February 13, 2025 Project # SEI-2202

Stormwater Management Narrative
19 & 27 Highland Avenue
Block 8; Lots 14 & 15
Borough of Keansburg, Monmouth County, New Jersey

Introduction

The proposed project has a site area of 12,500 SF and consists of the construction of an 8,641 SF parking lot. The development is bound by residential developments to the North and West, Highland Avenue to the East and Seabreeze Way to the South. The project is situated within the Mixed Use- Residential and Commercial Zone District (B-2).

Stormwater Management Summary

The project area contains 12,500 SF (0.29 acres), 506 SF (0.012 acres) of which are existing impervious area. The proposed improvements consist of a total of 8,497 SF (0.20 acres) of impervious, which is a net increase of impervious area by 7,991 SF (0.18 acres).

According to the Borough of Keansburg ordinance, §27-3, the Stormwater Management rules only apply to a Major Development which is defined as:

1. The disturbance of one or more acres of land since February 2, 2004;
2. The creation of ¼ acre or more of regulated impervious surface since February 2, 2004;
3. The creation of ¼ acre or more of regulated motor vehicle surface since March 2, 2021; or
4. A combination of Subsection 2 and 3 above that totals an area of ¼ acre or more. The same surface shall not be counted twice when determining if the combination area equals ¼ acre or more.

The subject project contains 0.29 acres, all of which are being disturbed but remain under one acre of land. There is an increase of 0.18 acres of impervious area. Since the increase in impervious area is less than ¼ of an acre, the Borough of Keansburg stormwater management rules for a Major Development regarding reduction of stormwater quantity and stormwater quality do not apply.

The runoff from the existing project area is conveyed to the existing stormwater collection system within the Keansburg right-of-way. The proposed improvements will

maintain the same drainage patterns that currently exist on site, discharging ultimately to the stormwater collection system within the right-of-way. The pre and post development runoff was calculated for the 2, 10, and 100-year storm events. The table below provides a summary of the pre and post-development peak runoff rates for the project area:

Storm Event (Years)	Pre-Dev Runoff (cfs)	Post-Dev Runoff (cfs)
2	0.07	1.17
10	0.25	1.92
100	0.71	3.41

Offsite Stability

Pursuant to the Standards for Soil Erosion and Sediment Control in New Jersey, the site is required to maintain the stability and integrity of natural resources on downstream property. The site generally flat and even and the proposed grading maintains that condition. Proposed grading on site does not have well defined channel or vegetation that would concentrate flows to the storm system in Highland Avenue. All off-site flows will disperse evenly across pavement, sidewalk, and stone. With low run-off rates and no discharge over vegetation, the risk for soil erosion and unstable conditions are at a minimum. Additionally, stormwater discharged into the stormwater system within Highland Avenue is directly discharged into Raritan Bay.

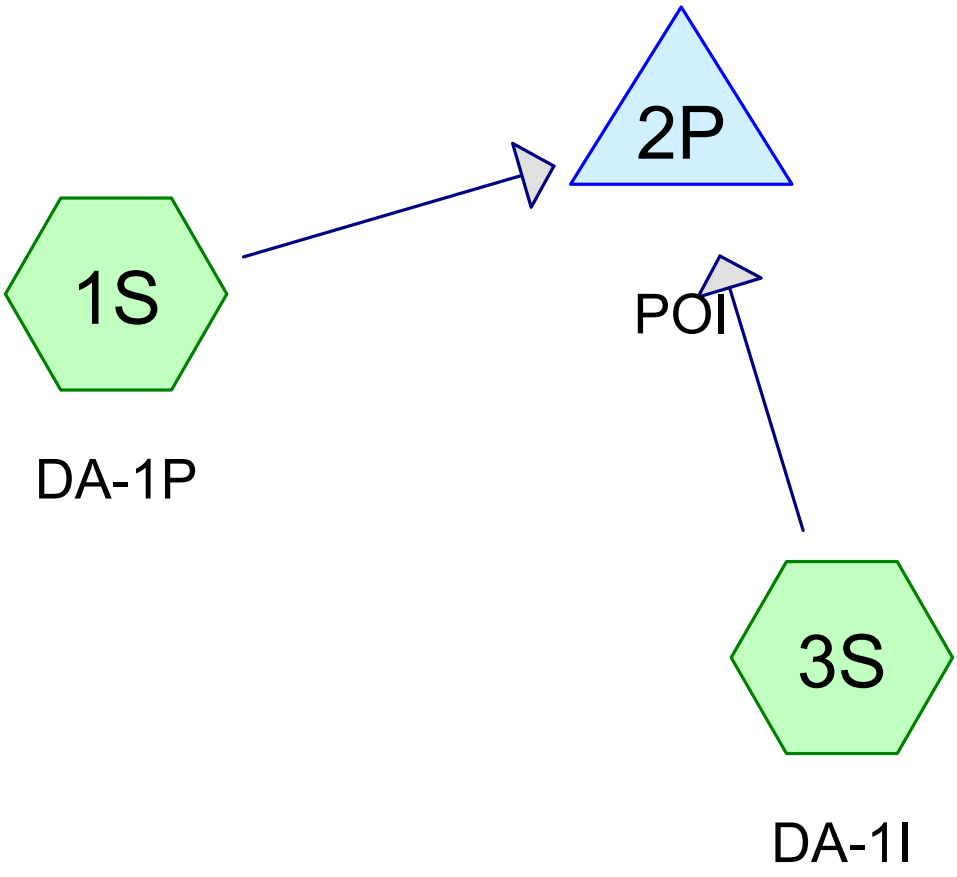
Conclusion

The proposed improvements will maintain the existing drainage patterns in the post-developed condition. Runoff rates are increased in the post-development, however, by an amount that would not have any negative impact on downstream drainage systems. The erosion control methods used will ensure the proposed project will not have a negative impact on the surrounding area or downstream drainage system. By creating less than one acre of new disturbance and not increasing total impervious coverage by ¼ acre, the project does not meet the definition of Major Development as defined in the Borough of Keansburg stormwater management rules and therefore the standards for stormwater quantity reduction and stormwater quality do not apply.

MidAtlantic Engineering Partners

Ian A. Burton, P.E.
Licensed Professional Engineer
New Jersey License No. 54136

Appendix A – Pre-Development Drainage Analysis



Subcat Reach Pond Link

Routing Diagram for 2025-01-07 Pre-Dev
Prepared by MidAtlantic Engineering, Printed 1/28/2025

Summary for Subcatchment 1S: DA-1P

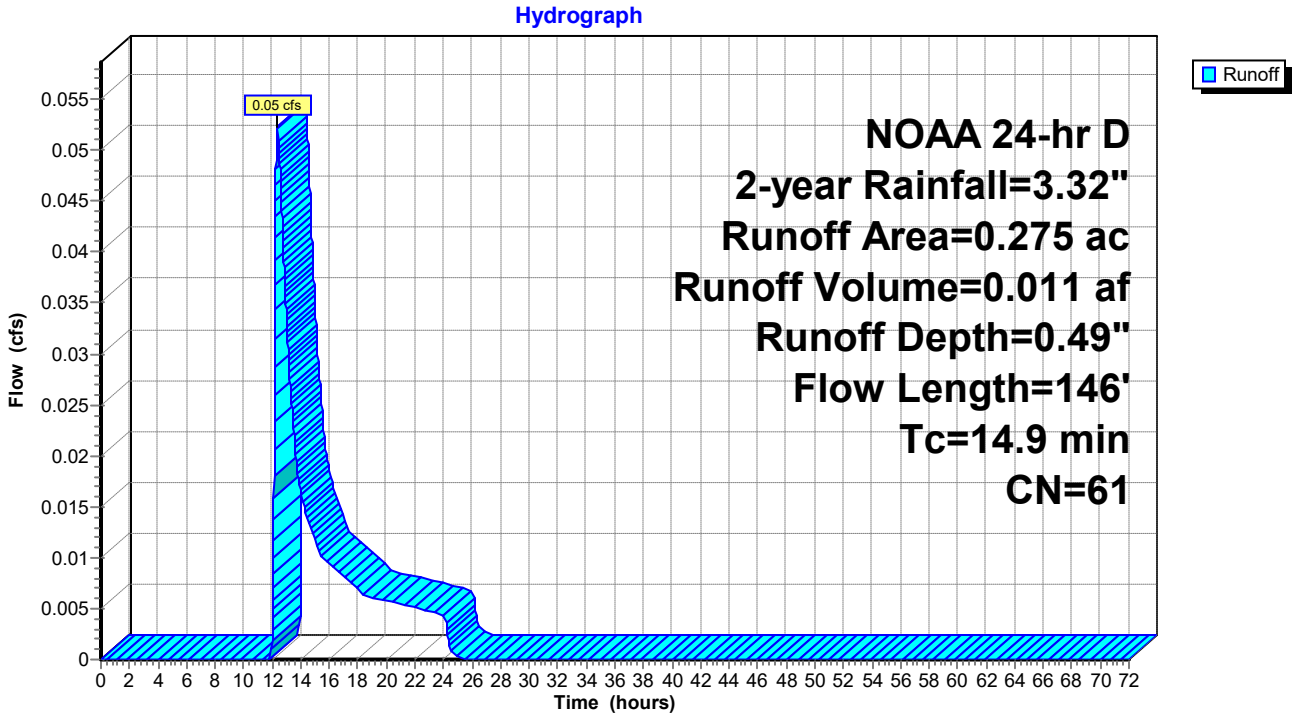
Runoff = 0.05 cfs @ 12.35 hrs, Volume= 0.011 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-year Rainfall=3.32"

Area (ac)	CN	Description
0.275	61	>75% Grass cover, Good, HSG B
0.275		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0092	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.8	46	0.0039	0.44		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.9	146	Total			

