DRAINAGE SUMMARY

PROPOSED CONDOMINIUM DEVELOPMENT
24 WILSON CIRCLE
NEWTON, MASSACHUSETTS

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DRAINAGE SUMMARY
PROPOSED CONDOMINIUM DEVELOPMENT
24 WILSON CIRCLE
NEWTON, MASSACHUSETTS

The proposed project consists of the demolition of an existing single-family residential dwelling, and the construction of a 5-unit condominium development including new driveways and drainage improvements at 24 Wilson Circle in Newton, MA, under the requirements of the City of Newton Stormwater Management and Erosion Control Rules & Regulations.

The on-site soils in the area are shown as "626B – Merrimac-Urban land complex, 0 to 8 percent slopes" and "254C – Merrimac fine sandy loam, 8 to 15 percent slopes" soils on the NRCS Soils Survey map of the area, which are areas that fall within Hydrological Soil Groups of A. To confirm soil conditions, VTP performed three (3) test pits onsite on June 21, 2022 and found the parent material to be sand and gravel. For purposes of our design, VTP has used A soils with an infiltration rate of 8.27 in/hr in accordance with Table 2.3.3. 1982 Rawles Rates from the Massachusetts Stormwater Handbook.

Ground cover on the site is a dense residential grass area, buildings, bituminous concrete walkways and driveways and gravel walkways and driveways. The existing drainage on the site flows overland from the rear of property, westerly towards Wilson Circle. Overall, the site will maintain the current flow pattern, however new collection systems for the proposed impervious areas have been provided to collect the runoff and attenuate offsite flows.

There are no wetlands or other Resource Areas within 100 feet of the lot. The proposed drainage controls are designed to capture & contain the runoff from the proposed impervious areas. This system will store the runoff from the new impervious area and allow the stored water to slowly infiltrate after the storm event and overflow offsite.

Under the proposed conditions, with the new buildings and driveways the rate of site runoff from the re-developed lot area will be greater than the existing conditions for the 2, 10, 25 & 100-year storm events. The proposed controls have been designed to store this increase to maintain the pre and post runoff rates.

COMPLIANCE WITH STORMWATER STANDARDS

Untreated Stormwater (Standard 1)

The project is designed so that new stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, existing wetlands.

Post-Development Peak Rates (Standard 2)

A hydrologic study was performed to determine the rate of runoff for the 100-year storm events under pre-development (existing) conditions. Unmitigated post-development rates

were then computed in a similar manner. The study point where the peak rates were compared were taken at one (1) location at the existing offsite flow area. From these analyses, it was determined that the proposed project and its stormwater management system would not increase the peak runoff rates above existing levels. It is the intent of the stormwater management system to minimize impacts to drainage patterns, and downstream property prior to its release from the site or discharge to wetlands.

The *United States Department of Agriculture (U.S.D.A)*. Soil Conservation Service (SCS) Technical Release 55 (TR-55), 1986, was used as the procedure for estimating runoff. A SCS TR-20-based computer program was used for estimating peak discharges. TR-55 is a generally accepted model for use on small sites that begin with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). CN is based on soils, plant cover, impervious areas, interception, and surface storage. Runoff is then transformed into a hydrograph that depends on runoff travel time through segments of the watershed.

Development in a watershed changes the watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which can result in significantly higher peak rates of runoff. The volume of runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, antecedent rainfall, type of vegetal cover, impervious surfaces, and surface retention. Travel time is determined primarily by slope, flow length, depth of flow, and roughness of flow surfaces. Peak rates of discharge are based on the relationship of the above parameters, as well as the total drainage area of the watershed, the location of the development in relation to the total drainage area, and the effect of any flood control works or other manmade storage. Peak rates of discharge are also influenced by the distribution of rainfall within a given storm event.

Stormwater management computations for the full-build were performed using a SCS-based *HYDROCAD* for existing and proposed conditions, curve numbers, time of concentrations and unit hydrograph computations.

Existing Conditions

Table 1. Shows the curve numbers, areas and times of concentration used to develop the pre-development hydrologic model of the site.

Table 1. – Existing Conditions					
Sub-Areas	**Surface Cover**	**Curve Number (CN)**	**Area (SF)**	**Tc (Mins.)**	**Remarks**
Area #1				6.0	
	Exist. Bldgs.	98	1,704		Incls. garage
	Exist. Walks	98	4,764		Gravel
	Exist. Drive	98	2,382		Incl. Patio
	Old Found.	98	209		

	Lawn Areas	39	19,454		
		Total Area	28,513		
*CN based on Class A soils.					

Proposed Conditions

The proposed conditions will result in a new collection system that will collect the site run-off from the proposed condominium units and proposed driveways and direct it to underground leaching systems prior to overflowing off-site.

Table 2. Shows the curve numbers, areas and times of concentration used to develop the post-development hydrologic model of the site.

Table 2. – Proposed Conditions					
Sub-Areas	**Surface Cover**	**Curve Number (CN)**	**Area (SF)**	**Tc (Mins.)**	**Remarks**
Area #1				6.0	
	Lawn Area	39	11,498		
	Prop. Patios	98	1,175		
Area #2					
	Prop. Building	98	6,005		
	Prop. Driveway	98	4,057		
Area #3					
	Prop. Driveway	98	1,778		Front Portion
		Total Area	28,513		
*CN based on Class A soils.					

Peak Rate Summary

Table 3. Shows the peak runoff for the existing, as well as for the developed site at 2, 10, 25 & 100-year design storms.

Areas	**Design Storm**	**Existing Runoff* (CFS)**	**Existing Volume* (Ac-Ft)**	**Proposed Runoff* (CFS)**	**Proposed Volume* (Ac-Ft)**
Offsite Flow					
Existing	2-yr.	0.11	0.015	0.00	0.000
	10-yr.	0.67	0.051	0.04	0.007
	25-yr.	1.24	0.088	0.14	0.016
	100-yr.	2.74	0.186	1.10	0.074

Recharge to Groundwater (Standard 3)

The change in groundcover for the new development will change by increasing the impervious areas by approximately 3,956 sf. Groundwater infiltration will be achieved through the individual underground storage areas.

Required Recharge Volume for the entire site was calculated in accordance with the Massachusetts Stormwater Management Standards:

Rv = F * impervious area (in acres)
Rv = (0.60/12) * 0.298 = 0.015 Ac-ft. = 650.75 CF

Rv = Required Recharge Volume;
F = Target Depth Factor (0.60 in. for soils of Hydrologic Soil Group A);
Impervious area = building, pavement on site in post development condition (0.298 Ac).

The two proposed onsite leaching systems will store and infiltrate 650.75 cf in just the 2-year storm event.

Removal of TSS (Standard 4)

The proposed building will have clean runoff and the proposed driveways will flow through catchbasins/manholes with a 4' deep sump, and then infiltration to address TSS removal.

BMP[1]	Rate[1]	Load*	Removed (C*D)	Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Subsurface Infiltration Structure	**0.80**	**0.75**	**0.60**	**0.15**

Total TSS Removal =	**85%**

Land Uses with Higher Potential Pollutant Loads (Standard 5)

The use proposed does not differ from the current residential use of the space and has no higher potential for pollution.

Critical Areas (Standard 6 – Water Quality Treatments)

This site does not lie within a critical area. One-half inch (1/2") of runoff is the standard for treatment relative to water quality, but as stated prior, the proposed use will not create pollutants in excess of what exists today.

Redevelopment (Standard 7)

Redevelopment projects are those that involve development, rehabilitation or expansion on previously developed sites provided the redevelopment results in no net increase in impervious area. Furthermore, components of redevelopment project, which include development of previously undeveloped sites, do not fall under Standard 7. In addition, redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

The project, as proposed, are new buildings, replacing existing buildings on a developed sited and we are increasing the impervious area, however it is minimal. VTP has considered this project a new development and we have met all of the applicable standards of the Massachusetts Stormwater Policy.

Erosion and Sedimentation Controls (Standard 8)

Erosion Control measures have been provided on the plans that accompany this application.

Operation and Maintenance Plan (Standard 9)

An Operation and Maintenance (O&M) Plan is provided as part of the application.

Prohibition of Illicit Discharges

The Owner and User of the facility, assures that there will not be illicit discharges to the nearby wetlands from the proposed facility.

Floodplain (310 CMR 10.57)

The project site does not fall with a floodplain district.

City of Newton Standards

In accordance with the City of Newton's Stormwater Management and Erosion Control Rules and Regulations, this project requires a Minor Stormwater Permit, as it is a residential development less than 4 units with land disturbance less than 0.5 acres.

Storage of Total Impervious area

The proposed project results in a post-development total impervious area of 13,015 SF. Per the City of Newton's Stormwater Management and Erosion Control Rules and Regulations, Section 5, Subsection B.1, this project is a teardown of an existing structure and therefore requires the applicant to retain 2" of runoff for the total of all impervious area.

Volume = (2"/12) * (13,015 sf) = 2,169 CF

As noted in the post-development HydroCAD report provided, the proposed BMP's offer a total storage volume of 0.06 acre-ft, which is equivalent to **2,613 CF** of available storage, which exceeds the required storage capacity of 2,169 CF

Total Phosphorus Removal

Existing Phosphorus Load

BMP Sub Area	Land Use Category	Cover Type	Area (Acres)	PLER (lb/acre/yr)*
1	Developed Land Pervious (HSG- A)	Impervious	0.208	1.96
2	Medium-Density Residential (MDR)	Pervious	0.446	0.03

***From Table 3-1 of appendix F.**

BMP_{Load} = (0.208 x 1.96) + (0.446 x 0.03) = 0.421 lbs P/yr

Proposed BMP's

Infiltration System #1

BMP Volume $_{ft3}$ (see HydroCAD) = 0.052 acre-ft = 2,265 ft^3

$BMP_{inches\ of\ runoff}$ = BMP_{Volume} (ft^3)/IA x 12 in/ft x 1 acre/43,560 ft^2
= 2,265 ft^3/0.231 acre x 12 in/ft x 1 acre/43,560 ft^2
= 2.70 in.

Infiltration System #2

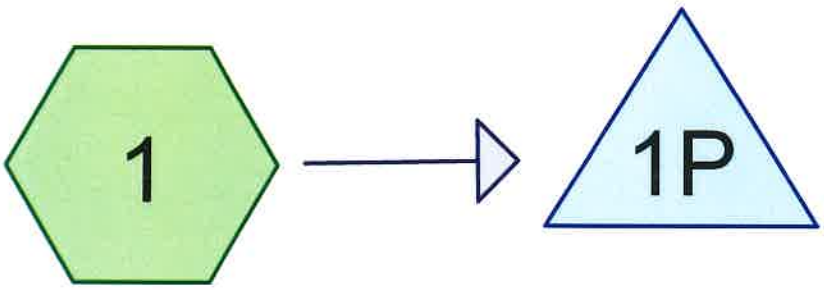
BMP Volume $_{ft3}$ (see HydroCAD) = 0.008 acre-ft = 348.48 ft^3

$BMP_{inches\ of\ runoff}$ = BMP_{Volume} (ft^3)/IA x 12 in/ft x 1 acre/43,560 ft^2
= 348.48 ft^3/0.041 acre x 12 in/ft x 1 acre/43,560 ft^2
= 2.34 in.

In accordance with BMP Curves for Soil Infiltration Rate: Infiltration Basin the BMP will have a 100% load reduction Efficiency for soils with an infiltration rate of 8.27 in/hr. and at least 2.0 inches of runoff.

72-hour Drawdown

VTP has provided copies of the drawdown for Pond #1 & Pond #2, which shows that they are both fully drawn-down within 72-hours.



Existing Site

Offsite

Subcat Reach Pond Link

Routing Diagram for 24 Wilson Circle - Existing
Prepared by HP, Printed 8/30/2022

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.447	39	>75% Grass cover, Good, HSG A (1)
0.055	98	Exist. Drive (1)
0.005	98	Exist. Foundation (1)
0.109	98	Exist. Walks & Patios (1)
0.039	98	Existing Buildings (1)
0.655	**58**	**TOTAL AREA**

Summary for Subcatchment 1: Existing Site

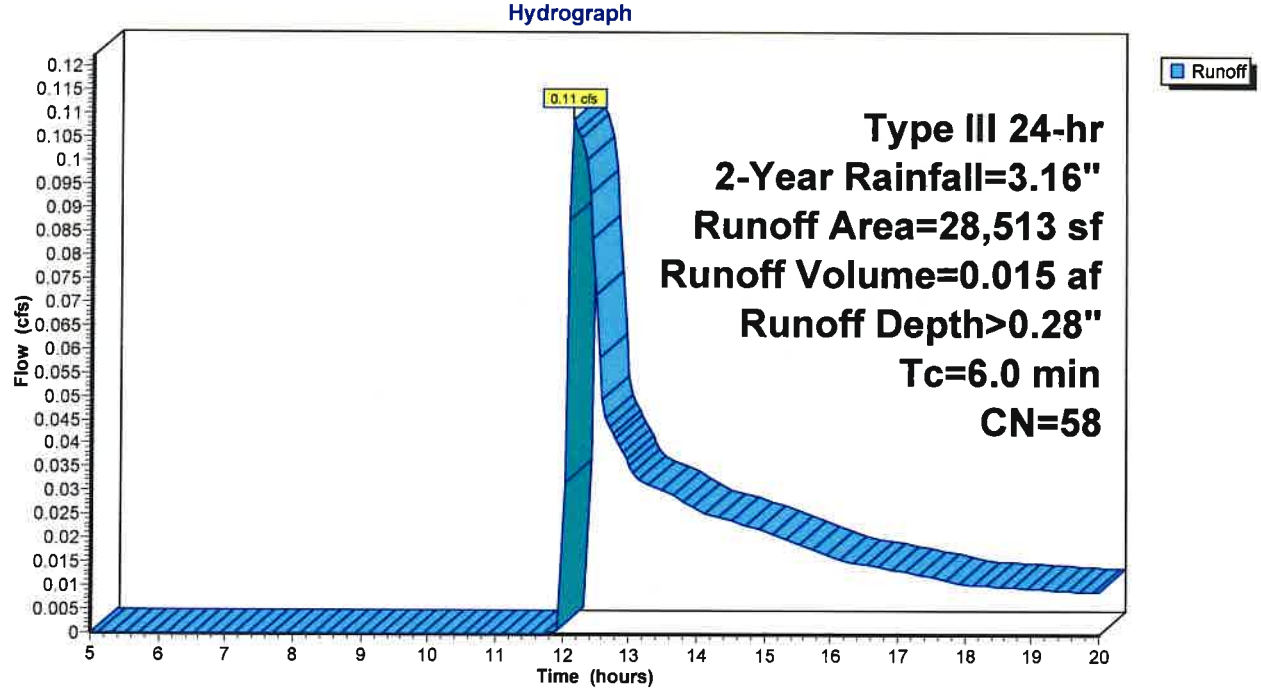
Runoff = 0.11 cfs @ 12.15 hrs, Volume= 0.015 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
	19,454	39	>75% Grass cover, Good, HSG A
*	2,382	98	Exist. Drive
*	209	98	Exist. Foundation
*	4,764	98	Exist. Walks & Patios
*	1,704	98	Existing Buildings
	28,513	58	Weighted Average
	19,454		68.23% Pervious Area
	9,059		31.77% Impervious Area

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

Subcatchment 1: Existing Site

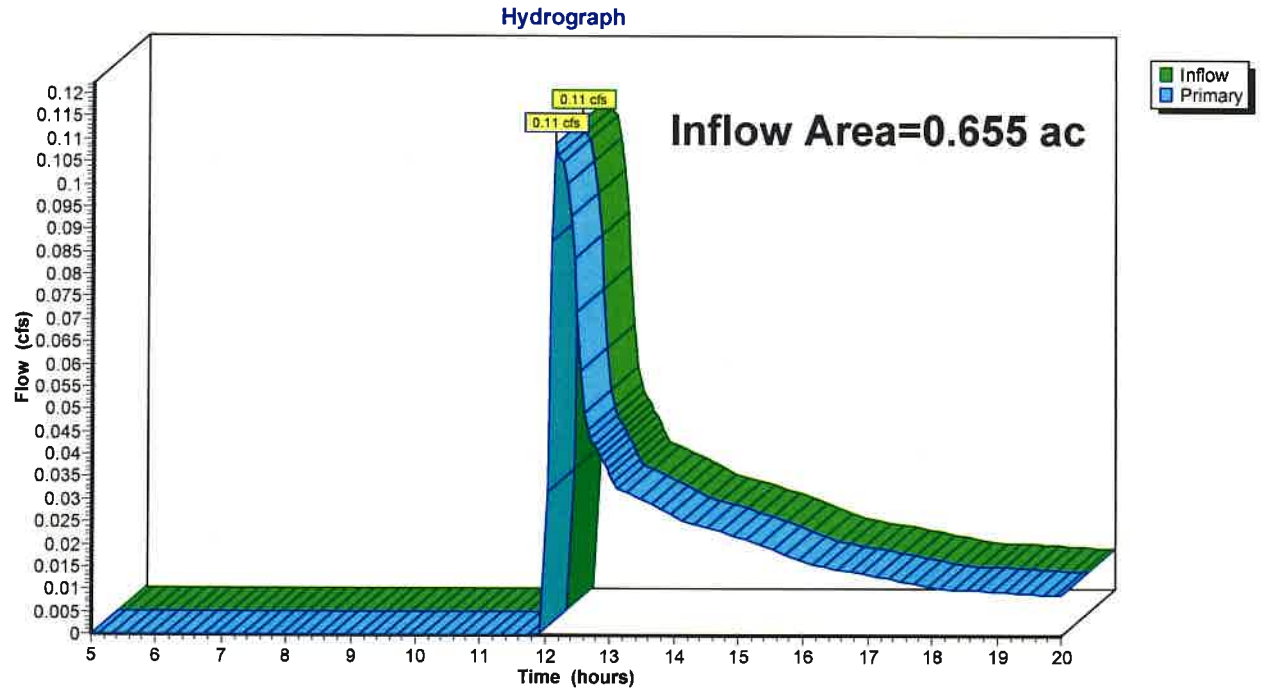


Summary for Pond 1P: Offsite

Inflow Area = 0.655 ac, 31.77% Impervious, Inflow Depth > 0.28" for 2-Year event
Inflow = 0.11 cfs @ 12.15 hrs, Volume= 0.015 af
Primary = 0.11 cfs @ 12.15 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Existing Site

