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VOICE: 973-379-3280 FAX: 973-379-7993

STORM WATER MANAGEMENT REPORT

512-516 PLEASANT VALLEY WAY

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

Block 154.06, Lots 11 & 12

PROJECT # 1240815

DATE: August 11, 2025

REVISED: December 02, 2025

REVISED: February 04, 2025



MICHAEL LANZAFAMA, P.E. & P.L.S.

NJ REG. #CB 30084

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STORM WATER MANAGEMENT REPORT SUMMARY

PROJECT LOCATION

The project is located at 512-516 Pleasant Valley Way in the Township of West Orange, Essex County, New Jersey. The site is located across the intersection with Greenwood Avenue and about 560 feet to the intersection with the southerly line of Eagle Rock Avenue. The property lies within the Office Building Zoning District.

EXISTING CONDITIONS

The site is currently occupied by two commercial buildings. One is a One-Story frame dwelling with parking in the rear and the second building a Two story masonry building. This building has also a parking lot on the rear of the property.

The site area is 16,242 square feet in size or 0.373 acres. Its frontage on Pleasant Valley Way 124.99 feet, and it has a lot depth of 130.0 feet. It will be serviced with all basic utilities—water, gas, electric, sanitary sewer, and cable, which are provided from underground pipelines and conduits.

The area around the site is developed with residential and commercial uses. The property is not impacted by flood plains, and freshwater wetlands have not been observed.

TOPOGRAPHY

The site slopes from north to south.

The highest elevation is approximately 422.0 feet at the most northern corner of the property.

The lowest elevation is at approximately 412.0 feet in the most southern corner of the property.

SOILS

The site contains two soil types. The Soil Survey of Essex County has identified the soils as Urban Land, Boonton, 0 to 8 percent slopes and Boonton - Urban Land, Boonton, 0 to 8 percent slopes. The Natural Resources Conservation Service has classified these soils as being in Hydrologic Soil Group "C".

IMPERVIOUS COVERAGE SUMMARY

	EXISTING (LOT 11)	EXISTING (LOT 12)	PROPOSED
BUILDING(S)	1685	1023	3426
DRIVEWAY(S)	5460	2102	6411
WALKS/STEPS	595	69	1265
PATIO/DECK	0	82	0
MISC.	12	0	93
TOTAL	7752	3276	11195
NET COVERAGE			167

STORMWATER MANAGEMENT

As with any construction project, stormwater management is an important part of the overall development process. Modern practice is a combination of the site designer's knowledge and goals in conjunction with the rules and regulations of the local municipality and the New Jersey Department of Environmental Protection (see *Hydrology* section below). Part of stormwater management is to minimize the use of artificial structures; however, practical considerations of most development sites require a combination of non-structural and structural components. A substantial portion of the existing site contains buildings and bituminous pavement.

The entire site drains to the south area where it runs thru a swale to the street on the rear and is collected by the storm system within Beasley Street. Stormwater hydrographs for both existing and proposed conditions for each drainage area, are included in this report.

The Township of West Orange requires that stormwater analyses be performed for the 2-year, 10-year, 25-year, and 100-year storm events. For major developments, the reduction factors applied to the 2-, 10-, and 100-year storm events are 50%, 25%, and 20%, respectively. This project does qualify as a major development, and these reductions were applied to comply with the township's requirements in addition to further enhancing site performance. The "Natural Resources Conservation Service Method," as outlined in Technical Release 55 (TR-55), was utilized to size and route stormwater through the proposed drywell system.

DISCHARGE SUMMARY

The following table shows that the site would produce post-developed runoff rates and volumes that are lower than the site's existing rates of runoff.

The existing and proposed peak runoff rates (Q) from the site are summarized as follows:

Site Discharge

Summary Peak Detention Flow

Frequency	Disturbed Q		Reduction		After Reduction Q		Q Non Disturb		Q Allowable		Total Q Proposed	
2 - 2020	0.97	x	0.50	=	0.49	+	0.00	=	0.49		0.44	COMPLY
10 - 2020	1.63	x	0.25	=	1.22	+	0.00	=	1.22		0.79	COMPLY
25 - 2020	2.10	x	0.00	=	2.10	+	0.00	=	2.10		1.09	COMPLY
100 - 2020	2.96	x	0.20	=	2.37	+	0.00	=	2.37		1.80	COMPLY
2 - 2050	1.19	x	0.50	=	0.60	+	0.00	=	0.60		0.56	COMPLY
10 - 2050	1.98	x	0.25	=	1.49	+	0.00	=	1.49		1.00	COMPLY
25 - 2050	2.59	x	0.00	=	2.59	+	0.00	=	2.59		1.51	COMPLY
100 - 2050	3.81	x	0.20	=	3.05	+	0.00	=	3.05		2.35	COMPLY

The Site Discharge table shows that the proposed project would result in post-developed runoff rates that are less than or equal to the site's existing runoff rates. The hydrographs for the 2-year, 10-year and 100-year storms do not exceed at any time the pre-developed hydrographs for the same events as required per West Orange's ordinance.

Based upon this analysis, it is our professional opinion that the proposed storm water management system would enhance the existing downstream conveyance systems and meet the required Municipal standards.

Calculations supporting these findings constitute the remainder of this report.

SOILS

Development Engineering, LLC
550 Colfax Road
Wayne, NJ 07470
(973) 835-0340

Soil Percolation Report

June 30, 2025

Isaac Lefkowitz
127 Mitchell LLC
516 Pleasant Valley Way
West Orange, NJ

RE: Percolation Test
Seepage Pit/Drywell for Proposed Office Building
512 & 516 Pleasant Valley Way
West Orange, NJ

Percolation Rate by Soil Category

Percolation speed or percolation rate, measured in inches per hour, depends greatly on the soil type as described below:

- Sandy soils usually have very high percolation rates, measured in the range of 1 to 8 inches or more per hour. That means sandy soils dry out very quickly, heat up very quickly.
- Silty soils, including loam, have moderate percolation speeds, ranging from 0.1 to 1 inch per hour.
- Clay soils have notoriously slow percolation speeds of 0.1 inch or less per hour. These soils easily become waterlogged, and plant roots can suffocate as a result.
- Any soil can vary significantly from the percolation rate averages. This variation can be due to factors that include soil compaction, organic matter content and/or soil temperature. Yet soil types are by far the single biggest determinant for percolation rates.

Percolation Rate Field Measurement

Estimating percolation speed is based on general knowledge of soil's type and/or through observation of how well it drains. Also, however, a simple percolation test can easily be done to determine a more precise percolation rate following the steps below to conduct the field tests:

Field Tests

Development Engineering, LLC
550 Colfax Road
Wayne, NJ 07470
(973) 835-0340

The field test was performed Monday about 10:30 AM June 13, 2025 within the proposed area of the seepage pit, shown on the proposed Drainage Plan of the Site Plan, in accordance to the following steps:

Step 1: Test Hole

Excavated one hole in the proposed drywell area (desired soil percolation rate testing area). The hole measured about 4 feet wide by 7 feet long and about 10 feet deep. Since the proposed seepage pit area is about 8 feet x 10 feet wide, only one hole was dug in the center of the proposed seepage pit area.

A soil sample was also collected from the bottom of the pit for laboratory analysis.

Step 2: Soil Saturation

Attempted to completely fill the test hole with water, and waited several hours for the water to fill the hole so it subsequently drains into the soil but the water was draining very rapidly.

Step 3: Refill Test Hole

Ensured the water had drained completely, and refilled the hole with water up to within 10" inches of its bottom.

Step 4: Measure Initial Water Level

Laid a wood board across the top of the test hole as the measuring baseline. Then, inserted a tape measure to the test hole bottom and measured the distance from the measuring baseline (2x10 board) to the water level.

Step 5: Measure Final Water Level Change

Returned to the test hole, inserted a tape measure to the test hole's bottom, and after 7.5 minutes measured the new distance from the board to the water level.

Step 6: Repeat Measurements

Measured the distance between the water level and the board every 7.5 minutes three additional times. After taking four measurements, determined how much the water level had dropped between each measurement. The amount of change per hour is the soil's percolation rate. For the proposed seepage pit area, the water level dropped at the rate of more than **5.8 inches per hour**.

The water table was not encountered during the test hole excavation about 10.0 feet below the grade.

Development Engineering, LLC
550 Colfax Road
Wayne, NJ 07470
(973) 835-0340

The variability of soil permeability test results shall be considered acceptable only where the results of all replicate tests fall within one soil permeability class or two adjacent permeability classes. New Jersey Storm Water BMP Manual Appendix E defines soil permeability classes as follows:

Measured Permeability Greater than (in/hr)	Soil Permeability Class
20	K5
6-20	K4
2-6	K3
0.6-2	K2
0.2-0.6	K1
Less than 0.2	K0

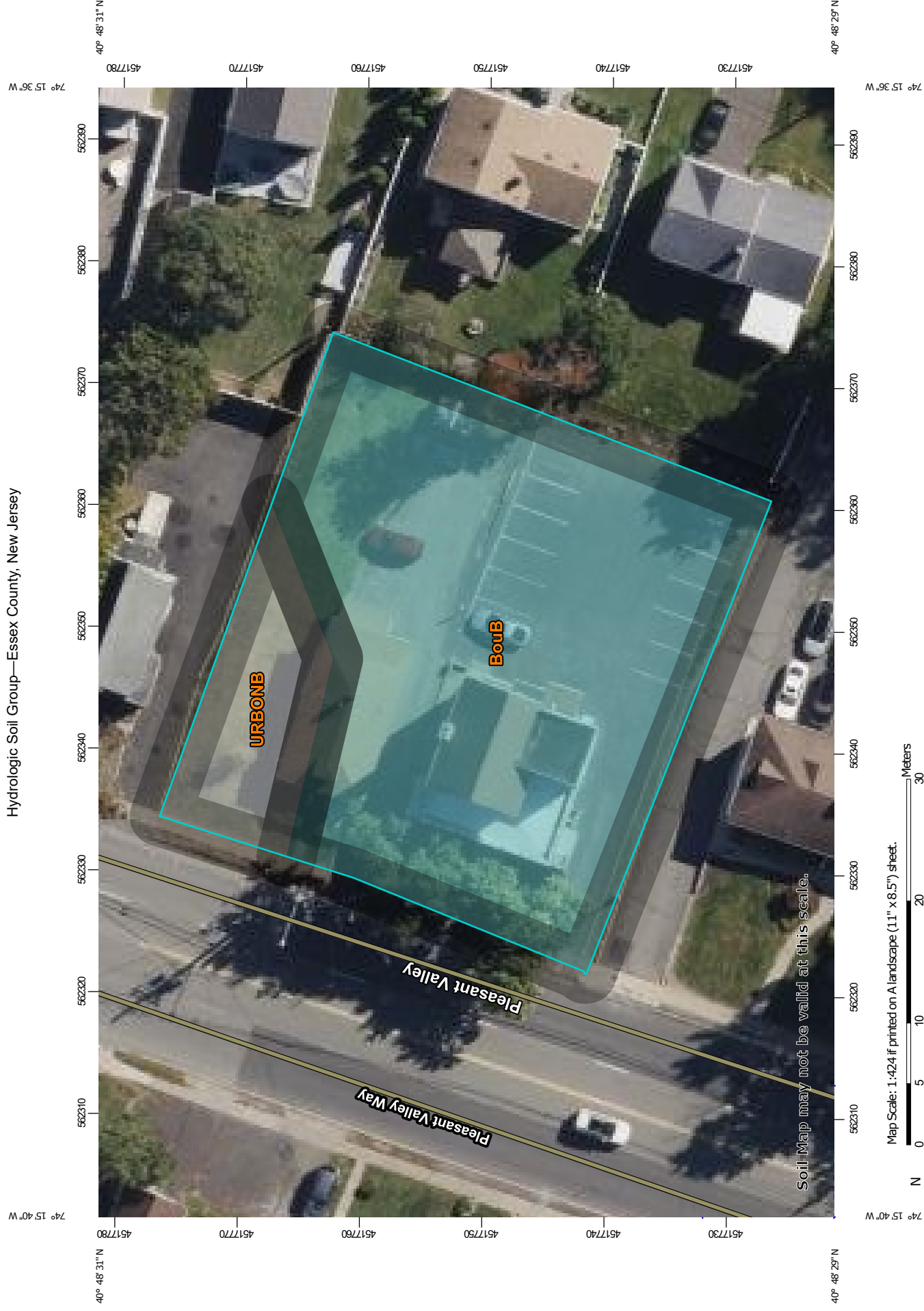
Based on the field results, the subject soil permeability class is K3 which is very suitable for installation of the proposed seepage pit.

Please contact us if you require additional information or have questions.

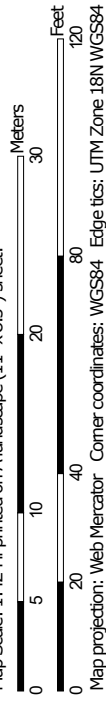
Sincerely,
Development Engineering, LLC

Bahman Izadmehr

Bahman Izadmehr, PhD, PE
NJPE# GE07470

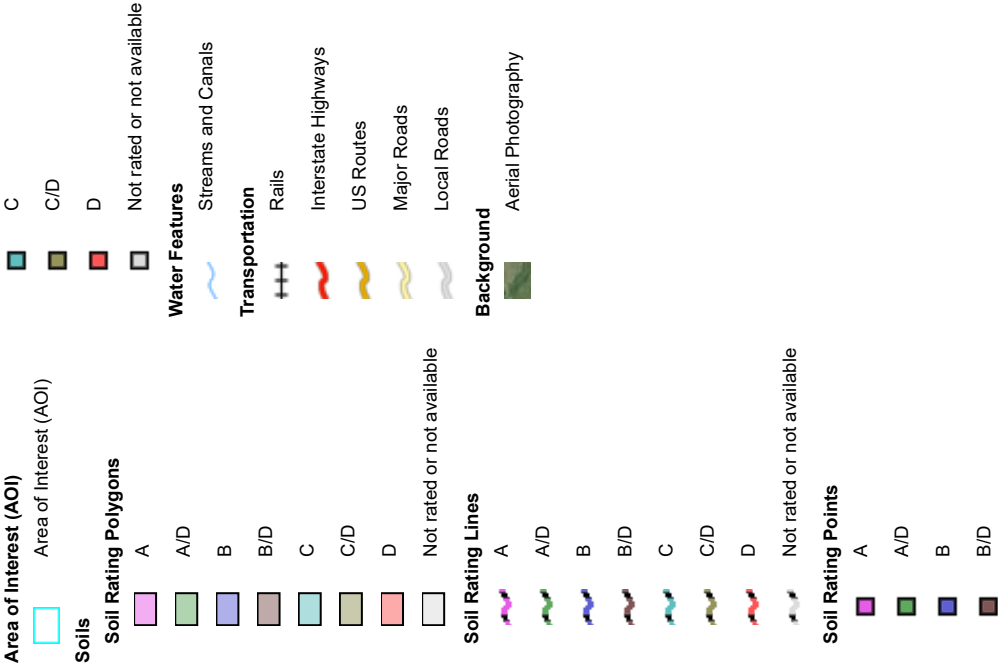


Map Scale: 1:424 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

Soil Survey Area: Essex County, New Jersey
Survey Area Data: Version 20, Sep 3, 2024

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

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BouB	Boonton - Urban land, Boonton substratum complex, 0 to 8 percent slopes	C	0.3	86.4%
URBONB	Urban land, Boonton substratum, 0 to 8 percent slopes		0.1	13.6%
Totals for Area of Interest			0.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

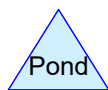
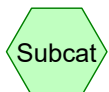
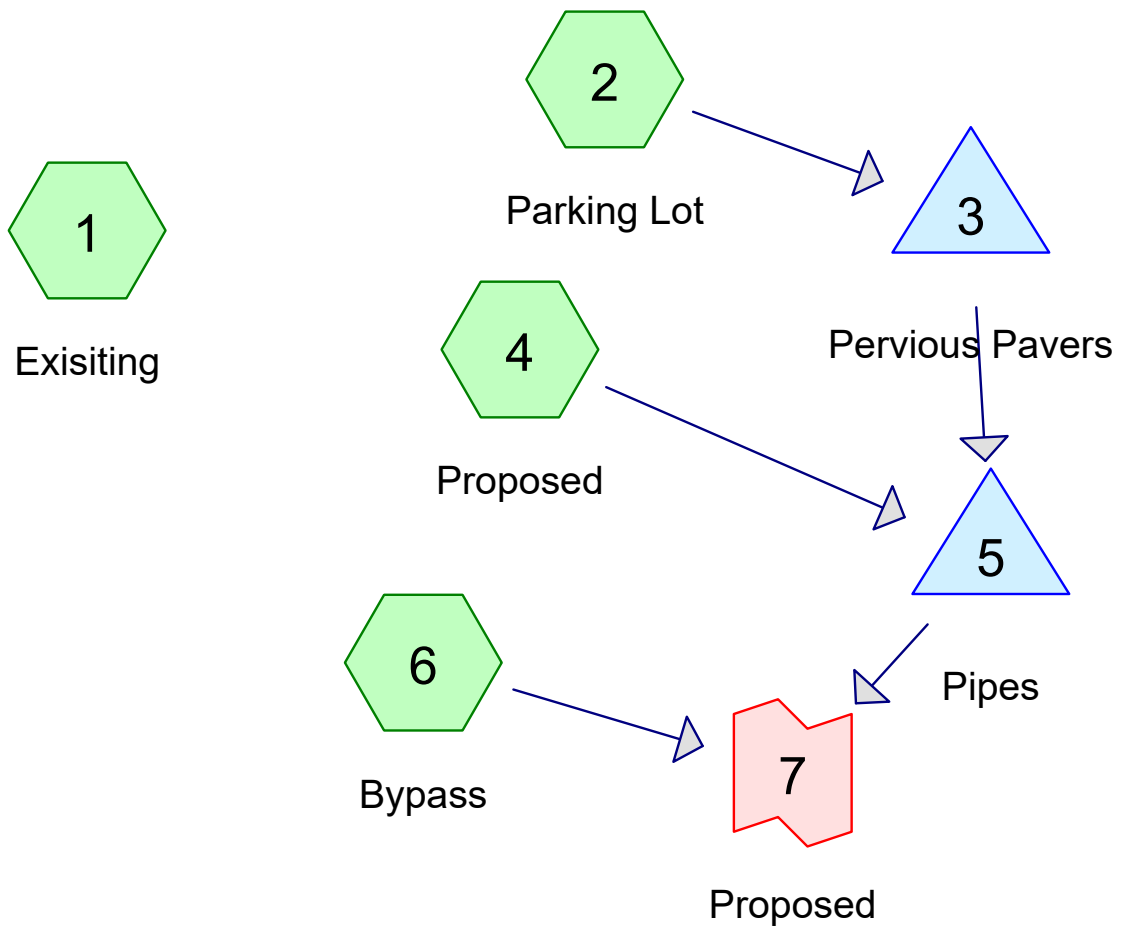
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

II WATER QUALITY CALCULATIONS



Routing Diagram for 1240815-pipes3-C
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1240815-pipes3-C

Prepared by Casey & Keller, Inc

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=2.59"
Flow Length=141' Tc=5.9 min CN=74/98 Runoff=0.97 cfs 0.080 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=2.97"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.59 cfs 0.044 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=2.52"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.48 cfs 0.035 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=1.22"
Flow Length=128' Tc=6.0 min CN=74/0 Runoff=0.04 cfs 0.003 af

Pond 3: Pervious Pavers

Peak Elev=414.07' Storage=369 cf Inflow=0.59 cfs 0.044 af
Discarded=0.11 cfs 0.044 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.044 af

Pond 5: Pipes

Peak Elev=411.37' Storage=163 cf Inflow=0.48 cfs 0.035 af
Discarded=0.03 cfs 0.023 af Primary=0.41 cfs 0.012 af Outflow=0.43 cfs 0.035 af

Link 7: Proposed

Inflow=0.44 cfs 0.015 af
Primary=0.44 cfs 0.015 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.162 af Average Runoff Depth = 2.61"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

1240815-pipes3-C

Prepared by Casey & Keller, Inc

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 1: Existing

Runoff = 0.97 cfs @ 12.13 hrs, Volume= 0.080 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	66	0.0680	0.27		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
1.4	21	0.0950	0.24		Sheet Flow, 2 Grass: Short n= 0.150 P2= 3.47"
0.2	13	0.0390	1.24		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.9	141	Total			

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Prepared by Casey & Keller, Inc

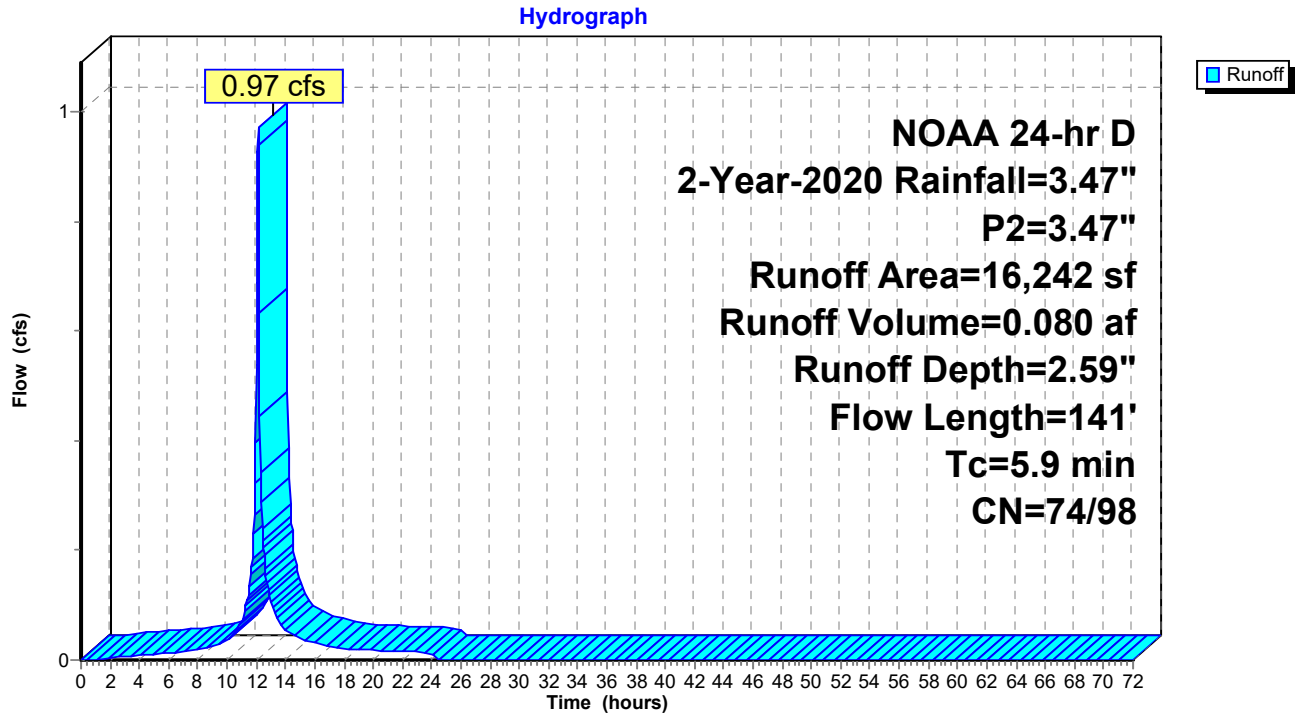
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512-516 Pleasant Valley Way, West Orange

NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment 1: Exisiting



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512-516 Pleasant Valley Way, West Orange

NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 2: Parking Lot

Runoff = 0.59 cfs @ 12.06 hrs, Volume= 0.044 af, Depth= 2.97"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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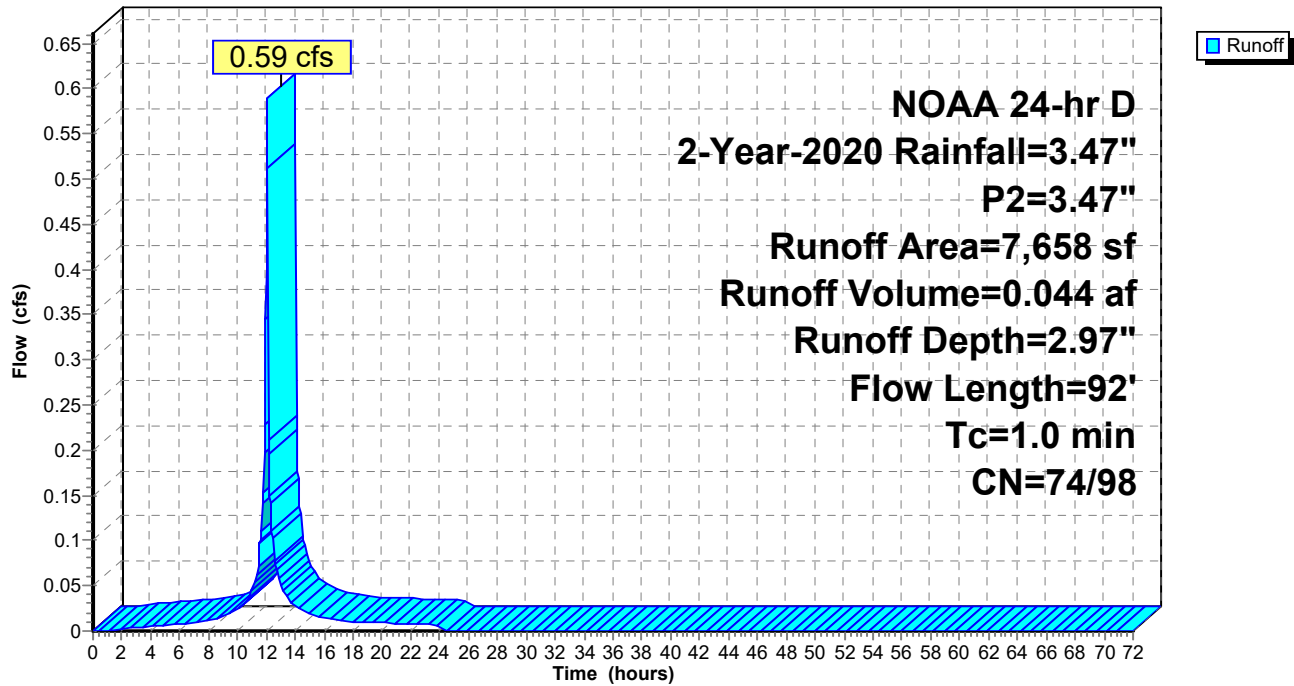
512-516 Pleasant Valley Way, West Orange

NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Subcatchment 2: Parking Lot

Hydrograph



1240815-pipes3-C

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512-516 Pleasant Valley Way, West Orange

NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Summary for Subcatchment 4: Proposed

Runoff = 0.48 cfs @ 12.06 hrs, Volume= 0.035 af, Depth= 2.52"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1 Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2 Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4 Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

1240815-pipes3-C

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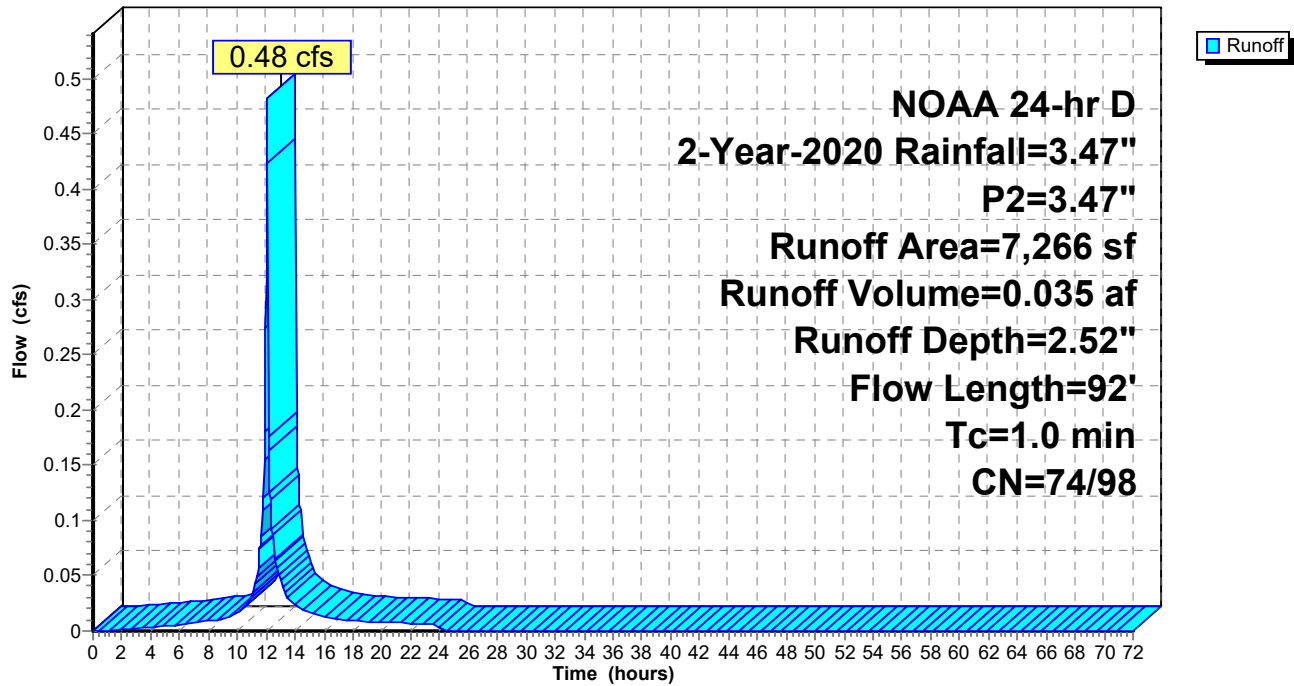
512-516 Pleasant Valley Way, West Orange

NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment 4: Proposed

Hydrograph



1240815-pipes3-C

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 6: Bypass

Runoff = 0.04 cfs @ 12.14 hrs, Volume= 0.003 af, Depth= 1.22"
 Routed to Link 7 : Proposed

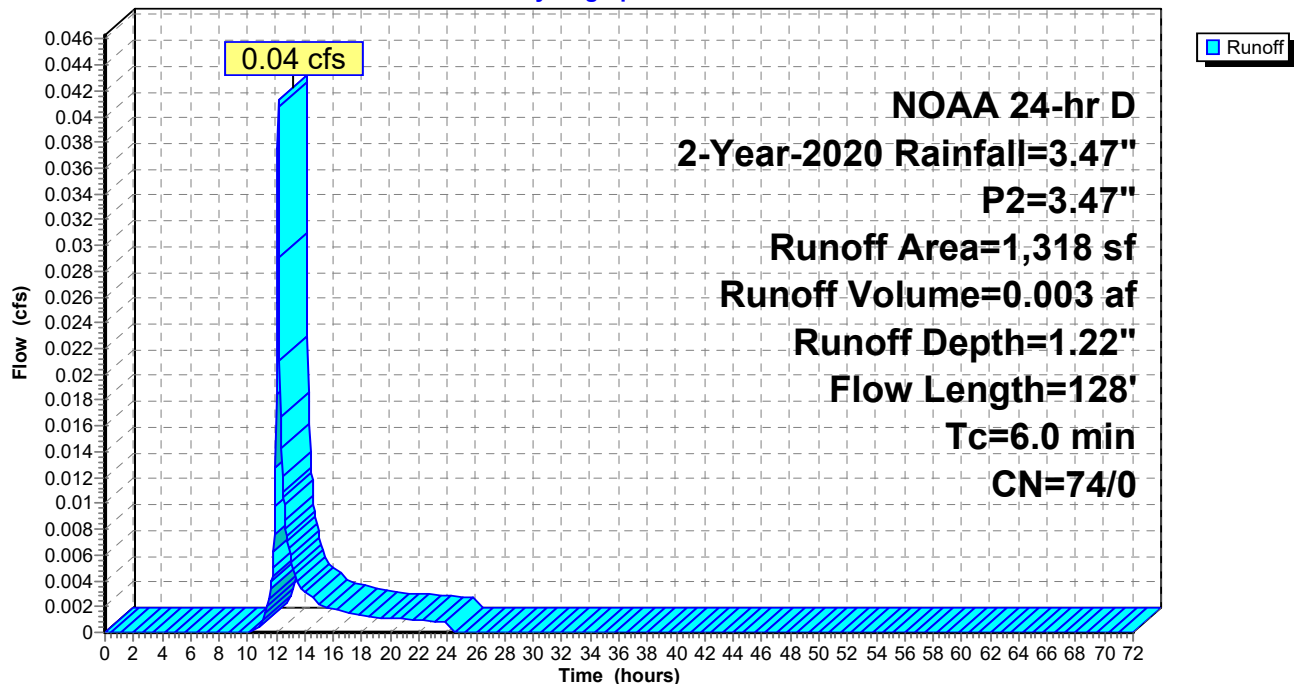
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0650	0.28		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
6.0	128	Total			

Subcatchment 6: Bypass

Hydrograph



1240815-pipes3-C

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Printed 2/4/2026

Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 2.97" for 2-Year-2020 event
 Inflow = 0.59 cfs @ 12.06 hrs, Volume= 0.044 af
 Outflow = 0.11 cfs @ 11.75 hrs, Volume= 0.044 af, Atten= 82%, Lag= 0.0 min
 Discarded = 0.11 cfs @ 11.75 hrs, Volume= 0.044 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 414.07' @ 12.38 hrs Surf.Area= 1,620 sf Storage= 369 cf

Plug-Flow detention time= 17.7 min calculated for 0.044 af (100% of inflow)
 Center-of-Mass det. time= 17.7 min (775.7 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.75 hrs HW=413.53' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=413.50' (Free Discharge)
 ↑**2=Culvert** (Controls 0.00 cfs)