Subcatchment 1S: DA-1P



Summary for Subcatchment 3S: DA-1I

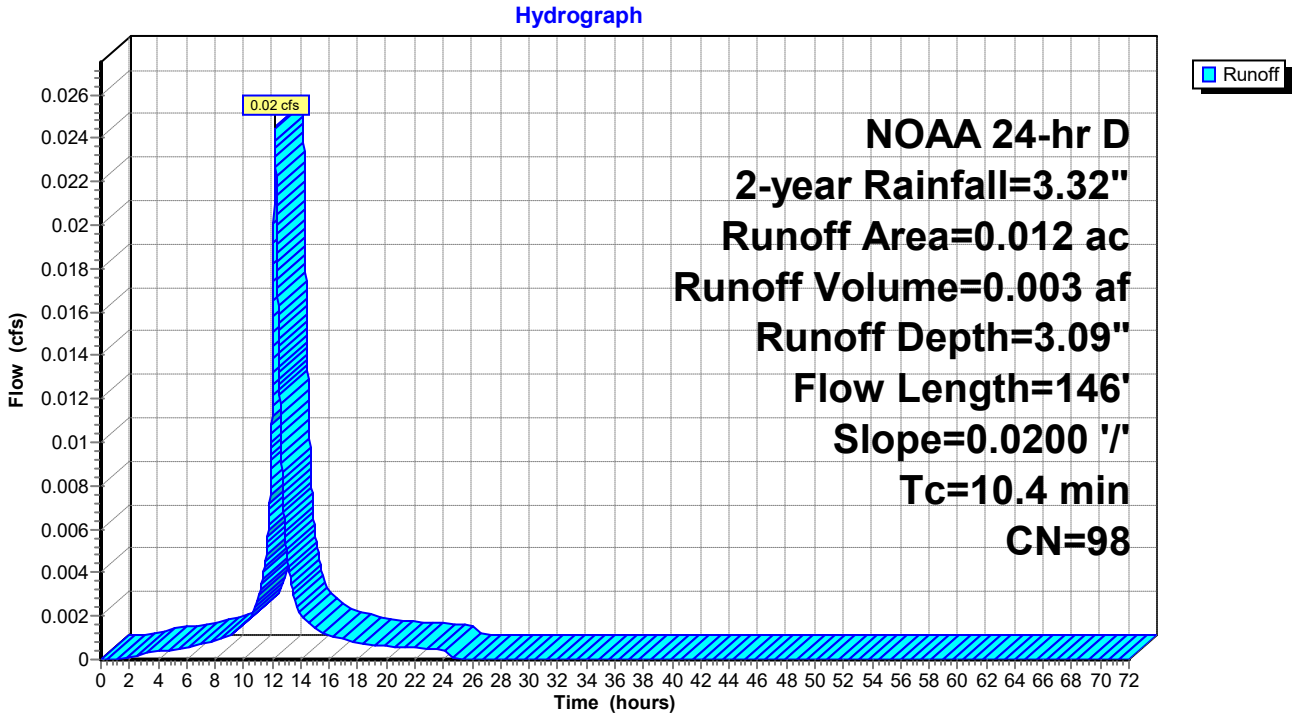
Runoff = 0.02 cfs @ 12.18 hrs, Volume= 0.003 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-year Rainfall=3.32"

Area (ac)	CN	Description
0.012	98	Paved parking, HSG D
0.012		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.8	46	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	146	Total			

Subcatchment 3S: DA-1I

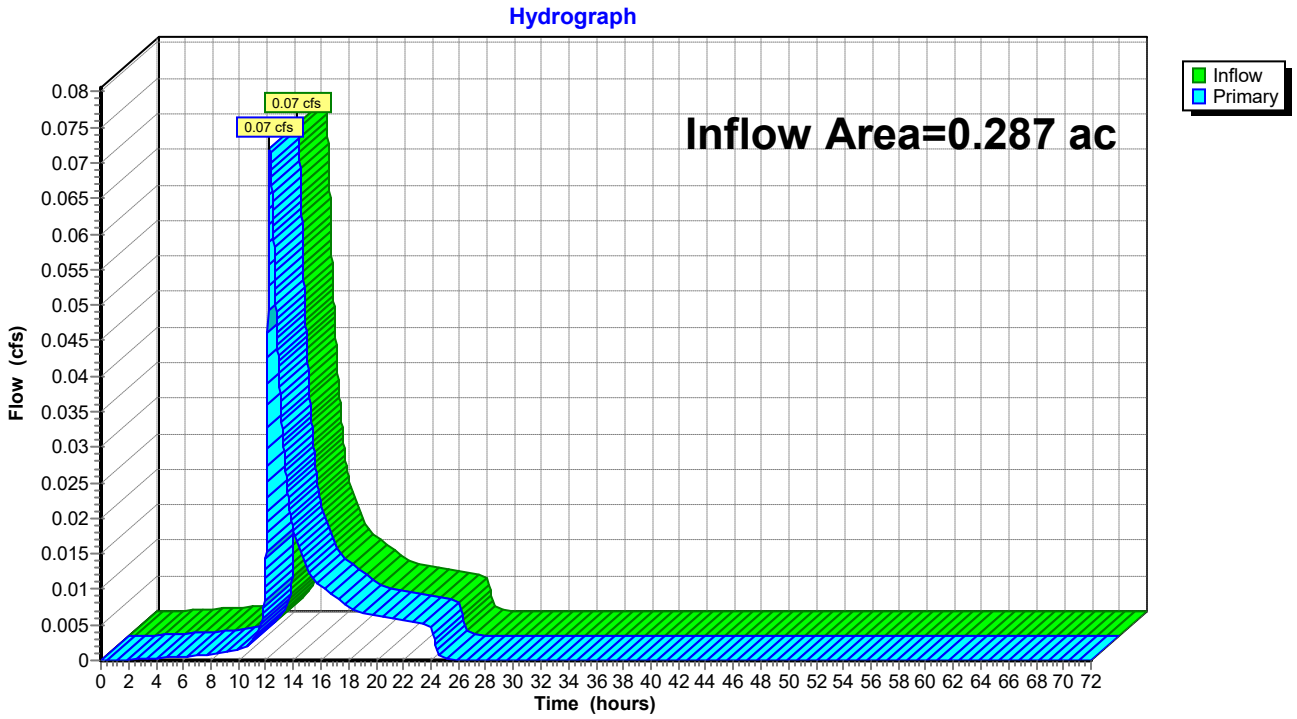


Summary for Pond 2P: POI

Inflow Area = 0.287 ac, 4.18% Impervious, Inflow Depth = 0.60" for 2-year event
Inflow = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af
Primary = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond 2P: POI



Summary for Subcatchment 1S: DA-1P

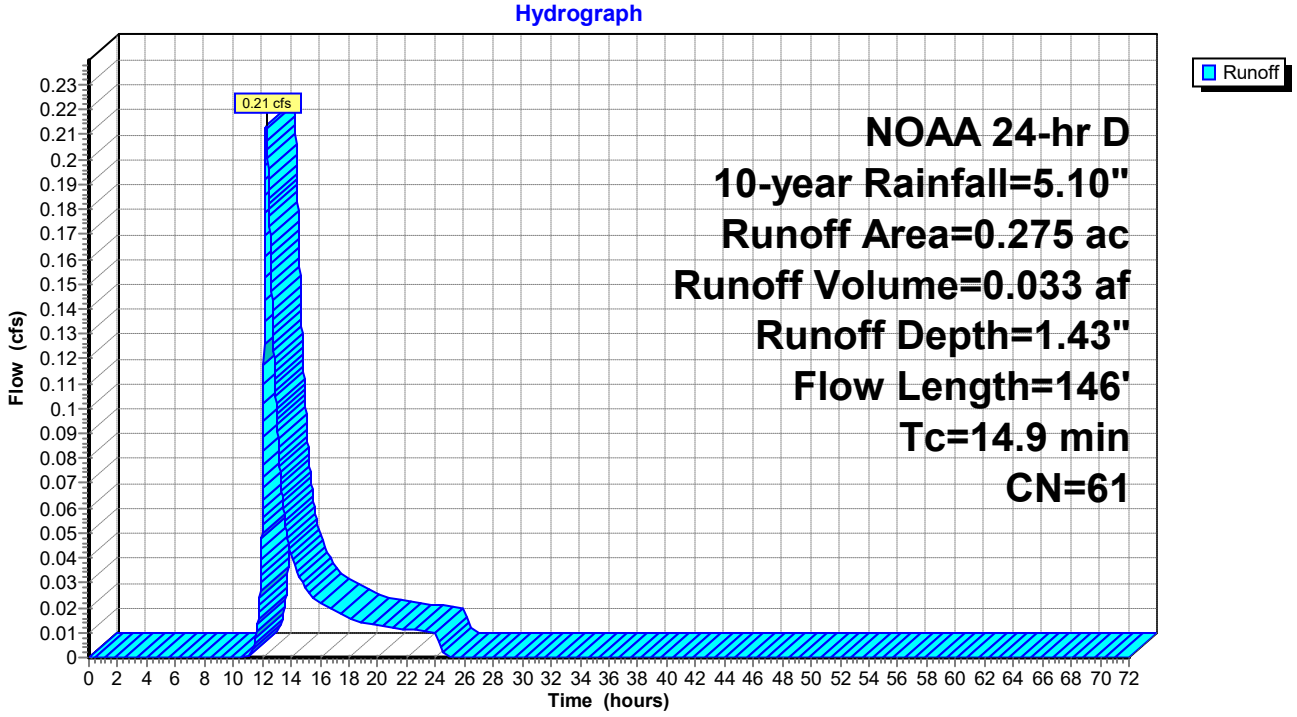
Runoff = 0.21 cfs @ 12.28 hrs, Volume= 0.033 af, Depth= 1.43"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-year Rainfall=5.10"

Area (ac)	CN	Description
0.275	61	>75% Grass cover, Good, HSG B
0.275		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0092	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.8	46	0.0039	0.44		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.9	146	Total			

