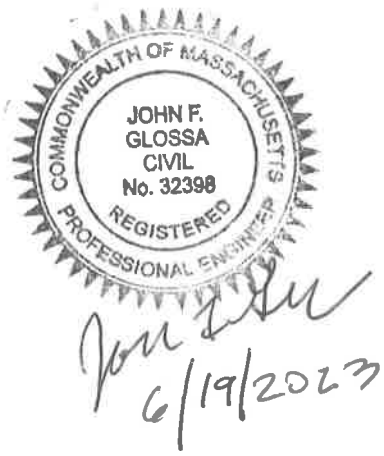
STORM WATER REPORT
PROPOSED BUILDING AND PARKING LOT ADDITION
13 FRANKLIN STREET
FRANKLIN, MA
June 19, 2023



OWNER: BETH F. BRYSON
226 TAUNTON STREET
WRENTHAM, MA 02093

APPLICANT: VILLAGE HALL LLC
P.O. BOX 2
WRENTHAM, MA 02093

ENGINEER: GLOSSA ENGINEERING INC
46 EAST STREET
EAST WALPOLE, MA 02032

Table of Contents

NARRATIVE

The proposal is to update, renovate and restore the existing building at 13 Franklin Street, Wrentham, MA. The changes to the structure include a three story addition off of the back of the building for an elevator and to compensate for space that will be lost due to the requirement for two interior stairwells. There will also be a two story terrace added to the side of the building all as shown on the site plans. 2,900 s.f. of pavement will be added to the existing paved driveway at the site to allow for four new parking stalls. In total there will be 3,800 s.f. of new impervious surface added to the site.

The site slopes from front to rear and all of the runoff from the site flows to Sweatt Park at the rear of the locus. The overgrown gravel area at the rear of the site was the location of a previously removed 24' x 32' barn and a gravel driveway and parking area.

The site will not allow for mitigation for the slight increase in the rates of runoff from the site due to the additional impervious surface. Recharge volumes and water quality volumes cannot be recharged into the ground due to the proximity of the upgraded onsite sewage treatment and disposal system to be constructed at the site.

Therefore, the purpose of this report is to establish a fair cost for the installation of a conforming storm water management system, so that the amount of money needed to construct that management system can be applied to a nearby public project to be constructed in the same watershed.

It is not the intention of the applicant to construct the stormwater management system that is described below and is shown on the included plans, but it is the intention of the applicant to establish a fair cost for the system.

STORM WATER MANAGEMENT SYSTEM

Stormwater will be captured in a deep sump hooded catch basin which will discharge to an underground infiltration basin through a water quality device. The hydrocad model shows that there is no increase in stormwater flow for the 2, 10, 25 and 100 year storms. The stormwater mitigation system will meet all of the requirements found in the MA DEP Stormwater Management Regulations. Stormwater recharge will be provided for .6 inches of runoff over the entire impervious surface and the water quality volume of 1" of runoff over the entire impervious surface will be infiltrated into the ground. 44% of TSS will be removed from the storm water runoff prior to discharge to the infiltration basin.

STANDARD #2 – PEAK RATE ATTENUATION:

EXISTING CONDITIONS:

	Stormwater Runoff Summary			
Subarea	Storm Event			
Pre-development.	2-yr	10-yr	25-yr	100-yr
EX-1 (cfs)	0.54	0.85	1.09	1.36
EX -1 (ac-ft.)	0.039	0.062	0.080	0.101
Total Area 0.987 ac				

PROPOSED CONDITIONS:

	Stormwater Runoff Summary			
Subarea	Storm Event			
Post-development.	2-yr	10-yr	25-yr	100-yr
PR-1 (cfs)	0.64	0.94	1.18	1.44
PR-1 (ac-ft.)	0.047	0.071	0.091	0.112
Total Area 0.987 ac				
Leaching Pit System				
Qout infiltration (cfs)	0.10	0.10	0.10	0.10
Vout infiltration (ac-ft.)	0.047	0.071	0.091	0.112
Qout (cfs)	0.0	0.0	0.0	0.0
Vout (ac-ft.)	0.0	0.0	0.0	0.0
Peak Depth (ft.)	91.35	93.06	94.60	96.73

APPENDIX I

STANDARD 3
STORM WATER RECHARGE

HYDROLOGIC GROUP A SOIL

PARKING AREA, WALKWAYS, AND ROOFTOP

TOTAL IMPERVIOUS AREA AT THE SITE = 9,091 S.F.

REQUIRED RECHARGE VOLUME

TOTAL IMPERVIOUS AREA TO THE INFILTRATION BASIN

BY PLAN THE IMPERVIOUS AREA = 9,091 S.F.
9,091 S.F. x 0.6"/12 = 455 C.F. REQUIRED

THE VOLUME OF THE INFILTRATION BASIN BELOW THE OUTLET = 2,003 C.F.
455 C.F. < 2,003 C.F. OK

WATER QUALITY VOLUME

TOTAL IMPERVIOUS AREA TO THE INFILTRATION BASIN

BY PLAN THE IMPERVIOUS AREA = 9,091 S.F.
9,091 S.F. X 1.0"/12 = 758 C.F.

THE VOLUME OF THE INFILTRA BASIN BELOW THE OUTLET = 2,003 C.F.
758 C.F. < 2,003 C.F. OK

DRAWDOWN

THE MAXIMUM VOLUME OF STORM WATER IN THE INFILTRATION BASIN IS 1,960.2 C.F.

THE BOTTOM AREA OF THE INFILTRATION BASIN IS 512 S.F.

USING AN INFILTRATION RATE OF 8.27 IN/HR = 0.689 FT/HR = 0.689 C.F./HR

0.689 C.F./HR x 512 S.F. = 352.76 CF/HR/INFILTRATION BASIN BOTTOM

1,960.2 C.F. / 352.76 C.F./HR = 5.56 HRS OK

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: 13 Franklin Street, Wrentham

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)
Street Sweeping - 0%	**0.00**	**1.00**	**0.00**	**1.00**
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Oil Grit Separator	**0.25**	**0.75**	**0.19**	**0.56**
Infiltration Basin	**0.80**	**0.56**	**0.45**	**0.11**
	0.00	**0.11**	**0.00**	**0.11**

Total TSS Removal = **89%**

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

Project: 13 Franklin Street, Wrentham
Prepared By: John F. Glossa P.E.
Date: 6/19/2023

