



May 31, 2021
Revised July 7, 2021

RPM-211

STORMWATER MANAGEMENT REPORT

FOR

**RPM DEVELOPMENT GROUP
MONTGOMERY SENIOR AFFORDABLE HOUSING
BLOCK 20001, LOT 10.05
MONTGOMERY TOWNSHIP, SOMERSET COUNTY, NEW JERSEY**

**PREPARED BY:
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WALL, NJ 07719**

A handwritten signature in blue ink, appearing to read "K. Shelly", is written over a horizontal line.

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I. SITE DESCRIPTION

The subject property, located in Montgomery Township, is known and designated as Block 20001, Lot 10.05 as shown on the current tax assessment map of the Montgomery Township, Somerset County, New Jersey. The applicant, RPM Development Group, proposes to construct a senior affordable housing building containing 71 units on a portion of the 45-acre parcel, that is currently owned by the Somerset County Improvement Authority (SCIA). A lease purchase agreement is in place between Montgomery Township and SCIA for the Township to acquire the property for various municipal purposes and the construction of affordable housing.

The site was previously utilized as the corporate offices of medical device maker ConvaTec, until it announced its intention to close the office back in 2014. The County acquired the property in 2017. Montgomery Township is currently constructing a new municipal complex on a large portion of the site, closest to Orchard Road.

The rear portion of the site where the proposed senior affordable housing development is proposed contains a large asphalt parking lot with approximately 280 parking spaces and a detention basin for the former improvements. The previous office headquarters was recently demolished, along with some other impervious surfaces surrounding the former building.

II. STORMWATER DESIGN OVERVIEW

This report describes and analyzes how the proposed stormwater management system has been designed in accordance with the applicable stormwater management rules and regulations established in N.J.A.C. 7:8 and the Montgomery Township Ordinance. The proposed project is not classified as a major development as it disturbs more than one (1) acre of land and increases the amount of impervious cover onsite by more than ¼ acre.

Runoff from 1.48 acres of developed area is collected and conveyed to two proposed stormwater management basins that are designed to entirely store and infiltrate the water quality design storm of 1.25 inches of rainfall in two hours, as well as portions of the 2, 10 and 100-year storm storms. One basin is designed as a bioretention basin and the other is an underground infiltration basin for the proposed building's roof runoff.

In accordance with the stormwater management rules, the proposed stormwater management system must achieve an 80% reduction in the post-developed total suspended solids (TSS) runoff from the new impervious surfaces, to satisfy the water quality requirements. TSS removal will be achieved through the use of a bioretention basin which is approved for 80% TSS removal.

Additionally, the stormwater management rules also require major developments include measures to prevent the loss of groundwater recharge at the project site. Groundwater recharge for this project is addressed through the use of the stormwater management basins to infiltrate 100% of the difference between the site's pre- and post-development 2-year runoff volume.

III. PRE-DEVELOPMENT CONDITIONS

The stormwater analysis of this report is limited to the 3.62-acres that will be disturbed as part of this project. Majority of the existing parking lot will not be disturbed. The existing 3.21-acre drainage area (EA-1) includes the grassed area where the former building used to stand, between the existing parking lot and the detention basin. Time of concentration was calculated assuming 150 linear feet of sheet flow and the remaining calculated as shallow concentrated and pipe flow. Based on Somerset County soils survey information, the various onsite soils are parts of Hydrologic Soil Group (HSG) B, C & D.

Runoff from the drainage area was modeled separately using HydroCAD 10.10 to determine the peak runoff rates during the 2, 10 and 100-year storms. The calculated peak runoff rates are as follows:

Drainage Area (EA-1)	
Storm Event (YR)	Pre-Dev Runoff (cfs)
2	3.91
10	8.75
100	19.19

IV. POST-DEVELOPMENT SUMMARY

A. DESIGN METHODOLOGY

The pre- and post-development flows were calculated using the USDA Natural Resources Conservation Service methodology, as presented in Technical Release 55 (TR-55), which is incorporated into HydroCAD 10.10 modeling software. All undisturbed areas of the site have been assumed to be in good hydrologic condition with good ground cover for the pre-development analysis.

B. RUNOFF QUANTITY

The stormwater management system has been designed to store and reduce the development runoff to 50%, 75% and 80% of the 2, 10 and 100-year storm storms, respectively, in the pre-developed condition for the area being disturbed. Flows are reduced by utilizing outlet structures in the basins. As such, the proposed system has been designed in accordance with Water Quantity requirements of N.J.A.C. 7-8-5.4.

C. STORMWATER MANAGEMENT DESIGN

The site has been designed so that majority of the runoff will be collected and conveyed via conventional drainage pipe networks to two basins. The underground roof runoff infiltration basin recharges the entire 100-year storm, whereas the bioretention basin discharges storms larger than the 2-year storm into the exiting detention basin in the rear of the property. The post-development allowable peak runoff rates were calculated by applying the required reduction rates to the pre-development peak runoff rates for EA-1. The allowable peak runoff rates are as follows:

Storm Event (YR)	Pre-Dev Runoff (cfs)	% Reduction	Allowable Runoff (cfs)	Post-Dev Runoff (cfs)
2	3.91	50	1.96	1.80
10	8.75	75	6.56	4.06
100	19.19	80	15.35	13.51

For each of the storms, the post-development runoff rates are less than the allowable runoff rates, this meeting the requirements of N.J.A.C. 7-8-5.4.

UNDERGROUND INFILTRATION BASIN

The underground infiltration basin has been designed to accept runoff from the proposed building, totaling 0.59 acres of all impervious coverage. The basin is a series of perforated 48" HDPE pipes surrounded by stone, with a total pipe length of 700 LF. The basin was analyzed with exfiltration in accordance with the stormwater runoff calculation requirements. The basin was modeled and analyzed with the HydroCAD 10.10 software and a summary of the peak flows, storage and basin elevations are outlined below:

Storm Event (YR)	Basin Inflow (cfs)	Basin Outflow (cfs)	Max. Basin Storage (ac-ft)	Water Surface Elevation
WQ	1.54	0.00	0.045	85.33
2	1.68	0.00	0.095	86.11
10	2.54	0.00	0.163	87.02
100	4.18	0.00	0.307	89.04

The perforated pipes will be constructed above a 12" thick stone bottom layer at elevation 84.19. The proposed basin is located within an area of Hydrologic Soil Group (HSG) B soils, where infiltration rates at a minimum of 1.0 inches/hour are anticipated. Calculations are provided in Appendix C demonstrating that the basin fully drains within 72 hours with an infiltration rate of 0.5 inches/hour, which incorporates a factor of safety of 2.

BIORETENTION BASIN

The bioretention basin has been designed to accept runoff from 0.89 acres of the proposed development, with majority of the new pavement and sidewalks including in this area. The basin was analyzed without exfiltration as the basin is located within an area of Hydrologic Soil Group (HSG) D soils, where infiltration rates at a minimum of 1.0 inches/hour are not anticipated. Instead, the basin will be designed with an underdrain system to bypass runoff once filtered through the bio-filtration media. The basin was modeled and analyzed with the HydroCAD 10.10 software and a summary of the peak flows, storage and basin elevations are outlined below:

Storm Event (YR)	Basin Inflow (cfs)	Basin Outflow (cfs)	Max. Basin Storage (cf)	Water Surface Elevation
WQ	0.47	0.00	708	86.31
2	1.50	0.00	5,344	87.93
10	2.81	0.48	5,615	88.01
100	5.41	4.66	6,650	88.31

The bioretention basin bottom, which will be heavily vegetated with trees, shrubs and various plantings, is set at elevation 86.00 with a 24" deep soil bed above 6" of sand and 3" of stone above and below the underdrain, in accordance with the New Jersey Stormwater Best Management Practices Manual.

D. WATER QUALITY

The proposed bioretention basin has been designed to store and infiltrate the entire water quality design storm. Bioretention basins are approved as having an 80% total suspended solids (TSS) removal rate. Roof runoff entering the underground infiltration basin is considered clean and does not need to be treated for TSS removal. As such, the proposed systems have been designed in accordance with Water Quality requirements of N.J.A.C. 7-8-5.5.

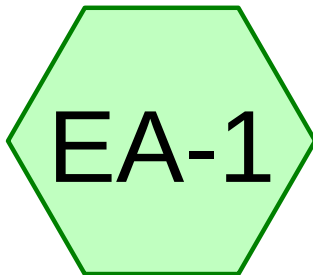
V. CONCLUSION

As demonstrated in this report, the proposed development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways or adjacent properties.

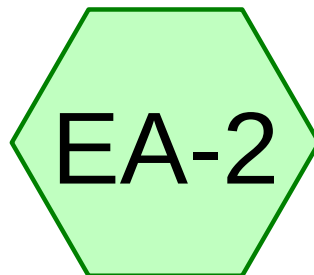
The proposed stormwater management system incorporates two different types of stormwater management basins designed to reduce peak flow rates for the proposed development to meet the Water Quantity requirements of N.J.A.C. 7-8-5.4. The bioretention basin provides an 80% total suspended solid (TSS) removal rate to meet the Water Quality requirements of N.J.A.C. 7-8-5.5. The basins were also designed to meet the Groundwater Recharge requirements of N.J.A.C. 7-8-5.6.

APPENDIX A

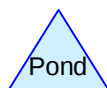
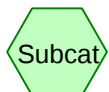
PRE-DEVELOPMENT ANALYSIS



EA-1



EA-2



Routing Diagram for Pre-Development

Prepared by {enter your company name here}, Printed 6/3/2021
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Pre-Development

Prepared by {enter your company name here}

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.34"

Printed 6/3/2021

Summary for Subcatchment EA-1: EA-1

Runoff = 3.91 cfs @ 12.09 hrs, Volume= 0.287 af, Depth= 1.07"

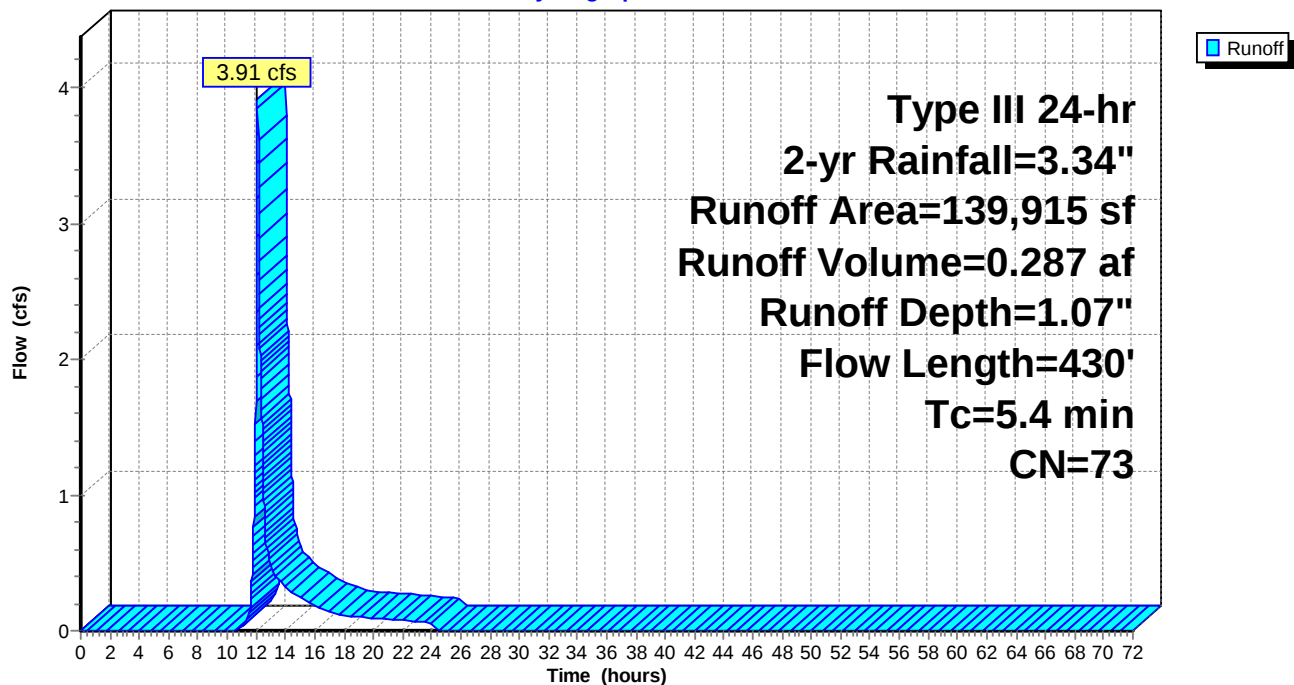
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
1,610	98	Paved parking, HSG A
47,300	61	>75% Grass cover, Good, HSG B
11,116	74	>75% Grass cover, Good, HSG C
79,889	80	>75% Grass cover, Good, HSG D
139,915	73	Weighted Average
138,305		98.85% Pervious Area
1,610		1.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.6	187	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	93	0.0100	10.22	72.26	Pipe Channel, 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.012 Concrete pipe, finished
5.4	430	Total			

Subcatchment EA-1: EA-1

Hydrograph



Pre-Development

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 6/3/2021

Summary for Subcatchment EA-2: EA-2

Runoff = 0.14 cfs @ 12.18 hrs, Volume= 0.017 af, Depth= 0.50"

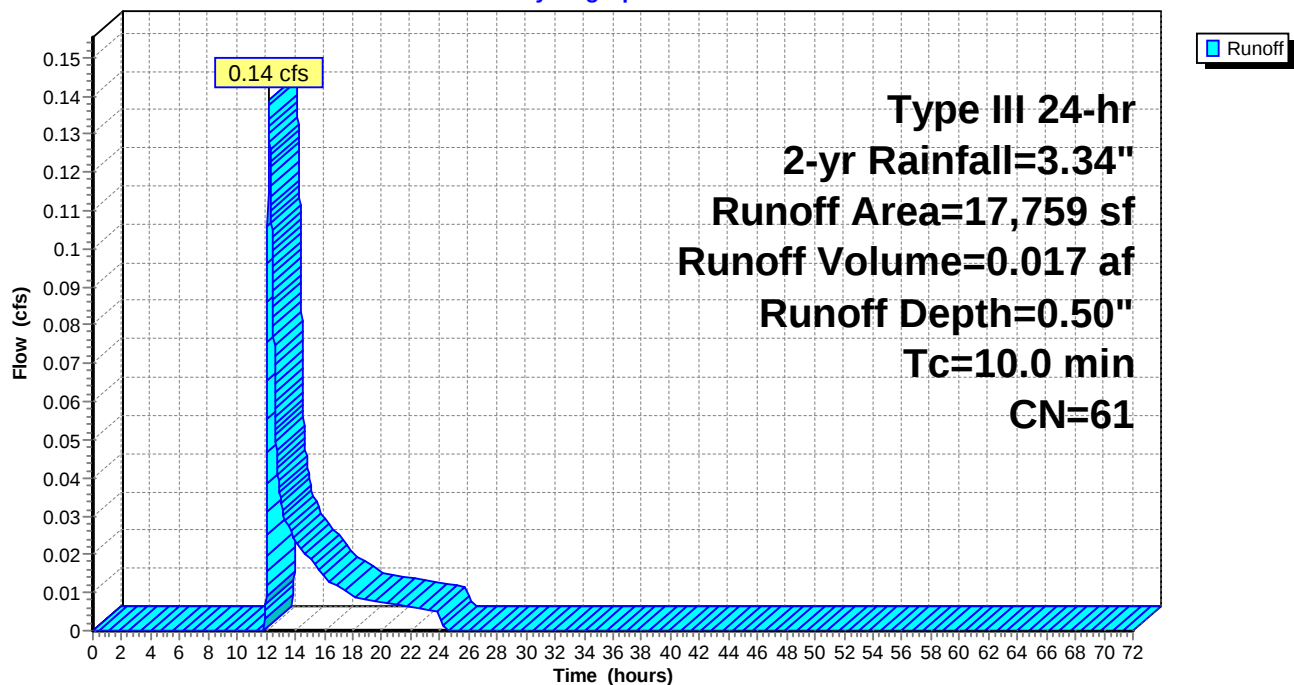
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
17,759	61	>75% Grass cover, Good, HSG B
17,759		100.00% Pervious Area

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

Subcatchment EA-2: EA-2

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.01"

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Summary for Subcatchment EA-1: EA-1

Runoff = 8.75 cfs @ 12.08 hrs, Volume= 0.613 af, Depth= 2.29"

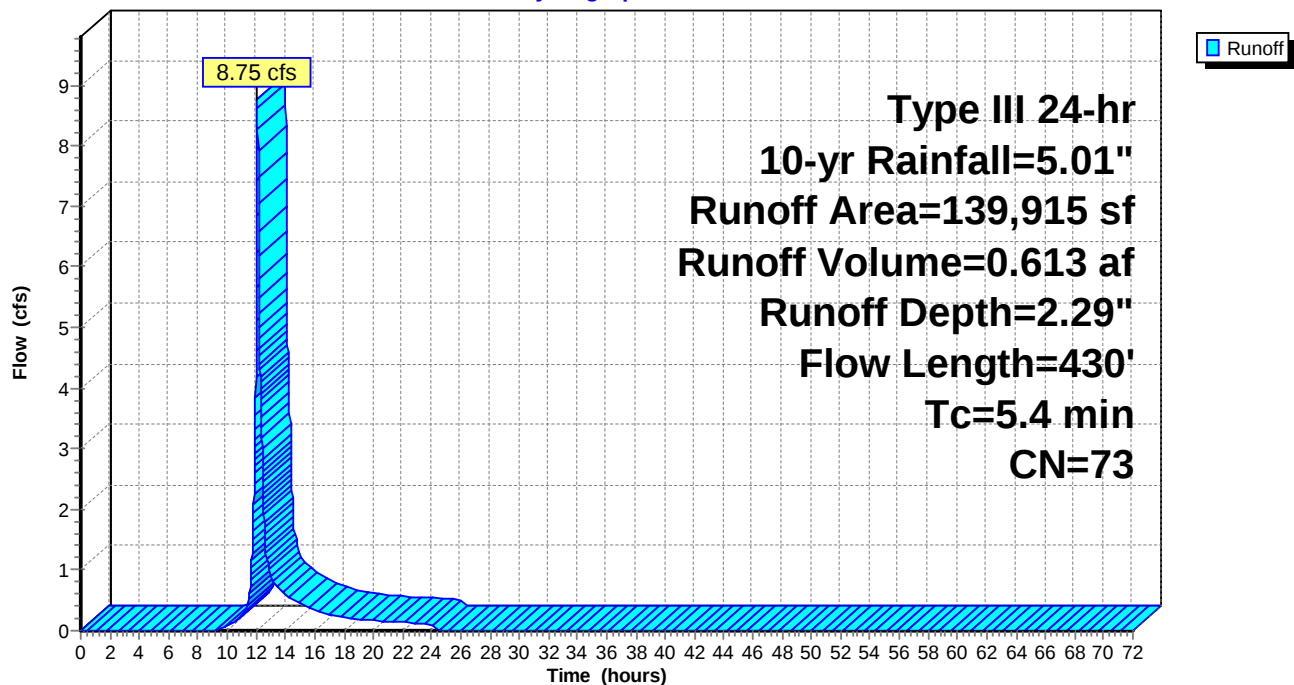
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.01"

Area (sf)	CN	Description
1,610	98	Paved parking, HSG A
47,300	61	>75% Grass cover, Good, HSG B
11,116	74	>75% Grass cover, Good, HSG C
79,889	80	>75% Grass cover, Good, HSG D
139,915	73	Weighted Average
138,305		98.85% Pervious Area
1,610		1.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.6	187	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	93	0.0100	10.22	72.26	Pipe Channel, 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.012 Concrete pipe, finished
5.4	430	Total			

Subcatchment EA-1: EA-1

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.01"

Printed 6/3/2021

Summary for Subcatchment EA-2: EA-2

Runoff = 0.52 cfs @ 12.15 hrs, Volume= 0.047 af, Depth= 1.38"

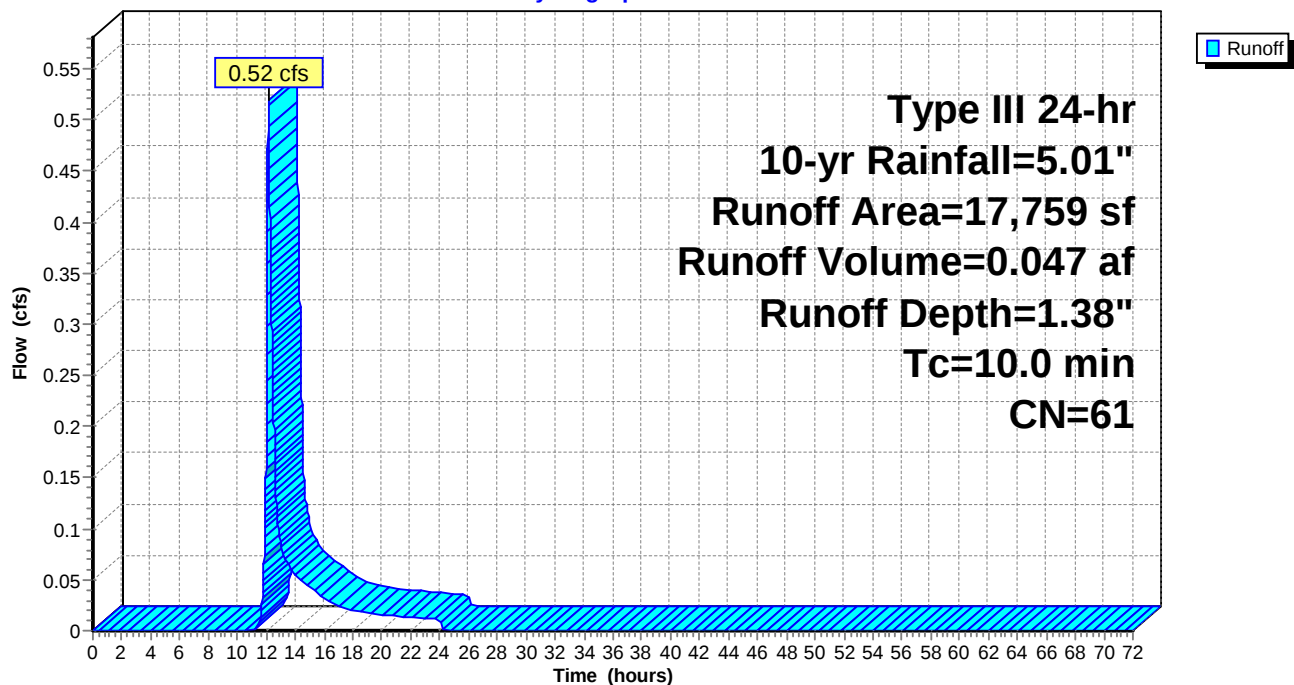
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.01"

Area (sf)	CN	Description
17,759	61	>75% Grass cover, Good, HSG B
17,759		100.00% Pervious Area

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

Subcatchment EA-2: EA-2

Hydrograph



Pre-Development

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 6/3/2021

Summary for Subcatchment EA-1: EA-1

Runoff = 19.19 cfs @ 12.08 hrs, Volume= 1.337 af, Depth= 5.00"

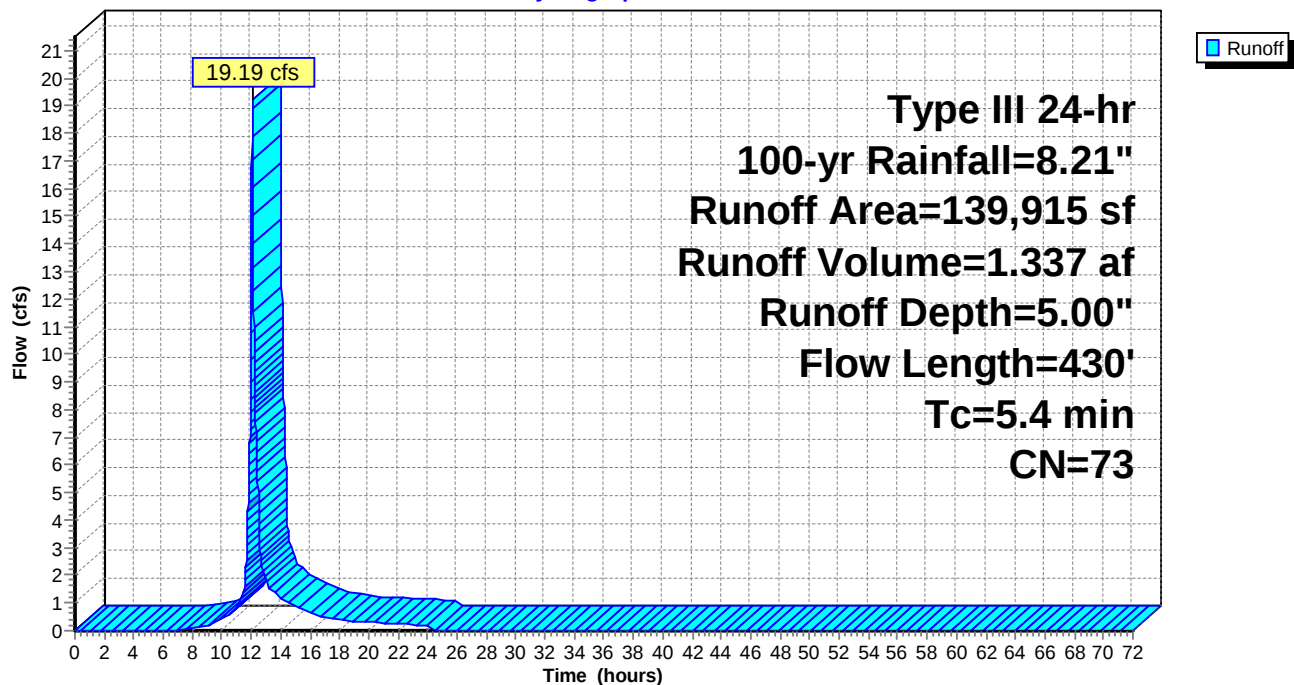
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=8.21"

Area (sf)	CN	Description
1,610	98	Paved parking, HSG A
47,300	61	>75% Grass cover, Good, HSG B
11,116	74	>75% Grass cover, Good, HSG C
79,889	80	>75% Grass cover, Good, HSG D
139,915	73	Weighted Average
138,305		98.85% Pervious Area
1,610		1.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.6	187	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	93	0.0100	10.22	72.26	Pipe Channel, 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.012 Concrete pipe, finished
5.4	430	Total			

Subcatchment EA-1: EA-1

Hydrograph



Pre-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 6/3/2021

Summary for Subcatchment EA-2: EA-2

Runoff = 1.49 cfs @ 12.14 hrs, Volume= 0.122 af, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