1240815-pipes3-C

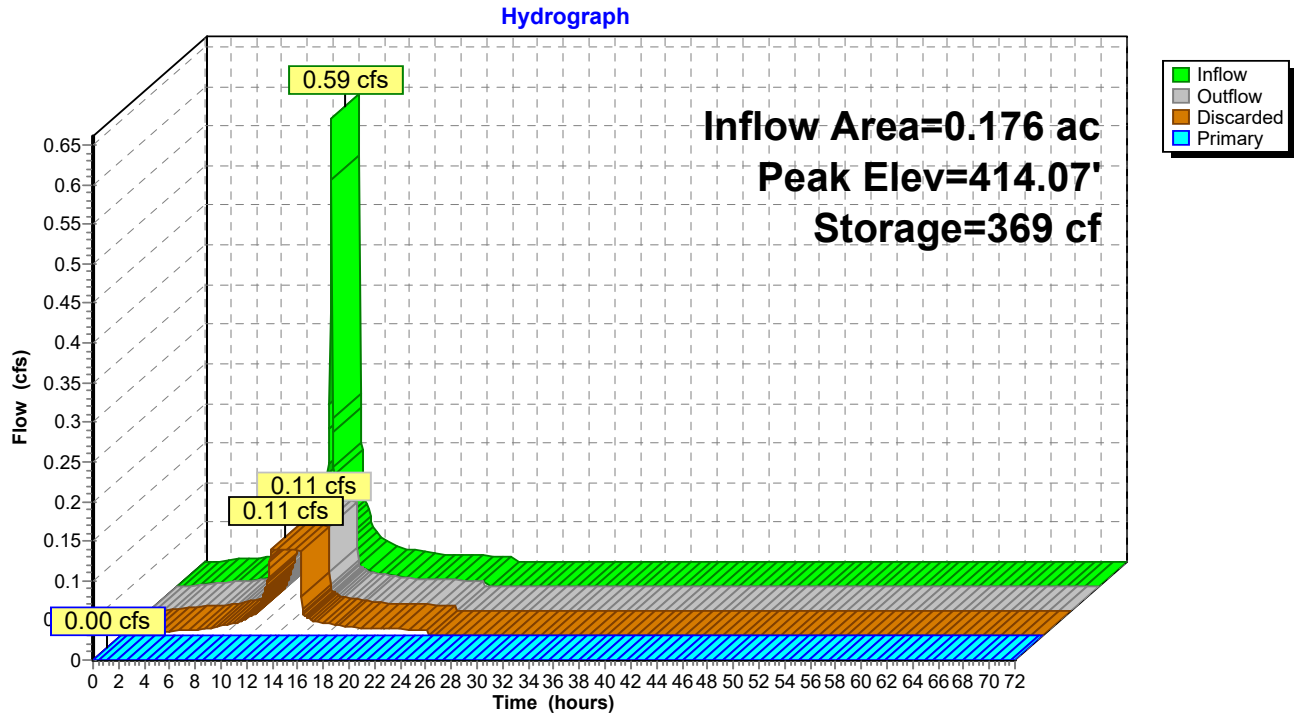
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Pond 3: Pervious Pavers



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Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 1.23" for 2-Year-2020 event
 Inflow = 0.48 cfs @ 12.06 hrs, Volume= 0.035 af
 Outflow = 0.43 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 10%, Lag= 1.9 min
 Discarded = 0.03 cfs @ 10.85 hrs, Volume= 0.023 af
 Primary = 0.41 cfs @ 12.09 hrs, Volume= 0.012 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.37' @ 12.09 hrs Surf.Area= 400 sf Storage= 163 cf

Plug-Flow detention time= 15.5 min calculated for 0.035 af (100% of inflow)
 Center-of-Mass det. time= 15.5 min (786.7 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 10.85 hrs HW=410.54' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.40 cfs @ 12.09 hrs HW=411.36' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.40 cfs of 0.40 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 0.40 cfs @ 2.05 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

1240815-pipes3-C

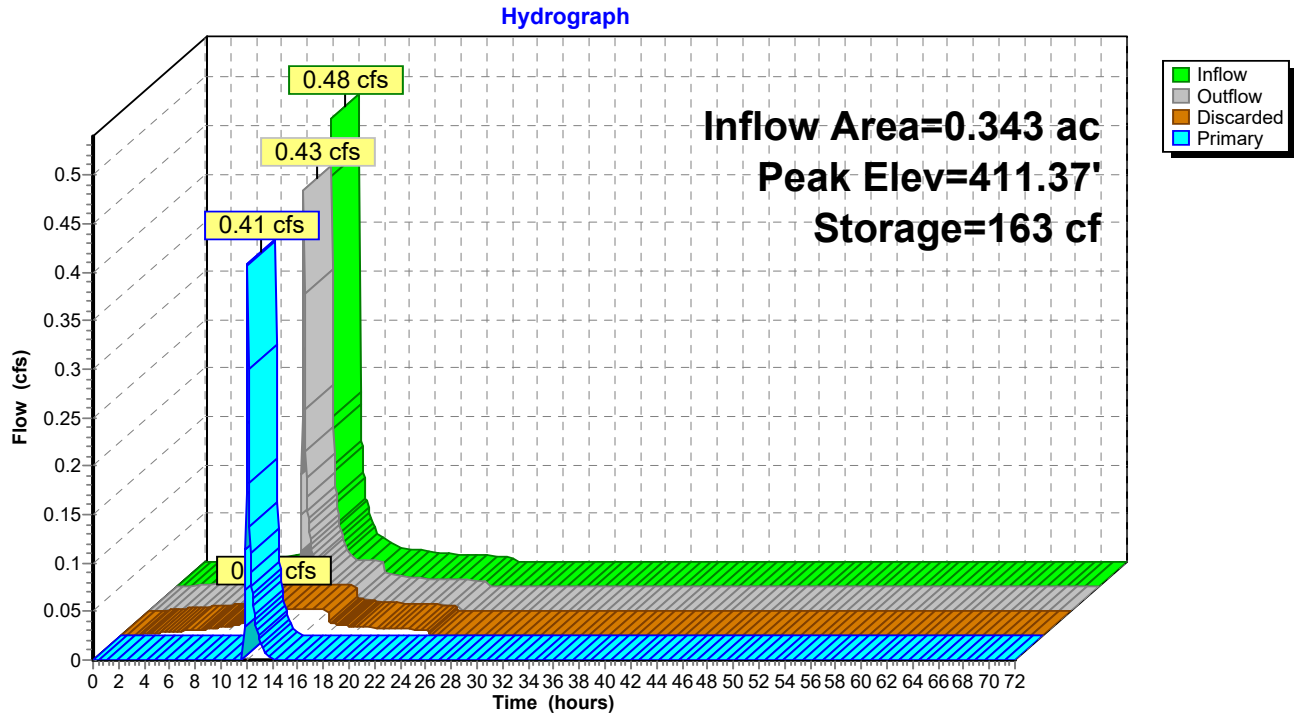
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Pond 5: Pipes



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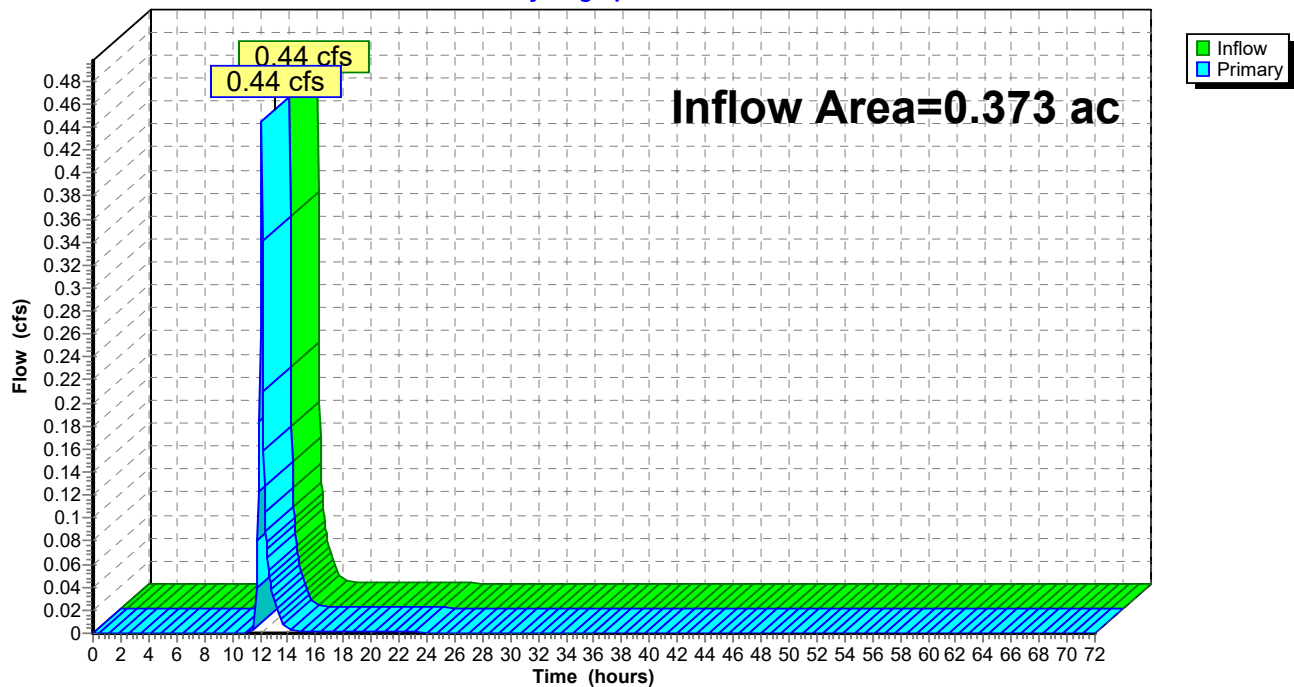
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 0.49" for 2-Year-2020 event
Inflow = 0.44 cfs @ 12.10 hrs, Volume= 0.015 af
Primary = 0.44 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=4.35"
Flow Length=141' Tc=5.9 min CN=74/98 Runoff=1.63 cfs 0.135 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=4.82"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.94 cfs 0.071 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=4.27"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.81 cfs 0.059 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=2.67"
Flow Length=128' Tc=6.0 min CN=74/0 Runoff=0.09 cfs 0.007 af

Pond 3: Pervious Pavers

Peak Elev=414.65' Storage=746 cf Inflow=0.94 cfs 0.071 af
Discarded=0.11 cfs 0.068 af Primary=0.06 cfs 0.003 af Outflow=0.17 cfs 0.071 af

Pond 5: Pipes

Peak Elev=411.52' Storage=204 cf Inflow=0.81 cfs 0.062 af
Discarded=0.03 cfs 0.032 af Primary=0.71 cfs 0.030 af Outflow=0.74 cfs 0.062 af

Link 7: Proposed

Inflow=0.79 cfs 0.037 af
Primary=0.79 cfs 0.037 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.272 af Average Runoff Depth = 4.37"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Existing

Runoff = 1.63 cfs @ 12.13 hrs, Volume= 0.135 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	66	0.0680	0.27		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
1.4	21	0.0950	0.24		Sheet Flow, 2 Grass: Short n= 0.150 P2= 3.47"
0.2	13	0.0390	1.24		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.9	141	Total			

1240815-pipes3-C

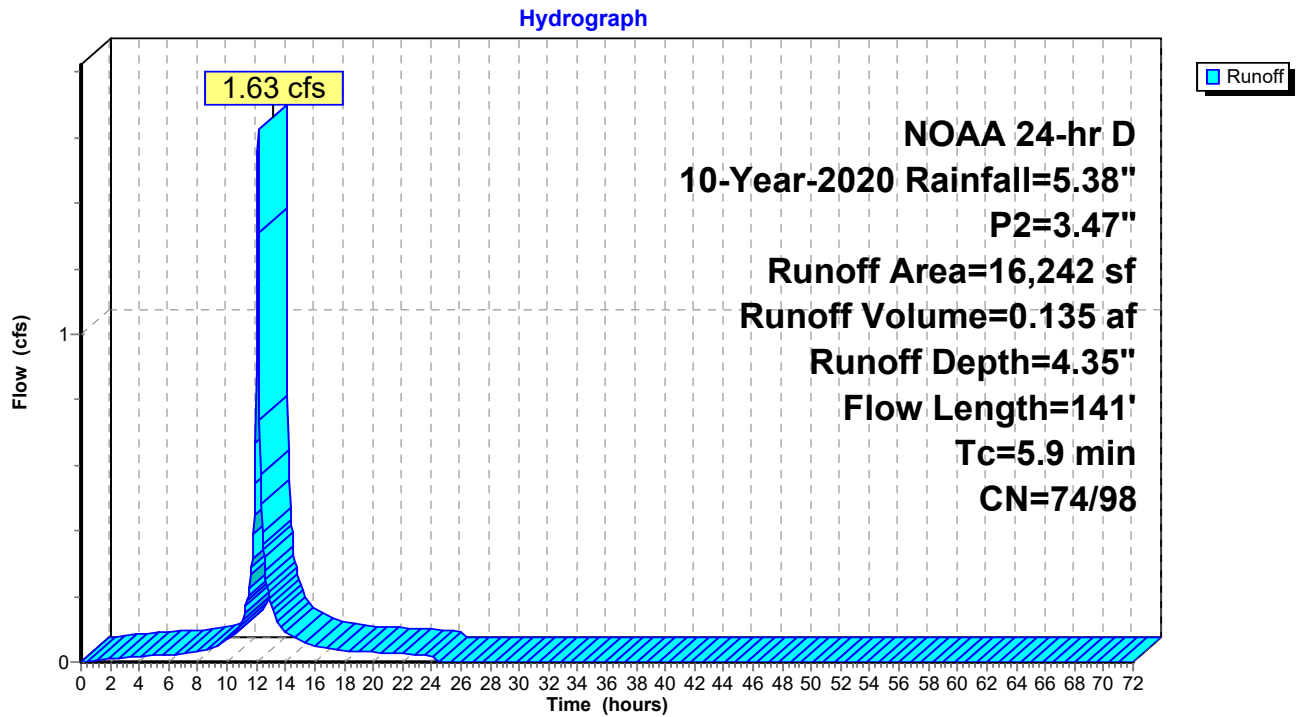
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Subcatchment 1: Existing



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Summary for Subcatchment 2: Parking Lot

Runoff = 0.94 cfs @ 12.06 hrs, Volume= 0.071 af, Depth= 4.82"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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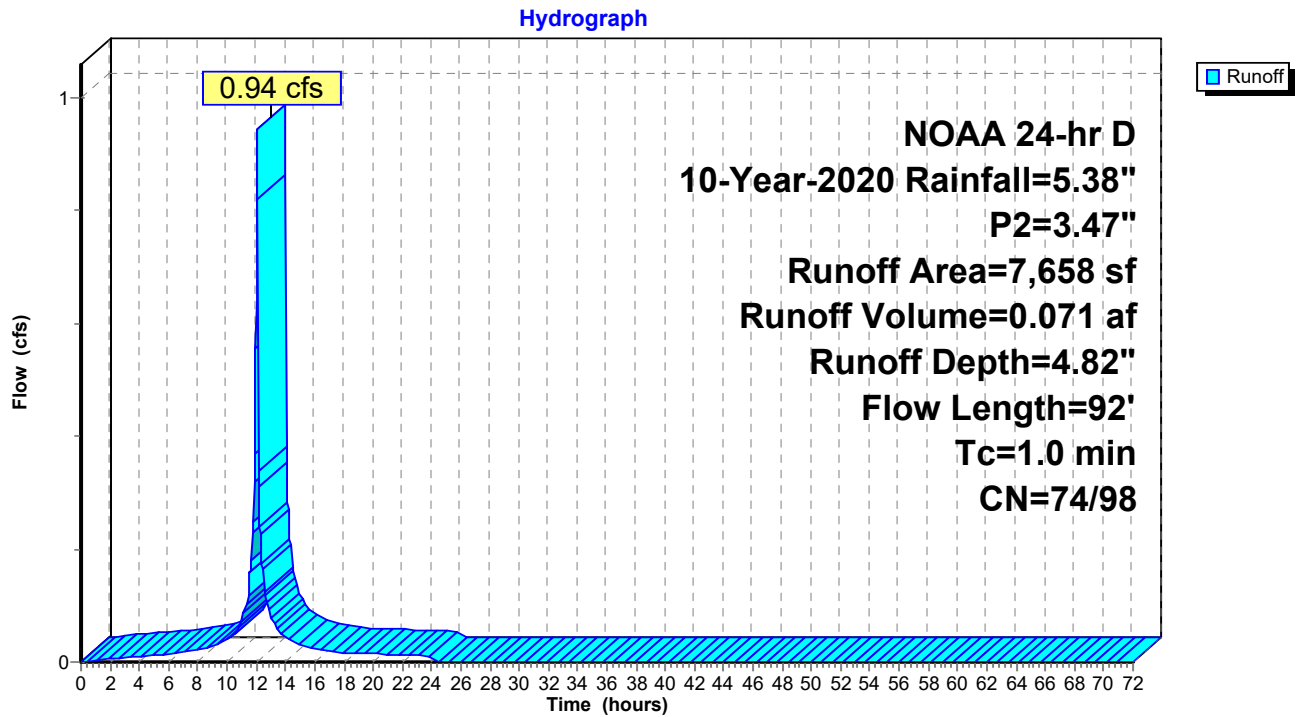
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Subcatchment 2: Parking Lot



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Summary for Subcatchment 4: Proposed

Runoff = 0.81 cfs @ 12.06 hrs, Volume= 0.059 af, Depth= 4.27"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1 Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2 Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4 Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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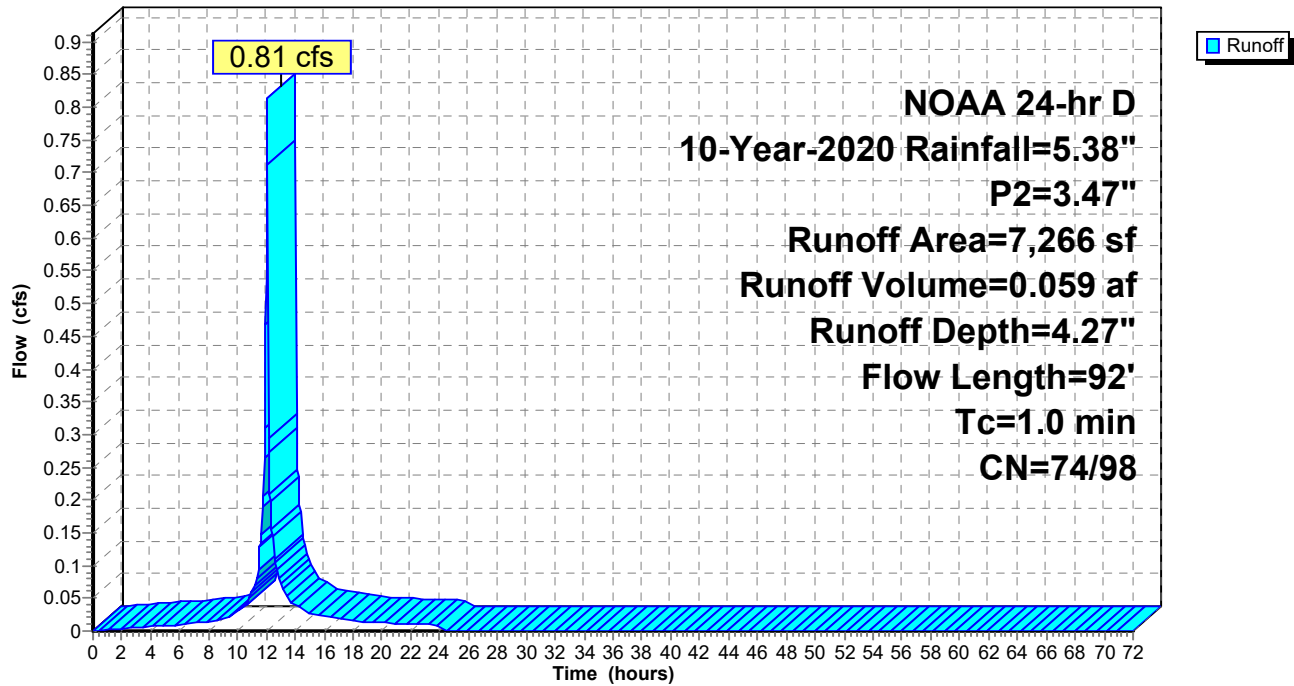
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Subcatchment 4: Proposed

Hydrograph



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Summary for Subcatchment 6: Bypass

Runoff = 0.09 cfs @ 12.13 hrs, Volume= 0.007 af, Depth= 2.67"
 Routed to Link 7 : Proposed

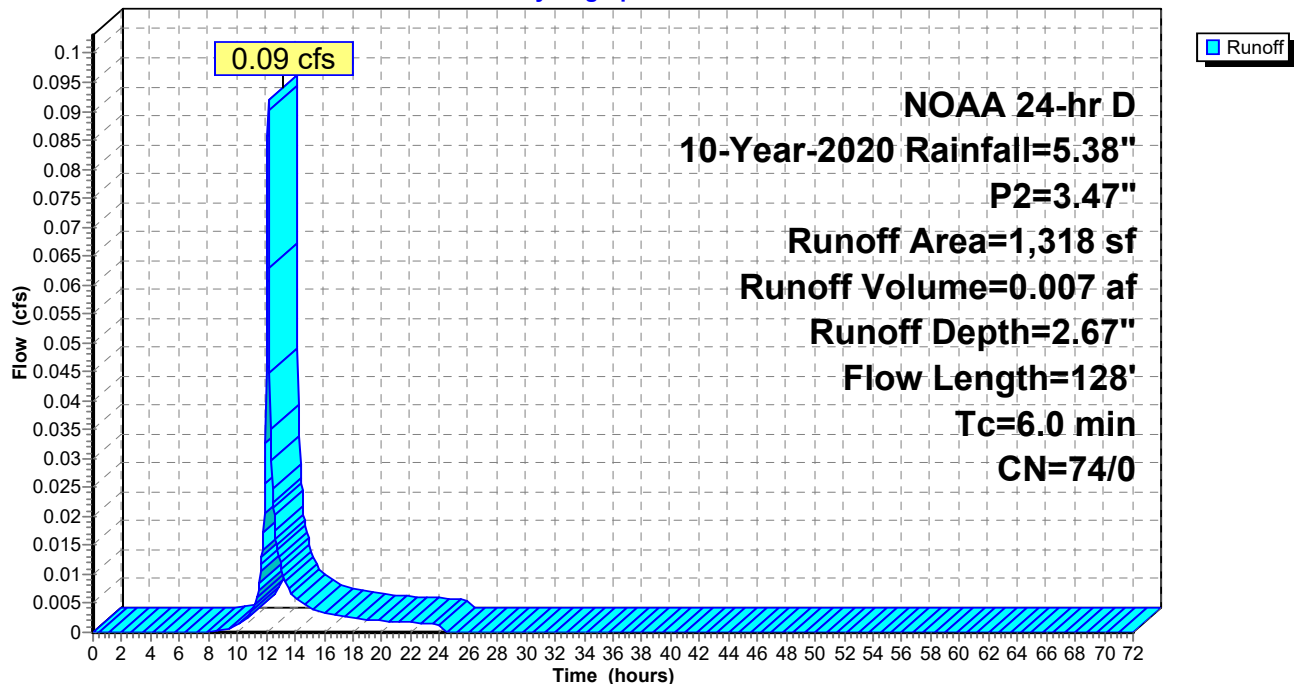
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0650	0.28		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
6.0	128	Total			

Subcatchment 6: Bypass

Hydrograph



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Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 4.82" for 10-Year-2020 event
 Inflow = 0.94 cfs @ 12.06 hrs, Volume= 0.071 af
 Outflow = 0.17 cfs @ 12.39 hrs, Volume= 0.071 af, Atten= 82%, Lag= 19.6 min
 Discarded = 0.11 cfs @ 11.45 hrs, Volume= 0.068 af
 Primary = 0.06 cfs @ 12.39 hrs, Volume= 0.003 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 414.65' @ 12.39 hrs Surf.Area= 1,620 sf Storage= 746 cf

Plug-Flow detention time= 36.4 min calculated for 0.071 af (100% of inflow)
 Center-of-Mass det. time= 36.4 min (786.8 - 750.4)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.45 hrs HW=413.53' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.06 cfs @ 12.39 hrs HW=414.65' (Free Discharge)
 ↑**2=Culvert** (Barrel Controls 0.06 cfs @ 1.90 fps)

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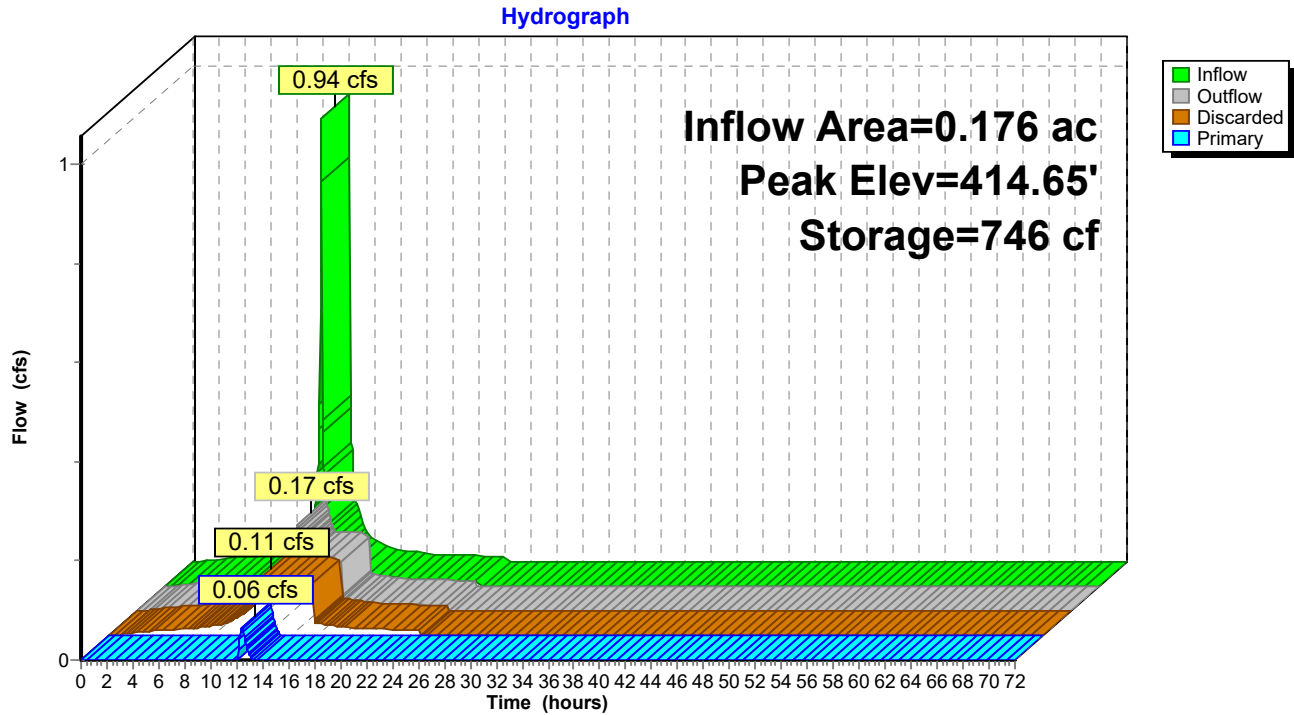
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Pond 3: Pervious Pavers



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Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 2.17" for 10-Year-2020 event
 Inflow = 0.81 cfs @ 12.06 hrs, Volume= 0.062 af
 Outflow = 0.74 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 10%, Lag= 1.8 min
 Discarded = 0.03 cfs @ 9.85 hrs, Volume= 0.032 af
 Primary = 0.71 cfs @ 12.09 hrs, Volume= 0.030 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.52' @ 12.09 hrs Surf.Area= 400 sf Storage= 204 cf

Plug-Flow detention time= 14.7 min calculated for 0.062 af (100% of inflow)
 Center-of-Mass det. time= 14.6 min (778.8 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 9.85 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=411.51' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.69 cfs of 0.76 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 0.69 cfs @ 2.43 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

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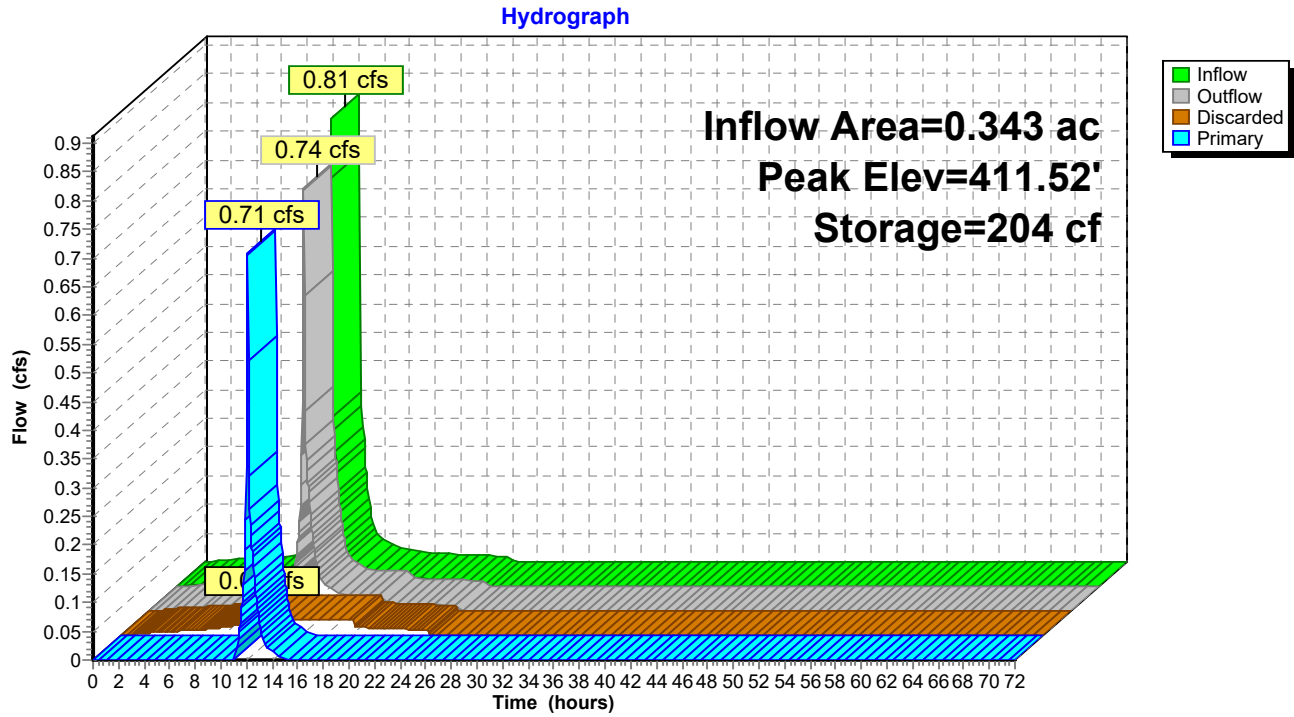
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Pond 5: Pipes



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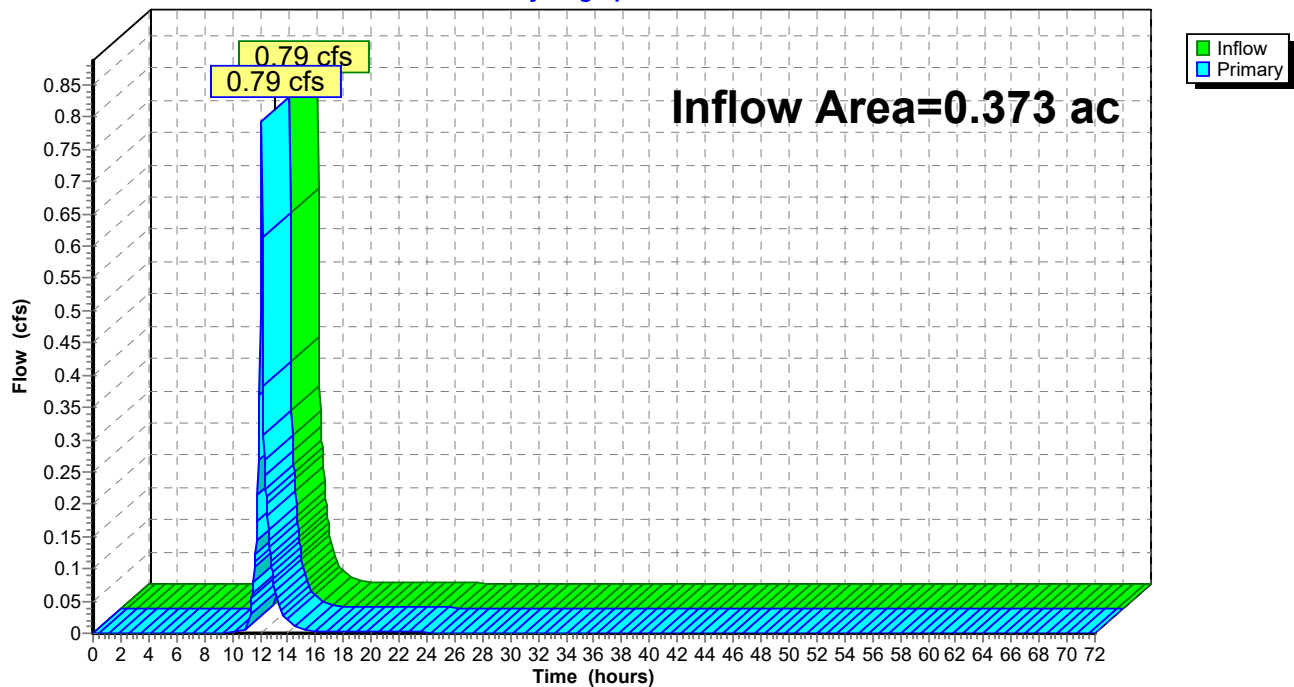
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 1.20" for 10-Year-2020 event
Inflow = 0.79 cfs @ 12.10 hrs, Volume= 0.037 af
Primary = 0.79 cfs @ 12.10 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=5.62"
Flow Length=141' Tc=5.9 min CN=74/98 Runoff=2.10 cfs 0.175 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=6.13"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=1.20 cfs 0.090 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=5.53"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=1.05 cfs 0.077 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=3.80"
Flow Length=128' Tc=6.0 min CN=74/0 Runoff=0.13 cfs 0.010 af

