-of-Mass det. time= 4.4 min (910.1 - 905.6)

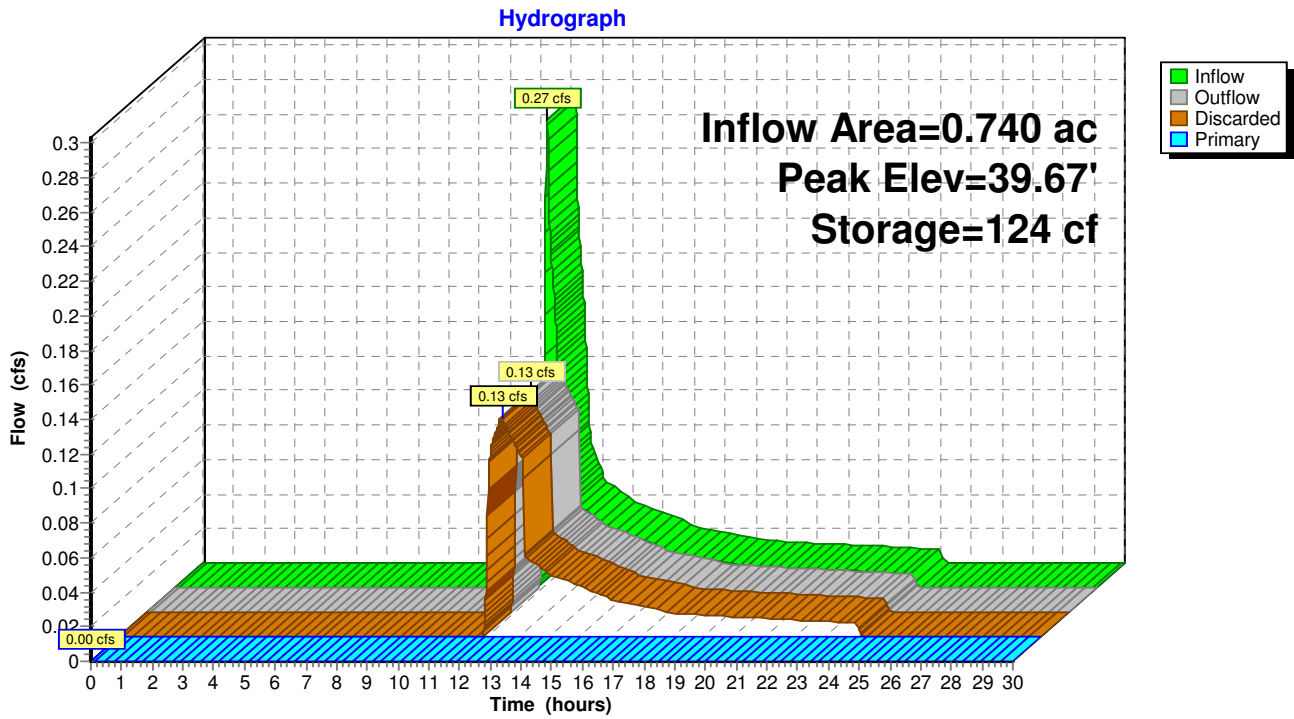
Volume	Invert	Avail.Storage	Storage Description			
#1	39.00'	2,270 cf	Custom Stage Data (Irregular) Listed below (Recalc) x 2			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	265	98.0	0.0	0	0	265
39.50	265	98.0	40.0	53	53	314
42.00	265	98.0	20.0	133	186	559
43.00	473	110.0	100.0	364	550	783
44.00	706	123.0	100.0	586	1,135	1,051

Device	Routing	Invert	Outlet Devices	
#1	Primary	43.00'	12.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads	
#2	Discarded	39.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'	

Discarded OutFlow Max=0.13 cfs @ 12.46 hrs HW=39.67' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=39.00' TW=35.00' (Dynamic Tailwater)
 ↑**1=Orifice/Grate** (Controls 0.00 cfs)

Pond SW: (2) Water Quality Swales

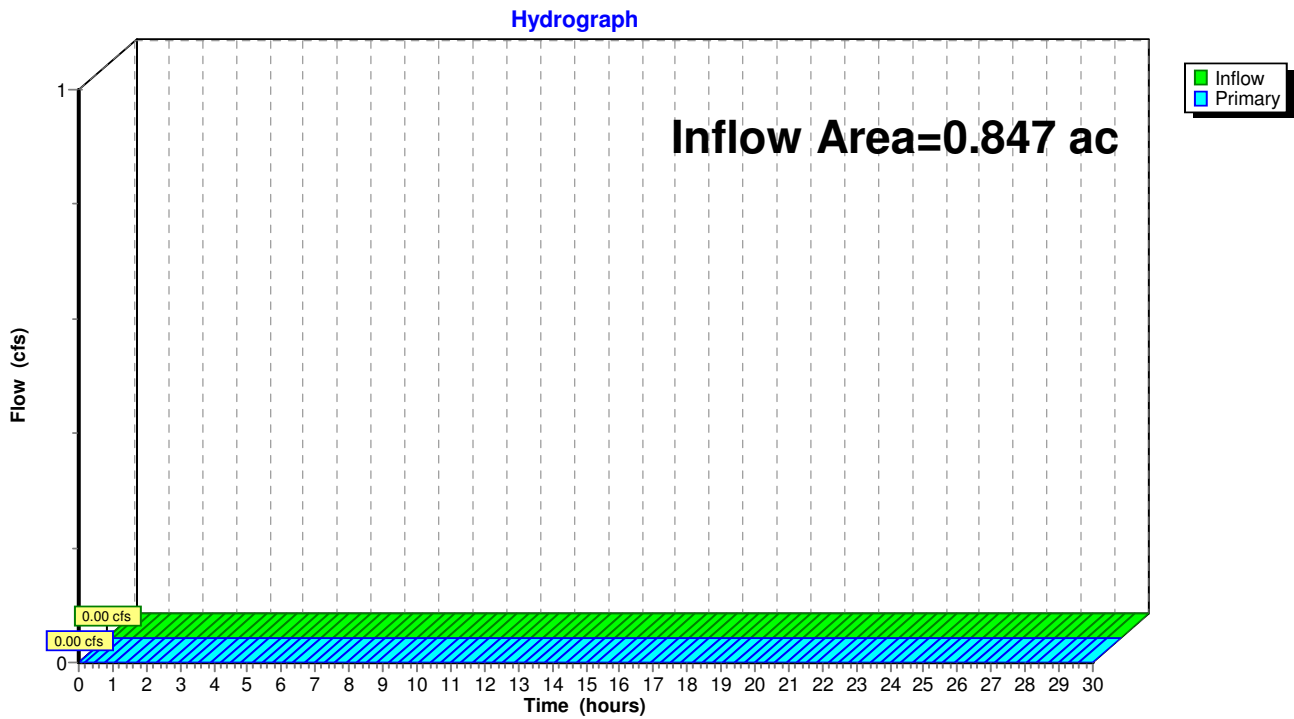


Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



8601.POST-DEV

Type III 24-hr 10-Year Rainfall=4.76"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=32,235 sf 44.48% Impervious Runoff Depth=1.57"
Tc=6.0 min CN=66 Runoff=1.29 cfs 0.097 af

Subcatchment 8S: Watershed

Runoff Area=4,650 sf 100.00% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=98 Runoff=0.50 cfs 0.040 af

Pond LP: Leaching Facility

Peak Elev=36.25' Storage=364 cf Inflow=0.50 cfs 0.040 af
Discarded=0.12 cfs 0.040 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.040 af

Pond SW: (2) Water Quality Swales

Peak Elev=43.01' Storage=1,113 cf Inflow=1.29 cfs 0.097 af
Discarded=0.30 cfs 0.096 af Primary=0.04 cfs 0.000 af Outflow=0.34 cfs 0.097 af

Link TSR: Total Site Runoff

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.137 af Average Runoff Depth = 1.94"
48.52% Pervious = 0.411 ac 51.48% Impervious = 0.436 ac

Summary for Subcatchment 1: Watershed

Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.097 af, Depth= 1.57"

