

April 13, 2026

File: 29906

STORMWATER MANAGEMENT REPORT

PREPARED FOR

PROPOSED TWO LOT MINOR SUBDIVISION

Located at

**15 RIDGEWAY AVENUE
BLOCK 158 LOT 28.01**

Within The

**TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NJ**



William Scott, PE, CME
NJ License GE44863

STORMWATER DRAINAGE REPORT

04/13/26

Minor Subdivision 15 Ridgeway Ave West Orange, NJ

Introduction and Major Stormwater Justification

This report has been prepared to demonstrate that the runoff from the proposed improvements to the site, which result in an increase of impervious coverage, is properly mitigated in accord with the Township of West Orange requirements for a major stormwater project, and will pose no negative impact to any surrounding downstream properties.

To ensure that the design complies with the requirements and goals of the Township Stormwater Ordinance a detailed analysis of the site condition was performed. A soils evaluator tested various areas of the site to identify both seasonal high water levels and the ability of the soil to infiltrate runoff. Additionally areas allowing for use of low impact development were identified; including potential preservation of large deciduous trees, lessening the slope of surfaces and elongation of drainage paths. This study focused the design on the area of the site which would allow for use of infiltration.

A small scale sub-surface extended detention infiltration basin (a system allowing for infiltration and controlled release) was chosen as the green infrastructure BMP to provide infiltration, recharge and reduction of runoff quantity. The basin is located at the area of the site where the soils evaluation determined an acceptable infiltration rate for design (A factor of safety was applied to the analysis by utilizing $\frac{1}{2}$ of the measured infiltration rate in all calculations).

The basin shall be a shared system, accepting runoff from both lots, therefore an easement allowing for common use and maintenance shall be established. Operations and maintenance requirements and responsibilities shall be filed with the record owner deeds.

Permeable pavement, another green infrastructure BMP, is specified for all driveway surfaces. This system is rated for 80% total suspended solids reduction providing water quality treatment for the site.

The analysis shows that the runoff from the developed portion of the site directed towards the infiltration basin when combined with the runoff rate from the developed portions of the site which bypass the system, has been reduced to no more than 50% of the two year storm rate. 75% of the 10 year storm rate and 80% for the 100 year storm rate from what would have occurred if the design area were an undeveloped wooded lot.

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Introduction and Major Stormwater Justification (continued)

In addition to the utilization of two green infrastructure BMPs low impact development measures are implemented throughout the unstudied portion of the site (not experiencing placement of impervious cover and maintaining existing lawn surfaces) which will serve to lessen the overall stormwater runoff from the site. These measures include; preservation of large trees, lessening of slopes and increasing drainage paths to increase time of concentration. These items are shown on the Land Use Planning and Source Control Plan within the site plan set.

Property Description

The project site is an existing flag lot with a stem portion containing the driveway which fronts on Ridgeway Avenue. The 1.219 acre property was previously developed with a single family dwelling with attached garage, covered parking or storage area, retaining walls, bocci court and koi pond. The property is located within an existing residential neighborhood. The existing home is served by public utilities which are located within the bed of Ridgeway Avenue.

Drainage from a small portion of the property (approximately 3,000 sf) flows overland from a highpoint on the driveway stem towards Ridgeway Avenue. The remainder of the site drains overland from South to the North towards the rear of Lot 21.01 at which point runoff from the site is collected by an existing inlet and piped through Lot 21.01 to the Township storm sewer system. No existing stormwater management facilities were found on the site.

There are no protected steep slopes on the site; slopes on the property are predominantly between 1.5% and 8%.

The soils on the site are silt loam to loamy sand noted as BouB Boonton Urban Land within hydrologic soil type "C", with a seasonal water table depth exceeding 80" in depth and a moderately low to moderately high infiltration rate of the most restrictive soil layer of 0.06 to 0.20 in/hr (USDA NRCS Soil Survey).

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Property Description (continued)

On site soils testing revealed a depth to seasonal high water varying from 5' to 7.5' with an infiltration rate varying from 0.32"/hr to 1.00"/hr. Testing was done towards the four corners of the site. Only the southwest portion of the site yielded permeability rates great enough to support an infiltration system.

The vegetation on the site is predominantly well established lawn, with a number of large deciduous trees located predominantly along the exterior boundary of the site with a lesser concentration within the site interior.

A review of the NJ Geoweb site along with a site inspection by the engineer did not reveal any indications of wetlands, waterways or presence of protected species which might impact the development of the site.

Project Scope and Stormwater Management System Overview

It is proposed to subdivide the property into two lots. One lot will contain the existing home to the northeast of the site and a new home will be constructed on the second lot. Both lots will share a driveway access centered on the stem portions of the lots accessing Ridgeway Avenue.

Utility services for the homes shall be provided through the stem portions of the lot connecting to the mains on Ridgeway Ave.

Renovations and reconfiguration of the existing home was undertaken pursuant to an approved zoning permit. During the course of demolition the builder removed a significant portion of the existing dwelling leaving only the garage as a standing structure. Therefore from a stormwater modeling perspective the project shall be now considered the construction of two new homes.

A shared stormwater management system shall be constructed on the two lots. All proposed vehicle surfaces shall be constructed with permeable pavement. The driveway surfaces shall be underlain with a stone bed and an interconnecting perforated pipe system, both of which will collect runoff from the driveway and direct it towards a proposed basin at the southwest corner of the site. Runoff from all roof surfaces which will receive pre-treatment through the use of a gutter screening system, will also be directed directly to the proposed basin or into the stone bed below the driveway surface.

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Project Scope and Stormwater Management System Overview (continued)

Infiltration may be used in the model of the stormwater basin routing as all runoff entering the system from developed surfaces receives pretreatment by either a gutter screening system or by passing through the permeable pavement layer. The basin shall, through the use of infiltration and orifice control, provide the required stormwater quantity reductions, recharge volumes and the required 80% reduction of total suspended solids for water quality.

Design Discussion

Stormwater analysis of the project is accomplished utilizing HydroCAD version 10.20-8a Software furnished by HydroCAD Software Solutions LLC. The SCS-TR20 methodology is used to analyze NOAA 24 hr type C storms for both the current (2020) and projected (2050) 2, 10 and 100 year rainfalls along with the NJDEP 2 hour water quality design storm.

The model of this project focuses solely on the “developed” area of the site within the drainage area directed towards the residential properties to the north. As the Township stormwater ordinance defines the reconstruction of a home or milling or replacement of pavement as placement of new impervious surface, all impervious surfaces within this area whether driveway or existing roofs shall be considered “new” and altered from a good condition wood ground cover. The remaining portions of this drainage area which shall not be proposed with an impervious cover are considered existing lawn conditions to remain, and therefore are not included within the study.

A small portion of the paved driveway stem from which runoff flows from the existing highpoint towards Ridgeway Ave is considered as replacement as it has existed prior to 1980 and continues to drain towards Ridgeway Ave.

These areas are depicted on the drainage area map.

The area of the site to be studied in the existing condition is modeled as type “C” HSG with ground cover type of “good condition woods” with a curve number of 70. The time of concentration was calculated as 10.9 minutes consisting of sheet and shallow concentrated flow from the rear of the proposed homes travelling to the study point which shall be the existing inlet to the rear of the site. The existing study area totals 18,843 sf.

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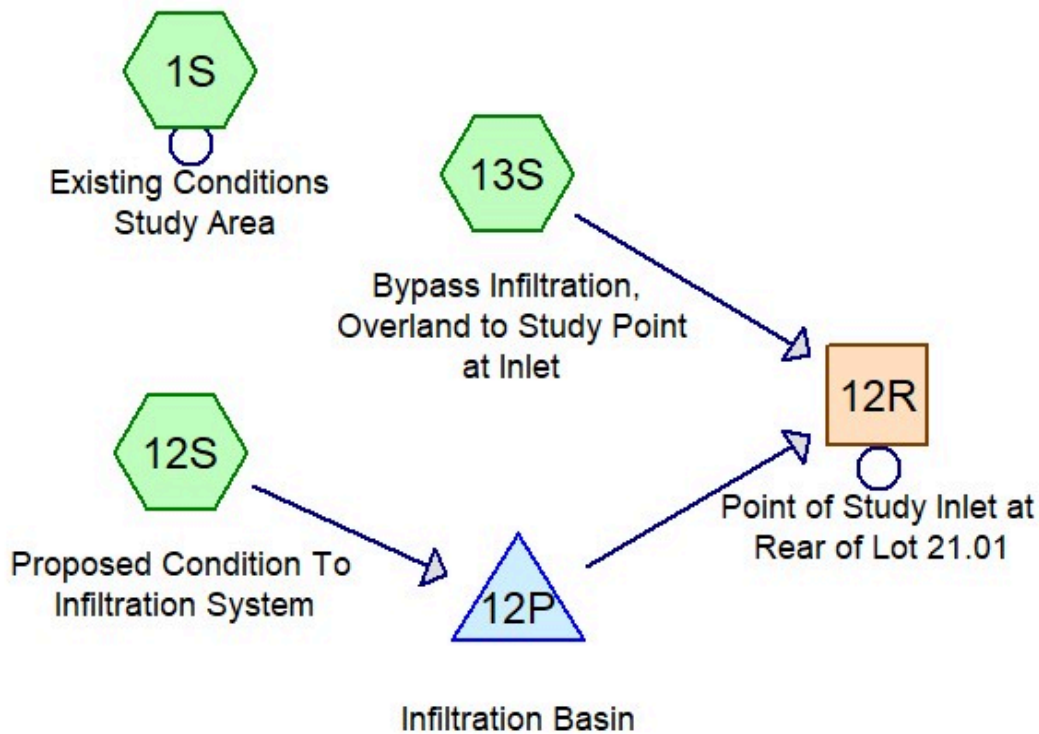
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Design Discussion (continued)

The areas of the site to be studied in the proposed condition are modeled as impervious surfaces with a curve number of 98, The proposed study area is 18,843 sf, equaling the existing condition study area. The proposed condition is modeled into two sub areas, both fully impervious, one contributing runoff to the infiltration system and the other bypassing the infiltration system with runoff traveling overland to the inlet at the rear of the property.

A diagram of the drainage analysis follows...

Diagram of Proposed Stormwater Management Study



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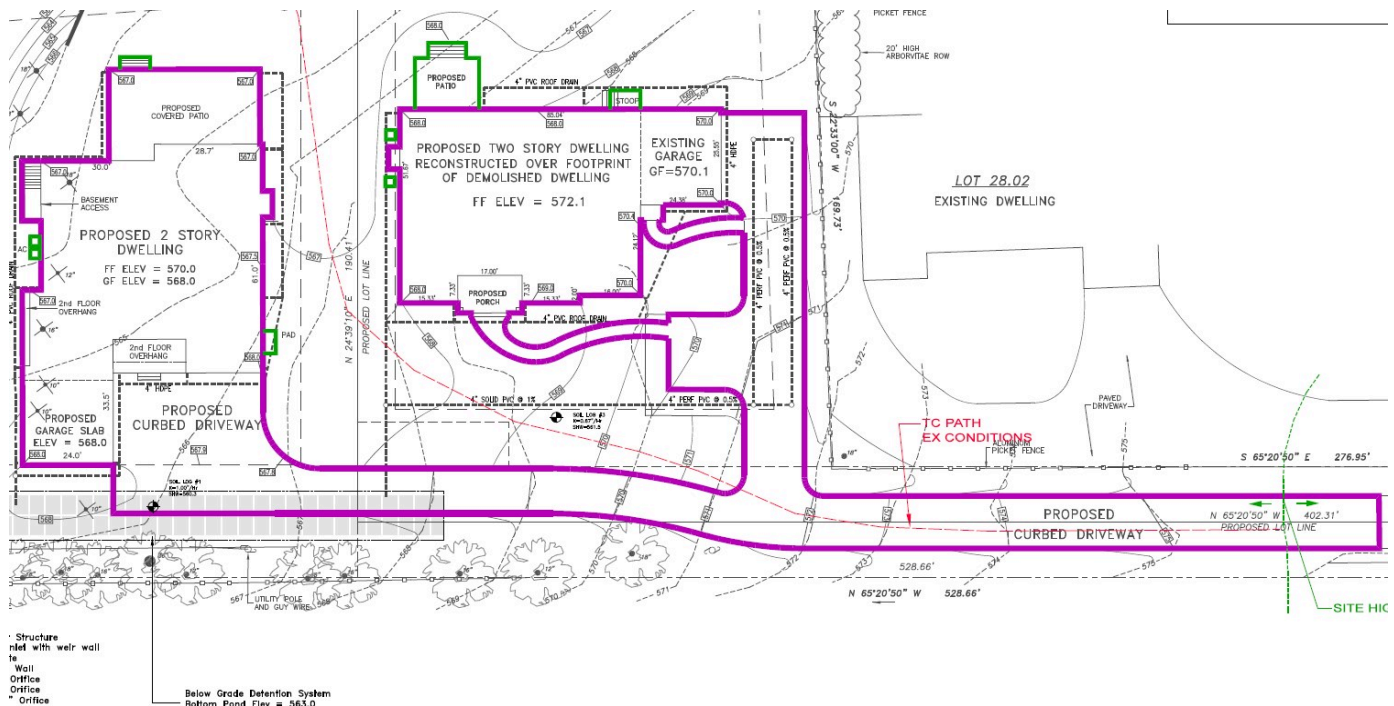
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Design Discussion (continued)

Drainage areas connected directly via roof drain piping or indirectly via flow through the impervious pavement are shown in purple,

Drainage areas shown in green generate runoff which will flow overland via sheet flow to the inlet at the rear of the site, bypassing the infiltration system.

Diagram of Proposed Drainage Areas



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Design Discussion (continued)

The below grade infiltration basin has been sized as required to restrict the volumes of the design storms and provide the necessary reductions in rate. It is also required that the designed pond volume can drain within 72 hours via infiltration.

The maximum storage for the projected 100 year storm is 3,667 cf.

Time to empty: $(3,667 \text{ cf max} / (125.5' \times 12.75') \text{ sf flat bottom}) \times 12''/\text{ft} / 0.5''/\text{hr} = 55 \text{ hrs}$

The maximum volume within the pond 4,026 cf.

Time to empty: $(4,026 \text{ cf max} / (125.5' \times 12.75') \text{ sf flat bottom}) \times 12''/\text{ft} / 0.5''/\text{hr} = 60 \text{ hrs}$

The infiltration rate utilized in the design analysis is 0.5"/hour which is half of the infiltration rate measured of 1.00"/hr at the soil log situated within the infiltration bed.

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Stormwater Analysis

Stormwater Quantity

Requirements

To comply with the Major Stormwater regulations quantity control restrictions, stormwater management measures shall be designed so that the post-construction peak runoff rates for the current and projected 2-, 10 and 100 year storm events, as defined and determined pursuant to N.J.A.C. 7:8-5.7(c) and (d), respectively, are 50, 75 and 80 percent, respectively, of the preconstruction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.

Design Methodology/Discussion

The runoff rates from the existing condition were determined. The runoff rates from the proposed conditions were determined. A study point is modeled at the existing inlet to the rear of the site at which all runoff from the studied area is collected. A comparison to the pre construction and post construction rates along with the maximum allowed reduced rates follows.

Current Intensity Storm

	<u>Pre Construction Rate</u>	<u>Maximum</u>	<u>Post Construction Rate</u>
2 Year Storm	0.38 cfs	0.19 cfs	0.19 cfs
10 Year Storm	0.95 cfs	0.71 cfs	0.66 cfs
100 Year Storm	2.26 cfs	1.81 cfs	1.80 cfs

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Design Methodology/Discussion (continued)**Projected Intensity Storm**

	<u>Pre Construction Rate</u>	<u>Maximum</u>	<u>Post Construction Rate</u>
2 Year Storm	0.57 cfs	0.29 cfs	0.26 cfs
10 Year Storm	1.31 cfs	0.98 cfs	0.90 cfs
100 Year Storm	3.17 cfs	2.54 cfs	2.33 cfs

Stormwater Recharge**Requirements**

To comply with the Major Stormwater regulations recharge requirements, stormwater management measures shall be designed to demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the projected two-year storm, as defined and determined pursuant to N.J.A.C. 7:8- 5.7(d), is infiltrated.

Design Methodology/Discussion

Recharge has been provided by the use of a small scale infiltration basin and has been analyzed by utilizing the New Jersey Groundwater Recharge Spreadsheet (NJGRS)

As the NJGRS cannot model infiltration from a system which is simultaneously discharging outflow through an orifice the study area is limited to a 2" thick stone bed set below the system outlet. The BMP variable is the depth from the surface invert of the discharge orifice or 48". The depth to the lower surface is 50" and the effective depth of the BMP is 1.6" or 0.4 voids x 2" stone depth.

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Design Methodology/Discussion (continued)

The NJGRS calculation sheet was used to solve for the minimum allowable infiltration footprint and checked against the provided area. The minimum area was calculated to be 1,339 sf while the provided infiltration footprint is 1,600 sf.

As shown on the following two exhibits the required recharge volume is provided.