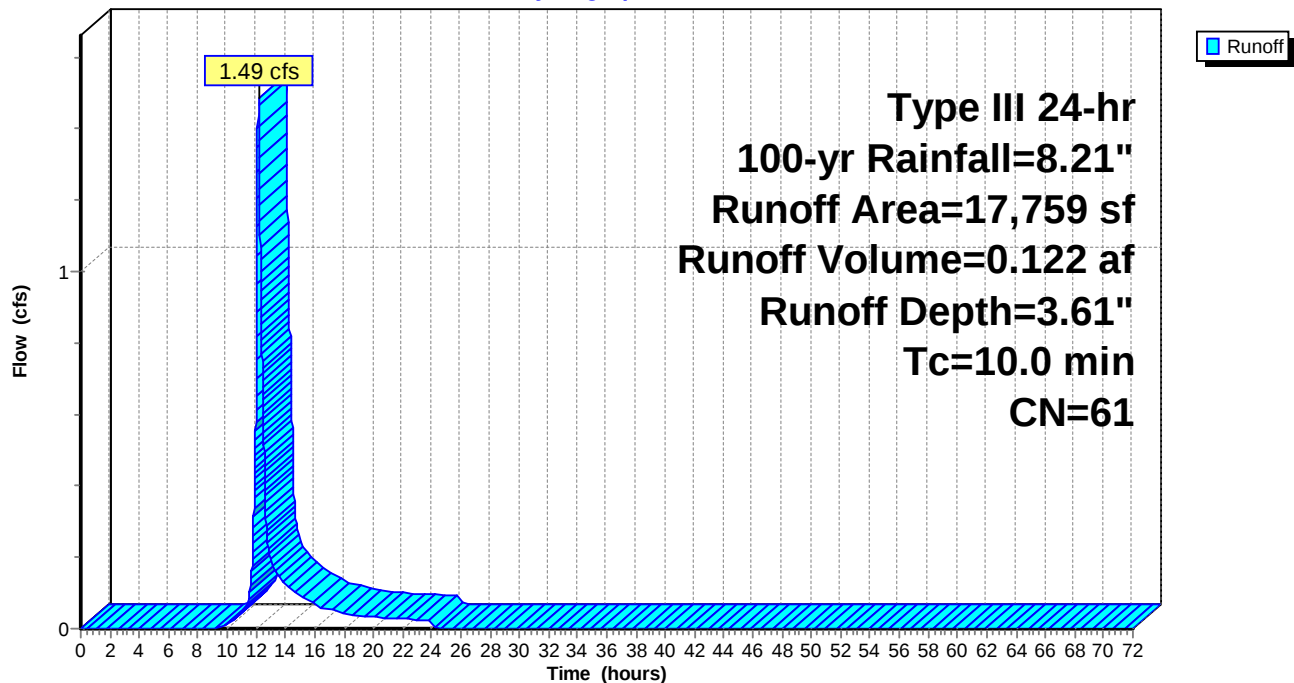
Type III 24-hr 100-yr Rainfall=8.21"

Area (sf)	CN	Description
17,759	61	>75% Grass cover, Good, HSG B
17,759		100.00% Pervious Area

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

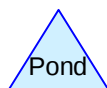
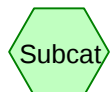
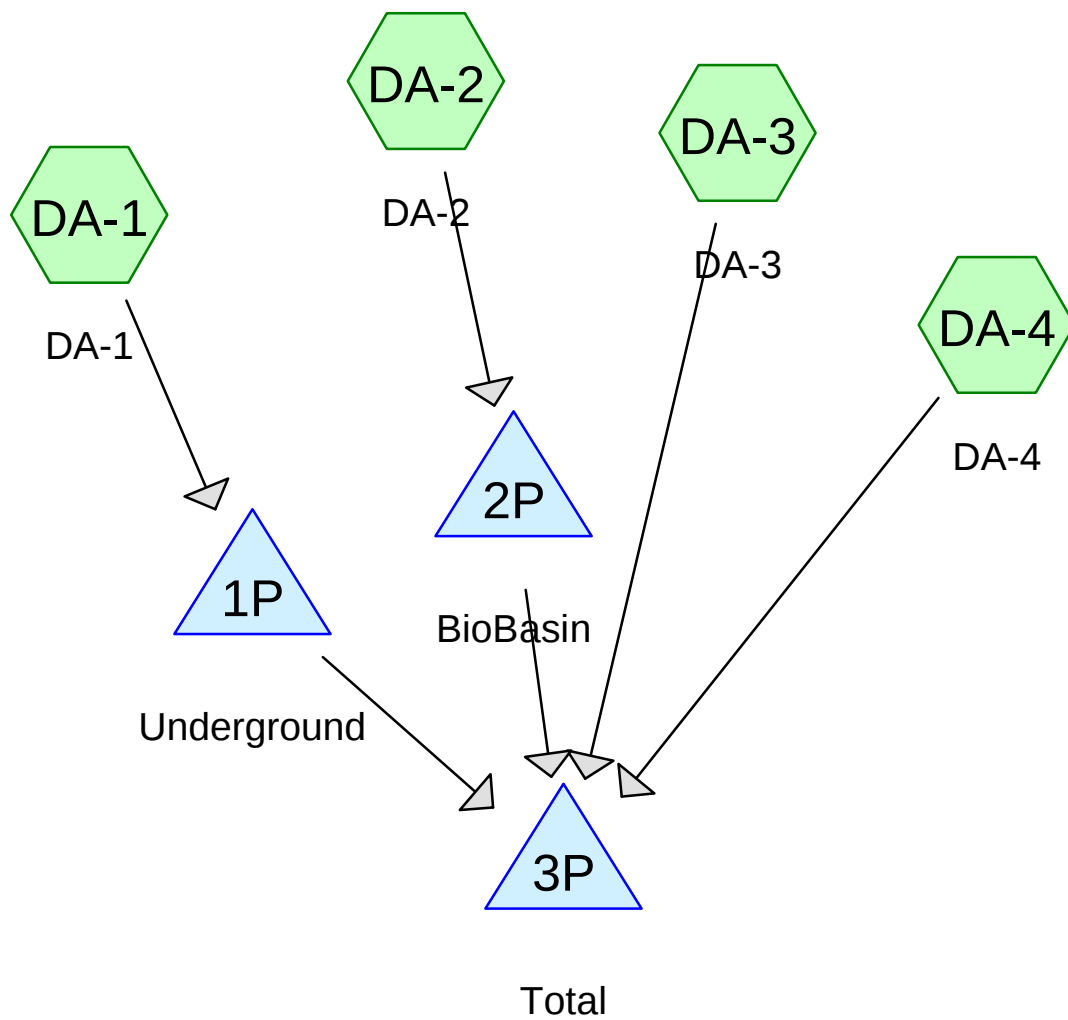
Subcatchment EA-2: EA-2

Hydrograph



APPENDIX B

POST-DEVELOPMENT ANALYSIS



Post-Development

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Subcatchment DA-1: DA-1

Runoff = 1.54 cfs @ 1.15 hrs, Volume= 0.051 af, Depth= 1.03"

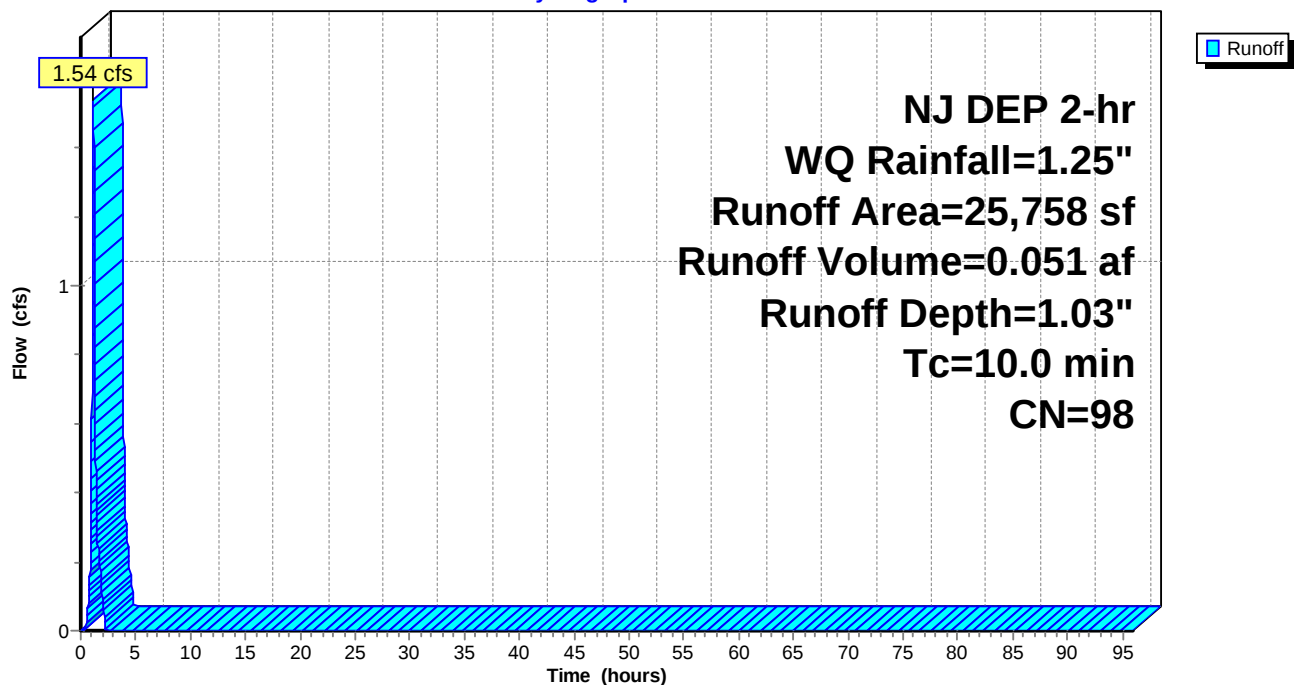
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (sf)	CN	Description
25,758	98	Roofs, HSG D
25,758		100.00% Impervious Area

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

Subcatchment DA-1: DA-1

Hydrograph



Post-Development

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Subcatchment DA-2: DA-2

Runoff = 0.47 cfs @ 1.19 hrs, Volume= 0.016 af, Depth= 0.22"

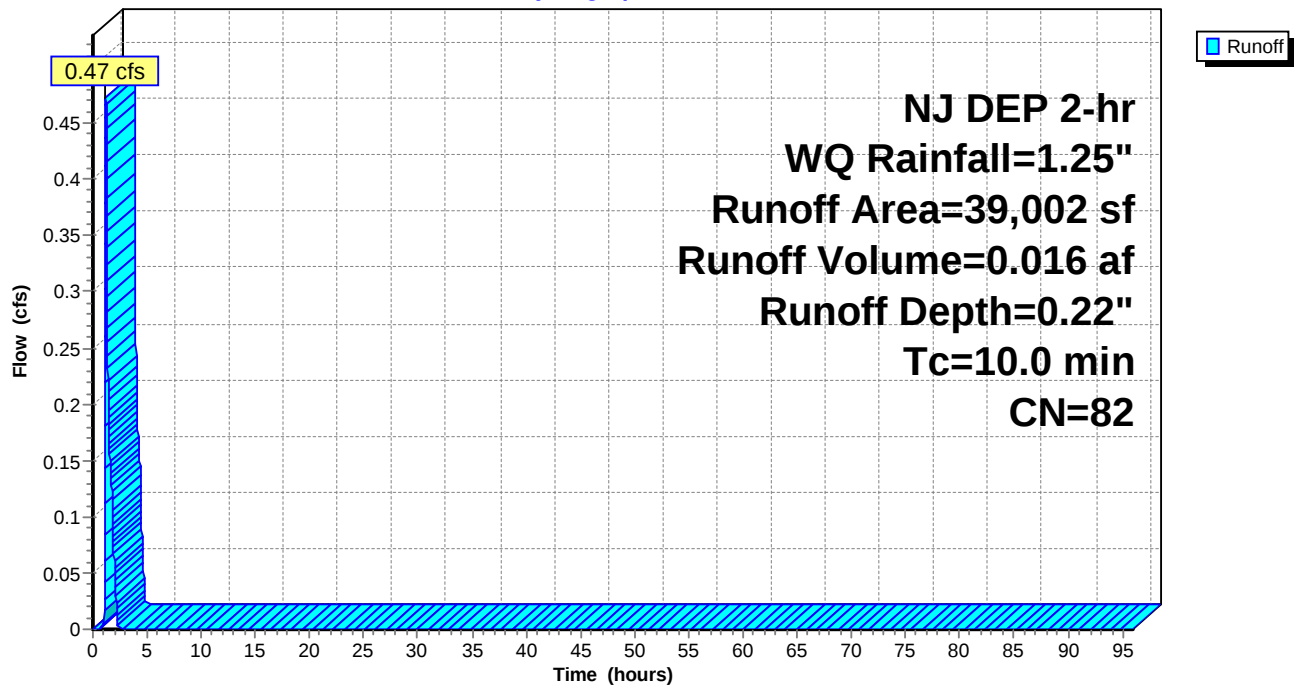
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (sf)	CN	Description
5,773	61	>75% Grass cover, Good, HSG B
5,981	74	>75% Grass cover, Good, HSG C
14,003	80	>75% Grass cover, Good, HSG D
* 2,940	98	Sidewalks, HSG C
9,656	98	Paved parking, HSG C
* 649	98	Hardscape, HSG C
39,002	82	Weighted Average
25,757		66.04% Pervious Area
13,245		33.96% Impervious Area

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

Subcatchment DA-2: DA-2

Hydrograph



Post-Development

Prepared by {enter your company name here}

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Subcatchment DA-3: DA-3

Runoff = 0.01 cfs @ 1.81 hrs, Volume= 0.000 af, Depth= 0.01"

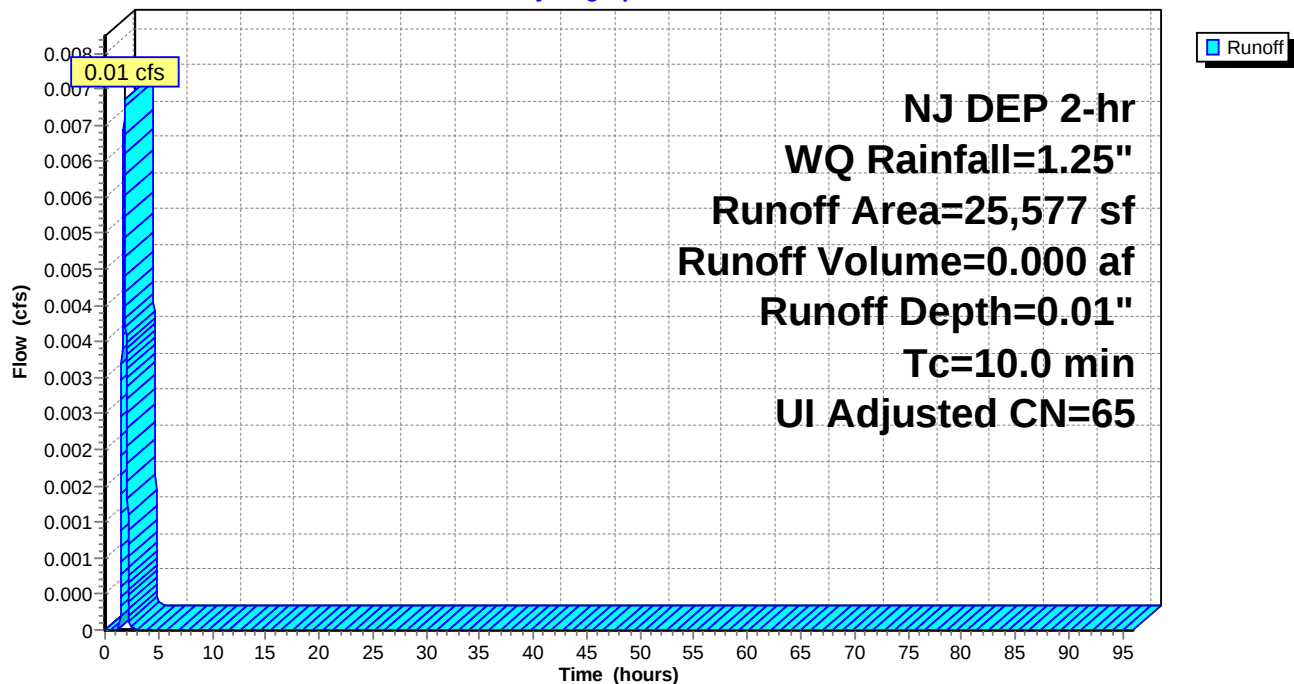
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

	Area (sf)	CN	Adj	Description
	649	98		Unconnected roofs, HSG C
*	4,993	80		>75% Grass cover, Good, HSG D
	19,935	61		>75% Grass cover, Good, HSG B
	25,577	66	65	Weighted Average, UI Adjusted
	24,928			97.46% Pervious Area
	649			2.54% Impervious Area
	649			100.00% Unconnected

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

Subcatchment DA-3: DA-3

Hydrograph



Post-Development

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Subcatchment DA-4: DA-4

Runoff = 0.22 cfs @ 1.23 hrs, Volume= 0.009 af, Depth= 0.10"

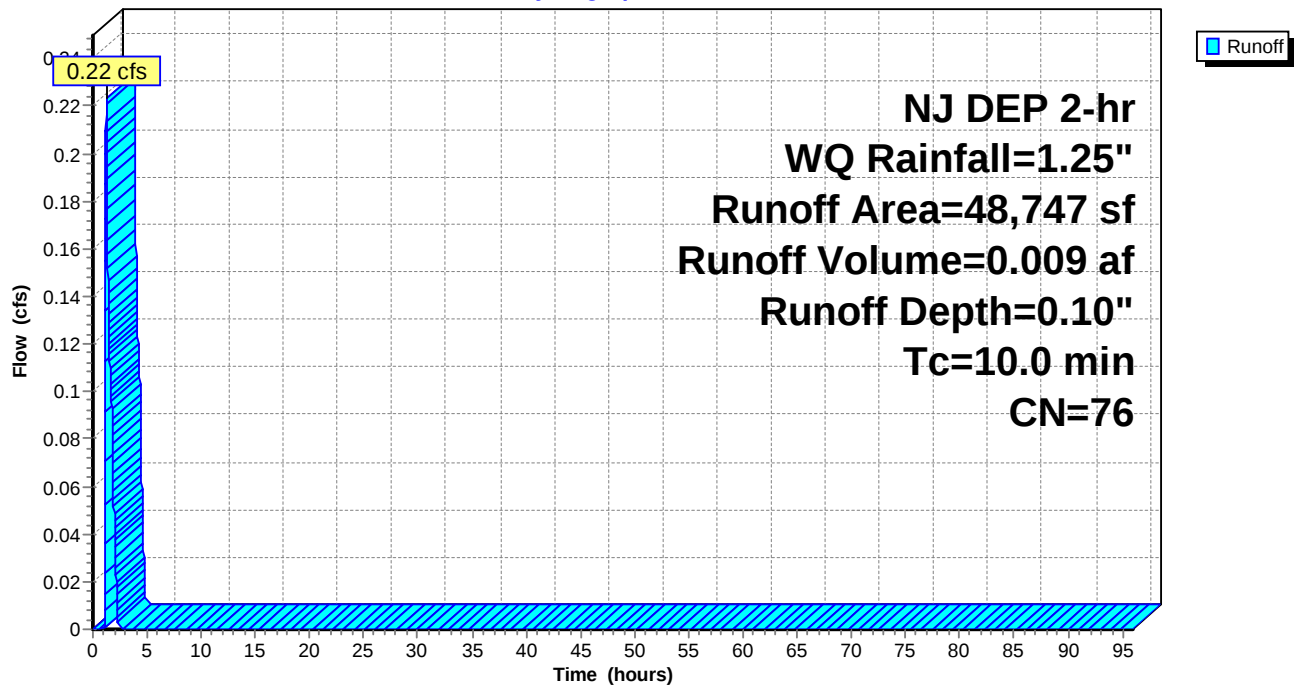
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr WQ Rainfall=1.25"

Area (sf)	CN	Description
16,312	61	>75% Grass cover, Good, HSG B
2,332	74	>75% Grass cover, Good, HSG C
23,645	80	>75% Grass cover, Good, HSG D
2,779	98	Paved parking, HSG C
* 3,419	98	Sidewalks, HSG C
* 260	98	Hardscapes, HSG C
48,747	76	Weighted Average
42,289		86.75% Pervious Area
6,458		13.25% Impervious Area

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

Subcatchment DA-4: DA-4

Hydrograph



Post-Development

Prepared by {enter your company name here}

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 1.03" for WQ event
Inflow = 1.54 cfs @ 1.15 hrs, Volume = 0.051 af
Outflow = 0.05 cfs @ 0.92 hrs, Volume = 0.051 af, Atten = 97%, Lag = 0.0 min
Discarded = 0.05 cfs @ 0.92 hrs, Volume = 0.051 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-96.00 hrs, dt = 0.01 hrs
Peak Elev = 85.33' @ 2.10 hrs Surf.Area = 0.096 ac Storage = 0.045 af

Plug-Flow detention time = 353.8 min calculated for 0.051 af (100% of inflow)
Center-of-Mass det. time = 353.9 min (427.8 - 74.0)

Volume	Invert	Avail.Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L = 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L = 22.0' RCP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 85.19' / 84.97' S = 0.0100 ' / ' Cc = 0.900 n = 0.012 Concrete pipe, finished, Flow Area = 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C = 0.600 Limited to weir flow at low heads

Discarded OutFlow Max = 0.05 cfs @ 0.92 hrs HW = 84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max = 0.00 cfs @ 0.00 hrs HW = 84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Post-Development

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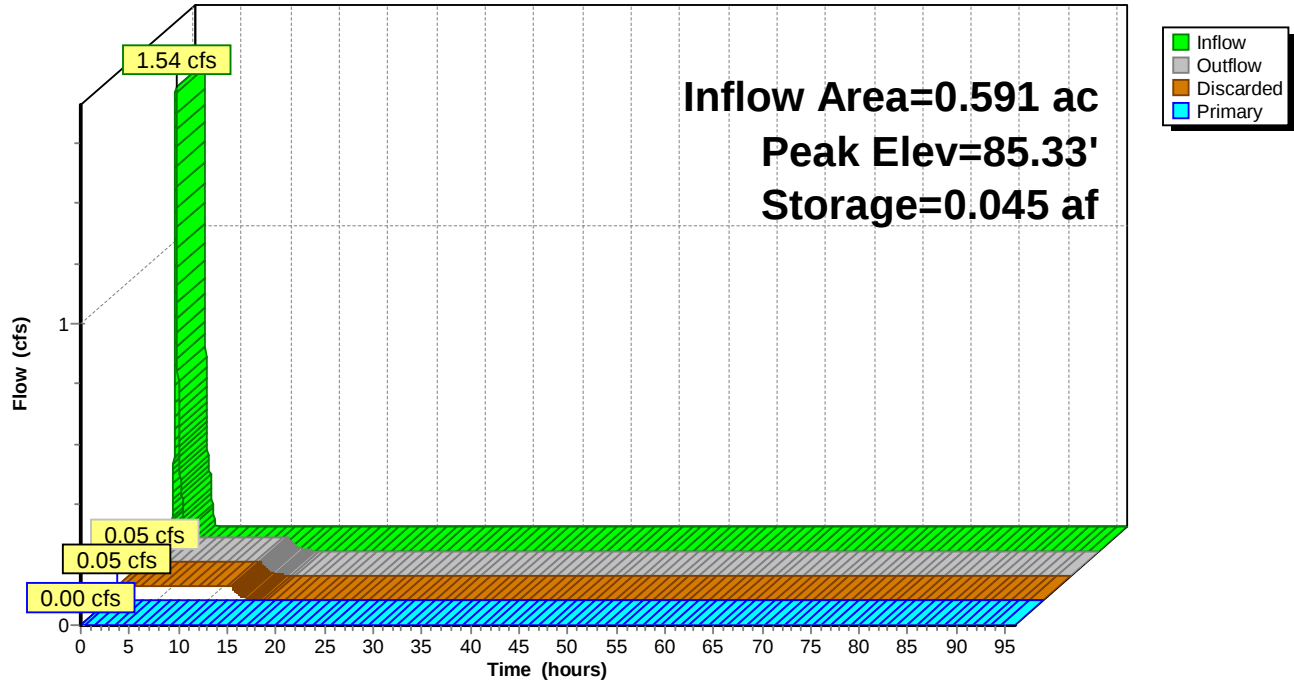
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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Pond 1P: Underground

Hydrograph



Post-Development

NJ DEP 2-hr WQ Rainfall=1.25"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 1P: Underground

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	84.19	0.00	0.00	0.00
2.00	0.07	0.045	85.33	0.05	0.05	0.00
4.00	0.00	0.038	85.17	0.05	0.05	0.00
6.00	0.00	0.030	84.97	0.05	0.05	0.00
8.00	0.00	0.022	84.76	0.05	0.05	0.00
10.00	0.00	0.014	84.55	0.05	0.05	0.00
12.00	0.00	0.006	84.34	0.05	0.05	0.00
14.00	0.00	0.001	84.21	0.01	0.01	0.00
16.00	0.00	0.000	84.19	0.00	0.00	0.00
18.00	0.00	0.000	84.19	0.00	0.00	0.00
20.00	0.00	0.000	84.19	0.00	0.00	0.00
22.00	0.00	0.000	84.19	0.00	0.00	0.00
24.00	0.00	0.000	84.19	0.00	0.00	0.00
26.00	0.00	0.000	84.19	0.00	0.00	0.00
28.00	0.00	0.000	84.19	0.00	0.00	0.00
30.00	0.00	0.000	84.19	0.00	0.00	0.00
32.00	0.00	0.000	84.19	0.00	0.00	0.00
34.00	0.00	0.000	84.19	0.00	0.00	0.00
36.00	0.00	0.000	84.19	0.00	0.00	0.00
38.00	0.00	0.000	84.19	0.00	0.00	0.00
40.00	0.00	0.000	84.19	0.00	0.00	0.00
42.00	0.00	0.000	84.19	0.00	0.00	0.00
44.00	0.00	0.000	84.19	0.00	0.00	0.00
46.00	0.00	0.000	84.19	0.00	0.00	0.00
48.00	0.00	0.000	84.19	0.00	0.00	0.00
50.00	0.00	0.000	84.19	0.00	0.00	0.00
52.00	0.00	0.000	84.19	0.00	0.00	0.00
54.00	0.00	0.000	84.19	0.00	0.00	0.00
56.00	0.00	0.000	84.19	0.00	0.00	0.00
58.00	0.00	0.000	84.19	0.00	0.00	0.00
60.00	0.00	0.000	84.19	0.00	0.00	0.00
62.00	0.00	0.000	84.19	0.00	0.00	0.00
64.00	0.00	0.000	84.19	0.00	0.00	0.00
66.00	0.00	0.000	84.19	0.00	0.00	0.00
68.00	0.00	0.000	84.19	0.00	0.00	0.00
70.00	0.00	0.000	84.19	0.00	0.00	0.00
72.00	0.00	0.000	84.19	0.00	0.00	0.00
74.00	0.00	0.000	84.19	0.00	0.00	0.00
76.00	0.00	0.000	84.19	0.00	0.00	0.00
78.00	0.00	0.000	84.19	0.00	0.00	0.00
80.00	0.00	0.000	84.19	0.00	0.00	0.00
82.00	0.00	0.000	84.19	0.00	0.00	0.00
84.00	0.00	0.000	84.19	0.00	0.00	0.00
86.00	0.00	0.000	84.19	0.00	0.00	0.00
88.00	0.00	0.000	84.19	0.00	0.00	0.00
90.00	0.00	0.000	84.19	0.00	0.00	0.00
92.00	0.00	0.000	84.19	0.00	0.00	0.00
94.00	0.00	0.000	84.19	0.00	0.00	0.00
96.00	0.00	0.000	84.19	0.00	0.00	0.00