Routed to Pond SW : (2) Water Quality Swales

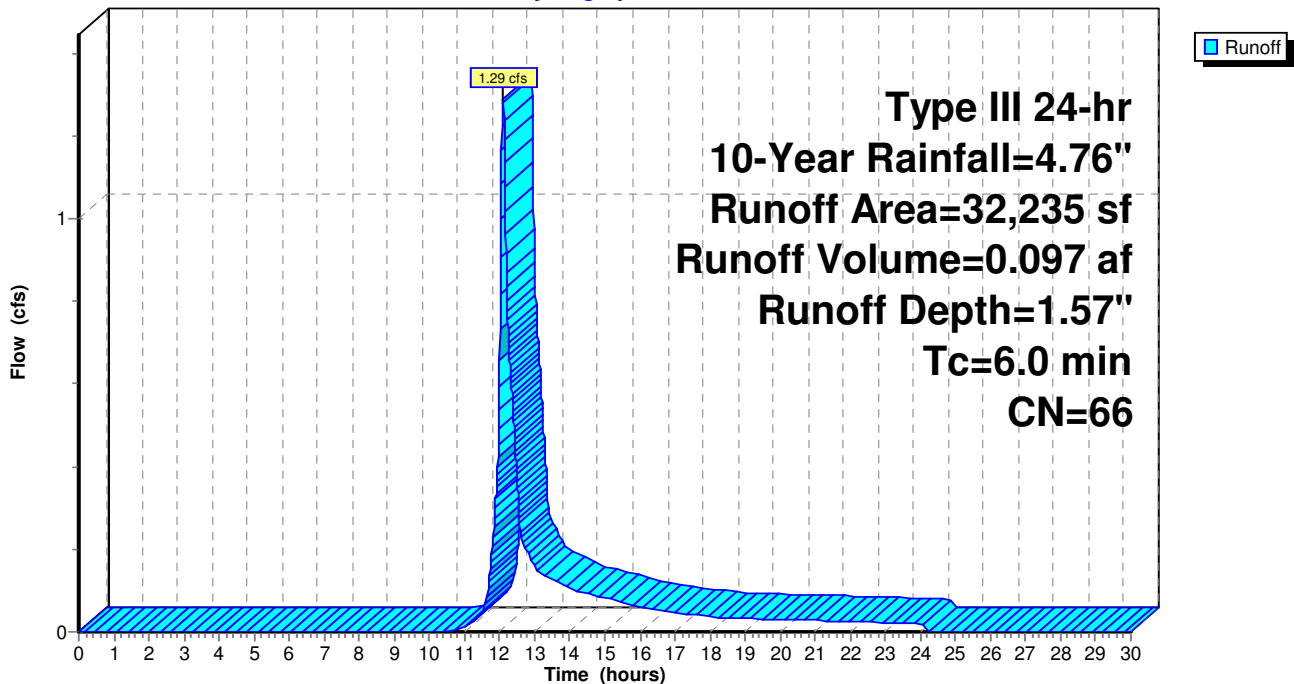
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.76"

Area (sf)	CN	Description
2,407	98	Roofs, HSG A
11,931	98	Paved parking, HSG A
15,000	39	>75% Grass cover, Good, HSG A
2,897	43	Woods/grass comb., Fair, HSG A
32,235	66	Weighted Average
17,897		55.52% Pervious Area
14,338		44.48% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph



Summary for Subcatchment 8S: Watershed

Runoff = 0.50 cfs @ 12.08 hrs, Volume= 0.040 af, Depth= 4.52"

Routed to Pond LP : Leaching Facility

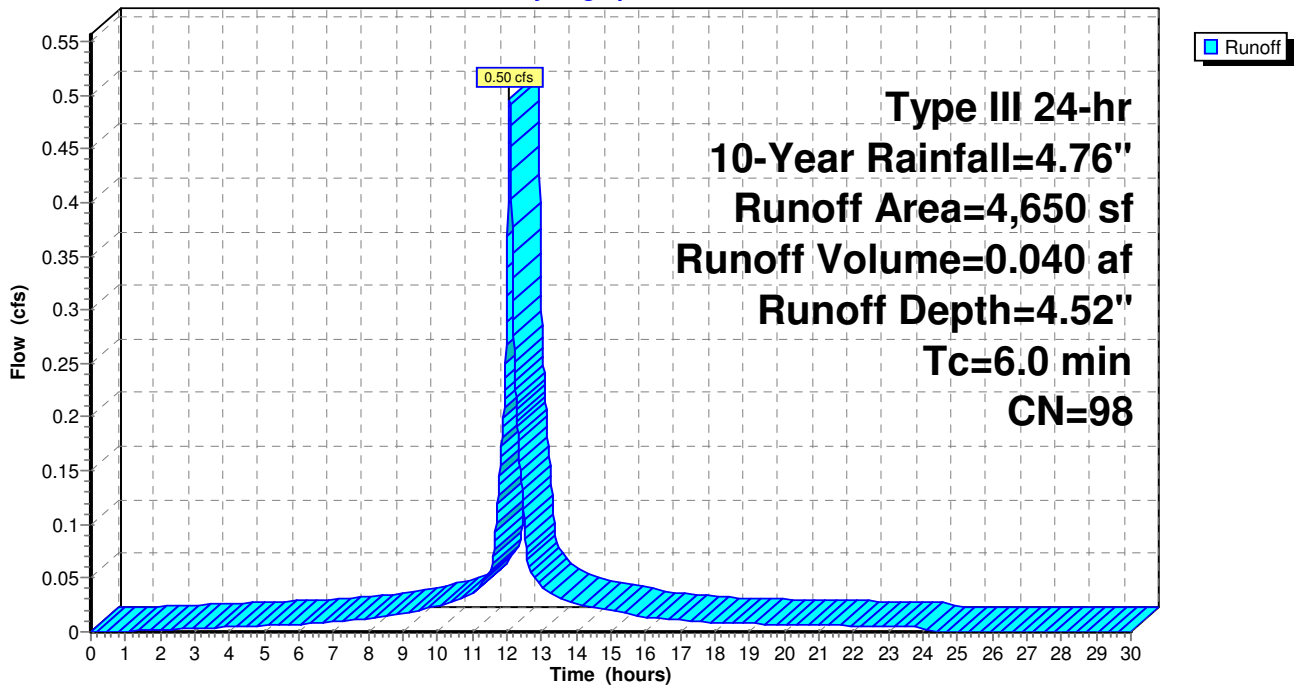
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Rainfall=4.76"

Area (sf)	CN	Description
4,650	98	Roofs, HSG A
4,650		100.00% Impervious Area

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

Subcatchment 8S: Watershed

Hydrograph



8601.POST-DEV

Type III 24-hr 10-Year Rainfall=4.76"

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Summary for Pond LP: Leaching Facility

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.57" for 10-Year event
 Inflow = 0.50 cfs @ 12.08 hrs, Volume= 0.040 af
 Outflow = 0.12 cfs @ 12.53 hrs, Volume= 0.040 af, Atten= 75%, Lag= 26.7 min
 Discarded = 0.12 cfs @ 12.53 hrs, Volume= 0.040 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link TSR : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 36.25' @ 12.53 hrs Surf.Area= 500 sf Storage= 364 cf

Plug-Flow detention time= 15.2 min calculated for 0.040 af (100% of inflow)
 Center-of-Mass det. time= 15.2 min (764.0 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	902 cf	10.00'W x 50.00'L x 6.00'H Stone 3,000 cf Overall - 995 cf Embedded = 2,005 cf x 45.0% Voids
#2	35.00'	848 cf	6.00'D x 6.00'H Vertical Cone/Cylinder x 5 Inside #1 995 cf Overall - 3.0" Wall Thickness = 848 cf
		1,750 cf	Total Available Storage

