

**Storm Drainage Computations
Town of South Windsor
Pleasant Valley School
591 Ellington Road
South Windsor, Connecticut**

Prepared by:

**Design Professionals, Inc.
21 Jeffrey Drive, PO Box 1167
South Windsor, CT 06074**

March 16, 2021



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Introduction

The Town of South Windsor is proposing a development at 591, 623, & 647 Ellington Road in South Windsor, Connecticut (to be known as 591 Ellington Road). The properties are referenced on the South Windsor Tax Assessors map as GIS No. 30300591, 30300623, & 30300647, respectively. The proposed development will include the construction of a 102,150± sf elementary school and associated site improvements to include but not be limited to new access driveways, parking areas for vehicles, sidewalks, landscaping, lighting, utilities, common access drive, and stormwater management BMP's.

The total combined tract area is 24.91 acres. 19.149 acres of the parcel is proposed to be disturbed during construction. For more information, please refer to the plans entitled "Pleasant Valley Elementary School ~ Site Plan Modification / Special Exception ~ 591 Ellington Road ~ South Windsor, CT" prepared by Design Professionals, Inc., and dated March 16, 2021, as amended.

Pre-Development Site Conditions

The existing surficial characteristics of the area to be developed can be primarily classified as undisturbed woodland areas in the north region of the tract and developed school areas to the south. Review of the topography in the area indicated that stormwater runoff from the site would flow to one of three design points:

- **Design Point 1:** Existing CB in Ellington Road, ultimately conveying flows to the Podunk River (EXCB-8)
- **Design Point 2:** Sheet flow across the northern and eastern watershed boundaries
- **Design Point 3:** Sheet Flow across the southern property boundary

An existing ridge line spans from the north west corner of the tract to the south east corner of the tract, creating the major watershed divide for areas draining to DP1 and DP2. A small area to remain undisturbed drains to DP3. Existing conditions watershed delineations are identified in the Existing Conditions Drainage Map located in **Appendix F**.

Based on Natural Resources Conservation Service (NRCS) Hydrologic Soil Group (HSG) mapping, soils types A, B, C are located on site. See **Appendix C** for The NRCS Soil Map & Data.

An evaluation was performed to quantify the peak rate of stormwater discharge offsite to the design point. The Natural Resources Conservation Service's TR-55 Manual was followed in predicting the peak rates of runoff and volumes. HydroCAD computer modeling software was utilized.

Peak rates of stormwater runoff were evaluated for the 2-, 10-, 25-, 50- and 100-year storm events. For more information, please refer to the enclosed Pre-Development Drainage HydroCAD Report located in **Appendix A**.

Post-Development Site Conditions

A conventional stormwater collection system consisting of catchbasins, manholes, and underground culverts is proposed to convey storm runoff to a proposed water quality basin. The basin was designed to attenuate peak discharges and provide treatment of stormwater onsite. The proposed basin will have a bottom elevation of 85.50 and a top elevation of 96.00 (Emergency spillway at 95.50). The basin will be constructed with an underdrain system to ensure complete drainage between storm events, and retention of the determined water quality volume for the site. The underdrain system will be a 6-inch perforated PVC for the conveyance of infiltrated runoff. The PVC will have an invert / flow line set one foot below the bottom of the pond at elevation 84.50. A 6- and 10-inch orifice will be installed in the outlet structure at elevations 88.6 and 89.0, respectively. The orifice size and locations have been designed to attenuate peak discharges for 2-, 10-, 25-, and 100-year storm events. The outlet structure will discharge to a 15-inch RCP. The outlet structure's top of frame will be set at elevation 94.90 and will serve as an additional emergency stormwater flow release measure. The 100-year storm maximum water elevation is expected to reach 92.82± so the outlet structure's top of frame should never receive runoff under any of the evaluated storm conditions.

See **Appendix B** for the Post Development Condition and Pond summary HydroCAD reports. The Proposed Conditions Drainage Map for the site can be found in **Appendix F**.

Analysis of Results

The pre-development and post-development conditions were analyzed using HydroCAD consistent with National Resource Conservation Service (NRCS) hydrology methods. The discharge location (**Design Point #1**) was identified as a point of interest for assessing downstream effects. The following table contains the data generated from the HydroCAD software:

Reach		2 year	10 year	25 year	50 year	100 year
DP#1 – Existing CB in Ellington Road (EXCB-8)	Pre	1.79	11.37	19.97	26.94	35.32
	Post	1.17	11.05	18.05	23.41	29.63
DP#2 – Sheet Flow across NE Watershed boundary	Pre	0.03	0.59	1.32	1.98	2.90
	Post	0.03	0.59	1.32	2.01	2.97
DP#3 – Sheet Flow across Southern Property Boundary	Pre	0.00	0.00	0.00	0.01	0.03
	Post	0.00	0.00	0.00	0.01	0.03

As seen in the table above, the subject project will result in peak runoff rates in the proposed condition that are less than the peak runoff rates of the existing condition for 2-, 10-, 25- and 100-year design storms for design points 1 & 3. Peak discharges at the design point 3 will match existing conditions following 2-, 10-, and 25-year storm events. Analysis results did however indicate that there will be a slight increase in the peak rate of discharge during 50- and 100-year

storm events. It is our opinion that the observed increases at this location will have negligible impact to downgradient offsite areas.

Storm Sewer Collection System

The proposed subsurface stormwater collection and conveyance system was designed to adequately convey proposed runoff under 10- year storm event conditions. The design of the storm sewers followed the guidelines set forth in the Connecticut Department of Transportation's Drainage Manual. It is estimated that during a 10-year storm event, all proposed subsurface culverts will convey storm runoff without resulting in any unacceptable flooding conditions. The computations are included as **Appendix D**.

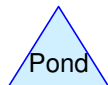
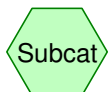
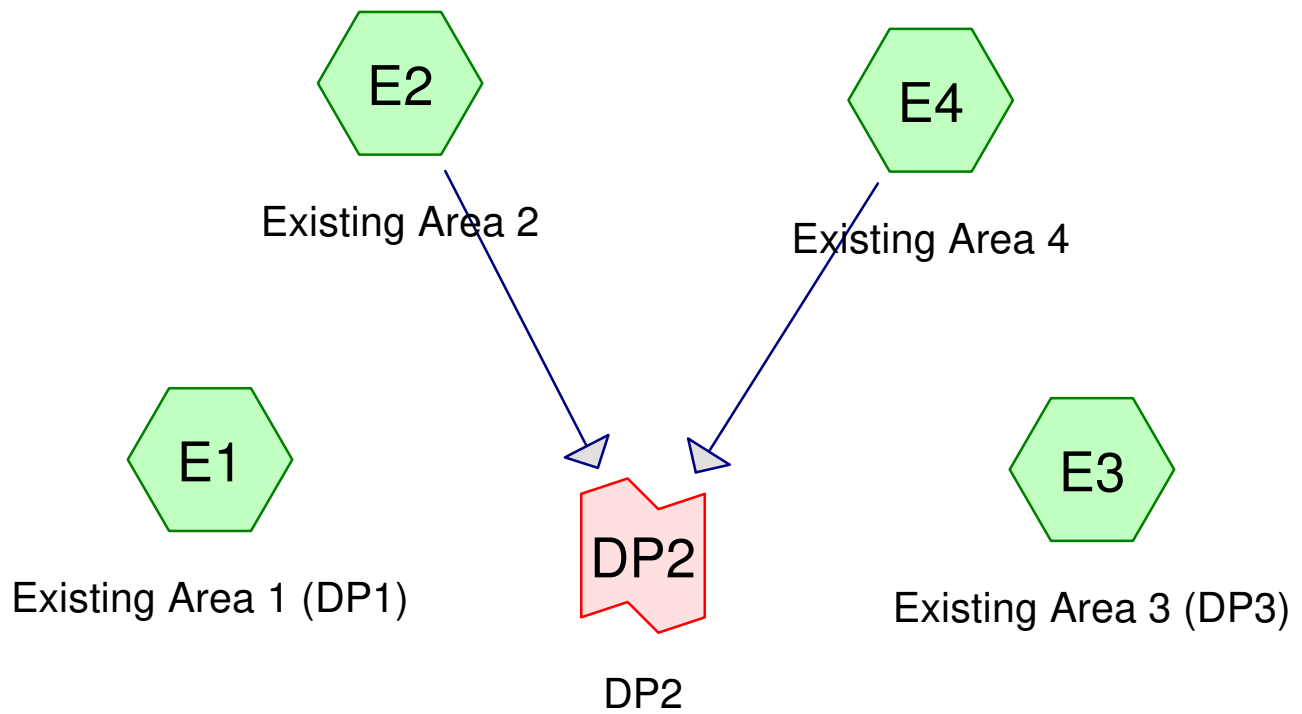
Water Quality

The proposed Forebay and Water Quality Depression (PP1), were sized in accordance with the 2004 Connecticut Stormwater Quality Manual, to provide 10% and 100% of the determined water quality volume, respectively. See **Appendix E** for calculations. The proposed temporary sediment basin was sized in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Conclusion

The proposed stormwater management system as discussed herein and shown on the referenced plans is appropriate for the proposed development on the subject site, is consistent with Town and State requirements, and should not pose any detrimental impacts to the environment.

APPENDIX A
Watershed Computations
(Pre-Development Drainage HydroCAD Report)



Routing Diagram for 4022 - HydroCAD

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4022 - HydroCAD

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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Page 2

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Area 1 (DP1) Runoff Area=21.643 ac 19.58% Impervious Runoff Depth=0.27"
Flow Length=1,883' Tc=37.3 min CN=57 Runoff=1.79 cfs 0.494 af

Subcatchment E2: Existing Area 2 Runoff Area=6.399 ac 1.93% Impervious Runoff Depth=0.00"
Flow Length=653' Tc=29.4 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment E3: Existing Area 3 (DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment E4: Existing Area 4 Runoff Area=1.730 ac 18.47% Impervious Runoff Depth=0.11"
Flow Length=255' Tc=16.6 min CN=50 Runoff=0.03 cfs 0.015 af

Link DP2: DP2

Inflow=0.03 cfs 0.015 af
Primary=0.03 cfs 0.015 af

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Existing Condition
Type III 24-hr 10-yr Rainfall=4.89"

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Page 3

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Area 1 (DP1) Runoff Area=21.643 ac 19.58% Impervious Runoff Depth=1.05"
Flow Length=1,883' Tc=37.3 min CN=57 Runoff=11.37 cfs 1.887 af

Subcatchment E2: Existing Area 2 Runoff Area=6.399 ac 1.93% Impervious Runoff Depth=0.03"
Flow Length=653' Tc=29.4 min CN=33 Runoff=0.02 cfs 0.017 af

Subcatchment E3: Existing Area 3 (DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment E4: Existing Area 4 Runoff Area=1.730 ac 18.47% Impervious Runoff Depth=0.65"
Flow Length=255' Tc=16.6 min CN=50 Runoff=0.59 cfs 0.093 af

Link DP2: DP2

Inflow=0.59 cfs 0.111 af
Primary=0.59 cfs 0.111 af

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Existing Condition
Type III 24-hr 25-yr Rainfall=6.02"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Area 1 (DP1) Runoff Area=21.643 ac 19.58% Impervious Runoff Depth=1.69"
Flow Length=1,883' Tc=37.3 min CN=57 Runoff=19.97 cfs 3.045 af

Subcatchment E2: Existing Area 2 Runoff Area=6.399 ac 1.93% Impervious Runoff Depth=0.17"
Flow Length=653' Tc=29.4 min CN=33 Runoff=0.15 cfs 0.092 af

Subcatchment E3: Existing Area 3 (DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.07"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.002 af

Subcatchment E4: Existing Area 4 Runoff Area=1.730 ac 18.47% Impervious Runoff Depth=1.15"
Flow Length=255' Tc=16.6 min CN=50 Runoff=1.32 cfs 0.166 af

Link DP2: DP2

Inflow=1.32 cfs 0.258 af
Primary=1.32 cfs 0.258 af

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Existing Condition
Type III 24-hr 50-yr Rainfall=6.84"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Area 1 (DP1) Runoff Area=21.643 ac 19.58% Impervious Runoff Depth=2.21"
Flow Length=1,883' Tc=37.3 min CN=57 Runoff=26.94 cfs 3.981 af

Subcatchment E2: Existing Area 2 Runoff Area=6.399 ac 1.93% Impervious Runoff Depth=0.33"
Flow Length=653' Tc=29.4 min CN=33 Runoff=0.39 cfs 0.178 af

Subcatchment E3: Existing Area 3 (DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.19"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.01 cfs 0.006 af

Subcatchment E4: Existing Area 4 Runoff Area=1.730 ac 18.47% Impervious Runoff Depth=1.58"
Flow Length=255' Tc=16.6 min CN=50 Runoff=1.98 cfs 0.228 af

Link DP2: DP2

Inflow=1.98 cfs 0.406 af
Primary=1.98 cfs 0.406 af

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Existing Condition
Type III 24-hr 100-yr Rainfall=7.76"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Area 1 (DP1) Runoff Area=21.643 ac 19.58% Impervious Runoff Depth=2.83"
Flow Length=1,883' Tc=37.3 min CN=57 Runoff=35.32 cfs 5.109 af

Subcatchment E2: Existing Area 2 Runoff Area=6.399 ac 1.93% Impervious Runoff Depth=0.57"
Flow Length=653' Tc=29.4 min CN=33 Runoff=1.04 cfs 0.304 af

Subcatchment E3: Existing Area 3 (DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.36"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.03 cfs 0.012 af

Subcatchment E4: Existing Area 4 Runoff Area=1.730 ac 18.47% Impervious Runoff Depth=2.11"
Flow Length=255' Tc=16.6 min CN=50 Runoff=2.78 cfs 0.303 af

Link DP2: DP2

Inflow=2.90 cfs 0.608 af
Primary=2.90 cfs 0.608 af

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment E1: Existing Area 1 (DP1)

Runoff = 1.79 cfs @ 12.77 hrs, Volume= 0.494 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
2.049	39	>75% Grass cover, Good, HSG A
6.288	61	>75% Grass cover, Good, HSG B
0.078	74	>75% Grass cover, Good, HSG C
* 3.910	98	IMPERVIOUS
1.639	51	1 acre lots, 20% imp, HSG A
5.429	30	Woods, Good, HSG A
1.738	55	Woods, Good, HSG B
0.512	70	Woods, Good, HSG C
21.643	57	Weighted Average
17.405		80.42% Pervious Area
4.238		19.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.1000	0.08		Sheet Flow, WOODLAND SF Woods: Dense underbrush n= 0.800 P2= 3.09"
9.8	525	0.0320	0.89		Shallow Concentrated Flow, WOODLAND SCF Woodland Kv= 5.0 fps
2.0	127	0.0236	1.08		Shallow Concentrated Flow, GRASS SCF Short Grass Pasture Kv= 7.0 fps
3.4	307	0.0900	1.50		Shallow Concentrated Flow, WOODLAND SCF Woodland Kv= 5.0 fps
2.1	824	0.0170	6.41	5.03	Pipe Channel, Existing Strm Run 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
37.3	1,883	Total			

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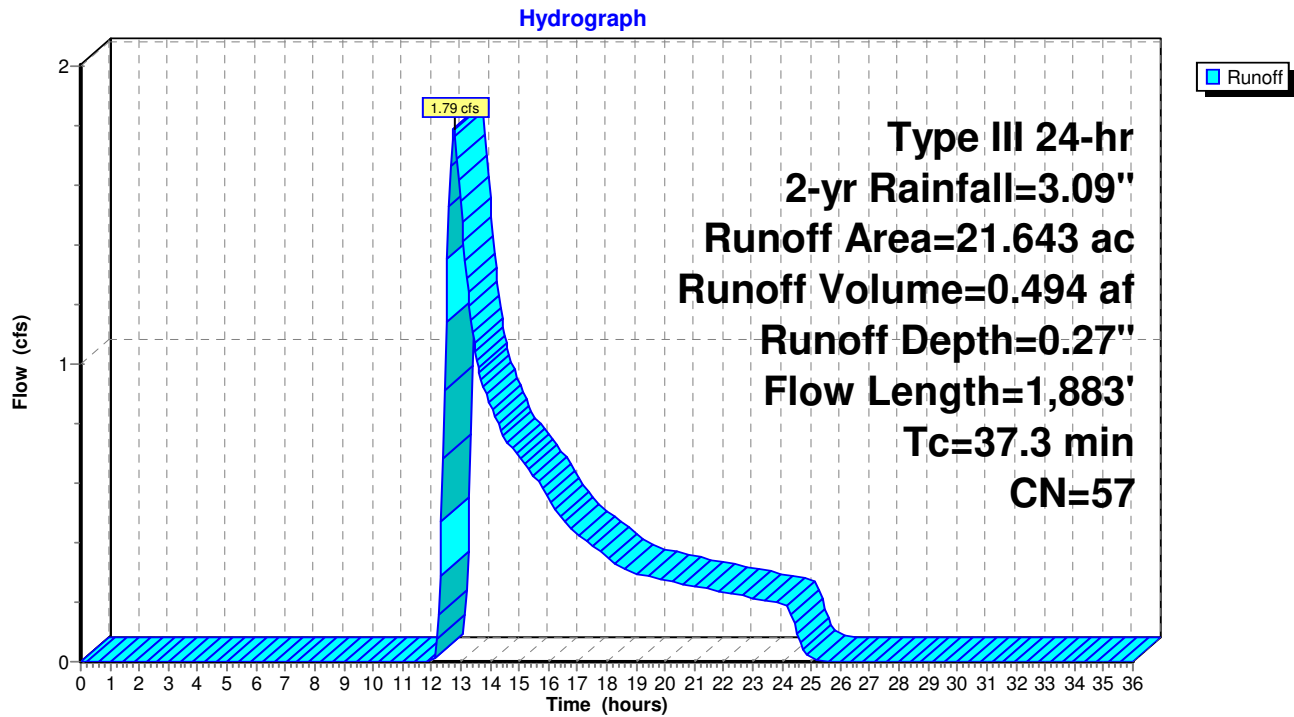
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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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Subcatchment E1: Existing Area 1 (DP1)



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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment E2: Existing Area 2

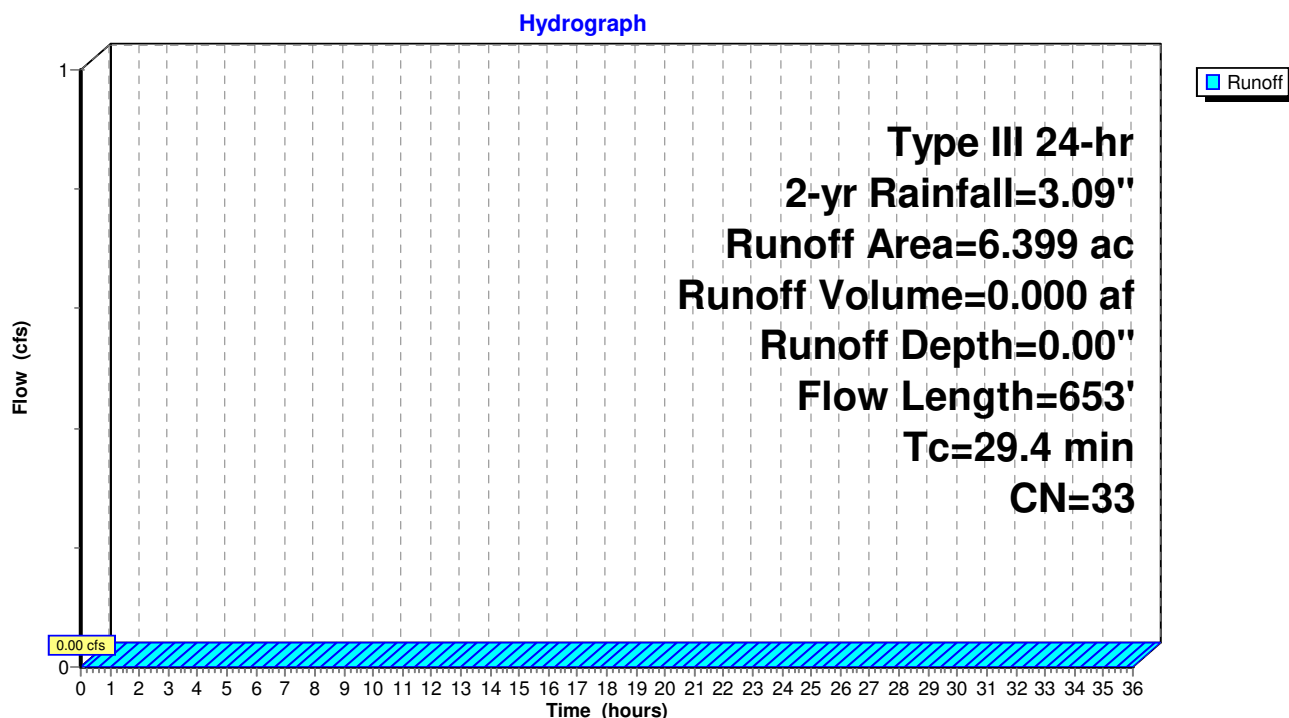
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.820	39	>75% Grass cover, Good, HSG A
* 0.036	98	IMPERVIOUS
0.439	51	1 acre lots, 20% imp, HSG A
5.104	30	Woods, Good, HSG A
6.399	33	Weighted Average
6.275		98.07% Pervious Area
0.124		1.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	100	0.0912	0.08		Sheet Flow, WOODLAND SF
					Woods: Dense underbrush n= 0.800 P2= 3.09"
8.7	553	0.0450	1.06		Shallow Concentrated Flow, WOODLAND SCF
					Woodland Kv= 5.0 fps
29.4	653	Total			

Subcatchment E2: Existing Area 2

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment E3: Existing Area 3 (DP3)

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

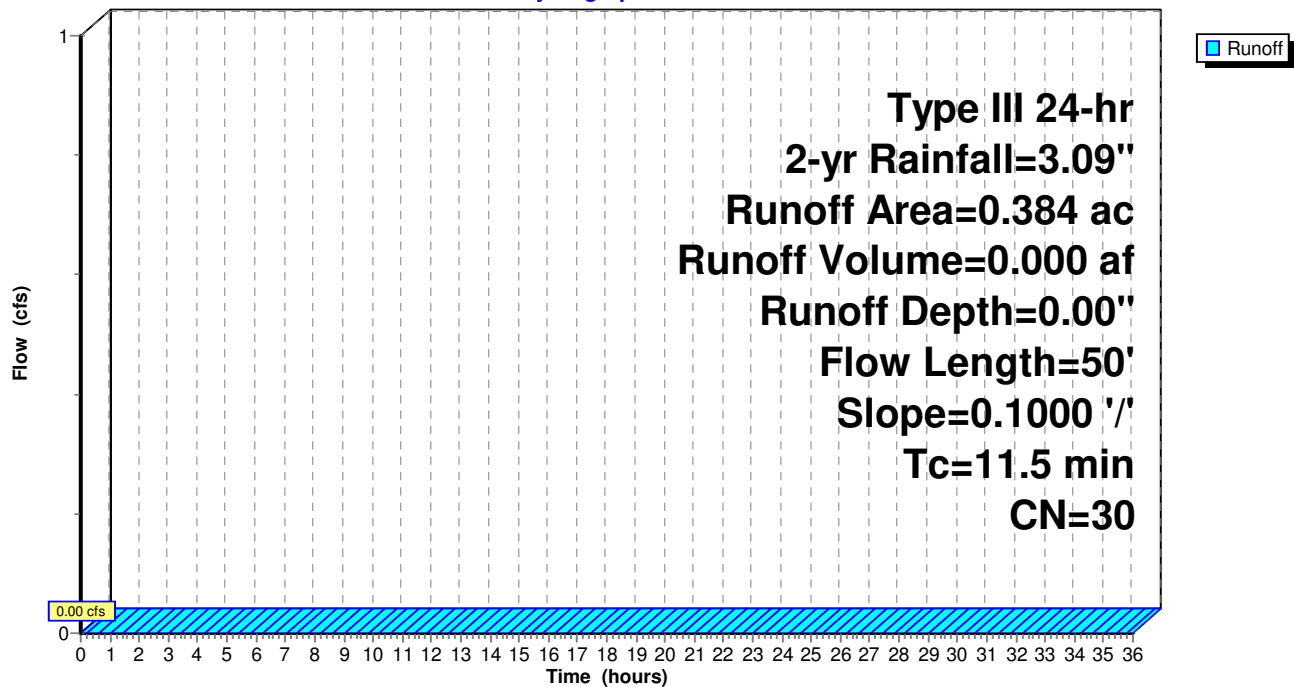
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.384	30	Woods, Good, HSG A
0.384		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.1000	0.07		Sheet Flow, WOODLAND SF Woods: Dense underbrush n= 0.800 P2= 3.09"

Subcatchment E3: Existing Area 3 (DP3)

Hydrograph



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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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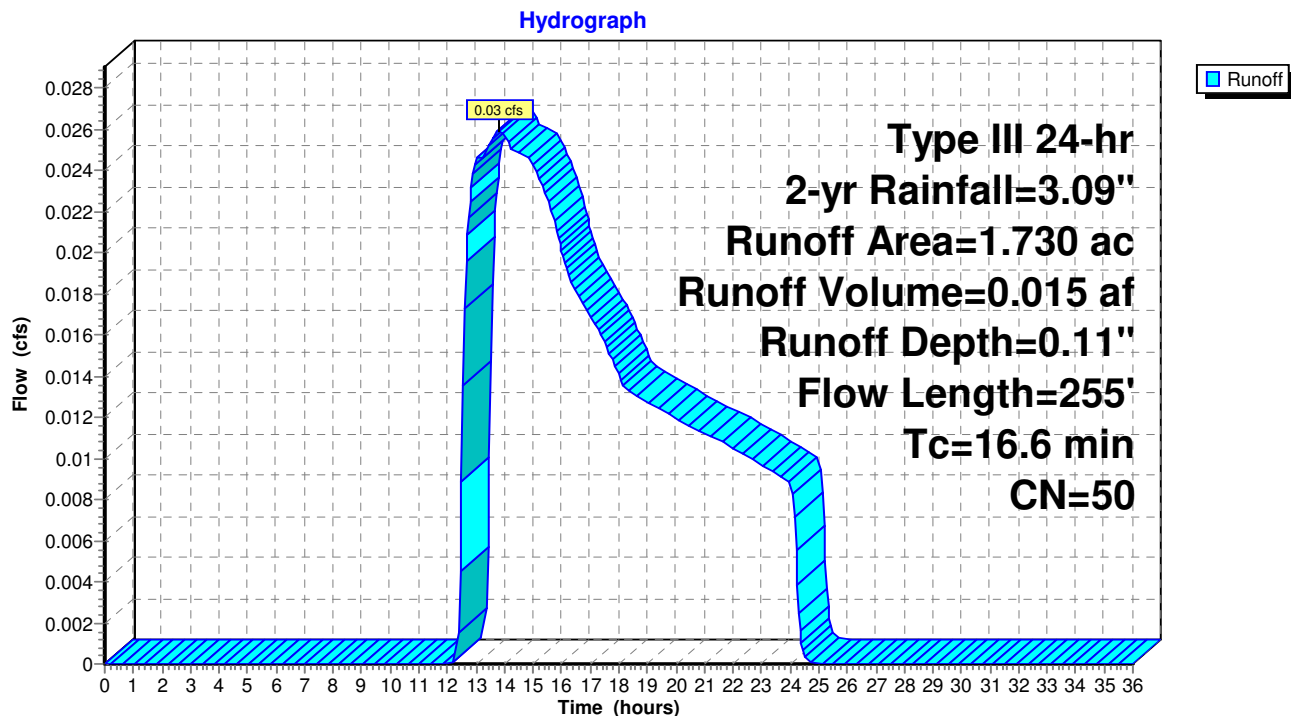
Summary for Subcatchment E4: Existing Area 4

Runoff = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.038	39	>75% Grass cover, Good, HSG A
* 0.000	98	IMPERVIOUS
1.598	51	1 acre lots, 20% imp, HSG A
0.094	30	Woods, Good, HSG A
1.730	50	Weighted Average
1.410		81.53% Pervious Area
0.320		18.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0530	0.11		Sheet Flow, WOODLAND SF
					Woods: Light underbrush n= 0.400 P2= 3.09"
1.8	155	0.0430	1.45		Shallow Concentrated Flow, GRASS SCF
					Short Grass Pasture Kv= 7.0 fps
16.6	255	Total			

Subcatchment E4: Existing Area 4

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.09"

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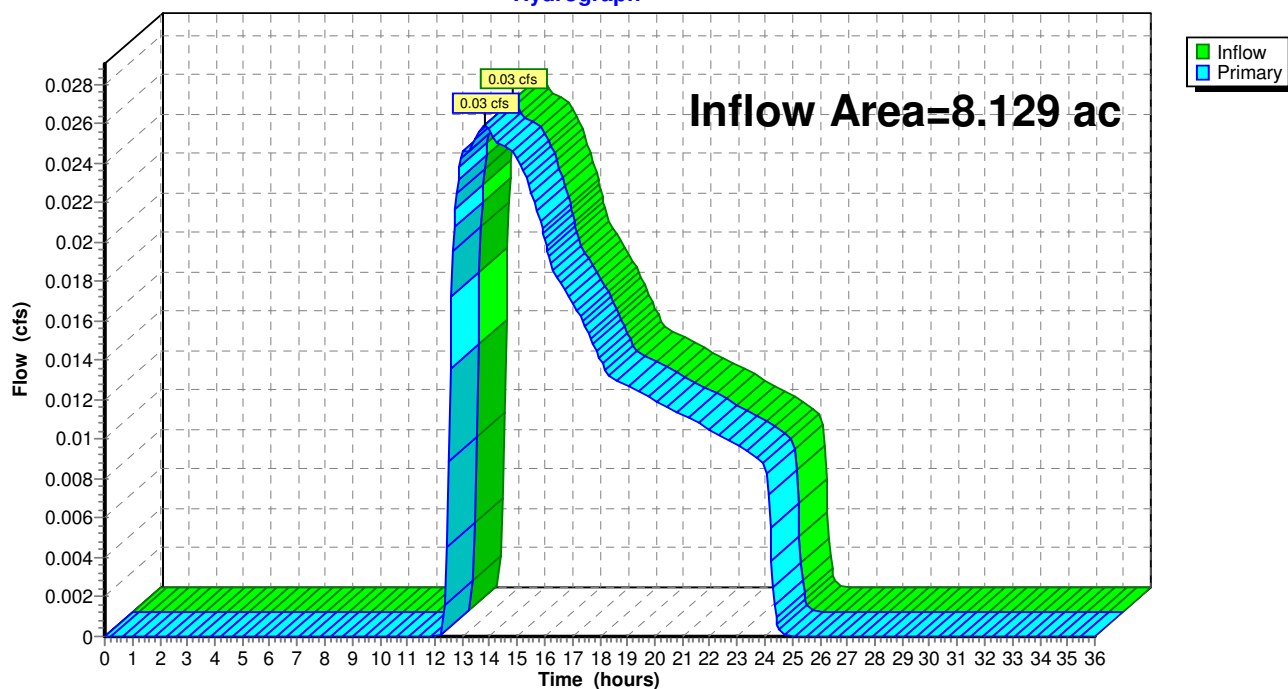
Summary for Link DP2: DP2

Inflow Area = 8.129 ac, 5.45% Impervious, Inflow Depth = 0.02" for 2-yr event
Inflow = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af
Primary = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link DP2: DP2

Hydrograph



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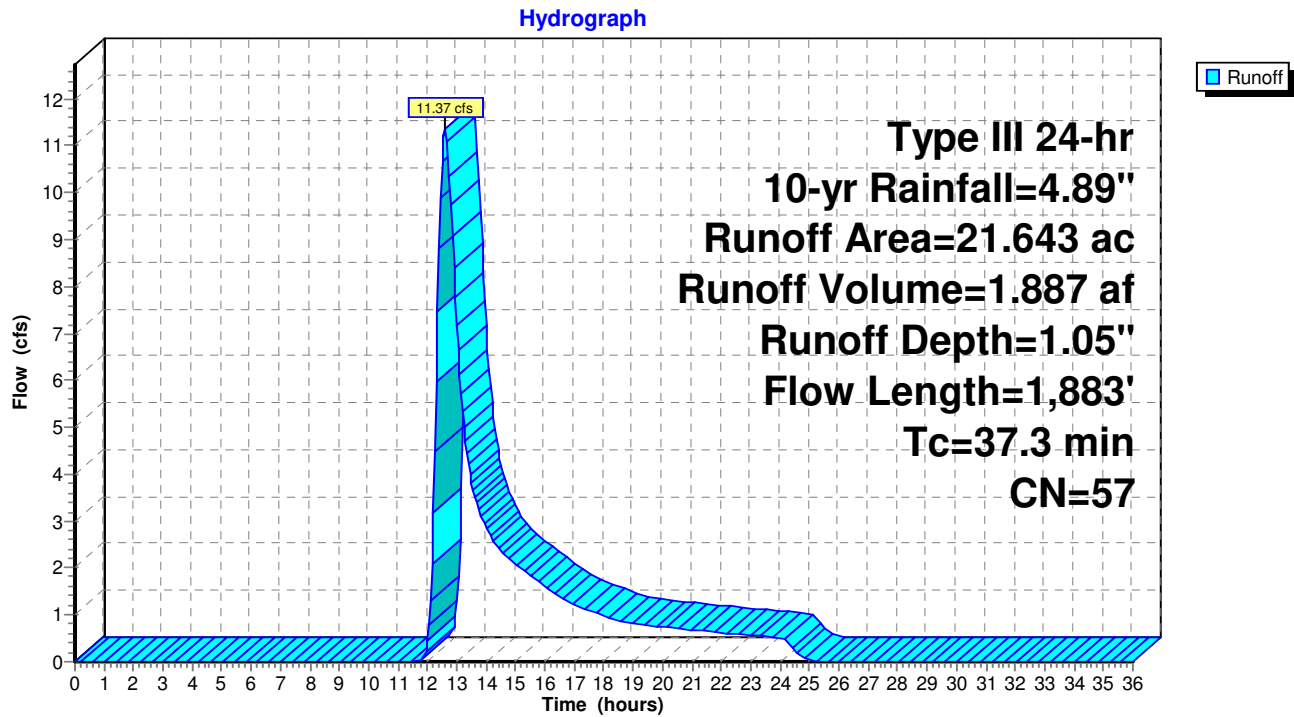
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Existing Condition
Type III 24-hr 10-yr Rainfall=4.89"

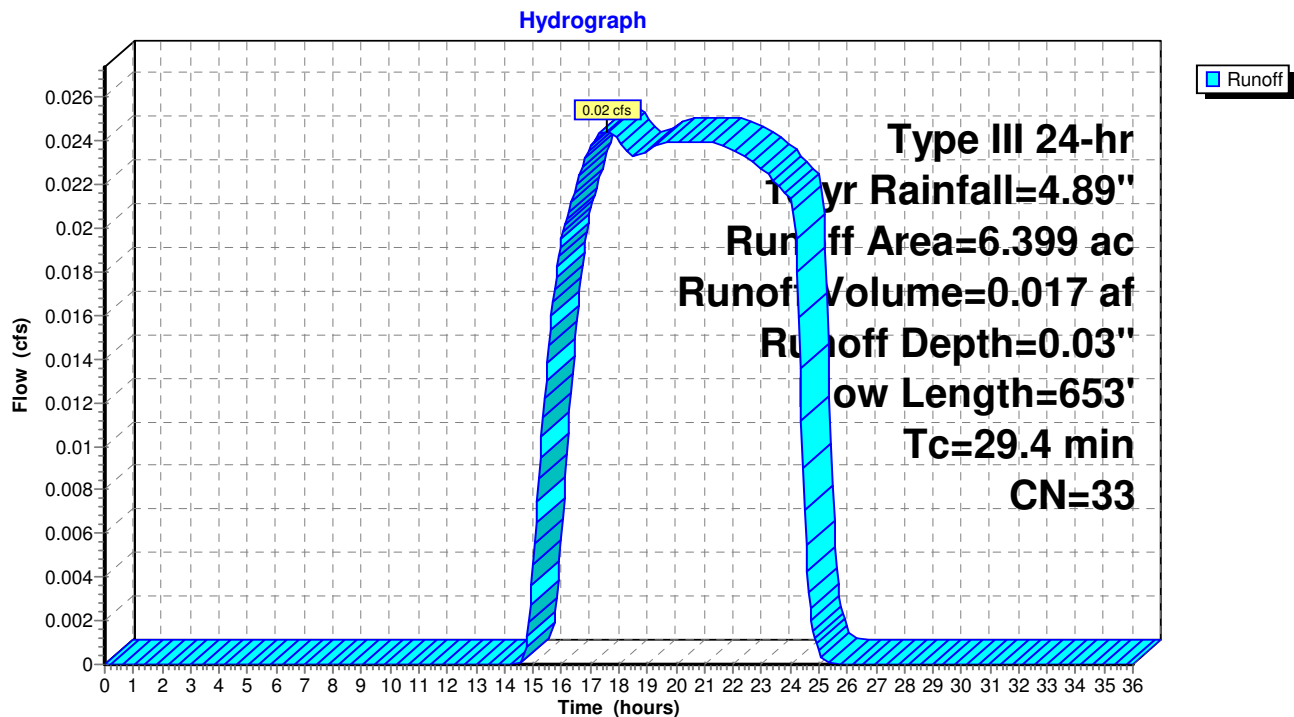
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Subcatchment E1: Existing Area 1 (DP1)



