

**Stormwater Management Report
25 Talbot Lane
5 & 25 Talbot Lane and
475 & 551 Governor's Highway
South Windsor, Connecticut**

Prepared by:

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

**July 2, 2021
Revised to: October 15, 2021**

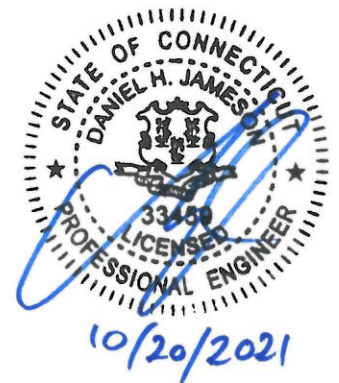


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Introduction

UW Vintage Lane II, LLC is proposing an industrial development of a tract of land comprised of four properties located at 5 & 25 Talbot Lane and 475 & 551 Governor's Highway, South Windsor, Connecticut. The properties are referenced on the Town of South Windsor Tax Assessors map as GIS#: 88900005, 88900025, 36900475 and 36900551, respectively. The proposed development will include the construction of one 359,640 SF industrial building. Associated site improvements will include but not be limited to new access driveways, parking areas for vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMP's.

The total combined tract area is 30.37 acres. 27.1± acres of this area are proposed to be disturbed during construction. For more information, please refer to the plans entitled "25 Talbot Lane ~ Site Plan Application ~ 5 & 25 Talbot Lane and 475 & 551 Governor's Highway ~ South Windsor, Ct ~ GIS#: 88900005, 88900025, 36900475 and 36900551" prepared by Design Professionals, Inc., and dated July 02, 2021, as amended.

Pre-Development Site Conditions

The existing surficial characteristics of the area to be developed can be primarily classified as undisturbed woodland area with industrial development to the west and residential properties to south and east. The northern property line along Governors Highway forms the drainage divide for storm water that falls within the ROW. No runoff from the site flows to the Governors Highway drainage system directly. Review of the site topography indicated all stormwater runoff generated across the tract would flow to one of four design points. These four design points were identified as follows:

1. **Design Point 1 (DP#1):** Existing stilling basin @ SW corner of property. Conveying water through Carla's Pasta (50 Talbot Lane) via a 36" HDPE culvert.
2. **Design Point 2 (DP#2):** Existing outlet structure with 24" RCP culvert outlet to the Cody Circle subsurface drainage system.
3. **Design Point 3 (DP#3):** Sheet flow runoff across the SE Property corner.
4. **Design Point 4 (DP#4):** Existing outlet structure with 15" RCP culvert outlet to Temple Beth Hillel's drainage system (20 Baker Lane).

DP#1 ultimately drains to The Newbury Brook, and is a part of local basin ID 4000-21-1. DP#2 - 4 ultimately drain to The Podunk River, and is a part of local basin ID 4004-00-2-R1. 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 C, A/D, & B/D 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 points identified. 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

The proposed development will include the construction of one 359,640 SF industrial building. Associated site improvements will include but not be limited to new access driveways, parking areas for vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMP's. Site generated runoff from all proposed roofs, roadways, parking, and landscaped areas will be collected in an underground storm water conveyance system. This conveyance system will be comprised of a series of catchbasins connected with culverts and an underground stormwater chamber system. All first flush stormwater will either be directed to proposed isolation rows within the underground chamber system, or the forebay within the proposed water quality basin for treatment.

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. Four discharge locations (**Design Point #1 - 4**) were identified as points 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 Stilling Basin	Pre	2.39	8.67	13.43	17.21	21.61
	Post	2.31	8.64	13.20	17.1	21.33
DP#2 – 24" RCP To Cody Circle	Pre	2.85	8.66	12.87	16.15	19.89
	Post	2.51	4.59	5.97	7.01	8.19
DP#3 – SE Overflow	Pre	0.91	2.85	4.26	5.36	6.62
	Post	0.94	2.82	4.18	5.24	6.45
DP#4 – 15" RCP To Temple Beth Hillel	Pre	2.21	7.27	11.01	13.95	17.32
	Post	0.66	1.99	2.94	3.69	4.54

As seen in the table above, most of the storm events evaluated for 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-, 50- and 100-year design storms. There was a small 0.03 cfs increase in peak flow to DP#3 in the 2-yr storm. This increase to DP#3 is offset by reductions in the peak flow to DP#2 & 4, all of which ultimately drain to the Podunk River. It is our opinion that this increase is negligible and will not cause any detrimental downstream impacts.

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. Autodesk Storm and Sanitary Analysis software was used for analysis. The computations are included as **Appendix D**.

Water Quality

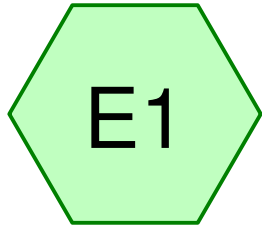
The proposed water quality basin and forebay were sized to treat a 3.10" rain event (per NOAA's Atlas 14 Point Precipitation Frequency Estimate for a 2-year, 24-hr storm) instead of 1" as recommended in the 2004 Connecticut Stormwater Quality Manual, per your recommendation. The proposed forebay was sized to store over 10% of this water quality volume as recommended by the 2004 Connecticut Stormwater Quality Manual. The water quality basin shall be evaluated at least every 5 years for the buildup of organic matter. If recommended by a qualified ecological consultant, the organic matter buildup shall be removed as directed.

Cultec Isolator rows will also be utilized to address water quality for pavement surfaces draining to them. The number of isolator rows provided will be more than adequate to treat the required water quality flow rate based on the determined water quality flow and manufacture specs for treated flow rate per chamber. The required water quality flow was also calculated considering a 3.10" rain event. See **Attachment C** for water quality flow & volume calcs, pond and forebay stage storage reports, and Cultec Isolator rows manufactures specs.

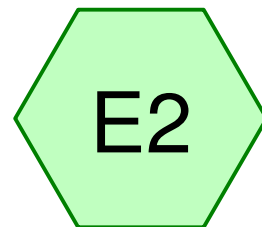
Conclusion

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

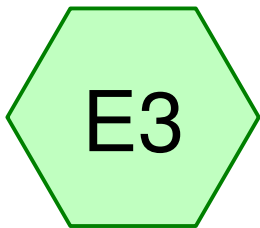
APPENDIX A
Watershed Computations
(Pre-Development Drainage HydroCAD Report)



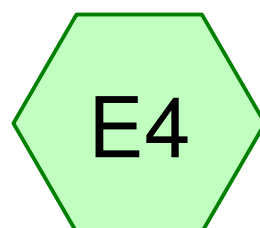
Existing E1 (DP1)



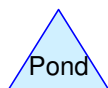
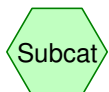
Existing E2 (DP2)



Existing E3 (DP3)



Existing E4 (DP4)



Routing Diagram for 1976.U Hydrocad

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 E1 (DP1)

Runoff Area=14.370 ac 0.56% Impervious Runoff Depth=0.54"
Flow Length=1,260' Tc=72.1 min CN=64 Runoff=2.39 cfs 0.642 af

Subcatchment E2: Existing E2 (DP2)

Runoff Area=10.640 ac 0.09% Impervious Runoff Depth=0.71"
Flow Length=934' Tc=62.6 min CN=68 Runoff=2.85 cfs 0.626 af

Subcatchment E3: Existing E3 (DP3)

Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=0.66"
Flow Length=286' Tc=41.9 min CN=67 Runoff=0.91 cfs 0.161 af

Subcatchment E4: Existing E4 (DP4)

Runoff Area=6.569 ac 0.76% Impervious Runoff Depth=0.62"
Flow Length=658' Tc=29.0 min CN=66 Runoff=2.21 cfs 0.338 af

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Existing Condition
Type III 24-hr 10-yr Rainfall=4.99"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 E1 (DP1)	Runoff Area=14.370 ac 0.56% Impervious Runoff Depth=1.57" Flow Length=1,260' Tc=72.1 min CN=64 Runoff=8.67 cfs 1.885 af
Subcatchment E2: Existing E2 (DP2)	Runoff Area=10.640 ac 0.09% Impervious Runoff Depth=1.87" Flow Length=934' Tc=62.6 min CN=68 Runoff=8.66 cfs 1.660 af
Subcatchment E3: Existing E3 (DP3)	Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=1.80" Flow Length=286' Tc=41.9 min CN=67 Runoff=2.85 cfs 0.437 af
Subcatchment E4: Existing E4 (DP4)	Runoff Area=6.569 ac 0.76% Impervious Runoff Depth=1.72" Flow Length=658' Tc=29.0 min CN=66 Runoff=7.27 cfs 0.942 af

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Existing Condition
Type III 24-hr 25-yr Rainfall=6.13"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 E1 (DP1) Runoff Area=14.370 ac 0.56% Impervious Runoff Depth=2.36"
Flow Length=1,260' Tc=72.1 min CN=64 Runoff=13.43 cfs 2.822 af

Subcatchment E2: Existing E2 (DP2) Runoff Area=10.640 ac 0.09% Impervious Runoff Depth=2.72"
Flow Length=934' Tc=62.6 min CN=68 Runoff=12.87 cfs 2.413 af

Subcatchment E3: Existing E3 (DP3) Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=2.63"
Flow Length=286' Tc=41.9 min CN=67 Runoff=4.26 cfs 0.640 af

Subcatchment E4: Existing E4 (DP4) Runoff Area=6.569 ac 0.76% Impervious Runoff Depth=2.54"
Flow Length=658' Tc=29.0 min CN=66 Runoff=11.01 cfs 1.389 af

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Existing Condition
Type III 24-hr 50-yr Rainfall=6.97"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 E1 (DP1) Runoff Area=14.370 ac 0.56% Impervious Runoff Depth=2.98"
Flow Length=1,260' Tc=72.1 min CN=64 Runoff=17.21 cfs 3.567 af

Subcatchment E2: Existing E2 (DP2) Runoff Area=10.640 ac 0.09% Impervious Runoff Depth=3.39"
Flow Length=934' Tc=62.6 min CN=68 Runoff=16.15 cfs 3.002 af

Subcatchment E3: Existing E3 (DP3) Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=3.28"
Flow Length=286' Tc=41.9 min CN=67 Runoff=5.36 cfs 0.799 af

Subcatchment E4: Existing E4 (DP4) Runoff Area=6.569 ac 0.76% Impervious Runoff Depth=3.18"
Flow Length=658' Tc=29.0 min CN=66 Runoff=13.95 cfs 1.741 af

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Existing Condition
Type III 24-hr 100-yr Rainfall=7.90"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
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 E1 (DP1) Runoff Area=14.370 ac 0.56% Impervious Runoff Depth=3.70"
Flow Length=1,260' Tc=72.1 min CN=64 Runoff=21.61 cfs 4.433 af

Subcatchment E2: Existing E2 (DP2) Runoff Area=10.640 ac 0.09% Impervious Runoff Depth=4.15"
Flow Length=934' Tc=62.6 min CN=68 Runoff=19.89 cfs 3.681 af

Subcatchment E3: Existing E3 (DP3) Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=4.04"
Flow Length=286' Tc=41.9 min CN=67 Runoff=6.62 cfs 0.983 af

Subcatchment E4: Existing E4 (DP4) Runoff Area=6.569 ac 0.76% Impervious Runoff Depth=3.93"
Flow Length=658' Tc=29.0 min CN=66 Runoff=17.32 cfs 2.149 af

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment E1: Existing E1 (DP1)

Runoff = 2.39 cfs @ 13.14 hrs, Volume= 0.642 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.170	60	>75% Grass cover, Good, HSG A/D
* 0.010	71	>75% Grass cover, Good, HSG B/D
0.030	74	>75% Grass cover, Good, HSG C
* 0.080	98	IMPERVIOUS
1.200	30	Woods, Good, HSG A
* 1.860	54	Woods, Good, HSG A/D
* 3.710	66	Woods, Good, HSG B/D
7.310	70	Woods, Good, HSG C
14.370	64	Weighted Average
14.290		99.44% Pervious Area
0.080		0.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.6	100	0.0250	0.09		Sheet Flow, Woodland Sheet Flow
					Woods: Light underbrush n= 0.400 P2= 3.22"
52.4	1,144	0.0053	0.36		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
0.1	16	0.2450	2.47		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
72.1	1,260	Total			

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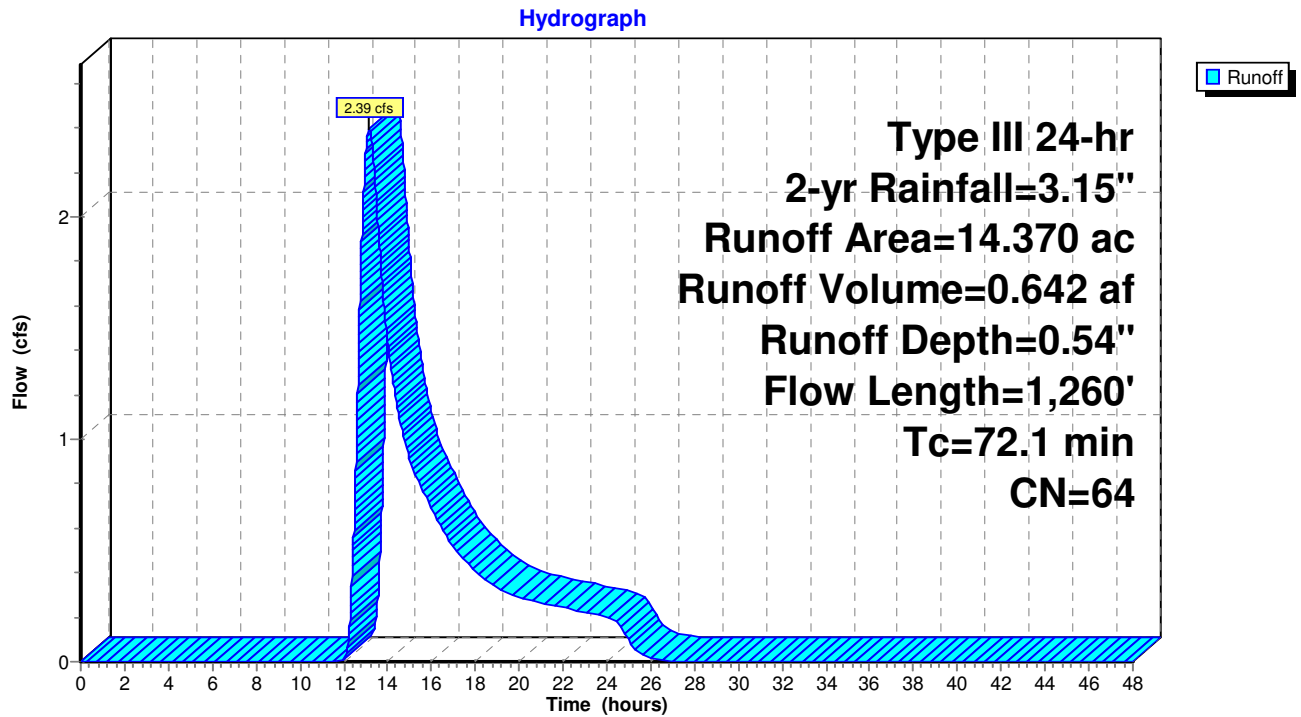
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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Subcatchment E1: Existing E1 (DP1)



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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment E2: Existing E2 (DP2)

Runoff = 2.85 cfs @ 12.94 hrs, Volume= 0.626 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.150	71	>75% Grass cover, Good, HSG B/D
0.440	74	>75% Grass cover, Good, HSG C
* 0.010	98	IMPERVIOUS
* 4.610	66	Woods, Good, HSG B/D
5.430	70	Woods, Good, HSG C
10.640	68	Weighted Average
10.630		99.91% Pervious Area
0.010		0.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.2	100	0.0067	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
9.2	227	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
20.2	607	0.0005	0.50	18.04	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050 Scattered brush, heavy weeds
62.6	934	Total			