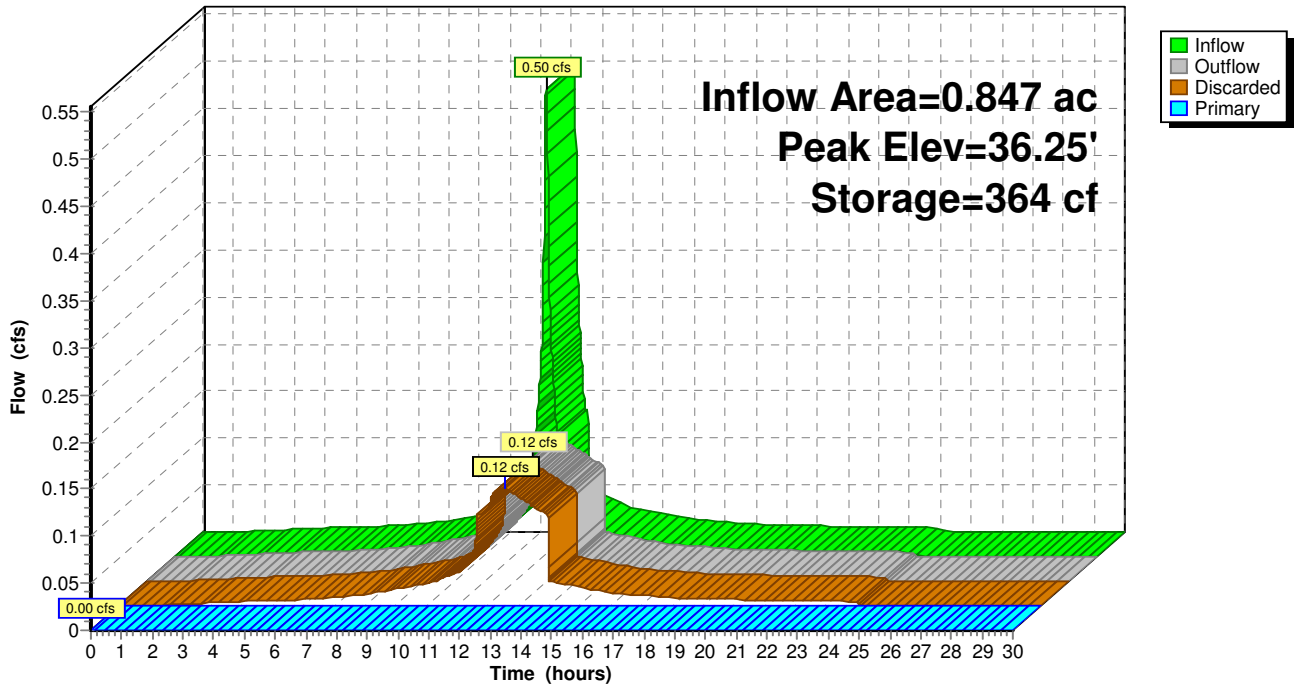
Device	Routing	Invert	Outlet Devices
#1	Discarded	35.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'
#2	Primary	40.90'	24.0" Horiz. Orifice/Grate X 4.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.53 hrs HW=36.25' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

Pond LP: Leaching Facility

Hydrograph



Summary for Pond SW: (2) Water Quality Swales

Inflow Area = 0.740 ac, 44.48% Impervious, Inflow Depth = 1.57" for 10-Year event
 Inflow = 1.29 cfs @ 12.10 hrs, Volume= 0.097 af
 Outflow = 0.34 cfs @ 12.52 hrs, Volume= 0.097 af, Atten= 74%, Lag= 25.4 min
 Discarded = 0.30 cfs @ 12.52 hrs, Volume= 0.096 af
 Primary = 0.04 cfs @ 12.52 hrs, Volume= 0.000 af

Routed to Pond LP : Leaching Facility

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 43.01' @ 12.52 hrs Surf.Area= 952 sf Storage= 1,113 cf

Plug-Flow detention time= 29.0 min calculated for 0.097 af (100% of inflow)
 Center-of-Mass det. time= 29.0 min (890.2 - 861.2)

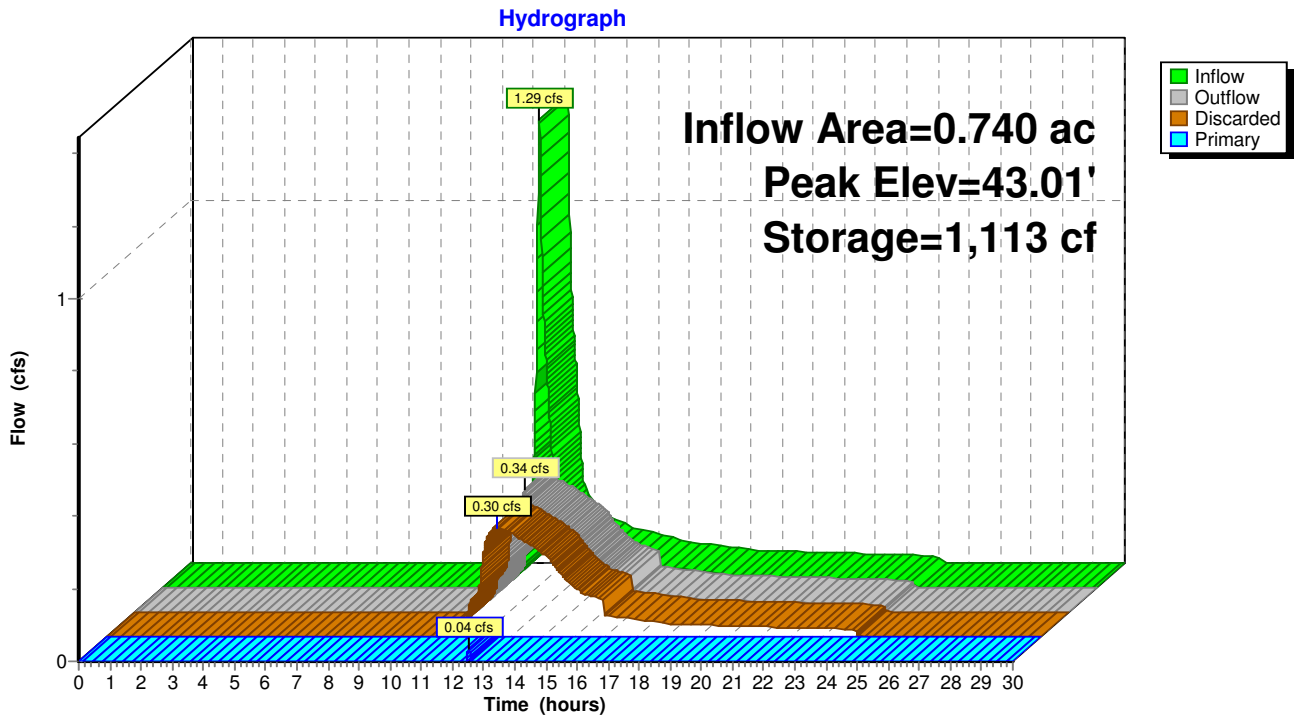
Volume	Invert	Avail.Storage	Storage Description			
#1	39.00'	2,270 cf	Custom Stage Data (Irregular) Listed below (Recalc) x 2			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	265	98.0	0.0	0	0	265
39.50	265	98.0	40.0	53	53	314
42.00	265	98.0	20.0	133	186	559
43.00	473	110.0	100.0	364	550	783
44.00	706	123.0	100.0	586	1,135	1,051

Device	Routing	Invert	Outlet Devices	
#1	Primary	43.00'	12.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads	
#2	Discarded	39.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'	

Discarded OutFlow Max=0.30 cfs @ 12.52 hrs HW=43.01' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.04 cfs @ 12.52 hrs HW=43.01' TW=36.25' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.39 fps)

Pond SW: (2) Water Quality Swales



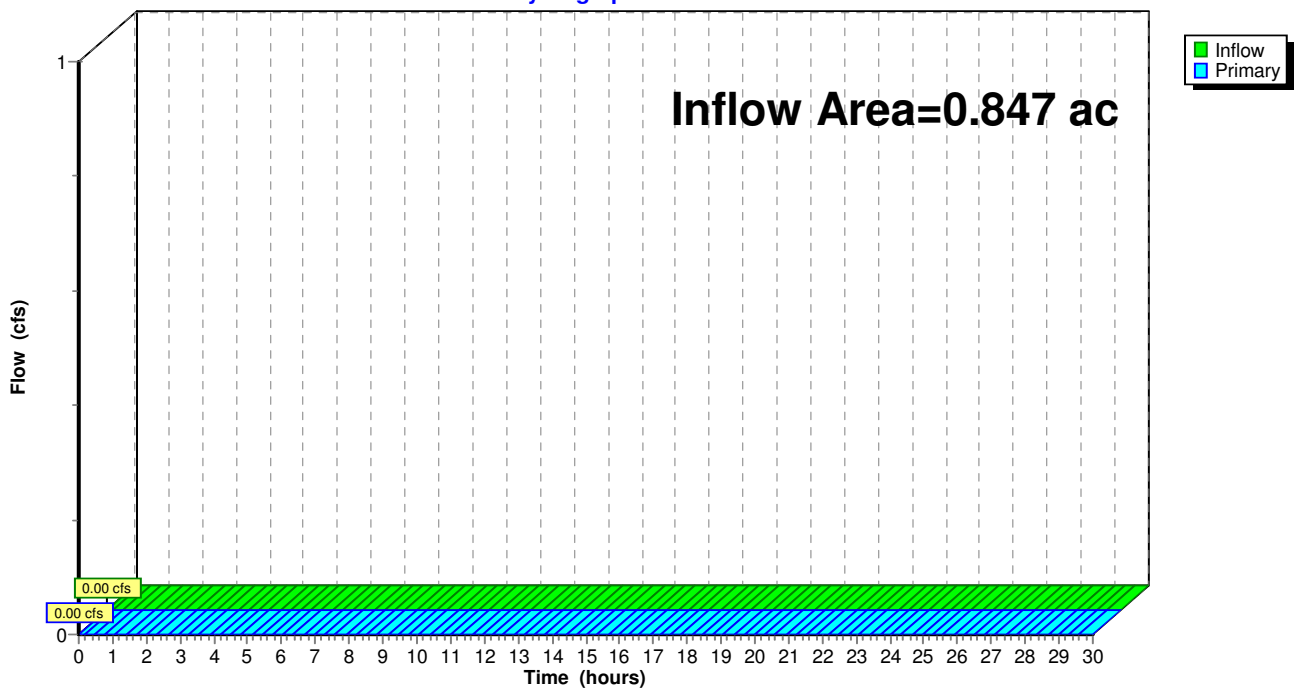
Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff