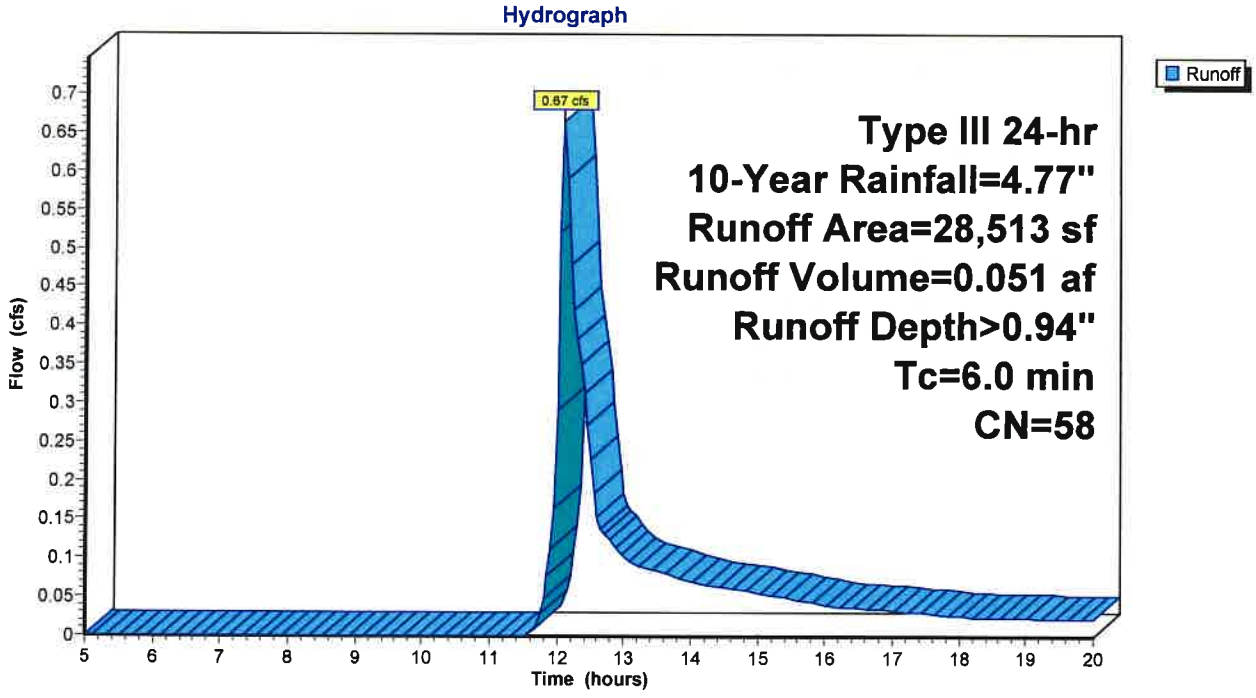
Runoff = 0.67 cfs @ 12.11 hrs, Volume= 0.051 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
	19,454	39	>75% Grass cover, Good, HSG A
*	2,382	98	Exist. Drive
*	209	98	Exist. Foundation
*	4,764	98	Exist. Walks & Patios
*	1,704	98	Existing Buildings
	28,513	58	Weighted Average
	19,454		68.23% Pervious Area
	9,059		31.77% Impervious Area

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

Subcatchment 1: Existing Site

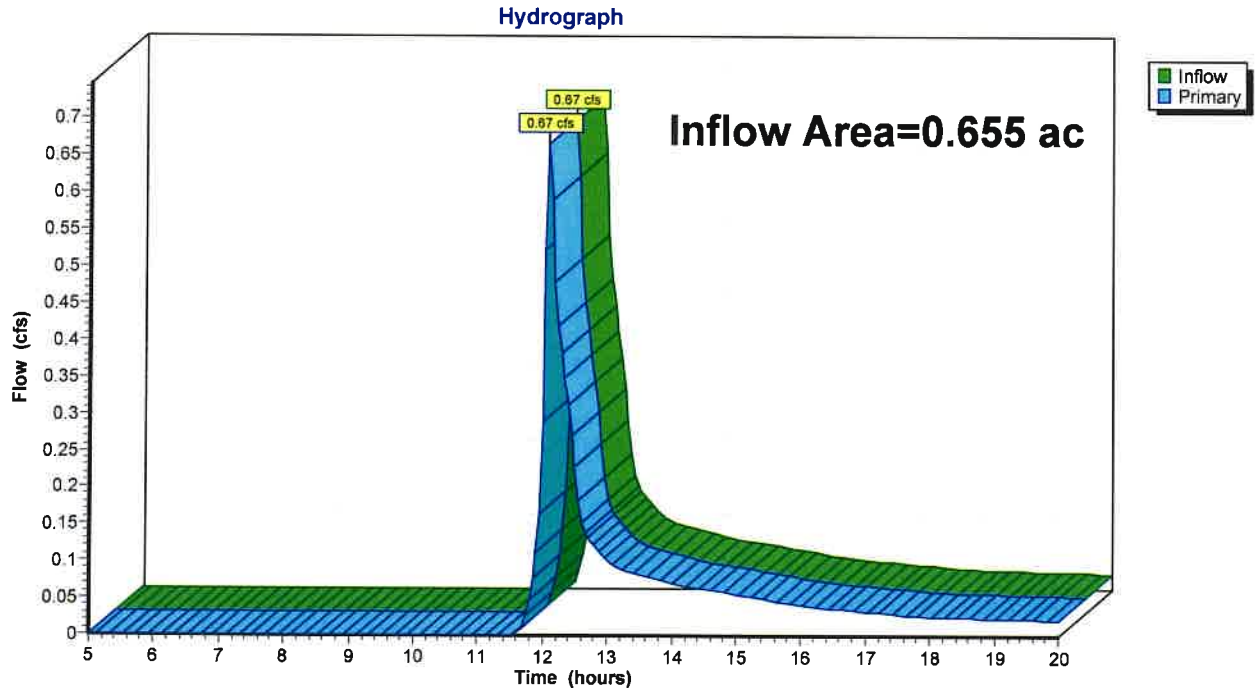


Summary for Pond 1P: Offsite

Inflow Area = 0.655 ac, 31.77% Impervious, Inflow Depth > 0.94" for 10-Year event
Inflow = 0.67 cfs @ 12.11 hrs, Volume= 0.051 af
Primary = 0.67 cfs @ 12.11 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Existing Site

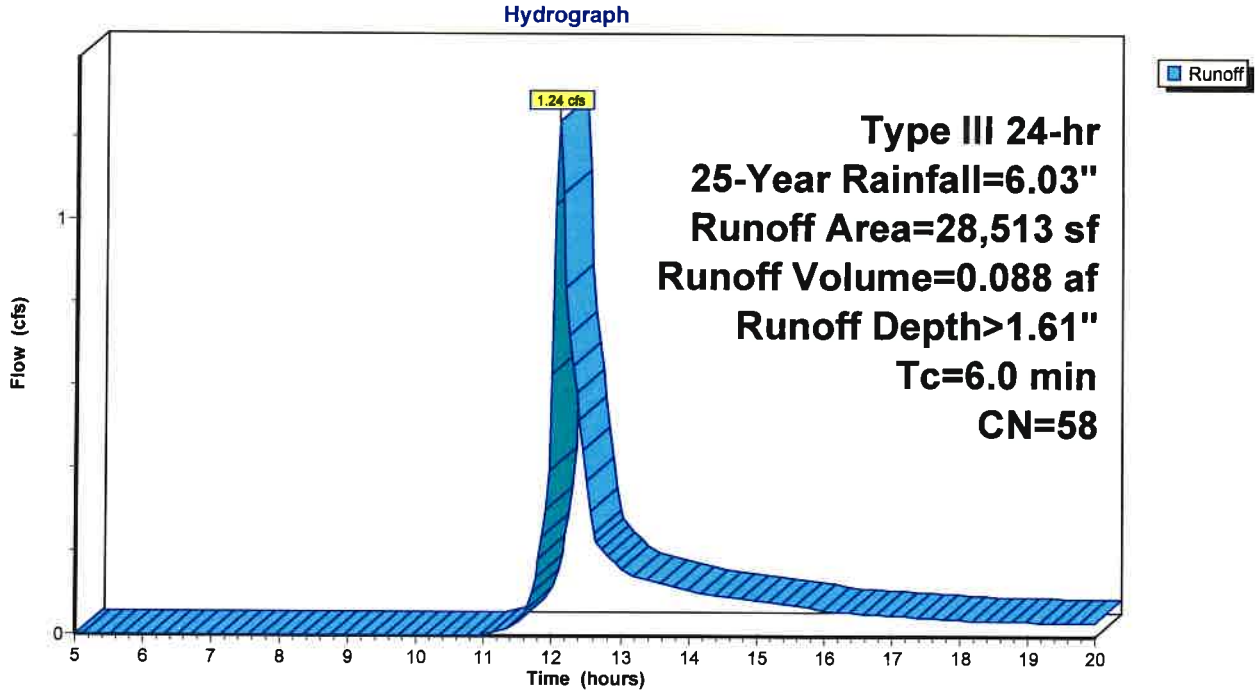
Runoff = 1.24 cfs @ 12.10 hrs, Volume= 0.088 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
	19,454	39	>75% Grass cover, Good, HSG A
*	2,382	98	Exist. Drive
*	209	98	Exist. Foundation
*	4,764	98	Exist. Walks & Patios
*	1,704	98	Existing Buildings
	28,513	58	Weighted Average
	19,454		68.23% Pervious Area
	9,059		31.77% Impervious Area

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

Subcatchment 1: Existing Site

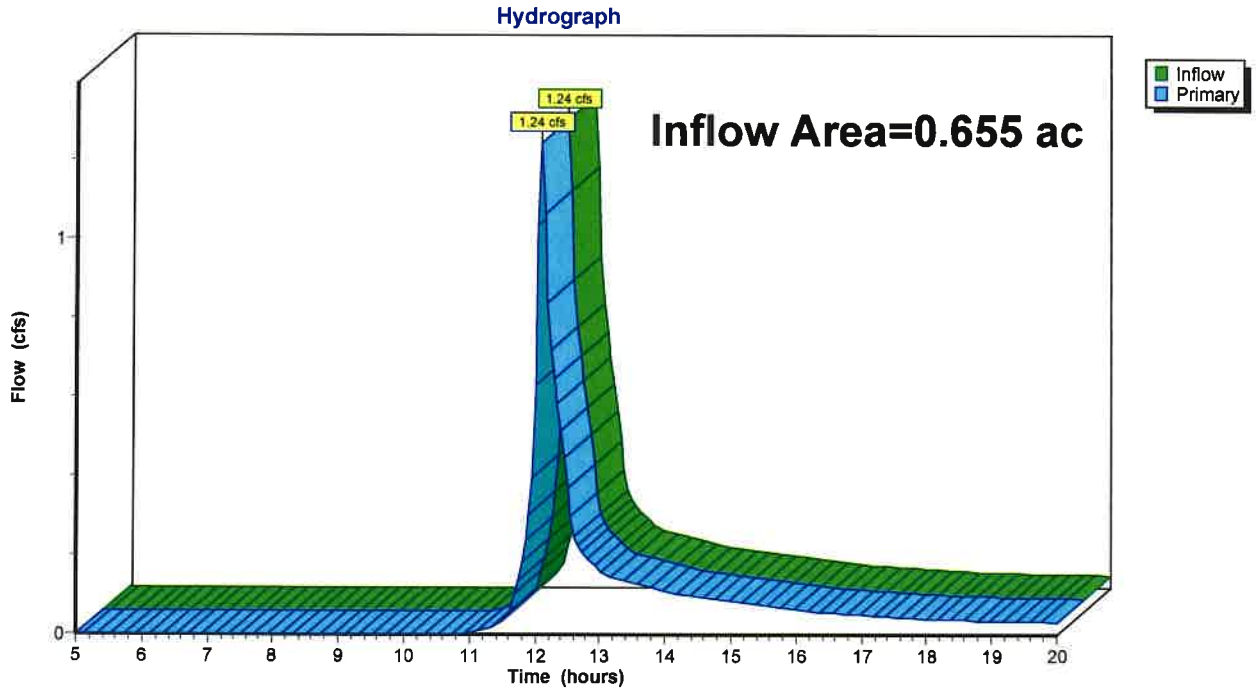


Summary for Pond 1P: Offsite

Inflow Area = 0.655 ac, 31.77% Impervious, Inflow Depth > 1.61" for 25-Year event
Inflow = 1.24 cfs @ 12.10 hrs, Volume= 0.088 af
Primary = 1.24 cfs @ 12.10 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Existing Site

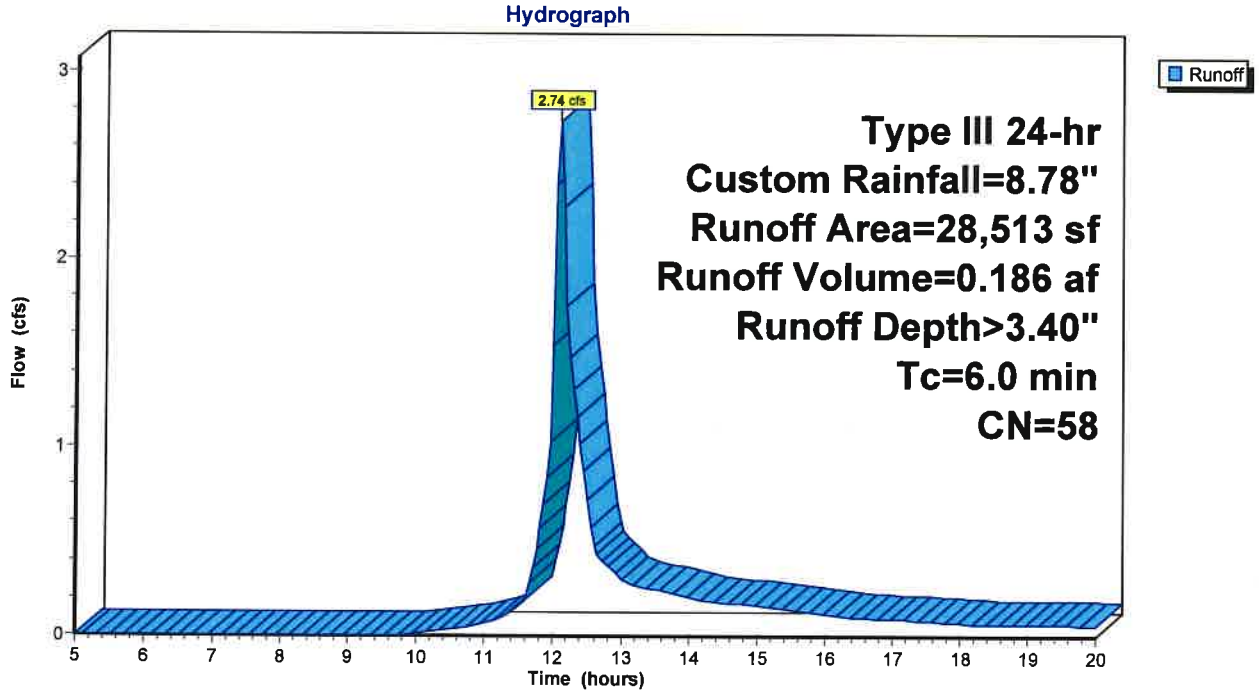
Runoff = 2.74 cfs @ 12.10 hrs, Volume= 0.186 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=8.78"

	Area (sf)	CN	Description
	19,454	39	>75% Grass cover, Good, HSG A
*	2,382	98	Exist. Drive
*	209	98	Exist. Foundation
*	4,764	98	Exist. Walks & Patios
*	1,704	98	Existing Buildings
	28,513	58	Weighted Average
	19,454		68.23% Pervious Area
	9,059		31.77% Impervious Area