*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

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Ge
Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (
thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the hal
rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension.
wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin.
distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user
"Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will
values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

hours	days
36	1.50

In the report
(USGS SIR 2(
(ft/d) is assu
hydraulic co

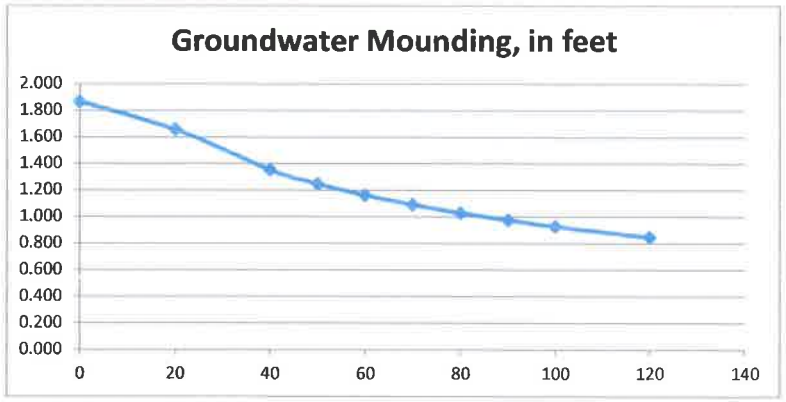
Input Values

16.5400	*R*	**Recharge (infiltration) rate (feet/day)**
0.085	Sy	**Specific yield, Sy (dimensionless, between 0 and 1)**
48.20	K	**Horizontal hydraulic conductivity, Kh (feet/day)***
16.000	x	**1/2 length of basin (x direction, in feet)**
8.000	y	**1/2 width of basin (y direction, in feet)**
3.000	t	**duration of infiltration period (days)**
60.000	hi(0)	**initial thickness of saturated zone (feet)**

61.867	h(max)	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.867	Δh(max)	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.867	0
1.658	20
1.353	40
1.246	50
1.162	60
1.091	70
1.029	80
0.976	90
0.928	100
0.846	120

Re-Calculate Now



Disclaimer

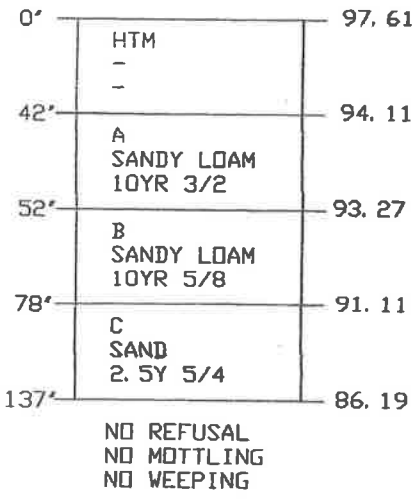
This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

SOIL TEST PERFORMED BY JOHN F. GLOSSA P.E. AND WITNESSED BY WADE SAUCIER R.S., WRENTHAM BOARD OF HEALTH AGENT ON APRIL 20, 2021.

PERCOLATION RATE IN PERC#1 = 2 MPI AT EL=90.70
PERCOLATION RATE IN PERC#2 = 2 MPI AT EL=88.27

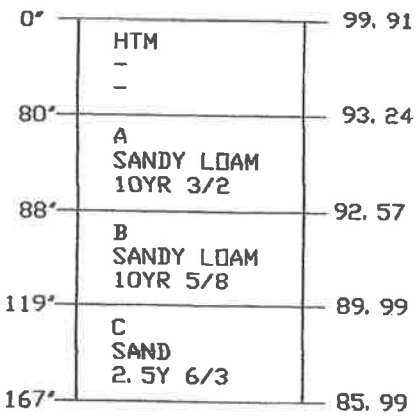
SOIL DATA

TEST PIT # 1



NO REFUSAL
NO MOTTLING
NO WEEPING

TEST PIT # 2



NO REFUSAL
NO MOTTLING
NO WEEPING

APPENDIX II

EX-1

Subcat Reach Pond Link

Routing Diagram for Existing
Prepared by Chessia Consulting Services LLC, Printed 6/13/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.20	2
2	10-yr	Type III 24-hr		Default	24.00	1	4.50	2
3	25-yr	Type III 24-hr		Default	24.00	1	5.55	2
4	100-yr	Type III 24-hr		Default	24.00	1	6.70	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.224	89	Urban commercial, 85% imp, HSG A (1S)
0.224	**89**	**TOTAL AREA**

Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=9,757 sf 85.00% Impervious Runoff Depth=2.08"
Tc=6.0 min CN=89 Runoff=0.54 cfs 0.039 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.039 af Average Runoff Depth = 2.08"
15.00% Pervious = 0.034 ac 85.00% Impervious = 0.190 ac

Summary for Subcatchment 1S: EX-1

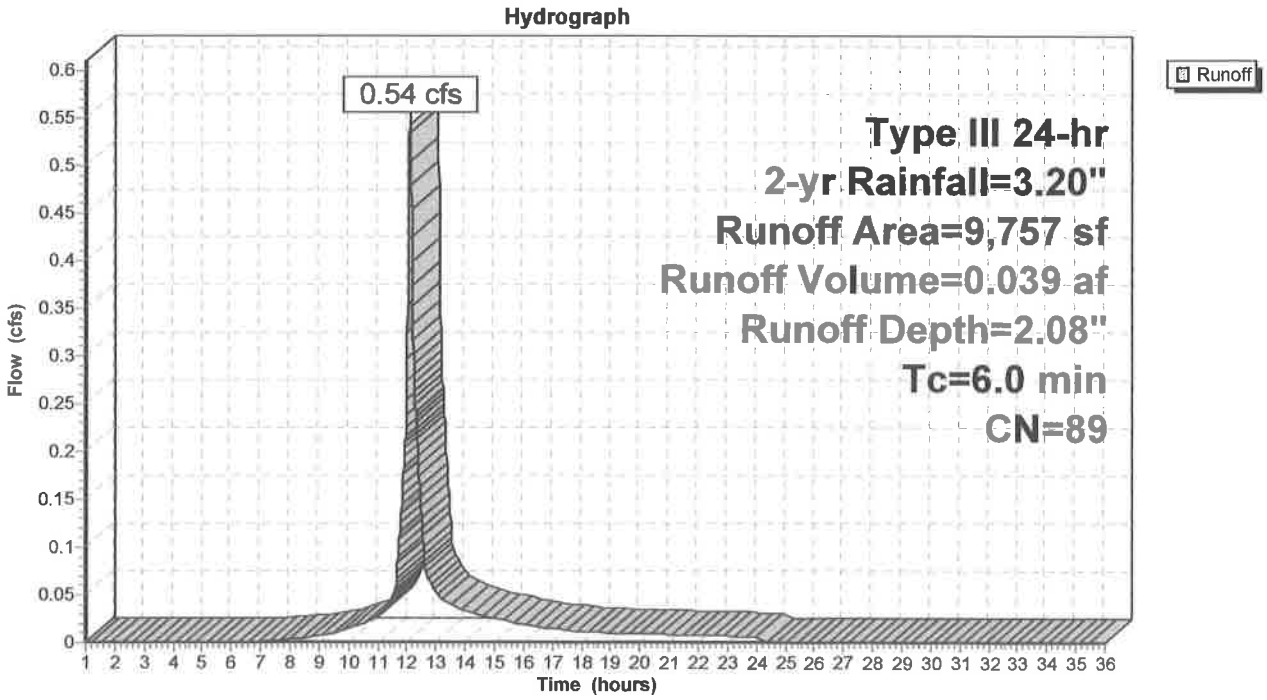
Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 2.08"
Routed to nonexistent node 7R