Hydrograph



8601.POST-DEV

Type III 24-hr 25-Year Rainfall=5.68"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed Runoff Area=32,235 sf 44.48% Impervious Runoff Depth=2.21"
Tc=6.0 min CN=66 Runoff=1.87 cfs 0.136 af

Subcatchment 8S: Watershed Runoff Area=4,650 sf 100.00% Impervious Runoff Depth=5.44"
Tc=6.0 min CN=98 Runoff=0.59 cfs 0.048 af

Pond LP: Leaching Facility Peak Elev=38.96' Storage=1,156 cf Inflow=1.11 cfs 0.066 af
Discarded=0.19 cfs 0.066 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.066 af

Pond SW: (2) Water Quality Swales Peak Elev=43.12' Storage=1,211 cf Inflow=1.87 cfs 0.136 af
Discarded=0.31 cfs 0.119 af Primary=0.80 cfs 0.017 af Outflow=1.11 cfs 0.136 af

Link TSR: Total Site Runoff Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.184 af Average Runoff Depth = 2.61"
48.52% Pervious = 0.411 ac 51.48% Impervious = 0.436 ac

Summary for Subcatchment 1: Watershed

Runoff = 1.87 cfs @ 12.09 hrs, Volume= 0.136 af, Depth= 2.21"

Routed to Pond SW : (2) Water Quality Swales

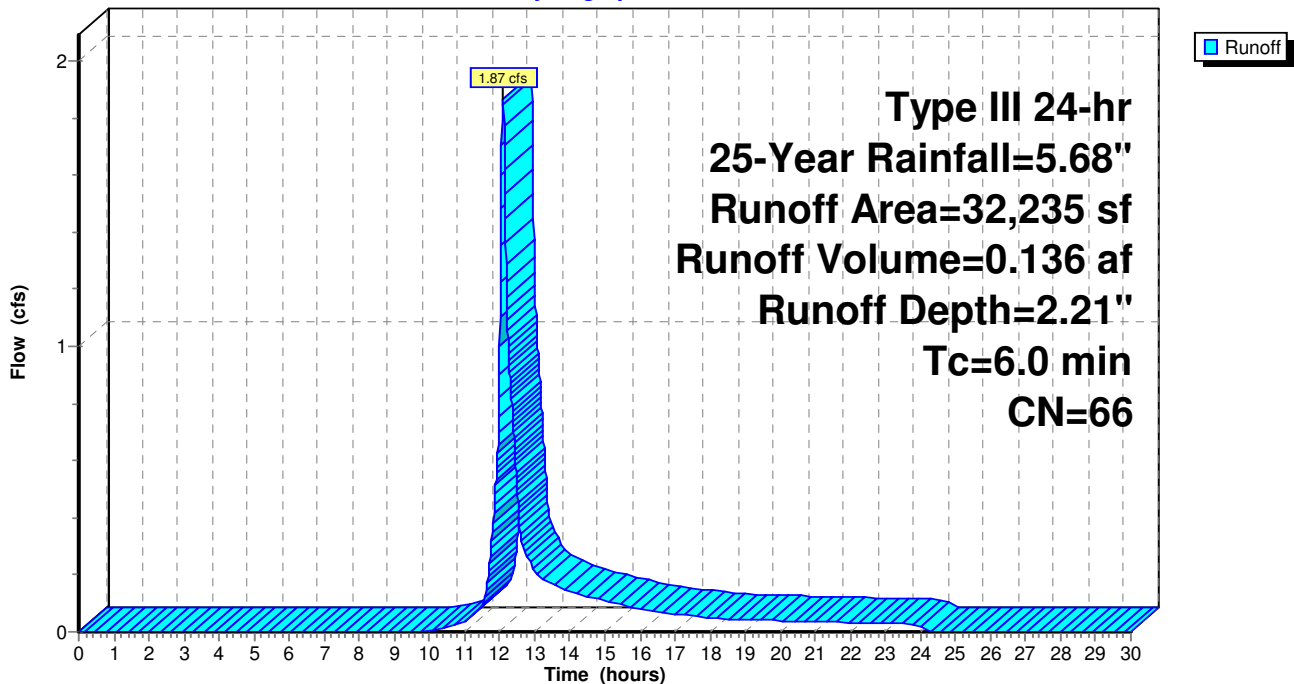
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.68"

Area (sf)	CN	Description
2,407	98	Roofs, HSG A
11,931	98	Paved parking, HSG A
15,000	39	>75% Grass cover, Good, HSG A
2,897	43	Woods/grass comb., Fair, HSG A
32,235	66	Weighted Average
17,897		55.52% Pervious Area
14,338		44.48% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph



Summary for Subcatchment 8S: Watershed

Runoff = 0.59 cfs @ 12.08 hrs, Volume= 0.048 af, Depth= 5.44"

Routed to Pond LP : Leaching Facility

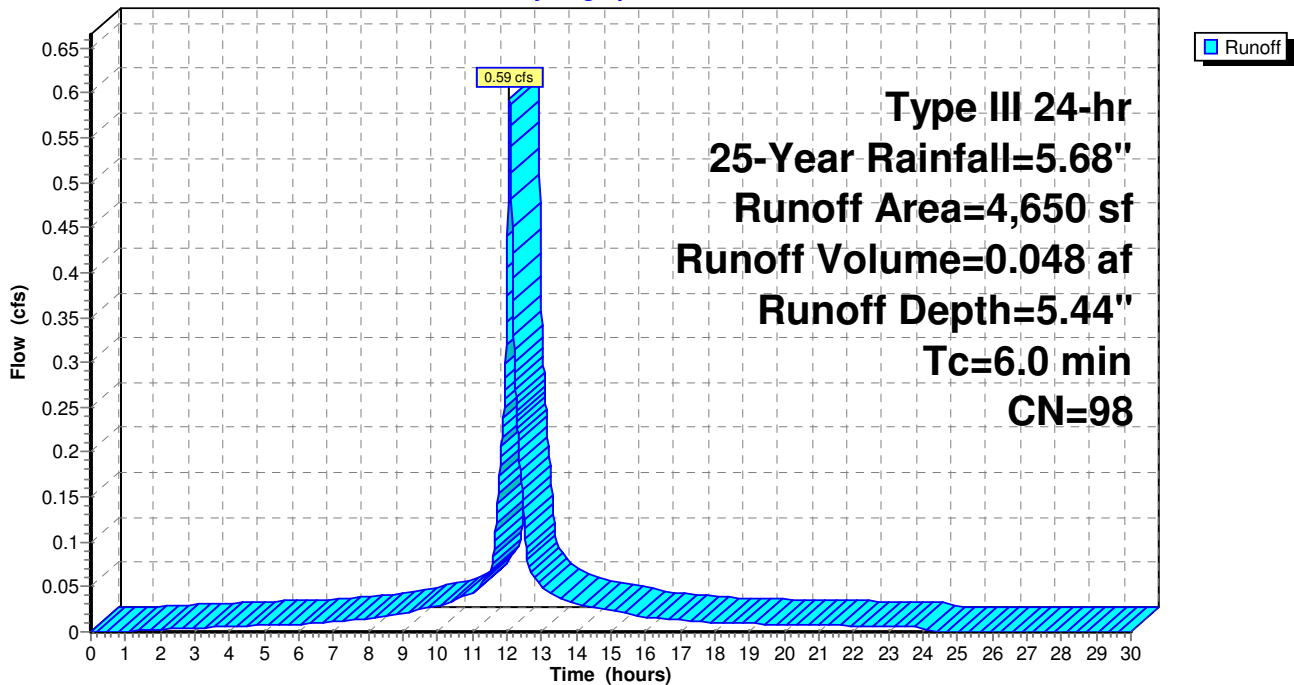
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Rainfall=5.68"