Pond 3: Pervious Pavers

Peak Elev=414.86' Storage=879 cf Inflow=1.20 cfs 0.090 af
Discarded=0.11 cfs 0.078 af Primary=0.30 cfs 0.011 af Outflow=0.41 cfs 0.090 af

Pond 5: Pipes

Peak Elev=411.66' Storage=245 cf Inflow=1.11 cfs 0.088 af
Discarded=0.03 cfs 0.037 af Primary=0.96 cfs 0.052 af Outflow=0.99 cfs 0.088 af

Link 7: Proposed

Inflow=1.09 cfs 0.061 af
Primary=1.09 cfs 0.061 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.351 af Average Runoff Depth = 5.65"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Exisiting

Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.175 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	66	0.0680	0.27		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
1.4	21	0.0950	0.24		Sheet Flow, 2 Grass: Short n= 0.150 P2= 3.47"
0.2	13	0.0390	1.24		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.9	141	Total			

1240815-pipes3-C

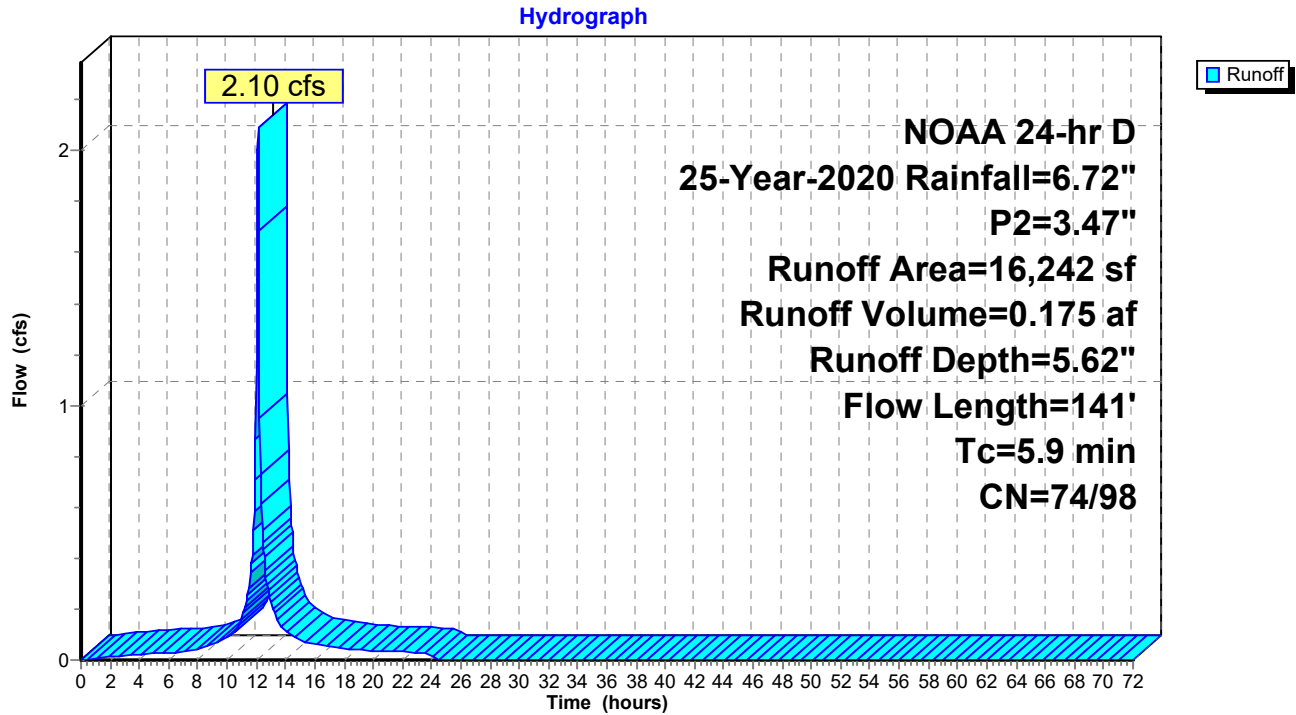
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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

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Subcatchment 1: Exisiting



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NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

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Summary for Subcatchment 2: Parking Lot

Runoff = 1.20 cfs @ 12.06 hrs, Volume= 0.090 af, Depth= 6.13"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

1240815-pipes3-C

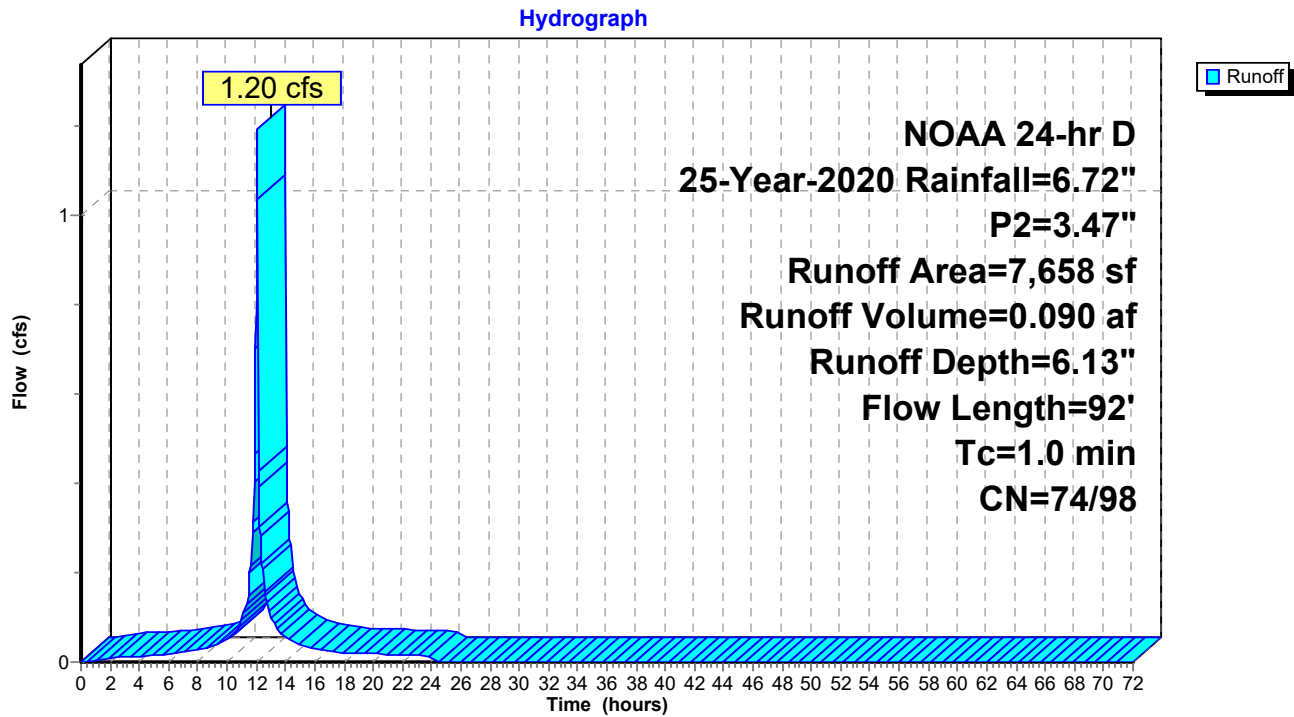
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Subcatchment 2: Parking Lot



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Summary for Subcatchment 4: Proposed

Runoff = 1.05 cfs @ 12.06 hrs, Volume= 0.077 af, Depth= 5.53"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1 Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2 Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4 Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

1240815-pipes3-C

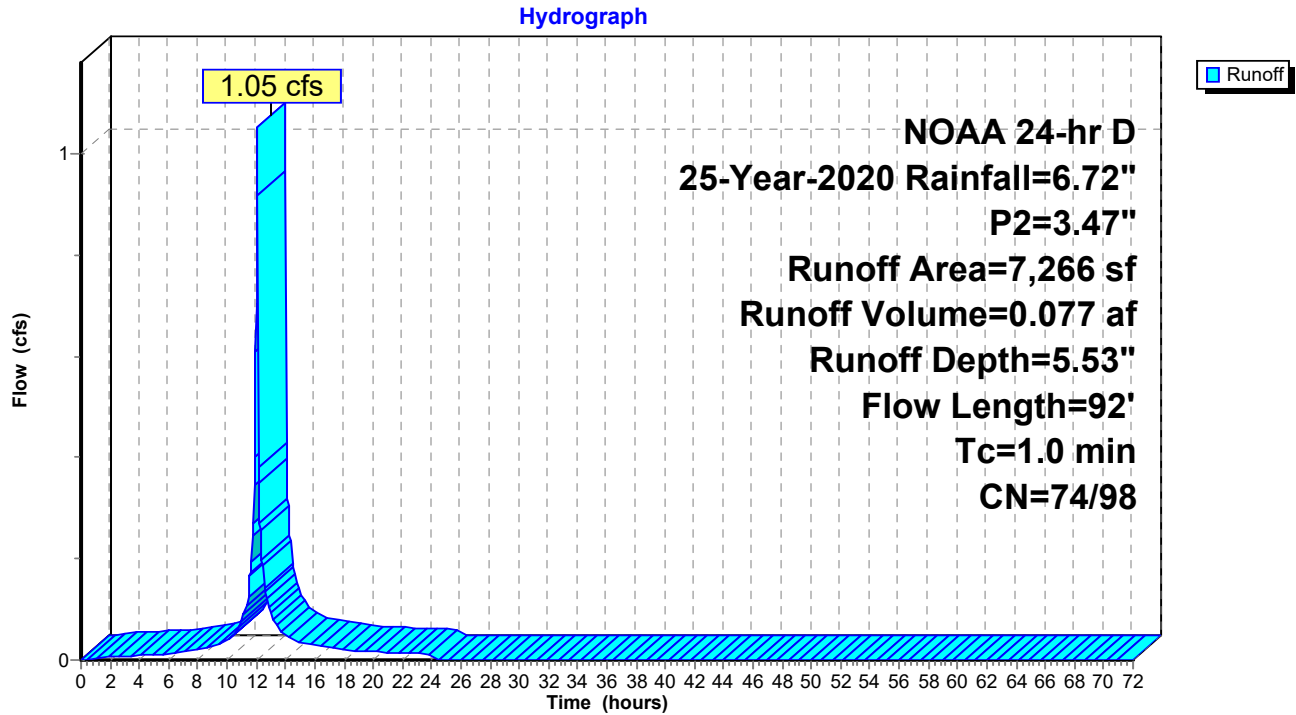
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Subcatchment 4: Proposed



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Summary for Subcatchment 6: Bypass

Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.010 af, Depth= 3.80"
 Routed to Link 7 : Proposed

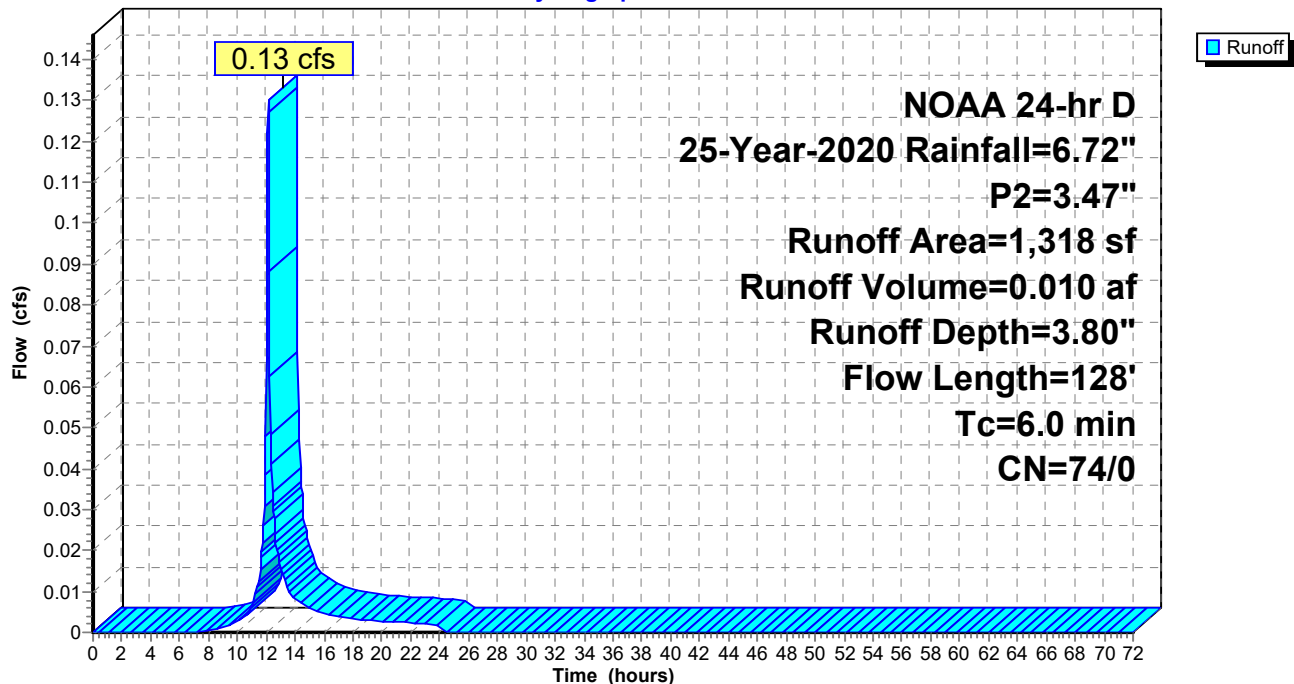
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2020 Rainfall=6.72", P2=3.47"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0650	0.28		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
6.0	128	Total			

Subcatchment 6: Bypass

Hydrograph



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Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 6.13" for 25-Year-2020 event
 Inflow = 1.20 cfs @ 12.06 hrs, Volume= 0.090 af
 Outflow = 0.41 cfs @ 12.18 hrs, Volume= 0.090 af, Atten= 66%, Lag= 7.0 min
 Discarded = 0.11 cfs @ 11.20 hrs, Volume= 0.078 af
 Primary = 0.30 cfs @ 12.18 hrs, Volume= 0.011 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 414.86' @ 12.18 hrs Surf.Area= 1,620 sf Storage= 879 cf

Plug-Flow detention time= 34.7 min calculated for 0.090 af (100% of inflow)
 Center-of-Mass det. time= 34.6 min (781.7 - 747.0)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.20 hrs HW=413.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.30 cfs @ 12.18 hrs HW=414.86' (Free Discharge)
 ↑ **2=Culvert** (Barrel Controls 0.30 cfs @ 2.81 fps)

1240815-pipes3-C

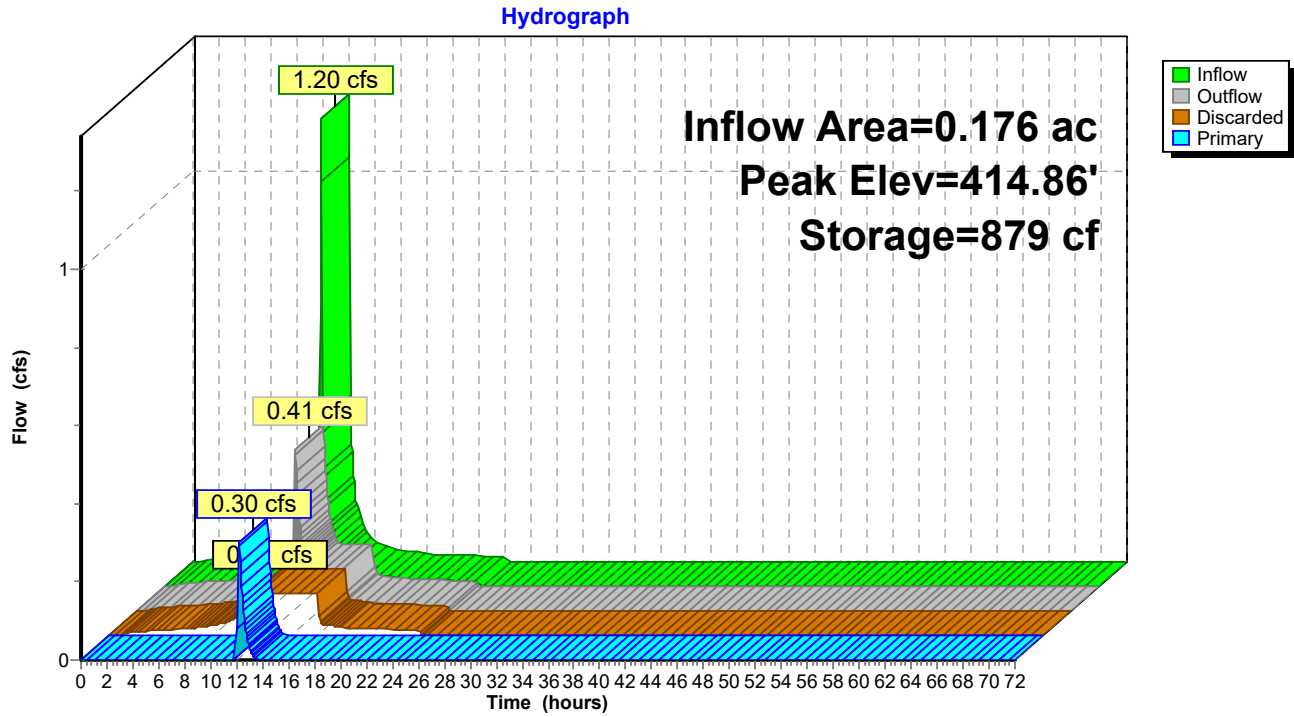
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Pond 3: Pervious Pavers



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Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 3.09" for 25-Year-2020 event
 Inflow = 1.11 cfs @ 12.08 hrs, Volume= 0.088 af
 Outflow = 0.99 cfs @ 12.11 hrs, Volume= 0.088 af, Atten= 11%, Lag= 1.9 min
 Discarded = 0.03 cfs @ 9.25 hrs, Volume= 0.037 af
 Primary = 0.96 cfs @ 12.11 hrs, Volume= 0.052 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.66' @ 12.11 hrs Surf.Area= 400 sf Storage= 245 cf

Plug-Flow detention time= 13.6 min calculated for 0.088 af (100% of inflow)
 Center-of-Mass det. time= 13.6 min (772.9 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 9.25 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.95 cfs @ 12.11 hrs HW=411.65' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.95 cfs of 1.17 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 0.95 cfs @ 2.74 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

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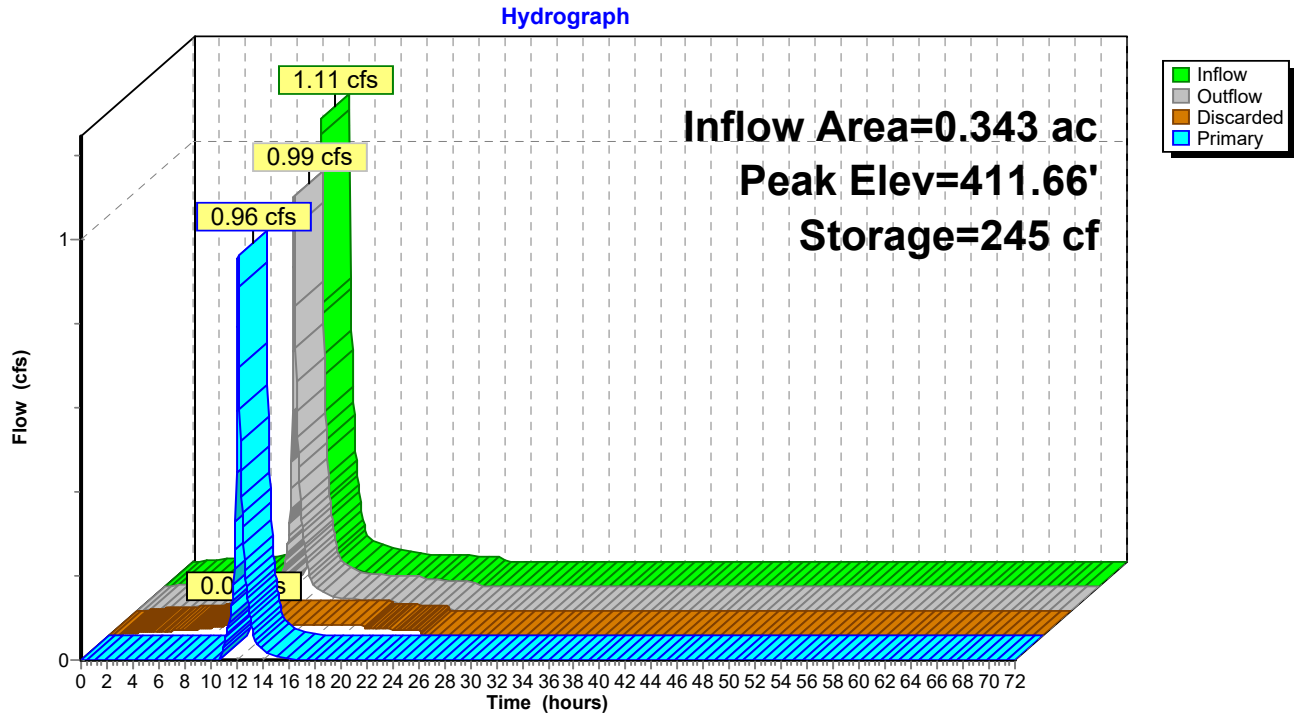
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Pond 5: Pipes



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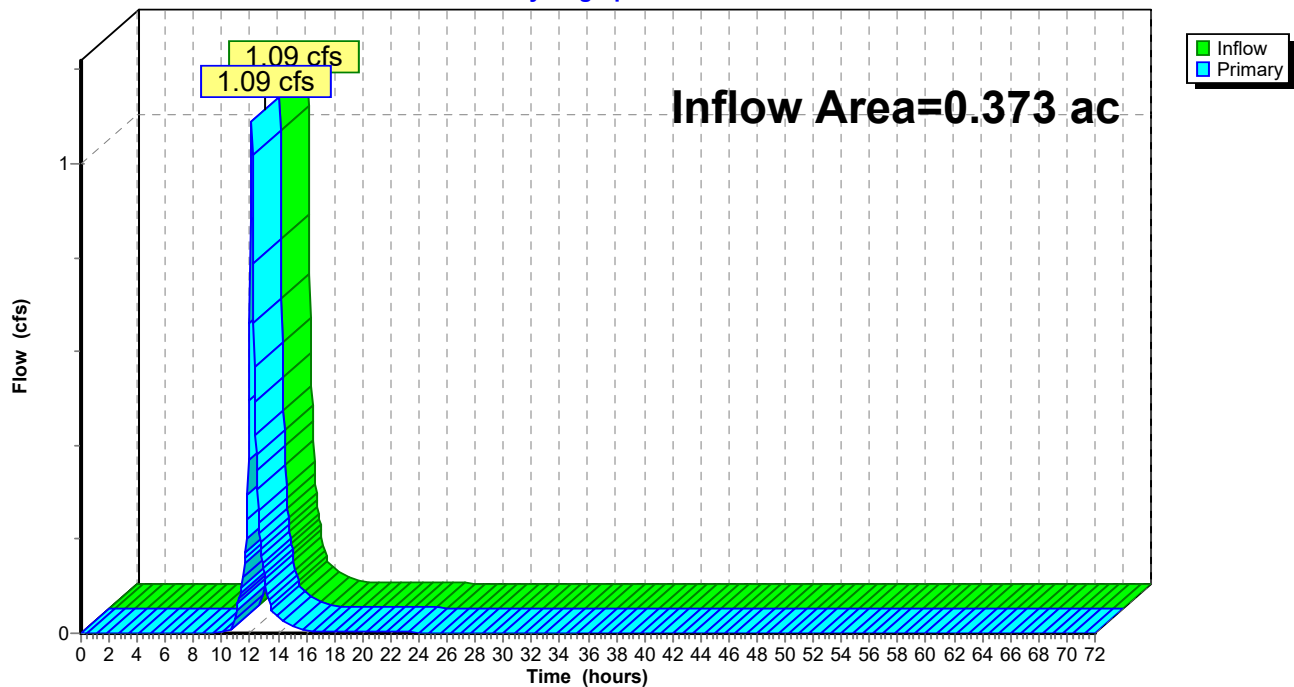
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 1.97" for 25-Year-2020 event
Inflow = 1.09 cfs @ 12.11 hrs, Volume= 0.061 af
Primary = 1.09 cfs @ 12.11 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=7.99"
Flow Length=141' Tc=5.9 min CN=74/98 Runoff=2.96 cfs 0.248 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=8.55"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=1.66 cfs 0.125 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=7.90"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=1.49 cfs 0.110 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=5.99"
Flow Length=128' Tc=6.0 min CN=74/0 Runoff=0.20 cfs 0.015 af

Pond 3: Pervious Pavers

Peak Elev=415.32' Storage=1,177 cf Inflow=1.66 cfs 0.125 af
Discarded=0.11 cfs 0.096 af Primary=0.67 cfs 0.029 af Outflow=0.78 cfs 0.125 af

Pond 5: Pipes

Peak Elev=412.24' Storage=420 cf Inflow=2.07 cfs 0.139 af
Discarded=0.03 cfs 0.044 af Primary=1.60 cfs 0.096 af Outflow=1.63 cfs 0.139 af

Link 7: Proposed

Inflow=1.80 cfs 0.111 af
Primary=1.80 cfs 0.111 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.499 af Average Runoff Depth = 8.02"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Existing

Runoff = 2.96 cfs @ 12.13 hrs, Volume= 0.248 af, Depth= 7.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	66	0.0680	0.27		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
1.4	21	0.0950	0.24		Sheet Flow, 2 Grass: Short n= 0.150 P2= 3.47"
0.2	13	0.0390	1.24		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.9	141	Total			

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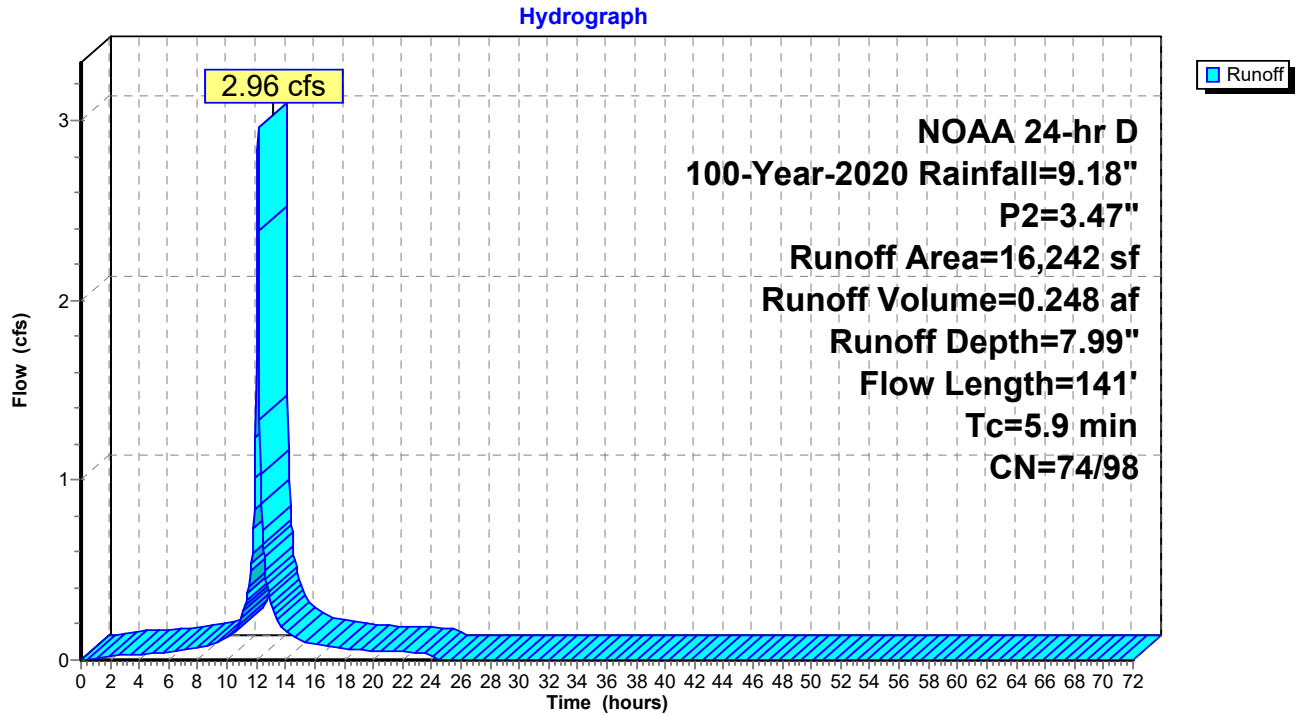
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Subcatchment 1: Exisiting



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Summary for Subcatchment 2: Parking Lot

Runoff = 1.66 cfs @ 12.06 hrs, Volume= 0.125 af, Depth= 8.55"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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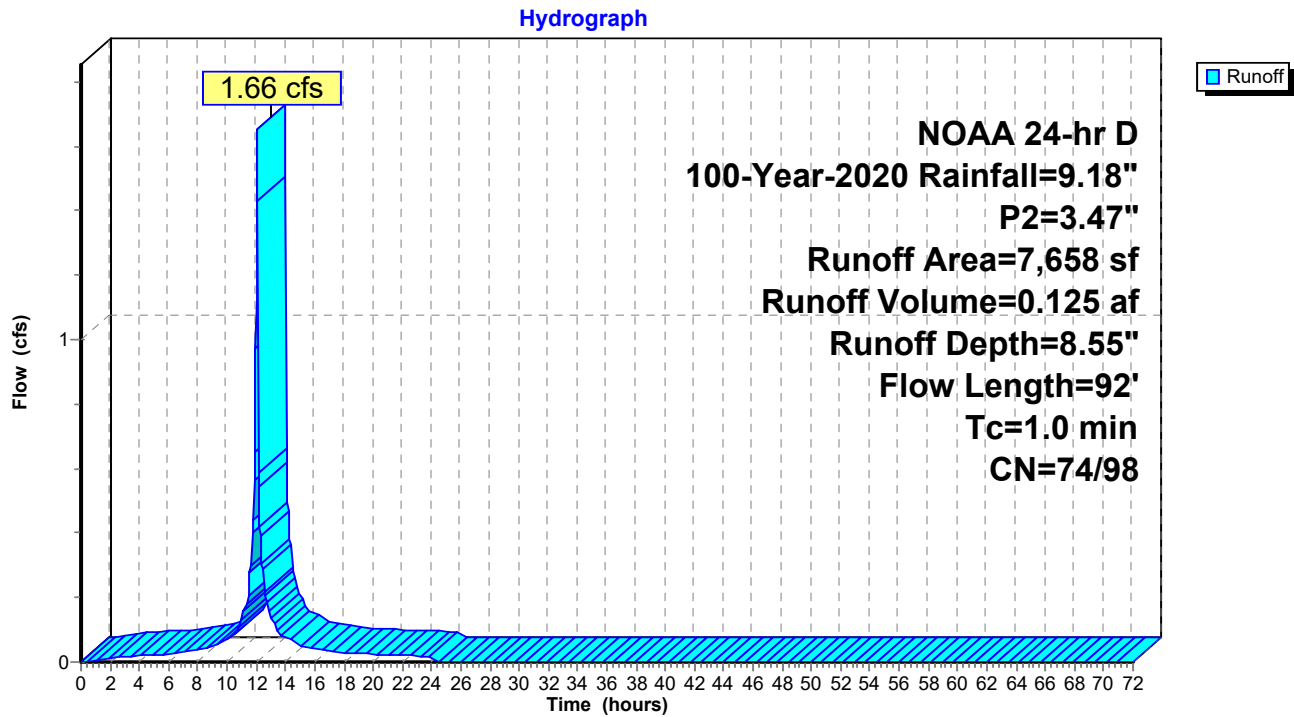
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Subcatchment 2: Parking Lot



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Summary for Subcatchment 4: Proposed

Runoff = 1.49 cfs @ 12.06 hrs, Volume= 0.110 af, Depth= 7.90"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1 Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2 Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4 Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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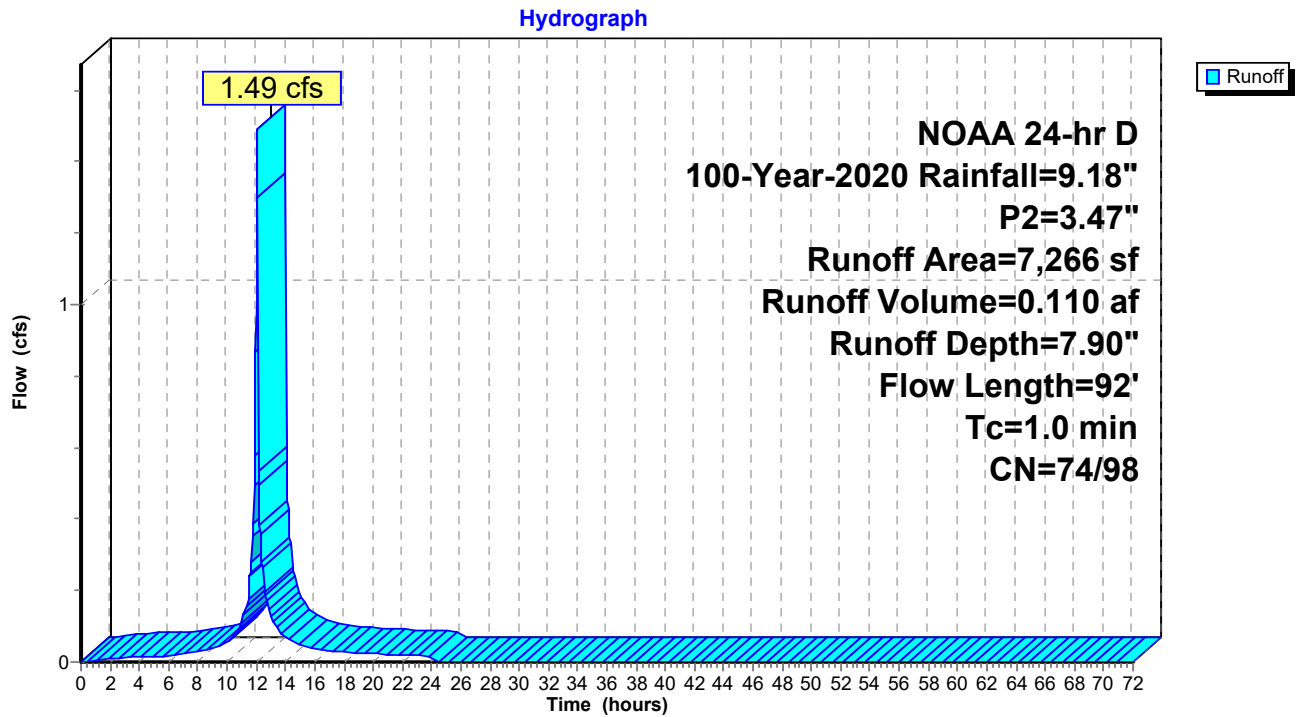
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Subcatchment 4: Proposed