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

Subcatchment 1: Existing Site

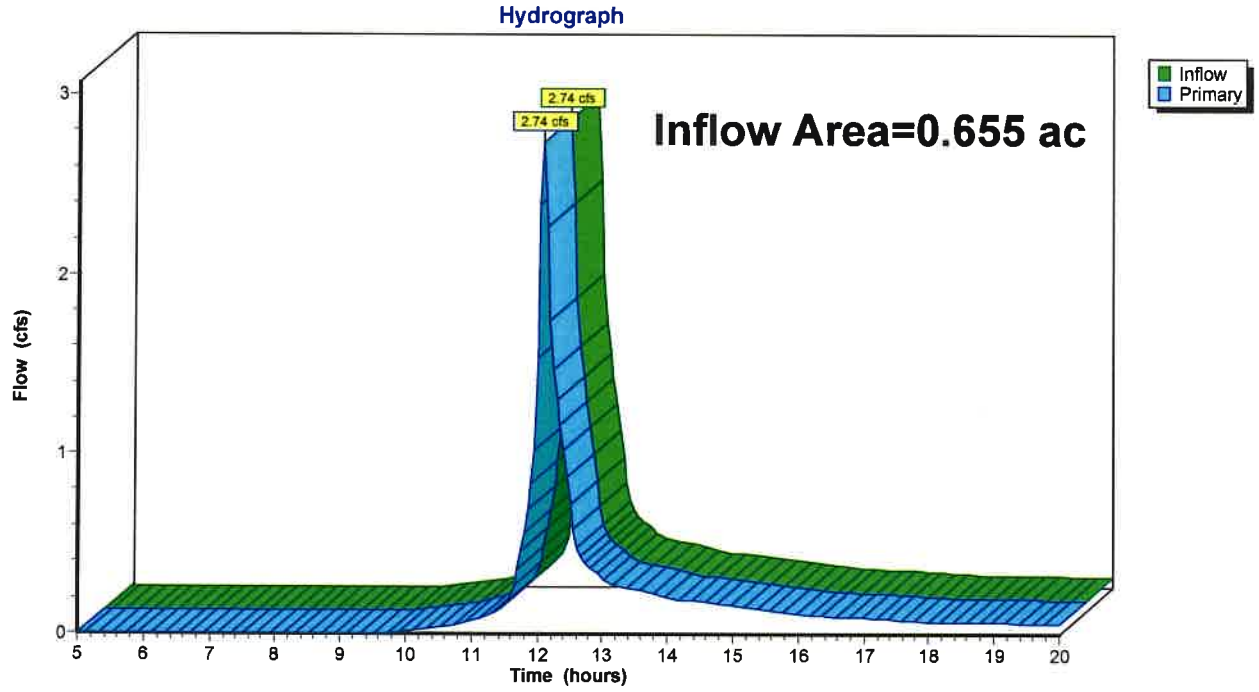


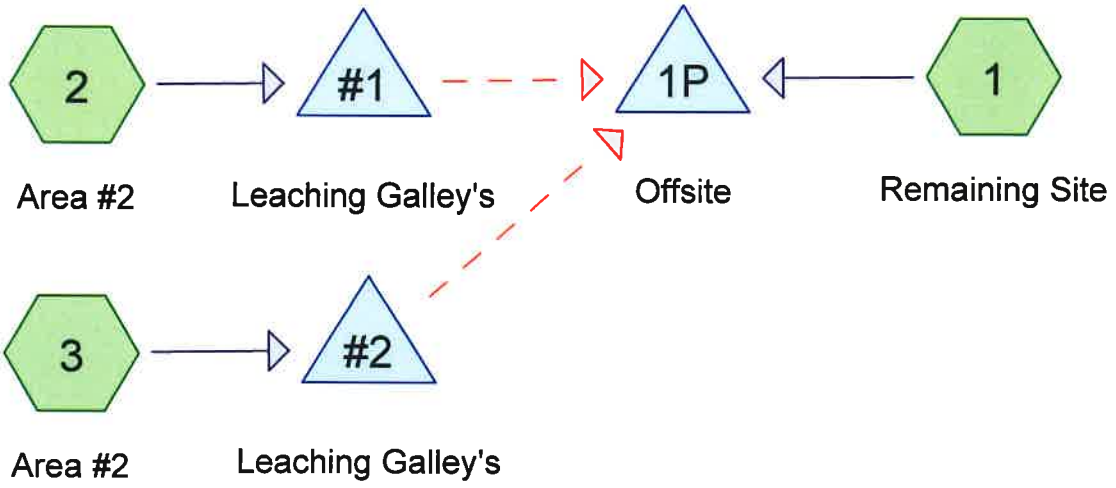
Summary for Pond 1P: Offsite

Inflow Area = 0.655 ac, 31.77% Impervious, Inflow Depth > 3.40" for Custom event
Inflow = 2.74 cfs @ 12.10 hrs, Volume= 0.186 af
Primary = 2.74 cfs @ 12.10 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite





Subcat Reach Pond Link

Routing Diagram for 24 Wilson Circle - Proposed
Prepared by HP, Printed 8/30/2022

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.264	39	>75% Grass cover, Good, HSG A (1)
0.138	98	Prop. Building (2)
0.134	98	Prop. Driveway (2, 3)
0.027	98	Prop. Patios (1)
0.563	**70**	**TOTAL AREA**

Summary for Subcatchment 1: Remaining Site

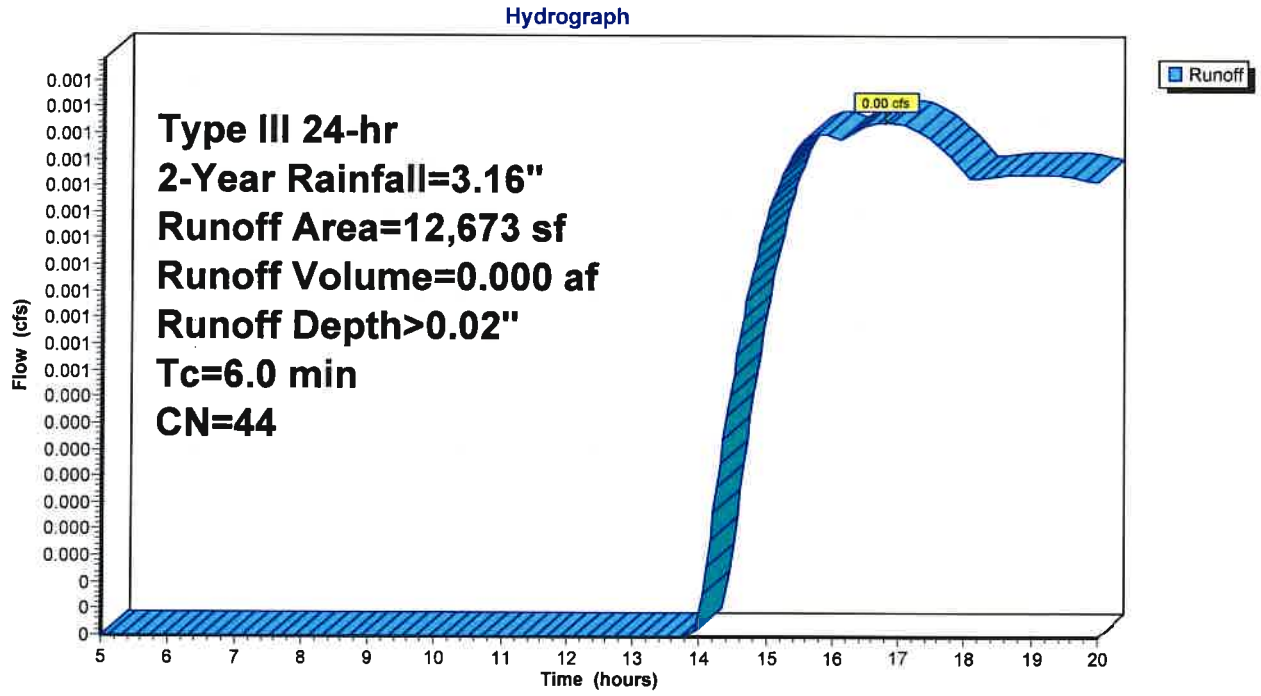
Runoff = 0.00 cfs @ 16.80 hrs, Volume= 0.000 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
	11,498	39	>75% Grass cover, Good, HSG A
*	1,175	98	Prop. Patios
	12,673	44	Weighted Average
	11,498		90.73% Pervious Area
	1,175		9.27% Impervious Area

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

Subcatchment 1: Remaining Site



Summary for Subcatchment 2: Area #2

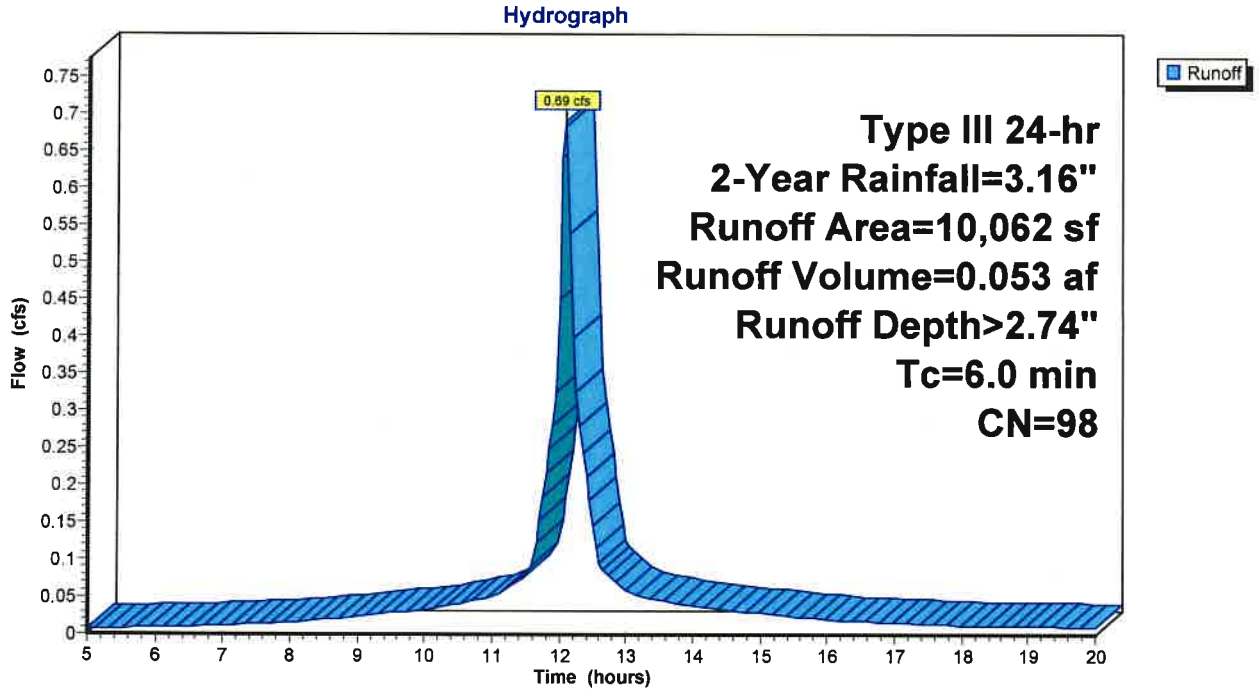
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.053 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	4,057	98	Prop. Driveway
*	6,005	98	Prop. Building
	10,062	98	Weighted Average
	10,062		100.00% Impervious Area

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

Subcatchment 2: Area #2



Summary for Subcatchment 3: Area #2

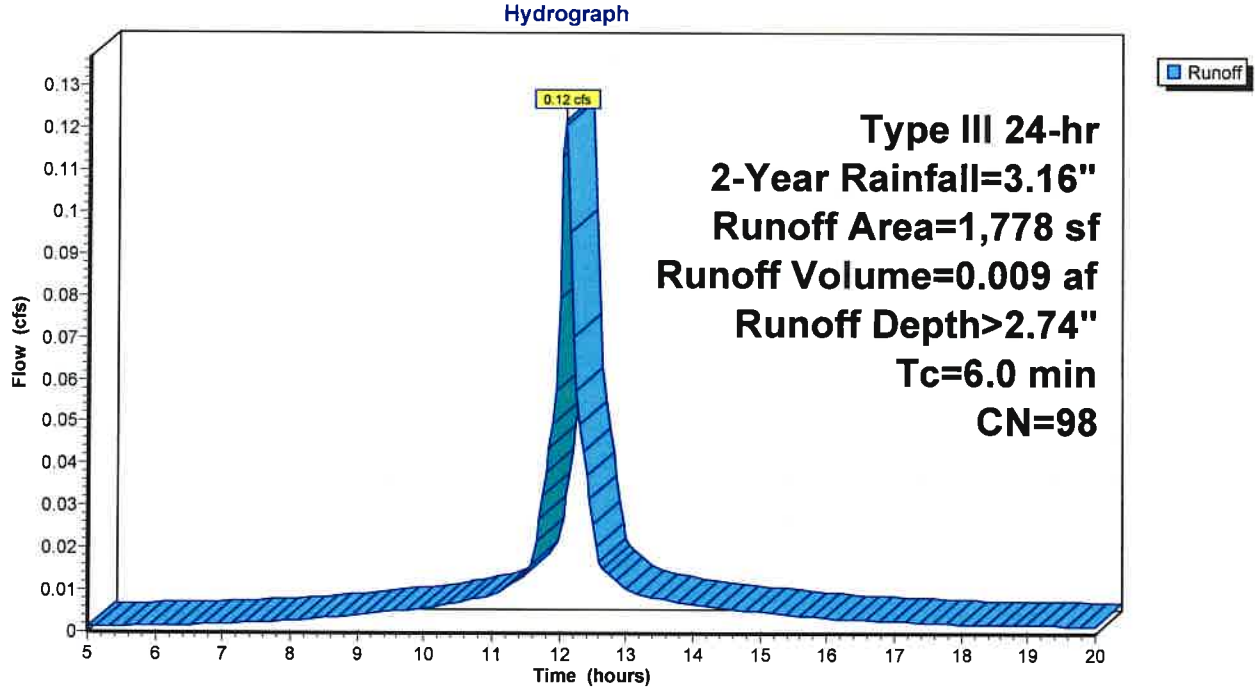
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	1,778	98	Prop. Driveway
	1,778		100.00% Impervious Area

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

Subcatchment 3: Area #2



Summary for Pond #1: Leaching Galley's

Inflow Area =	0.231 ac,100.00% Impervious,	Inflow Depth >	2.74"	for 2-Year event
Inflow =	0.69 cfs @	12.09 hrs, Volume=	0.053 af	
Outflow =	0.10 cfs @	11.65 hrs, Volume=	0.053 af,	Atten= 86%, Lag= 0.0 min
Discarded =	0.10 cfs @	11.65 hrs, Volume=	0.053 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 118.44' @ 12.60 hrs Surf.Area= 0.012 ac Storage= 0.016 af

Plug-Flow detention time= 46.3 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 45.7 min (784.4 - 738.7)

Volume	Invert	Avail.Storage	Storage Description
#1	115.75'	0.014 af	**16.00'W x 32.00'L x 6.25'H Gravel**
			0.073 af Overall - 0.038 af Embedded = 0.036 af x 40.0% Voids
#2	117.75'	0.038 af	**4.00'W x 4.60'L x 4.25'H Leaching Galley**x 21 Inside #1
		0.052 af	Total Available Storage

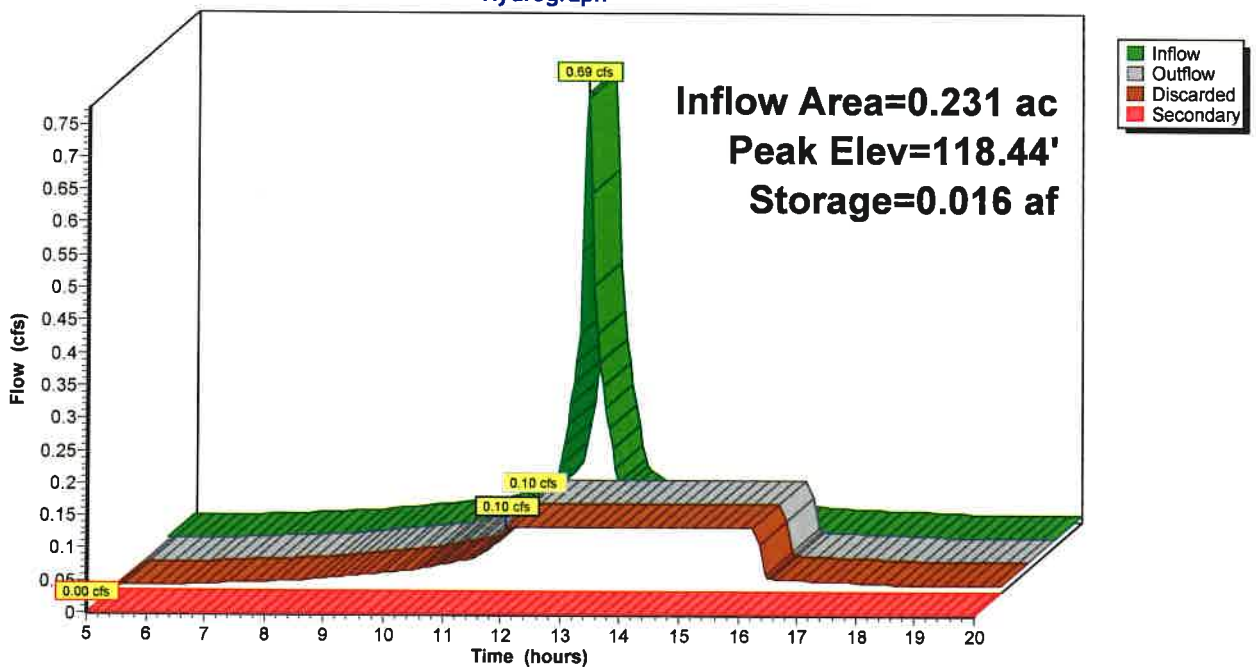
Device	Routing	Invert	Outlet Devices
#1	Discarded	115.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	121.00'	**6.0" Vert. Orifice** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 11.65 hrs HW=115.82' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=115.75' (Free Discharge)
↑—**2=Orifice** (Controls 0.00 cfs)

Pond #1: Leaching Galley's

Hydrograph



Summary for Pond #2: Leaching Galley's

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth > 2.74" for 2-Year event
Inflow = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.04 cfs @ 11.80 hrs, Volume= 0.009 af, Atten= 71%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.80 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 111.77' @ 12.42 hrs Surf.Area= 0.004 ac Storage= 0.002 af

Plug-Flow detention time= 10.3 min calculated for 0.009 af (100% of inflow)
Center-of-Mass det. time= 10.1 min (748.8 - 738.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	111.00'	0.004 af	**5.92'W x 31.00'L x 3.21'H Field A** 0.014 af Overall - 0.004 af Embedded = 0.009 af x 40.0% Voids
#2A	111.50'	0.004 af	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 1 rows
		0.008 af	Total Available Storage