Area (sf)	CN	Description
4,650	98	Roofs, HSG A
4,650		100.00% Impervious Area

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

Subcatchment 8S: Watershed

Hydrograph



8601.POST-DEV

Type III 24-hr 25-Year Rainfall=5.68"

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Summary for Pond LP: Leaching Facility

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.93" for 25-Year event
 Inflow = 1.11 cfs @ 12.21 hrs, Volume= 0.066 af
 Outflow = 0.19 cfs @ 12.59 hrs, Volume= 0.066 af, Atten= 83%, Lag= 22.9 min
 Discarded = 0.19 cfs @ 12.59 hrs, Volume= 0.066 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link TSR : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 38.96' @ 12.59 hrs Surf.Area= 500 sf Storage= 1,156 cf

Plug-Flow detention time= 44.8 min calculated for 0.066 af (100% of inflow)
 Center-of-Mass det. time= 44.8 min (789.2 - 744.4)

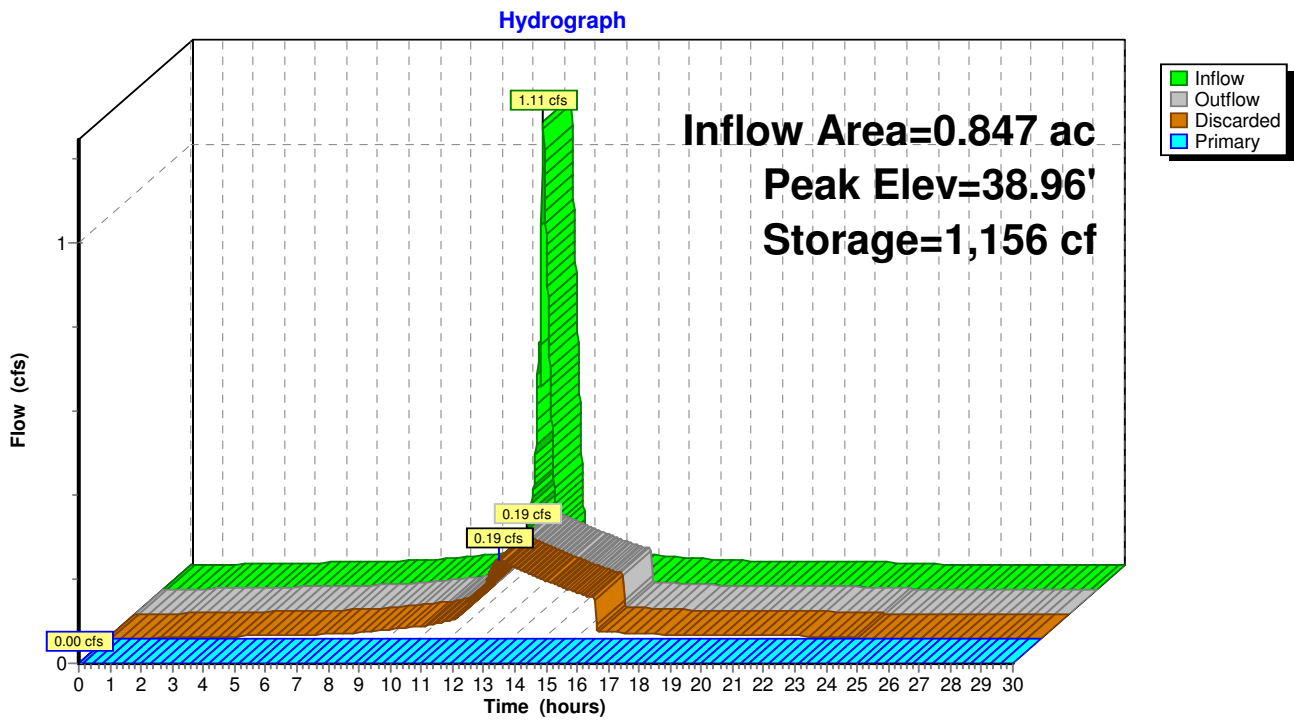
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	902 cf	10.00'W x 50.00'L x 6.00'H Stone 3,000 cf Overall - 995 cf Embedded = 2,005 cf x 45.0% Voids
#2	35.00'	848 cf	6.00'D x 6.00'H Vertical Cone/Cylinder x 5 Inside #1 995 cf Overall - 3.0" Wall Thickness = 848 cf
		1,750 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	35.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'
#2	Primary	40.90'	24.0" Horiz. Orifice/Grate X 4.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 12.59 hrs HW=38.96' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

Pond LP: Leaching Facility



Summary for Pond SW: (2) Water Quality Swales

Inflow Area = 0.740 ac, 44.48% Impervious, Inflow Depth = 2.21" for 25-Year event
 Inflow = 1.87 cfs @ 12.09 hrs, Volume= 0.136 af
 Outflow = 1.11 cfs @ 12.21 hrs, Volume= 0.136 af, Atten= 40%, Lag= 7.3 min
 Discarded = 0.31 cfs @ 12.21 hrs, Volume= 0.119 af
 Primary = 0.80 cfs @ 12.21 hrs, Volume= 0.017 af

Routed to Pond LP : Leaching Facility

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 43.12' @ 12.21 hrs Surf.Area= 995 sf Storage= 1,211 cf

Plug-Flow detention time= 27.3 min calculated for 0.136 af (100% of inflow)
 Center-of-Mass det. time= 27.3 min (878.1 - 850.8)

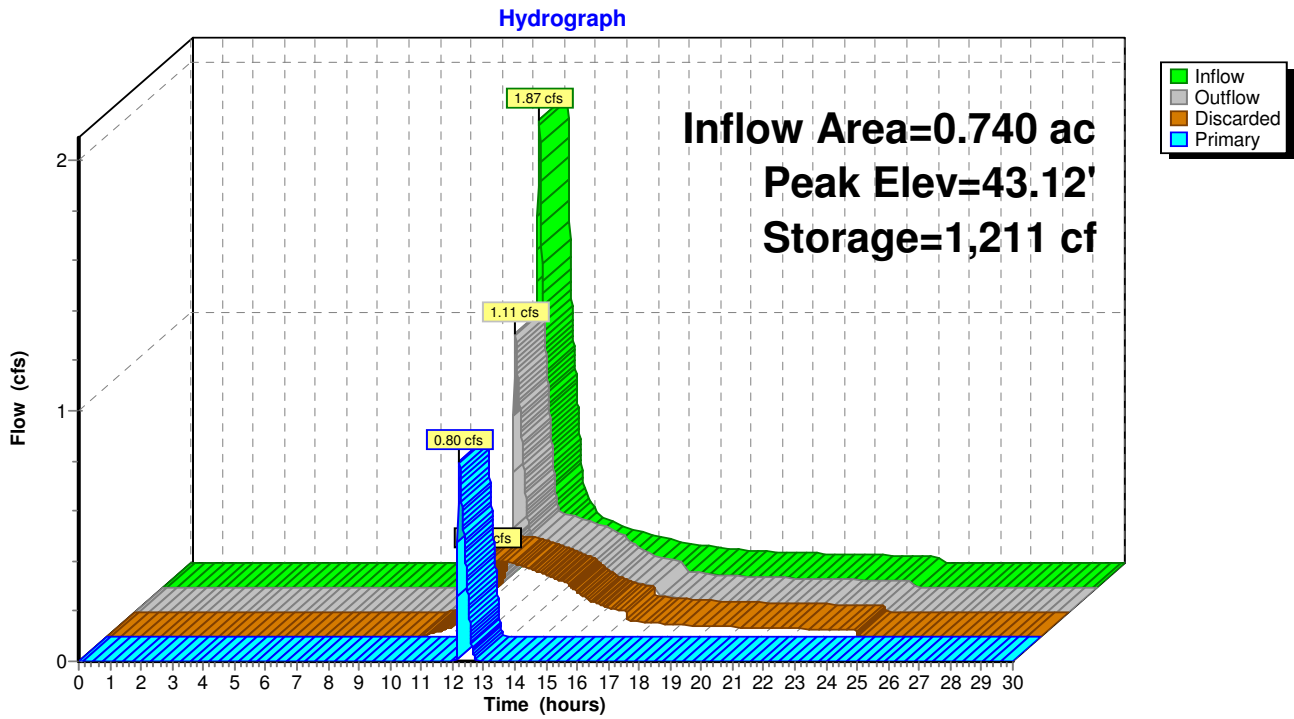
Volume	Invert	Avail.Storage	Storage Description			
#1	39.00'	2,270 cf	Custom Stage Data (Irregular) Listed below (Recalc) x 2			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	265	98.0	0.0	0	0	265
39.50	265	98.0	40.0	53	53	314
42.00	265	98.0	20.0	133	186	559
43.00	473	110.0	100.0	364	550	783
44.00	706	123.0	100.0	586	1,135	1,051