Subcatchment E2: Existing Area 2



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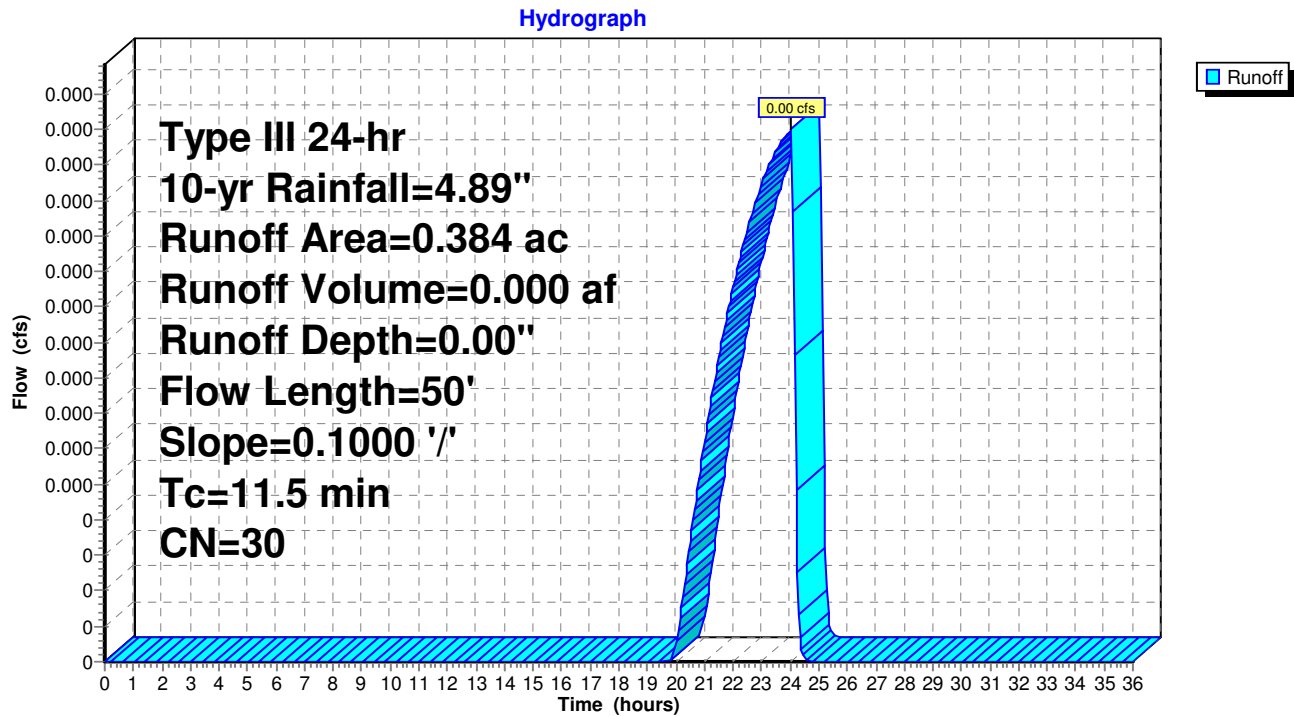
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Existing Condition
Type III 24-hr 10-yr Rainfall=4.89"

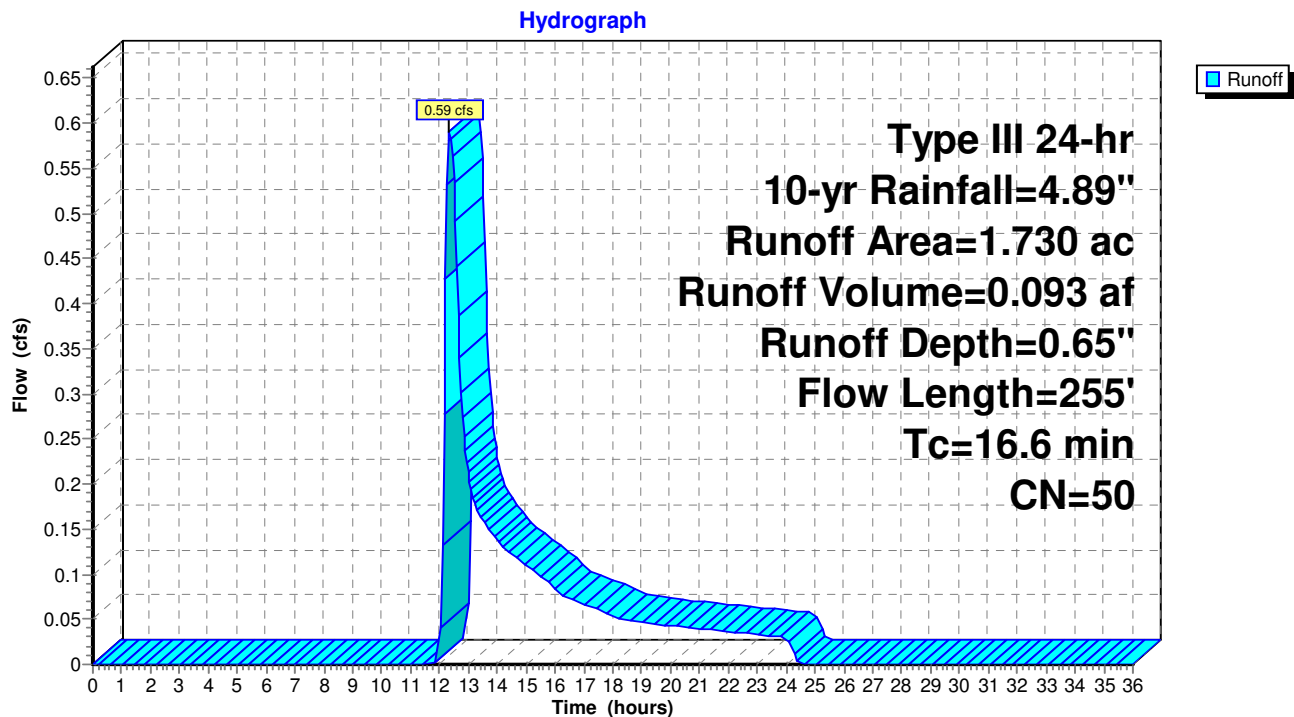
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Subcatchment E3: Existing Area 3 (DP3)



Subcatchment E4: Existing Area 4



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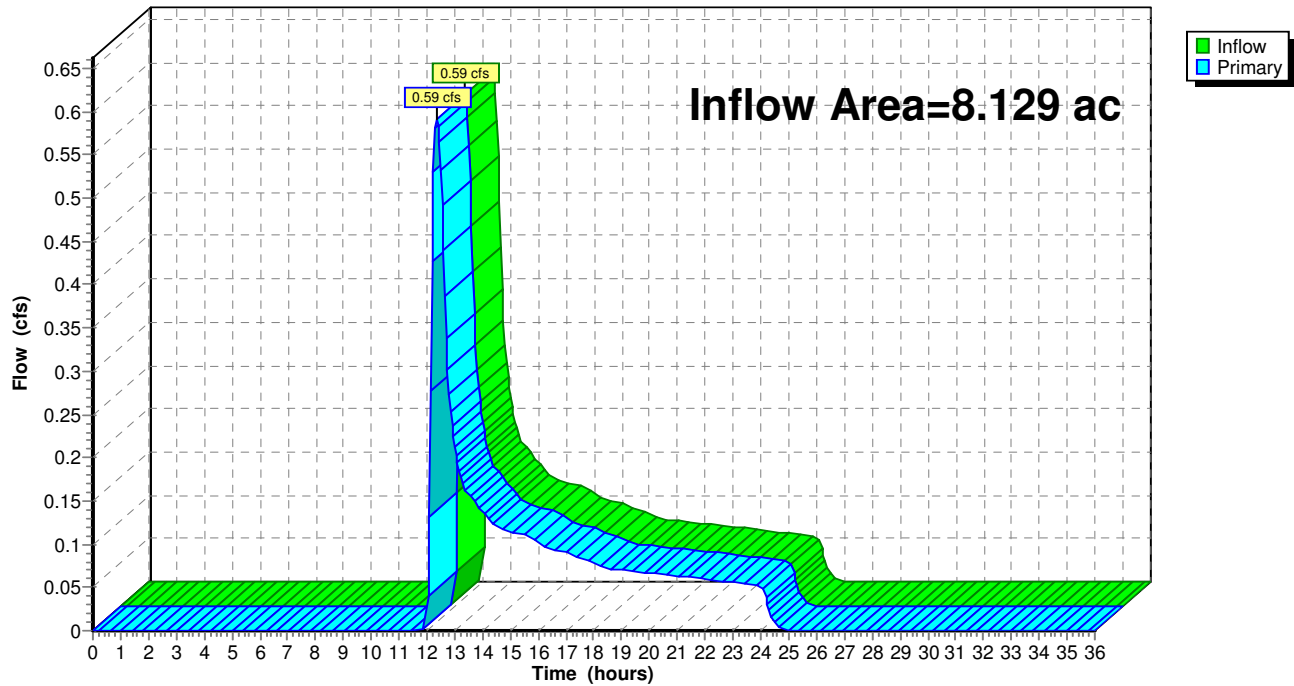
Existing Condition
Type III 24-hr 10-yr Rainfall=4.89"

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Link DP2: DP2

Hydrograph



4022 - HydroCAD

Prepared by Design Professionals, Inc.

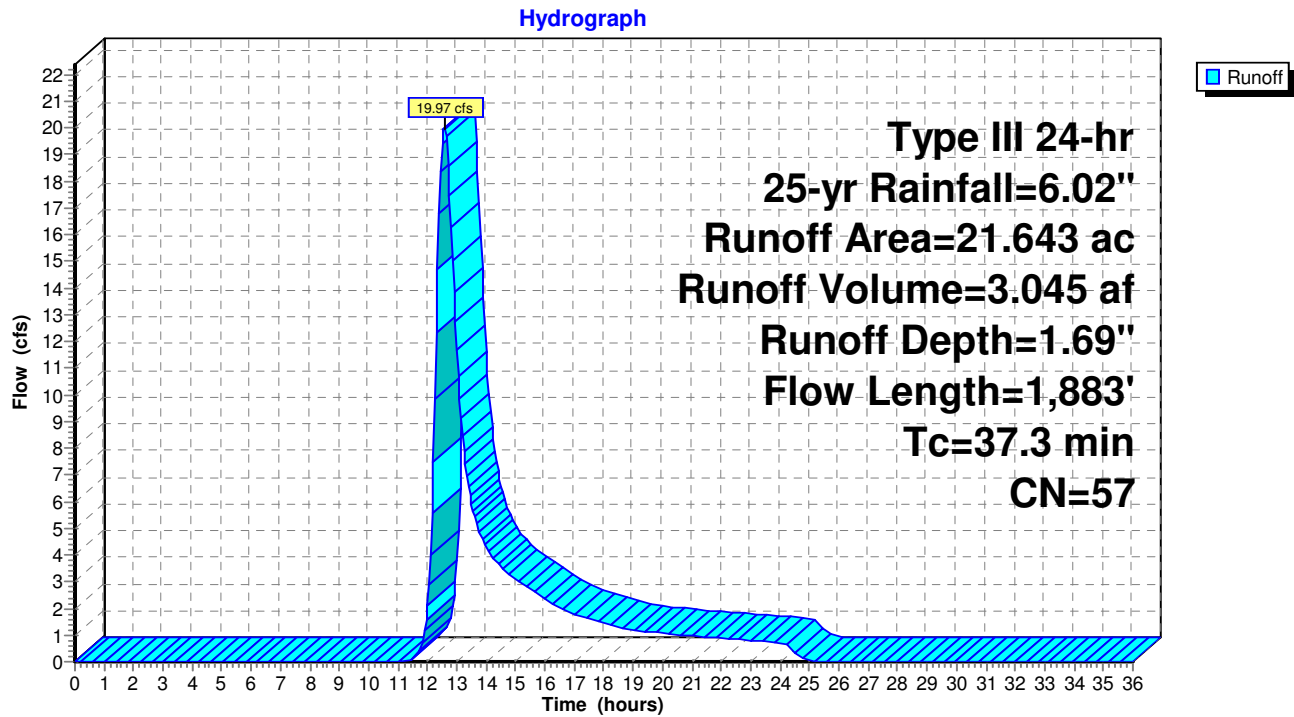
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Existing Condition
Type III 24-hr 25-yr Rainfall=6.02"

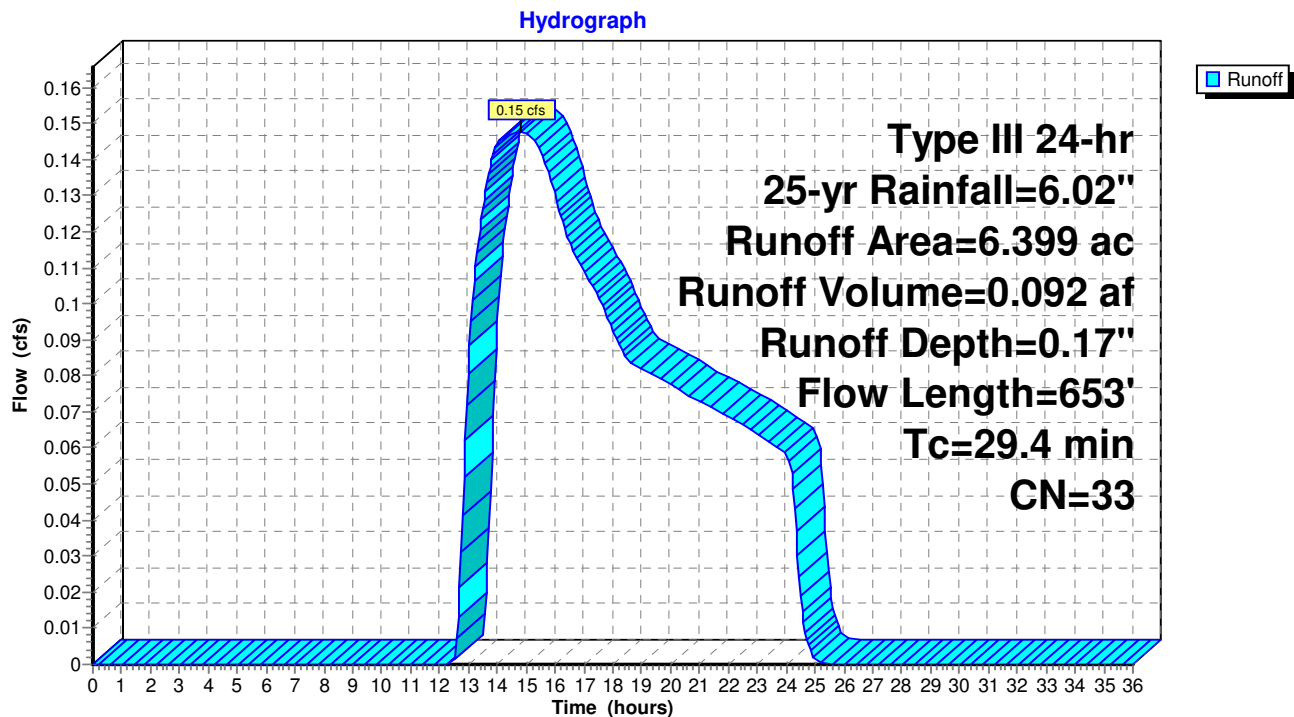
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Subcatchment E1: Existing Area 1 (DP1)



Subcatchment E2: Existing Area 2



4022 - HydroCAD

Prepared by Design Professionals, Inc.

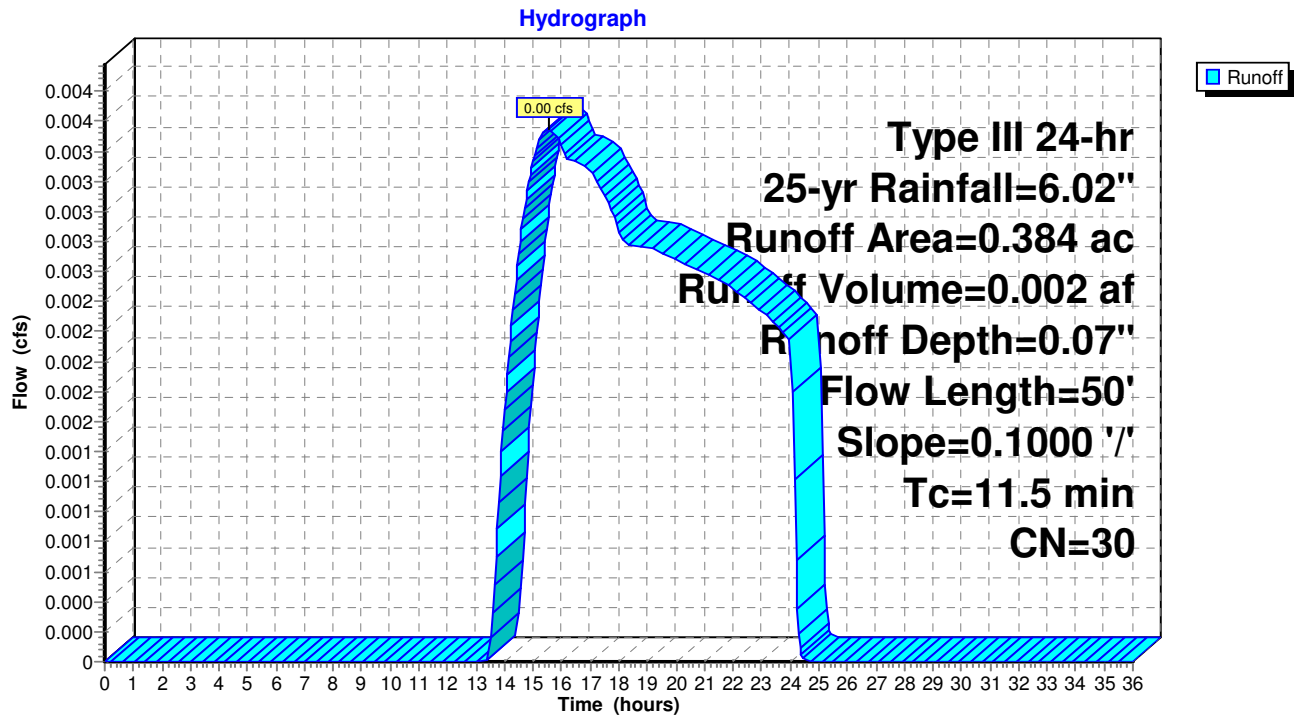
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Existing Condition
Type III 24-hr 25-yr Rainfall=6.02"

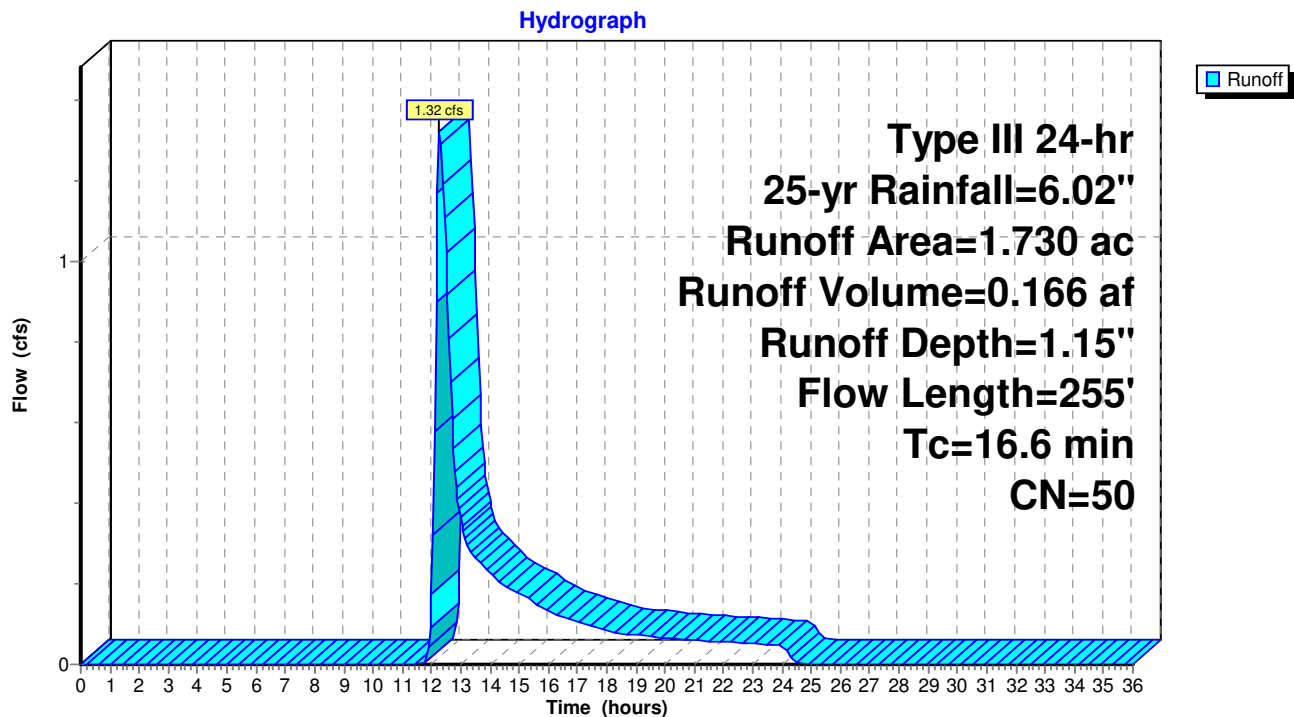
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Subcatchment E3: Existing Area 3 (DP3)



Subcatchment E4: Existing Area 4



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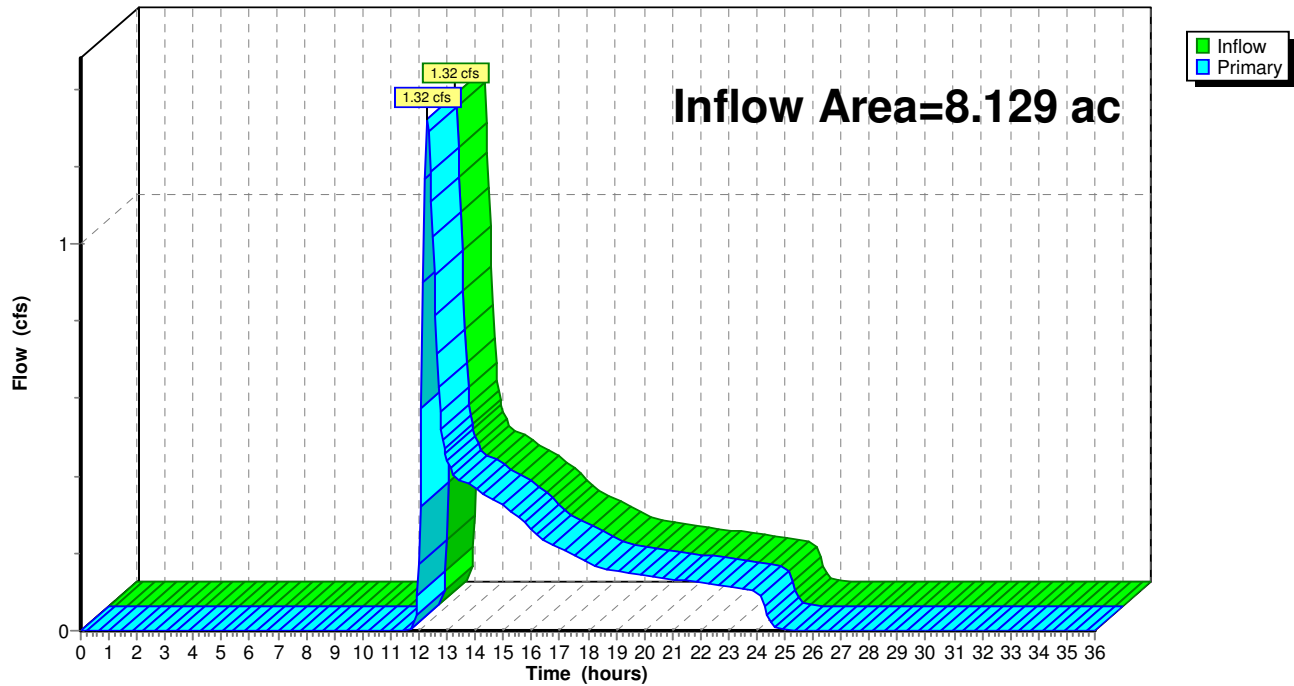
Existing Condition
Type III 24-hr 25-yr Rainfall=6.02"

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Link DP2: DP2

Hydrograph



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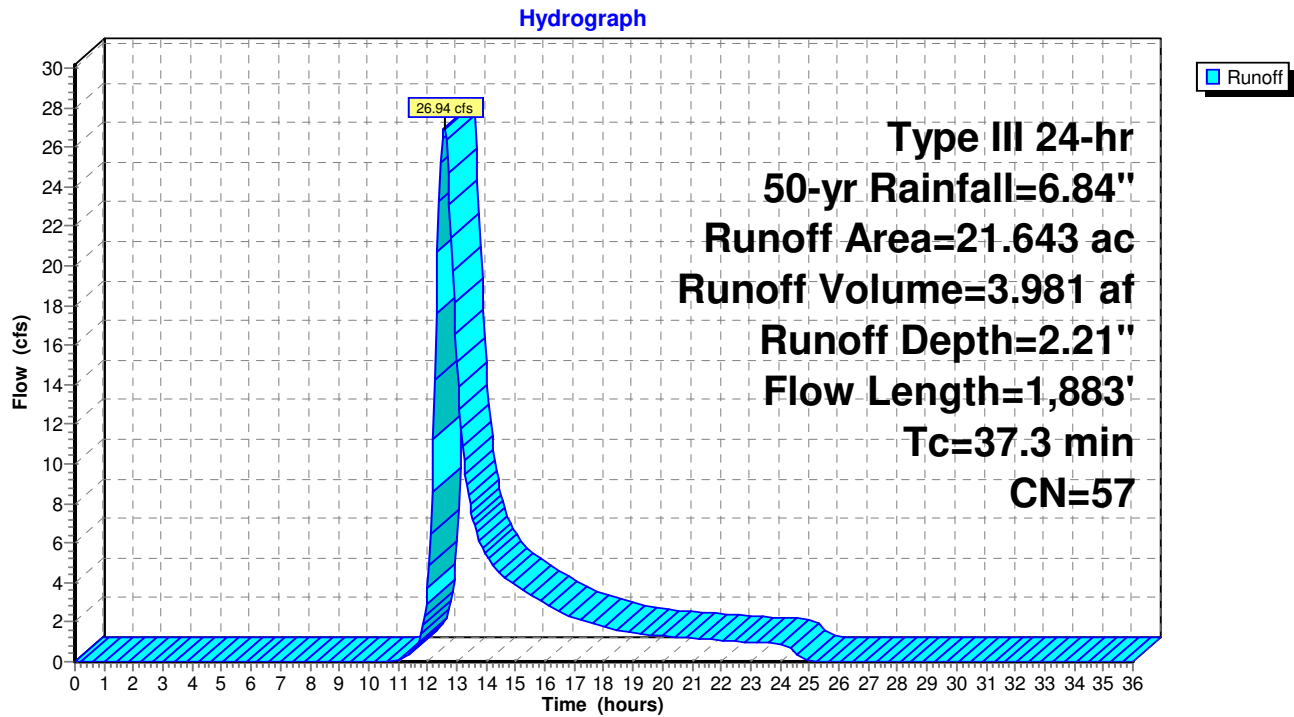
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Existing Condition
Type III 24-hr 50-yr Rainfall=6.84"

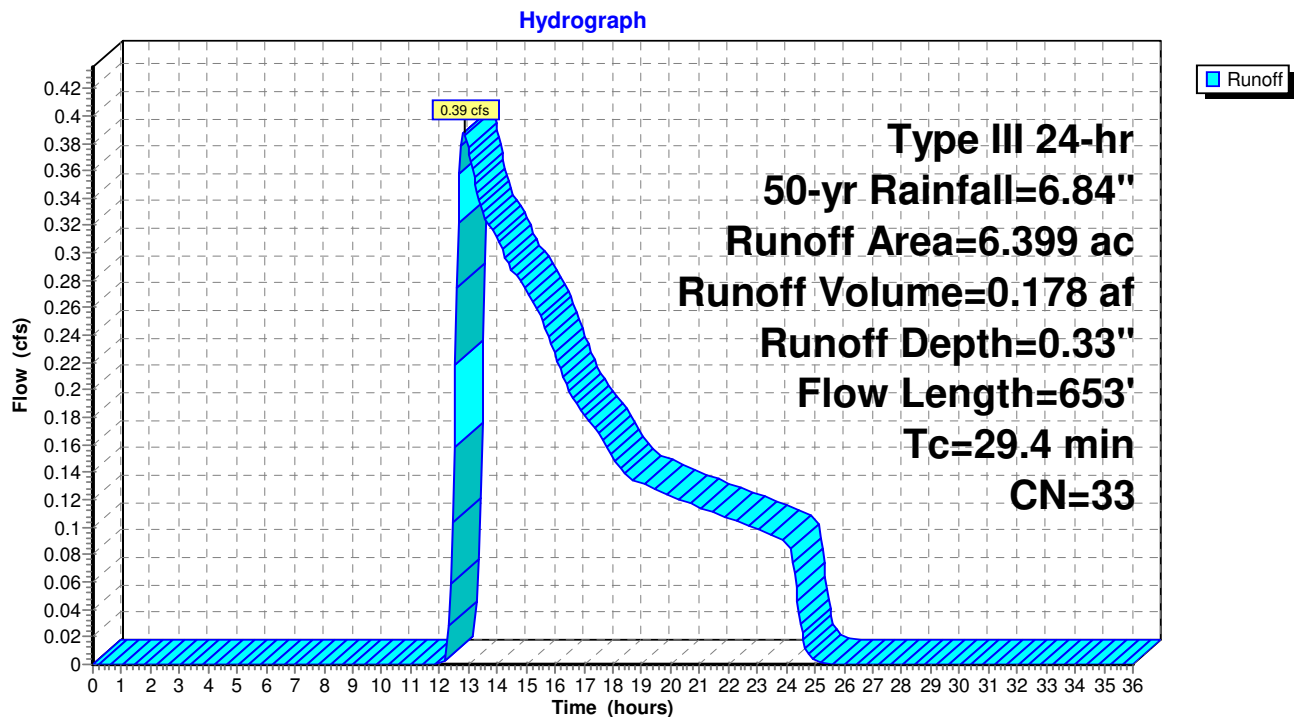
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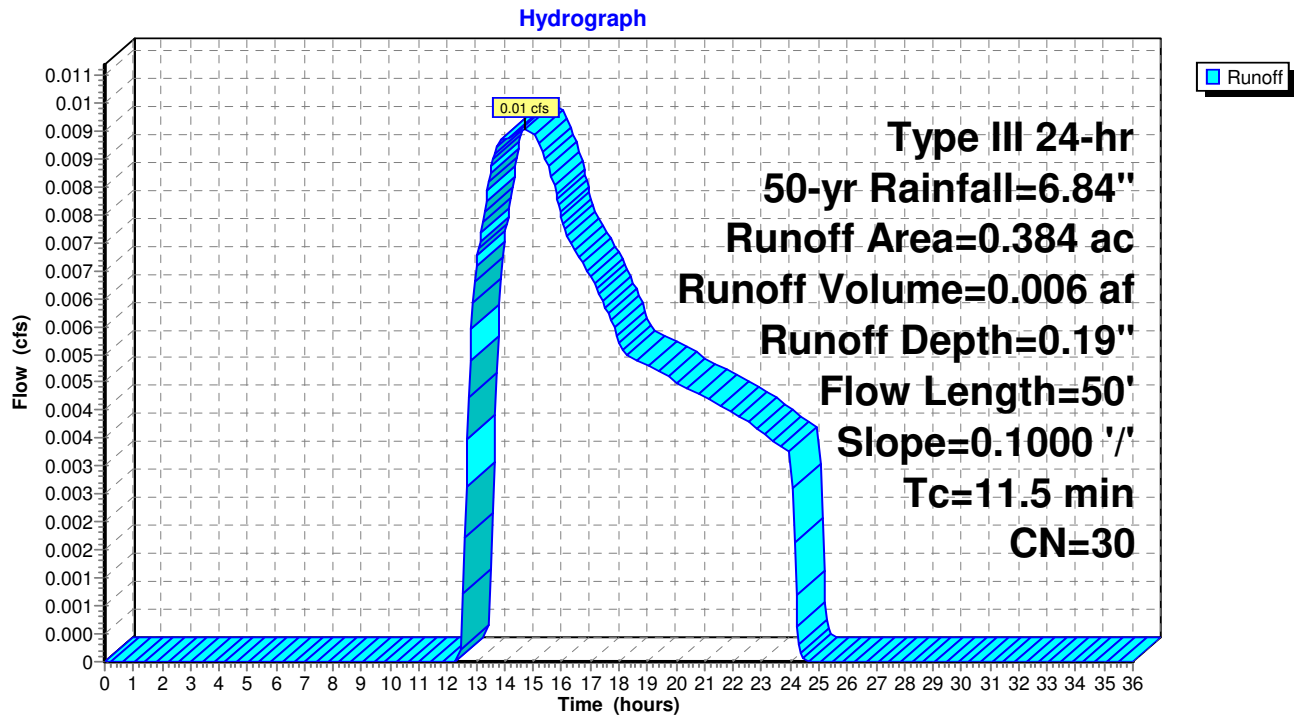
Subcatchment E1: Existing Area 1 (DP1)