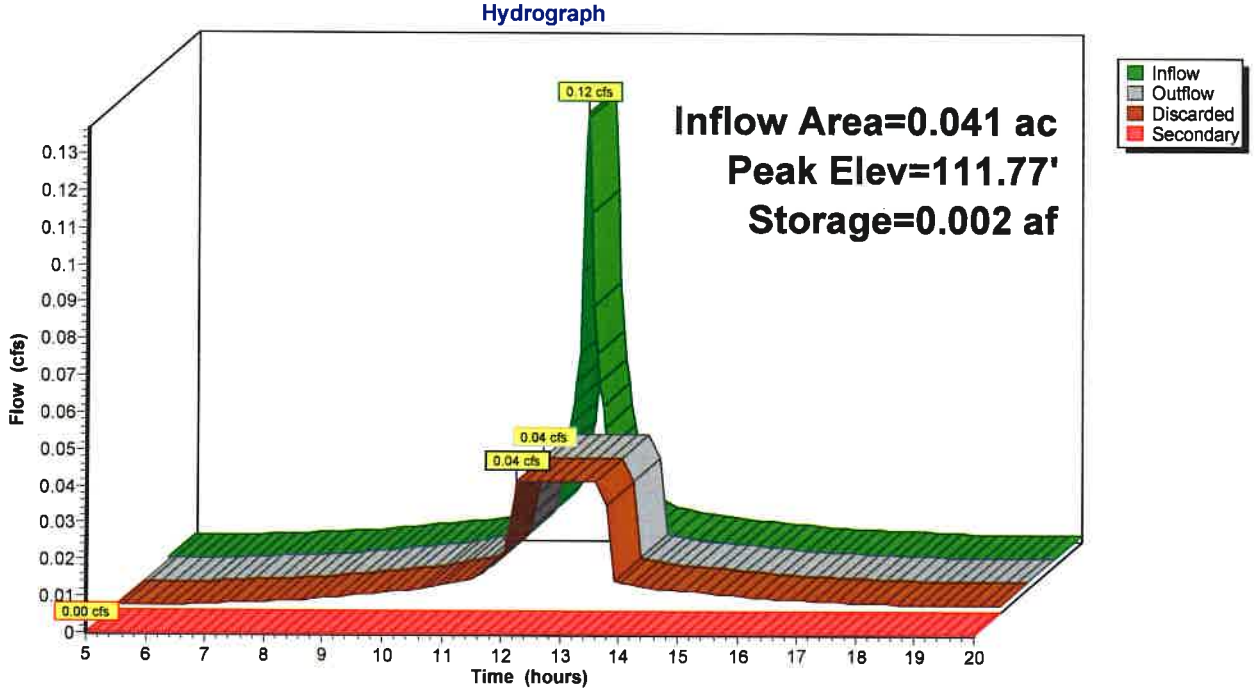
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	111.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	113.21'	**6.0" Vert. Inlet** C= 0.600

Discarded OutFlow Max=0.04 cfs @ 11.80 hrs HW=111.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=111.00' (Free Discharge)
↑—**2=Inlet** (Controls 0.00 cfs)

Pond #2: Leaching Galley's

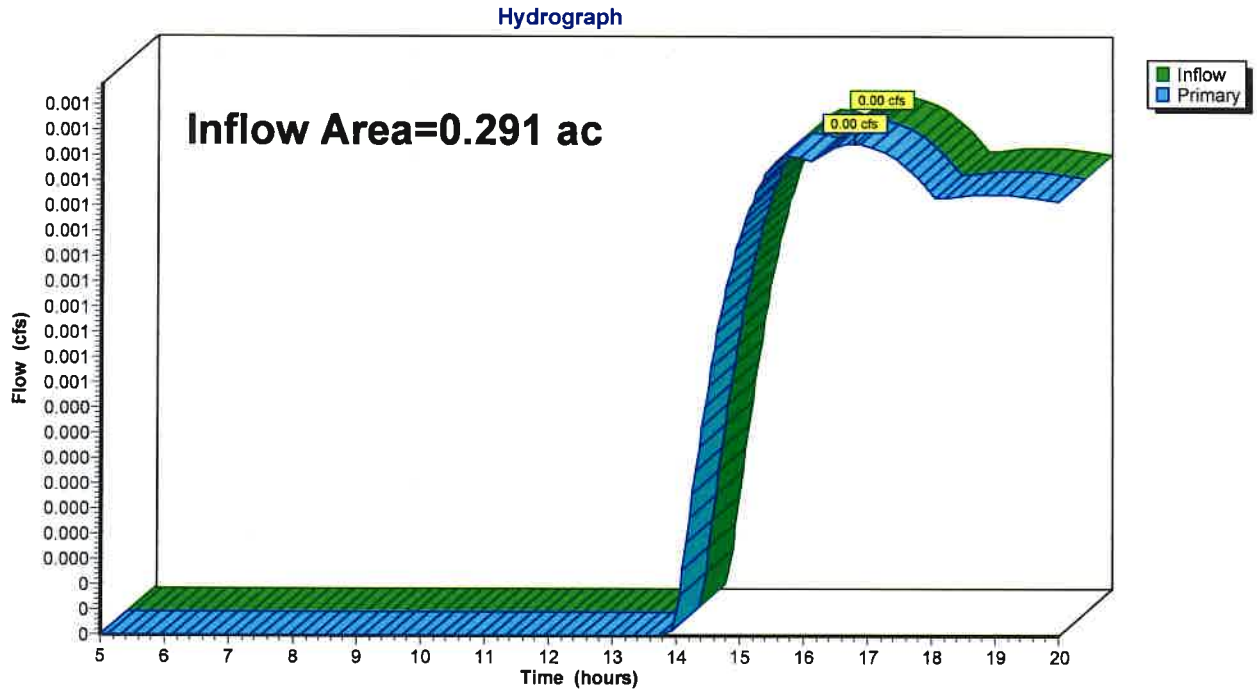


Summary for Pond 1P: Offsite

Inflow Area = 0.291 ac, 9.27% Impervious, Inflow Depth > 0.02" for 2-Year event
Inflow = 0.00 cfs @ 16.80 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 16.80 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Remaining Site

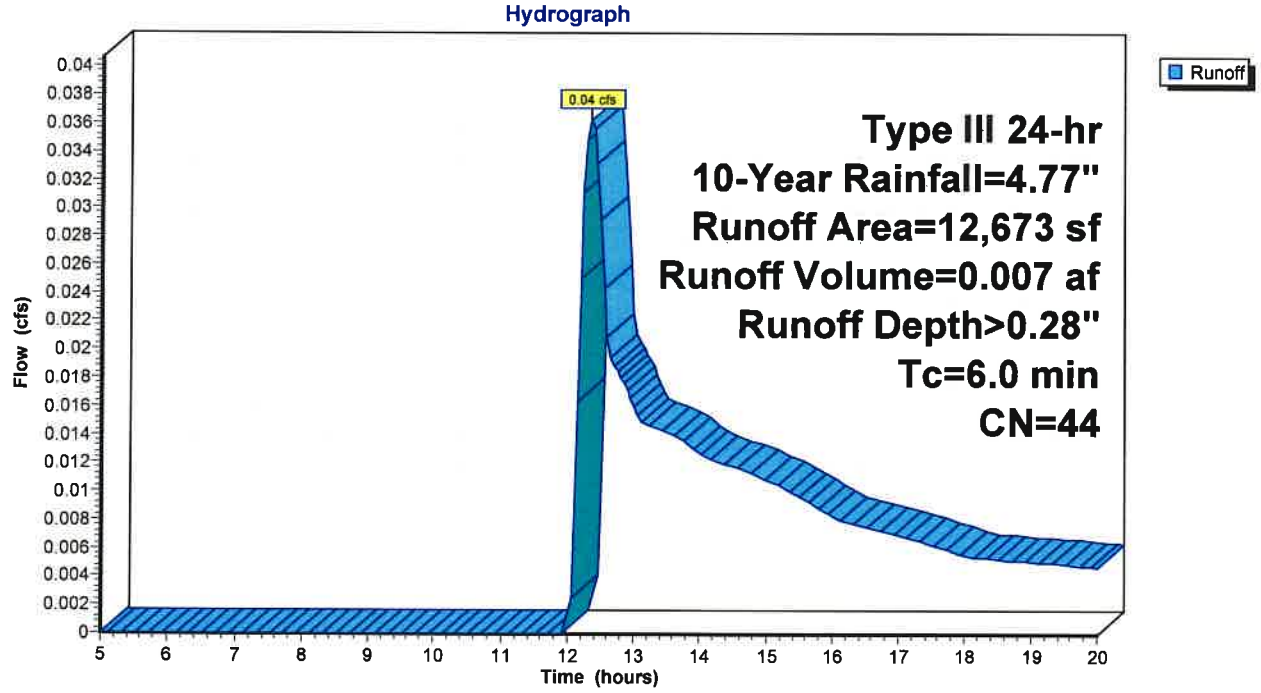
Runoff = 0.04 cfs @ 12.36 hrs, Volume= 0.007 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
	11,498	39	>75% Grass cover, Good, HSG A
*	1,175	98	Prop. Patios
	12,673	44	Weighted Average
	11,498		90.73% Pervious Area
	1,175		9.27% Impervious Area

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

Subcatchment 1: Remaining Site



Summary for Subcatchment 2: Area #2

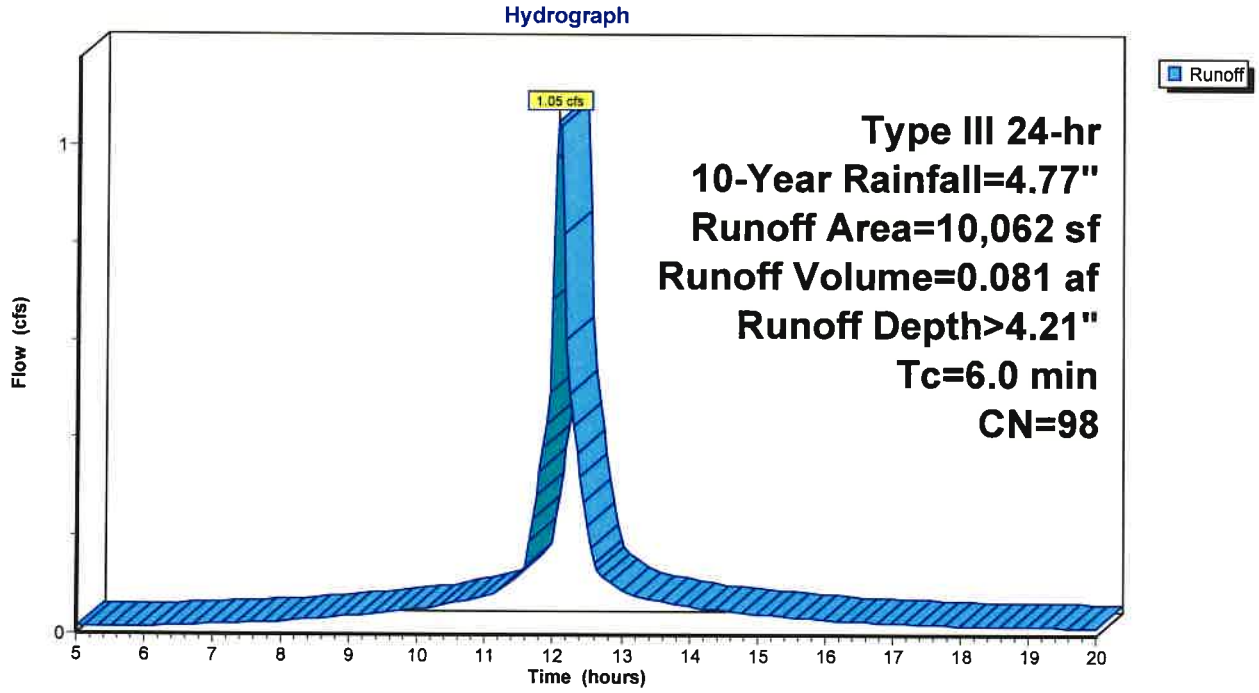
Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.081 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	4,057	98	Prop. Driveway
*	6,005	98	Prop. Building
	10,062	98	Weighted Average
	10,062		100.00% Impervious Area

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

Subcatchment 2: Area #2



Summary for Subcatchment 3: Area #2

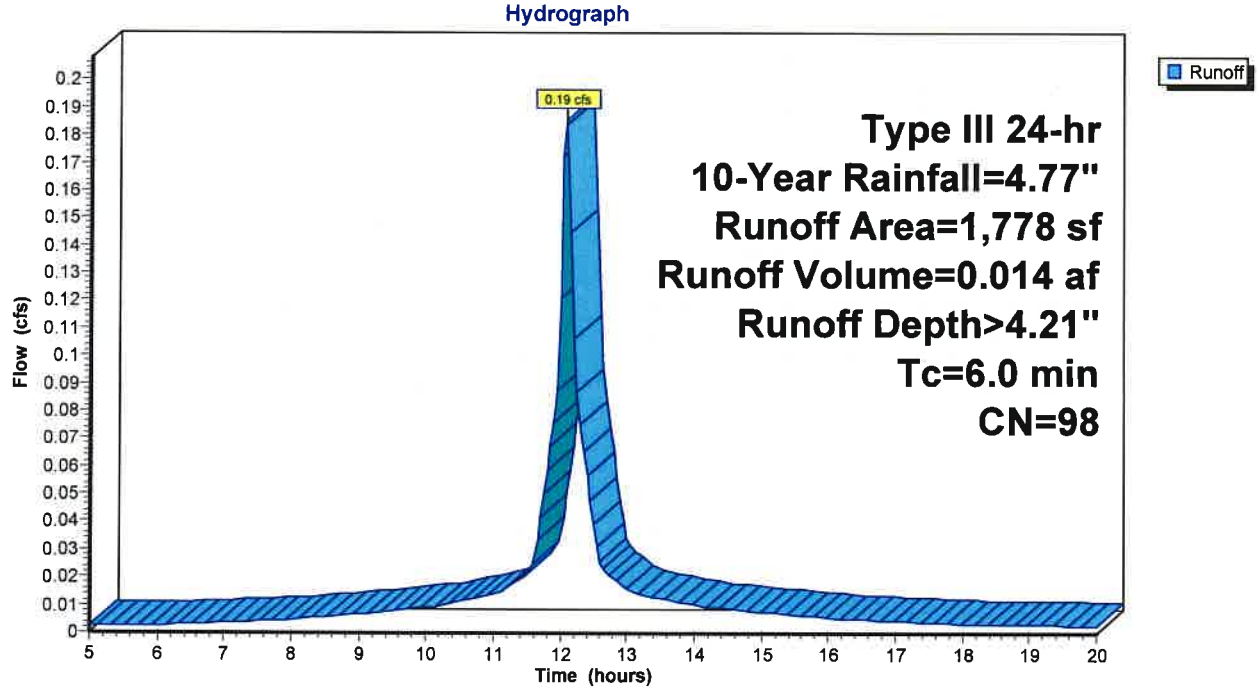
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	1,778	98	Prop. Driveway
	1,778		100.00% Impervious Area

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

Subcatchment 3: Area #2



Summary for Pond #1: Leaching Galley's

Inflow Area =	0.231 ac,100.00% Impervious,	Inflow Depth >	4.21"	for 10-Year event
Inflow =	1.05 cfs @	12.09 hrs, Volume=	0.081 af	
Outflow =	0.10 cfs @	11.35 hrs, Volume=	0.081 af,	Atten= 91%, Lag= 0.0 min
Discarded =	0.10 cfs @	11.35 hrs, Volume=	0.081 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 119.79' @ 12.92 hrs Surf.Area= 0.012 ac Storage= 0.030 af

Plug-Flow detention time= 97.5 min calculated for 0.081 af (100% of inflow)
Center-of-Mass det. time= 97.1 min (832.5 - 735.4)

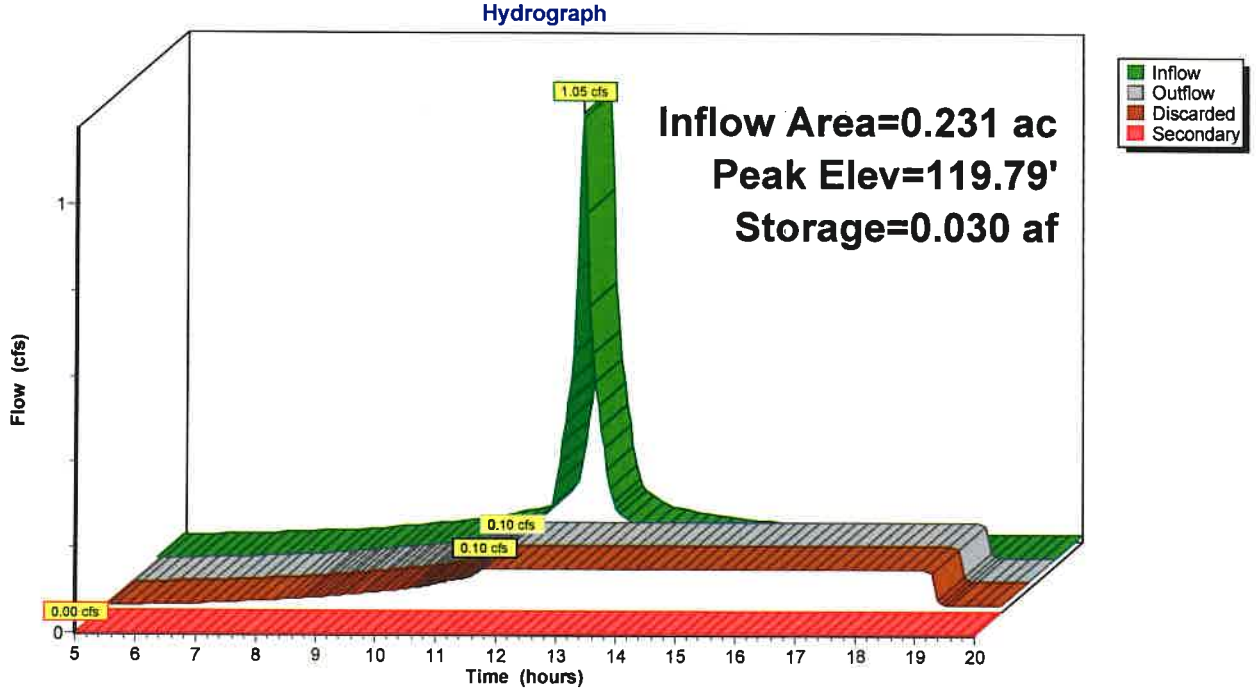
Volume	Invert	Avail.Storage	Storage Description
#1	115.75'	0.014 af	**16.00'W x 32.00'L x 6.25'H Gravel**
			0.073 af Overall - 0.038 af Embedded = 0.036 af x 40.0% Voids
#2	117.75'	0.038 af	**4.00'W x 4.60'L x 4.25'H Leaching Galley**x 21 Inside #1
		0.052 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	115.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	121.00'	**6.0" Vert. Orifice** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 11.35 hrs HW=115.82' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=115.75' (Free Discharge)
↑**2=Orifice** (Controls 0.00 cfs)