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Summary for Subcatchment 6: Bypass

Runoff = 0.20 cfs @ 12.13 hrs, Volume= 0.015 af, Depth= 5.99"
 Routed to Link 7 : Proposed

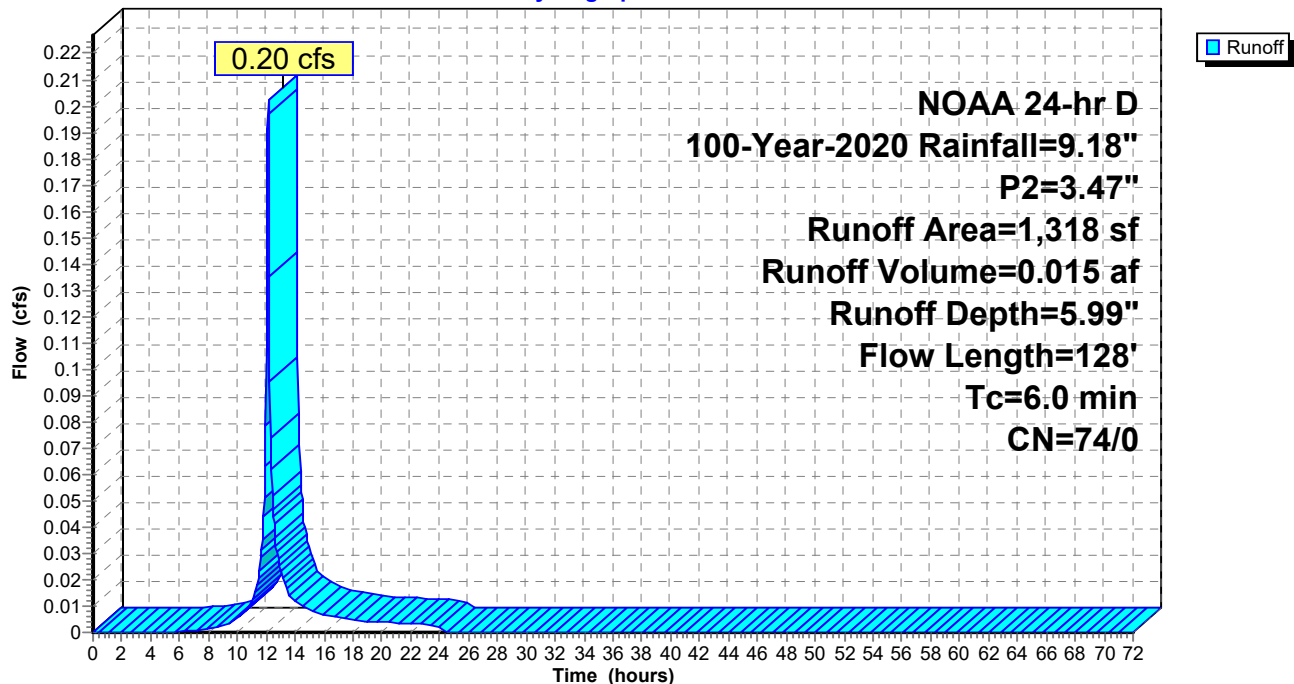
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0650	0.28		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
6.0	128	Total			

Subcatchment 6: Bypass

Hydrograph



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Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 8.55" for 100-Year-2020 event
 Inflow = 1.66 cfs @ 12.06 hrs, Volume= 0.125 af
 Outflow = 0.78 cfs @ 12.15 hrs, Volume= 0.125 af, Atten= 53%, Lag= 5.5 min
 Discarded = 0.11 cfs @ 10.85 hrs, Volume= 0.096 af
 Primary = 0.67 cfs @ 12.15 hrs, Volume= 0.029 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 415.32' @ 12.15 hrs Surf.Area= 1,620 sf Storage= 1,177 cf

Plug-Flow detention time= 32.7 min calculated for 0.125 af (100% of inflow)
 Center-of-Mass det. time= 32.7 min (775.5 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 10.85 hrs HW=413.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.67 cfs @ 12.15 hrs HW=415.31' (Free Discharge)
 ↑ **2=Culvert** (Barrel Controls 0.67 cfs @ 3.42 fps)

1240815-pipes3-C

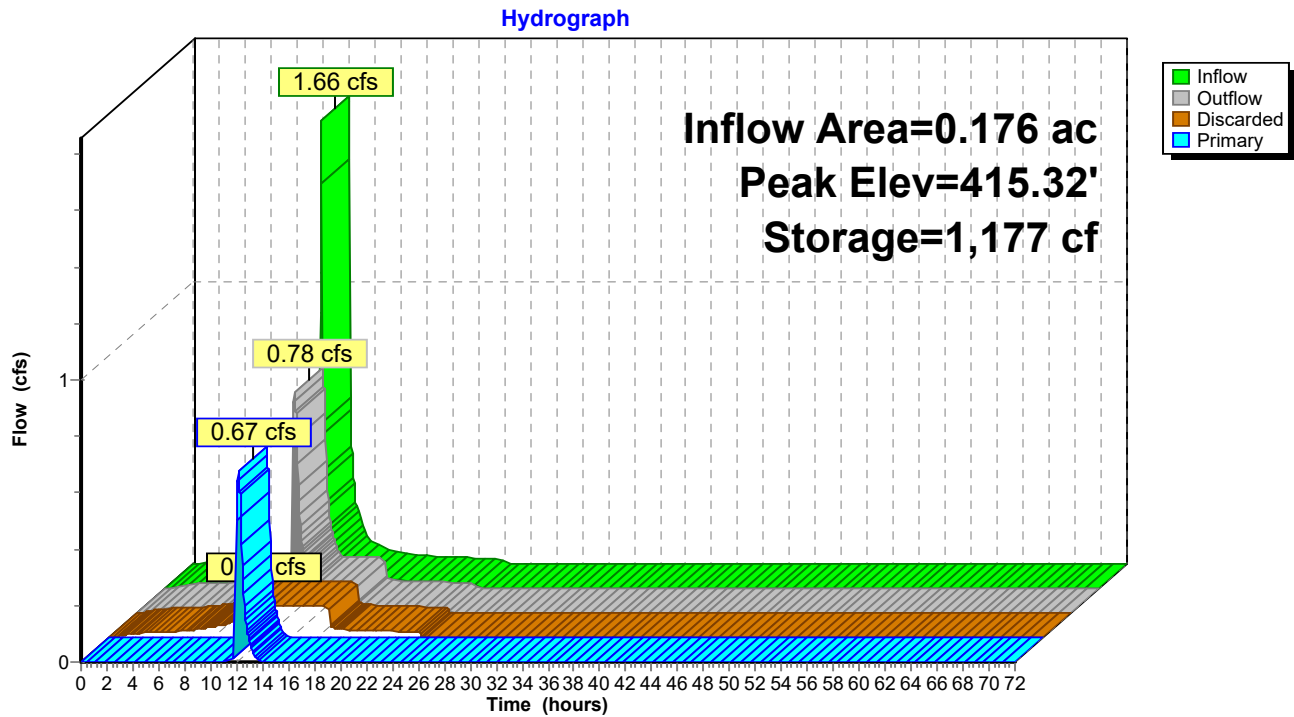
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NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

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Pond 3: Pervious Pavers



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NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Printed 2/4/2026

Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 4.88" for 100-Year-2020 event
 Inflow = 2.07 cfs @ 12.07 hrs, Volume= 0.139 af
 Outflow = 1.63 cfs @ 12.12 hrs, Volume= 0.139 af, Atten= 21%, Lag= 3.1 min
 Discarded = 0.03 cfs @ 7.70 hrs, Volume= 0.044 af
 Primary = 1.60 cfs @ 12.12 hrs, Volume= 0.096 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 412.24' @ 12.12 hrs Surf.Area= 400 sf Storage= 420 cf

Plug-Flow detention time= 12.9 min calculated for 0.139 af (100% of inflow)
 Center-of-Mass det. time= 12.9 min (766.7 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 7.70 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.56 cfs @ 12.12 hrs HW=412.20' (Free Discharge)
 ↑ **2=Culvert** (Passes 1.56 cfs of 3.03 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 1.56 cfs @ 4.48 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

1240815-pipes3-C

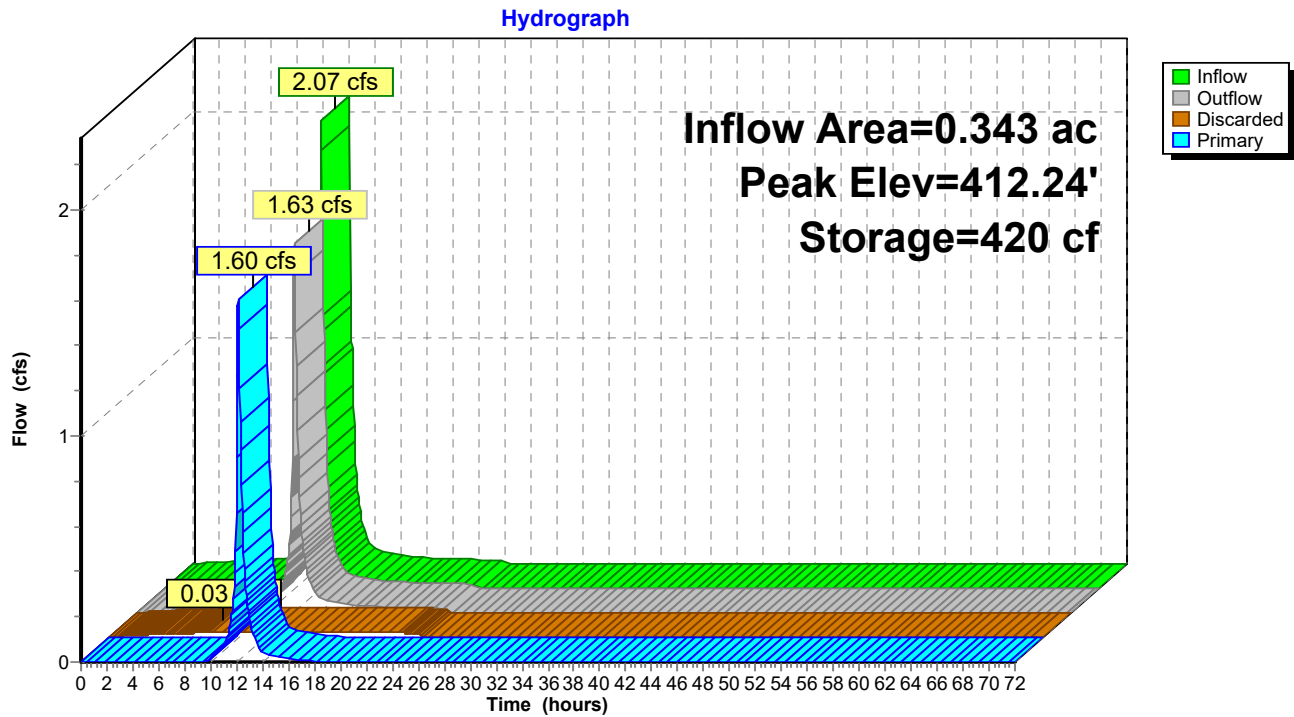
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Pond 5: Pipes



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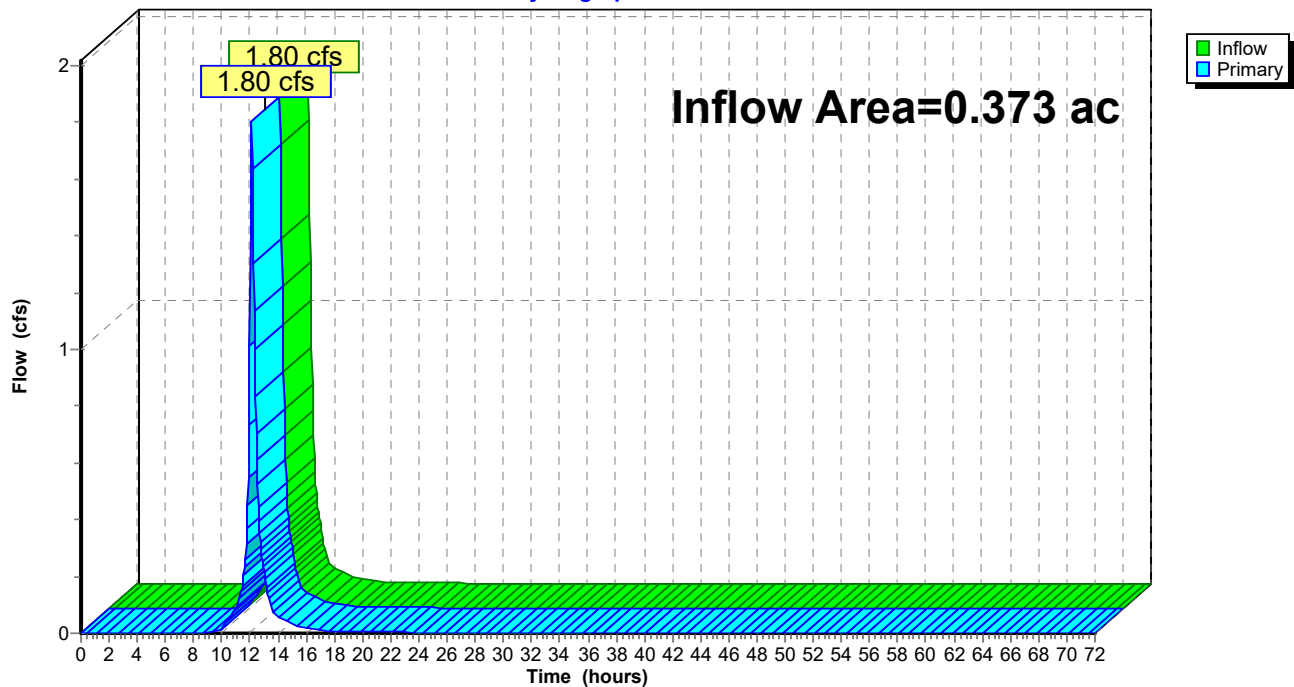
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 3.57" for 100-Year-2020 event
Inflow = 1.80 cfs @ 12.12 hrs, Volume= 0.111 af
Primary = 1.80 cfs @ 12.12 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=3.15"
Flow Length=141' Tc=5.5 min CN=74/98 Runoff=1.19 cfs 0.098 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=3.57"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=0.70 cfs 0.052 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=3.08"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=0.59 cfs 0.043 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=1.66"
Flow Length=128' Tc=5.5 min CN=74/0 Runoff=0.06 cfs 0.004 af

Pond 3: Pervious Pavers

Peak Elev=414.28' Storage=503 cf Inflow=0.70 cfs 0.052 af
Discarded=0.11 cfs 0.052 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.052 af

Pond 5: Pipes

Peak Elev=411.42' Storage=176 cf Inflow=0.59 cfs 0.043 af
Discarded=0.03 cfs 0.026 af Primary=0.50 cfs 0.017 af Outflow=0.53 cfs 0.043 af

Link 7: Proposed

Inflow=0.56 cfs 0.021 af
Primary=0.56 cfs 0.021 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.197 af Average Runoff Depth = 3.17"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Existing

Runoff = 1.19 cfs @ 12.12 hrs, Volume= 0.098 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	66	0.0680	0.29		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
1.3	21	0.0950	0.26		Sheet Flow, 2 Grass: Short n= 0.150 P2= 4.09"
0.2	13	0.0390	1.35		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 4.09"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.5	141	Total			

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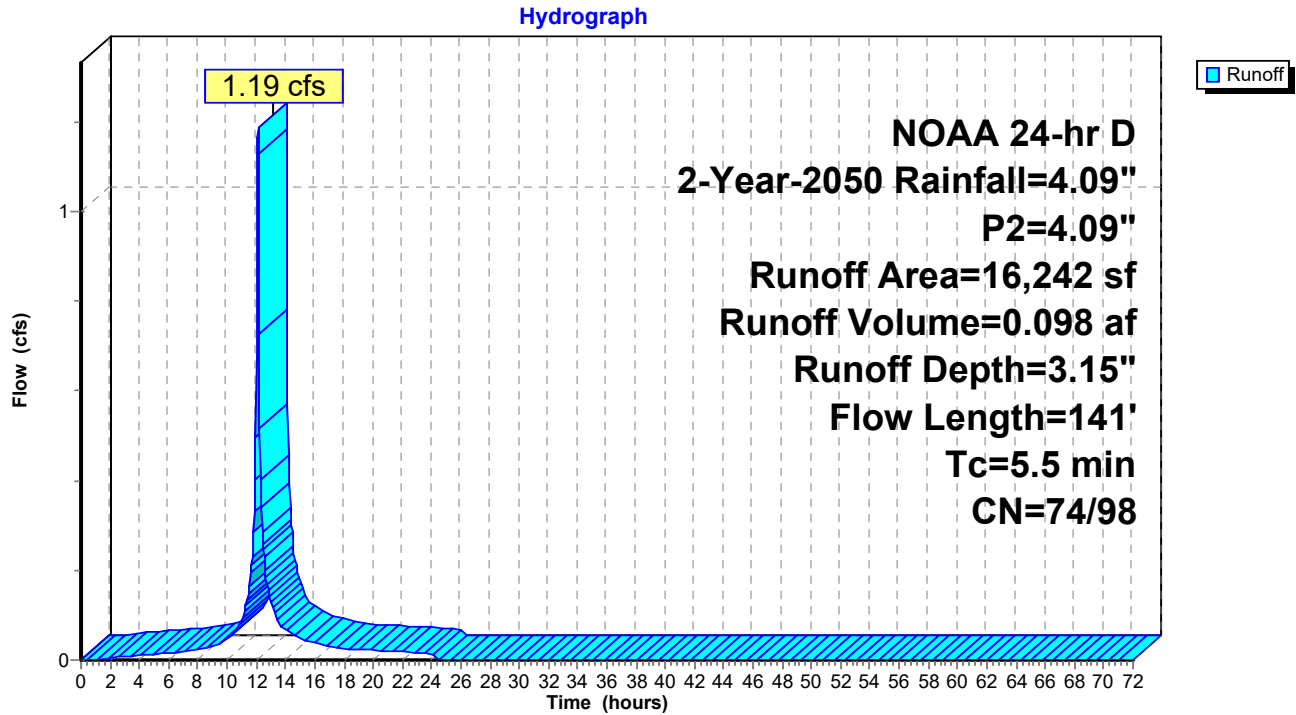
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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment 1: Existing



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Subcatchment 2: Parking Lot

Runoff = 0.70 cfs @ 12.06 hrs, Volume= 0.052 af, Depth= 3.57"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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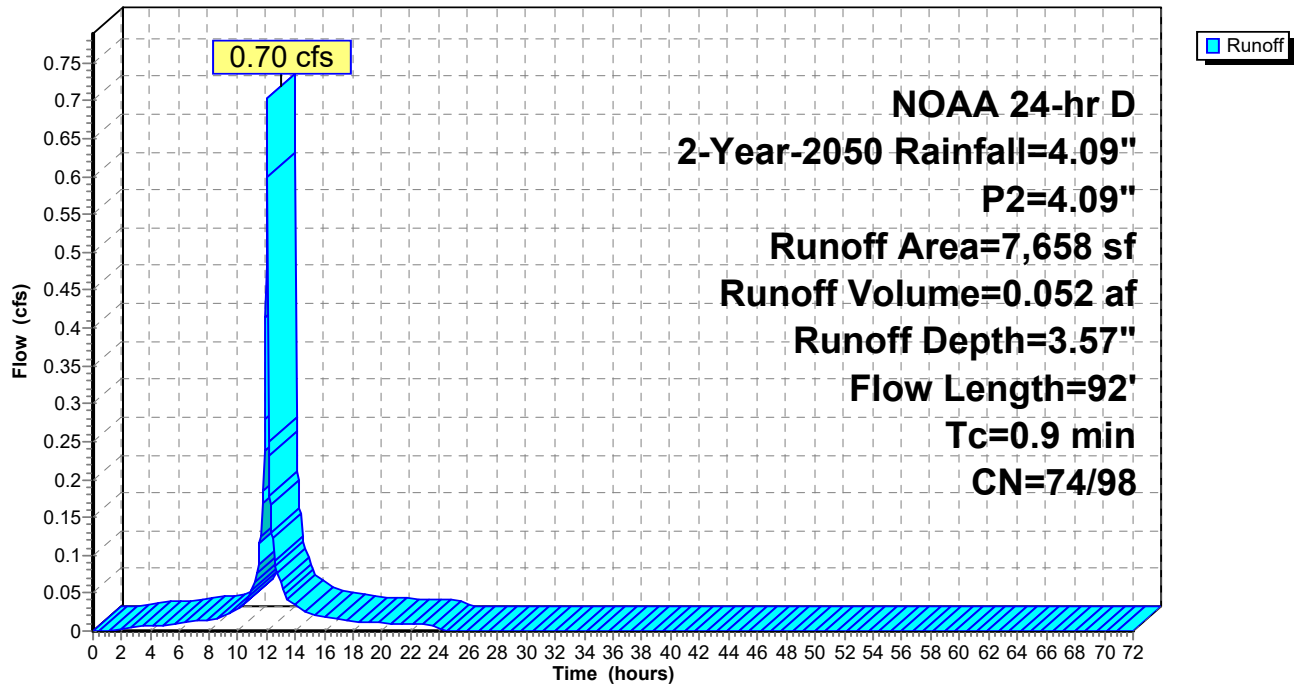
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Subcatchment 2: Parking Lot

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Subcatchment 4: Proposed

Runoff = 0.59 cfs @ 12.06 hrs, Volume= 0.043 af, Depth= 3.08"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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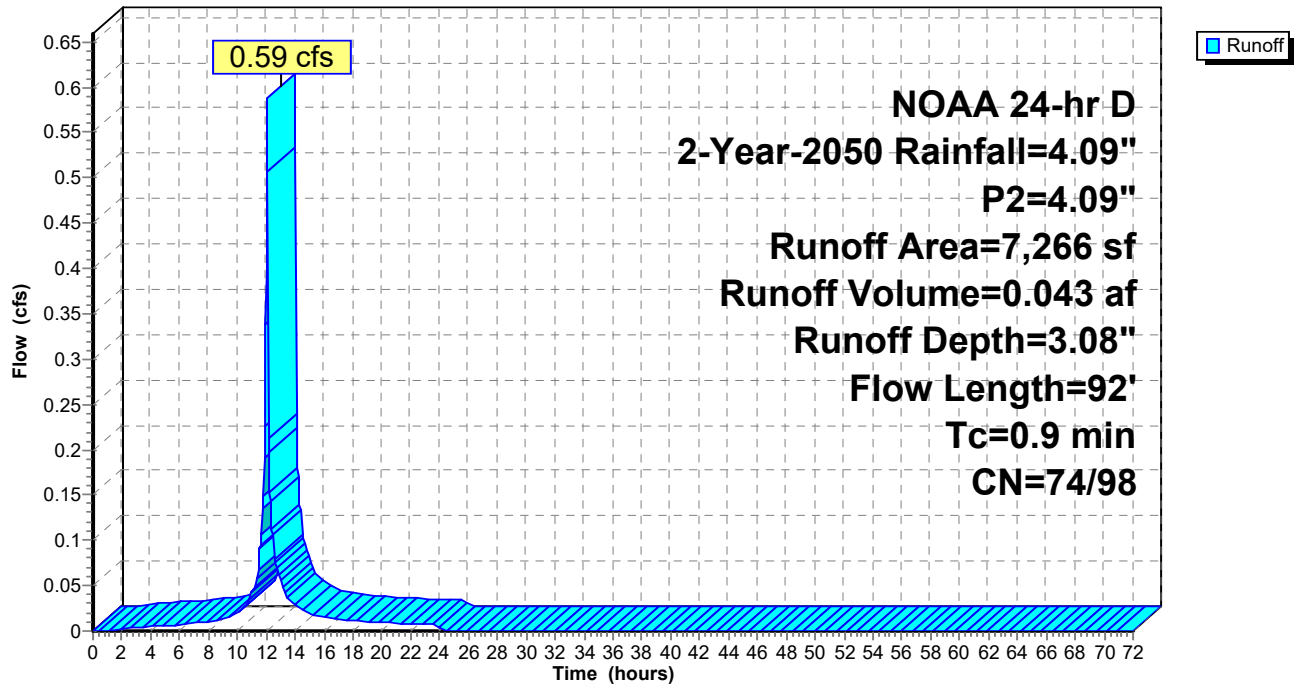
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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment 4: Proposed

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Subcatchment 6: Bypass

Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.004 af, Depth= 1.66"
Routed to Link 7 : Proposed

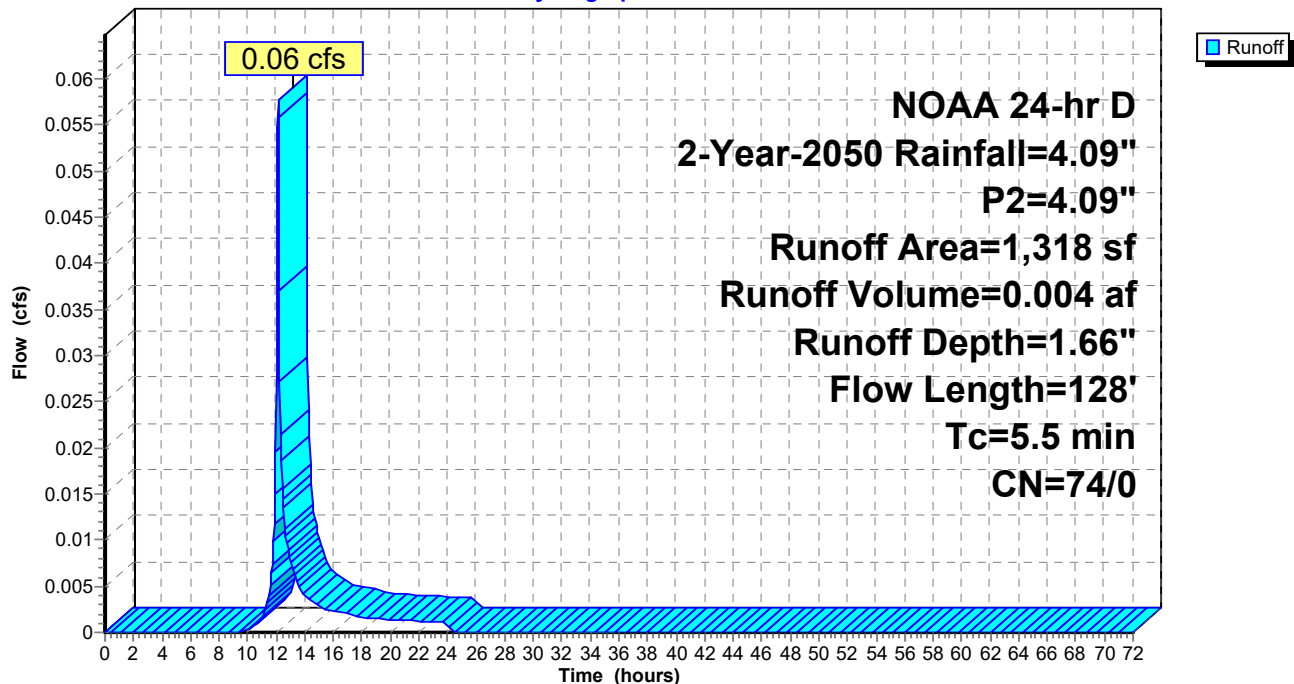
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.0650	0.31		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
5.5	128	Total			

Subcatchment 6: Bypass

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 3.57" for 2-Year-2050 event
 Inflow = 0.70 cfs @ 12.06 hrs, Volume= 0.052 af
 Outflow = 0.11 cfs @ 11.60 hrs, Volume= 0.052 af, Atten= 85%, Lag= 0.0 min
 Discarded = 0.11 cfs @ 11.60 hrs, Volume= 0.052 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 414.28' @ 12.51 hrs Surf.Area= 1,620 sf Storage= 503 cf

Plug-Flow detention time= 25.2 min calculated for 0.052 af (100% of inflow)
 Center-of-Mass det. time= 25.2 min (780.0 - 754.9)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.60 hrs HW=413.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=413.50' (Free Discharge)
 ↑ **2=Culvert** (Controls 0.00 cfs)

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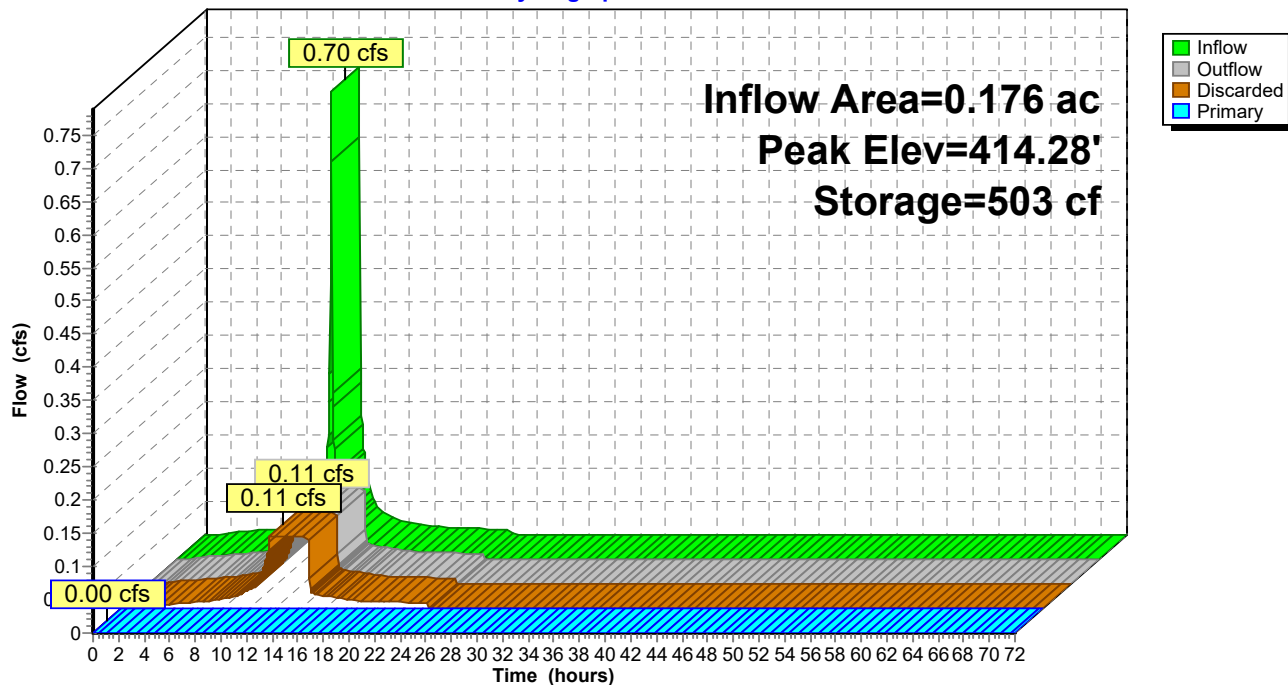
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Pond 3: Pervious Pavers

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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Printed 2/4/2026

Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 1.50" for 2-Year-2050 event
 Inflow = 0.59 cfs @ 12.06 hrs, Volume= 0.043 af
 Outflow = 0.53 cfs @ 12.09 hrs, Volume= 0.043 af, Atten= 10%, Lag= 1.9 min
 Discarded = 0.03 cfs @ 10.60 hrs, Volume= 0.026 af
 Primary = 0.50 cfs @ 12.09 hrs, Volume= 0.017 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.42' @ 12.09 hrs Surf.Area= 400 sf Storage= 176 cf

Plug-Flow detention time= 15.3 min calculated for 0.043 af (100% of inflow)
 Center-of-Mass det. time= 15.3 min (784.0 - 768.7)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 10.60 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.49 cfs @ 12.09 hrs HW=411.41' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.49 cfs of 0.51 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 0.49 cfs @ 2.18 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

