STORMWATER MANAGEMENT REPORT

for

RUMSON COUNTRY CLUB

Located at

BLOCK 112, LOT 1.01
163 RUMSON ROAD
BOROUGH OF RUMSON
MONMOUTH COUNTY, NJ

Has been prepared for

RUMSON COUNTRY CLUB

163 RUMSON ROAD
RUMSON, NJ 07760

On

August 14, 2026

InSite Project No. 24-1664-03

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INTRODUCTION

This stormwater management report is being submitted as part of the development application for Rumson Country Club, located on Block 112, Lot 1.01, in the Borough of Rumson, Monmouth County, New Jersey. This report was prepared in accordance with the Borough of Rumson, the State Soil Conservation District (SCD) Standards, and the New Jersey Department of Environmental Protection (NJDEP), as well as current industry standards and practices for stormwater management.

PROJECT LOCATION

The property is located at 163 Rumson Road and is zoned as "R-1 Single Family Residential". The surrounding area consists of R-1 and R-2 single family residential. The site has frontage on Rumson Road and Club Way.

PROJECT DESCRIPTION

Lot 1.01 is currently a developed lot with an existing 18-hole golf course, clubhouse, and other amenities. The project includes widening of the roadway in areas to provide a 24 foot wide cartway width to allow safer circulation for the two way private road. This will also include the installation of new underground utility lines and reconstruction of existing utilities, such as relocating the overhead electric lines to underground. The golf course renovations include regrading, drainage improvements, and construction of two pavilions for bathrooms and lightning shelter. The construction, reconstruction, and additions to the various buildings onsite are proposed for the benefit of the employees and members. The legally existing bridge and road crossings will also be reconstructed for maintenance and safety. Upgrades to the shooting facility building include raising of the building and the renovation of the bathrooms and parking. Improvements near the marina include reconstruction of the tennis courts, a clubhouse and clubhouse additions, paved parking lot and the addition of a new entrance to River House

The project disturbs more than one acre and proposes more than one-quarter acre of new impervious surfaces; therefore, the project is a major development. The development discharges to a tidal water body and is not subject to stormwater runoff quantity reduction standards. The net

increase of regulated motor vehicle surfaces is more than one-quarter acre and therefore stormwater runoff quality standards apply. The proposed development is located within Planning Area 1 (Metropolitan Planning Area) and is exempt from groundwater recharge requirements. The following report outlines compliance with stormwater management requirements.

FLOOD HAZARD AREA

According to FEMA's Effective FIRM entitled, "Flood Insurance Rate Map (FIRM)", map numbers 34023C0182H and 34023C0184H dated 06/15/22, they identify a portion of the property within a tidal AE flood zone with a 100-year flood elevation ranging from elevation 8 to 9 (NAVD88). The Limit of Moderate Wave Action (LIMWA) is also shown on the plans per the FIRM.

GEOTECHNICAL INFORMATION

Geotechnical information for this application is based on the report and plans prepared by Whitestone Associates, Inc., entitled "Report of Geotechnical Investigation", dated 06/13/25. The soil boring map and logs, test pit map and logs, and infiltration rates are provided in Appendix E.

SOIL CHARACTERISTICS

The existing soil classifications for the site are based on the USDA NRCS Web Soil Survey. The survey is useful at the planning level to draw general conclusions about the suitability of a site for certain land uses. A Soil Map Exhibit is located within Appendix A. Based on the NRCS data, the site consists of the following hydrologic soil group (HSG) type(s):

SOIL NAME	HYDROLOGIC GROUP
HocA – Holmdel sandy loam, 2 to 5 percent slopes	C
ShrA – Shrewsbury sandy loam, 0 to 2 percent slopes	B/D

Since there is a dual HSG, the depth of the seasonal high water table (SHWT) must be confirmed. Per BMP Chapter 12, if the SHWT is within 24 inches of the ground surface, then the soil must be classified as HSG “D”. Test pits SPP-8 and -9 show the depth of SHWT to be greater than 24 inches from ground surface, therefore HSG “B” is used in the analysis.

PRE-DEVELOPMENT CONDITIONS

The property is developed as an 18-hole golf club with club house, cart paths, various amenity and maintenance buildings and multiple parking lots. There is an existing shooting range and River House near the Shrewsbury River.

Refer to Appendix C for detailed calculations for each drainage area's runoff curve number (CN), hydrologic soil group(s) (HSG), associated areas, time of concentration (Tc), peak flow rates, and hydrographs. Refer to Appendix H for the Pre-Development Drainage Map.

POST-DEVELOPMENT CONDITIONS

The project proposed to improve the subject property with additions to the existing clubhouse, Pro Shop, Shooting Facility, Grounds building, and River House. Additional improvements include new pavilions with bathrooms, the widening of Rumson Country Club Drive, parking areas, lighting and landscaping measures, improved stormwater management facilities, reconstructed greens and other associated site amenities.

Refer to Appendix D for detailed calculations for each drainage area's runoff curve number (CN), hydrologic soil group(s) (HSG), associated areas, time of concentration (Tc), peak flow rates, and hydrographs. Refer to Appendix H for the Post-Development Drainage Area Map.

GREEN INFRASTRUCTURE (N.J.A.C. 7:8-5.3)

For Green Infrastructure compliance, the design engineer shall utilize BMPs from Table 5-1 or from Table 5-2 and/or an alternative stormwater management measure approved in accordance with N.J.A.C. 7:8-5.2(g). The proposed pervious paving system is listed in Table 5-1 and therefore complies.

BMP COMPLIANCE

Pervious Pavement System

The pervious pavement area is 0.15 acres and the drainage area is 0.51 acres, thus complying with the 3:1 ratio (4:1 inclusive of the pervious pavement area). In accordance with Test Pits SPP-8 and -9, groundwater was encountered in this area at elevation 1.0 and 1.6, whereas the bottom of stone is at elevation 2.60, thus complying with the one-foot separation requirement. The pervious pavement system is designed with underdrains and does not utilize infiltration. The system provides underdrains to assist with equalizing the water elevation within the stone bedding and convey the water to the outlet. The basin complies with the 72 hour drain down time requirement.

STORMWATER MANAGEMENT SUMMARY (N.J.A.C. 7:8-5.7)

Methods of determining stormwater runoff and peak discharge follow the procedures as outlined in "Urban Hydrology for Small Watersheds", Soil Conservation Service Technical Release No. 55. The rainfall precipitation values for the 2-, 10-, 25-, and 100-year storm events have been determined utilizing NOAA, National Weather Service's Atlas 14 Point Precipitation Frequency Estimates, based on 24-hour storm events for Monmouth County. These precipitation values were then adjusted based upon Table 5-5 adjustment factors to get "current" values and based upon Table 5-6 adjustment factors to get "future" values. Refer to Appendix B for calculated precipitation values utilized for stormwater analysis. The storm events were studied using the SCS TR-20 runoff method, NOAA Region D rainfall distribution, and the Delmarva Unit Hydrograph. Stormwater hydrographs were performed using HydroCAD Software Solutions' "HydroCAD" (ver. 10.0) computer program. Pervious and impervious CN values are computed separately rather than a composite CN value and have a separate time of concentration (TC) within each site area.

WATER QUANTITY N.J.A.C. (7:8-5.6)

In accordance with NJAC 7:8-5.6(b)4. for tidal flood hazard areas, "*No analysis is required if the stormwater is discharged directly into any ocean, bay, inlet, or the reach of any watercourse between its confluence with an ocean, bay, or inlet and downstream of the first water control structure*."

The majority of the project is proposed within or near the flood hazard areas onsite. Since the property slopes and flows towards the Shrewsbury River, a tidal water body, no additional analysis is required for water quantity. The golf course sections of the property sheet flow into the drainage inlets which are piped into the surrounding tidal and wetland areas. The drainage pattern for the road widening will remain similar to existing conditions where the runoff flows overland through vegetation before reaching the nearest water body. The areas along the River sheet flow into the tidal water body, similar to existing conditions. The post-development flows are marginally increased due to the project and no adverse flooding impacts are anticipated from the development since the stormwater flows directly to the tidal water body.

WATER QUALITY (N.J.A.C. 7:8-5.5)

NJDEP regulations require that water quality treatment be provided when a major development project results in a net increase of one-quarter acre or more of regulated motor vehicle surface (MVS). The water quality standards require that stormwater management measures be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm for new asphalt areas by 80% of the anticipated load from the developed site.

The project proposes to increase motor vehicle surfaces by more than one quarter of an acre and will satisfy the water quality reductions for the entire project via the proposed pervious pavement system. The surface parking lot adjacent to the proposed tennis courts is being reconstructed with pervious pavement. The pervious pavement will treat the MVS for the proposed parking lot near the tennis courts.

The net increase for MVS is 0.33 acres. MVS are added to widen the roadway and a portion of MVS is reduced where the proposed tennis courts extend into the existing gravel lot. An area of 0.48 acres of MVS, inclusive of the pervious pavement, is treated to comply with the TSS reductions.

GROUNDWATER RECHARGE (N.J.A.C. 7:8-5.4)

In accordance with N.J.A.C. 7:8-5.4(a).2.ii, groundwater recharge does not apply to projects within the "urban redevelopment area". An Urban Redevelopment Area is defined, per N.J.A.C. 7:8 1.2, as development portions of areas delineated on the State Plan Policy Map as the Metropolitan Planning Area. The proposed development is located within Planning Area 1 (Metropolitan Planning Area) and is not required to meet groundwater recharge.

SOIL EROSION AND SEDIMENT CONTROL

In accordance with the Soil Erosion and Sediment Control Act, soil erosion measures will be incorporated into the design and graphically depicted on the Soil Erosion and Sediment Control Plans. These measures consist of, but are not limited to:

- Sediment Barriers and Silt Fences
- Stabilized Construction Access
- Topsoil Stockpiles
- Temporary and Permanent Stabilization

The conduit outlet protection for the 12" drainage pipes within the golf course area are designed for maximum allowable flows.

CONCLUSION

The project disturbs more than one acre and proposes more than one-quarter acre of new impervious surfaces; therefore, the project is a major development. The development discharges to a tidal water body and is not subject to stormwater runoff quantity reduction standards. The net increase of regulated motor vehicle surfaces is more than one-quarter acre and therefore stormwater runoff quality standards apply. The proposed development is located within Planning Area 1 (Metropolitan Planning Area) and is exempt from groundwater recharge requirements. The project complies with stormwater quality, exempt from stormwater quantity, and exempt from groundwater recharge.

APPENDIX A

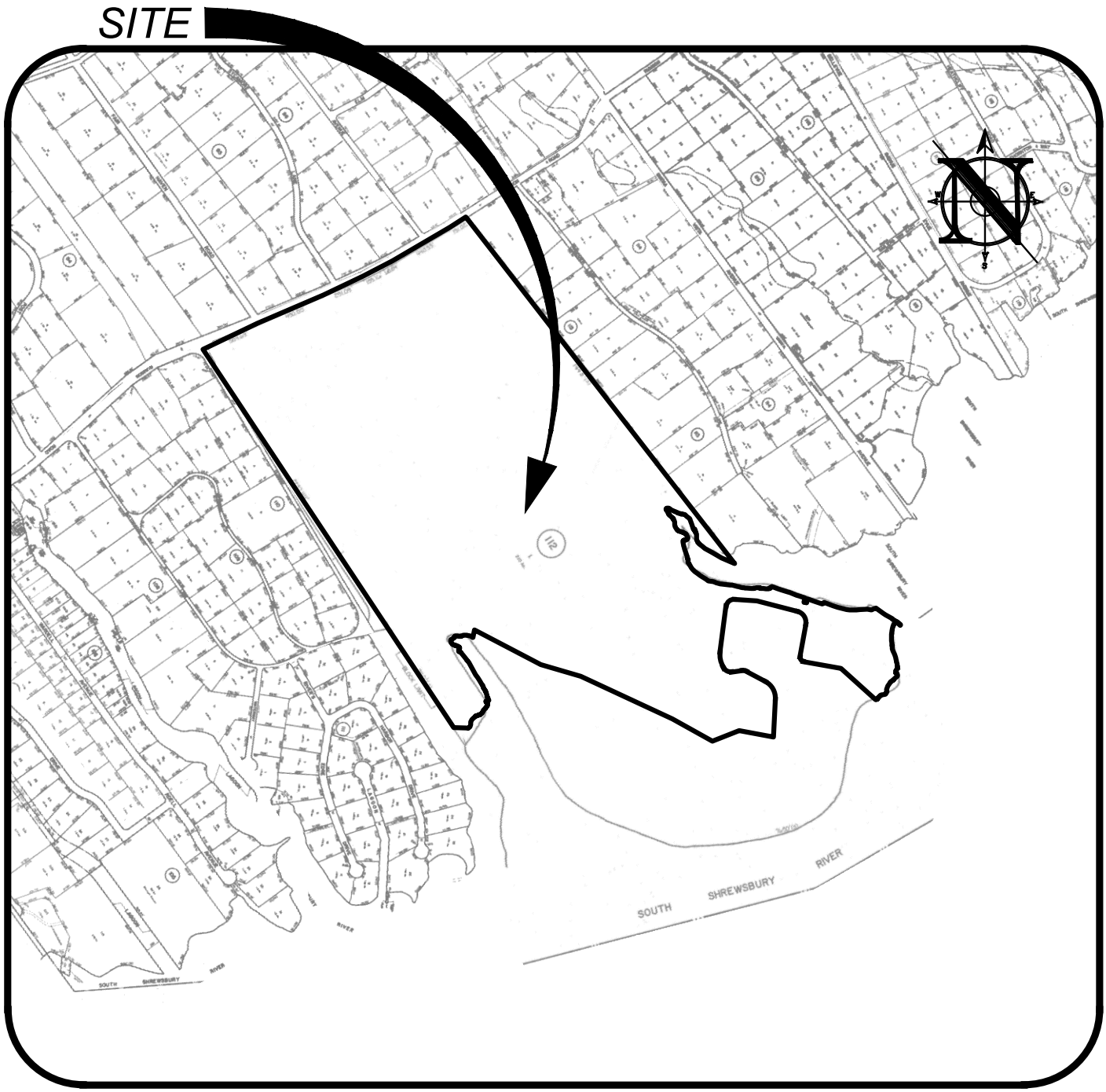
Tax Map

USGS Map

Soils Map

FEMA FIRM Effective Map

State Planning Area Map



PLAN

1000 0 1000

Scale 1"=1,000'

TAX MAP EXHIBIT

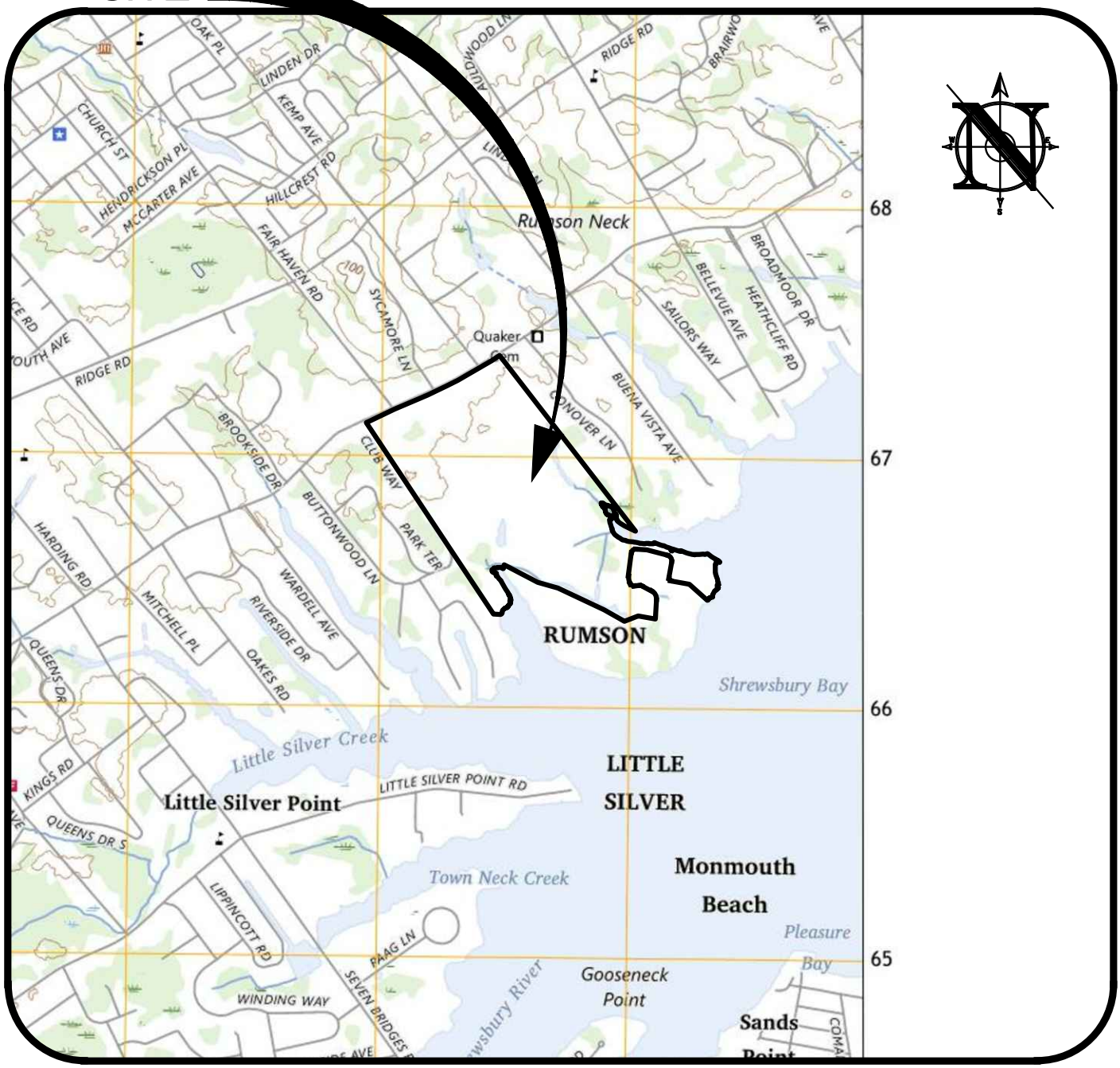
InSite Engineering, LLC
CERTIFICATE OF AUTHORIZATION:
24GA28083200
1955 ROUTE 34, SUITE 1A
WALL, NJ 07719
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732-531-7344 (Fax)
InSite@InSiteEng.net www.InSiteEng.net

Site Location:
Rumson Country Club
163 Rumson Road
Block 112, Lot 1
Borough of Rumson, Monmouth County, NJ

InSite Project No.
21-1664-03
Drawing No.
21-1664-03
Date
December 17, 2024

Reference:
XXX-Tax Map
Sheet:
Date:

Revisions



PLAN

2,000 0 2,000

Scale 1"=2,000'

USGS MAP EXHIBIT

InSite Engineering, LLC
CERTIFICATE OF AUTHORIZATION:
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1955 ROUTE 34, SUITE 1A
WALL, NJ 07719
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Borough of Rumson, Monmouth County, NJ

InSite Project No.
21-1664-03
Drawing No.
21-1664-03
Date
December 17, 2024

Reference:
US Geological Survey
Long Branch West Quadrangle-2019 &
Asbury Park Quadrangle- 2019

Revisions



Map Scale: 1:11,800 if printed on A landscape (11" x 8.5") sheet.

N

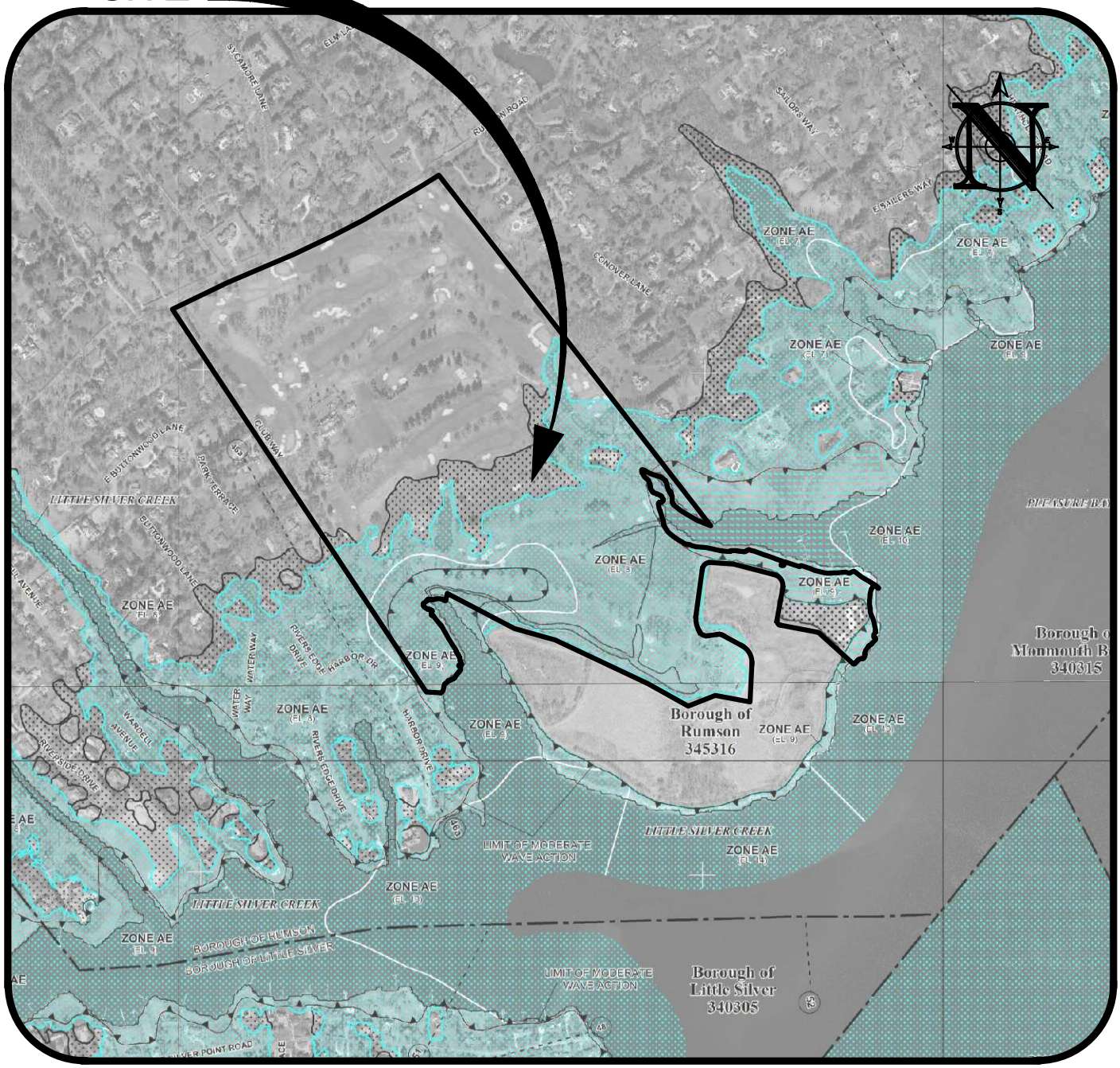
Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AptAv	Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes, very frequently flooded	B/D	7.8	3.0%
FrkB	Freehold sandy loam, 2 to 5 percent slopes	B	6.6	2.5%
HocA	Holmdel sandy loam, 0 to 2 percent slopes	C	149.0	57.6%
ShrA	Shrewsbury sandy loam, 0 to 2 percent slopes	B/D	63.9	24.7%
UdaB	Udorthents, 0 to 8 percent slopes	D	0.0	0.0%
WATER	Water		0.5	0.2%
WDv2	Duvall Creek fine sand, 1 to 2 meter water depth	D	7.2	2.8%
WOb1	Overboard mucky loam, 1 to 2 meter water depth	D	11.9	4.6%
WSr1	South River sand, 0.5 to 2 meter water depth	D	12.0	4.6%
Totals for Area of Interest			**258.7**	**100.0%**



PLAN

1,000 0 1,000

Scale 1"=1,000'

EFFECTIVE FEMA FIRM EXHIBIT

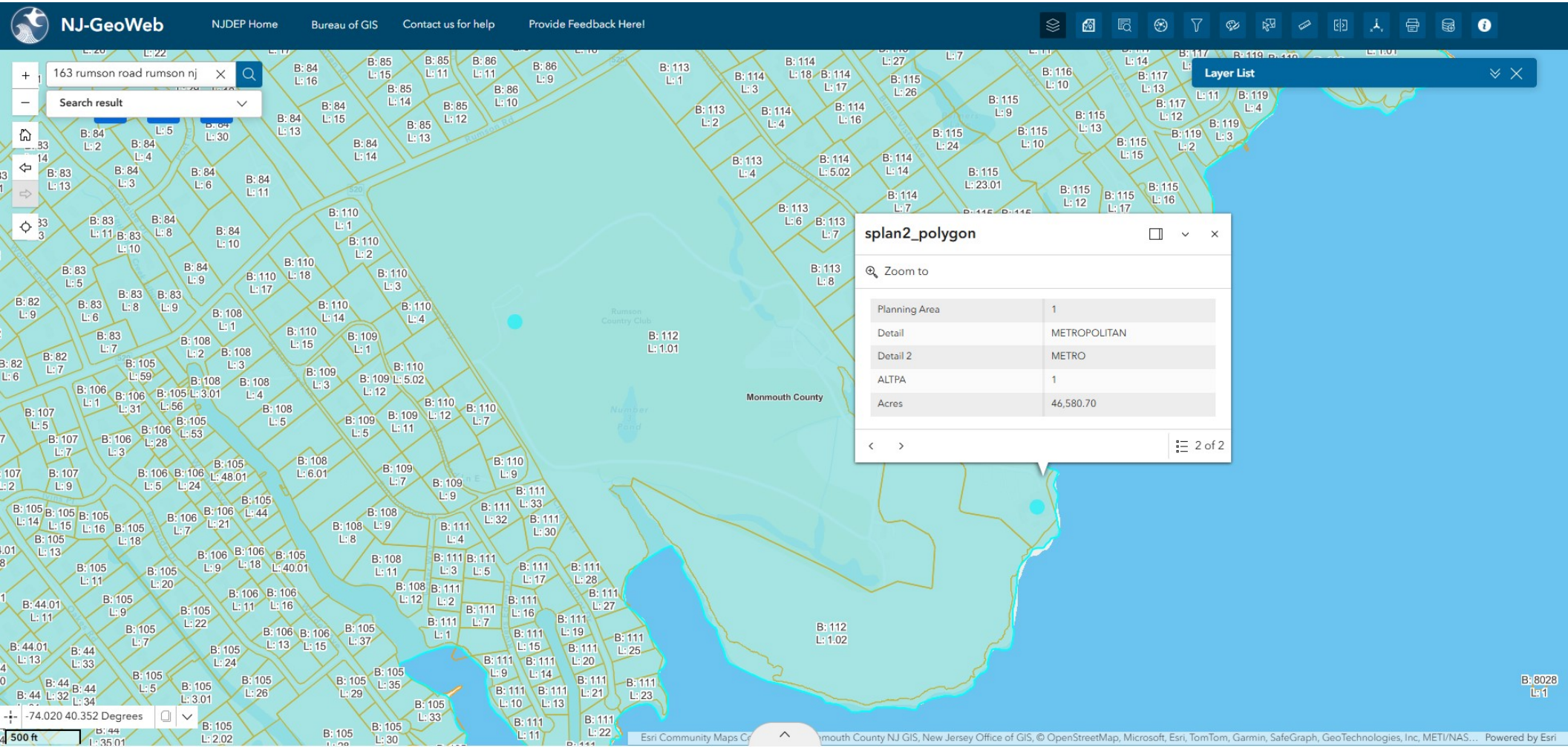
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InSite Project No.
21-1664-03
Drawing No.
21-1664-03
Date
December 17, 2024

Reference:
Federal Emergency Management Agency
Effective Flood Insurance Rate Map
Map Number: 34025C0182H
Effective Date: June 15, 2022

Revisions


NJ-GeoWeb
NJDEP Home
Bureau of GIS
Contact us for help
Provide Feedback Here!
163 rumson road rumson nj
Search result
Layer List
splan2_polygon
Zoom to
Planning Area 1
Detail METROPOLITAN
Detail 2 METRO
ALTPA 1
Acres 46,580.70
2 of 2
Monmouth County
-74.020 40.352 Degrees
500 ft
Esri Community Maps Co
mouth County NJ GIS, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NAS...
Powered by Esri

APPENDIX B

Rainfall Calculations

NJDEP Current Adjusted & Future Year 2100 Rainfall Data

Project Name:	Rumson Country Club	Date:	3/3/2026
Project Location:	163 Rumson Road	Revised:	Rev. 0
InSite Project No.:	24-1664-03	Engineer:	SGM

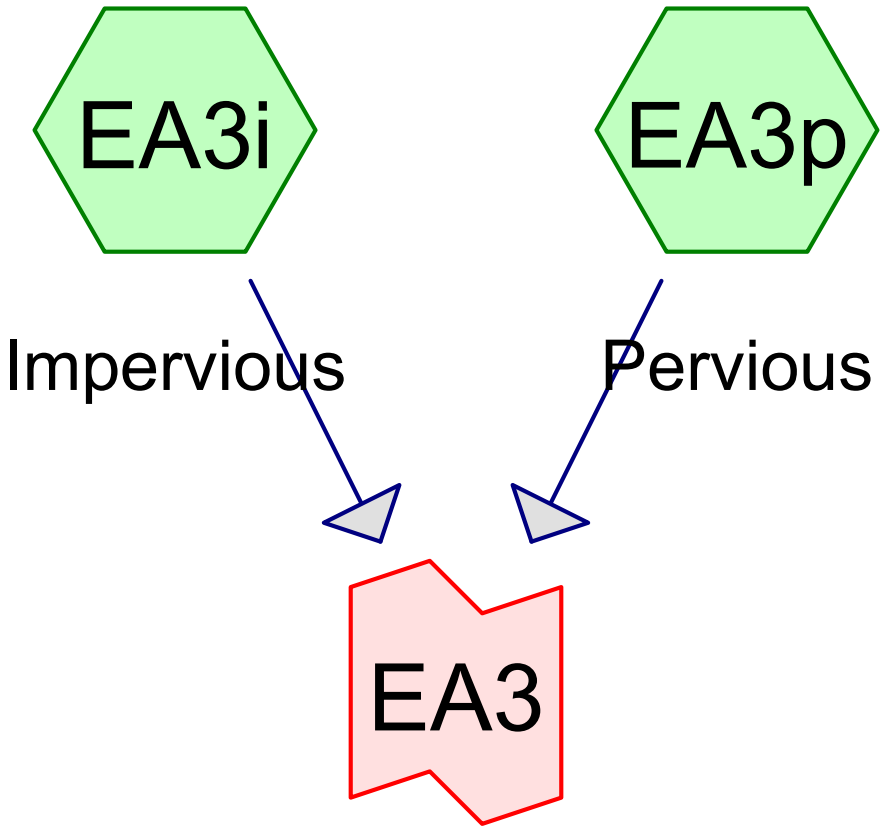
NJ County: Monmouth
NOAA Curve Type: D

24 Hour Storm Event	Baseline NOAA Rainfall (in)	Current Adjustment Factor	Current Adjusted Rainfall (in)	2100 Adjustment Factor	2100 Adjusted Rainfall (in)
WQDS	1.25	No Change	1.25	No Change	1.25
2-yr	3.38	1.00	3.38	1.19	4.02
10-yr	5.23	1.01	5.28	1.19	6.22
25-yr	6.53	No Change	6.53	No Change	6.53
100-yr	8.94	1.02	9.12	1.26	11.26

* Baseline rainfall values per NOAA Atlas 14

APPENDIX C

Pre-Development Flow Calculations



River House Parking Areas

Subcat Reach Pond Link

Routing Diagram for 260303 r0 Monmouth County
Prepared by InSite Engineering, LLC, Printed 3/17/2026
HydroCAD® 10.20-8a s/n 03018 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=1.4 cfs 0.041 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=0.07"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.0 cfs 0.000 af

Link EA3: River House Parking Areas Inflow=1.4 cfs 0.042 af
Primary=1.4 cfs 0.042 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.042 af Average Runoff Depth = 1.00"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

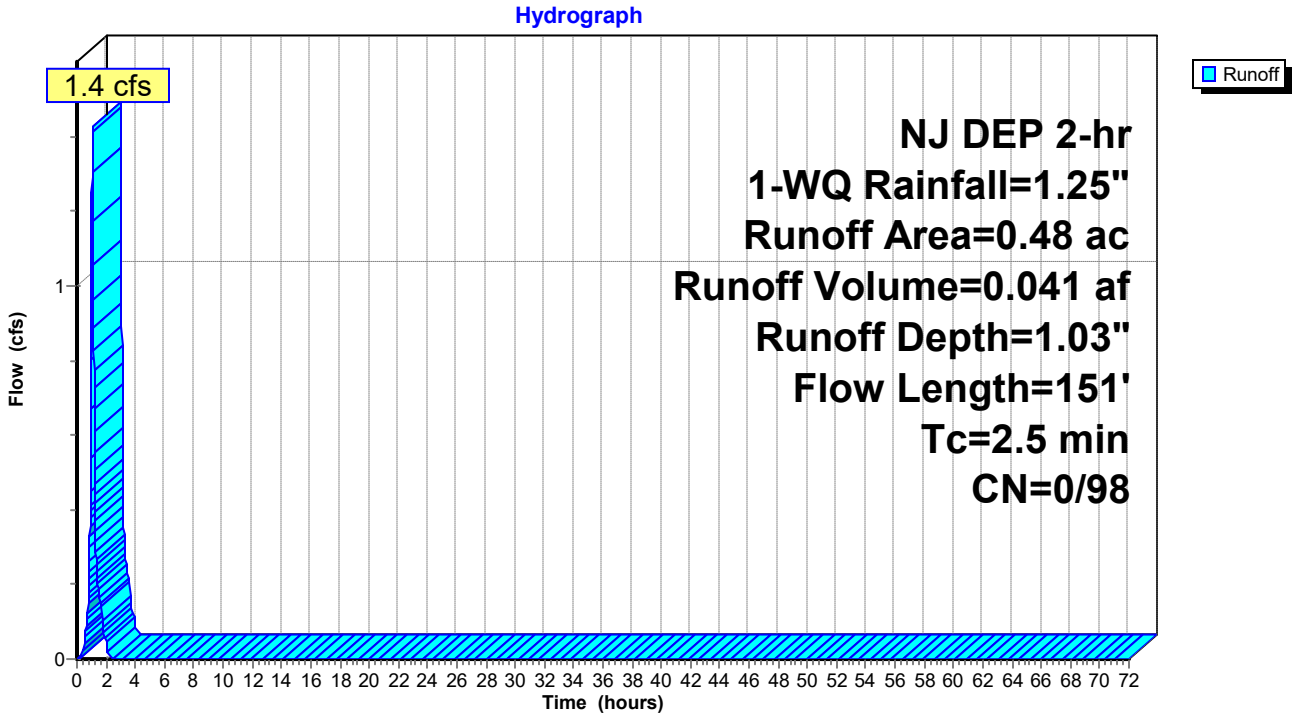
Runoff = 1.4 cfs @ 1.09 hrs, Volume= 0.041 af, Depth= 1.03"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1-WQ Rainfall=1.25"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