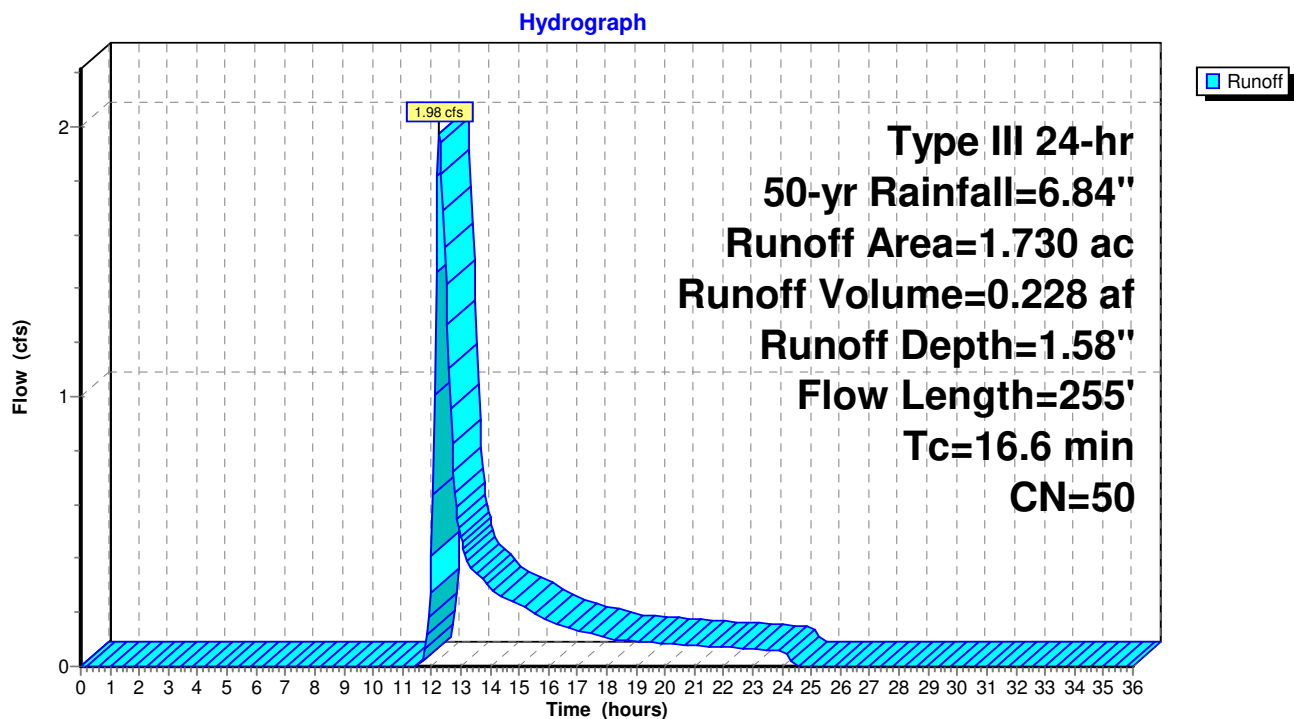
Subcatchment E2: Existing Area 2



Subcatchment E3: Existing Area 3 (DP3)



Subcatchment E4: Existing Area 4



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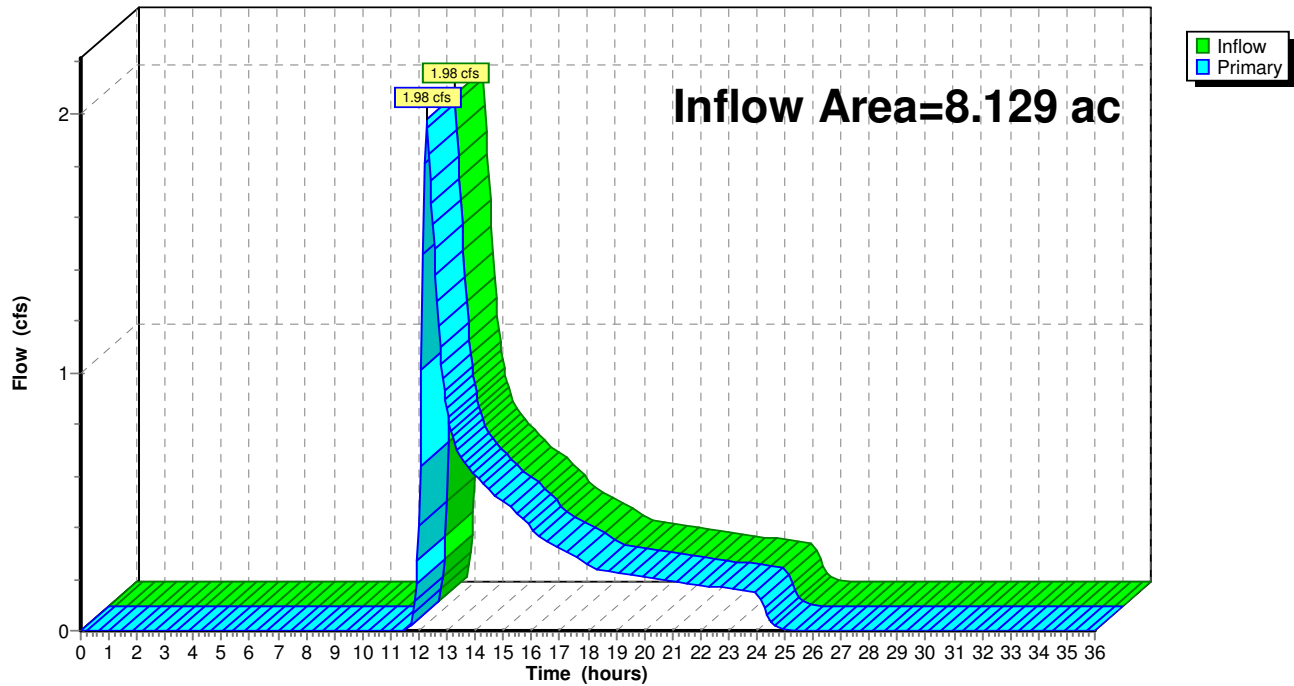
Existing Condition
Type III 24-hr 50-yr Rainfall=6.84"

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Link DP2: DP2

Hydrograph



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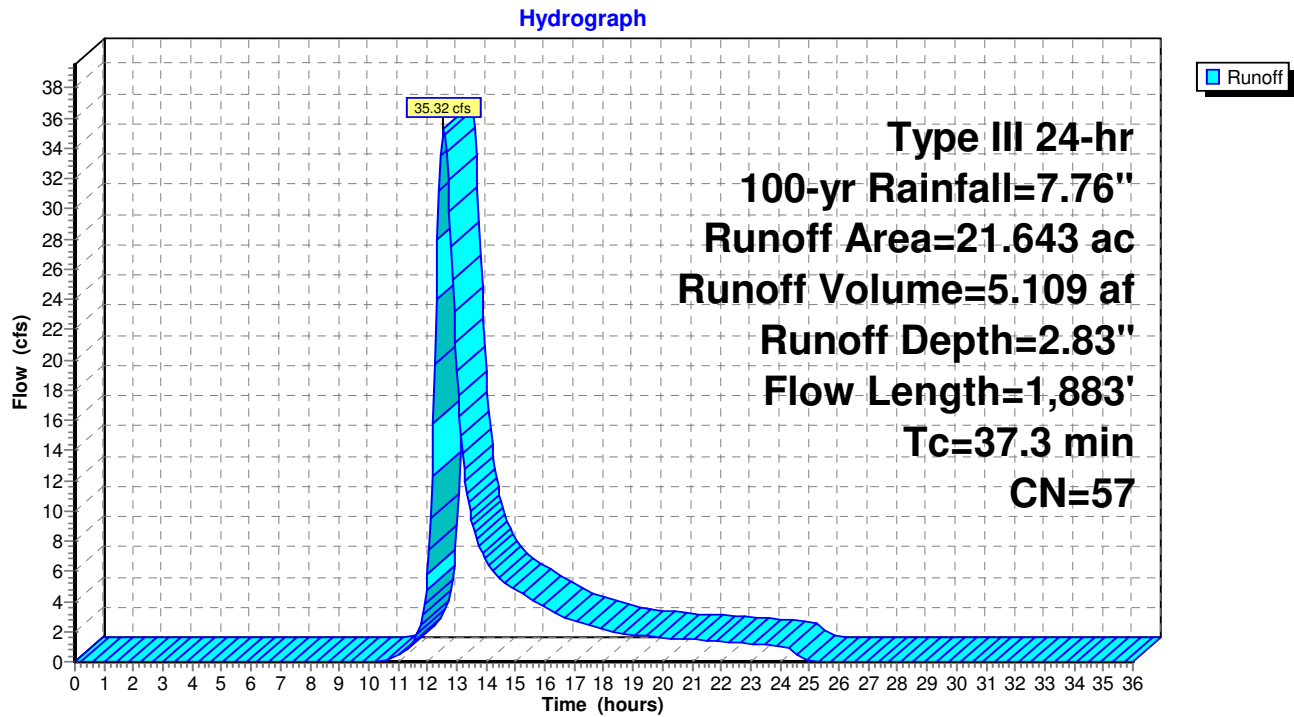
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Existing Condition
Type III 24-hr 100-yr Rainfall=7.76"

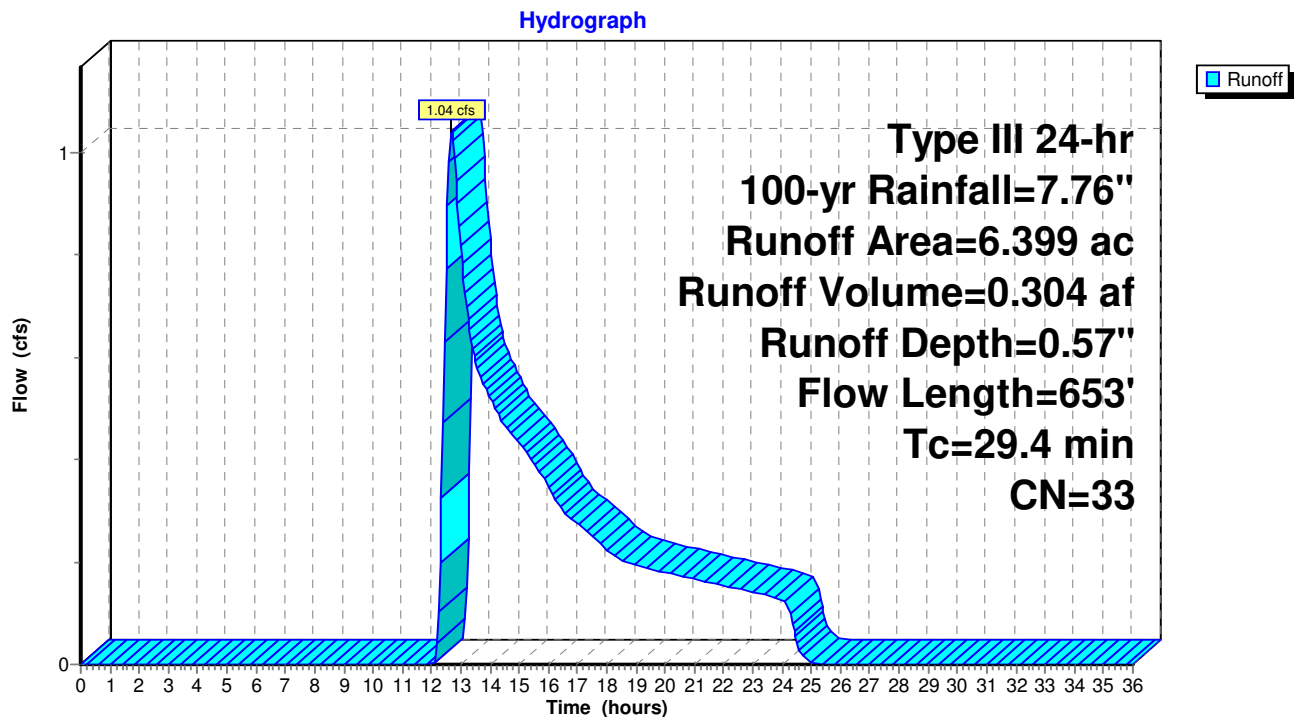
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Subcatchment E1: Existing Area 1 (DP1)



Subcatchment E2: Existing Area 2



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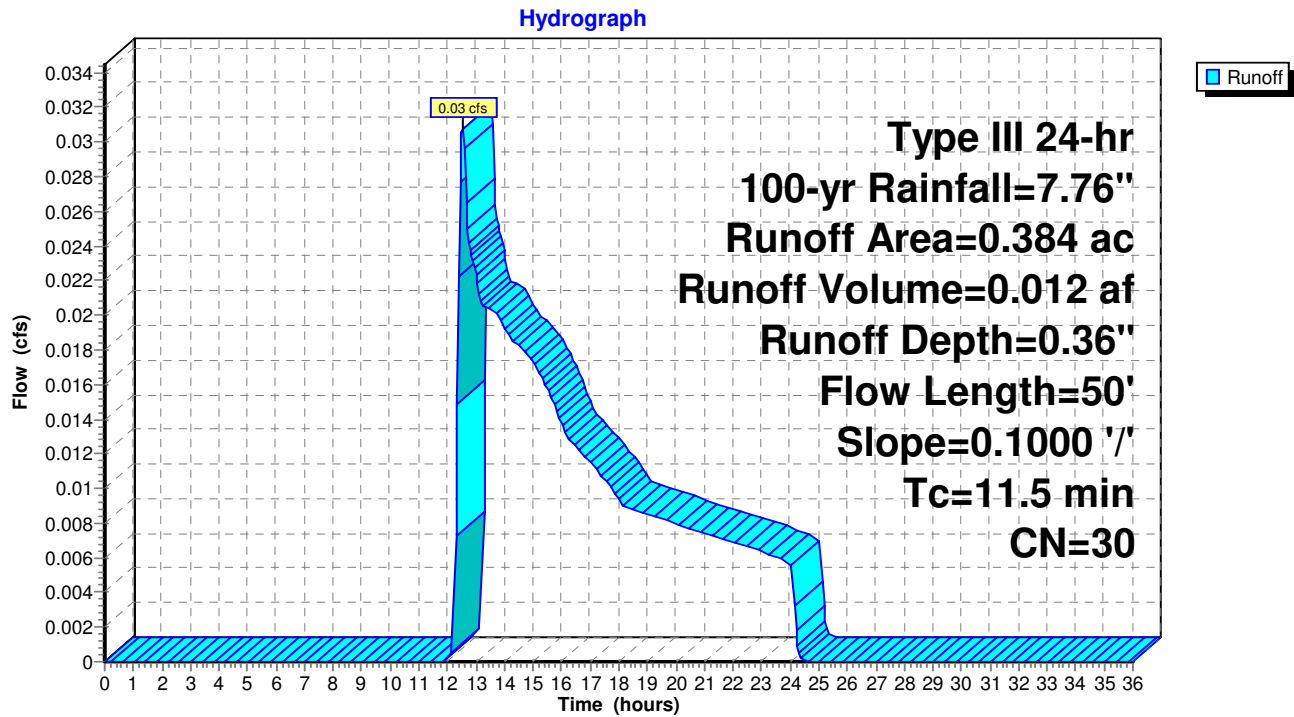
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Existing Condition
Type III 24-hr 100-yr Rainfall=7.76"

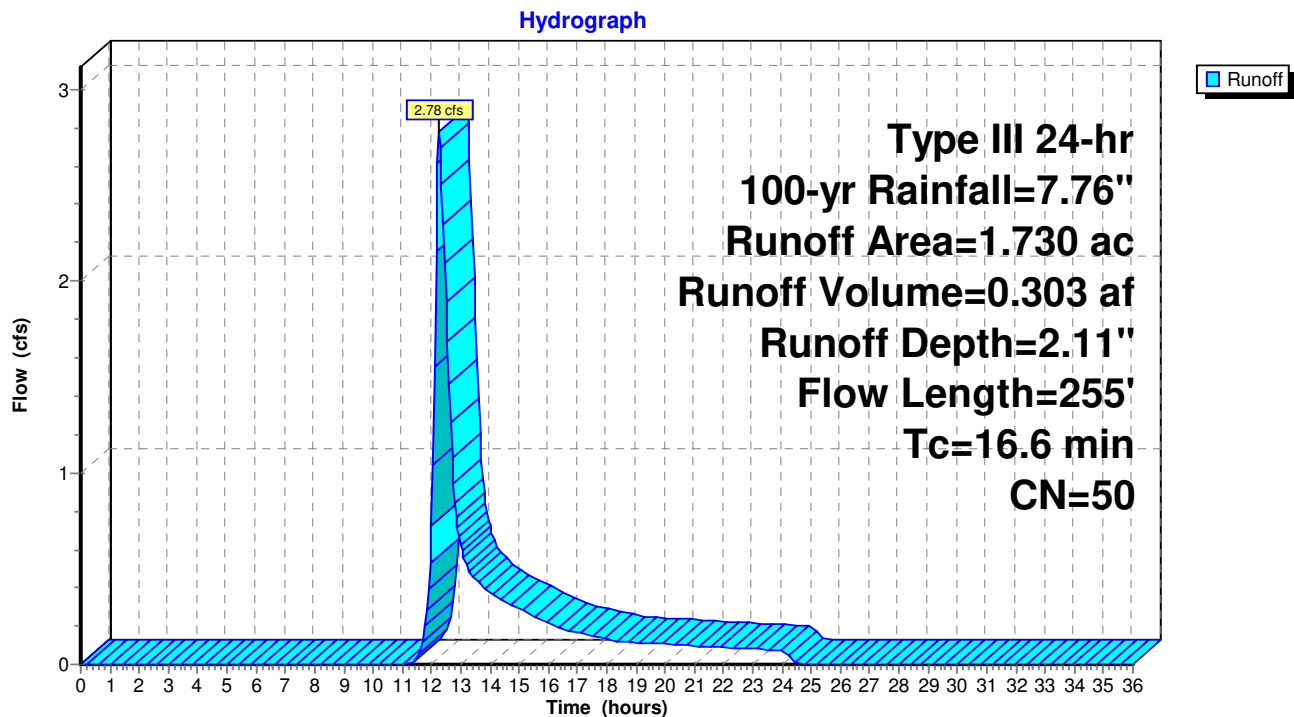
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Subcatchment E3: Existing Area 3 (DP3)



Subcatchment E4: Existing Area 4



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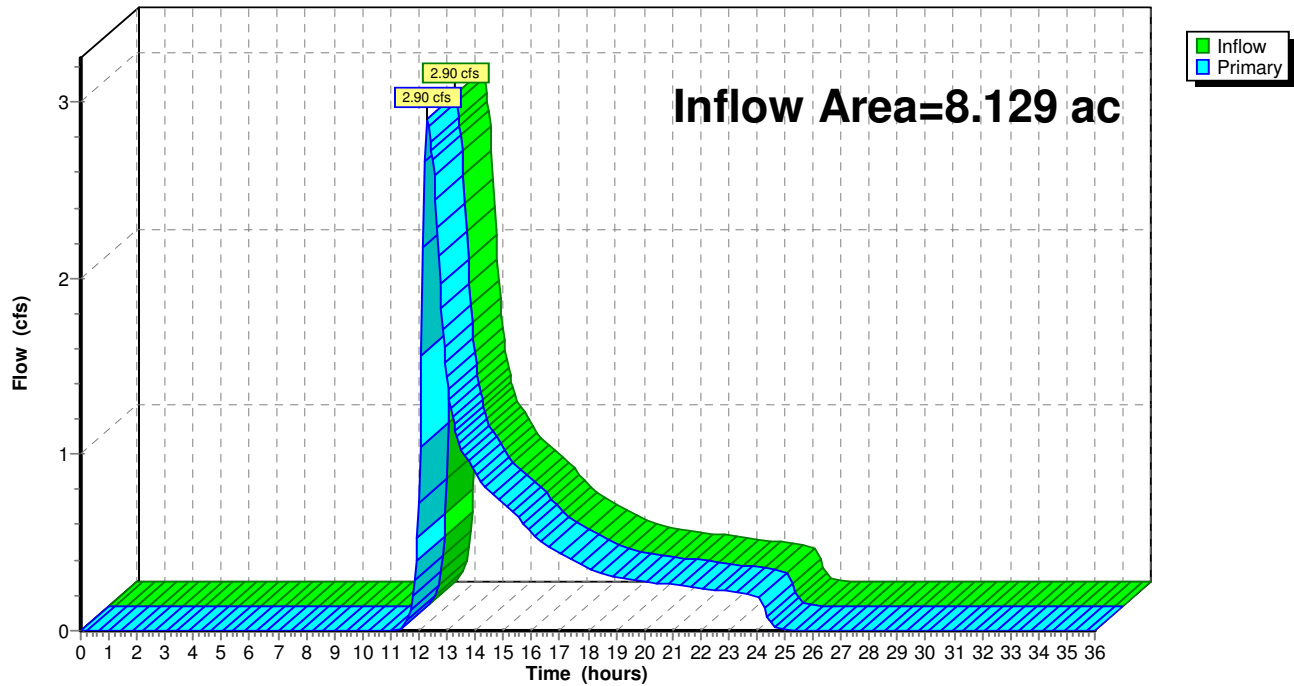
Existing Condition
Type III 24-hr 100-yr Rainfall=7.76"

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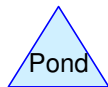
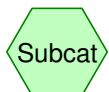
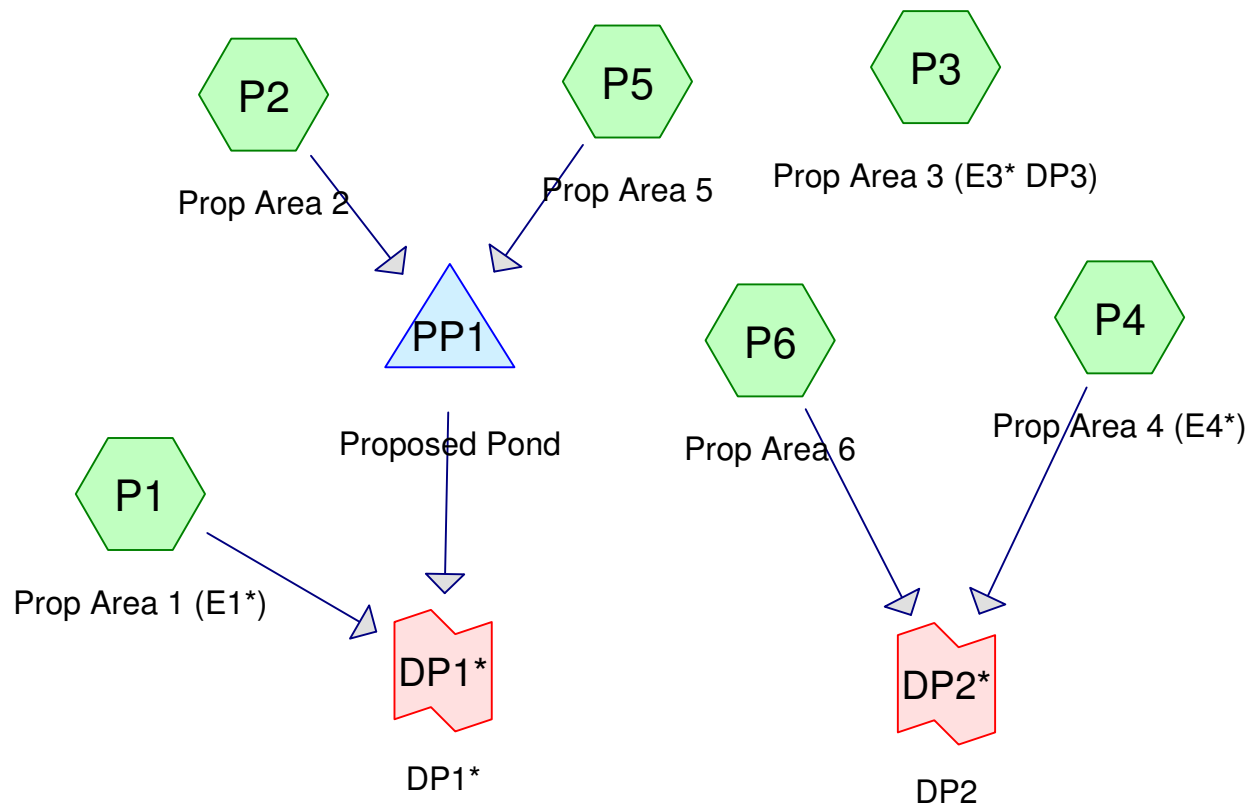
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Link DP2: DP2

Hydrograph



APPENDIX B
Watershed Computations
(Post-Development Drainage HydroCAD Report)



Routing Diagram for 4022 - HydroCAD

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Proposed Conditions

Type III 24-hr 2-yr Rainfall=3.09"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Prop Area 1 (E1*) Runoff Area=14.911 ac 13.83% Impervious Runoff Depth=0.27"
Flow Length=1,453' Tc=41.7 min CN=57 Runoff=1.17 cfs 0.340 af

Subcatchment P2: Prop Area 2 Runoff Area=10.967 ac 55.77% Impervious Runoff Depth=1.02"
Tc=8.0 min CN=75 Runoff=11.45 cfs 0.932 af

Subcatchment P3: Prop Area 3 (E3* DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment P4: Prop Area 4 (E4*) Runoff Area=1.718 ac 18.60% Impervious Runoff Depth=0.11"
Flow Length=255' Tc=16.6 min CN=50 Runoff=0.03 cfs 0.015 af

Subcatchment P5: Prop Area 5 Runoff Area=1.164 ac 54.98% Impervious Runoff Depth=0.81"
Tc=8.0 min CN=71 Runoff=0.90 cfs 0.079 af

Subcatchment P6: Prop Area 6 Runoff Area=1.000 ac 2.92% Impervious Runoff Depth=0.00"
Tc=20.0 min CN=36 Runoff=0.00 cfs 0.000 af

Pond PP1: Proposed Pond Peak Elev=89.13' Storage=30,762 cf Inflow=12.36 cfs 1.011 af
Outflow=0.56 cfs 0.421 af

Link DP1*: DP1* Inflow=1.17 cfs 0.762 af
Primary=1.17 cfs 0.762 af

Link DP2*: DP2 Inflow=0.03 cfs 0.015 af
Primary=0.03 cfs 0.015 af

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Type III 24-hr 10-yr Rainfall=4.89"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Prop Area 1 (E1*) Runoff Area=14.911 ac 13.83% Impervious Runoff Depth=1.05"
Flow Length=1,453' Tc=41.7 min CN=57 Runoff=7.40 cfs 1.300 af

Subcatchment P2: Prop Area 2 Runoff Area=10.967 ac 55.77% Impervious Runoff Depth=2.36"
Tc=8.0 min CN=75 Runoff=27.84 cfs 2.157 af

Subcatchment P3: Prop Area 3 (E3* DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment P4: Prop Area 4 (E4*) Runoff Area=1.718 ac 18.60% Impervious Runoff Depth=0.65"
Flow Length=255' Tc=16.6 min CN=50 Runoff=0.59 cfs 0.093 af

Subcatchment P5: Prop Area 5 Runoff Area=1.164 ac 54.98% Impervious Runoff Depth=2.03"
Tc=8.0 min CN=71 Runoff=2.51 cfs 0.197 af

Subcatchment P6: Prop Area 6 Runoff Area=1.000 ac 2.92% Impervious Runoff Depth=0.09"
Tc=20.0 min CN=36 Runoff=0.01 cfs 0.008 af

Pond PP1: Proposed Pond Peak Elev=90.36' Storage=50,289 cf Inflow=30.35 cfs 2.354 af
Outflow=3.71 cfs 1.763 af

Link DP1*: DP1* Inflow=11.05 cfs 3.063 af
Primary=11.05 cfs 3.063 af

Link DP2*: DP2 Inflow=0.59 cfs 0.101 af
Primary=0.59 cfs 0.101 af

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Proposed Conditions
Type III 24-hr 25-yr Rainfall=6.02"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Prop Area 1 (E1*) Runoff Area=14.911 ac 13.83% Impervious Runoff Depth=1.69"
Flow Length=1,453' Tc=41.7 min CN=57 Runoff=12.99 cfs 2.098 af

Subcatchment P2: Prop Area 2 Runoff Area=10.967 ac 55.77% Impervious Runoff Depth=3.30"
Tc=8.0 min CN=75 Runoff=39.09 cfs 3.015 af

Subcatchment P3: Prop Area 3 (E3* DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.07"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.00 cfs 0.002 af

Subcatchment P4: Prop Area 4 (E4*) Runoff Area=1.718 ac 18.60% Impervious Runoff Depth=1.15"
Flow Length=255' Tc=16.6 min CN=50 Runoff=1.31 cfs 0.165 af

Subcatchment P5: Prop Area 5 Runoff Area=1.164 ac 54.98% Impervious Runoff Depth=2.91"
Tc=8.0 min CN=71 Runoff=3.65 cfs 0.283 af

Subcatchment P6: Prop Area 6 Runoff Area=1.000 ac 2.92% Impervious Runoff Depth=0.30"
Tc=20.0 min CN=36 Runoff=0.06 cfs 0.025 af

Pond PP1: Proposed Pond Peak Elev=91.32' Storage=72,009 cf Inflow=42.73 cfs 3.298 af
Outflow=5.11 cfs 2.706 af

Link DP1*: DP1* Inflow=18.05 cfs 4.804 af
Primary=18.05 cfs 4.804 af

Link DP2*: DP2 Inflow=1.32 cfs 0.190 af
Primary=1.32 cfs 0.190 af

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Proposed Conditions
Type III 24-hr 50-yr Rainfall=6.84"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Prop Area 1 (E1*) Runoff Area=14.911 ac 13.83% Impervious Runoff Depth=2.21"
Flow Length=1,453' Tc=41.7 min CN=57 Runoff=17.53 cfs 2.743 af

Subcatchment P2: Prop Area 2 Runoff Area=10.967 ac 55.77% Impervious Runoff Depth=4.01"
Tc=8.0 min CN=75 Runoff=47.47 cfs 3.664 af

Subcatchment P3: Prop Area 3 (E3* DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.19"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.01 cfs 0.006 af

Subcatchment P4: Prop Area 4 (E4*) Runoff Area=1.718 ac 18.60% Impervious Runoff Depth=1.58"
Flow Length=255' Tc=16.6 min CN=50 Runoff=1.96 cfs 0.226 af

Subcatchment P5: Prop Area 5 Runoff Area=1.164 ac 54.98% Impervious Runoff Depth=3.59"
Tc=8.0 min CN=71 Runoff=4.51 cfs 0.348 af

Subcatchment P6: Prop Area 6 Runoff Area=1.000 ac 2.92% Impervious Runoff Depth=0.51"
Tc=20.0 min CN=36 Runoff=0.17 cfs 0.043 af

Pond PP1: Proposed Pond Peak Elev=92.04' Storage=89,491 cf Inflow=51.98 cfs 4.012 af
Outflow=5.95 cfs 3.419 af

Link DP1*: DP1* Inflow=23.41 cfs 6.162 af
Primary=23.41 cfs 6.162 af

Link DP2*: DP2 Inflow=2.01 cfs 0.269 af
Primary=2.01 cfs 0.269 af

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Type III 24-hr 100-yr Rainfall=7.76"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Prop Area 1 (E1*) Runoff Area=14.911 ac 13.83% Impervious Runoff Depth=2.83"
Flow Length=1,453' Tc=41.7 min CN=57 Runoff=22.97 cfs 3.520 af

Subcatchment P2: Prop Area 2 Runoff Area=10.967 ac 55.77% Impervious Runoff Depth=4.83"
Tc=8.0 min CN=75 Runoff=57.02 cfs 4.410 af

Subcatchment P3: Prop Area 3 (E3* DP3) Runoff Area=0.384 ac 0.00% Impervious Runoff Depth=0.36"
Flow Length=50' Slope=0.1000 '/' Tc=11.5 min CN=30 Runoff=0.03 cfs 0.012 af

Subcatchment P4: Prop Area 4 (E4*) Runoff Area=1.718 ac 18.60% Impervious Runoff Depth=2.11"
Flow Length=255' Tc=16.6 min CN=50 Runoff=2.76 cfs 0.301 af

Subcatchment P5: Prop Area 5 Runoff Area=1.164 ac 54.98% Impervious Runoff Depth=4.37"
Tc=8.0 min CN=71 Runoff=5.50 cfs 0.424 af

Subcatchment P6: Prop Area 6 Runoff Area=1.000 ac 2.92% Impervious Runoff Depth=0.80"
Tc=20.0 min CN=36 Runoff=0.34 cfs 0.067 af

Pond PP1: Proposed Pond Peak Elev=92.83' Storage=110,104 cf Inflow=62.51 cfs 4.834 af
Outflow=6.74 cfs 4.241 af

Link DP1*: DP1* Inflow=29.63 cfs 7.761 af
Primary=29.63 cfs 7.761 af

Link DP2*: DP2 Inflow=2.97 cfs 0.368 af
Primary=2.97 cfs 0.368 af

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Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment P1: Prop Area 1 (E1*)

Runoff = 1.17 cfs @ 12.84 hrs, Volume= 0.340 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
2.233	39	>75% Grass cover, Good, HSG A
7.056	61	>75% Grass cover, Good, HSG B
0.215	74	>75% Grass cover, Good, HSG C
* 1.734	98	IMPERVIOUS
1.639	51	1 acre lots, 20% imp, HSG A
2.034	30	Woods, Good, HSG A
14.911	57	Weighted Average
12.849		86.17% Pervious Area
2.062		13.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.1000	0.08		Sheet Flow, WOODLAND SF
					Woods: Dense underbrush n= 0.800 P2= 3.09"
9.8	525	0.0320	0.89		Shallow Concentrated Flow, WOODLAND SCF
					Woodland Kv= 5.0 fps
2.0	127	0.0236	1.08		Shallow Concentrated Flow, GRASS SCF
					Short Grass Pasture Kv= 7.0 fps
3.4	307	0.0900	1.50		Shallow Concentrated Flow, WOODLAND SCF
					Woodland Kv= 5.0 fps
1.9	153	0.0380	1.36		Shallow Concentrated Flow, GRASS SCF
					Short Grass Pasture Kv= 7.0 fps
2.3	137	0.0380	0.97		Shallow Concentrated Flow, WOODLAND SCF
					Woodland Kv= 5.0 fps
1.3	104	0.0380	1.36		Shallow Concentrated Flow, GRASS SCF
					Short Grass Pasture Kv= 7.0 fps
1.0					Direct Entry, Exist pipe
41.7	1,453	Total			

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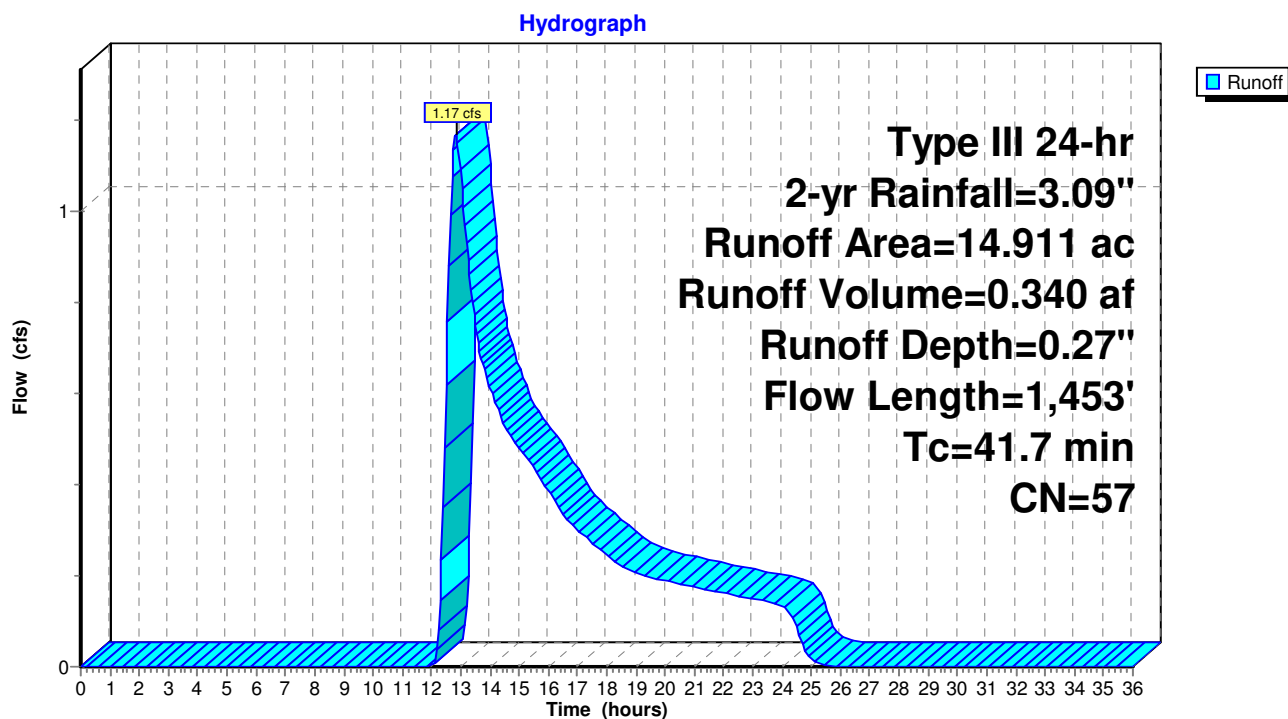
Proposed Conditions