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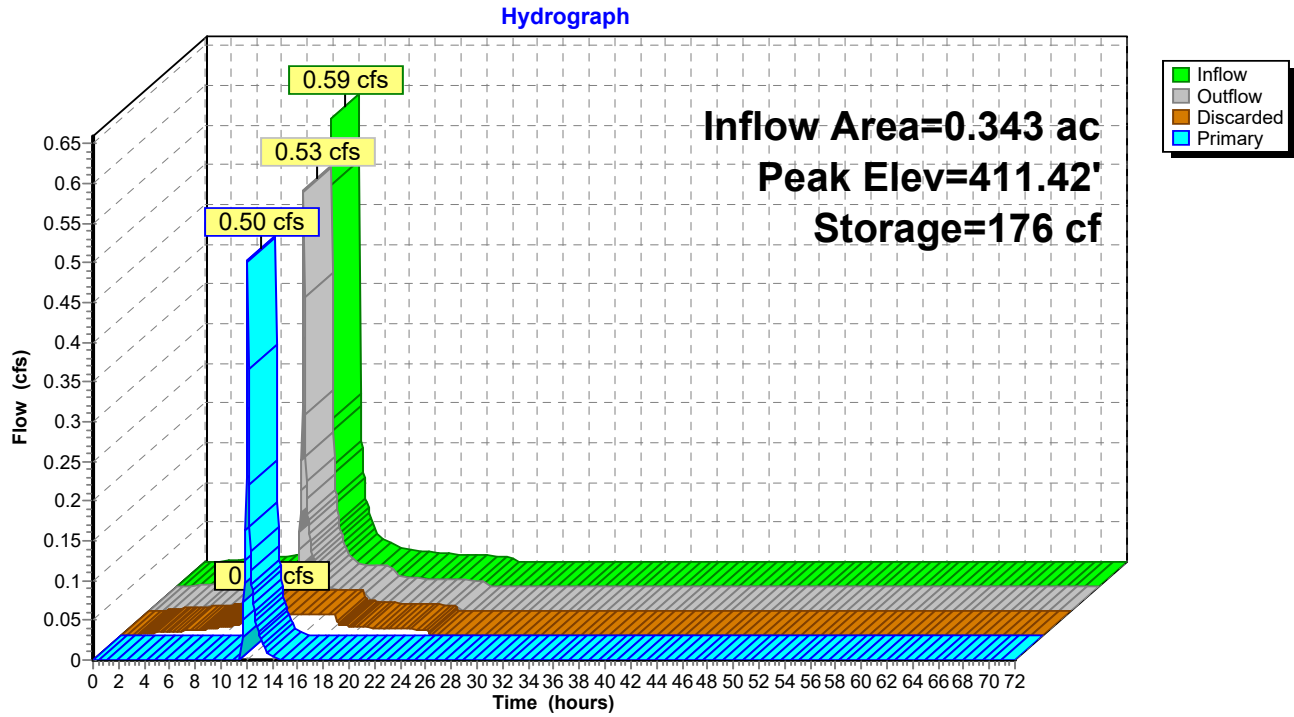
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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Pond 5: Pipes



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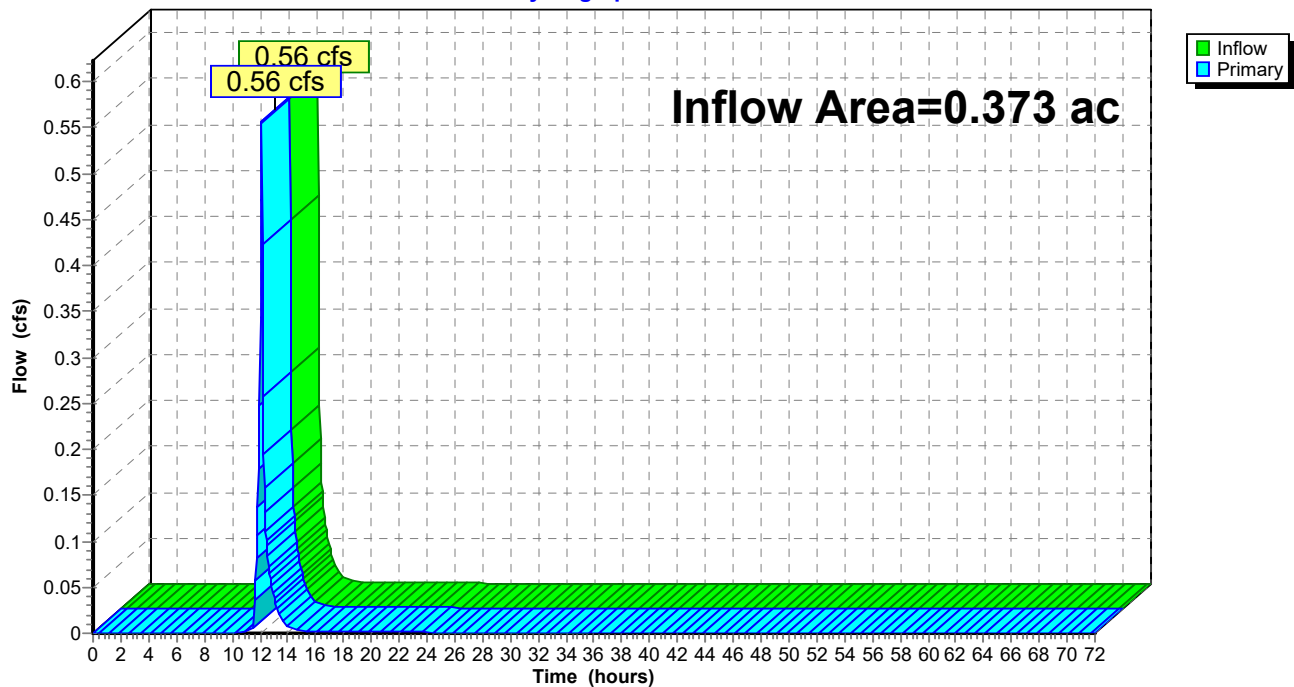
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 0.67" for 2-Year-2050 event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.021 af
Primary = 0.56 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=5.29"
Flow Length=141' Tc=5.5 min CN=74/98 Runoff=1.98 cfs 0.164 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=5.79"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=1.13 cfs 0.085 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=5.20"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=0.99 cfs 0.072 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=3.50"
Flow Length=128' Tc=5.5 min CN=74/0 Runoff=0.12 cfs 0.009 af

Pond 3: Pervious Pavers

Peak Elev=414.80' Storage=843 cf Inflow=1.13 cfs 0.085 af
Discarded=0.11 cfs 0.076 af Primary=0.23 cfs 0.009 af Outflow=0.34 cfs 0.085 af

Pond 5: Pipes

Peak Elev=411.60' Storage=229 cf Inflow=1.00 cfs 0.081 af
Discarded=0.03 cfs 0.035 af Primary=0.88 cfs 0.046 af Outflow=0.91 cfs 0.081 af

Link 7: Proposed

Inflow=1.00 cfs 0.055 af
Primary=1.00 cfs 0.055 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.330 af Average Runoff Depth = 5.31"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

1240815-pipes3-C

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Printed 2/4/2026

Summary for Subcatchment 1: Exisiting

Runoff = 1.98 cfs @ 12.12 hrs, Volume= 0.164 af, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	66	0.0680	0.29		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
1.3	21	0.0950	0.26		Sheet Flow, 2 Grass: Short n= 0.150 P2= 4.09"
0.2	13	0.0390	1.35		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 4.09"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.5	141	Total			

1240815-pipes3-C

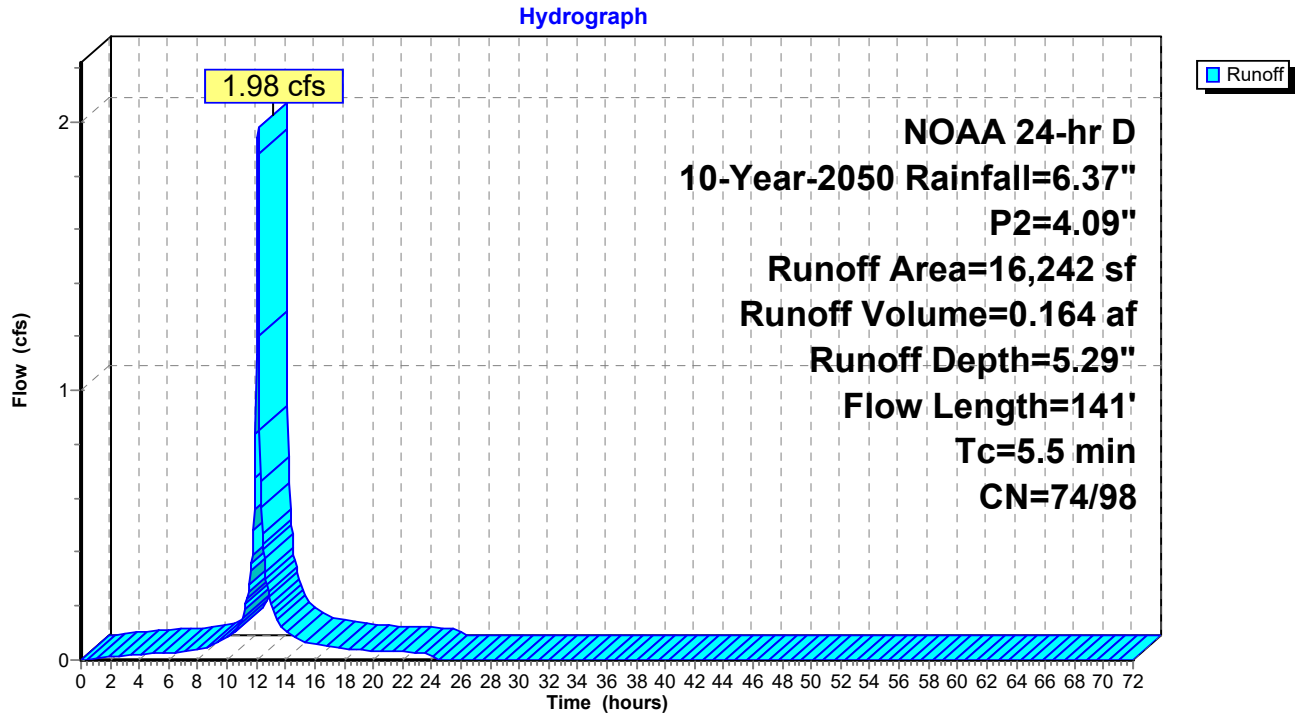
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Subcatchment 1: Exisiting



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Printed 2/4/2026

Summary for Subcatchment 2: Parking Lot

Runoff = 1.13 cfs @ 12.06 hrs, Volume= 0.085 af, Depth= 5.79"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

1240815-pipes3-C

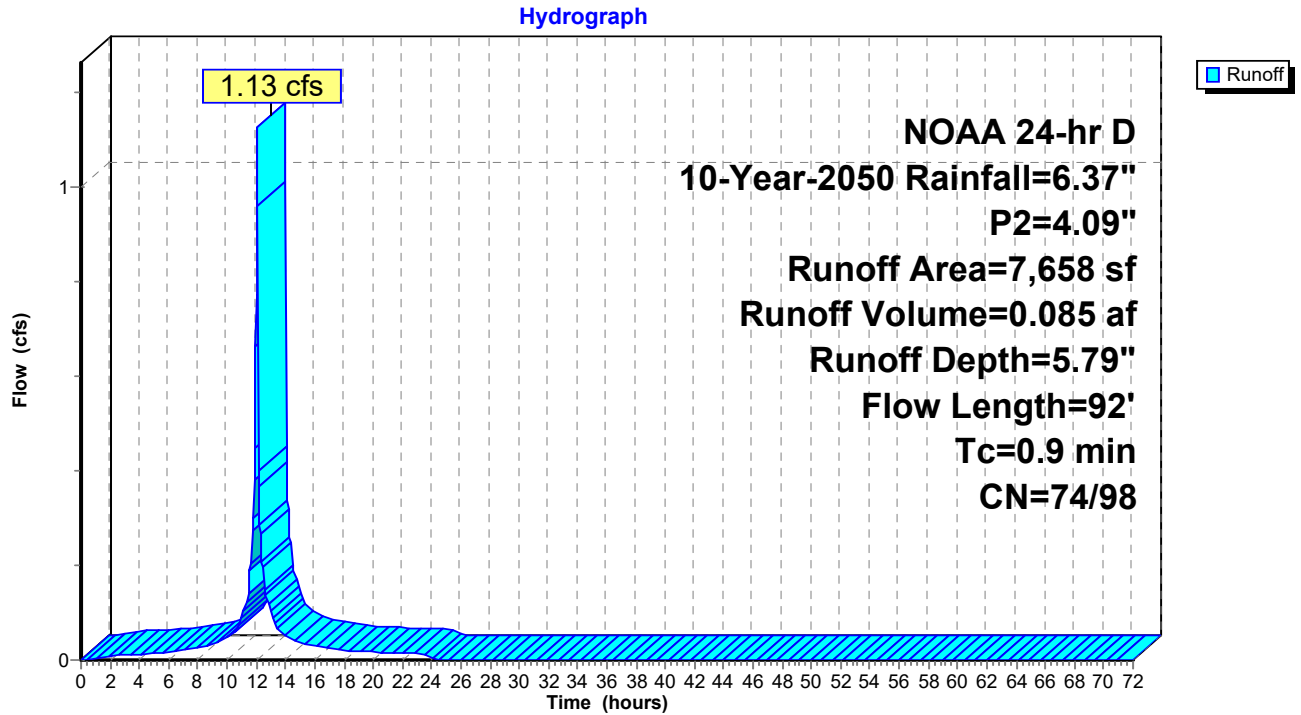
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Subcatchment 2: Parking Lot



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Summary for Subcatchment 4: Proposed

Runoff = 0.99 cfs @ 12.06 hrs, Volume= 0.072 af, Depth= 5.20"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

1240815-pipes3-C

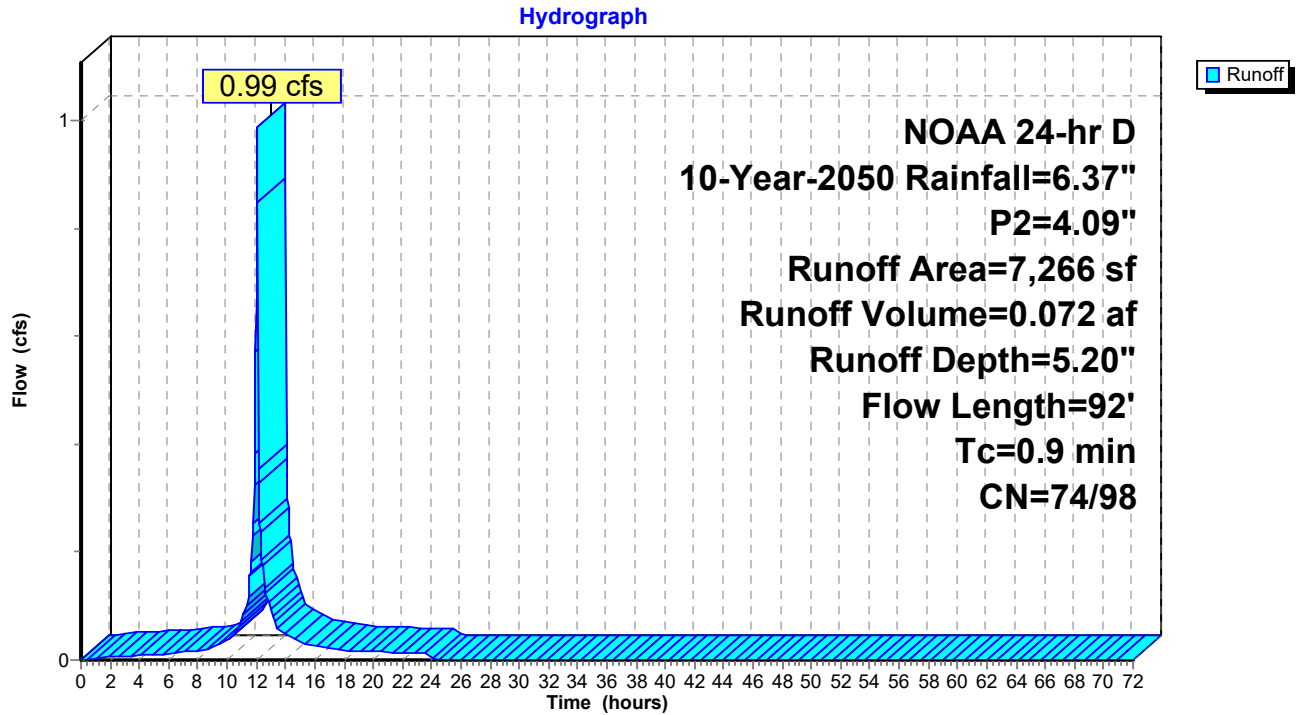
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Subcatchment 4: Proposed



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Summary for Subcatchment 6: Bypass

Runoff = 0.12 cfs @ 12.12 hrs, Volume= 0.009 af, Depth= 3.50"
 Routed to Link 7 : Proposed

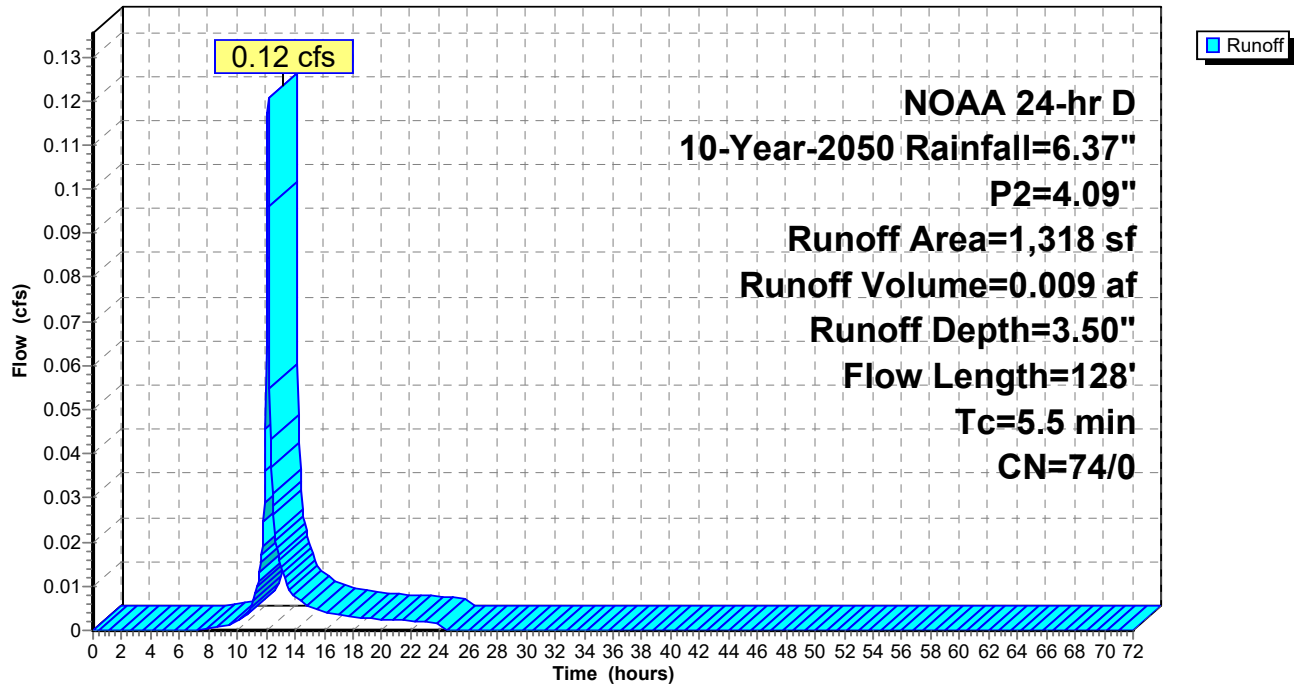
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.0650	0.31		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
5.5	128	Total			

Subcatchment 6: Bypass

Hydrograph



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Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 5.79" for 10-Year-2050 event
 Inflow = 1.13 cfs @ 12.06 hrs, Volume= 0.085 af
 Outflow = 0.34 cfs @ 12.22 hrs, Volume= 0.085 af, Atten= 70%, Lag= 9.7 min
 Discarded = 0.11 cfs @ 11.25 hrs, Volume= 0.076 af
 Primary = 0.23 cfs @ 12.22 hrs, Volume= 0.009 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 414.80' @ 12.22 hrs Surf.Area= 1,620 sf Storage= 843 cf

Plug-Flow detention time= 35.1 min calculated for 0.085 af (100% of inflow)
 Center-of-Mass det. time= 35.1 min (782.8 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.25 hrs HW=413.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.22 cfs @ 12.22 hrs HW=414.80' (Free Discharge)
 ↑ **2=Culvert** (Barrel Controls 0.22 cfs @ 2.63 fps)

1240815-pipes3-C

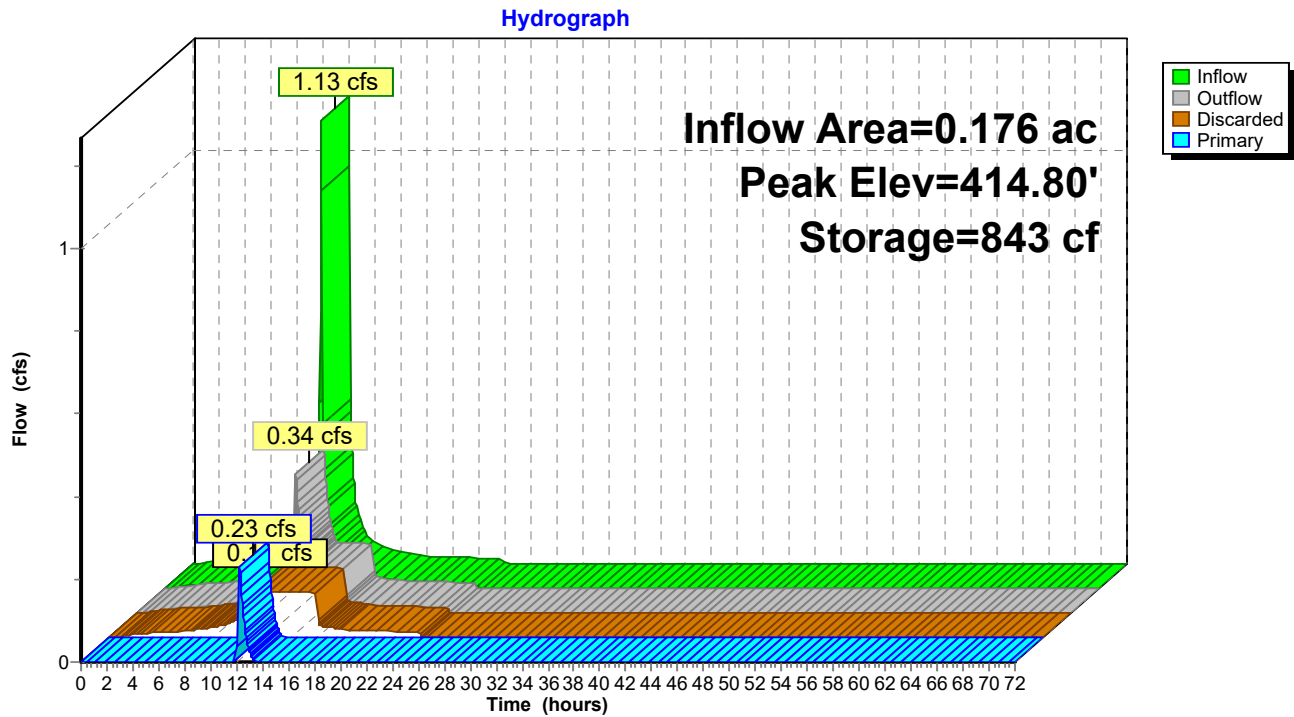
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Pond 3: Pervious Pavers



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 2.85" for 10-Year-2050 event
 Inflow = 1.00 cfs @ 12.07 hrs, Volume= 0.081 af
 Outflow = 0.91 cfs @ 12.10 hrs, Volume= 0.081 af, Atten= 9%, Lag= 2.0 min
 Discarded = 0.03 cfs @ 9.40 hrs, Volume= 0.035 af
 Primary = 0.88 cfs @ 12.10 hrs, Volume= 0.046 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.60' @ 12.10 hrs Surf.Area= 400 sf Storage= 229 cf

Plug-Flow detention time= 13.9 min calculated for 0.081 af (100% of inflow)
 Center-of-Mass det. time= 13.9 min (774.2 - 760.3)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 9.40 hrs HW=410.54' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.88 cfs @ 12.10 hrs HW=411.60' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.88 cfs of 1.04 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 0.88 cfs @ 2.65 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

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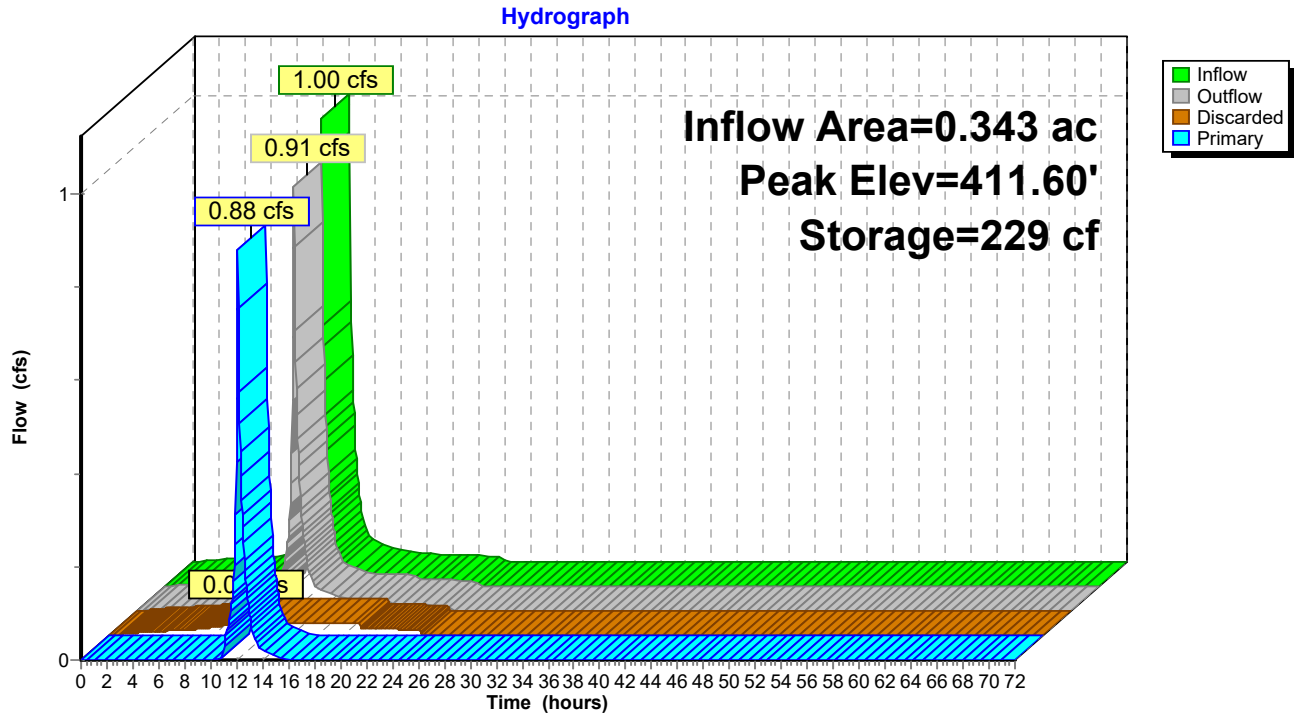
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Pond 5: Pipes



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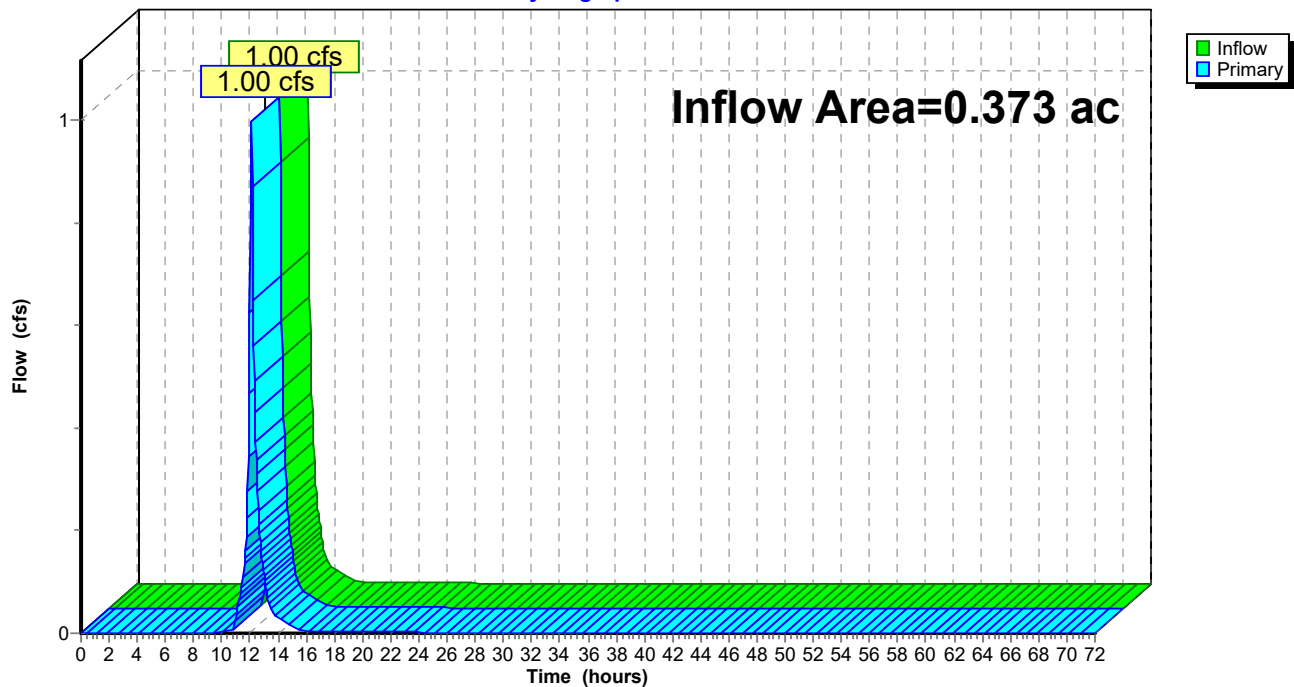
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 1.76" for 10-Year-2050 event
Inflow = 1.00 cfs @ 12.10 hrs, Volume= 0.055 af
Primary = 1.00 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=6.93"
Flow Length=141' Tc=5.5 min CN=74/98 Runoff=2.59 cfs 0.215 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=7.47"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=1.45 cfs 0.109 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=6.83"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=1.30 cfs 0.095 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=5.00"
Flow Length=128' Tc=5.5 min CN=74/0 Runoff=0.17 cfs 0.013 af

Pond 3: Pervious Pavers

Peak Elev=415.10' Storage=1,034 cf Inflow=1.45 cfs 0.109 af
Discarded=0.11 cfs 0.088 af Primary=0.59 cfs 0.021 af Outflow=0.70 cfs 0.109 af

Pond 5: Pipes

Peak Elev=411.96' Storage=336 cf Inflow=1.68 cfs 0.116 af
Discarded=0.03 cfs 0.041 af Primary=1.34 cfs 0.075 af Outflow=1.36 cfs 0.116 af

Link 7: Proposed

Inflow=1.51 cfs 0.088 af
Primary=1.51 cfs 0.088 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.432 af Average Runoff Depth = 6.96"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Exisiting

Runoff = 2.59 cfs @ 12.12 hrs, Volume= 0.215 af, Depth= 6.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	66	0.0680	0.29		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
1.3	21	0.0950	0.26		Sheet Flow, 2 Grass: Short n= 0.150 P2= 4.09"
0.2	13	0.0390	1.35		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 4.09"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.5	141	Total			

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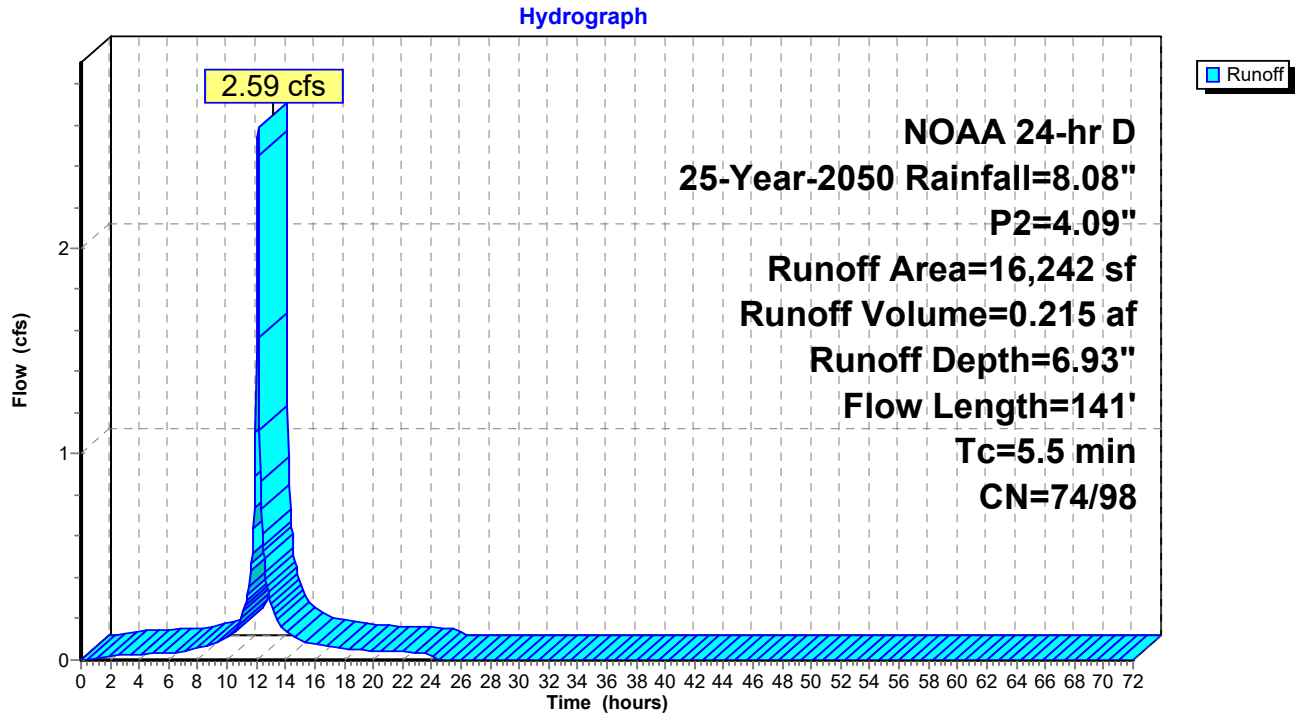
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Subcatchment 1: Existing