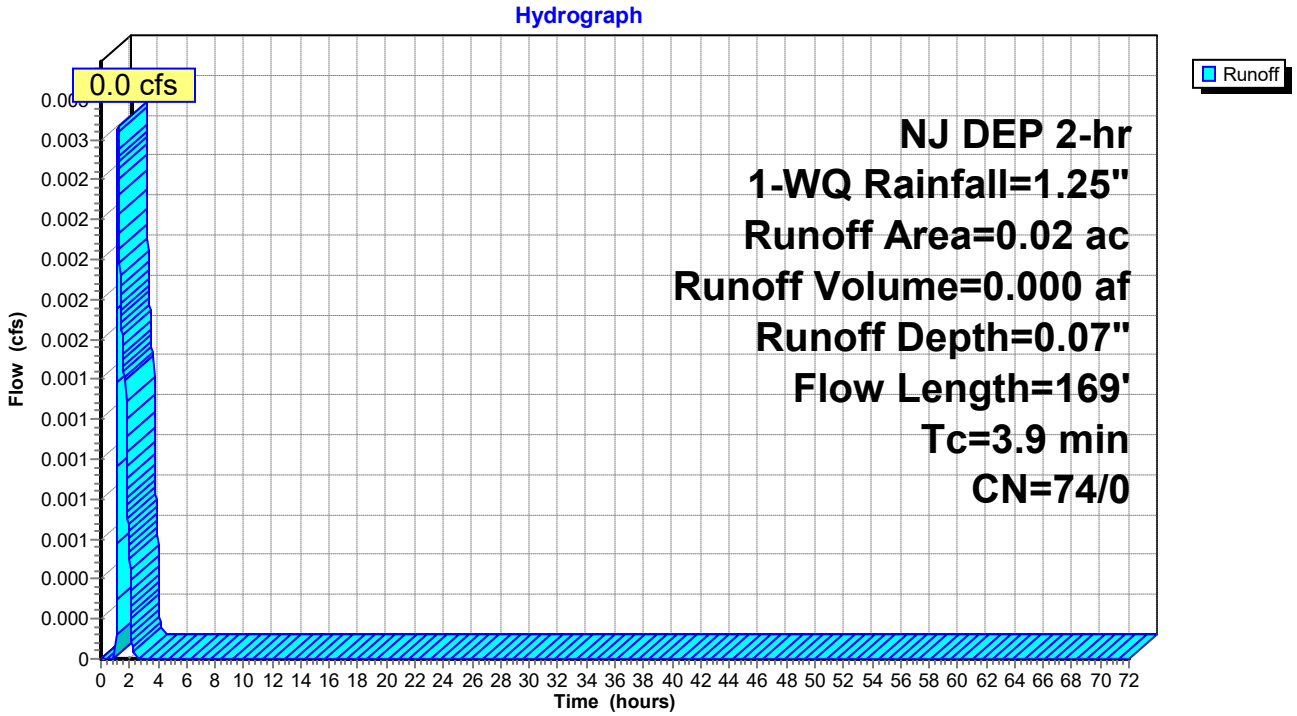
Runoff = 0.0 cfs @ 1.20 hrs, Volume= 0.000 af, Depth= 0.07"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1-WQ Rainfall=1.25"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

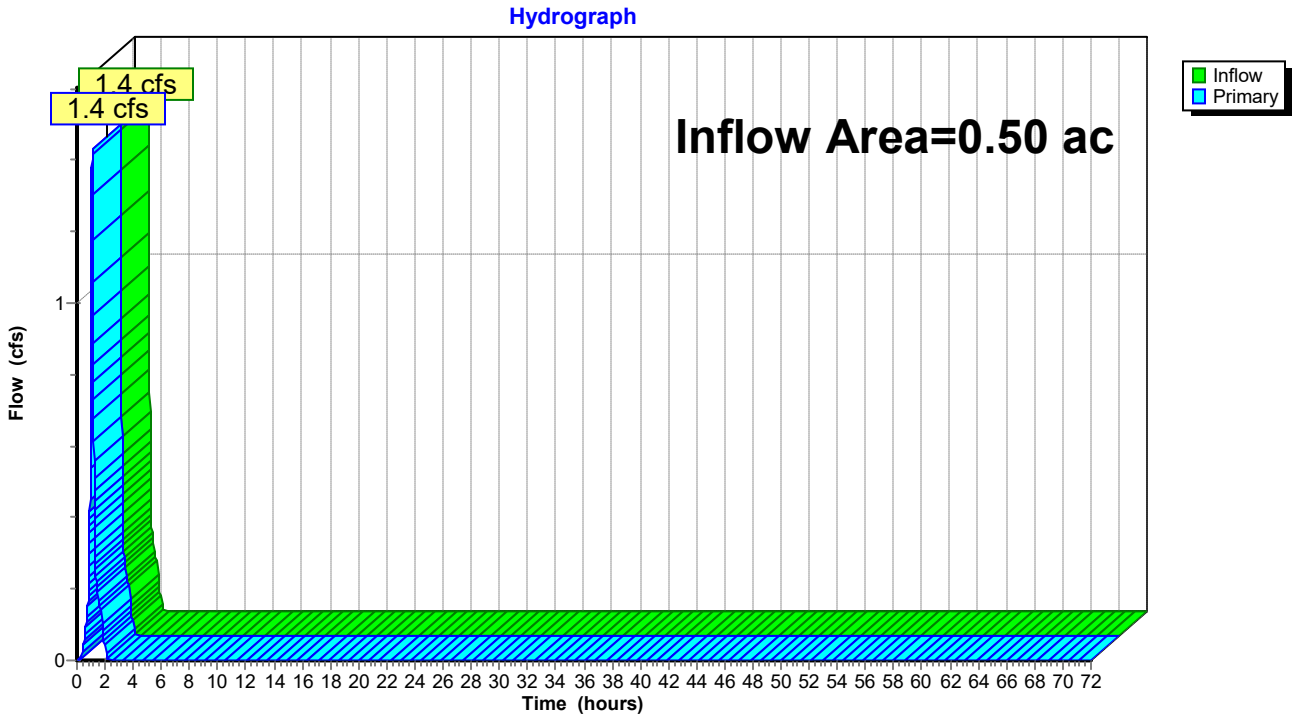


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 1.00" for 1-WQ event
Inflow = 1.4 cfs @ 1.09 hrs, Volume= 0.042 af
Primary = 1.4 cfs @ 1.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=3.15"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=1.6 cfs 0.126 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=1.16"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.0 cfs 0.002 af

Link EA3: River House Parking Areas Inflow=1.6 cfs 0.128 af
Primary=1.6 cfs 0.128 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.128 af Average Runoff Depth = 3.07"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

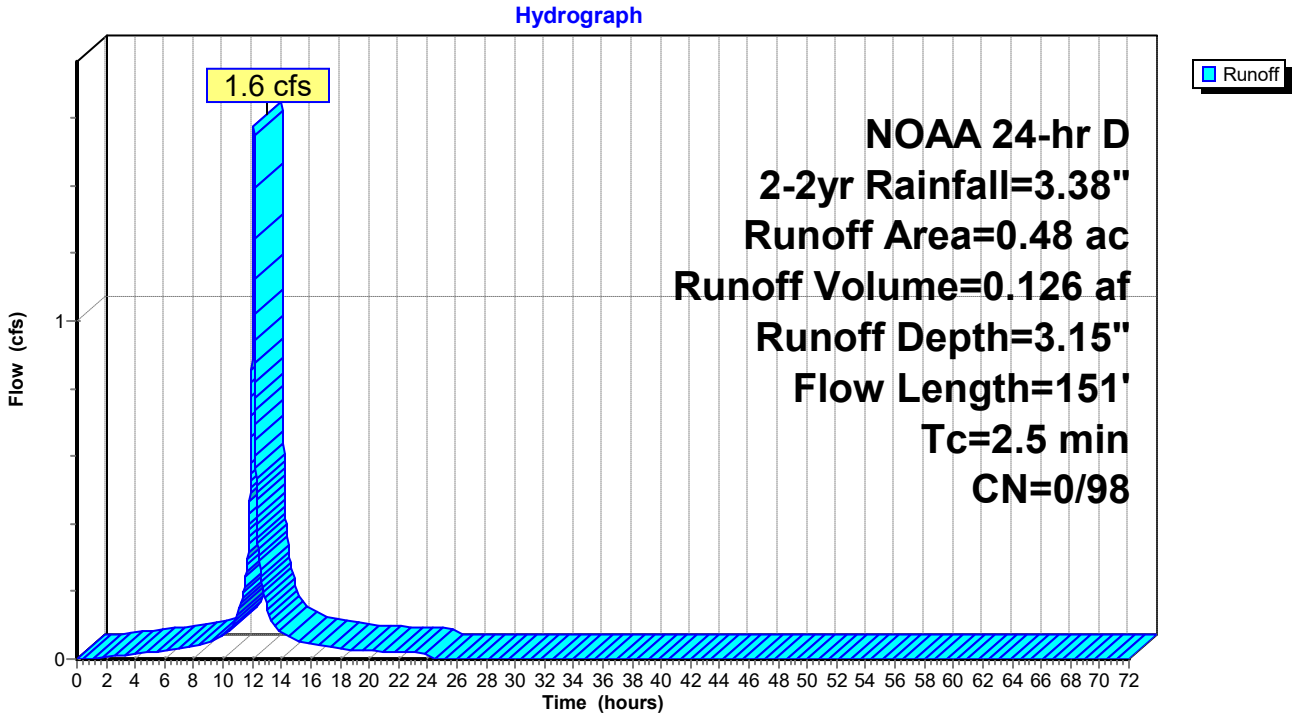
Runoff = 1.6 cfs @ 12.11 hrs, Volume= 0.126 af, Depth= 3.15"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-2yr Rainfall=3.38"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

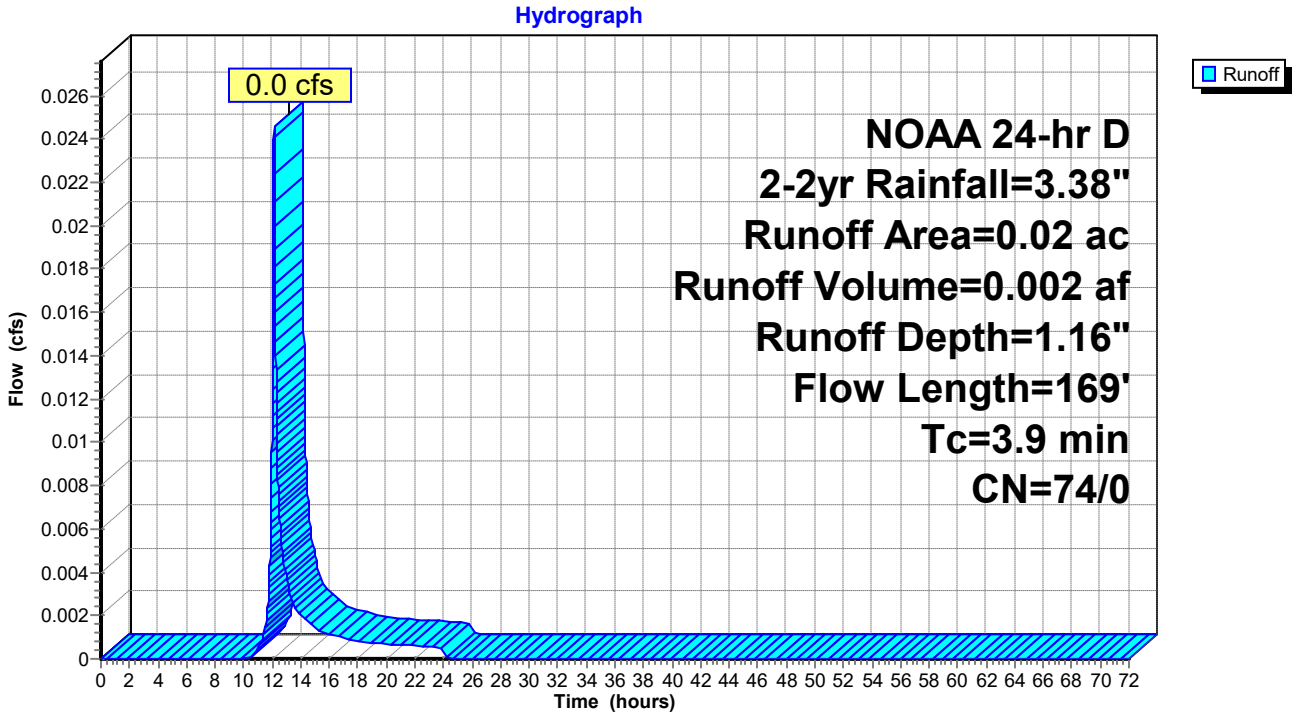
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.002 af, Depth= 1.16"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-2yr Rainfall=3.38"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

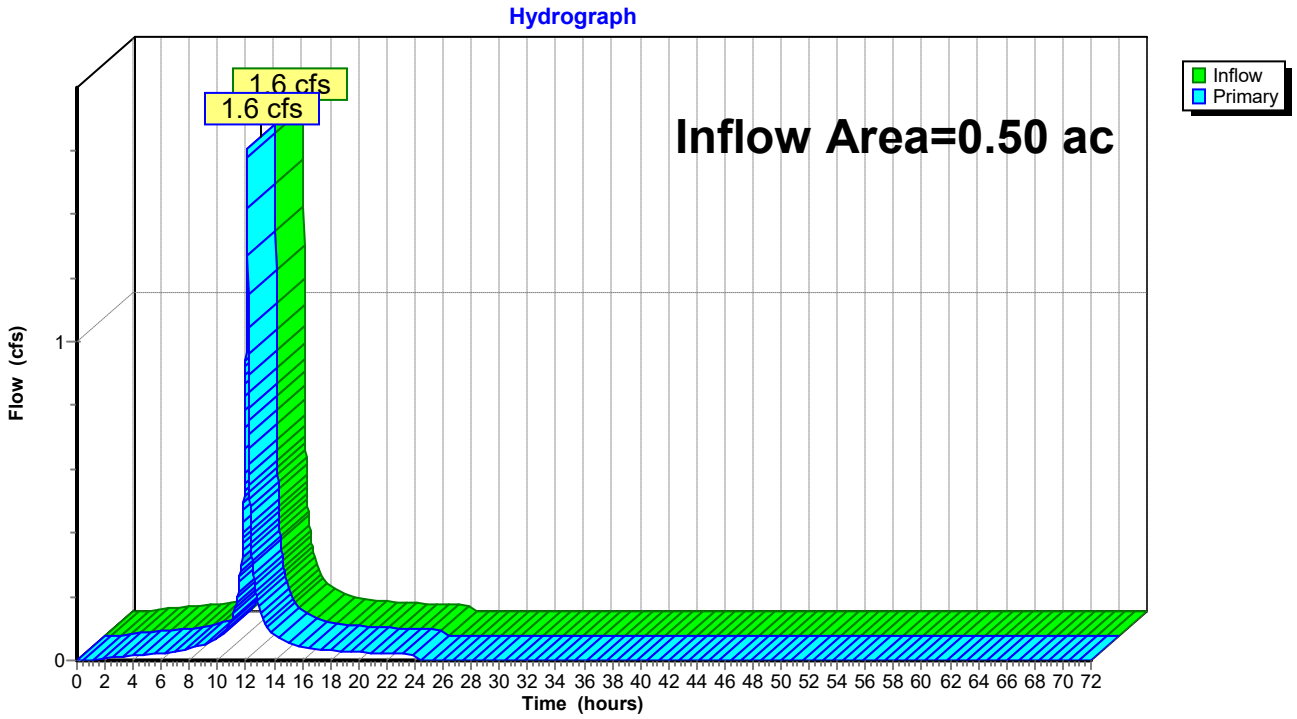


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 3.07" for 2-2yr event
Inflow = 1.6 cfs @ 12.11 hrs, Volume= 0.128 af
Primary = 1.6 cfs @ 12.11 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=5.04"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=2.5 cfs 0.202 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=2.59"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.1 cfs 0.004 af

Link EA3: River House Parking Areas Inflow=2.5 cfs 0.206 af
Primary=2.5 cfs 0.206 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.206 af Average Runoff Depth = 4.94"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

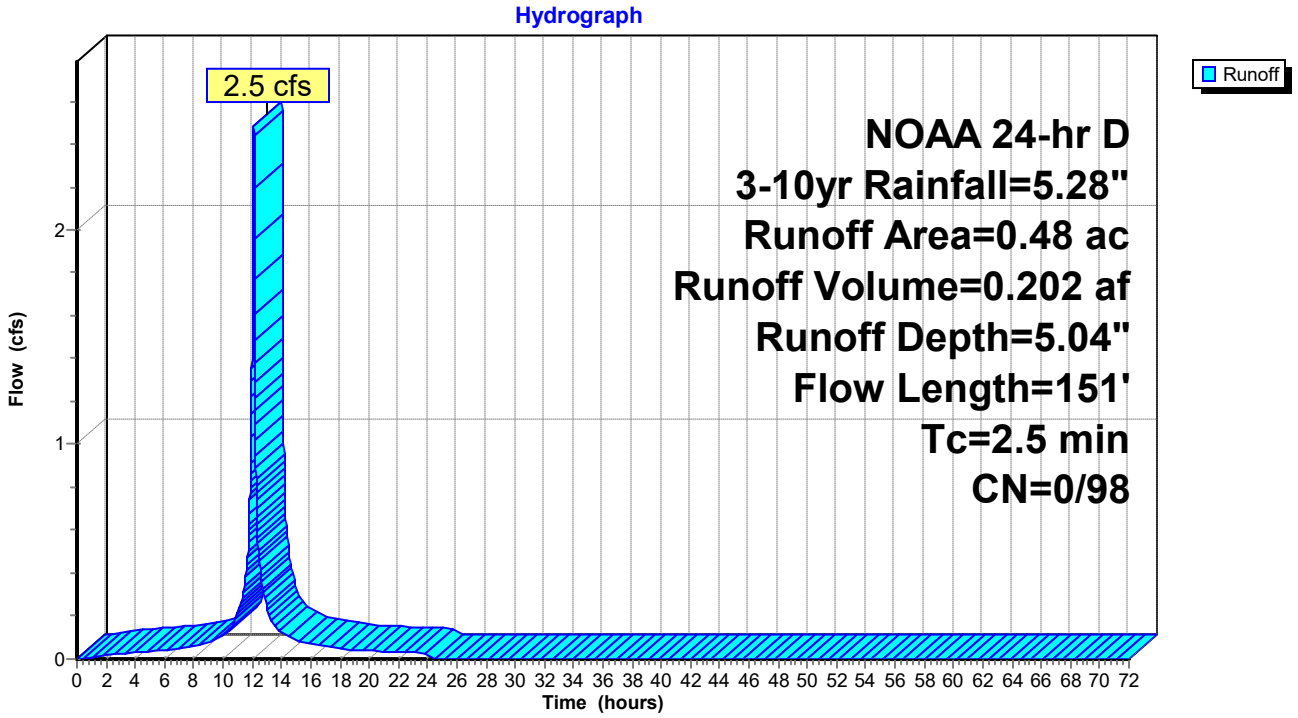
Runoff = 2.5 cfs @ 12.11 hrs, Volume= 0.202 af, Depth= 5.04"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 3-10yr Rainfall=5.28"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

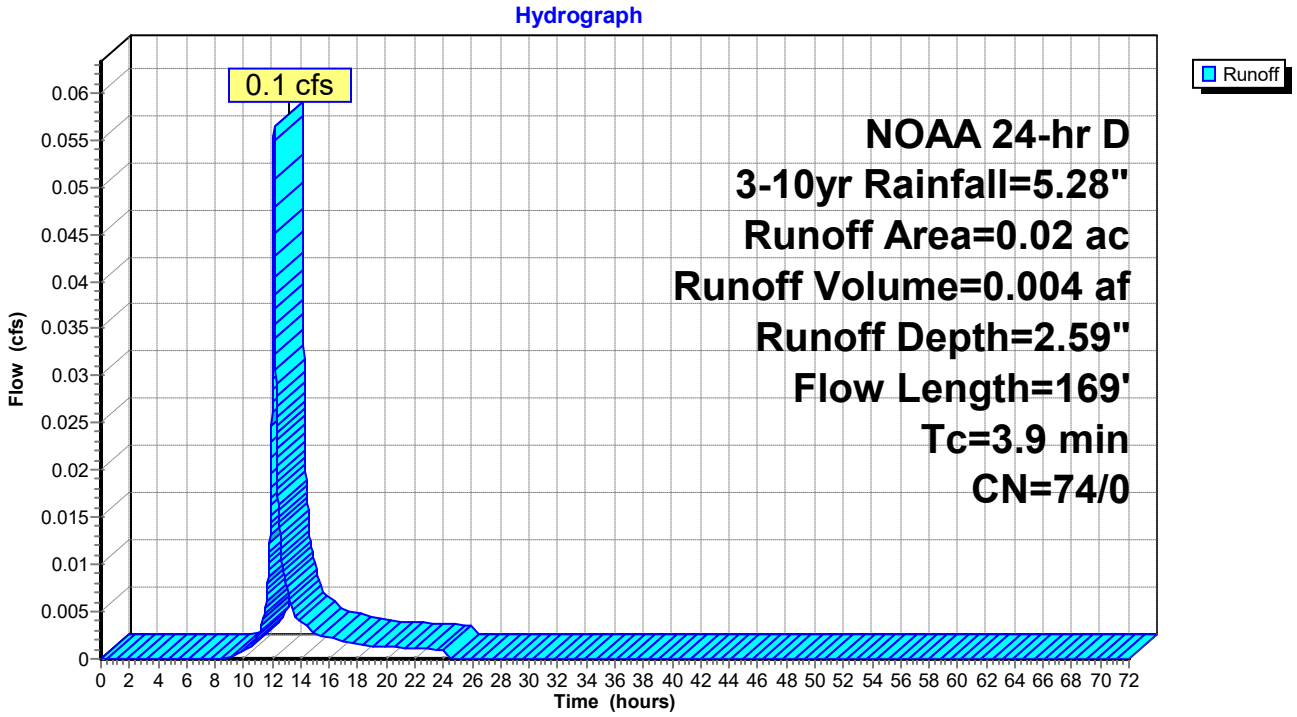
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.004 af, Depth= 2.59"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 3-10yr Rainfall=5.28"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

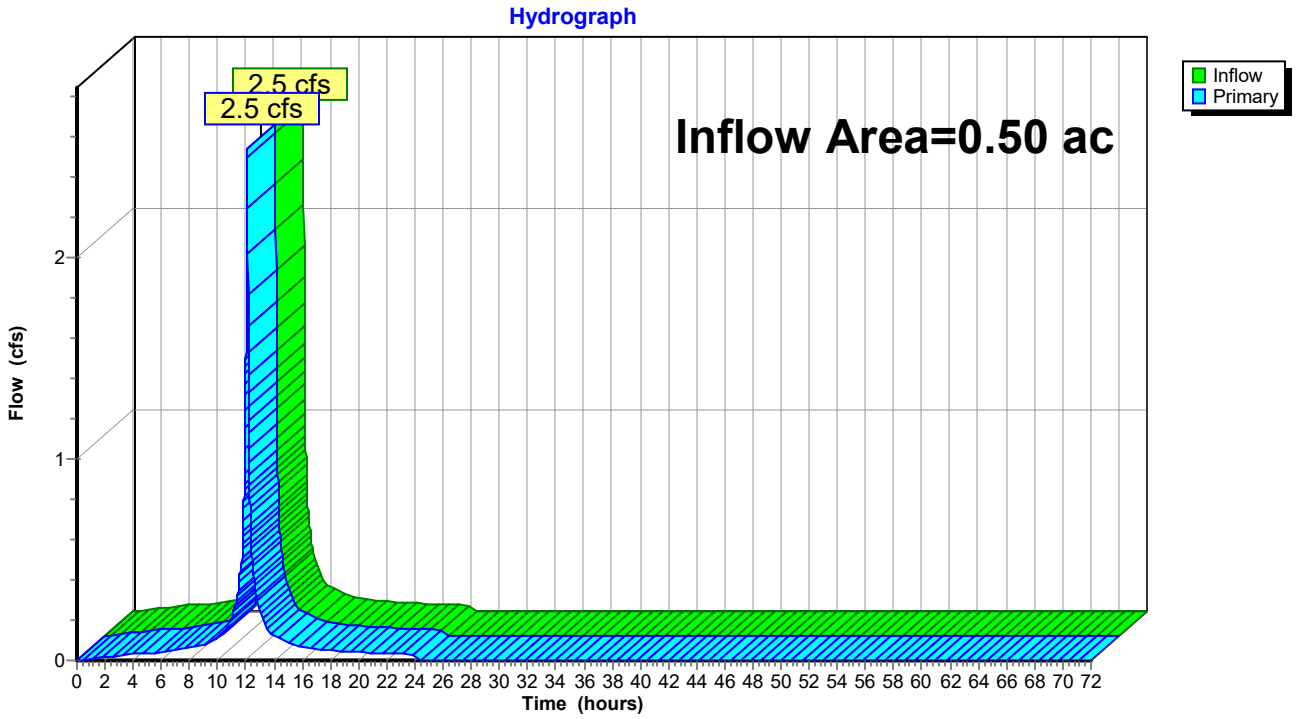


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 4.94" for 3-10yr event
Inflow = 2.5 cfs @ 12.11 hrs, Volume= 0.206 af
Primary = 2.5 cfs @ 12.11 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=6.29"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=3.1 cfs 0.252 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=3.64"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.1 cfs 0.006 af

Link EA3: River House Parking Areas Inflow=3.2 cfs 0.258 af
Primary=3.2 cfs 0.258 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.258 af Average Runoff Depth = 6.19"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

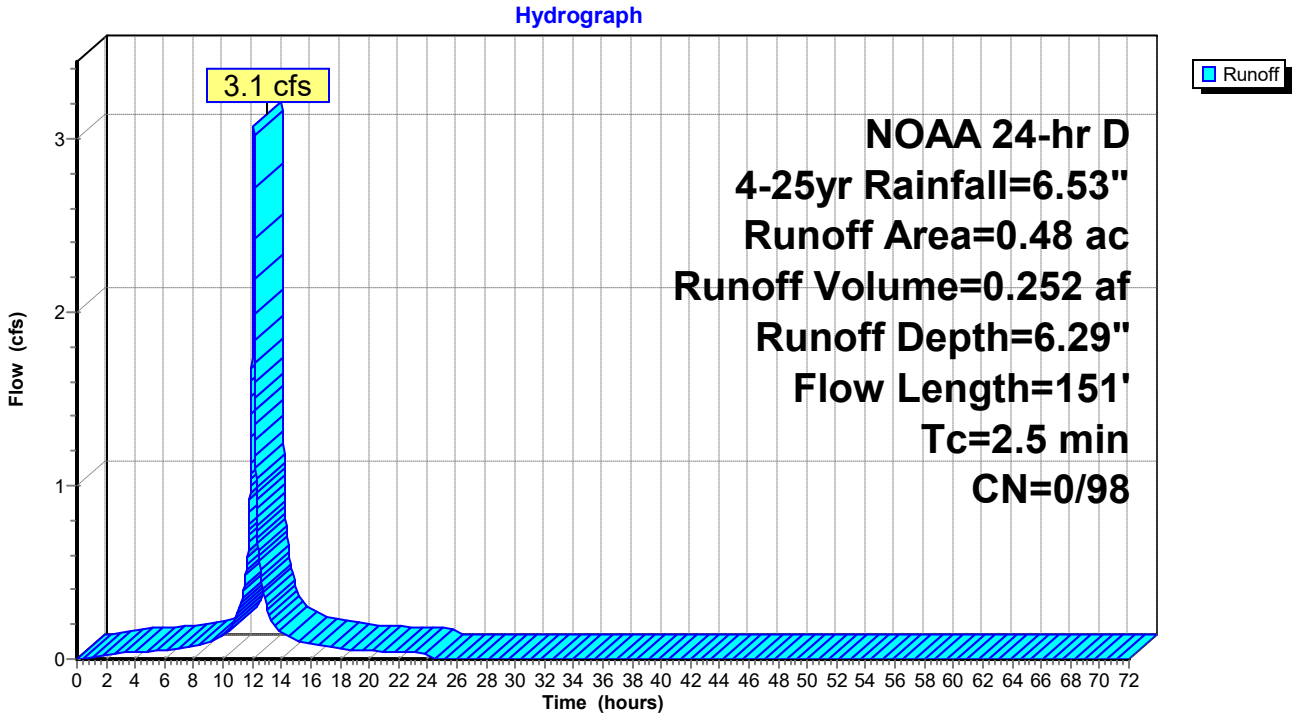
Runoff = 3.1 cfs @ 12.11 hrs, Volume= 0.252 af, Depth= 6.29"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 4-25yr Rainfall=6.53"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

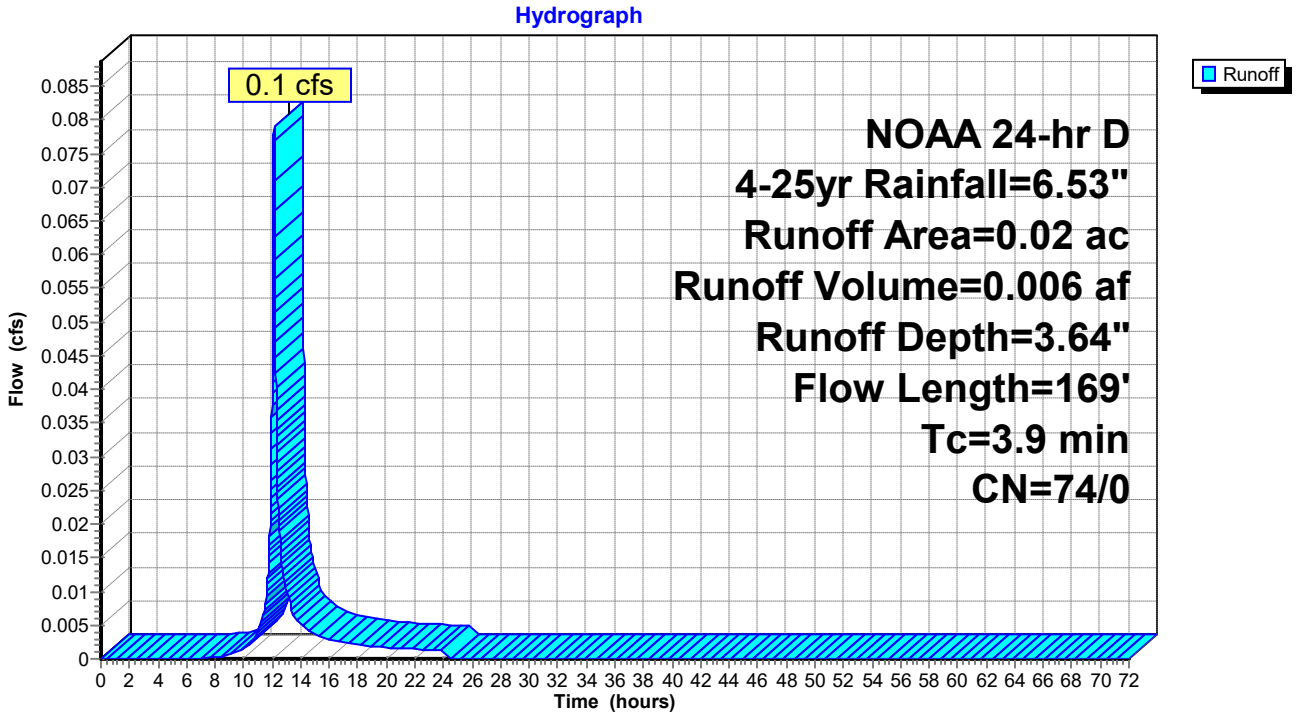
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.006 af, Depth= 3.64"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 4-25yr Rainfall=6.53"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

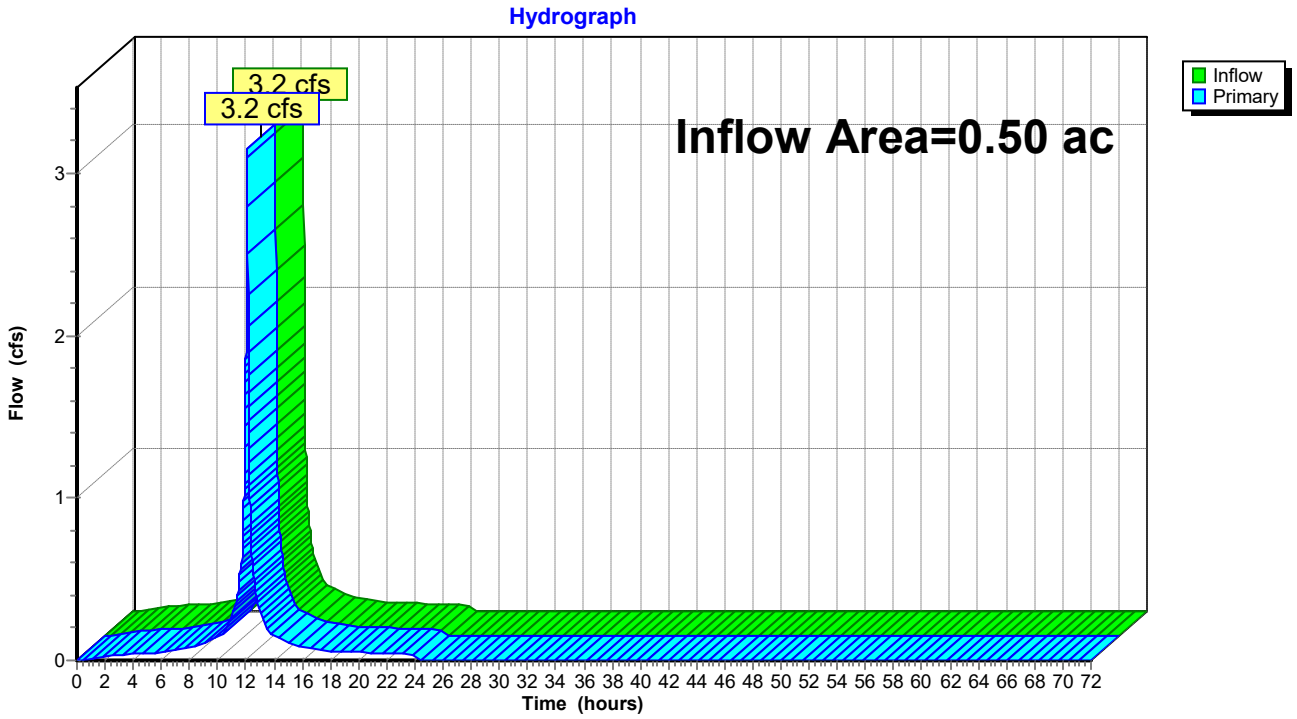


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 6.19" for 4-25yr event
Inflow = 3.2 cfs @ 12.11 hrs, Volume= 0.258 af
Primary = 3.2 cfs @ 12.11 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=8.88"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=4.3 cfs 0.355 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=5.94"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.1 cfs 0.010 af