Pond #1: Leaching Galley's



Summary for Pond #2: Leaching Galley's

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth > 4.21" for 10-Year event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.04 cfs @ 11.70 hrs, Volume= 0.014 af, Atten= 81%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.70 hrs, Volume= 0.014 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 112.41' @ 12.53 hrs Surf.Area= 0.004 ac Storage= 0.004 af

Plug-Flow detention time= 25.4 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 25.1 min (760.5 - 735.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	111.00'	0.004 af	**5.92'W x 31.00'L x 3.21'H Field A** 0.014 af Overall - 0.004 af Embedded = 0.009 af x 40.0% Voids
#2A	111.50'	0.004 af	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 1 rows
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

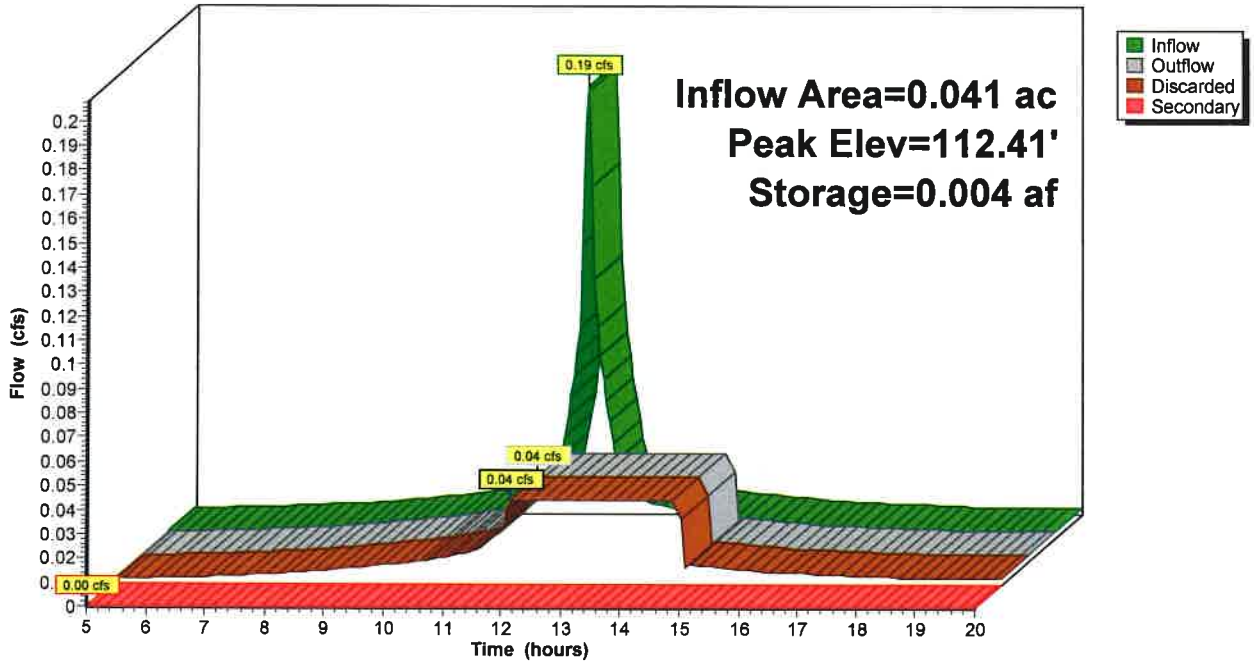
Device	Routing	Invert	Outlet Devices
#1	Discarded	111.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	113.21'	**6.0" Vert. Inlet** C= 0.600

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=111.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=111.00' (Free Discharge)
↑—**2=Inlet** (Controls 0.00 cfs)

Pond #2: Leaching Galley's

Hydrograph

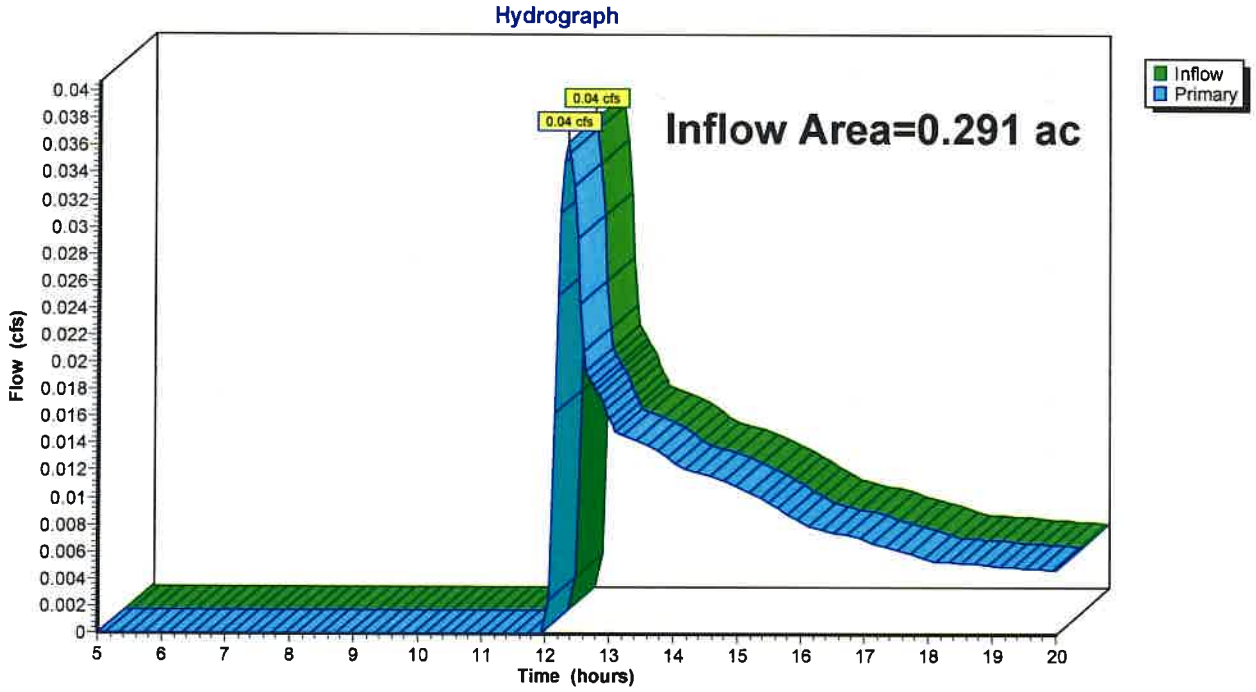


Summary for Pond 1P: Offsite

Inflow Area = 0.291 ac, 9.27% Impervious, Inflow Depth > 0.28" for 10-Year event
Inflow = 0.04 cfs @ 12.36 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 12.36 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Remaining Site

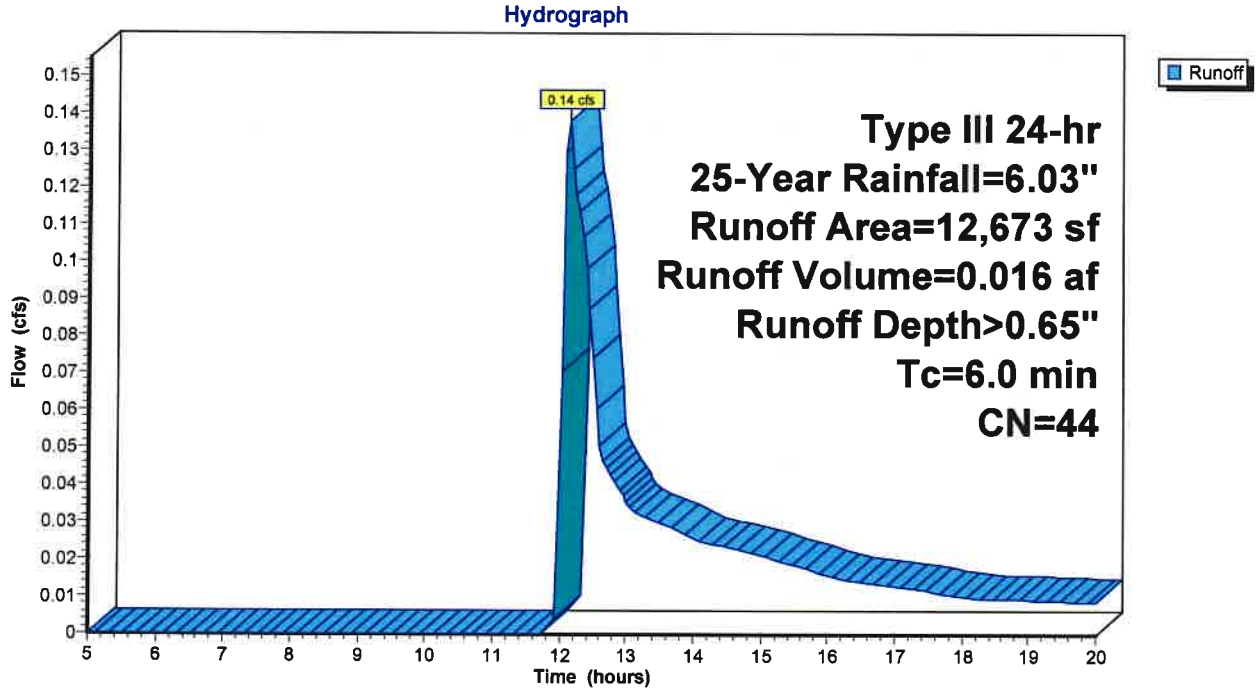
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 0.016 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
	11,498	39	>75% Grass cover, Good, HSG A
*	1,175	98	Prop. Patios
	12,673	44	Weighted Average
	11,498		90.73% Pervious Area
	1,175		9.27% Impervious Area

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

Subcatchment 1: Remaining Site



Summary for Subcatchment 2: Area #2

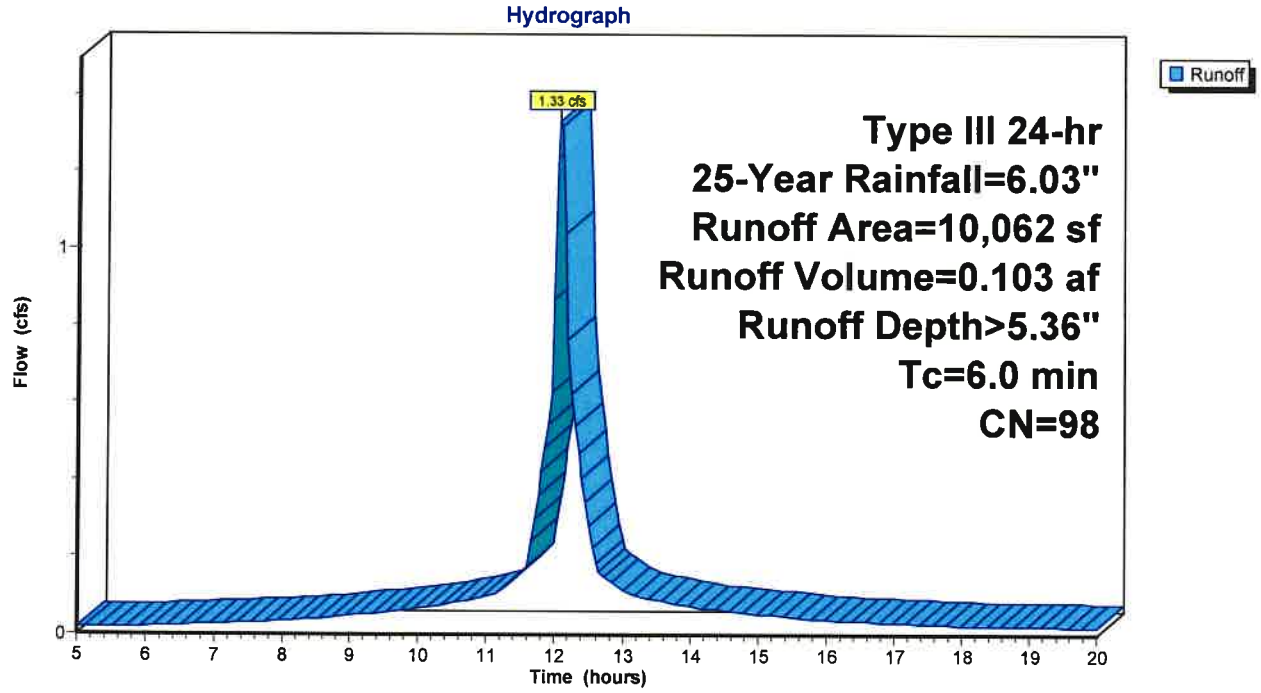
Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.103 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	4,057	98	Prop. Driveway
*	6,005	98	Prop. Building
	10,062	98	Weighted Average
	10,062		100.00% Impervious Area

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

Subcatchment 2: Area #2



Summary for Subcatchment 3: Area #2

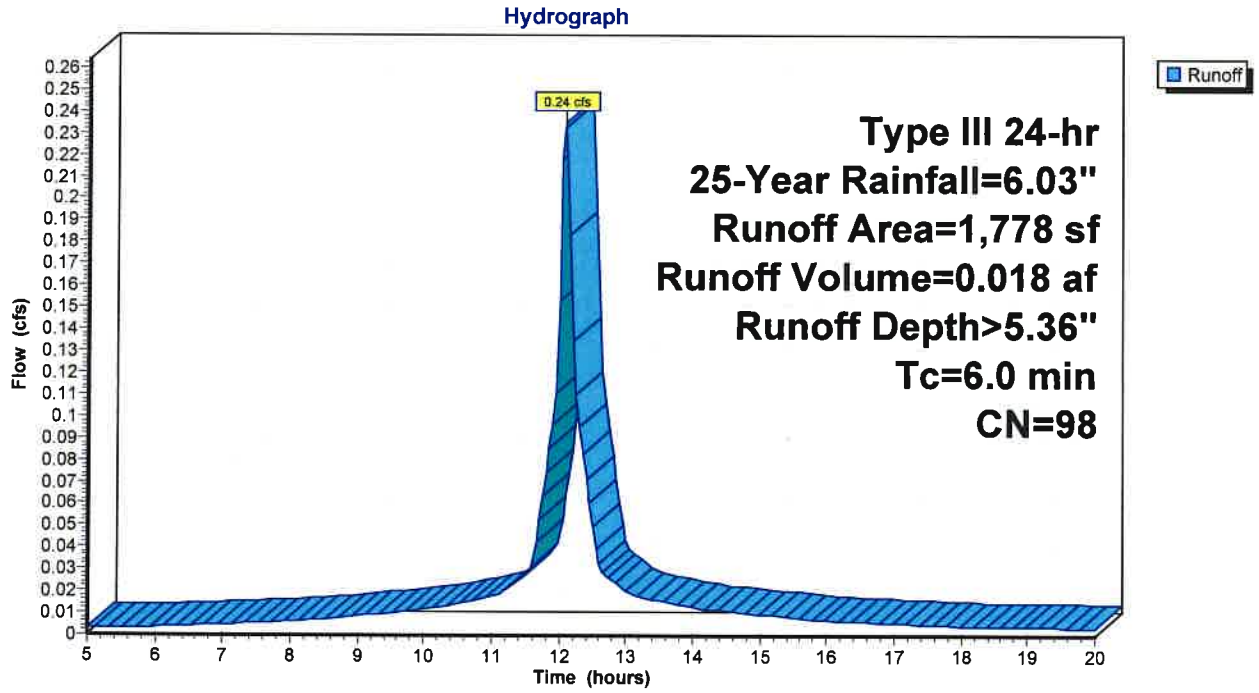
Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	1,778	98	Prop. Driveway
	1,778		100.00% Impervious Area

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

Subcatchment 3: Area #2



Summary for Pond #1: Leaching Galley's

Inflow Area = 0.231 ac,100.00% Impervious, Inflow Depth > 5.36" for 25-Year event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 0.10 cfs @ 11.05 hrs, Volume= 0.094 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.05 hrs, Volume= 0.094 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 120.99' @ 13.22 hrs Surf.Area= 0.012 ac Storage= 0.042 af

Plug-Flow detention time= 141.9 min calculated for 0.093 af (90% of inflow)
Center-of-Mass det. time= 109.7 min (843.8 - 734.1)