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Summary for Subcatchment 2: Parking Lot

Runoff = 1.45 cfs @ 12.06 hrs, Volume= 0.109 af, Depth= 7.47"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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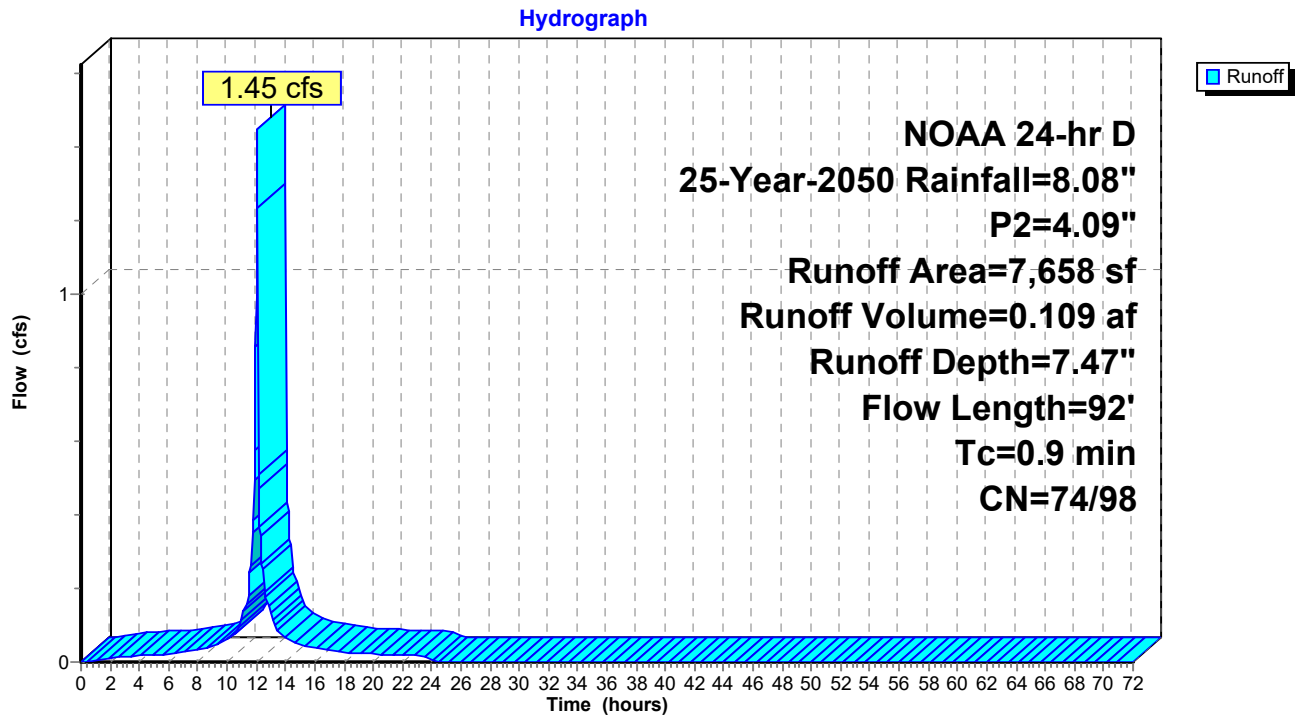
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Subcatchment 2: Parking Lot



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NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

Printed 2/4/2026

Summary for Subcatchment 4: Proposed

Runoff = 1.30 cfs @ 12.06 hrs, Volume= 0.095 af, Depth= 6.83"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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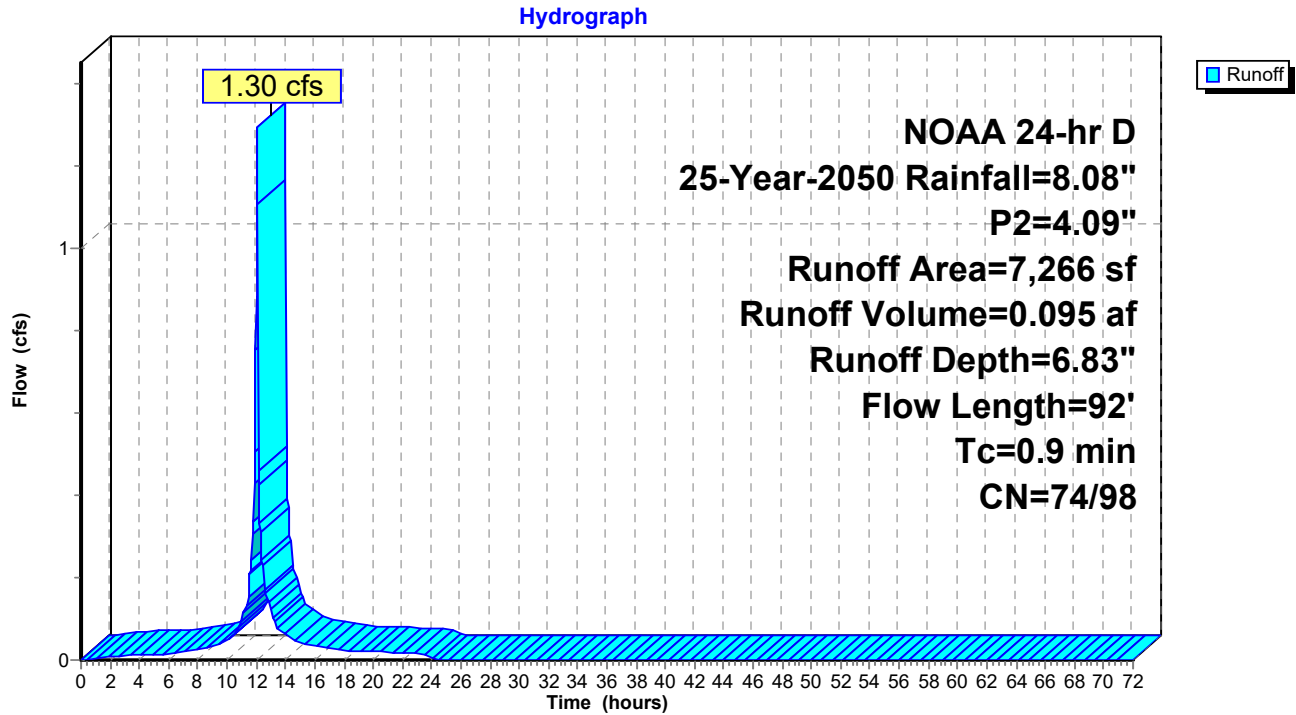
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Subcatchment 4: Proposed



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NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

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Summary for Subcatchment 6: Bypass

Runoff = 0.17 cfs @ 12.12 hrs, Volume= 0.013 af, Depth= 5.00"
 Routed to Link 7 : Proposed

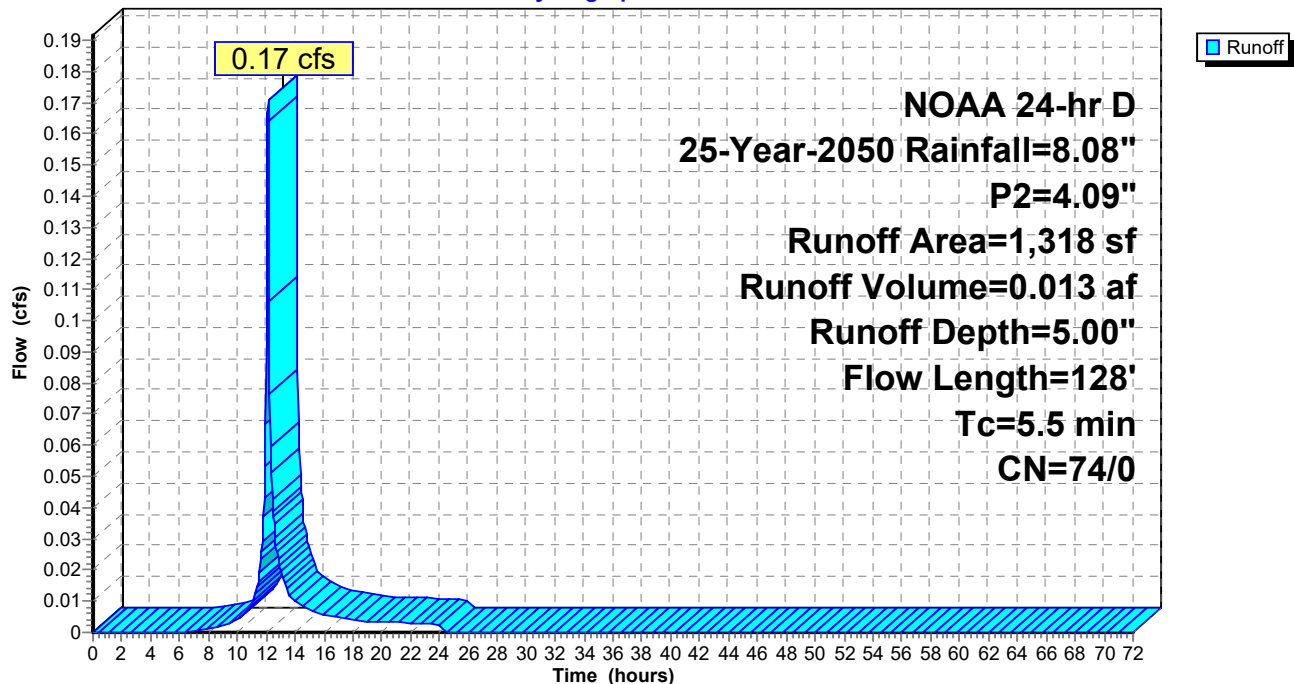
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.0650	0.31		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
5.5	128	Total			

Subcatchment 6: Bypass

Hydrograph



1240815-pipes3-C

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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 25-Year-2050 Rainfall=8.08", P2=4.09"

Printed 2/4/2026

Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 7.47" for 25-Year-2050 event
 Inflow = 1.45 cfs @ 12.06 hrs, Volume= 0.109 af
 Outflow = 0.70 cfs @ 12.15 hrs, Volume= 0.109 af, Atten= 52%, Lag= 5.5 min
 Discarded = 0.11 cfs @ 11.00 hrs, Volume= 0.088 af
 Primary = 0.59 cfs @ 12.15 hrs, Volume= 0.021 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 415.10' @ 12.15 hrs Surf.Area= 1,620 sf Storage= 1,034 cf

Plug-Flow detention time= 33.3 min calculated for 0.109 af (100% of inflow)
 Center-of-Mass det. time= 33.3 min (777.7 - 744.4)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.00 hrs HW=413.53' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.59 cfs @ 12.15 hrs HW=415.09' (Free Discharge)
 ↑**2=Culvert** (Barrel Controls 0.59 cfs @ 3.18 fps)

1240815-pipes3-C

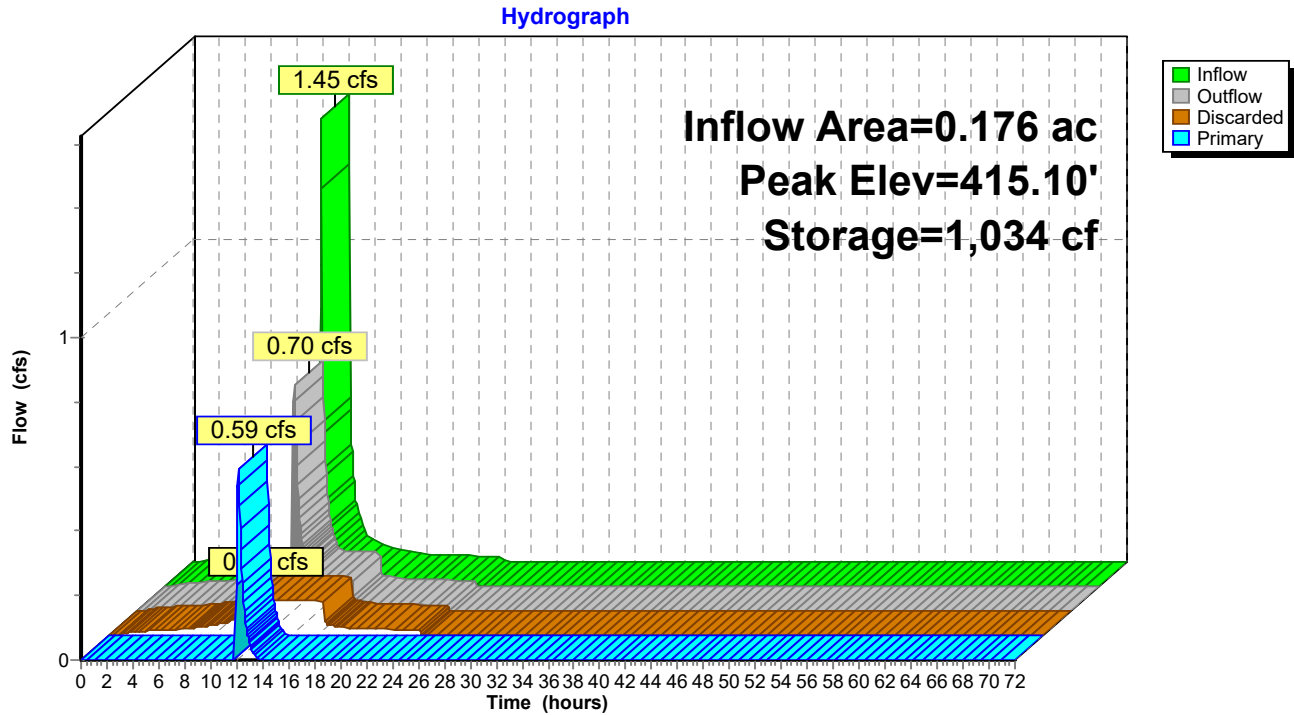
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Pond 3: Pervious Pavers



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Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 4.07" for 25-Year-2050 event
 Inflow = 1.68 cfs @ 12.08 hrs, Volume= 0.116 af
 Outflow = 1.36 cfs @ 12.13 hrs, Volume= 0.116 af, Atten= 19%, Lag= 2.6 min
 Discarded = 0.03 cfs @ 8.45 hrs, Volume= 0.041 af
 Primary = 1.34 cfs @ 12.13 hrs, Volume= 0.075 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.96' @ 12.13 hrs Surf.Area= 400 sf Storage= 336 cf

Plug-Flow detention time= 13.0 min calculated for 0.116 af (100% of inflow)
 Center-of-Mass det. time= 12.9 min (768.6 - 755.7)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 8.45 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.31 cfs @ 12.13 hrs HW=411.94' (Free Discharge)
 ↑ **2=Culvert** (Passes 1.31 cfs of 2.20 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 1.31 cfs @ 3.76 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

1240815-pipes3-C

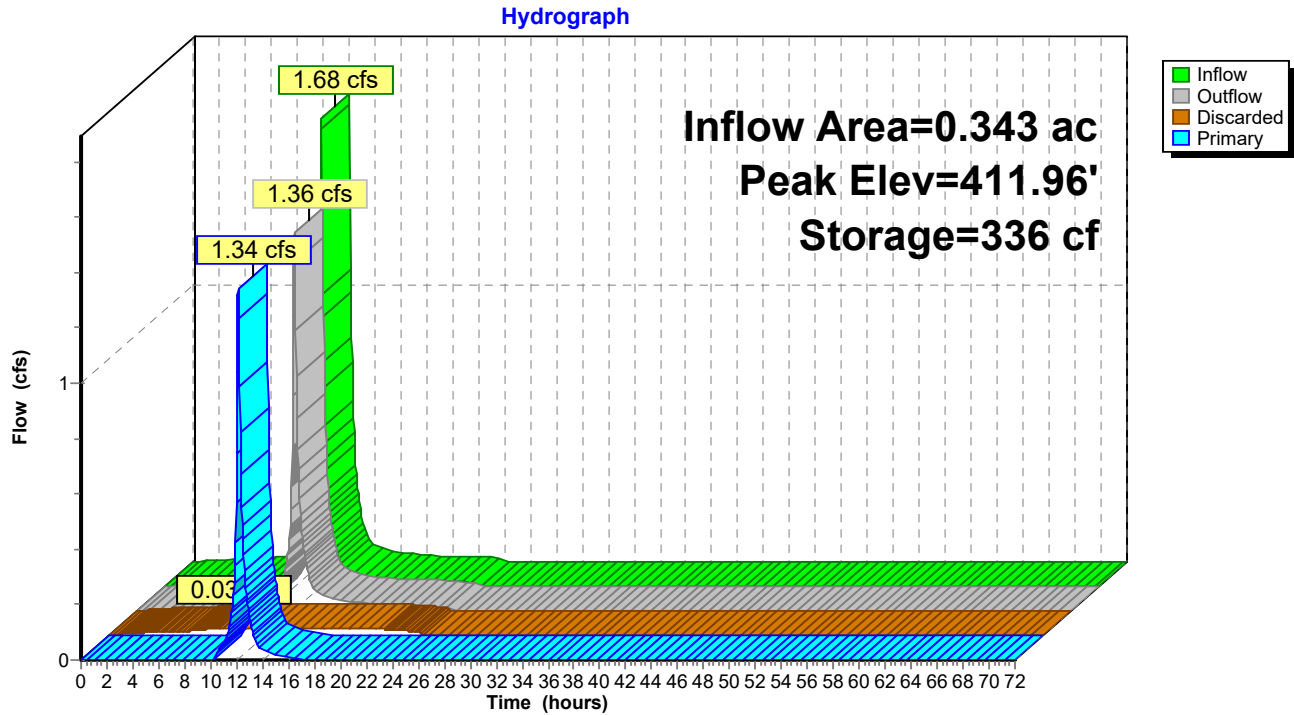
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Pond 5: Pipes



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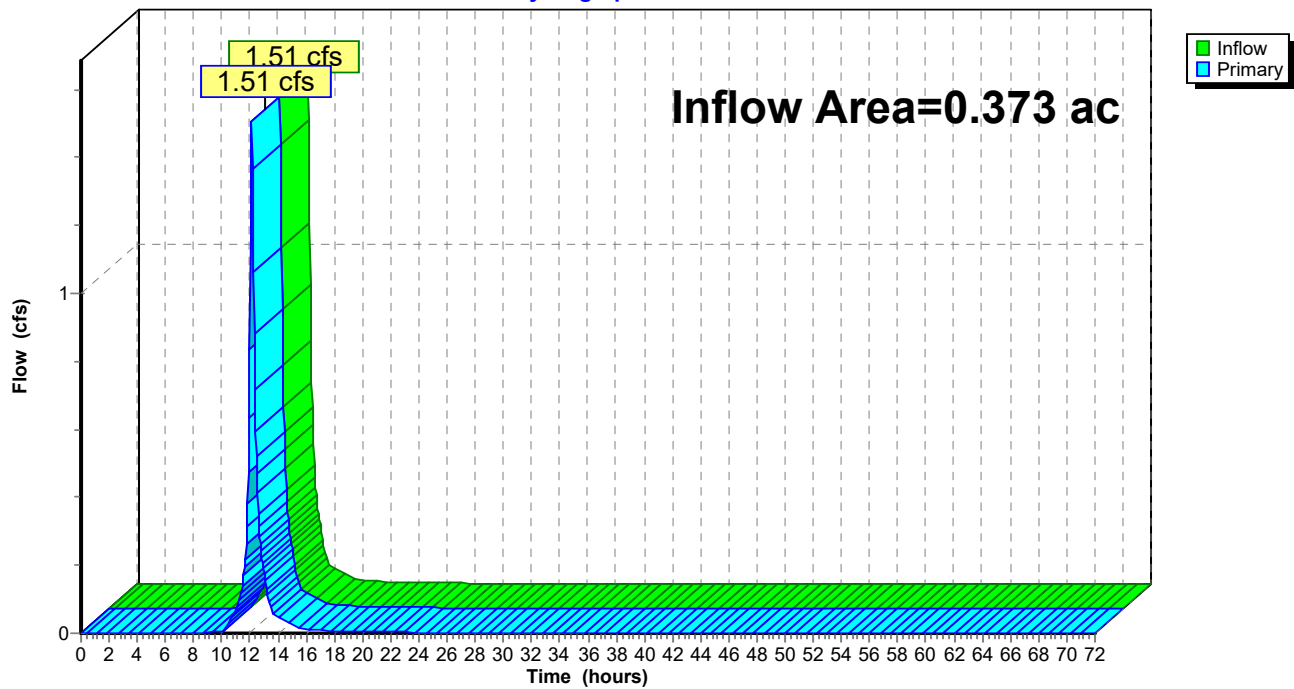
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 2.83" for 25-Year-2050 event
Inflow = 1.51 cfs @ 12.13 hrs, Volume= 0.088 af
Primary = 1.51 cfs @ 12.13 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=10.28"
Flow Length=141' Tc=5.5 min CN=74/98 Runoff=3.81 cfs 0.319 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=10.87"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=2.09 cfs 0.159 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=10.18"
Flow Length=92' Tc=0.9 min CN=74/98 Runoff=1.92 cfs 0.141 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=8.17"
Flow Length=128' Tc=5.5 min CN=74/0 Runoff=0.27 cfs 0.021 af

Pond 3: Pervious Pavers

Peak Elev=415.76' Storage=1,465 cf Inflow=2.09 cfs 0.159 af
Discarded=0.11 cfs 0.111 af Primary=0.87 cfs 0.048 af Outflow=0.98 cfs 0.159 af

Pond 5: Pipes

Peak Elev=412.85' Storage=591 cf Inflow=2.66 cfs 0.190 af
Discarded=0.03 cfs 0.048 af Primary=2.07 cfs 0.142 af Outflow=2.10 cfs 0.190 af

Link 7: Proposed

Inflow=2.35 cfs 0.162 af
Primary=2.35 cfs 0.162 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.641 af Average Runoff Depth = 10.31"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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Summary for Subcatchment 1: Existing

Runoff = 3.81 cfs @ 12.12 hrs, Volume= 0.319 af, Depth=10.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	66	0.0680	0.29		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
1.3	21	0.0950	0.26		Sheet Flow, 2 Grass: Short n= 0.150 P2= 4.09"
0.2	13	0.0390	1.35		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 4.09"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.5	141	Total			

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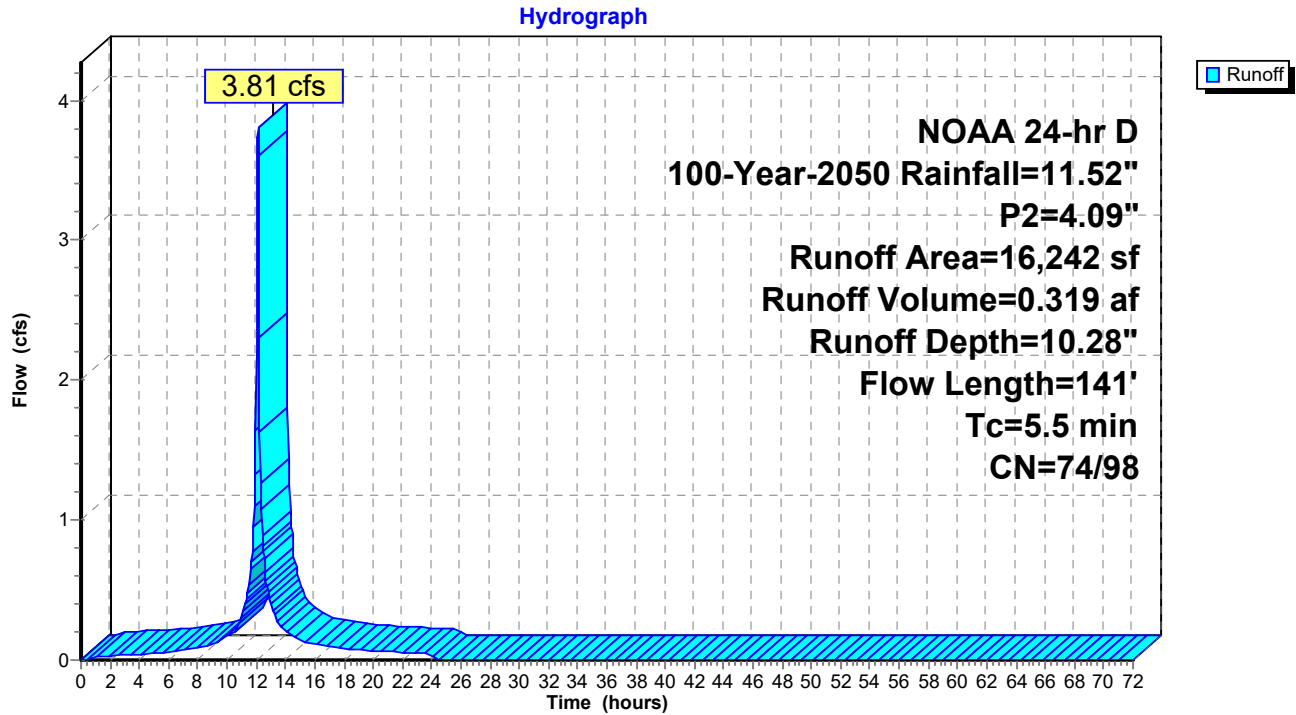
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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment 1: Exisiting



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Summary for Subcatchment 2: Parking Lot

Runoff = 2.09 cfs @ 12.06 hrs, Volume= 0.159 af, Depth=10.87"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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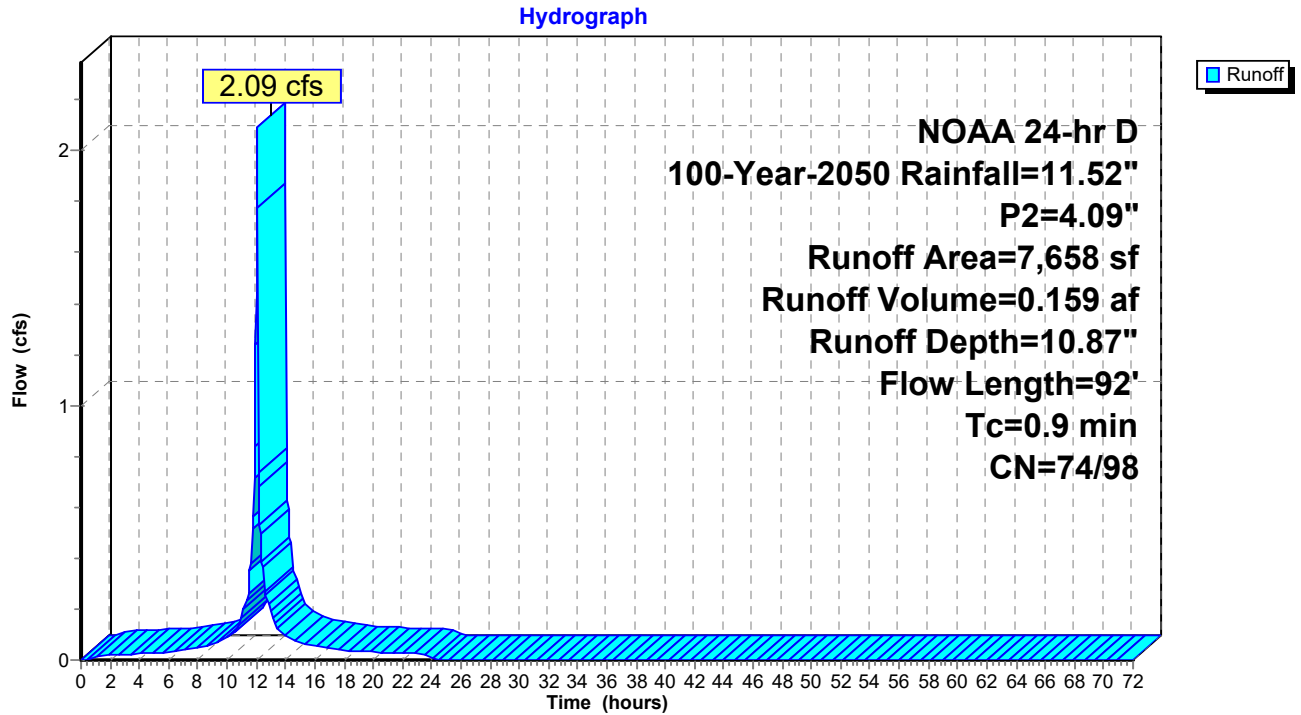
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Subcatchment 2: Parking Lot



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Summary for Subcatchment 4: Proposed

Runoff = 1.92 cfs @ 12.06 hrs, Volume= 0.141 af, Depth=10.18"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.50		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	15	0.0670	1.73		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 4.09"
0.5	59	0.0500	2.02		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 4.09"
0.2	10	0.0250	1.07		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 4.09"
0.9	92	Total			

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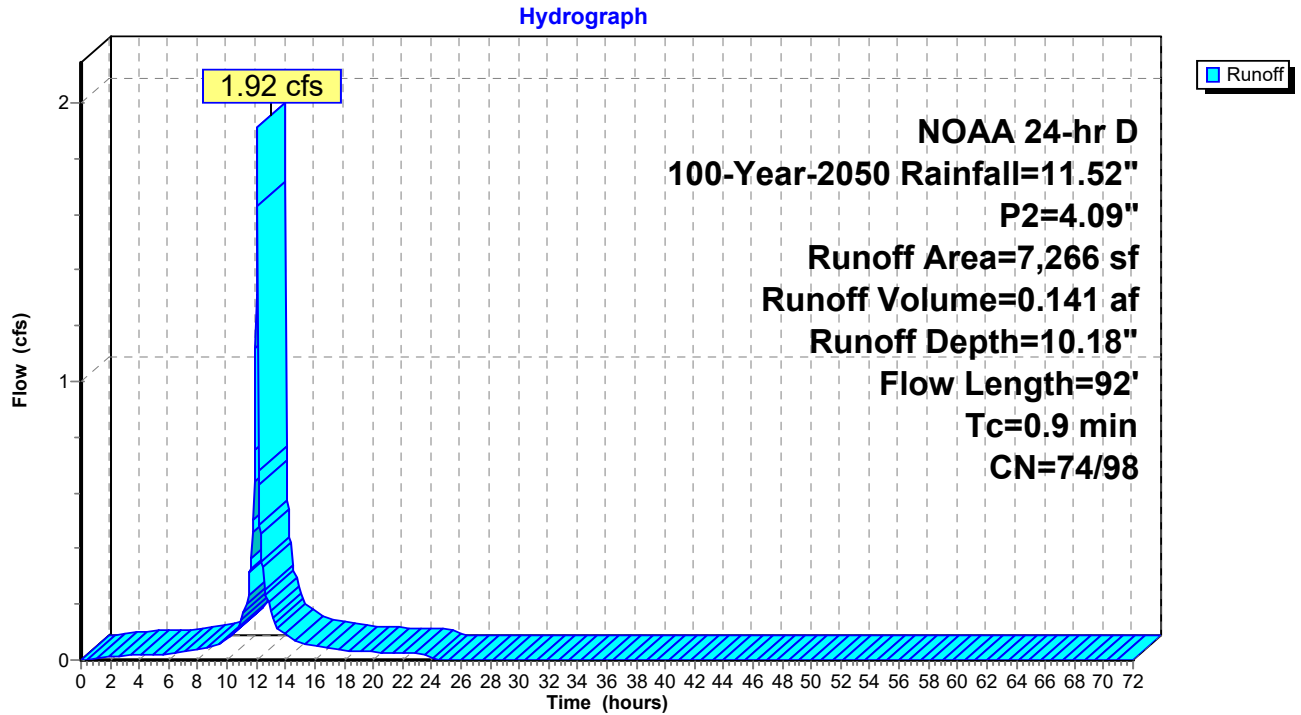
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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment 4: Proposed



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Summary for Subcatchment 6: Bypass

Runoff = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af, Depth= 8.17"
Routed to Link 7 : Proposed

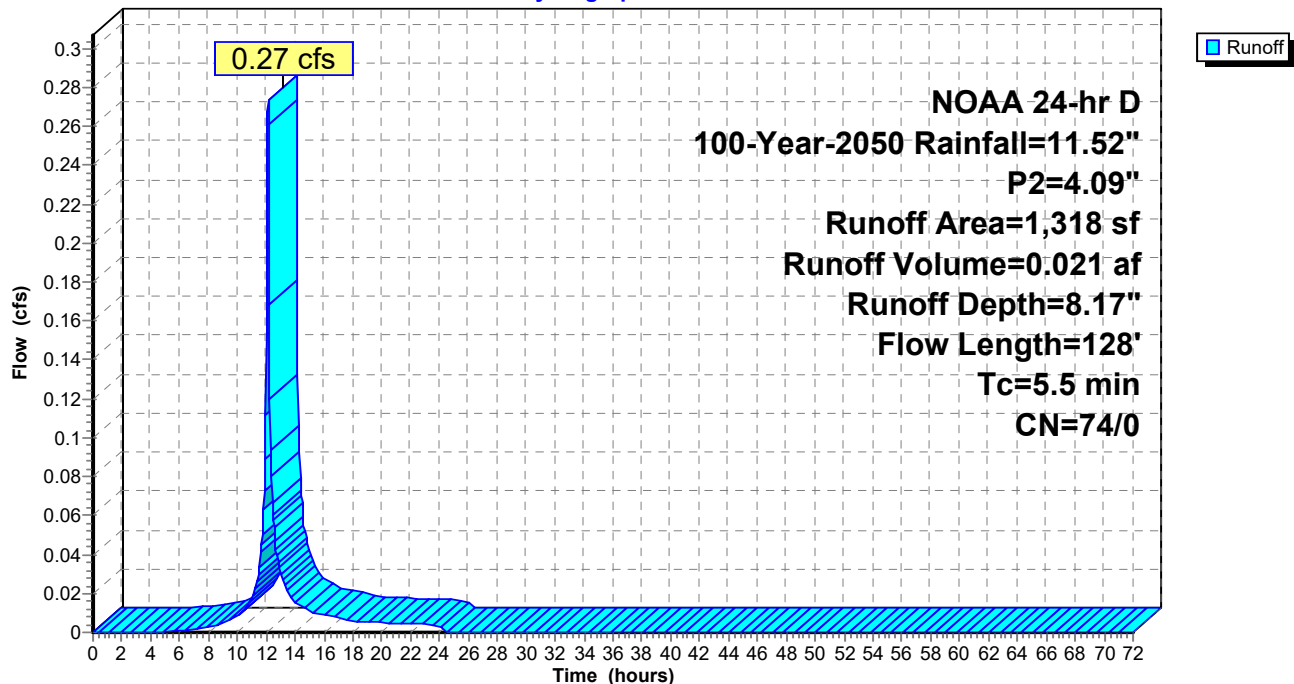
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.0650	0.31		Sheet Flow, 1 Grass: Short n= 0.150 P2= 4.09"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2 Grassed Waterway Kv= 15.0 fps
5.5	128	Total			