Subcatchment 1S: DA-1P



Summary for Subcatchment 3S: DA-1I

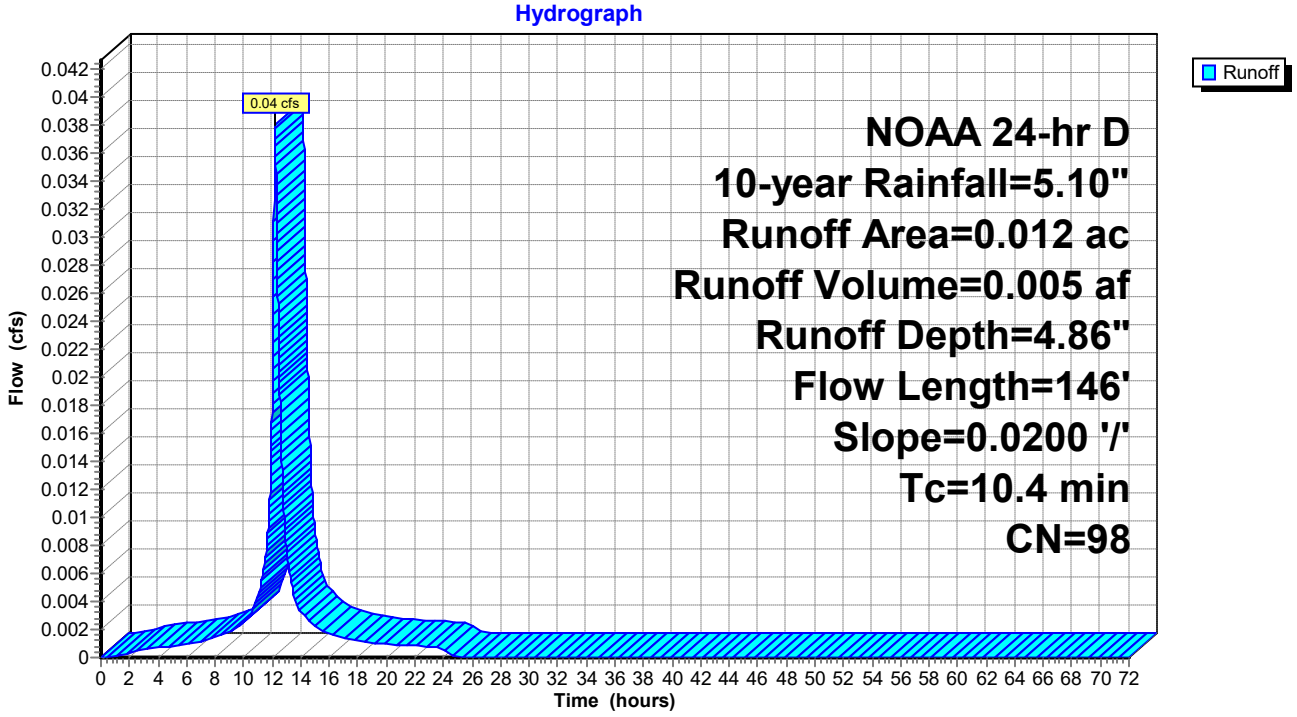
Runoff = 0.04 cfs @ 12.18 hrs, Volume= 0.005 af, Depth= 4.86"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-year Rainfall=5.10"

Area (ac)	CN	Description
0.012	98	Paved parking, HSG D
0.012		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.8	46	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	146	Total			

Subcatchment 3S: DA-1I

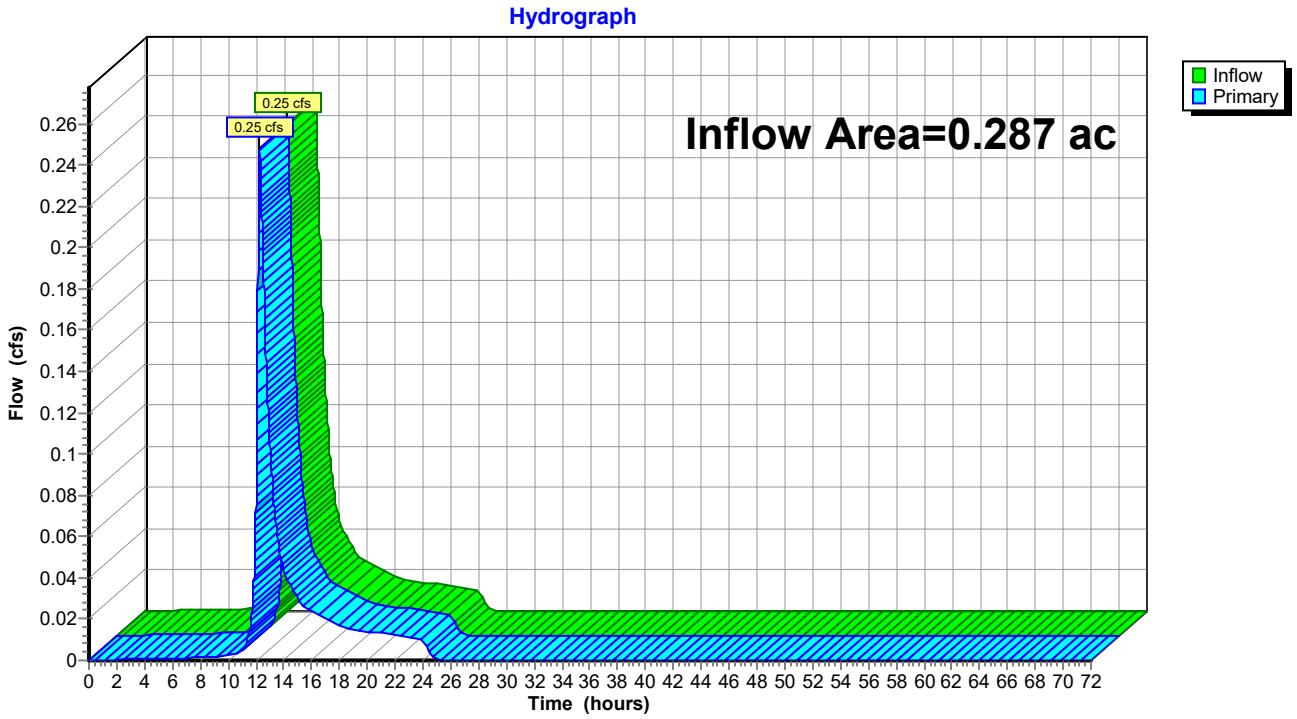


Summary for Pond 2P: POI

Inflow Area = 0.287 ac, 4.18% Impervious, Inflow Depth = 1.57" for 10-year event
Inflow = 0.25 cfs @ 12.26 hrs, Volume= 0.038 af
Primary = 0.25 cfs @ 12.26 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond 2P: POI



Summary for Subcatchment 1S: DA-1P

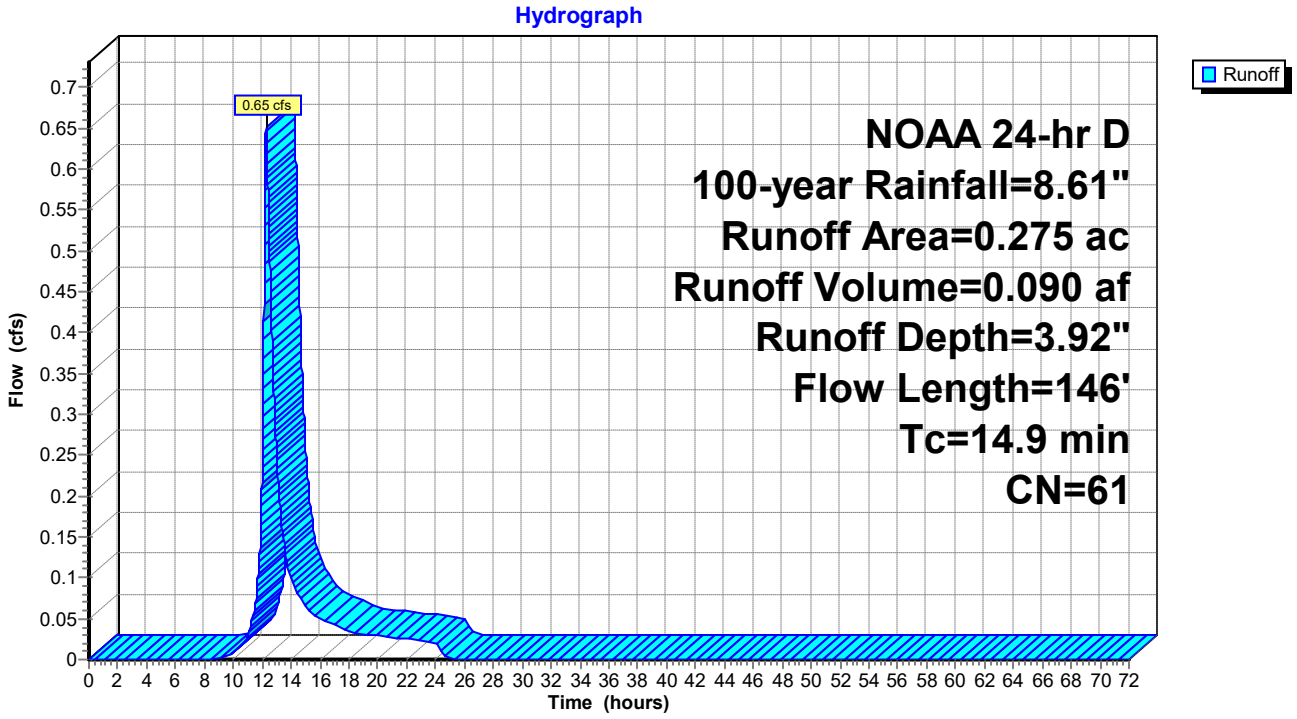
Runoff = 0.65 cfs @ 12.25 hrs, Volume= 0.090 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-year Rainfall=8.61"

Area (ac)	CN	Description
0.275	61	>75% Grass cover, Good, HSG B
0.275		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0092	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.8	46	0.0039	0.44		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
14.9	146	Total			