Device	Routing	Invert	Outlet Devices	
#1	Primary	43.00'	12.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads	
#2	Discarded	39.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'	

Discarded OutFlow Max=0.31 cfs @ 12.21 hrs HW=43.11' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.80 cfs @ 12.21 hrs HW=43.11' TW=36.85' (Dynamic Tailwater)
 ↑**1=Orifice/Grate** (Weir Controls 0.80 cfs @ 1.11 fps)

Pond SW: (2) Water Quality Swales



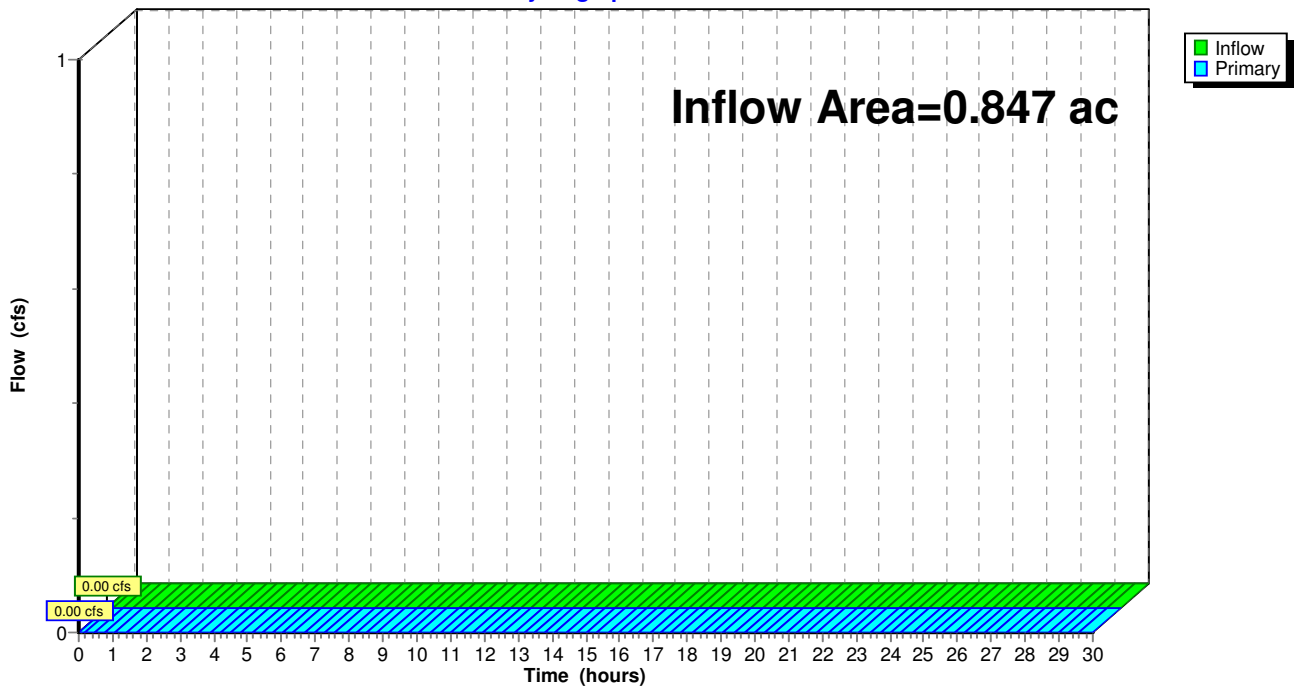
Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.00" for 25-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff

Hydrograph



8601.POST-DEV*Type III 24-hr 100-Year Rainfall=7.10"*

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1: Watershed

Runoff Area=32,235 sf 44.48% Impervious Runoff Depth=3.28"
 Tc=6.0 min CN=66 Runoff=2.83 cfs 0.202 af

Subcatchment 8S: Watershed

Runoff Area=4,650 sf 100.00% Impervious Runoff Depth=6.86"
 Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Pond LP: Leaching Facility

Peak Elev=40.97' Storage=1,740 cf Inflow=2.99 cfs 0.112 af
 Discarded=0.23 cfs 0.091 af Primary=1.39 cfs 0.021 af Outflow=1.62 cfs 0.112 af

Pond SW: (2) Water Quality Swales

Peak Elev=43.23' Storage=1,331 cf Inflow=2.83 cfs 0.202 af
 Discarded=0.32 cfs 0.151 af Primary=2.31 cfs 0.051 af Outflow=2.64 cfs 0.202 af

Link TSR: Total Site Runoff

Inflow=1.39 cfs 0.021 af
 Primary=1.39 cfs 0.021 af

Total Runoff Area = 0.847 ac Runoff Volume = 0.263 af Average Runoff Depth = 3.73"
48.52% Pervious = 0.411 ac 51.48% Impervious = 0.436 ac

Summary for Subcatchment 1: Watershed

Runoff = 2.83 cfs @ 12.09 hrs, Volume= 0.202 af, Depth= 3.28"

Routed to Pond SW : (2) Water Quality Swales

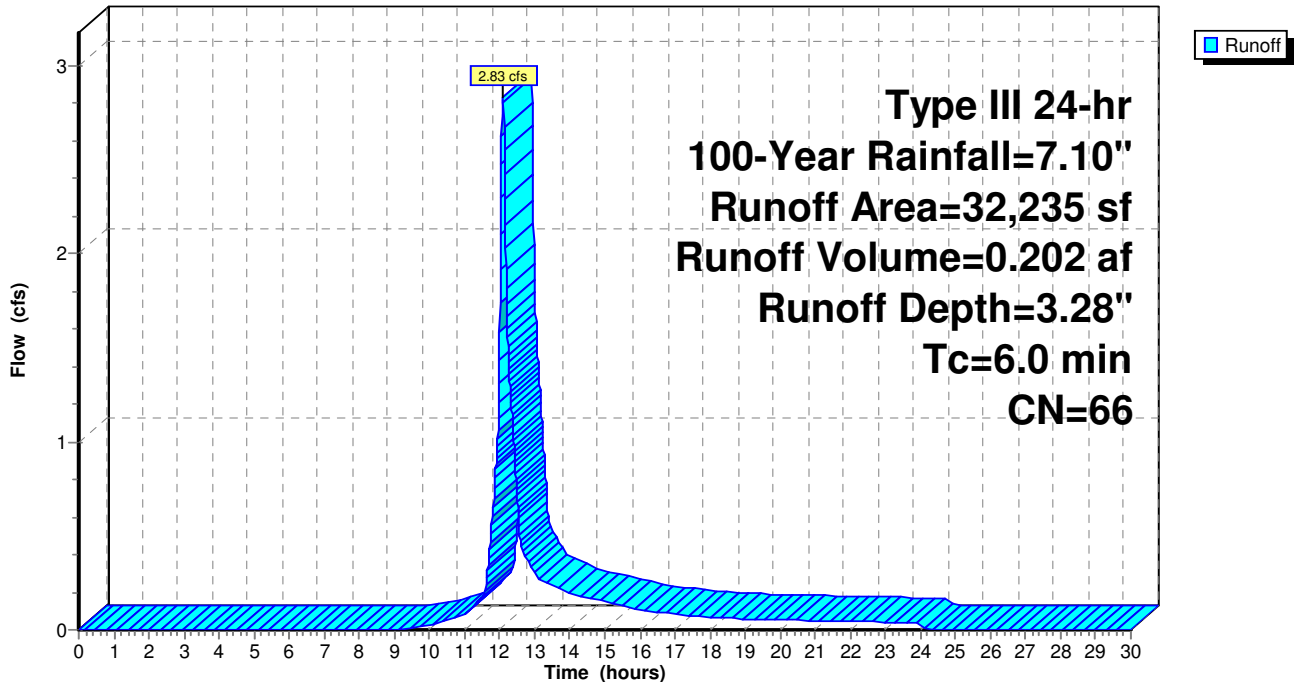
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
2,407	98	Roofs, HSG A
11,931	98	Paved parking, HSG A
15,000	39	>75% Grass cover, Good, HSG A
2,897	43	Woods/grass comb., Fair, HSG A
32,235	66	Weighted Average
17,897		55.52% Pervious Area
14,338		44.48% Impervious Area