Type III 24-hr 2-yr Rainfall=3.09"

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Subcatchment P1: Prop Area 1 (E1*)



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Summary for Subcatchment P2: Prop Area 2

Runoff = 11.45 cfs @ 12.12 hrs, Volume= 0.932 af, Depth= 1.02"

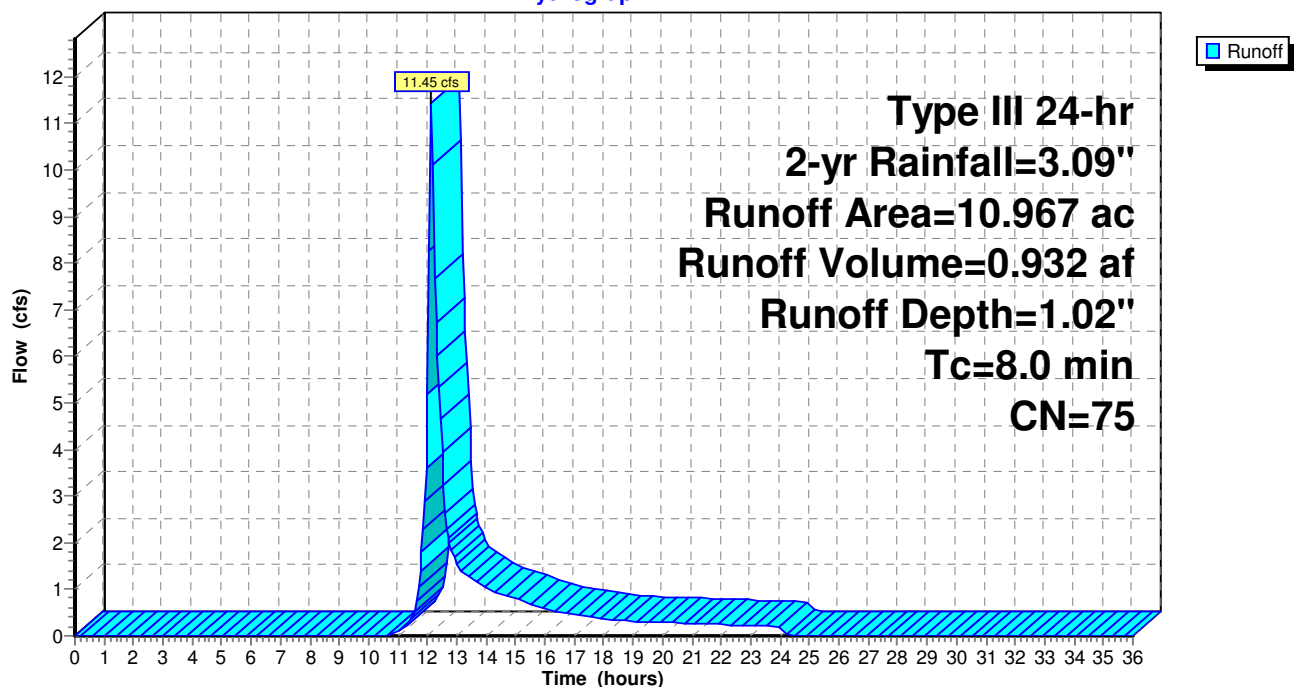
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
2.637	39	>75% Grass cover, Good, HSG A
1.179	61	>75% Grass cover, Good, HSG B
0.225	74	>75% Grass cover, Good, HSG C
* 6.033	98	IMPERVIOUS
0.418	51	1 acre lots, 20% imp, HSG A
0.475	30	Woods, Good, HSG A
10.967	75	Weighted Average
4.850		44.23% Pervious Area
6.117		55.77% Impervious Area

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

Subcatchment P2: Prop Area 2

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment P3: Prop Area 3 (E3* DP3)

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

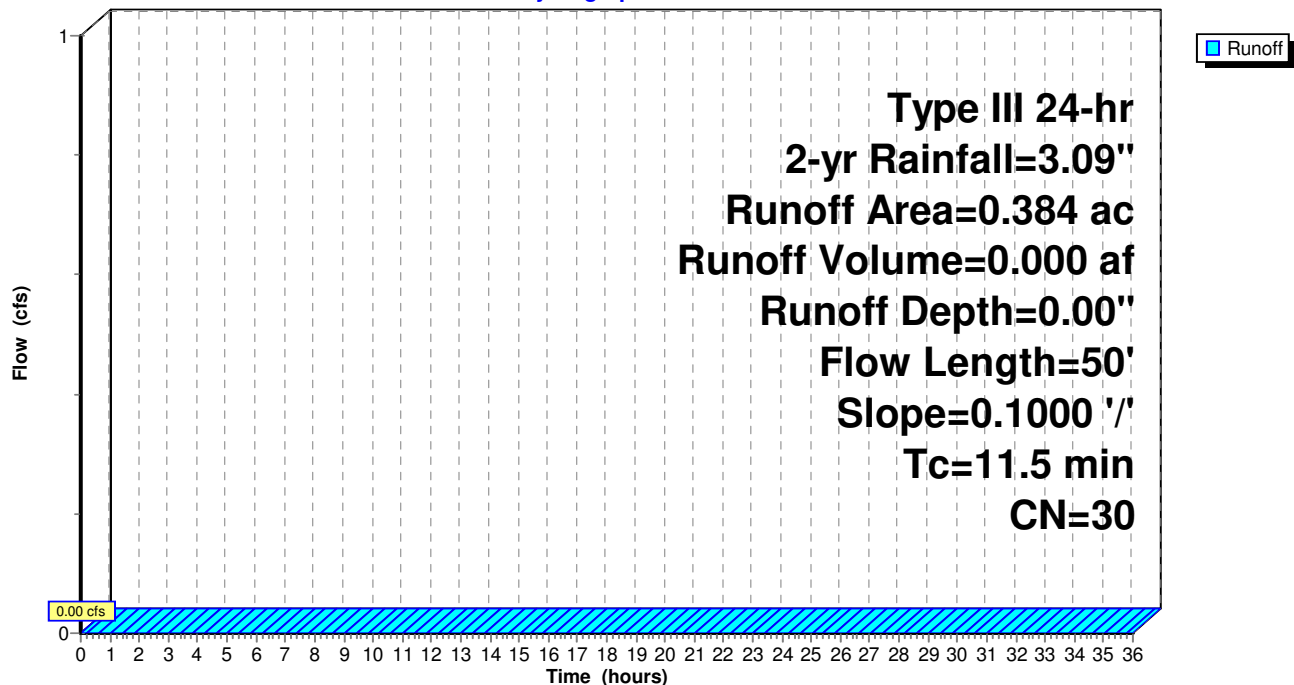
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.384	30	Woods, Good, HSG A
0.384		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.1000	0.07		Sheet Flow, WOODLAND SF Woods: Dense underbrush n= 0.800 P2= 3.09"

Subcatchment P3: Prop Area 3 (E3* DP3)

Hydrograph



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Proposed Conditions

Type III 24-hr 2-yr Rainfall=3.09"

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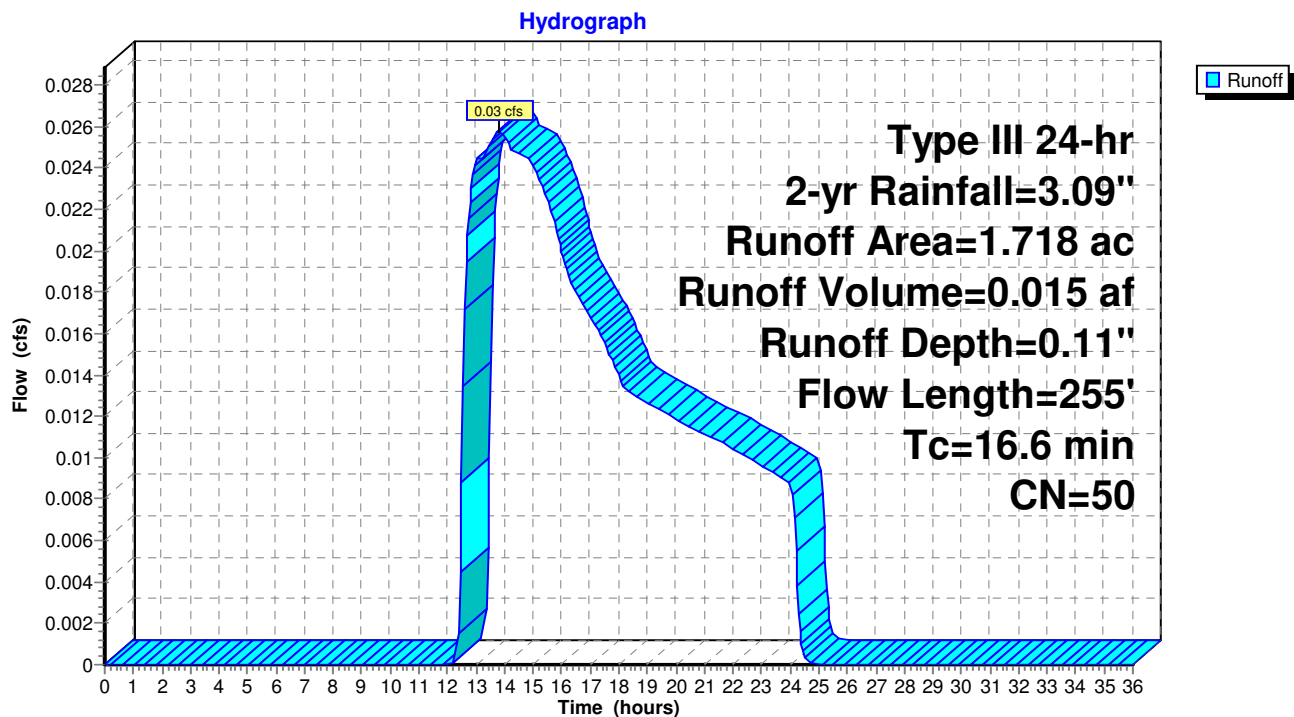
Summary for Subcatchment P4: Prop Area 4 (E4*)

Runoff = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.026	39	>75% Grass cover, Good, HSG A
1.598	51	1 acre lots, 20% imp, HSG A
0.094	30	Woods, Good, HSG A
1.718	50	Weighted Average
1.398		81.40% Pervious Area
0.320		18.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	100	0.0530	0.11		Sheet Flow, WOODLAND SF
					Woods: Light underbrush n= 0.400 P2= 3.09"
1.8	155	0.0430	1.45		Shallow Concentrated Flow, GRASS SCF
					Short Grass Pasture Kv= 7.0 fps
16.6	255	Total			

Subcatchment P4: Prop Area 4 (E4*)

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Summary for Subcatchment P5: Prop Area 5

Runoff = 0.90 cfs @ 12.13 hrs, Volume= 0.079 af, Depth= 0.81"

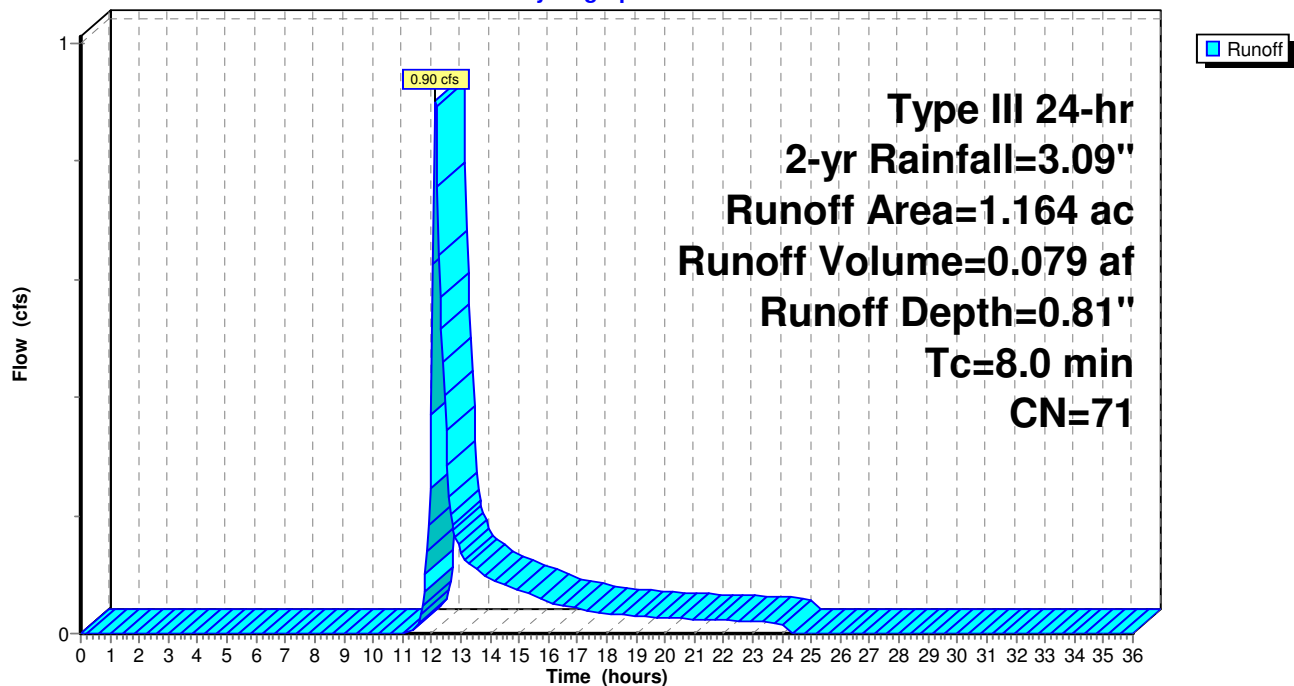
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.518	39	>75% Grass cover, Good, HSG A
* 0.640	98	IMPERVIOUS
0.006	30	Woods, Good, HSG A
1.164	71	Weighted Average
0.524		45.02% Pervious Area
0.640		54.98% Impervious Area

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

Subcatchment P5: Prop Area 5

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Subcatchment P6: Prop Area 6

[45] Hint: Runoff=Zero

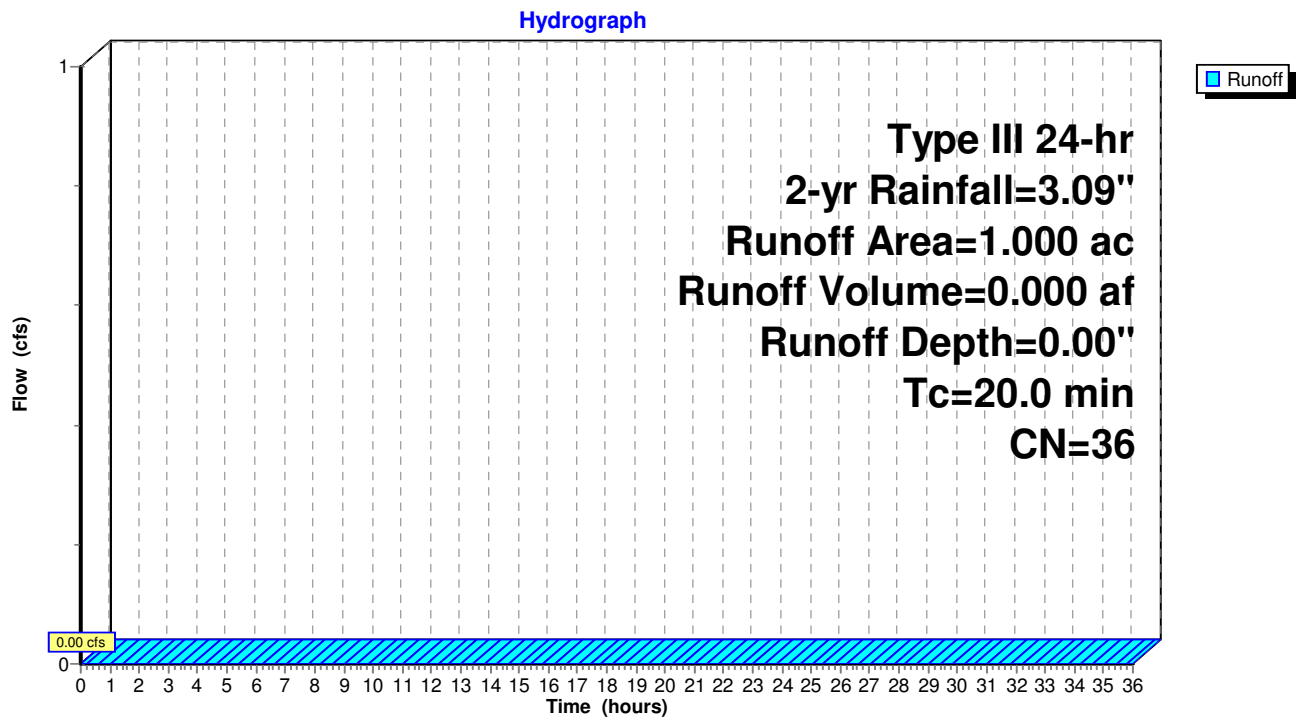
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.09"

Area (ac)	CN	Description
0.429	39	>75% Grass cover, Good, HSG A
* 0.025	98	IMPERVIOUS
0.021	51	1 acre lots, 20% imp, HSG A
0.525	30	Woods, Good, HSG A
1.000	36	Weighted Average
0.971		97.08% Pervious Area
0.029		2.92% Impervious Area

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

Subcatchment P6: Prop Area 6



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Proposed Conditions
Type III 24-hr 2-yr Rainfall=3.09"

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Summary for Pond PP1: Proposed Pond

Mitigation above 10-yr Elevation

Inflow Area = 12.131 ac, 55.70% Impervious, Inflow Depth = 1.00" for 2-yr event
 Inflow = 12.36 cfs @ 12.12 hrs, Volume= 1.011 af
 Outflow = 0.56 cfs @ 16.49 hrs, Volume= 0.421 af, Atten= 95%, Lag= 261.8 min
 Primary = 0.56 cfs @ 16.49 hrs, Volume= 0.421 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.13' @ 16.49 hrs Surf.Area= 11,240 sf Storage= 30,762 cf

Plug-Flow detention time= 463.3 min calculated for 0.421 af (42% of inflow)
 Center-of-Mass det. time= 328.2 min (1,192.1 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	216,588 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	6,448	0	0
86.00	6,949	3,349	3,349
87.00	7,960	7,455	10,804
88.00	9,056	8,508	19,312
89.00	10,200	9,628	28,940
90.00	18,339	14,270	43,209
90.50	21,345	9,921	53,130
91.00	22,861	11,052	64,182
92.00	25,401	24,131	88,313
92.90	27,176	23,660	111,972
93.00	30,417	2,880	114,852
94.00	32,531	31,474	146,326
95.00	34,751	33,641	179,967
96.00	38,490	36,621	216,588

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	15.0" Round Culvert L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 81.00' S= 0.0050 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.00'	10.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	88.60'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.56 cfs @ 16.49 hrs HW=89.13' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.56 cfs of 10.40 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.06 cfs @ 1.22 fps)
 3=Orifice/Grate (Orifice Controls 0.50 cfs @ 2.54 fps)

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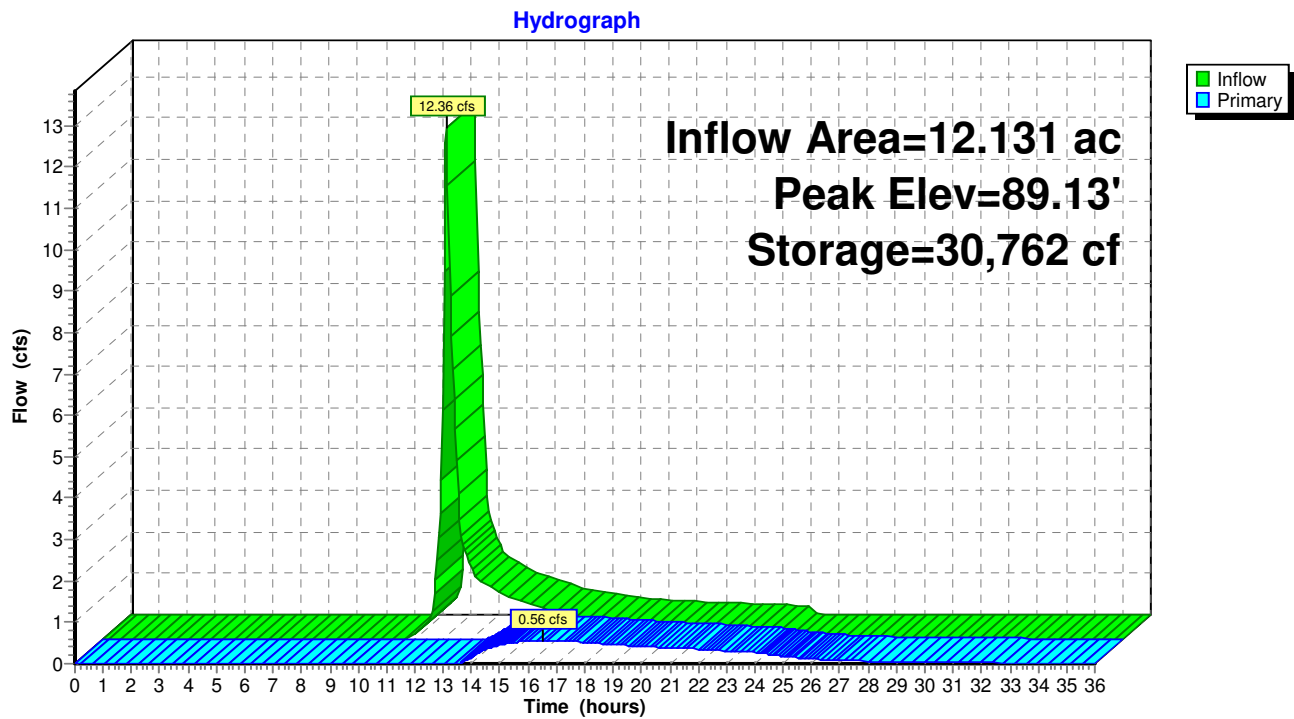
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Proposed Conditions
Type III 24-hr 2-yr Rainfall=3.09"

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Pond PP1: Proposed Pond



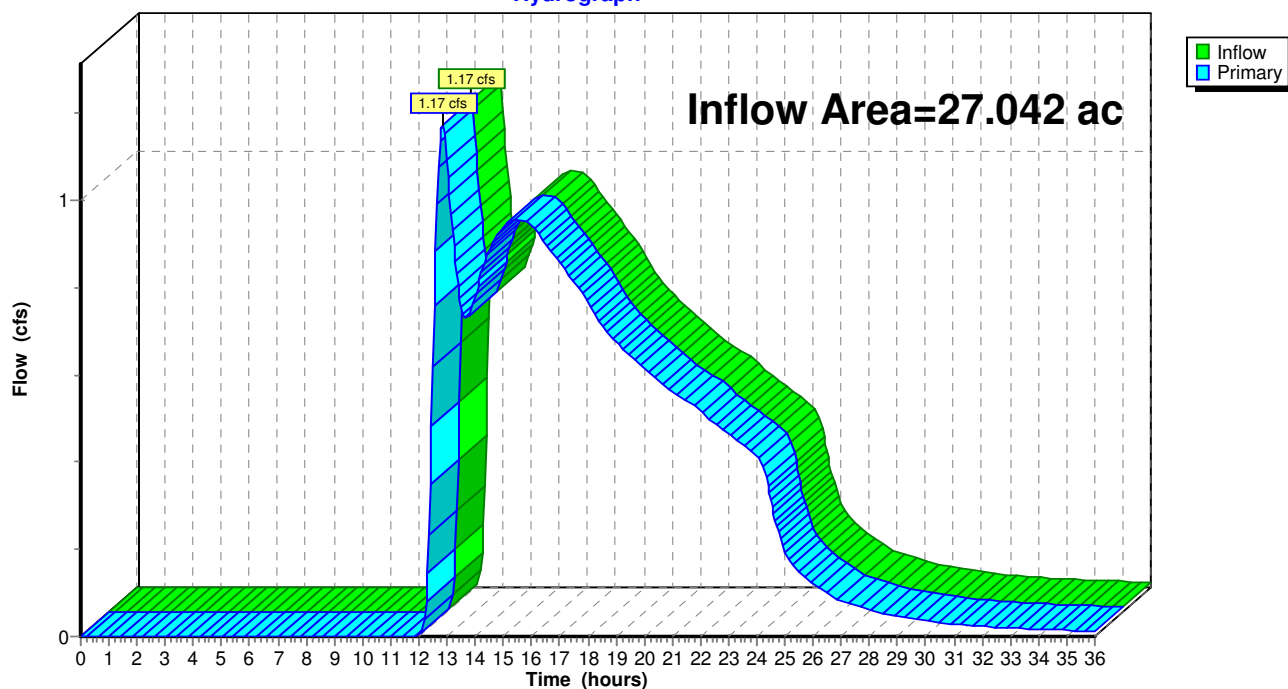
Summary for Link DP1*: DP1*

Inflow Area = 27.042 ac, 32.61% Impervious, Inflow Depth > 0.34" for 2-yr event
Inflow = 1.17 cfs @ 12.84 hrs, Volume= 0.762 af
Primary = 1.17 cfs @ 12.84 hrs, Volume= 0.762 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link DP1*: DP1*

Hydrograph



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Proposed Conditions
Type III 24-hr 2-yr Rainfall=3.09"

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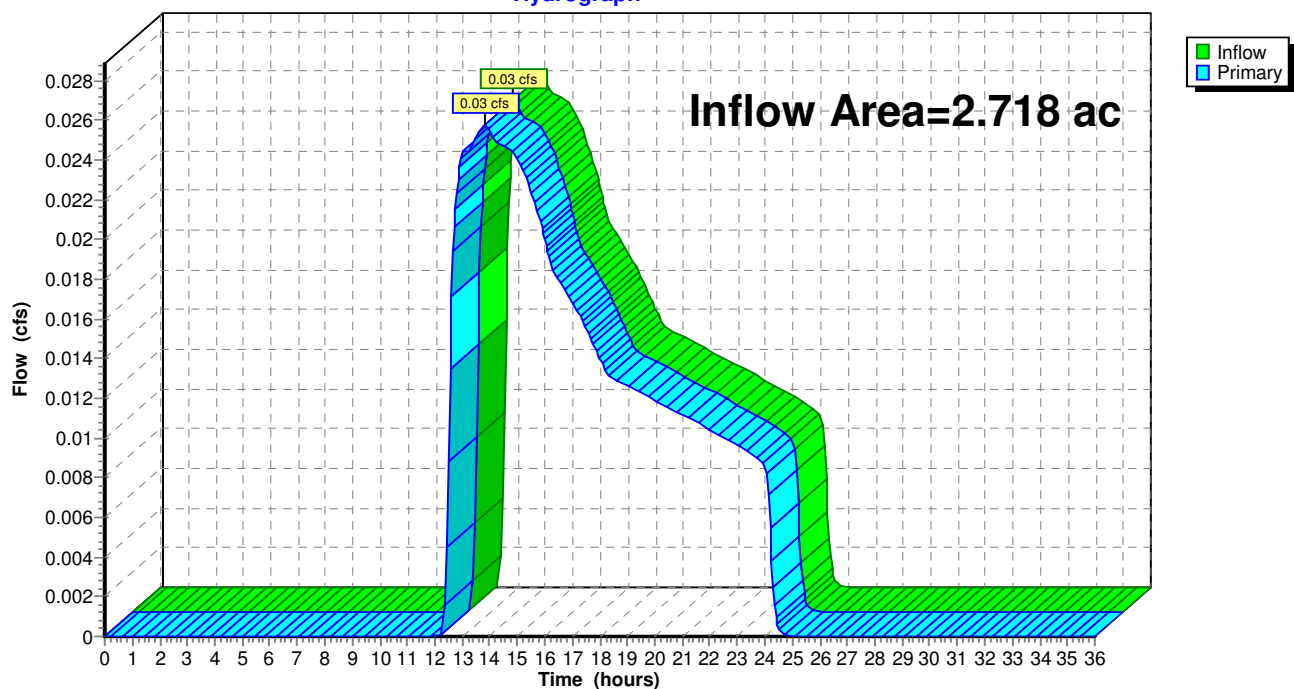
Summary for Link DP2*: DP2

Inflow Area = 2.718 ac, 12.83% Impervious, Inflow Depth = 0.07" for 2-yr event
Inflow = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af
Primary = 0.03 cfs @ 13.81 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link DP2*: DP2

Hydrograph



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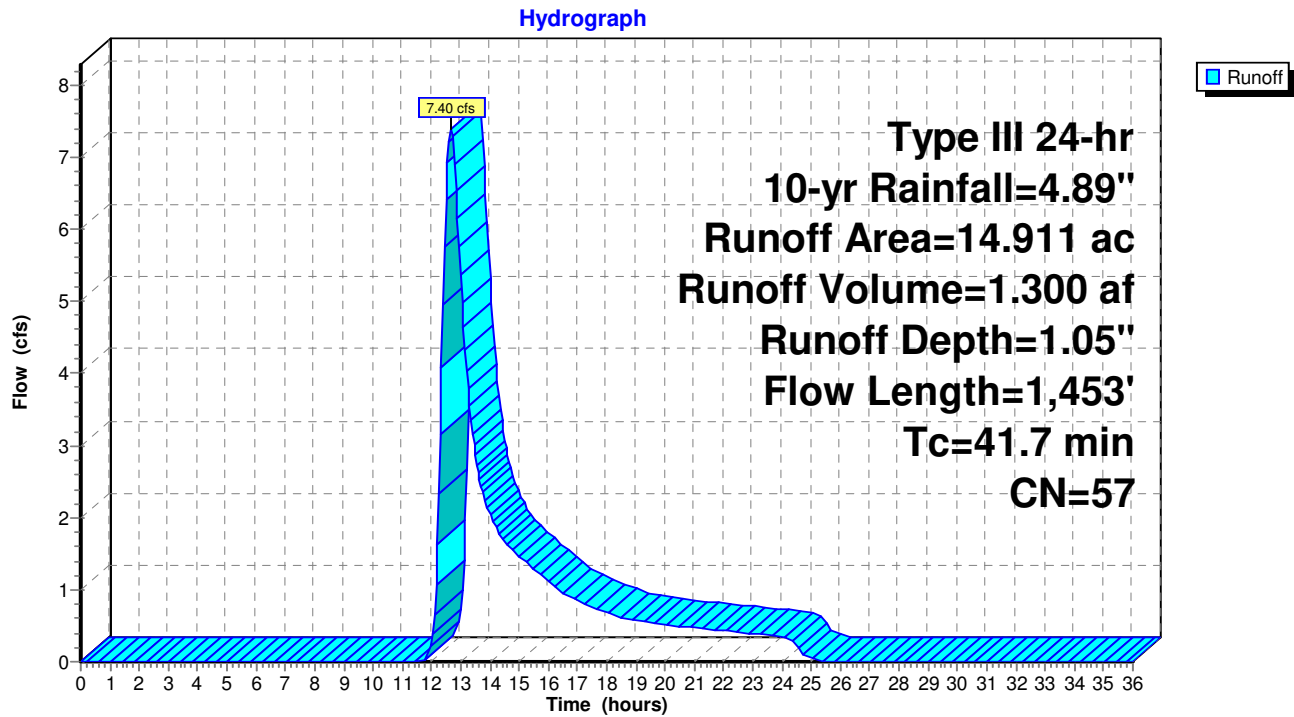
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Proposed Conditions
Type III 24-hr 10-yr Rainfall=4.89"

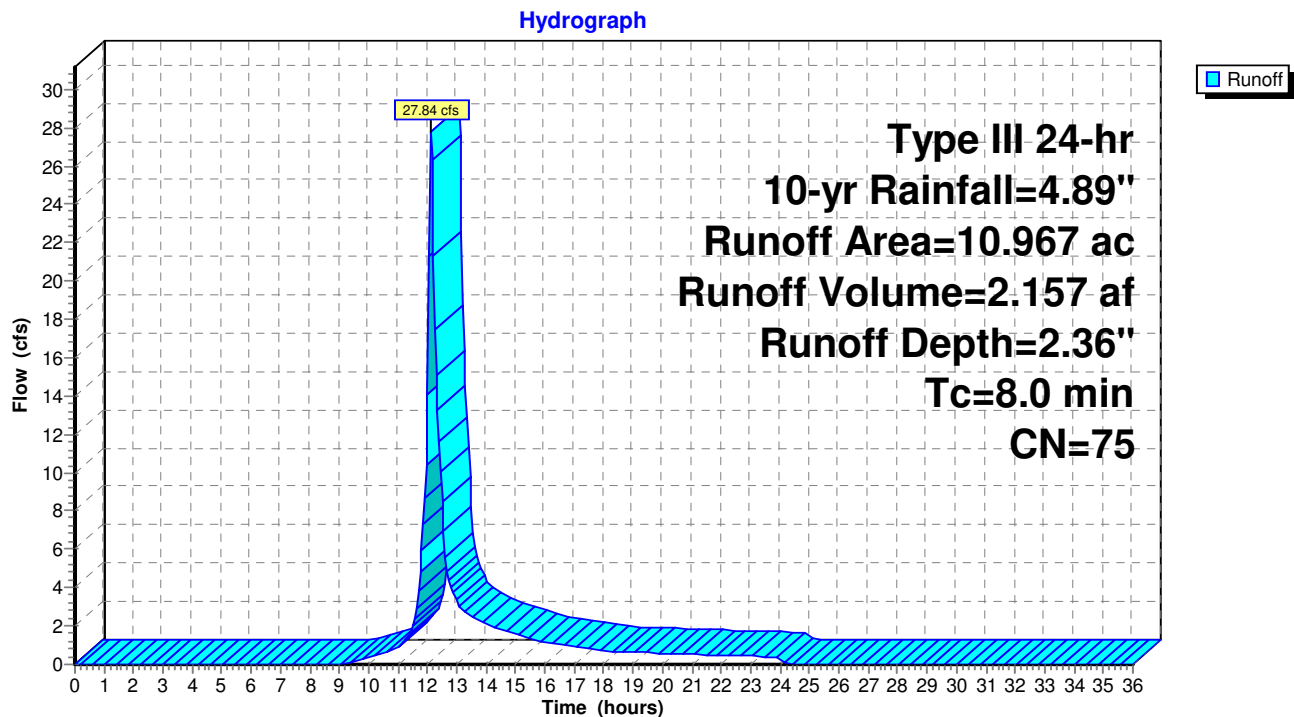
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Subcatchment P1: Prop Area 1 (E1*)