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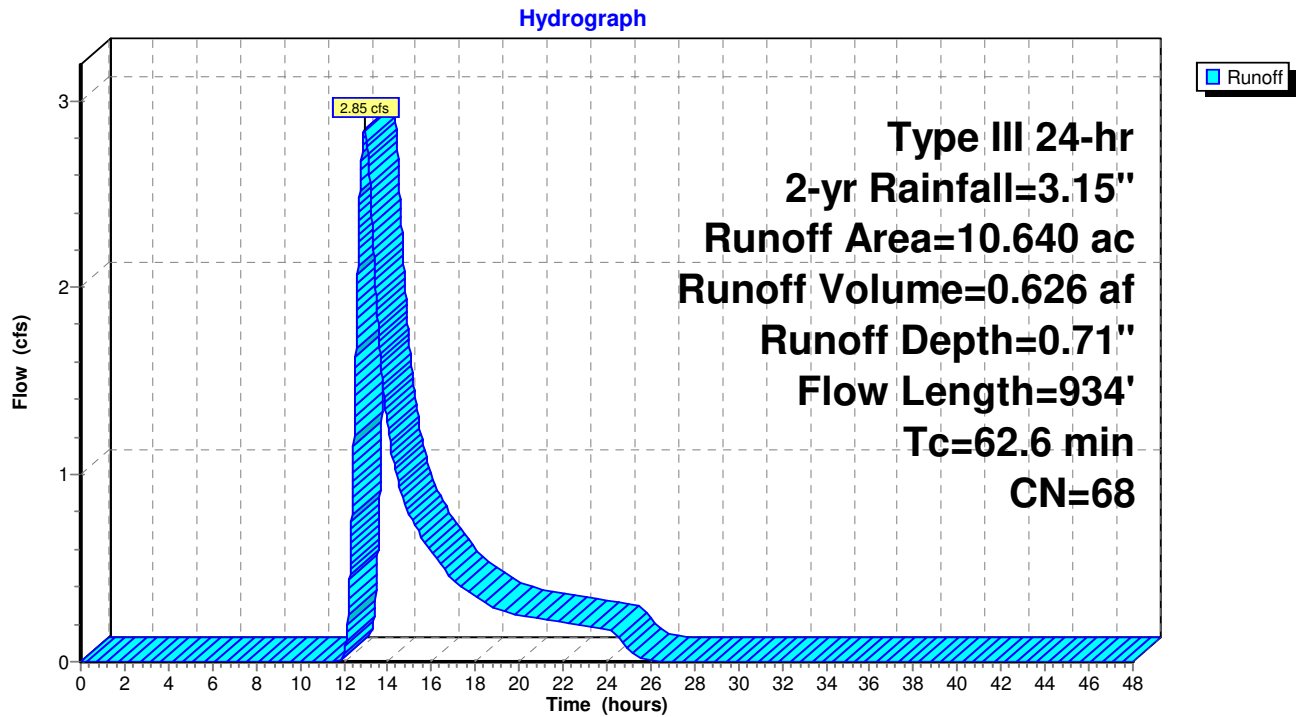
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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Subcatchment E2: Existing E2 (DP2)



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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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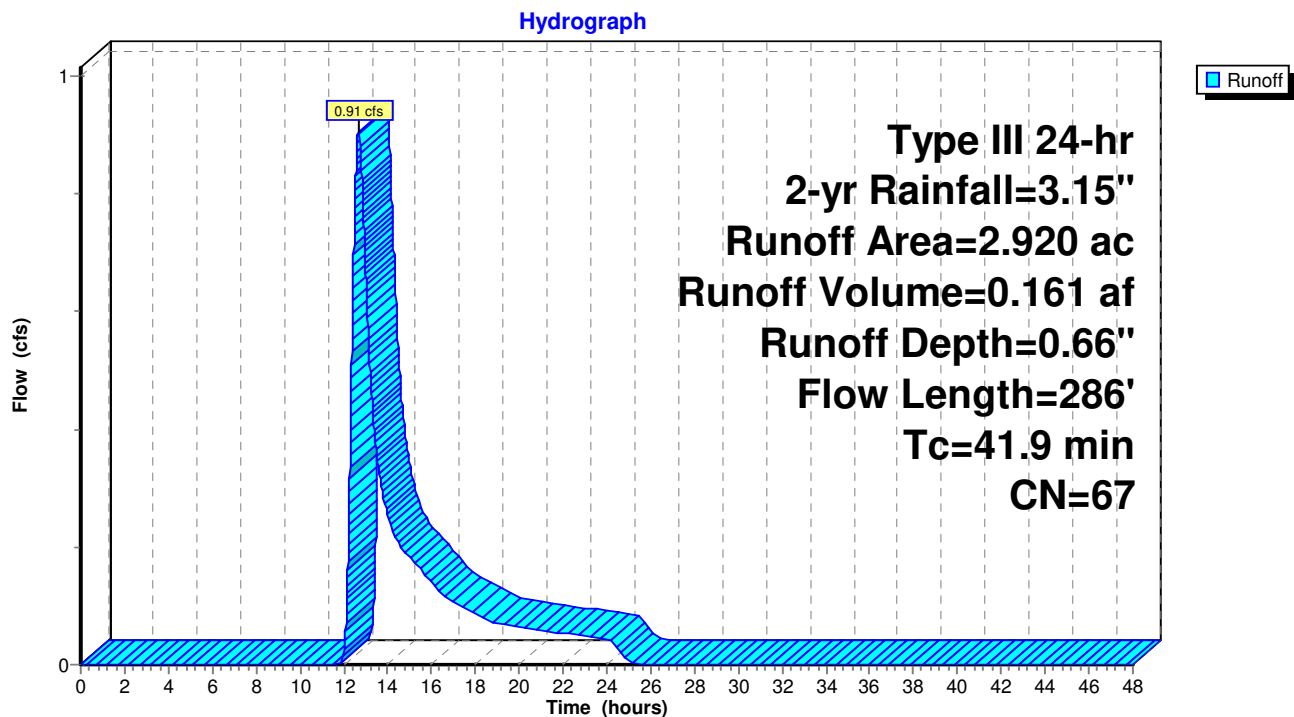
Summary for Subcatchment E3: Existing E3 (DP3)

Runoff = 0.91 cfs @ 12.67 hrs, Volume= 0.161 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 2.220	66	Woods, Good, HSG B/D
0.700	70	Woods, Good, HSG C
2.920	67	Weighted Average
2.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.9	100	0.0080	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
11.0	186	0.0032	0.28		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
41.9	286	Total			

Subcatchment E3: Existing E3 (DP3)

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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment E4: Existing E4 (DP4)

Runoff = 2.21 cfs @ 12.50 hrs, Volume= 0.338 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.070	66	>75% Grass cover, Good, HSG B/D
* 0.050	98	IMPERVIOUS
0.219	30	Woods, Good, HSG A
* 5.220	66	Woods, Good, HSG B/D
1.010	70	Woods, Good, HSG C
6.569	66	Weighted Average
6.519		99.24% Pervious Area
0.050		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0496	0.11		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
9.9	294	0.0098	0.49		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
4.2	264	0.0022	1.05	37.66	Channel Flow, Channel Flow Area= 35.9 sf Perim= 55.0' r= 0.65' n= 0.050 Scattered brush, heavy weeds
29.0	658	Total			

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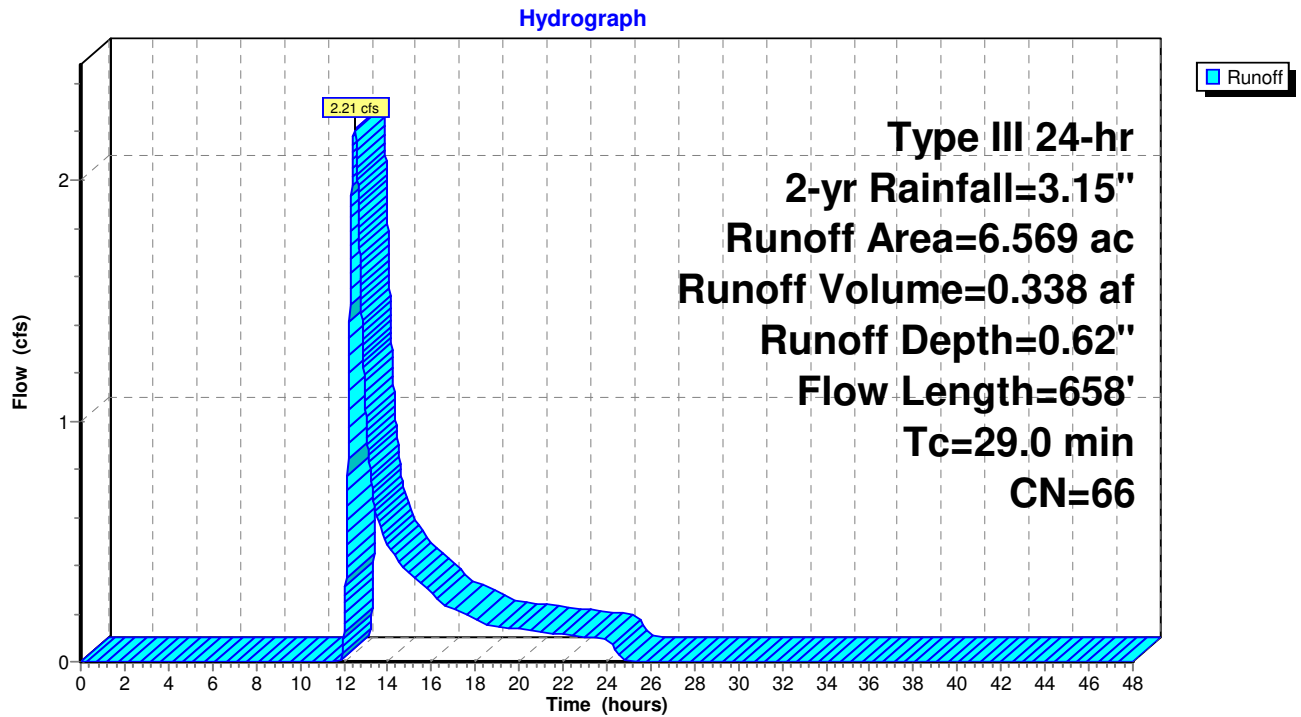
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Existing Condition
Type III 24-hr 2-yr Rainfall=3.15"

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Subcatchment E4: Existing E4 (DP4)



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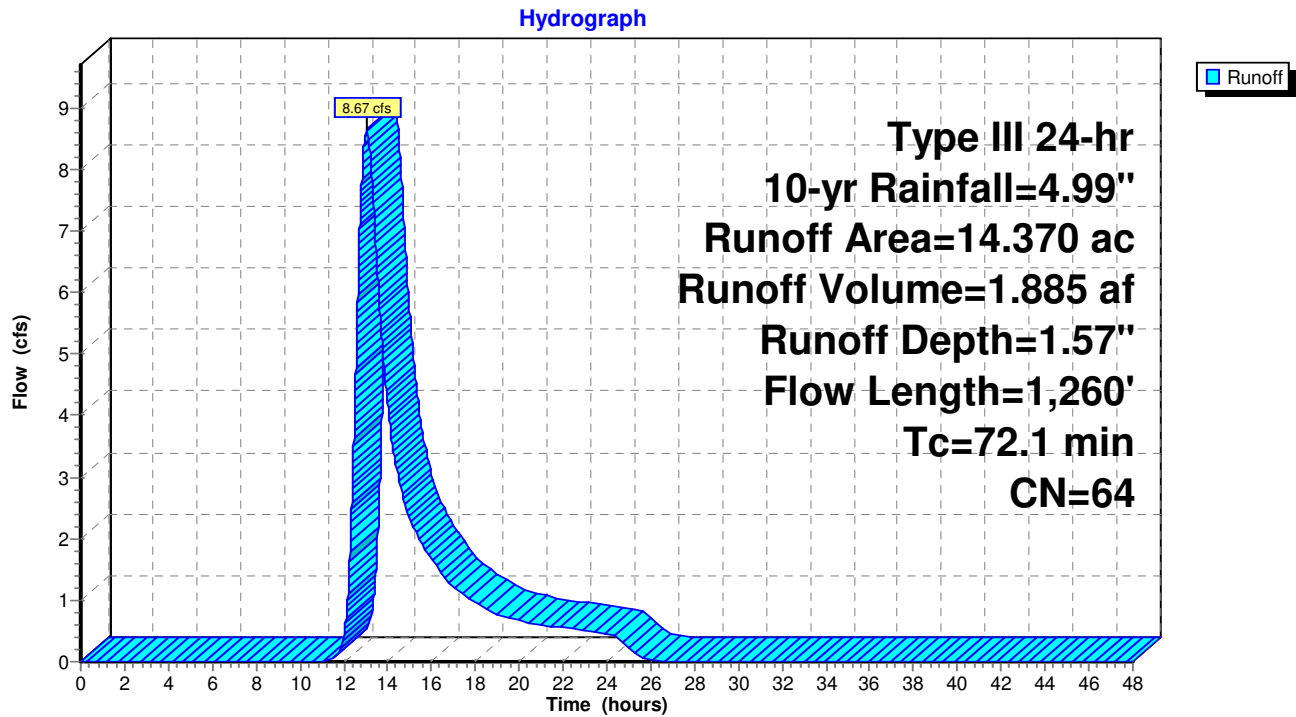
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Existing Condition
Type III 24-hr 10-yr Rainfall=4.99"

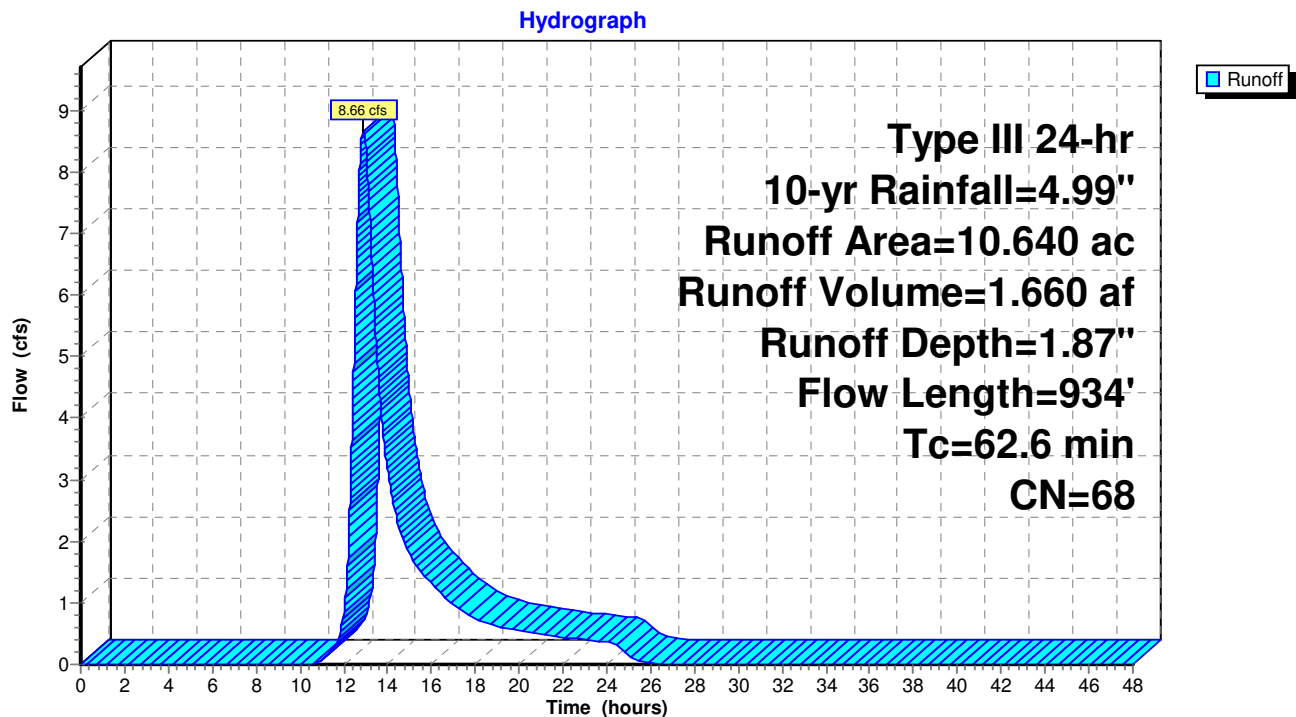
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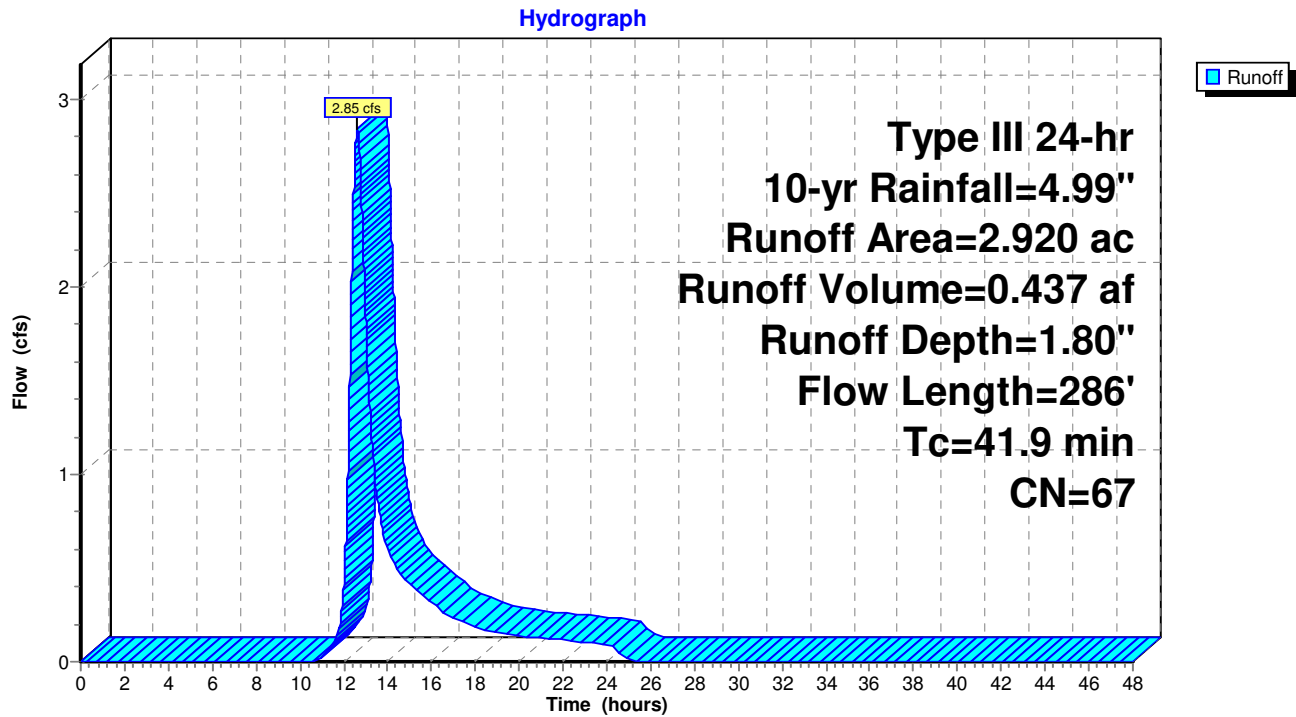
Subcatchment E1: Existing E1 (DP1)