Subcatchment 1S: DA-1P



Summary for Subcatchment 3S: DA-1I

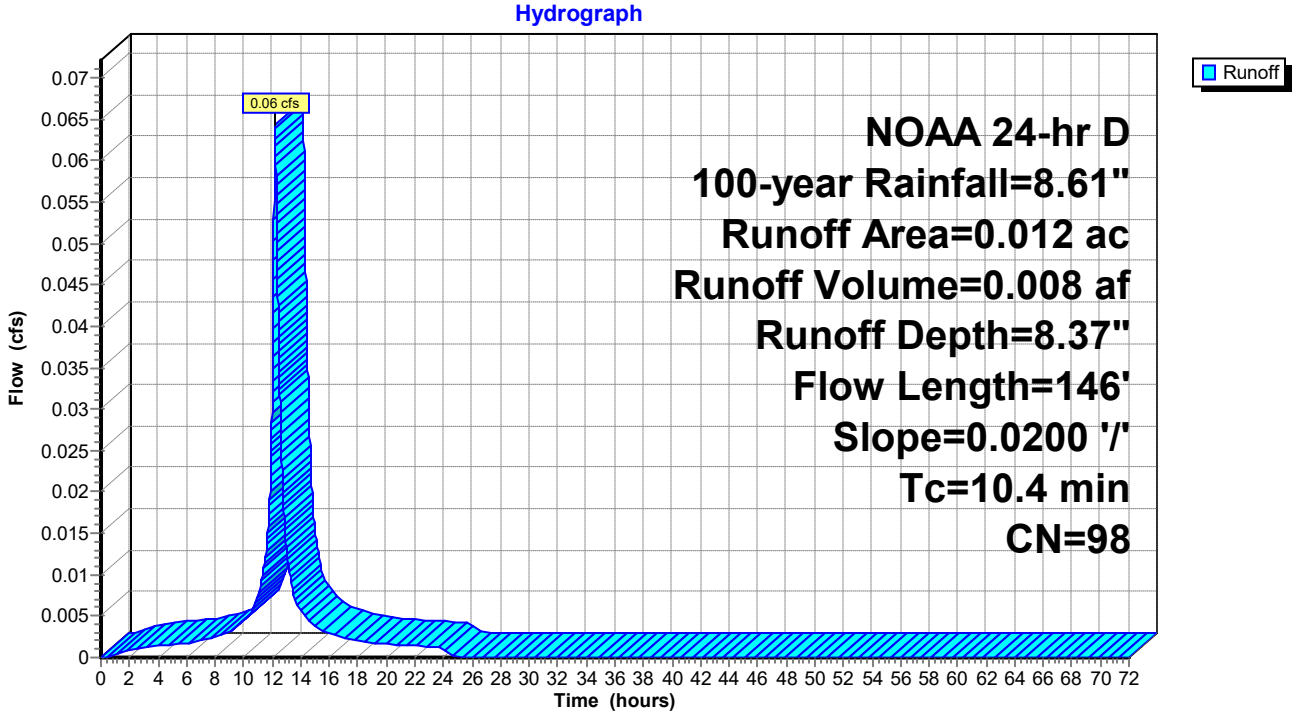
Runoff = 0.06 cfs @ 12.18 hrs, Volume= 0.008 af, Depth= 8.37"

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-year Rainfall=8.61"

Area (ac)	CN	Description
0.012	98	Paved parking, HSG D
0.012		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.8	46	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	146	Total			

Subcatchment 3S: DA-1I

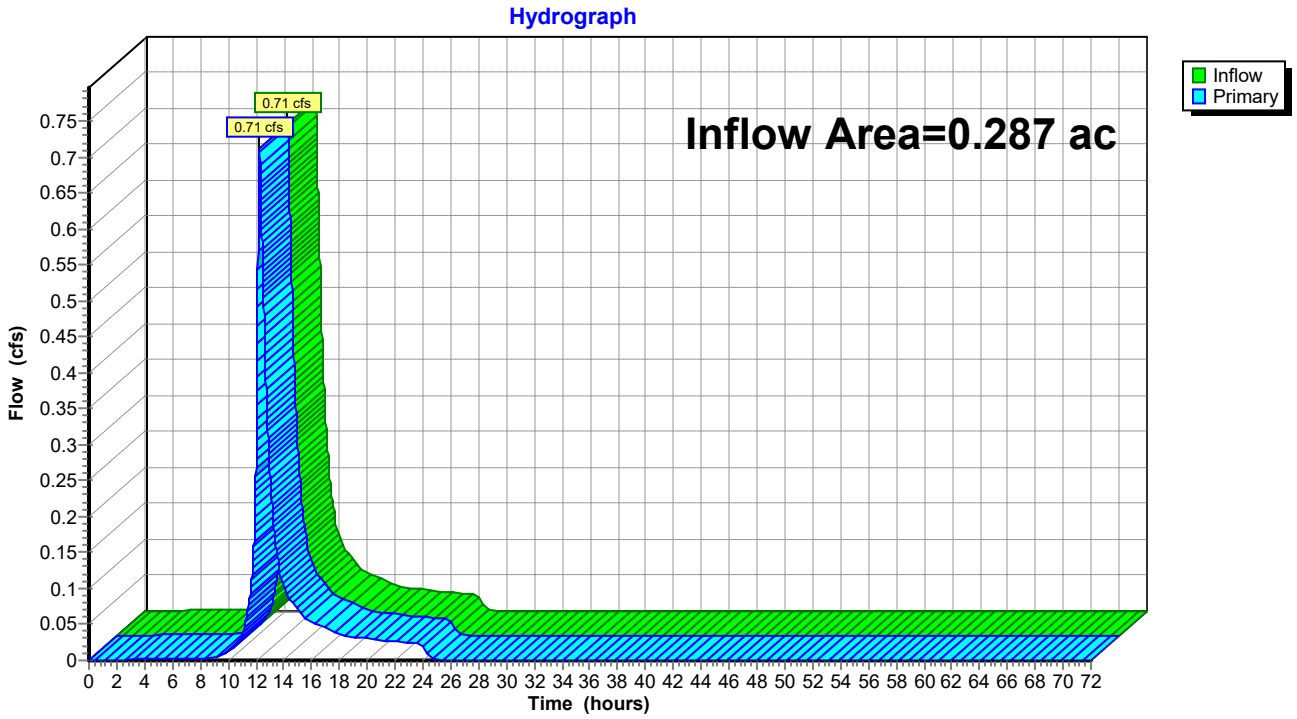


Summary for Pond 2P: POI

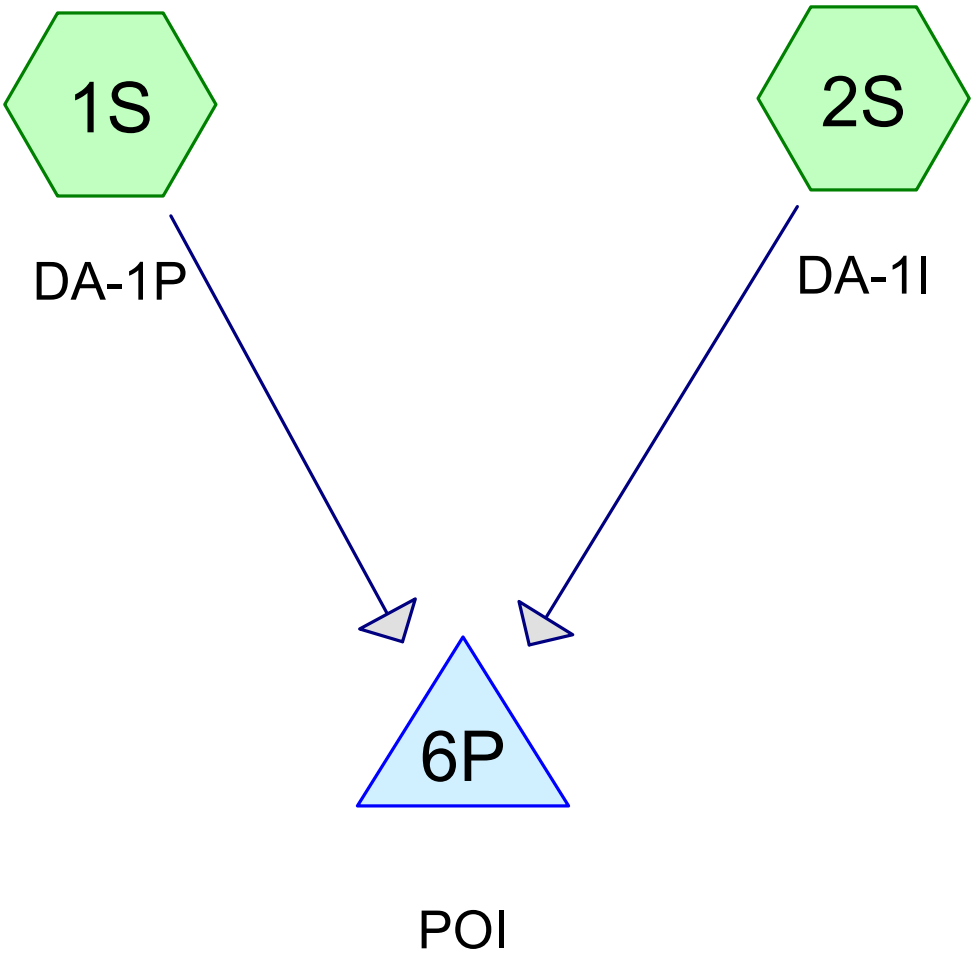
Inflow Area = 0.287 ac, 4.18% Impervious, Inflow Depth = 4.10" for 100-year event
Inflow = 0.71 cfs @ 12.25 hrs, Volume= 0.098 af
Primary = 0.71 cfs @ 12.25 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond 2P: POI



Appendix B – Post-Development Drainage Analysis



Subcat Reach Pond Link

Routing Diagram for 2025-01-07 Post-Dev
Prepared by MidAtlantic Engineering, Printed 1/28/2025