Link EA3: River House Parking Areas Inflow=4.4 cfs 0.365 af
Primary=4.4 cfs 0.365 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.365 af Average Runoff Depth = 8.76"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

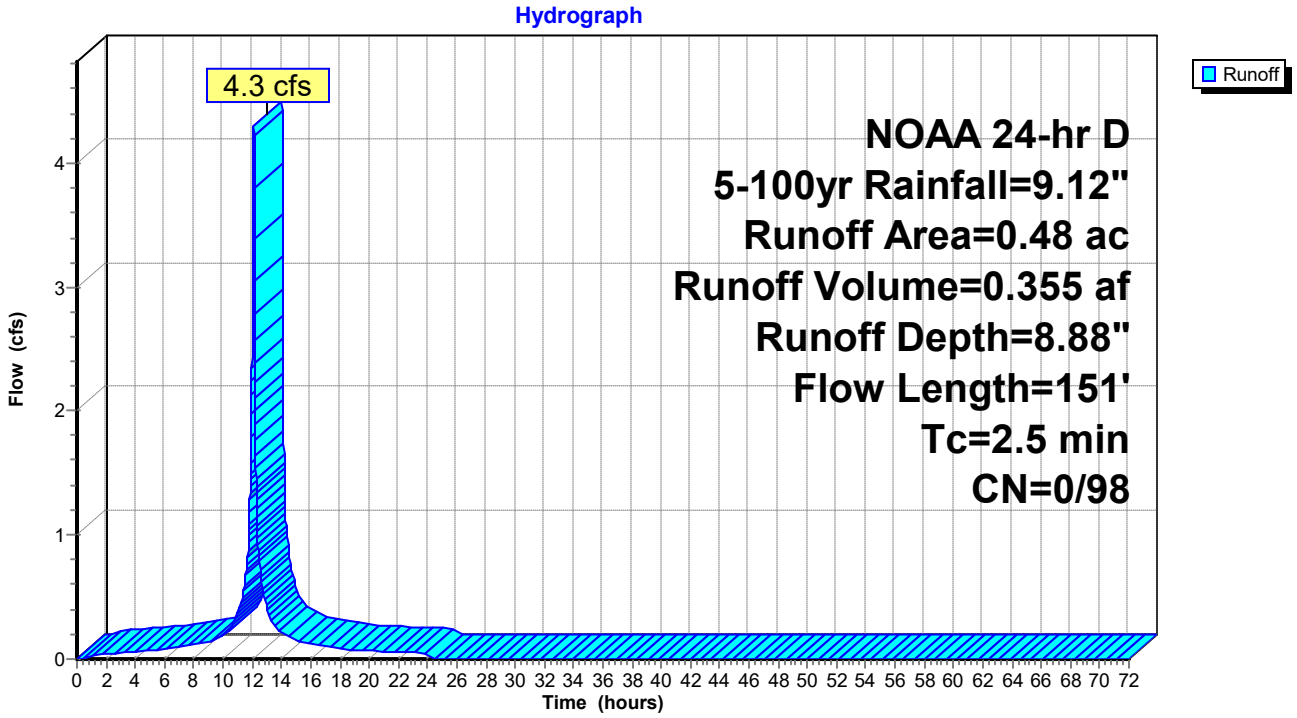
Runoff = 4.3 cfs @ 12.11 hrs, Volume= 0.355 af, Depth= 8.88"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 5-100yr Rainfall=9.12"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

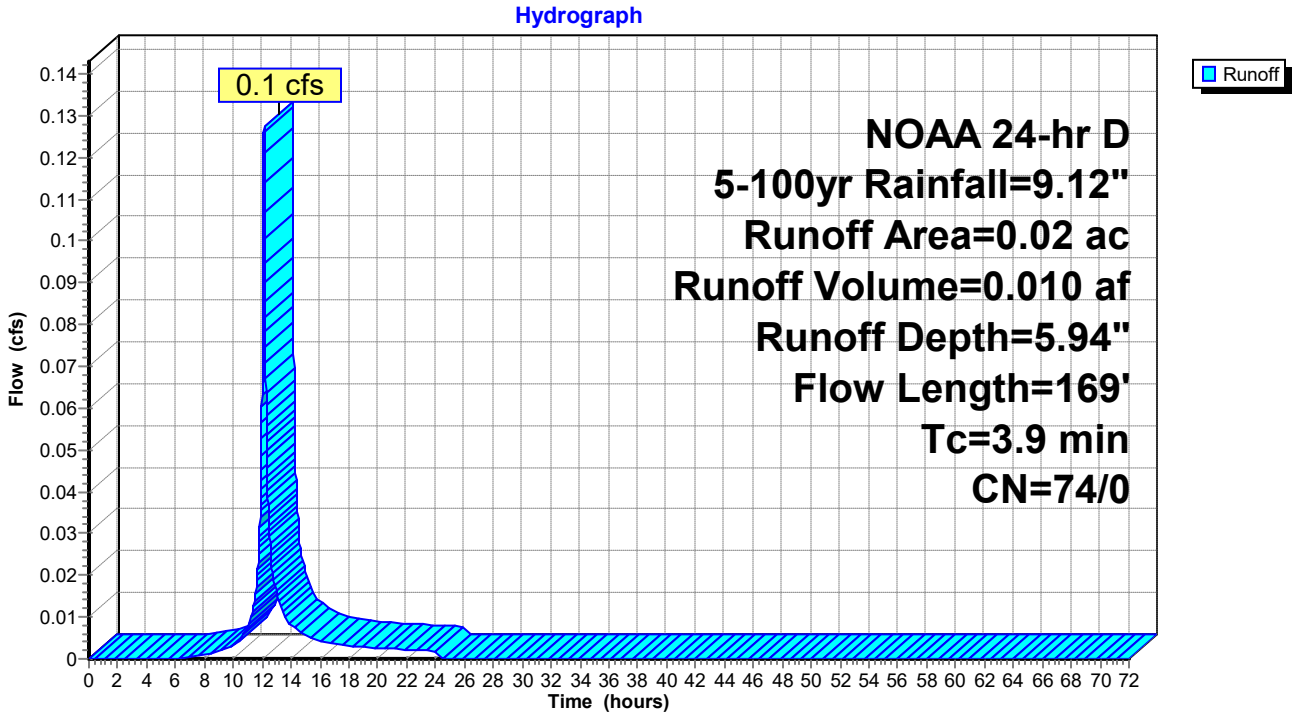
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.010 af, Depth= 5.94"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 5-100yr Rainfall=9.12"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

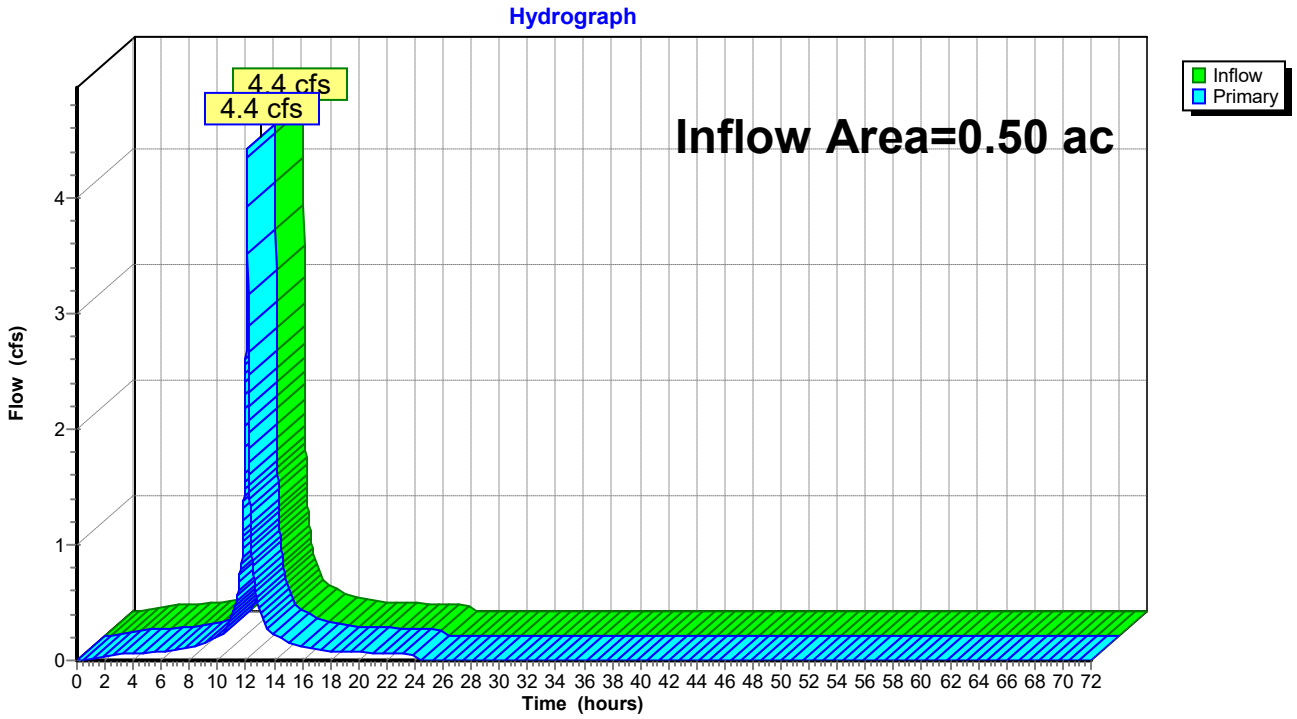


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 8.76" for 5-100yr event
Inflow = 4.4 cfs @ 12.11 hrs, Volume= 0.365 af
Primary = 4.4 cfs @ 12.11 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=3.79"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=1.9 cfs 0.151 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=1.61"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.0 cfs 0.003 af

Link EA3: River House Parking Areas Inflow=1.9 cfs 0.154 af
Primary=1.9 cfs 0.154 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.154 af Average Runoff Depth = 3.70"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

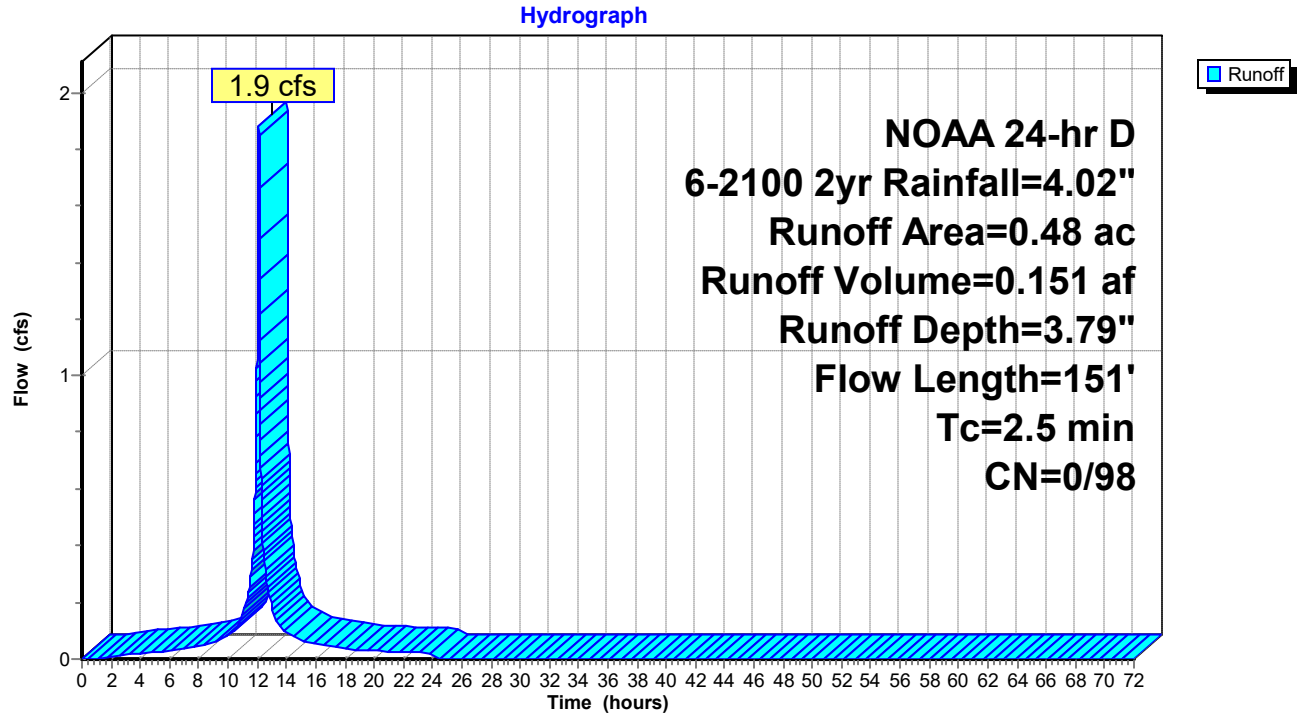
Runoff = 1.9 cfs @ 12.11 hrs, Volume= 0.151 af, Depth= 3.79"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 6-2100 2yr Rainfall=4.02"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

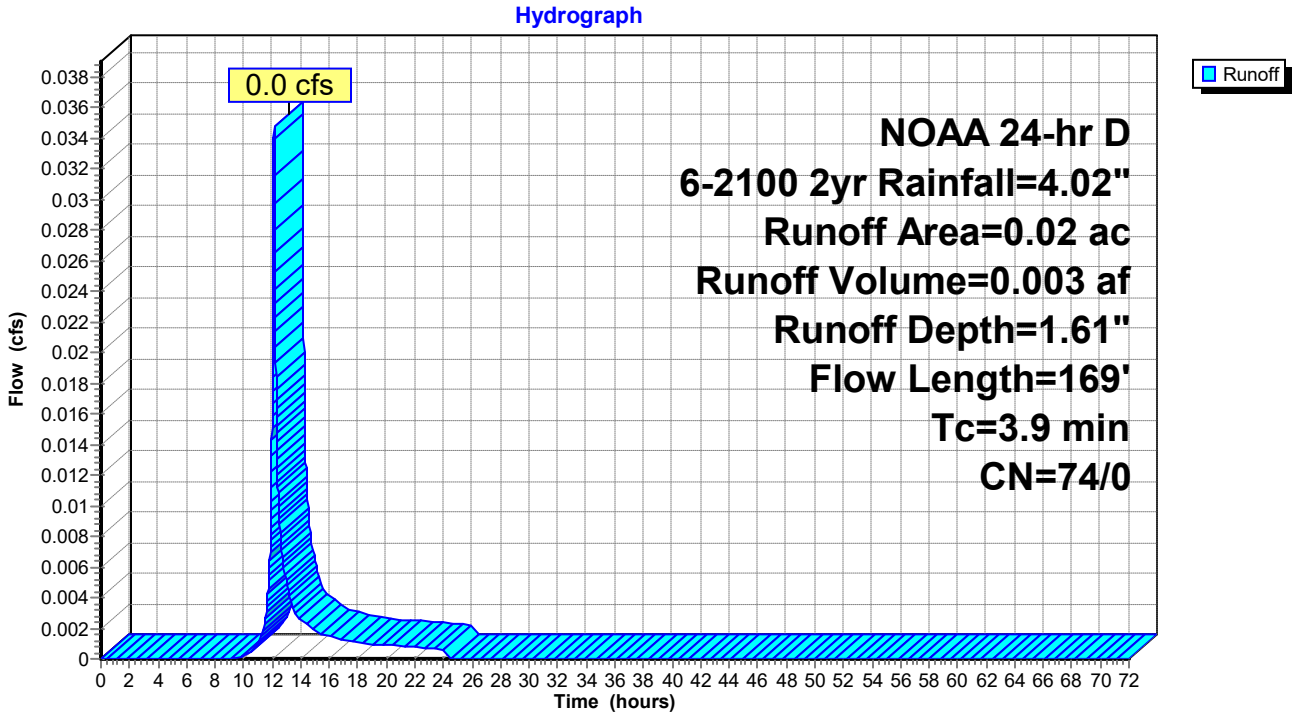
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.003 af, Depth= 1.61"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 6-2100 2yr Rainfall=4.02"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

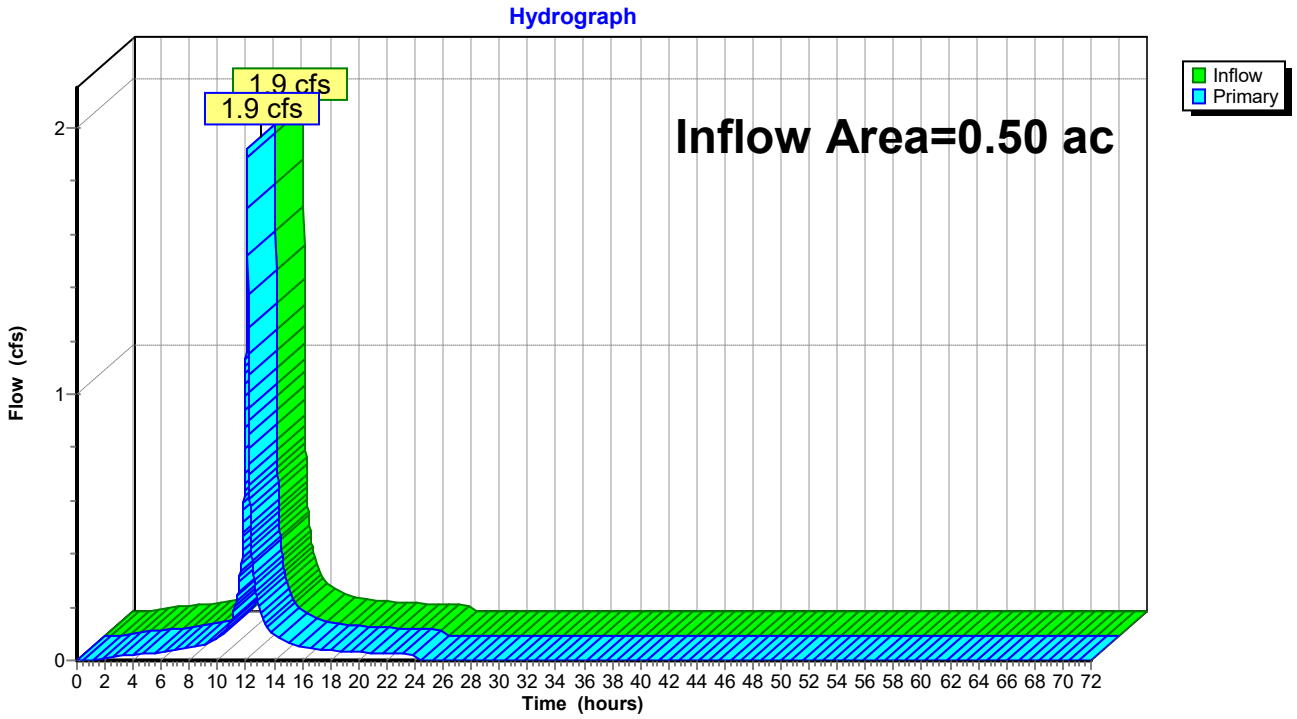


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 3.70" for 6-2100 2yr event
Inflow = 1.9 cfs @ 12.11 hrs, Volume= 0.154 af
Primary = 1.9 cfs @ 12.11 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=5.98"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=2.9 cfs 0.239 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=3.37"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.1 cfs 0.006 af

Link EA3: River House Parking Areas Inflow=3.0 cfs 0.245 af
Primary=3.0 cfs 0.245 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.245 af Average Runoff Depth = 5.88"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

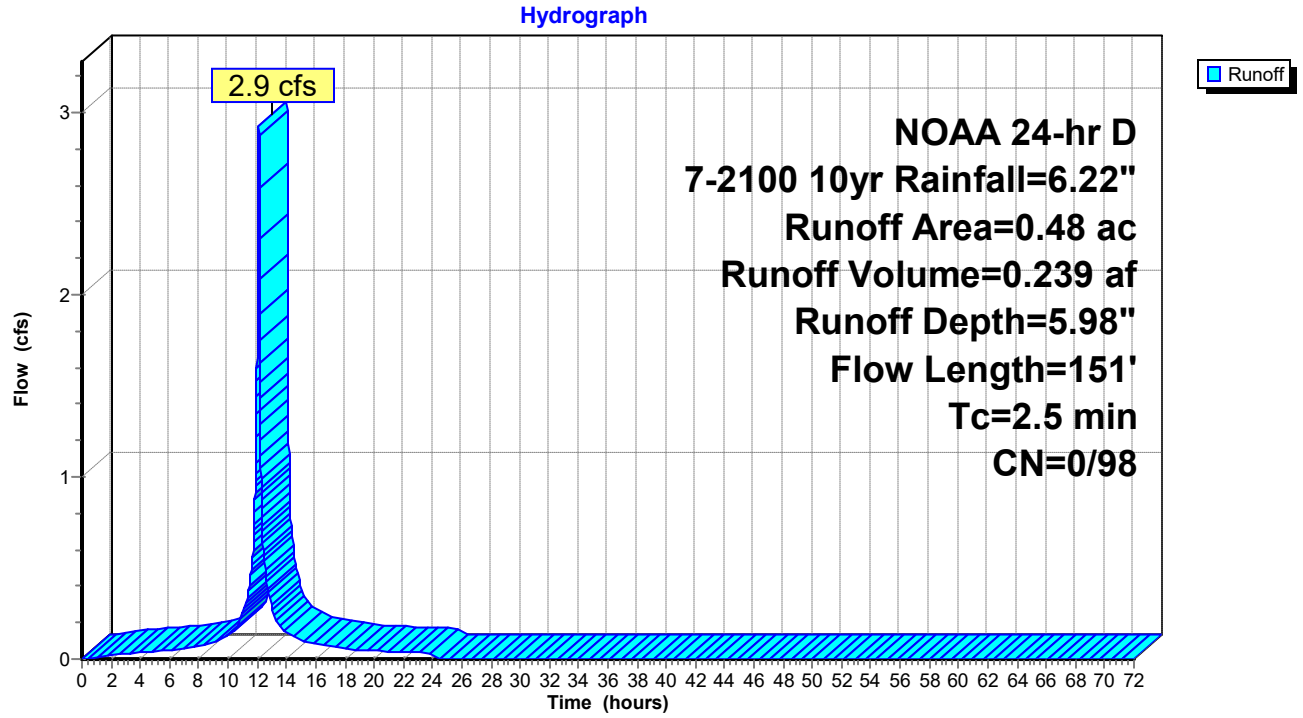
Runoff = 2.9 cfs @ 12.11 hrs, Volume= 0.239 af, Depth= 5.98"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 7-2100 10yr Rainfall=6.22"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

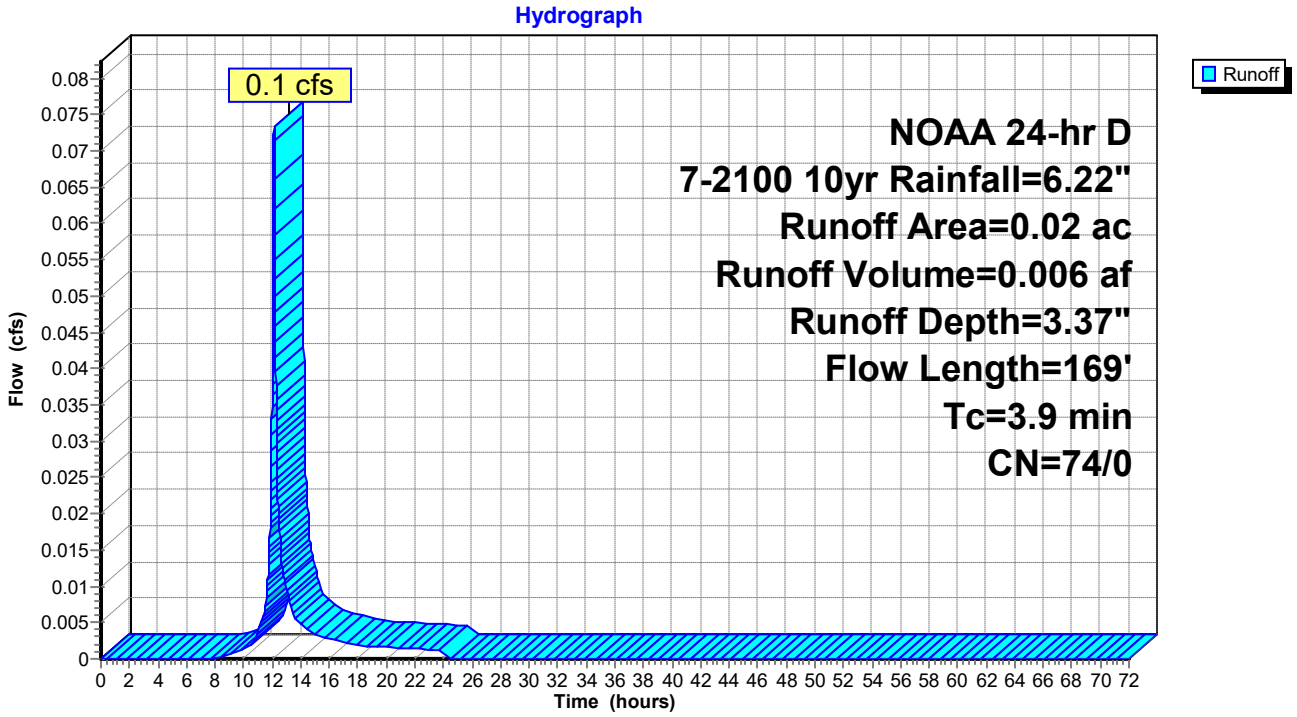
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.006 af, Depth= 3.37"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 7-2100 10yr Rainfall=6.22"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

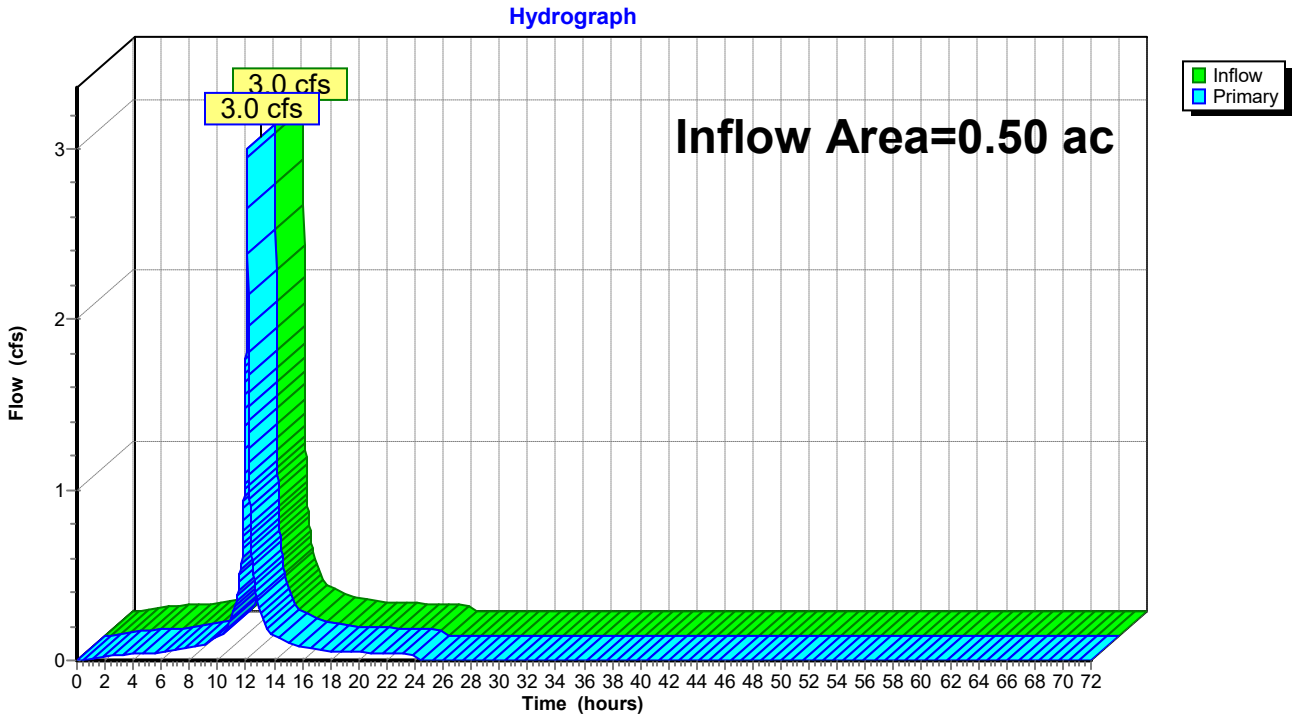


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 5.88" for 7-2100 10yr event
Inflow = 3.0 cfs @ 12.11 hrs, Volume= 0.245 af
Primary = 3.0 cfs @ 12.11 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EA3i: Impervious Runoff Area=0.48 ac 100.00% Impervious Runoff Depth=11.02"
Flow Length=151' Tc=2.5 min CN=0/98 Runoff=5.3 cfs 0.441 af

Subcatchment EA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=7.92"
Flow Length=169' Tc=3.9 min CN=74/0 Runoff=0.2 cfs 0.013 af

Link EA3: River House Parking Areas Inflow=5.5 cfs 0.454 af
Primary=5.5 cfs 0.454 af

Total Runoff Area = 0.50 ac Runoff Volume = 0.454 af Average Runoff Depth = 10.89"
4.00% Pervious = 0.02 ac 96.00% Impervious = 0.48 ac

Summary for Subcatchment EA3i: Impervious

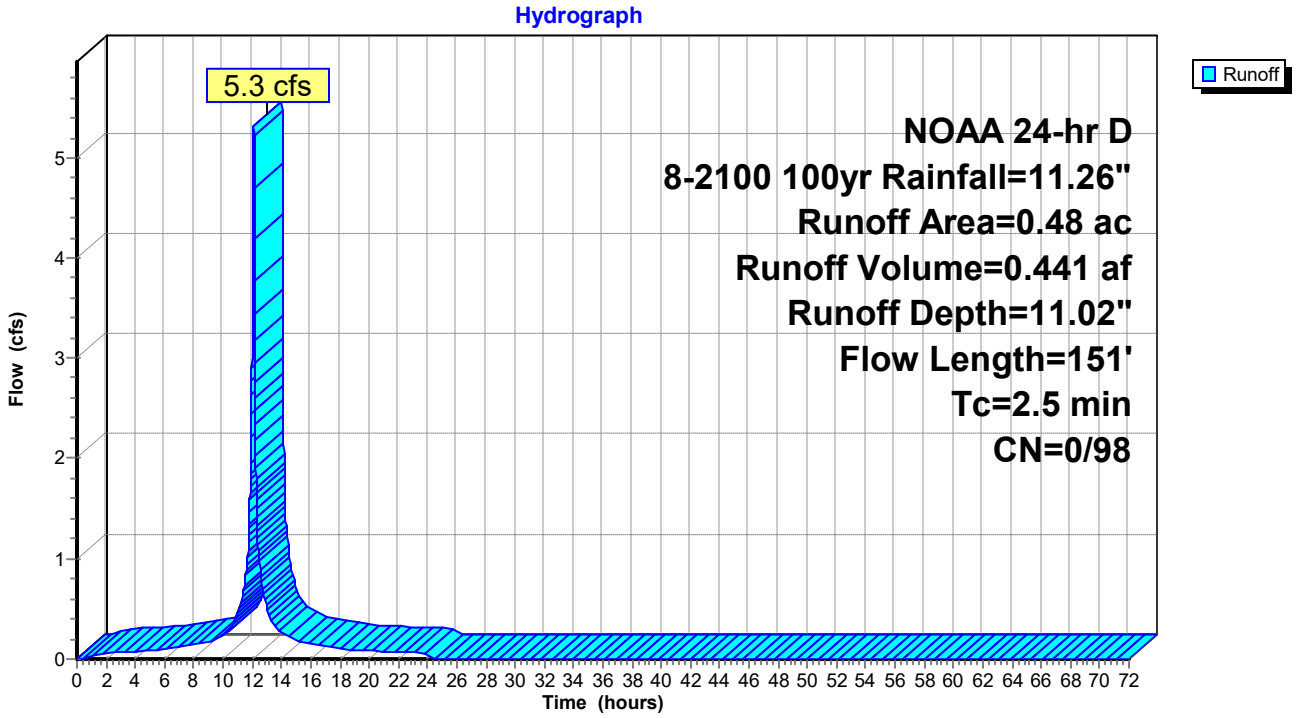
Runoff = 5.3 cfs @ 12.11 hrs, Volume= 0.441 af, Depth=11.02"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 8-2100 100yr Rainfall=11.26"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG C
0.48	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
0.9	51	0.0020	0.91		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
2.5	151	Total			