Post-Development

Prepared by {enter your company name here}

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Summary for Pond 2P: BioBasin

Inflow Area = 0.895 ac, 33.96% Impervious, Inflow Depth = 0.22" for WQ event
Inflow = 0.47 cfs @ 1.19 hrs, Volume= 0.016 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 86.31' @ 2.57 hrs Surf.Area= 2,356 sf Storage= 711 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	11,525 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,166	0	0
87.00	2,769	2,468	2,468
88.00	3,431	3,100	5,568
89.00	4,147	3,789	9,357
89.50	4,527	2,169	11,525

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	15.0" Round Culvert L= 139.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.00' / 84.61' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	87.93'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.00' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Post-Development

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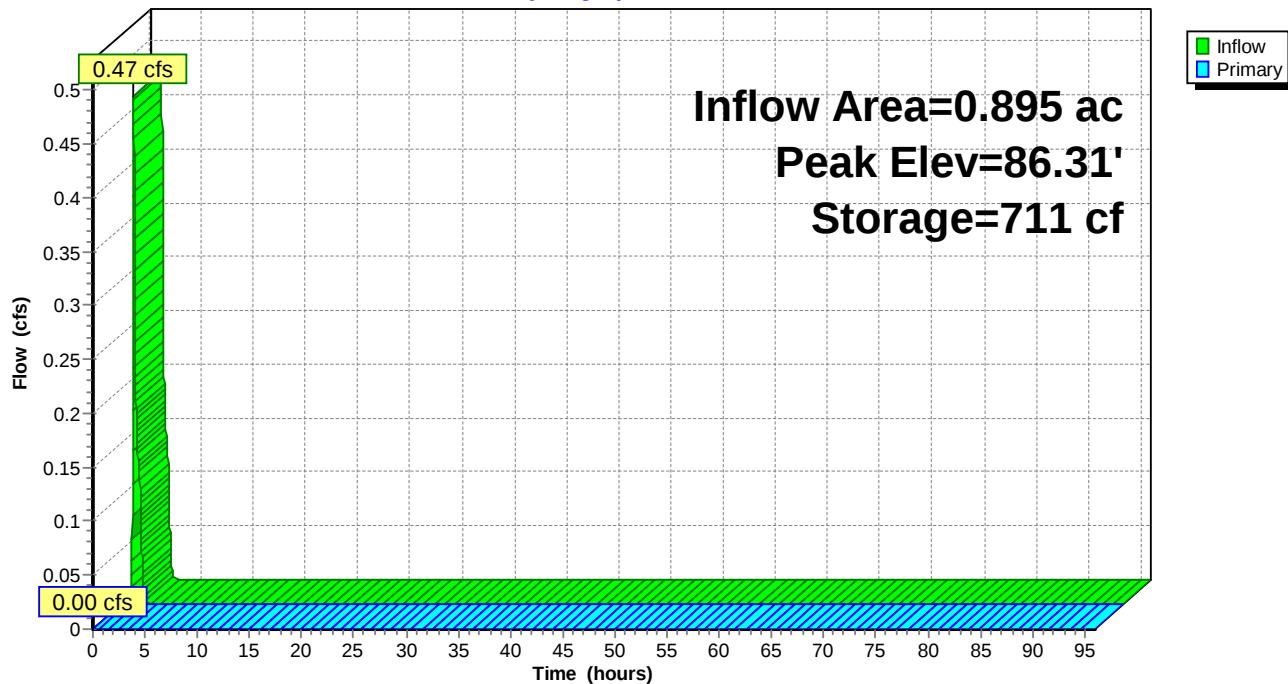
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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

Pond 2P: BioBasin

Hydrograph



Post-Development

NJ DEP 2-hr WQ Rainfall=1.25"

Prepared by {enter your company name here}

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Hydrograph for Pond 2P: BioBasin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	86.00	0.00
2.00	0.05	686	86.30	0.00
4.00	0.00	711	86.31	0.00
6.00	0.00	711	86.31	0.00
8.00	0.00	711	86.31	0.00
10.00	0.00	711	86.31	0.00
12.00	0.00	711	86.31	0.00
14.00	0.00	711	86.31	0.00
16.00	0.00	711	86.31	0.00
18.00	0.00	711	86.31	0.00
20.00	0.00	711	86.31	0.00
22.00	0.00	711	86.31	0.00
24.00	0.00	711	86.31	0.00
26.00	0.00	711	86.31	0.00
28.00	0.00	711	86.31	0.00
30.00	0.00	711	86.31	0.00
32.00	0.00	711	86.31	0.00
34.00	0.00	711	86.31	0.00
36.00	0.00	711	86.31	0.00
38.00	0.00	711	86.31	0.00
40.00	0.00	711	86.31	0.00
42.00	0.00	711	86.31	0.00
44.00	0.00	711	86.31	0.00
46.00	0.00	711	86.31	0.00
48.00	0.00	711	86.31	0.00
50.00	0.00	711	86.31	0.00
52.00	0.00	711	86.31	0.00
54.00	0.00	711	86.31	0.00
56.00	0.00	711	86.31	0.00
58.00	0.00	711	86.31	0.00
60.00	0.00	711	86.31	0.00
62.00	0.00	711	86.31	0.00
64.00	0.00	711	86.31	0.00
66.00	0.00	711	86.31	0.00
68.00	0.00	711	86.31	0.00
70.00	0.00	711	86.31	0.00
72.00	0.00	711	86.31	0.00
74.00	0.00	711	86.31	0.00
76.00	0.00	711	86.31	0.00
78.00	0.00	711	86.31	0.00
80.00	0.00	711	86.31	0.00
82.00	0.00	711	86.31	0.00
84.00	0.00	711	86.31	0.00
86.00	0.00	711	86.31	0.00
88.00	0.00	711	86.31	0.00
90.00	0.00	711	86.31	0.00
92.00	0.00	711	86.31	0.00
94.00	0.00	711	86.31	0.00
96.00	0.00	711	86.31	0.00

Post-Development

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 7/6/2021

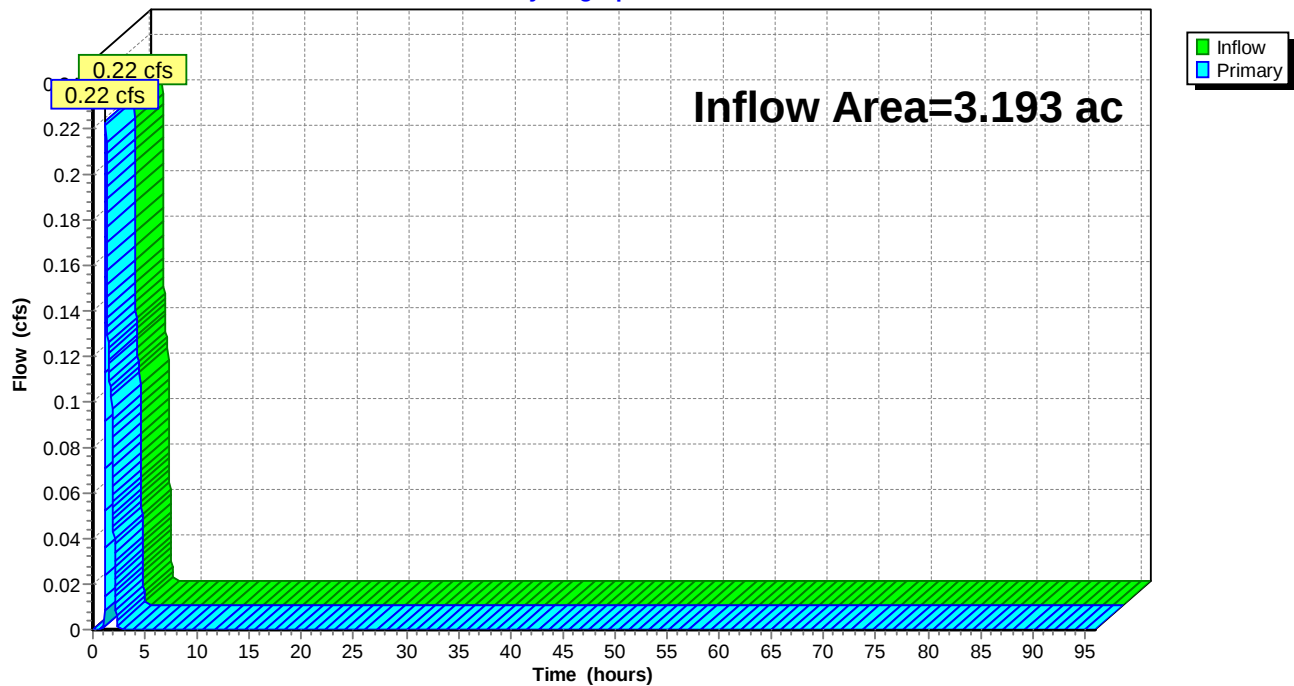
Summary for Pond 3P: Total

Inflow Area = 3.193 ac, 33.15% Impervious, Inflow Depth = 0.04" for WQ event
Inflow = 0.22 cfs @ 1.23 hrs, Volume= 0.010 af
Primary = 0.22 cfs @ 1.23 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Pond 3P: Total

Hydrograph



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-1: DA-1

Runoff = 1.68 cfs @ 12.13 hrs, Volume= 0.153 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

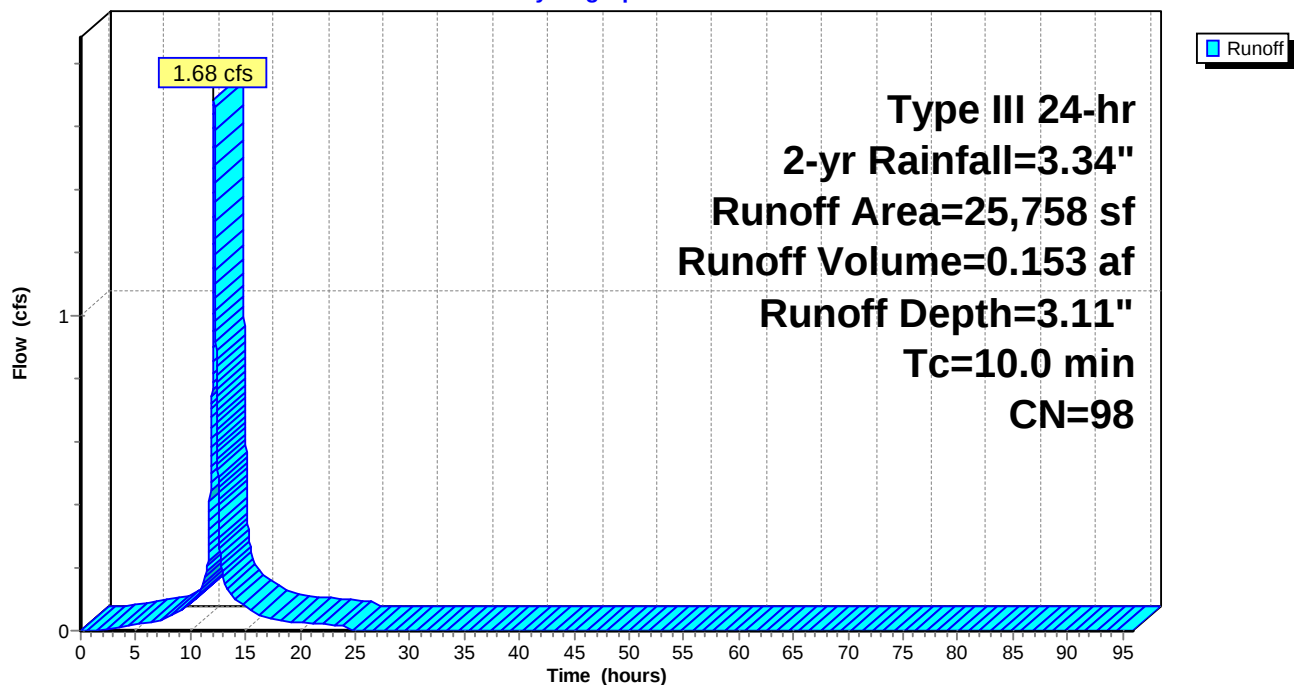
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
25,758	98	Roofs, HSG D
25,758		100.00% Impervious Area

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

Subcatchment DA-1: DA-1

Hydrograph



Post-Development

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-2: DA-2

Runoff = 1.51 cfs @ 12.14 hrs, Volume= 0.123 af, Depth= 1.65"

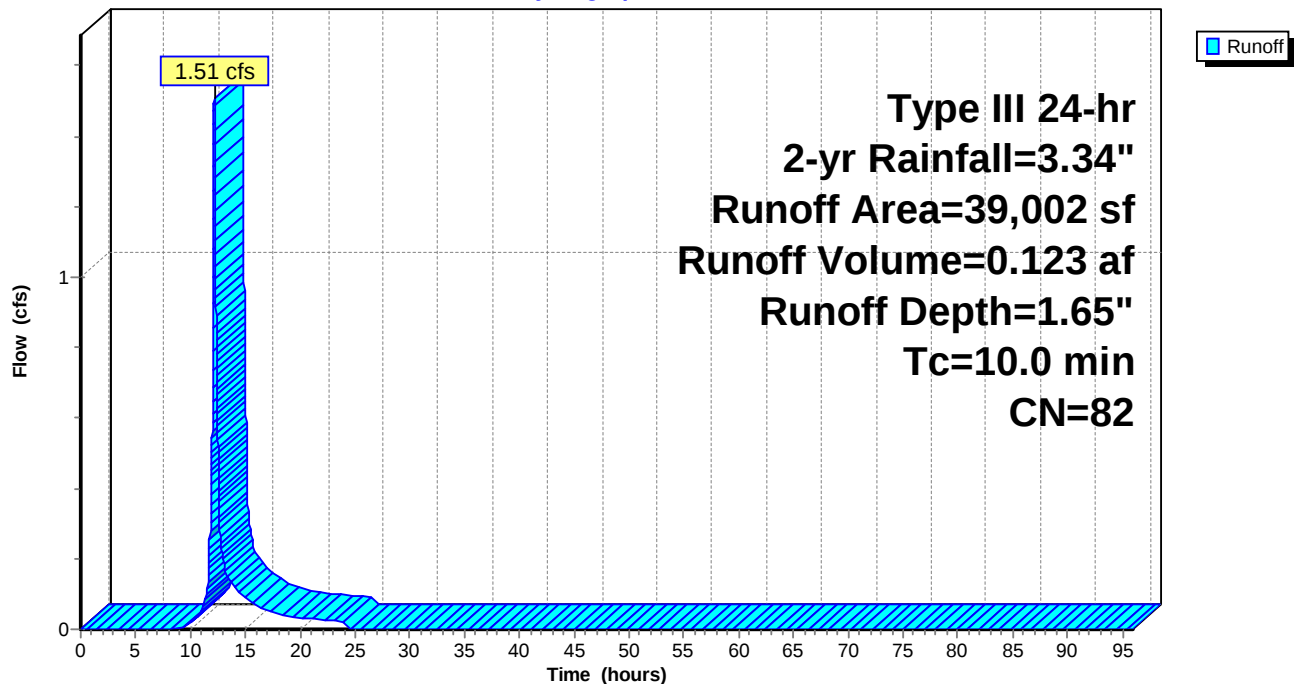
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
5,773	61	>75% Grass cover, Good, HSG B
5,981	74	>75% Grass cover, Good, HSG C
14,003	80	>75% Grass cover, Good, HSG D
* 2,940	98	Sidewalks, HSG C
9,656	98	Paved parking, HSG C
* 649	98	Hardscape, HSG C
39,002	82	Weighted Average
25,757		66.04% Pervious Area
13,245		33.96% Impervious Area

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

Subcatchment DA-2: DA-2

Hydrograph



Post-Development

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-3: DA-3

Runoff = 0.32 cfs @ 12.16 hrs, Volume= 0.033 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

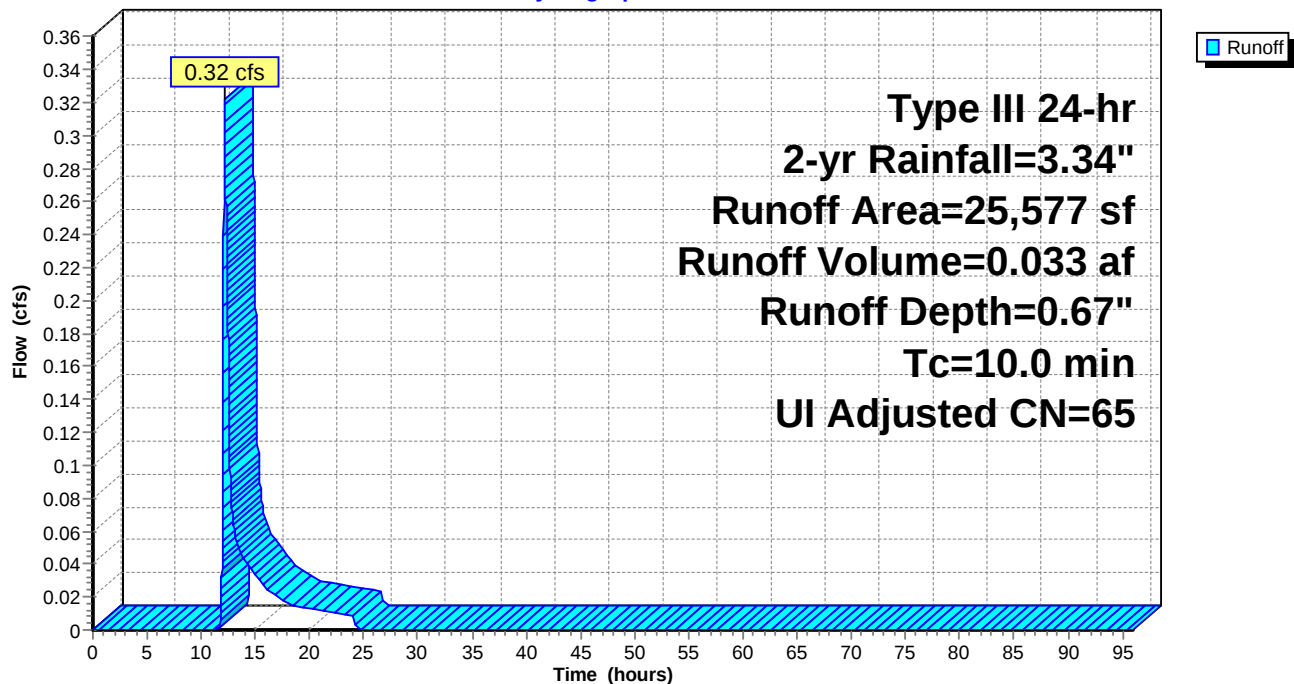
Type III 24-hr 2-yr Rainfall=3.34"

	Area (sf)	CN	Adj	Description
	649	98		Unconnected roofs, HSG C
*	4,993	80		>75% Grass cover, Good, HSG D
	19,935	61		>75% Grass cover, Good, HSG B
	25,577	66	65	Weighted Average, UI Adjusted
	24,928			97.46% Pervious Area
	649			2.54% Impervious Area
	649			100.00% Unconnected

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

Subcatchment DA-3: DA-3

Hydrograph



Post-Development

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-4: DA-4

Runoff = 1.39 cfs @ 12.15 hrs, Volume= 0.117 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

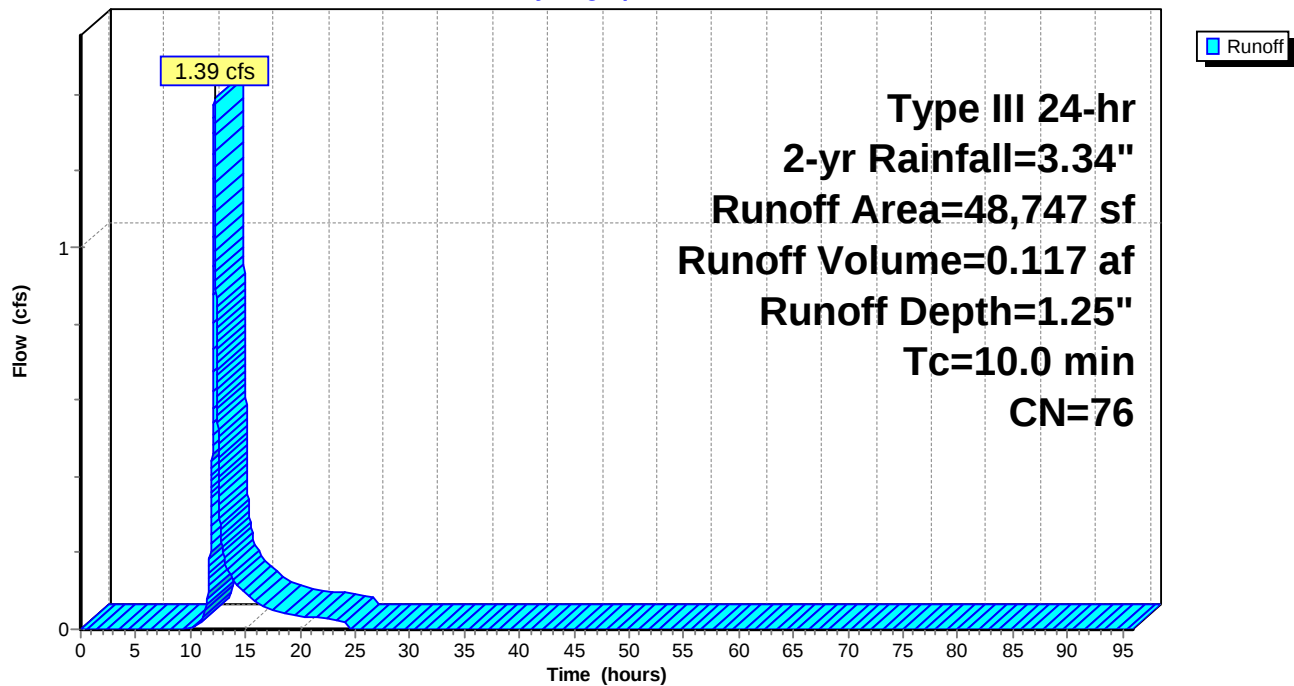
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
16,312	61	>75% Grass cover, Good, HSG B
2,332	74	>75% Grass cover, Good, HSG C
23,645	80	>75% Grass cover, Good, HSG D
2,779	98	Paved parking, HSG C
* 3,419	98	Sidewalks, HSG C
* 260	98	Hardscapes, HSG C
48,747	76	Weighted Average
42,289		86.75% Pervious Area
6,458		13.25% Impervious Area

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

Subcatchment DA-4: DA-4

Hydrograph



Post-Development

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 3.11" for 2-yr event
Inflow = 1.68 cfs @ 12.13 hrs, Volume= 0.153 af
Outflow = 0.05 cfs @ 9.02 hrs, Volume= 0.153 af, Atten= 97%, Lag= 0.0 min
Discarded = 0.05 cfs @ 9.02 hrs, Volume= 0.153 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 86.11' @ 16.45 hrs Surf.Area= 0.096 ac Storage= 0.095 af

Plug-Flow detention time= 758.9 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 759.0 min (1,518.2 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L= 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L= 22.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.19' / 84.97' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 9.02 hrs HW=84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

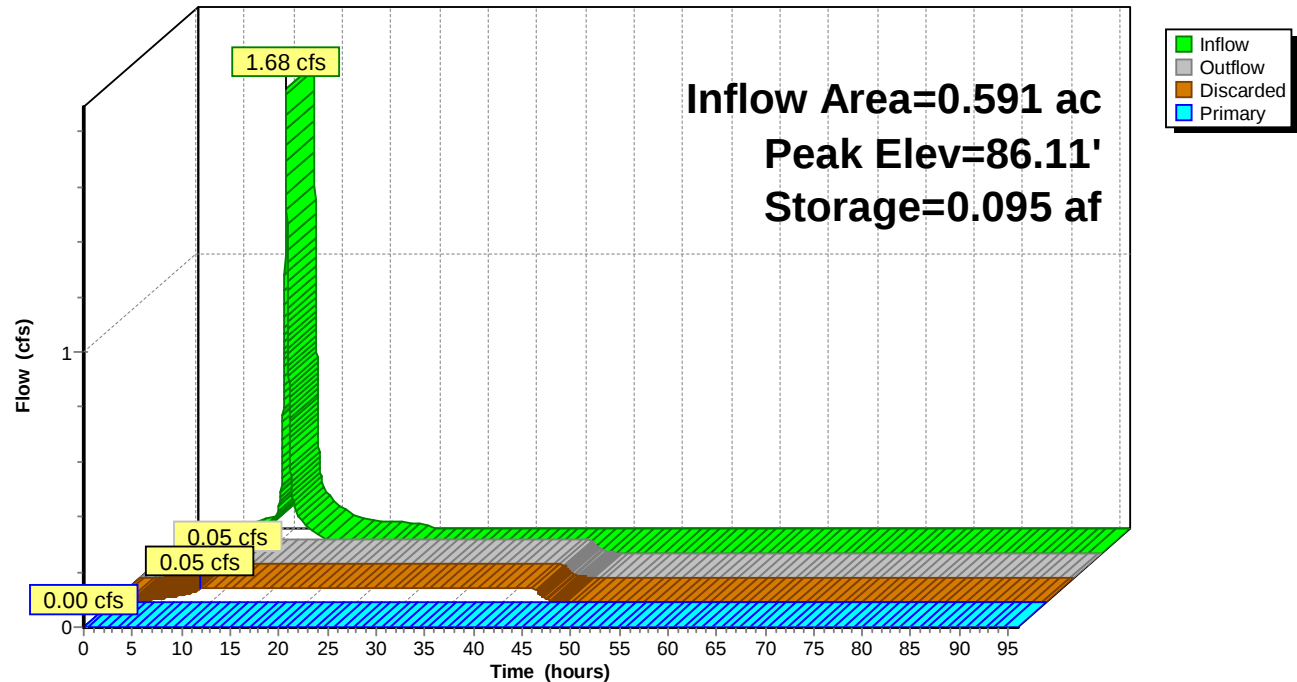
Post-Development

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Type III 24-hr 2-yr Rainfall=3.34"
Printed 7/6/2021