Recharge Work Sheet One

Annual Groundwater Recharge Analysis (based on GSR-32)						Project Name: 15 Ridgeway Subdivision					
Select Township ↓				Average Annual P (in)	Climatic Factor	Description: File 29906					
ESSEX CO., WEST ORANGE TOWN				49.0	1.67	Analysis Date: 04/13/26					
Pre-Developed Conditions						Post-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)	Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.874	Woods	Boonton	15.7	49,676	1	0.432	Impervious areas	Boonton	0.0	-
2	0.344	Impervious areas	Boonton	0.0	-	2	0.786	Open space	Boonton	14.9	42,650
3						3					
4						4					
5						5	0				
6						6	0				
7	0					7	0				
8	0					8	0				
9	0					9	0				
10	0					10	0				
11	0					11	0				
12	0					12	0				
13	0					13	0				
14	0					14	0				
15	0					15	0				
Total =	1.2					Total =	1.2				
				Total Annual Recharge (in)	Total Annual Recharge (cu.ft)					Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				11.2	49,676					9.6	42,650
Procedure to fill the Pre-Development and Post-Development Conditions Tables						Annual Recharge Requirements Calculation ↓					
For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.						% of Pre-Developed Annual Recharge to Preserve = 100%					
						Post-Development Annual Recharge Deficit= 7,026 (cubic feet)					
						Recharge Efficiency Parameters Calculations (area averages)					
						RWCV= 3.56 (in) DRWC= 0.00 (in)					
						ERWC= 0.59 (in) EDRWC= 0.00 (in)					

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Design Methodology/Discussion (continued)

Recharge Work Sheet Two

Project Name	Description	Analysis Date	BMP or LID Type
15 Ridgeway Subdivision	File 29906	04/13/26	Infiltration Basin
Recharge BMP Input Parameters			
Parameter	Symbol	Value	Unit
BMP Area	ABMP	1339.9	sq.ft
BMP Effective Depth, this is the design variable	dBMP	0.8	in
Upper level of the BMP surface (negative if above ground)	dBMPu	48.0	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	50.0	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	0	unitless
Root Zone Water capacity Calculated Parameters			
Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.59	in
ERWC Modified to consider dEXC	EDRWC	0.00	in
Empty Portion of RWC under Infiltr. BMP	RERWC	0.00	in
Recharge Design Parameters			
Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	0.06	in
Inches of Rainfall to capture	Pdesign	0.11	in
Recharge Provided Avg. over Imp. Area		4.5	in
Runoff Captured Avg. over imp. Area		4.5	in
Solve for ABMP to provide Vdef			
Solve for dBMP to provide Vdef			
Default Vdef & Aimp			
BMP Calculated Size Parameters			
ABMP/Aimp	Aratio	0.07	unitless
BMP Volume	VBMP	89	cu.ft
Parameters from Annual Recharge Worksheet			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	7,026	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	18,818	sq.ft
Root Zone Water Capacity	RWC	3.56	in
RWC Modified to consider dEXC	DRWC	0.00	in
Climatic Factor	C-factor	1.67	no units
Average Annual P	Pavg	49.0	in
Recharge Requirement over Imp. Area	dr	4.5	in
System Performance Calculated Parameters			
Annual BMP Recharge Volume		7,026	cu.ft
Avg BMP Recharge Efficiency		100.0%	Represents % Infiltration Recharged
%Rainfall became Runoff		78.5%	%
%Runoff Infiltrated		11.6%	%
%Runoff Recharged		11.6%	%
%Rainfall Recharged		9.1%	%
CALCULATION CHECK MESSAGES			
Volume Balance--> OK			
dBMP Check--> OK			
dEXC Check--> OK			
BMP Location--> Location is selected as distributed or undetermined			
OTHER NOTES			
Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses			
How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef & Aimp" button.			

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Stormwater Quality

To comply with the Major Stormwater regulations water quality requirements, stormwater management measures shall be designed to provide 80% reduction of the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm over the net increase of motor vehicle surface.

Design Methodology/Discussion

Clean roof runoff and runoff from lawns, walkways, patios or decks do not have to be treated for TSS removal.

Therefore discussion of water quality provision on site is limited to the remaining impervious surface comprising driveway cover. All proposed driveways on the site are specified to be constructed of a permeable pavement system. The system is rated to provide 80% TSS removal if the storage bed below the pavement can accommodate the water quality storm.

Construction details provide a non-woven geotextile fabric underlain stone bed under all permeable pavement with a minimum depth of 12" Void storage at a 40% ratio provides an effective depth of 4.8" well in excess of the water quality storm depth of 1.25"

STORMWATER DRAINAGE REPORT Minor Subdivision 15 Ridgeway Ave West Orange, NJ

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Infiltration Mounding Analysis

The mounding of the infiltrated water below the basin bottom is modeled utilizing the Hantush spreadsheet calculator downloaded from the NJDEP.

Depth for the mounding analysis is based on the maximum depth of the projected 100 year storm or 3.44 feet.

The initial calculation inputs are as follows

The recharge rate, R, or the permeability rate utilized is $\frac{1}{2}$ of the measured rate of 1.0"/hr
 $R=0.5$ "/hr

The basin dimensions for spread sheet entry were 65" x 6.5'. Because the basin shape is linear the spread sheet is run twice with the x and y values transposed.

The specific yield utilized was the default value of 0.15.

The horizontal hydraulic conductivity was set equal to the design permeability rate of 0.5"/hr.

The duration of the infiltration period was calculated as follows.

Infiltrated Vol (0.045 af) (43,560 sf) (12") / Footprint (1,600 sf) (0.5"/hr) = 29 hrs

The initial thickness of the saturated zone utilized was the default value of 10 feet.

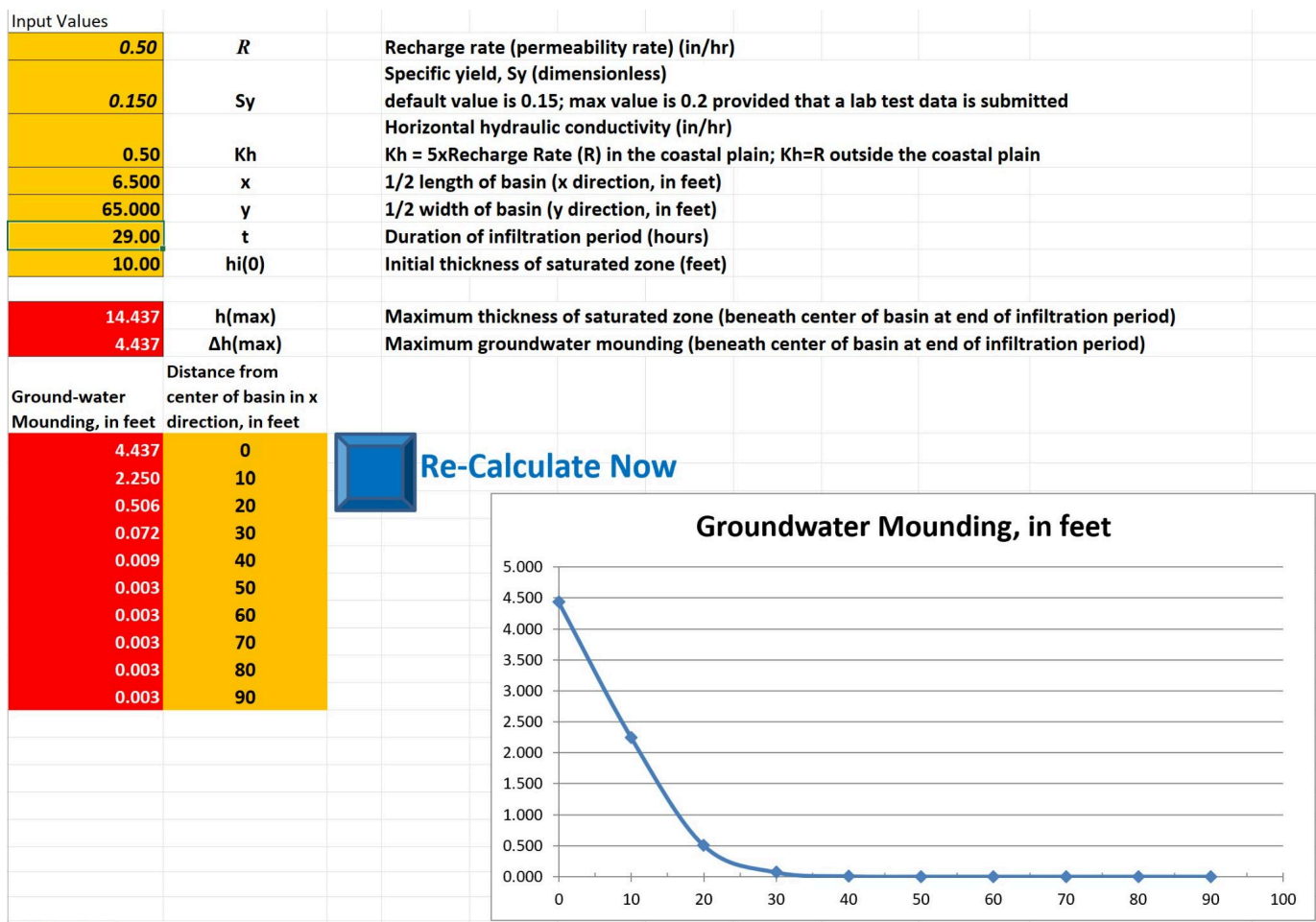
Results indicate a zero change in mounding at a distance 23.5' from the long axis of the pond and a zero change in mounding at a distance 25' from the long axis of the pond. There are no building structures with a basement within the area which would experience an increase of ground water elevation.

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Infiltration Mounding Analysis One

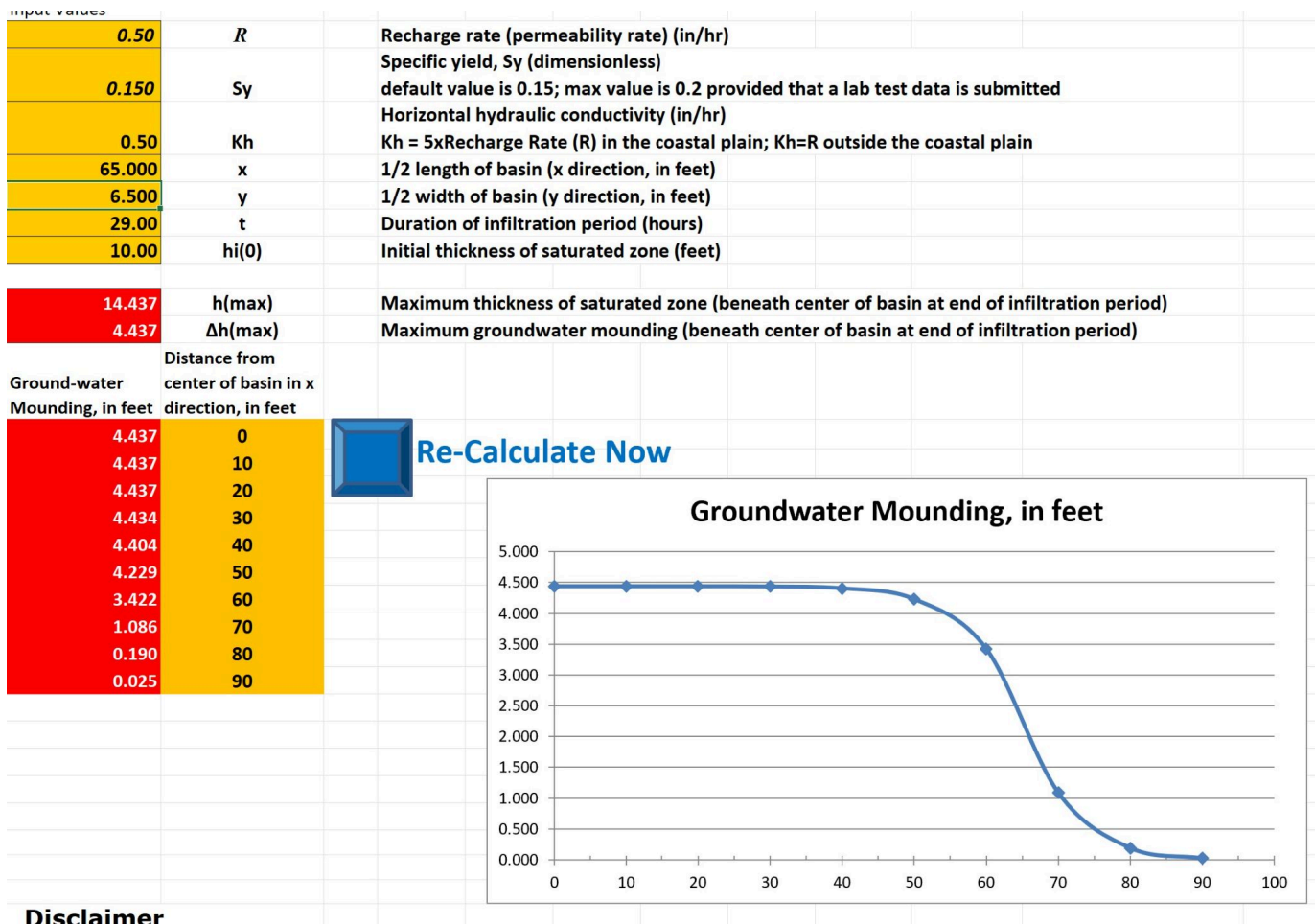


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Minor Subdivision 15 Ridgeway Ave West Orange, NJ

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Infiltration Mounding Analysis Two



DEPTH LOGGED BY:VINCENT CREEVY,Block 158, Proposed Lot 28.04 West Orange
SOIL LOG -3-Dry Well-03/20/2026

SOIL DESCRIPTION

0-31" 7.5YR 4/4 Brown, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

31"-68" 7.5YR 6/6 Redish yellow, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

68"-144" 7.5YR 5/4 Brown siltloam (SAMPLE @ 73") 15% Gravel-25% Cobble-3" to 8" 110" -144"
slightly moist, subangular blocky, friable, plastic
*****MOTTLES OBSERVED 10YR 5/6 @ 95"(few, medium, distinct) SEASONAL HIGH WATER
*****WATER SEEPAGE OBSERVED @ 105"

DEPTH LOGGED BY:VINCENT CREEVY,Block 158, Proposed Lot 28.03 West Orange
SOIL LOG -1-Dry Well-03/20/2026

SOIL DESCRIPTION

0-13" 7.5YR 3/3 Dark brown, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

31"-68" 7.5YR 6/4 light brown, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

68"-130" 7.5YR 5/4 Brown siltloam (SAMPLE @ 73") 15% Gravel-25% Cobble-3" to 10" 108" -130"
moist, subangular blocky, friable, plastic
*****MOTTLES OBSERVED 10YR 5/6 @ 68"(few, medium, distinct) SEASONAL HIGH WATER
*****WATER SEEPAGE OBSERVED @ 70"

LOGGED BY:VINCENT CREEVY,Block 158, Proposed Lot 28.04 West Orange
DEPTH SOIL LOG -2-Dry Well-03/20/2026
SOIL DESCRIPTION

0-44" 7.5YR 4/4 Brown, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

44"-69" 7.5YR 6/6 Redish yellow, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****MOTTLES OBSERVED 10YR 5/6 @ 60"(few, medium, distinct) SEASONAL HIGH WATER
*****WATER SEEPAGE OBSERVED @ 65"

69"-144" 7.5YR 5/4 Brown siltloam (SAMPLE @ 75") 15% Gravel-10% Cobble-3" to 8" 101" -144"
moist, subangular blocky, friable, plastic
*****WET THROUGH OUT

LOGGED BY:VINCENT CREEVY,Block 158, Proposed Lot 28.03 West Orange
DEPTH SOIL LOG -4-Dry Well-03/20/2026

SOIL DESCRIPTION

0-65" 7.5YR 4/4 Brown, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****NO MOTTLES OR WATER OBSERVED

65"-75" 7.5YR 6/6 Redish yellow, siltloam
slightly moist, subangular blocky, friable, slightly plastic to plastic
*****MOTTLES OBSERVED 10YR 5/6 @ 74"(few, medium, distinct) SEASONAL HIGH WATER

75"-144" 7.5YR 5/4 Brown siltloam (SAMPLE @ 80") 15% Gravel-25% Cobble-3" to 8" 105" -144"
moist, subangular blocky, friable, plastic
*****WATER SEEPAGE OBSERVED @ 76"

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.03 W. Orange (Dry Well)

1. Test Number Log -4 Replicate (letter) B Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 80"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.7"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

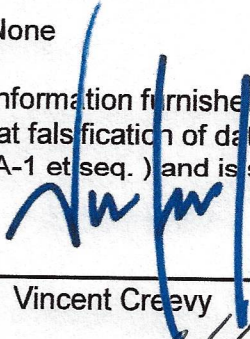
5.62min./inch
5.64min./inch
5.64min./inch
5.65min./inch
5.65min./inch
5.65min./inch

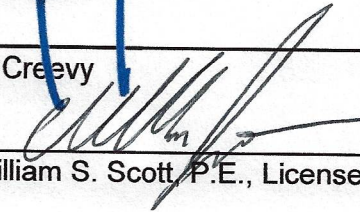
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.7" / 5.63$$
$$\times \ln(7.0/6.0) = 0.33 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.03 W. Orange (Dry Well)

1. Test Number Log -4 Replicate (letter) A Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 80"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.5"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

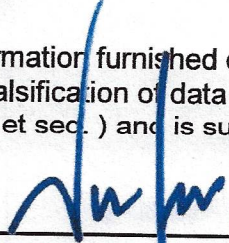
5.60min./inch
5.62min./inch
5.62min./inch
5.63min./inch
5.63min./inch
5.63min./inch

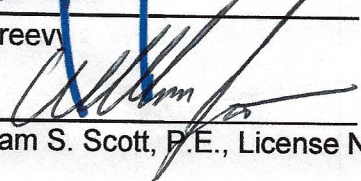
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.5" / 5.63$$
$$\times \ln(7.0/6.0) = 0.32 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.03 W. Orange (Dry Well)

1. Test Number Log -4 Replicate (letter) A Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 80"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.5"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

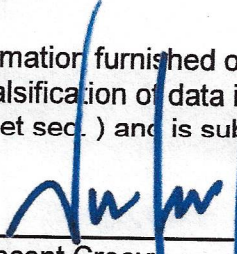
5.60min./inch
5.62min./inch
5.62min./inch
5.63min./inch
5.63min./inch
5.63min./inch

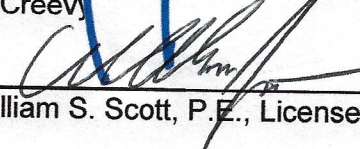
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.5" / 5.63$$
$$\times \ln(7.0/6.0) = 0.32 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.03 W. Orange (Dry Well)