Subcatchment P2: Prop Area 2



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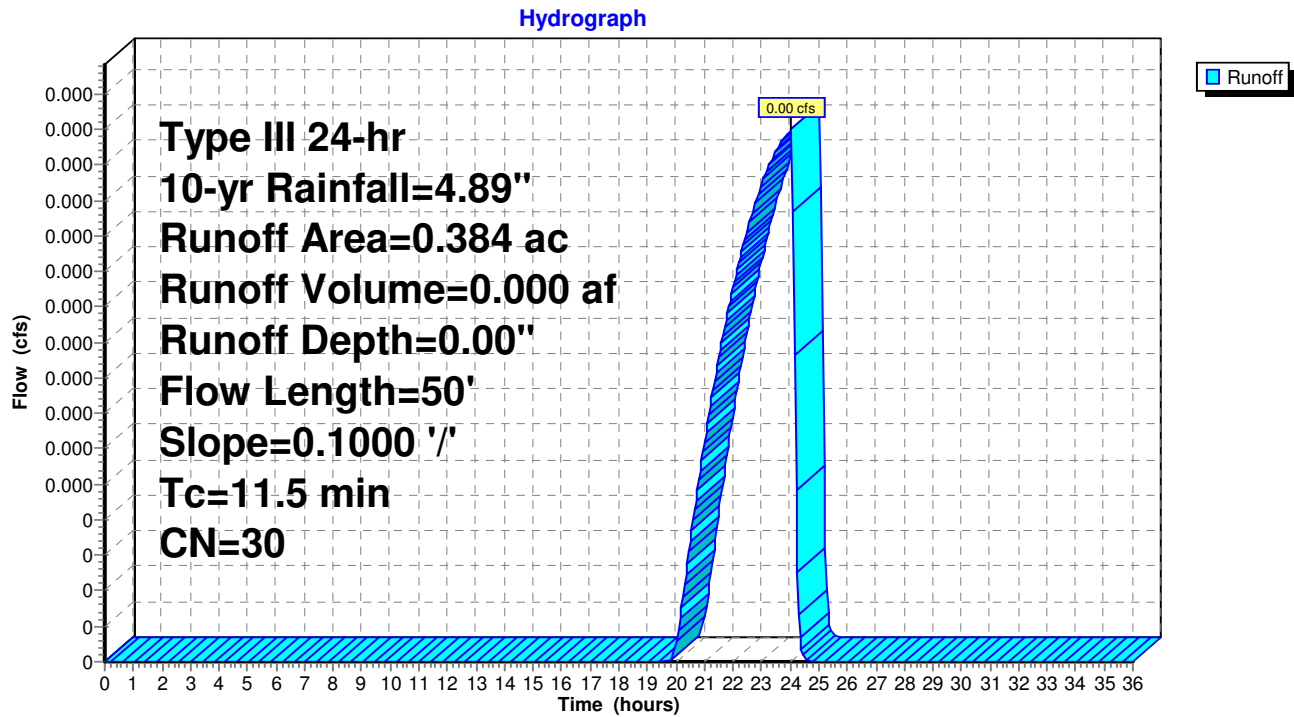
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Type III 24-hr 10-yr Rainfall=4.89"

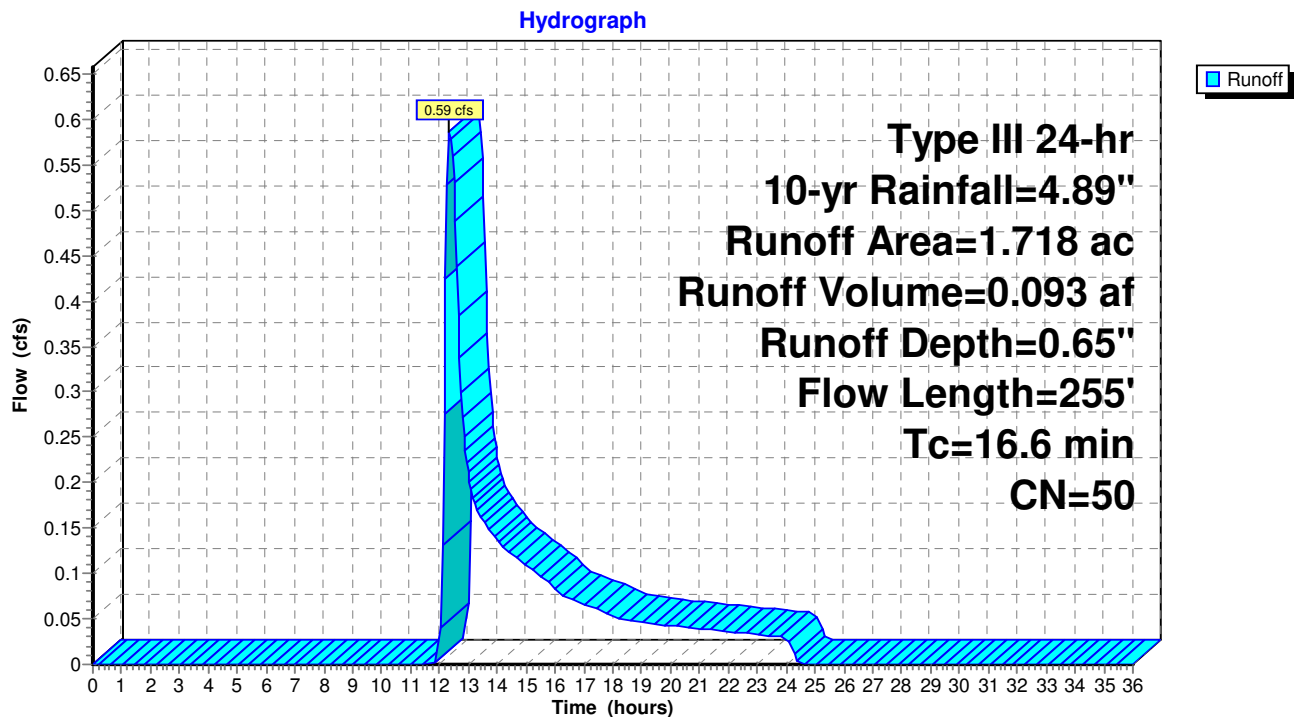
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Subcatchment P3: Prop Area 3 (E3* DP3)



Subcatchment P4: Prop Area 4 (E4*)



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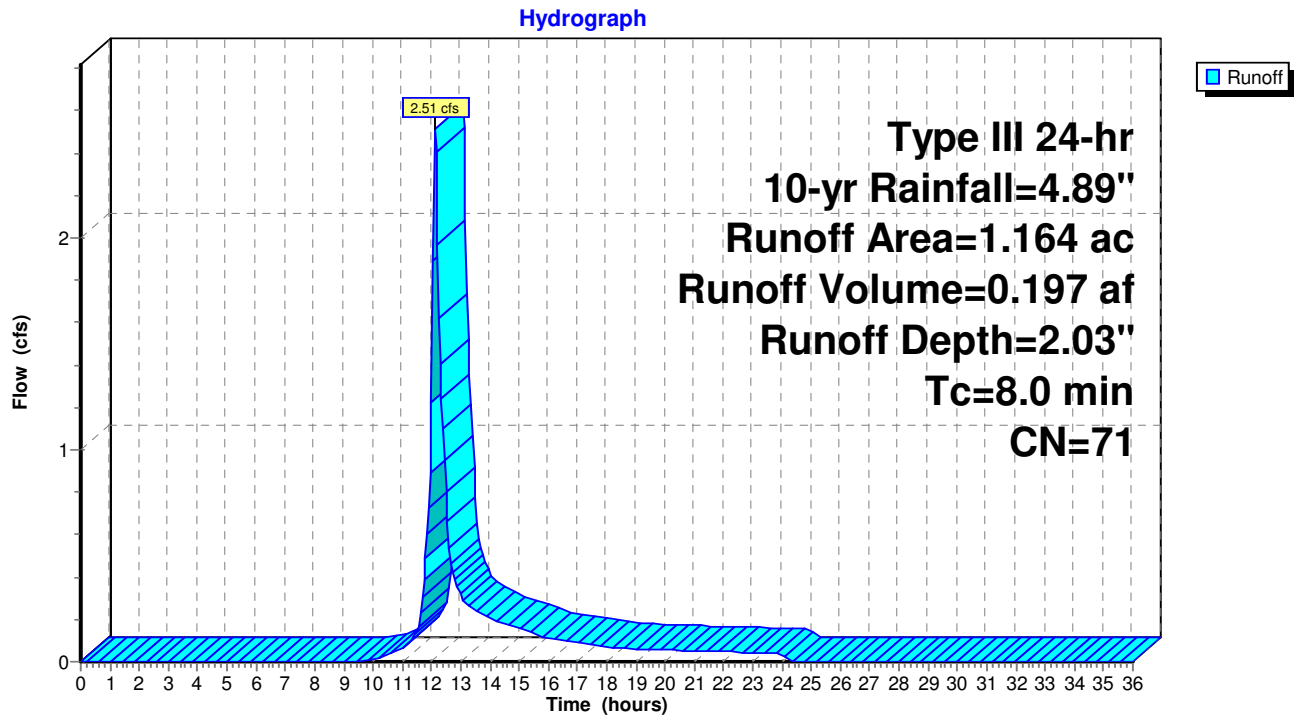
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Proposed Conditions
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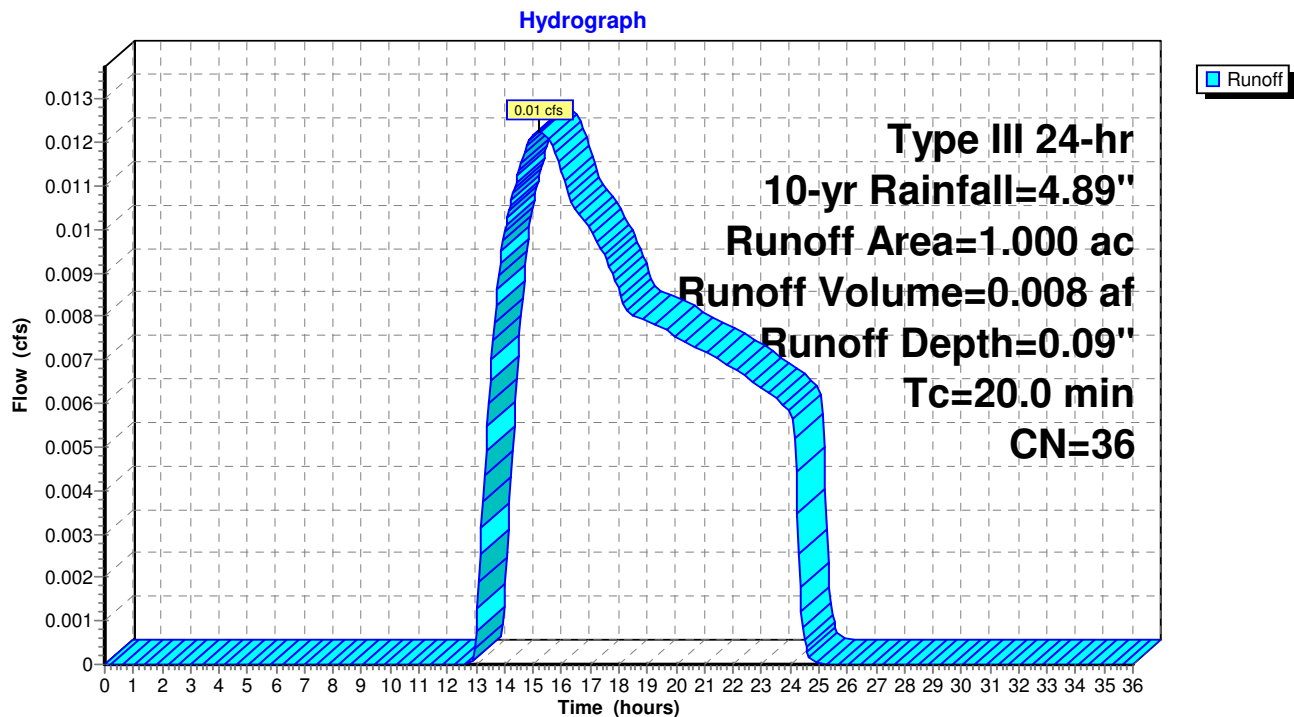
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Subcatchment P5: Prop Area 5



Subcatchment P6: Prop Area 6



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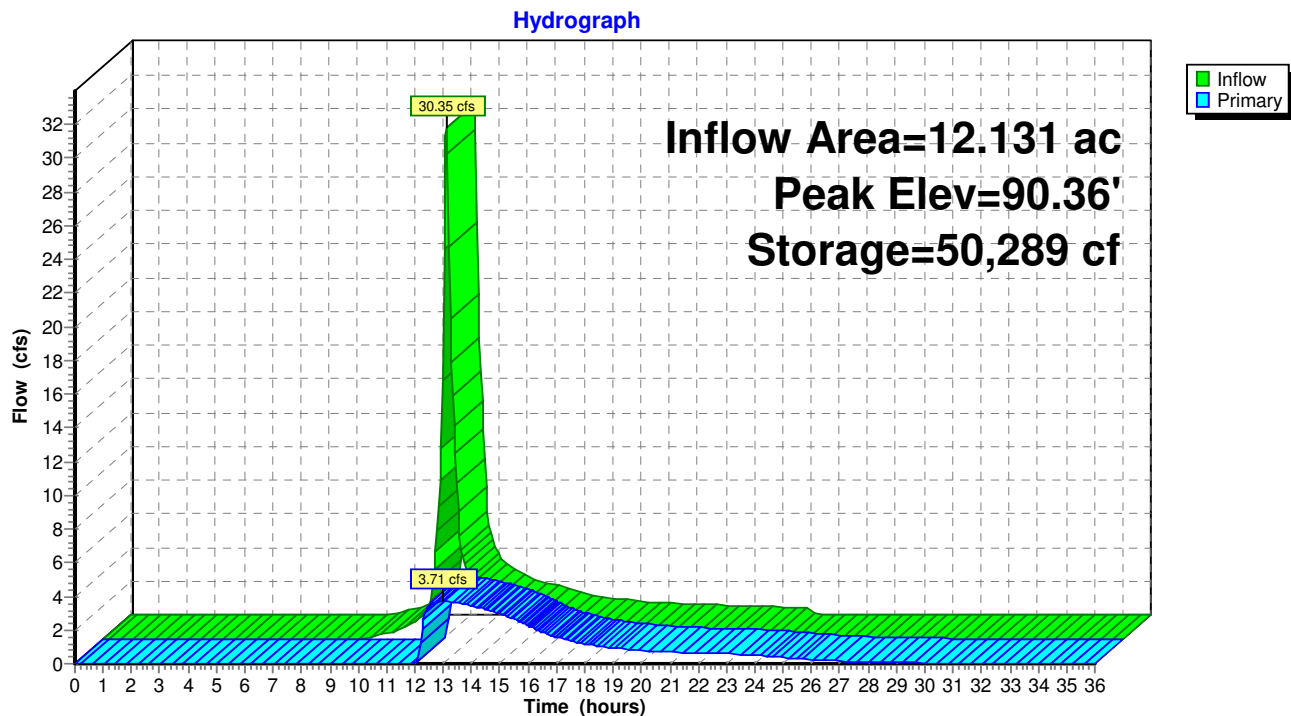
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Type III 24-hr 10-yr Rainfall=4.89"

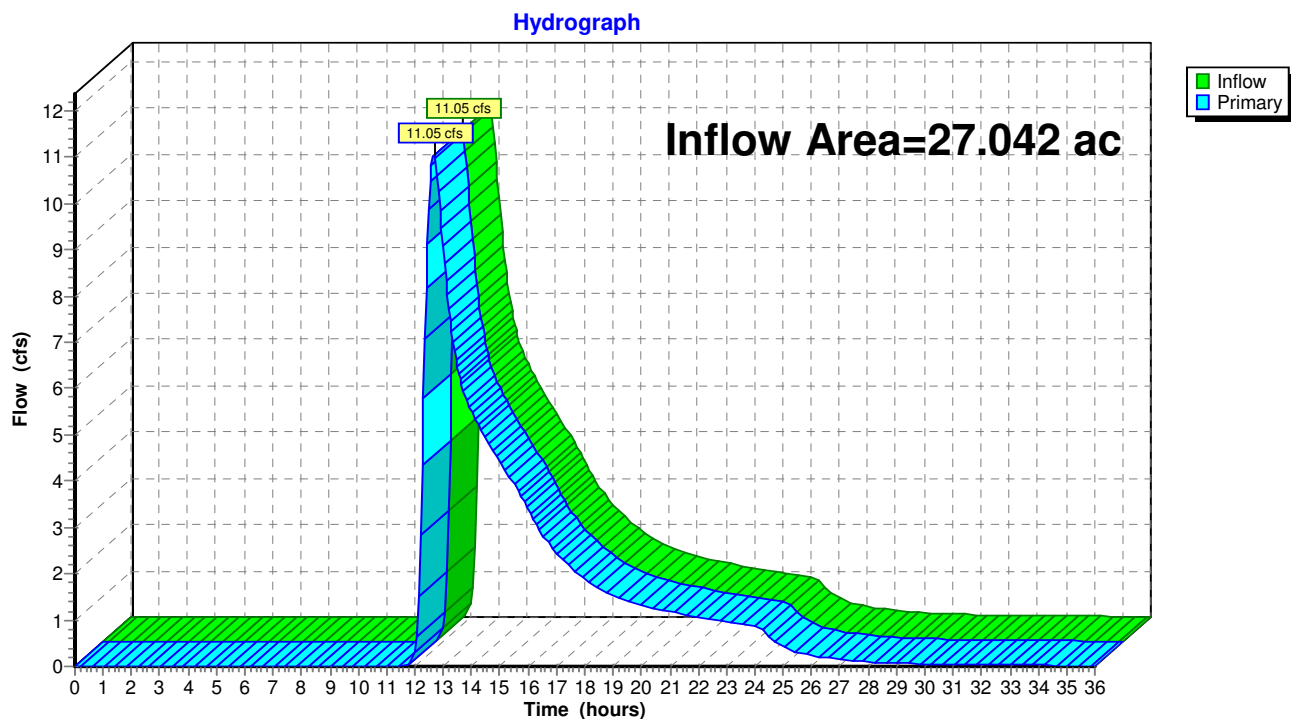
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Pond PP1: Proposed Pond



Link DP1*: DP1*



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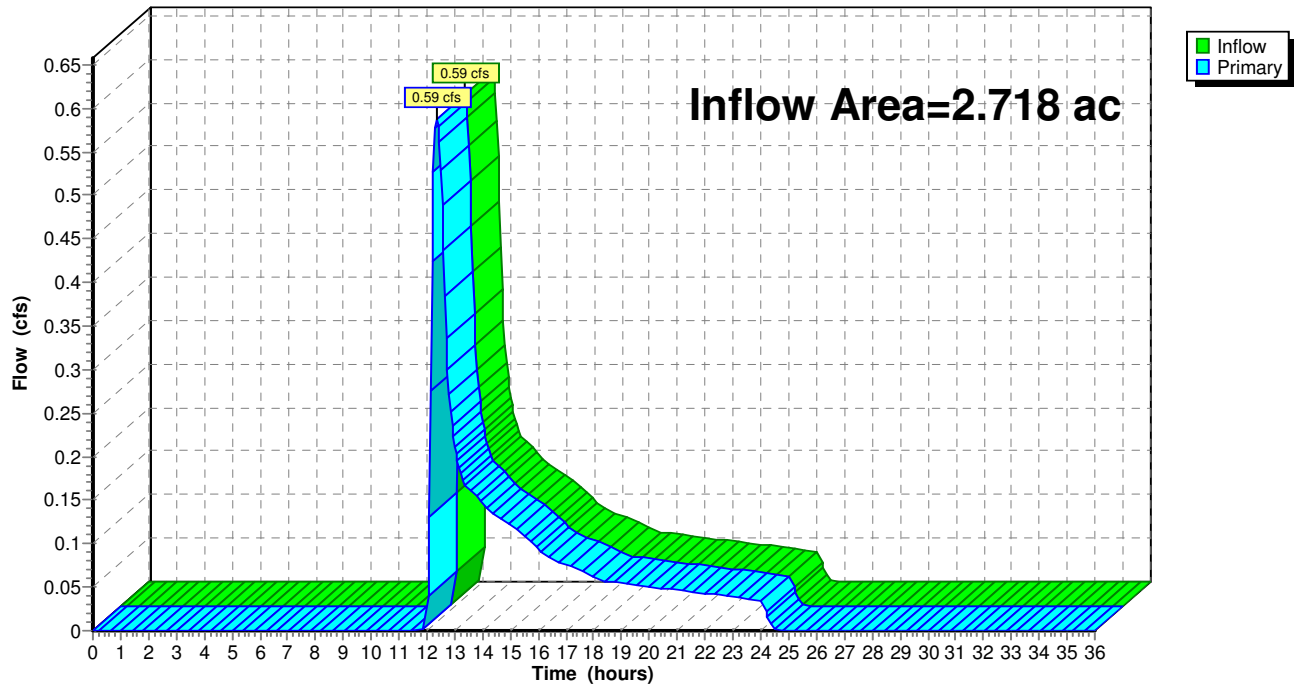
Proposed Conditions
Type III 24-hr 10-yr Rainfall=4.89"

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Link DP2*: DP2

Hydrograph



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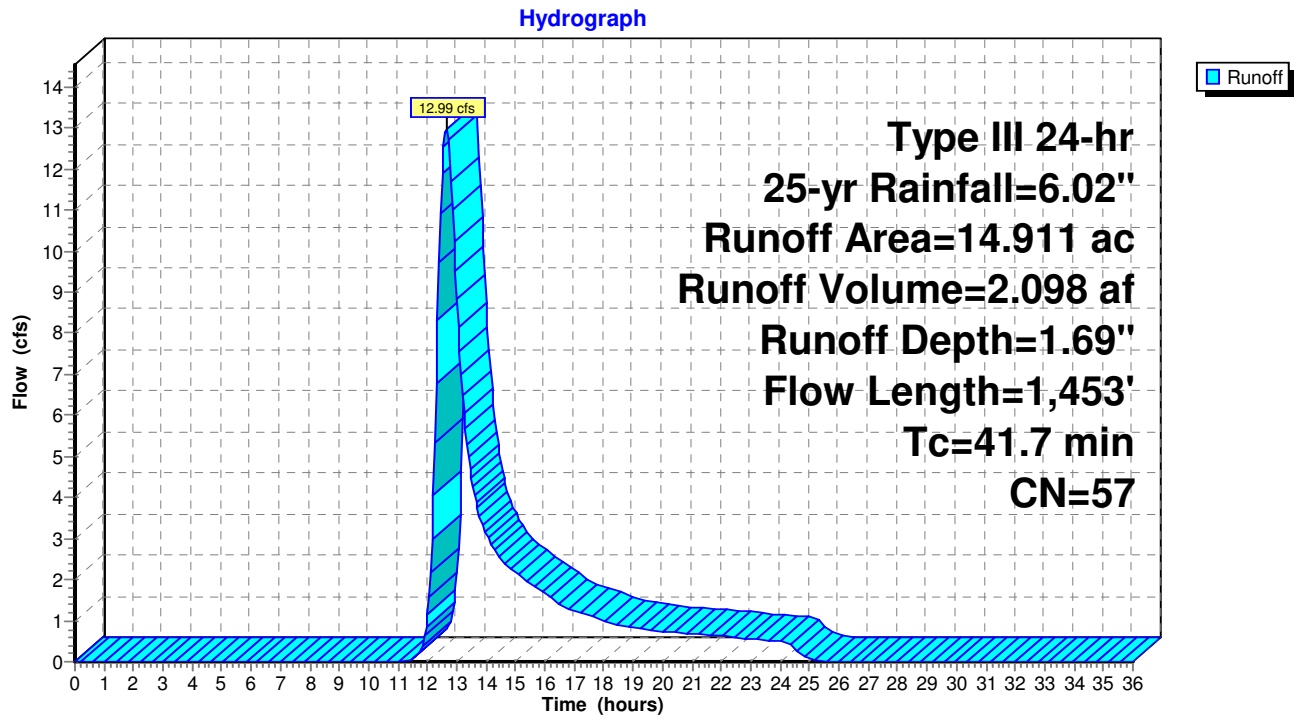
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Proposed Conditions
Type III 24-hr 25-yr Rainfall=6.02"

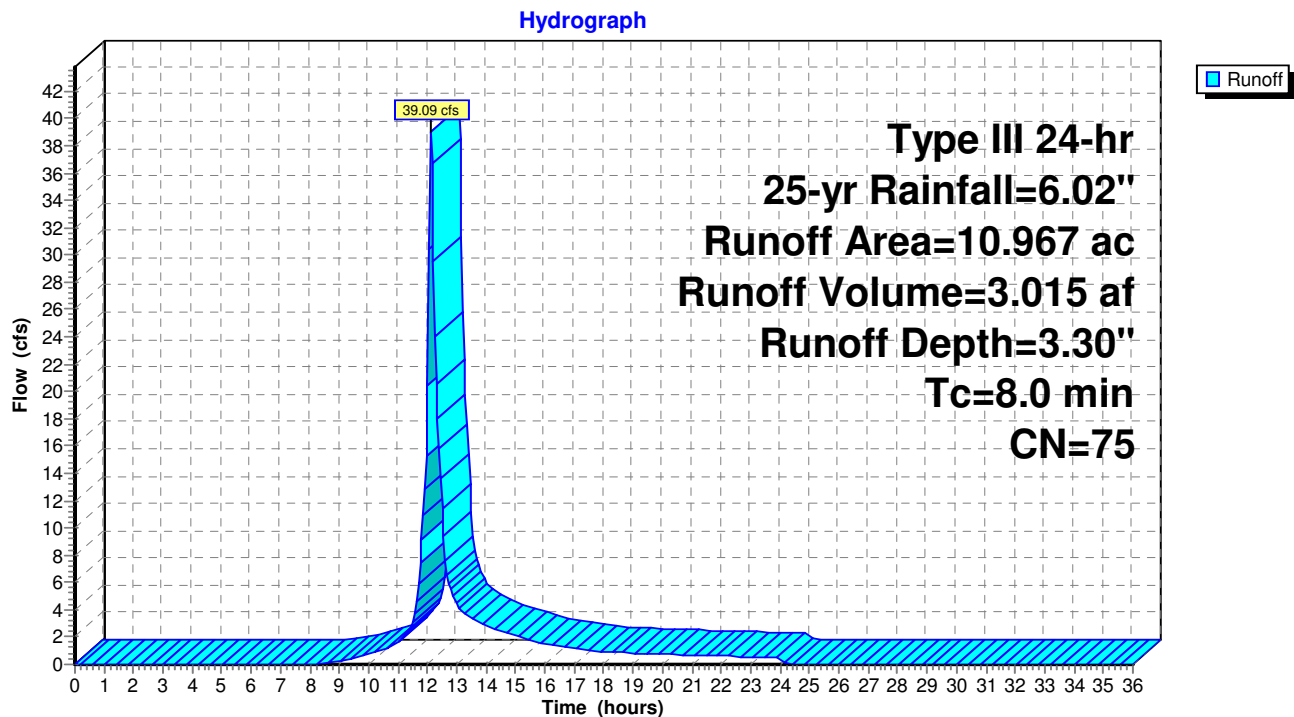
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Subcatchment P1: Prop Area 1 (E1*)



Subcatchment P2: Prop Area 2



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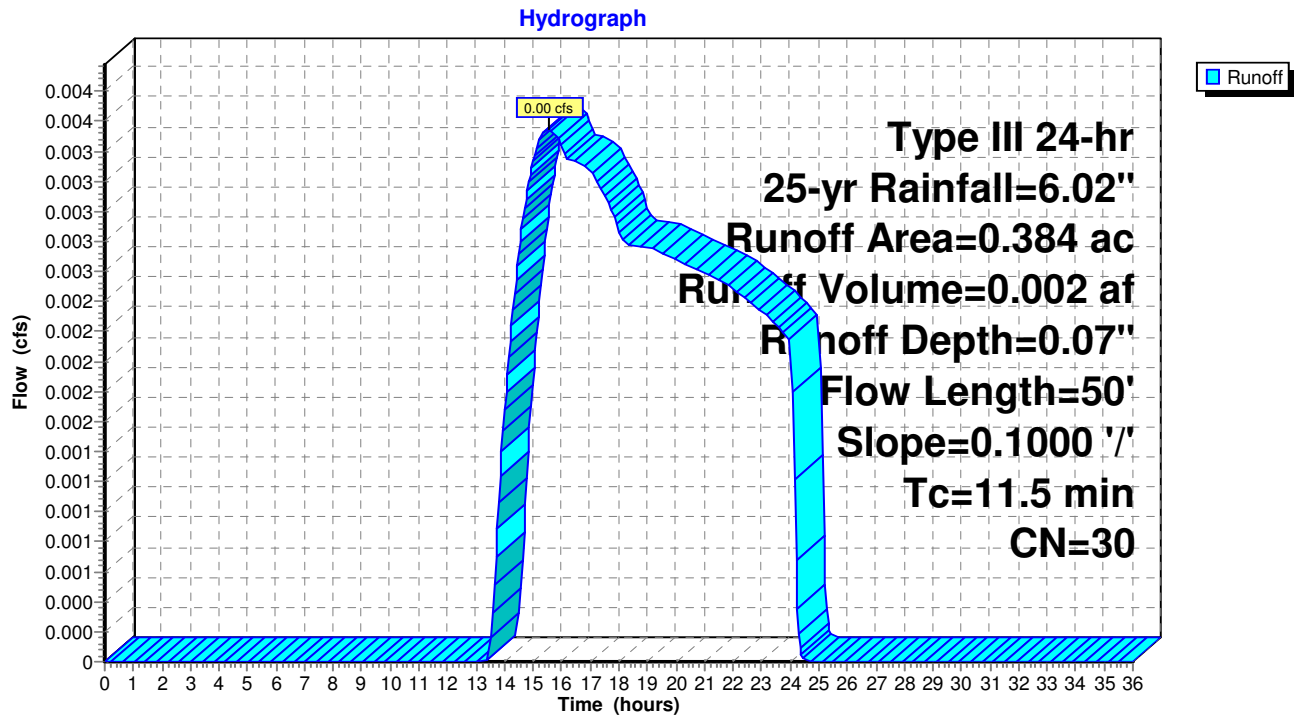
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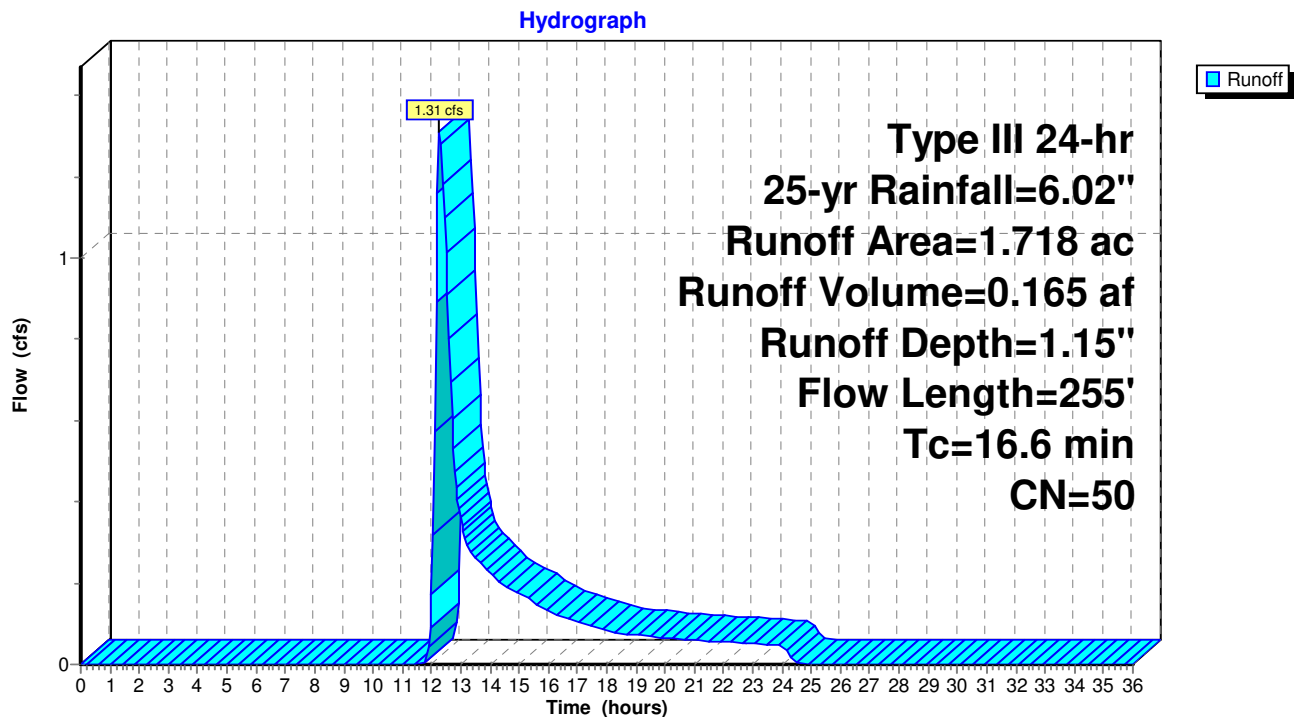
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Subcatchment P3: Prop Area 3 (E3* DP3)



Subcatchment P4: Prop Area 4 (E4*)



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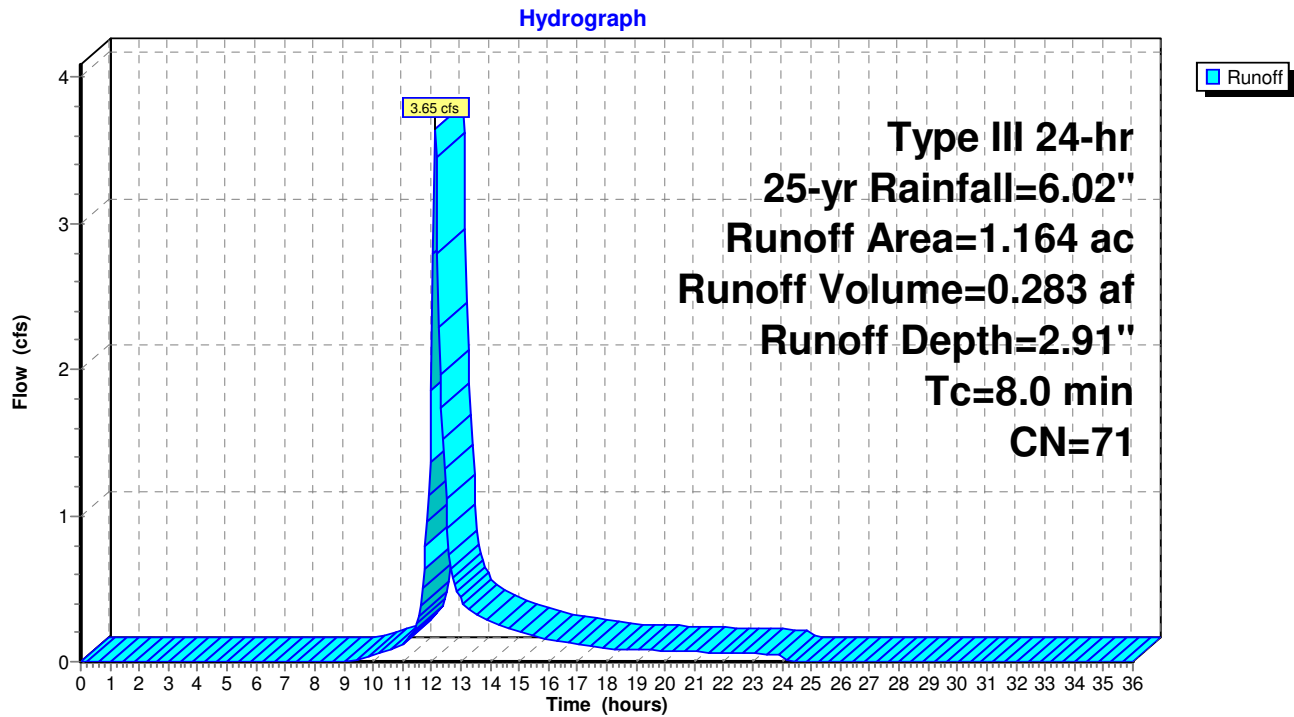
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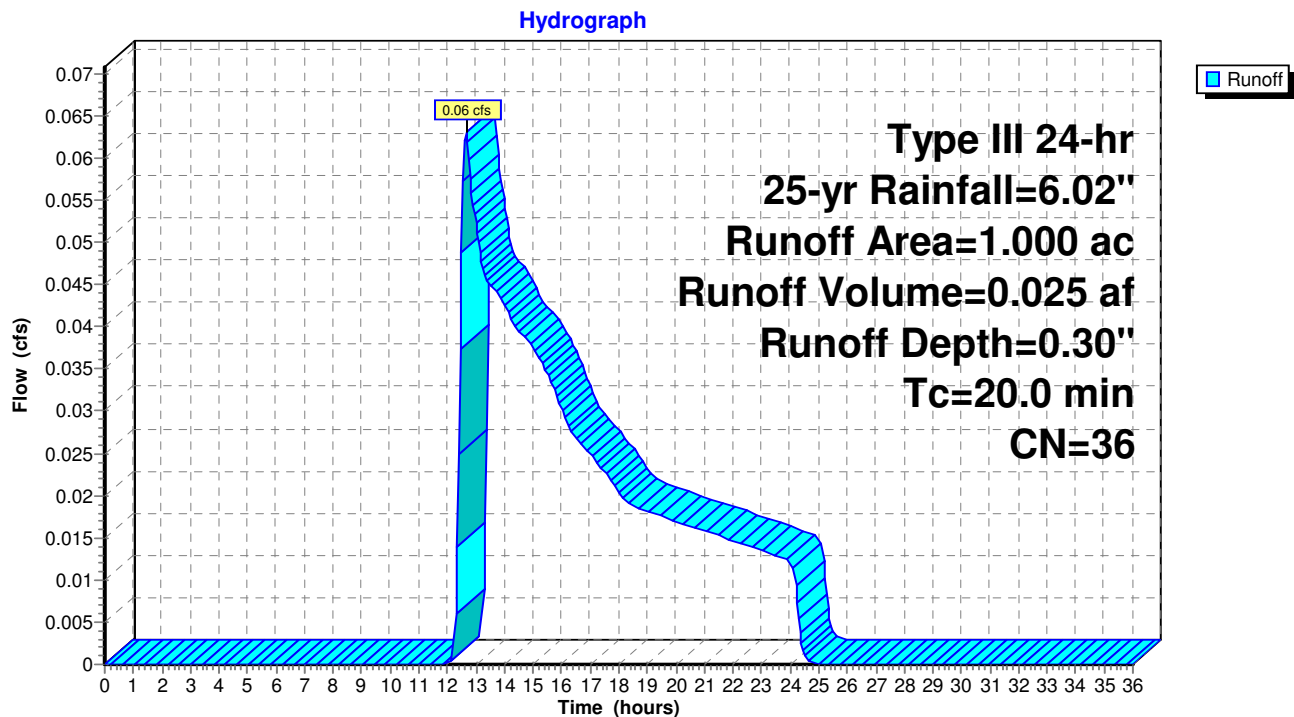
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Subcatchment P5: Prop Area 5