Pond 1P: Underground

Hydrograph



Post-Development

Type III 24-hr 2-yr Rainfall=3.34"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 1P: Underground

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	84.19	0.00	0.00	0.00
2.00	0.00	0.000	84.19	0.00	0.00	0.00
4.00	0.01	0.001	84.21	0.01	0.01	0.00
6.00	0.02	0.001	84.22	0.02	0.02	0.00
8.00	0.04	0.002	84.25	0.03	0.03	0.00
10.00	0.09	0.006	84.34	0.05	0.05	0.00
12.00	0.90	0.031	85.00	0.05	0.05	0.00
14.00	0.10	0.090	86.04	0.05	0.05	0.00
16.00	0.06	0.095	86.10	0.05	0.05	0.00
18.00	0.03	0.094	86.09	0.05	0.05	0.00
20.00	0.03	0.091	86.05	0.05	0.05	0.00
22.00	0.02	0.087	85.99	0.05	0.05	0.00
24.00	0.02	0.082	85.92	0.05	0.05	0.00
26.00	0.00	0.074	85.80	0.05	0.05	0.00
28.00	0.00	0.066	85.68	0.05	0.05	0.00
30.00	0.00	0.058	85.55	0.05	0.05	0.00
32.00	0.00	0.050	85.41	0.05	0.05	0.00
34.00	0.00	0.042	85.26	0.05	0.05	0.00
36.00	0.00	0.034	85.07	0.05	0.05	0.00
38.00	0.00	0.026	84.86	0.05	0.05	0.00
40.00	0.00	0.018	84.65	0.05	0.05	0.00
42.00	0.00	0.010	84.44	0.05	0.05	0.00
44.00	0.00	0.002	84.24	0.03	0.03	0.00
46.00	0.00	0.000	84.20	0.00	0.00	0.00
48.00	0.00	0.000	84.19	0.00	0.00	0.00
50.00	0.00	0.000	84.19	0.00	0.00	0.00
52.00	0.00	0.000	84.19	0.00	0.00	0.00
54.00	0.00	0.000	84.19	0.00	0.00	0.00
56.00	0.00	0.000	84.19	0.00	0.00	0.00
58.00	0.00	0.000	84.19	0.00	0.00	0.00
60.00	0.00	0.000	84.19	0.00	0.00	0.00
62.00	0.00	0.000	84.19	0.00	0.00	0.00
64.00	0.00	0.000	84.19	0.00	0.00	0.00
66.00	0.00	0.000	84.19	0.00	0.00	0.00
68.00	0.00	0.000	84.19	0.00	0.00	0.00
70.00	0.00	0.000	84.19	0.00	0.00	0.00
72.00	0.00	0.000	84.19	0.00	0.00	0.00
74.00	0.00	0.000	84.19	0.00	0.00	0.00
76.00	0.00	0.000	84.19	0.00	0.00	0.00
78.00	0.00	0.000	84.19	0.00	0.00	0.00
80.00	0.00	0.000	84.19	0.00	0.00	0.00
82.00	0.00	0.000	84.19	0.00	0.00	0.00
84.00	0.00	0.000	84.19	0.00	0.00	0.00
86.00	0.00	0.000	84.19	0.00	0.00	0.00
88.00	0.00	0.000	84.19	0.00	0.00	0.00
90.00	0.00	0.000	84.19	0.00	0.00	0.00
92.00	0.00	0.000	84.19	0.00	0.00	0.00
94.00	0.00	0.000	84.19	0.00	0.00	0.00
96.00	0.00	0.000	84.19	0.00	0.00	0.00

Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Pond 2P: BioBasin

Inflow Area = 0.895 ac, 33.96% Impervious, Inflow Depth = 1.65" for 2-yr event
Inflow = 1.51 cfs @ 12.14 hrs, Volume= 0.123 af
Outflow = 0.02 cfs @ 24.10 hrs, Volume= 0.001 af, Atten= 99%, Lag= 717.3 min
Primary = 0.02 cfs @ 24.10 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 87.93' @ 24.10 hrs Surf.Area= 3,388 sf Storage= 5,346 cf

Plug-Flow detention time= 875.3 min calculated for 0.001 af (1% of inflow)
Center-of-Mass det. time= 613.5 min (1,451.4 - 837.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	11,525 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,166	0	0
87.00	2,769	2,468	2,468
88.00	3,431	3,100	5,568
89.00	4,147	3,789	9,357
89.50	4,527	2,169	11,525

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	15.0" Round Culvert L= 139.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.00' / 84.61' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	87.93'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.01 cfs @ 24.10 hrs HW=87.93' (Free Discharge)

↑ **1=Culvert** (Passes 0.01 cfs of 6.76 cfs potential flow)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.17 fps)

Post-Development

Prepared by {enter your company name here}

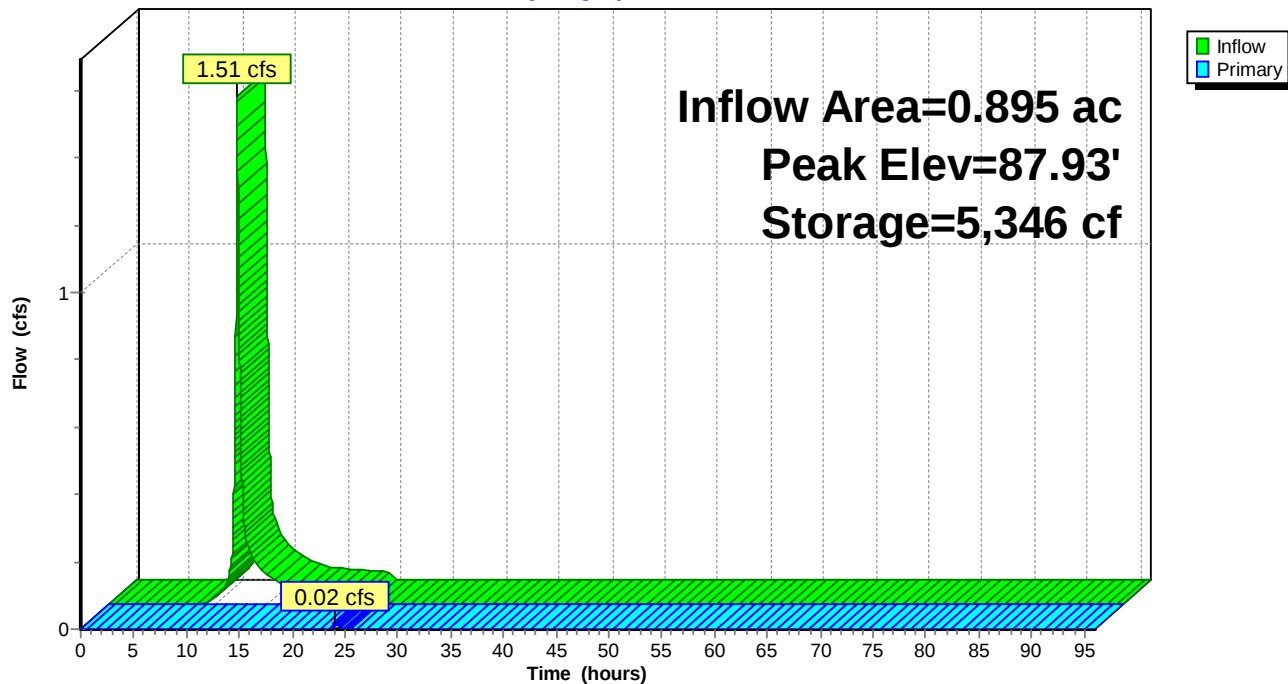
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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Pond 2P: BioBasin

Hydrograph



Post-Development

Type III 24-hr 2-yr Rainfall=3.34"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 2P: BioBasin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	86.00	0.00
2.00	0.00	0	86.00	0.00
4.00	0.00	0	86.00	0.00
6.00	0.00	0	86.00	0.00
8.00	0.00	0	86.00	0.00
10.00	0.02	39	86.02	0.00
12.00	0.69	823	86.36	0.00
14.00	0.12	3,685	87.42	0.00
16.00	0.07	4,342	87.63	0.00
18.00	0.04	4,716	87.75	0.00
20.00	0.03	4,972	87.82	0.00
22.00	0.03	5,183	87.89	0.00
24.00	0.02	5,344	87.93	0.02
26.00	0.00	5,329	87.93	0.00
28.00	0.00	5,329	87.93	0.00
30.00	0.00	5,329	87.93	0.00
32.00	0.00	5,329	87.93	0.00
34.00	0.00	5,329	87.93	0.00
36.00	0.00	5,329	87.93	0.00
38.00	0.00	5,329	87.93	0.00
40.00	0.00	5,329	87.93	0.00
42.00	0.00	5,329	87.93	0.00
44.00	0.00	5,329	87.93	0.00
46.00	0.00	5,329	87.93	0.00
48.00	0.00	5,329	87.93	0.00
50.00	0.00	5,329	87.93	0.00
52.00	0.00	5,329	87.93	0.00
54.00	0.00	5,329	87.93	0.00
56.00	0.00	5,329	87.93	0.00
58.00	0.00	5,329	87.93	0.00
60.00	0.00	5,329	87.93	0.00
62.00	0.00	5,329	87.93	0.00
64.00	0.00	5,329	87.93	0.00
66.00	0.00	5,329	87.93	0.00
68.00	0.00	5,329	87.93	0.00
70.00	0.00	5,329	87.93	0.00
72.00	0.00	5,329	87.93	0.00
74.00	0.00	5,329	87.93	0.00
76.00	0.00	5,329	87.93	0.00
78.00	0.00	5,329	87.93	0.00
80.00	0.00	5,329	87.93	0.00
82.00	0.00	5,329	87.93	0.00
84.00	0.00	5,329	87.93	0.00
86.00	0.00	5,329	87.93	0.00
88.00	0.00	5,329	87.93	0.00
90.00	0.00	5,329	87.93	0.00
92.00	0.00	5,329	87.93	0.00
94.00	0.00	5,329	87.93	0.00
96.00	0.00	5,329	87.93	0.00

Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 2-yr Rainfall=3.34"

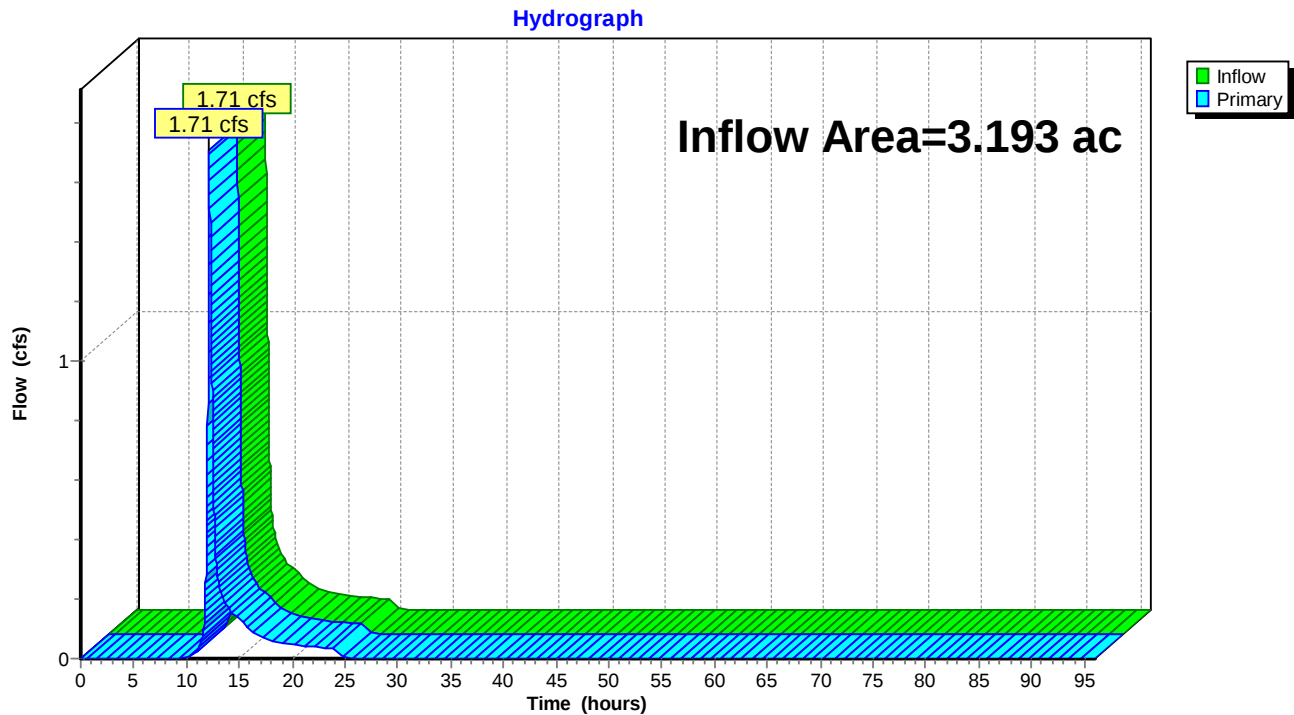
Printed 7/6/2021

Summary for Pond 3P: Total

Inflow Area = 3.193 ac, 33.15% Impervious, Inflow Depth = 0.56" for 2-yr event
Inflow = 1.71 cfs @ 12.15 hrs, Volume= 0.150 af
Primary = 1.71 cfs @ 12.15 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Pond 3P: Total



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Summary for Subcatchment DA-1: DA-1

Runoff = 2.54 cfs @ 12.13 hrs, Volume= 0.235 af, Depth= 4.77"

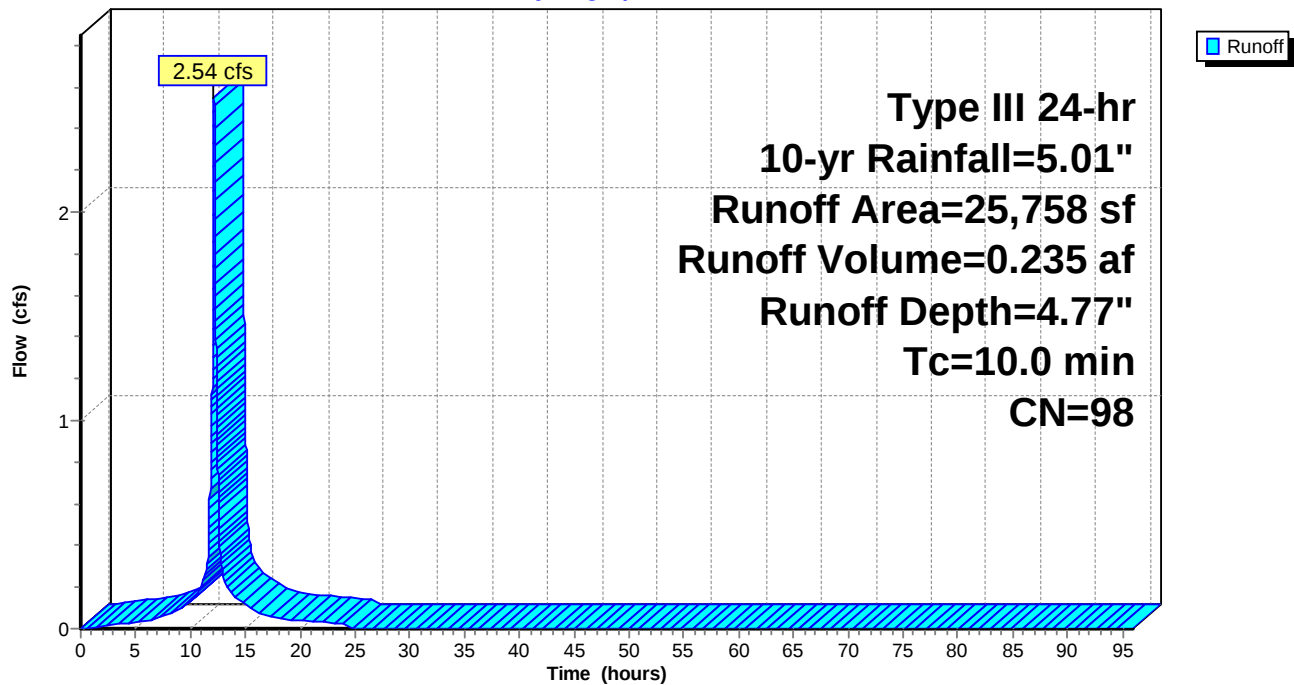
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.01"

Area (sf)	CN	Description
25,758	98	Roofs, HSG D
25,758		100.00% Impervious Area

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

Subcatchment DA-1: DA-1

Hydrograph



Post-Development

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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Summary for Subcatchment DA-2: DA-2

Runoff = 2.83 cfs @ 12.14 hrs, Volume= 0.230 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

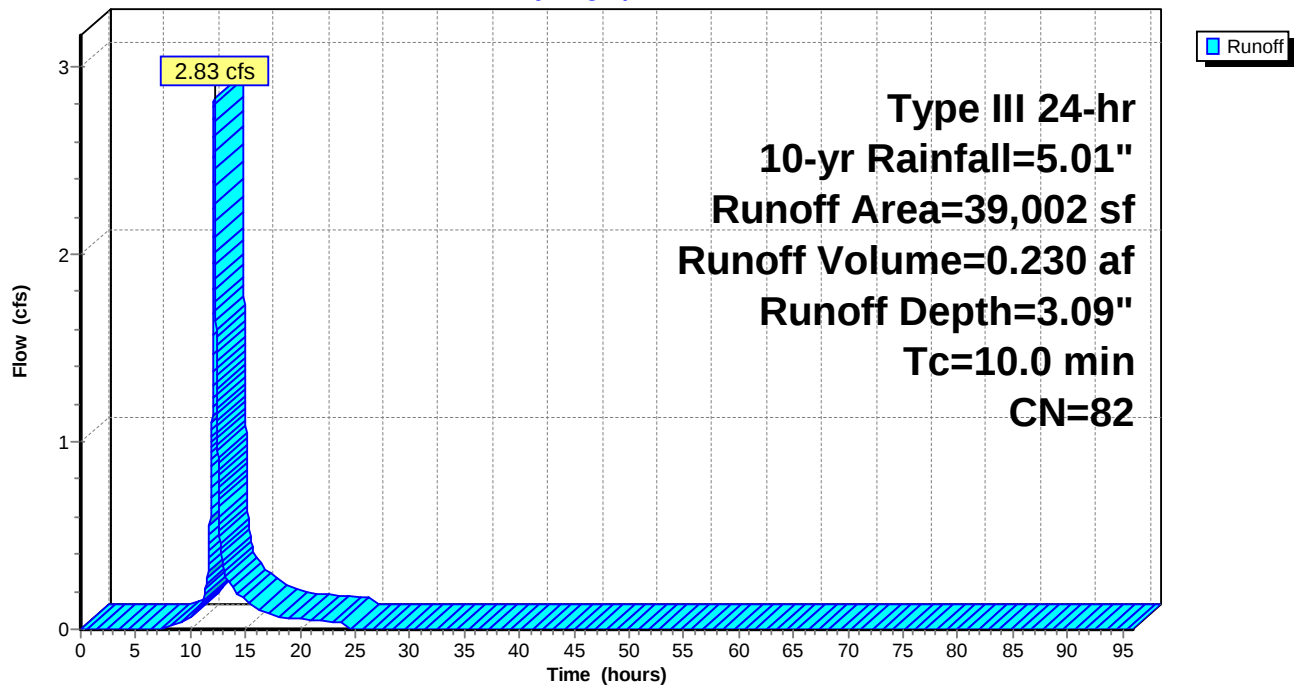
Type III 24-hr 10-yr Rainfall=5.01"

Area (sf)	CN	Description
5,773	61	>75% Grass cover, Good, HSG B
5,981	74	>75% Grass cover, Good, HSG C
14,003	80	>75% Grass cover, Good, HSG D
* 2,940	98	Sidewalks, HSG C
9,656	98	Paved parking, HSG C
* 649	98	Hardscape, HSG C
39,002	82	Weighted Average
25,757		66.04% Pervious Area
13,245		33.96% Impervious Area

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

Subcatchment DA-2: DA-2

Hydrograph



Post-Development

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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Summary for Subcatchment DA-3: DA-3

Runoff = 0.95 cfs @ 12.15 hrs, Volume= 0.081 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

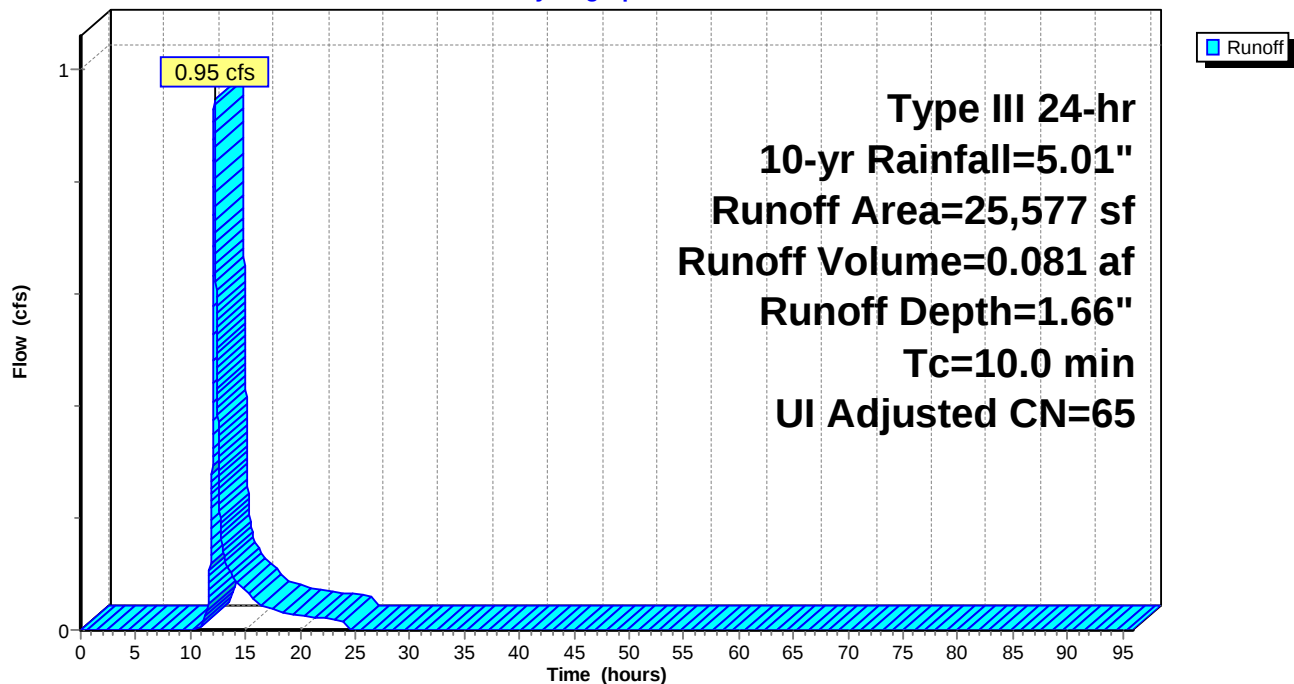
Type III 24-hr 10-yr Rainfall=5.01"

	Area (sf)	CN	Adj	Description
	649	98		Unconnected roofs, HSG C
*	4,993	80		>75% Grass cover, Good, HSG D
	19,935	61		>75% Grass cover, Good, HSG B
	25,577	66	65	Weighted Average, UI Adjusted
	24,928			97.46% Pervious Area
	649			2.54% Impervious Area
	649			100.00% Unconnected

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

Subcatchment DA-3: DA-3

Hydrograph



Post-Development

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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Summary for Subcatchment DA-4: DA-4

Runoff = 2.91 cfs @ 12.14 hrs, Volume= 0.237 af, Depth= 2.54"

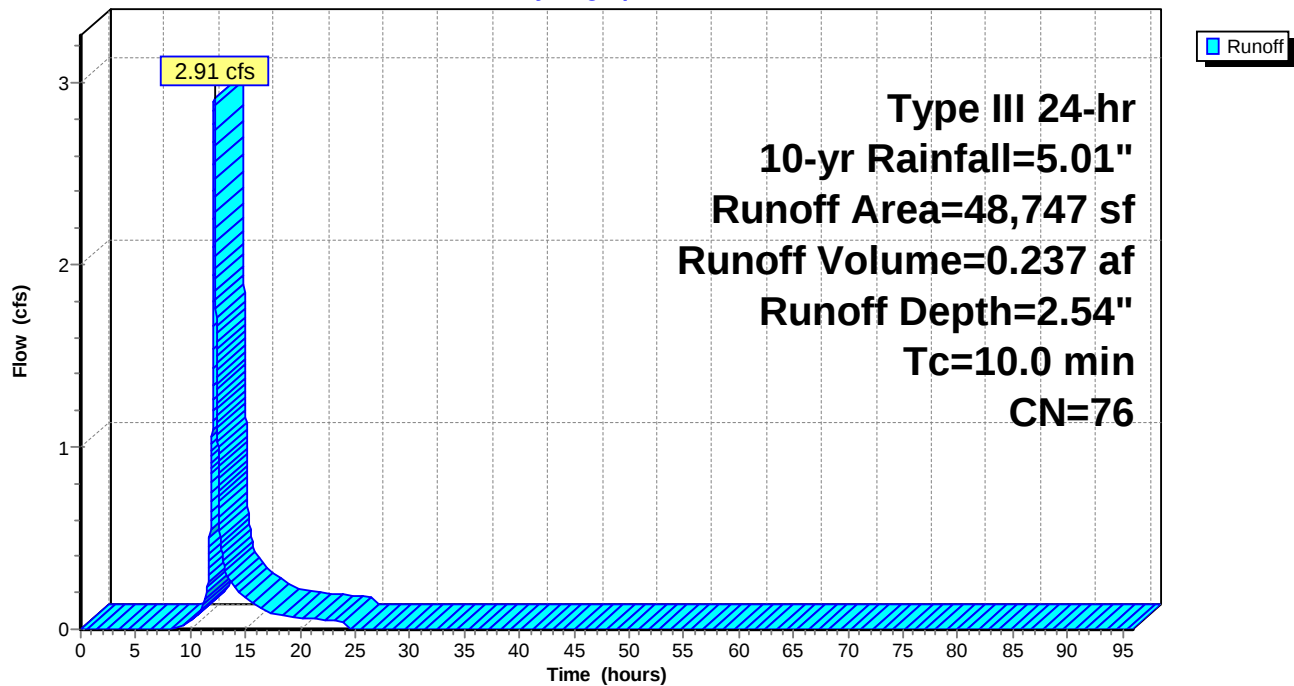
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.01"