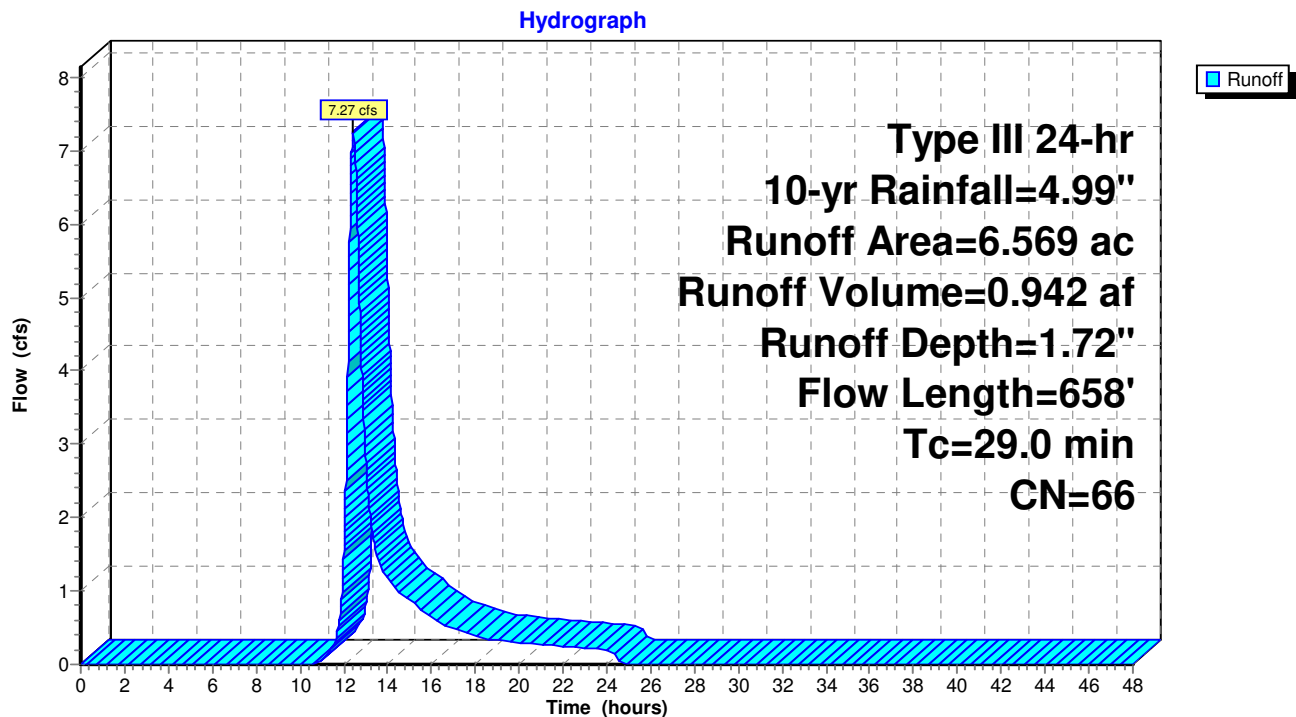
Subcatchment E2: Existing E2 (DP2)



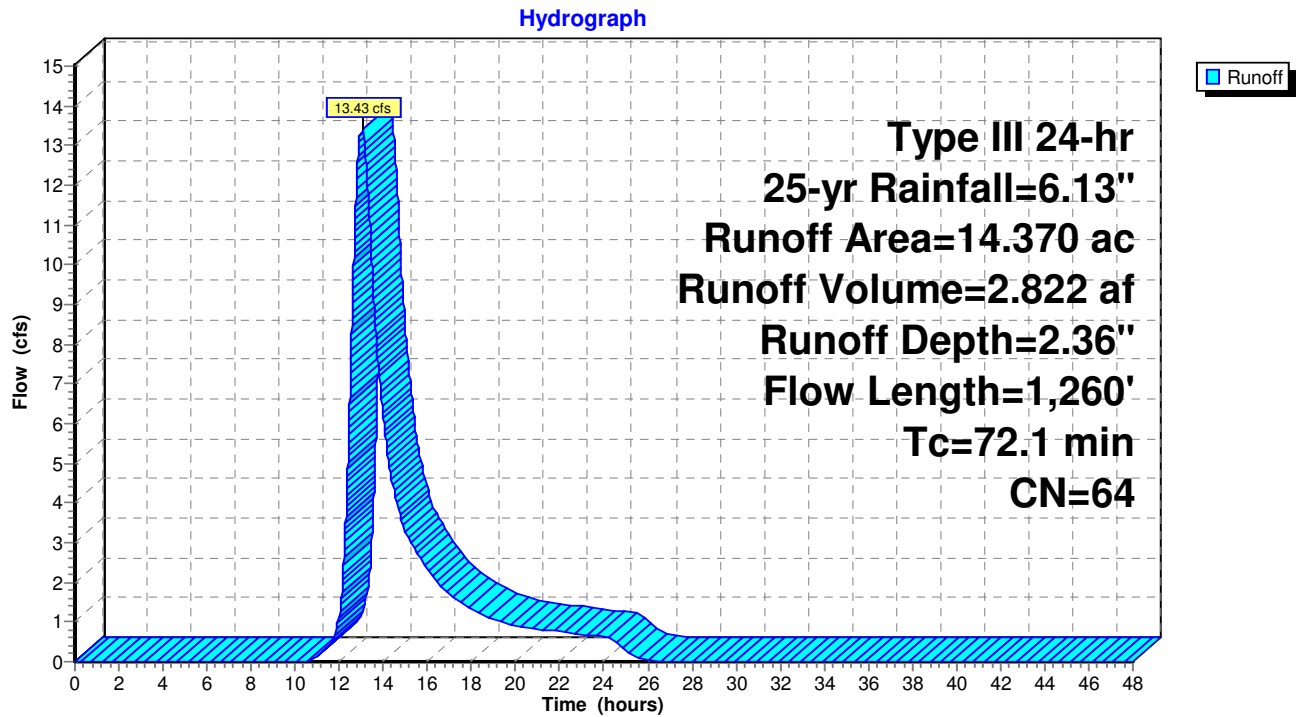
Subcatchment E3: Existing E3 (DP3)



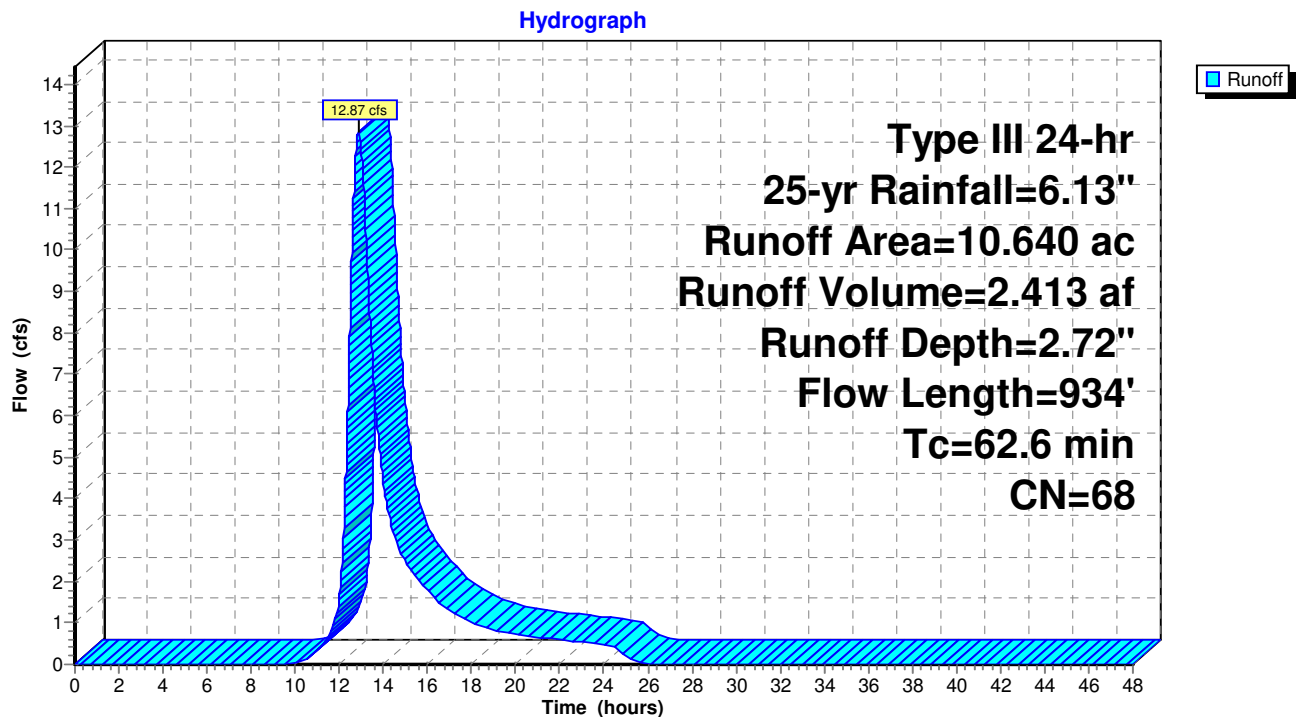
Subcatchment E4: Existing E4 (DP4)



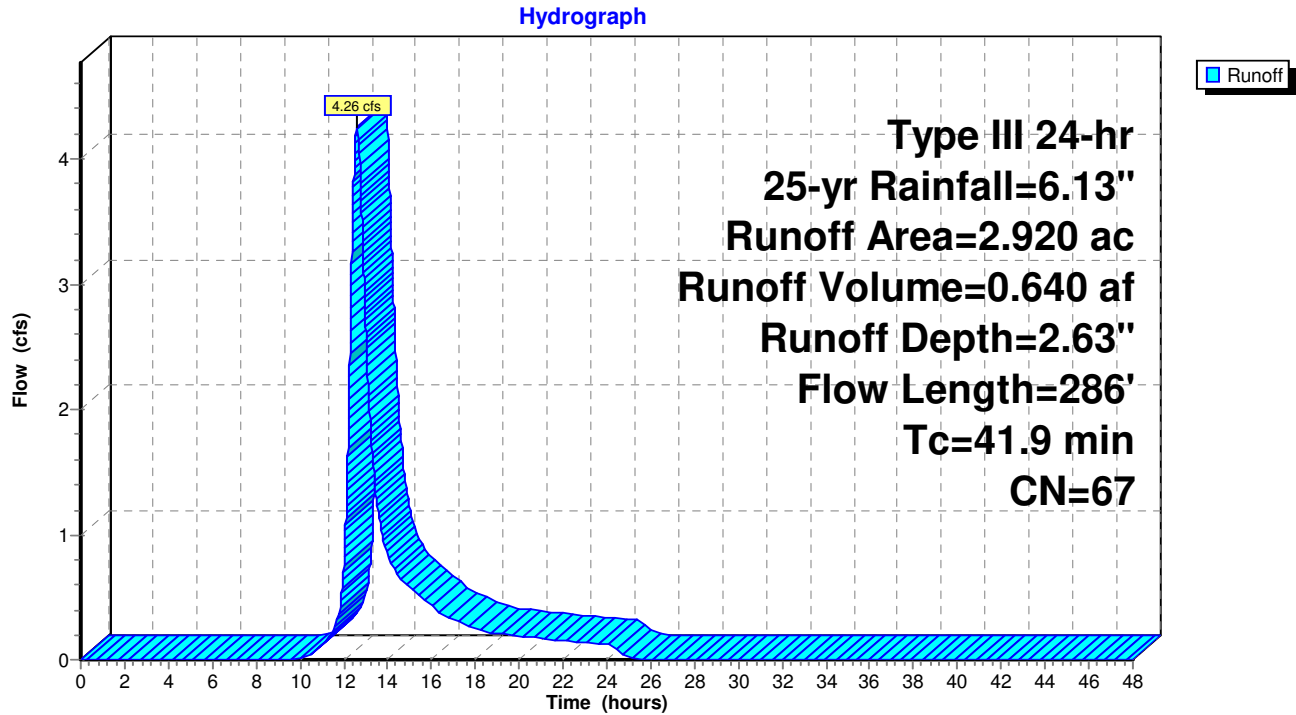
Subcatchment E1: Existing E1 (DP1)



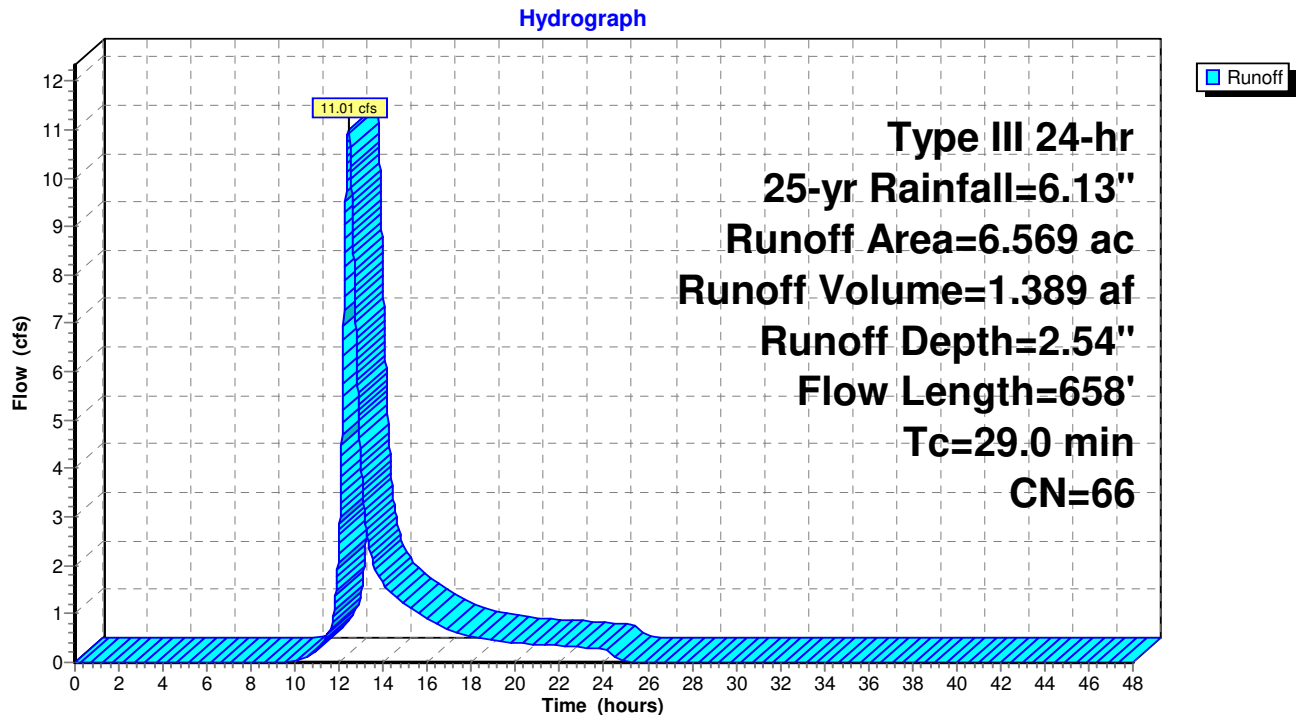
Subcatchment E2: Existing E2 (DP2)