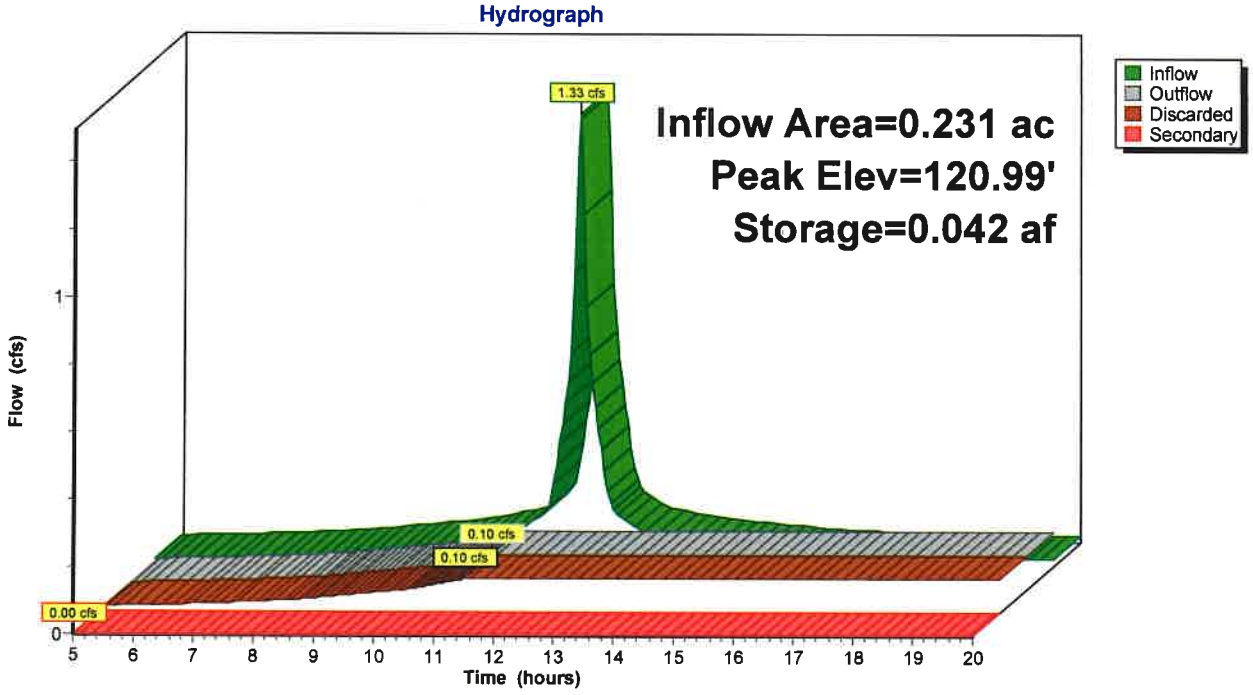
Volume	Invert	Avail.Storage	Storage Description
#1	115.75'	0.014 af	**16.00'W x 32.00'L x 6.25'H Gravel**
			0.073 af Overall - 0.038 af Embedded = 0.036 af x 40.0% Voids
#2	117.75'	0.038 af	**4.00'W x 4.60'L x 4.25'H Leaching Galley**x 21 Inside #1
		0.052 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	115.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	121.00'	**6.0" Vert. Orifice** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 11.05 hrs HW=115.81' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=115.75' (Free Discharge)
↑**2=Orifice** (Controls 0.00 cfs)

Pond #1: Leaching Galley's



Summary for Pond #2: Leaching Galley's

Inflow Area = 0.041 ac,100.00% Impervious, Inflow Depth > 5.36" for 25-Year event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.04 cfs @ 11.65 hrs, Volume= 0.018 af, Atten= 85%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.65 hrs, Volume= 0.018 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 113.00' @ 12.58 hrs Surf.Area= 0.004 ac Storage= 0.005 af

Plug-Flow detention time= 40.3 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 40.1 min (774.2 - 734.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	111.00'	0.004 af	**5.92'W x 31.00'L x 3.21'H Field A** 0.014 af Overall - 0.004 af Embedded = 0.009 af x 40.0% Voids
#2A	111.50'	0.004 af	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 1 rows
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

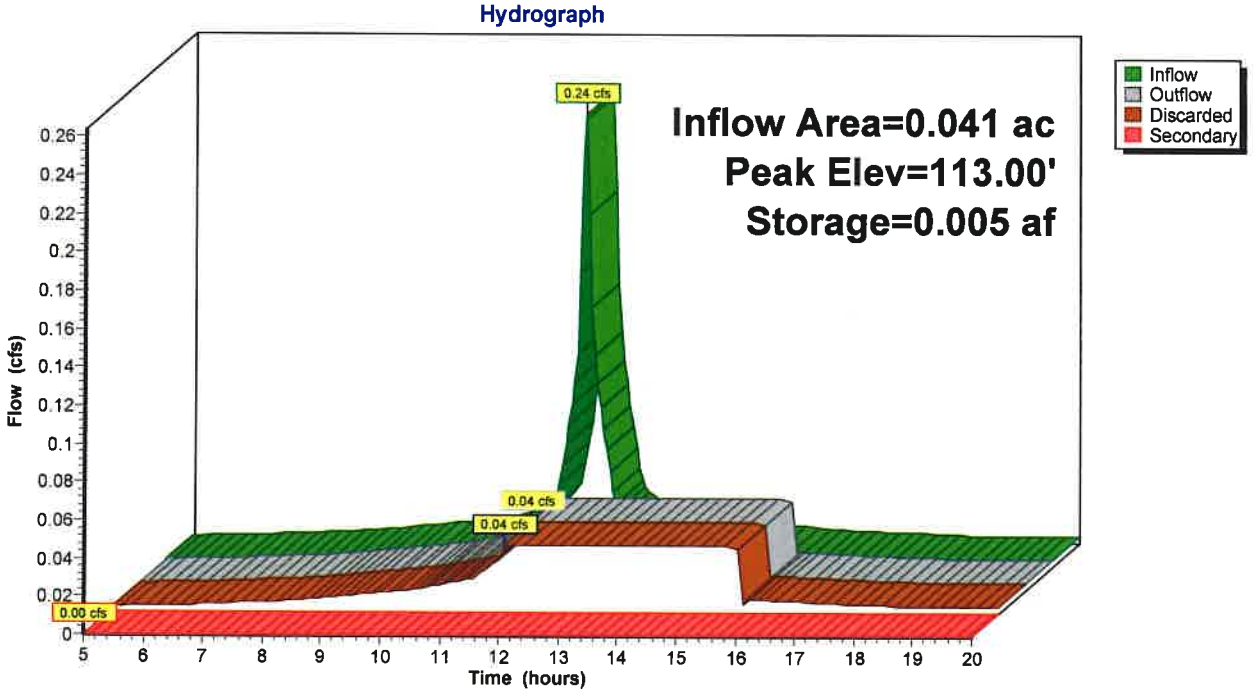
Device	Routing	Invert	Outlet Devices
#1	Discarded	111.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	113.21'	**6.0" Vert. Inlet** C= 0.600

Discarded OutFlow Max=0.04 cfs @ 11.65 hrs HW=111.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=111.00' (Free Discharge)
↑—**2=Inlet** (Controls 0.00 cfs)

Pond #2: Leaching Galley's

Hydrograph

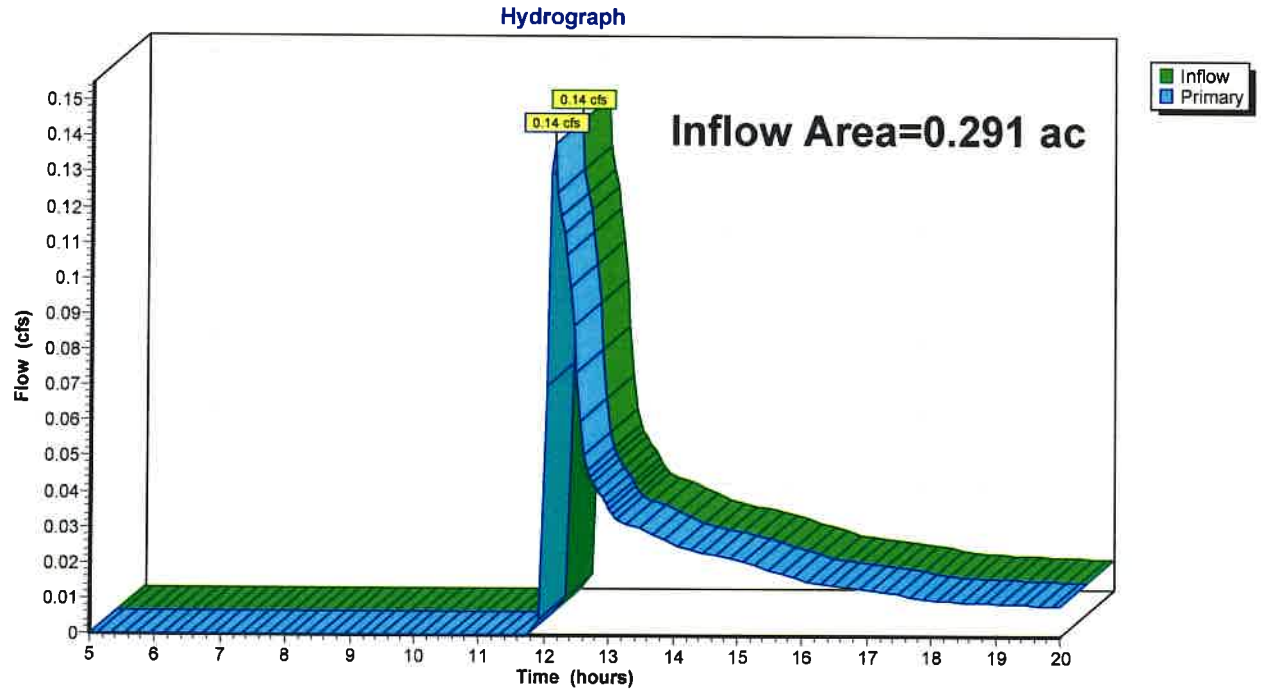


Summary for Pond 1P: Offsite

Inflow Area = 0.291 ac, 9.27% Impervious, Inflow Depth > 0.65" for 25-Year event
Inflow = 0.14 cfs @ 12.14 hrs, Volume= 0.016 af
Primary = 0.14 cfs @ 12.14 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



Summary for Subcatchment 1: Remaining Site

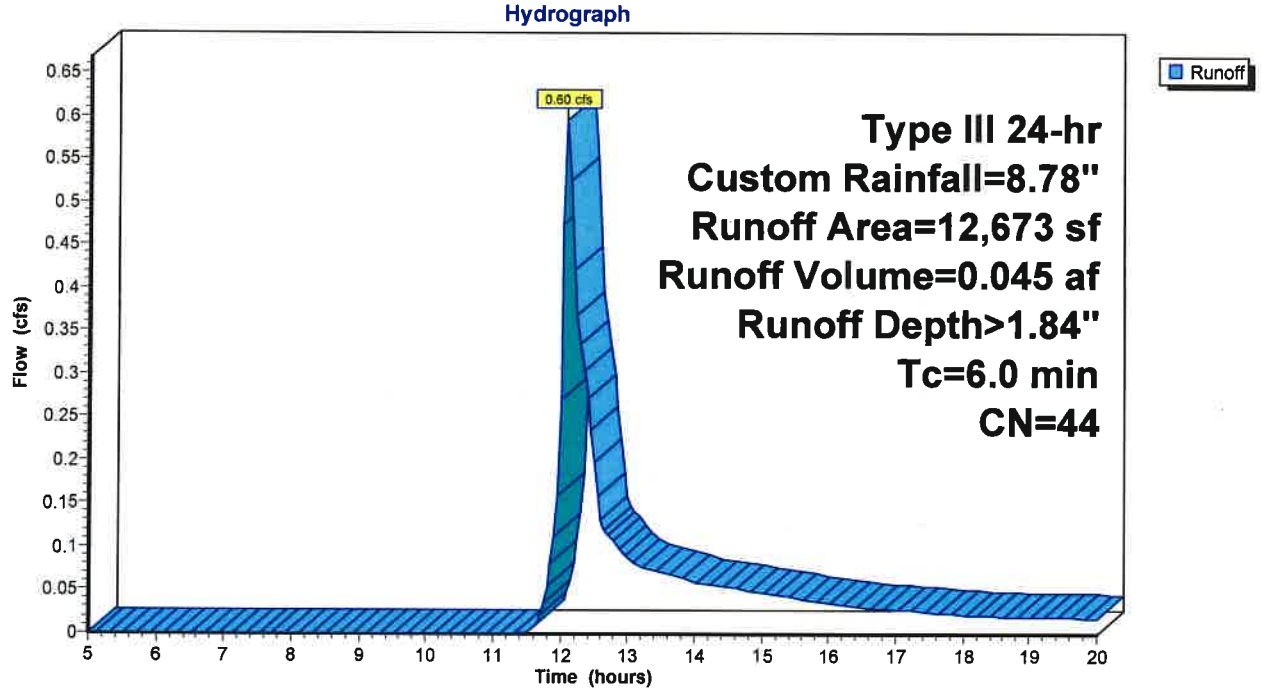
Runoff = 0.60 cfs @ 12.11 hrs, Volume= 0.045 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=8.78"

	Area (sf)	CN	Description
	11,498	39	>75% Grass cover, Good, HSG A
*	1,175	98	Prop. Patios
	12,673	44	Weighted Average
	11,498		90.73% Pervious Area
	1,175		9.27% Impervious Area

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

Subcatchment 1: Remaining Site



Summary for Subcatchment 2: Area #2

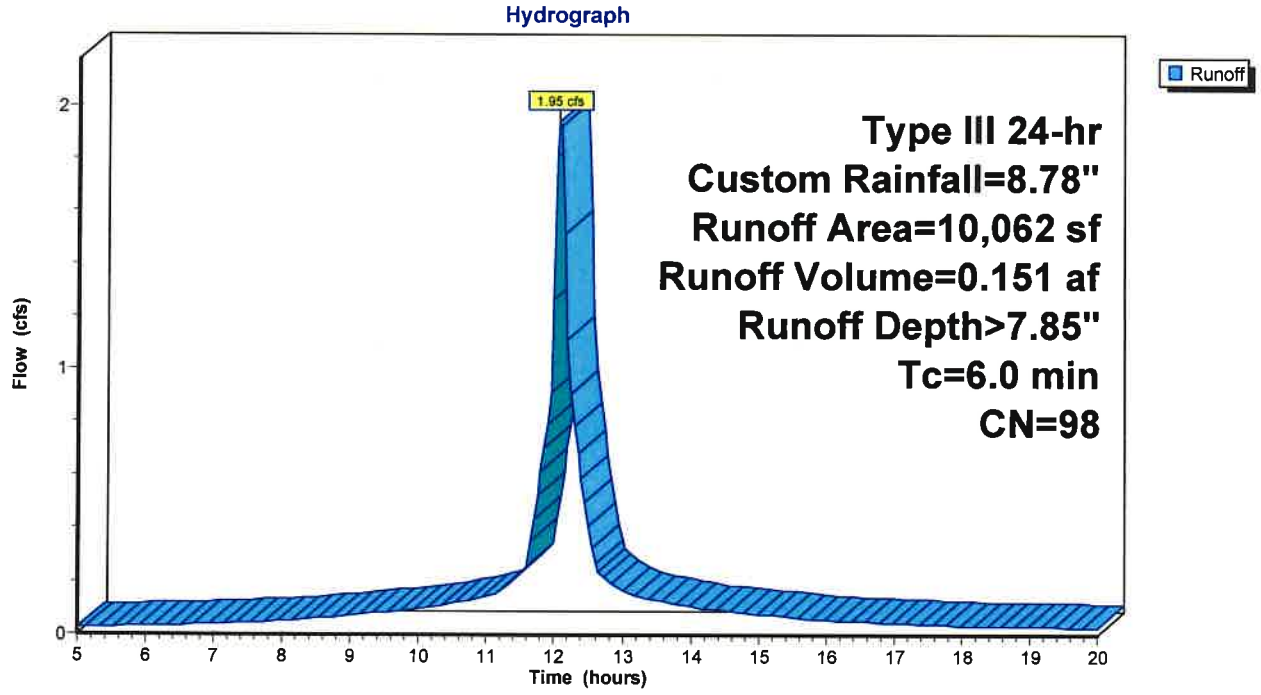
Runoff = 1.95 cfs @ 12.09 hrs, Volume= 0.151 af, Depth> 7.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=8.78"

	Area (sf)	CN	Description
*	4,057	98	Prop. Driveway
*	6,005	98	Prop. Building
	10,062	98	Weighted Average
	10,062		100.00% Impervious Area

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

Subcatchment 2: Area #2



Summary for Subcatchment 3: Area #2

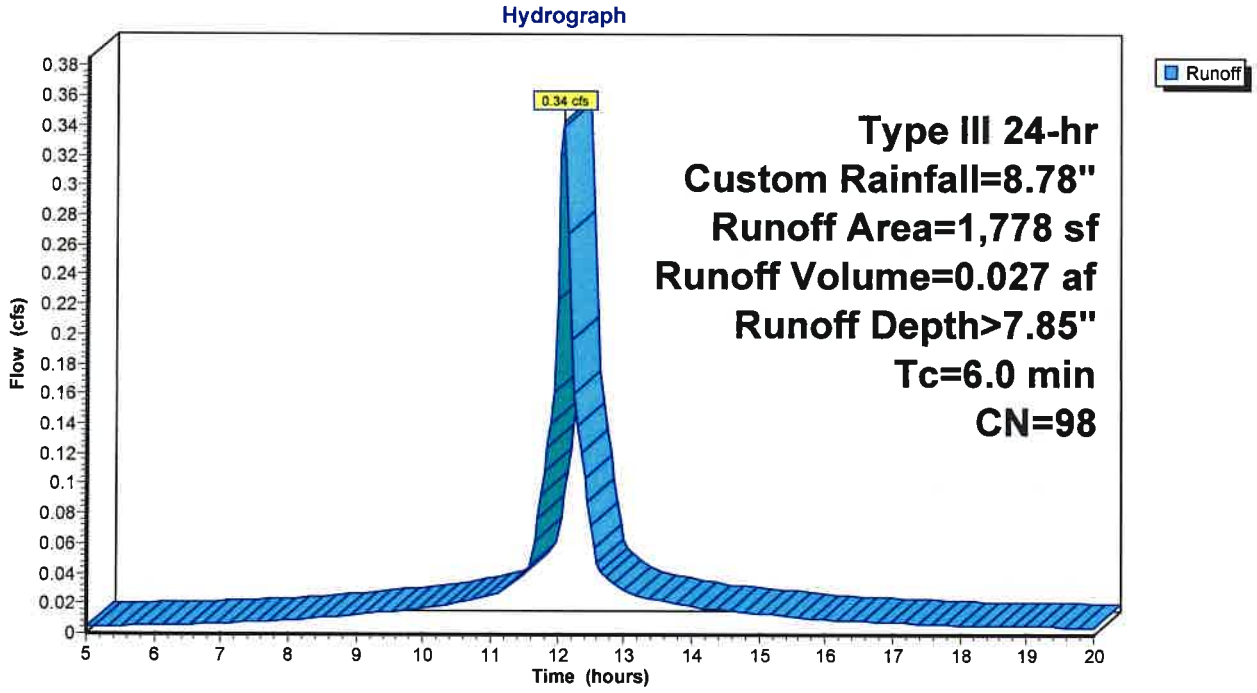
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 7.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=8.78"