Area (sf)	CN	Description
16,312	61	>75% Grass cover, Good, HSG B
2,332	74	>75% Grass cover, Good, HSG C
23,645	80	>75% Grass cover, Good, HSG D
2,779	98	Paved parking, HSG C
* 3,419	98	Sidewalks, HSG C
* 260	98	Hardscapes, HSG C
48,747	76	Weighted Average
42,289		86.75% Pervious Area
6,458		13.25% Impervious Area

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

Subcatchment DA-4: DA-4

Hydrograph



Post-Development

Type III 24-hr 10-yr Rainfall=5.01"

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Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 4.77" for 10-yr event
Inflow = 2.54 cfs @ 12.13 hrs, Volume = 0.235 af
Outflow = 0.05 cfs @ 7.43 hrs, Volume = 0.235 af, Atten = 98%, Lag = 0.0 min
Discarded = 0.05 cfs @ 7.43 hrs, Volume = 0.235 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-96.00 hrs, dt = 0.01 hrs
Peak Elev = 87.02' @ 18.10 hrs Surf. Area = 0.096 ac Storage = 0.163 af

Plug-Flow detention time = 1,277.1 min calculated for 0.235 af (100% of inflow)
Center-of-Mass det. time = 1,277.3 min (2,029.0 - 751.7)

Volume	Invert	Avail. Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L = 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L = 22.0' RCP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 85.19' / 84.97' S = 0.0100 ' / ' Cc = 0.900 n = 0.012 Concrete pipe, finished, Flow Area = 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C = 0.600 Limited to weir flow at low heads

Discarded OutFlow Max = 0.05 cfs @ 7.43 hrs HW = 84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max = 0.00 cfs @ 0.00 hrs HW = 84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Post-Development

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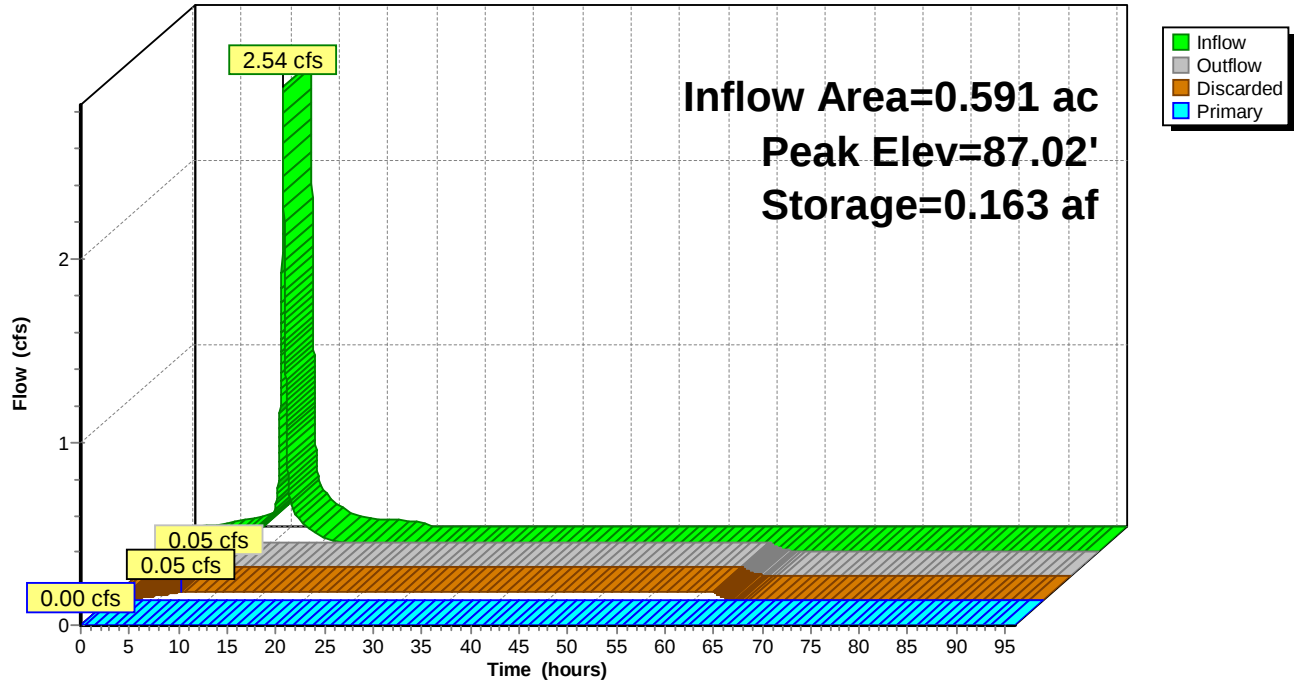
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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Pond 1P: Underground

Hydrograph



Post-Development

Type III 24-hr 10-yr Rainfall=5.01"

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Printed 7/6/2021

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Hydrograph for Pond 1P: Underground

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	84.19	0.00	0.00	0.00
2.00	0.01	0.000	84.20	0.00	0.00	0.00
4.00	0.03	0.001	84.23	0.02	0.02	0.00
6.00	0.04	0.002	84.25	0.03	0.03	0.00
8.00	0.07	0.004	84.30	0.05	0.05	0.00
10.00	0.14	0.013	84.52	0.05	0.05	0.00
12.00	1.36	0.056	85.53	0.05	0.05	0.00
14.00	0.16	0.149	86.83	0.05	0.05	0.00
16.00	0.08	0.160	86.98	0.05	0.05	0.00
18.00	0.05	0.163	87.02	0.05	0.05	0.00
20.00	0.04	0.162	87.01	0.05	0.05	0.00
22.00	0.03	0.160	86.98	0.05	0.05	0.00
24.00	0.03	0.157	86.94	0.05	0.05	0.00
26.00	0.00	0.149	86.84	0.05	0.05	0.00
28.00	0.00	0.141	86.73	0.05	0.05	0.00
30.00	0.00	0.133	86.63	0.05	0.05	0.00
32.00	0.00	0.125	86.52	0.05	0.05	0.00
34.00	0.00	0.117	86.41	0.05	0.05	0.00
36.00	0.00	0.109	86.30	0.05	0.05	0.00
38.00	0.00	0.101	86.19	0.05	0.05	0.00
40.00	0.00	0.093	86.08	0.05	0.05	0.00
42.00	0.00	0.085	85.96	0.05	0.05	0.00
44.00	0.00	0.077	85.85	0.05	0.05	0.00
46.00	0.00	0.069	85.72	0.05	0.05	0.00
48.00	0.00	0.061	85.60	0.05	0.05	0.00
50.00	0.00	0.053	85.46	0.05	0.05	0.00
52.00	0.00	0.045	85.32	0.05	0.05	0.00
54.00	0.00	0.037	85.14	0.05	0.05	0.00
56.00	0.00	0.029	84.93	0.05	0.05	0.00
58.00	0.00	0.021	84.72	0.05	0.05	0.00
60.00	0.00	0.013	84.51	0.05	0.05	0.00
62.00	0.00	0.004	84.31	0.05	0.05	0.00
64.00	0.00	0.000	84.20	0.01	0.01	0.00
66.00	0.00	0.000	84.19	0.00	0.00	0.00
68.00	0.00	0.000	84.19	0.00	0.00	0.00
70.00	0.00	0.000	84.19	0.00	0.00	0.00
72.00	0.00	0.000	84.19	0.00	0.00	0.00
74.00	0.00	0.000	84.19	0.00	0.00	0.00
76.00	0.00	0.000	84.19	0.00	0.00	0.00
78.00	0.00	0.000	84.19	0.00	0.00	0.00
80.00	0.00	0.000	84.19	0.00	0.00	0.00
82.00	0.00	0.000	84.19	0.00	0.00	0.00
84.00	0.00	0.000	84.19	0.00	0.00	0.00
86.00	0.00	0.000	84.19	0.00	0.00	0.00
88.00	0.00	0.000	84.19	0.00	0.00	0.00
90.00	0.00	0.000	84.19	0.00	0.00	0.00
92.00	0.00	0.000	84.19	0.00	0.00	0.00
94.00	0.00	0.000	84.19	0.00	0.00	0.00
96.00	0.00	0.000	84.19	0.00	0.00	0.00

Post-Development

Type III 24-hr 10-yr Rainfall=5.01"

Prepared by {enter your company name here}

Printed 7/6/2021

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Summary for Pond 2P: BioBasin

Inflow Area = 0.895 ac, 33.96% Impervious, Inflow Depth = 3.09" for 10-yr event
Inflow = 2.83 cfs @ 12.14 hrs, Volume= 0.230 af
Outflow = 0.49 cfs @ 12.68 hrs, Volume= 0.108 af, Atten= 83%, Lag= 32.5 min
Primary = 0.49 cfs @ 12.68 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 88.02' @ 12.68 hrs Surf.Area= 3,442 sf Storage= 5,621 cf

Plug-Flow detention time= 256.6 min calculated for 0.108 af (47% of inflow)
Center-of-Mass det. time= 140.3 min (960.2 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	11,525 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,166	0	0
87.00	2,769	2,468	2,468
88.00	3,431	3,100	5,568
89.00	4,147	3,789	9,357
89.50	4,527	2,169	11,525

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	15.0" Round Culvert L= 139.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.00' / 84.61' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	87.93'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.49 cfs @ 12.68 hrs HW=88.02' (Free Discharge)

↑ **1=Culvert** (Passes 0.49 cfs of 6.97 cfs potential flow)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 0.71 fps)

Post-Development

Prepared by {enter your company name here}

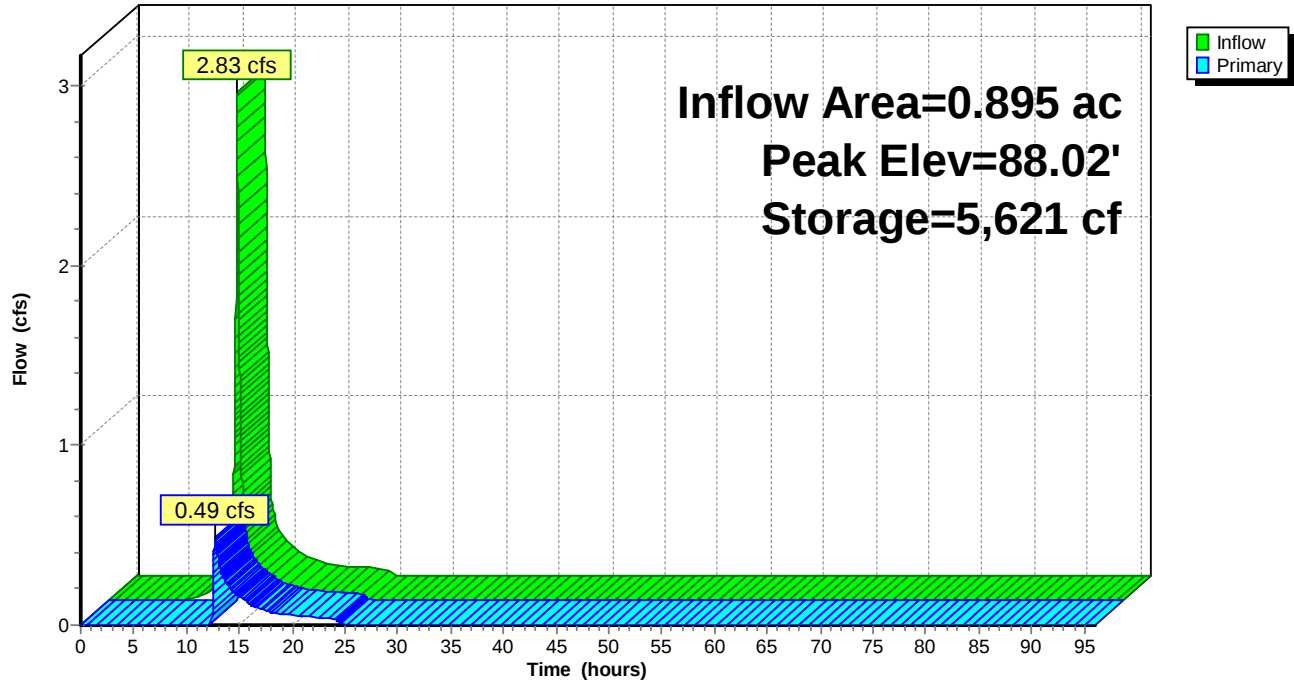
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Type III 24-hr 10-yr Rainfall=5.01"

Printed 7/6/2021

Pond 2P: BioBasin

Hydrograph



Post-Development

Type III 24-hr 10-yr Rainfall=5.01"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 2P: BioBasin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	86.00	0.00
2.00	0.00	0	86.00	0.00
4.00	0.00	0	86.00	0.00
6.00	0.00	0	86.00	0.00
8.00	0.01	18	86.01	0.00
10.00	0.07	270	86.12	0.00
12.00	1.37	2,068	86.85	0.00
14.00	0.20	5,494	87.98	0.22
16.00	0.11	5,439	87.96	0.12
18.00	0.07	5,402	87.95	0.07
20.00	0.05	5,384	87.95	0.05
22.00	0.04	5,375	87.94	0.05
24.00	0.04	5,366	87.94	0.04
26.00	0.00	5,329	87.93	0.00
28.00	0.00	5,329	87.93	0.00
30.00	0.00	5,329	87.93	0.00
32.00	0.00	5,329	87.93	0.00
34.00	0.00	5,329	87.93	0.00
36.00	0.00	5,329	87.93	0.00
38.00	0.00	5,329	87.93	0.00
40.00	0.00	5,329	87.93	0.00
42.00	0.00	5,329	87.93	0.00
44.00	0.00	5,329	87.93	0.00
46.00	0.00	5,329	87.93	0.00
48.00	0.00	5,329	87.93	0.00
50.00	0.00	5,329	87.93	0.00
52.00	0.00	5,329	87.93	0.00
54.00	0.00	5,329	87.93	0.00
56.00	0.00	5,329	87.93	0.00
58.00	0.00	5,329	87.93	0.00
60.00	0.00	5,329	87.93	0.00
62.00	0.00	5,329	87.93	0.00
64.00	0.00	5,329	87.93	0.00
66.00	0.00	5,329	87.93	0.00
68.00	0.00	5,329	87.93	0.00
70.00	0.00	5,329	87.93	0.00
72.00	0.00	5,329	87.93	0.00
74.00	0.00	5,329	87.93	0.00
76.00	0.00	5,329	87.93	0.00
78.00	0.00	5,329	87.93	0.00
80.00	0.00	5,329	87.93	0.00
82.00	0.00	5,329	87.93	0.00
84.00	0.00	5,329	87.93	0.00
86.00	0.00	5,329	87.93	0.00
88.00	0.00	5,329	87.93	0.00
90.00	0.00	5,329	87.93	0.00
92.00	0.00	5,329	87.93	0.00
94.00	0.00	5,329	87.93	0.00
96.00	0.00	5,329	87.93	0.00

Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 10-yr Rainfall=5.01"

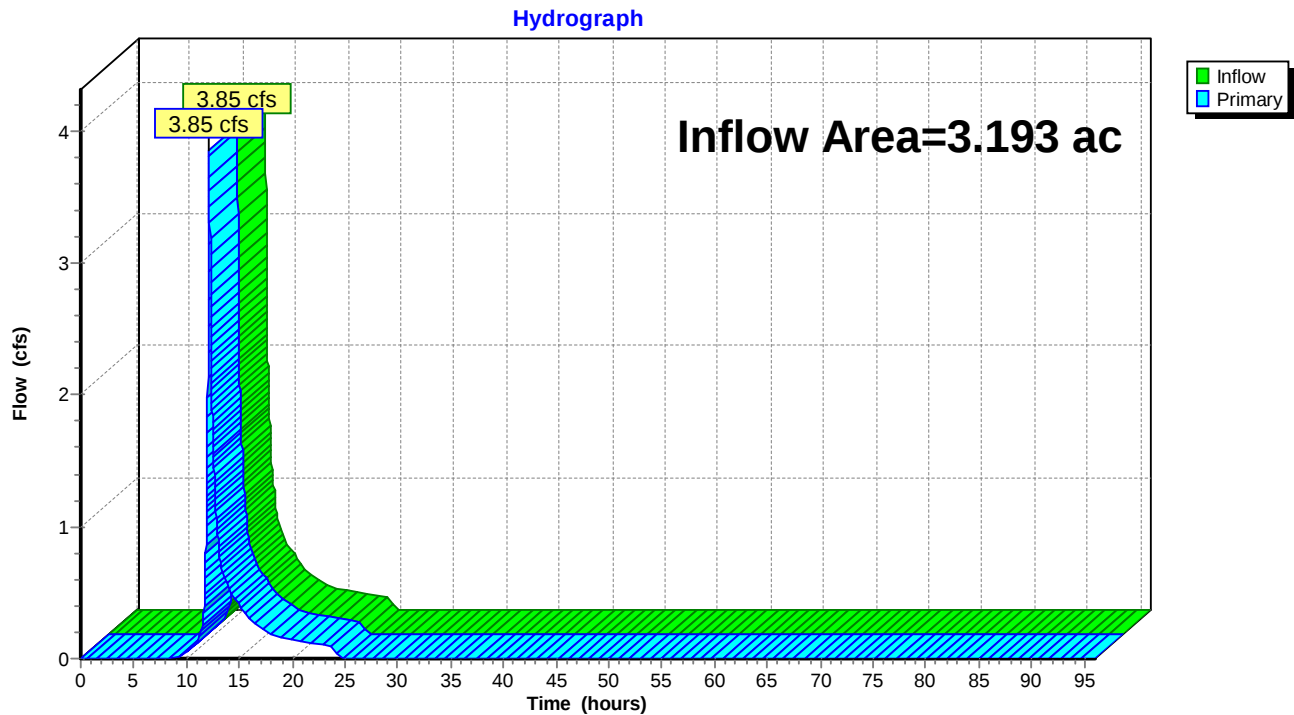
Printed 7/6/2021

Summary for Pond 3P: Total

Inflow Area = 3.193 ac, 33.15% Impervious, Inflow Depth = 1.60" for 10-yr event
Inflow = 3.85 cfs @ 12.14 hrs, Volume= 0.427 af
Primary = 3.85 cfs @ 12.14 hrs, Volume= 0.427 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Pond 3P: Total



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Summary for Subcatchment DA-1: DA-1

Runoff = 4.18 cfs @ 12.13 hrs, Volume= 0.393 af, Depth= 7.97"

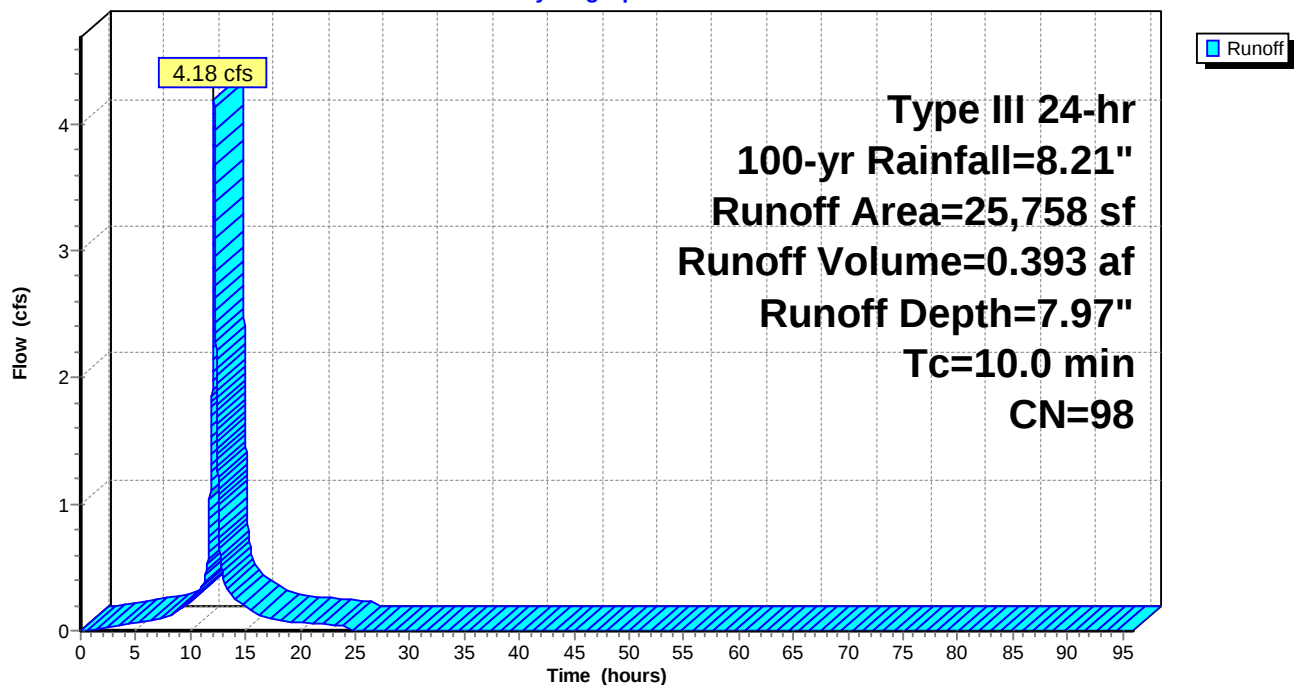
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=8.21"

Area (sf)	CN	Description
25,758	98	Roofs, HSG D
25,758		100.00% Impervious Area

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

Subcatchment DA-1: DA-1

Hydrograph



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Summary for Subcatchment DA-2: DA-2

Runoff = 5.43 cfs @ 12.14 hrs, Volume= 0.452 af, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

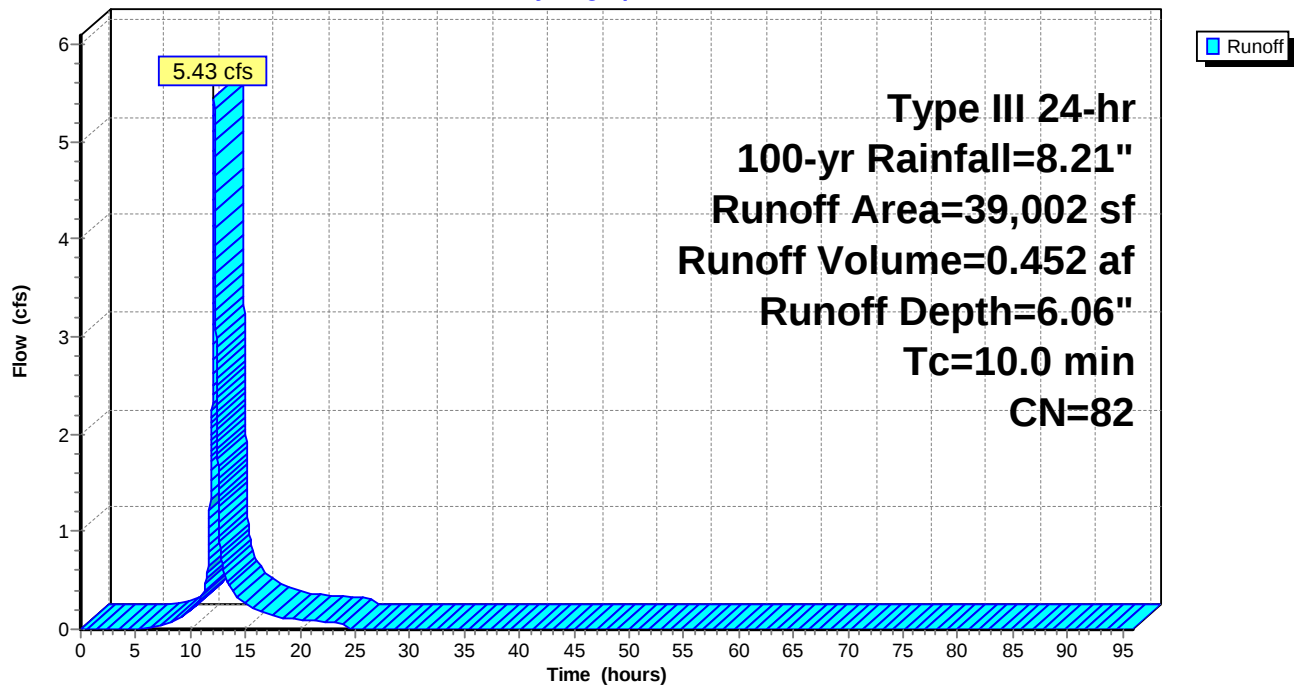
Type III 24-hr 100-yr Rainfall=8.21"

Area (sf)	CN	Description
5,773	61	>75% Grass cover, Good, HSG B
5,981	74	>75% Grass cover, Good, HSG C
14,003	80	>75% Grass cover, Good, HSG D
* 2,940	98	Sidewalks, HSG C
9,656	98	Paved parking, HSG C
* 649	98	Hardscape, HSG C
39,002	82	Weighted Average
25,757		66.04% Pervious Area
13,245		33.96% Impervious Area

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

Subcatchment DA-2: DA-2

Hydrograph



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Summary for Subcatchment DA-3: DA-3

Runoff = 2.44 cfs @ 12.14 hrs, Volume= 0.199 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