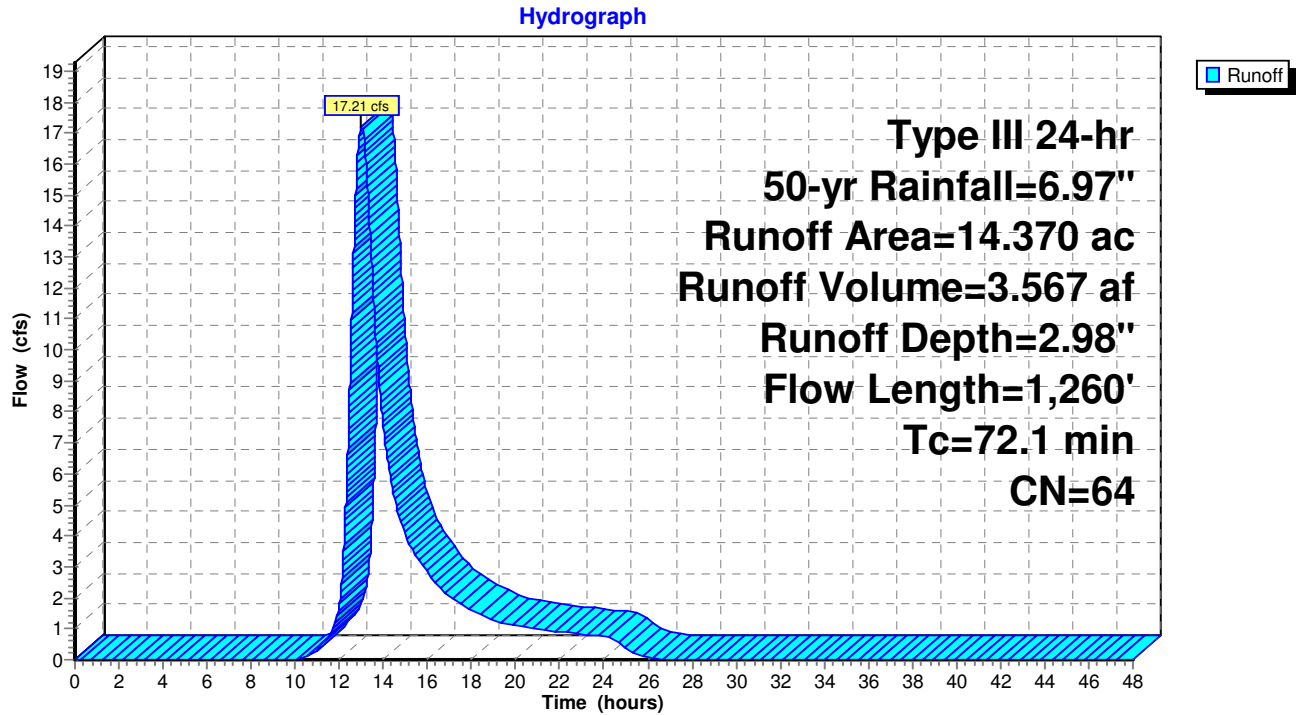
Subcatchment E3: Existing E3 (DP3)



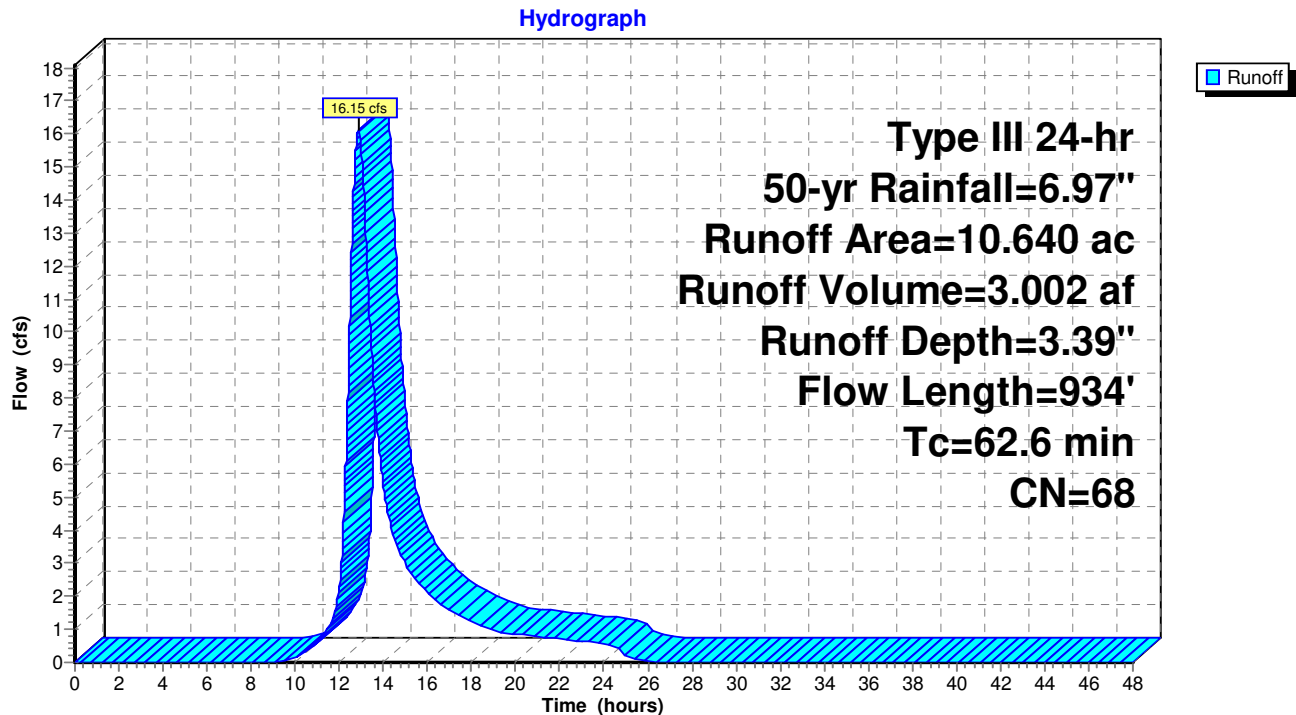
Subcatchment E4: Existing E4 (DP4)



Subcatchment E1: Existing E1 (DP1)



Subcatchment E2: Existing E2 (DP2)



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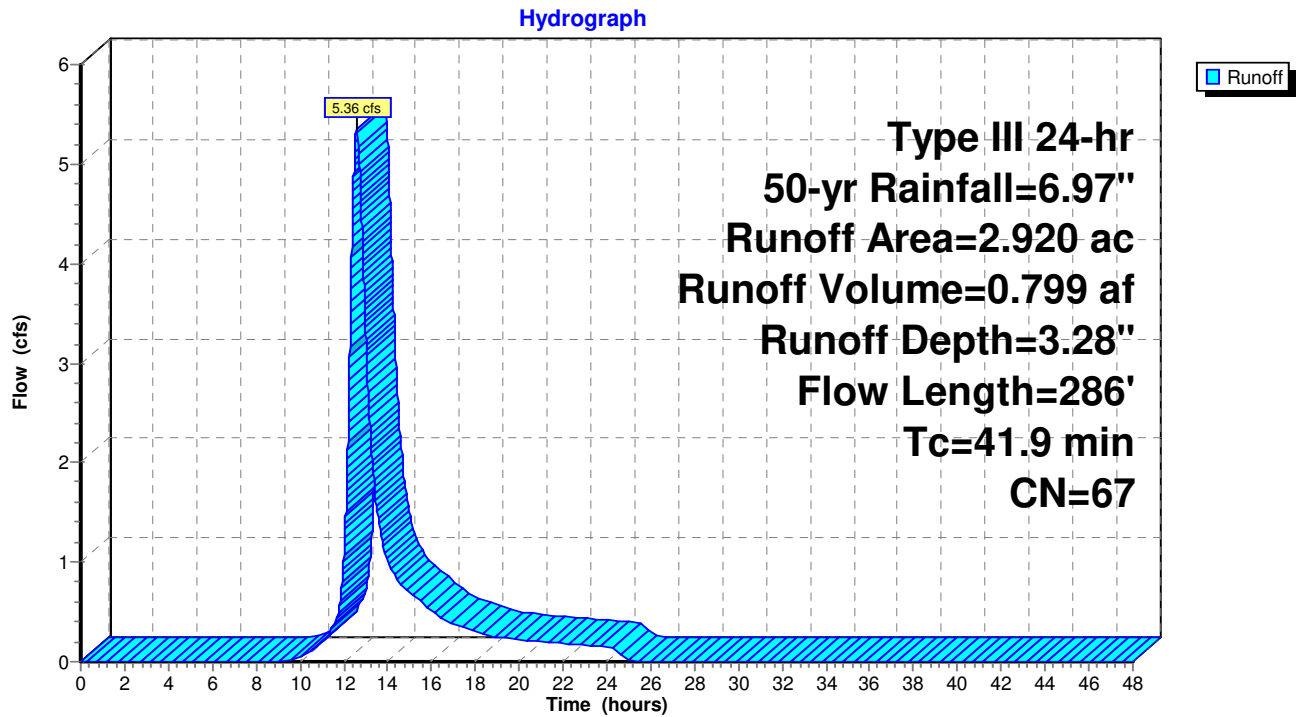
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Existing Condition
Type III 24-hr 50-yr Rainfall=6.97"

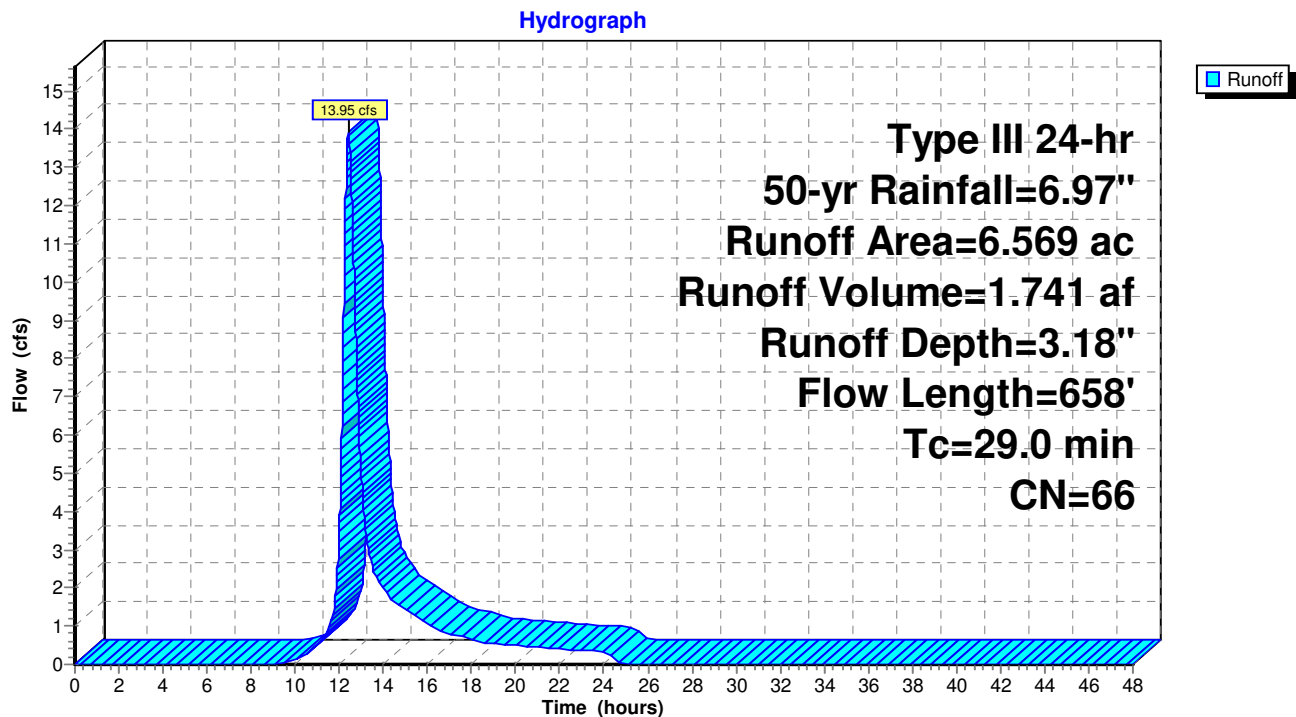
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Subcatchment E3: Existing E3 (DP3)

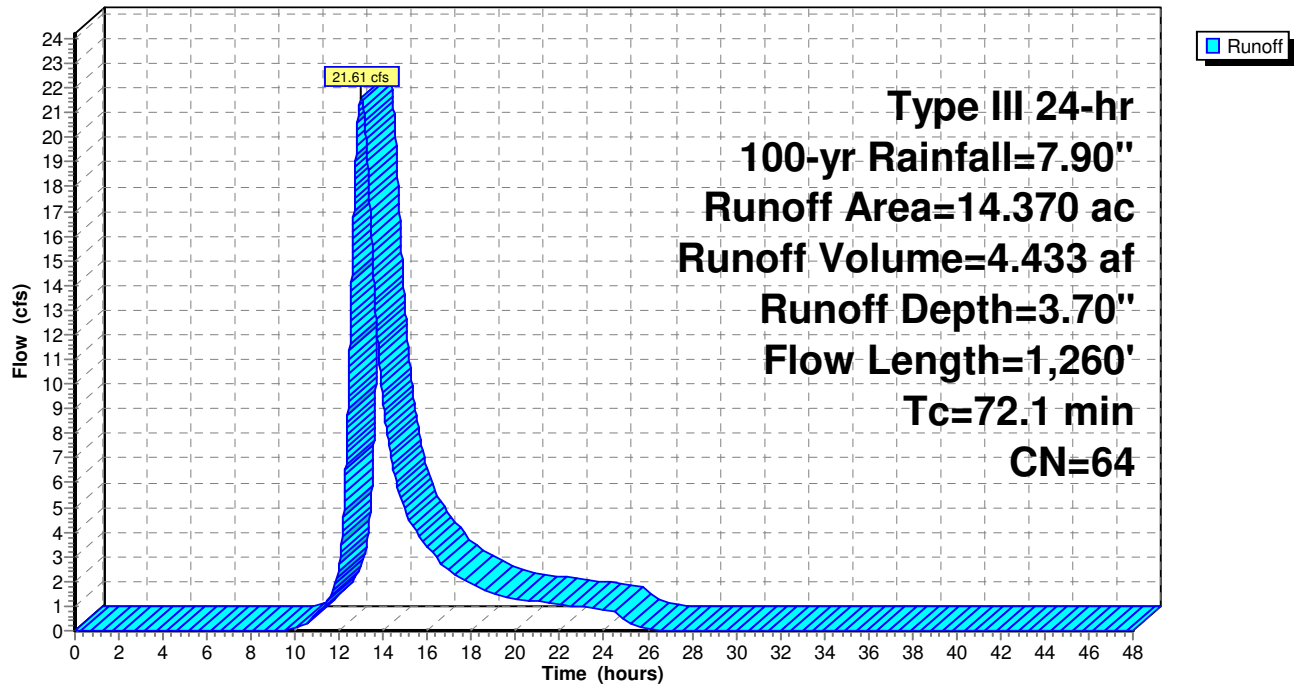


Subcatchment E4: Existing E4 (DP4)



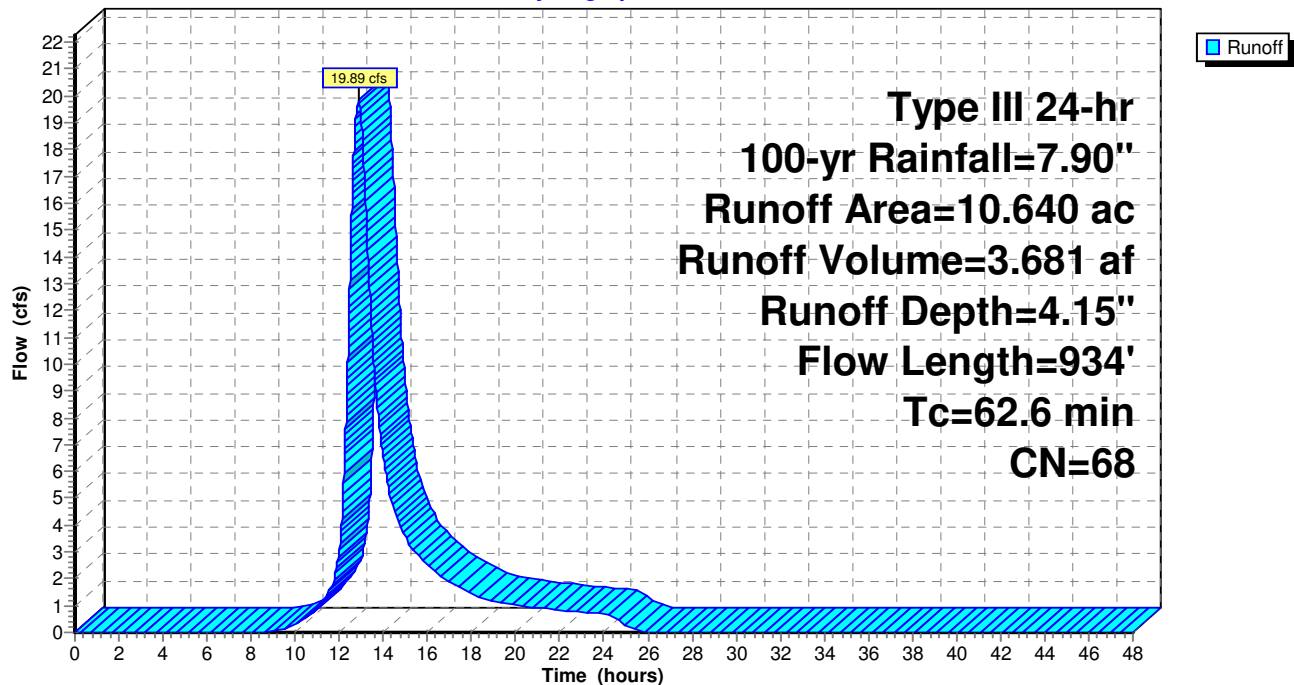
Subcatchment E1: Existing E1 (DP1)