Subcatchment P6: Prop Area 6



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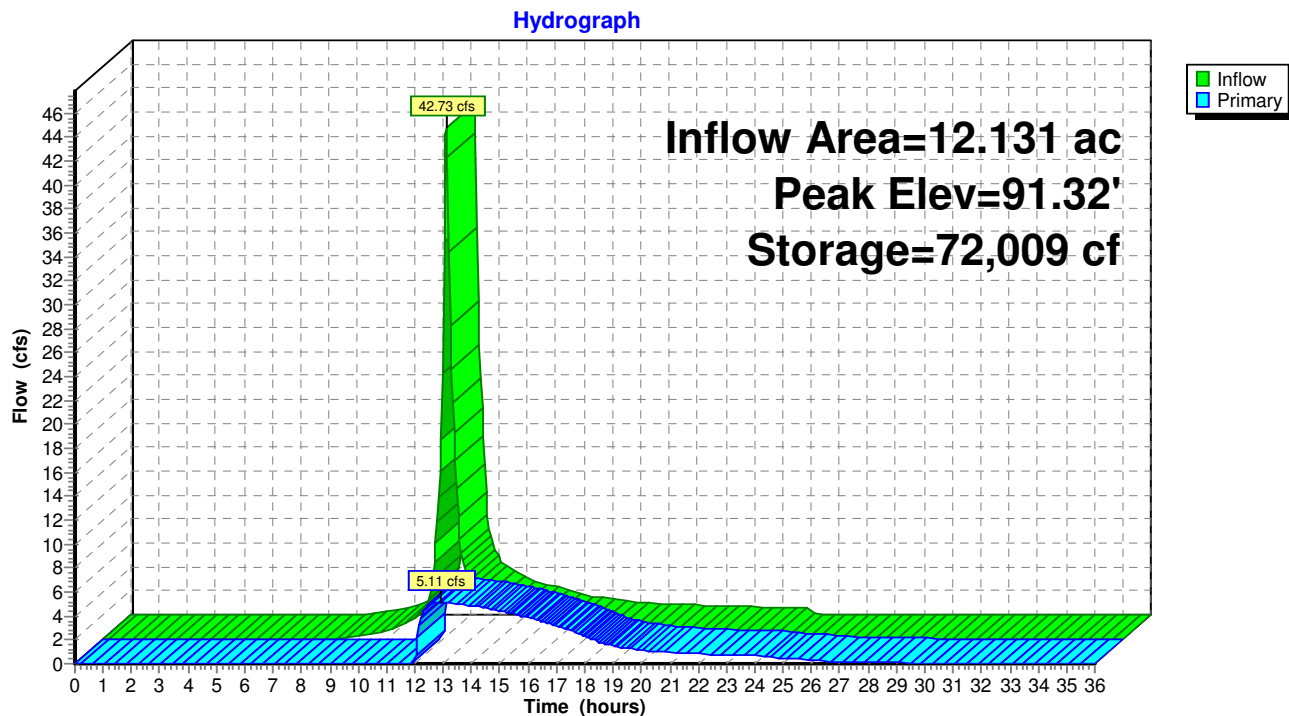
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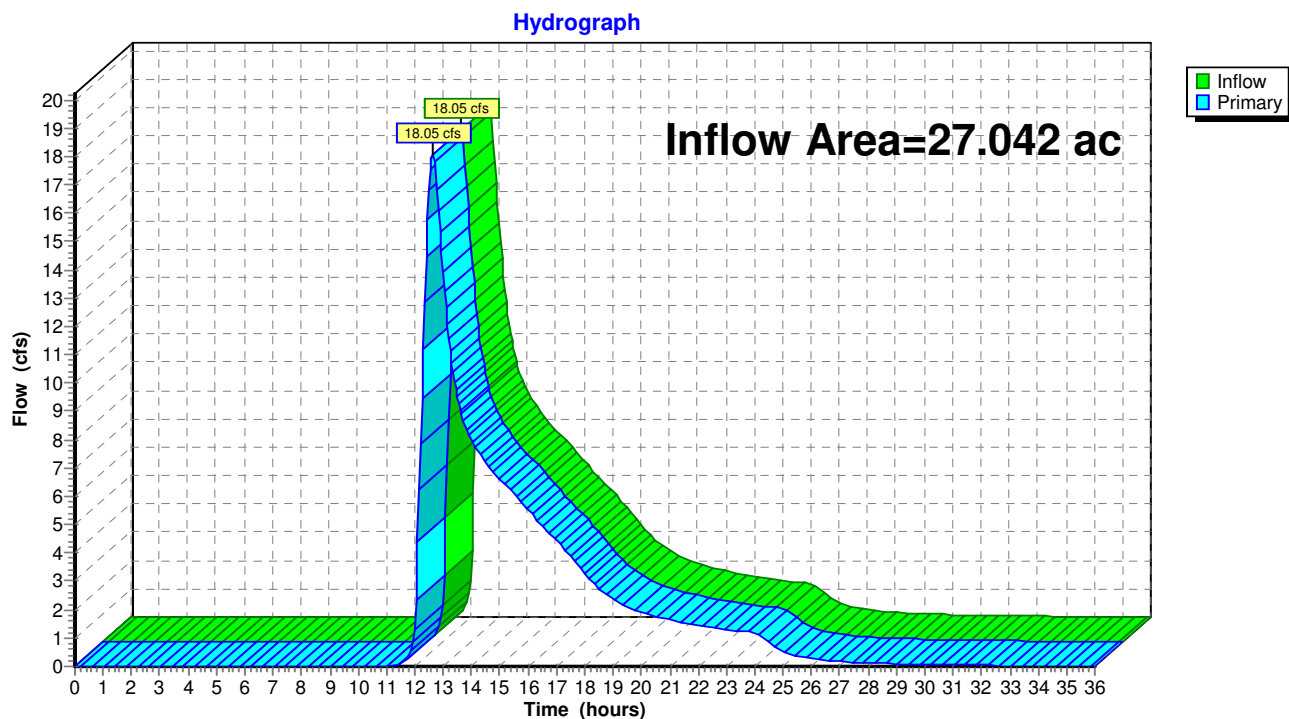
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Pond PP1: Proposed Pond



Link DP1*: DP1*



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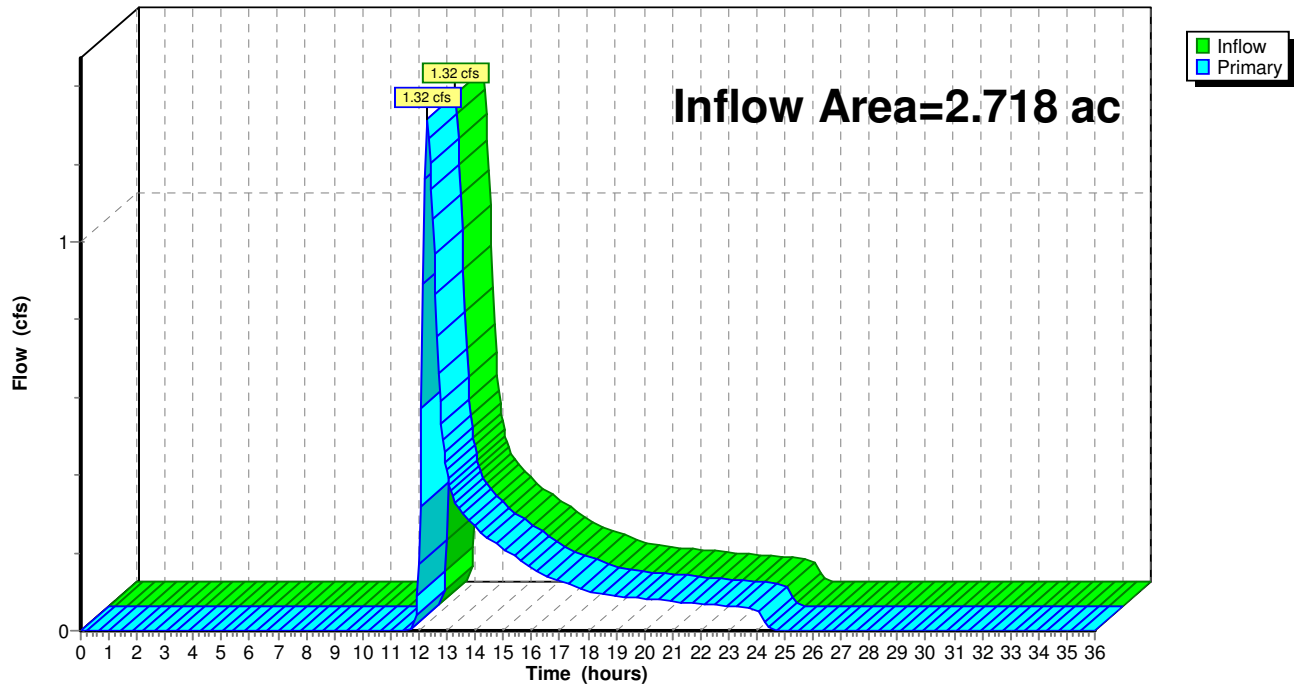
Proposed Conditions
Type III 24-hr 25-yr Rainfall=6.02"

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Link DP2*: DP2

Hydrograph



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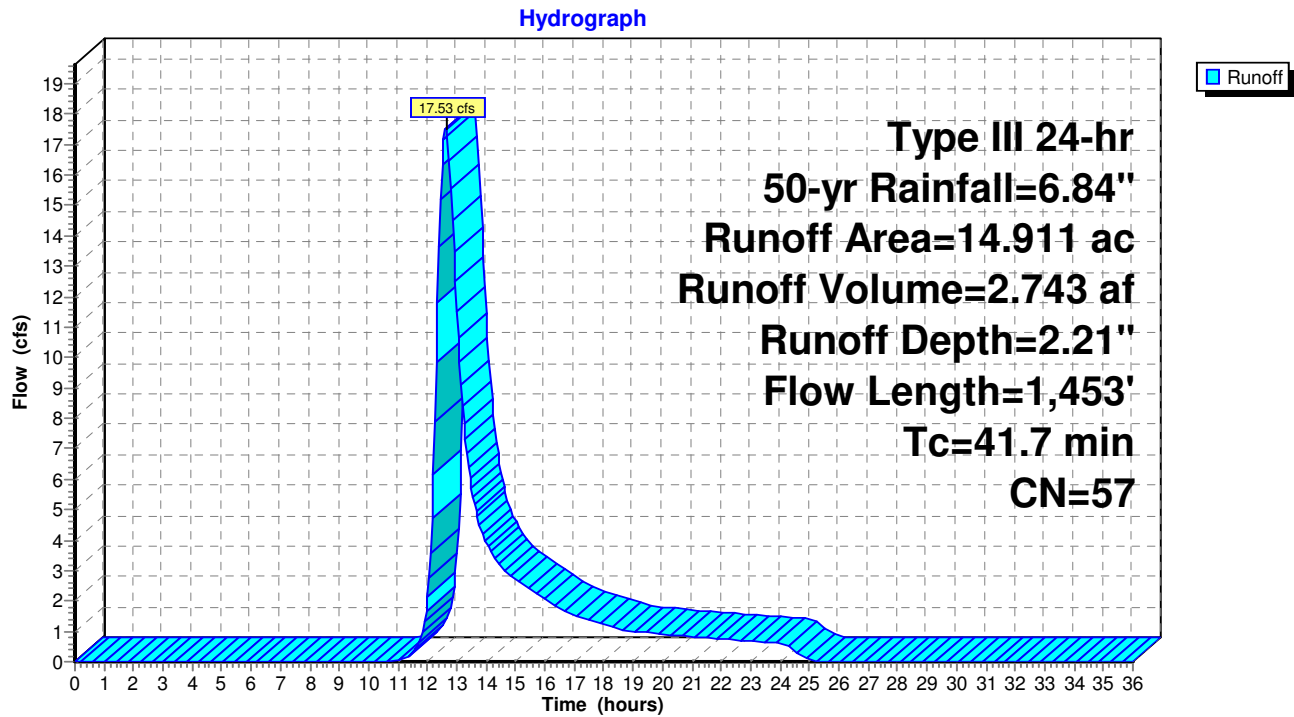
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Proposed Conditions
Type III 24-hr 50-yr Rainfall=6.84"

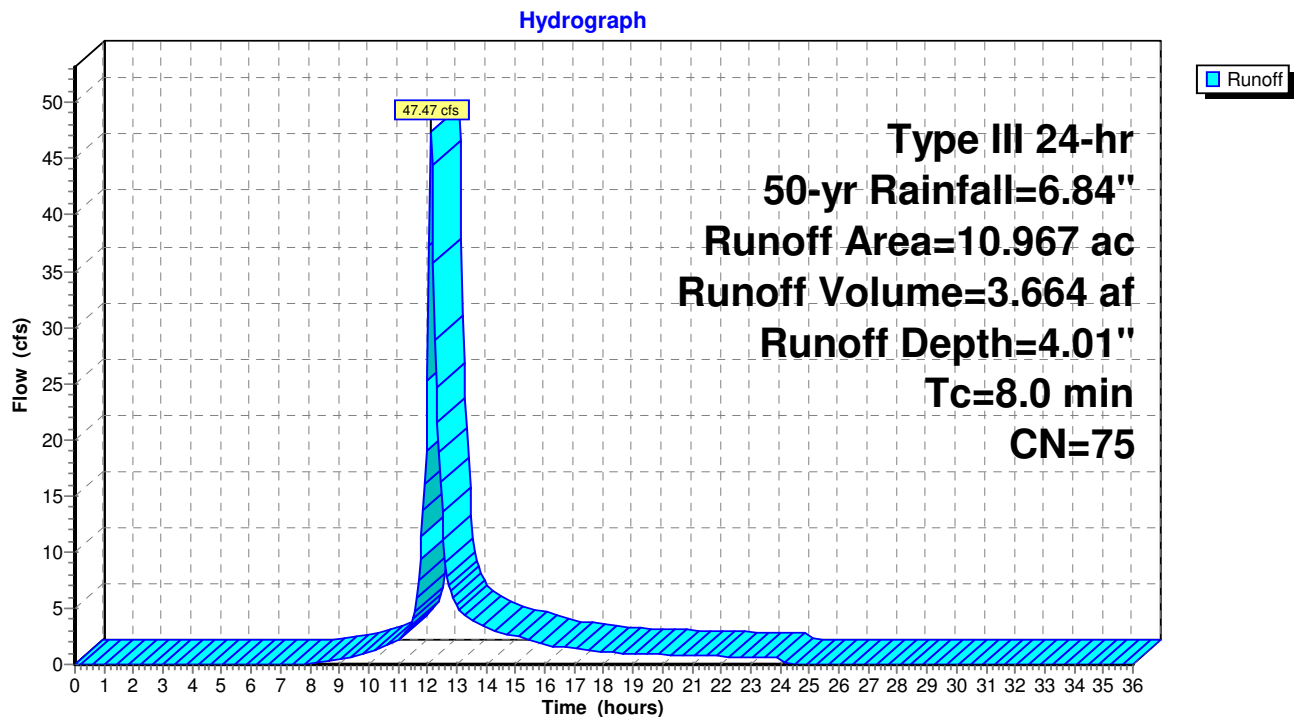
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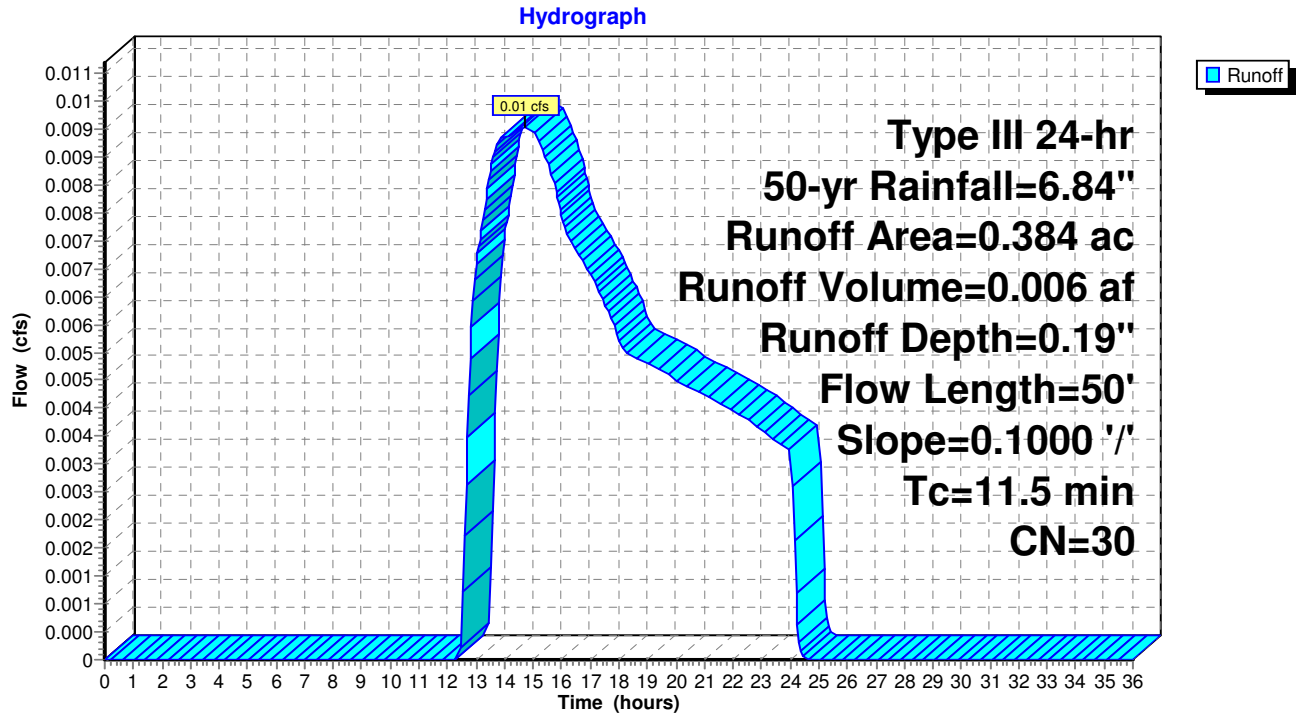
Subcatchment P1: Prop Area 1 (E1*)



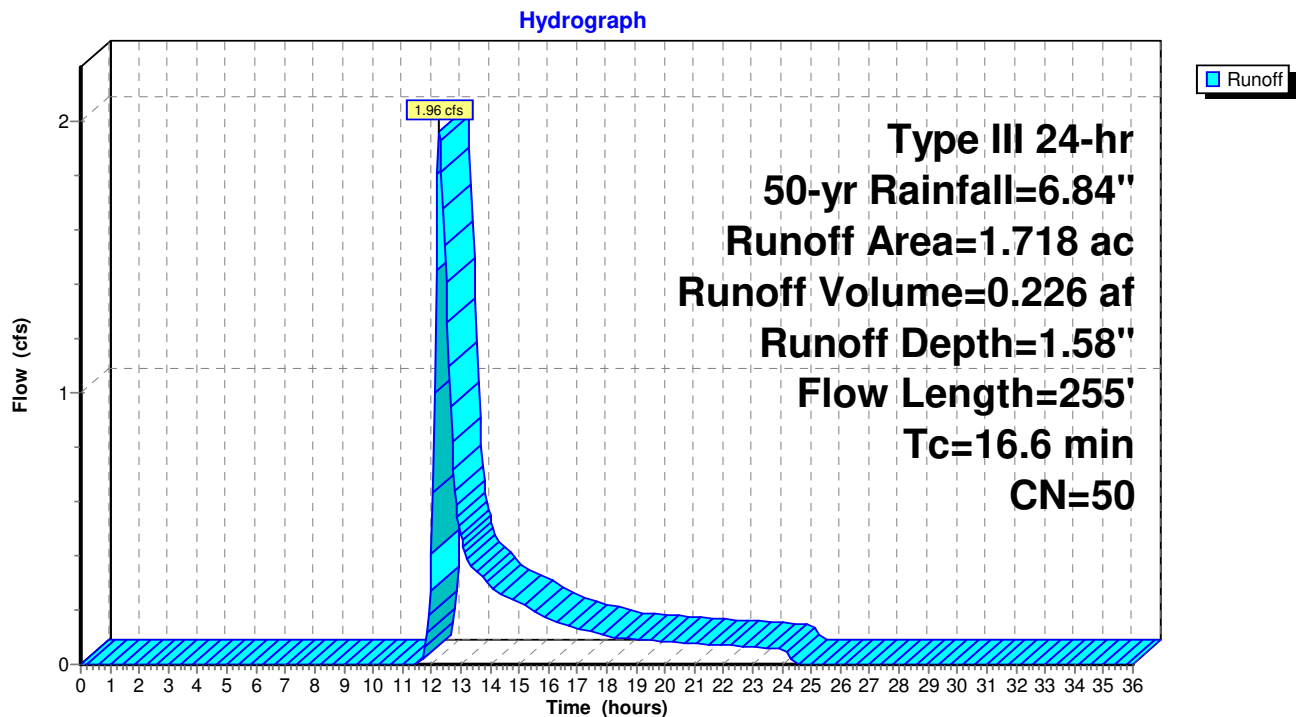
Subcatchment P2: Prop Area 2



Subcatchment P3: Prop Area 3 (E3* DP3)



Subcatchment P4: Prop Area 4 (E4*)



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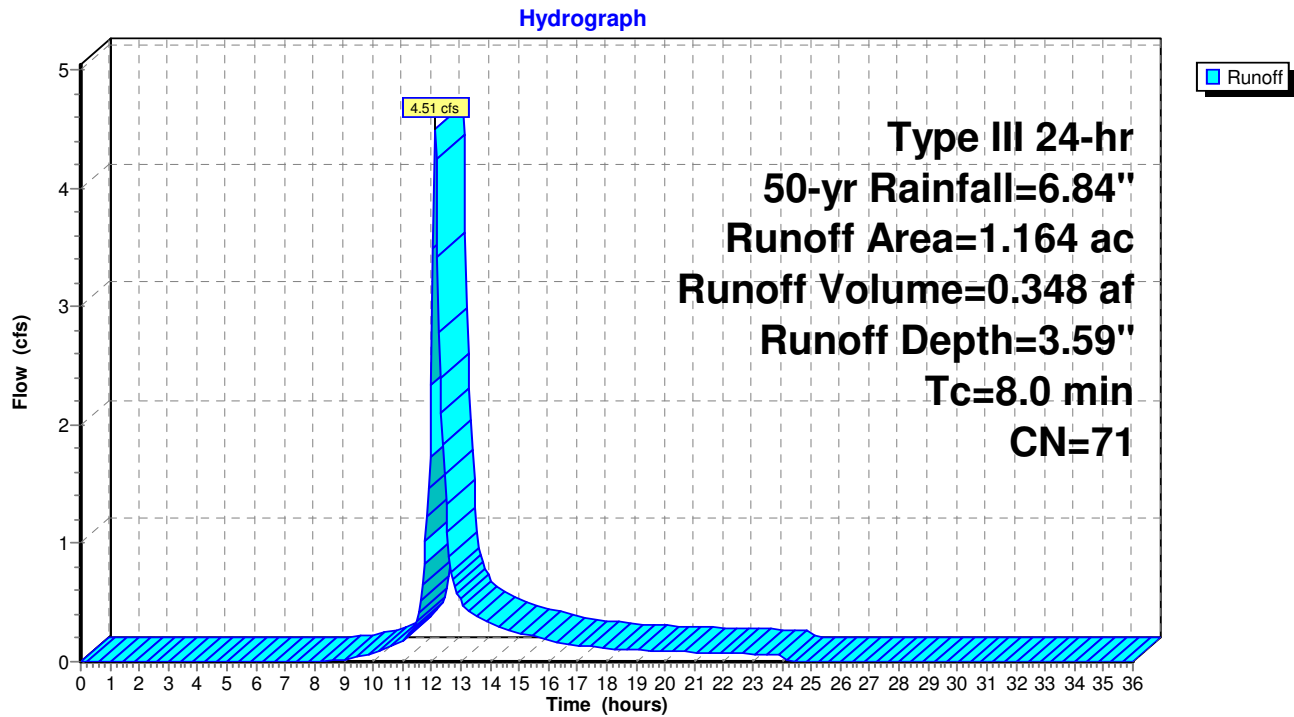
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Proposed Conditions
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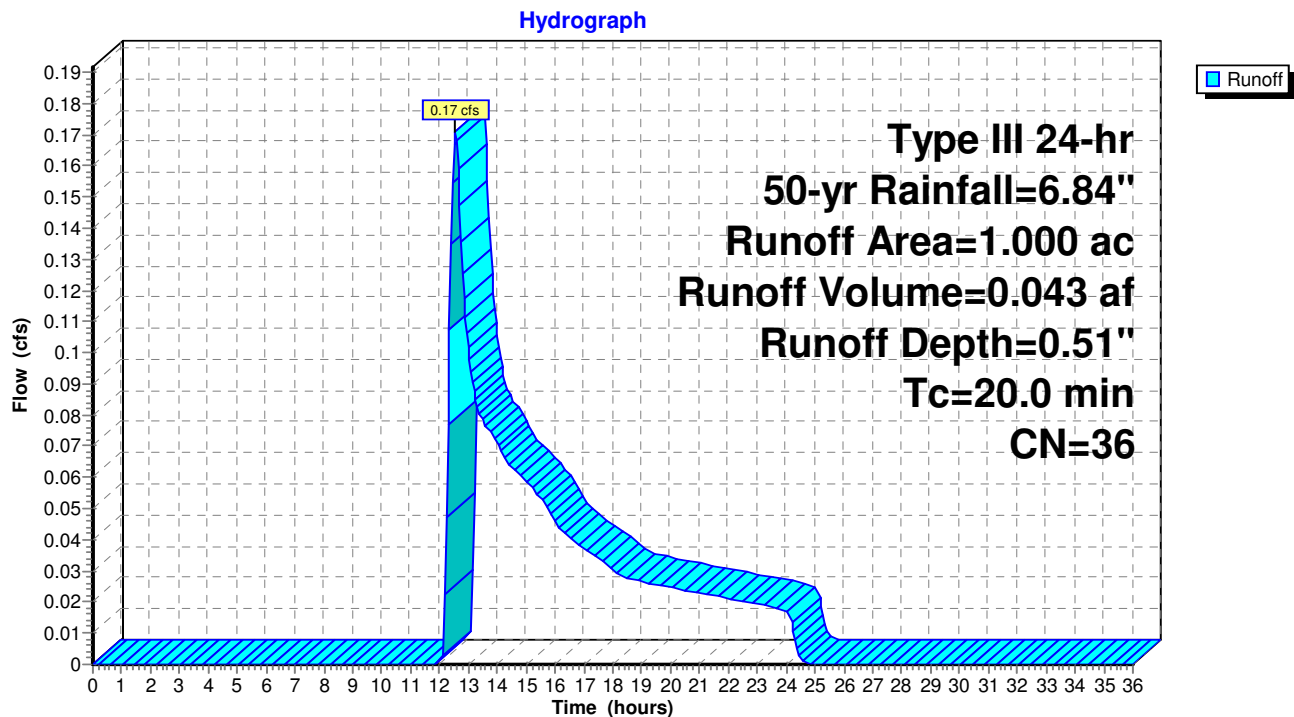
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Subcatchment P5: Prop Area 5



Subcatchment P6: Prop Area 6



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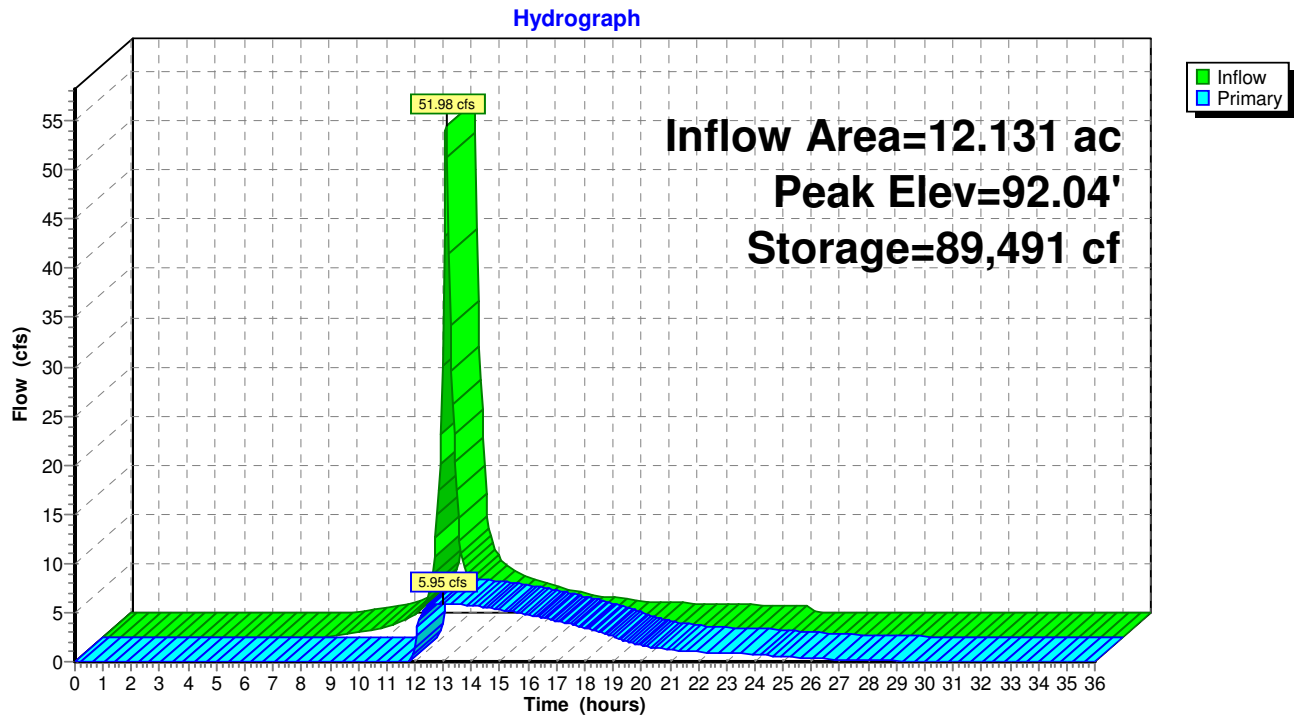
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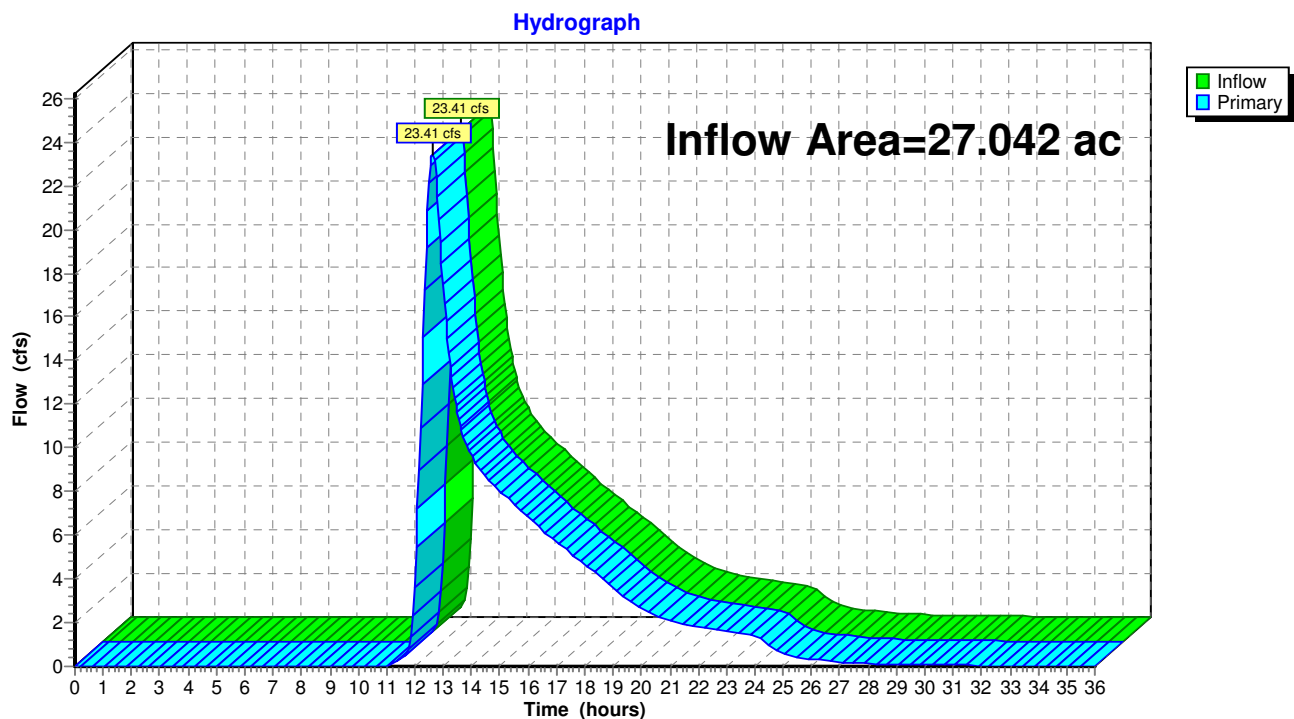
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Pond PP1: Proposed Pond