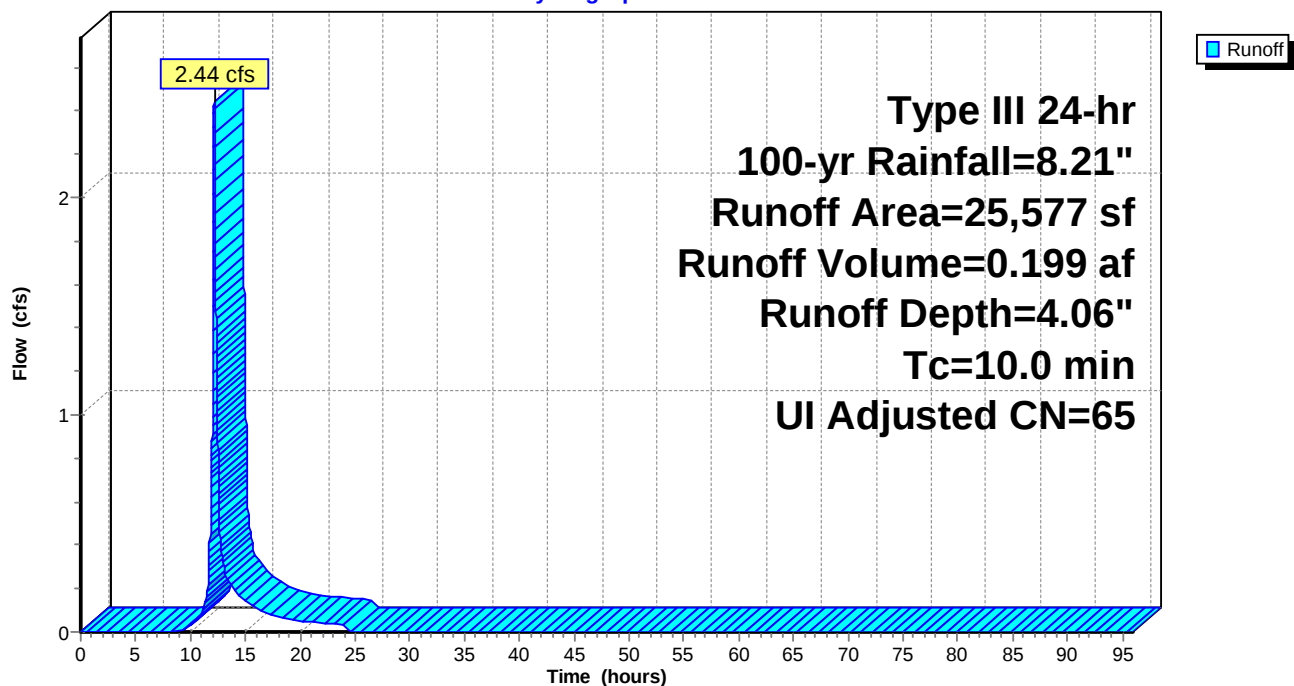
Type III 24-hr 100-yr Rainfall=8.21"

	Area (sf)	CN	Adj	Description
	649	98		Unconnected roofs, HSG C
*	4,993	80		>75% Grass cover, Good, HSG D
	19,935	61		>75% Grass cover, Good, HSG B
	25,577	66	65	Weighted Average, UI Adjusted
	24,928			97.46% Pervious Area
	649			2.54% Impervious Area
	649			100.00% Unconnected

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

Subcatchment DA-3: DA-3

Hydrograph



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Summary for Subcatchment DA-4: DA-4

Runoff = 6.10 cfs @ 12.14 hrs, Volume= 0.499 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

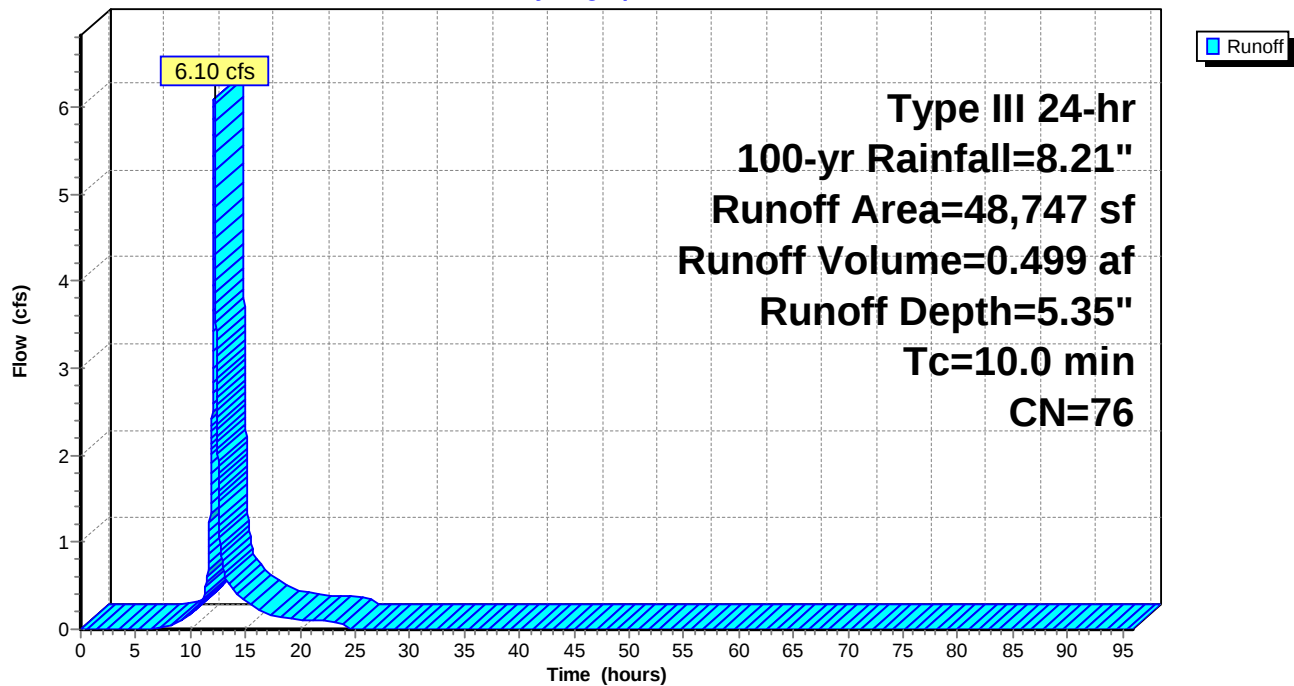
Type III 24-hr 100-yr Rainfall=8.21"

Area (sf)	CN	Description
16,312	61	>75% Grass cover, Good, HSG B
2,332	74	>75% Grass cover, Good, HSG C
23,645	80	>75% Grass cover, Good, HSG D
2,779	98	Paved parking, HSG C
* 3,419	98	Sidewalks, HSG C
* 260	98	Hardscapes, HSG C
48,747	76	Weighted Average
42,289		86.75% Pervious Area
6,458		13.25% Impervious Area

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

Subcatchment DA-4: DA-4

Hydrograph



Post-Development

Type III 24-hr 100-yr Rainfall=8.21"

Prepared by {enter your company name here}

Printed 7/6/2021

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Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 7.97" for 100-yr event
Inflow = 4.18 cfs @ 12.13 hrs, Volume = 0.393 af
Outflow = 0.05 cfs @ 4.58 hrs, Volume = 0.375 af, Atten = 99%, Lag = 0.0 min
Discarded = 0.05 cfs @ 4.58 hrs, Volume = 0.375 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-96.00 hrs, dt = 0.01 hrs
Peak Elev = 89.04' @ 22.88 hrs Surf. Area = 0.096 ac Storage = 0.307 af

Plug-Flow detention time = 2,240.9 min calculated for 0.375 af (96% of inflow)
Center-of-Mass det. time = 2,214.0 min (2,958.6 - 744.6)

Volume	Invert	Avail. Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L = 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L = 22.0' RCP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 85.19' / 84.97' S = 0.0100 ' S Cc = 0.900 n = 0.012 Concrete pipe, finished, Flow Area = 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C = 0.600 Limited to weir flow at low heads

Discarded OutFlow Max = 0.05 cfs @ 4.58 hrs HW = 84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max = 0.00 cfs @ 0.00 hrs HW = 84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Post-Development

Prepared by {enter your company name here}

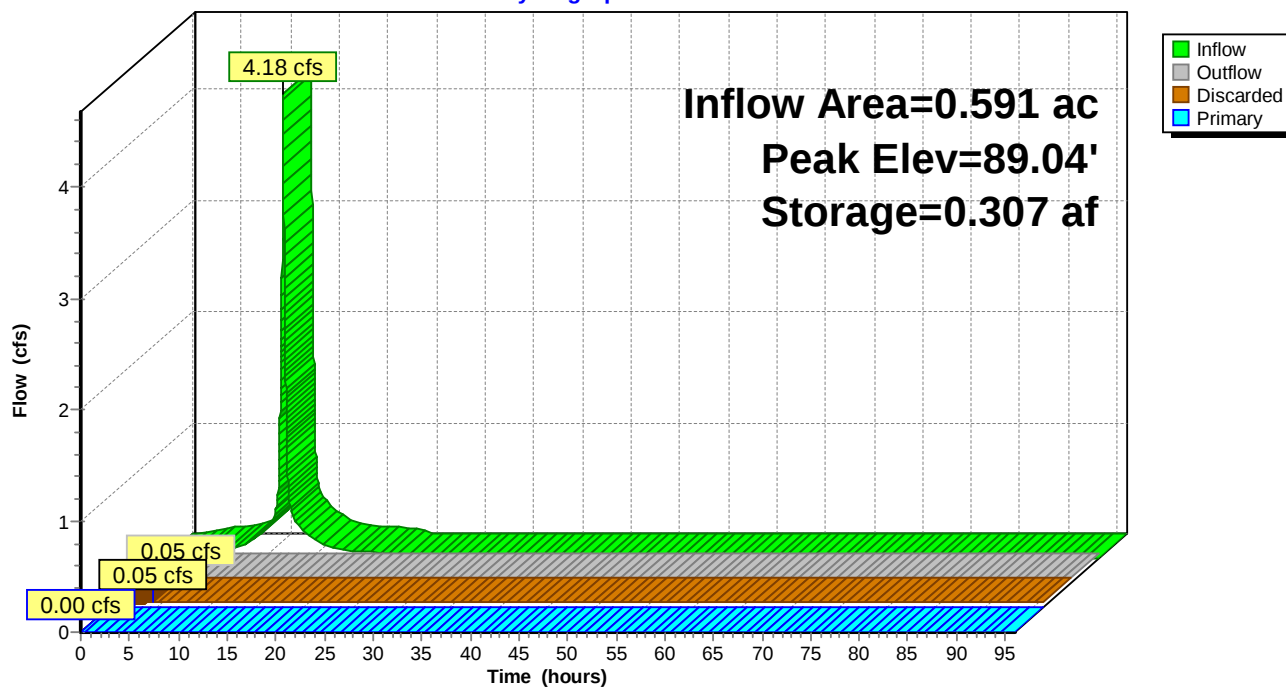
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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Pond 1P: Underground

Hydrograph



Post-Development

Type III 24-hr 100-yr Rainfall=8.21"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 1P: Underground

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	84.19	0.00	0.00	0.00
2.00	0.03	0.001	84.22	0.02	0.02	0.00
4.00	0.05	0.003	84.27	0.04	0.04	0.00
6.00	0.07	0.005	84.33	0.05	0.05	0.00
8.00	0.12	0.013	84.52	0.05	0.05	0.00
10.00	0.23	0.033	85.05	0.05	0.05	0.00
12.00	2.24	0.111	86.32	0.05	0.05	0.00
14.00	0.26	0.267	88.41	0.05	0.05	0.00
16.00	0.14	0.291	88.77	0.05	0.05	0.00
18.00	0.08	0.301	88.93	0.05	0.05	0.00
20.00	0.06	0.305	89.00	0.05	0.05	0.00
22.00	0.05	0.306	89.03	0.05	0.05	0.00
24.00	0.04	0.306	89.03	0.05	0.05	0.00
26.00	0.00	0.299	88.90	0.05	0.05	0.00
28.00	0.00	0.291	88.77	0.05	0.05	0.00
30.00	0.00	0.283	88.64	0.05	0.05	0.00
32.00	0.00	0.275	88.52	0.05	0.05	0.00
34.00	0.00	0.267	88.40	0.05	0.05	0.00
36.00	0.00	0.259	88.29	0.05	0.05	0.00
38.00	0.00	0.251	88.17	0.05	0.05	0.00
40.00	0.00	0.243	88.06	0.05	0.05	0.00
42.00	0.00	0.235	87.96	0.05	0.05	0.00
44.00	0.00	0.227	87.85	0.05	0.05	0.00
46.00	0.00	0.218	87.74	0.05	0.05	0.00
48.00	0.00	0.210	87.63	0.05	0.05	0.00
50.00	0.00	0.202	87.53	0.05	0.05	0.00
52.00	0.00	0.194	87.42	0.05	0.05	0.00
54.00	0.00	0.186	87.32	0.05	0.05	0.00
56.00	0.00	0.178	87.22	0.05	0.05	0.00
58.00	0.00	0.170	87.11	0.05	0.05	0.00
60.00	0.00	0.162	87.01	0.05	0.05	0.00
62.00	0.00	0.154	86.90	0.05	0.05	0.00
64.00	0.00	0.146	86.80	0.05	0.05	0.00
66.00	0.00	0.138	86.69	0.05	0.05	0.00
68.00	0.00	0.130	86.59	0.05	0.05	0.00
70.00	0.00	0.122	86.48	0.05	0.05	0.00
72.00	0.00	0.114	86.37	0.05	0.05	0.00
74.00	0.00	0.106	86.26	0.05	0.05	0.00
76.00	0.00	0.098	86.15	0.05	0.05	0.00
78.00	0.00	0.090	86.04	0.05	0.05	0.00
80.00	0.00	0.082	85.92	0.05	0.05	0.00
82.00	0.00	0.074	85.80	0.05	0.05	0.00
84.00	0.00	0.066	85.68	0.05	0.05	0.00
86.00	0.00	0.058	85.55	0.05	0.05	0.00
88.00	0.00	0.050	85.41	0.05	0.05	0.00
90.00	0.00	0.042	85.26	0.05	0.05	0.00
92.00	0.00	0.034	85.06	0.05	0.05	0.00
94.00	0.00	0.026	84.86	0.05	0.05	0.00
96.00	0.00	0.018	84.65	0.05	0.05	0.00

Post-Development

Type III 24-hr 100-yr Rainfall=8.21"

Prepared by {enter your company name here}

Printed 7/6/2021

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Summary for Pond 2P: BioBasin

Inflow Area = 0.895 ac, 33.96% Impervious, Inflow Depth = 6.06" for 100-yr event
Inflow = 5.43 cfs @ 12.14 hrs, Volume= 0.452 af
Outflow = 4.69 cfs @ 12.20 hrs, Volume= 0.330 af, Atten= 14%, Lag= 3.7 min
Primary = 4.69 cfs @ 12.20 hrs, Volume= 0.330 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 88.31' @ 12.20 hrs Surf.Area= 3,651 sf Storage= 6,656 cf

Plug-Flow detention time= 152.7 min calculated for 0.330 af (73% of inflow)
Center-of-Mass det. time= 64.3 min (865.2 - 800.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	11,525 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,166	0	0
87.00	2,769	2,468	2,468
88.00	3,431	3,100	5,568
89.00	4,147	3,789	9,357
89.50	4,527	2,169	11,525

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	15.0" Round Culvert L= 139.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.00' / 84.61' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	87.93'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.68 cfs @ 12.20 hrs HW=88.31' (Free Discharge)

↑ **1=Culvert** (Passes 4.68 cfs of 7.46 cfs potential flow)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 4.68 cfs @ 1.55 fps)

Post-Development

Prepared by {enter your company name here}

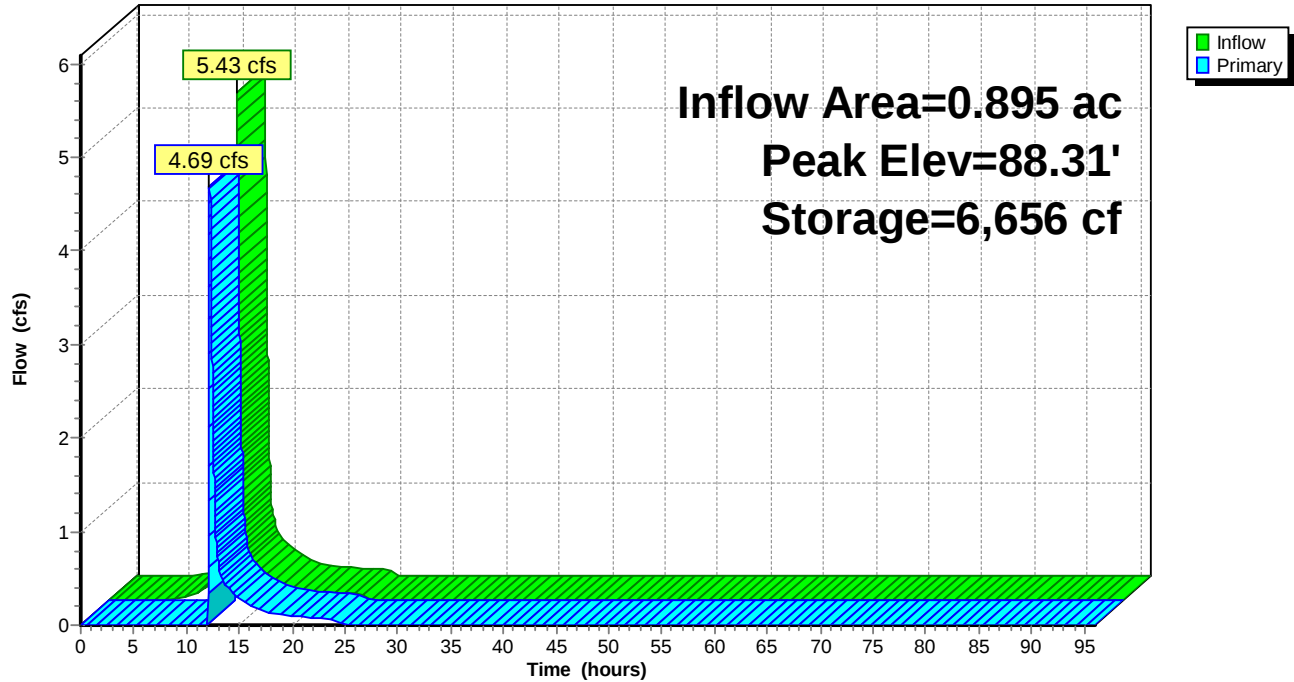
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Type III 24-hr 100-yr Rainfall=8.21"

Printed 7/6/2021

Pond 2P: BioBasin

Hydrograph



Post-Development

Type III 24-hr 100-yr Rainfall=8.21"

Prepared by {enter your company name here}

Printed 7/6/2021

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Hydrograph for Pond 2P: BioBasin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	86.00	0.00
2.00	0.00	0	86.00	0.00
4.00	0.00	0	86.00	0.00
6.00	0.01	24	86.01	0.00
8.00	0.06	264	86.12	0.00
10.00	0.19	1,108	86.48	0.00
12.00	2.76	5,115	87.87	0.00
14.00	0.36	5,576	88.00	0.38
16.00	0.19	5,487	87.98	0.21
18.00	0.12	5,443	87.96	0.12
20.00	0.09	5,425	87.96	0.10
22.00	0.08	5,409	87.95	0.08
24.00	0.06	5,393	87.95	0.06
26.00	0.00	5,329	87.93	0.00
28.00	0.00	5,329	87.93	0.00
30.00	0.00	5,329	87.93	0.00
32.00	0.00	5,329	87.93	0.00
34.00	0.00	5,329	87.93	0.00
36.00	0.00	5,329	87.93	0.00
38.00	0.00	5,329	87.93	0.00
40.00	0.00	5,329	87.93	0.00
42.00	0.00	5,329	87.93	0.00
44.00	0.00	5,329	87.93	0.00
46.00	0.00	5,329	87.93	0.00
48.00	0.00	5,329	87.93	0.00
50.00	0.00	5,329	87.93	0.00
52.00	0.00	5,329	87.93	0.00
54.00	0.00	5,329	87.93	0.00
56.00	0.00	5,329	87.93	0.00
58.00	0.00	5,329	87.93	0.00
60.00	0.00	5,329	87.93	0.00
62.00	0.00	5,329	87.93	0.00
64.00	0.00	5,329	87.93	0.00
66.00	0.00	5,329	87.93	0.00
68.00	0.00	5,329	87.93	0.00
70.00	0.00	5,329	87.93	0.00
72.00	0.00	5,329	87.93	0.00
74.00	0.00	5,329	87.93	0.00
76.00	0.00	5,329	87.93	0.00
78.00	0.00	5,329	87.93	0.00
80.00	0.00	5,329	87.93	0.00
82.00	0.00	5,329	87.93	0.00
84.00	0.00	5,329	87.93	0.00
86.00	0.00	5,329	87.93	0.00
88.00	0.00	5,329	87.93	0.00
90.00	0.00	5,329	87.93	0.00
92.00	0.00	5,329	87.93	0.00
94.00	0.00	5,329	87.93	0.00
96.00	0.00	5,329	87.93	0.00

Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

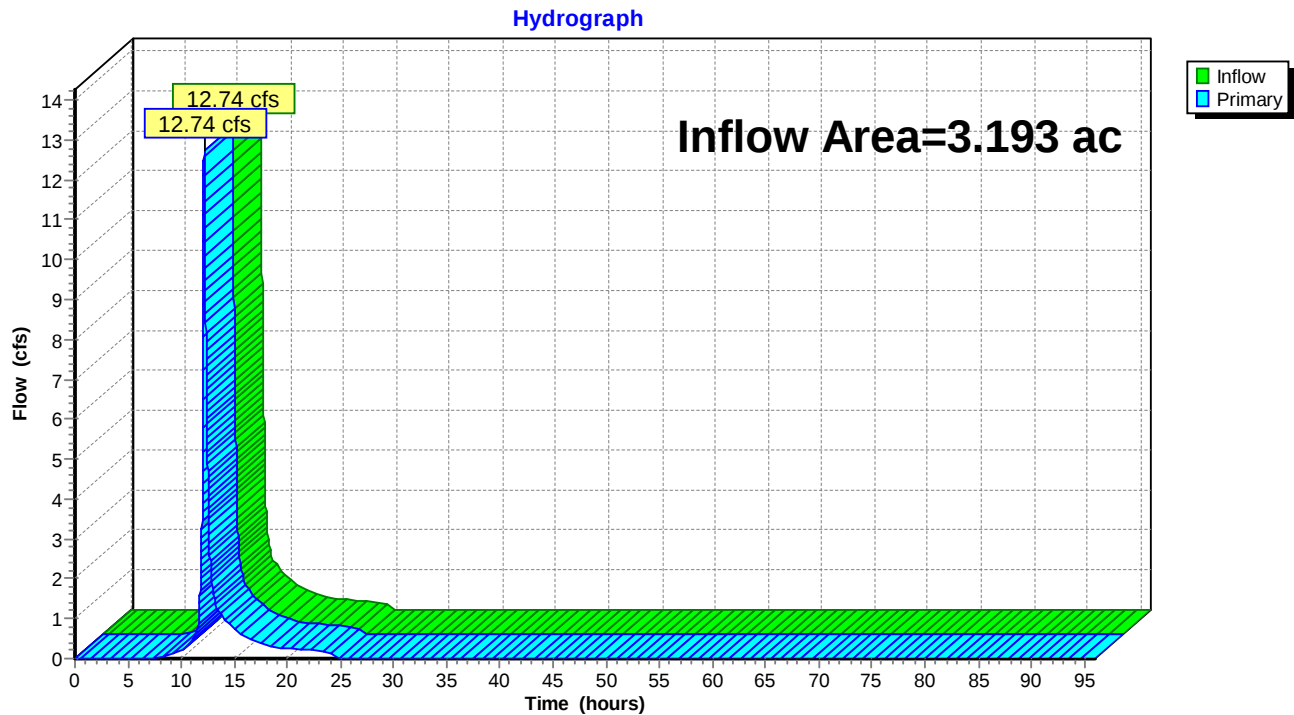
Printed 7/6/2021

Summary for Pond 3P: Total

Inflow Area = 3.193 ac, 33.15% Impervious, Inflow Depth = 3.86" for 100-yr event
Inflow = 12.74 cfs @ 12.16 hrs, Volume= 1.028 af
Primary = 12.74 cfs @ 12.16 hrs, Volume= 1.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Pond 3P: Total



APPENDIX C

INFILTRATION ANALYSIS

Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 100-yr Rainfall=8.21"

Printed 6/3/2021

Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 7.97" for 100-yr event
Inflow = 4.18 cfs @ 12.13 hrs, Volume = 0.393 af
Outflow = 0.05 cfs @ 4.58 hrs, Volume = 0.375 af, Atten = 99%, Lag = 0.0 min
Discarded = 0.05 cfs @ 4.58 hrs, Volume = 0.375 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-96.00 hrs, dt = 0.01 hrs
Peak Elev = 89.04' @ 22.88 hrs Surf. Area = 0.096 ac Storage = 0.307 af

Plug-Flow detention time = 2,240.9 min calculated for 0.375 af (96% of inflow)
Center-of-Mass det. time = 2,214.0 min (2,958.6 - 744.6)

Volume	Invert	Avail. Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L = 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L = 22.0' RCP, square edge headwall, Ke = 0.500 Inlet / Outlet Invert = 85.19' / 84.97' S = 0.0100 ' / ' Cc = 0.900 n = 0.012 Concrete pipe, finished, Flow Area = 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C = 0.600 Limited to weir flow at low heads

Discarded OutFlow Max = 0.05 cfs @ 4.58 hrs HW = 84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max = 0.00 cfs @ 0.00 hrs HW = 84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

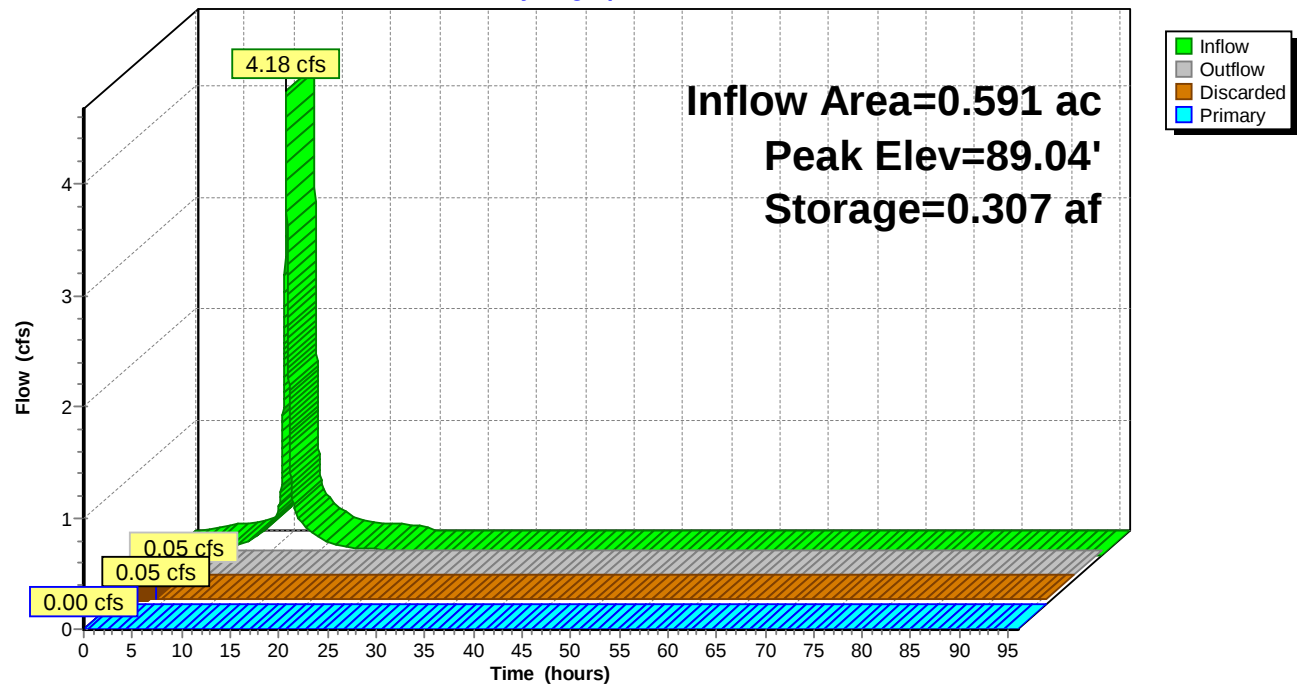
Post-Development

Prepared by {enter your company name here}
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Type III 24-hr 100-yr Rainfall=8.21"
Printed 6/3/2021