1. Test Number Log -3 Replicate (letter) B Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 73"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.4"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

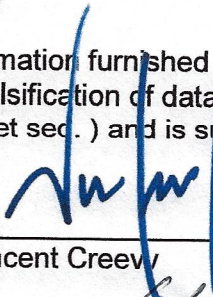
2.47min./inch
2.48min./inch
2.49min./inch
2.49min./inch
2.49min./inch
2.49min./inch

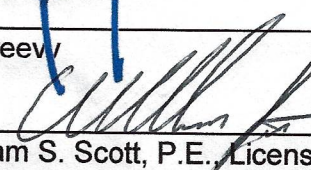
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2) \\ = (60 \text{ min/hr} \times 0.194/3.534) \times 3.4" / 2.49 \\ \times \ln(7.0/6.0) = 0.69 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.03 W. Orange (Dry Well)

1. Test Number Log -3 Replicate (letter) A Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 73"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.5"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

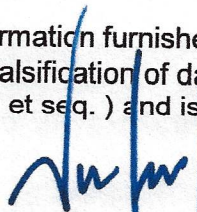
2.62min./inch
2.63min./inch
2.63min./inch
2.65min./inch
2.65min./inch
2.65min./inch

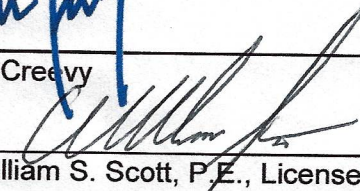
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2) \\ = (60 \text{ min/hr} \times 0.194/3.534) \times 3.5" / 2.65 \\ \times \ln(7.0/6.0) = 0.67 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.04 W. Orange (Dry Well)

1. Test Number Log -2 Replicate (letter) B Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 75"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.6"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

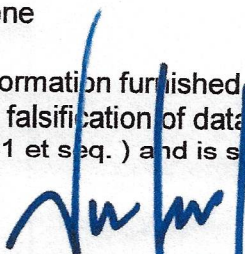
4.14min./inch
4.13min./inch
4.14min./inch
4.15min./inch
4.15min./inch
4.15min./inch

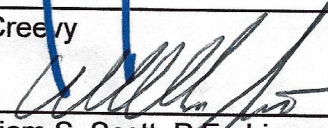
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2) \\ = (60 \text{ min/hr} \times 0.194/3.534) \times 3.6" / 4.15 \\ \times \ln(7.0/6.0) = 0.44 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.04 W. Orange (Dry Well)

1. Test Number Log -2 Replicate (letter) A Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 75"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.4"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

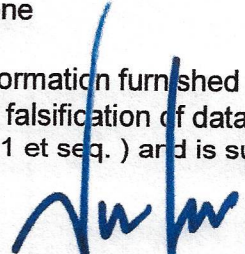
3.84min./inch
3.84min./inch
3.85min./inch
4.0min./inch
4.0min./inch
4.0min./inch

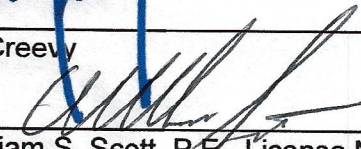
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2) \\ = (60 \text{ min/hr} \times 0.194/3.534) \times 3.4" / 4.0 \\ \times \ln(7.0/6.0) = 0.43 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.04 W. Orange (Dry Well)

1. Test Number Log -1 Replicate (letter) B Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 72"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.5"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

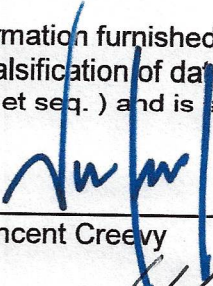
1.73min./inch
1.74min./inch
1.74min./inch
1.75min./inch
1.75min./inch
1.75min./inch

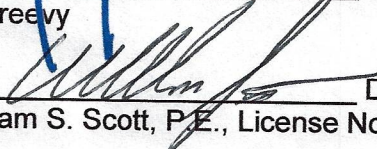
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2) \\ = (60 \text{ min/hr} \times 0.194/3.534) \times 3.5" / 1.75 \\ \times \ln(7.0/6.0) = 1.02 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

Form 3b. Tube Permeameter Test Data: Blk. 158, Prop. Lot 28.04 W. Orange (Dry Well)

1. Test Number Log -1 Replicate (letter) A Date Collected 03/20/2025

2. Material Tested: Test in Native Soil – Indicate Depth 72"

3. Type of Sample: X Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.25"

5. Bulk Density Determination:

6. Standpipe used: No X Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:
*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

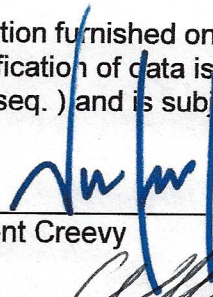
1.64min./inch
1.64min./inch
1.65min./inch
1.65min./inch
1.65min./inch
1.65min./inch

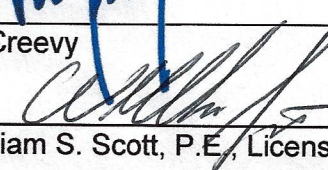
9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.25" / 1.65$$
$$\times \ln(7.0/6.0) = 1.0 \text{ in/hr} = K-1$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3B of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator  Date 03/21/2026
Vincent Creevy

Signature of Professional Engineer  Date 03/21/2026
William S. Scott, P.E., License No. 44863

ENSURPLAN, INC.

Civil Engineers & Land Surveyors
Certificate of Authorization 24GA27997700

www.Ensurplan.net
Ph: (732) 469-0400

STORMWATER DRAINAGE REPORT
Minor Subdivision 15 Ridgeway Ave West Orange, NJ

04/13/26

Existing Conditions Information and Hydrographs

Summary for Subcatchment 1S: Existing Conditions Study Area

Runoff = 0.38 cfs @ 12.20 hrs, Volume= 0.036 af, Depth= 0.99"

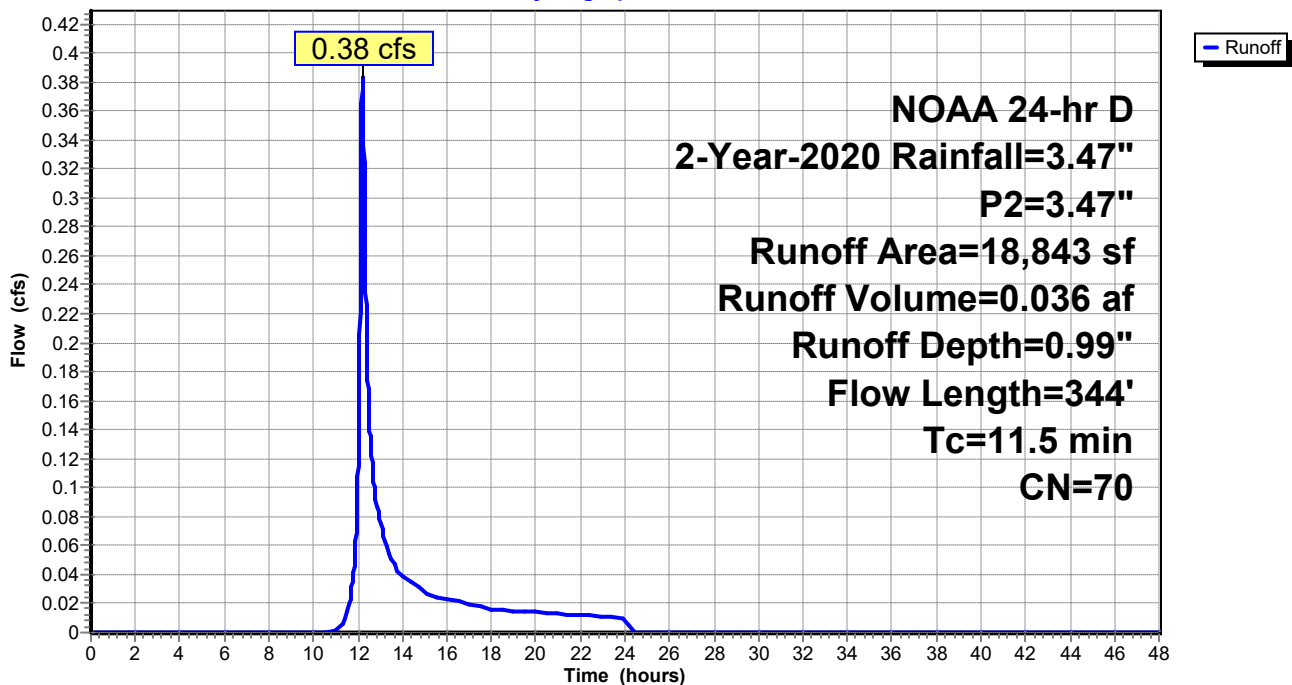
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0370	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.47"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.5	344	Total			

Subcatchment 1S: Existing Conditions Study Area

Hydrograph



Summary for Subcatchment 1S: Existing Conditions Study Area

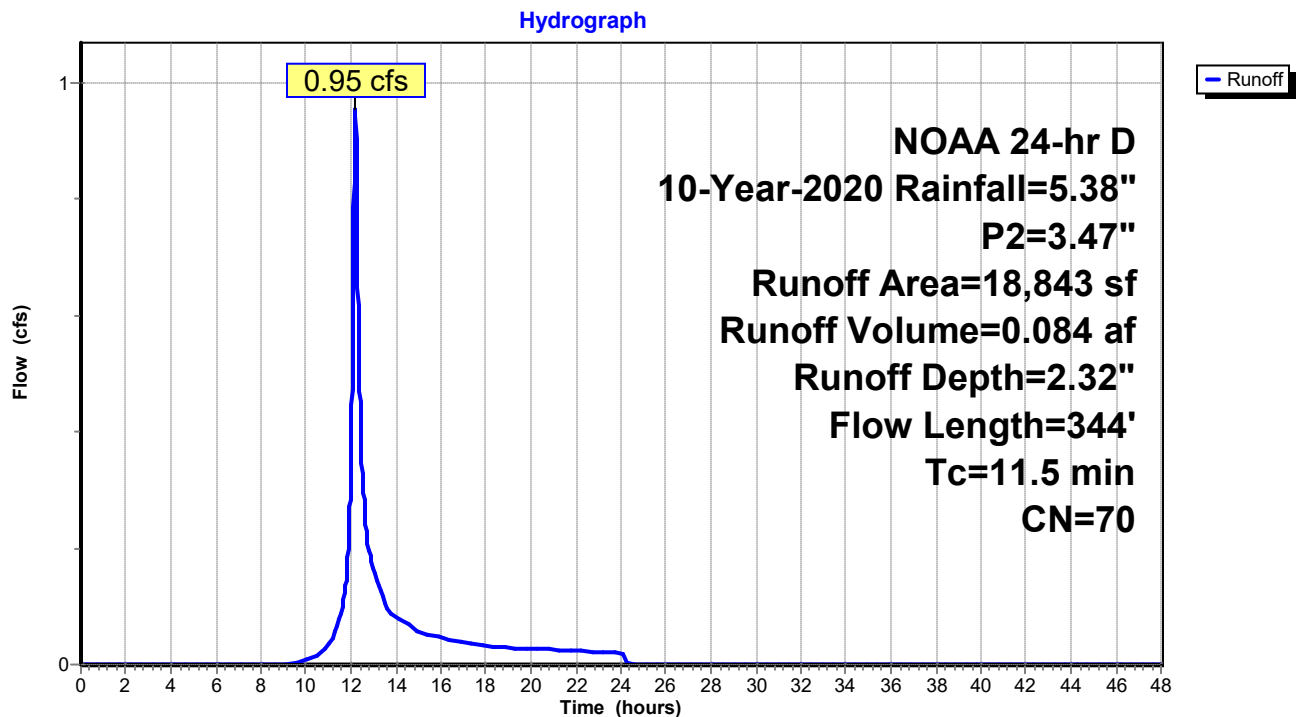
Runoff = 0.95 cfs @ 12.20 hrs, Volume= 0.084 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0370	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.47"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.5	344	Total			

Subcatchment 1S: Existing Conditions Study Area



Summary for Subcatchment 1S: Existing Conditions Study Area

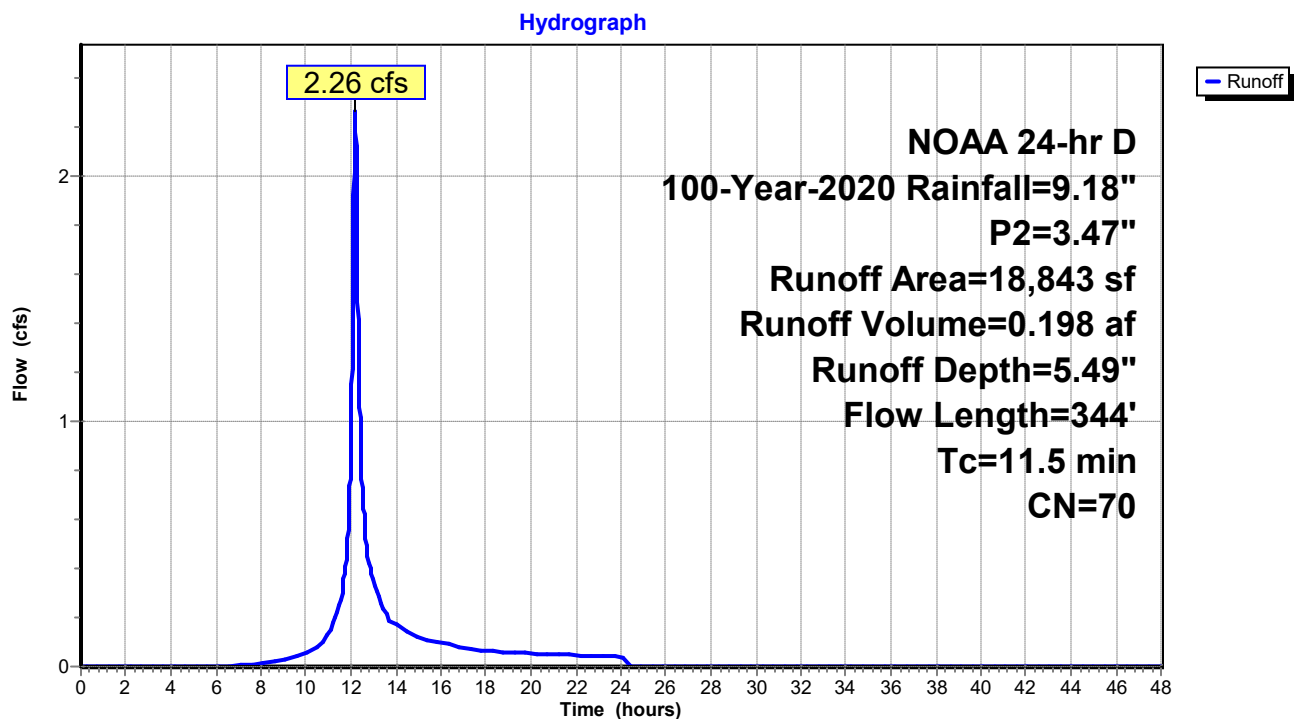
Runoff = 2.26 cfs @ 12.19 hrs, Volume= 0.198 af, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0370	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.47"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.5	344	Total			

Subcatchment 1S: Existing Conditions Study Area



Summary for Subcatchment 1S: Existing Conditions Study Area

Runoff = 0.57 cfs @ 12.19 hrs, Volume= 0.050 af, Depth= 1.39"

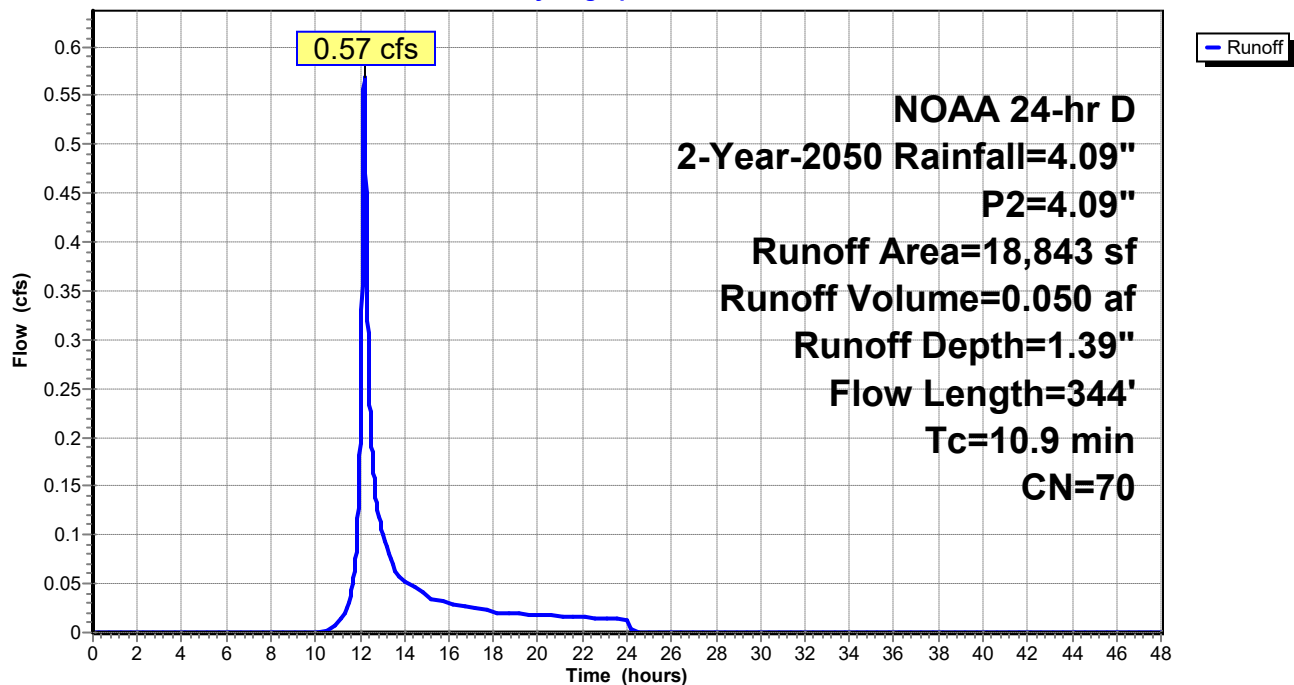
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0370	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 4.09"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.9	344	Total			