Subcatchment 6: Bypass

Hydrograph



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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 10.87" for 100-Year-2050 event
 Inflow = 2.09 cfs @ 12.06 hrs, Volume= 0.159 af
 Outflow = 0.98 cfs @ 12.15 hrs, Volume= 0.159 af, Atten= 53%, Lag= 5.5 min
 Discarded = 0.11 cfs @ 10.55 hrs, Volume= 0.111 af
 Primary = 0.87 cfs @ 12.15 hrs, Volume= 0.048 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 415.76' @ 12.15 hrs Surf.Area= 1,620 sf Storage= 1,465 cf

Plug-Flow detention time= 32.3 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 32.3 min (772.3 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 10.55 hrs HW=413.53' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.87 cfs @ 12.15 hrs HW=415.76' (Free Discharge)
 ↑**2=Culvert** (Barrel Controls 0.87 cfs @ 4.45 fps)

1240815-pipes3-C

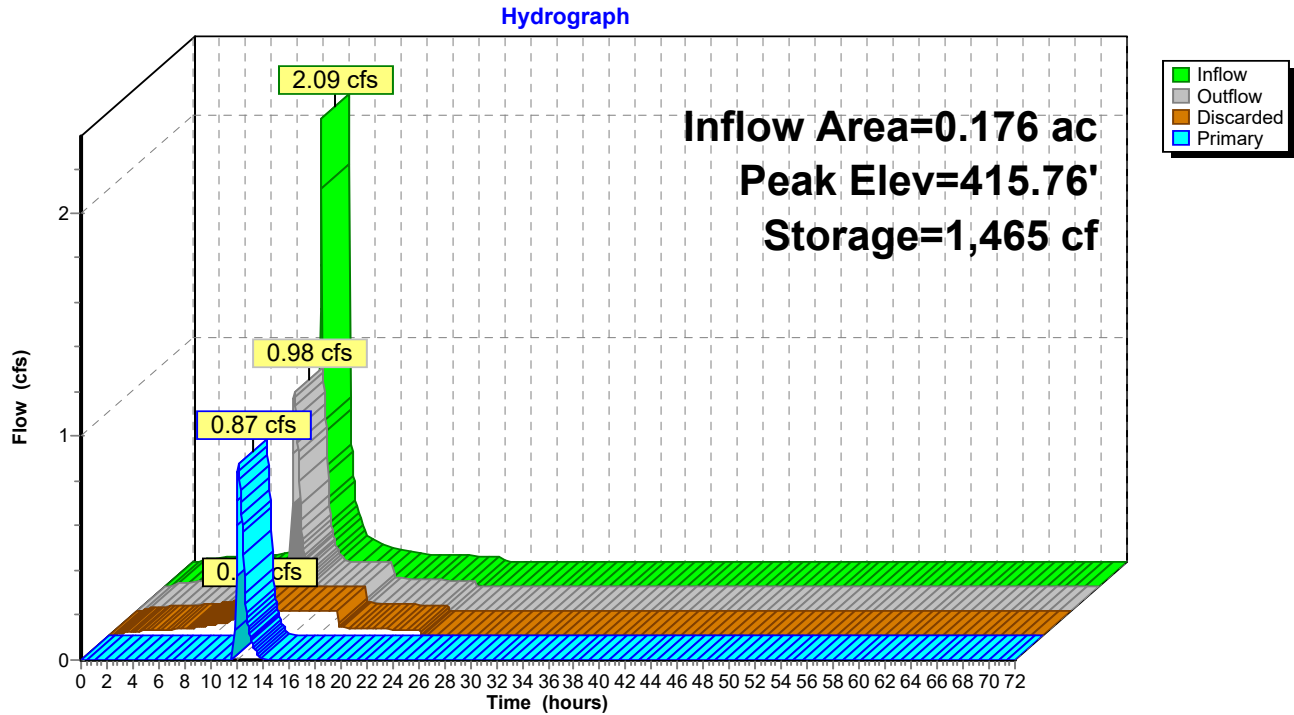
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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Pond 3: Pervious Pavers



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 6.65" for 100-Year-2050 event
 Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.190 af
 Outflow = 2.10 cfs @ 12.12 hrs, Volume= 0.190 af, Atten= 21%, Lag= 3.3 min
 Discarded = 0.03 cfs @ 6.60 hrs, Volume= 0.048 af
 Primary = 2.07 cfs @ 12.12 hrs, Volume= 0.142 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 412.85' @ 12.12 hrs Surf.Area= 400 sf Storage= 591 cf

Plug-Flow detention time= 12.7 min calculated for 0.190 af (100% of inflow)
 Center-of-Mass det. time= 12.7 min (763.7 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 6.60 hrs HW=410.53' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=2.03 cfs @ 12.12 hrs HW=412.79' (Free Discharge)
 ↑ **2=Culvert** (Passes 2.03 cfs of 4.80 cfs potential flow)
 ↑ **3=Orifice** (Orifice Controls 2.03 cfs @ 5.82 fps)
 ↑ **4=Grate** (Controls 0.00 cfs)

1240815-pipes3-C

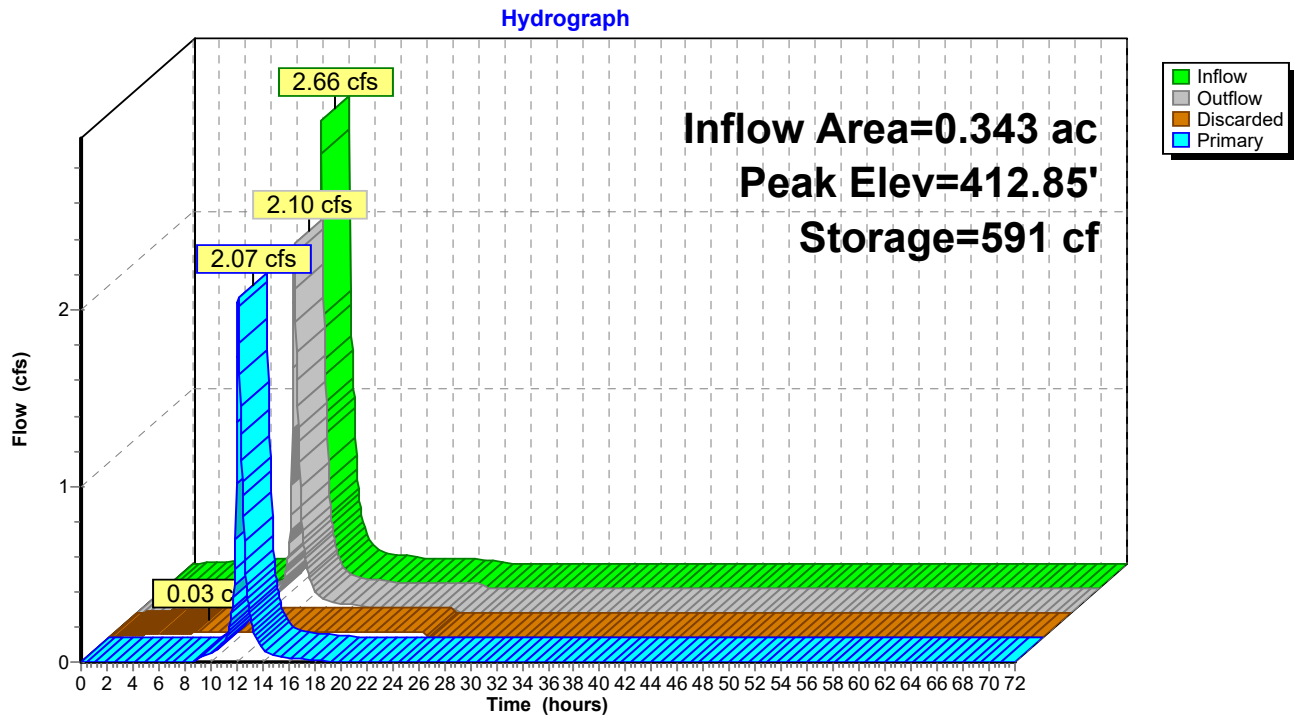
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512-516 Pleasant Valley Way, West Orange
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Printed 2/4/2026

Pond 5: Pipes



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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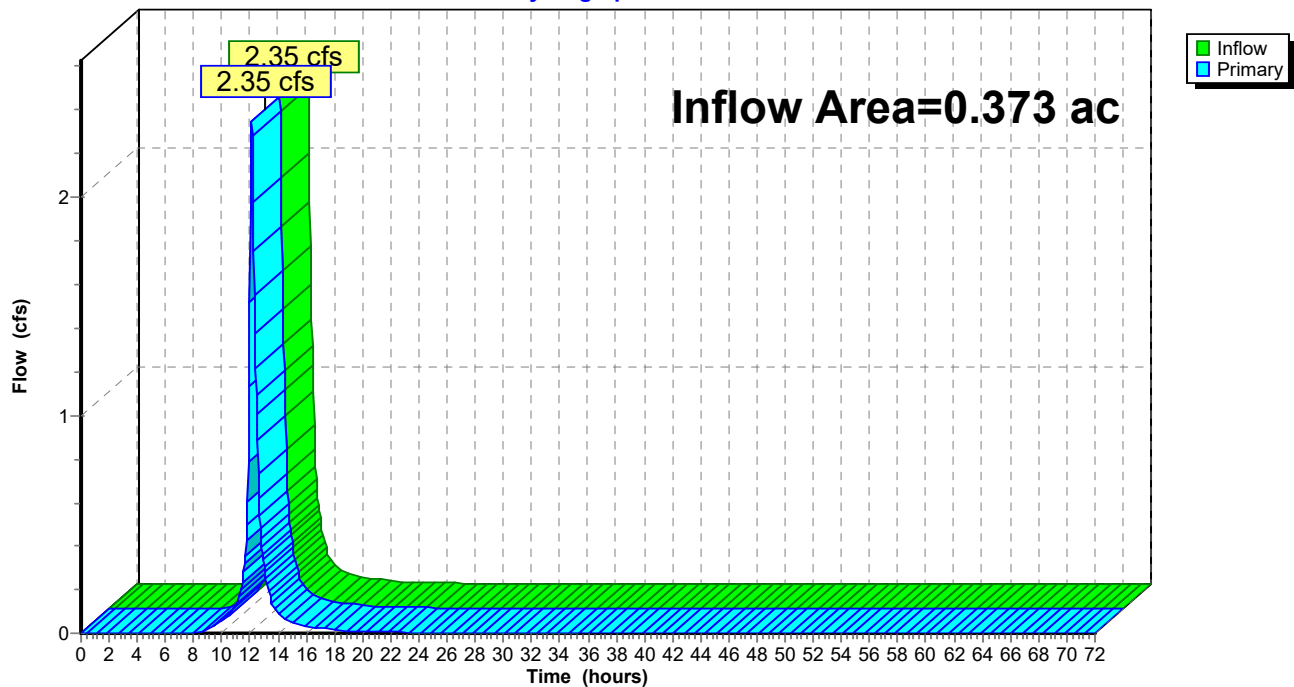
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 5.23" for 100-Year-2050 event
Inflow = 2.35 cfs @ 12.12 hrs, Volume= 0.162 af
Primary = 2.35 cfs @ 12.12 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange
Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Exisiting

Runoff Area=16,242 sf 67.90% Impervious Runoff Depth=0.73"
Flow Length=141' Tc=5.9 min CN=74/98 Runoff=0.72 cfs 0.023 af

Subcatchment2: Parking Lot

Runoff Area=7,658 sf 86.88% Impervious Runoff Depth=0.91"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.46 cfs 0.013 af

Subcatchment4: Proposed

Runoff Area=7,266 sf 64.56% Impervious Runoff Depth=0.69"
Flow Length=92' Tc=1.0 min CN=74/98 Runoff=0.33 cfs 0.010 af

Subcatchment6: Bypass

Runoff Area=1,318 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=128' Tc=6.0 min CN=74/0 Runoff=0.00 cfs 0.000 af

Pond 3: Pervious Pavers

Peak Elev=413.90' Storage=256 cf Inflow=0.46 cfs 0.013 af
Discarded=0.11 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.013 af

Pond 5: Pipes

Peak Elev=411.28' Storage=140 cf Inflow=0.33 cfs 0.010 af
Discarded=0.03 cfs 0.005 af Primary=0.24 cfs 0.005 af Outflow=0.27 cfs 0.010 af

Link 7: Proposed

Inflow=0.24 cfs 0.005 af
Primary=0.24 cfs 0.005 af

Total Runoff Area = 0.746 ac Runoff Volume = 0.046 af Average Runoff Depth = 0.74"
31.13% Pervious = 0.232 ac 68.87% Impervious = 0.514 ac

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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 1: Existing

Runoff = 0.72 cfs @ 1.14 hrs, Volume= 0.023 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

	Area (sf)	CN	Description
*	2,708	98	Buildings
*	758	98	Walks/Steps & Patio
	7,562	98	Paved parking, HSG C
	5,214	74	>75% Grass cover, Good, HSG C
	16,242	90	Weighted Average
	5,214	74	32.10% Pervious Area
	11,028	98	67.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	66	0.0680	0.27		Sheet Flow, 1 Grass: Short n= 0.150 P2= 3.47"
1.4	21	0.0950	0.24		Sheet Flow, 2 Grass: Short n= 0.150 P2= 3.47"
0.2	13	0.0390	1.24		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.1	13	0.0390	4.01		Shallow Concentrated Flow, 4 Paved Kv= 20.3 fps
0.1	28	0.0360	3.85		Shallow Concentrated Flow, 5 Paved Kv= 20.3 fps
5.9	141	Total			

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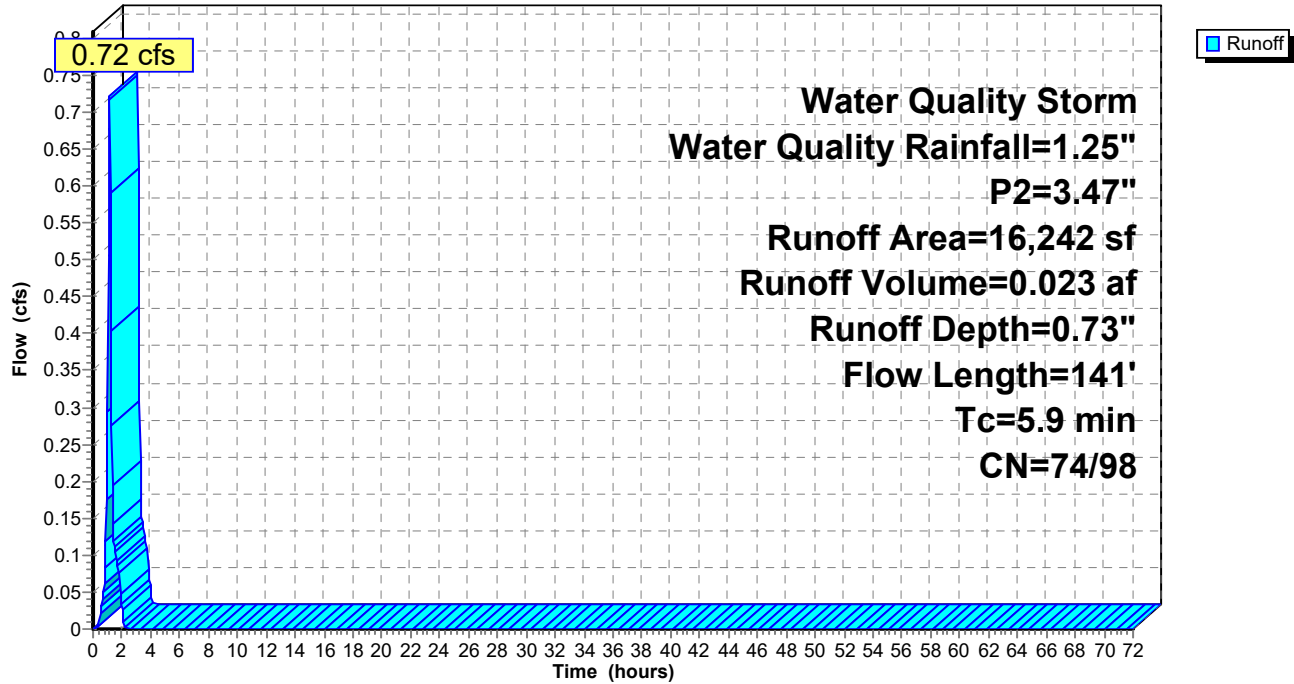
512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

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Subcatchment 1: Exisiting

Hydrograph



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 2: Parking Lot

Runoff = 0.46 cfs @ 1.07 hrs, Volume= 0.013 af, Depth= 0.91"
 Routed to Pond 3 : Pervious Pavers

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

	Area (sf)	CN	Description
*	6,578	98	PARKING LOT
	1,005	74	>75% Grass cover, Good, HSG C
*	75	98	REFUSE AREA
	7,658	95	Weighted Average
	1,005	74	13.12% Pervious Area
	6,653	98	86.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2
					Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3
					Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4
					Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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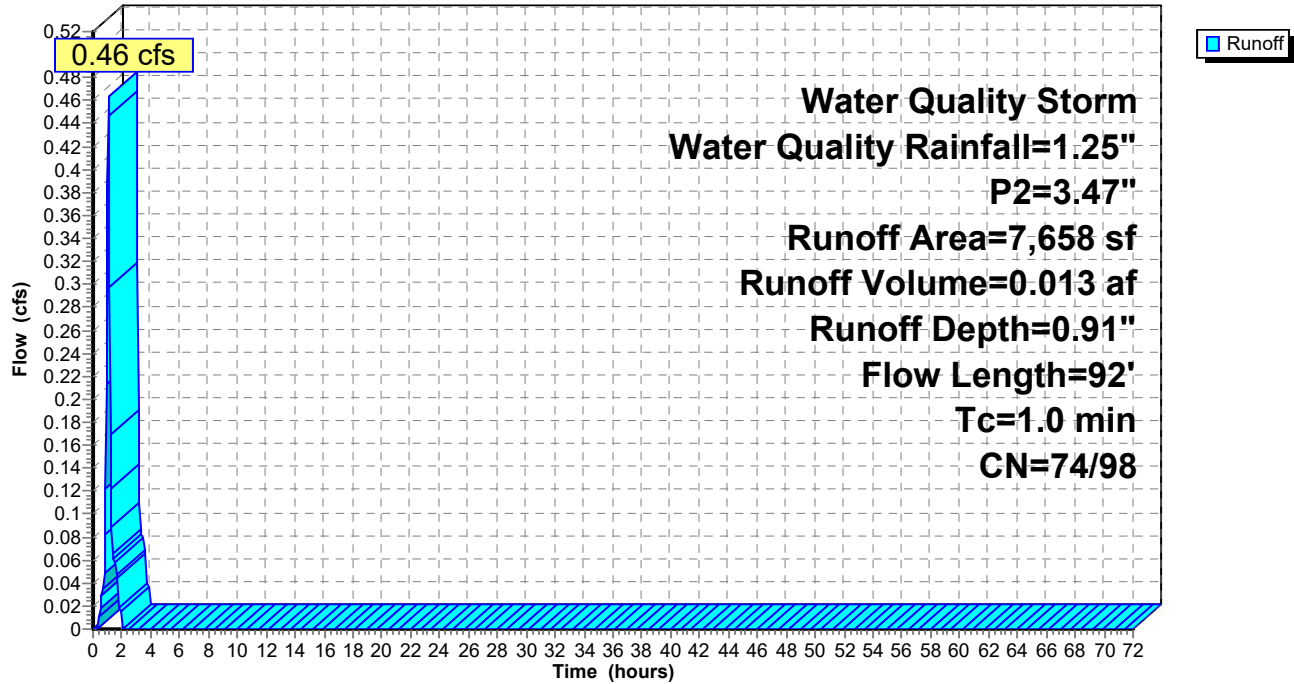
512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Subcatchment 2: Parking Lot

Hydrograph



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 4: Proposed

Runoff = 0.33 cfs @ 1.07 hrs, Volume= 0.010 af, Depth= 0.69"
 Routed to Pond 5 : Pipes

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Area (sf)	CN	Description
3,426	98	Roofs, HSG C
1,265	98	Paved parking, HSG C
2,575	74	>75% Grass cover, Good, HSG C
7,266	89	Weighted Average
2,575	74	35.44% Pervious Area
4,691	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	8	0.0650	1.38		Sheet Flow, 1 Smooth surfaces n= 0.011 P2= 3.47"
0.2	15	0.0670	1.59		Sheet Flow, 2 Smooth surfaces n= 0.011 P2= 3.47"
0.5	59	0.0500	1.86		Sheet Flow, 3 Smooth surfaces n= 0.011 P2= 3.47"
0.2	10	0.0250	0.99		Sheet Flow, 4 Smooth surfaces n= 0.011 P2= 3.47"
1.0	92	Total			

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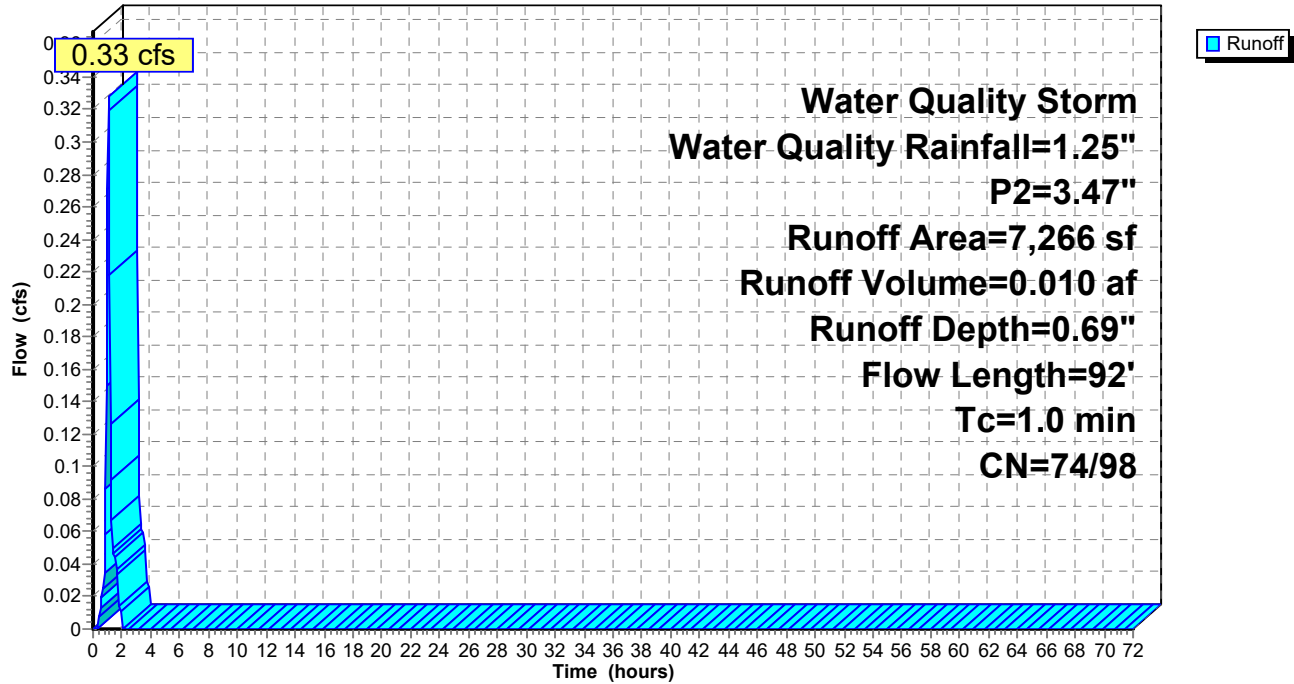
512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Subcatchment 4: Proposed

Hydrograph



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Subcatchment 6: Bypass

Runoff = 0.00 cfs @ 1.25 hrs, Volume= 0.000 af, Depth= 0.07"
 Routed to Link 7 : Proposed

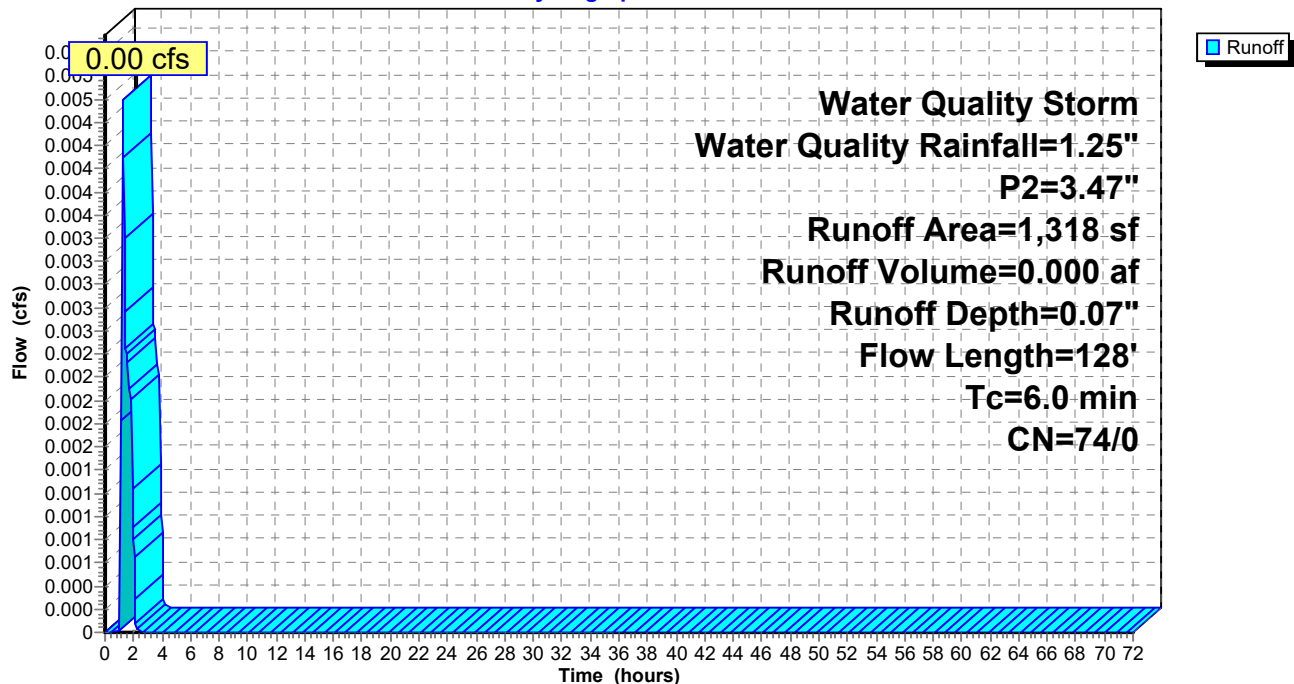
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05
 Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Area (sf)	CN	Description
1,318	74	>75% Grass cover, Good, HSG C
1,318	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0650	0.28		Sheet Flow, 1
					Grass: Short n= 0.150 P2= 3.47"
0.1	28	0.0900	4.50		Shallow Concentrated Flow, 2
					Grassed Waterway Kv= 15.0 fps
6.0	128	Total			

Subcatchment 6: Bypass

Hydrograph



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Pond 3: Pervious Pavers

Inflow Area = 0.176 ac, 86.88% Impervious, Inflow Depth = 0.91" for Water Quality event
 Inflow = 0.46 cfs @ 1.07 hrs, Volume= 0.013 af
 Outflow = 0.11 cfs @ 0.95 hrs, Volume= 0.013 af, Atten= 77%, Lag= 0.0 min
 Discarded = 0.11 cfs @ 0.95 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 5 : Pipes

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 413.90' @ 1.27 hrs Surf.Area= 1,620 sf Storage= 256 cf

Plug-Flow detention time= 21.6 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 21.6 min (89.7 - 68.1)

Volume	Invert	Avail.Storage	Storage Description
#1	413.50'	1,730 cf	60.00'W x 27.00'L x 2.67'H STONE & PAVERS 4,325 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	413.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	414.50'	6.0" Round Culvert L= 50.0' Ke= 0.200 Inlet / Outlet Invert= 414.50' / 414.17' S= 0.0066 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 0.95 hrs HW=413.54' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=413.50' (Free Discharge)
 ↑**2=Culvert** (Controls 0.00 cfs)

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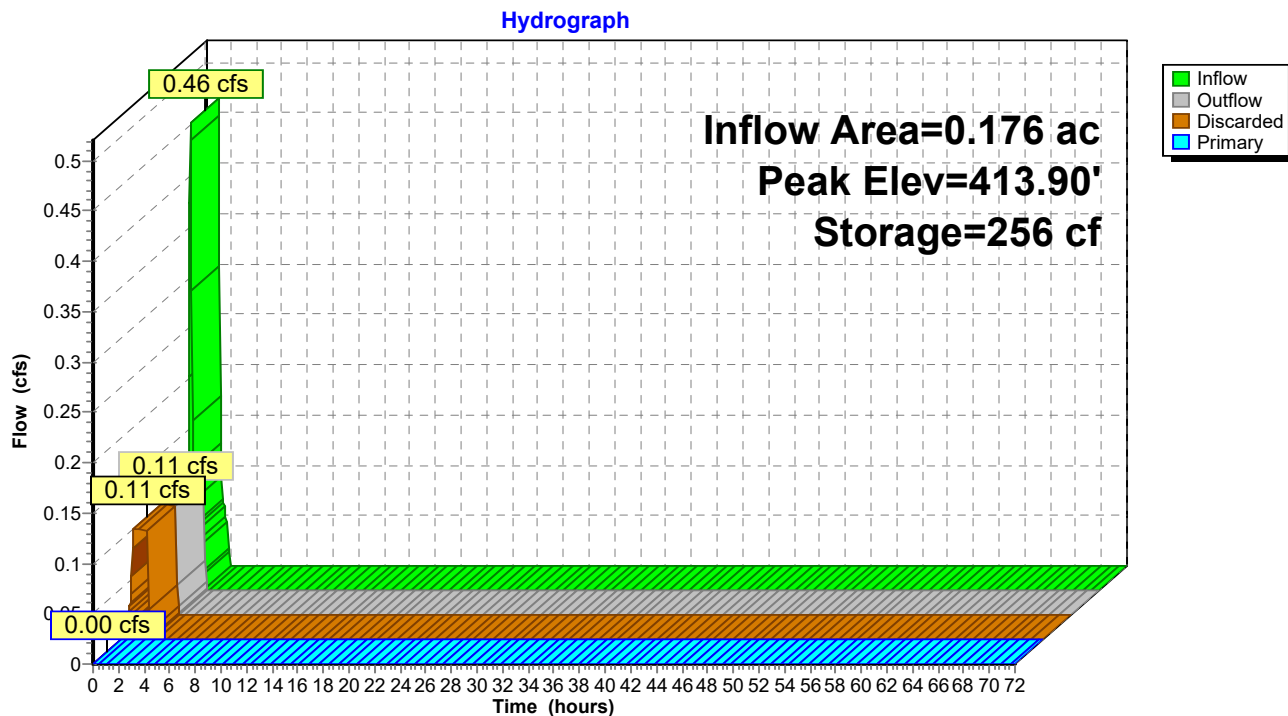
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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

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Pond 3: Pervious Pavers



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

Printed 2/4/2026

Summary for Pond 5: Pipes

Inflow Area = 0.343 ac, 76.01% Impervious, Inflow Depth = 0.34" for Water Quality event
 Inflow = 0.33 cfs @ 1.07 hrs, Volume= 0.010 af
 Outflow = 0.27 cfs @ 1.13 hrs, Volume= 0.010 af, Atten= 19%, Lag= 3.8 min
 Discarded = 0.03 cfs @ 0.80 hrs, Volume= 0.005 af
 Primary = 0.24 cfs @ 1.13 hrs, Volume= 0.005 af
 Routed to Link 7 : Proposed

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 411.28' @ 1.13 hrs Surf.Area= 400 sf Storage= 140 cf

Plug-Flow detention time= 20.0 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 20.0 min (88.6 - 68.6)

Volume	Invert	Avail.Storage	Storage Description
#1	410.50'	329 cf	10.00'W x 40.00'L x 3.00'H STONE 1,200 cf Overall - 377 cf Embedded = 823 cf x 40.0% Voids
#2	411.00'	377 cf	24.0" Round Pipe Storage x 3 Inside #1 L= 40.0' S= 0.0020 '/'
		706 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.50'	2.900 in/hr Exfiltration over Surface area
#2	Primary	411.00'	12.0" Round Culvert L= 14.0' Ke= 0.100 Inlet / Outlet Invert= 411.00' / 410.94' S= 0.0043 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	411.00'	8.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 2	413.90'	24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 0.80 hrs HW=410.54' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.23 cfs @ 1.13 hrs HW=411.27' (Free Discharge)
 ↑ **2=Culvert** (Barrel Controls 0.23 cfs @ 2.00 fps)
 ↑ **3=Orifice** (Passes 0.23 cfs of 0.24 cfs potential flow)
 ↑ **4=Grate** (Controls 0.00 cfs)