Subcatchment EA3i: Impervious



Summary for Subcatchment EA3p: Pervious

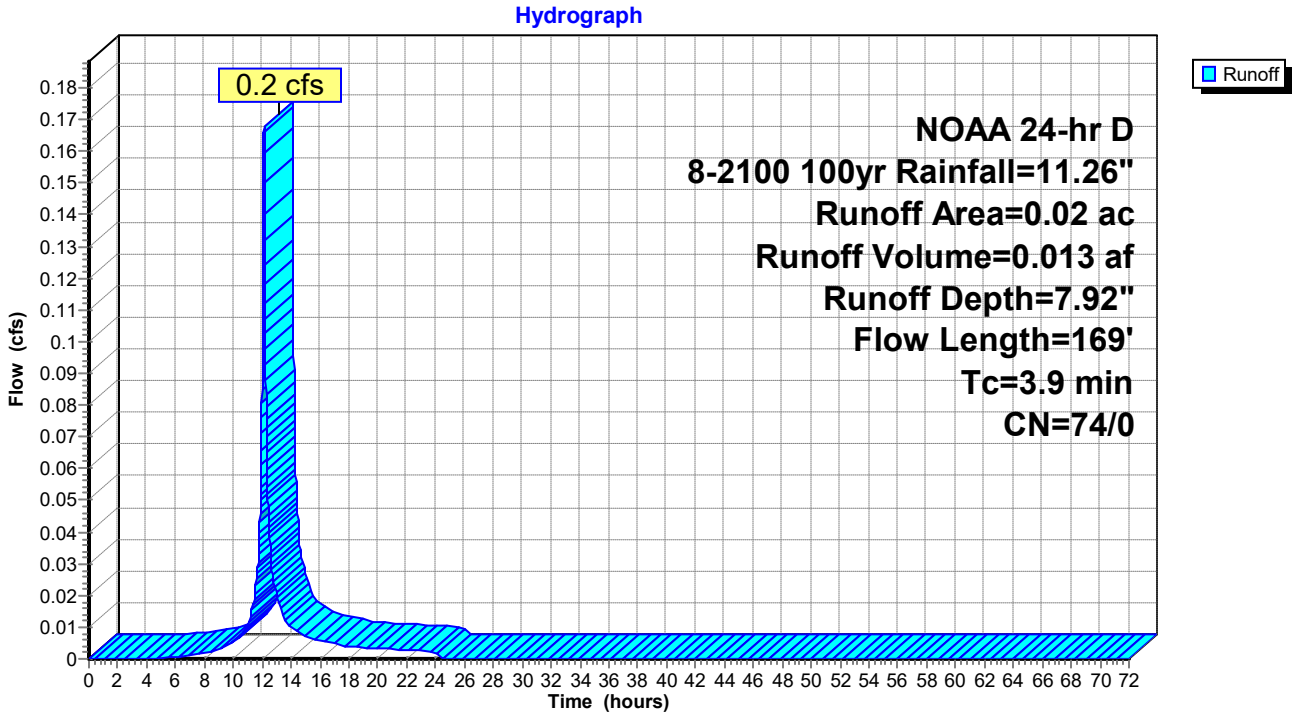
Runoff = 0.2 cfs @ 12.12 hrs, Volume= 0.013 af, Depth= 7.92"
Routed to Link EA3 : River House Parking Areas

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 8-2100 100yr Rainfall=11.26"

Area (ac)	CN	Description
0.02	74	>75% Grass cover, Good, HSG C
0.02	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	18	0.0560	0.19		**Sheet Flow, 5.8 - 4.8** Grass: Short n= 0.150 P2= 3.40"
1.3	82	0.0110	1.07		**Sheet Flow, 4.8 - 3.9** Smooth surfaces n= 0.011 P2= 3.40"
1.0	69	0.0030	1.11		**Shallow Concentrated Flow, 3.9 - 3.7** Paved Kv= 20.3 fps
3.9	169	Total			

Subcatchment EA3p: Pervious

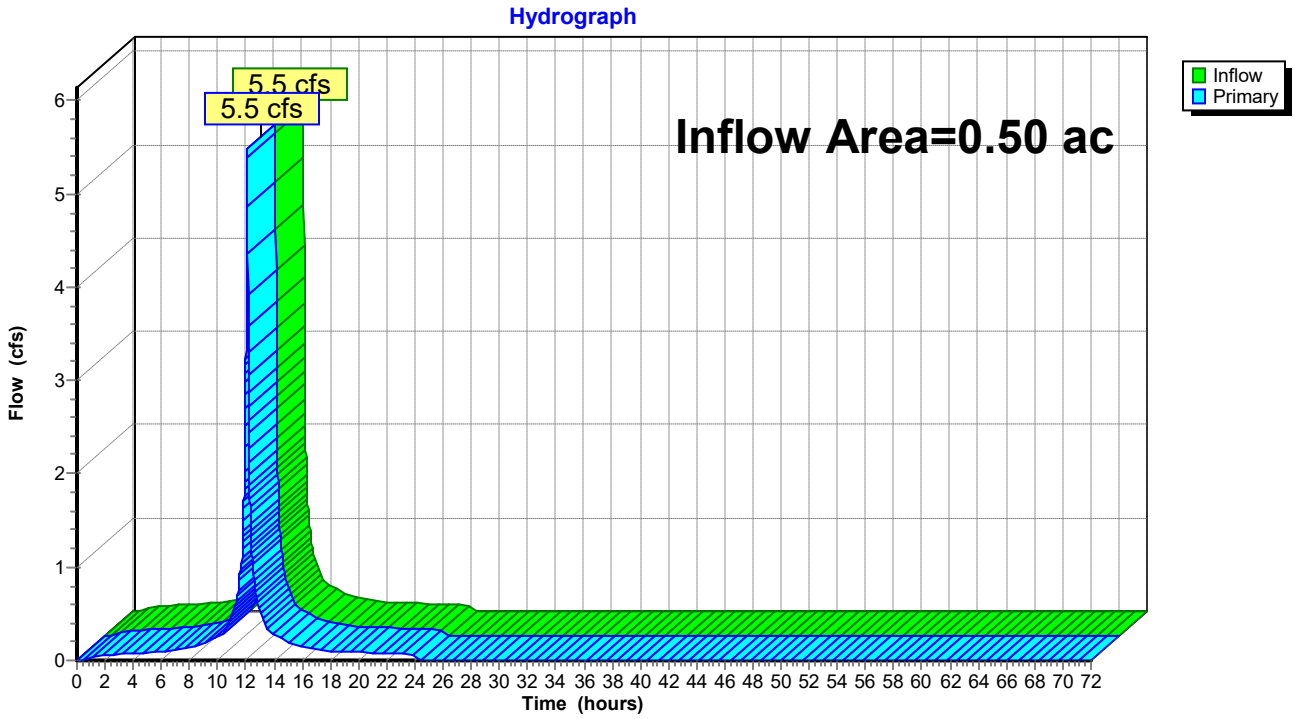


Summary for Link EA3: River House Parking Areas

Inflow Area = 0.50 ac, 96.00% Impervious, Inflow Depth = 10.89" for 8-2100 100yr event
Inflow = 5.5 cfs @ 12.11 hrs, Volume= 0.454 af
Primary = 5.5 cfs @ 12.11 hrs, Volume= 0.454 af, Atten= 0%, Lag= 0.0 min

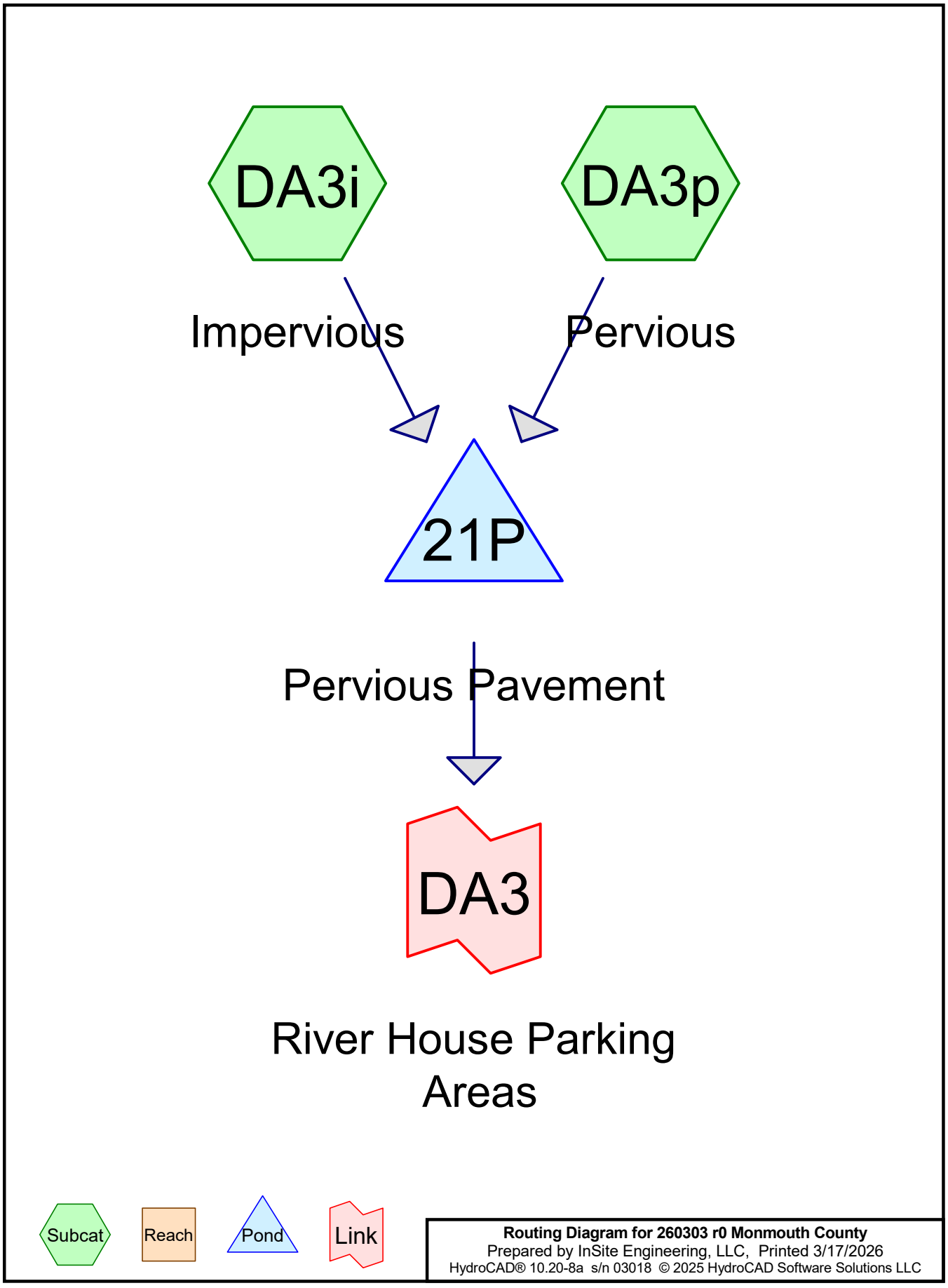
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link EA3: River House Parking Areas



APPENDIX D

Post-Development Flow Calculations



Routing Diagram for 260303 r0 Monmouth County
Prepared by InSite Engineering, LLC, Printed 3/17/2026
HydroCAD® 10.20-8a s/n 03018 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=1.03"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=1.4 cfs 0.042 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.0 cfs 0.000 af

Pond 21P: Pervious Pavement Peak Elev=1.79' Storage=1,627 cf Inflow=1.4 cfs 0.042 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.1 cfs 0.038 af

Link DA3: River House Parking Areas Inflow=0.1 cfs 0.038 af
Primary=0.1 cfs 0.038 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.042 af Average Runoff Depth = 0.99"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

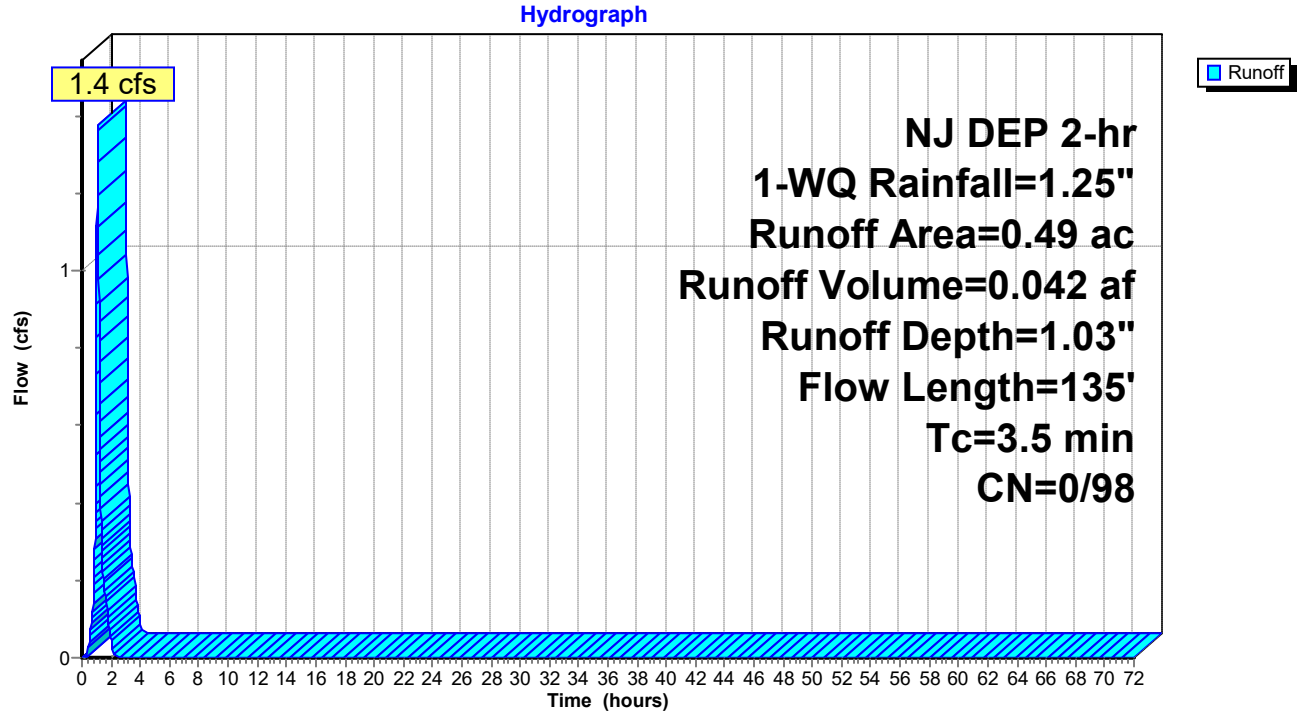
Runoff = 1.4 cfs @ 1.10 hrs, Volume= 0.042 af, Depth= 1.03"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1-WQ Rainfall=1.25"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

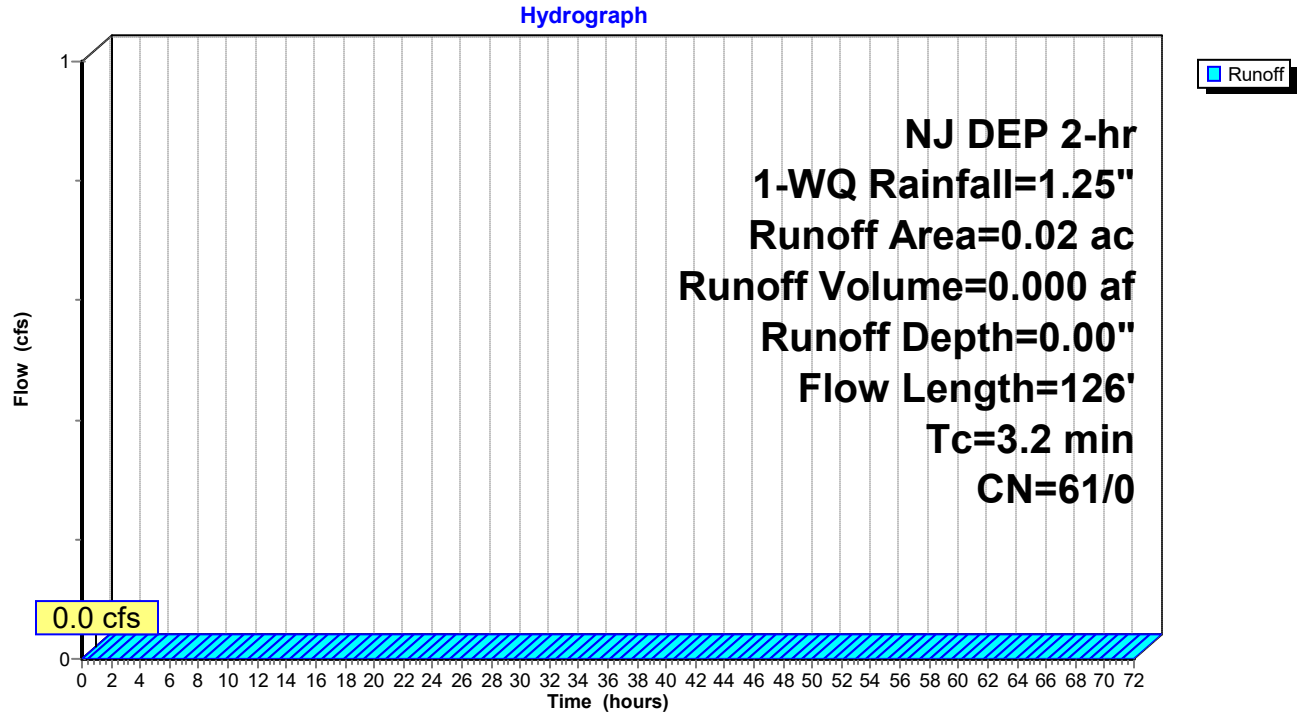
Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1-WQ Rainfall=1.25"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 0.99" for 1-WQ event
Inflow = 1.4 cfs @ 1.10 hrs, Volume= 0.042 af
Outflow = 0.1 cfs @ 1.86 hrs, Volume= 0.038 af, Atten= 95%, Lag= 45.9 min
Primary = 0.1 cfs @ 1.86 hrs, Volume= 0.038 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 1.79' @ 1.86 hrs Surf.Area= 21,060 sf Storage= 1,627 cf

Plug-Flow detention time= 623.3 min calculated for 0.038 af (91% of inflow)
Center-of-Mass det. time= 620.1 min (690.2 - 70.1)

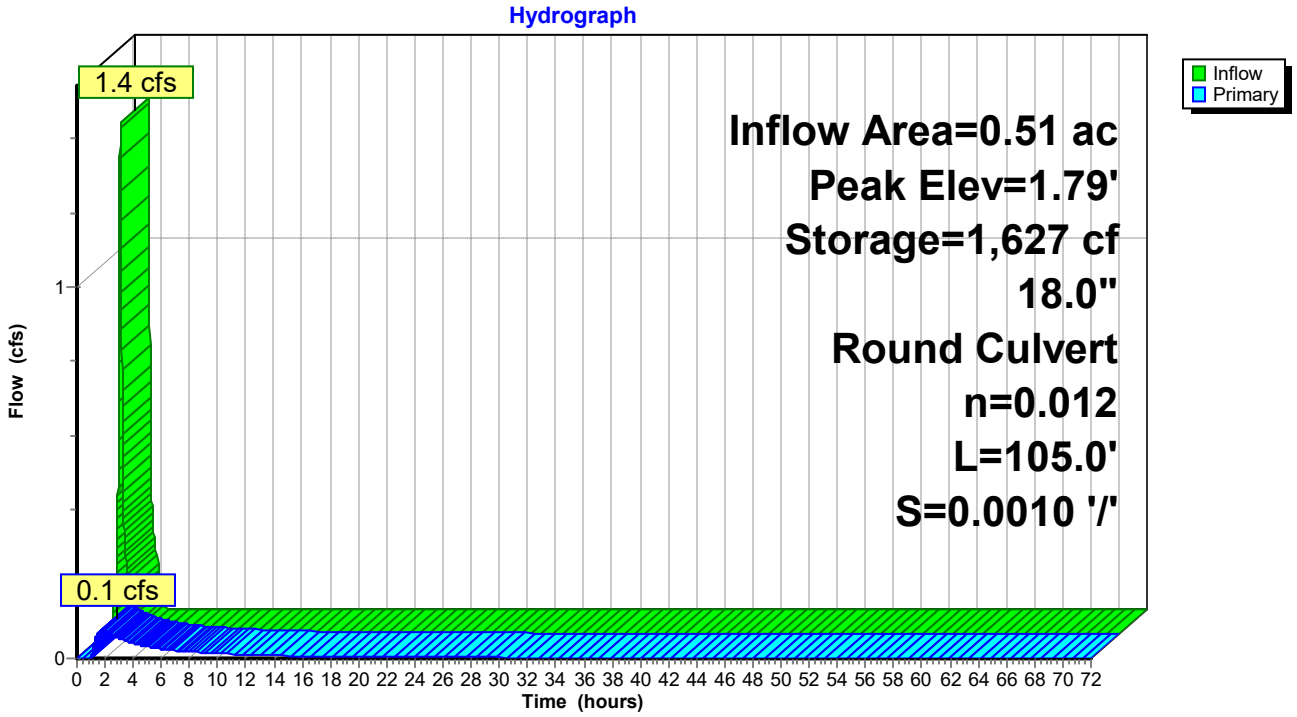
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.1 cfs @ 1.86 hrs HW=1.79' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.1 cfs @ 0.88 fps)

Pond 21P: Pervious Pavement

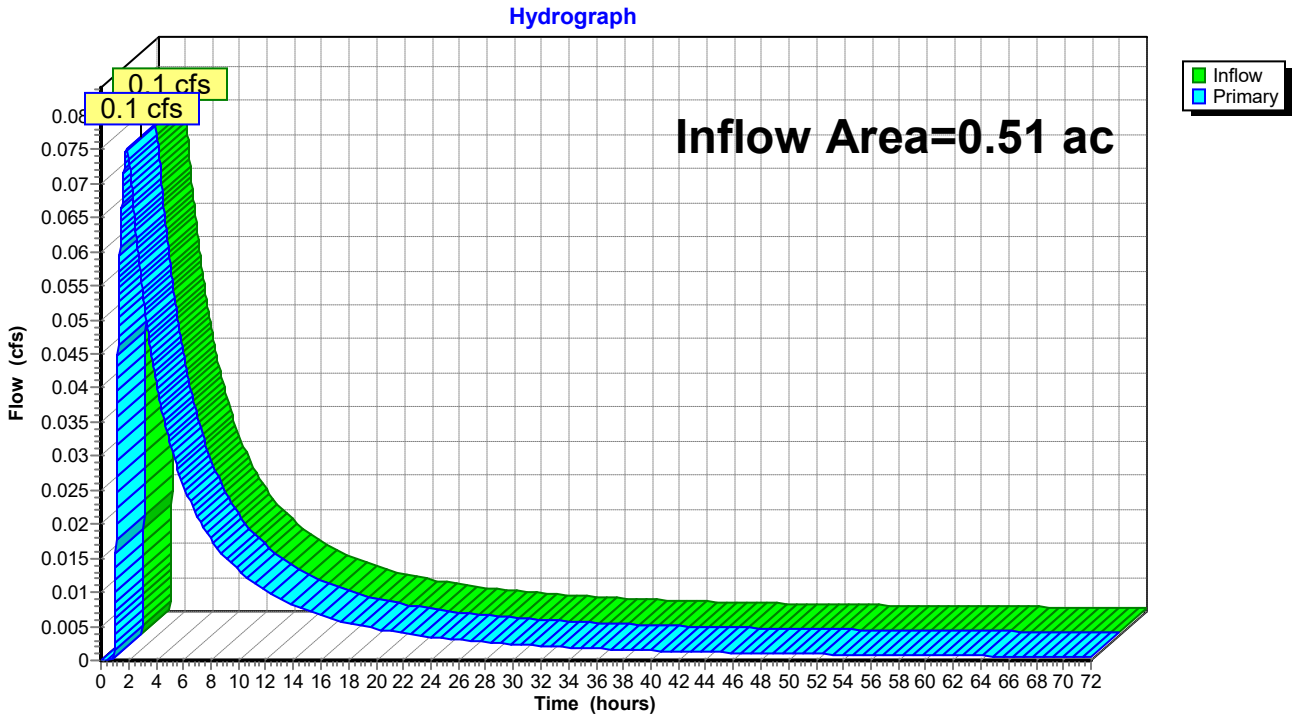


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 0.90" for 1-WQ event
Inflow = 0.1 cfs @ 1.86 hrs, Volume= 0.038 af
Primary = 0.1 cfs @ 1.86 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=3.15"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=1.5 cfs 0.128 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.0 cfs 0.001 af

Pond 21P: Pervious Pavement Peak Elev=1.94' Storage=2,921 cf Inflow=1.5 cfs 0.129 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.3 cfs 0.124 af

Link DA3: River House Parking Areas Inflow=0.3 cfs 0.124 af
Primary=0.3 cfs 0.124 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.129 af Average Runoff Depth = 3.04"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

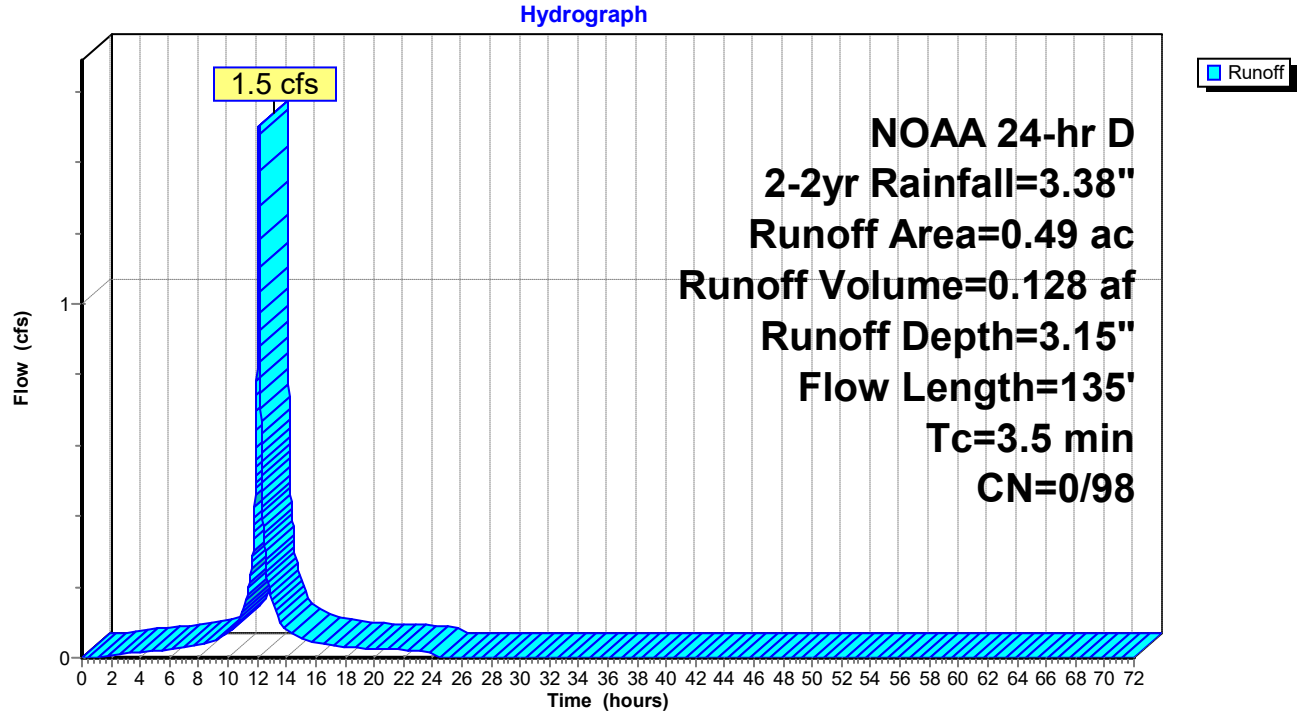
Runoff = 1.5 cfs @ 12.12 hrs, Volume= 0.128 af, Depth= 3.15"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-2yr Rainfall=3.38"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

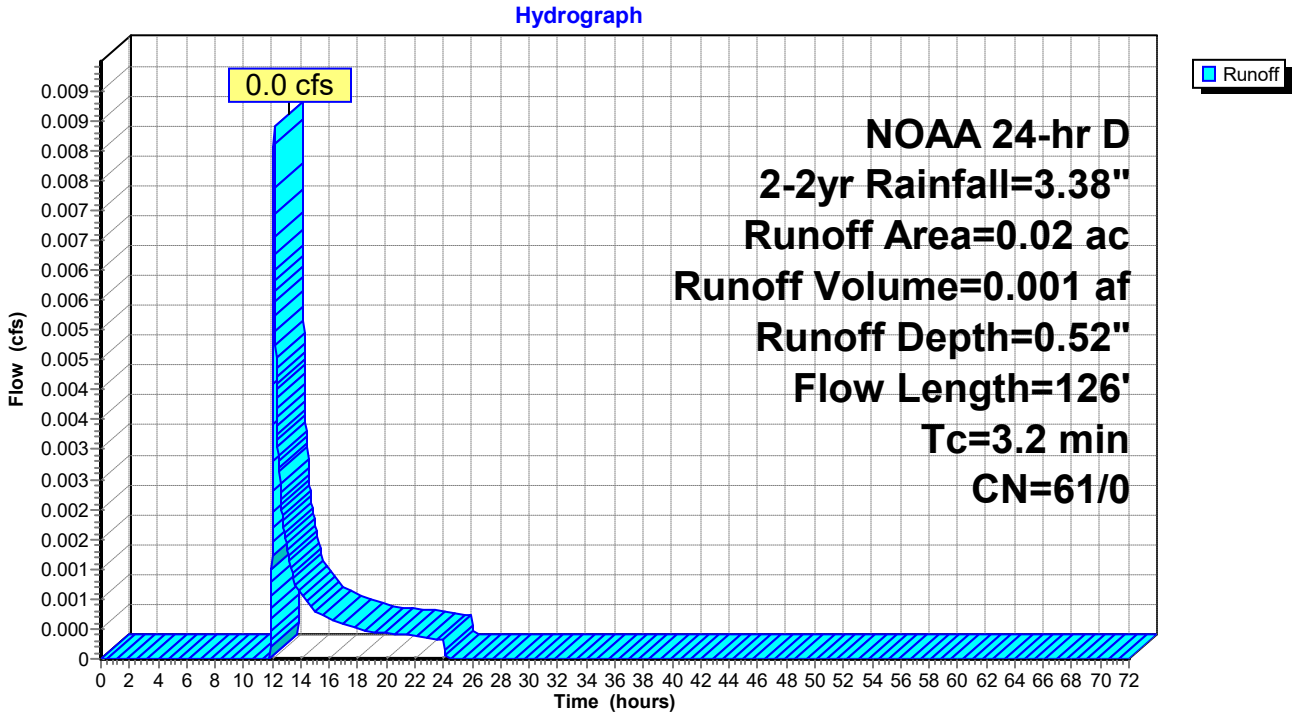
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.001 af, Depth= 0.52"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-2yr Rainfall=3.38"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 3.04" for 2-2yr event
Inflow = 1.5 cfs @ 12.12 hrs, Volume= 0.129 af
Outflow = 0.3 cfs @ 12.58 hrs, Volume= 0.124 af, Atten= 82%, Lag= 27.6 min
Primary = 0.3 cfs @ 12.58 hrs, Volume= 0.124 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 1.94' @ 12.58 hrs Surf.Area= 21,060 sf Storage= 2,921 cf

Plug-Flow detention time= 384.6 min calculated for 0.124 af (96% of inflow)
Center-of-Mass det. time= 360.9 min (1,119.0 - 758.1)

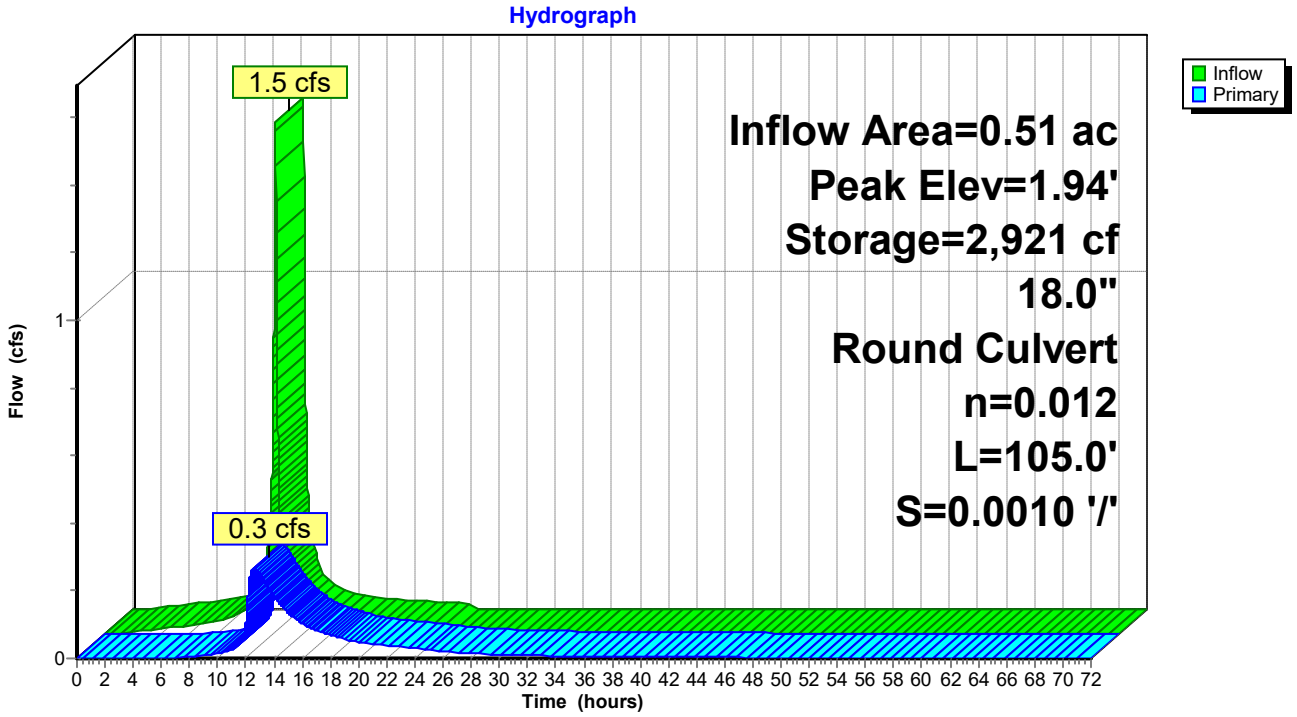
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.3 cfs @ 12.58 hrs HW=1.94' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.3 cfs @ 1.33 fps)