Subcatchment 1S: Existing Conditions Study Area

Hydrograph



Summary for Subcatchment 1S: Existing Conditions Study Area

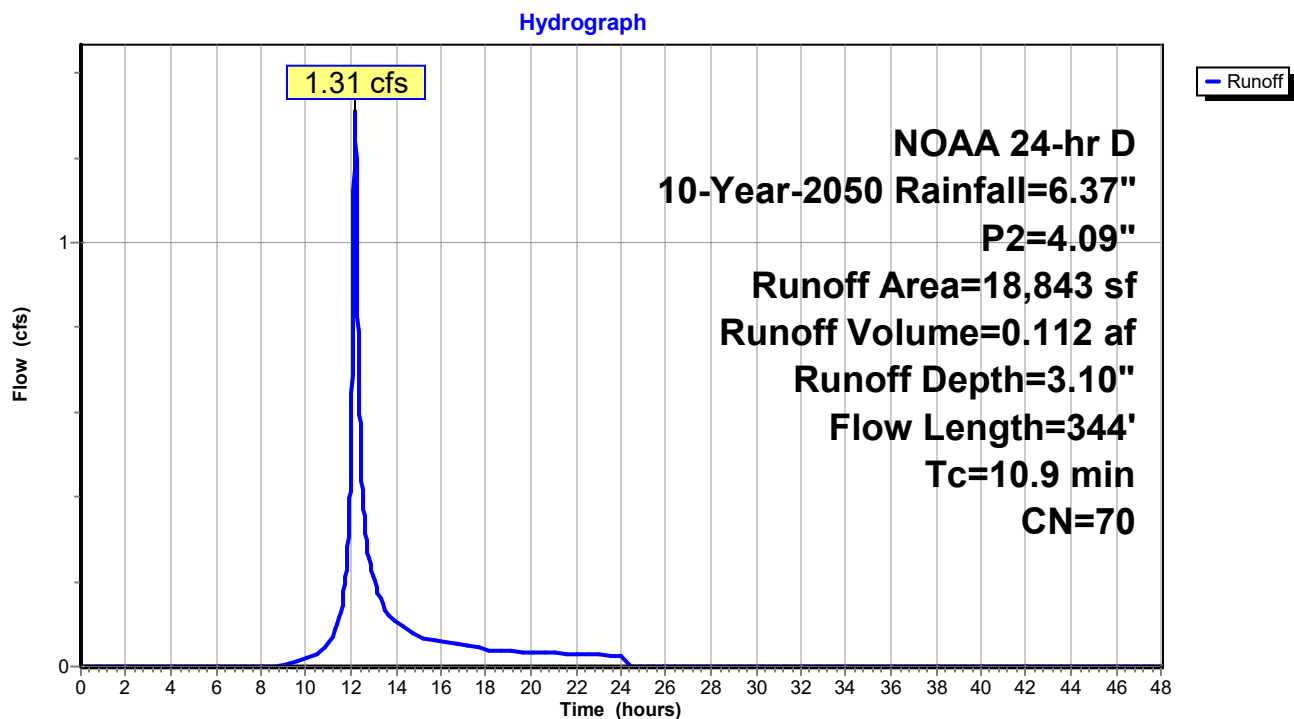
Runoff = 1.31 cfs @ 12.19 hrs, Volume= 0.112 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0370	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 4.09"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.9	344	Total			

Subcatchment 1S: Existing Conditions Study Area



Summary for Subcatchment 1S: Existing Conditions Study Area

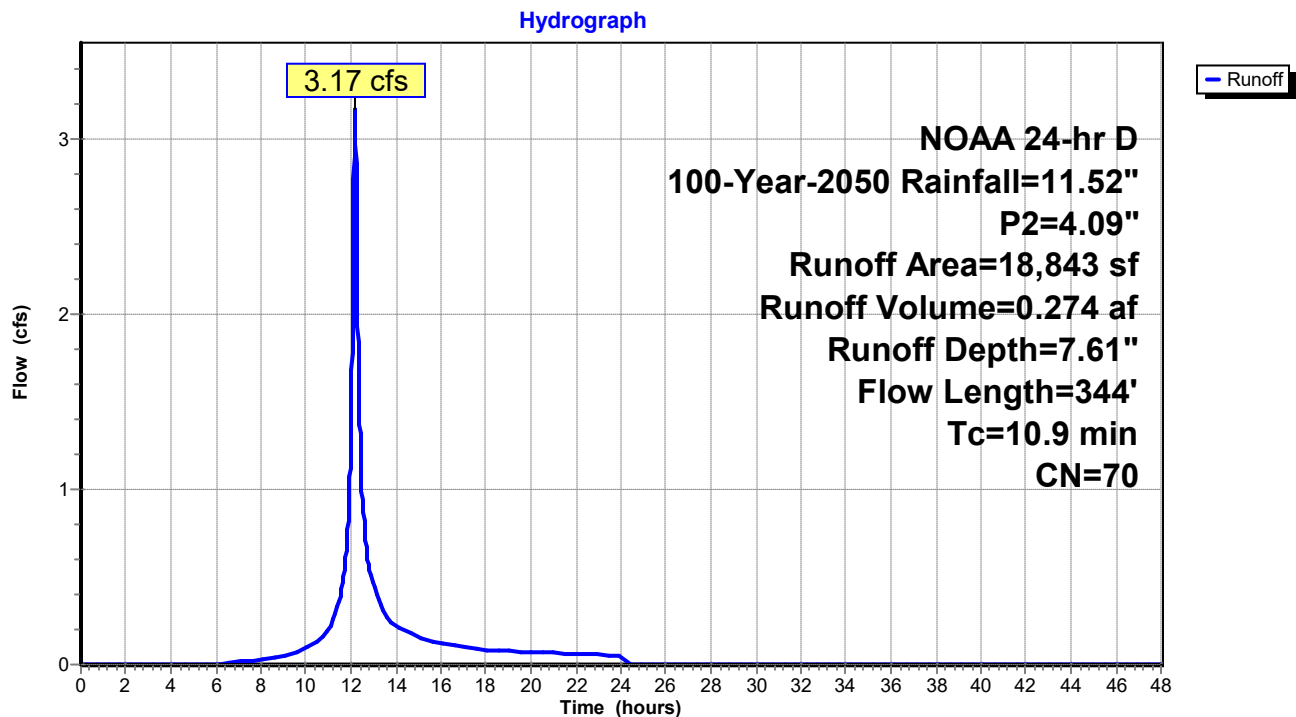
Runoff = 3.17 cfs @ 12.18 hrs, Volume= 0.274 af, Depth= 7.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
18,843	70	Woods, Good, HSG C
18,843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0370	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 4.09"
4.1	244	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.9	344	Total			

Subcatchment 1S: Existing Conditions Study Area



ENSURPLAN, INC.

Civil Engineers & Land Surveyors
Certificate of Authorization 24GA27997700

www.Ensurplan.net
Ph: (732) 469-0400

STORMWATER DRAINAGE REPORT
Minor Subdivision 15 Ridgeway Ave West Orange, NJ

04/13/26

Proposed Conditions Information and Hydrographs

Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

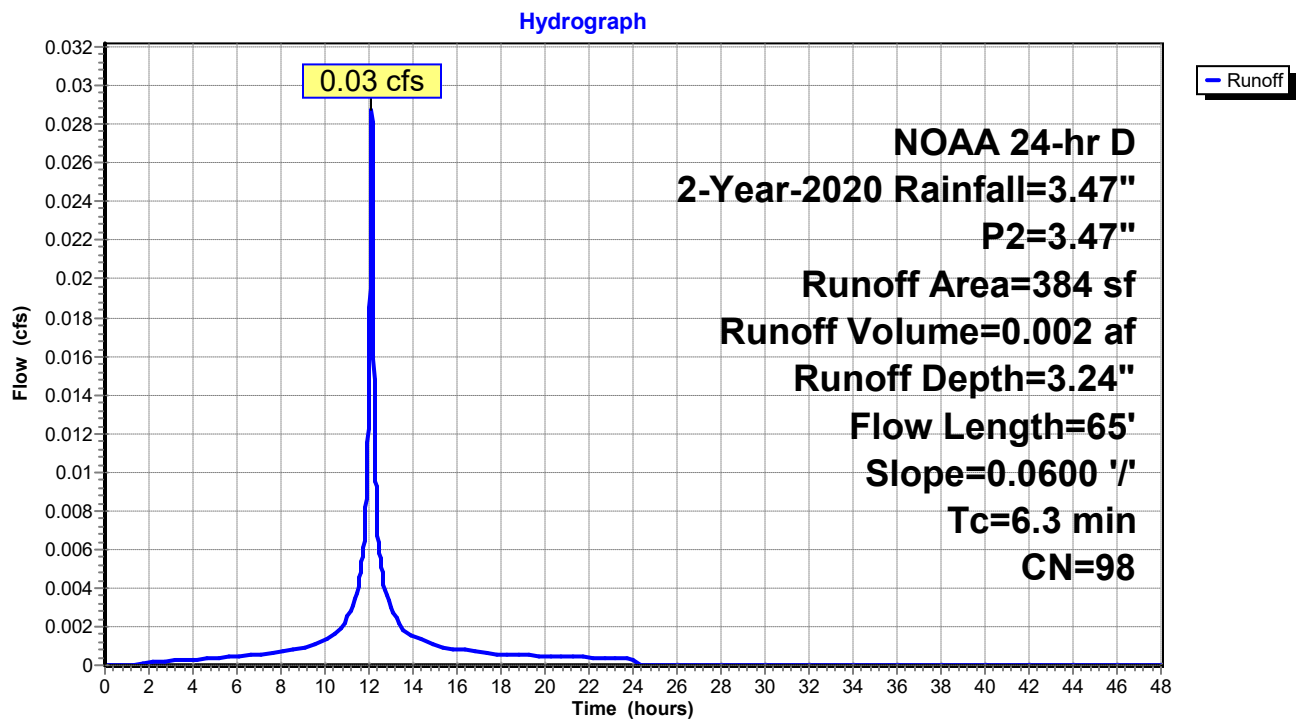
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 3.24"
 Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	65	0.0600	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

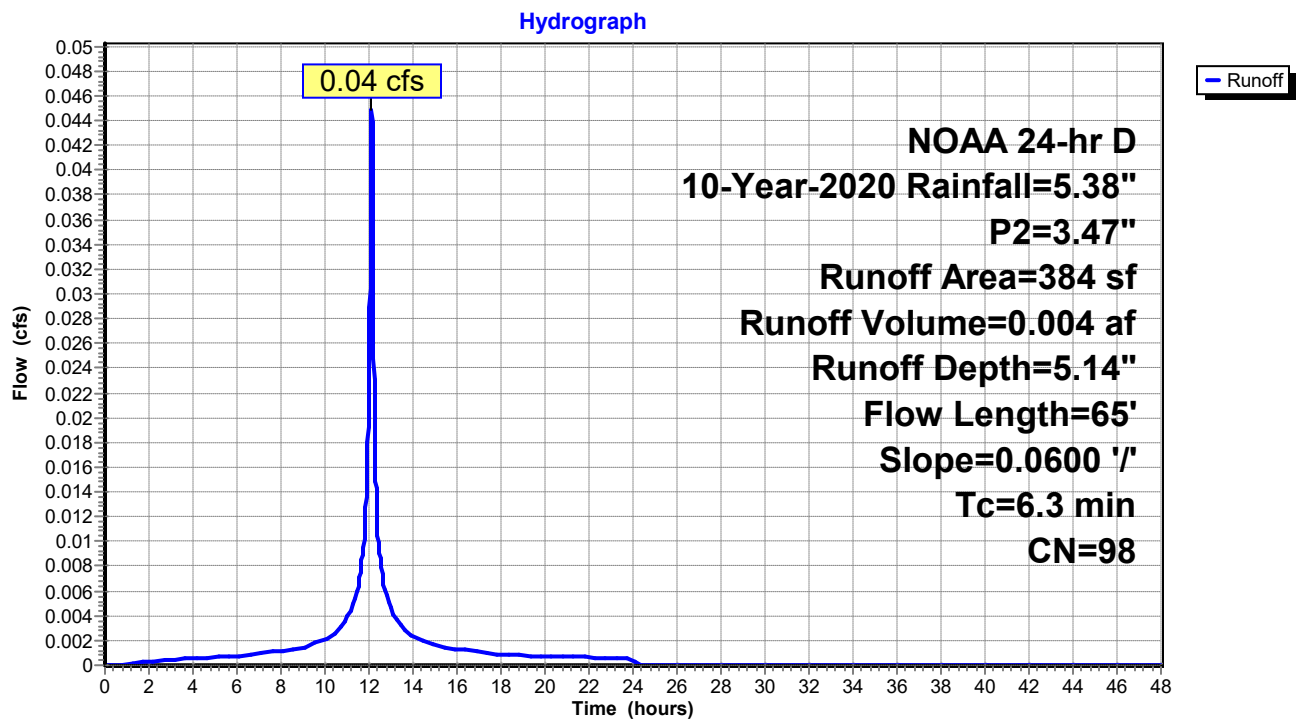
Runoff = 0.04 cfs @ 12.13 hrs, Volume= 0.004 af, Depth= 5.14"
 Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	65	0.0600	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

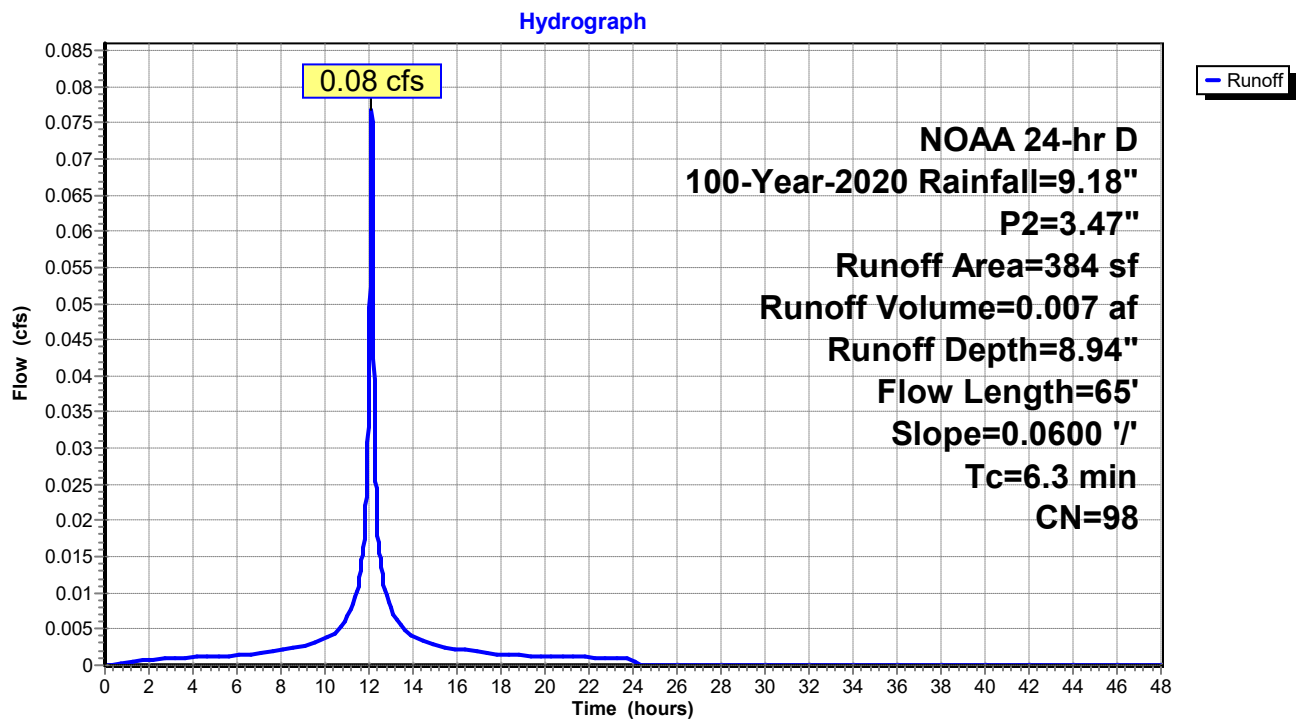
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 0.007 af, Depth= 8.94"
 Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	65	0.0600	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