Summary for Subcatchment 1S: DA-1P

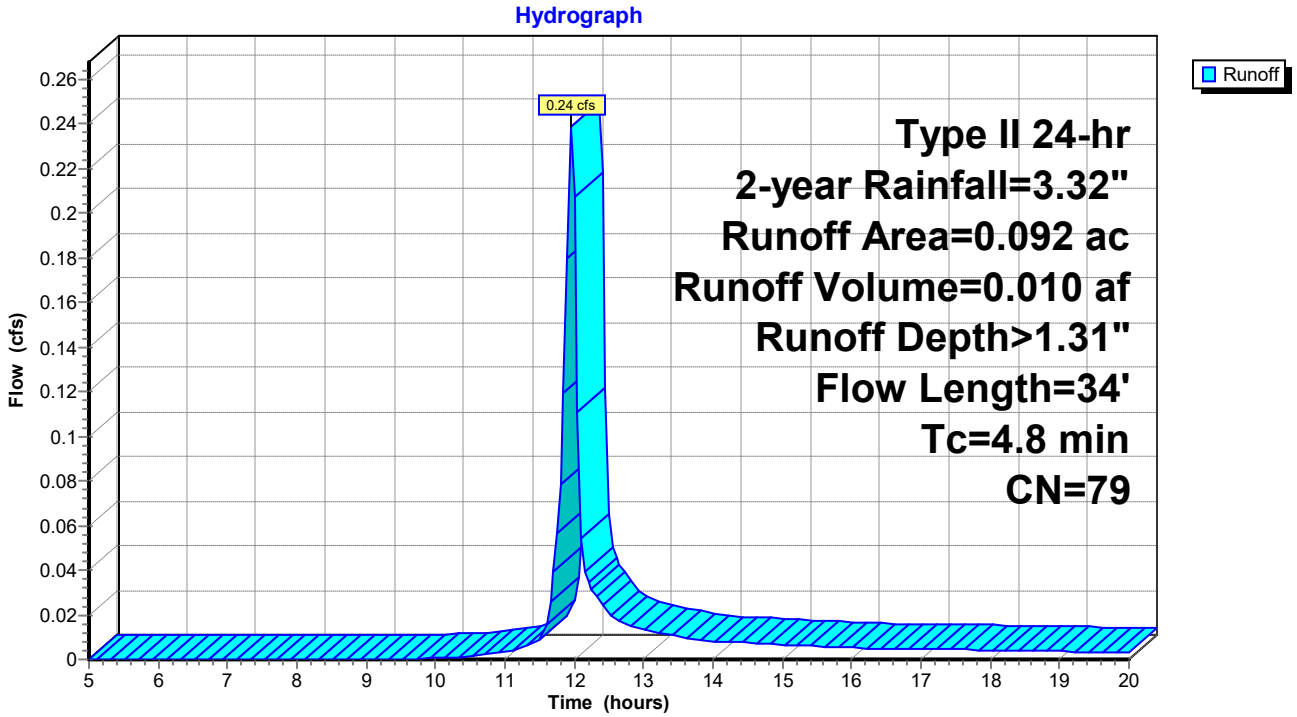
Runoff = 0.24 cfs @ 11.96 hrs, Volume= 0.010 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.32"

Area (ac)	CN	Description
0.092	79	<50% Grass cover, Poor, HSG B
0.092		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34		0.12		**Direct Entry,**

Subcatchment 1S: DA-1P



Summary for Subcatchment 2S: DA-1I

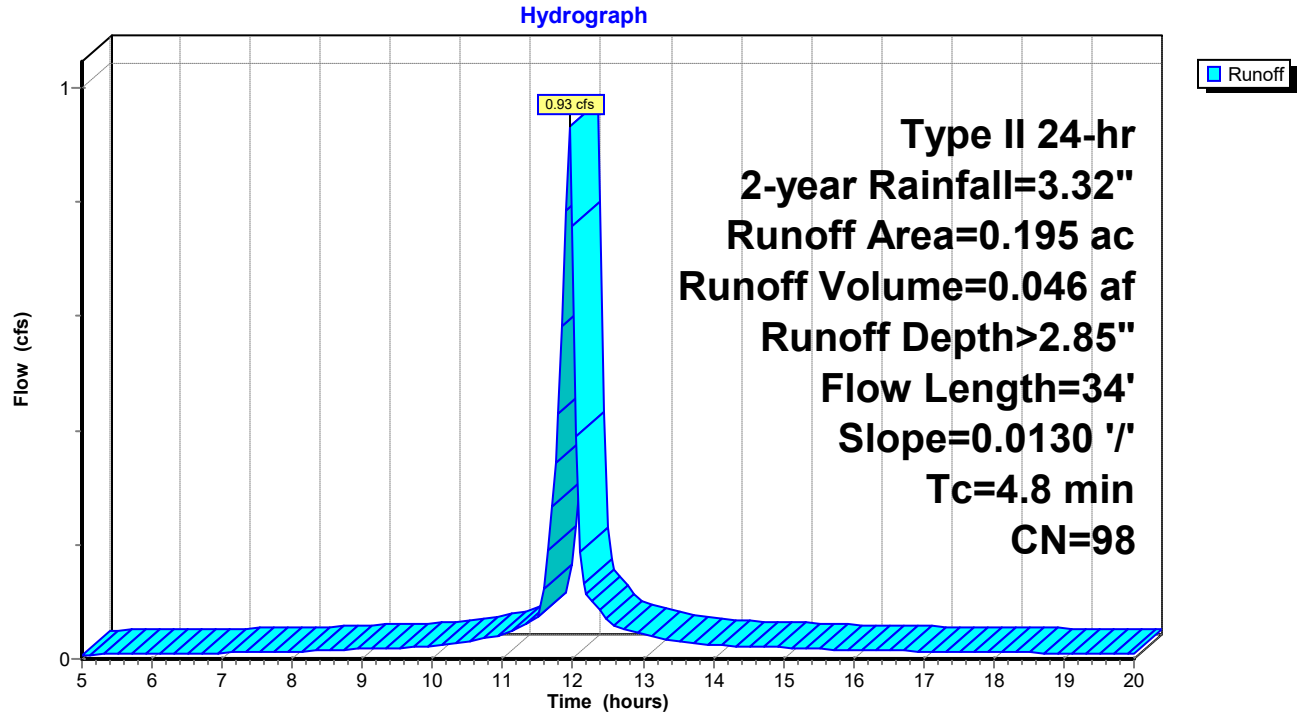
Runoff = 0.93 cfs @ 11.95 hrs, Volume= 0.046 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.32"

Area (ac)	CN	Description
0.195	98	Paved parking, HSG B
0.195		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34	0.0130	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"

Subcatchment 2S: DA-1I

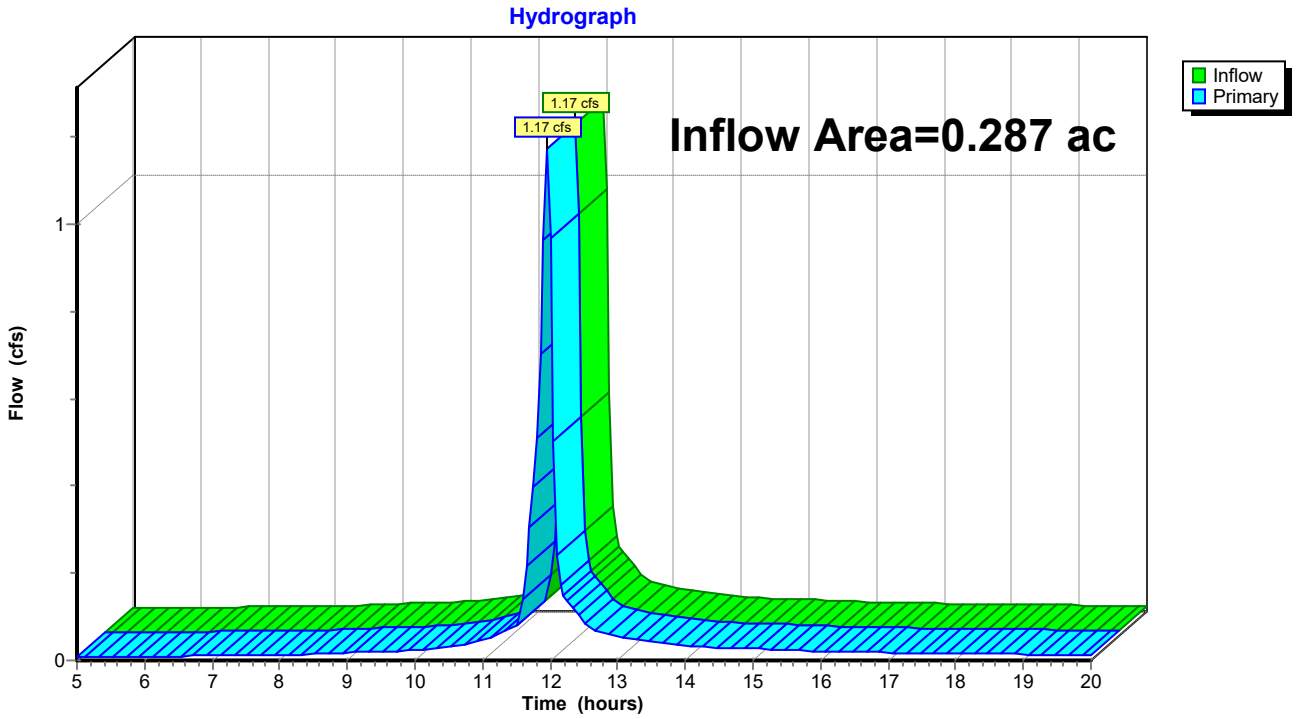


Summary for Pond 6P: POI

Inflow Area = 0.287 ac, 67.94% Impervious, Inflow Depth > 2.36" for 2-year event
Inflow = 1.17 cfs @ 11.95 hrs, Volume= 0.056 af
Primary = 1.17 cfs @ 11.95 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