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

Subcatchment 1: Watershed

Hydrograph



Summary for Subcatchment 8S: Watershed

Runoff = 0.74 cfs @ 12.08 hrs, Volume= 0.061 af, Depth= 6.86"

Routed to Pond LP : Leaching Facility

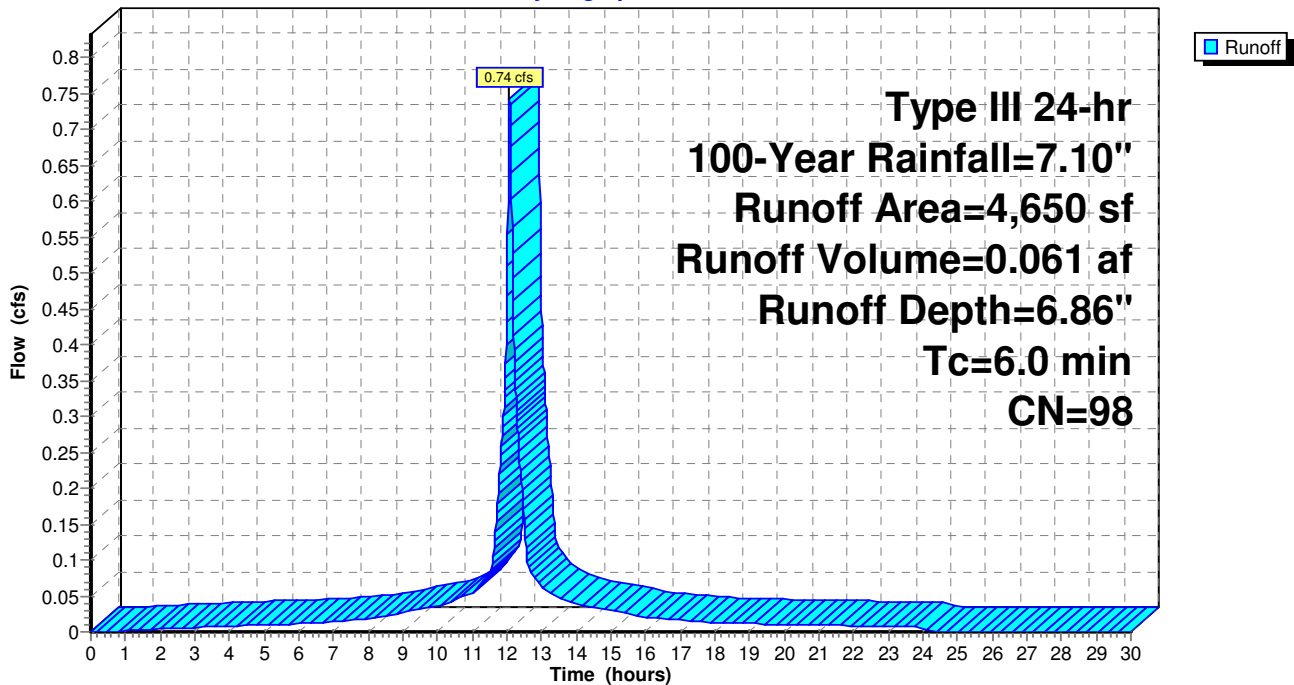
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
4,650	98	Roofs, HSG A
4,650		100.00% Impervious Area

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

Subcatchment 8S: Watershed

Hydrograph



Summary for Pond LP: Leaching Facility

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 1.59" for 100-Year event
 Inflow = 2.99 cfs @ 12.12 hrs, Volume= 0.112 af
 Outflow = 1.62 cfs @ 12.26 hrs, Volume= 0.112 af, Atten= 46%, Lag= 8.5 min
 Discarded = 0.23 cfs @ 12.26 hrs, Volume= 0.091 af
 Primary = 1.39 cfs @ 12.26 hrs, Volume= 0.021 af
 Routed to Link TSR : Total Site Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 40.97' @ 12.26 hrs Surf.Area= 500 sf Storage= 1,740 cf

Plug-Flow detention time= 52.0 min calculated for 0.112 af (100% of inflow)
 Center-of-Mass det. time= 52.0 min (792.1 - 740.1)

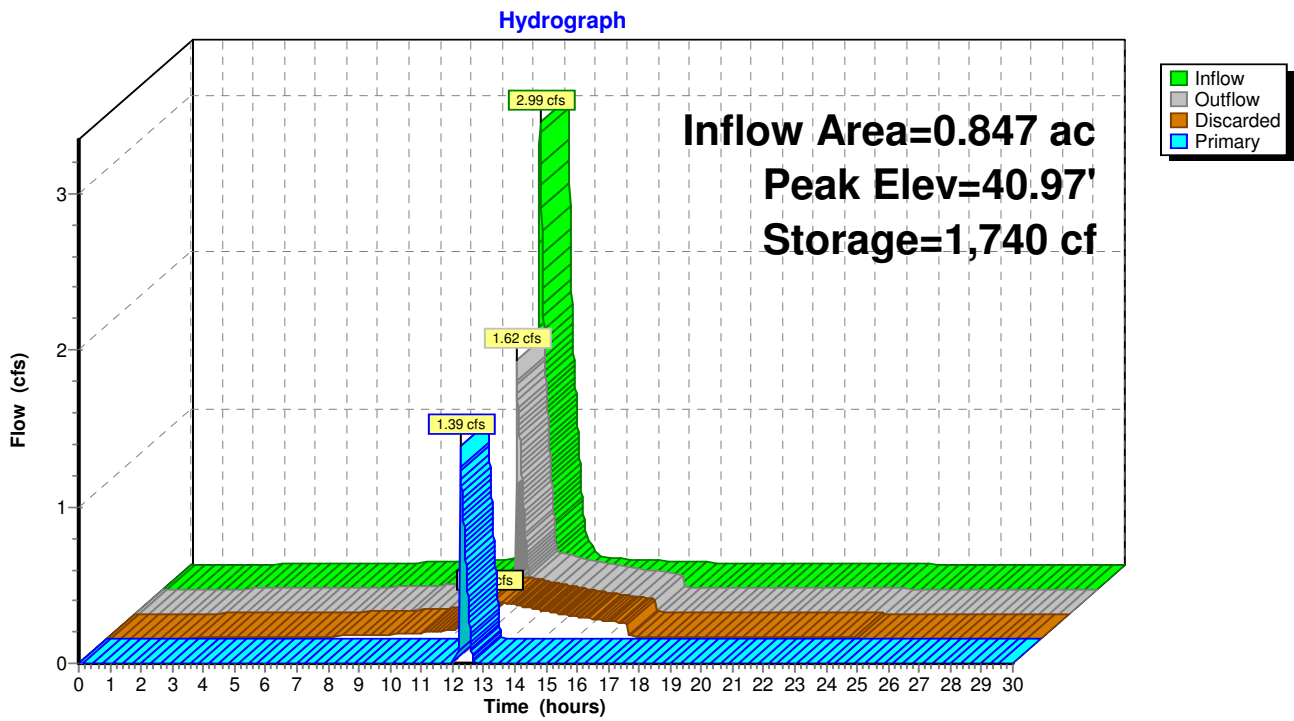
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	902 cf	10.00'W x 50.00'L x 6.00'H Stone 3,000 cf Overall - 995 cf Embedded = 2,005 cf x 45.0% Voids
#2	35.00'	848 cf	6.00'D x 6.00'H Vertical Cone/Cylinder x 5 Inside #1 995 cf Overall - 3.0" Wall Thickness = 848 cf
		1,750 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	35.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'
#2	Primary	40.90'	24.0" Horiz. Orifice/Grate X 4.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.23 cfs @ 12.26 hrs HW=40.97' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=1.38 cfs @ 12.26 hrs HW=40.97' TW=0.00' (Dynamic Tailwater)
 ↑2=Orifice/Grate (Weir Controls 1.38 cfs @ 0.84 fps)

Pond LP: Leaching Facility



Summary for Pond SW: (2) Water Quality Swales

Inflow Area = 0.740 ac, 44.48% Impervious, Inflow Depth = 3.28" for 100-Year event
 Inflow = 2.83 cfs @ 12.09 hrs, Volume= 0.202 af
 Outflow = 2.64 cfs @ 12.12 hrs, Volume= 0.202 af, Atten= 7%, Lag= 2.0 min
 Discarded = 0.32 cfs @ 12.12 hrs, Volume= 0.151 af
 Primary = 2.31 cfs @ 12.12 hrs, Volume= 0.051 af