	Area (sf)	CN	Description
*	1,778	98	Prop. Driveway
	1,778		100.00% Impervious Area

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

Subcatchment 3: Area #2



Summary for Pond #1: Leaching Galley's

Inflow Area =	0.231 ac,100.00% Impervious,	Inflow Depth >	7.85"	for Custom event
Inflow =	1.95 cfs @	12.09 hrs, Volume=	0.151 af	
Outflow =	0.77 cfs @	12.31 hrs, Volume=	0.132 af,	Atten= 61%, Lag= 13.6 min
Discarded =	0.10 cfs @	10.10 hrs, Volume=	0.102 af	
Secondary =	0.67 cfs @	12.31 hrs, Volume=	0.030 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 121.75' @ 12.31 hrs Surf.Area= 0.012 ac Storage= 0.050 af

Plug-Flow detention time= 109.5 min calculated for 0.132 af (88% of inflow)
Center-of-Mass det. time= 69.2 min (802.0 - 732.8)

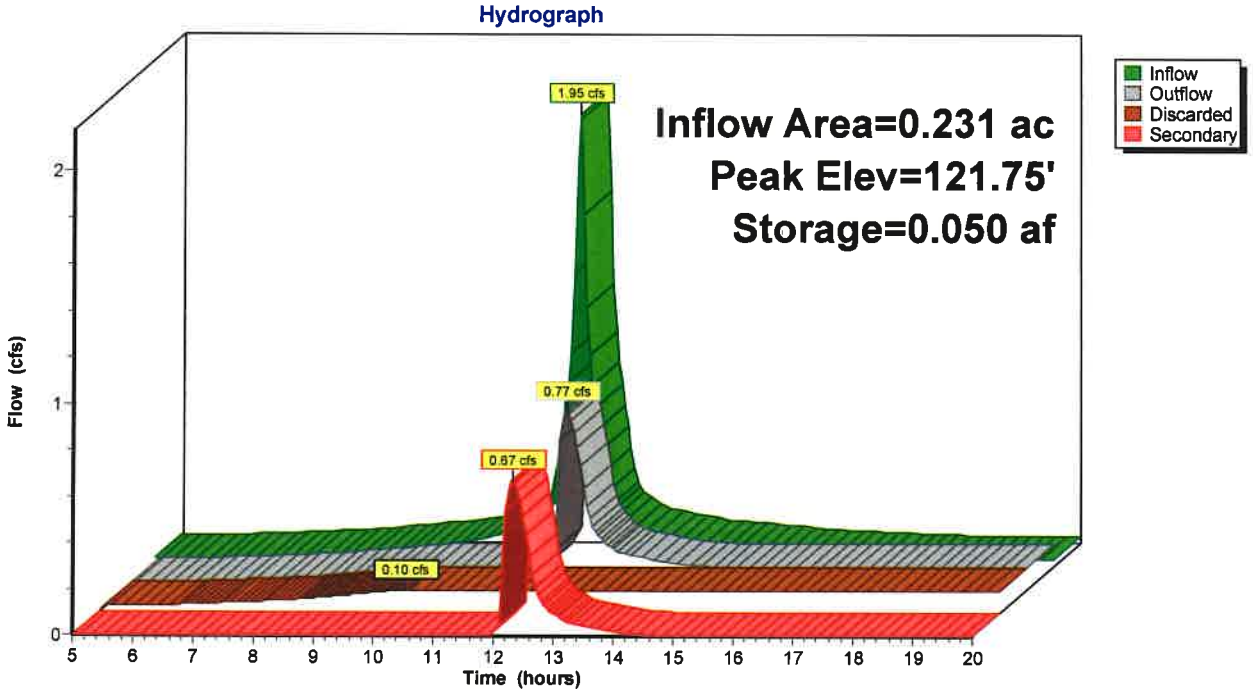
Volume	Invert	Avail.Storage	Storage Description
#1	115.75'	0.014 af	**16.00'W x 32.00'L x 6.25'H Gravel**
			0.073 af Overall - 0.038 af Embedded = 0.036 af x 40.0% Voids
#2	117.75'	0.038 af	**4.00'W x 4.60'L x 4.25'H Leaching Galley**x 21 Inside #1
		0.052 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	115.75'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	121.00'	**6.0" Vert. Orifice** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 10.10 hrs HW=115.81' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.67 cfs @ 12.31 hrs HW=121.75' (Free Discharge)
↑—**2=Orifice** (Orifice Controls 0.67 cfs @ 3.39 fps)

Pond #1: Leaching Galley's



Summary for Pond #2: Leaching Galley's

Inflow Area =	0.041 ac,100.00% Impervious,	Inflow Depth >	7.85"	for Custom event
Inflow =	0.34 cfs @	12.09 hrs, Volume=	0.027 af	
Outflow =	0.21 cfs @	12.22 hrs, Volume=	0.027 af,	Atten= 40%, Lag= 8.1 min
Discarded =	0.04 cfs @	11.40 hrs, Volume=	0.023 af	
Secondary =	0.17 cfs @	12.22 hrs, Volume=	0.003 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 113.47' @ 12.22 hrs Surf.Area= 0.004 ac Storage= 0.007 af

Plug-Flow detention time= 43.1 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 42.8 min (775.6 - 732.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	111.00'	0.004 af	**5.92'W x 31.00'L x 3.21'H Field A** 0.014 af Overall - 0.004 af Embedded = 0.009 af x 40.0% Voids
#2A	111.50'	0.004 af	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 1 rows
		0.008 af	Total Available Storage

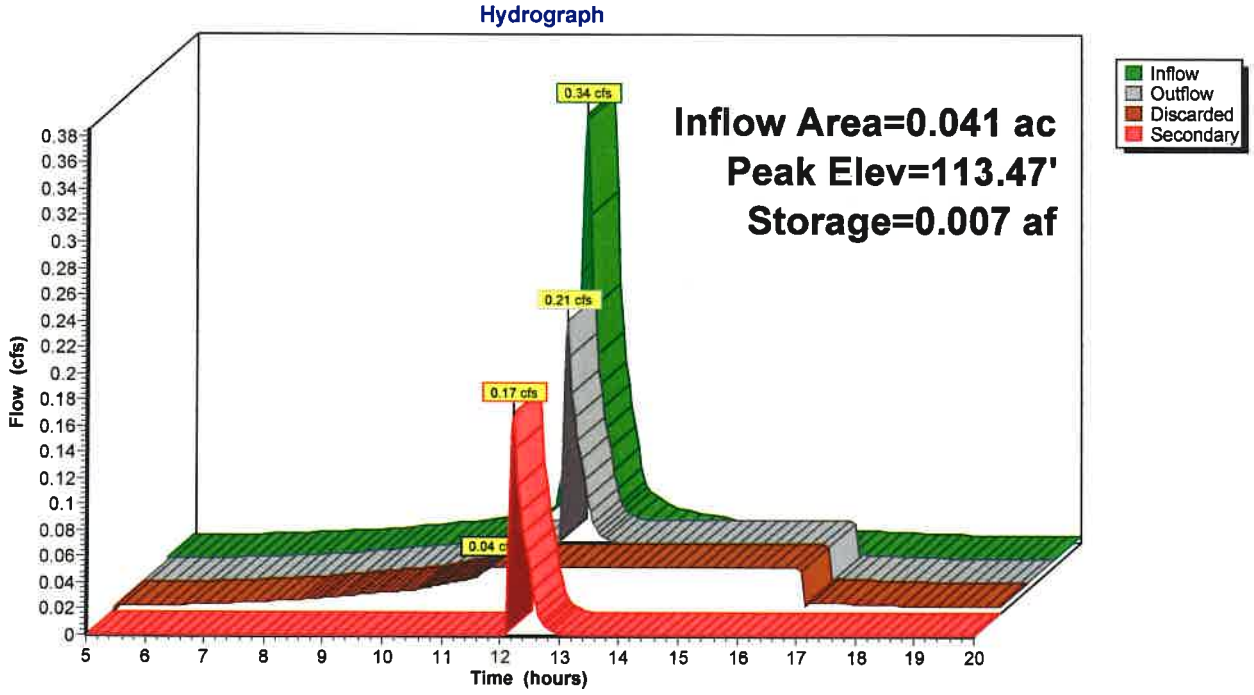
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	111.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Secondary	113.21'	**6.0" Vert. Inlet** C= 0.600

Discarded OutFlow Max=0.04 cfs @ 11.40 hrs HW=111.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.15 cfs @ 12.22 hrs HW=113.45' (Free Discharge)
↑—**2=Inlet** (Orifice Controls 0.15 cfs @ 1.65 fps)

Pond #2: Leaching Galley's

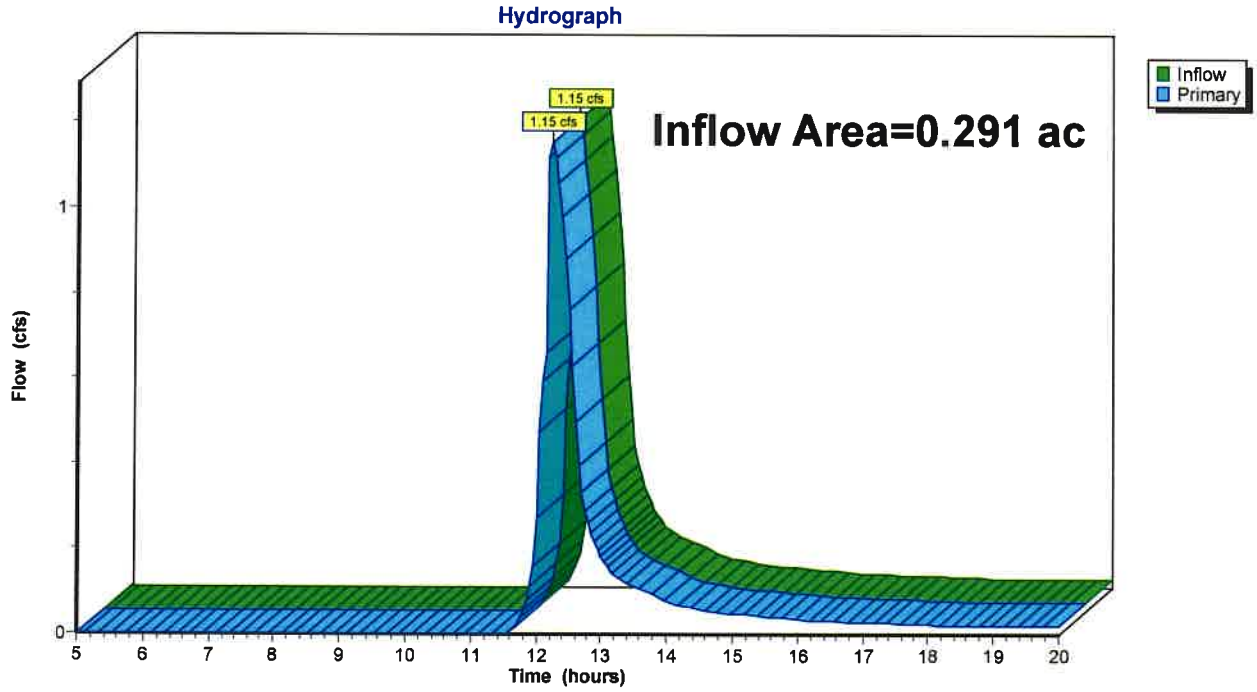


Summary for Pond 1P: Offsite

Inflow Area = 0.291 ac, 9.27% Impervious, Inflow Depth > 3.23" for Custom event
Inflow = 1.15 cfs @ 12.25 hrs, Volume= 0.078 af
Primary = 1.15 cfs @ 12.25 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Offsite



OPERATION & MAINTENANCE PLAN

STORMWATER MANAGEMENT FACILITIES
PROPOSED CONDOMINIUM DEVELOPMENT
24 WILSON CIRCLE
NEWTON, MASSACHUSETTS

August 30, 2022

VERNE T. PORTER JR., PLS
LAND SURVEYORS – CIVIL ENGINEERS
354 ELLIOT STREET
NEWTON, MA 02464

OPERATION & MAINTENANCE PLAN
STORMWATER MANAGEMENT FACILITIES
PROPOSED CONDOMINIUM DEVELOPMENT
24 WILSON CIRCLE
NEWTON, MA

The proposed project includes stormwater runoff controls associated with the construction of a new 5-unit condominium development and driveways. The major components associated with maintenance needs are the proposed leaching gallies that will handle runoff from the proposed building and proposed driveway. These will need to be cleaned periodically as noted below. Cleaning of this structures shall be done by the property owner or by a specialty contractor with hydraulic cleaning ability. The following outlines the major maintenance issues associated with the project:

Leaching Galley/Cleaning:

The proposed leaching gallies should be inspected monthly during the first year, and then every third year following the 1-year inspection.

The leaching gallies are equipped with a frame and cover. After removal of the cover, a stadia rod should be used to measure the depth of sediment. If the depth of sediment is in excess of 3", then the sediment should be removed.

Catch Basin Inspection/Cleaning:

Have all catchbasins cleaned out completely twice annually during April and October, if required.

Drain Manhole Inspection/Cleaning:

Have all drain manholes cleaned out completely twice annually during April and October, if required.

Trench Drain Inspection/Cleaning:

Have all trench drains cleaned out completely twice annually during April and October, if required.

Street Sweeping

Have the driveway swept bi-annually in April and October.

MAINTENANCE RESPONSIBILITIES

The maintenance of the Drainage System is the responsibility of the Property Owners. The actual work can be accomplished by the Owner or can be subcontracted to a company that specializes in the cleaning of storm drainage facilities. Inspections should be performed by independent individual such as the design engineer or other experienced individual in the field.

Construction period pollution control

Erosion and sedimentation control measures will be implemented prior to and during construction activities to minimize impacts from land disturbance activities. Erosion and sedimentation control measures implemented on the site will include, at a minimum, dust control measures, the installation of silt fence barriers on the up-gradient side of resource areas, and catch basin inlet protection. Controls may also include temporary sedimentation basins and diversion swales and temporary seeding. The erosion and sedimentation controls will be inspected at the end of the day if precipitation is forecast, and after each rainfall event of 0.5 inches or more. Should construction occur during winter months, seasonally appropriate stabilization measure will be utilized.

Below is a summary of the minimum construction period pollution control requirements. These topics are presented as a means of demonstrating understanding of pollution control but are not meant to supplant preparation of the SWPPP. Please refer to the SWPPP for complete construction activity details.

a. Dust Control

Mitigation measures will be implemented to control fugitive dust during construction activities. Dust control measure may include seeding, wet suppression, application of soil stabilization agents, or other measures to control dust generated by construction activities. The Contractor shall confirm with state and local regulations to see if the use of calcium chloride for dust suppression is allowed.

b. Erosion Control Barriers

Prior to any ground disturbance, erosion control barriers will be installed at the limit of work at down-gradient positions on the site. The barriers will consist of silt fence and staked hay bales and will be entrenched in the soil to prevent underflow.

c. Catch Basin/Trench Drain Inlet Protection

All existing and newly installed catch basins or trench drains shall be protected during construction with a filter insert system. These sedimentation control measures will be regularly maintained until the drainage area tributary to the catch basin has been stabilized.

d. Temporary Sedimentation Basins and Diversion Swales

If necessary, temporary sedimentation basins will be constructed to prevent transport of fine-grained sediment into wetland resource areas and other off-site areas. These temporary basins will be located where appropriate, as determined by the contractor. Temporary diversion swales or berms may be used to convey runoff from construction areas to temporary or previously constructed basins.

e. Temporary Seeding

Temporary seeding will be used where vegetative cover is required for less than one year on disturbed soil areas. Such areas will be seeded if the soils will be exposed without construction activity for more than 30 days. Rapidly growing annual grasses, such as annual rye grass, oats, perennial rye grass or winter rye will be uniformly applied. Depending on the slope, the soil may be covered with a layer of straw mulch, an erosion control blanket, or a bonded fiber matrix.

f. Permanent Seeding

Upon completion of the final grading, any areas not covered by pavement, other forms of stabilization, including landscaping, will be seeded with rapidly growing annual rye grass/red fescue seed mix.