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (sf)	CN	Description
9,757	89	Urban commercial, 85% imp, HSG A
1,464		15.00% Pervious Area
8,293		85.00% Impervious Area

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

Subcatchment 1S: EX-1



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=9,757 sf 85.00% Impervious Runoff Depth=3.30"
Tc=6.0 min CN=89 Runoff=0.85 cfs 0.062 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.062 af Average Runoff Depth = 3.30"
15.00% Pervious = 0.034 ac 85.00% Impervious = 0.190 ac

Summary for Subcatchment 1S: EX-1

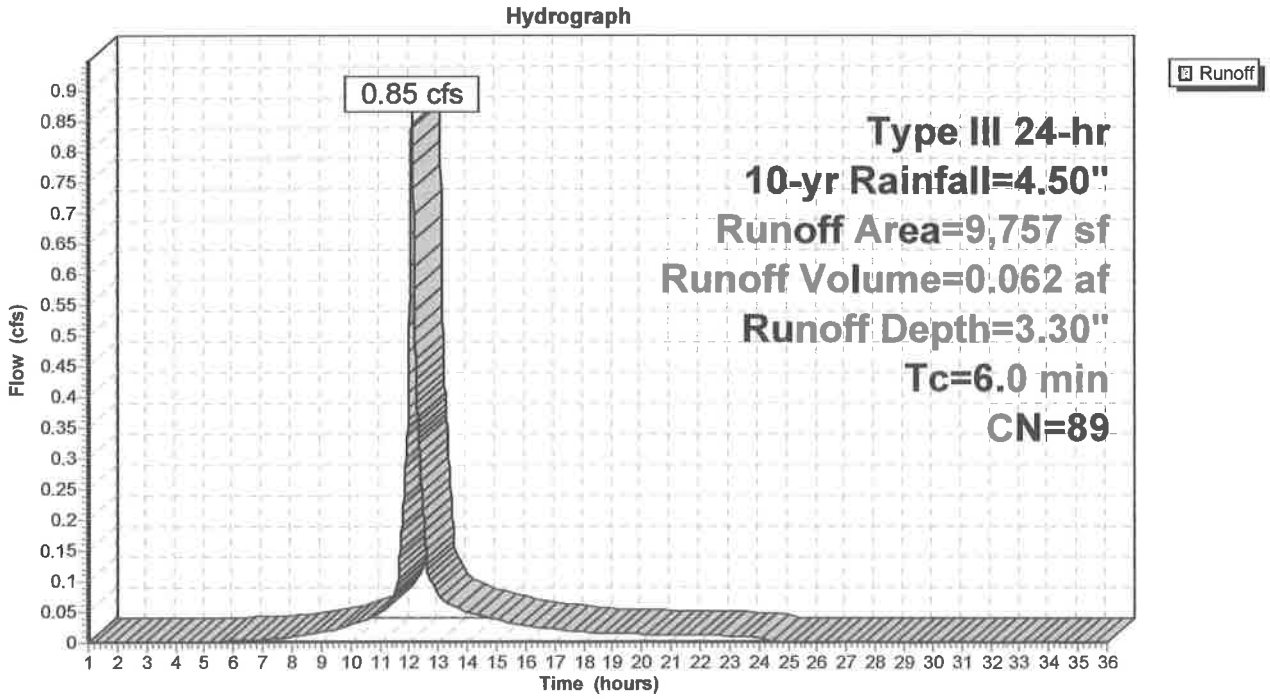
Runoff = 0.85 cfs @ 12.09 hrs, Volume= 0.062 af, Depth= 3.30"
Routed to nonexistent node 7R

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.50"

Area (sf)	CN	Description
9,757	89	Urban commercial, 85% imp, HSG A
1,464		15.00% Pervious Area
8,293		85.00% Impervious Area

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

Subcatchment 1S: EX-1



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=9,757 sf 85.00% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=89 Runoff=1.09 cfs 0.080 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.080 af Average Runoff Depth = 4.30"
15.00% Pervious = 0.034 ac 85.00% Impervious = 0.190 ac

Summary for Subcatchment 1S: EX-1

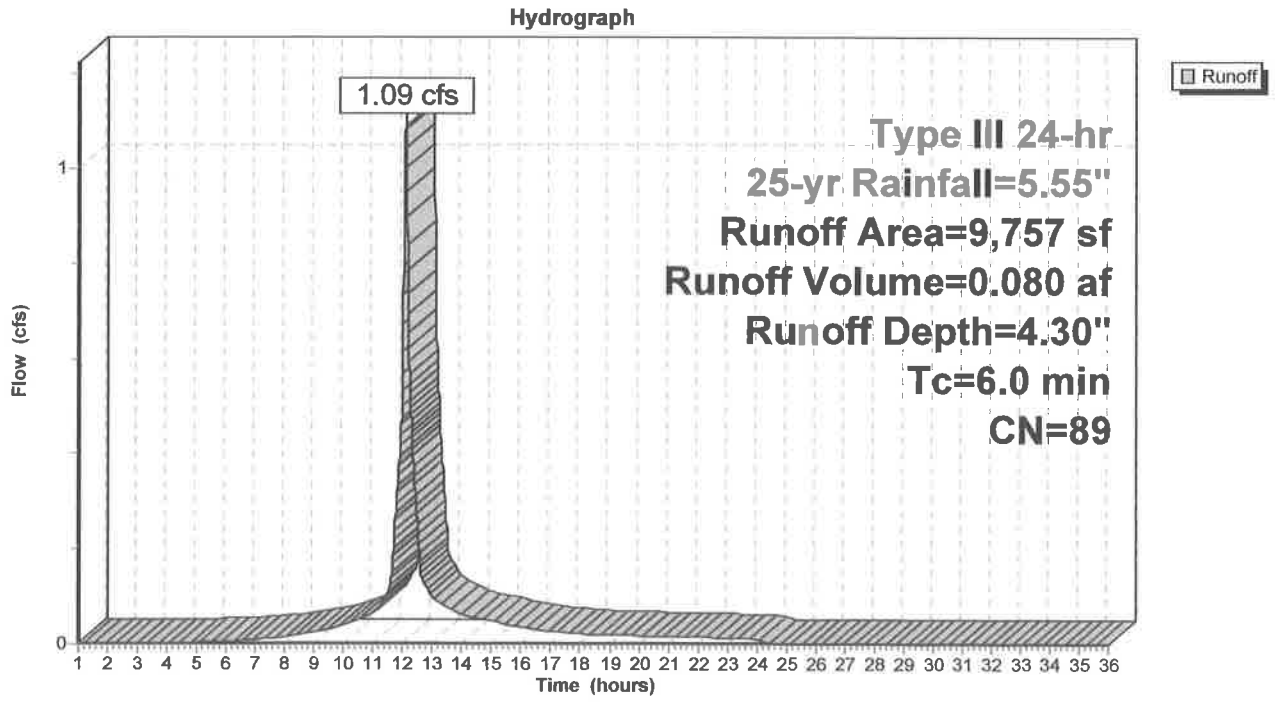
Runoff = 1.09 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 4.30"
Routed to nonexistent node 7R