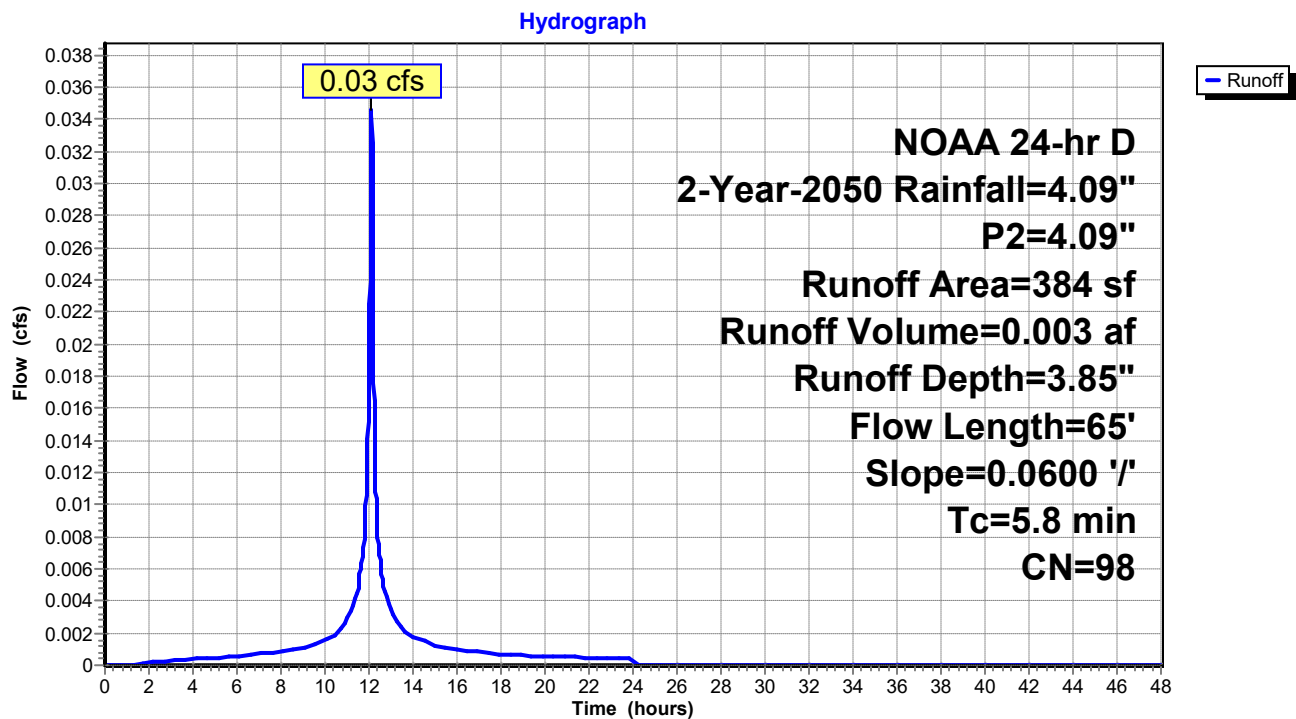
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 0.003 af, Depth= 3.85"
 Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	65	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

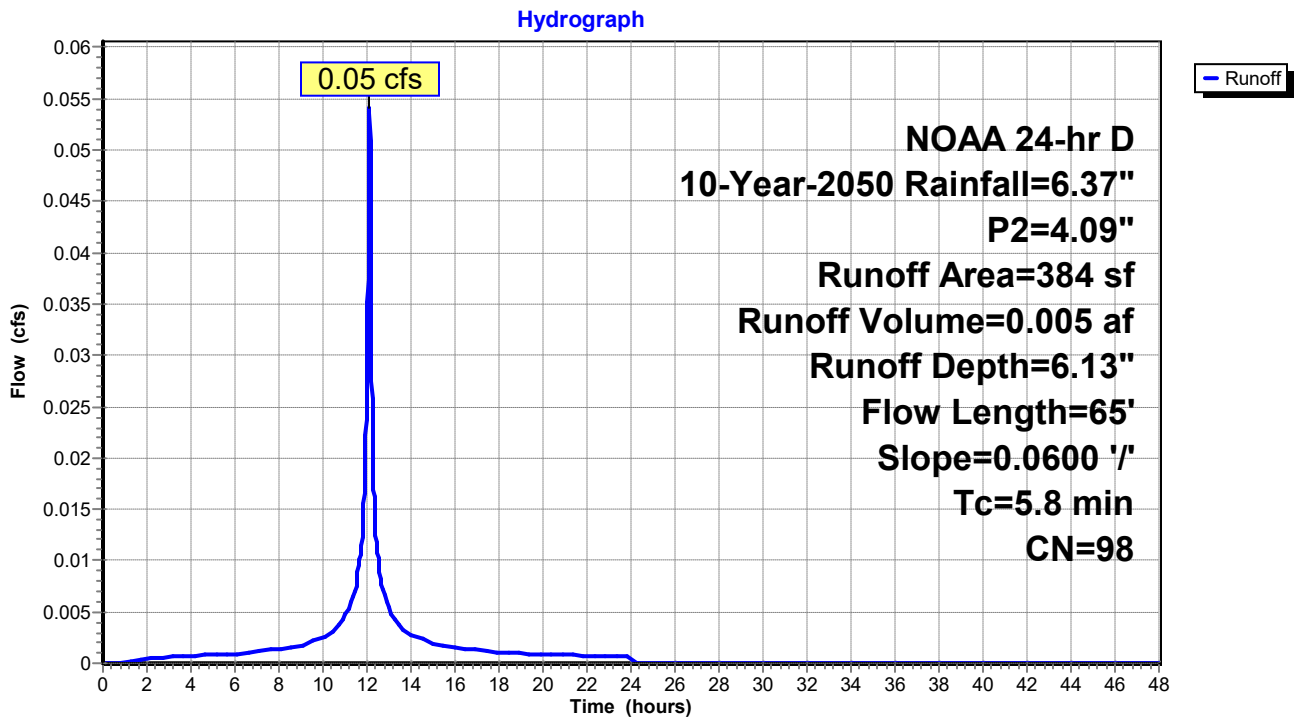
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 0.005 af, Depth= 6.13"
Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	65	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet

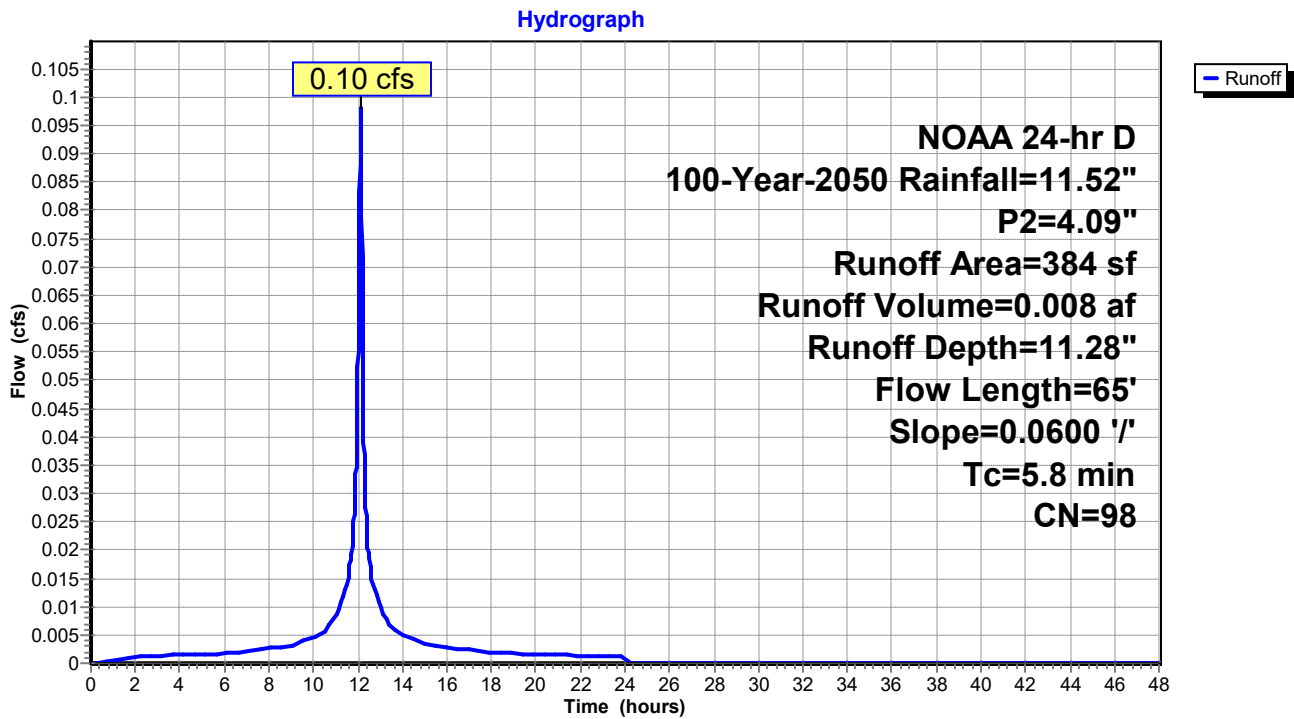
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth=11.28"
Routed to Reach 12R : Study Point At Inlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
* 384	98	Misc Impervious To Rear Property
384		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	65	0.0600	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"

Subcatchment 13S: Bypass Infiltration, Overland to Study Point at Inlet



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

Runoff = 1.30 cfs @ 12.12 hrs, Volume= 0.103 af, Depth= 3.24"
 Routed to Pond 12P : Infiltration basin

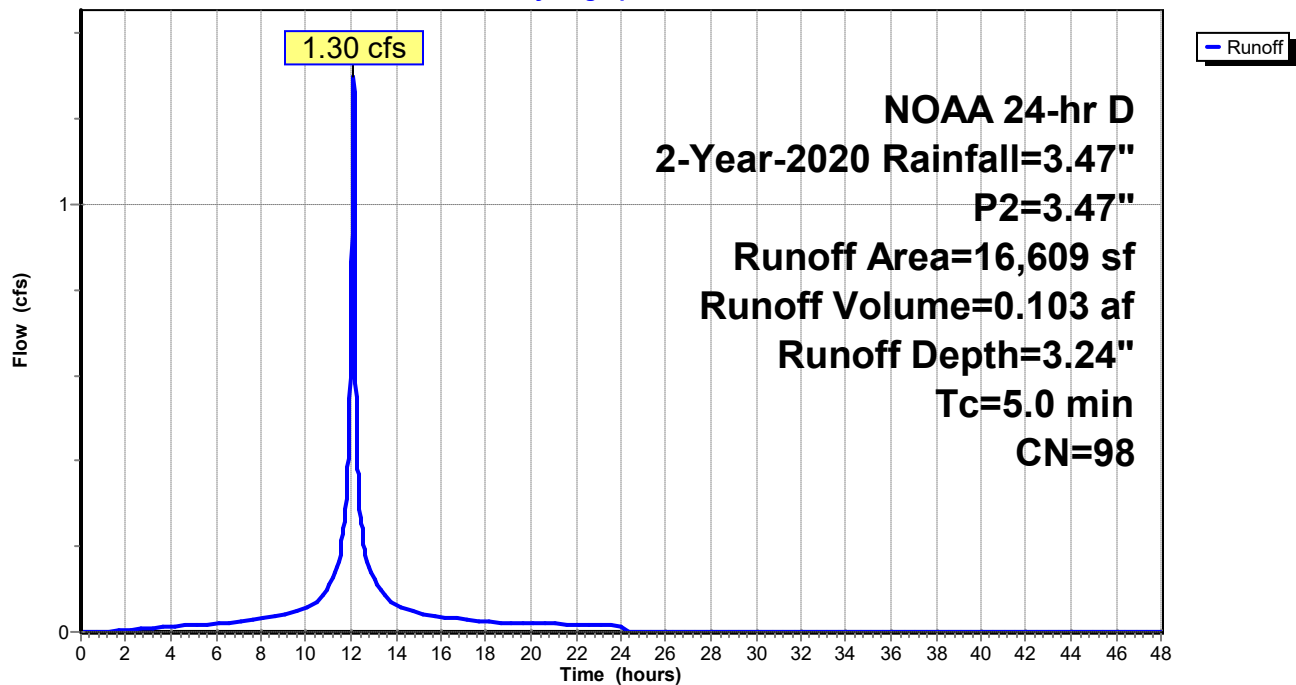
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System

Hydrograph



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

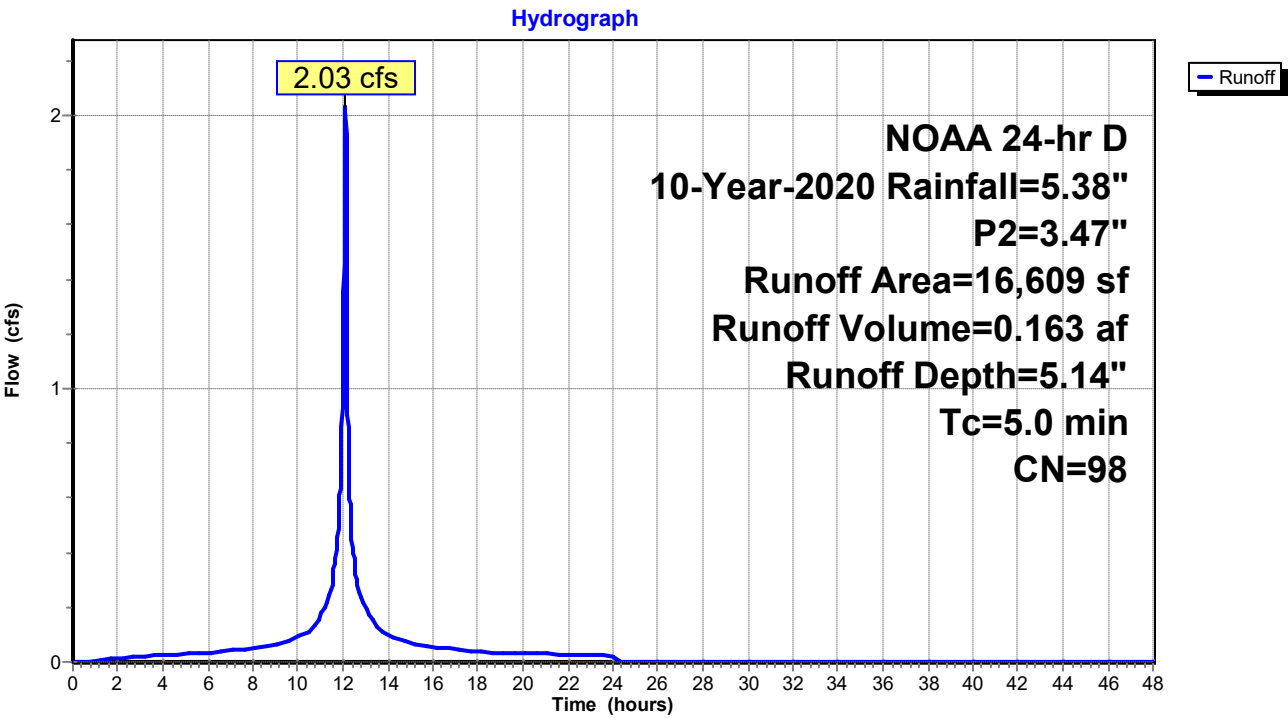
Runoff = 2.03 cfs @ 12.12 hrs, Volume= 0.163 af, Depth= 5.14"
Routed to Pond 12P : Infiltration basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

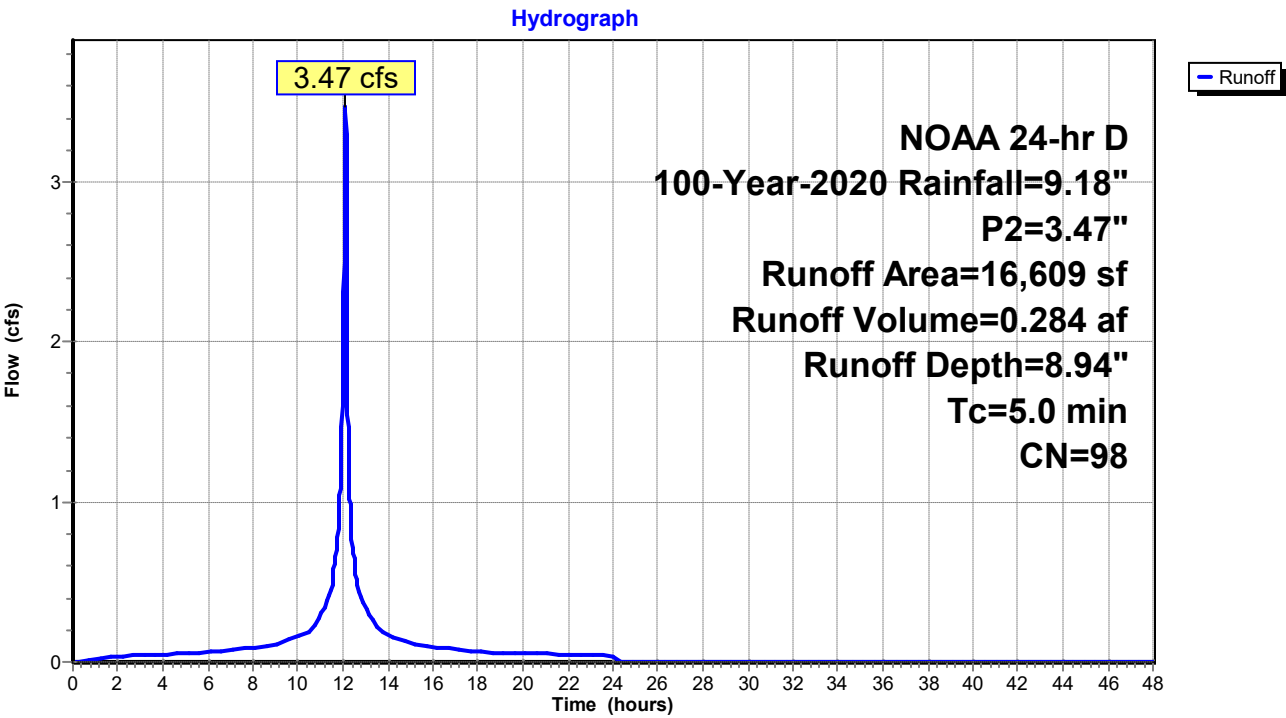
Runoff = 3.47 cfs @ 12.12 hrs, Volume= 0.284 af, Depth= 8.94"
Routed to Pond 12P : Infiltration basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