Pond 21P: Pervious Pavement

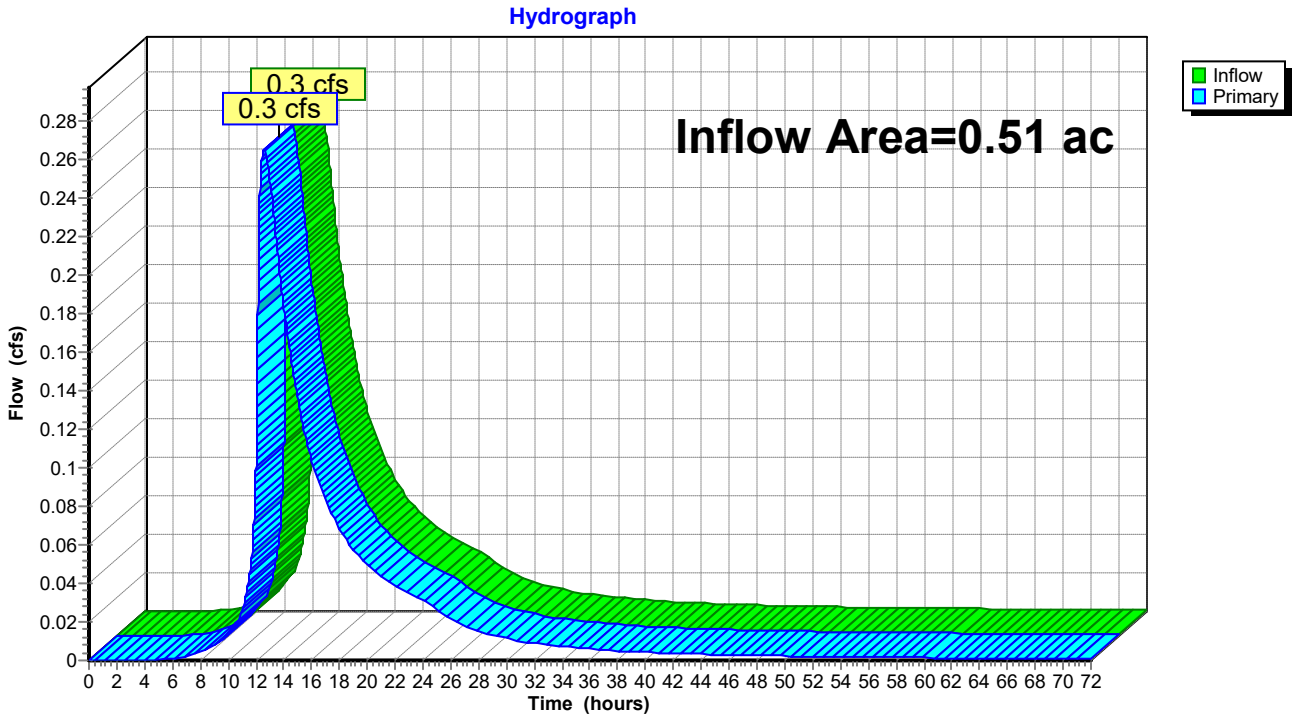


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 2.93" for 2-2yr event
Inflow = 0.3 cfs @ 12.58 hrs, Volume= 0.124 af
Primary = 0.3 cfs @ 12.58 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=5.04"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=2.4 cfs 0.206 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=1.54"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.0 cfs 0.003 af

Pond 21P: Pervious Pavement Peak Elev=2.09' Storage=4,186 cf Inflow=2.4 cfs 0.208 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.6 cfs 0.203 af

Link DA3: River House Parking Areas Inflow=0.6 cfs 0.203 af
Primary=0.6 cfs 0.203 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.208 af Average Runoff Depth = 4.91"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

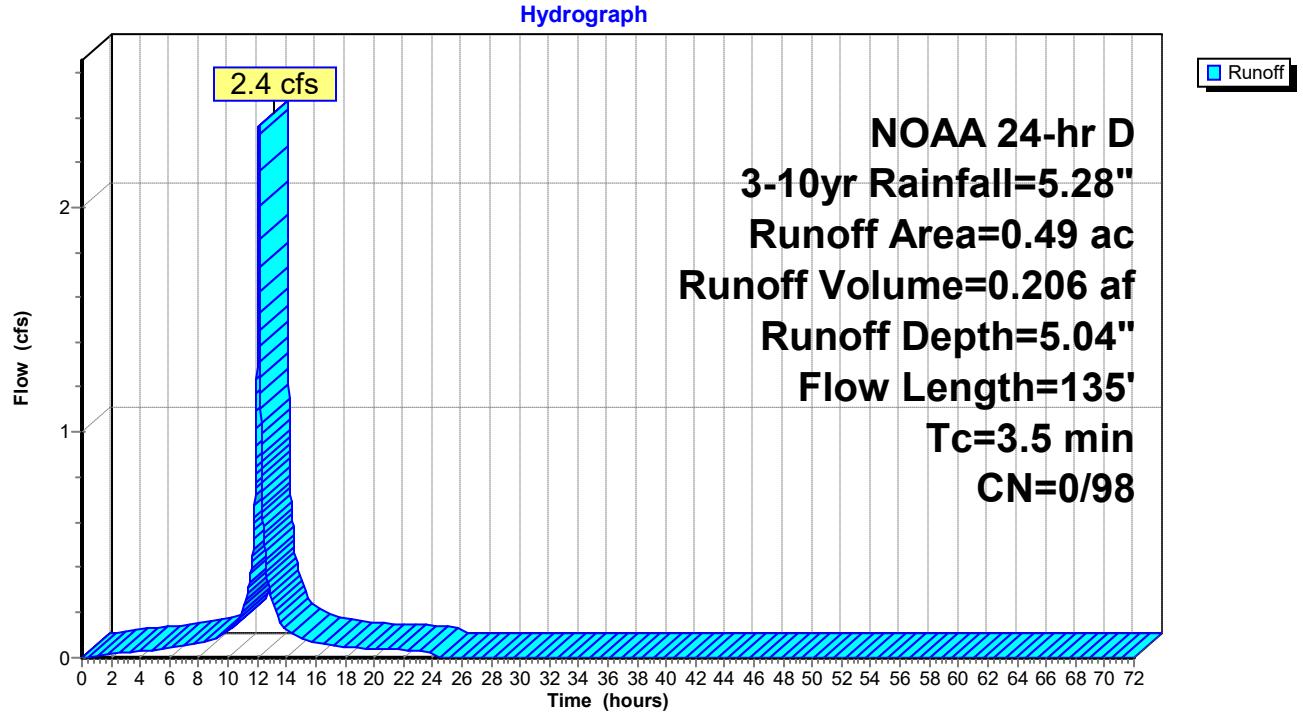
Runoff = 2.4 cfs @ 12.12 hrs, Volume= 0.206 af, Depth= 5.04"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 3-10yr Rainfall=5.28"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

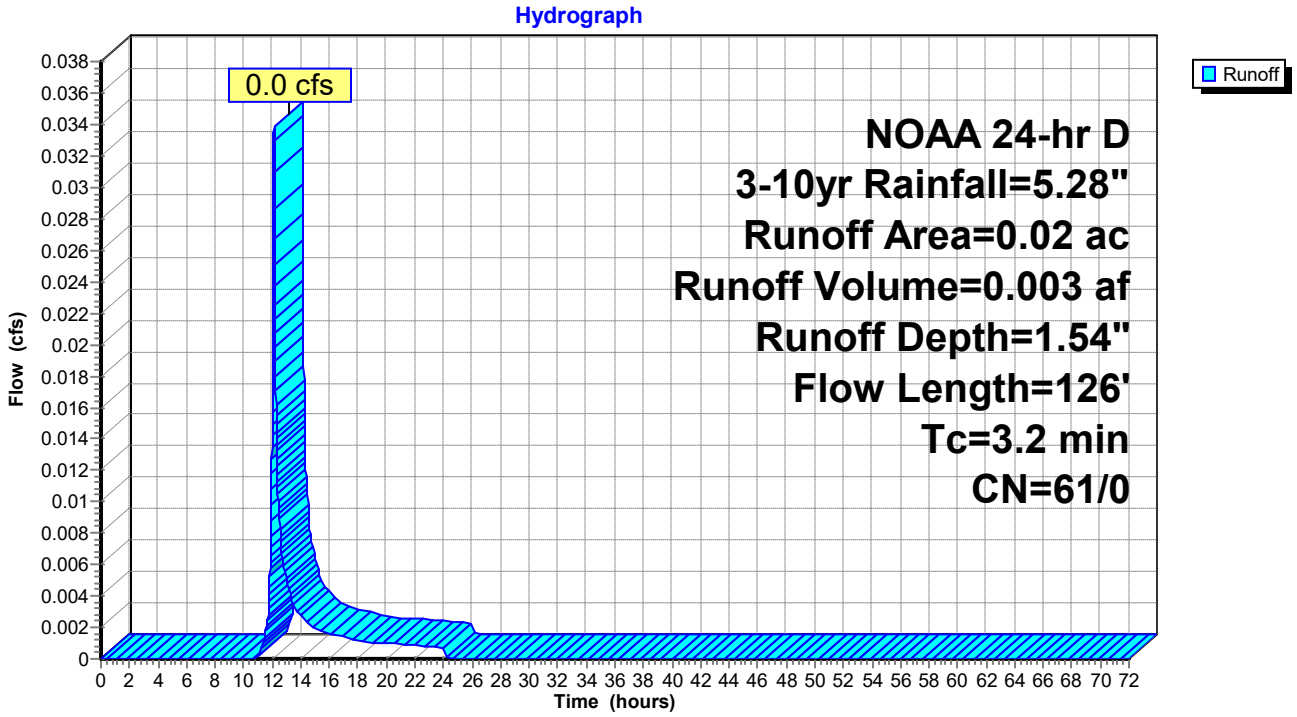
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.003 af, Depth= 1.54"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 3-10yr Rainfall=5.28"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 4.91" for 3-10yr event
Inflow = 2.4 cfs @ 12.12 hrs, Volume= 0.208 af
Outflow = 0.6 cfs @ 12.42 hrs, Volume= 0.203 af, Atten= 76%, Lag= 18.3 min
Primary = 0.6 cfs @ 12.42 hrs, Volume= 0.203 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 2.09' @ 12.42 hrs Surf.Area= 21,060 sf Storage= 4,186 cf

Plug-Flow detention time= 295.9 min calculated for 0.203 af (98% of inflow)
Center-of-Mass det. time= 280.2 min (1,029.9 - 749.8)

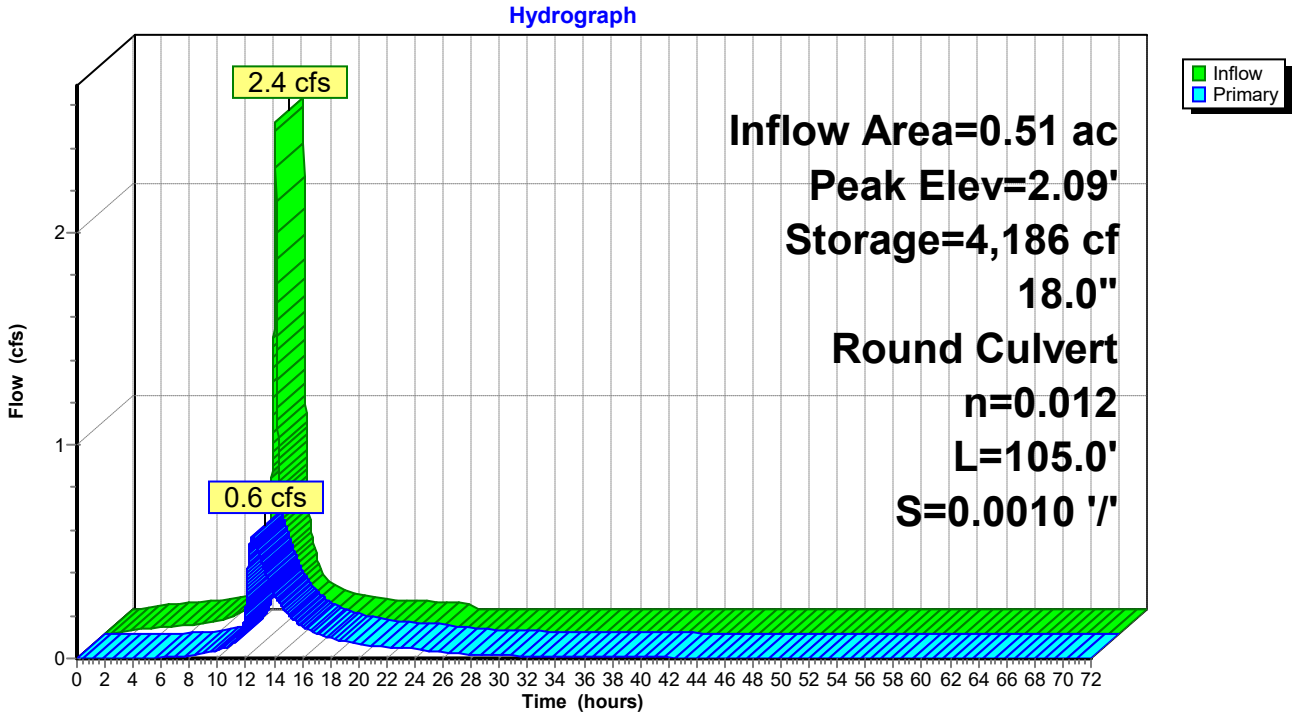
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.6 cfs @ 12.42 hrs HW=2.09' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.6 cfs @ 1.70 fps)

Pond 21P: Pervious Pavement

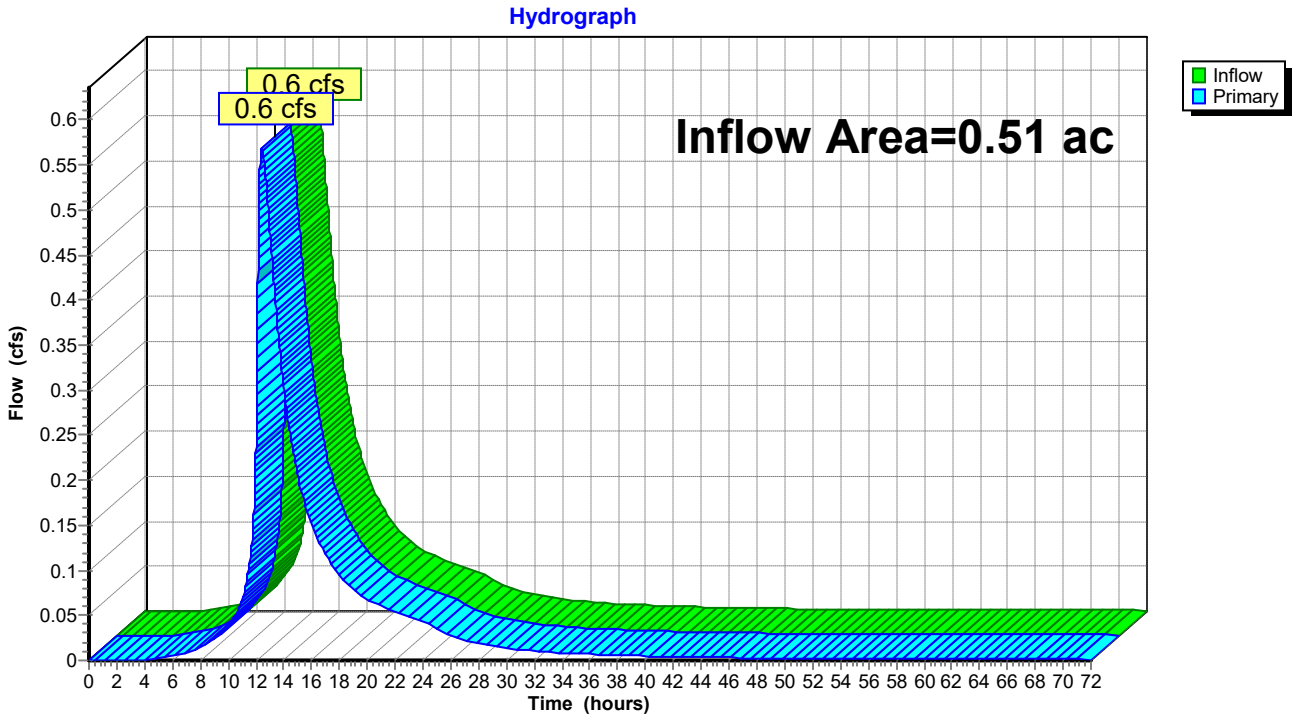


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 4.79" for 3-10yr event
Inflow = 0.6 cfs @ 12.42 hrs, Volume= 0.203 af
Primary = 0.6 cfs @ 12.42 hrs, Volume= 0.203 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=6.29"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=2.9 cfs 0.257 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=2.37"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.1 cfs 0.004 af

Pond 21P: Pervious Pavement Peak Elev=2.17' Storage=4,928 cf Inflow=3.0 cfs 0.261 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.8 cfs 0.256 af

Link DA3: River House Parking Areas Inflow=0.8 cfs 0.256 af
Primary=0.8 cfs 0.256 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.261 af Average Runoff Depth = 6.14"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

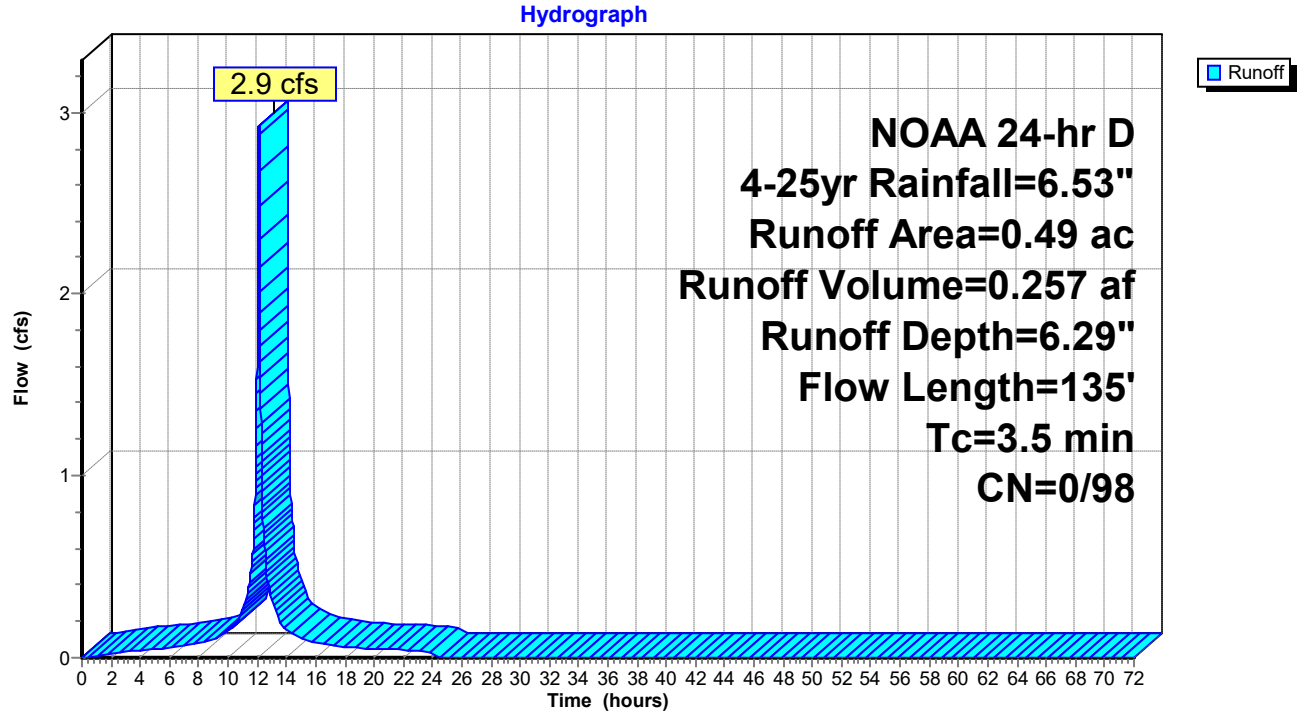
Runoff = 2.9 cfs @ 12.12 hrs, Volume= 0.257 af, Depth= 6.29"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 4-25yr Rainfall=6.53"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

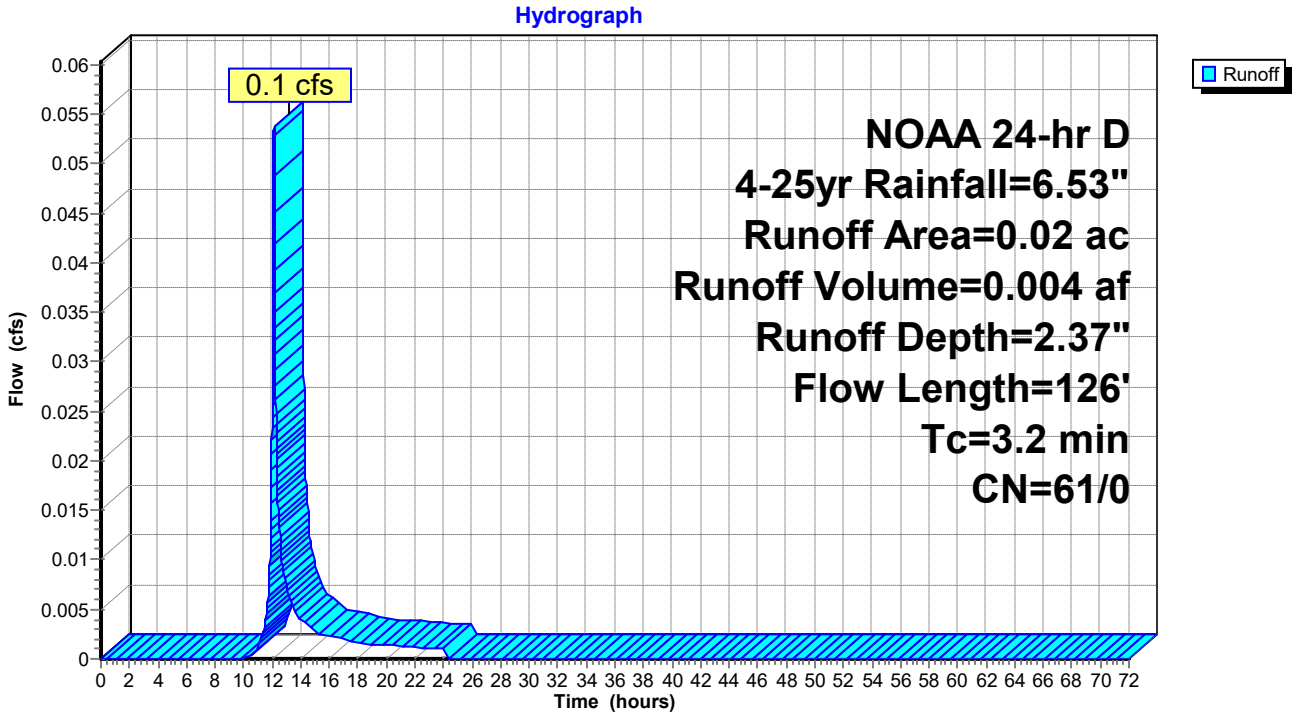
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.004 af, Depth= 2.37"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 4-25yr Rainfall=6.53"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 6.14" for 4-25yr event
Inflow = 3.0 cfs @ 12.12 hrs, Volume= 0.261 af
Outflow = 0.8 cfs @ 12.38 hrs, Volume= 0.256 af, Atten= 73%, Lag= 15.7 min
Primary = 0.8 cfs @ 12.38 hrs, Volume= 0.256 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 2.17' @ 12.38 hrs Surf.Area= 21,060 sf Storage= 4,928 cf

Plug-Flow detention time= 261.4 min calculated for 0.256 af (98% of inflow)
Center-of-Mass det. time= 248.9 min (995.4 - 746.6)

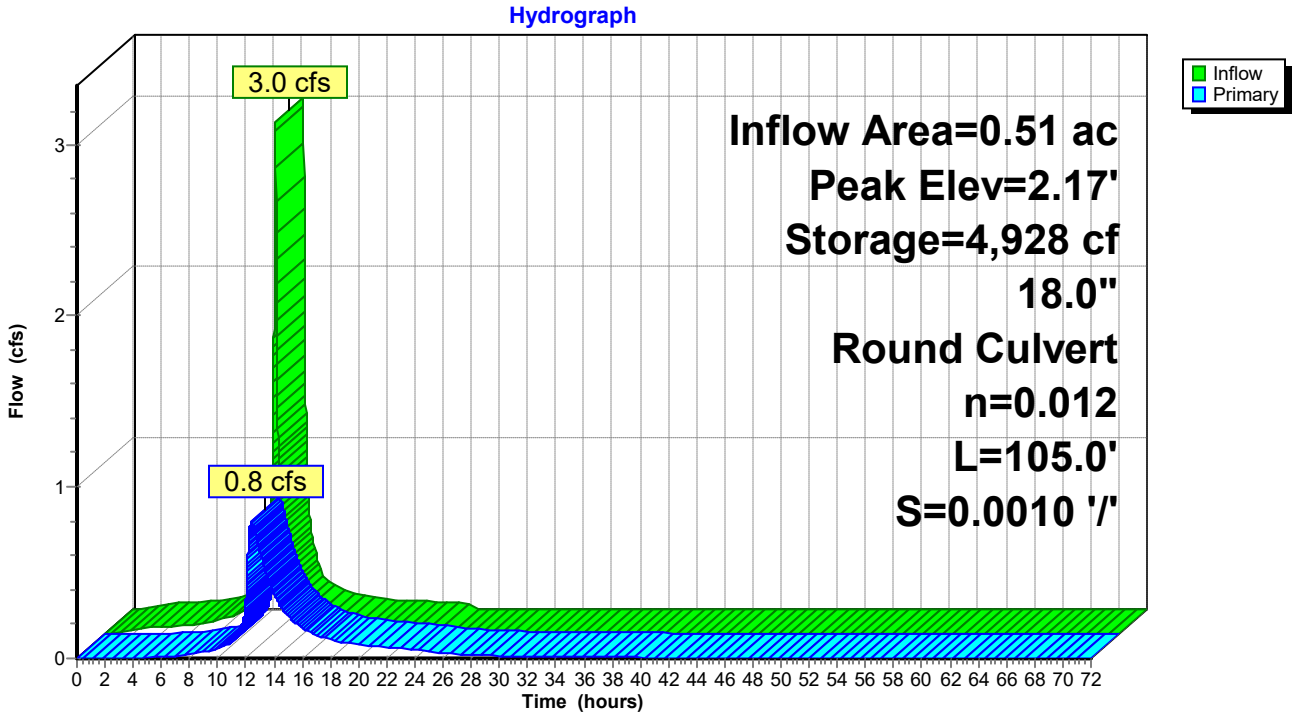
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.8 cfs @ 12.38 hrs HW=2.17' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.8 cfs @ 1.90 fps)

Pond 21P: Pervious Pavement

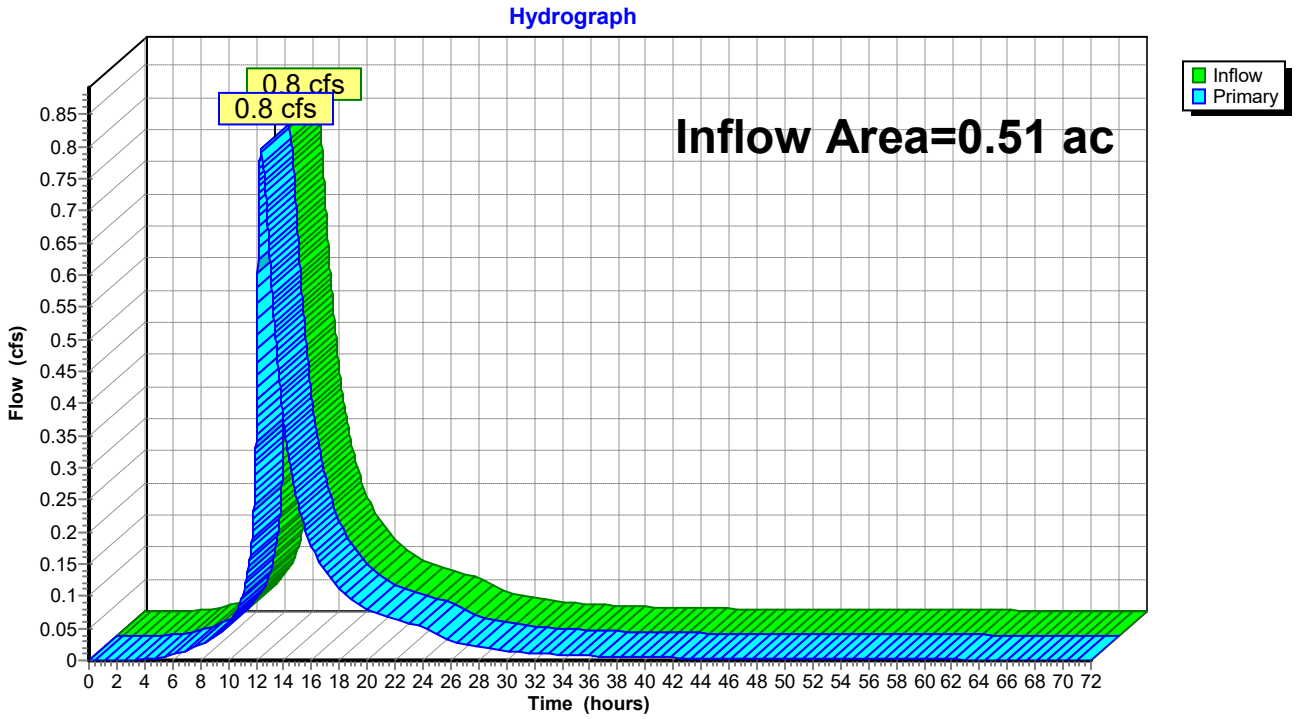


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 6.02" for 4-25yr event
Inflow = 0.8 cfs @ 12.38 hrs, Volume= 0.256 af
Primary = 0.8 cfs @ 12.38 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=8.88"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=4.1 cfs 0.363 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=4.32"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.1 cfs 0.007 af

Pond 21P: Pervious Pavement Peak Elev=2.34' Storage=6,307 cf Inflow=4.2 cfs 0.370 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=1.3 cfs 0.365 af

Link DA3: River House Parking Areas Inflow=1.3 cfs 0.365 af
Primary=1.3 cfs 0.365 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.370 af Average Runoff Depth = 8.70"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

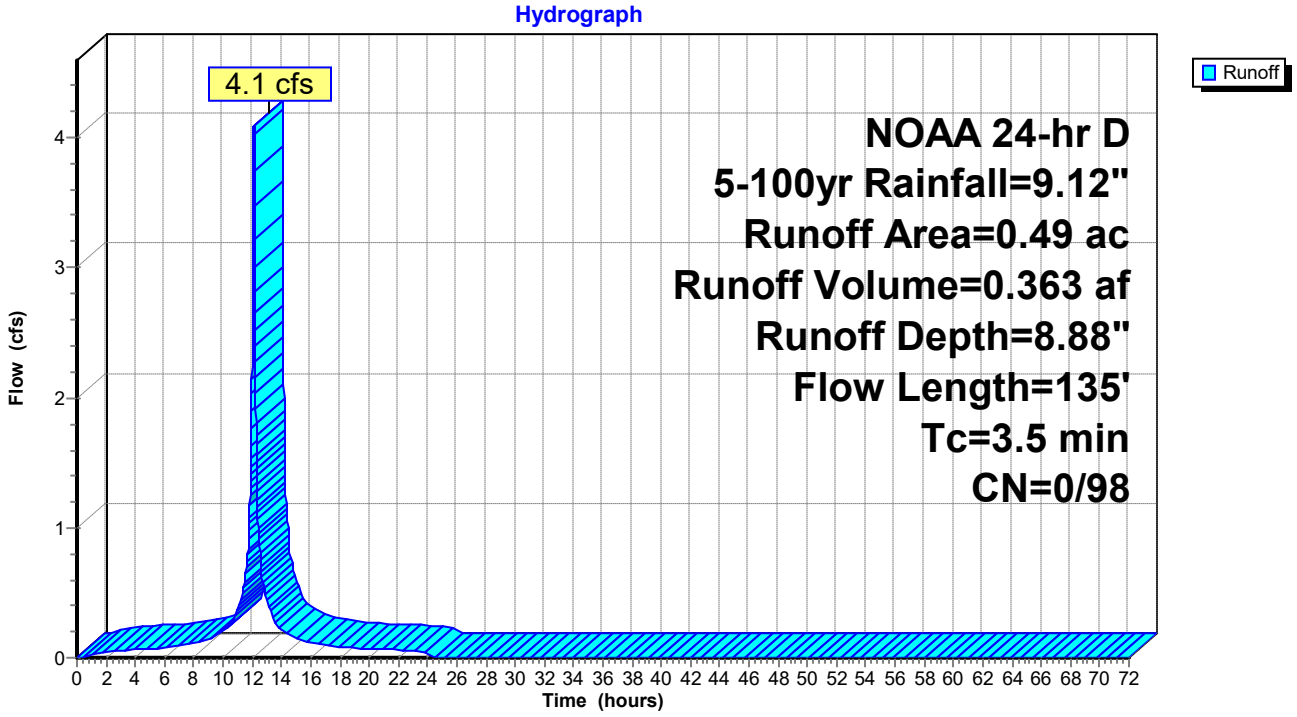
Runoff = 4.1 cfs @ 12.12 hrs, Volume= 0.363 af, Depth= 8.88"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 5-100yr Rainfall=9.12"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