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.55"

Area (sf)	CN	Description
9,757	89	Urban commercial, 85% imp, HSG A
1,464		15.00% Pervious Area
8,293		85.00% Impervious Area

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

Subcatchment 1S: EX-1



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=9,757 sf 85.00% Impervious Runoff Depth=5.42"
Tc=6.0 min CN=89 Runoff=1.36 cfs 0.101 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.101 af Average Runoff Depth = 5.42"
15.00% Pervious = 0.034 ac 85.00% Impervious = 0.190 ac

Summary for Subcatchment 1S: EX-1

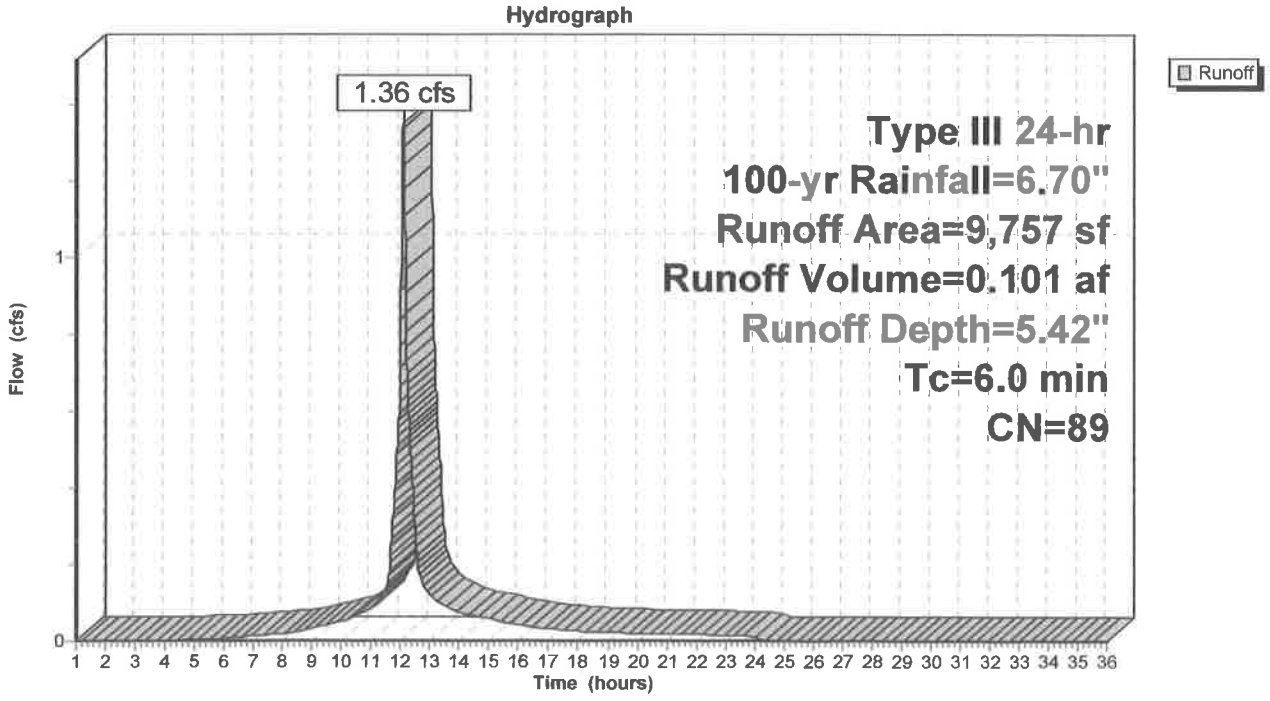
Runoff = 1.36 cfs @ 12.08 hrs, Volume= 0.101 af, Depth= 5.42"
Routed to nonexistent node 7R

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

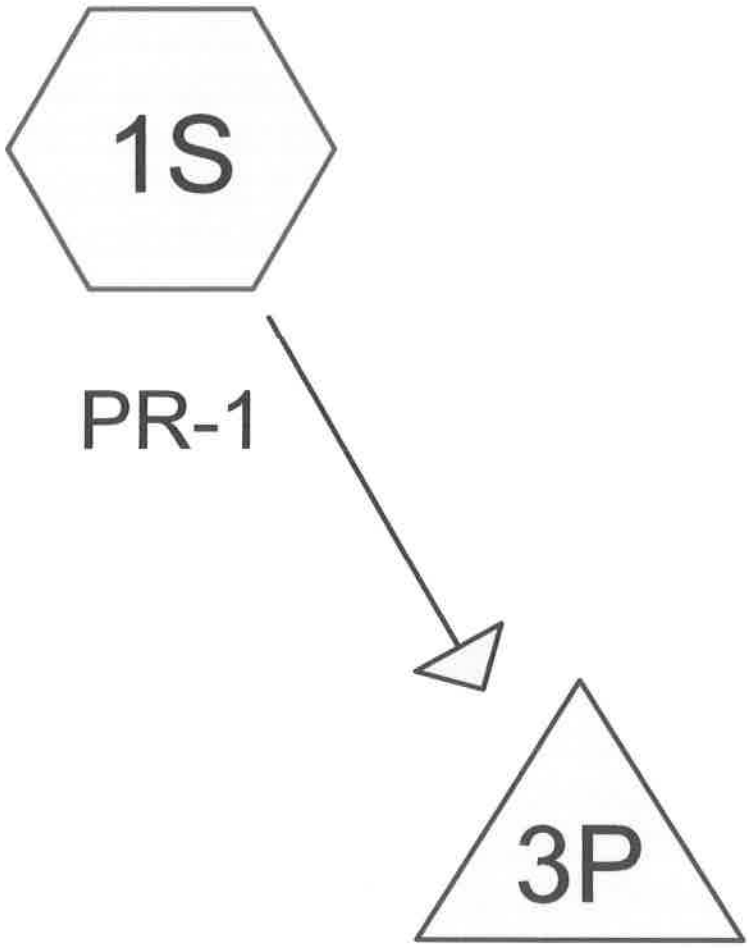
Area (sf)	CN	Description
9,757	89	Urban commercial, 85% imp, HSG A
1,464		15.00% Pervious Area
8,293		85.00% Impervious Area

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

Subcatchment 1S: EX-1



APPENDIX III



Subsurface System

Subcat Reach Pond Link

Routing Diagram for Proposed
Prepared by Chessia Consulting Services LLC, Printed 6/13/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.20	2
2	10-yr	Type III 24-hr		Default	24.00	1	4.50	2
3	25-yr	Type III 24-hr		Default	24.00	1	5.55	2
4	100-yr	Type III 24-hr		Default	24.00	1	6.70	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.015	39	>75% Grass cover, Good, HSG A (1S)
0.145	98	Paved parking, HSG A (1S)
0.064	98	Roofs, HSG A (1S)
0.224	**94**	**TOTAL AREA**

Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PR-1 Runoff Area=9,757 sf 93.17% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=94 Runoff=0.64 cfs 0.047 af