Pond 1P: Underground

Hydrograph



Post-Development

Type III 24-hr 100-yr Rainfall=8.21"

Prepared by {enter your company name here}

Printed 6/3/2021

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Hydrograph for Pond 1P: Underground

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	84.19	0.00	0.00	0.00
2.00	0.03	0.001	84.22	0.02	0.02	0.00
4.00	0.05	0.003	84.27	0.04	0.04	0.00
6.00	0.07	0.005	84.33	0.05	0.05	0.00
8.00	0.12	0.013	84.52	0.05	0.05	0.00
10.00	0.23	0.033	85.05	0.05	0.05	0.00
12.00	2.24	0.111	86.32	0.05	0.05	0.00
14.00	0.26	0.267	88.41	0.05	0.05	0.00
16.00	0.14	0.291	88.77	0.05	0.05	0.00
18.00	0.08	0.301	88.93	0.05	0.05	0.00
20.00	0.06	0.305	89.00	0.05	0.05	0.00
22.00	0.05	0.306	89.03	0.05	0.05	0.00
24.00	0.04	0.306	89.03	0.05	0.05	0.00
26.00	0.00	0.299	88.90	0.05	0.05	0.00
28.00	0.00	0.291	88.77	0.05	0.05	0.00
30.00	0.00	0.283	88.64	0.05	0.05	0.00
32.00	0.00	0.275	88.52	0.05	0.05	0.00
34.00	0.00	0.267	88.40	0.05	0.05	0.00
36.00	0.00	0.259	88.29	0.05	0.05	0.00
38.00	0.00	0.251	88.17	0.05	0.05	0.00
40.00	0.00	0.243	88.06	0.05	0.05	0.00
42.00	0.00	0.235	87.96	0.05	0.05	0.00
44.00	0.00	0.227	87.85	0.05	0.05	0.00
46.00	0.00	0.218	87.74	0.05	0.05	0.00
48.00	0.00	0.210	87.63	0.05	0.05	0.00
50.00	0.00	0.202	87.53	0.05	0.05	0.00
52.00	0.00	0.194	87.42	0.05	0.05	0.00
54.00	0.00	0.186	87.32	0.05	0.05	0.00
56.00	0.00	0.178	87.22	0.05	0.05	0.00
58.00	0.00	0.170	87.11	0.05	0.05	0.00
60.00	0.00	0.162	87.01	0.05	0.05	0.00
62.00	0.00	0.154	86.90	0.05	0.05	0.00
64.00	0.00	0.146	86.80	0.05	0.05	0.00
66.00	0.00	0.138	86.69	0.05	0.05	0.00
68.00	0.00	0.130	86.59	0.05	0.05	0.00
70.00	0.00	0.122	86.48	0.05	0.05	0.00
72.00	0.00	0.114	86.37	0.05	0.05	0.00
74.00	0.00	0.106	86.26	0.05	0.05	0.00
76.00	0.00	0.098	86.15	0.05	0.05	0.00
78.00	0.00	0.090	86.04	0.05	0.05	0.00
80.00	0.00	0.082	85.92	0.05	0.05	0.00
82.00	0.00	0.074	85.80	0.05	0.05	0.00
84.00	0.00	0.066	85.68	0.05	0.05	0.00
86.00	0.00	0.058	85.55	0.05	0.05	0.00
88.00	0.00	0.050	85.41	0.05	0.05	0.00
90.00	0.00	0.042	85.26	0.05	0.05	0.00
92.00	0.00	0.034	85.06	0.05	0.05	0.00
94.00	0.00	0.026	84.86	0.05	0.05	0.00
96.00	0.00	0.018	84.65	0.05	0.05	0.00

Pipe drains in less than 72 hours

APPENDIX D

GROUNDWATER RECHARGE ANALYSIS

Pre-Development

Prepared by {enter your company name here}

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.34"

Printed 6/4/2021

Summary for Subcatchment EA-1: EA-1

Runoff = 3.91 cfs @ 12.09 hrs, Volume= 0.287 af, Depth= 1.07"

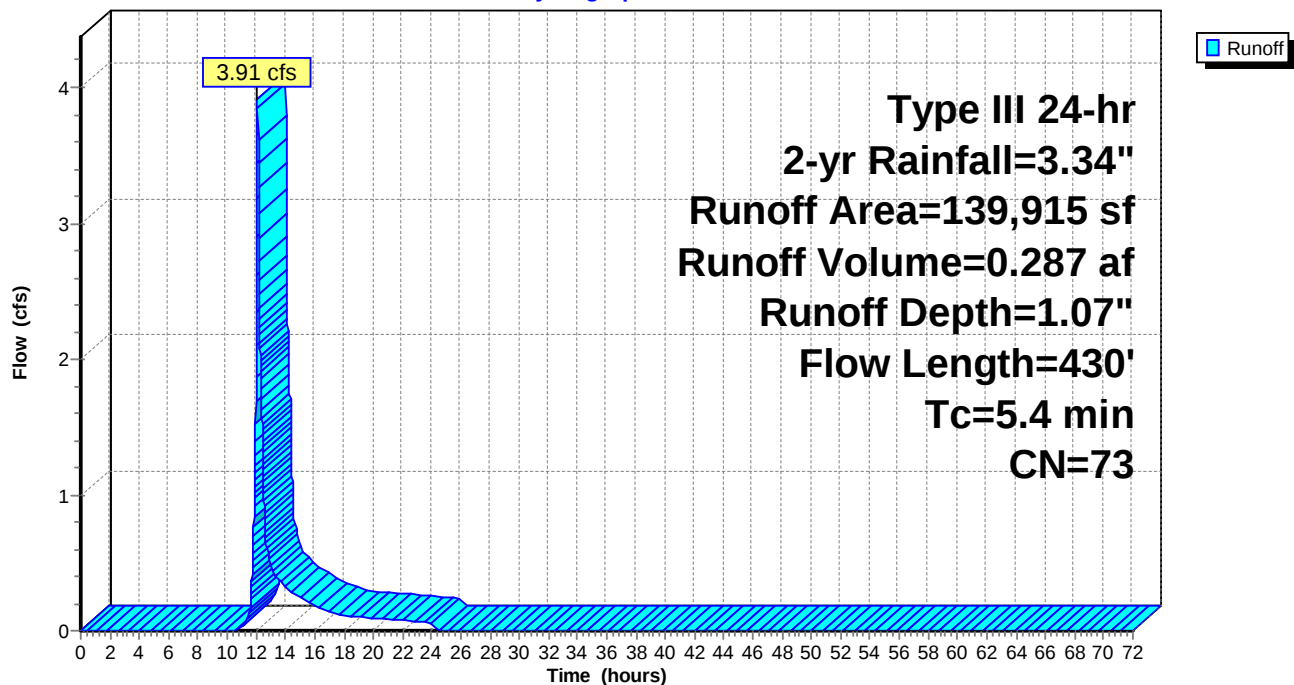
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
1,610	98	Paved parking, HSG A
47,300	61	>75% Grass cover, Good, HSG B
11,116	74	>75% Grass cover, Good, HSG C
79,889	80	>75% Grass cover, Good, HSG D
139,915	73	Weighted Average
138,305		98.85% Pervious Area
1,610		1.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	150	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.6	187	0.0350	2.00		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.35"
0.2	93	0.0100	10.22	72.26	Pipe Channel, 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.012 Concrete pipe, finished
5.4	430	Total			

Subcatchment EA-1: EA-1

Hydrograph



Post-Development

Prepared by {enter your company name here}

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-1: DA-1

Runoff = 1.68 cfs @ 12.13 hrs, Volume= 0.153 af, Depth= 3.11"

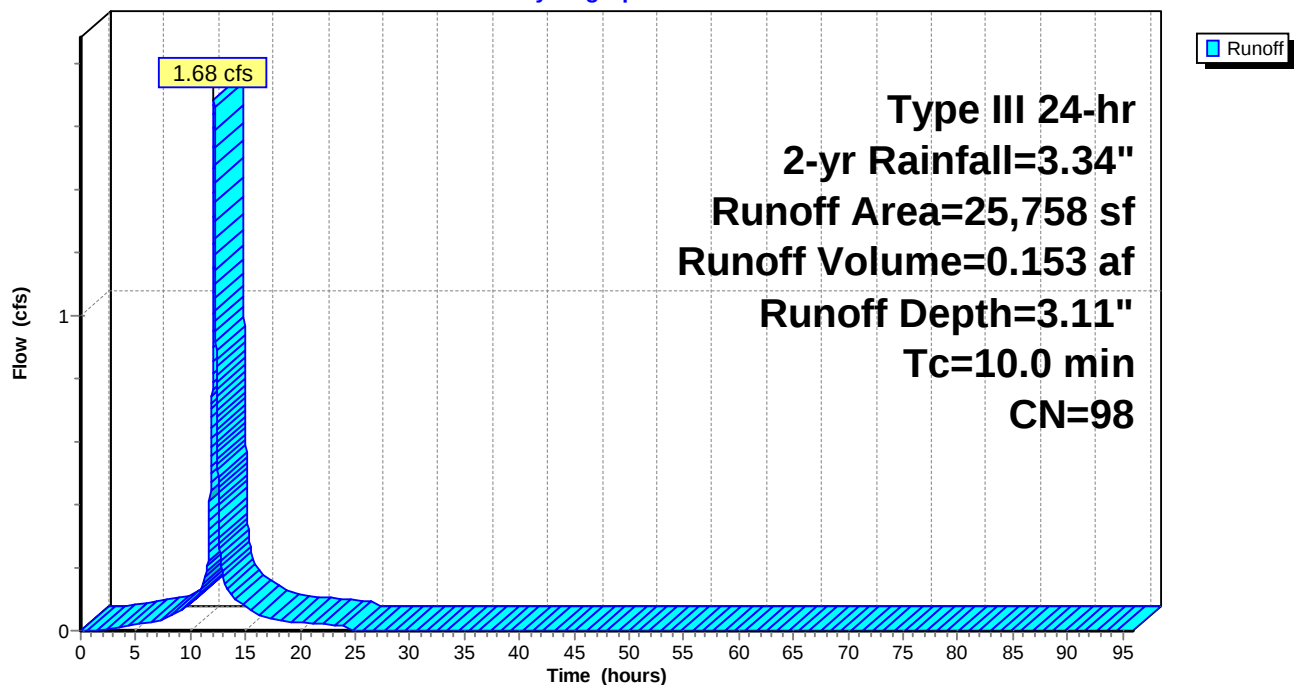
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
25,758	98	Roofs, HSG D
25,758		100.00% Impervious Area

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

Subcatchment DA-1: DA-1

Hydrograph



Post-Development

Prepared by {enter your company name here}

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-2: DA-2

Runoff = 1.51 cfs @ 12.14 hrs, Volume= 0.123 af, Depth= 1.65"

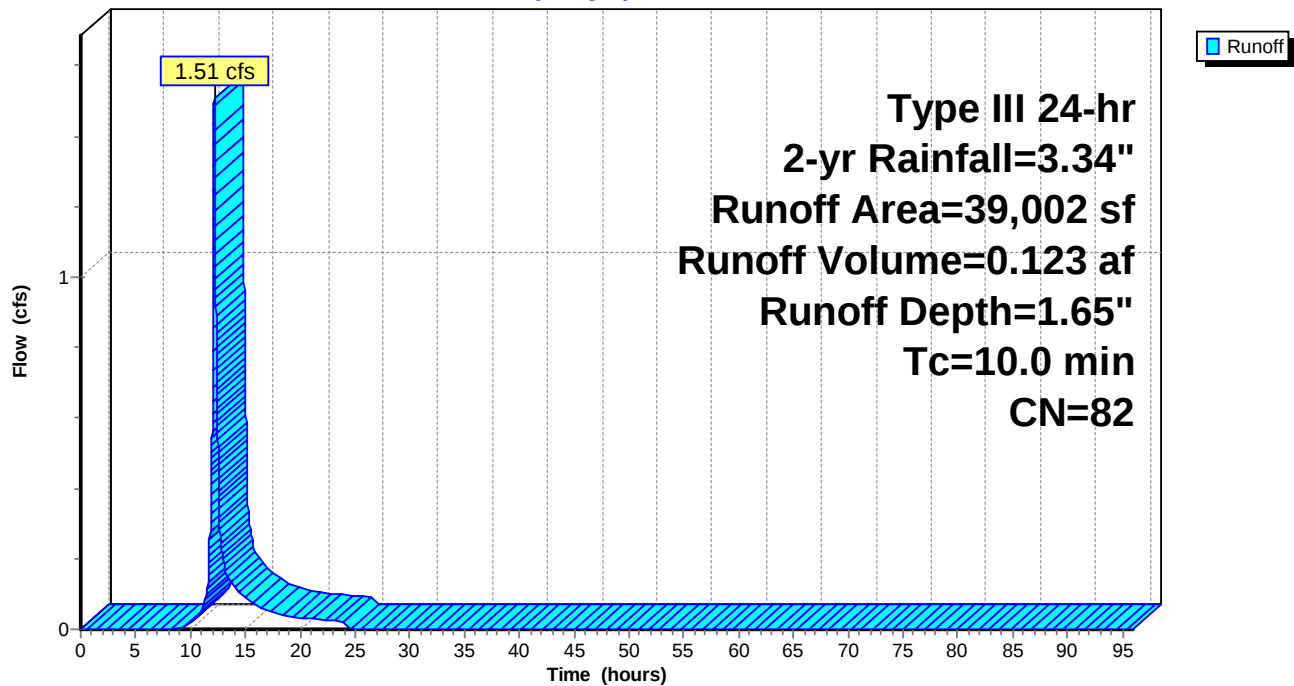
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

Area (sf)	CN	Description
5,773	61	>75% Grass cover, Good, HSG B
5,981	74	>75% Grass cover, Good, HSG C
14,003	80	>75% Grass cover, Good, HSG D
* 2,940	98	Sidewalks, HSG C
9,656	98	Paved parking, HSG C
* 649	98	Hardscape, HSG C
39,002	82	Weighted Average
25,757		66.04% Pervious Area
13,245		33.96% Impervious Area

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

Subcatchment DA-2: DA-2

Hydrograph



Post-Development

Prepared by {enter your company name here}

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Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Subcatchment DA-3: DA-3

Runoff = 0.32 cfs @ 12.16 hrs, Volume= 0.033 af, Depth= 0.67"

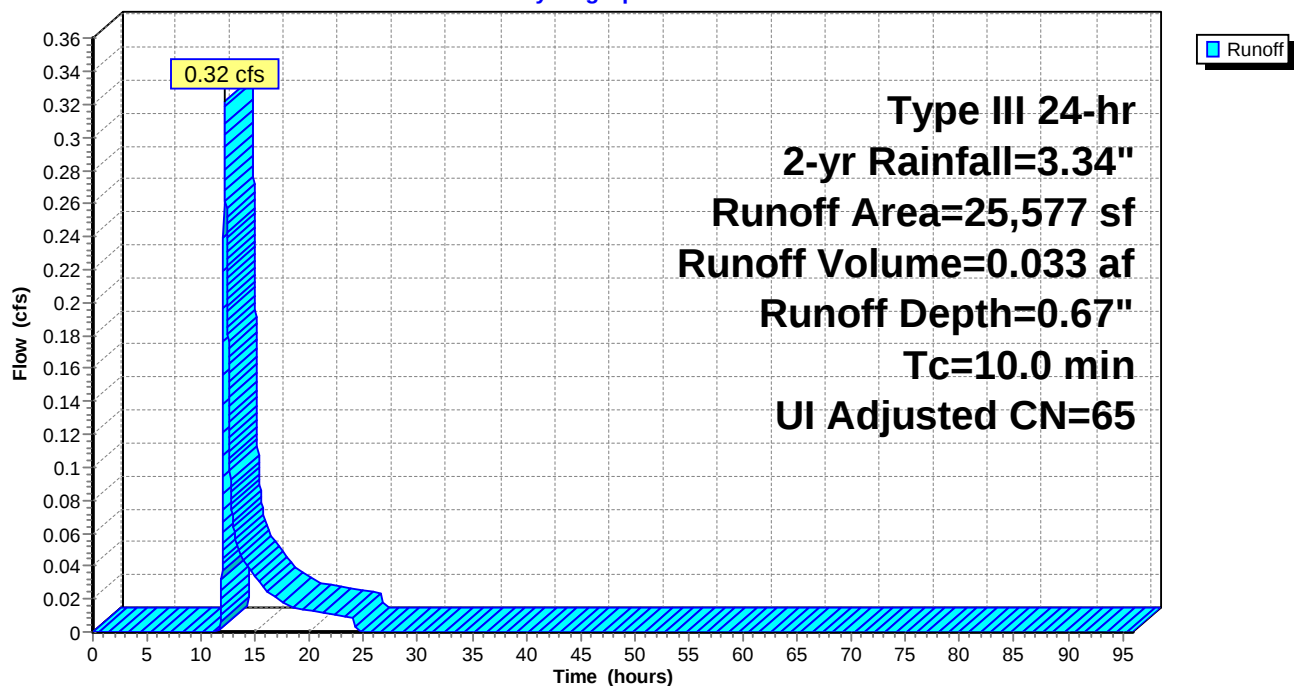
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.34"

	Area (sf)	CN	Adj	Description
	649	98		Unconnected roofs, HSG C
*	4,993	80		>75% Grass cover, Good, HSG D
	19,935	61		>75% Grass cover, Good, HSG B
	25,577	66	65	Weighted Average, UI Adjusted
	24,928			97.46% Pervious Area
	649			2.54% Impervious Area
	649			100.00% Unconnected

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

Subcatchment DA-3: DA-3

Hydrograph



Post-Development

Prepared by {enter your company name here}

HydroCAD® 10.10-3a s/n 11244 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-yr Rainfall=3.34"

Printed 7/6/2021

Summary for Pond 1P: Underground

Inflow Area = 0.591 ac, 100.00% Impervious, Inflow Depth = 3.11" for 2-yr event
Inflow = 1.68 cfs @ 12.13 hrs, Volume= 0.153 af
Outflow = 0.05 cfs @ 9.02 hrs, Volume= 0.153 af, Atten= 97%, Lag= 0.0 min
Discarded = 0.05 cfs @ 9.02 hrs, Volume= 0.153 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 86.11' @ 16.45 hrs Surf.Area= 0.096 ac Storage= 0.095 af

Plug-Flow detention time= 758.9 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 759.0 min (1,518.2 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	84.19'	0.151 af	6.00'W x 140.00'L x 6.00'H 6'x6' Stone Trench x 5 0.579 af Overall - 0.202 af Embedded = 0.377 af x 40.0% Voids
#2	85.19'	0.202 af	48.0" Round Pipe Storage x 5 Inside #1 L= 140.0'
		0.353 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.19'	0.500 in/hr Exfiltration over Surface area
#2	Primary	85.19'	15.0" Round Culvert L= 22.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.19' / 84.97' S= 0.0100 ' / ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Device 2	89.04'	48.0" W x 48.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 9.02 hrs HW=84.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.19' (Free Discharge)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

APPENDIX E

BASIN SUMMARY SHEETS

New Jersey Department of Agriculture
Hydrologic Modeling Database – Data Entry Form

Project Site Details

Chpt. 251 Application Number:

Start Date (if known):

Street Address: Headquarters Park Drive

County: Somerset

Municipality: . Montgomery Township

Block: 20001

Lot: 10.05

NJDEP Anderson Landuse Code (4 digits): 1600

Landuse description: Mixed Urban or Built-up Land

Site Centroid Location (NJ State Plane Feet): ¹

Northing: 577,528

Easting: 448,057

Project Contact Details

Applicant: RPM Development Group

Address: 77 Park Street, Montclair, NJ 07042

Phone: 973-744-5410

Email: shenschel@rpmdev.com

Post Construction Operation & Maintenance:²

Party Name: RPM Development Group

Address: 77 Park Street, Montclair, NJ 07042

Phone: 973-744-5410

Email: shenschel@rpmdev.com

Party type: Owner

New Jersey Department of Agriculture
Hydrologic Modeling Database – Data Entry Form

Basin Details:³ Underground Infiltration Basin

Basin Centroid (NJ State Plane Feet):⁴

Northing: 585,480

Easting: 546,605

Basin Type: Infiltration Basin

Construction: Perforated HDPE Pipe

Status phase:⁵ Design ☒ As-built ☐

Dam Height (ft) N/A

top width (ft) N/A

Dam Classification: N/A

Drainage Area(s) to Basin [note- include any bypass areas]⁶

Drainage Area Name	Drainage Area (acres)	Post-Development CN#	Percent Impervious	Time of Concentration (min)
DA-1	0.59	98	100%	10

Basin Outlet Structure(s)⁷

ID: Exfiltration

End of Pipe Location:⁸ Northing: 577,695

Easting: 447,813

Discharge Type ⁹ (weir, orifice, etc)	Dimensions (diameter, length)	Elevation (USGS)	Discharge ¹⁰ Coefficient	Equation Used ¹¹
Exfiltration	N/A	85.19	N/A	0.5 in/hr

New Jersey Department of Agriculture

Hydrologic Modeling Database – Data Entry Form

Basin Outlet Structure(s)

ID.

End of Pipe Location: Northing:

Easting:

Discharge Type (weir, orifice, etc)	Dimensions (diameter, length)	Elevation (USGS)	Discharge Coefficient	Equation Used

Basin Stage-Discharge Rating Table¹²

Elevation (USGS Feet)	Storage (Acre-Ft)	Total Outlet Structure Discharge (cfs)
84.40	0.008	0.00
85.00	0.031	0.00
85.40	0.049	0.00
86.00	0.087	0.00
86.40	0.115	0.00
87.00	0.161	0.00
87.40	0.192	0.00
88.00	0.237	0.00
88.40	0.266	0.00
89.00	0.304	0.00
89.40	0.322	2.66
90.00	0.345	11.89
90.40	0.353	12.64
91.00	0.353	13.44
91.40	0.353	13.95
92.00	0.353	14.68
92.40	0.353	15.15
93.00	0.353	15.83

New Jersey Department of Agriculture

Hydrologic Modeling Database – Data Entry Form

NJDEP BMP Water Quality Structures¹³

Type (rain garden, green roof, seepage pit etc)	Size	Size Units (cu ft, sq ft etc)	Northing (SPF)	Easting (SPF)
N/A				

Explanatory Notes-

¹ Approximate location of center of site, coordinates in state plane feet

² Indicate who will be responsible for permanent operation and maintenance

³ Additional Basin Detail Pages can be used for more than one basin in a project.

⁴ Approximate location of center of basin, coordinates in state plane feet

⁵ Indicate “design” for basins not yet constructed

⁶ Drainage areas which are modified by construction, but not directed to the basin should still be listed and described

⁷ “Outlet structure” means the control box, outlet headwall, FES etc. This does not refer to an individual control on the structure such as a weir or orifice. There are two tables for more than one outlet structure

⁸ Approximate location of terminal discharge end of basin outfall, coordinates in state plane feet

⁹ Indicate the type of outlet – weir, orifice, hydro brake, etc.

¹⁰ Discharge Coefficient specific to the type of outlet control i.e., 0.6 for circular orifice

¹¹ List the discharge equation for each outlet (weir, orifice etc) used

¹² For basins with dead storage below the primary outlet, indicate 0 cfs discharge until the lowest outlet is reached. Routing table should begin at the lowest basin elevation.

¹³ Describe NJDEP BMP Manual water quality devices such as seepage pits, rain gardens etc. Size is appropriate for device – cubic feet, square feet or linear feet. Location of device using state plane feet coordinates.

New Jersey Department of Agriculture
Hydrologic Modeling Database – Data Entry Form

Basin Details:³ Bio-retention Basin

Basin Centroid (NJ State Plane Feet):⁴

Northing: 577,607

Easting: 448,016

Basin Type: Infiltration Basin

Construction: Bio-Retention

Status phase:⁵ Design ☒ As-built ☐

Dam Height (ft) N/A

top width (ft) N/A

Dam Classification: N/A

Drainage Area(s) to Basin [note- include any bypass areas]⁶

Drainage Area Name	Drainage Area (acres)	Post-Development CN#	Percent Impervious	Time of Concentration (min)
DA-2	0.90	82	34.0%	10

Basin Outlet Structure(s)⁷

ID: OS-7

End of Pipe Location:⁸ Northing: 577,607

Easting: 448,016

Discharge Type ⁹ (weir, orifice, etc)	Dimensions (diameter, length)	Elevation (USGS)	Discharge ¹⁰ Coefficient	Equation Used ¹¹
Culvert	15"	86.00	0.60	$Q=CA(2gh)^{0.5}$
Spillway	2'x2'	87.93		

New Jersey Department of Agriculture
Hydrologic Modeling Database – Data Entry Form

Basin Outlet Structure(s)

ID.

End of Pipe Location: Northing:

Easting:

Discharge Type (weir, orifice, etc)	Dimensions (diameter, length)	Elevation (USGS)	Discharge Coefficient	Equation Used

Basin Stage-Discharge Rating Table¹²

Elevation (USGS Feet)	Storage (Acre-Ft)	Total Outlet Structure Discharge (cfs)
86.00	0.000	0.00
86.50	0.027	0.00
87.00	0.057	0.00
87.50	0.090	0.00
88.00	0.128	0.36
88.50	0.169	7.75
89.00	0.215	8.42
89.50	0.265	9.10

New Jersey Department of Agriculture

Hydrologic Modeling Database – Data Entry Form

NJDEP BMP Water Quality Structures¹³

Type (rain garden, green roof, seepage pit etc)	Size	Size Units (cu ft, sq ft etc)	Northing (SPF)	Easting (SPF)
small scale bioretention systems - 80% TSS - Chapter 9.7 NJ Stormwater BMP Manual				

Explanatory Notes-

¹ Approximate location of center of site, coordinates in state plane feet

² Indicate who will be responsible for permanent operation and maintenance

³ Additional Basin Detail Pages can be used for more than one basin in a project.