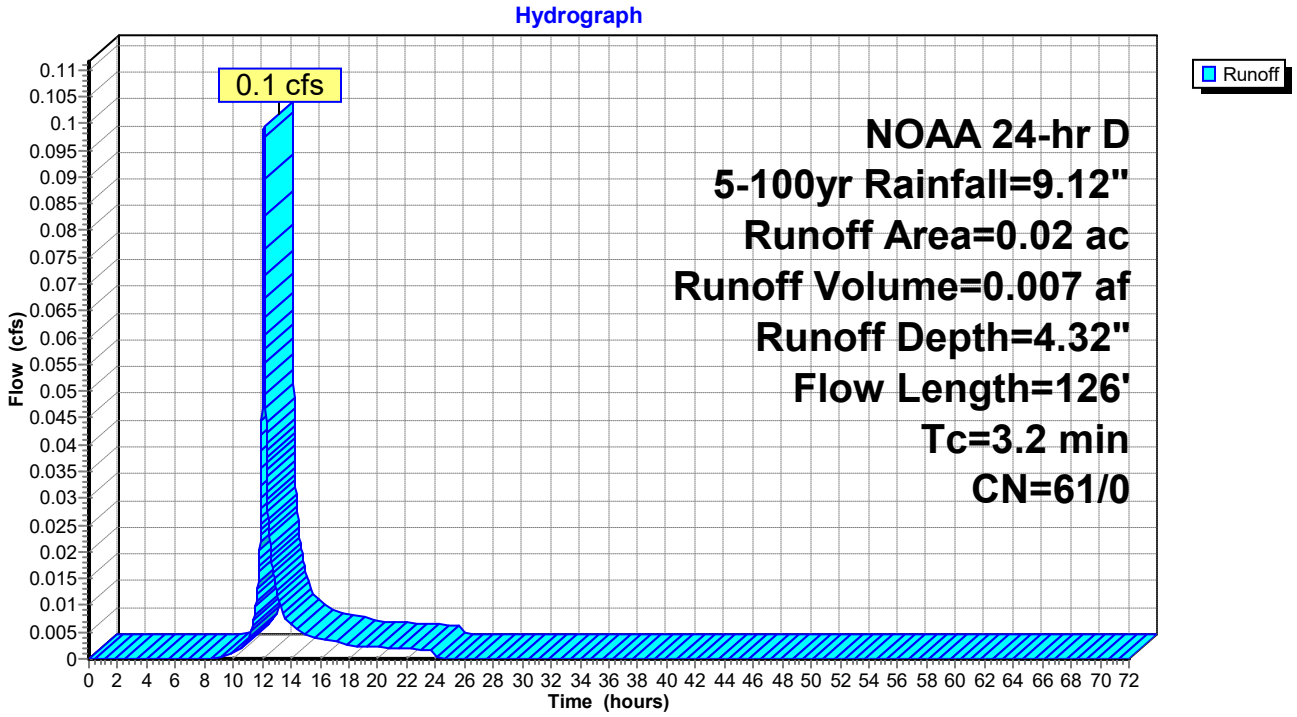
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.007 af, Depth= 4.32"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 5-100yr Rainfall=9.12"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 8.70" for 5-100yr event
Inflow = 4.2 cfs @ 12.12 hrs, Volume= 0.370 af
Outflow = 1.3 cfs @ 12.34 hrs, Volume= 0.365 af, Atten= 69%, Lag= 13.4 min
Primary = 1.3 cfs @ 12.34 hrs, Volume= 0.365 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 2.34' @ 12.34 hrs Surf.Area= 21,060 sf Storage= 6,307 cf

Plug-Flow detention time= 216.5 min calculated for 0.365 af (99% of inflow)
Center-of-Mass det. time= 207.1 min (949.4 - 742.3)

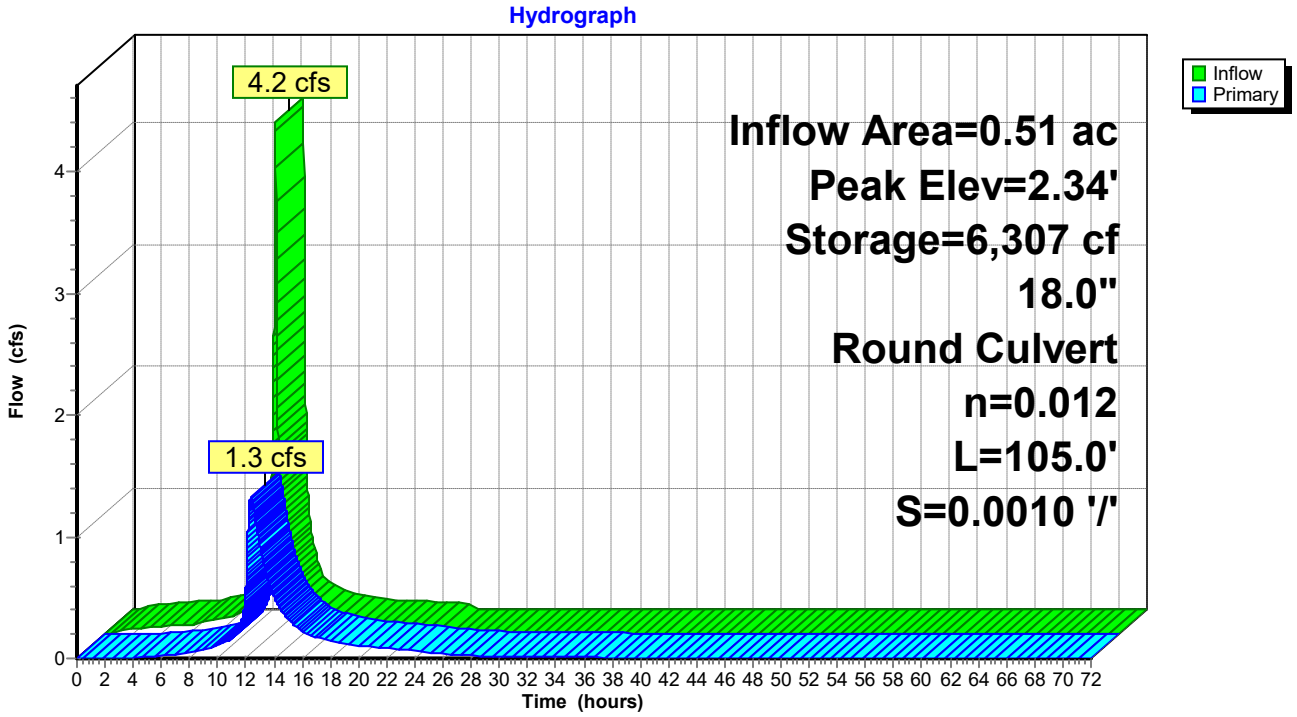
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.3 cfs @ 12.34 hrs HW=2.34' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.3 cfs @ 2.23 fps)

Pond 21P: Pervious Pavement

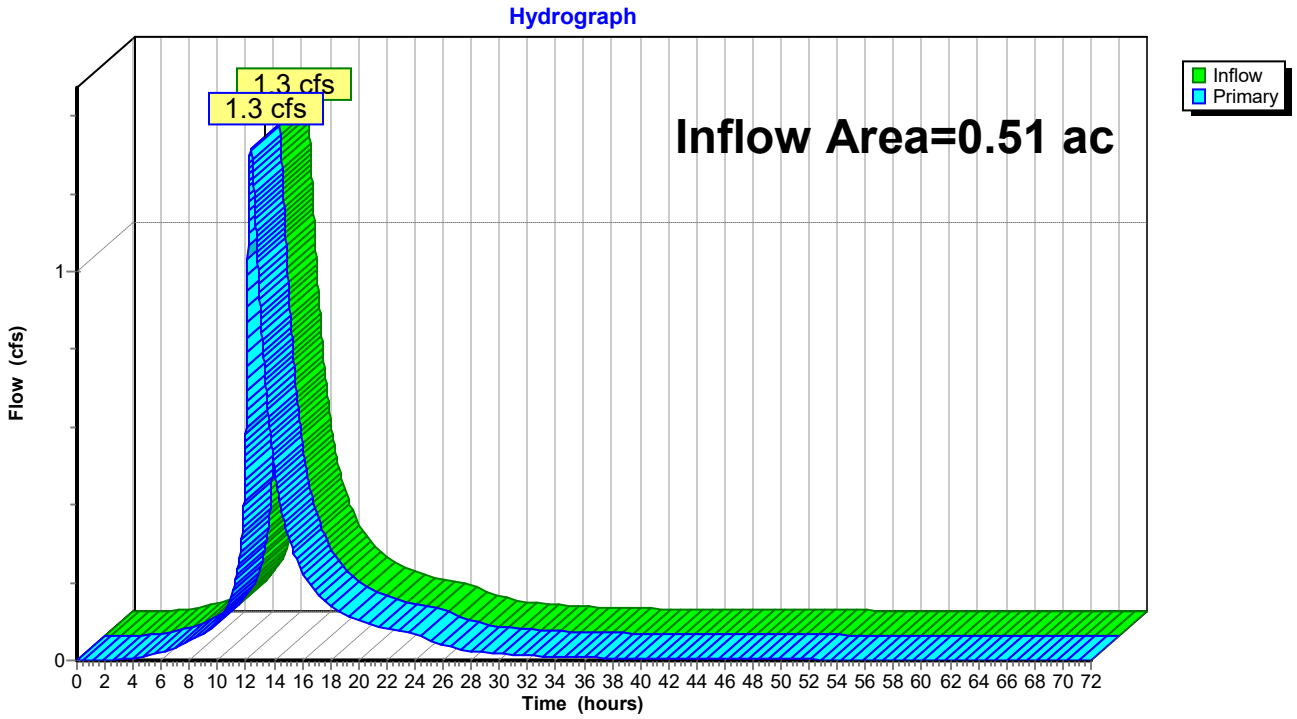


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 8.58" for 5-100yr event
Inflow = 1.3 cfs @ 12.34 hrs, Volume= 0.365 af
Primary = 1.3 cfs @ 12.34 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=3.79"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=1.8 cfs 0.155 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=0.82"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.0 cfs 0.001 af

Pond 21P: Pervious Pavement Peak Elev=1.99' Storage=3,370 cf Inflow=1.8 cfs 0.156 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.4 cfs 0.151 af

Link DA3: River House Parking Areas Inflow=0.4 cfs 0.151 af
Primary=0.4 cfs 0.151 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.156 af Average Runoff Depth = 3.67"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

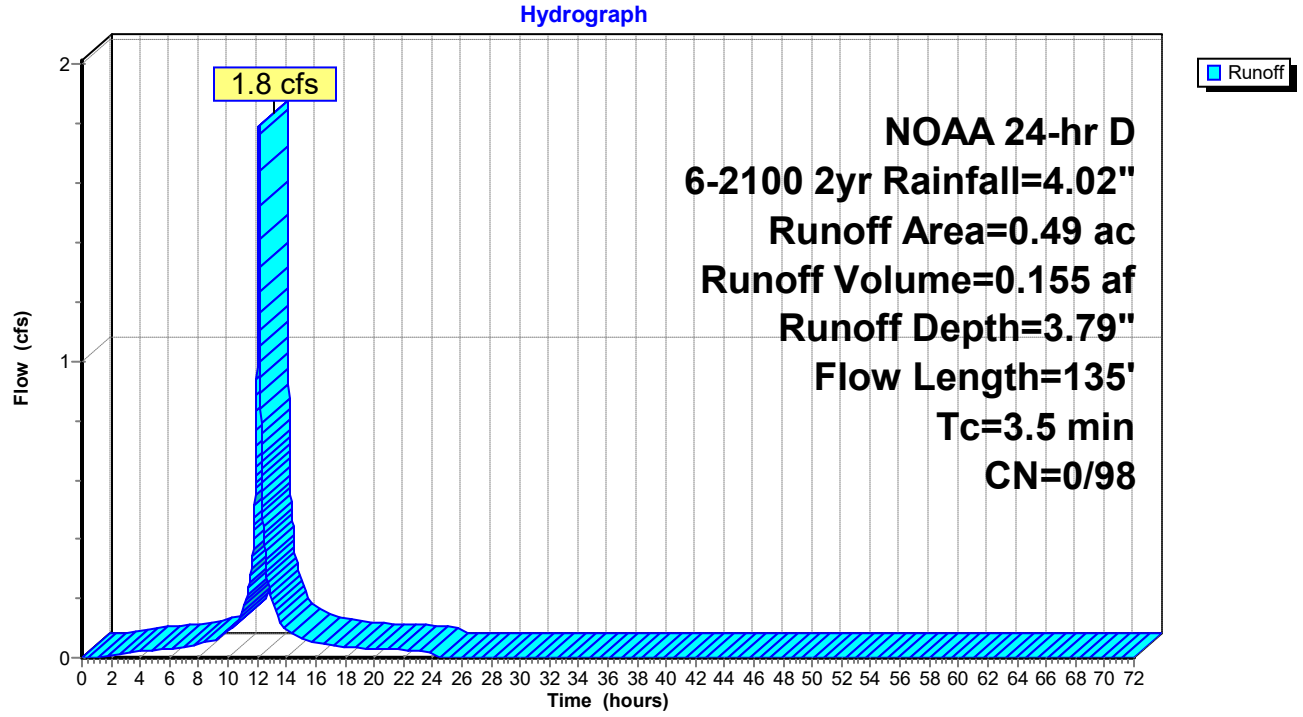
Runoff = 1.8 cfs @ 12.12 hrs, Volume= 0.155 af, Depth= 3.79"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 6-2100 2yr Rainfall=4.02"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

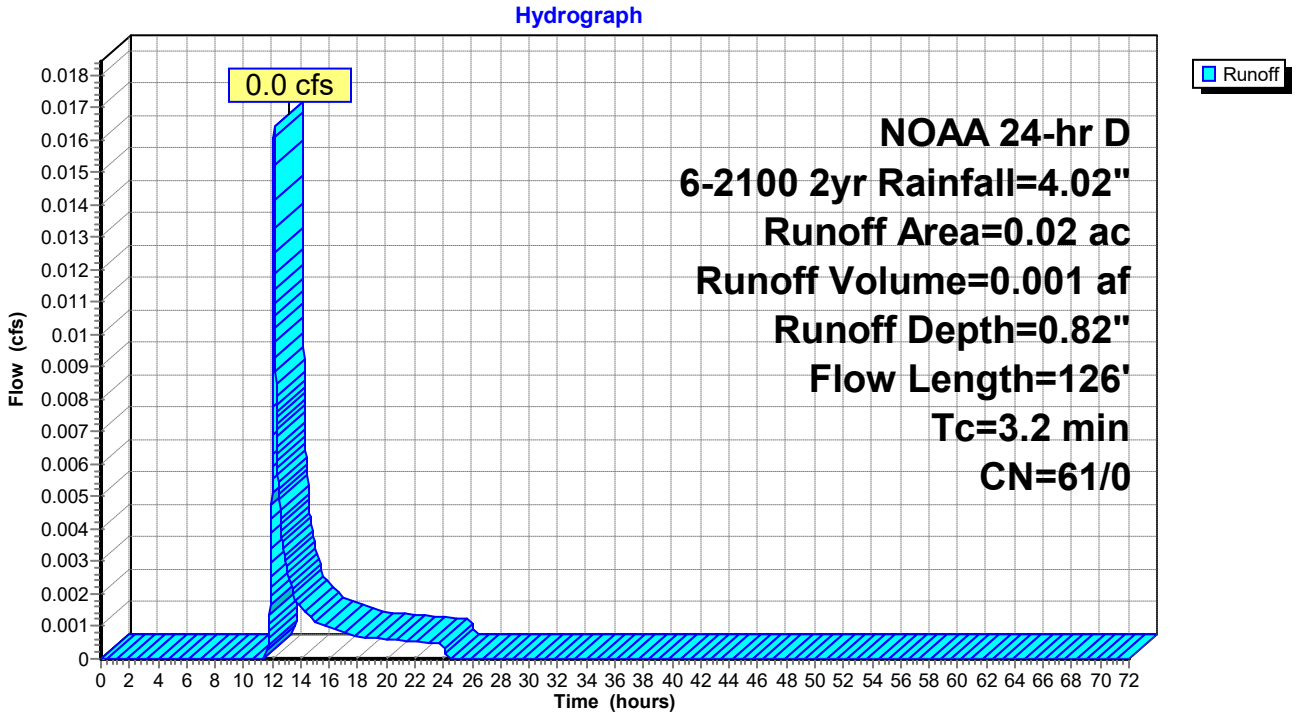
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.001 af, Depth= 0.82"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 6-2100 2yr Rainfall=4.02"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 3.67" for 6-2100 2yr event
Inflow = 1.8 cfs @ 12.12 hrs, Volume= 0.156 af
Outflow = 0.4 cfs @ 12.53 hrs, Volume= 0.151 af, Atten= 80%, Lag= 25.0 min
Primary = 0.4 cfs @ 12.53 hrs, Volume= 0.151 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 1.99' @ 12.53 hrs Surf.Area= 21,060 sf Storage= 3,370 cf

Plug-Flow detention time= 346.6 min calculated for 0.151 af (97% of inflow)
Center-of-Mass det. time= 326.8 min (1,081.4 - 754.6)

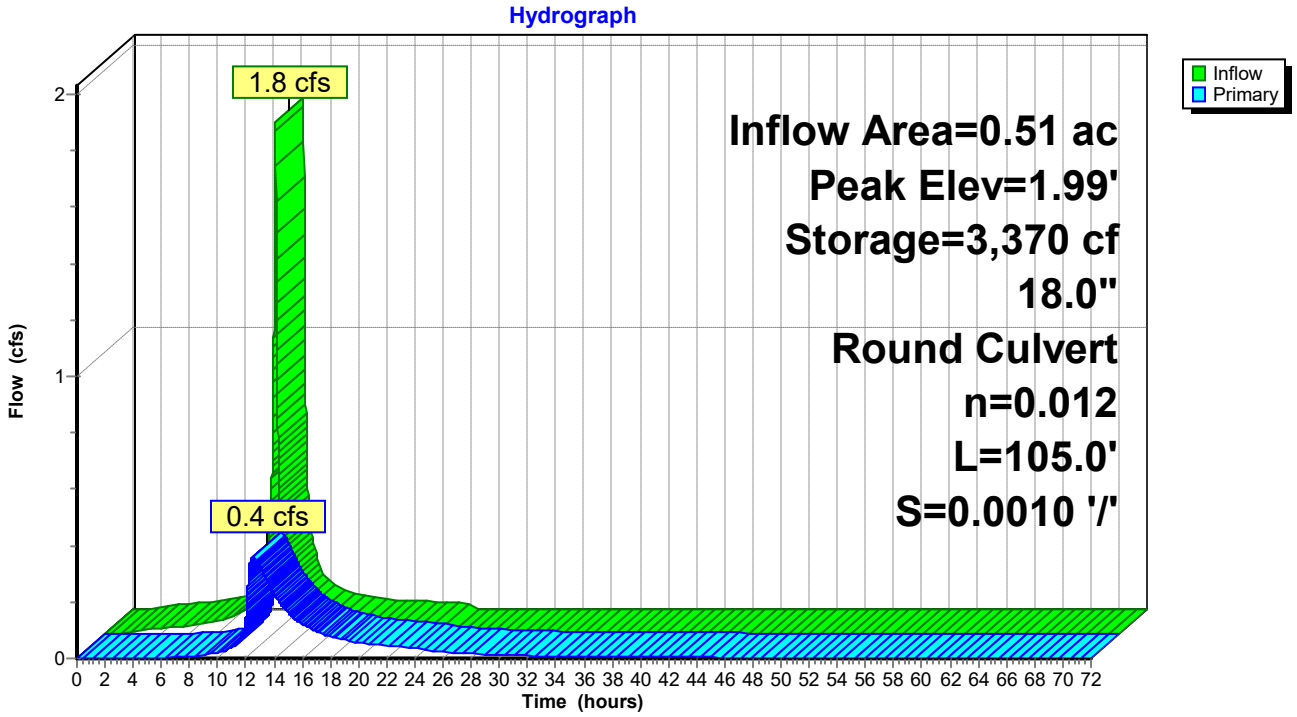
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.4 cfs @ 12.53 hrs HW=1.99' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.4 cfs @ 1.47 fps)

Pond 21P: Pervious Pavement

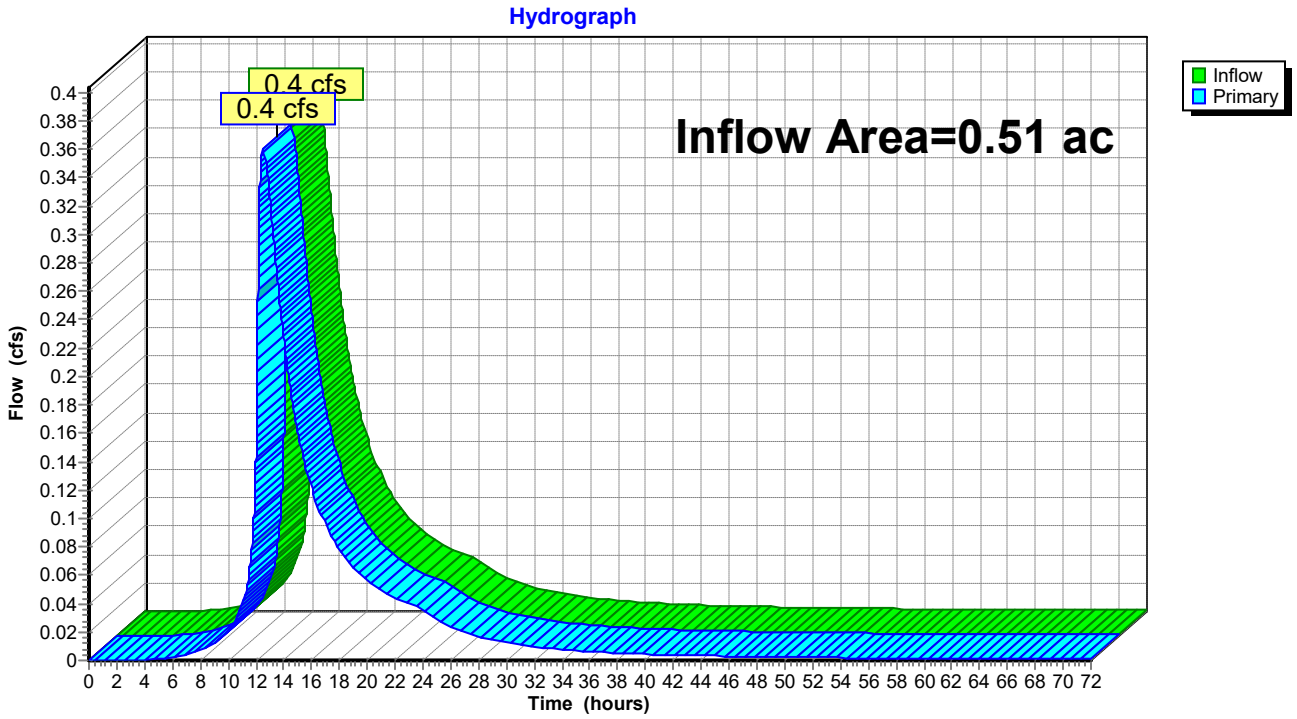


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 3.55" for 6-2100 2yr event
Inflow = 0.4 cfs @ 12.53 hrs, Volume= 0.151 af
Primary = 0.4 cfs @ 12.53 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=5.98"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=2.8 cfs 0.244 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=2.15"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.0 cfs 0.004 af

Pond 21P: Pervious Pavement Peak Elev=2.15' Storage=4,749 cf Inflow=2.8 cfs 0.248 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=0.7 cfs 0.243 af

Link DA3: River House Parking Areas Inflow=0.7 cfs 0.243 af
Primary=0.7 cfs 0.243 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.248 af Average Runoff Depth = 5.83"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

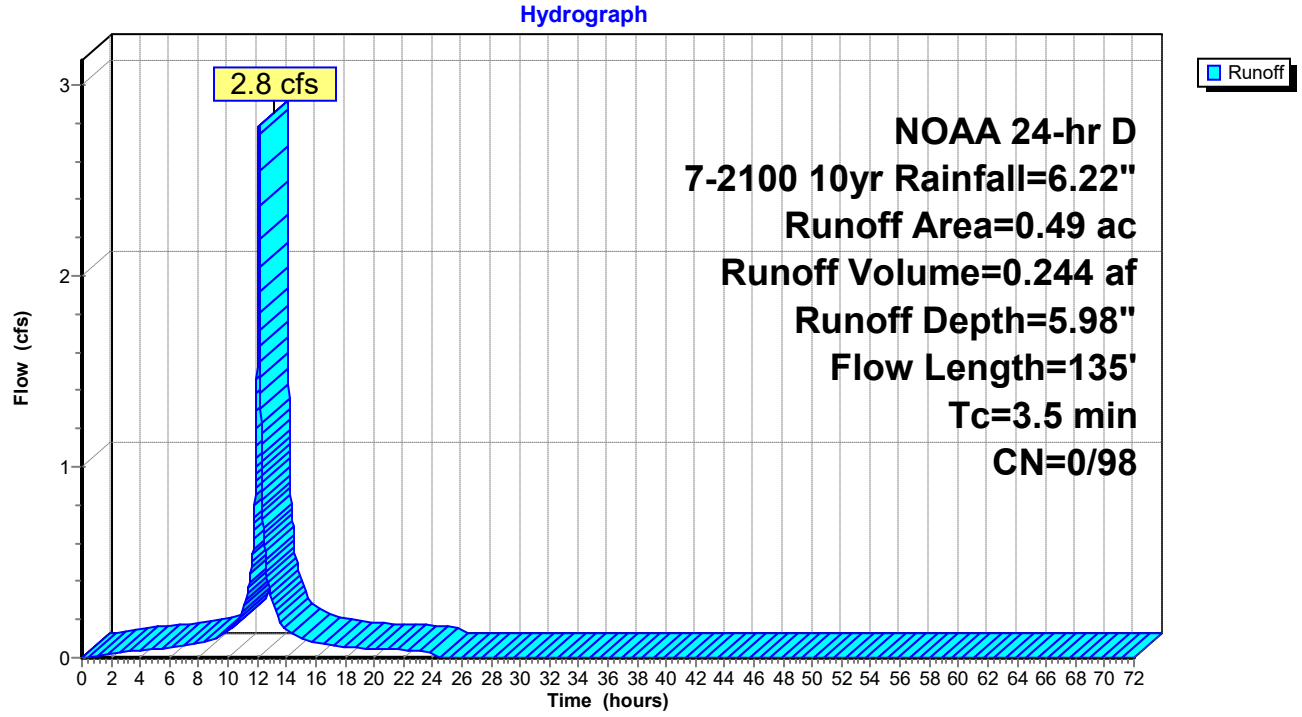
Runoff = 2.8 cfs @ 12.12 hrs, Volume= 0.244 af, Depth= 5.98"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 7-2100 10yr Rainfall=6.22"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

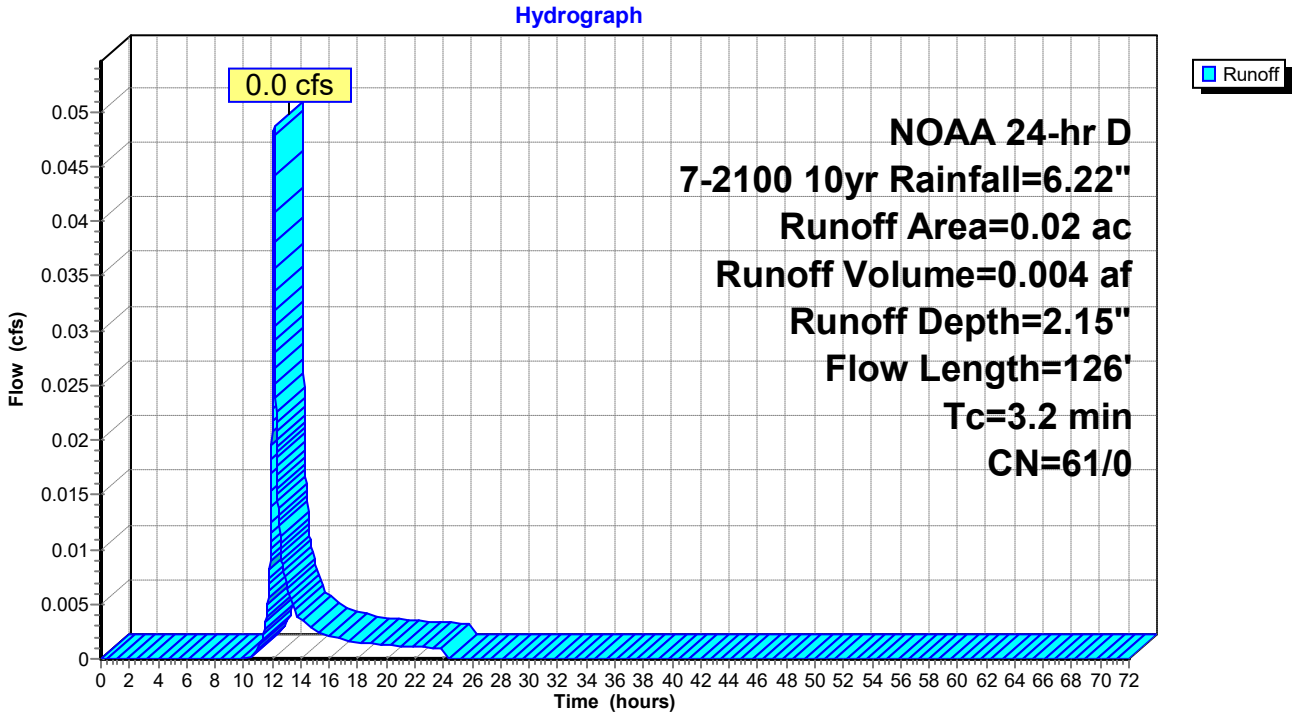
Runoff = 0.0 cfs @ 12.12 hrs, Volume= 0.004 af, Depth= 2.15"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 7-2100 10yr Rainfall=6.22"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 5.83" for 7-2100 10yr event
Inflow = 2.8 cfs @ 12.12 hrs, Volume= 0.248 af
Outflow = 0.7 cfs @ 12.38 hrs, Volume= 0.243 af, Atten= 74%, Lag= 16.1 min
Primary = 0.7 cfs @ 12.38 hrs, Volume= 0.243 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 2.15' @ 12.38 hrs Surf.Area= 21,060 sf Storage= 4,749 cf

Plug-Flow detention time= 268.8 min calculated for 0.243 af (98% of inflow)
Center-of-Mass det. time= 255.7 min (1,002.9 - 747.3)

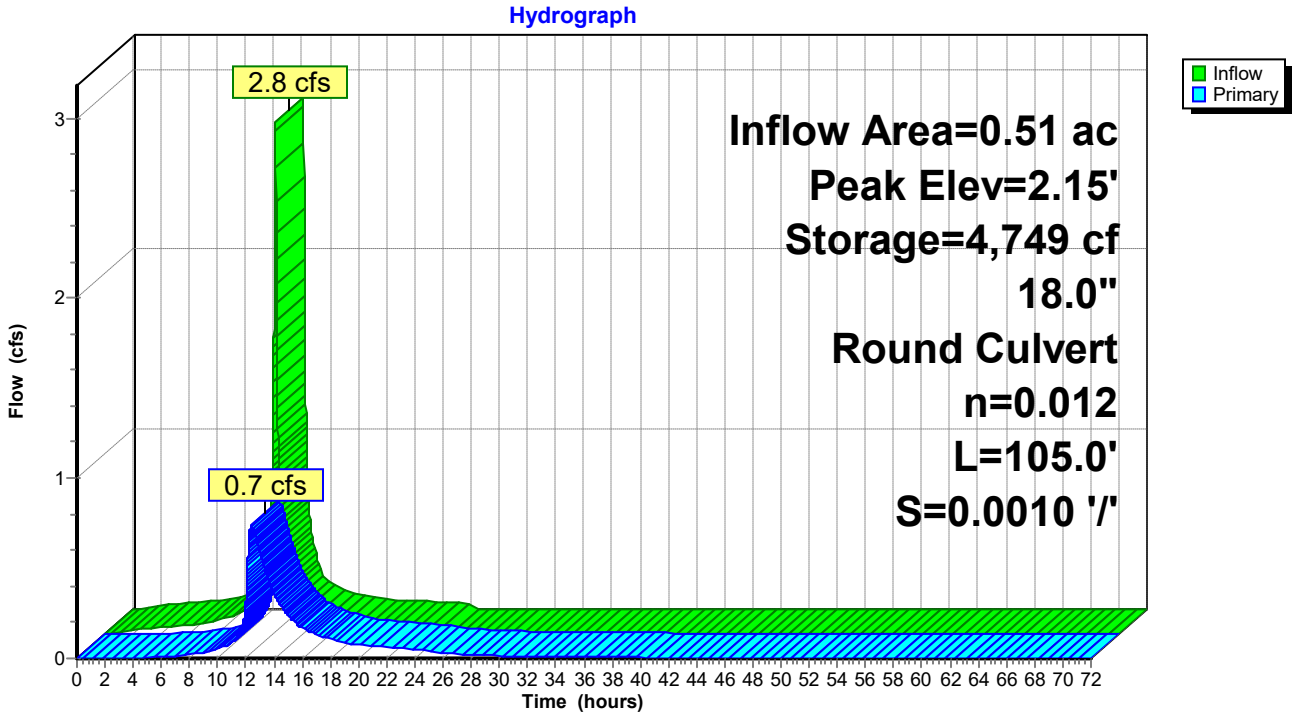
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.7 cfs @ 12.38 hrs HW=2.15' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.7 cfs @ 1.85 fps)

Pond 21P: Pervious Pavement

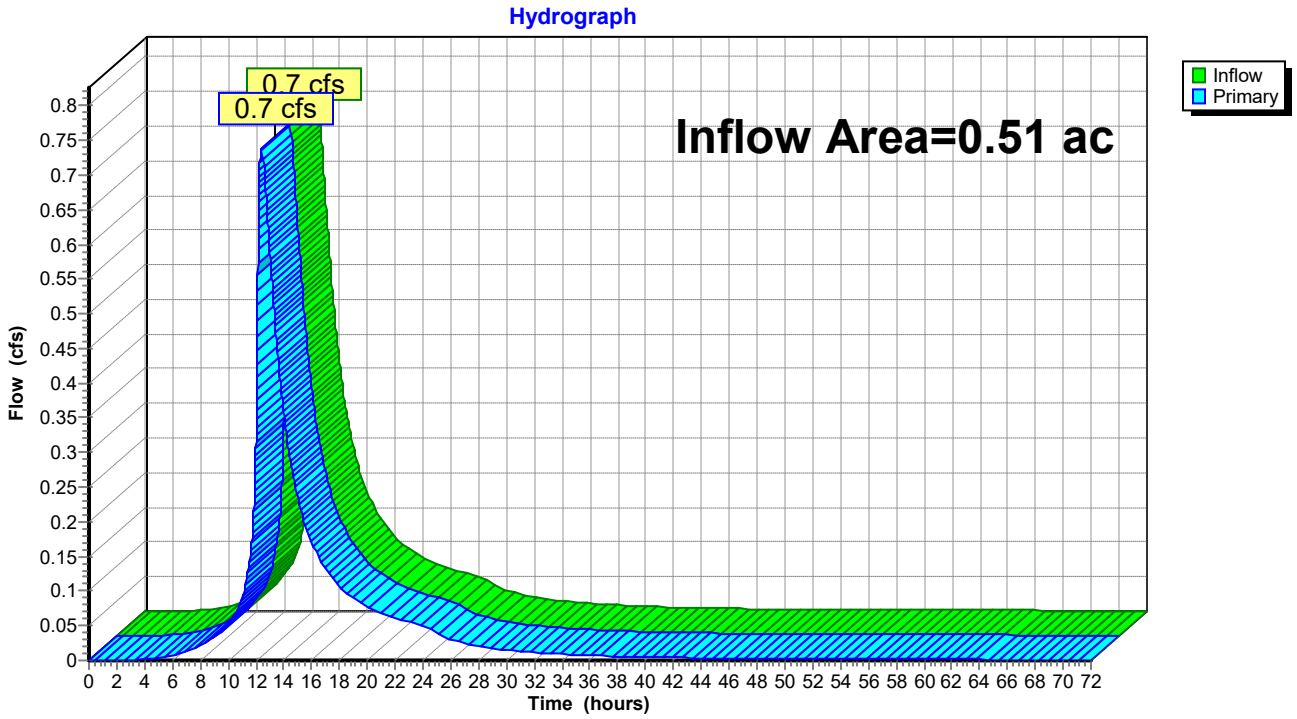


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 5.71" for 7-2100 10yr event
Inflow = 0.7 cfs @ 12.38 hrs, Volume= 0.243 af
Primary = 0.7 cfs @ 12.38 hrs, Volume= 0.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment DA3i: Impervious Runoff Area=0.49 ac 100.00% Impervious Runoff Depth=11.02"
Flow Length=135' Tc=3.5 min CN=0/98 Runoff=5.1 cfs 0.450 af