Hydrograph



Subcatchment E2: Existing E2 (DP2)

Hydrograph



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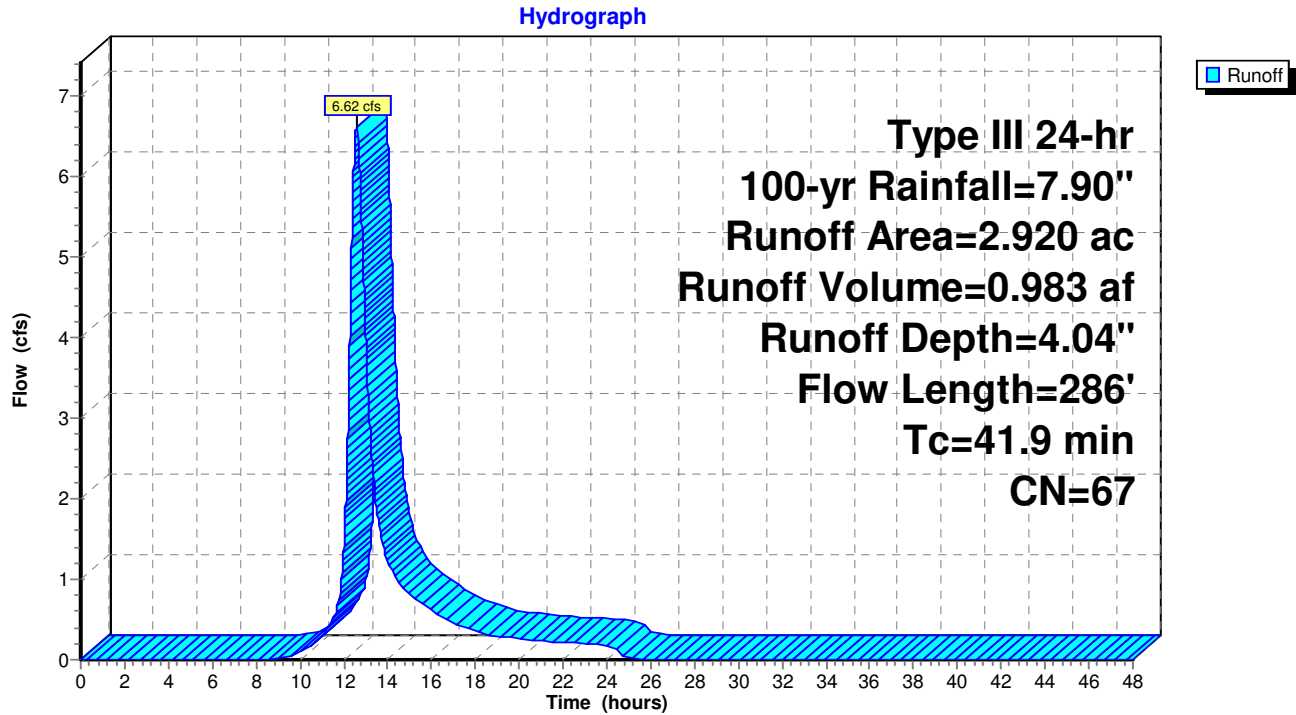
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Existing Condition
Type III 24-hr 100-yr Rainfall=7.90"

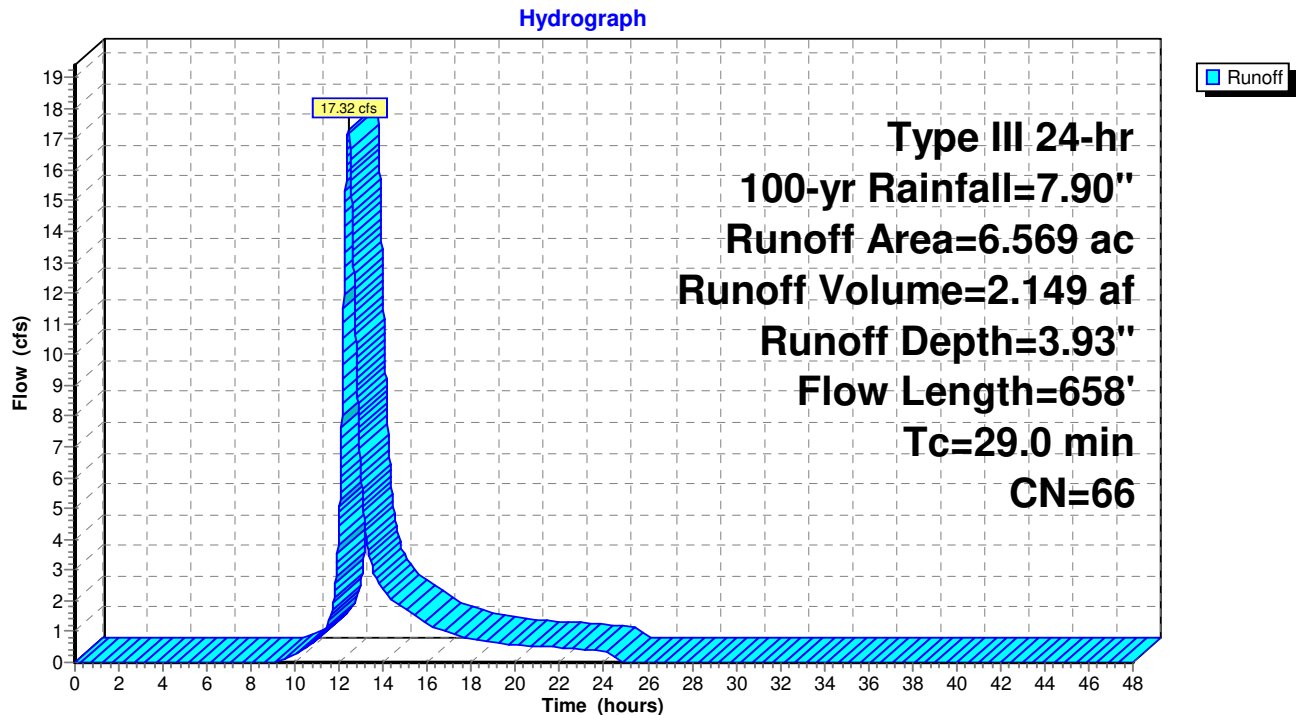
Printed 6/30/2021

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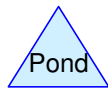
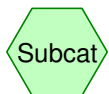
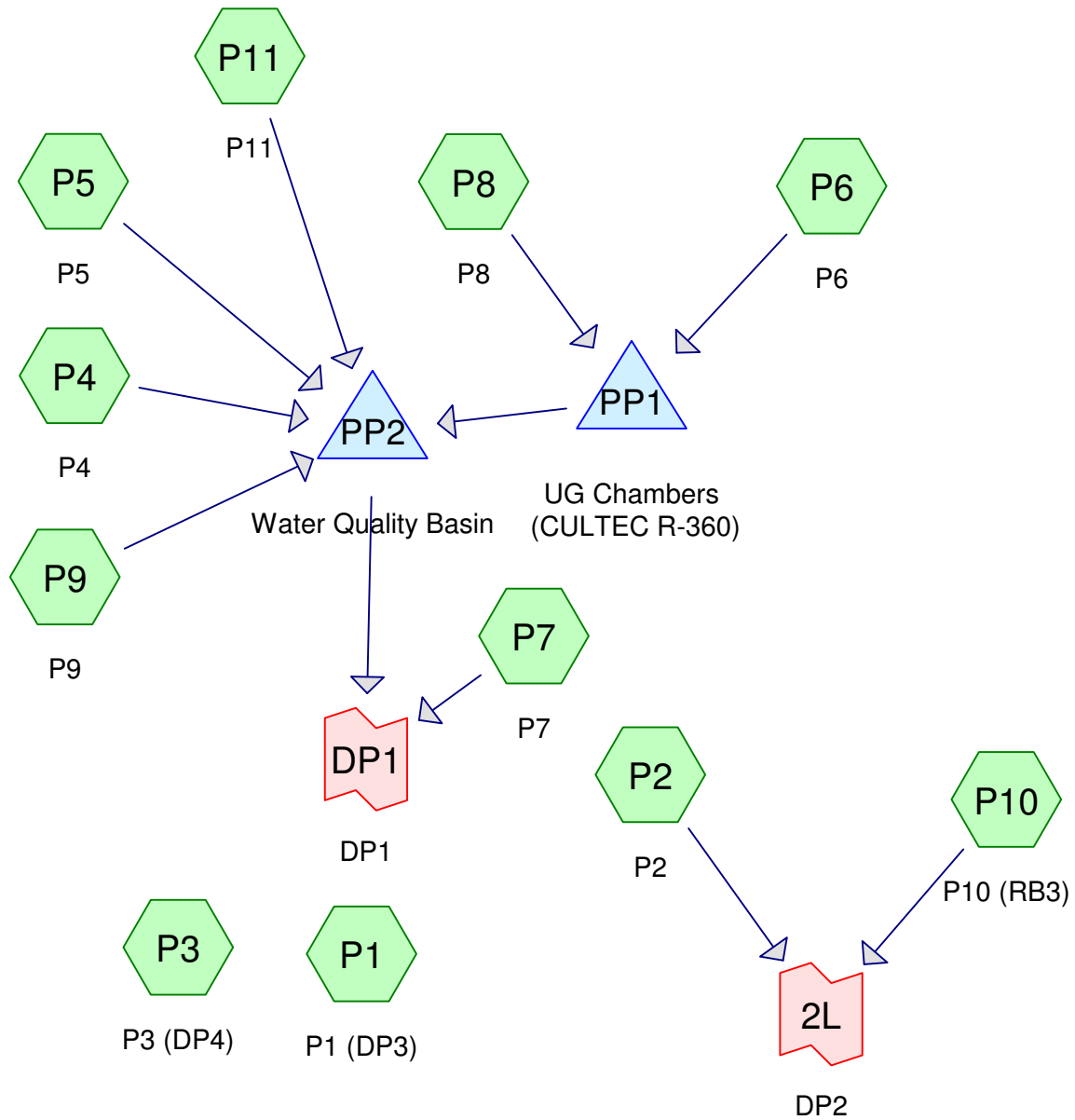
Subcatchment E3: Existing E3 (DP3)



Subcatchment E4: Existing E4 (DP4)



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



Routing Diagram for 1976.U Hydrocad

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Type III 24-hr 2-yr Rainfall=3.15"

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Page 2

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points x 3

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: P1 (DP3)Runoff Area=2.430 ac 0.00% Impervious Runoff Depth=0.71"
Flow Length=198' Tc=32.5 min CN=68 Runoff=0.94 cfs 0.143 af**Subcatchment P10: P10 (RB3)**Runoff Area=0.745 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=2.28 cfs 0.181 af**Subcatchment P11: P11**Runoff Area=2.302 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=7.04 cfs 0.560 af**Subcatchment P2: P2**Runoff Area=2.034 ac 0.69% Impervious Runoff Depth=0.85"
Flow Length=514' Tc=30.9 min CN=71 Runoff=1.02 cfs 0.144 af**Subcatchment P3: P3 (DP4)**Runoff Area=1.922 ac 0.36% Impervious Runoff Depth=0.71"
Flow Length=490' Tc=41.0 min CN=68 Runoff=0.66 cfs 0.113 af**Subcatchment P4: P4**Runoff Area=2.389 ac 54.42% Impervious Runoff Depth=1.50"
Tc=10.0 min CN=82 Runoff=3.64 cfs 0.298 af**Subcatchment P5: P5**Runoff Area=6.487 ac 52.52% Impervious Runoff Depth=1.79"
Tc=10.0 min CN=86 Runoff=11.91 cfs 0.969 af**Subcatchment P6: P6**Runoff Area=7.411 ac 72.49% Impervious Runoff Depth=2.04"
Tc=10.0 min CN=89 Runoff=15.38 cfs 1.257 af**Subcatchment P7: P7**Runoff Area=3.585 ac 6.16% Impervious Runoff Depth=0.58"
Flow Length=471' Tc=32.5 min CN=65 Runoff=1.04 cfs 0.172 af**Subcatchment P8: P8**Runoff Area=4.128 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=12.62 cfs 1.004 af**Subcatchment P9: P9**Runoff Area=1.081 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=3.30 cfs 0.263 af**Pond PP1: UG Chambers (CULTEC R-360)**Peak Elev=72.18' Storage=10,330 cf Inflow=26.78 cfs 2.261 af
Outflow=24.21 cfs 2.261 af**Pond PP2: Water Quality Basin**Peak Elev=71.15' Storage=500,254 cf Inflow=47.93 cfs 4.350 af
Outflow=1.44 cfs 4.040 af**Link 2L: DP2**Inflow=2.51 cfs 0.325 af
Primary=2.51 cfs 0.325 af**Link DP1: DP1**Inflow=2.31 cfs 4.212 af
Primary=2.31 cfs 4.212 af

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Type III 24-hr 10-yr Rainfall=4.99"

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Page 3

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points x 3

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: P1 (DP3)Runoff Area=2.430 ac 0.00% Impervious Runoff Depth=1.87"
Flow Length=198' Tc=32.5 min CN=68 Runoff=2.82 cfs 0.379 af**Subcatchment P10: P10 (RB3)**Runoff Area=0.745 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=3.64 cfs 0.295 af**Subcatchment P11: P11**Runoff Area=2.302 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=11.24 cfs 0.912 af**Subcatchment P2: P2**Runoff Area=2.034 ac 0.69% Impervious Runoff Depth=2.11"
Flow Length=514' Tc=30.9 min CN=71 Runoff=2.76 cfs 0.357 af**Subcatchment P3: P3 (DP4)**Runoff Area=1.922 ac 0.36% Impervious Runoff Depth=1.87"
Flow Length=490' Tc=41.0 min CN=68 Runoff=1.99 cfs 0.300 af**Subcatchment P4: P4**Runoff Area=2.389 ac 54.42% Impervious Runoff Depth=3.07"
Tc=10.0 min CN=82 Runoff=7.50 cfs 0.611 af**Subcatchment P5: P5**Runoff Area=6.487 ac 52.52% Impervious Runoff Depth=3.46"
Tc=10.0 min CN=86 Runoff=22.70 cfs 1.869 af**Subcatchment P6: P6**Runoff Area=7.411 ac 72.49% Impervious Runoff Depth=3.76"
Tc=10.0 min CN=89 Runoff=27.81 cfs 2.324 af**Subcatchment P7: P7**Runoff Area=3.585 ac 6.16% Impervious Runoff Depth=1.65"
Flow Length=471' Tc=32.5 min CN=65 Runoff=3.58 cfs 0.492 af**Subcatchment P8: P8**Runoff Area=4.128 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=20.15 cfs 1.635 af**Subcatchment P9: P9**Runoff Area=1.081 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=5.28 cfs 0.428 af**Pond PP1: UG Chambers (CULTEC R-360)**Peak Elev=72.68' Storage=13,472 cf Inflow=46.05 cfs 3.959 af
Outflow=42.83 cfs 3.958 af**Pond PP2: Water Quality Basin**Peak Elev=71.96' Storage=571,542 cf Inflow=86.48 cfs 7.778 af
Outflow=5.97 cfs 7.350 af**Link 2L: DP2**Inflow=4.59 cfs 0.653 af
Primary=4.59 cfs 0.653 af**Link DP1: DP1**Inflow=8.64 cfs 7.842 af
Primary=8.64 cfs 7.842 af