⁴ Approximate location of center of basin, coordinates in state plane feet

⁵ Indicate "design" for basins not yet constructed

⁶ Drainage areas which are modified by construction, but not directed to the basin should still be listed and described

⁷ "Outlet structure" means the control box, outlet headwall, FES etc. This does not refer to an individual control on the structure such as a weir or orifice. There are two tables for more than one outlet structure

⁸ Approximate location of terminal discharge end of basin outfall, coordinates in state plane feet

⁹ Indicate the type of outlet – weir, orifice, hydro brake, etc.

¹⁰ Discharge Coefficient specific to the type of outlet control i.e., 0.6 for circular orifice

¹¹ List the discharge equation for each outlet (weir, orifice etc) used

¹² For basins with dead storage below the primary outlet, indicate 0 cfs discharge until the lowest outlet is reached. Routing table should begin at the lowest basin elevation.

¹³ Describe NJDEP BMP Manual water quality devices such as seepage pits, rain gardens etc. Size is appropriate for device – cubic feet, square feet or linear feet. Location of device using state plane feet coordinates.

APPENDIX F

LOW IMPACT DEVELOPMENT CHECKLIST

New Jersey Stormwater Best Management Practices Manual

February 2004

A P P E N D I X A

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

Municipality: Montgomery Township

County: Somerset Date: 05/31/21

Review board or agency: Montgomery Township

Proposed land development name: Montgomery Senior Affordable Housing

Lot(s): 10.05 Block(s): 20001

Project or application number: _____

Applicant's name: RPM Development Group

Applicant's address: 77 Park Street

Montclair, NJ 07042

Telephone: 973-744-5410 Fax: _____

Email address: shenschel@rpmdev.com

Designer's name: Kevin E. Shelly, P.E., Shore Point Engineering

Designer's address: 1985 Highway 34, Suite A7

Wall, NJ 07719

Telephone: 732-924-8100 Fax: 732-924-8110

Email address: kshelly@shorepointengineering.com

Part 1: Description of Nonstructural Approach to Site Design

In narrative form, provide an overall description of the nonstructural stormwater management approach and strategies incorporated into the proposed site's design. Attach additional pages as necessary. Details of each nonstructural strategy are provided in Part 3 below.

The 45-acre parcel was previously utilized as the corporate offices until 2014. Somerset County acquired the property in 2017 and Montgomery Township is currently constructing a new municipal complex on a large portion of the site, closest to Orchard Road. The application is proposing a senior affordable housing development with 280 parking spaces.

For the post development condition, the runoff will be collected via a conventional piped stormwater collection system and conveyed to one of one (1) underground extended detention basins, one (1) bio-retention basin, and one (1) existing basin to be converted to a bio-retention basin. Both quality and quantity control are provided by basins. The allowable peak runoff rates for the post-developed site were found by applying the required reductions to the pre-developed peak flows for the onsite disturbed areas

The stormwater management basins have been designed to meet the requirements of the "NJDEP Stormwater and Non-point Source Pollution - Best Management Practices Manual." It is designed for minimum disturbance to the natural landscape and utilizes the natural terrain for the majority of its storage. The stormwater collection system also utilizes both a pipe network, and to the maximum extent possible, overland drainage swales.

The system meets the technical requirements as well as the overall intent of the NJDEP regulations in an aesthetically pleasing and technically compliant manner.

Site design has been adjusted to minimize land disturbance and impervious coverage while maximizing preservation of existing vegetation and natural drainage features. Site landscaping will also utilize native plant species where possible. Trash refuse areas are provided inside the buildings and in an enclosed dumpster to help minimize the accumulation of trash and debris that may otherwise enter the drainage system.

Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

N.J.A.C. 7:8 Stormwater Management Rules - Last revised 3/2/20

Do regulations include nonstructural requirements? Yes: X No:

If yes, briefly describe: Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss; Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces; Maximize the protection of natural drainage features and vegetation; Minimize the decrease in the "time of concentration" from pre-construction to postconstruction.; Minimize land disturbance including clearing and grading; Minimize soil compaction; Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides

List LID-BMPs prohibited by local regulations: N/A

Pre-design meeting held? Yes: X Date: 5/2021 No: _____

Meeting held with: Shore Point Engineering

RPM Development Group

Pre-design site walk held? Yes: X Date: 5/2021 No: _____

Site walk held with: Shore Point Engineering

RPM Development Group

Other agencies with stormwater review jurisdiction:

Name: Somerset Soil Conservation District

Required approval: Soil Erosion Permit

Name: Montgomery Township

Required approval: Site Plan Approval

Name: Somerset County

Required approval: Site Plan Approval

Part 3: Nonstructural Strategies and LID-BMPs in Design

3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed? Yes: X No:

If yes, was this inventory a factor in the site's layout and design? Yes: X No:

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes: No: X If yes, specify % of site:

Native ground cover? Yes: No: X If yes, specify % of site:

Vegetated buffers? Yes: No: X If yes, specify % of site:

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: No: X If yes, specify % of site:

Native ground cover? Yes: No: X If yes, specify % of site:

Vegetated buffers? Yes: No: X If yes, specify % of site:

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient: Yes: No: N/A

Reduce runoff pollutant loads through runoff treatment: Yes: No: N/A

Maintain groundwater recharge by preserving natural areas: Yes: No: N/A

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed? Yes: X No: _____

If yes, were these inventories factors in the site's layout and design? Yes: X No:

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes: _____ No: X

If yes, how: _____

Restrict temporary site disturbance during construction? Yes: _____ No: X

If yes, how: _____

Consider soils and slopes in selecting disturbance limits? N/A Yes: _____ No: _____

If yes, how: _____

C. Specify percentage of site to be cleared: 0% Regraded: 12.4%

D. Specify percentage of cleared areas done so for buildings: 0%

For driveways and parking: 0% For roadways:

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

The site has been designed to reduce disturbance and minimize impervious coverage to the maximum extent possible while complying with municipal zone requirements. Reduction of percentages in C & D will result in a loss of units, making the project no longer viable.

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: _____ HSG B: 16.7% HSG C: 76.0% HSG D: 7.3%

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: _____ HSG B: 33% HSG C: 22.4% HSG D: 44.6%

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

The project area is located within HSG B, C and D soils.

Disturbance areas have been minimized to the maximum extent

feasible.

I. Does the site include Karst topography?

Yes: _____ No: X

If yes, discuss measures taken to limit Karst impacts:

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: 0.01% Proposed: 2.3%

B. Specify maximum site impervious coverage allowed by regulations: 25%

C. Compare proposed street cartway widths with those required by regulations:

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking	24 '	24 '
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: 9' x 18' Regulations: RSIS - 9' x 18'

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: 129 Regulations: RSIS - 128

F. Specify percentage of total site impervious cover created by buildings: 57.2%
By driveways and parking: 42.8% By roadways: 0%

G. What design criteria and/or site changes would be required to reduce the percentages in F above?
In order to reduce with percentages above, buildings/units
would need to be removed, which is not a viable option.

H. Specify percentage of total impervious area that will be unconnected:
Total site: 0% Buildings: _____ Driveways and parking: _____ Roads: _____

I. Specify percentage of total impervious area that will be porous:
Total site: 0% Buildings: _____ Driveways and parking: _____ Roads: _____

J. Specify percentage of total building roof area that will be vegetated: 0%

K. Specify percentage of total parking area located beneath buildings: 0%

L. Specify percentage of total parking located within multi-level parking deck: 0%

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: 68.9% Vegetated swale: _____ Natural channel: _____

Stormwater management facility: 31.1% Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

Any changes to the site design to increase vegetated swales and natural channels would impact the site layout and require the loss of parking spaces or residential units which is not viable.

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: N/A

Increase overland flow roughness: N/A

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles

Specify the number of trash receptacles provided: 1

Specify the spacing between the trash receptacles: N/A

Compare trash receptacles proposed with those required by regulations:

Proposed: 1 Regulations: 1

B. Pet Waste Stations

Specify the number of pet waste stations provided: 0

Specify the spacing between the pet waste stations: N/A

Compare pet waste stations proposed with those required by regulations:

Proposed: N/A Regulations: N/A

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: 100%

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: Monthly Regulations: N/A

Litter collection: Proposed: Weekly Regulations: N/A

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

N/A

E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: N/A Location: N/A

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.	X	
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.	X	
3.	Maximize the protection of natural drainage features and vegetation.	X	
4.	Minimize the decrease in the pre-construction time of concentration.	X	
5.	Minimize land disturbance including clearing and grading.	X	
6.	Minimize soil compaction.	X	
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.	X	
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.	X	
9.	Provide preventative source controls.	X	

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

APPENDIX G

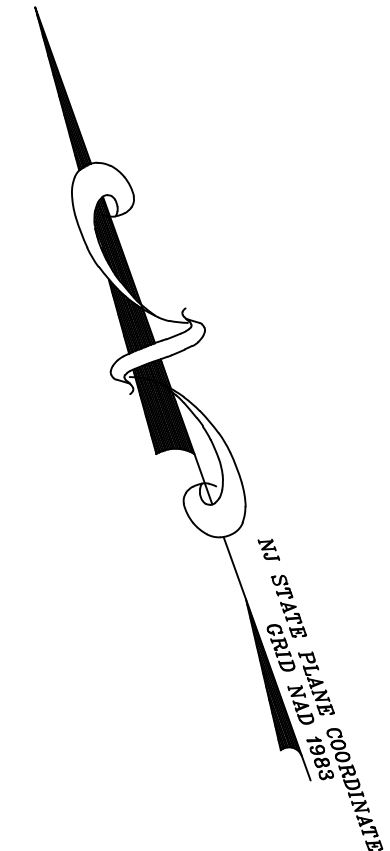
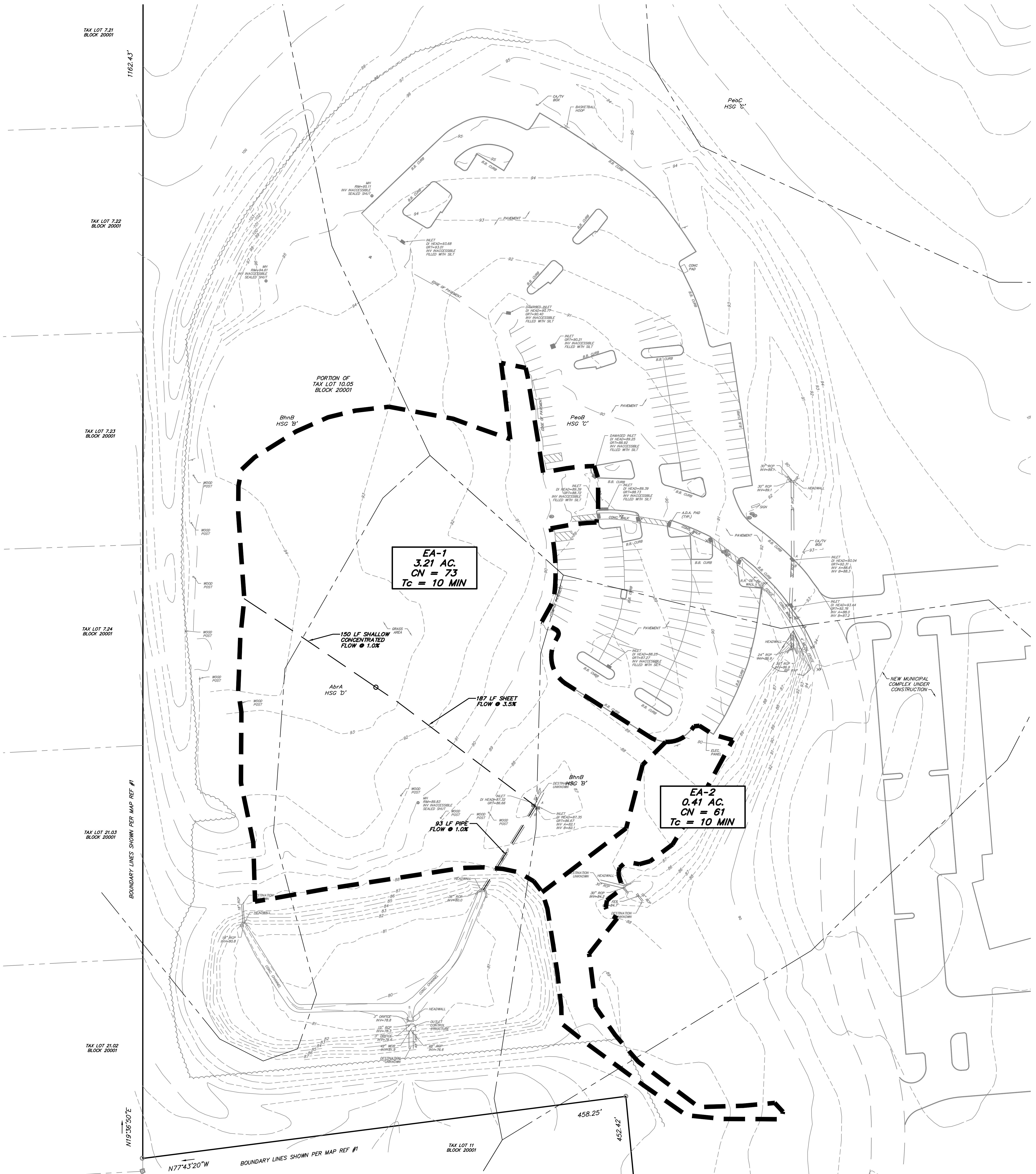
DRAINAGE PIPE DESIGN

Line No.	Inlet ID	Drng Area	Total Area	Runoff Coeff	i Sys	Line Size	Line Length	Invert Up	Invert Dn	Line Slope	Flow Rate	Capac Full	n-val Pipe	Vel Ave	Vel Up	Vel Dn	HGL Up	HGL Dn	Tc	
		(ac)	(ac)	(C)	(in/hr)	(in)	(ft)	(ft)	(ft)	(%)	(cfs)	(cfs)		(ft/s)	(ft/s)	(ft/s)	(ft)	(ft)	(min)	
1	MH-16	0.00	0.59	0.00	6.48	15	56.275	81.19	80.80	0.69	3.27	5.82	0.012	4.41	4.41	4.41	81.92	81.53	9.6	
2	CB-15 'E'	0.27	0.59	0.85	6.60	15	86.696	81.62	81.19	0.50	3.33	4.93	0.012	4.31	4.31	4.31	82.37	81.94	9.1	
3	CB-14 'E'	0.06	0.32	0.85	6.94	15	119.628	82.82	81.62	1.00	1.90	7.01	0.012	2.85	3.67	2.02	83.37 j	82.52	7.9	
4	CB-12 'A'	0.26	0.26	0.86	7.53	15	157.516	84.40	82.82	1.00	1.68	7.01	0.012	3.39	3.54	3.25	84.91 j	83.37	6.0	
5	CB-4 'B'	0.01	0.35	0.99	6.94	15	15.105	86.10	86.00	0.66	2.12	5.69	0.012	3.80	3.80	3.80	86.68	86.58	7.9	
6	CB-3 'B'	0.03	0.34	0.99	7.02	15	29.916	86.39	86.24	0.50	2.07	4.95	0.012	3.82	3.78	3.86	86.96	86.80	7.6	
7	CB-2 'E'	0.08	0.31	0.85	7.07	15	15.957	86.47	86.39	0.50	1.88	4.95	0.012	3.54	3.66	3.42	87.01	86.96	7.5	
8	CB-1 'A'	0.23	0.23	0.86	7.53	15	105.884	87.00	86.47	0.50	1.49	4.95	0.012	3.15	3.41	2.90	87.48 j	87.01	6.0	
9	CB-6 'B'	0.01	0.01	0.99	7.53	15	17.496	86.09	86.00	0.51	0.07	5.02	0.012	1.48	1.44	1.51	86.20	86.10	6.0	
10	CB-9 'B'	0.55	0.55	0.98	7.53	15	12.618	86.00	85.94	0.48	4.06	4.82	0.012	4.61	4.43	4.79	86.87	86.75	6.0	
11	MH-9	0.00	0.00	0.00	0.00	15	96.410	82.74	82.26	0.50	1.84	4.94	0.012	3.63	3.63	3.63	83.28	82.80	6.6	
12	OS-8	0.00	0.00	0.00	0.00	15	51.069	83.00	82.74	0.51	1.84	4.99	0.012	3.63	3.63	3.63	83.54	83.28	6.0	
Project File: 2021-07-06 Proposed Drainage.stm													Number of lines: 12				Date: 7/6/2021			
NOTES: Intensity = 84.74 / (Inlet time + 12.30) ^ 0.83 -- Return period = 25 Yrs. ; ** Critical depth																				

APPENDIX H

DRAINAGE AREA MAPS

File Name: C:\Users\mch\OneDrive - Shore Point Engineering\Shore Point - Shore Point Engineering\Shore Point - Clients\RPM Development\Jobs\RPM-211 - Montgomery Senior Affordable Housing Area Map.dwg
Plot Date: 05/31/2024 10:30am



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING STORM SEWER LINE
- PROPOSED STORM SEWER LINE
- EXISTING INLET
- PROPOSED INLET
- 100-YR WATER SURFACE ELEV.
- SOIL BOUNDARY LINE
- EXISTING DRAINAGE AREA
- BOUNDARY LINE
- EXISTING DRAINAGE AREA
- FLOW PATH

Scale: 1" = 40'

GRAPHIC SCALE
1 INCH = 40 FEET

DATE	REVISIONS	BY

SHORE POINT ENGINEERING
Certificate of Authorization No. 24GA28317800
Kevin E. Shelly P.E. PE No. GE05081300
PO Box 287, Manasquan, NJ 08736
T: 732-924-8100 | F: 732-924-8110
www.shorepointengineering.com

Date:
Kevin E. Shelly, P.E.
PROFESSIONAL ENGINEER
N.J. Lic. No. 48099290

PRELIMINARY MAJOR SITE PLAN
MONTGOMERY SENIOR AFFORDABLE HOUSING
BLOCK 20001, LOT 10.05

SITUATED IN
MONTGOMERY TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

PRE-DEVELOPMENT DRAINAGE AREA MAP

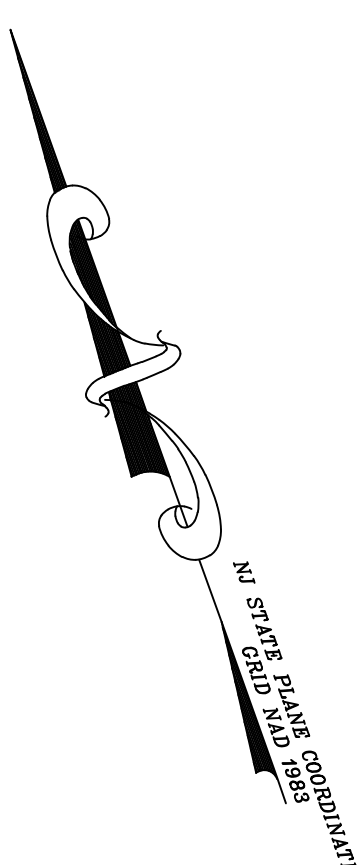
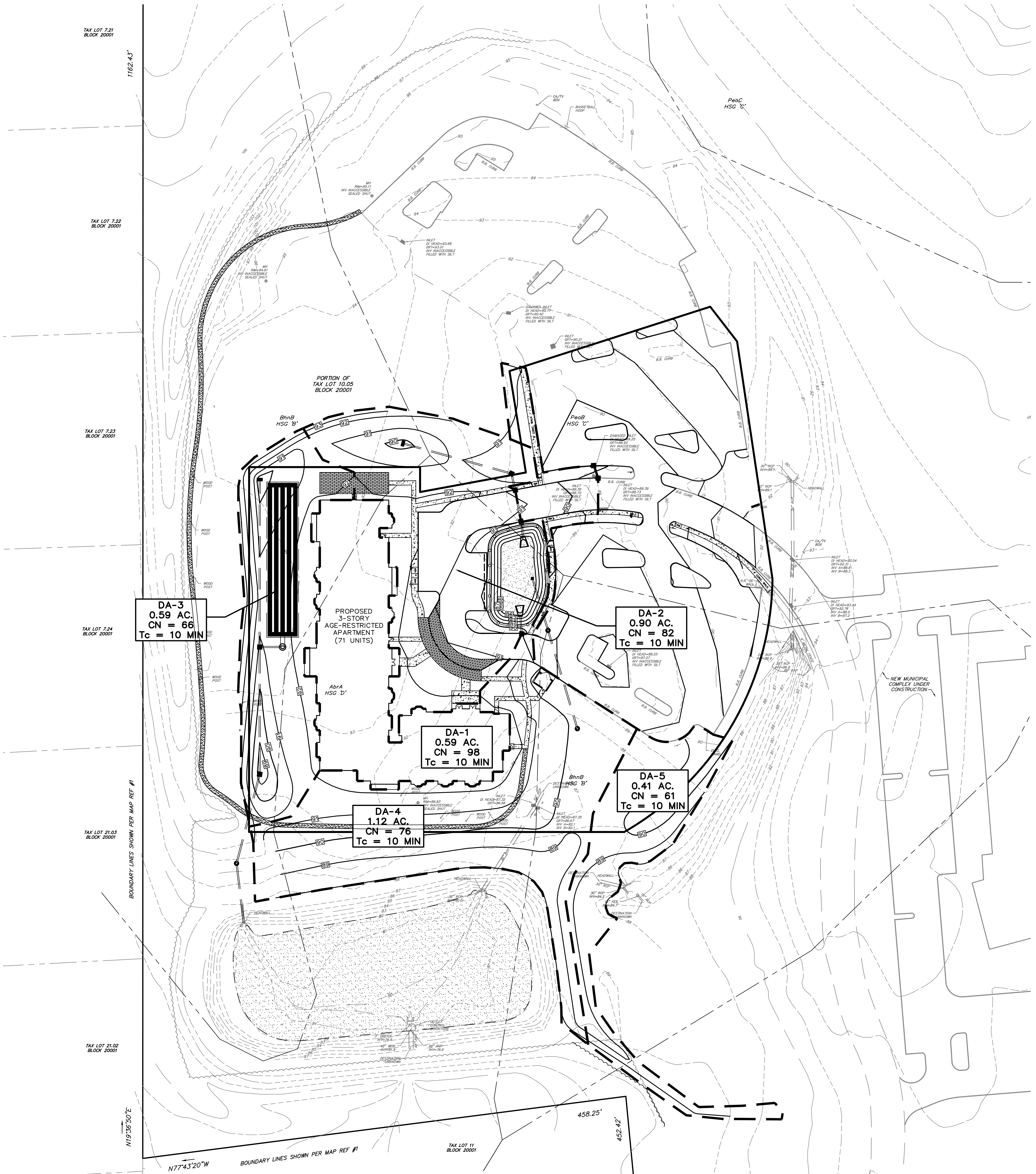
SCALE:	PROJECT No.:
1" = 40'	RPM-211

RELEASED BY:	DATE:
KES	05/31/21

CHECKED BY:	Sheet Number
KES	1 OF 3

DRAWN BY:
RZH

File Name: C:\Users\jmol\OneDrive - Shore Point Engineering\Shore Point - Clients\JPM Development\Jobs\JPM-211 - Montgomery Senior Affordable Housing Area Map.dwg
Plot Date: 05/31/2024 11:03am



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING STORM SEWER LINE
- PROPOSED STORM SEWER LINE
- EXISTING INLET
- PROPOSED INLET
- PROPOSED MANHOLE
- 100-YR WATER SURFACE ELEV.
- SOIL BOUNDARY LINE
- PROPOSED DRAINAGE AREA
- BOUNDARY LINE

1" = 40'

GRAPHIC SCALE
1 INCH = 40 FEET

40 20 0 40 80 120

30 10

57.6

57.6

DATE	REVISIONS	BY

SHORE POINT ENGINEERING

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Date

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**PRELIMINARY MAJOR SITE PLAN
MONTGOMERY SENIOR AFFORDABLE HOUSING**
BLOCK 20001, LOT 10.05

SITUATED IN
MONTGOMERY TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

POST-DEVELOPMENT DRAINAGE AREA MAP

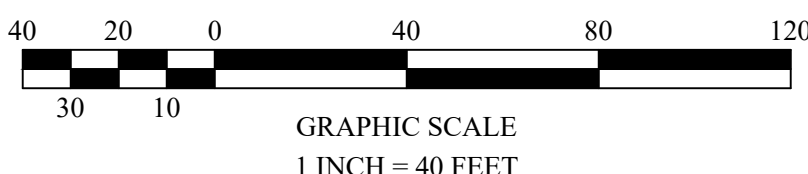
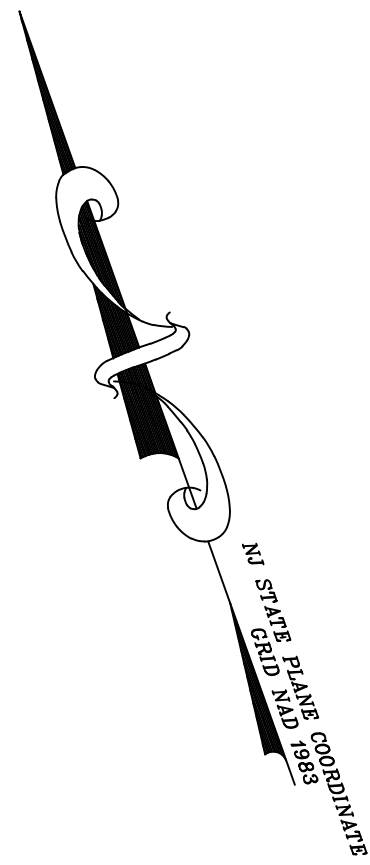
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KES	2 OF 3

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RZH

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User: michael Date: 05/31/21 Time: 3:58pm



DATE			REVISIONS			BY		
SHORE POINT ENGINEERING Certificate of Authorization No. 24GA28317800 Kevin E. Shelly P.E. PE No. GE05031300 PO Box 257, Manasquan, NJ 08736 T: 732-924-8100 F: 732-924-8110 www.shorepointengineering.com								
Date Kevin E. Shelly, P.E. PROFESSIONAL ENGINEER N.J. Lic. No. 050303000								
PRELIMINARY MAJOR SITE PLAN MONTGOMERY SENIOR AFFORDABLE HOUSING BLOCK 20001, LOT 10.05 SITUATED IN MONTGOMERY TOWNSHIP, SOMERSET COUNTY, NEW JERSEY								
INLET AREA MAP								
SCALE: 1" = 40'			PROJECT No.: RPM-211					
RELEASED BY: KES			DATE: 05/31/21					
CHECKED BY: KES			Sheet Number 3 OF 3					
DRAWN BY: RZH								