Subcatchment DA3p: Pervious Runoff Area=0.02 ac 0.00% Impervious Runoff Depth=6.08"
Flow Length=126' Tc=3.2 min CN=61/0 Runoff=0.1 cfs 0.010 af

Pond 21P: Pervious Pavement Peak Elev=2.46' Storage=7,336 cf Inflow=5.2 cfs 0.460 af
18.0" Round Culvert n=0.012 L=105.0' S=0.0010 '/' Outflow=1.8 cfs 0.455 af

Link DA3: River House Parking Areas Inflow=1.8 cfs 0.455 af
Primary=1.8 cfs 0.455 af

Total Runoff Area = 0.51 ac Runoff Volume = 0.460 af Average Runoff Depth = 10.83"
3.92% Pervious = 0.02 ac 96.08% Impervious = 0.49 ac

Summary for Subcatchment DA3i: Impervious

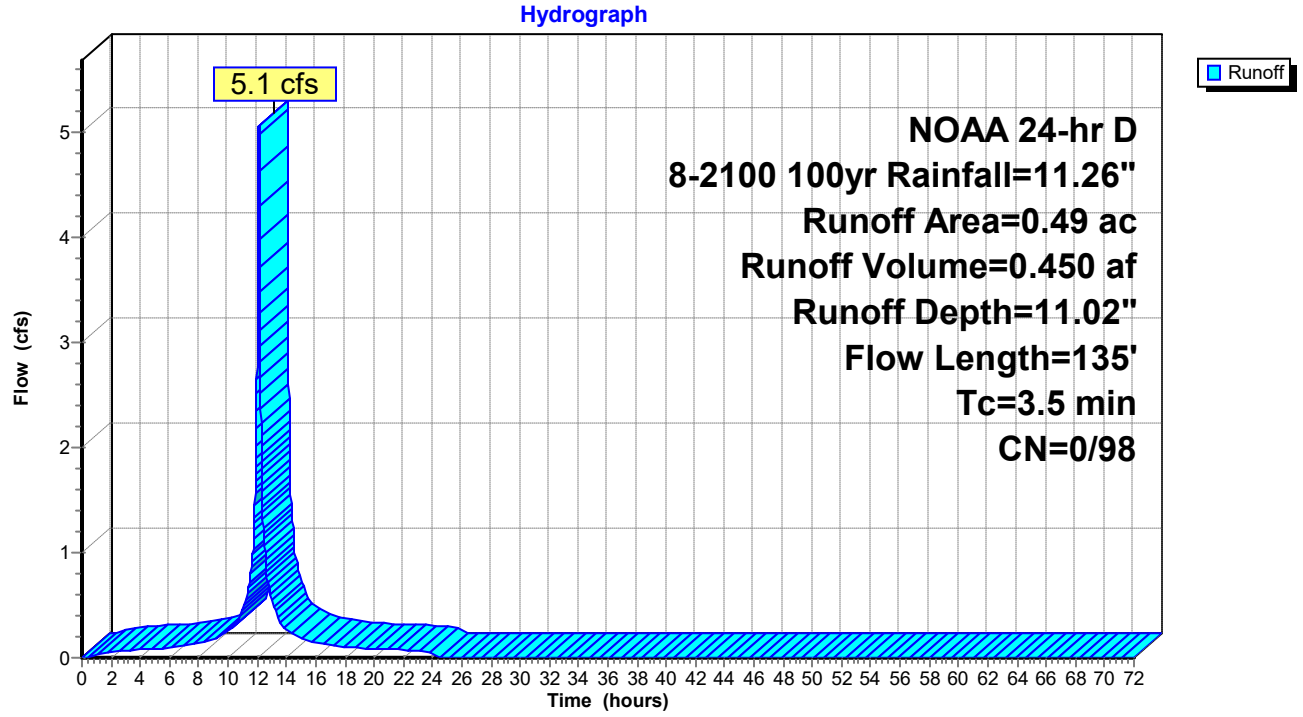
Runoff = 5.1 cfs @ 12.12 hrs, Volume= 0.450 af, Depth=11.02"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 8-2100 100yr Rainfall=11.26"

Area (ac)	CN	Description
0.48	98	Paved parking, HSG B
0.01	98	Unconnected pavement, HSG B
0.49	98	Weighted Average
0.49	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	9	0.0050	0.50		**Sheet Flow, 5.9 - 5.9** Smooth surfaces n= 0.011 P2= 3.40"
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.5	135	Total			

Subcatchment DA3i: Impervious



Summary for Subcatchment DA3p: Pervious

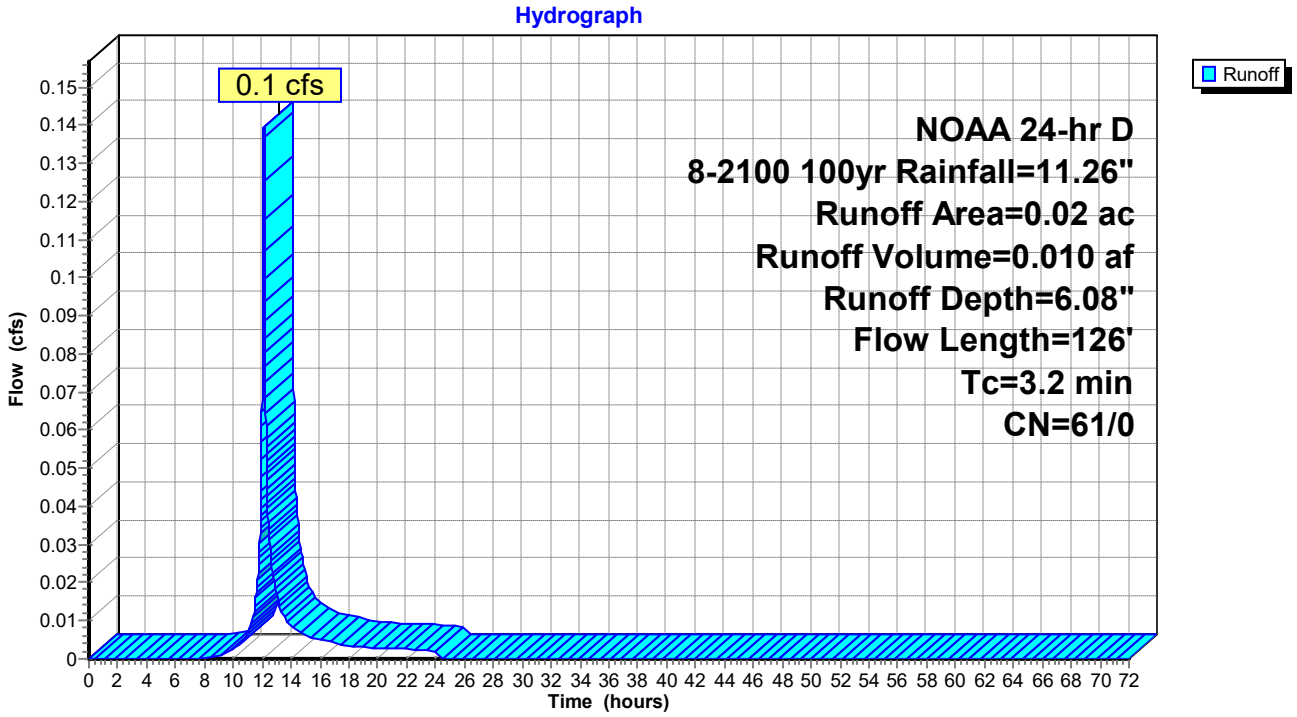
Runoff = 0.1 cfs @ 12.12 hrs, Volume= 0.010 af, Depth= 6.08"
Routed to Pond 21P : Pervious Pavement

Runoff by SCS TR-20 method, UH=Delmarva, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 8-2100 100yr Rainfall=11.26"

Area (ac)	CN	Description
0.02	61	>75% Grass cover, Good, HSG B
0.02	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	9	0.0100	0.08		**Sheet Flow, 5.9 - 5.8** Grass: Short n= 0.150 P2= 3.40"
1.2	86	0.0150	1.23		**Sheet Flow, 5.8 - 4.5** Smooth surfaces n= 0.011 P2= 3.40"
0.2	31	0.0150	2.49		**Shallow Concentrated Flow, 4.5 - 4.1** Paved Kv= 20.3 fps
3.2	126	Total			

Subcatchment DA3p: Pervious



Summary for Pond 21P: Pervious Pavement

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth = 10.83" for 8-2100 100yr event
Inflow = 5.2 cfs @ 12.12 hrs, Volume= 0.460 af
Outflow = 1.8 cfs @ 12.32 hrs, Volume= 0.455 af, Atten= 66%, Lag= 12.2 min
Primary = 1.8 cfs @ 12.32 hrs, Volume= 0.455 af
Routed to Link DA3 : River House Parking Areas

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 2.46' @ 12.32 hrs Surf.Area= 21,060 sf Storage= 7,336 cf

Plug-Flow detention time= 192.0 min calculated for 0.455 af (99% of inflow)
Center-of-Mass det. time= 184.7 min (924.7 - 740.0)

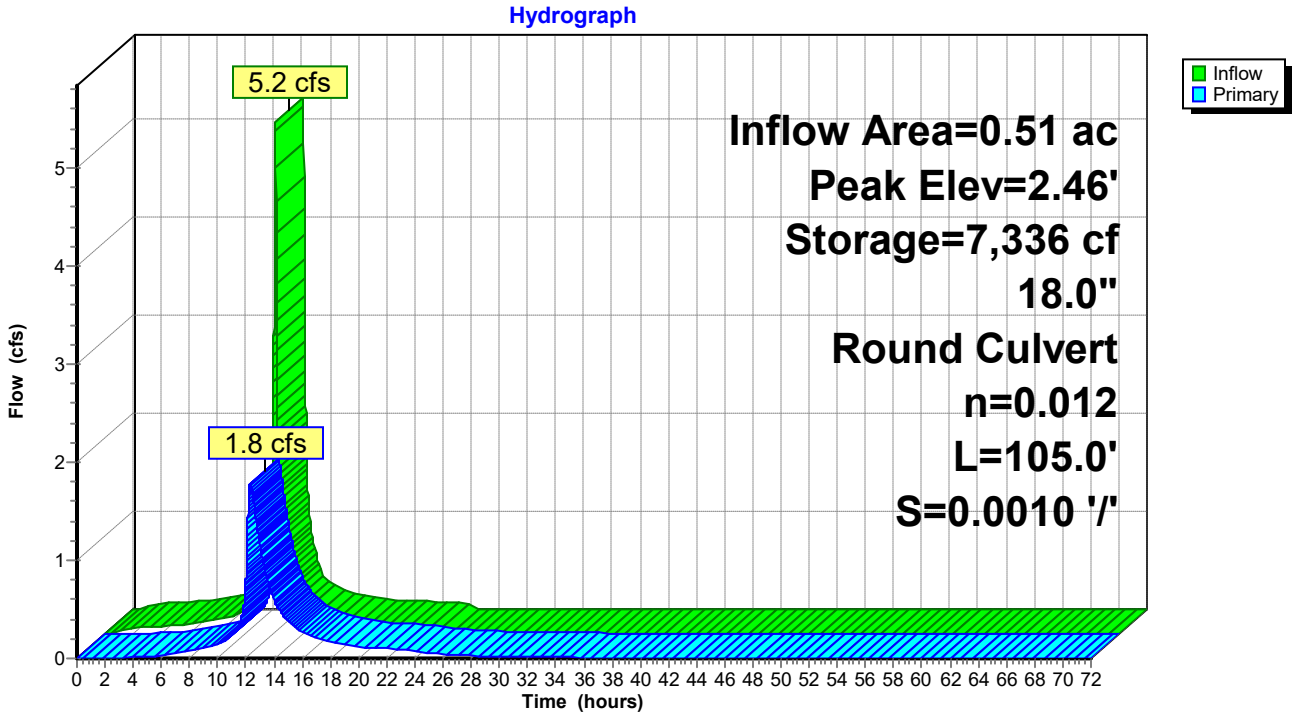
Volume	Invert	Avail.Storage	Storage Description
#1	1.60'	12,570 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 31,590 cf Overall - 166 cf Embedded = 31,424 cf x 40.0% Voids
#2	1.60'	166 cf	**8.0" Round Pipe Storage** Inside #1 L= 476.0'
		12,736 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1.60	21,060	0	0
3.10	21,060	31,590	31,590

Device	Routing	Invert	Outlet Devices
#1	Primary	1.60'	**18.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1.60' / 1.50' S= 0.0010 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.8 cfs @ 12.32 hrs HW=2.46' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.8 cfs @ 2.45 fps)

Pond 21P: Pervious Pavement

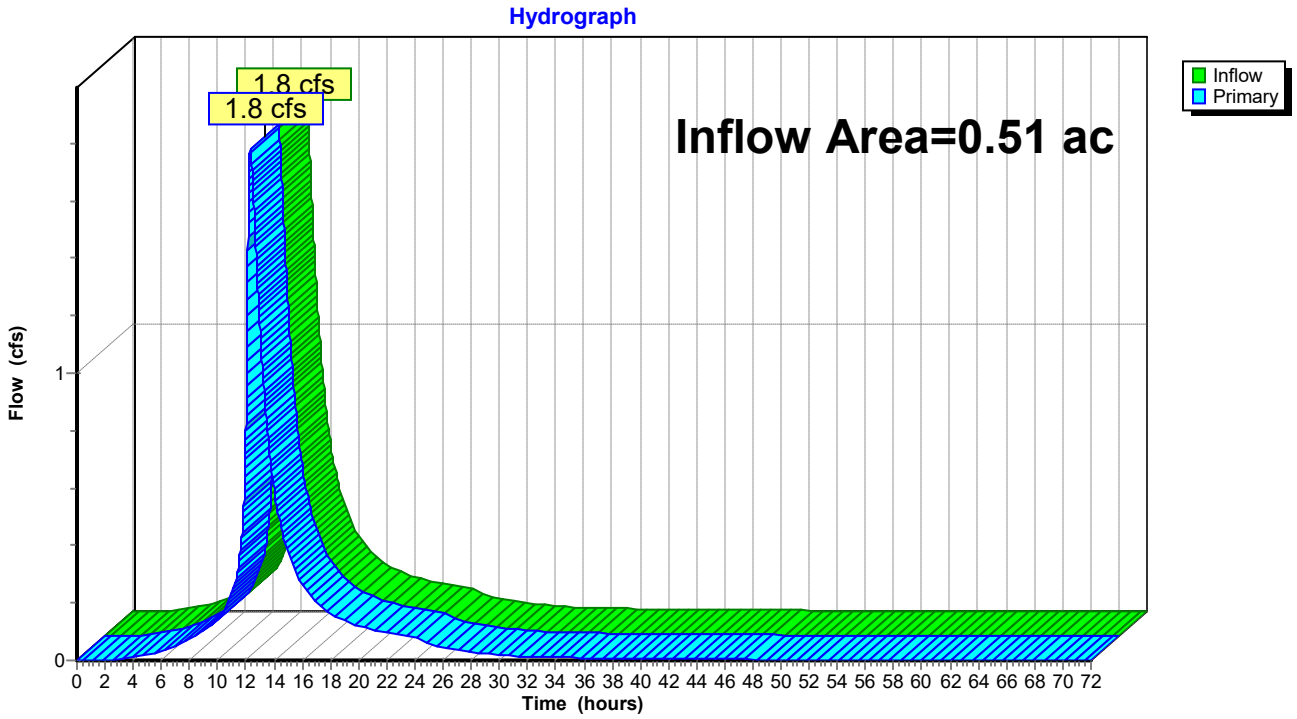


Summary for Link DA3: River House Parking Areas

Inflow Area = 0.51 ac, 96.08% Impervious, Inflow Depth > 10.70" for 8-2100 100yr event
Inflow = 1.8 cfs @ 12.32 hrs, Volume= 0.455 af
Primary = 1.8 cfs @ 12.32 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DA3: River House Parking Areas



APPENDIX E

Geotechnical Information

WHITESTONE

FIGURE 1
Boring Location Plan

LEGEND

B-1 — BORING

SUBJECT PROPERTY BOUNDARY

REFERENCE

THIS PLAN IS BASED ON A JANUARY 30, 2025 OVERALL SITE LAYOUT PLAN PREPARED BY INSITE ENGINEERING, LLC & ALL SITE LOCATIONS ARE APPROXIMATE.

WHITESTONE
An Employee-Owned Company
1959 HIGHWAY 34 BUILDING A, UNIT 102 WALL, NJ 07719
732-592-2101 WHITESTONEASSOC.COM

DRAWING TITLE: **BORING LOCATION PLAN**

CLIENT: **RUMSON COUNTRY CLUB**

PROJECT: PROPOSED IMPROVEMENTS 163 RUMSON ROAD RUMSON, MONMOUTH COUNTY, NJ

PROJECT #: GJ2523304.000	
DESIGNED BY: GR	PROJ. MGR.: CAW
DATE: 6/9/25	FIGURE: 1
SCALE: AS SHOWN	

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WHITESTONE

FIGURE 2
Test Location Plan

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SCALE: 1" = 250'	DESIGNED BY: GR	PROJECT #: GJ2523304.000
DATE: 6/9/25		
FIGURE: 2	PROJ. MGR.: CAW	

DRAWING TITLE:
TEST LOCATION PLAN

CLIENT:
RUMSON COUNTRY CLUB

PROJECT:
PROPOSED IMPROVEMENTS
163 RUMSON ROAD
RUMSON, MONMOUTH COUNTY, NJ

WHITESTONE
An Employee-Owned Company
1959 HIGHWAY 34 BUILDING A, UNIT 102 WALL, NJ 07719
732-592-2101 WHITESTONEASSOC.COM

WHITESTONE

APPENDIX A
Records of Subsurface Exploration

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-1

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club
Surface Elevation:	± NS feet	**Date Started:**	5/6/2025
Termination Depth:	18.1 feet bgs	**Date Completed:**	5/6/2025
Proposed Location:	Addition	**Logged By:**	NL
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate
		Equipment:	CME-45

	Water Depth (feet bgs)	Elevation (feet)	Cave-In Depth (feet bgs)	Elevation (feet)
During:	7.0	---		
At Completion:	6.0	---	8.0	---
24 Hours:	---	---	---	---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0	TOPSOIL		3" Landscaping and Topsoil	
0 - 2	S-1		2 - 3 - 6 - 7	8	9	0.3	FILL		Grayish-Brown and Brown Clayey Sand, Moist (FILL)	
2 - 4	S-2		9 - 13 - 17 - 17	13	30	2.0			Grayish-Brown Sandy Clay, Moist (FILL)	
4 - 6	S-3		6 - 4 - 5 - 5	9	9	4.0			Grayish-Brown and Brown Clayey Sand, Moist (FILL)	
6 - 8	S-4		4 - 4 - 9 - 21	6	13	5.0	COASTAL PLAIN DEPOSITS		Grayish-Brown Silty Sand, Wet, Medium Dense (SM)	
8 - 10	S-5		3 - 2 - 6 - 6	12	8	8.0			As Above, Loose (SM)	Organic Odor
						10.0				
13 - 15	S-6		3 - 4 - 7 - 5	15	11	15.0			As Above, Brown, with Some Gravel, Medium Dense (SM)	
						18.0			As Above, Very Dense (SM)	
18 - 18.1	S-7		50/1"	1	50/1"	18.1			Boring Log B-1 Terminated at a Depth of 18.1 Feet Below Ground Surface Due to Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-2

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	5/6/2025		
Termination Depth:	18.2 feet bgs	**Date Completed:**	5/6/2025		
Proposed Location:	Addition	**Logged By:**	NL	**During:** 8.0 | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate	**At Completion:** 8.0 | ---	**At Completion:** DNC | ---
		Equipment:	CME-45	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
0 - 2	S-1		11 - 13 - 11 - 12	8	24	0.4	TOPSOIL		5" Landscaping and Topsoil	
							FILL		Grayish-Brown Clayey Sand, Moist (FILL)	
2 - 4	S-2		9 - 11 - 13 - 11	12	24				As Above, Grayish-Brown and Brown, Moist (FILL)	
						4.0				
4 - 6	S-3		5 - 4 - 4 - 5	12	8	5.0			Grayish-Brown Sandy Clay, Moist (FILL)	
6 - 8	S-4		8 - 7 - 7 - 6	10	14				As Above (FILL)	
						8.0 ▽▼				
8 - 10	S-5		4 - 4 - 5 - 4	12	9		COASTAL PLAIN DEPOSITS		Brown with Grayish-Brown Sandy Clay, Wet, Soft (CL)	Organic Odor Qu = 0.25 tsf
						10.0				
13 - 15	S-6		5 - 4 - 5 - 4	18	9				Brown Sandy Clay, Trace Gravel, Wet, Soft (CL)	
						15.0				
						18.0				
18 - 18.2	S-7		50/2"	2	50/2"	18.2			Dark Gray Silty Sand, Moist, Very Dense (SM)	
									Boring Log B-2 Terminated at a Depth of 18.2 Feet Below Ground Surface Due to Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-3

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	5/6/2025		
Termination Depth:	16.0 feet bgs	**Date Completed:**	5/6/2025		
Proposed Location:	Addition	**Logged By:**	NL	**During:** 4.0 | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate	**At Completion:** 3.5 | ---	**At Completion:** 5.0 | ---
		Equipment:	CME-45	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
0 - 2	S-1		6 - 8 - 8 - 6	12	16	0.3	TOPSOIL / FILL		4" Lawn and Topsoil Yellowish-Brown and Dark Gray Silty Sand, Moist (FILL)	
2 - 4	S-2		6 - 6 - 8 - 9	15	14	4.0			As Above, Dark Gray (FILL)	
4 - 6	S-3		3 - 3 - 3 - 4	9	6	5.0	COASTAL PLAIN DEPOSITS		Brown Silty Sand, Wet, Loose (SM)	
6 - 8	S-4		4 - 6 - 3 - 4	13	9				As Above (SM)	
8 - 10	S-5		11 - 6 - 4 - 4	17	10	10.0			As Above, Medium Dense (SM)	
						15.0			Running Sands	
						16.0			Boring Log B-3 Terminated at a Depth of 16.0 Feet Below Ground Surface Due to Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-4

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club
Surface Elevation:	± NS feet	**Date Started:**	5/6/2025
Termination Depth:	17.0 feet bgs	**Date Completed:**	5/6/2025
Proposed Location:	Addition	**Logged By:**	NL
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate
		Equipment:	CME-45

Water Depth (feet bgs) | Elevation (feet)		Cave-In Depth (feet bgs) | Elevation (feet)	
During:	6.0 | ---		
At Completion:	4.0 | ---	**At Completion:**	6.0 | ---
24 Hours:	--- | ---	**24 Hours:**	--- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0	TOPSOIL		4" Lawn and Topsoil	
0 - 2	S-1		3 - 4 - 6 - 5	11	10	0.3	FILL		Brown Clayey Sand, Trace Gravel, Moist (FILL)	
2 - 4	S-2		6 - 9 - 8 - 5	10	17	2.0			Brown Silty Sand, Trace Gravel, Moist (FILL)	
4 - 6	S-3		3 - 3 - 6 - 9	8	9	5.0			As Above (FILL)	Angular Gravel
6 - 8	S-4		9 - 9 - 10 - 15	12	19	6.0	COASTAL PLAIN DEPOSITS		Brown Silty Sand, Wet, Medium Dense (SM)	
8 - 10	S-5		10 - 7 - 4 - 8	12	11				As Above (SM)	
						10.0				
						15.0			Running Sands	
						17.0				
						20.0			Boring Log B-4 Terminated at a Depth of 17.0 Feet Below Ground Surface Due to Refusal	
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-5

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club
Surface Elevation:	± NS feet	**Date Started:**	5/7/2025
Termination Depth:	18.5 feet bgs	**Date Completed:**	5/7/2025
Proposed Location:	Addition	**Logged By:**	NL
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate
		Equipment:	CME-45

Water Depth (feet bgs) | Elevation (feet)		Cave-In Depth (feet bgs) | Elevation (feet)	
During:	7.0 | ---		
At Completion:	7.0 | ---	**At Completion:**	8.0 | ---
24 Hours:	--- | ---	**24 Hours:**	--- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
						0.2	TOPSOIL		2" Lawn and Topsoil	
0 - 2	S-1	X	1 - 3 - 3 - 4	15	6		COASTAL PLAIN DEPOSITS		Brown Silty Sand, Moist, Loose (SM)	
2 - 4	S-2	X	3 - 4 - 4 - 3	12	8				As Above, Yellowish-Brown (SM)	
4 - 6	S-3	X	1 - 3 - 3 - 5	12	6	5.0			As Above (SM)	
6 - 8	S-4	X	3 - 9 - 15 - 17	14	24				As Above, Gray, Wet, Medium Dense (SM)	
8 - 10	S-5	X	12 - 11 - 11 - 13	18	22				As Above (SM)	
						10.0				
						13.0				
13 - 15	S-6	X	9 - 13 - 15 - 21	18	28				Dark Reddish-Brown Clayey Sand, Wet, Medium Dense (SC)	
						15.0				
17 - 18.5	S-7	X	11 - 32 - 50/3"	6	82/9"				As Above, Very Dense (SC)	
						18.5				
									Boring Log B-5 Terminated at a Depth of 18.5 Feet Below Ground Surface Due to Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-6

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club
Surface Elevation:	± NS feet	**Date Started:**	5/7/2025
Termination Depth:	18.6 feet bgs	**Date Completed:**	5/7/2025
Proposed Location:	Addition	**Logged By:**	NL
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate
		Equipment:	CME-45

Water Depth (feet bgs) | Elevation (feet)		Cave-In Depth (feet bgs) | Elevation (feet)	
During:	7.0 | ---		
At Completion:	6.5 | ---	**At Completion:**	7.5 | ---
24 Hours:	--- | ---	**24 Hours:**	--- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
						0.2	TOPSOIL		2" Lawn and Topsoil	
0 - 2	S-1	X	3 - 3 - 2 - 2	13	5		COASTAL PLAIN DEPOSITS		Dark Brown and Yellowish-Brown Silty Sand, Moist, Loose (SM)	
2 - 4	S-2	X	1 - 3 - 3 - 15	15	6				As Above, Grayish-Brown (SM)	
4 - 6	S-3	X	5 - 5 - 7 - 9	10	12	5.0			As Above, Medium Dense (SM)	
6 - 8	S-4	X	8 - 16 - 20 - 21	12	36				As Above, Yellowish-Brown, Wet, Dense (SM)	
8 - 10	S-5	X	16 - 13 - 14 - 14	15	27				As Above, Medium Dense (SM)	
						10.0				
13 - 15	S-6	X	14 - 16 - 18 - 20	12	34				As Above, Dark Reddish-Brown to Dark Gray, Dense (SM)	
						15.0				
18 - 18.6	S-7	X	19 - 50/1"	4	50/1"	18.6			As Above, Dark Gray, Very Dense (SM)	
									Boring Log B-6 Terminated at a Depth of 18.6 Feet Below Ground Surface Due to Refusal	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-7

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	5/7/2025		
Termination Depth:	18.8 feet bgs	**Date Completed:**	5/7/2025		
Proposed Location:	Building	**Logged By:**	NL	**During:** 8.0 | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate	**At Completion:** 8.0 | ---	**At Completion:** 9.0 | ---
		Equipment:	CME-45	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0	TOPSOIL		2" Topsoil	
0 - 2	S-1	X	1 - 2 - 2 - 4	8	4		FILL		Yellowish-Brown Sandy Silt, Moist (FILL)	
						2.0				
2 - 4	S-2	X	4 - 4 - 4 - 7	8	8		COASTAL PLAIN DEPOSITS		Yellowish-Brown Silty Sand, Moist, Loose (SM)	
4 - 6	S-3	X	10 - 10 - 12 - 15	12	22	5.0			As Above, Medium Dense (SM)	
6 - 8	S-4	X	8 - 10 - 8 - 10	10	18				As Above, Trace Gravels (SM)	
8 - 10	S-5	X	6 - 9 - 9 - 8	12	18				As Above, Wet (SM)	
						10.0				
						13.0				
13 - 15	S-6	X	11 - 23 - 23 - 19	8	46				As Above, with Some Gravel, Dense (SM)	
						15.0				
18 - 18.8	S-6	X	23 - 50/3"	4	50/3"	18.8			As Above (SM)	
									Boring Log B-7 Terminated at a Depth of 18.8 Feet Below Ground Surface	
						20.0				
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-8

Page 1 of 1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

				Water Depth | Elevation (feet bgs) | (feet)	Cave-In Depth | Elevation (feet bgs) | (feet)
Surface Elevation:	± NS feet	**Date Started:**	5/7/2025		
Termination Depth:	19.7 feet bgs	**Date Completed:**	5/7/2025		
Proposed Location:	Addition	**Logged By:**	NL	**During:** 8.0 | ---	
Drill / Test Method:	HSA / SPT	**Contractor:**	Accurate	**At Completion:** 8.0 | ---	**At Completion:** 9.0 | ---
		Equipment:	CME-45	**24 Hours:** --- | ---	**24 Hours:** --- | ---

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0	TOPSOIL		2" Topsoil	
0 - 2	S-1		2 - 2 - 2 - 2	10	4		FILL		Yellowish-Brown Sandy Silt, Moist (FILL)	
						2.0				
2 - 4	S-2		3 - 8 - 12 - 13	8	20		COASTAL PLAIN DEPOSITS		Yellowish-Brown Silty Sand, Moist, Medium Dense (SM)	
4 - 6	S-3		14 - 19 - 14 - 15	8	33	5.0			As Above, Dense (SM)	
6 - 8	S-4		4 - 8 - 10 - 9	10	18	6.0			As Above, with Some Gravel, Medium Dense (SM)	
8 - 10	S-5		9 - 12 - 11 - 15	12	23				As Above, Wet (SM)	
						10.0				
13 - 15	S-6		14 - 23 - 19 - 20	12	42				As Above, Dense (SM)	
						15.0				
18 - 19.7	S-7		11 - 29 - 38 - 50/2"	8	67				As Above, Very Dense (SM)	
						19.7				
						20.0			Boring Log B-8 Terminated at a Depth of 19.7 Feet Below Ground Surface	
						25.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-1

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/28/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	10.0 feet bgs	**Date Completed:**	4/28/2025	**During:**	9.0	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	9.0	---	**At Completion:** 2.5 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil	
			1.0				
1 - 2.5	S-2	BAG		1 - 2.5	COASTAL PLAIN DEPOSITS	Yellowish-Brown (10YR 5/4) LOAM; 5% Gravel; Moist; Moderate, Fine, Subangular Blocky Structure; Friable; Few, Coarse Roots	IT-1 @ 1.0 fbgs
			2.0				
2.5 - 4	S-3	BAG		2.5 - 4		As Above, with Grayish-Brown (10YR 5/2); Common, Medium, Distinct Mottling	
			3.0				
			4.0				
4 - 9	S-4	BAG		4 - 9		Reddish-Brown (2.5YR 4/4) LOAMY SAND; 10% Gravel; Moist; Moderate, Medium Granular Structure; Friable; No Roots	
			5.0				
			6.0				
			7.0				
			8.0				
			9.0 ▽▼				
9 - 10	S-5	BAG		9 - 10		As Above, Wet	Water @ 9.0 fbgs
			10.0				
						Soil Profile Pit SPP-1 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Excessive Cave-Ins	
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-2

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/28/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	4/28/2025				
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**During:**	9.0	---	
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**At Completion:**	9.0	---	**At Completion:** 2.5 / ---
Test Method:	Visual Observation	**Rig Type:**	Komatsu	**24 Hours:**	---	---	

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1.5	S-1	BAG		0 - 1.5	TOPSOIL	18" Topsoil	
			1.0				
			2.0	1.5 - 2.5	COASTAL PLAIN DEPOSITS	Yellowish-Brown (10YR 5/4) LOAM; 5% Gravel; Moist; Moderate, Fine, Granular Structure; Friable; No Roots	IT-2 @ 1.5 fbgs
2.5 - 4.5	S-2	BAG	3.0	2.5 - 4.5		As Above, with Grayish-Brown (10YR 5/2); Common, Medium, Distinct Mottling	
			4.0				
4.5 - 9	S-3	BAG	5.0	4.5 - 9		Dark Reddish-Brown (5YR 3/3) LOAMY SAND; 10% Gravel; Moist; Moderate, Medium Granular Structure; Friable; No Roots	
			6.0				
			7.0				
			8.0				
			9.0 ▽▼				
9 - 12	S-4	BAG	10.0	9 - 12		As Above, Wet	
			11.0				
			12.0				
			13.0			Soil Profile Pit SPP-2 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-3