Pond 3P: Subsurface System Peak Elev=91.35' Storage=0.014 af Inflow=0.64 cfs 0.047 af
Outflow=0.10 cfs 0.047 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.047 af Average Runoff Depth = 2.54"
6.83% Pervious = 0.015 ac 93.17% Impervious = 0.209 ac

Summary for Subcatchment 1S: PR-1

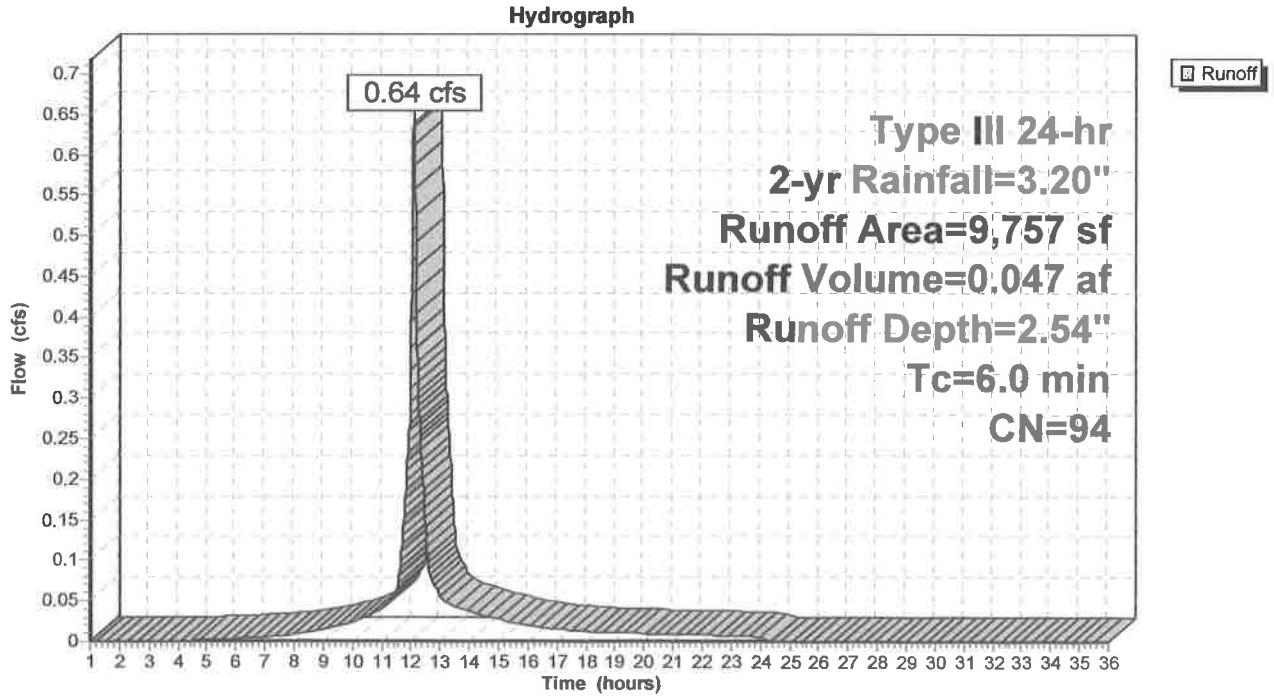
Runoff = 0.64 cfs @ 12.08 hrs, Volume= 0.047 af, Depth= 2.54"
Routed to Pond 3P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (sf)	CN	Description
2,768	98	Roofs, HSG A
6,323	98	Paved parking, HSG A
666	39	>75% Grass cover, Good, HSG A
9,757	94	Weighted Average
666		6.83% Pervious Area
9,091		93.17% Impervious Area

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

Subcatchment 1S: PR-1



Summary for Pond 3P: Subsurface System

Inflow Area = 0.224 ac, 93.17% Impervious, Inflow Depth = 2.54" for 2-yr event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 0.047 af
Outflow = 0.10 cfs @ 11.69 hrs, Volume= 0.047 af, Atten= 85%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.69 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 91.35' @ 12.57 hrs Surf.Area= 0.012 ac Storage= 0.014 af

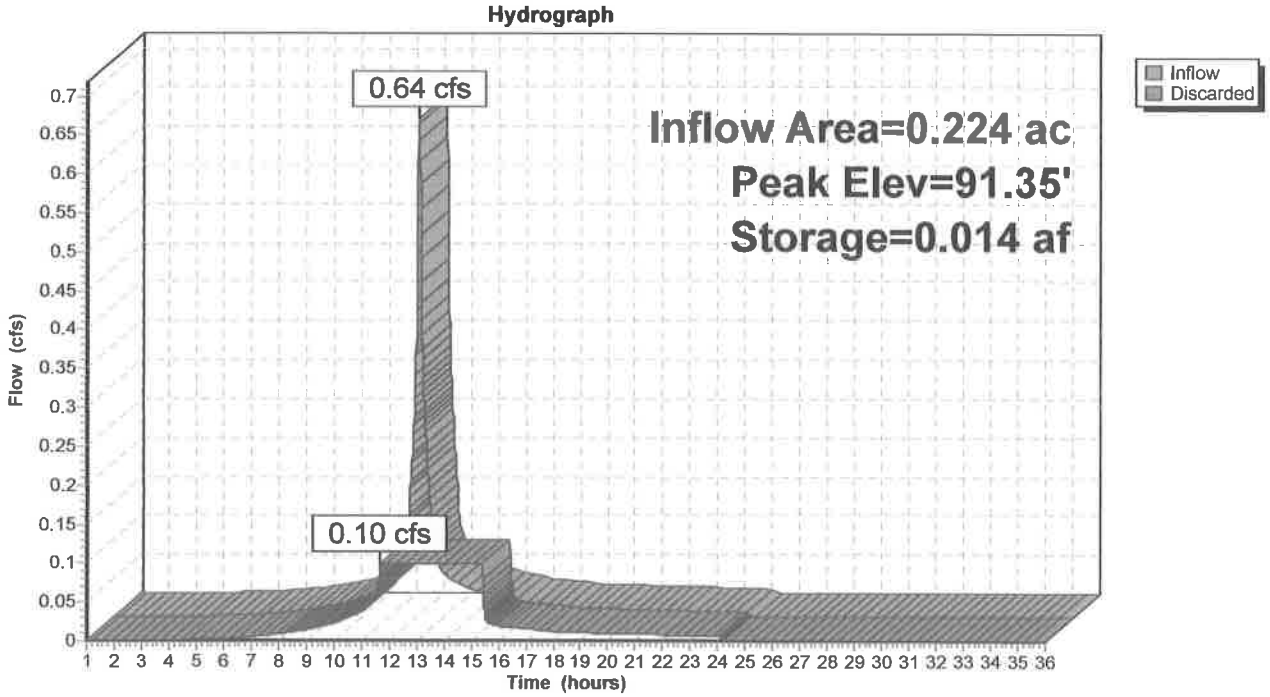
Plug-Flow detention time= 38.7 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 38.7 min (825.8 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.83'	0.033 af	**16.00'W x 32.00'L x 8.17'H Prismatoid** 0.096 af Overall - 0.013 af Embedded = 0.083 af x 40.0% Voids
#2	89.83'	0.013 af	**8.00'D x 5.50'H Vertical Cone/Cylinder** x 2 Inside #1
		0.046 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.83'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 11.69 hrs HW=88.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 3P: Subsurface System