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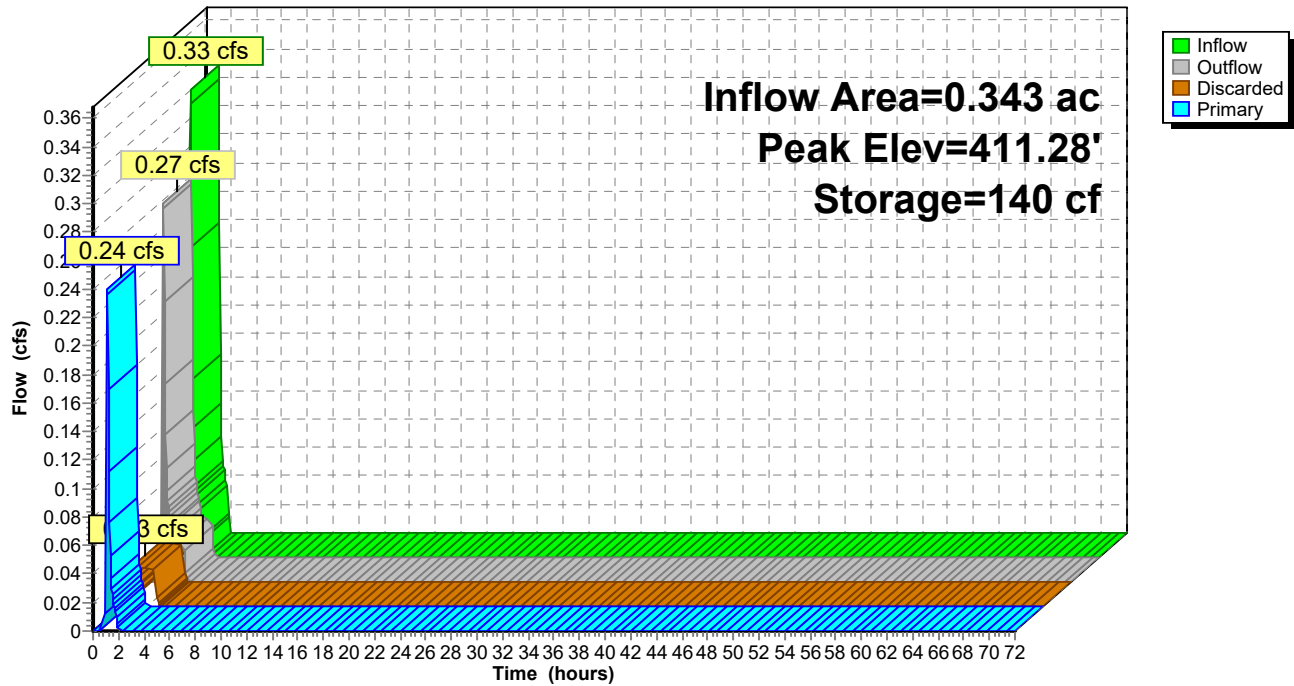
512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

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Pond 5: Pipes

Hydrograph



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512-516 Pleasant Valley Way, West Orange

Water Quality Storm Water Quality Rainfall=1.25", P2=3.47"

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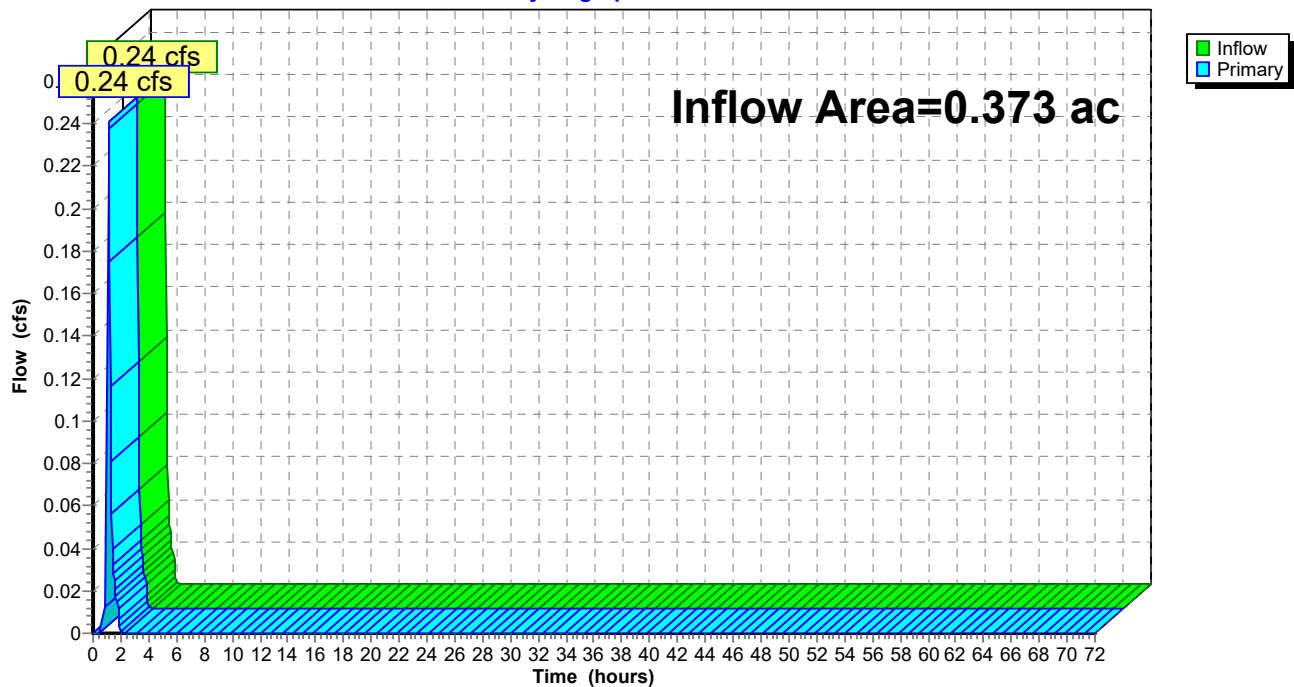
Summary for Link 7: Proposed

Inflow Area = 0.373 ac, 69.84% Impervious, Inflow Depth = 0.16" for Water Quality event
Inflow = 0.24 cfs @ 1.14 hrs, Volume= 0.005 af
Primary = 0.24 cfs @ 1.14 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

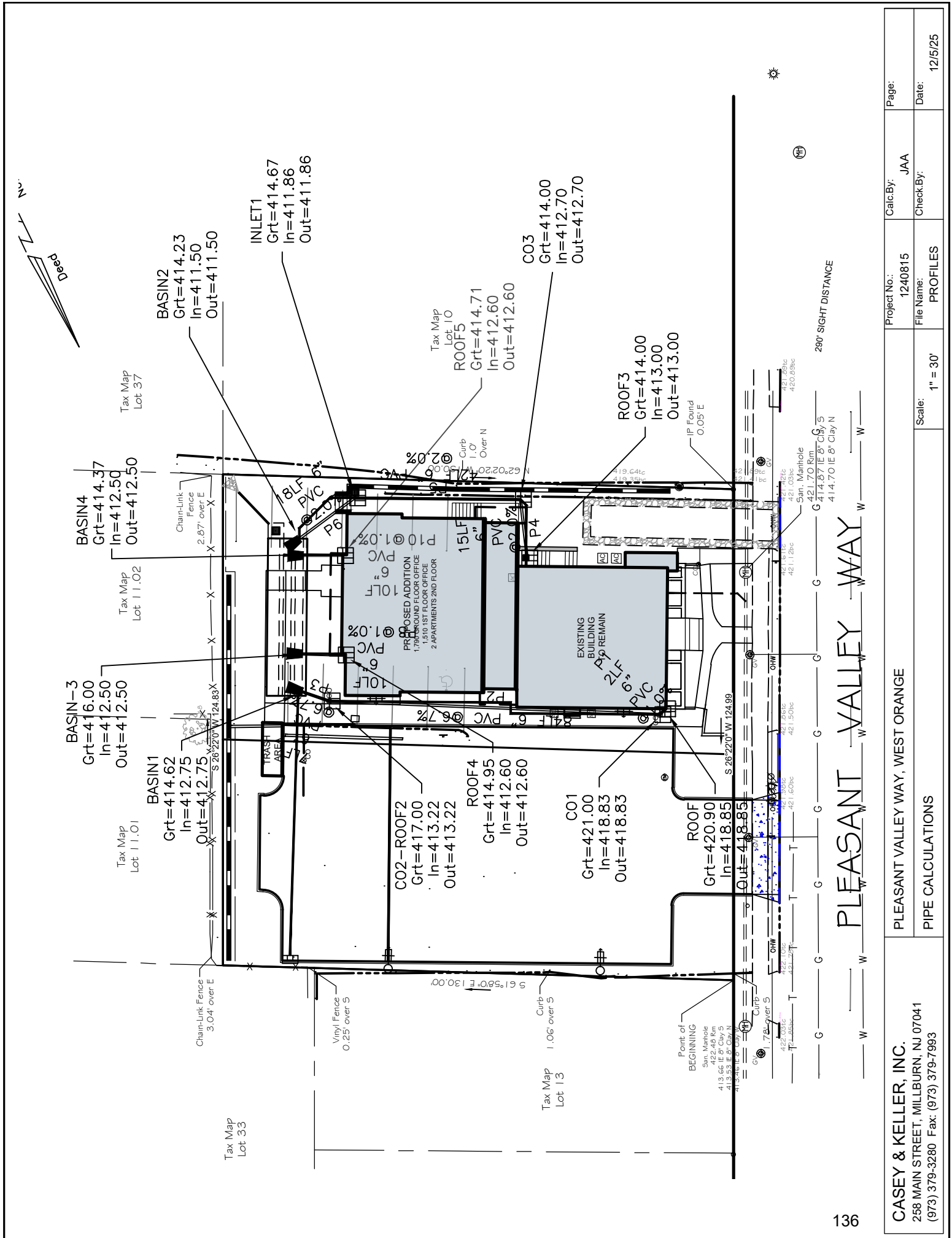
Link 7: Proposed

Hydrograph



V
DRAINAGE COLLECTION SYSTEM
CALCULATIONS

Rainfall Event	Pipe Name	Up stream Node	Down stream Node	DA (Acres)	Runoff Coef.	CA (Accum.)	Intensity (in/hr)	Total Runoff (cfs)	Full Flow (cfs)	Pipe Length (ft)	Size (in)	Slope (ft/ft)	n	Up stream Velocity (fps)	Tc (min)	Up stream Pipe Invert (ft)	Down stream Pipe Invert (ft)	Up stream HGL (ft)	Down stream HGL (ft)	Down stream Rim Elev (ft)
100 YEAR	P1	ROOF	CO1	0.02	0.99	0.02	7.61	0.12	0.37	2	6	0.010	0.020	1.48	10.00	418.85	418.83	419.06	419.05	421.00
100 YEAR	P2	CO1	CO2-ROOF2	0.00	0.00	0.02	7.60	0.12	0.94	84	6	0.067	0.020	1.99	10.02	418.83	413.22	419.00	413.44	417.00
100 YEAR	P3	CO2-ROOF2	BASIN1	0.01	0.99	0.03	7.40	0.19	0.92	7	6	0.064	0.020	3.71	10.95	413.22	412.75	413.37	412.90	414.62
100 YEAR	P4	ROOF3	CO3	0.02	0.99	0.02	7.61	0.17	0.52	15	6	0.020	0.020	2.21	10.00	413.00	412.70	413.20	412.98	414.00
100 YEAR	P5	CO3	INLET1	0.00	0.00	0.02	7.58	0.17	0.51	42	6	0.020	0.020	2.24	10.14	412.70	411.86	412.91	412.16	414.67
100 YEAR	P6	INLET1	BASIN2	0.02	0.51	0.04	7.49	0.26	0.52	18	6	0.021	0.020	2.66	10.54	411.86	411.50	412.11	411.75	414.23
100 YEAR	P8	ROOF4	BASIN-3	0.02	0.99	0.02	7.61	0.14	0.36	10	6	0.010	0.020	1.68	10.00	412.60	412.50	412.84	412.68	416.00
100 YEAR	P10	ROOF5	BASIN4	0.02	0.99	0.02	7.61	0.14	0.36	10	6	0.010	0.020	1.70	10.00	412.60	412.50	412.83	412.68	414.37



CASEY & KELLER, INC. 258 MAIN STREET, MILLBURN, NJ 07041 (973) 379-3280 Fax: (973) 379-7993	PLEASANT VALLEY WAY, WEST ORANGE			Project No.: 1240815	Calc.By: JAA	Page:
	PIPE CALCULATIONS			File Name: PROFILES	Check.By:	Date: 12/5/25

VI

SCOUR HOLE CALCULATIONS

Casey & Keller, Inc.

LAND surveyors + civil engineers + PLANNERS

N.J. STATE BOARD OF PROFESSIONAL ENGINEERS & LAND SURVEYORS

CERTIFICATE OF AUTHORIZATION NO. 24GA27985400

258 Main Street, Millburn, NEW JERSEY, 07041

voice :973-379-3280 fax: 973-379-7993

Job # 1240815

Job Name: 512-516 Pleasant Valley Way

Designed by: TF

Checked by: JAA

Structure: **SCOUR 1**Q = **2.22** C.F.S.W_o = **1.00** FT.D_o = **1.00** FT.q = Q/W_o = **2.22** C.F.S.TW = **0.20** FT.(For areas where Tw cannot be computed, use Tw = 0.2D_o)**d₅₀ Stone size formula****Where Y = 1/2 D_o**

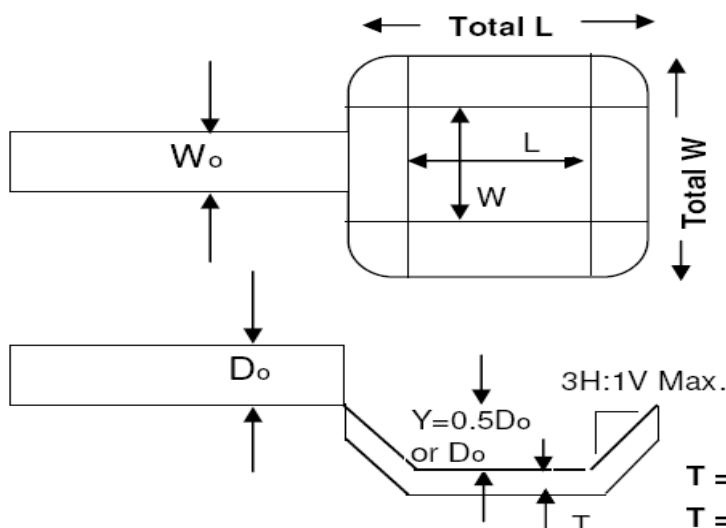
$$d_{50} = \frac{0.0125 * q^{1.33}}{TW} = 0.18 \text{ Ft.}$$

3 " STONE USED**0.50 Ft. = Y****6 " = T (Use filter fabric)****9 " = T (No filter fabric)****d₅₀ Stone size formula****Where Y = D_o**

$$d_{50} = \frac{0.0082 * q^{1.33}}{TW} = 0.12 \text{ Ft.}$$

3 " STONE USED**1.00 Ft. = Y****6 " = T (Use filter fabric)****9 " = T (No filter fabric)**

Y = Depth of scour hole below culvert invert, T = Thickness of riprap

**L = 3 D_o = 3.00 Ft.****W = 2 W_o = 2.00 Ft.****If Y = 1/2 D_o****Total L = 6.00 , Total W = 5.00****If Y = D_o****Total L = 9.00 , Total W = 8.00****T = d₅₀ Stone size x 2 if filter fabric is used****T = d₅₀ Stone size x 3 if no filter fabric is used****STRUCTURE SCOUR 1 DESIGN SUMMARY**☒ **Use Y = 1/2 D_o, Use filter fabric**☐ **Use Y = 1/2 D_o, No filter fabric**☐ **Use Y = D_o, Use filter fabric**☐ **Use Y = D_o, No filter fabric****Total L = 6 ' L = 3 '****Total W = 5 ' W = 2 '****Depth of scour hole (Y) = 0.5 '****d₅₀ Stone size = 3 "****Thickness of riprap (T) = 6 "**

VII

GROUNDWATER RECHARGE

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
ESSEX CO., WEST ORANGE TOWN	49.0	1.67

Project Name:

1240815

Description:

Pleasant Valley Way, W Orange

Analysis Date:

12/04/25

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.117	Open space	Boonton	14.9	6,349
2	0.256	Impervious areas	Boonton	0.0	-
3					
4					
5					
6					
7	0.000				
8	0.000				
9	0.000				
10	0.000				
11	0.000				
12	0.000				
13	0.000				
14	0.000				
15	0.000				
Total =	0.4			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				4.7	6,349

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.115	Open space	Boonton	14.9	6,240
2	0.258	Impervious areas	Boonton	0.0	-
3					
4					
5	0.000				
6	0.000				
7	0.000				
8	0.000				
9	0.000				
10	0.000				
11	0.000				
12	0.000				
13	0.000				
14	0.000				
15	0.000				
Total =	0.4			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				4.6	6,240

Procedure to fill the Pre-Development and Post-Development Conditions Tables

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.

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	11,238
--	------	-------------------------------	--------

Post-Development Annual Recharge Deficit=

109

(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	3.44	(in)	DRWC=	0.72	(in)
ERWC =	0.57	(in)	EDRWC=	0.12	(in)

Project Name	Description	Analysis Date	BMP or LID Type
1240815	Pleasant Valley Way, W Orange	12/04/25	

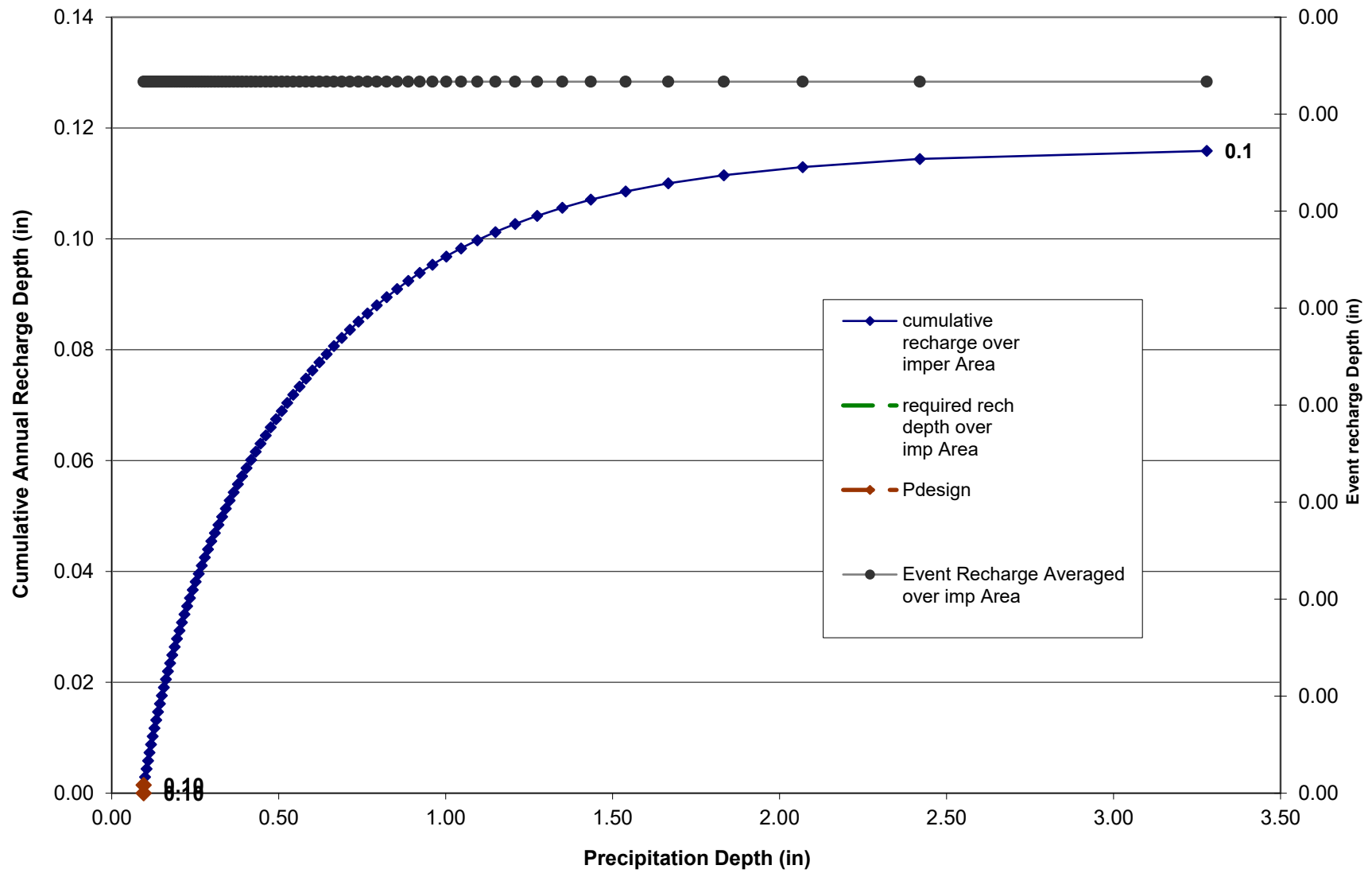
Recharge BMP Input Parameters				Root Zone Water capacity Calculated Parameters				Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	160.0	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.61	in	Inches of Runoff to capture	Qdesign	0.05	in
BMP Effective Depth, this is the design variable	dBMP	0.2	in	ERWC Modified to consider dEXC	EDRWC	0.18	in	Inches of Rainfall to capture	Pdesign	0.10	in
Upper level of the BMP surface (negative if above ground)	dBMPu	1.0	in	Empty Portion of RWC under Infil. BMP	RERWC	0.14	in	Recharge Provided Avg. over Imp. Area		0.1	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	40.8	in					Runoff Captured Avg. over imp. Area		0.3	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	1	unitless								

BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES
ABMP/Aimp	Aratio	0.01	unitless	Volume Balance--> OK dBMP Check--> OK dEXC Check--> OK BMP Location--> OK
BMP Volume	VBMP	3	cu.ft	

Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	109	cu.ft	Annual BMP Recharge Volume		109	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	11,238	sq.ft	Avg BMP Recharge Efficiency		41.6%	Represents % Infiltration Recharged
Root Zone Water Capacity	RWC	3.69	in	%Rainfall became Runoff		78.5%	%
RWC Modified to consider dEXC	DRWC	1.12	in	%Runoff Infiltrated		0.7%	%
Climatic Factor	C-factor	1.67	no units	%Runoff Recharged		0.3%	%
Average Annual P	Pavg	49.0	in	%Rainfall Recharged		0.2%	%
Recharge Requirement over Imp. Area	dr	0.1	in				

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.



VIII

MOUNDING CALCULATIONS

PIPES SYSTEM MOUNDING CALCULATIONS

Input Values

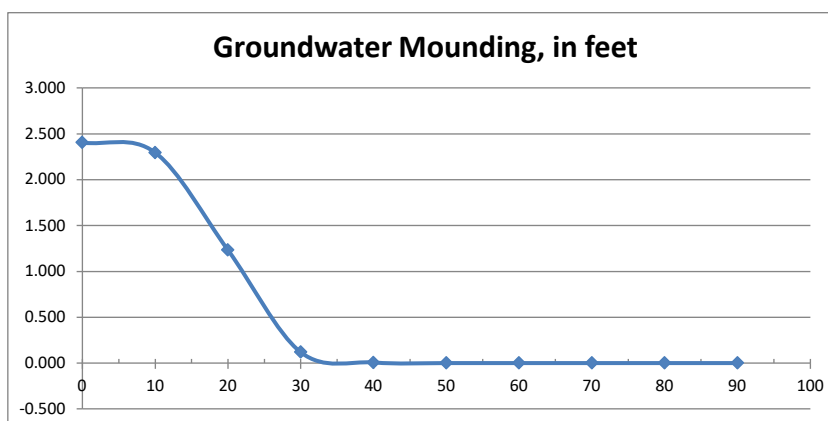
2.90	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.90	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
20.000	x	1/2 length of basin (x direction, in feet)
5.000	y	1/2 width of basin (y direction, in feet)
2.50	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

12.406	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.406	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

2.406	0
2.296	10
1.233	20
0.120	30
0.007	40
0.001	50
0.001	60
0.001	70
0.001	80
0.001	90



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.

POROUS PAVERS MOUNDING CALCULATIONS

Input Values

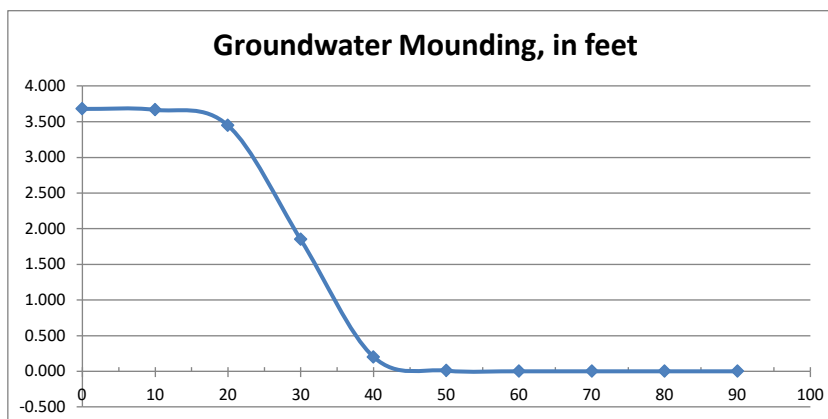
2.90	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
2.90	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
30.000	x	1/2 length of basin (x direction, in feet)
16.000	y	1/2 width of basin (y direction, in feet)
2.25	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.680	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.680	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)
Distance from		
Ground-water	center of basin in x	
Mounding, in feet	direction, in feet	

3.680	0
3.667	10
3.447	20
1.850	30
0.200	40
0.010	50
0.001	60
0.001	70
0.001	80
0.001	90



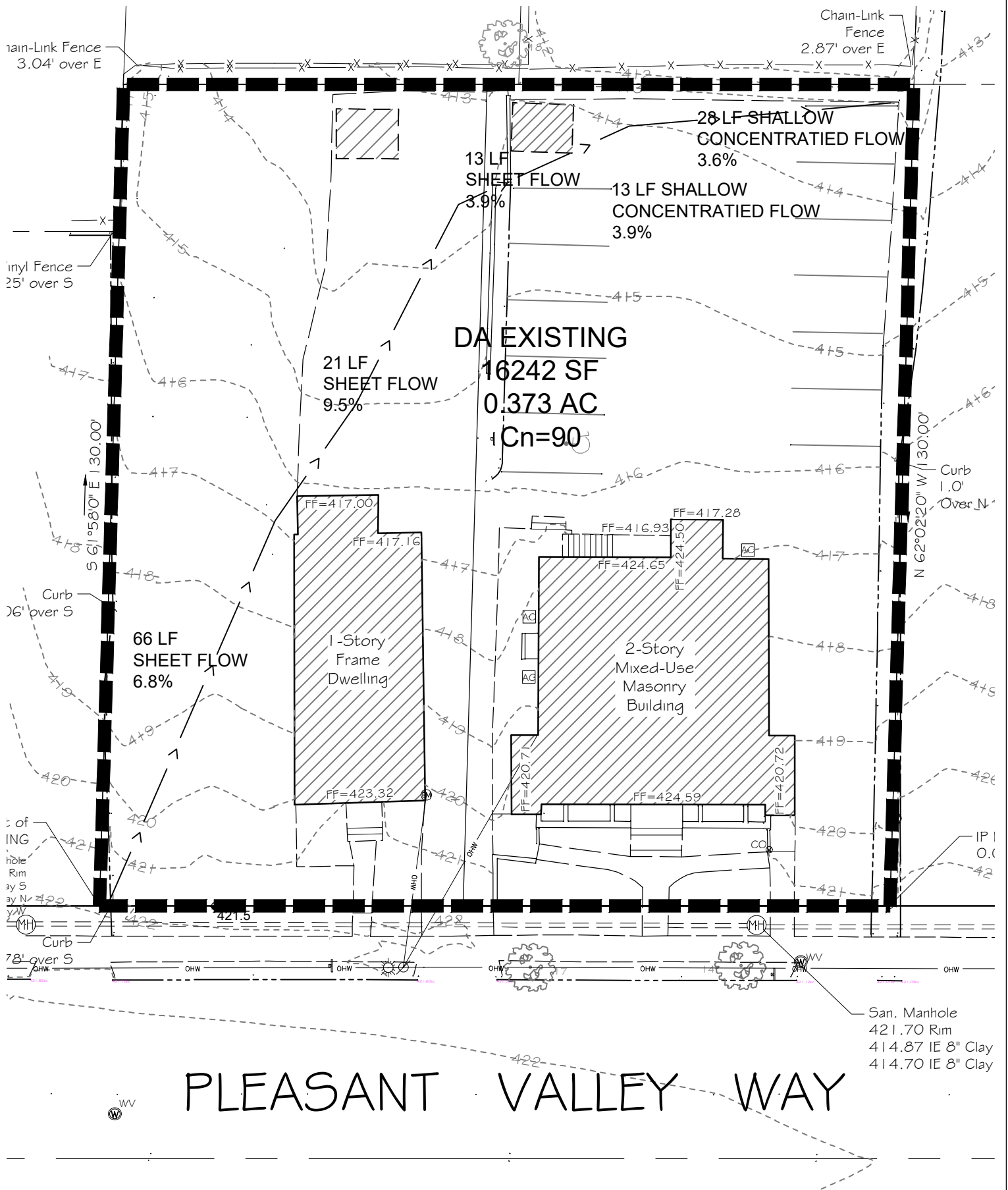
Re-Calculate Now

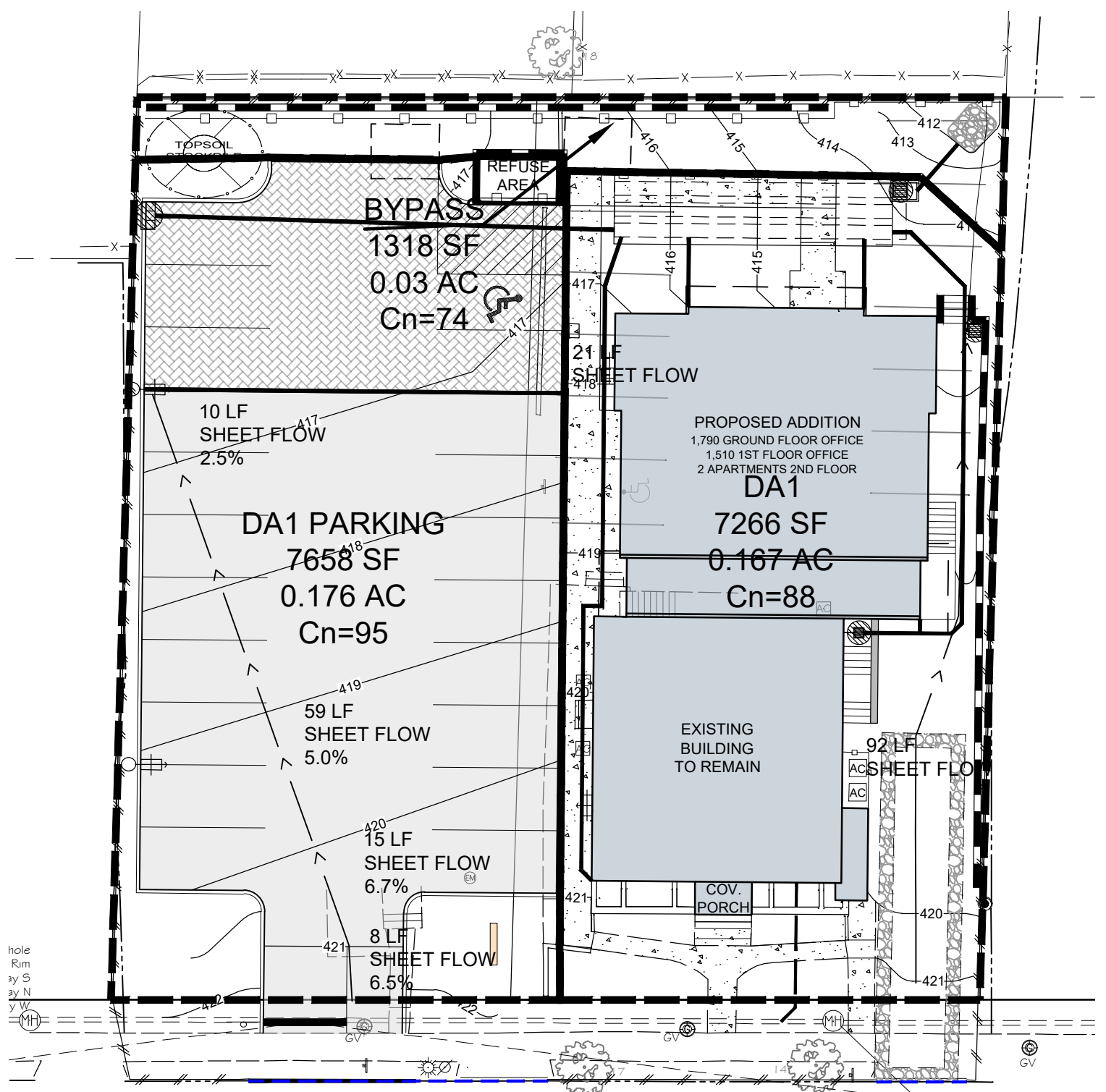


Disclaimer

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IX DRAINAGE AREA MAPS





PLEASANT VALLEY WAY

CASEY & KELLER, INC.
258 MAIN STREET, MILLBURN, NJ 07041
(973) 379-3280 Fax: (973) 379-7993

512-516 PLEASANT VALLEY WAY, WEST ORANGE
PROPOSED DRAINAGE AREA
Scale: 1" = 20'

Project No.: 1240815
File Name: DA-EXISTING

Calc. By: JAA
Check By: JAA

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Date: 9/11/25