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Type III 24-hr 25-yr Rainfall=6.13"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points x 3
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: P1 (DP3)	Runoff Area=2.430 ac 0.00% Impervious Runoff Depth=2.72" Flow Length=198' Tc=32.5 min CN=68 Runoff=4.18 cfs 0.551 af
Subcatchment P10: P10 (RB3)	Runoff Area=0.745 ac 100.00% Impervious Runoff Depth=5.89" Tc=6.0 min CN=98 Runoff=4.48 cfs 0.366 af
Subcatchment P11: P11	Runoff Area=2.302 ac 100.00% Impervious Runoff Depth=5.89" Tc=6.0 min CN=98 Runoff=13.83 cfs 1.130 af
Subcatchment P2: P2	Runoff Area=2.034 ac 0.69% Impervious Runoff Depth=3.00" Flow Length=514' Tc=30.9 min CN=71 Runoff=3.97 cfs 0.509 af
Subcatchment P3: P3 (DP4)	Runoff Area=1.922 ac 0.36% Impervious Runoff Depth=2.72" Flow Length=490' Tc=41.0 min CN=68 Runoff=2.94 cfs 0.436 af
Subcatchment P4: P4	Runoff Area=2.389 ac 54.42% Impervious Runoff Depth=4.11" Tc=10.0 min CN=82 Runoff=9.97 cfs 0.818 af
Subcatchment P5: P5	Runoff Area=6.487 ac 52.52% Impervious Runoff Depth=4.53" Tc=10.0 min CN=86 Runoff=29.45 cfs 2.451 af
Subcatchment P6: P6	Runoff Area=7.411 ac 72.49% Impervious Runoff Depth=4.86" Tc=10.0 min CN=89 Runoff=35.48 cfs 3.002 af
Subcatchment P7: P7	Runoff Area=3.585 ac 6.16% Impervious Runoff Depth=2.45" Flow Length=471' Tc=32.5 min CN=65 Runoff=5.48 cfs 0.731 af
Subcatchment P8: P8	Runoff Area=4.128 ac 100.00% Impervious Runoff Depth=5.89" Tc=6.0 min CN=98 Runoff=24.80 cfs 2.027 af
Subcatchment P9: P9	Runoff Area=1.081 ac 100.00% Impervious Runoff Depth=5.89" Tc=6.0 min CN=98 Runoff=6.50 cfs 0.531 af
Pond PP1: UG Chambers (CULTEC R-360)	Peak Elev=72.97' Storage=15,163 cf Inflow=57.95 cfs 5.029 af Outflow=54.43 cfs 5.028 af
Pond PP2: Water Quality Basin	Peak Elev=72.50' Storage=621,949 cf Inflow=110.61 cfs 9.958 af Outflow=8.81 cfs 9.484 af
Link 2L: DP2	Inflow=5.97 cfs 0.875 af Primary=5.97 cfs 0.875 af
Link DP1: DP1	Inflow=13.20 cfs 10.215 af Primary=13.20 cfs 10.215 af

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Type III 24-hr 50-yr Rainfall=6.97"

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Page 5

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points x 3
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: P1 (DP3)	Runoff Area=2.430 ac 0.00% Impervious Runoff Depth=3.39" Flow Length=198' Tc=32.5 min CN=68 Runoff=5.24 cfs 0.686 af
Subcatchment P10: P10 (RB3)	Runoff Area=0.745 ac 100.00% Impervious Runoff Depth=6.73" Tc=6.0 min CN=98 Runoff=5.09 cfs 0.418 af
Subcatchment P11: P11	Runoff Area=2.302 ac 100.00% Impervious Runoff Depth=6.73" Tc=6.0 min CN=98 Runoff=15.74 cfs 1.291 af
Subcatchment P2: P2	Runoff Area=2.034 ac 0.69% Impervious Runoff Depth=3.70" Flow Length=514' Tc=30.9 min CN=71 Runoff=4.91 cfs 0.627 af
Subcatchment P3: P3 (DP4)	Runoff Area=1.922 ac 0.36% Impervious Runoff Depth=3.39" Flow Length=490' Tc=41.0 min CN=68 Runoff=3.69 cfs 0.542 af
Subcatchment P4: P4	Runoff Area=2.389 ac 54.42% Impervious Runoff Depth=4.89" Tc=10.0 min CN=82 Runoff=11.80 cfs 0.973 af
Subcatchment P5: P5	Runoff Area=6.487 ac 52.52% Impervious Runoff Depth=5.34" Tc=10.0 min CN=86 Runoff=34.41 cfs 2.885 af
Subcatchment P6: P6	Runoff Area=7.411 ac 72.49% Impervious Runoff Depth=5.68" Tc=10.0 min CN=89 Runoff=41.10 cfs 3.507 af
Subcatchment P7: P7	Runoff Area=3.585 ac 6.16% Impervious Runoff Depth=3.08" Flow Length=471' Tc=32.5 min CN=65 Runoff=6.98 cfs 0.920 af
Subcatchment P8: P8	Runoff Area=4.128 ac 100.00% Impervious Runoff Depth=6.73" Tc=6.0 min CN=98 Runoff=28.23 cfs 2.315 af
Subcatchment P9: P9	Runoff Area=1.081 ac 100.00% Impervious Runoff Depth=6.73" Tc=6.0 min CN=98 Runoff=7.39 cfs 0.606 af
Pond PP1: UG Chambers (CULTEC R-360)	Peak Elev=73.17' Storage=16,323 cf Inflow=66.68 cfs 5.823 af Outflow=62.97 cfs 5.822 af
Pond PP2: Water Quality Basin	Peak Elev=72.88' Storage=659,361 cf Inflow=128.40 cfs 11.578 af Outflow=11.25 cfs 11.074 af
Link 2L: DP2	Inflow=7.01 cfs 1.045 af Primary=7.01 cfs 1.045 af
Link DP1: DP1	Inflow=17.10 cfs 11.994 af Primary=17.10 cfs 11.994 af

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Proposed Conditions
Type III 24-hr 100-yr Rainfall=7.90"

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Page 6

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points x 3
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: P1 (DP3)	Runoff Area=2.430 ac 0.00% Impervious Runoff Depth=4.15" Flow Length=198' Tc=32.5 min CN=68 Runoff=6.45 cfs 0.841 af
Subcatchment P10: P10 (RB3)	Runoff Area=0.745 ac 100.00% Impervious Runoff Depth=7.66" Tc=6.0 min CN=98 Runoff=5.78 cfs 0.476 af
Subcatchment P11: P11	Runoff Area=2.302 ac 100.00% Impervious Runoff Depth=7.66" Tc=6.0 min CN=98 Runoff=17.85 cfs 1.469 af
Subcatchment P2: P2	Runoff Area=2.034 ac 0.69% Impervious Runoff Depth=4.49" Flow Length=514' Tc=30.9 min CN=71 Runoff=5.97 cfs 0.761 af
Subcatchment P3: P3 (DP4)	Runoff Area=1.922 ac 0.36% Impervious Runoff Depth=4.15" Flow Length=490' Tc=41.0 min CN=68 Runoff=4.54 cfs 0.665 af
Subcatchment P4: P4	Runoff Area=2.389 ac 54.42% Impervious Runoff Depth=5.76" Tc=10.0 min CN=82 Runoff=13.83 cfs 1.148 af
Subcatchment P5: P5	Runoff Area=6.487 ac 52.52% Impervious Runoff Depth=6.23" Tc=10.0 min CN=86 Runoff=39.88 cfs 3.370 af
Subcatchment P6: P6	Runoff Area=7.411 ac 72.49% Impervious Runoff Depth=6.59" Tc=10.0 min CN=89 Runoff=47.29 cfs 4.069 af
Subcatchment P7: P7	Runoff Area=3.585 ac 6.16% Impervious Runoff Depth=3.81" Flow Length=471' Tc=32.5 min CN=65 Runoff=8.70 cfs 1.139 af
Subcatchment P8: P8	Runoff Area=4.128 ac 100.00% Impervious Runoff Depth=7.66" Tc=6.0 min CN=98 Runoff=32.02 cfs 2.635 af
Subcatchment P9: P9	Runoff Area=1.081 ac 100.00% Impervious Runoff Depth=7.66" Tc=6.0 min CN=98 Runoff=8.38 cfs 0.690 af
Pond PP1: UG Chambers (CULTEC R-360)	Peak Elev=73.40' Storage=17,539 cf Inflow=76.32 cfs 6.704 af Outflow=72.44 cfs 6.704 af
Pond PP2: Water Quality Basin	Peak Elev=73.31' Storage=702,630 cf Inflow=148.08 cfs 13.381 af Outflow=13.53 cfs 12.843 af
Link 2L: DP2	Inflow=8.19 cfs 1.237 af Primary=8.19 cfs 1.237 af
Link DP1: DP1	Inflow=21.33 cfs 13.982 af Primary=21.33 cfs 13.982 af

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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P1: P1 (DP3)

Runoff = 0.94 cfs @ 12.53 hrs, Volume= 0.143 af, Depth= 0.71"

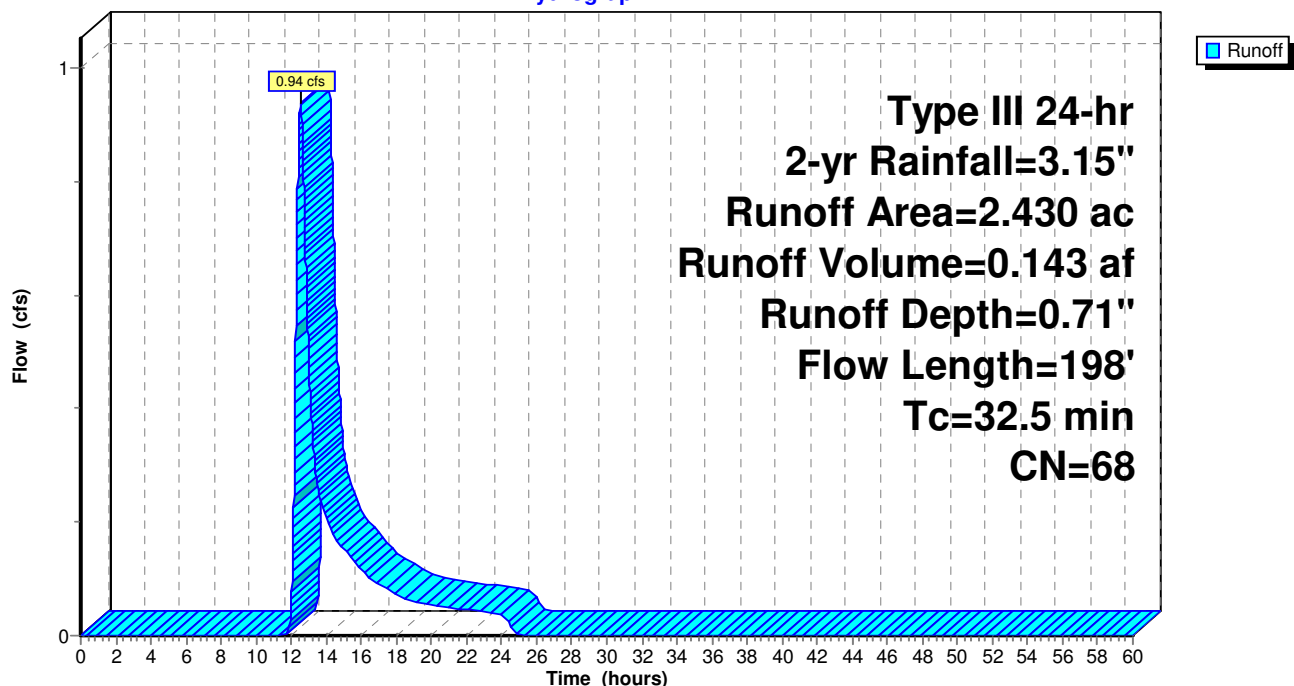
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.420	71	>75% Grass cover, Good, HSG B/D
0.160	74	>75% Grass cover, Good, HSG C
* 1.220	66	Woods, Good, HSG B/D
0.630	70	Woods, Good, HSG C
2.430	68	Weighted Average
2.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	28	0.2100	0.15		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
25.5	72	0.0067	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
4.0	98	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
32.5	198	Total			

Subcatchment P1: P1 (DP3)

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P10: P10 (RB3)

Runoff = 2.28 cfs @ 12.08 hrs, Volume= 0.181 af, Depth= 2.92"

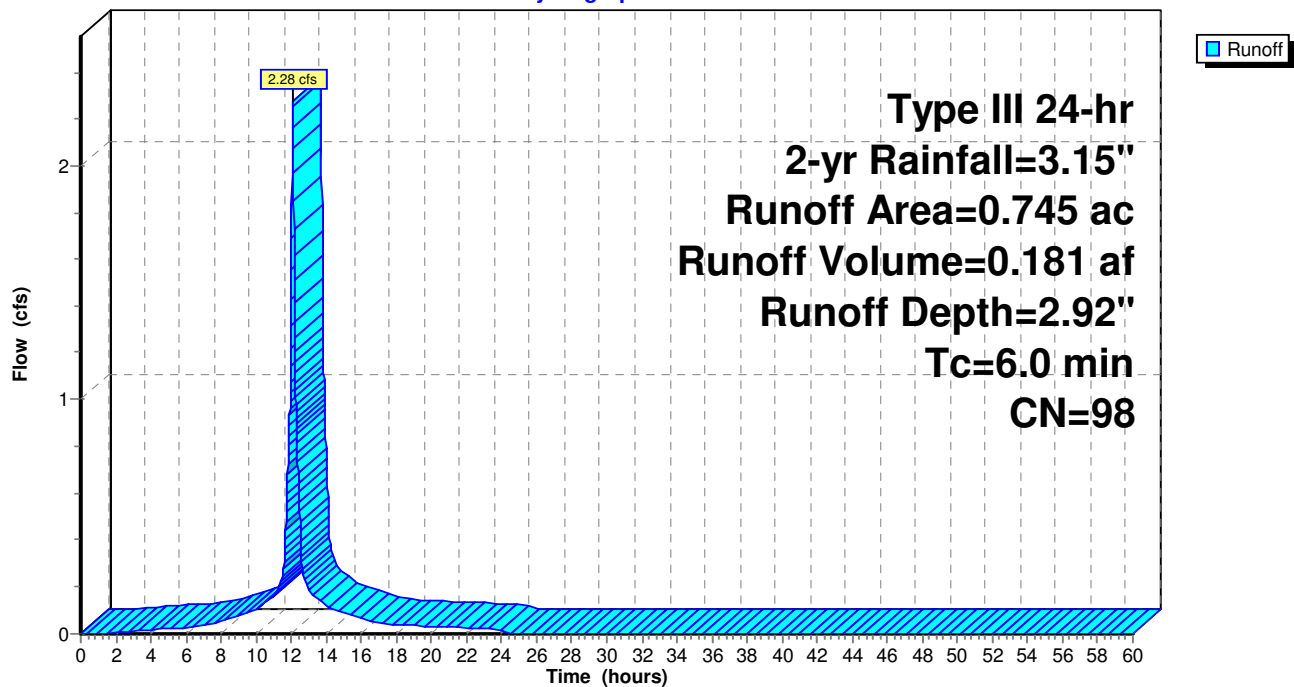
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.745	98	IMPERVIOUS
0.745		100.00% Impervious Area

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

Subcatchment P10: P10 (RB3)

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P11: P11

Runoff = 7.04 cfs @ 12.08 hrs, Volume= 0.560 af, Depth= 2.92"

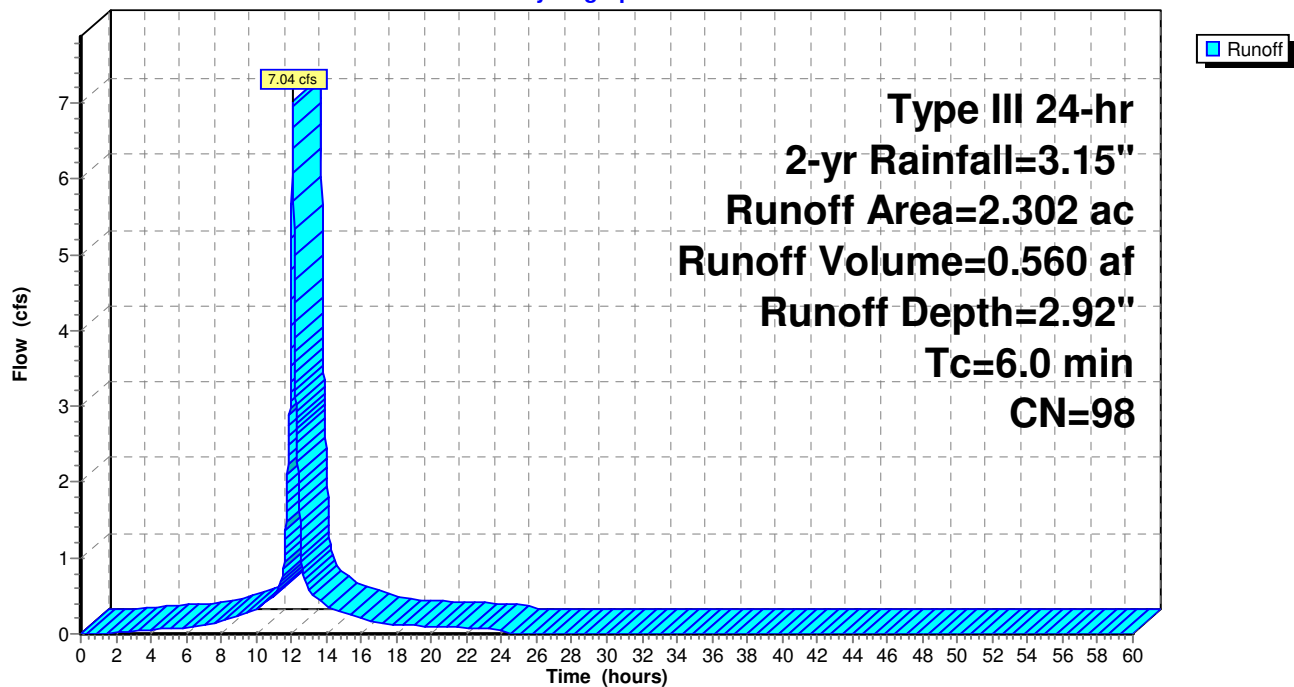
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 2.302	98	IMPERVIOUS
2.302		100.00% Impervious Area