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/28/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	6.0 feet bgs	**Date Completed:**	4/28/2025	**During:**	5.0	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	5.0	---	**At Completion:** 2.0 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil	
			1.0				
1 - 2	S-2	BAG		1 - 2	COASTAL PLAIN DEPOSITS	Yellowish-Brown (10YR 5/4) SANDY LOAM; 5% Gravel; Moist; Moderate, Fine, Granular Structure; Friable; No Roots	Tubes @ 1.0 fbgs
			2.0				
2 - 5	S-3	BAG		2 - 5		As Above, with Grayish-Brown (10YR 5/2); Common, Medium, Distinct Mottling	
			3.0				
			4.0				
			5.0 ▽▼				
5 - 6	S-4	BAG				Dark Reddish-Brown (5YR 3/3) LOAMY SAND; 10% Gravel; Wet; Moderate, Medium Granular Structure; Friable; No Roots	
			6.0				
						Soil Profile Pit SPP-3 Terminated at a Depth of 6.0 Feet Below Ground Surface	
			7.0				
			8.0				
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-4

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/28/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	7.5 feet bgs	**Date Completed:**	4/28/2025	**During:**	5.0	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	5.0	---	**At Completion:** 2.0 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil	
			1.0				
1 - 2	S-2	BAG		1 - 2	COASTAL PLAIN DEPOSITS	Yellowish-Brown (10YR 5/4) SANDY LOAM; 5% Gravel; Moist; Moderate, Fine, Granular Structure; Friable; No Roots	Tubes @ 1.0 fbgs
			2.0				
2 - 5	S-3	BAG		2 - 5		As Above, with Grayish-Brown (10YR 5/2); Common, Medium, Distinct Mottling	
			3.0				
			4.0				
			5.0 ▽▼				
5 - 7.5	S-4	BAG		5 - 7.5		Dark Reddish-Brown (5YR 3/3) LOAMY SAND; 10% Gravel; Wet; Moderate, Medium Granular Structure; Friable; No Roots	
			6.0				
			7.0				
			8.0			Soil Profile Pit SPP-4 Terminated at a Depth of 7.5 Feet Below Ground Surface	
			9.0				
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-5

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/28/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	8.5 feet bgs	**Date Completed:**	4/28/2025	**During:**	5.5	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	5.5	---	**At Completion:** 2.5 | ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil	
			1.0				
1 - 2.5	S-2	BAG		1 - 2.5	COASTAL PLAIN DEPOSITS	Reddish-Brown (2.5YR 4/4) LOAMY SAND; No Coarse Fragments; Moist; Moderate, Fine Granular Structure; Friable; No Roots	Tubes @ 1.0 fbgs
			2.0				
2.5 - 4.5	S-3	BAG		2.5 - 4.5		As Above, with Grayish-Brown (10YR 5/2); Common, Medium, Distinct Mottling	
			3.0				
			4.0				
			5.0				
				5.5 - 8.5		As Above, Wet	Water @ 5.5 fbgs
5.5 - 8.5	S-4	BAG	6.0				
			7.0				
			8.0				
			9.0			Soil Profile Pit SPP-5 Terminated at a Depth of 8.5 Feet Below Ground Surface	
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

WHITESTONE

Soil Profile Pit No.: SPP-6

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/29/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	10.0 feet bgs	**Date Completed:**	4/29/2025	**During:**	7.5	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	7.5	---	**At Completion:** 2.0 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil/Grass	
			1.0				
1 - 2	S-2	BAG		1 - 2	COASTAL PLAIN DEPOSITS	Yellowish-Brown (10YR 5/4) SANDY LOAM; 5% Gravel; Moist; Moderate, Medium, Subangular Blocky Structure; Friable; No Roots	IT-6 @ 1.0 fbgs
			2.0				
2 - 3	S-3	BAG		2 - 3		As Above, Common, Medium, Distinct Mottling	
			3.0				
3 - 7.5	S-4	BAG		3 - 7.5		Grayish-Brown (10YR 5/2) SILTY CLAY; No Coarse Fragments; Moist; Moderate, Fine, Massive Structure; Plastic; Common, Medium, Distinct Mottling; No Roots	
			4.0				
			5.0				
			6.0				
			7.0				
				7.5 - 10		Dark Reddish-Brown (5YR 3/3) SANDY LOAM; 15% Gravel; Wet; Moderate, Medium Granular Structure; Friable; No Roots	
7.5 - 10	S-5	BAG	8.0				
			9.0				
			10.0				
						Soil Profile Pit SPP-6 Terminated at a Depth of 10.0 Feet Below Ground Surface	
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-7

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/29/2025	**Water Depth (feet bgs) | Elevation (feet)**		**Estimated Seasonal High Groundwater Depth (feet bgs) | Elevation (feet)**	
Termination Depth:	12.0 feet bgs	**Date Completed:**	4/29/2025				
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**During:**	9.0 | ---		
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**At Completion:**	9.0 | ---	**At Completion:**	4.0 | ---
Test Method:	Visual Observation	**Rig Type:**	Komatsu	**24 Hours:**	--- | ---		

SAMPLE INFORMATION			DEPTH (feet)		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type					
			0.0				
0 - 1.5	S-1	BAG	1.0	0 - 1.5	TOPSOIL	18" Topsoil	
1.5 - 4	S-2	BAG	2.0 3.0 4.0	1.5 - 4	COASTAL PLAIN DEPOSITS	Reddish-Brown (2.5YR 4/4) LOAM; No Coarse Fragments; Moist; Moderate, Medium, Granular Structure; Friable; No Roots	IT-7 @ 2.0 fbgs
4 - 9	S-3	BAG	5.0 6.0 7.0 8.0 9.0	4 - 9		Grayish-Brown (10YR 5/2) CLAY; No Coarse Fragments; Moist; Moderate, Fine, Massive Structure; Plastic; Common, Medium, Distinct Mottling; No Roots	
9 - 12	S-4	BAG	10.0 11.0 12.0			Reddish-Brown (2.5YR 4/4) LOAM; No Coarse Fragments; Wet; Moderate, Medium Granular Structure; Friable; No Roots	
			13.0 14.0 15.0			Soil Profile Pit SPP-7 Terminated at a Depth of 12.0 Feet Below Ground Surface	

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: SPP-8

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/29/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	12.0 feet bgs	**Date Completed:**	4/29/2025	**During:**	5.5	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	5.5	---	**At Completion:** 2.5 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

SAMPLE INFORMATION			DEPTH (feet)	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type				
			0.0			
0 - 0.75	S-1	BAG	0 - 0.75	TOPSOIL	9" Topsoil	
0.75 - 2.5	S-2	BAG	0.75 - 2.5	COASTAL PLAIN DEPOSITS	Reddish-Brown (2.5YR 4/4) LOAM; 5% Gravel; Moist; Moderate, Medium, Granular Structure; Friable; No Roots	Tubes @ 0.75 fbgs
2.5 - 5.5	S-3	BAG	2.5 - 5.5		Brown (7.5YR 4/2) CLAY; 5% Gravel; Moist; Moderate, Fine, Massive Structure; Plastic; Common, Medium, Distinct Mottling; No Roots	
5.5 - 12	S-4	BAG	5.5 - 12		Grayish-Brown (10YR 5/2) LOAMY SAND; No Coarse Fragments; Wet; Moderate, Medium, Granular Structure; Friable; No Roots	
					Soil Profile Pit SPP-8 Terminated at a Depth of 12.0 Feet Below Ground Surface	

1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

RECORD OF SUBSURFACE EXPLORATION

WHITESTONE

Soil Profile Pit No.: SPP-9

Project:	Proposed Improvements	**WAI Project No.:**	GJ2523304.000
Location:	163 Rumson Road; Rumson, Monmouth County, NJ	**Client:**	Rumson Country Club

Surface Elevation:	± NS feet	**Date Started:**	4/29/2025		**Water Depth (feet bgs)**	**Elevation (feet)**	**Estimated Seasonal High Groundwater Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	8.5 feet bgs	**Date Completed:**	4/29/2025	**During:**	4.0	---	
Proposed Location:	SWM - Pervious Pavement	**Logged By:**	RN	**At Completion:**	4.0	---	**At Completion:** 2.5 / ---
Excavating Method:	Test Pit Excavation	**Contractor:**	Traditional	**24 Hours:**	---	---	
Test Method:	Visual Observation	**Rig Type:**	Komatsu				

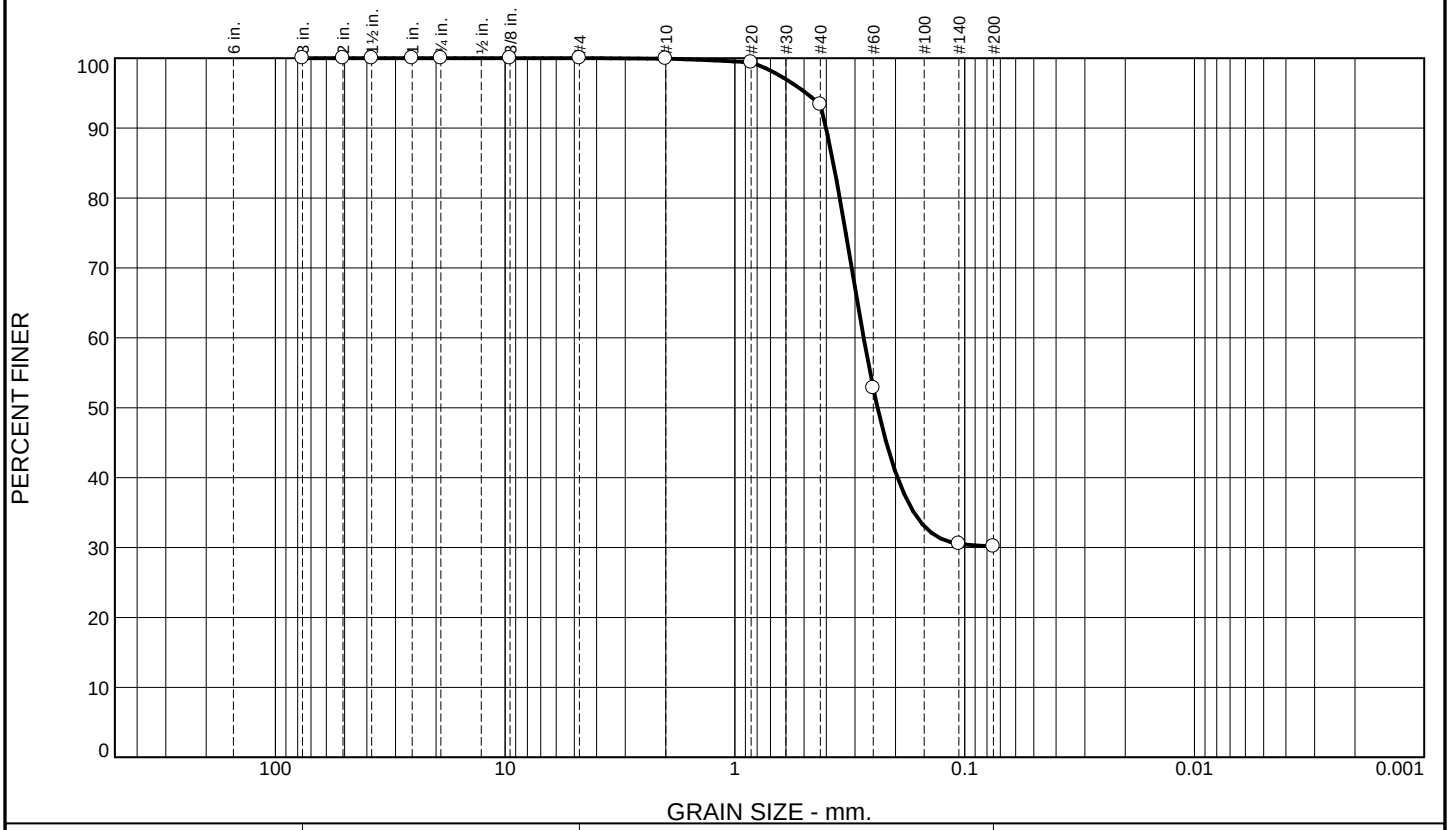
SAMPLE INFORMATION			DEPTH		HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet				
			0.0				
0 - 1	S-1	BAG		0 - 1	TOPSOIL	12" Topsoil	
			1.0				
1 - 2	S-2	BAG		1 - 2	COASTAL PLAIN DEPOSITS	Dark Yellowish-Brown (10YR 4/4) LOAMY SAND; 10% Gravel; Moist; Moderate, Medium, Subangular Blocky Structure; Friable; No Roots	IT-9 @ 1.0 fbgs
			2.0				
2 - 2.5	S-3	BAG		2 - 2.5		As Above, Light Gray (10YR 7/2)	
				2.5 - 5		Dark Gray (10YR 4/11) SILTY CLAY; No Coarse Fragments; Moist; Moderate, Fine, Massive Structure; Plastic; Common, Coarse, Distinct Mottling; No Roots	
2.5 - 5	S-4	BAG	3.0				
			4.0 ▽▽				
			5.0				
5 - 8.5	S-5	BAG		5 - 8.5		Gray (10YR 5/1) SAND; No Coarse Fragments; Wet; Moderate, Medium, Granular Structure; Friable; No Roots	
			6.0				
			7.0				
			8.0				
			9.0			Soil Profile Pit SPP-9 Terminated at a Depth of 8.5 Feet Below Ground Surface	
			10.0				
			11.0				
			12.0				
			13.0				
			14.0				
			15.0				

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

APPENDIX B
Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	6.5	63.2	30.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.4		
#40	93.4		
#60	52.8		
#140	30.6		
#200	30.2		

* (no specification provided)

Material Description

Silty Sand

Atterberg Limits

PL= 20 LL= 23 PI= 3

Coefficients

D_{90}= 0.4011 D_{85}= 0.3731 D_{60}= 0.2750
D_{50}= 0.2394 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

W_n = 14.3%

Source of Sample: B-1 **Depth:** 6.0' - 8.0'
Sample Number: S-4

Date: 6/5/2025

WHITESTONE ASSOCIATES, INC.
Warren, New Jersey

Client: Rumson Country Club
Project: Proposed Improvements
163 Rumson Road, Rumson, Monmouth County, New Jersey
Project No: GJ2523304.000 **Figure**

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-3** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) A Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

Wt. of Tube Containing Sample _____
Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
8:58:00	10:58:00	120.00

***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

_____ None

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-3** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) B Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

   Wt. of Tube Containing Sample _____
   Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
8:58:00	10:58:00	120.00

***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

    K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    _____ None

    _____ Soil/Tube Contact _____Large Gravel _____ Large Roots

    _____ Dry Soil _____Smearing _____ Compaction

    _____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-4** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) A Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

Wt. of Tube Containing Sample _____
Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
8:58:00	10:58:00	120.00

***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

_____ None

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-4** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) B Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

Wt. of Tube Containing Sample _____
Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes	
8:58:00	10:58:00	120.00	***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

_____ None

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-5** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) A Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

Wt. of Tube Containing Sample _____
Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
8:58:00	10:58:00	120.00

***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

_____ None

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-5** **Sample No.:** **T-1** **Depth:** 1.0'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) B Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

Wt. of Tube Containing Sample _____
Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes	
8:58:00	10:58:00	120.00	***No movement in 120 minutes**

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 120.00

K (in/hr) = 0.00 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

_____ None

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-8** **Sample No.:** **T-1** **Depth:** 0.75'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) A Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

   Wt. of Tube Containing Sample _____
   Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.75

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
9:00:00	10:15:00	75.00
10:15:00	11:30:00	75.00
11:30:00	12:45:00	75.00
12:45:00	2:00:00	75.00

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 75.00

    K (in/hr) = 0.16 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    _____ None

    _____ Soil/Tube Contact _____Large Gravel _____ Large Roots

    _____ Dry Soil _____Smearing _____ Compaction

    _____ Other - Specify _____

Tube Permeameter Test Data

Job Number: GJ2523304.000
Project: Proposed Improvements
Client: Rumson Country Club
Lab Tech:

Sample ID: **Profile Pit No.:** **SPP-8** **Sample No.:** **T-1** **Depth:** 0.75'

COUNTY/MUNICIPALITY Rumson, Monmouth County, New Jersey BLOCK 112 LOT 1

1. Test Number 1 Replicate (letter) B Date Collected 4/28/2025

2. Material Tested: _____ Fill X Test in Native Soil

3. Type of Sample: X Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 1.91
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams 0.00

   Wt. of Tube Containing Sample _____
   Wt. of Empty Tube _____

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 115.77

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. 0 > 1.2

9. Standpipe Used: _____ No _____ Yes, Indicate Internal Radius, cm.

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.75

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
9:00:00	10:15:00	75.00
10:15:00	11:30:00	75.00
11:30:00	12:45:00	75.00
12:45:00	2:00:00	75.00

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 75.00

    K (in/hr) = 0.16 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    _____ None

    _____ Soil/Tube Contact _____Large Gravel _____ Large Roots

    _____ Dry Soil _____Smearing _____ Compaction

    _____ Other - Specify _____

WHITESTONE

APPENDIX C
Infiltration Test Results

WHITESTONE

INFILTRATION TEST

Client: Rumson Country Club

Project: Proposed Improvements

Location: 163 Rumson Road
Rumson, Monmouth County, NJ

File No. GJ2523304.000

Test Hole No.: IT-1@SPP-1

Date: 4/28/2025

Weather: Sunny, 61°

Field Engineer: RN

Surface Elevation: NS

Test Depth (Feet): 2.0

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	8:15	9:15	3.0	0.0	3.0	1.0	---
1	9:15	10:00	3.0	2.0	1.0	0.75	1.3
2	10:15	11:00	3.0	2.0	1.0	0.75	1.3
3	11:15	12:00	3.0	2.0	1.0	0.75	1.3

Remarks: Field i = 1.25 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Rumson Country Club

Project: Proposed Improvements

Location: 163 Rumson Road
Rumson, Monmouth County, NJ

File No. GJ2523304.000

Test Hole No.: IT-2@SPP-2

Date: 4/28/2025

Weather: Sunny, 62°

Field Engineer: RN

Surface Elevation: NS

Test Depth (Feet): 2.5

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	9:25	10:25	3.0	0.0	3.0	1.0	---
1	11:25	12:25	3.0	2.0	1.0	1.0	1.0
2	12:25	1:25	3.0	2.0	1.0	1.0	1.0
3	1:25	2:25	3.0	2.0	1.0	1.0	1.0

Remarks: Field *i* = 0.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Rumson Country Club

Project: Proposed Improvements

Location: 163 Rumson Road
Rumson, Monmouth County, NJ

File No. GJ2523304.000

Test Hole No.: IT-6@SPP-6

Date: 4/28/2025

Weather: Sunny, 68°

Field Engineer: RN

Surface Elevation: NS

Test Depth (Feet): 1.0

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	8:45	9:07	3.0	0.0	3.0	0.37	---
1	9:09	9:17	3.0	2.0	1.0	0.12	8.3
2	9:17	9:24	3.0	2.0	1.0	0.12	8.3
3	9:24	9:32	3.0	2.0	1.0	0.12	8.3

Remarks: Field i = 8.3 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Rumson Country Club

Project: Proposed Improvements

Location: 163 Rumson Road
Rumson, Monmouth County, NJ

File No. GJ2523304.000

Test Hole No.: IT-7@SPP-7

Date: 4/28/2025

Weather: Sunny, 70°

Field Engineer: RN

Surface Elevation: NS

Test Depth (Feet): 2.0

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	9:48	10:48	3.0	0.0	3.0	1.0	---
1	10:52	11:17	3.0	2.0	1.0	0.42	2.4
2	11:17	11:43	3.0	2.0	1.0	0.43	2.3
3	11:45	12:08	3.0	2.0	1.0	0.38	2.6

Remarks: Field *i* = 2.4 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

WHITESTONE

INFILTRATION TEST

Client: Rumson Country Club

Project: Proposed Improvements

Location: 163 Rumson Road
Rumson, Monmouth County, NJ

File No. GJ2523304.000

Test Hole No.: IT-9@SPP-9

Date: 4/28/2025

Weather: Sunny, 73°

Field Engineer: RN

Surface Elevation: NS

Test Depth (Feet): 1.0

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	11:30	12:12	3.0	0.0	3.0	0.7	---
1	12:15	12:31	3.0	2.0	1.0	0.27	3.7
2	12:31	12:47	3.0	2.0	1.0	0.27	3.7
3	12:47	1:06	3.0	2.0	1.0	0.23	4.3

Remarks: Field i = 4.3 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed

APPENDIX F

Stormwater Pipe Design

Manning's Equation

Q = 1.49/n * A * R^2/3 * S^1/2

n (pvc) =	0.01	
d =	12	in
A (full) =	0.79	sf
ro (full) =	3.14	ft
R (full) =	0.25	ft
S =	0.003	ft / ft
Q (full) =	2.54	cfs
Q (max) =	2.75	cfs

APPENDIX G

Conduit Outlet Protection

InSite Engineering LLC

Project Name: Rumson Country Club
Project #: 24-1664-03
Date: 3/3/2026
Structure Name: FES A
Pipe Diameter: **12 inch** **HDPE**

SCOUR HOLE CONDUIT OUTLET PROTECTION

Do =	**1.00**	ft
Wo =	**1.00**	(CIRCULAR SAME AS Do)
TW =	**0.20**	(0.2 Do ASSUMED)
Q(25) =	**2.75**	CFS MAX. FLOW BASED ON HW
Y =	**0.50**	DEPTH OF SCOUR HOLE BELOW INVERT
q=	2.75	CFS/FT (Q/Wo)

CASE 1 - RIPRAP SIZE FOR Y = 1/2 Do

$$d50 = \frac{0.0125}{TW} \; q^{1.33}$$

CASE 2 - RIPRAP SIZE FOR Y = Do

$$d50 = \frac{0.0082}{TW} \; q^{1.33}$$

USE CASE **1**

d50	**0.24**	FEET	
RIPRAP SIZE =	USE	**3**	INCHES
Y =	**6**	INCHES	

APRON THICKNESS

T = 2 x D (50) With filter fabric = **6** INCHES

WIDTH OF HOLE BOTTOM

W(H) = 2 x Wo = **2** FEET

LENGTH OF HOLE BOTTOM

L(H) = 3 x Do = **3** FEET

OVERALL WIDTH

W = W(H) + 2 (3 * Y) = **5** FEET

OVERALL LENGTH

L = L(H) + 2 (3 * Y) = **6** FEET

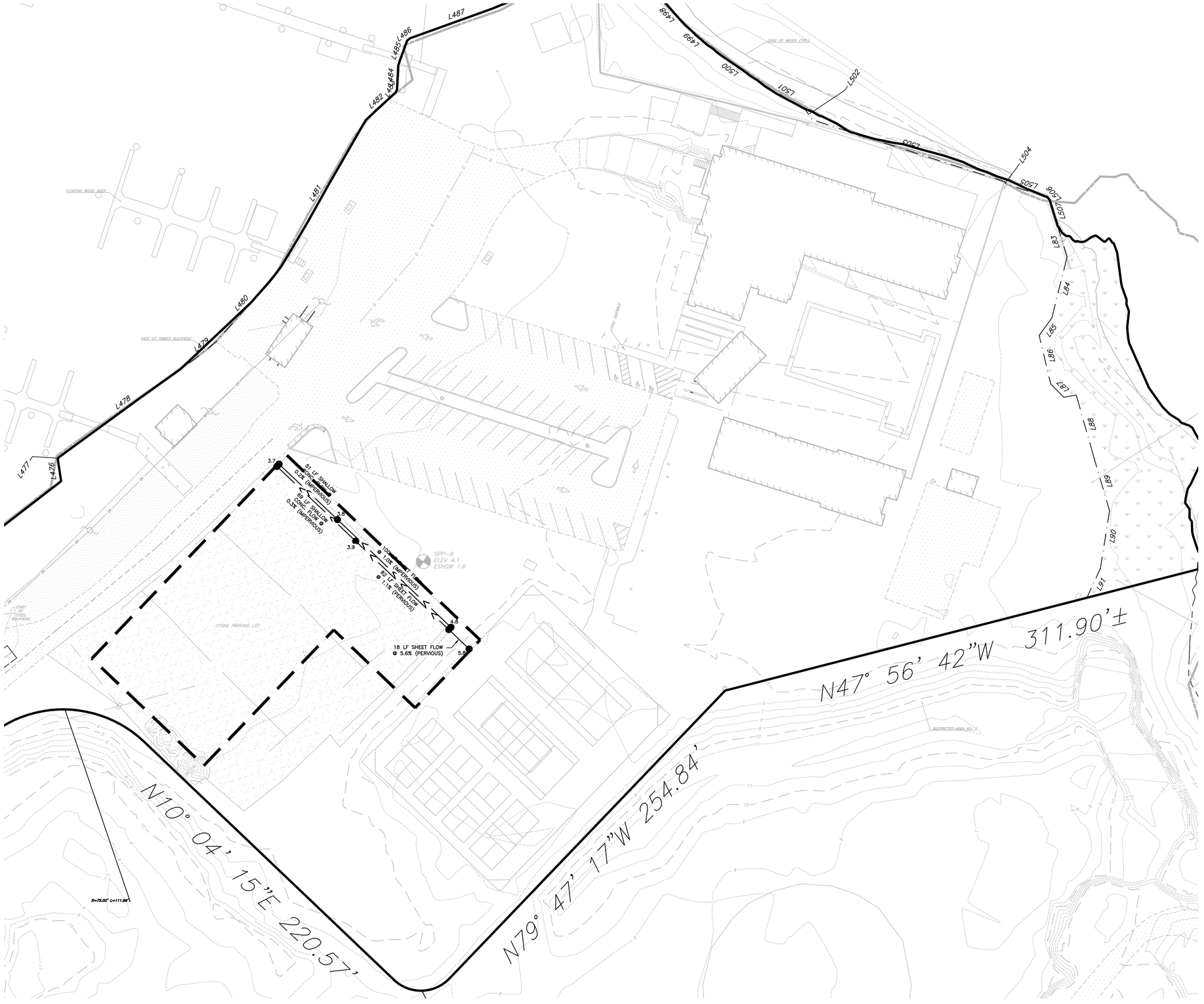
RIP RAP QUANTITY

= WLT(1/27) = **0.56** CUBIC YARDS

APPENDIX H

Pre-Development Drainage Area Map

Post-Development Drainage Area Map



REFERENCE MERIDIAN: N.J.S.P.C.S. NAD 1983

30 0 30 60

SCALE : 1" = 30'

LEGEND

EXISTING		PROPOSED
10	CONTOUR LINE	10
+ 46.80	SPOT ELEVATION	+ 46.80
	BUILDING	
G G	GAS	GAS
W W	WATER	WTR
	INLET	
	STORM	
	SANITARY MAIN	
SAN	SANITARY LATERAL	SAN
OH	OVERHEAD WIRE	O/H
E E	ELECTRIC	E
T T	TELEPHONE	TEL
	UTILITY POLE	
	HYDRANT	
	SIGN POST	
X X	FENCE	X X
	LIGHT FIXTURE	
TP-7	TEST PIT LOCATION	TP-1
	GRADE FLOW ARROW	
	SWALE CENTER LINE	

SEE SHEET C101 FOR PLAN NOTES

EXISTING GRAVEL PARKING LOT & RIVER HOUSE

PROJECT INFORMATION

PROJECT NAME:

RUMSON COUNTRY CLUB

PROJECT LOCATION:
BLOCK 112, LOT 1.01
TAX MAP SHEET 35
163 RUMSON ROAD
BOROUGH OF RUMSON,
MONMOUTH COUNTY, NJ

OWNER:
RUMSON COUNTRY CLUB
163 RUMSON ROAD
RUMSON, NJ 07760

APPLICANT:
RUMSON COUNTRY CLUB
163 RUMSON ROAD
RUMSON, NJ 07760

APPLICANT'S PROFESSIONALS

SURVEYOR:
INSITE SURVEYING, LLC
1955 ROUTE 34, SUITE 1A
WALL, NJ 07719

ARCHITECT:
MONTEFORTE ARCHITECTURAL STUDIO
733 HWY 35, SUITE C
OCEAN, NJ 07712

INSITE ENGINEERING, LLC SINCE 2003

CALL BEFORE YOU DIG!
NJ ONE CALL....800-272-1000
(at least 3 days prior to excavation)

ELECTRIC	RED
GAS / OIL	YELLOW
COMMUNICATION / TV	ORANGE
WATER	BLUE
SEWER	GREEN
TEMP. SURVEY MARKINGS	MAGENTA
PROPOSED EXCAVATION	WHITE

INSITE Engineering • Surveying • Planning
InSite Engineering, LLC
CERTIFICATE OF AUTHORIZATION: 24GA28083200
1955 ROUTE 34, SUITE 1A, WALL, NJ 07719
732-531-7100 (Ph) 732-531-7344 (Fax)
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LICENSED IN: NEW JERSEY, NEW YORK, PENNSYLVANIA
DELAWARE, CONNECTICUT, NORTH CAROLINA
COLORADO, & DISTRICT OF COLUMBIA

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Stephen G. Musto

STEPHEN G. MUSTO, PE, CME
PROFESSIONAL ENGINEER
NJ LIC. NO. 24GE05488400

REVISIONS

Rev. #	Date	Comment
0	08/14/26	INITIAL RELEASE

SCALE:	1"=30'	DESIGNED BY:	SGM
DATE:	08/14/26	DRAWN BY:	JAR
JOB #:	24-1664-03	CHECKED BY:	JLF
CAD ID:	24-1664-03r0		

NOT FOR CONSTRUCTION

APPROVED BY:

FOR CONSTRUCTION

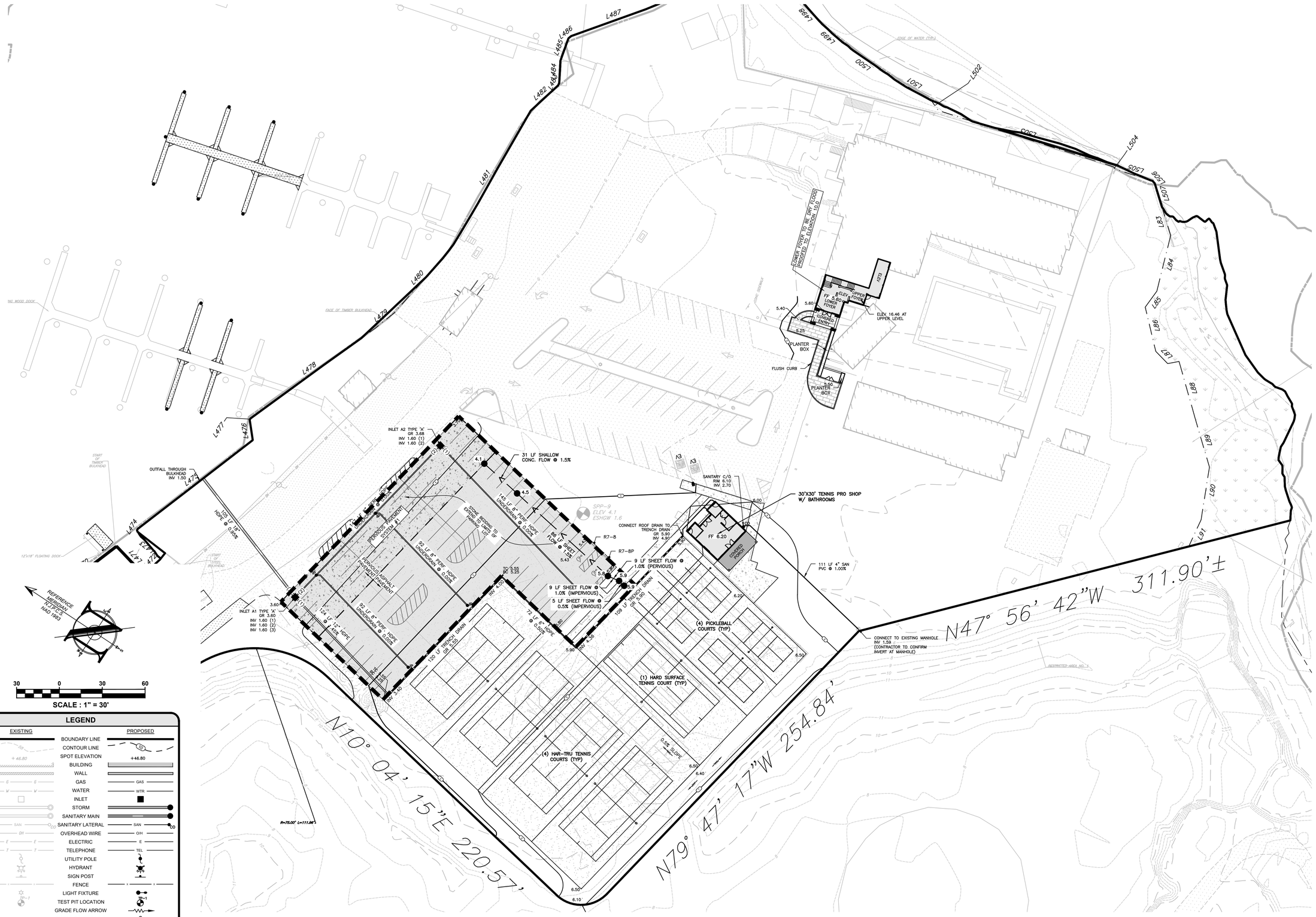
PLAN INFORMATION

DRAWING TITLE:
PRELIMINARY & FINAL MAJOR SITE PLAN

SHEET TITLE:
PRE-DEVELOPMENT DRAINAGE AREA MAP - RIVER HOUSE

SHEET NO:
DA101

Plot: X:\Jobs\1664 – Rumson Country Club\24-1664-03 – Preliminary Site Plan\24166403DA\Dwg\Drainage Area Maps 02 – Existing.dwg, ---> DA101 Pre-Development – River House
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LEGEND

EXISTING		PROPOSED
	BOUNDARY LINE	
	CONTOUR LINE	10
+ 46.80	SPOT ELEVATION	+46.80
	BUILDING	
	WALL	
G	GAS	GAS
W	WATER	WTR
	INLET	
	STORM	
	SANITARY MAIN	
SAN	SANITARY LATERAL	SAN
OH	OVERHEAD WIRE	O/H
E	ELECTRIC	E
T	TELEPHONE	TEL
	UTILITY POLE	
	HYDRANT	
	SIGN POST	
X	FENCE	X
LF-7	LIGHT FIXTURE	
	TEST PIT LOCATION	TP-1
	GRADE FLOW ARROW	
	SWALE CENTER LINE	

SEE SHEET C101 FOR PLAN NOTES

PROPOSED RIVER HOUSE & TENNIS PRO SHOP

PROJECT INFORMATION

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SHEET TITLE:

POST-DEVELOPMENT DRAINAGE AREA MAP - RIVER HOUSE

SHEET NO:

DA201

File: X:\Jobs\1664 — Rumson Country Club\24-1664-03 — Preliminary Site Plan\24166403D4\Dwg\Drainage Area Maps 03 — Proposed.dwg, ---> DA201 Post-Development — River House
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