Routed to Pond LP : Leaching Facility

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 43.23' @ 12.12 hrs Surf.Area= 1,046 sf Storage= 1,331 cf

Plug-Flow detention time= 25.5 min calculated for 0.202 af (100% of inflow)
 Center-of-Mass det. time= 25.5 min (864.5 - 839.0)

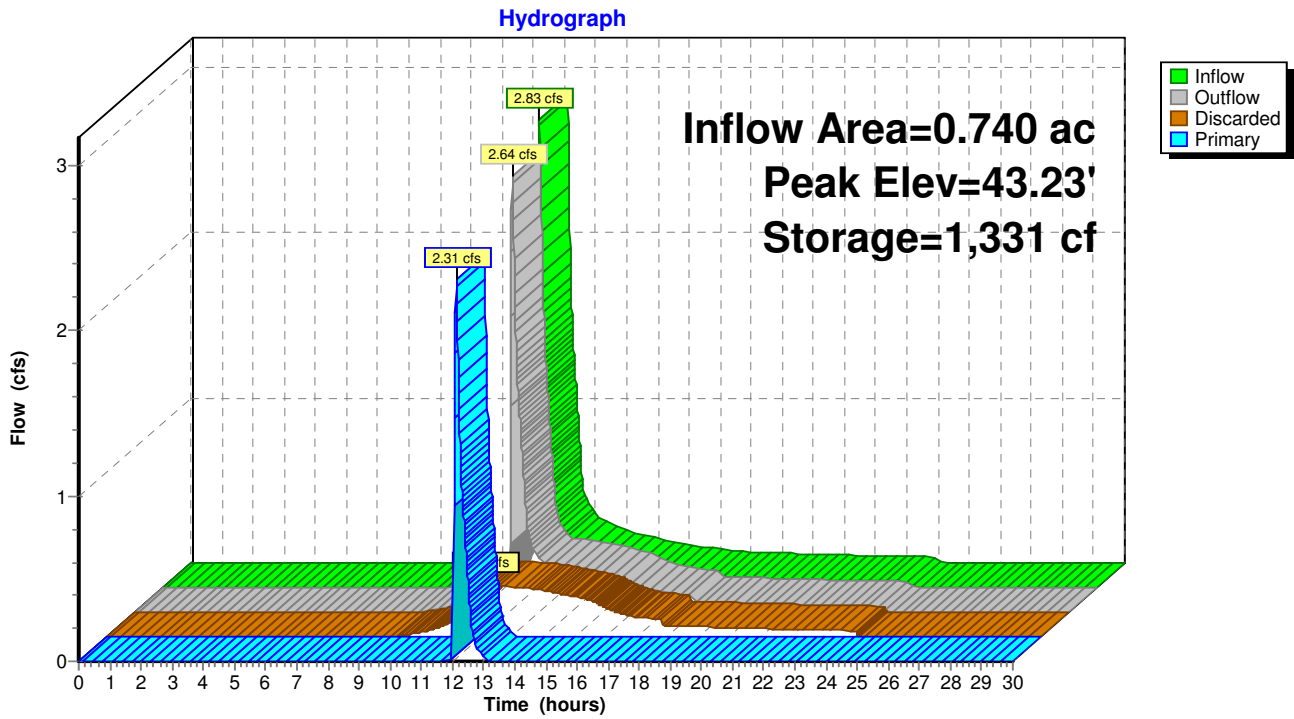
Volume	Invert	Avail.Storage	Storage Description			
#1	39.00'	2,270 cf	Custom Stage Data (Irregular) Listed below (Recalc) x 2			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	265	98.0	0.0	0	0	265
39.50	265	98.0	40.0	53	53	314
42.00	265	98.0	20.0	133	186	559
43.00	473	110.0	100.0	364	550	783
44.00	706	123.0	100.0	586	1,135	1,051

Device	Routing	Invert	Outlet Devices	
#1	Primary	43.00'	12.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads	
#2	Discarded	39.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'	

Discarded OutFlow Max=0.32 cfs @ 12.12 hrs HW=43.23' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=2.31 cfs @ 12.12 hrs HW=43.23' TW=37.84' (Dynamic Tailwater)
 ↑**1=Orifice/Grate** (Weir Controls 2.31 cfs @ 1.58 fps)

Pond SW: (2) Water Quality Swales

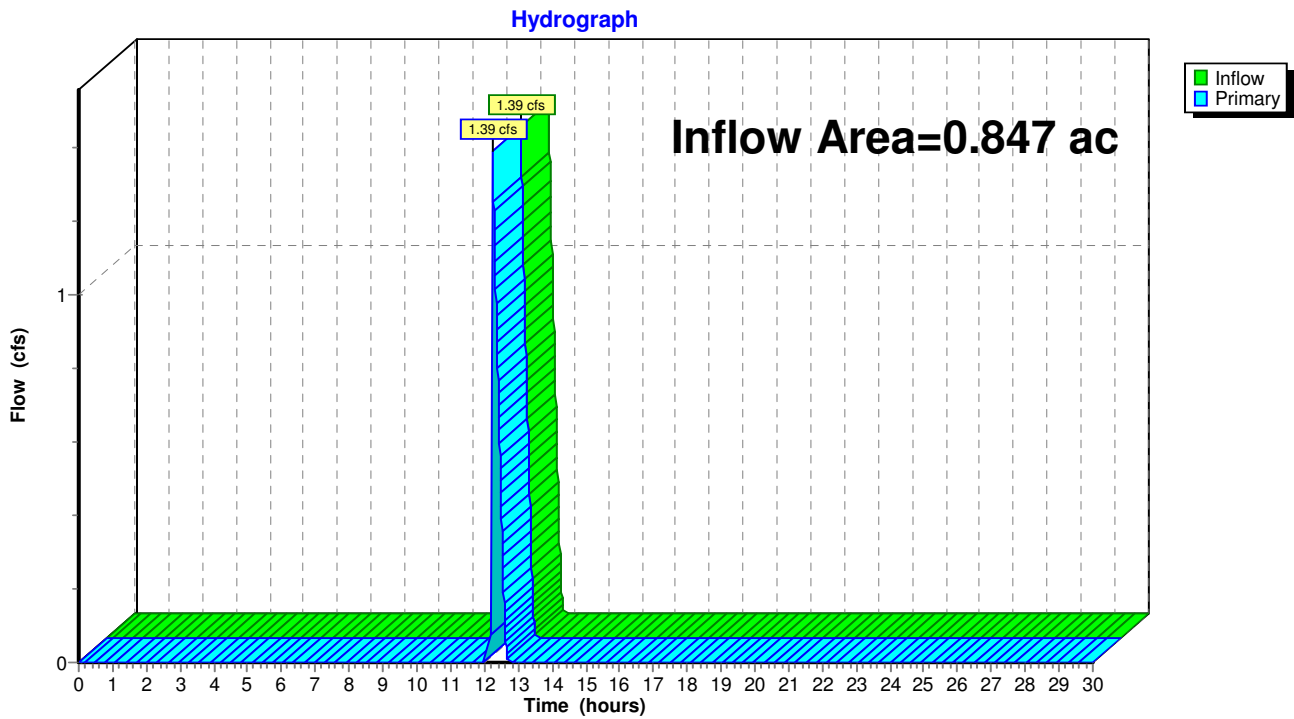


Summary for Link TSR: Total Site Runoff

Inflow Area = 0.847 ac, 51.48% Impervious, Inflow Depth = 0.30" for 100-Year event
Inflow = 1.39 cfs @ 12.26 hrs, Volume= 0.021 af
Primary = 1.39 cfs @ 12.26 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2R

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link TSR: Total Site Runoff



INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location:

	B	C	D	E	F
	BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
TSS Removal Calculation Worksheet	Water Quality Swale - Dry	0.70	1.00	0.70	0.30
	Subsurface Infiltration Structure	0.80	0.30	0.24	0.06
		0.00	0.06	0.00	0.06
		0.00	0.06	0.00	0.06
		0.00	0.06	0.00	0.06

Total TSS Removal =

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project:
 Prepared By:
 Date:

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
 1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location:

TSS Removal Calculation Worksheet

B BMP ¹	C TSS Removal Rate ¹	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Subsurface Infiltration Structure	0.80	1.00	0.80	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20

Total TSS Removal =

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project:
 Prepared By:
 Date:

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
 1. From MassDEP Stormwater Handbook Vol. 1