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

Subcatchment P11: P11

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P2: P2

Runoff = 1.02 cfs @ 12.47 hrs, Volume= 0.144 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.300	71	>75% Grass cover, Good, HSG B/D
0.527	74	>75% Grass cover, Good, HSG C
* 0.014	98	IMPERVIOUS
* 0.380	66	Woods, Good, HSG B/D
0.813	70	Woods, Good, HSG C
2.034	71	Weighted Average
2.020		99.31% Pervious Area
0.014		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	100	0.0084	0.08		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
2.6	100	0.0084	0.64		Shallow Concentrated Flow, Grass SCF Short Grass Pasture Kv= 7.0 fps
6.9	190	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
1.3	124	0.0050	1.58	57.03	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050
30.9	514	Total			

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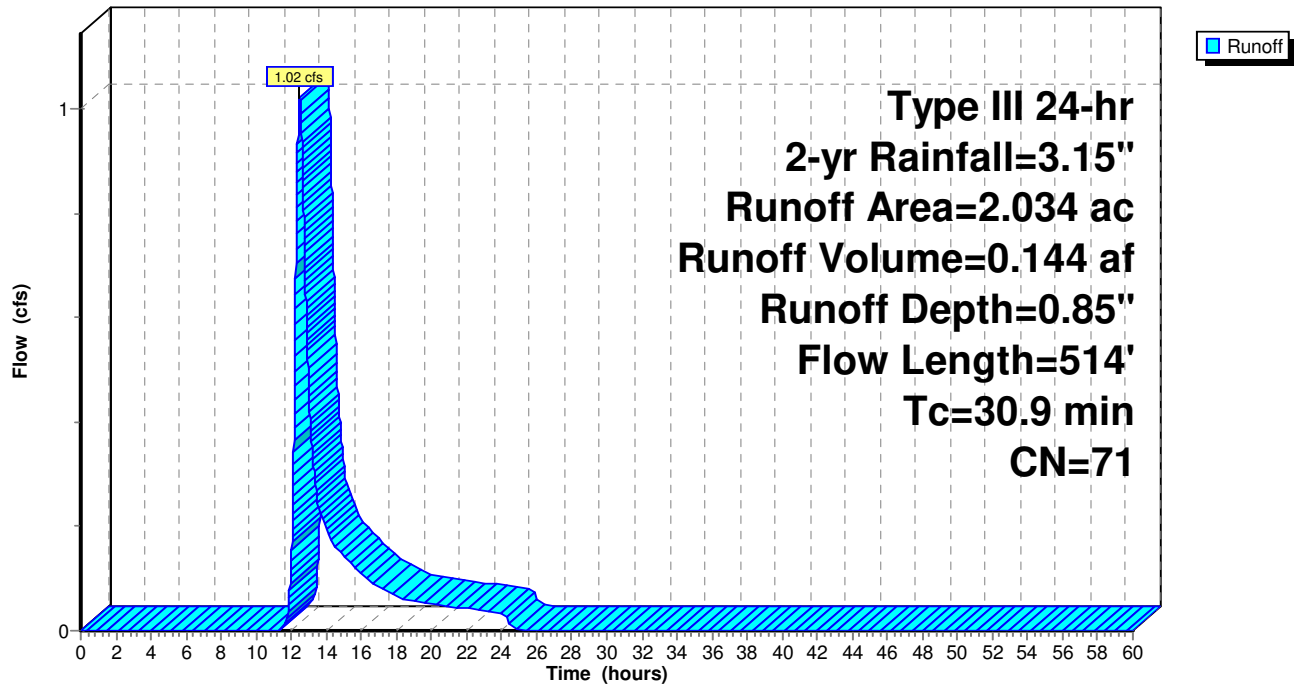
Type III 24-hr 2-yr Rainfall=3.15"

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Subcatchment P2: P2

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Summary for Subcatchment P3: P3 (DP4)

Runoff = 0.66 cfs @ 12.66 hrs, Volume= 0.113 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.441	71	>75% Grass cover, Good, HSG B/D
0.064	74	>75% Grass cover, Good, HSG C
* 1.292	66	Woods, Good, HSG B/D
0.118	70	Woods, Good, HSG C
* 0.007	98	IMPERVIOUS
1.922	68	Weighted Average
1.915		99.64% Pervious Area
0.007		0.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	16	0.2800	0.23		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
25.7	84	0.0089	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
14.2	390	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
41.0	490	Total			

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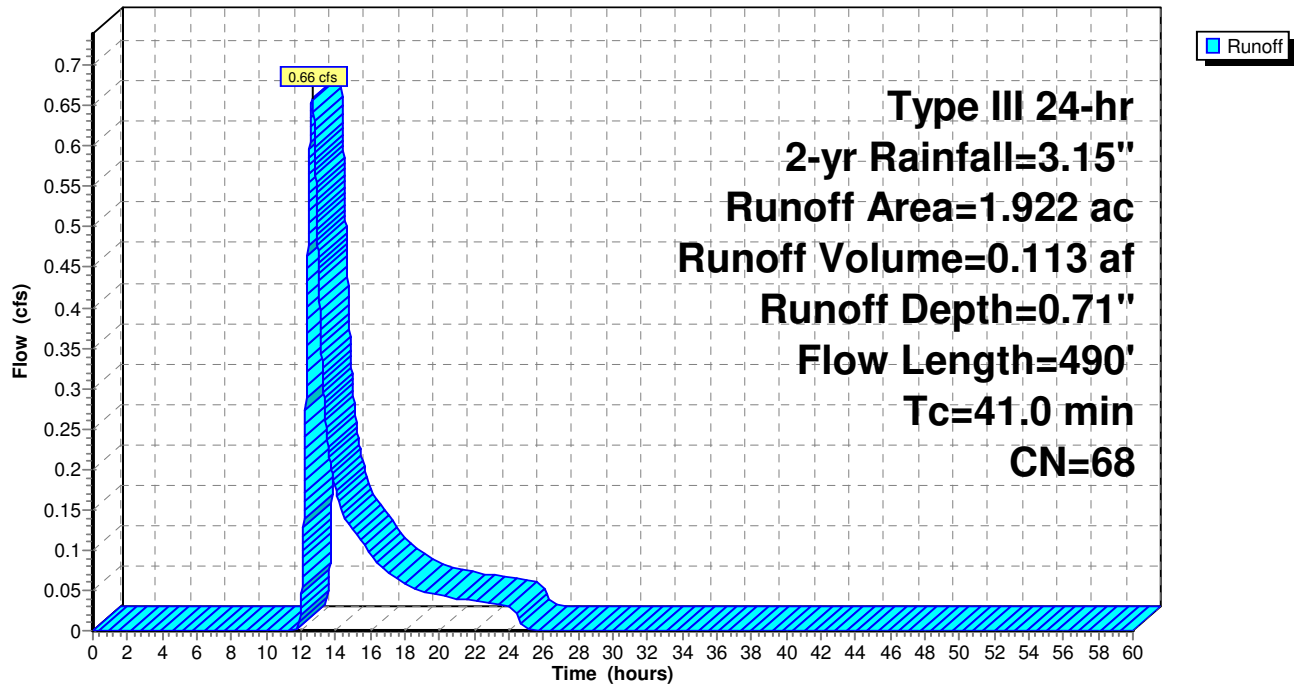
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Subcatchment P3: P3 (DP4)

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Summary for Subcatchment P4: P4

Runoff = 3.64 cfs @ 12.14 hrs, Volume= 0.298 af, Depth= 1.50"

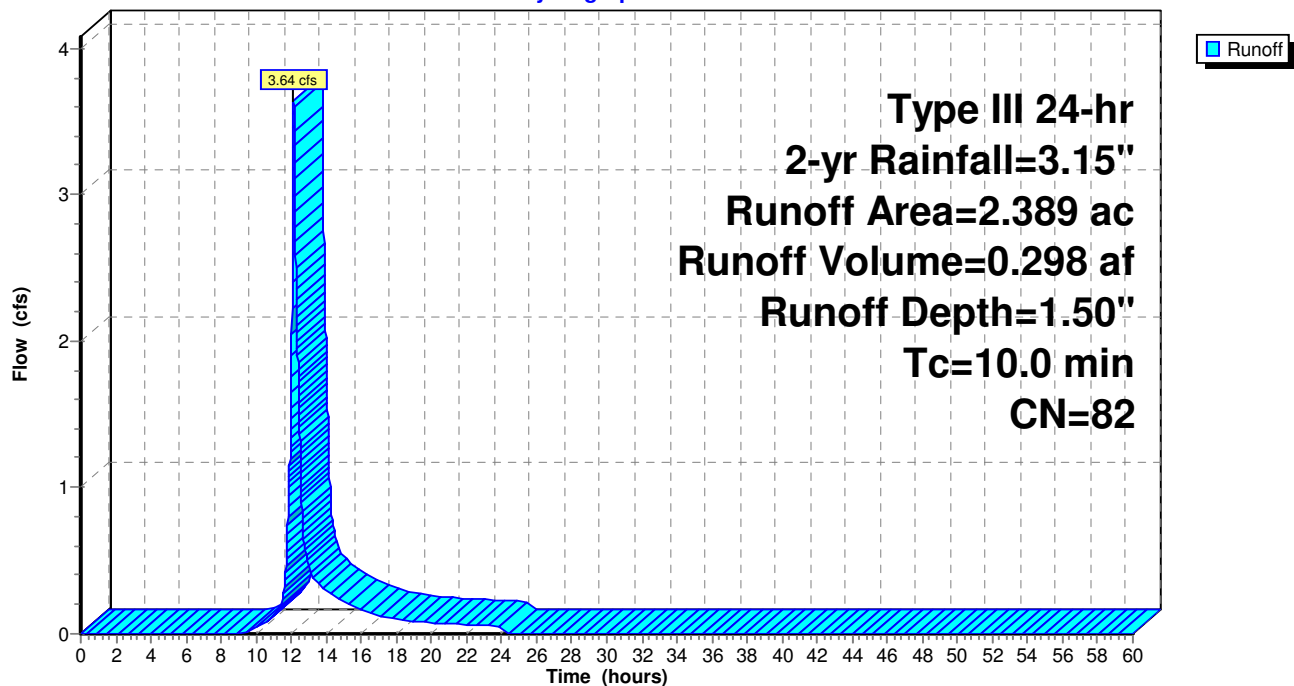
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
0.263	39	>75% Grass cover, Good, HSG A
* 0.792	71	>75% Grass cover, Good, HSG B/D
0.034	74	>75% Grass cover, Good, HSG C
* 1.300	98	IMPERVIOUS
2.389	82	Weighted Average
1.089		45.58% Pervious Area
1.300		54.42% Impervious Area

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

Subcatchment P4: P4

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Summary for Subcatchment P5: P5

Runoff = 11.91 cfs @ 12.14 hrs, Volume= 0.969 af, Depth= 1.79"

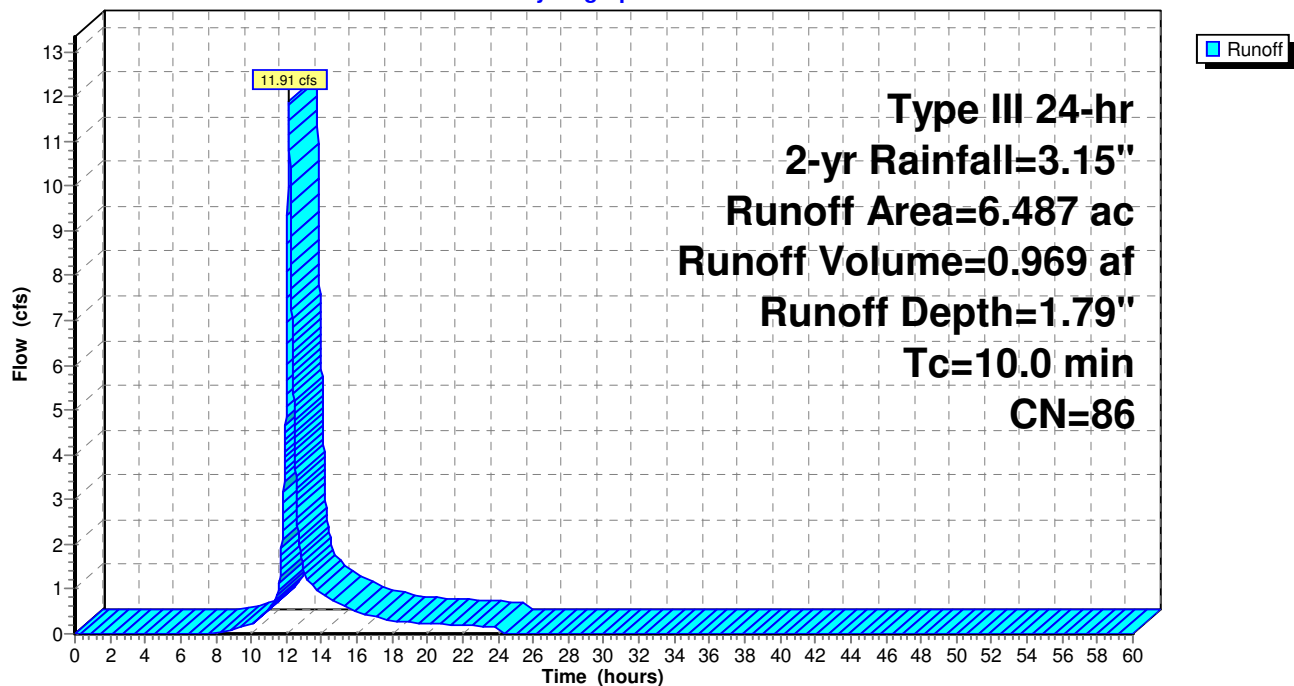
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.052	60	>75% Grass cover, Good, HSG A/D
* 1.761	71	>75% Grass cover, Good, HSG B/D
1.267	74	>75% Grass cover, Good, HSG C
* 3.407	98	IMPERVIOUS
6.487	86	Weighted Average
3.080		47.48% Pervious Area
3.407		52.52% Impervious Area

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

Subcatchment P5: P5

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Summary for Subcatchment P6: P6

Runoff = 15.38 cfs @ 12.14 hrs, Volume= 1.257 af, Depth= 2.04"