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

Pond 6P: POI



Summary for Subcatchment 1S: DA-1P

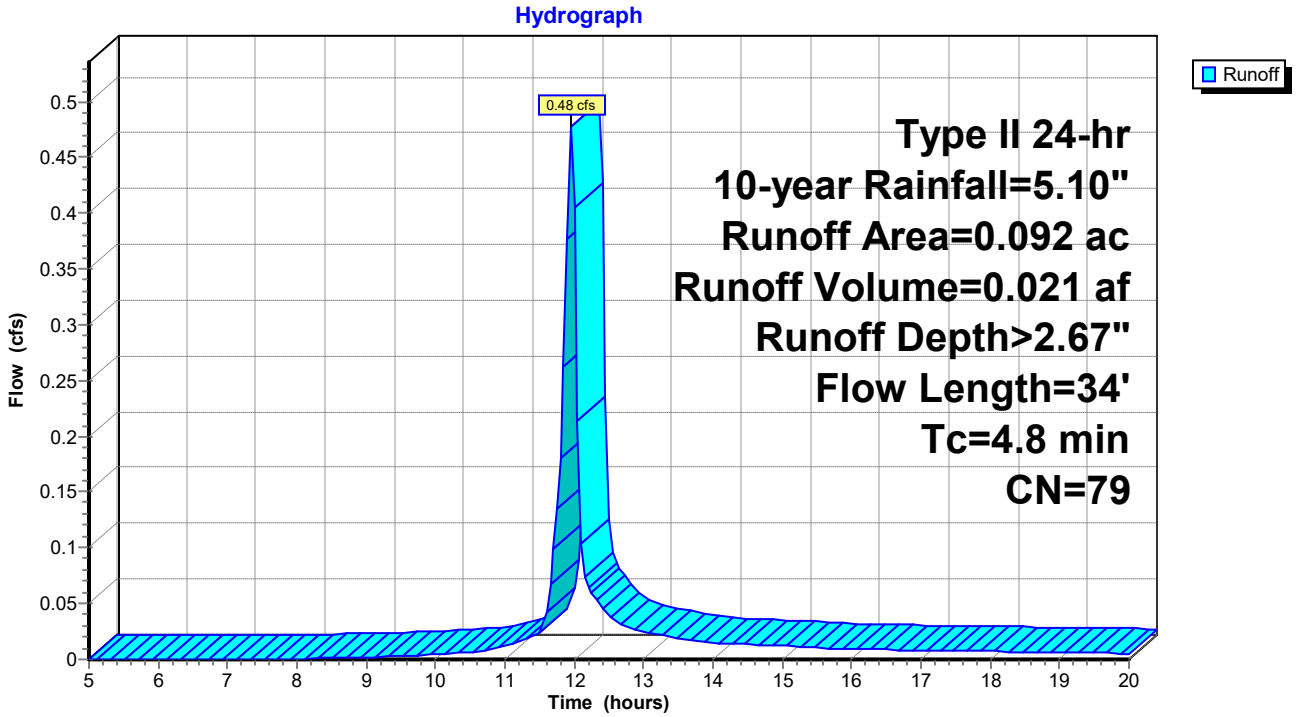
Runoff = 0.48 cfs @ 11.95 hrs, Volume= 0.021 af, Depth> 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.10"

Area (ac)	CN	Description
0.092	79	<50% Grass cover, Poor, HSG B
0.092		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34		0.12		**Direct Entry,**

Subcatchment 1S: DA-1P



Summary for Subcatchment 2S: DA-1I

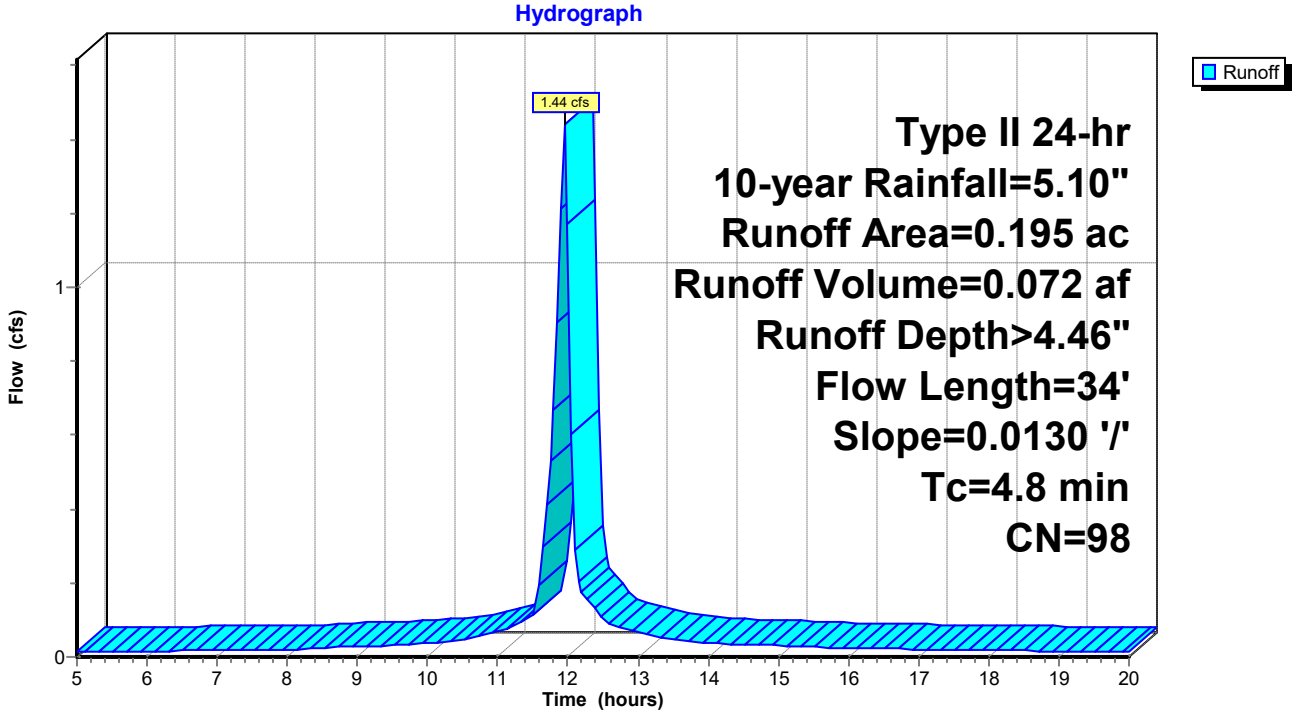
Runoff = 1.44 cfs @ 11.95 hrs, Volume= 0.072 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.10"

Area (ac)	CN	Description
0.195	98	Paved parking, HSG B
0.195		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34	0.0130	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"

Subcatchment 2S: DA-1I

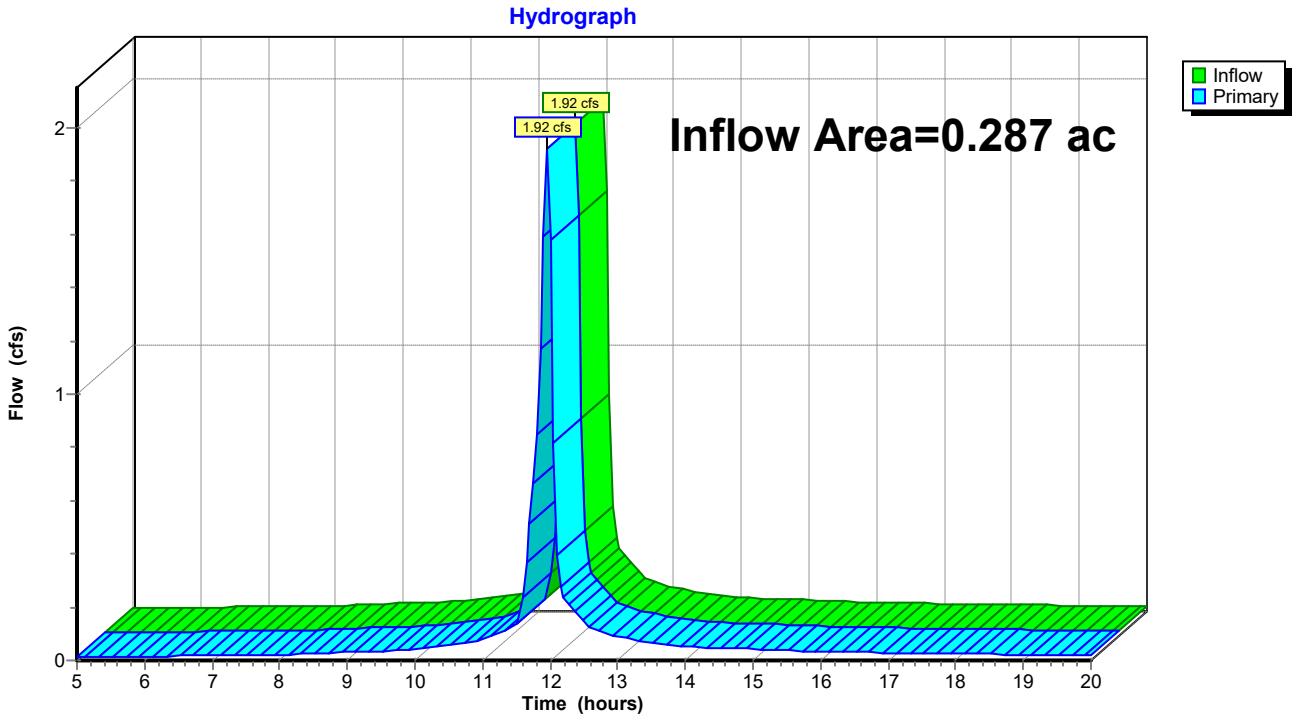


Summary for Pond 6P: POI

Inflow Area = 0.287 ac, 67.94% Impervious, Inflow Depth > 3.89" for 10-year event
Inflow = 1.92 cfs @ 11.95 hrs, Volume= 0.093 af
Primary = 1.92 cfs @ 11.95 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