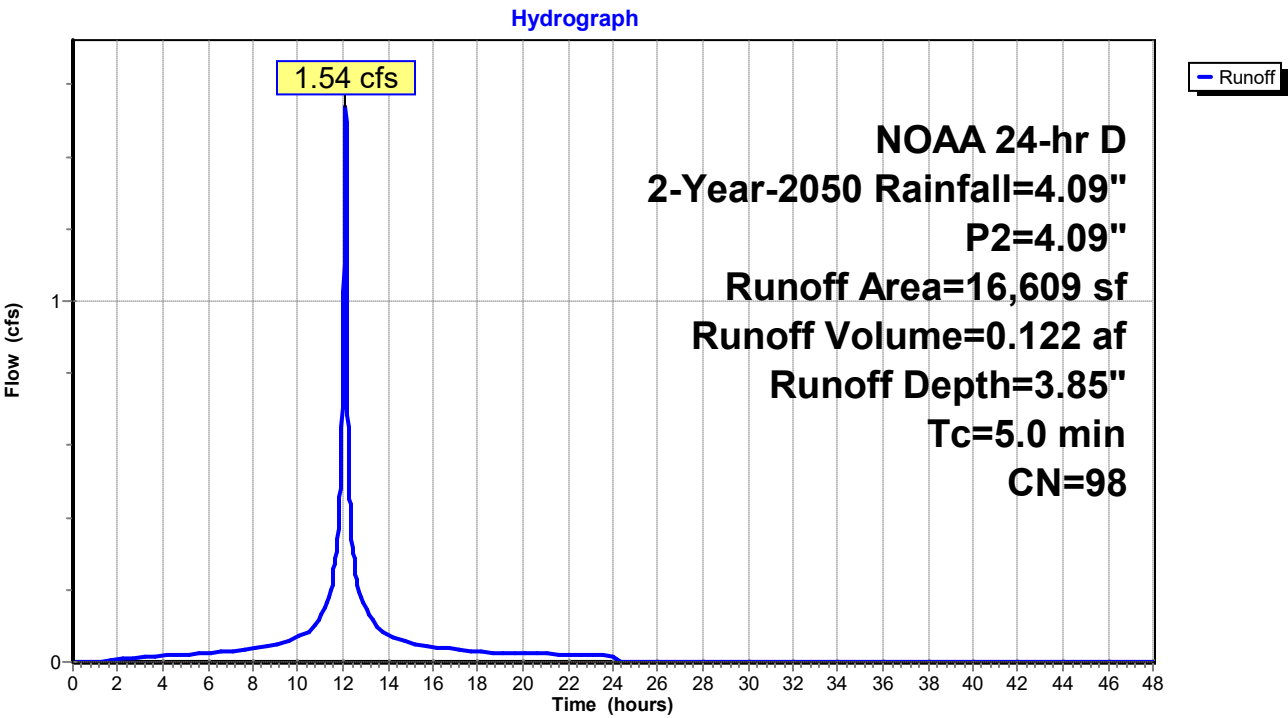
Runoff = 1.54 cfs @ 12.12 hrs, Volume= 0.122 af, Depth= 3.85"
Routed to Pond 12P : Infiltration basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

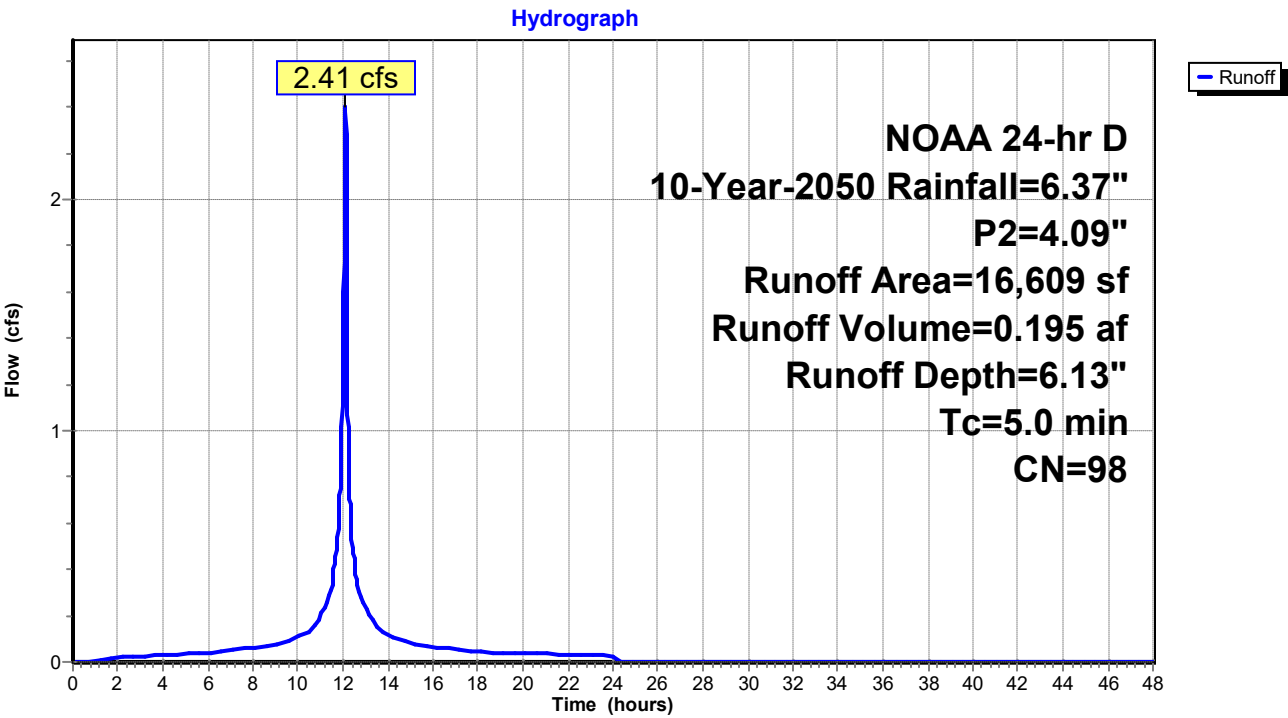
Runoff = 2.41 cfs @ 12.12 hrs, Volume= 0.195 af, Depth= 6.13"
Routed to Pond 12P : Infiltration basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System



Summary for Subcatchment 12S: Proposed Condition To Infiltration System

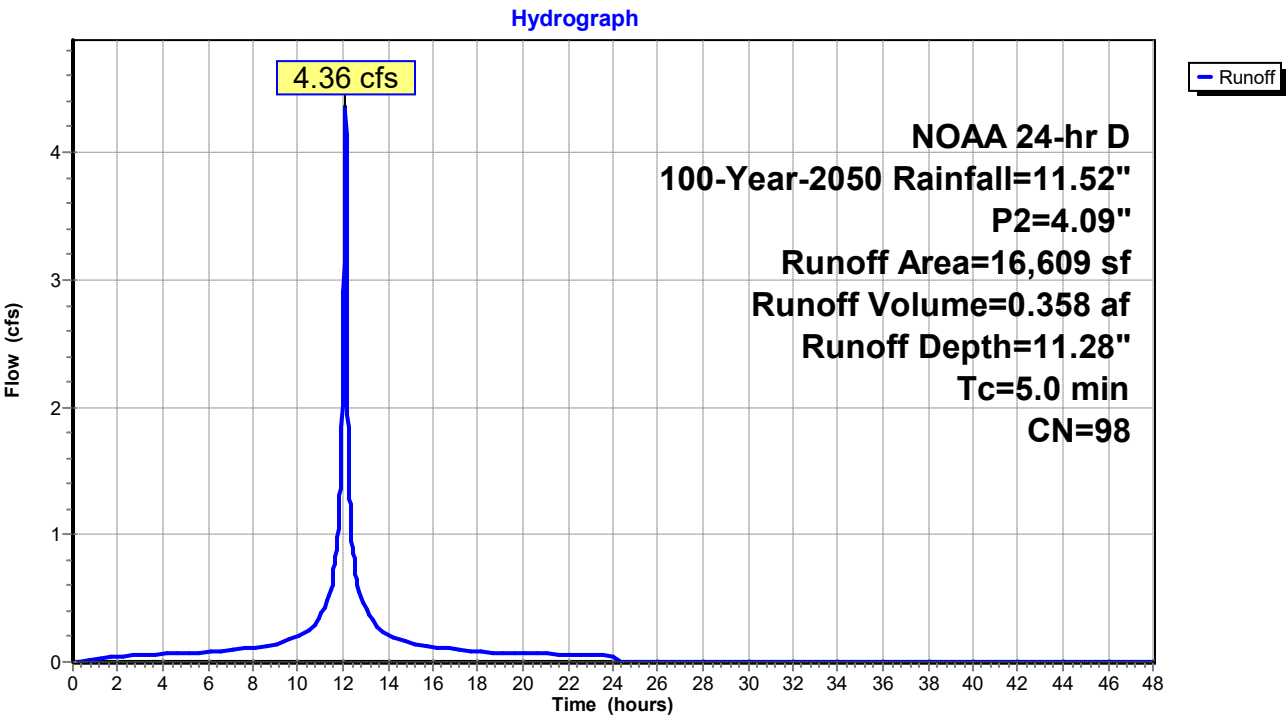
Runoff = 4.36 cfs @ 12.12 hrs, Volume= 0.358 af, Depth=11.28"
Routed to Pond 12P : Infiltration basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
* 16,609	98	Impervious to Permeable Pavement
16,609		100.00% Impervious Area

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

Subcatchment 12S: Proposed Condition To Infiltration System



ENSURPLAN, INC.

Civil Engineers & Land Surveyors
Certificate of Authorization 24GA27997700

www.Ensurplan.net
Ph: (732) 469-0400

STORMWATER DRAINAGE REPORT
Minor Subdivision 15 Ridgeway Ave West Orange, NJ

04/13/26

Routed Hydrographs and Pond Information

Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 3.24" for 2-Year-2020 event
 Inflow = 1.30 cfs @ 12.12 hrs, Volume= 0.103 af
 Outflow = 0.21 cfs @ 12.57 hrs, Volume= 0.103 af, Atten= 84%, Lag= 27.1 min
 Discarded = 0.03 cfs @ 12.57 hrs, Volume= 0.033 af
 Primary = 0.18 cfs @ 12.57 hrs, Volume= 0.070 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 564.32' @ 12.57 hrs Surf.Area= 1,600 sf Storage= 1,378 cf

Plug-Flow detention time= 59.4 min calculated for 0.103 af (100% of inflow)
 Center-of-Mass det. time= 59.4 min (815.0 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

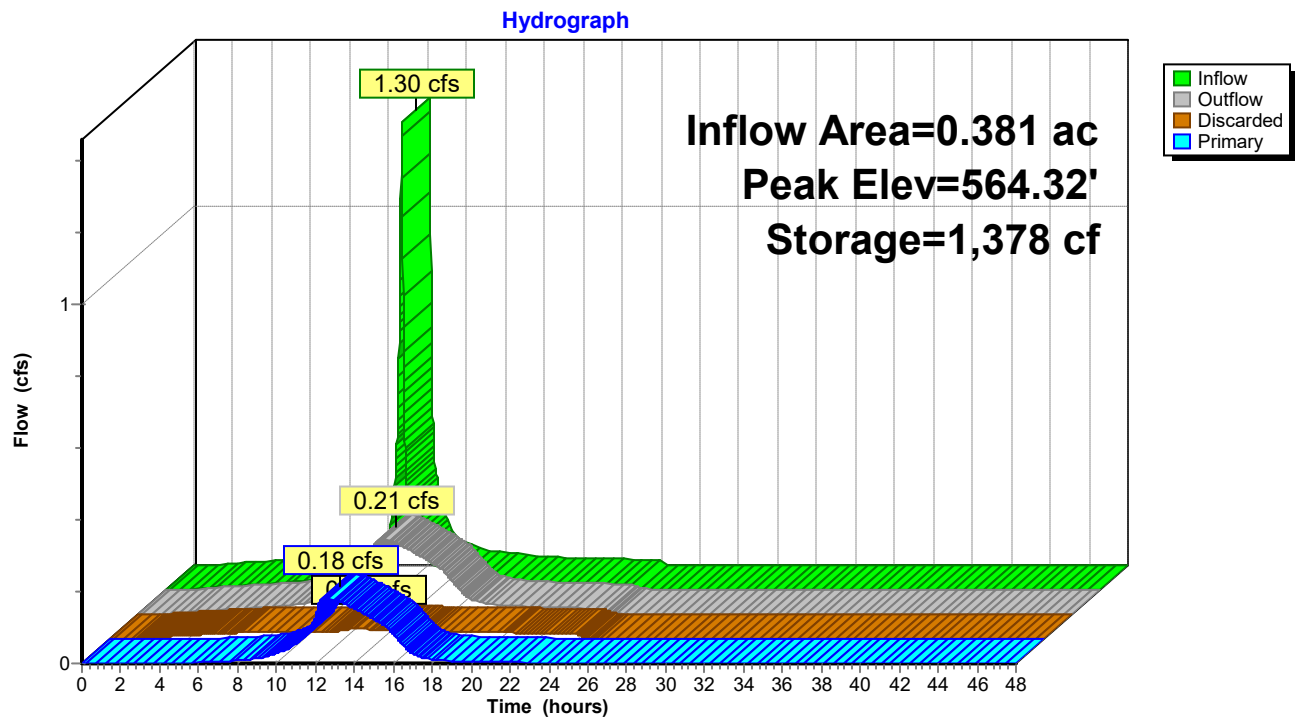
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.57 hrs HW=564.32' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.18 cfs @ 12.57 hrs HW=564.32' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 5.31 fps)
 — **3=Orifice/Grate** (Controls 0.00 cfs)
 — **4=Orifice/Grate** (Controls 0.00 cfs)
 — **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 5.14" for 10-Year-2020 event
 Inflow = 2.03 cfs @ 12.12 hrs, Volume= 0.163 af
 Outflow = 0.67 cfs @ 12.27 hrs, Volume= 0.163 af, Atten= 67%, Lag= 9.2 min
 Discarded = 0.03 cfs @ 12.27 hrs, Volume= 0.039 af
 Primary = 0.64 cfs @ 12.27 hrs, Volume= 0.125 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 564.85' @ 12.27 hrs Surf.Area= 1,600 sf Storage= 2,029 cf

Plug-Flow detention time= 60.9 min calculated for 0.163 af (100% of inflow)
 Center-of-Mass det. time= 60.9 min (808.0 - 747.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

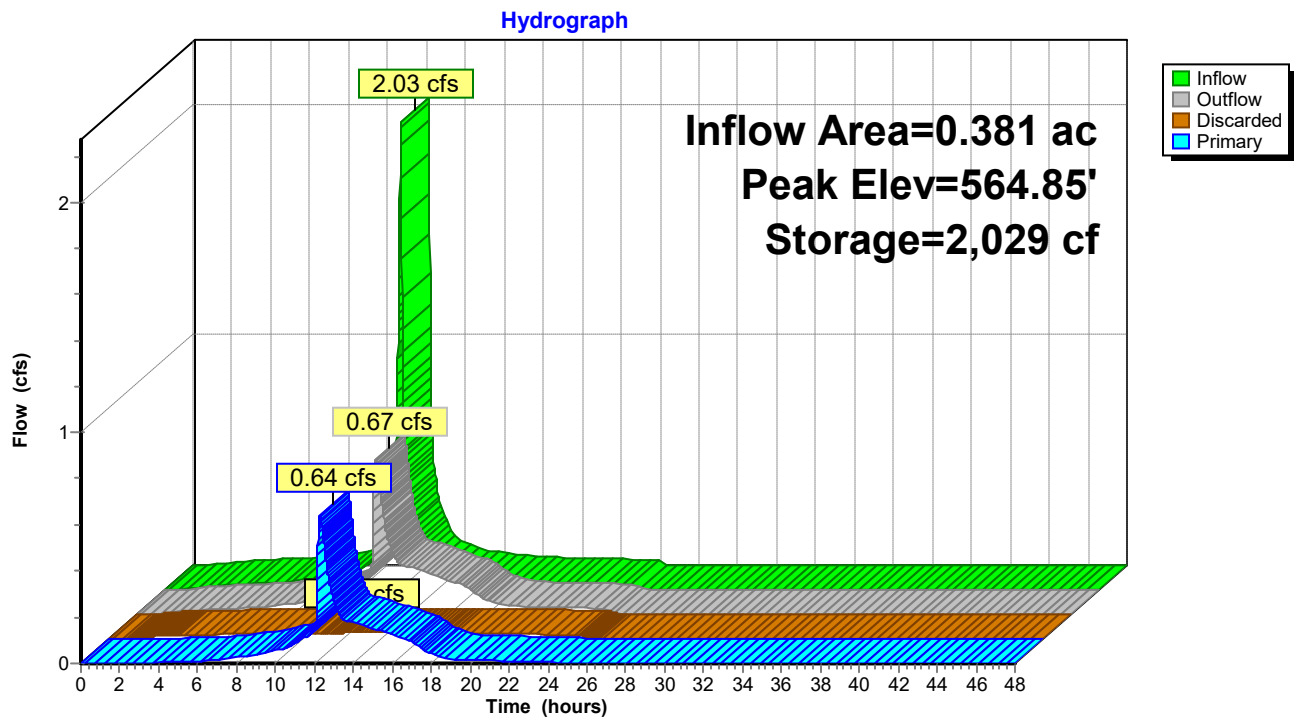
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.27 hrs HW=564.85' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.64 cfs @ 12.27 hrs HW=564.85' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.22 cfs @ 6.36 fps)
 | **3=Orifice/Grate** (Orifice Controls 0.42 cfs @ 2.28 fps)
 | **4=Orifice/Grate** (Controls 0.00 cfs)
 | **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 8.94" for 100-Year-2020 event
 Inflow = 3.47 cfs @ 12.12 hrs, Volume= 0.284 af
 Outflow = 1.78 cfs @ 12.20 hrs, Volume= 0.284 af, Atten= 49%, Lag= 4.8 min
 Discarded = 0.04 cfs @ 12.20 hrs, Volume= 0.043 af
 Primary = 1.74 cfs @ 12.20 hrs, Volume= 0.241 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 565.80' @ 12.20 hrs Surf.Area= 1,600 sf Storage= 3,105 cf

Plug-Flow detention time= 55.2 min calculated for 0.284 af (100% of inflow)
 Center-of-Mass det. time= 55.2 min (794.6 - 739.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