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-1 Runoff Area=9,757 sf 93.17% Impervious Runoff Depth=3.82"
Tc=6.0 min CN=94 Runoff=0.94 cfs 0.071 af

Pond 3P: Subsurface System Peak Elev=93.06' Storage=0.024 af Inflow=0.94 cfs 0.071 af
Outflow=0.10 cfs 0.071 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.071 af Average Runoff Depth = 3.82"
6.83% Pervious = 0.015 ac 93.17% Impervious = 0.209 ac

Summary for Subcatchment 1S: PR-1

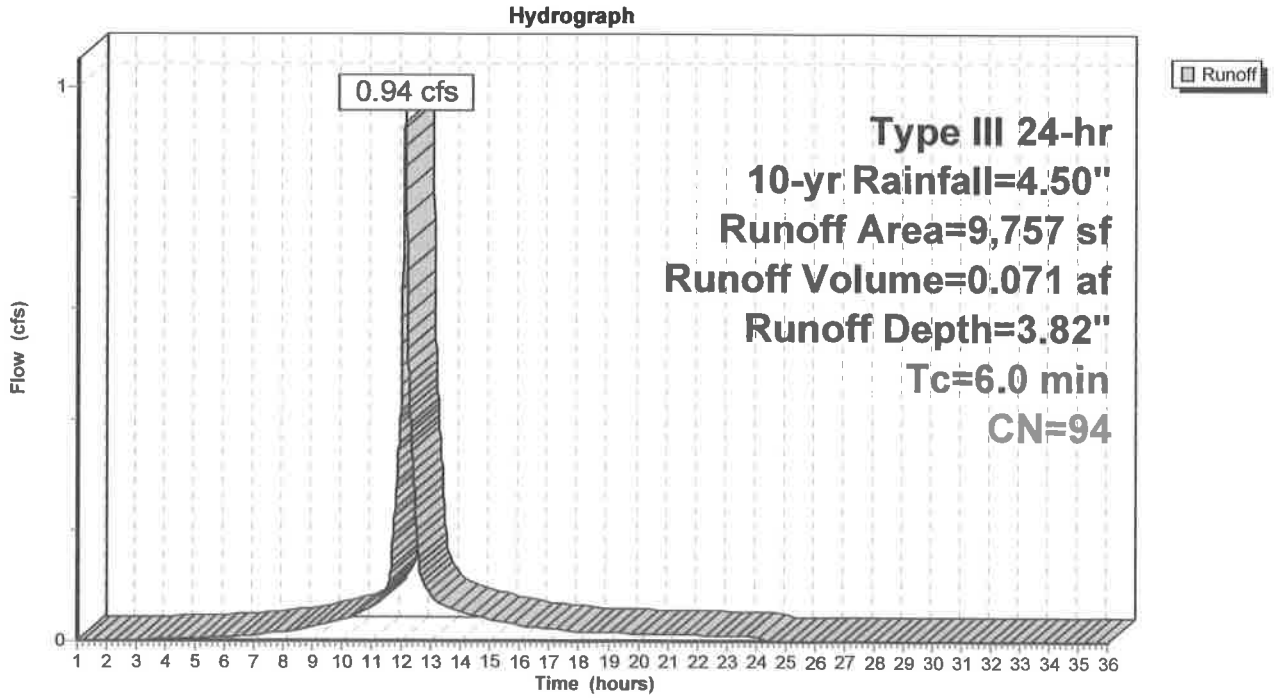
Runoff = 0.94 cfs @ 12.08 hrs, Volume= 0.071 af, Depth= 3.82"
Routed to Pond 3P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.50"

Area (sf)	CN	Description
2,768	98	Roofs, HSG A
6,323	98	Paved parking, HSG A
666	39	>75% Grass cover, Good, HSG A
9,757	94	Weighted Average
666		6.83% Pervious Area
9,091		93.17% Impervious Area

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

Subcatchment 1S: PR-1



Summary for Pond 3P: Subsurface System

Inflow Area = 0.224 ac, 93.17% Impervious, Inflow Depth = 3.82" for 10-yr event
Inflow = 0.94 cfs @ 12.08 hrs, Volume= 0.071 af
Outflow = 0.10 cfs @ 11.55 hrs, Volume= 0.071 af, Atten= 90%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.55 hrs, Volume= 0.071 af

Routing by Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 93.06' @ 12.81 hrs Surf.Area= 0.012 ac Storage= 0.024 af

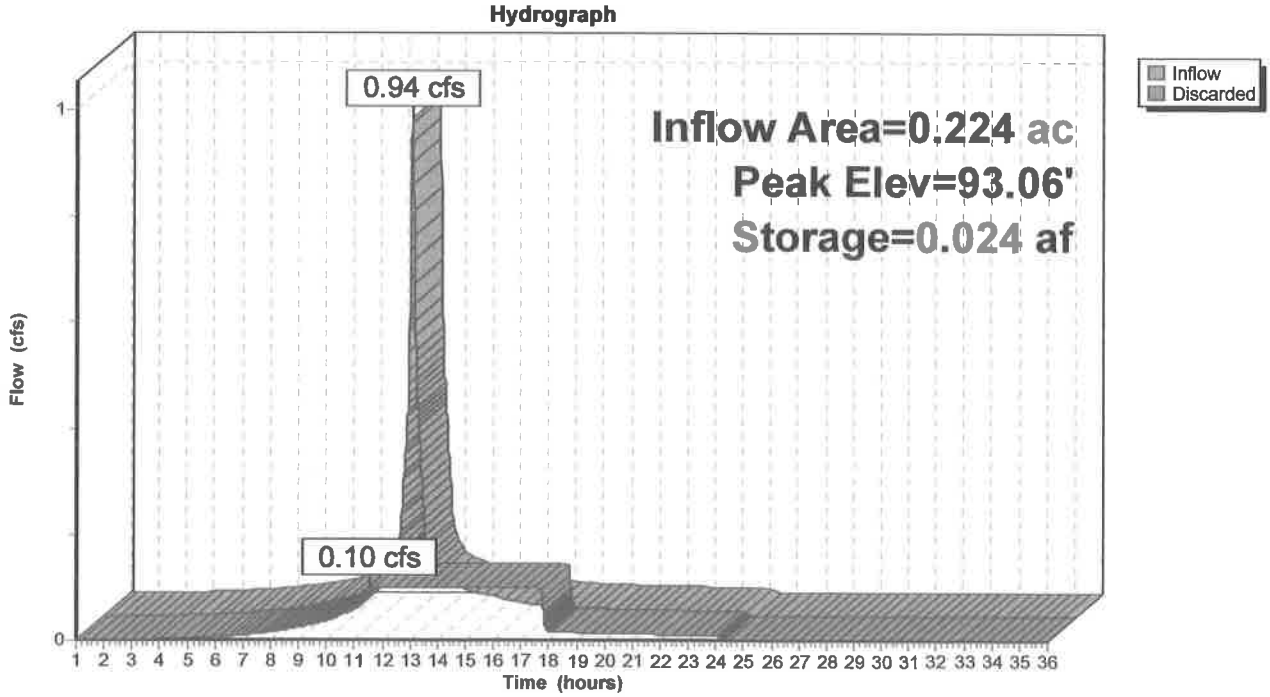
Plug-Flow detention time= 75.9 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 75.9 min (852.4 - 776.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.83'	0.033 af	**16.00'W x 32.00'L x 8.17'H Prismatoid**
			0.096 af Overall - 0.013 af Embedded = 0.083 af x 40.0% Voids
#2	89.83'	0.013 af	**8.00'D x 5.50'H Vertical Cone/Cylinder** x 2 Inside #1
		0.046 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.83'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 11.55 hrs HW=88.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 3P: Subsurface System