STORMWATER MANAGEMENT REPORT
PROPOSED CONDOMINIUM DEVELOPMENT
24 WILSON CIRCLE
NEWTON, MASSACHUSETTS

INSPECTION REPORT:

Inspection Firm: _____

Inspectors Name: _____ Date: _____

Components Inspected: _____

Signed: _____

SYSTEM MAINTENANCE:

Maintenance Firm: _____ Date: _____

Leaching Gallies Inspected: Yes____No__Comments:_____ _____

_____

Leaching Gallies Cleaned: Yes____No__Comments:_____

Catchbasins Inspected: Yes____No__Comments:_____

_____

Catchbasins Cleaned: Yes____No__Comments:_____

Manhole Inspected: Yes____No__Comments:_____

_____

Manhole Cleaned: Yes____No__Comments:_____

Trench Drain Inspected: Yes____No__Comments:_____

_____

Trench Drain Cleaned: Yes____No__Comments:_____

Estimate of Material Removed: _____

Other Comments: _____

_____

_____

Signed: _____

Hydrograph for Pond #1: Leaching Galley's

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Secondary (cfs)
0.00	0.00	0.000	115.75	0.00	0.00	0.00
2.50	0.01	0.000	115.76	0.01	0.01	0.00
5.00	0.03	0.000	115.77	0.03	0.03	0.00
7.50	0.04	0.000	115.78	0.04	0.04	0.00
10.00	**0.09**	**0.000**	**115.81**	**0.09**	**0.09**	**0.00**
12.50	**0.40**	**0.047**	**121.53**	**0.59**	**0.10**	**0.50**
15.00	0.08	0.042	120.96	0.10	0.10	0.00
17.50	0.04	0.032	120.04	0.10	0.10	0.00
20.00	0.03	0.018	118.65	0.10	0.10	0.00
22.50	0.02	0.003	116.40	0.10	0.10	0.00
25.00	0.00	0.000	115.75	0.00	0.00	0.00
27.50	0.00	0.000	115.75	0.00	0.00	0.00
30.00	0.00	0.000	115.75	0.00	0.00	0.00
32.50	0.00	0.000	115.75	0.00	0.00	0.00
35.00	0.00	0.000	115.75	0.00	0.00	0.00
37.50	0.00	0.000	115.75	0.00	0.00	0.00
40.00	0.00	0.000	115.75	0.00	0.00	0.00
42.50	0.00	0.000	115.75	0.00	0.00	0.00
45.00	0.00	0.000	115.75	0.00	0.00	0.00
47.50	0.00	0.000	115.75	0.00	0.00	0.00
50.00	0.00	0.000	115.75	0.00	0.00	0.00
52.50	0.00	0.000	115.75	0.00	0.00	0.00
55.00	0.00	0.000	115.75	0.00	0.00	0.00
57.50	0.00	0.000	115.75	0.00	0.00	0.00
60.00	0.00	0.000	115.75	0.00	0.00	0.00
62.50	0.00	0.000	115.75	0.00	0.00	0.00
65.00	0.00	0.000	115.75	0.00	0.00	0.00
67.50	0.00	0.000	115.75	0.00	0.00	0.00
70.00	0.00	0.000	115.75	0.00	0.00	0.00

Hydrograph for Pond #2: Leaching Galley's

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Secondary (cfs)
0.00	0.00	0.000	111.00	0.00	0.00	0.00
2.50	0.00	0.000	111.00	0.00	0.00	0.00
5.00	0.00	0.000	111.00	0.00	0.00	0.00
7.50	0.01	0.000	111.01	0.01	0.01	0.00
10.00	**0.02**	**0.000**	**111.02**	**0.02**	**0.02**	**0.00**
12.50	**0.07**	**0.006**	**113.34**	**0.08**	**0.04**	**0.05**
15.00	0.01	0.003	112.28	0.04	0.04	0.00
17.50	0.01	0.000	111.01	0.01	0.01	0.00
20.00	0.00	0.000	111.00	0.00	0.00	0.00
22.50	0.00	0.000	111.00	0.00	0.00	0.00
25.00	0.00	0.000	111.00	0.00	0.00	0.00
27.50	0.00	0.000	111.00	0.00	0.00	0.00
30.00	0.00	0.000	111.00	0.00	0.00	0.00
32.50	0.00	0.000	111.00	0.00	0.00	0.00
35.00	0.00	0.000	111.00	0.00	0.00	0.00
37.50	0.00	0.000	111.00	0.00	0.00	0.00
40.00	0.00	0.000	111.00	0.00	0.00	0.00
42.50	0.00	0.000	111.00	0.00	0.00	0.00
45.00	0.00	0.000	111.00	0.00	0.00	0.00
47.50	0.00	0.000	111.00	0.00	0.00	0.00
50.00	0.00	0.000	111.00	0.00	0.00	0.00
52.50	0.00	0.000	111.00	0.00	0.00	0.00
55.00	0.00	0.000	111.00	0.00	0.00	0.00
57.50	0.00	0.000	111.00	0.00	0.00	0.00
60.00	0.00	0.000	111.00	0.00	0.00	0.00
62.50	0.00	0.000	111.00	0.00	0.00	0.00
65.00	0.00	0.000	111.00	0.00	0.00	0.00
67.50	0.00	0.000	111.00	0.00	0.00	0.00
70.00	0.00	0.000	111.00	0.00	0.00	0.00

Soil Map—Middlesex County, Massachusetts

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

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 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, 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: May 22, 2022—Jun 5, 2022

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
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	0.4	72.9%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.1	27.1%
Totals for Area of Interest		**0.5**	**100.0%**

Middlesex County, Massachusetts

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 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

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

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Middlesex County, Massachusetts

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 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

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

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Middlesex County, Massachusetts

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 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

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

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

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Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Middlesex County, Massachusetts

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 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

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

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

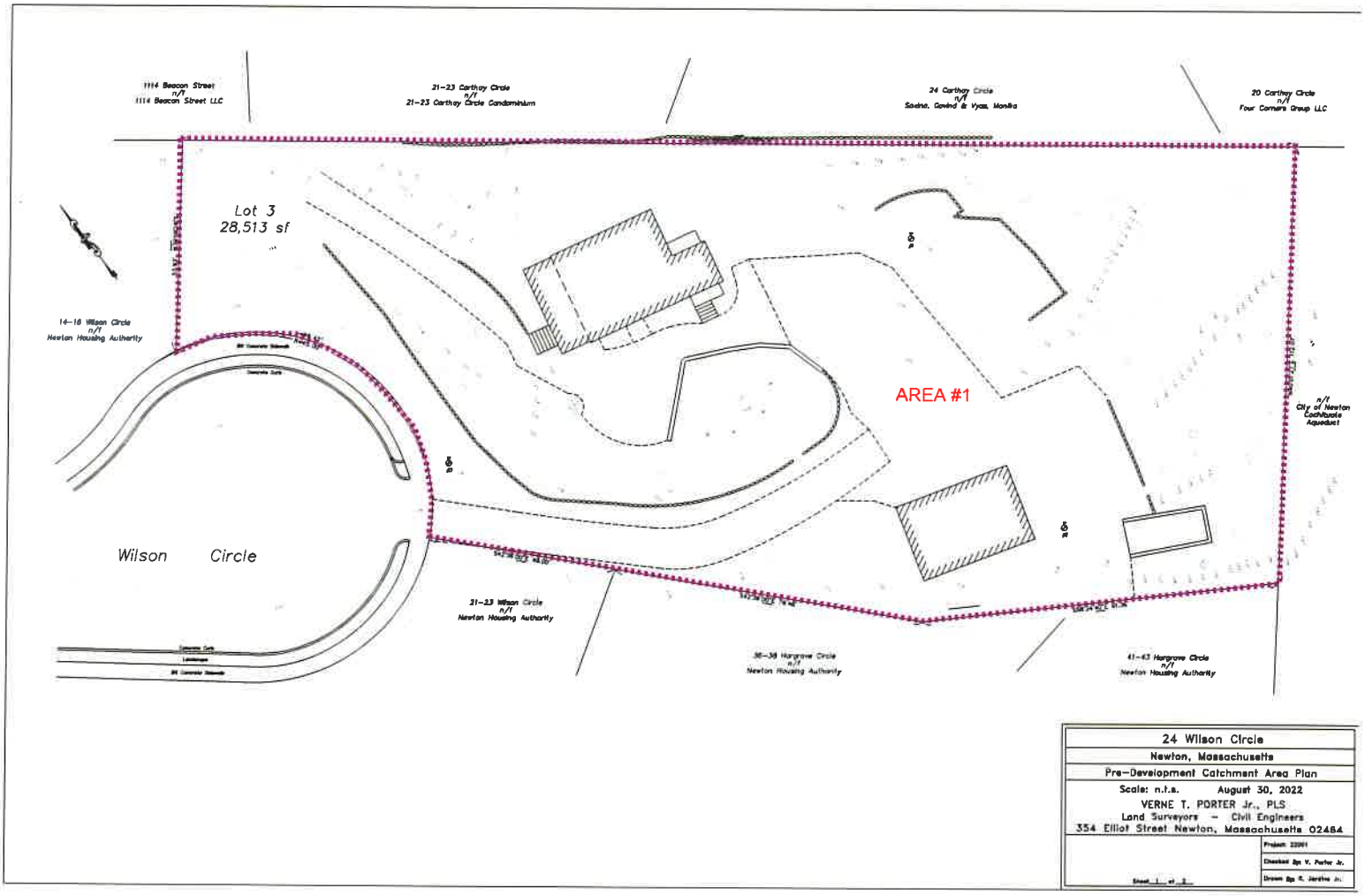
Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

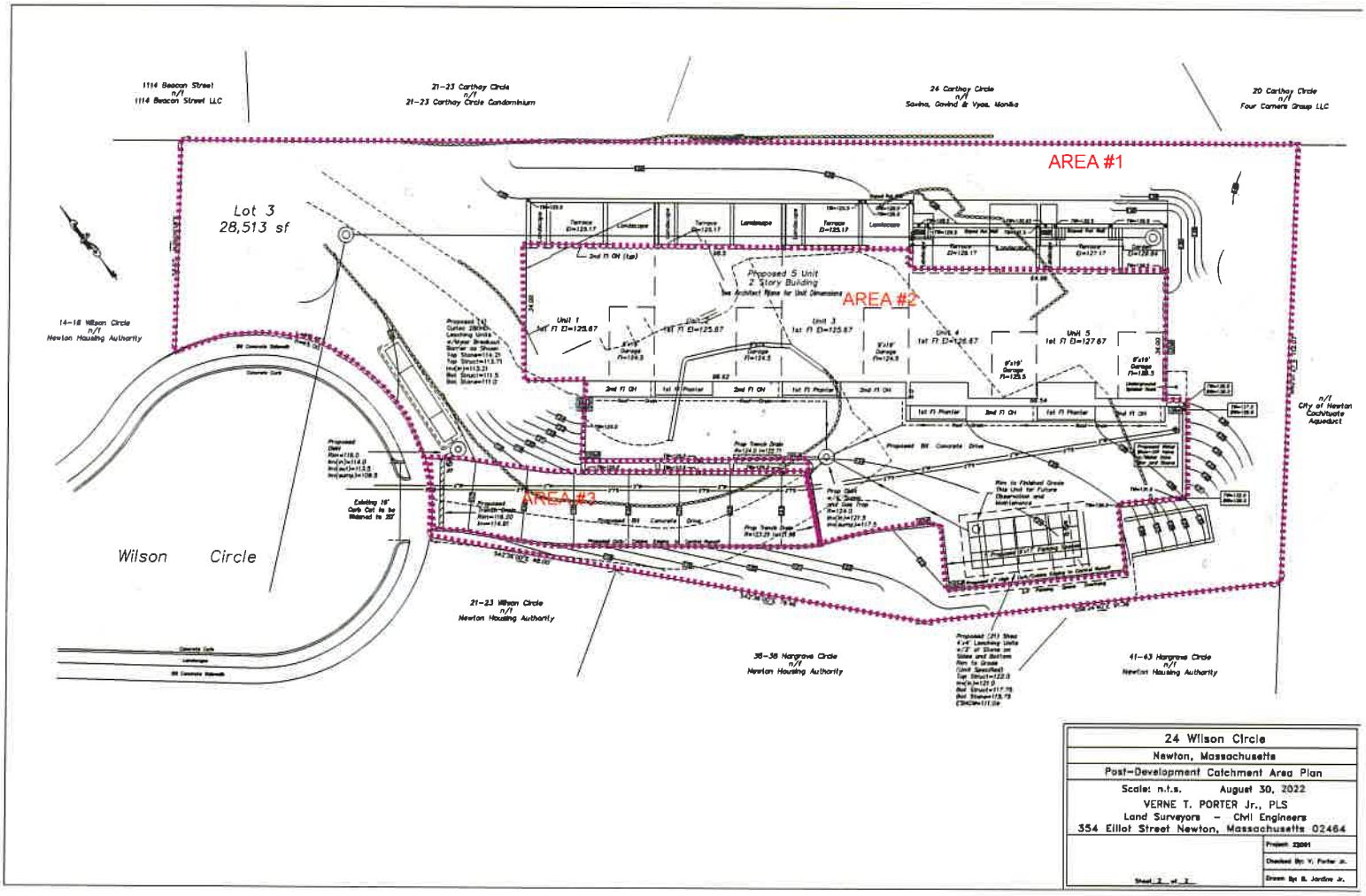
Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021



24 Wilson Circle	
Newton, Massachusetts	
Pre-Development Catchment Area Plan	
Scale: n.t.s. August 30, 2022	
VERNE T. PORTER Jr., PLS Land Surveyors - Civil Engineers 354 Elliot Street Newton, Massachusetts 02464	
Sheet 1 of 2	Project 22001 Checked By V. Porter Jr. Drawn By E. Jardine Jr.



24 Wilson Circle
Newton, Massachusetts
Post-Development Catchment Area Plan
Scale: n.t.s. August 30, 2022
VERNE T. PORTER Jr., PLS Land Surveyors - Civil Engineers 354 Elliot Street Newton, Massachusetts 02464
Project: 22001 Checked By: V. Porter Jr. Drawn By: B. Jardine Jr.
Sheet 2 of 2

TEST PIT FIELD LOG

PROJECT

DESCRIPTION: 24 WILSON CIR
LOCATION: NEWTON
TEST PIT NO. 1
DATE: 6-21-22
WEATHER: SUNNY 70°
GROUND EL: 125.0
ENGINEER: VERNE T PORTER JR

PERCOLATION RESULTS

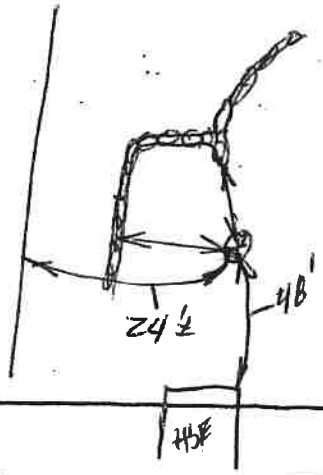
DEPTH:	TIME:
12"	
11"	
10"	
9"	
8"	
7"	
6"	

REMARKS:

AVERAGE RATE: 2 MIN/INCH

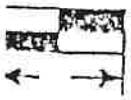
SOIL DESCRIPTION

DEPTH	SOIL DESCRIPTION	Excav. Effort	Boulder Count	Remar No.
0'				
1'	12" SANDY LOAM			
2'	MIXED SAND & LOAM			
3'				
4'				
5'				
6'	FINE TO MEDIUM SAND 10YR 6/4			
7'				
8'				
9'				
10'				
11'				
12'	NO WATER NO REFUSAL			



REMARKS:

ST PIT PLAN



LEGEND

Boulder Count
Size Range Classification
6"-18" --------A
18"-30" --------B

PROPORTIONS USED

Trace (TR)- 0 -10%
Little(LI.)-10-20%
Some (SO) -20-35%

ABBREVIATIONS

F-fine
M-medium
C-coarse
F/M-fine to med.
F/C-fine to coar.
V-very
GR-gray

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Groundwater	GW

TEST PIT FIELD LOG

PROJECT

DESCRIPTION: 24 WILSON CIR
LOCATION: NEWTON
TEST PIT NO. 2
DATE: 6-21-22
WEATHER: SUNNY 70°
GROUND EL: 123.0
ENGINEER: VERNE T PORTER JR

PERCOLATION RESULTS

DEPTH:	TIME:
12"	
11"	
10"	
9"	
8"	
7"	
6"	

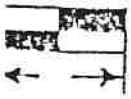
REMARKS:

AVERAGE RATE:

DEPTH	SOIL DESCRIPTION	Excav. Effort	Boulder Count	Remar No.
0'	6" GRAVEL BASE			
1'	12" LOAMY SAND			
2'	MIXED : SAND & LOAMY MIX			
3'				
4'	FINE TO MEDIUM SAND 10 YR 6/4			
5'				
6'				
7'				
8'				
9'	MEDIUM SAND & GRAVEL 10YR 4/4			
10'	NO WATER NO REFUSAL			

REMARKS:

ST PIT PLAN



LEGEND

Boulder Count Size Range Classification
6"-18" --------A
18"-30" --------B

PROPORTIONS USED

Trace (TR)- 0 -10%
Little(LI.)-10-20%
Some (SO) -20-35%

ABBREVIATIONS

F-fine
M-medium
C-coarse
F/M-fine to med.
F/C-fine to coar.
V-very
GR-gray

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Groundwater	GW

TEST PIT FIELD LOG

PROJECT

DESCRIPTION: 24 WILSON CIR
LOCATION: NEWTON
TEST PIT NO.: 3
DATE: 6-21-22
WEATHER: SUNNY 70°
GROUND EL: 116.0
ENGINEER: VERNET PORTER JR

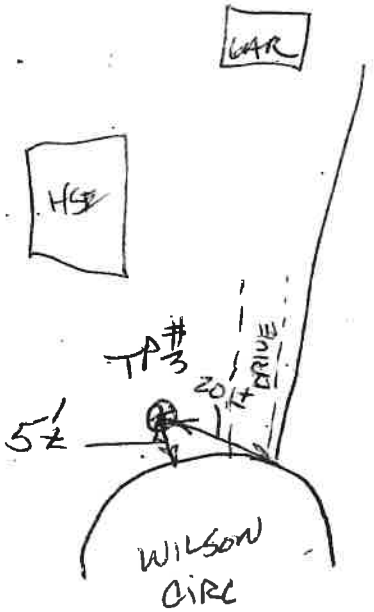
PERCOLATION RESULTS

DEPTH:	TIME:
12"	
11"	
10"	
9"	
8"	
7"	
6"	

REMARKS:

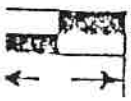
AVERAGE RATE:

DEPTH	SOIL DESCRIPTION	Excav. Effort	Boulder Count	Remar No.
0'				
1'	12" SANDY LOAM			
2'				
3'	48" FILL MIXED SANDY LOAM			
4'				
5'				
6'	FINE TO MEDIUM			
7'	▽ OBSERVED WATER			
8'	BOTTOM EXCAVATION			



REMARKS:

ST PIT PLAN



LEGEND

Boulder Count Size Range Classification
6"-18" --------A
18"-30" --------B

PROPORTIONS USED

Trace (TR)- 0 -10%
Little(LI.)-10-20%
Some (SO) -20-35%

ABBREVIATIONS

F-fine
M-medium
C-coarse
F/M-fine to med.
F/C-fine to coar.
V-very
GR-gray

EXCAVATION EFFORT

Easy	E
Moderate	M
Difficult	D
Groundwater	GI