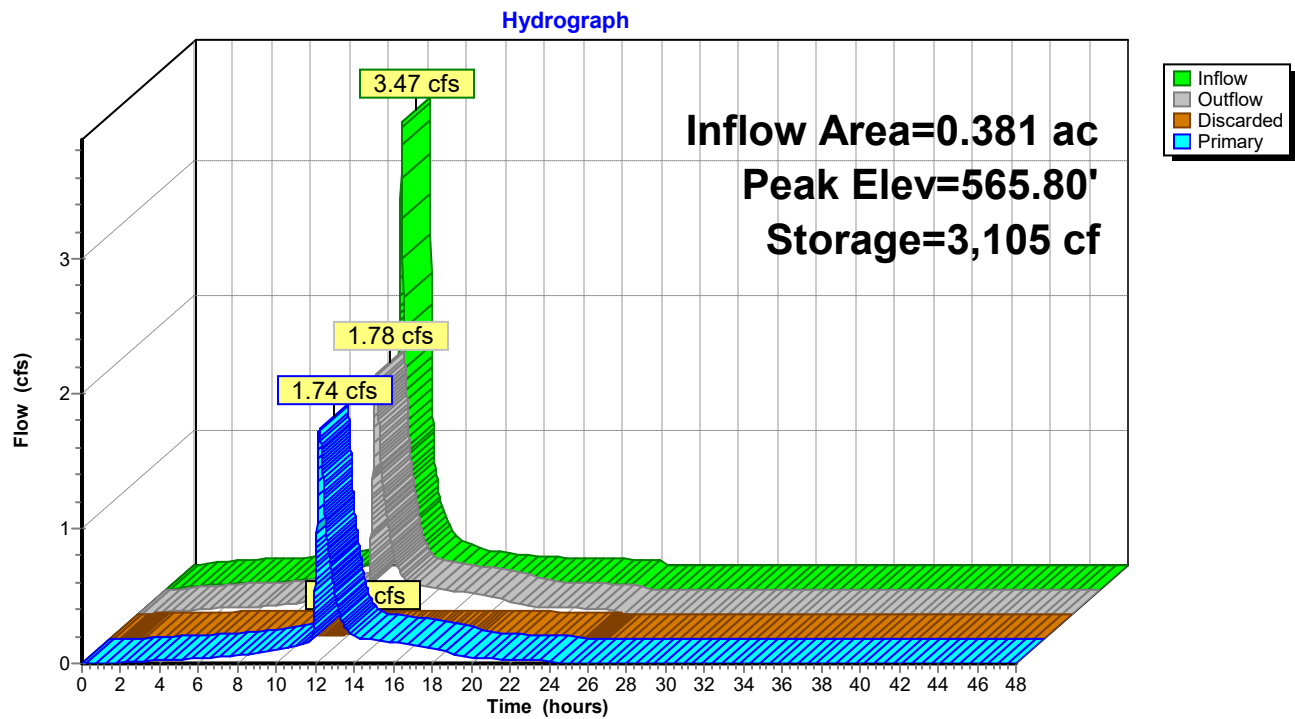
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.20 hrs HW=565.80' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=1.74 cfs @ 12.20 hrs HW=565.80' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.27 cfs @ 7.91 fps)
 | **3=Orifice/Grate** (Orifice Controls 1.01 cfs @ 5.16 fps)
 | **4=Orifice/Grate** (Orifice Controls 0.46 cfs @ 3.38 fps)
 | **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 3.85" for 2-Year-2050 event
 Inflow = 1.54 cfs @ 12.12 hrs, Volume= 0.122 af
 Outflow = 0.28 cfs @ 12.52 hrs, Volume= 0.122 af, Atten= 82%, Lag= 24.3 min
 Discarded = 0.03 cfs @ 12.52 hrs, Volume= 0.036 af
 Primary = 0.25 cfs @ 12.52 hrs, Volume= 0.087 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 564.54' @ 12.52 hrs Surf.Area= 1,600 sf Storage= 1,652 cf

Plug-Flow detention time= 64.1 min calculated for 0.122 af (100% of inflow)
 Center-of-Mass det. time= 64.1 min (816.2 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

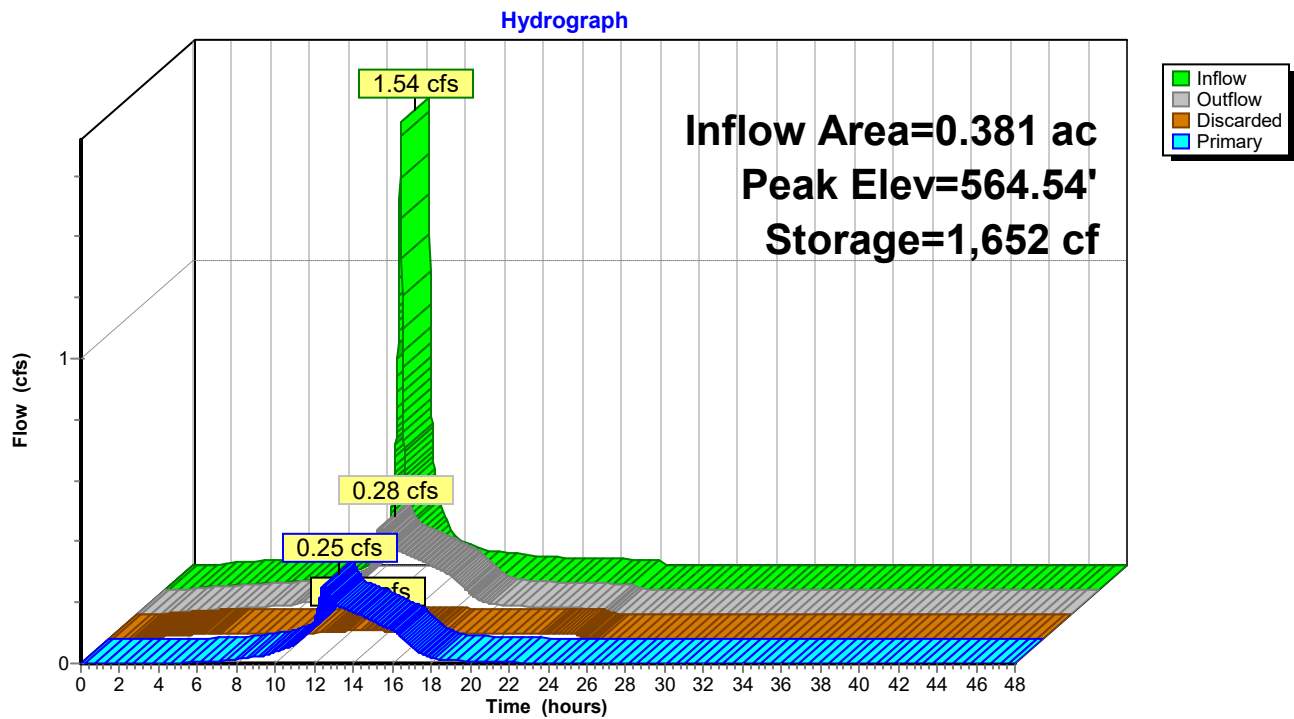
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.52 hrs HW=564.54' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.25 cfs @ 12.52 hrs HW=564.54' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.20 cfs @ 5.77 fps)
 | **3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.27 fps)
 | **4=Orifice/Grate** (Controls 0.00 cfs)
 | **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 6.13" for 10-Year-2050 event
 Inflow = 2.41 cfs @ 12.12 hrs, Volume= 0.195 af
 Outflow = 0.91 cfs @ 12.25 hrs, Volume= 0.195 af, Atten= 62%, Lag= 7.8 min
 Discarded = 0.03 cfs @ 12.25 hrs, Volume= 0.040 af
 Primary = 0.88 cfs @ 12.25 hrs, Volume= 0.155 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 565.11' @ 12.25 hrs Surf.Area= 1,600 sf Storage= 2,344 cf

Plug-Flow detention time= 58.9 min calculated for 0.195 af (100% of inflow)
 Center-of-Mass det. time= 58.9 min (803.3 - 744.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

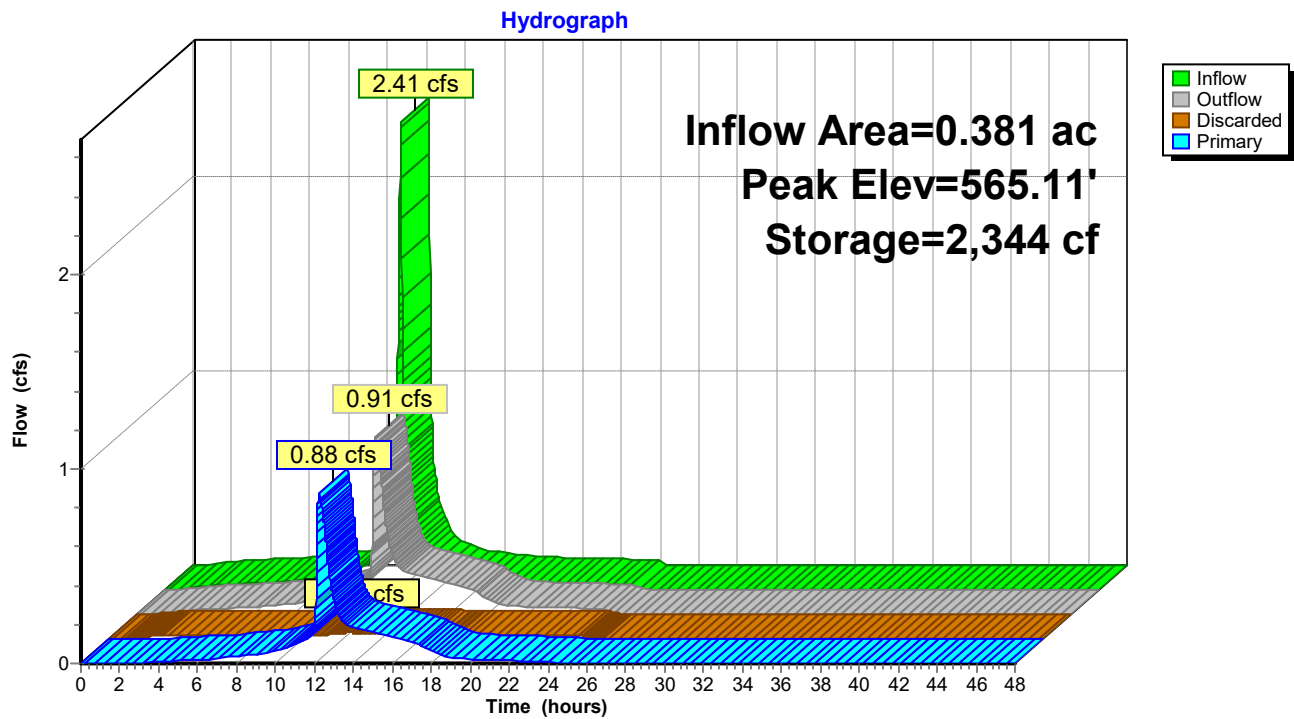
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.25 hrs HW=565.11' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.88 cfs @ 12.25 hrs HW=565.11' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.23 cfs @ 6.82 fps)
 | **3=Orifice/Grate** (Orifice Controls 0.64 cfs @ 3.28 fps)
 | **4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.39 fps)
 | **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



Summary for Pond 12P: Infiltration basin

Inflow Area = 0.381 ac, 100.00% Impervious, Inflow Depth = 11.28" for 100-Year-2050 event
 Inflow = 4.36 cfs @ 12.12 hrs, Volume= 0.358 af
 Outflow = 2.31 cfs @ 12.20 hrs, Volume= 0.358 af, Atten= 47%, Lag= 4.6 min
 Discarded = 0.04 cfs @ 12.20 hrs, Volume= 0.045 af
 Primary = 2.26 cfs @ 12.20 hrs, Volume= 0.313 af
 Routed to Reach 12R : Study Point At Inlet

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 566.44' @ 12.20 hrs Surf.Area= 1,600 sf Storage= 3,667 cf

Plug-Flow detention time= 53.7 min calculated for 0.358 af (100% of inflow)
 Center-of-Mass det. time= 53.7 min (790.6 - 736.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	563.00'	1,582 cf	12.75'W x 125.50'L x 4.00'H Field A 6,401 cf Overall - 2,444 cf Embedded = 3,956 cf x 40.0% Voids
#2A	563.50'	2,444 cf	Cultec R-360HD x 66 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 66 Chambers in 2 Rows Cap Storage= 6.5 cf x 2 x 2 rows = 25.8 cf
		4,027 cf	Total Available Storage

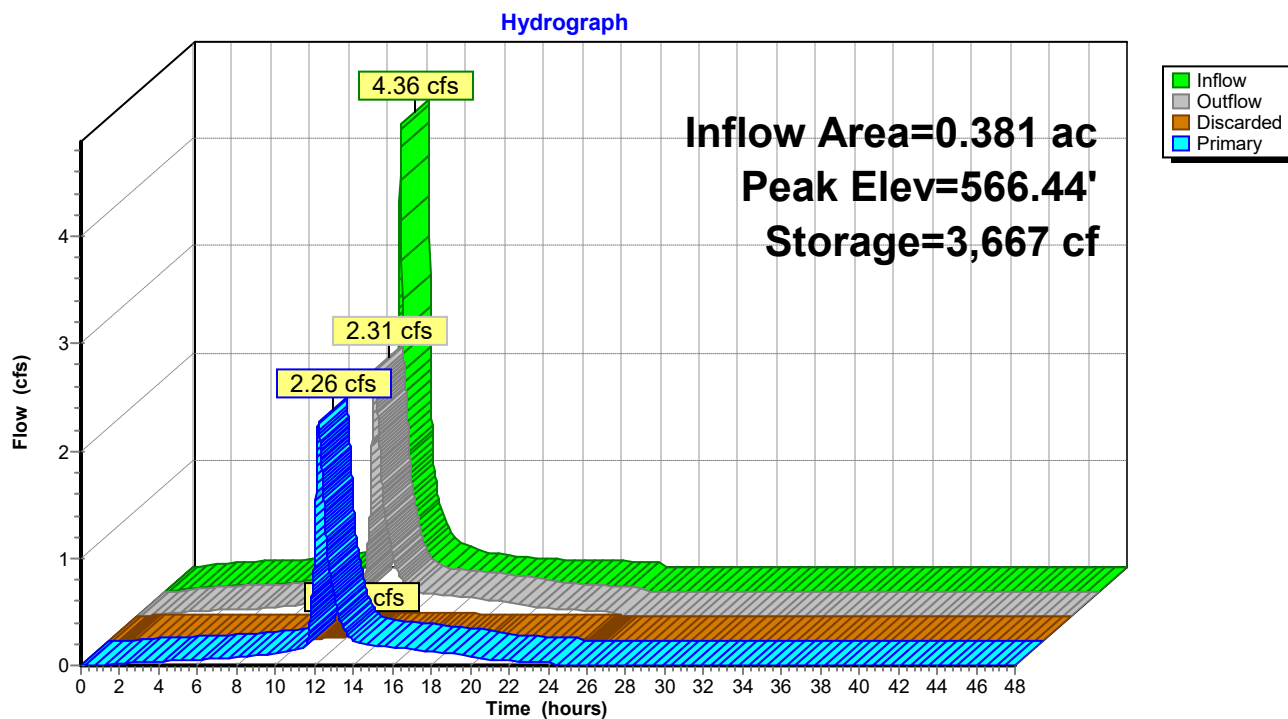
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	563.00'	0.500 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 560.30'
#2	Primary	563.00'	2.5" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	564.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	565.10'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Primary	566.95'	4.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.20 hrs HW=566.44' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=2.26 cfs @ 12.20 hrs HW=566.44' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 8.79 fps)
 — **3=Orifice/Grate** (Orifice Controls 1.26 cfs @ 6.44 fps)
 — **4=Orifice/Grate** (Orifice Controls 0.70 cfs @ 5.12 fps)
 — **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Infiltration basin



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Rainfall Events Listing (selected events)

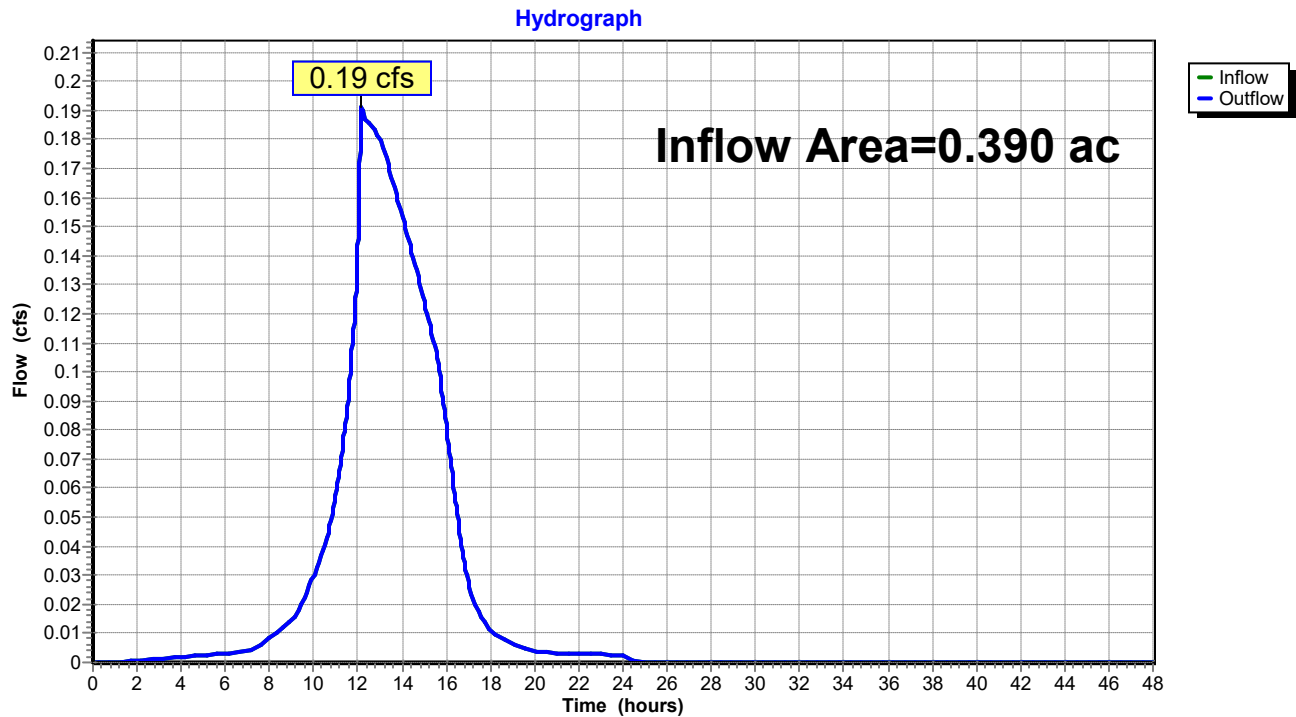
Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year-2020	NOAA 24-hr	D	Default	24.00	1	3.47	2	3.47
2	10-Year-2020	NOAA 24-hr	D	Default	24.00	1	5.38	2	3.47
3	100-Year-2020	NOAA 24-hr	D	Default	24.00	1	9.18	2	3.47
4	2-Year-2050	NOAA 24-hr	D	Default	24.00	1	4.09	2	4.09
5	10-Year-2050	NOAA 24-hr	D	Default	24.00	1	6.37	2	4.09
6	100-Year-2050	NOAA 24-hr	D	Default	24.00	1	11.52	2	4.09
7	WQDS	NJ DEP 2-hr		Default	2.00	1	1.25	2	3.44

Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 2.22" for 2-Year-2020 event
Inflow = 0.19 cfs @ 12.17 hrs, Volume= 0.072 af
Outflow = 0.19 cfs @ 12.17 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

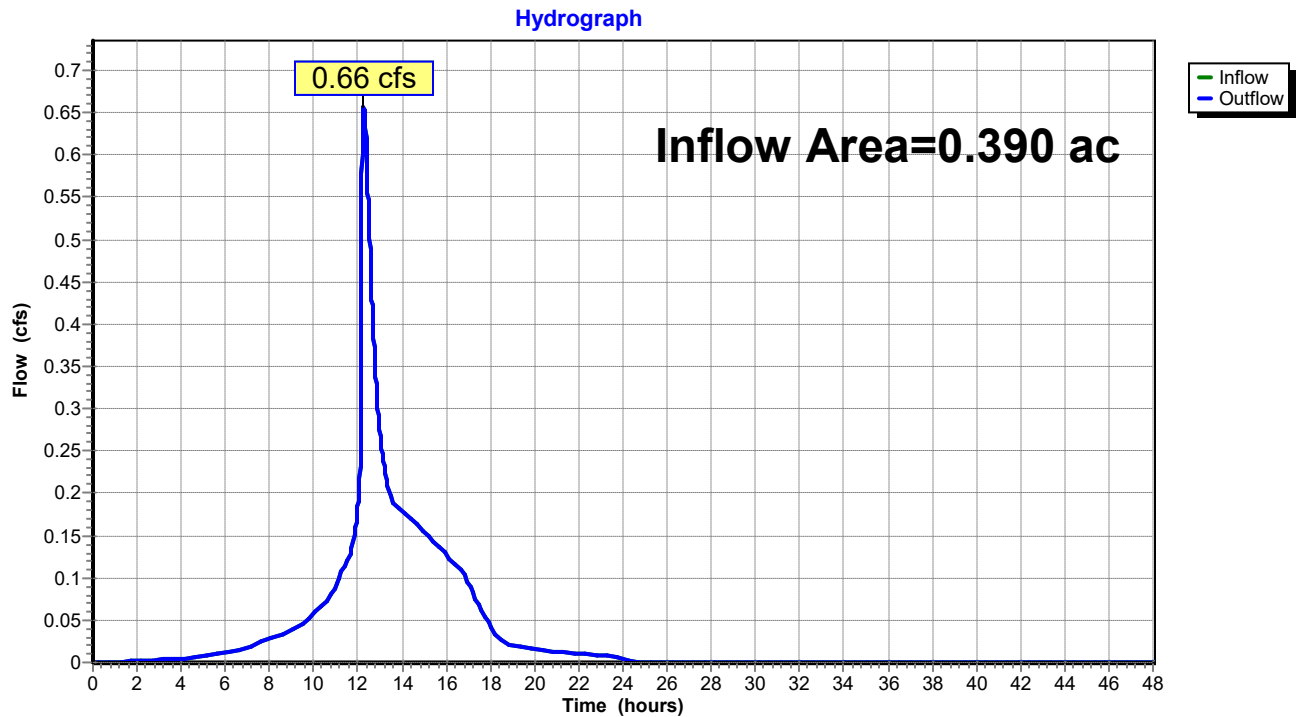


Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 3.95" for 10-Year-2020 event
Inflow = 0.66 cfs @ 12.27 hrs, Volume= 0.128 af
Outflow = 0.66 cfs @ 12.27 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

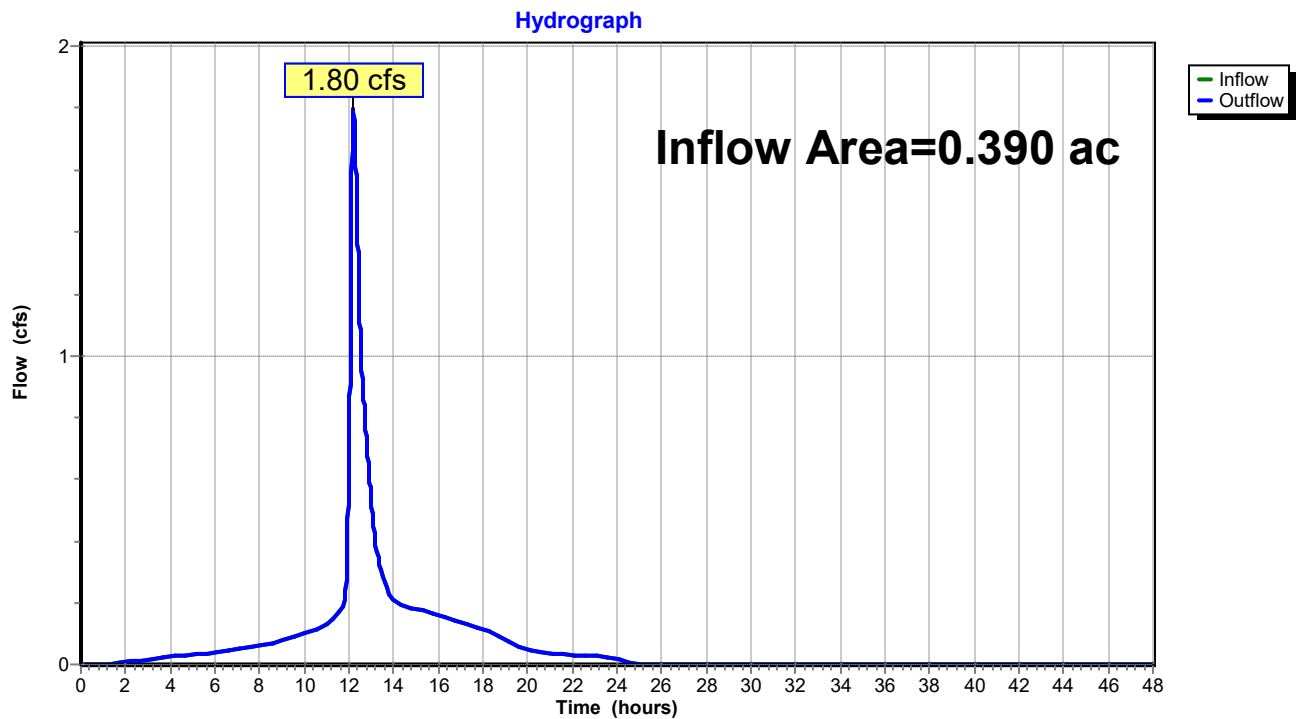


Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 7.61" for 100-Year-2020 event
Inflow = 1.80 cfs @ 12.19 hrs, Volume= 0.247 af
Outflow = 1.80 cfs @ 12.19 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

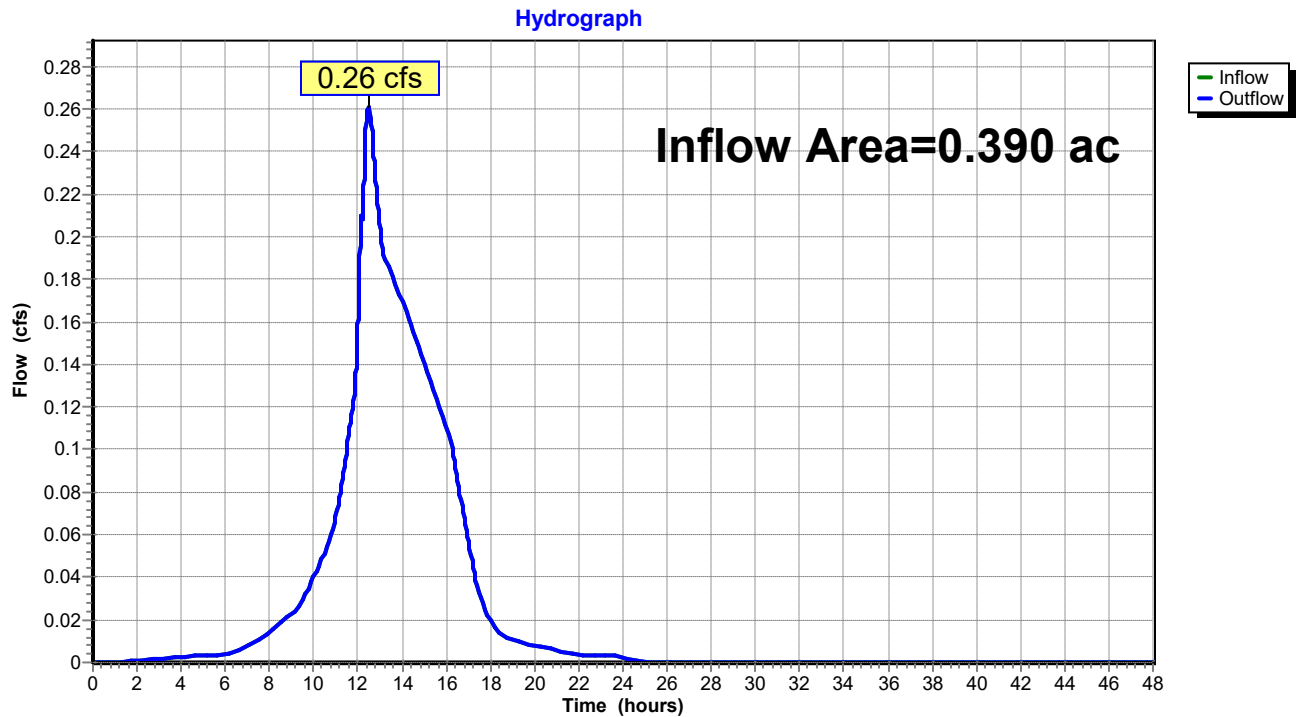


Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 2.76" for 2-Year-2050 event
Inflow = 0.26 cfs @ 12.52 hrs, Volume= 0.090 af
Outflow = 0.26 cfs @ 12.52 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

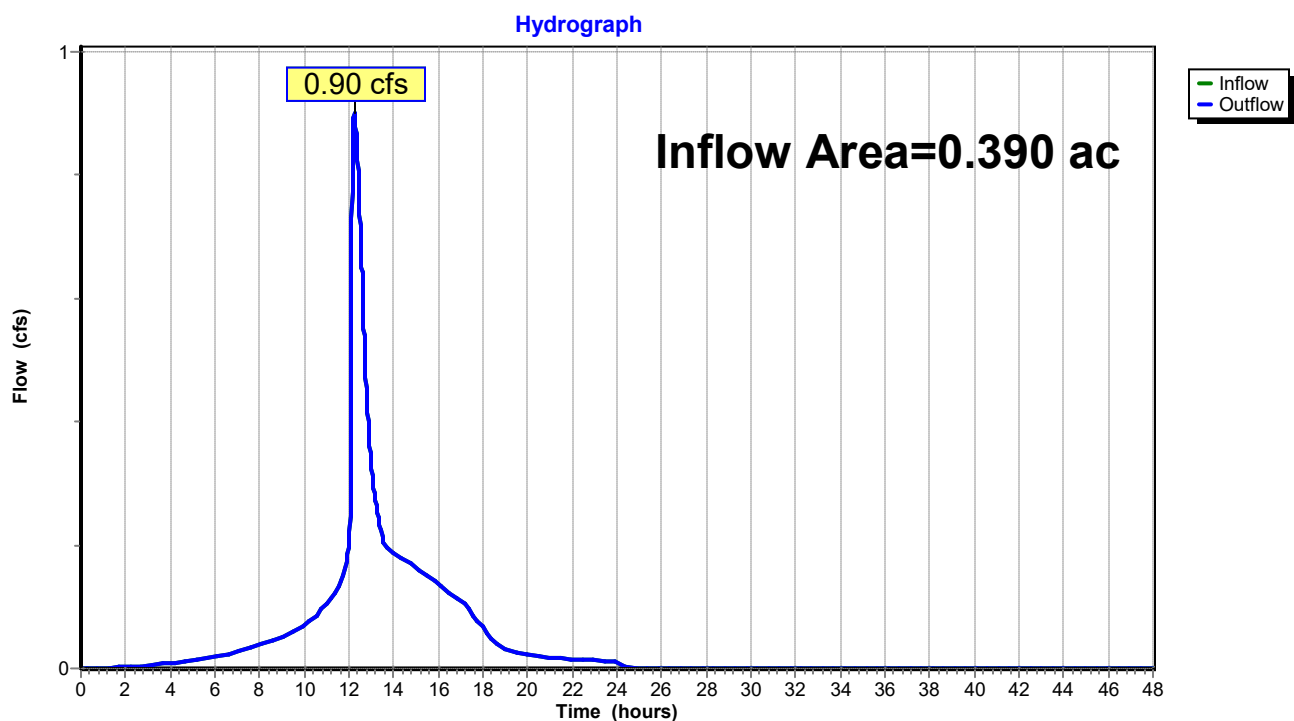


Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 4.89" for 10-Year-2050 event
Inflow = 0.90 cfs @ 12.24 hrs, Volume= 0.159 af
Outflow = 0.90 cfs @ 12.24 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

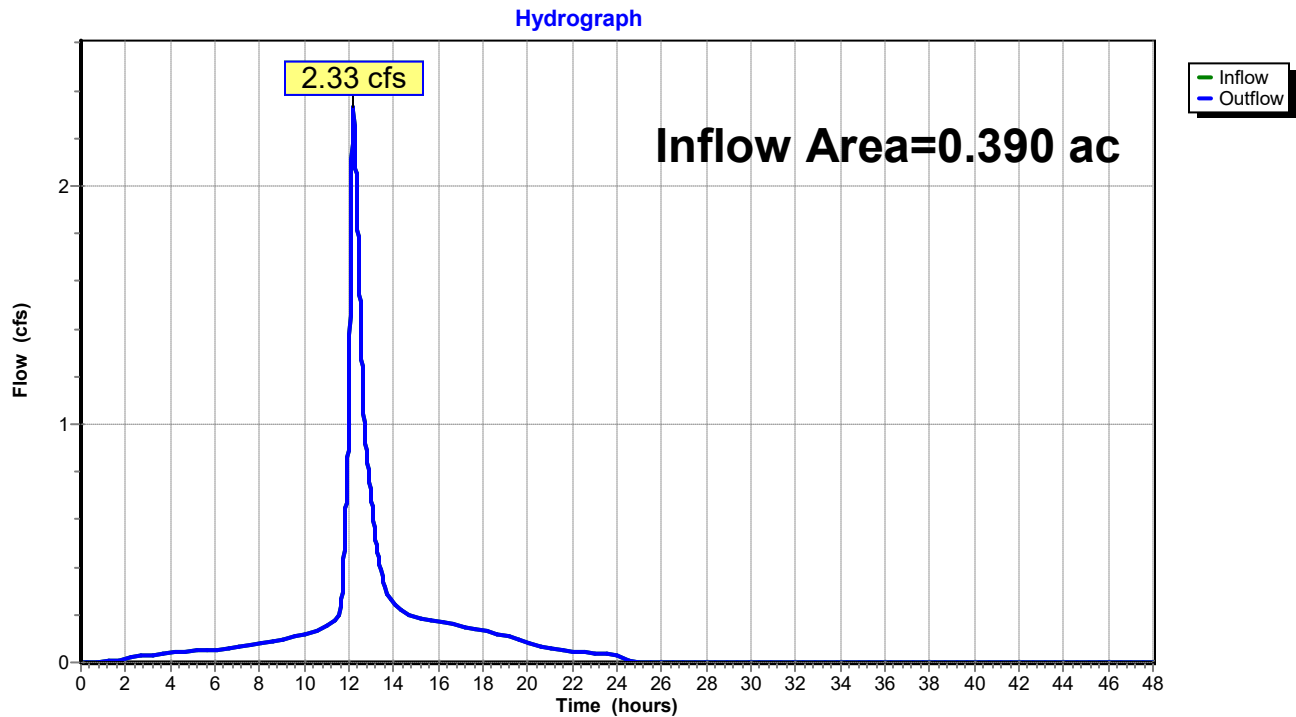


Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 9.88" for 100-Year-2050 event
Inflow = 2.33 cfs @ 12.19 hrs, Volume= 0.321 af
Outflow = 2.33 cfs @ 12.19 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet



Summary for Reach 12R: Study Point At Inlet

Inflow Area = 0.390 ac, 100.00% Impervious, Inflow Depth = 0.82" for WQDS event
Inflow = 0.16 cfs @ 1.16 hrs, Volume= 0.027 af
Outflow = 0.16 cfs @ 1.16 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: Study Point At Inlet