Link DP1*: DP1*



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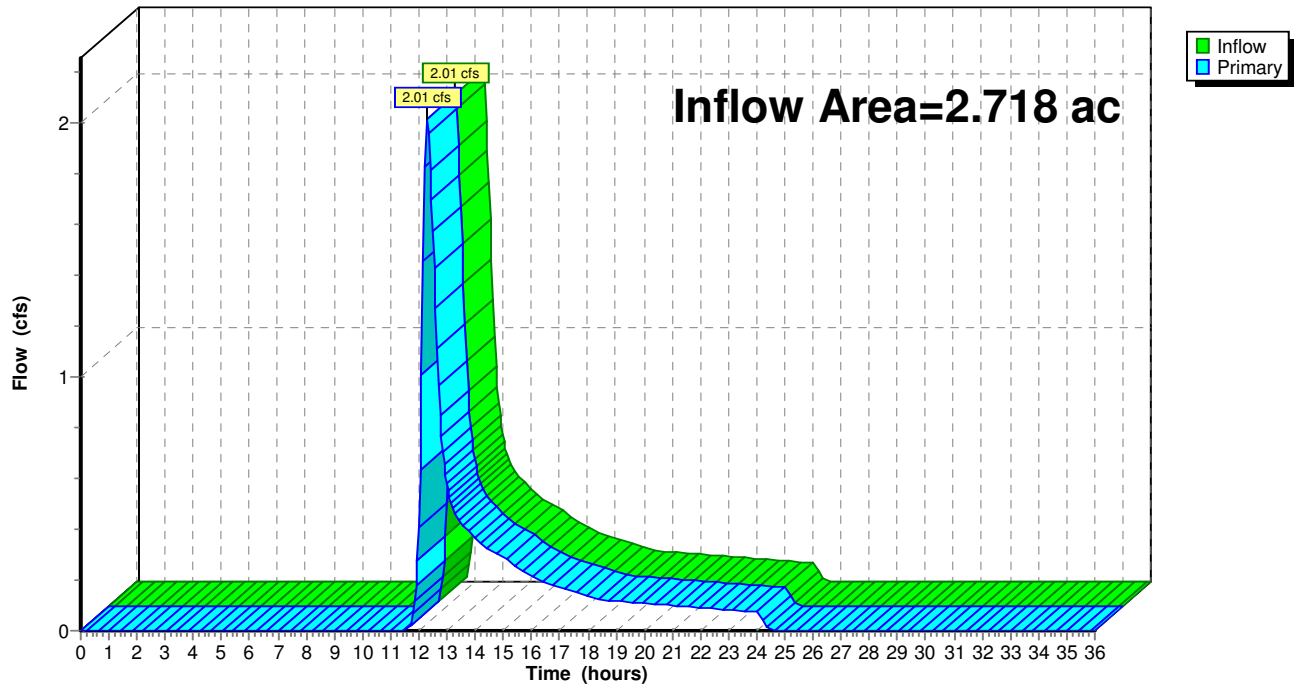
Proposed Conditions
Type III 24-hr 50-yr Rainfall=6.84"

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Link DP2*: DP2

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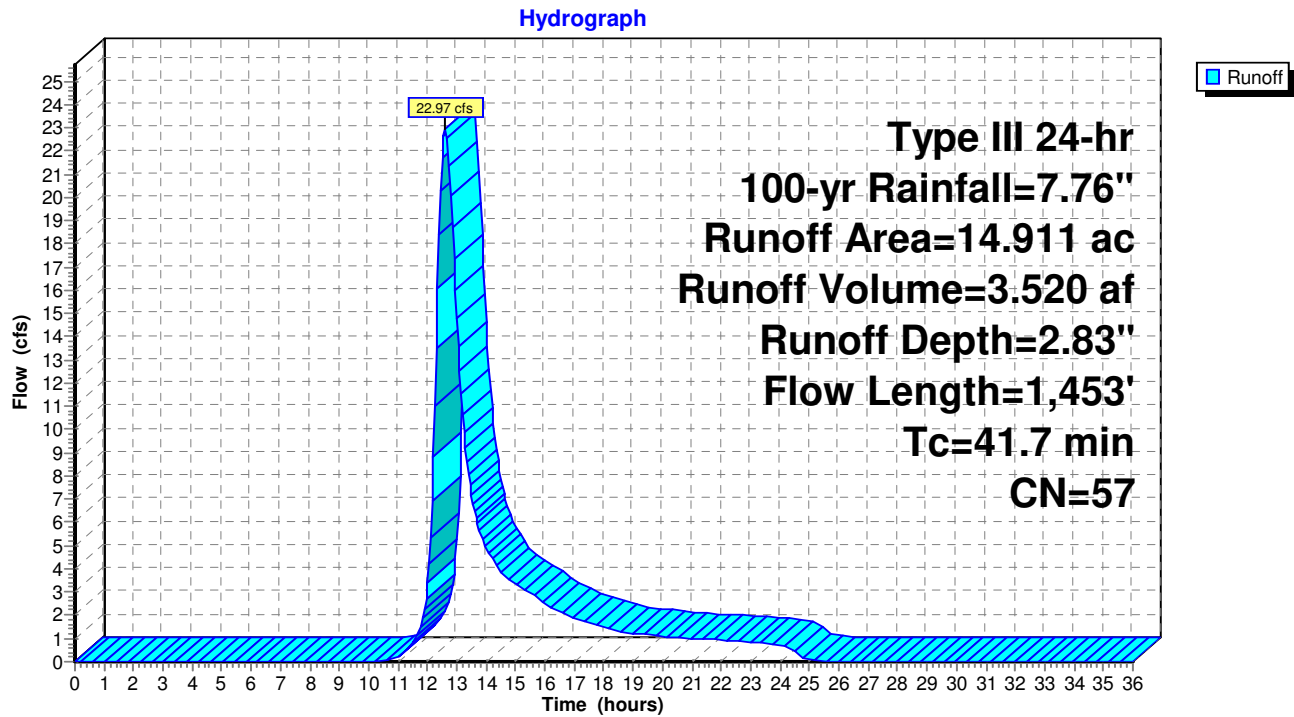
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Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.76"

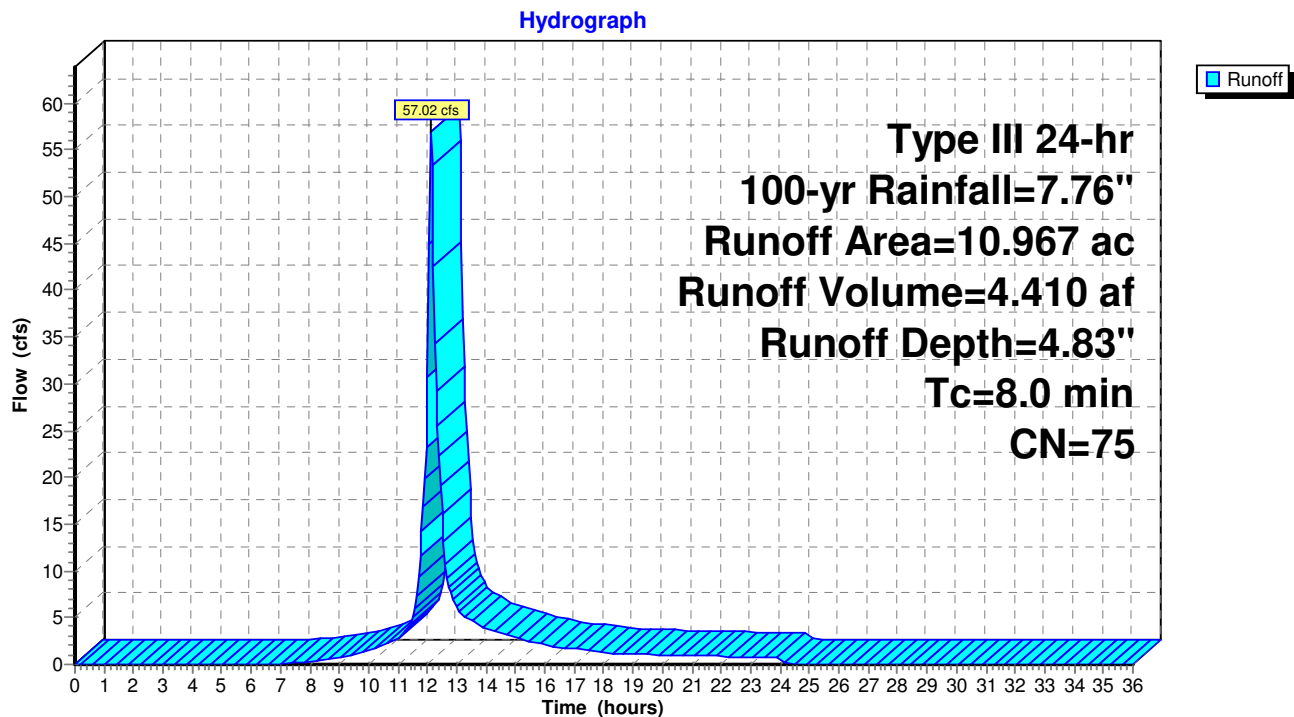
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Subcatchment P1: Prop Area 1 (E1*)



Subcatchment P2: Prop Area 2



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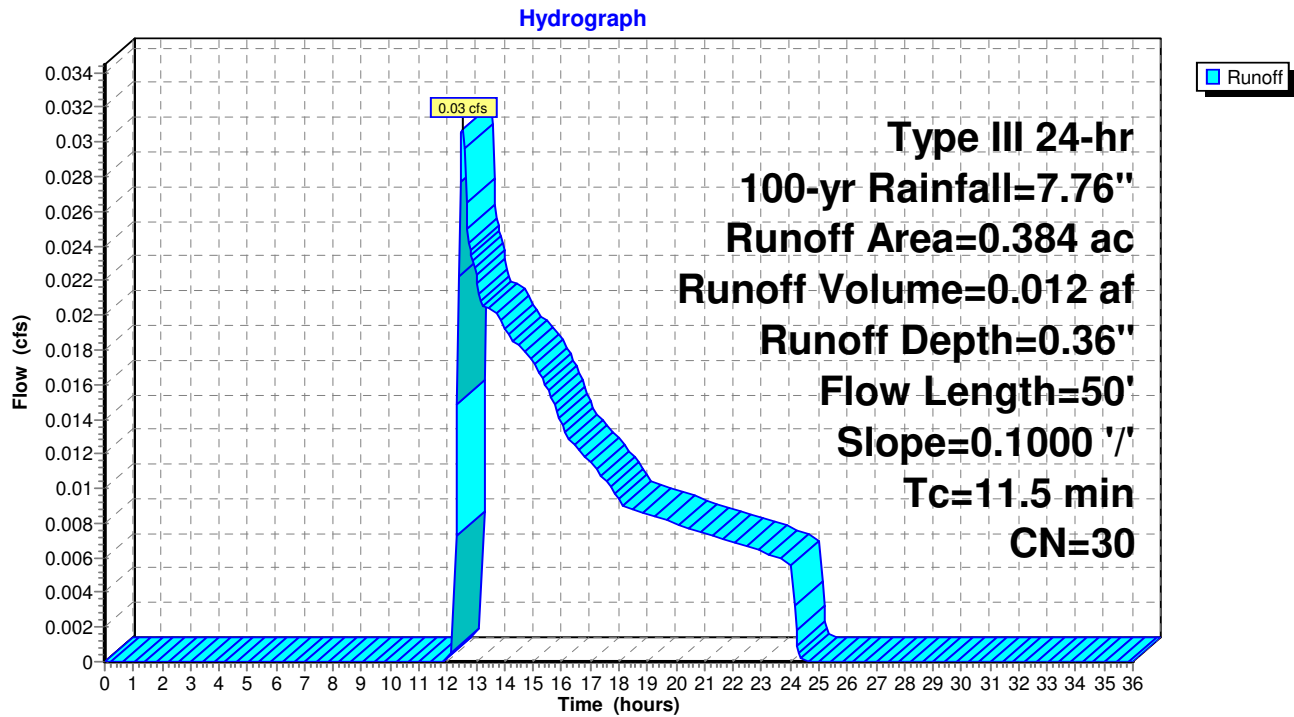
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Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.76"

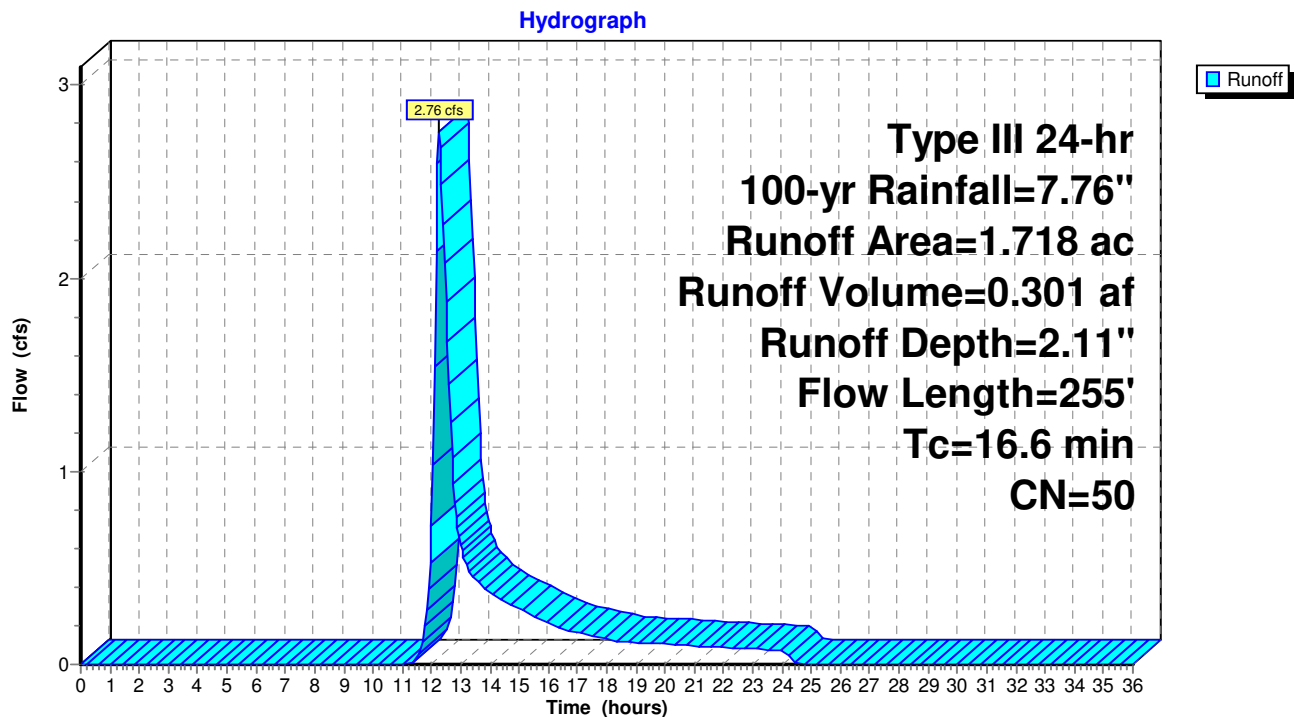
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Subcatchment P3: Prop Area 3 (E3* DP3)



Subcatchment P4: Prop Area 4 (E4*)



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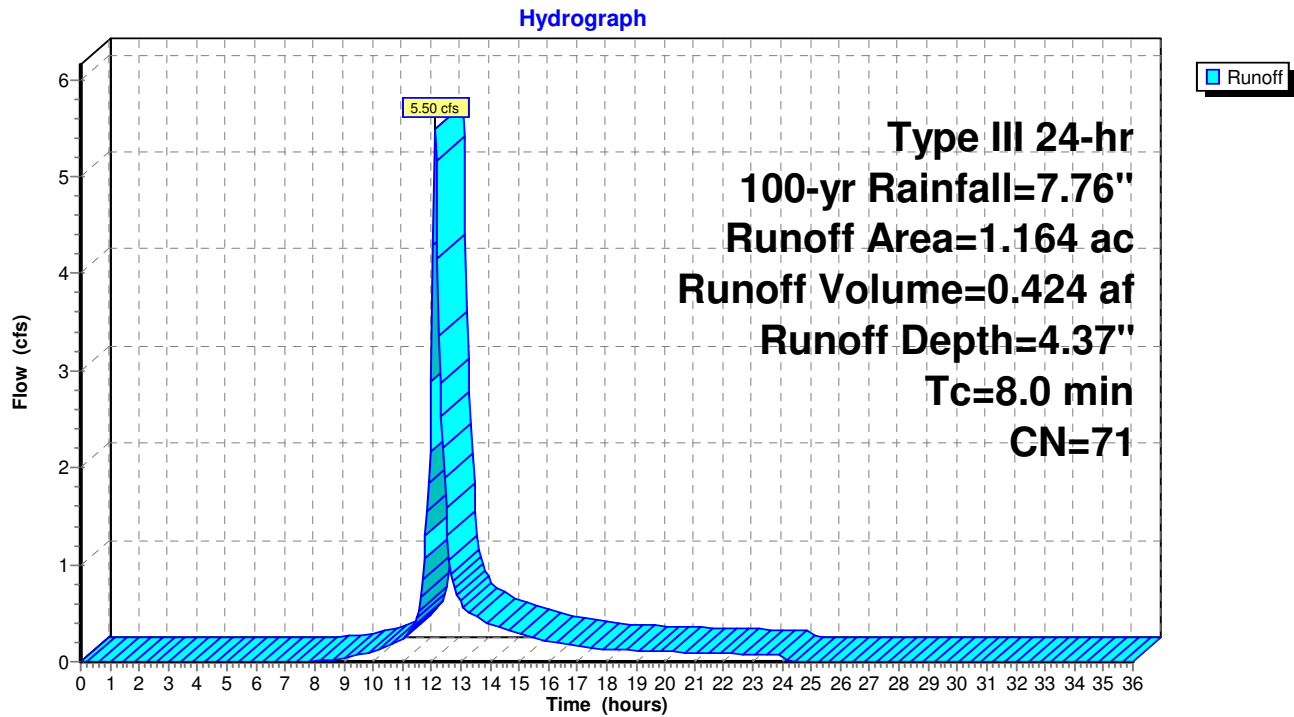
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Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.76"

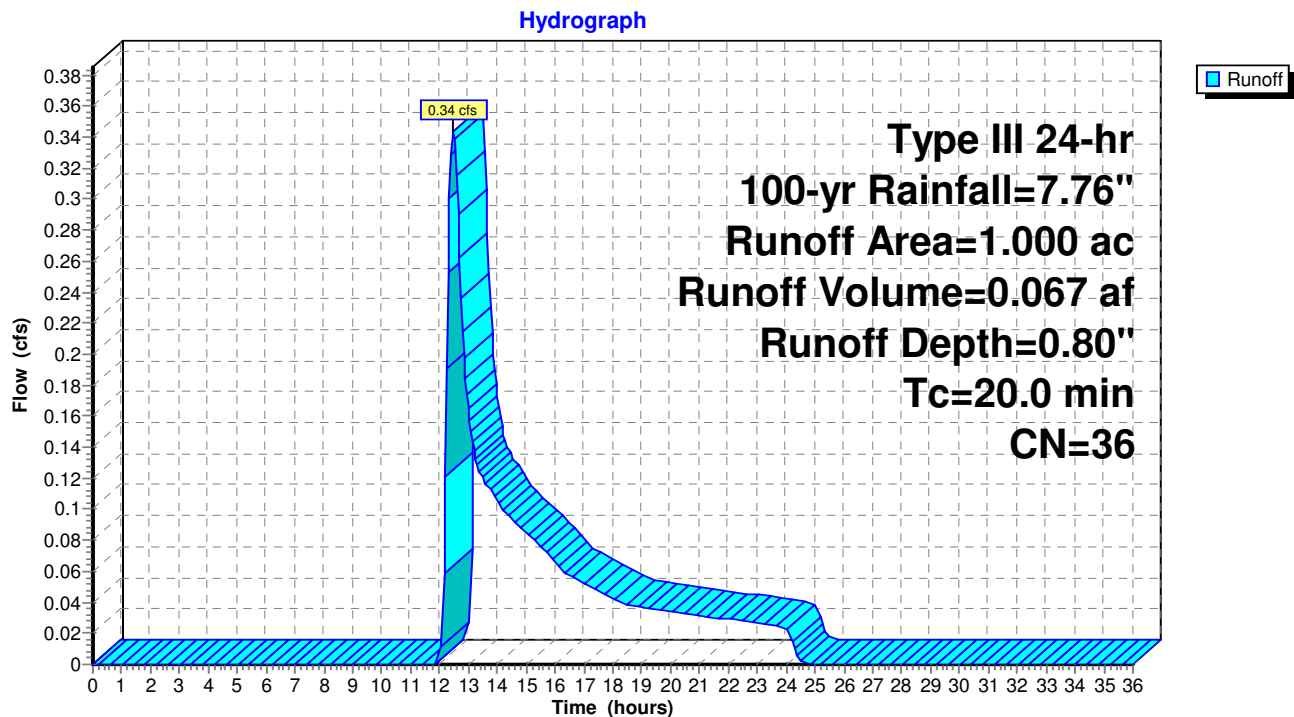
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Subcatchment P5: Prop Area 5



Subcatchment P6: Prop Area 6



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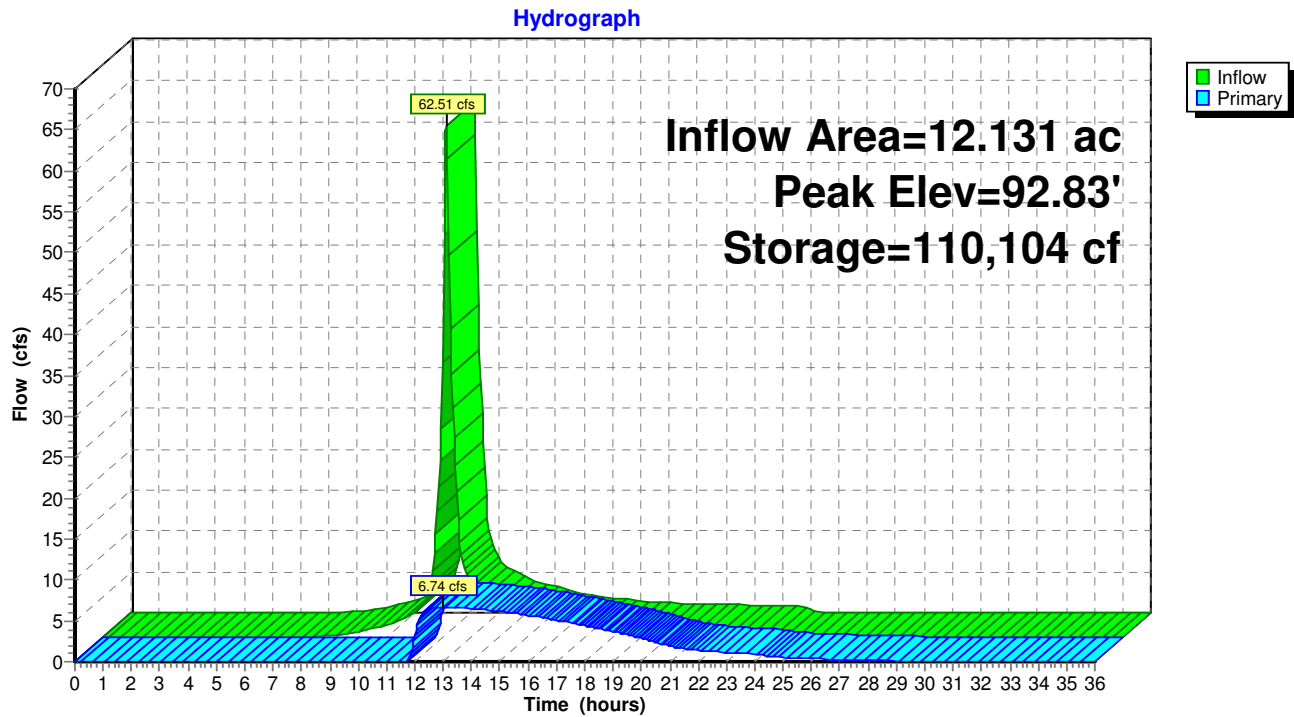
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Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.76"

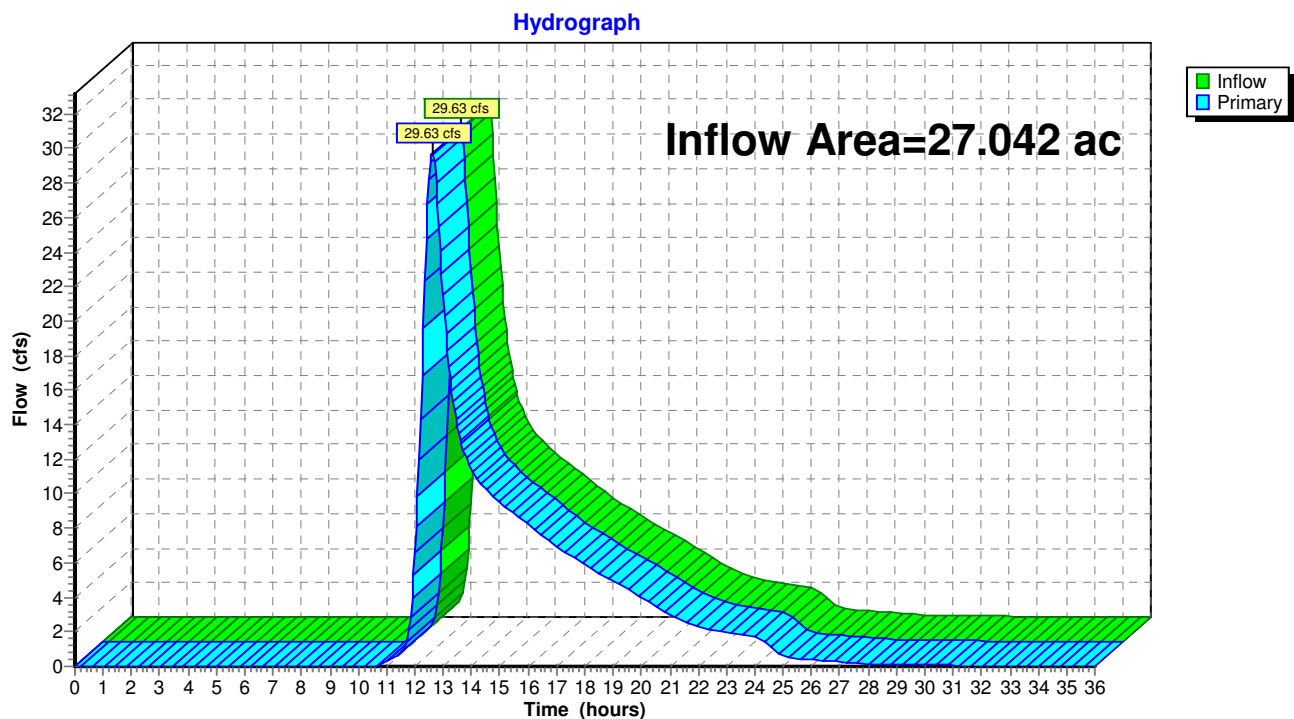
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Pond PP1: Proposed Pond



Link DP1*: DP1*



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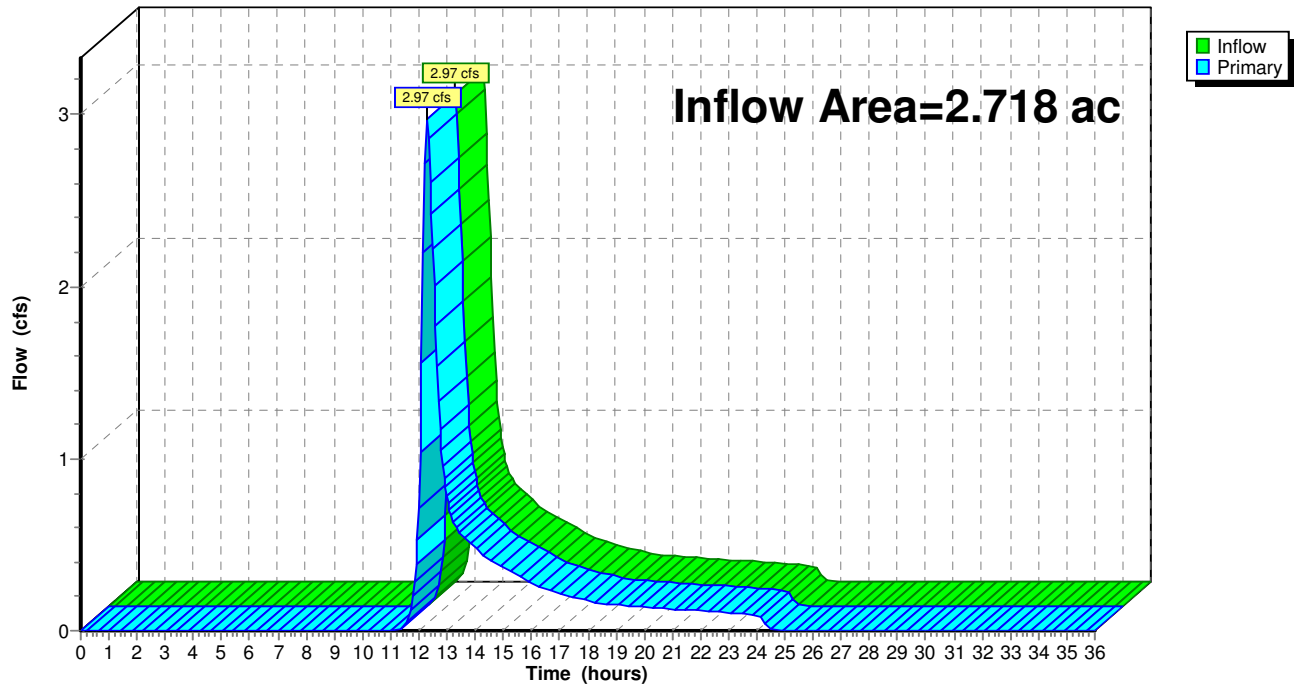
Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.76"

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Link DP2*: DP2

Hydrograph



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Proposed Condition
Type III 24-hr 100-yr Rainfall=7.76"

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Summary for Pond PP1: Proposed Pond

Inflow Area = 12.131 ac, 55.70% Impervious, Inflow Depth = 4.78" for 100-yr event
 Inflow = 62.51 cfs @ 12.11 hrs, Volume= 4.834 af
 Outflow = 6.74 cfs @ 13.00 hrs, Volume= 4.241 af, Atten= 89%, Lag= 52.9 min
 Primary = 6.74 cfs @ 13.00 hrs, Volume= 4.241 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.83' @ 13.00 hrs Surf.Area= 27,036 sf Storage= 110,104 cf

Plug-Flow detention time= 239.9 min calculated for 4.236 af (88% of inflow)
 Center-of-Mass det. time= 184.8 min (1,002.8 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	216,588 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	6,448	0	0
86.00	6,949	3,349	3,349
87.00	7,960	7,455	10,804
88.00	9,056	8,508	19,312
89.00	10,200	9,628	28,940
90.00	18,339	14,270	43,209
90.50	21,345	9,921	53,130
91.00	22,861	11,052	64,182
92.00	25,401	24,131	88,313
92.90	27,176	23,660	111,972
93.00	30,417	2,880	114,852
94.00	32,531	31,474	146,326
95.00	34,751	33,641	179,967
96.00	38,490	36,621	216,588

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	15.0" Round Culvert L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 81.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	89.00'	10.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	88.60'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=6.74 cfs @ 13.00 hrs HW=92.83' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 6.74 cfs of 12.90 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 4.85 cfs @ 8.89 fps)
 3=Orifice/Grate (Orifice Controls 1.89 cfs @ 9.60 fps)

APPENDIX C
NRCS Soil Map & Data



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for State of Connecticut



October 15, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Jul 15, 2019—Aug 29, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28B	Elmridge fine sandy loam, 3 to 8 percent slopes	0.0	0.0%
36A	Windsor loamy sand, 0 to 3 percent slopes	12.3	15.1%
36B	Windsor loamy sand, 3 to 8 percent slopes	52.2	64.1%
236B	Windsor-Urban land complex, 0 to 8 percent slopes	0.3	0.3%
304	Udorthents, loamy, very steep	2.5	3.0%
306	Udorthents-Urban land complex	11.3	13.8%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	2.9	3.6%
W	Water	0.1	0.1%
Totals for Area of Interest		81.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor

components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

28B—Elmridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lm1

Elevation: 0 to 1,200 feet

Mean annual precipitation: 43 to 54 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Elmridge and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmridge

Setting

Landform: Terraces

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Coarse-loamy eolian sands over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bw1 - 6 to 10 inches: fine sandy loam

Bw2 - 10 to 18 inches: fine sandy loam

Bw3 - 18 to 25 inches: sandy loam

2C - 25 to 65 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C

Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain

Hydric soil rating: No

Minor Components

Brancroft

Percent of map unit: 5 percent

Landform: Terraces

Custom Soil Resource Report

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Shaker

Percent of map unit: 3 percent

Landform: Depressions, drainageways, terraces

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Unnamed, red parent material

Percent of map unit: 2 percent

Hydric soil rating: No

Scitico

Percent of map unit: 2 percent

Landform: Drainageways, terraces, depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent

Landform: Outwash plains, terraces

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Belgrade

Percent of map unit: 2 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Ninigret

Percent of map unit: 2 percent

Landform: Outwash plains, terraces

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Maybid

Percent of map unit: 1 percent

Landform: Depressions, drainageways, terraces

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Berlin

Percent of map unit: 1 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

36A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg

Elevation: 0 to 990 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash terraces, outwash plains, dunes, deltas

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand

Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

36B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Outwash terraces, deltas, outwash plains, dunes
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material

Custom Soil Resource Report

A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Eskers, kames, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

236B—Windsor-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w2wq
Elevation: 0 to 920 feet
Mean annual precipitation: 36 to 71 inches

Custom Soil Resource Report

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Windsor and similar soils: 45 percent

Urban land: 35 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: Outwash plains, outwash terraces, deltas, dunes

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

A - 0 to 3 inches: loamy sand

Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 0 inches to manufactured layer

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Custom Soil Resource Report

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Unranked

Minor Components

Udorthents

Percent of map unit: 10 percent

Landform: Outwash plains, outwash terraces, deltas, dunes

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent

Landform: Deltas, outwash plains, terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread, tal

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent

Landform: Deltas, outwash plains, eskers, kames

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Head slope, nose slope, side slope, crest,
rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

304—Udorthents, loamy, very steep

Map Unit Setting

National map unit symbol: 9lmd

Elevation: 0 to 1,200 feet

Mean annual precipitation: 37 to 52 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 90 percent

Minor components: 10 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Escarpments
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Shaker

Percent of map unit: 3 percent
Landform: Terraces, depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scitico

Percent of map unit: 3 percent
Landform: Drainageways, terraces, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent
Landform: Drainageways, terraces, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Raynham

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, frequently flooded

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Available water capacity: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent

Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

701B—Ninigret fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2y07f

Elevation: 0 to 1,260 feet

Mean annual precipitation: 43 to 54 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Moraines, outwash plains, kame terraces, outwash terraces, kames

Landform position (two-dimensional): Backslope, footslope, toeslope

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Convex, linear

Across-slope shape: Convex, concave

Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam

Bw1 - 8 to 16 inches: fine sandy loam

Bw2 - 16 to 26 inches: fine sandy loam

2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification

Drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: About 17 to 39 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C

Ecological site: F144AY026CT - Moist Silty Outwash

Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent

Landform: Moraines, outwash terraces, outwash plains, kames, eskers

Landform position (two-dimensional): Backslope, footslope, shoulder, summit, toeslope

Landform position (three-dimensional): Side slope, crest, head slope, nose slope, tread

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Agawam

Percent of map unit: 5 percent

Landform: Outwash terraces, outwash plains, kame terraces, kames, moraines

Landform position (two-dimensional): Backslope, shoulder, footslope, summit, toeslope

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Landform position (three-dimensional): Side slope, crest, nose slope, head slope, tread

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent

Landform: Valley trains, outwash plains, deltas, outwash terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Raypol