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-1 Runoff Area=9,757 sf 93.17% Impervious Runoff Depth=4.85"
Tc=6.0 min CN=94 Runoff=1.18 cfs 0.091 af

Pond 3P: Subsurface System Peak Elev=94.60' Storage=0.034 af Inflow=1.18 cfs 0.091 af
Outflow=0.10 cfs 0.091 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.091 af Average Runoff Depth = 4.85"
6.83% Pervious = 0.015 ac 93.17% Impervious = 0.209 ac

Summary for Subcatchment 1S: PR-1

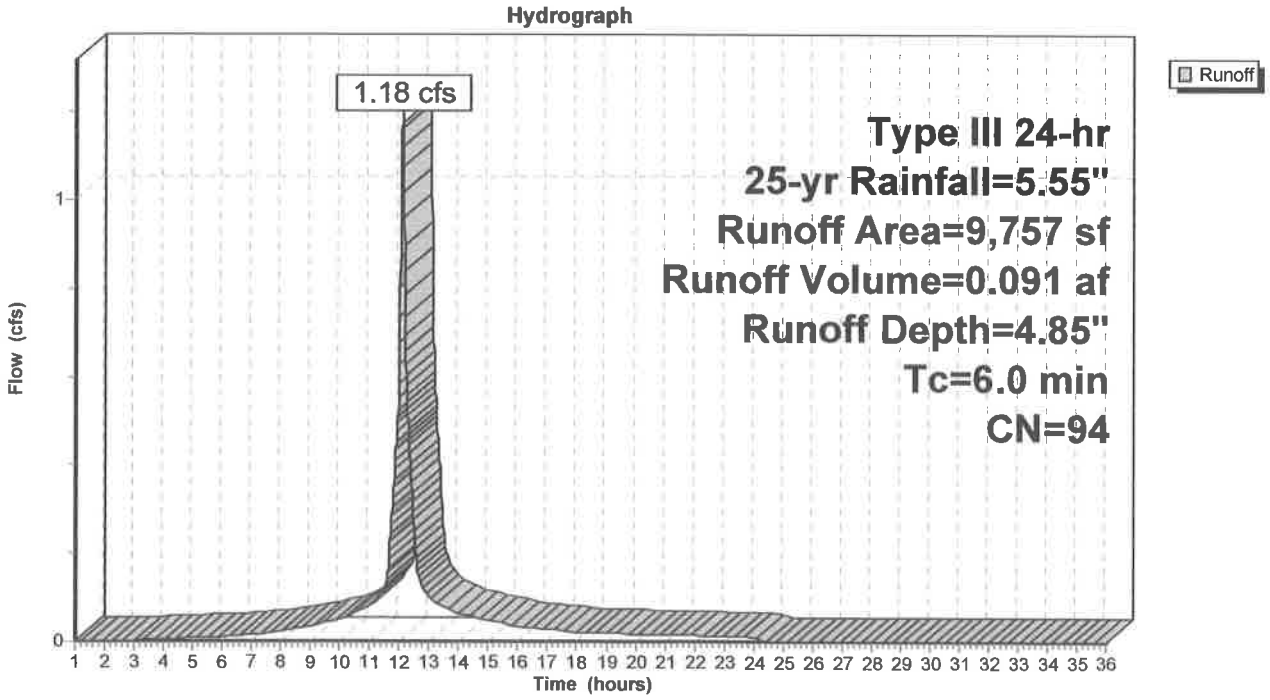
Runoff = 1.18 cfs @ 12.08 hrs, Volume= 0.091 af, Depth= 4.85"
Routed to Pond 3P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.55"

Area (sf)	CN	Description
2,768	98	Roofs, HSG A
6,323	98	Paved parking, HSG A
666	39	>75% Grass cover, Good, HSG A
9,757	94	Weighted Average
666		6.83% Pervious Area
9,091		93.17% Impervious Area

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

Subcatchment 1S: PR-1



Summary for Pond 3P: Subsurface System

Inflow Area = 0.224 ac, 93.17% Impervious, Inflow Depth = 4.85" for 25-yr event
Inflow = 1.18 cfs @ 12.08 hrs, Volume= 0.091 af
Outflow = 0.10 cfs @ 11.30 hrs, Volume= 0.091 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.30 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 94.60' @ 13.02 hrs Surf.Area= 0.012 ac Storage= 0.034 af

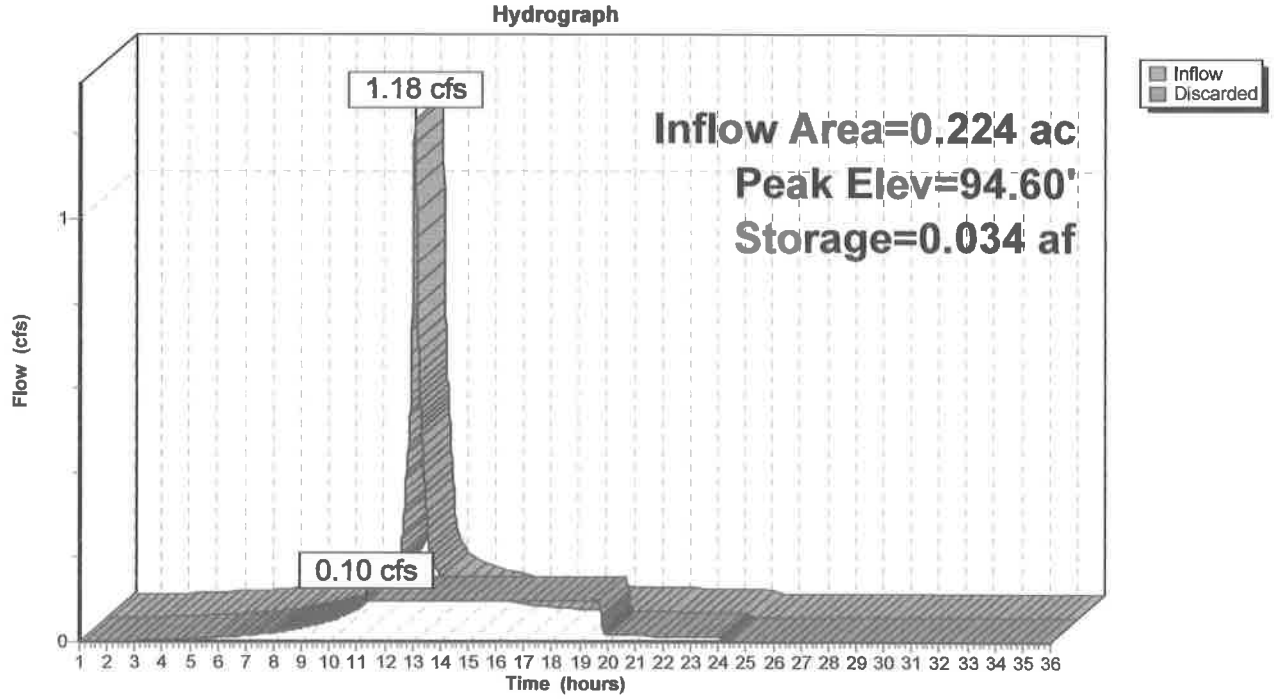
Plug-Flow detention time= 111.5 min calculated for 0.091 af (100% of inflow)
Center-of-Mass det. time= 111.5 min (882.1 - 770.6)