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

Pond 6P: POI



Summary for Subcatchment 1S: DA-1P

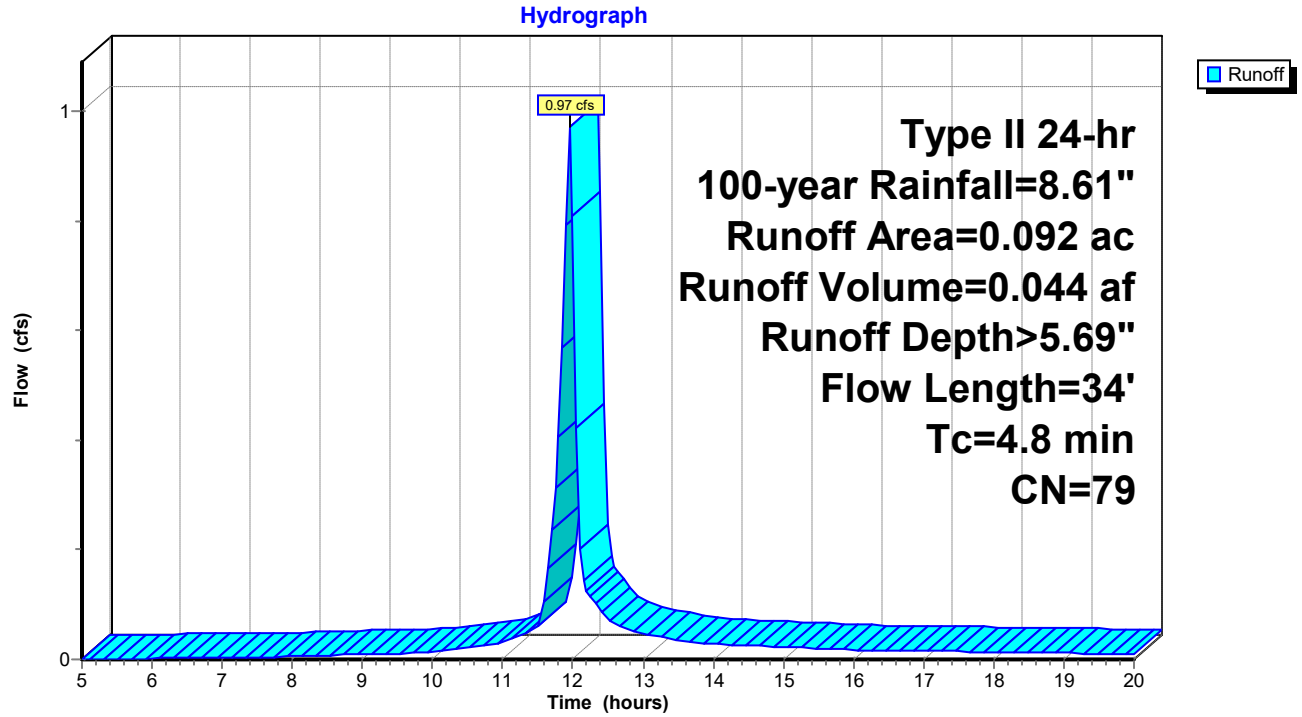
Runoff = 0.97 cfs @ 11.95 hrs, Volume= 0.044 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=8.61"

Area (ac)	CN	Description
0.092	79	<50% Grass cover, Poor, HSG B
0.092		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34		0.12		**Direct Entry,**

Subcatchment 1S: DA-1P



Summary for Subcatchment 2S: DA-1I

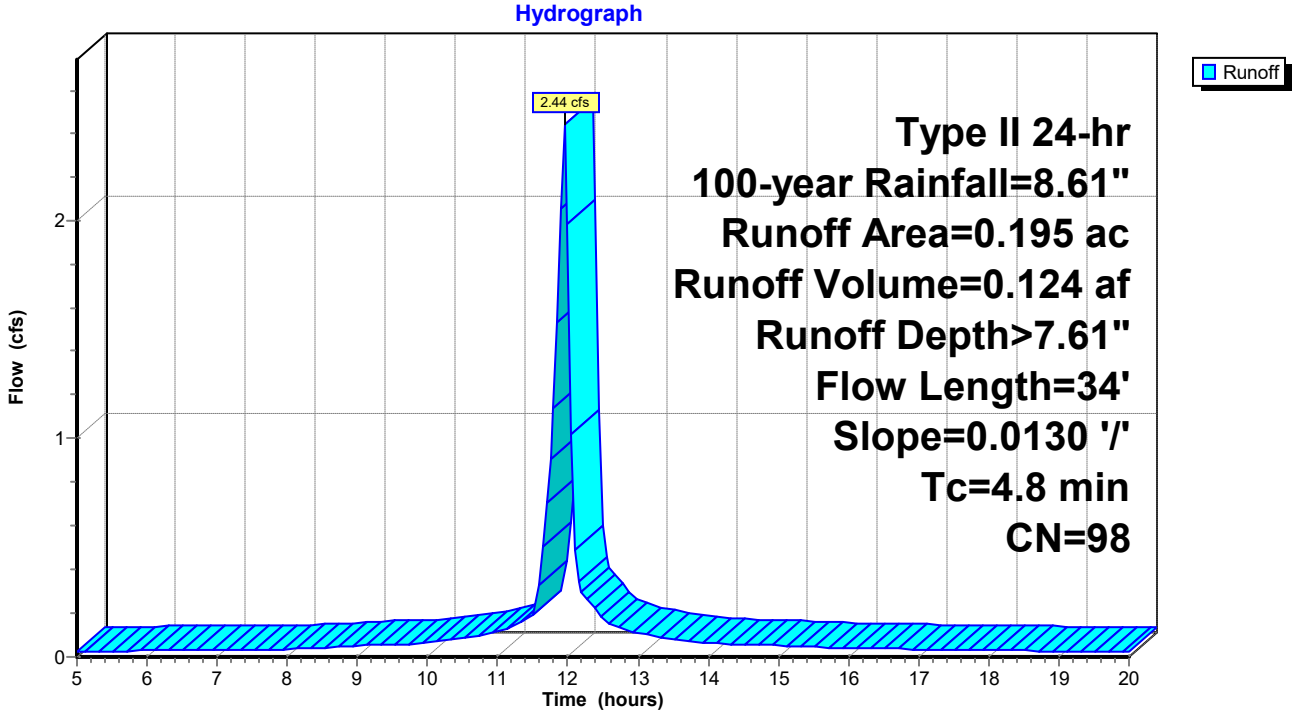
Runoff = 2.44 cfs @ 11.95 hrs, Volume= 0.124 af, Depth> 7.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=8.61"

Area (ac)	CN	Description
0.195	98	Paved parking, HSG B
0.195		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	34	0.0130	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"