Percent of map unit: 2 percent

Landform: Depressions, drainageways

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

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

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

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

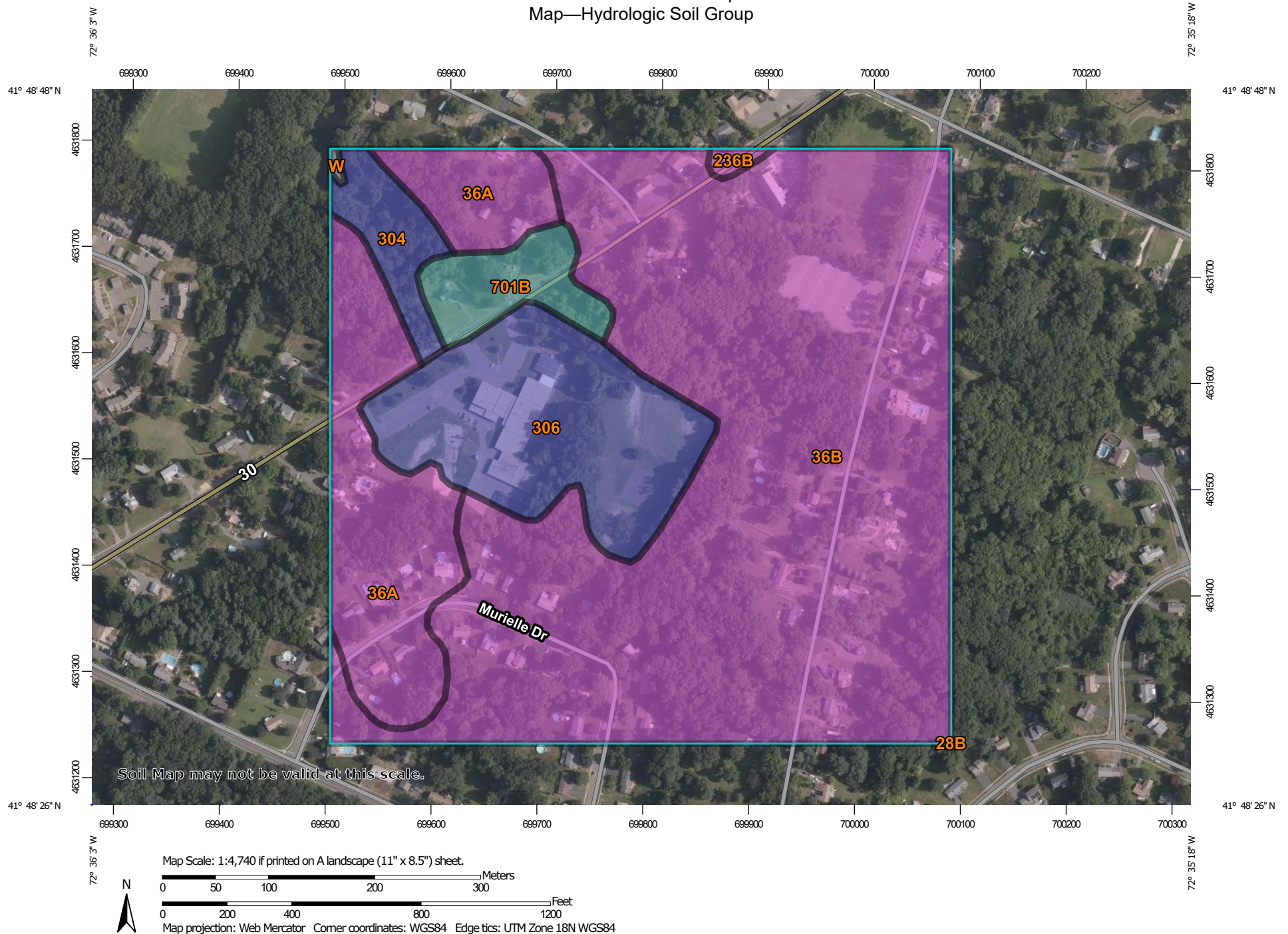
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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water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

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

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


Custom Soil Resource Report Map—Hydrologic Soil Group



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MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Jul 15, 2019—Aug 29, 2019

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
28B	Elmridge fine sandy loam, 3 to 8 percent slopes	C	0.0	0.0%
36A	Windsor loamy sand, 0 to 3 percent slopes	A	12.3	15.1%
36B	Windsor loamy sand, 3 to 8 percent slopes	A	52.2	64.1%
236B	Windsor-Urban land complex, 0 to 8 percent slopes	A	0.3	0.3%
304	Udorthents, loamy, very steep	B	2.5	3.0%
306	Udorthents-Urban land complex	B	11.3	13.8%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	2.9	3.6%
W	Water		0.1	0.1%
Totals for Area of Interest			81.5	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher

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APPENDIX D
Storm Sewer Analysis Results

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr (min)	Total (min)	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	95	0.36	7.47	0.46	0.17	4.37	9.0	12.4	4.8	20.83	52.96	6.54	30	1.42	90.50	91.85	92.04	93.40	93.40	101.68	CB20-FE2
2	1	23	0.09	6.86	0.53	0.05	4.04	9.0	12.4	4.8	19.33	32.09	6.44	30	0.52	91.95	92.07	93.40	93.56	101.68	100.49	CB2-CB20
3	2	70	0.15	6.30	0.48	0.07	3.68	9.0	12.2	4.8	17.72	31.42	6.23	30	0.50	92.17	92.52	93.56	93.94	100.49	101.82	CB3-CB2
4	3	204	0.15	5.59	0.66	0.10	3.34	8.0	11.0	5.1	17.09	17.33	6.29	24	0.50	92.62	93.64	94.23	95.25	101.82	103.54	CB4-CB3
5	4	53	0.10	3.31	0.81	0.08	1.91	6.0	10.8	5.2	9.87	17.16	5.54	24	0.49	98.75	99.01	99.84	100.13	103.54	105.00	CB5-CB4
6	5	162	0.46	3.21	0.44	0.20	1.83	9.0	10.3	5.3	9.68	17.33	5.53	24	0.50	99.26	100.07	100.33	101.18	105.00	105.93	CB7-CB5
7	6	109	0.30	2.75	0.55	0.17	1.63	8.0	10.0	5.4	8.77	17.41	5.36	24	0.50	100.17	100.72	101.18	101.78	105.93	106.62	CB8-CB7
8	7	128	0.48	2.05	0.58	0.28	1.11	9.0	9.5	5.5	6.08	8.04	5.01	18	0.50	100.82	101.46	101.80	102.43	106.62	105.72	CB9-CB8
9	8	5	0.81	1.46	0.45	0.36	0.75	9.0	9.5	5.5	4.12	24.83	9.90	15	12.60	102.85	103.48	103.19	104.30	105.72	106.15	CB10-CB9
10	9	122	0.22	0.65	0.48	0.11	0.39	9.0	9.0	5.7	2.18	2.73	3.80	12	0.50	103.58	104.19	104.30	104.85	106.15	108.70	CB11-CB10
11	10	97	0.43	0.43	0.65	0.28	0.28	8.0	8.0	6.0	1.68	2.71	3.36	12	0.49	104.29	104.77	104.97	105.32	108.70	107.40	YD5-CB11
12	7	96	0.40	0.40	0.90	0.36	0.36	6.0	6.0	6.9	2.48	1.68	4.54	10	0.50	103.02	103.50	103.85	104.90	106.62	104.66	RL2-CB8
13	3	14	0.20	0.56	0.86	0.17	0.26	6.0	12.2	4.8	1.27	20.90	6.31	15	8.93	98.72	99.97	98.93	100.41	101.82	103.22	CB6-CB3
14	13	208	0.09	0.36	0.25	0.02	0.09	10.0	11.0	5.1	0.46	3.77	2.90	12	0.96	100.22	102.21	100.46	102.49	103.22	107.20	YD4-CB6
15	14	138	0.27	0.27	0.25	0.07	0.07	10.0	10.0	5.4	0.36	2.73	2.40	12	0.50	102.31	103.00	102.56	103.25	107.20	107.20	YD3-YD4
16	8	63	0.11	0.11	0.71	0.08	0.08	7.0	7.0	6.4	0.50	4.91	0.42	15	0.49	101.56	101.87	103.02	103.02	105.72	104.58	CB17-CB9
17	2	27	0.11	0.35	0.78	0.09	0.21	7.0	8.2	5.9	1.25	19.46	6.06	15	7.74	97.12	99.21	97.33	99.65	100.49	102.31	CB18-CB2
18	17	38	0.24	0.24	0.52	0.12	0.12	8.0	8.0	6.0	0.75	17.21	2.78	15	6.05	99.31	101.61	99.65	101.95	102.31	103.61	CB19-CB18
19	4	222	0.23	2.13	0.59	0.14	1.33	8.0	8.2	5.9	7.88	17.33	2.52	24	0.50	93.74	94.85	96.58	96.80	103.54	98.84	CB12-CB4
20	19	29	0.49	1.80	0.54	0.26	1.10	8.0	8.1	6.0	6.58	21.54	5.72	15	9.48	94.95	97.70	97.02	98.73	98.84	100.80	CB13-CB12
21	20	42	1.31	1.31	0.64	0.84	0.84	8.0	8.0	6.0	5.04	8.36	5.20	15	1.43	97.80	98.40	98.73	99.31	100.80	101.40	CB14-CB13
22	1	115	0.25	0.25	0.64	0.16	0.16	8.0	8.0	6.0	0.96	4.97	3.06	15	0.50	97.56	98.14	97.93	98.52	101.68	101.14	CB27-CB20
Project File: 4022.D - Storm Sewers.stm																Number of lines: 63				Run Date: 3/16/2021		
NOTES:Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period =Yrs. 10 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	2	25	0.12	0.12	0.90	0.11	0.11	6.0	6.0	6.9	0.74	4.85	2.82	15	0.48	97.37	97.49	97.70	97.83	100.49	100.49	CB1-CB2
24	19	38	0.10	0.10	0.90	0.09	0.09	6.0	6.0	6.9	0.62	4.95	0.50	15	0.50	95.45	95.64	97.02	97.02	98.84	98.04	CB15-CB12
25	End	122	0.00	0.71	0.00	0.00	0.64	0.0	7.0	6.4	4.11	6.53	5.73	12	2.87	97.00	100.50	97.86	101.36	100.16	103.50	DMH1-FE1
26	25	198	0.00	0.27	0.00	0.00	0.24	0.0	6.2	6.8	1.65	2.95	4.32	10	1.55	100.83	103.89	101.36	104.47	103.50	107.60	DMH2-DMH1
27	26	41	0.27	0.27	0.90	0.24	0.24	6.0	6.0	6.9	1.67	1.70	3.55	10	0.51	103.99	104.20	104.66	104.87	107.60	104.77	RL3-DMH2
28	25	127	0.44	0.44	0.90	0.40	0.40	6.0	6.0	6.9	2.72	3.44	6.20	10	2.10	100.83	103.50	101.39	104.23	103.50	104.95	RL4-DMH1
29	End	73	0.04	2.77	0.78	0.03	1.69	7.0	11.7	4.9	8.35	10.14	6.15	18	0.79	90.50	91.08	91.54	92.20	91.95	95.82	CB29-FE4
30	29	30	0.08	2.65	0.41	0.03	1.60	9.0	11.6	5.0	7.92	8.04	5.19	18	0.50	91.18	91.33	92.39	92.54	95.82	94.80	CB30-CB29
31	30	56	0.31	2.57	0.50	0.16	1.56	9.0	11.4	5.0	7.83	12.44	4.71	18	1.20	91.43	92.10	93.17	93.35	94.80	97.24	CB21-CB30
32	31	84	0.06	2.26	0.75	0.05	1.41	7.0	11.1	5.1	7.17	8.14	4.10	18	0.51	92.20	92.63	93.75	94.05	97.24	102.65	CB22-CB21
33	32	44	0.06	1.48	0.79	0.05	1.00	7.0	10.9	5.1	5.11	8.04	4.82	18	0.50	99.59	99.81	100.46	100.68	102.65	104.90	CB28-CB22
34	33	81	0.09	1.42	0.77	0.07	0.95	7.0	10.6	5.2	4.94	7.99	4.76	18	0.49	99.91	100.31	100.76	101.16	104.90	104.80	CB16-CB28
35	34	59	0.18	1.33	0.77	0.14	0.88	7.0	10.4	5.3	4.63	4.90	4.54	15	0.49	100.41	100.70	101.38	101.67	104.80	103.80	CB25-CB16
36	35	94	0.00	1.15	0.00	0.00	0.74	0.0	10.0	5.4	3.98	7.97	4.00	15	1.30	100.80	102.02	102.11	102.83	103.80	107.10	DMH3-CB25
37	36	192	0.44	0.44	0.37	0.16	0.16	9.0	9.0	5.7	0.92	1.68	3.15	10	0.50	103.44	104.40	103.88	104.84	107.10	107.40	YD6-DMH3
38	36	83	0.44	0.44	0.90	0.40	0.40	6.0	6.0	6.9	2.72	3.06	5.46	10	1.66	102.12	103.50	102.83	104.23	107.10	104.25	RL1-DMH3
39	36	90	0.27	0.27	0.68	0.18	0.18	8.0	8.0	6.0	1.10	4.95	2.33	15	0.50	102.12	102.57	102.83	102.98	107.10	105.57	CB26-DMH3
40	32	220	0.52	0.72	0.46	0.24	0.37	9.0	9.0	5.7	2.08	4.95	2.39	15	0.50	92.97	94.07	94.45	94.74	102.65	97.17	CB23-CB22
41	40	90	0.20	0.20	0.64	0.13	0.13	8.0	8.0	6.0	0.77	14.24	1.87	15	4.14	94.17	97.90	94.96	98.24	97.17	100.90	CB24-CB23
42	29	68	0.08	0.08	0.79	0.06	0.06	7.0	7.0	6.4	0.41	12.23	3.47	15	3.06	92.82	94.90	92.98	95.15	95.82	97.90	CB31-CB29
43	End	29	0.53	10.05	0.66	0.35	3.61	6.0	43.0	2.2	11.63	41.71	5.33	30	1.03	63.20	63.50	64.34	64.64	74.16	71.64	EXCB8-EXCB12
44	43	10	0.00	9.23	0.00	0.00	3.08	0.0	43.0	2.2	10.47	58.00	4.97	30	2.00	63.50	63.70	64.64	64.78	71.64	72.18	EXDMH1-EXCB8
Project File: 4022.D - Storm Sewers.stm																Number of lines: 63				Run Date: 3/16/2021		
NOTES:Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period =Yrs. 10 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr (min)	Total (min)	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	226	0.51	2.65	0.36	0.18	0.80	10.0	11.7	4.9	7.65	11.49	7.49	15	3.16	63.90	71.05	64.78	72.15	72.18	74.23	EXCB6-EXDMH1
46	45	26	0.91	2.14	0.30	0.27	0.62	10.0	11.6	5.0	6.76	8.50	6.05	15	1.73	71.05	71.50	72.15	72.54	74.23	74.29	EXCB5-EXCB6
47	46	142	0.00	0.42	0.00	0.00	0.12	0.0	11.1	5.1	4.30	9.46	4.42	15	2.15	71.50	74.55	72.54	75.39	74.29	78.36	EXCB2-EXCB5
48	47	18	0.00	0.42	0.00	0.00	0.12	0.0	11.0	5.1	4.30	3.95	7.88	10	2.78	74.65	75.15	75.48	76.07	78.36	81.85	EXCB1-EXCB2
49	48	262	0.00	0.42	0.00	0.00	0.12	0.0	10.1	5.3	4.33	7.96	4.58	15	1.29	75.25	78.64	76.22	79.48	81.85	93.24	YD2-EXCB1
50	49	181	0.00	0.00	0.00	0.00	0.00	0.0	1.0	0.0	3.70	4.93	4.41	15	0.50	78.74	79.64	79.55	80.45	93.24	94.55	YD1-YD2
51	50	205	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	3.70	4.96	4.43	15	0.50	79.74	80.77	80.55	81.57	94.55	95.32	OCS-YD1
52	51	45	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.70	5.00	3.09	15	0.51	80.77	81.00	82.03	82.14	95.32	89.45	FE5-OCS
53	44	316	0.20	0.54	0.71	0.14	0.39	7.0	8.5	5.8	2.29	5.43	4.32	12	2.33	64.15	71.50	64.78	72.15	72.18	74.94	EXCB4-EXDMH1
54	53	296	0.34	0.34	0.74	0.25	0.25	7.0	7.0	6.4	1.61	11.49	3.20	15	3.17	71.57	80.94	72.15	81.44	74.94	84.71	EXCB3-EXCB4
55	44	125	1.54	4.81	0.38	0.59	1.44	12.0	42.7	2.2	3.19	1.90	5.85	10	0.64	64.00	64.80	64.83	67.10	72.18	71.34	EXCB9-EXDMH1
56	55	110	0.00	3.27	0.00	0.00	0.86	0.0	41.5	2.3	1.93	3.37	1.58	15	0.27	64.80	65.10	67.88	67.98	71.34	75.13	DMH4-EXCB9
57	56	74	0.93	3.27	0.27	0.25	0.86	10.0	41.2	2.3	1.94	4.27	4.00	10	3.24	66.40	68.80	68.01	69.43	75.13	71.10	YD8-DMH4
58	57	37	2.34	2.34	0.26	0.61	0.61	41.0	41.0	2.3	1.38	1.74	3.35	10	0.54	68.80	69.00	69.43	69.56	71.10	71.02	YD7-YD8
59	43	153	0.25	0.29	0.65	0.16	0.18	8.0	8.0	6.0	1.09	4.81	3.14	15	0.56	67.05	67.90	67.46	68.31	71.64	71.30	EXCB10-EXCB8
60	59	29	0.04	0.04	0.48	0.02	0.02	7.0	7.0	6.4	0.12	5.09	1.31	15	0.62	68.10	68.28	68.31	68.41	71.30	71.30	EXCB11-EXCB10
61	44	81	1.23	1.23	0.36	0.44	0.44	10.0	10.0	5.4	2.38	18.01	4.10	15	7.78	64.20	70.50	64.78	71.12	72.18	74.41	EXCB7-EXDMH1
62	46	26	0.81	0.81	0.28	0.23	0.23	10.0	10.0	5.4	1.22	2.73	2.05	12	0.50	71.77	71.90	72.54	72.56	74.29	74.90	YD10-EXCB5
63	49	18	0.42	0.42	0.28	0.12	0.12	10.0	10.0	5.4	0.63	3.86	3.20	12	1.00	84.02	84.20	84.29	84.53	93.24	87.20	YD9-YD2
Project File: 4022.D - Storm Sewers.stm																Number of lines: 63				Run Date: 3/16/2021		
NOTES:Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period =Yrs. 10 ; c = cir e = ellip b = box																						

Inlet Report

Line No	Inlet ID	Q = CIA	Q carry	Q capt	Q Byp	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
		(cfs)	(cfs)	(cfs)	(cfs)		Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	CCB-20	0.94	0.37	0.89	0.42	Comb	4.0	2.73	0.00	2.73	1.77	0.026	12.00	0.032	0.032	0.013	0.15	4.60	0.18	2.99	1.0	2
2	CCB TYPE II-2	0.27	0.46	0.73	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.026	0.026	0.000	0.09	5.32	0.18	5.32	1.0	Off
3	CCB-3	0.41	0.00	0.37	0.04	Comb	4.0	2.73	0.00	2.73	1.77	0.037	12.00	0.032	0.032	0.013	0.09	2.78	0.12	1.19	1.0	2
4	CCB-4	0.60	0.12	0.48	0.23	Comb	4.0	2.73	0.00	2.73	1.77	0.031	12.00	0.021	0.021	0.013	0.10	4.61	0.15	3.01	1.0	19
5	CCB-5	0.56	0.00	0.44	0.12	Comb	4.0	2.73	0.00	2.73	1.77	0.020	12.00	0.029	0.029	0.013	0.11	3.73	0.14	2.08	1.0	4
6	CCB-7	1.15	0.00	0.75	0.40	Comb	4.0	2.73	0.00	2.73	1.77	0.017	12.00	0.028	0.028	0.013	0.14	5.15	0.18	3.46	1.0	7
7	CLCB TYPE II-8	0.99	0.40	1.39	0.00	Grate	0.0	0.00	9.16	5.83	1.77	Sag	12.00	0.014	0.014	0.000	0.07	7.30	0.15	7.30	1.0	Off
8	CCB TYPE II-9	1.58	0.39	1.97	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.035	0.035	0.000	0.26	8.10	0.34	8.10	1.0	Off
9	CCB TYPE II-10	2.07	0.00	1.68	0.39	Comb	4.0	5.83	0.00	5.83	1.77	0.039	12.00	0.039	0.049	0.013	0.17	4.47	0.18	2.39	1.0	8
10	CLCB-11	0.60	0.00	0.60	0.00	Grate	0.0	0.00	4.83	2.73	1.77	Sag	12.00	0.019	0.019	0.000	0.04	4.75	0.12	4.75	1.0	Off
11	YD-5	1.68	0.00	1.68	0.00	Grate	0.0	0.00	0.75	0.38	2.00	Sag	12.00	0.039	0.039	0.000	0.22	6.52	0.30	6.52	1.0	Off
12	RL2	2.48	0.00	0.00	2.48	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
13	CCB-6	1.18	0.00	1.18	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.032	0.032	0.000	0.23	8.12	0.32	8.12	1.0	Off
14	YD-4	0.12	0.00	0.12	0.00	Grate	0.0	0.00	0.04	0.02	2.00	Sag	12.00	0.052	0.052	0.000	0.29	6.36	0.37	6.36	1.0	Off
15	YD-3	0.36	0.00	0.36	0.00	Grate	0.0	0.00	0.13	0.07	2.00	Sag	12.00	0.038	0.038	0.000	0.23	6.99	0.31	6.99	1.0	Off
16	CLCB-17	0.50	0.00	0.50	0.00	Grate	0.0	0.00	4.83	2.73	1.77	Sag	12.00	0.037	0.037	0.000	0.04	2.91	0.13	2.91	1.0	Off
17	CCB-18	0.55	0.00	0.47	0.08	Comb	4.0	2.73	0.00	2.73	1.77	0.020	12.00	0.037	0.037	0.013	0.12	3.19	0.14	1.55	1.0	1
18	CCB-19	0.75	0.00	0.69	0.06	Comb	4.0	2.73	0.00	2.73	1.77	0.040	12.00	0.050	0.050	0.013	0.13	2.61	0.13	1.02	1.0	1
19	CCB-12	0.82	0.23	1.05	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.032	0.032	0.000	0.21	7.48	0.29	7.48	1.0	Off
20	CCB TYPE II-13	1.59	2.02	3.61	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.023	0.023	0.000	0.35	15.25	0.43	15.25	1.0	Off
21	CCB TYPE II-14	5.04	0.00	3.03	2.02	Comb	4.0	5.83	0.00	5.83	1.77	0.018	12.00	0.025	0.025	0.013	0.24	9.53	0.25	6.76	1.0	20
22	CCB-27	0.96	0.00	0.73	0.23	Comb	4.0	2.73	0.00	2.73	1.77	0.043	12.00	0.032	0.032	0.013	0.12	3.73	0.15	2.18	1.0	1
23	CCB TYPE II-1	0.74	0.00	0.74	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.023	0.023	0.000	0.09	5.93	0.18	5.93	1.0	Off

Project File: 4022.D - Storm Sewers.stm

Number of lines: 63

Run Date: 3/16/2021

NOTES: Inlet N-Values = 0.016; Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period = 10 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			By Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	CCB-15	0.62	0.00	0.58	0.04	Comb	4.0	2.73	0.00	2.73	1.77	0.037	12.00	0.049	0.049	0.013	0.12	2.49	0.13	0.90	1.0	Off
25	DMH-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
26	DMH-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
27	RL3	1.67	0.00	0.00	1.67	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	RL4	2.72	0.00	0.00	2.72	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	CCB-29	0.20	0.00	0.20	0.00	Comb	4.0	2.73	0.00	2.73	1.77	0.032	12.00	0.033	0.033	0.013	0.07	2.15	0.10	0.51	1.0	Off
30	CCB-30	0.19	0.12	0.30	0.00	Comb	4.0	2.73	0.00	2.73	1.77	0.042	12.00	0.045	0.045	0.013	0.09	1.96	0.10	0.29	1.0	Off
31	CCB-21	0.88	0.01	0.77	0.12	Comb	4.0	2.73	0.00	2.73	1.77	0.038	12.00	0.046	0.046	0.013	0.14	2.95	0.15	1.38	1.0	30
32	CCB-22	0.29	0.00	0.28	0.01	Comb	4.0	2.73	0.00	2.73	1.77	0.050	12.00	0.036	0.036	0.013	0.08	2.14	0.10	0.52	1.0	31
33	CCB-28	0.30	0.00	0.30	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.024	0.024	0.000	0.04	4.14	0.13	4.14	1.0	Off
34	CCB-16	0.44	0.00	0.44	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.019	0.019	0.000	0.08	6.35	0.16	6.35	1.0	Off
35	CCB-25	0.89	0.00	0.89	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.027	0.027	0.000	0.18	7.70	0.26	7.70	1.0	Off
36	DMH-3	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
37	YD-6	0.92	0.00	0.59	0.34	Grate	0.0	0.00	0.00	1.00	2.00	0.020	10.00	0.020	0.020	0.250	0.34	17.22	0.32	11.79	1.0	61
38	RL1	2.72	0.00	0.00	2.72	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
39	CCB TYPE II-26	1.10	0.00	1.10	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.024	0.024	0.000	0.15	7.47	0.23	7.47	1.0	Off
40	CCB TYPE II-23	1.36	0.06	1.41	0.00	Comb	4.0	5.83	4.83	5.83	1.77	Sag	12.00	0.029	0.029	0.000	0.19	7.58	0.27	7.58	1.0	Off
41	CCB TYPE II-24	0.77	0.00	0.71	0.06	Comb	4.0	5.83	0.00	5.83	1.77	0.038	12.00	0.041	0.041	0.013	0.12	3.01	0.13	1.14	1.0	40
42	CCB-31	0.41	0.00	0.39	0.01	Comb	4.0	2.73	0.00	2.73	1.77	0.038	12.00	0.044	0.044	0.013	0.10	2.26	0.11	0.65	1.0	Off
43	EXCB-8	2.41	1.55	3.95	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.017	0.017	0.000	0.41	24.35	0.50	24.35	1.0	Off
44	EXDMH-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
45	EXCB-6	0.99	0.00	0.61	0.37	Grate	0.0	0.00	0.00	2.73	1.77	0.040	12.00	0.020	0.020	0.013	0.10	5.12	0.15	3.56	1.0	43
46	EXCB-5	1.47	0.00	0.81	0.65	Grate	0.0	0.00	0.00	2.73	1.77	0.040	12.00	0.020	0.020	0.013	0.12	5.94	0.17	4.39	1.0	43

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Number of lines: 63

Run Date: 3/16/2021

NOTES: Inlet N-Values = 0.016; Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period = 10 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
47	EXCB-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
48	EXCB-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
49	YD-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
50	YD-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
51	OCS-1 CLCB TYP	0.00	0.00	0.00	0.00	Grate	0.0	0.00	4.83	5.83	1.77	Sag	2.00	0.050	0.020	0.000	0.00	0.00	0.00	0.00	0.0	Off
52	FE-5	3.70*	0.00	0.00	3.70	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
53	EXCB-4	0.91	0.56	0.96	0.52	Comb	4.0	2.73	0.00	2.73	1.77	0.023	12.00	0.031	0.031	0.013	0.16	5.02	0.19	3.39	1.0	43
54	EXCB-3	1.61	0.00	1.05	0.56	Comb	4.0	2.73	0.00	2.73	1.77	0.035	12.00	0.031	0.031	0.013	0.15	4.80	0.18	3.24	1.0	53
55	EXCB-9	2.85	1.18	4.03	0.00	Grate	0.0	0.00	4.83	2.73	1.77	Sag	12.00	0.034	0.034	0.000	0.31	9.62	0.39	9.62	1.0	Off
56	DMH-4	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
57	YD-8	1.35	0.00	1.35	0.00	Grate	0.0	0.00	3.14	5.40	2.00	Sag	10.00	0.160	0.160	0.000	0.18	1.56	0.26	1.56	1.0	Off
58	YD-7	1.38	0.00	1.38	0.00	Grate	0.0	0.00	3.14	3.08	2.00	Sag	10.00	0.130	0.130	0.000	0.22	2.17	0.30	2.17	1.0	Off
59	EXCB-10	0.98	0.00	0.98	0.00	Comb	4.0	2.73	4.83	2.73	1.77	Sag	12.00	0.017	0.017	0.000	0.20	11.66	0.28	11.66	1.0	Off
60	EXCB-11	0.12	0.00	0.12	0.00	Comb	4.0	2.73	0.00	2.73	1.77	0.010	12.00	0.031	0.031	0.013	0.07	2.31	0.10	0.59	1.0	59
61	EXCB-7	2.38	0.34	1.53	1.18	Grate	0.0	0.00	0.00	2.73	1.77	0.017	12.00	0.034	0.034	0.013	0.21	6.30	0.24	4.61	1.0	55
62	YD10	1.22	0.00	1.22	0.00	Grate	0.0	0.00	1.56	0.78	2.00	Sag	12.00	0.100	0.100	0.000	0.22	2.80	0.30	2.80	1.0	Off
63	YD9	0.63	0.00	0.63	0.00	Grate	0.0	0.00	0.26	0.13	2.00	Sag	12.00	0.100	0.100	0.000	0.23	2.91	0.31	2.91	1.0	Off

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Number of lines: 63

Run Date: 3/16/2021

NOTES: Inlet N-Values = 0.016; Intensity = 37.58 / (Inlet time + 4.00) ^ 0.74; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

APPENDIX E
Water Quality Calculations

Pleasant Valley School
591 Ellington Road – DPI Project No.:4022.D
March 16, 2021

Water Quality Volume Calculations

Per 2004 Connecticut Stormwater Quality Manual, Section 7.4.1:

Areas for Calculation: Off Site to WQB (P1) & Proposed Site (P2)

	<u>Areas</u>	
	P2	P5
Impervious	6.111	0.640
Pervious	4.838	0.524
Total Area	10.949	1.164
%Impervious	55.81%	54.98%
Overall %Impervious		55.73%
Total Area	12.113	acres

Water Quality Volume (WQV) = (1")(R)(A)/12, where:

R = unitless volumetric runoff coefficient = $0.05 + 0.009(I)$, where:

I = percent impervious cover of drainage area = **55.73%** (DA P2+P5)

$R = 0.05 + 0.009(I)$

$R = 0.05 + 0.009(55.73)$

$R = \underline{0.552}$

A = drainage area in acres = **12.113** acres

$WQV = (1")(R)(A \text{ acres})/12 \text{ inches per foot}$

$WQV = (1")(0.552)(12.1 \text{ acres})/12 \text{ inches per foot}$

$WQV = \underline{0.557} \text{ acre-feet required} = 24,263 \text{ cft}$

Proposed BMP

The proposed water quality basin and forebay are proposed to provide **3,120 cft** (below spillway at ELEV. 90.50) and **~24,848 cft** (below 6" orifice at Elev. 88.60) of water quality storage, respectively. The forebay will provide storage for **12.9%** of the determined water quality volume draining to the basin. The forebay in combination with the proposed wet pool of the water quality will provide a total water quality storage volume of **27,968 cft**; more than 100% of the water quality volume.

4022 - HydroCAD

Prepared by Design Professionals, Inc.

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Type III 24-hr 100-yr Rainfall=7.76"

Printed 3/16/2021

Stage-Area-Storage for Pond PP1: Proposed Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
85.50	6,448	0	93.30	31,051	124,294
85.65	6,598	1,005	93.45	31,368	129,015
85.80	6,749	2,010	93.60	31,685	133,736
85.95	6,899	3,014	93.75	32,003	138,458
86.10	7,050	4,095	93.90	32,320	143,179
86.25	7,202	5,213	94.05	32,642	148,008
86.40	7,353	6,331	94.20	32,975	153,054
86.55	7,505	7,449	94.35	33,308	158,100
86.70	7,657	8,567	94.50	33,641	163,147
86.85	7,808	9,686	94.65	33,974	168,193
87.00	7,960	10,804	94.80	34,307	173,239
87.15	8,124	12,080	94.95	34,640	178,285
87.30	8,289	13,356	95.10	35,125	183,629
87.45	8,453	14,632	95.25	35,686	189,122
87.60	8,618	15,909	95.40	36,247	194,615
87.75	8,782	17,185	95.55	36,807	200,108
87.90	8,946	18,461	95.70	37,368	205,601
88.05	9,113	19,793	95.85	37,929	211,094
88.20	9,285	21,237	96.00	38,490	216,588
88.35	9,456	22,682			
88.50	9,628	24,126			
88.65	9,800	25,570			
88.80	9,971	27,014			
88.95	10,143	28,458			
89.10	11,014	30,367			
89.25	12,235	32,507			
89.40	13,456	34,648			
89.55	14,676	36,788			
89.70	15,897	38,928			
89.85	17,118	41,069			
90.00	18,339	43,209			
90.15	19,241	46,186			
90.30	20,143	49,162			
90.45	21,044	52,138			
90.60	21,648	55,341			
90.75	22,103	58,656			
90.90	22,558	61,971			
91.05	22,988	65,388			
91.20	23,369	69,008			
91.35	23,750	72,628			
91.50	24,131	76,247			
91.65	24,512	79,867			
91.80	24,893	83,487			
91.95	25,274	87,106			
92.10	25,598	90,942			
92.25	25,894	94,885			
92.40	26,190	98,828			
92.55	26,486	102,771			
92.70	26,782	106,715			
92.85	27,077	110,658			
93.00	30,417	114,852			
93.15	30,734	119,573			

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Type III 24-hr 100-yr Rainfall=7.76"

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Stage-Area-Storage for Pond 2P: Proposed Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
89.00	1,322	0	90.04	2,359	1,921
89.02	1,342	36	90.06	2,382	1,973
89.04	1,362	73	90.08	2,406	2,025
89.06	1,381	109	90.10	2,429	2,078
89.08	1,401	145	90.12	2,453	2,130
89.10	1,421	182	90.14	2,476	2,182
89.12	1,441	218	90.16	2,500	2,234
89.14	1,461	254	90.18	2,523	2,286
89.16	1,480	291	90.20	2,547	2,338
89.18	1,500	327	90.22	2,570	2,390
89.20	1,520	363	90.24	2,594	2,442
89.22	1,540	400	90.26	2,617	2,494
89.24	1,560	436	90.28	2,641	2,547
89.26	1,579	472	90.30	2,664	2,599
89.28	1,599	509	90.32	2,688	2,651
89.30	1,619	545	90.34	2,711	2,703
89.32	1,639	581	90.36	2,735	2,755
89.34	1,659	618	90.38	2,758	2,807
89.36	1,678	654	90.40	2,782	2,859
89.38	1,698	690	90.42	2,805	2,911
89.40	1,718	727	90.44	2,829	2,963
89.42	1,738	763	90.46	2,852	3,016
89.44	1,758	799	90.48	2,876	3,068
89.46	1,777	836	90.50	2,899	3,120
89.48	1,797	872	90.52	2,846	3,165
89.50	1,817	909	90.54	2,793	3,209
89.52	1,837	945	90.56	2,740	3,254
89.54	1,857	981	90.58	2,687	3,299
89.56	1,876	1,018	90.60	2,635	3,344
89.58	1,896	1,054	90.62	2,582	3,388
89.60	1,916	1,090	90.64	2,529	3,433
89.62	1,936	1,127	90.66	2,476	3,478
89.64	1,956	1,163	90.68	2,423	3,523
89.66	1,975	1,199	90.70	2,370	3,567
89.68	1,995	1,236	90.72	2,317	3,612
89.70	2,015	1,272	90.74	2,264	3,657
89.72	2,035	1,308	90.76	2,212	3,702
89.74	2,055	1,345	90.78	2,159	3,746
89.76	2,074	1,381	90.80	2,106	3,791
89.78	2,094	1,417	90.82	2,053	3,836
89.80	2,114	1,454	90.84	2,000	3,881
89.82	2,134	1,490	90.86	1,947	3,925
89.84	2,154	1,526	90.88	1,894	3,970
89.86	2,173	1,563	90.90	1,841	4,015
89.88	2,193	1,599	90.92	1,789	4,060
89.90	2,213	1,635	90.94	1,736	4,104
89.92	2,233	1,672	90.96	1,683	4,149
89.94	2,253	1,708	90.98	1,630	4,194
89.96	2,272	1,744	91.00	1,577	4,239
89.98	2,292	1,781			
90.00	2,312	1,817			
90.02	2,335	1,869			

APPENDIX F
Drainage Area Maps