Volume	Invert	Avail.Storage	Storage Description
#1	88.83'	0.033 af	**16.00'W x 32.00'L x 8.17'H Prismatoid**
			0.096 af Overall - 0.013 af Embedded = 0.083 af x 40.0% Voids
#2	89.83'	0.013 af	**8.00'D x 5.50'H Vertical Cone/Cylinder** x 2 Inside #1
		0.046 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.83'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 11.30 hrs HW=88.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 3P: Subsurface System



Time span=1.00-36.00 hrs, dt=0.01 hrs, 3501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-1 Runoff Area=9,757 sf 93.17% Impervious Runoff Depth=5.99"
Tc=6.0 min CN=94 Runoff=1.44 cfs 0.112 af

Pond 3P: Subsurface System Peak Elev=96.73' Storage=0.045 af Inflow=1.44 cfs 0.112 af
Outflow=0.10 cfs 0.112 af

Total Runoff Area = 0.224 ac Runoff Volume = 0.112 af Average Runoff Depth = 5.99"
6.83% Pervious = 0.015 ac 93.17% Impervious = 0.209 ac

Summary for Subcatchment 1S: PR-1

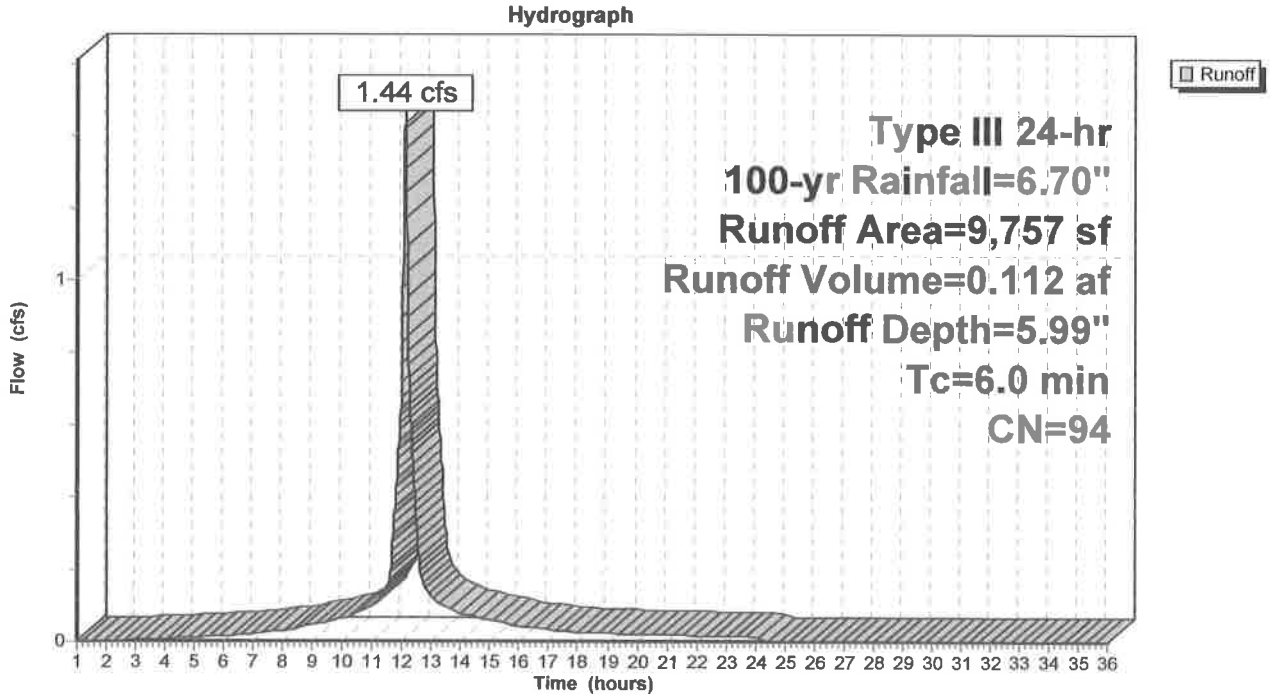
Runoff = 1.44 cfs @ 12.08 hrs, Volume= 0.112 af, Depth= 5.99"
Routed to Pond 3P : Subsurface System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (sf)	CN	Description
2,768	98	Roofs, HSG A
6,323	98	Paved parking, HSG A
666	39	>75% Grass cover, Good, HSG A
9,757	94	Weighted Average
666		6.83% Pervious Area
9,091		93.17% Impervious Area

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

Subcatchment 1S: PR-1



Summary for Pond 3P: Subsurface System

Inflow Area = 0.224 ac, 93.17% Impervious, Inflow Depth = 5.99" for 100-yr event
Inflow = 1.44 cfs @ 12.08 hrs, Volume= 0.112 af
Outflow = 0.10 cfs @ 11.06 hrs, Volume= 0.112 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.06 hrs, Volume= 0.112 af

Routing by Stor-Ind method, Time Span= 1.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 96.73' @ 13.40 hrs Surf.Area= 0.012 ac Storage= 0.045 af

Plug-Flow detention time= 155.5 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 155.4 min (921.1 - 765.7)

Volume	Invert	Avail.Storage	Storage Description
#1	88.83'	0.033 af	**16.00'W x 32.00'L x 8.17'H Prismatoid** 0.096 af Overall - 0.013 af Embedded = 0.083 af x 40.0% Voids
#2	89.83'	0.013 af	**8.00'D x 5.50'H Vertical Cone/Cylinder** x 2 Inside #1
		0.046 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.83'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 11.06 hrs HW=88.91' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 3P: Subsurface System