Subcatchment 2S: DA-1I

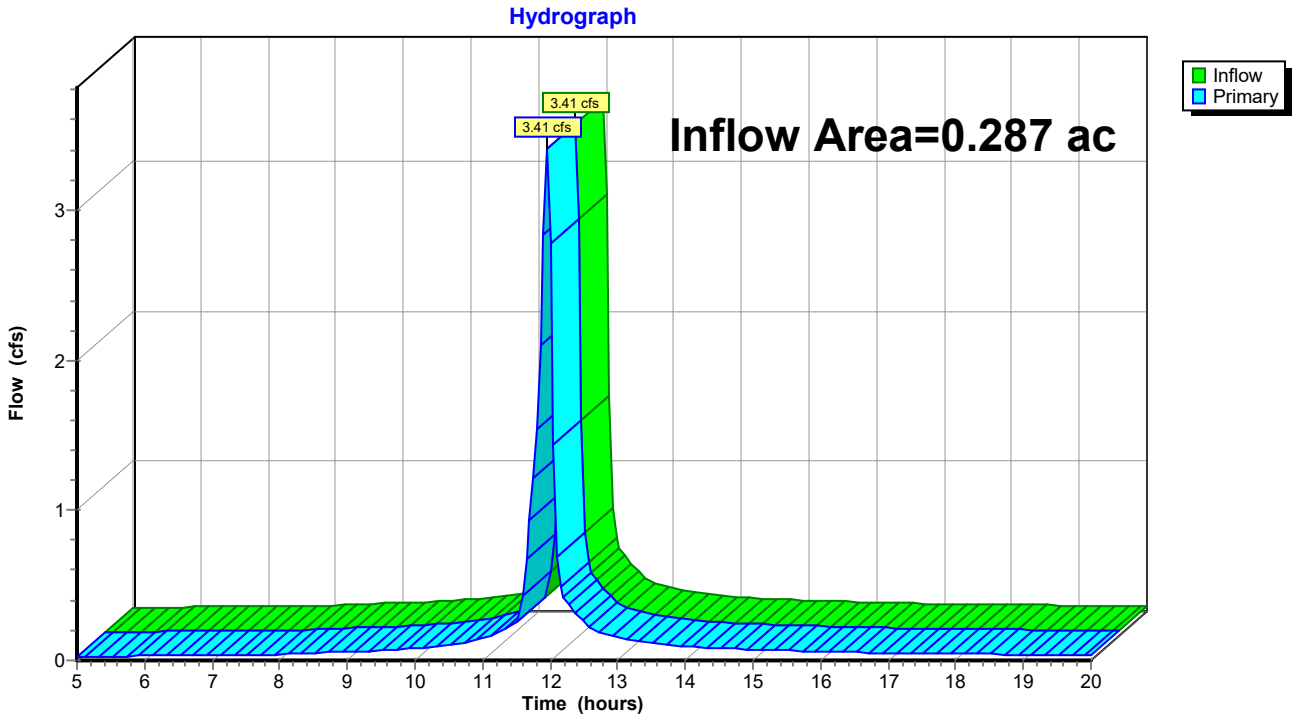


Summary for Pond 6P: POI

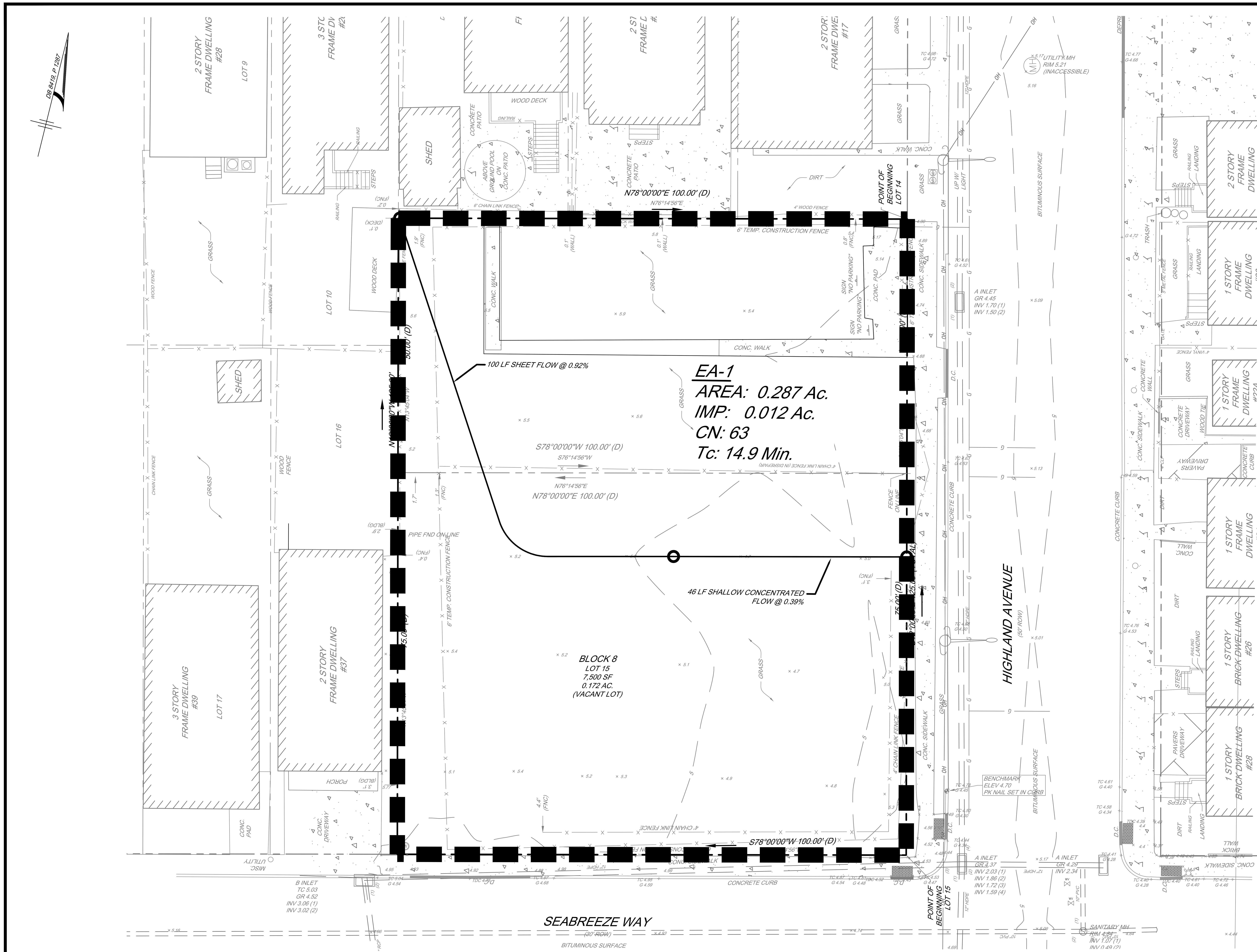
Inflow Area = 0.287 ac, 67.94% Impervious, Inflow Depth > 6.99" for 100-year event
Inflow = 3.41 cfs @ 11.95 hrs, Volume= 0.167 af
Primary = 3.41 cfs @ 11.95 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

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

Pond 6P: POI



Appendix C – Drainage Area Maps



LEGEND

PROJECT BOUNDARY
EXISTING BUILDING
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING SPOT ELEVATION
EXISTING SANITARY SEWER LINE
EXISTING SANITARY SEWER MANHOLE
EXISTING STORM SEWER LINE
EXISTING INLET/CATCH BASIN
EXISTING MANHOLE/STORM GRATE
EXISTING WATER LINE
EXISTING WATER VALVE
EXISTING SPRINKLER BOX
EXISTING GAS LINE
EXISTING GAS VALVE
EXISTING ELECTRIC LINE
EXISTING UTILITY POLE
EXISTING FENCELINE
EXISTING GUIDERAIL
EXISTING LIGHT POLE
EXISTING SIGNAGE
EXISTING HYDRANT
DRAINAGE AREA BOUNDARY
FLOW PATH BEGINNING/END
FLOW PATH

GRAPHIC SCALE
1 INCH = 10 FEET

Know what's below. Call before you dig. or 1-800-272-1000 NEW JERSEY ONE CALL

DRAWN BY:	CHECKED BY:
IRD	MS
HORIZONTAL SCALE: 1"=10'	VERTICAL SCALE: N/A
PROJECT No.: SEI-2202	
DATE: 02/13/25	

DATE	REVISIONS	DRAWN BY	CHECKED BY

PRE-DEVELOPMENT DRAINAGE AREA MAP

19 & 27 HIGHLAND AVENUE
BLOCK 8; LOTS 14 & 15

SITUATED IN
BOROUGH OF KEANSBURG, MONMOUTH COUNTY, NEW JERSEY

MidAtlantic Engineering Partners

2026B Briggs Rd, Suite 300
Mt. Laurel Twp, NJ 08054
609-910-4450

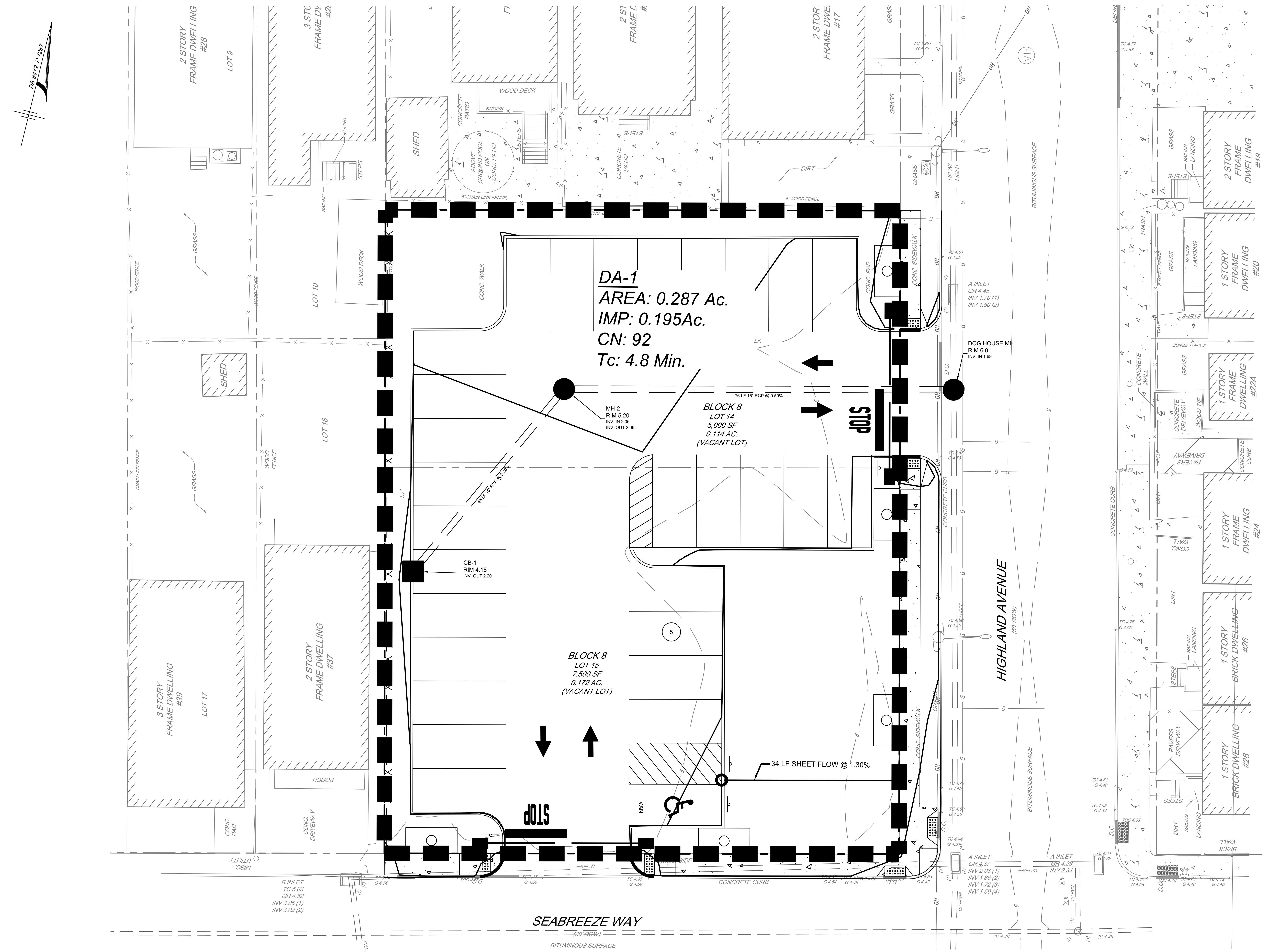
1971 Highway 34, Suite 201
Wall Township, NJ 07719
732-722-5899

321 W. State Street
Media, PA 19063
610-565-0020

26 Washington St, 3rd Floor
Morristown, NJ 07960
973-715-8652

Certificate of Authorization No. 24GA28184000

Sheet Number
1 OF 2



LEGEND

- PROJECT BOUNDARY
- EXISTING BUILDING
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING SPOT ELEVATION — x 57.6
- EXISTING SANITARY SEWER LINE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER LINE
- EXISTING INLET/CATCH BASIN
- EXISTING MANHOLE/STORM GRATE
- EXISTING WATER LINE
- EXISTING WATER VALVE
- EXISTING SPRINKLER BOX
- EXISTING GAS LINE
- EXISTING GAS VALVE
- EXISTING ELECTRIC LINE
- EXISTING UTILITY POLE
- EXISTING FENCELINE
- EXISTING GUIDERAIL
- EXISTING LIGHT POLE
- EXISTING SIGNAGE
- EXISTING HYDRANT
- DRAINAGE AREA BOUNDARY
- FLOW PATH BEGINNING/END
- FLOW PATH

GRAPHIC SCALE
1 INCH = 10 FEET

Know what's below. Call before you dig. or 1-800-272-1000 NEW JERSEY ONE CALL

POST-DEVELOPMENT DRAINAGE AREA MAP

19 & 27 HIGHLAND AVENUE
BLOCK 8; LOTS 14 & 15

SITUATED IN
BOROUGH OF KEANSBURG, MONMOUTH COUNTY, NEW JERSEY

DRAWN BY: IRD	CHECKED BY: MS
HORIZONTAL SCALE: 1"=10'	VERTICAL SCALE: N/A
PROJECT No.: SEI-2202	
DATE: 02/13/25	

DATE	REVISIONS	DRAWN BY	CHECKED BY

MidAtlantic Engineering Partners
2026B Briggs Rd, Suite 300, Mt. Laurel Twp, NJ 08054, 609-910-4450
1971 Highway 34, Suite 201, Wall Township, NJ 07719, 732-722-5899
321 W. State Street, Media, PA 19063, 610-565-0020
26 Washington St, 3rd Floor, Morristown, NJ 07960, 973-715-8652
Certificate of Authorization No. 24GA28184000

Sheet Number
2 OF 2

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Plot time: Feb 13, 2025 - 3:38pm