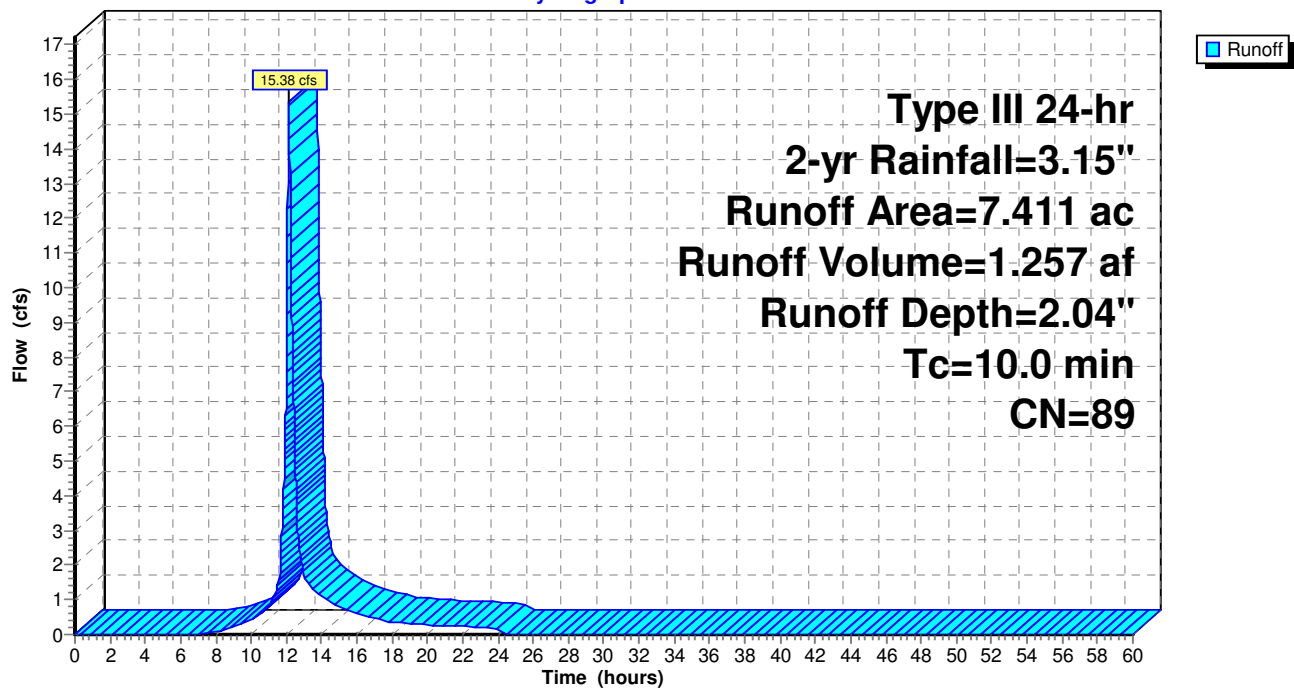
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
0.427	39	>75% Grass cover, Good, HSG A
* 0.012	60	>75% Grass cover, Good, HSG A/D
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.357	74	>75% Grass cover, Good, HSG C
* 5.372	98	IMPERVIOUS
7.411	89	Weighted Average
2.039		27.51% Pervious Area
5.372		72.49% Impervious Area

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

Subcatchment P6: P6

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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P7: P7

Runoff = 1.04 cfs @ 12.56 hrs, Volume= 0.172 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.550	60	>75% Grass cover, Good, HSG A/D
* 0.410	71	>75% Grass cover, Good, HSG B/D
0.335	74	>75% Grass cover, Good, HSG C
* 1.230	54	Woods, Good, HSG A/D
* 0.251	66	Woods, Good, HSG B/D
0.588	70	Woods, Good, HSG C
* 0.221	98	IMPERVIOUS
3.585	65	Weighted Average
3.364		93.84% Pervious Area
0.221		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	12	0.2600	0.21		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
21.6	88	0.0152	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"
10.0	371	0.0152	0.62		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
32.5	471	Total			

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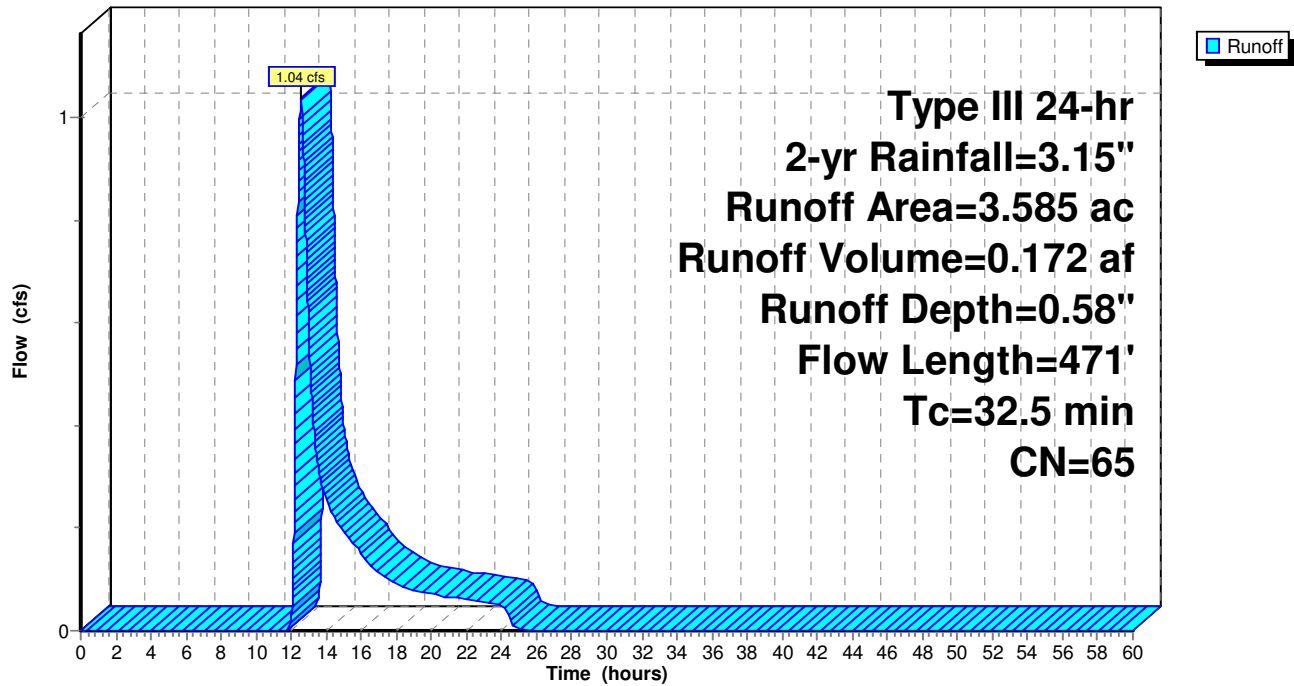
Type III 24-hr 2-yr Rainfall=3.15"

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Subcatchment P7: P7

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Summary for Subcatchment P8: P8

Runoff = 12.62 cfs @ 12.08 hrs, Volume= 1.004 af, Depth= 2.92"

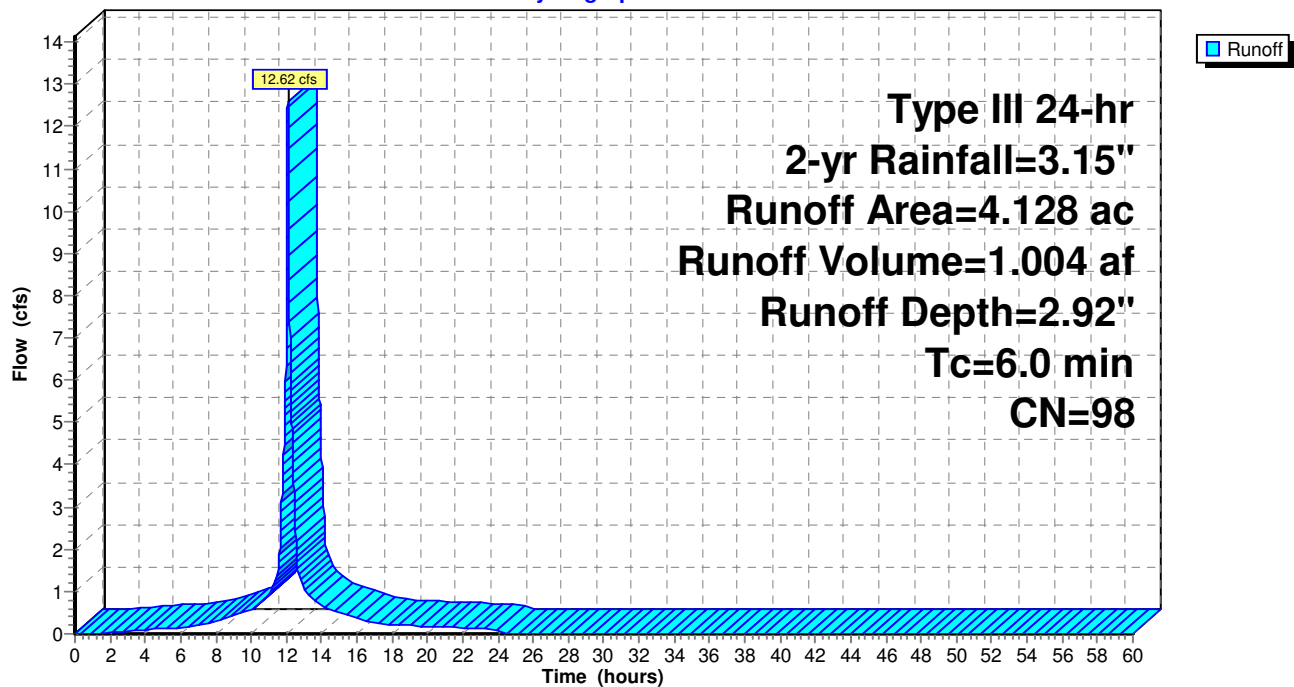
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 4.128	98	IMPERVIOUS
4.128		100.00% Impervious Area

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

Subcatchment P8: P8

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Type III 24-hr 2-yr Rainfall=3.15"

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Summary for Subcatchment P9: P9

Runoff = 3.30 cfs @ 12.08 hrs, Volume= 0.263 af, Depth= 2.92"

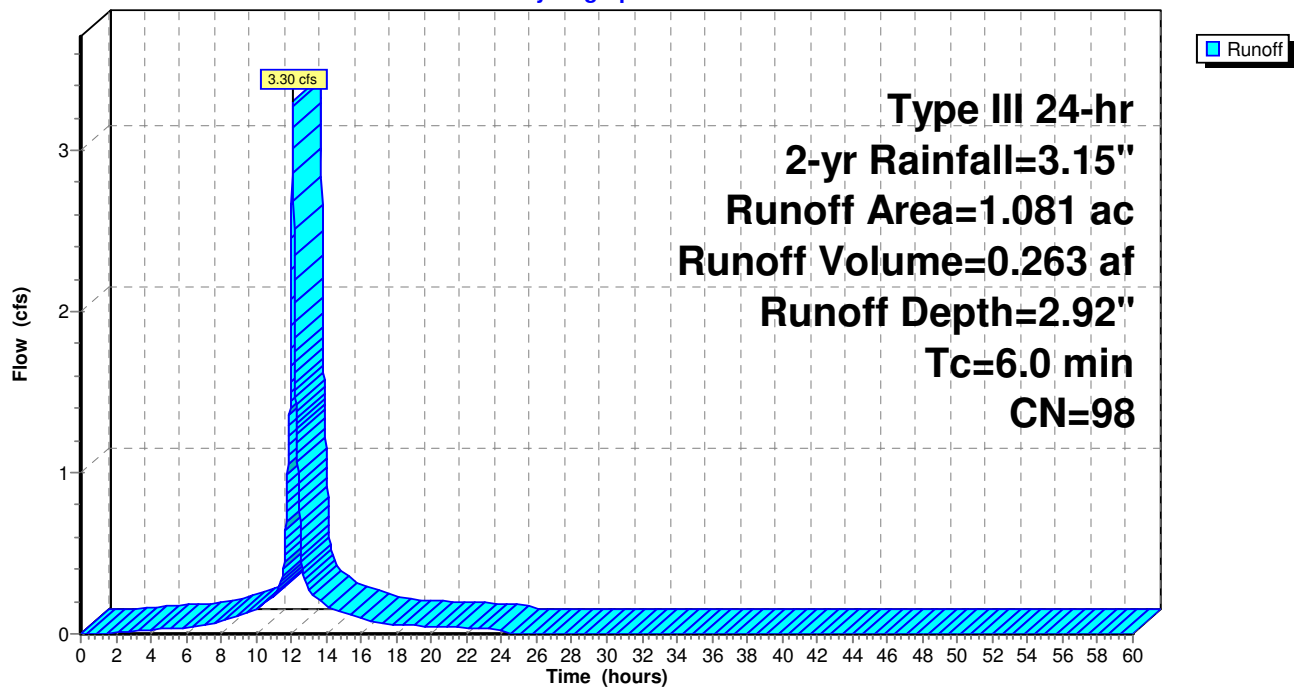
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 1.081	98	IMPERVIOUS
1.081		100.00% Impervious Area

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

Subcatchment P9: P9

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Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 2.35" for 2-yr event
 Inflow = 26.78 cfs @ 12.11 hrs, Volume= 2.261 af
 Outflow = 24.21 cfs @ 12.16 hrs, Volume= 2.261 af, Atten= 10%, Lag= 3.0 min
 Primary = 24.21 cfs @ 12.16 hrs, Volume= 2.261 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 72.18' @ 12.16 hrs Surf.Area= 8,790 sf Storage= 10,330 cf (7,948 cf above start)

Plug-Flow detention time= 47.0 min calculated for 2.206 af (98% of inflow)

Center-of-Mass det. time= 21.6 min (811.0 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 ' / ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B

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Type III 24-hr 2-yr Rainfall=3.15"

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#3 Primary 71.00' L= 37.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900
n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
30.0" Round UG1-OUTLET C
L= 41.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900
n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=24.19 cfs @ 12.16 hrs HW=72.18' TW=70.28' (Dynamic Tailwater)

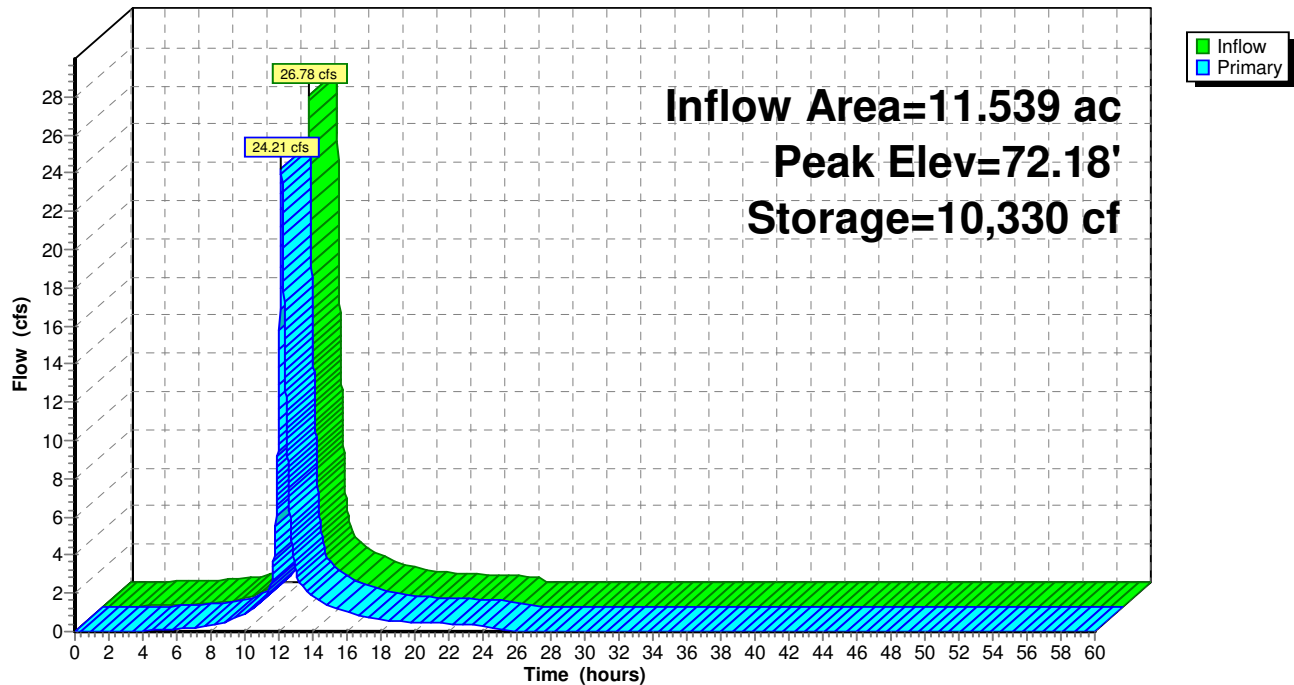
1=UG1-OUTLET A (Barrel Controls 8.14 cfs @ 5.23 fps)

2=UG1-OUTLET B (Barrel Controls 8.07 cfs @ 5.18 fps)

3=UG1-OUTLET C (Barrel Controls 7.98 cfs @ 5.13 fps)

Pond PP1: UG Chambers (CULTEC R-360)

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Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 2.19" for 2-yr event
 Inflow = 47.93 cfs @ 12.13 hrs, Volume= 4.350 af
 Outflow = 1.44 cfs @ 17.21 hrs, Volume= 4.040 af, Atten= 97%, Lag= 304.6 min
 Primary = 1.44 cfs @ 17.21 hrs, Volume= 4.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf

Peak Elev= 71.15' @ 17.21 hrs Surf.Area= 84,827 sf Storage= 500,254 cf (135,847 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 1,024.8 min (1,831.2 - 806.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

Device	Routing	Invert	Outlet Devices	
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf	
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate	C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate	C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate	C= 0.600

Primary OutFlow Max=1.44 cfs @ 17.21 hrs HW=71.15' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.44 cfs of 11.44 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.44 cfs @ 6.29 fps)
 3=Orifice/Grate (Controls 0.00 cfs)
 4=Orifice/Grate (Controls 0.00 cfs)

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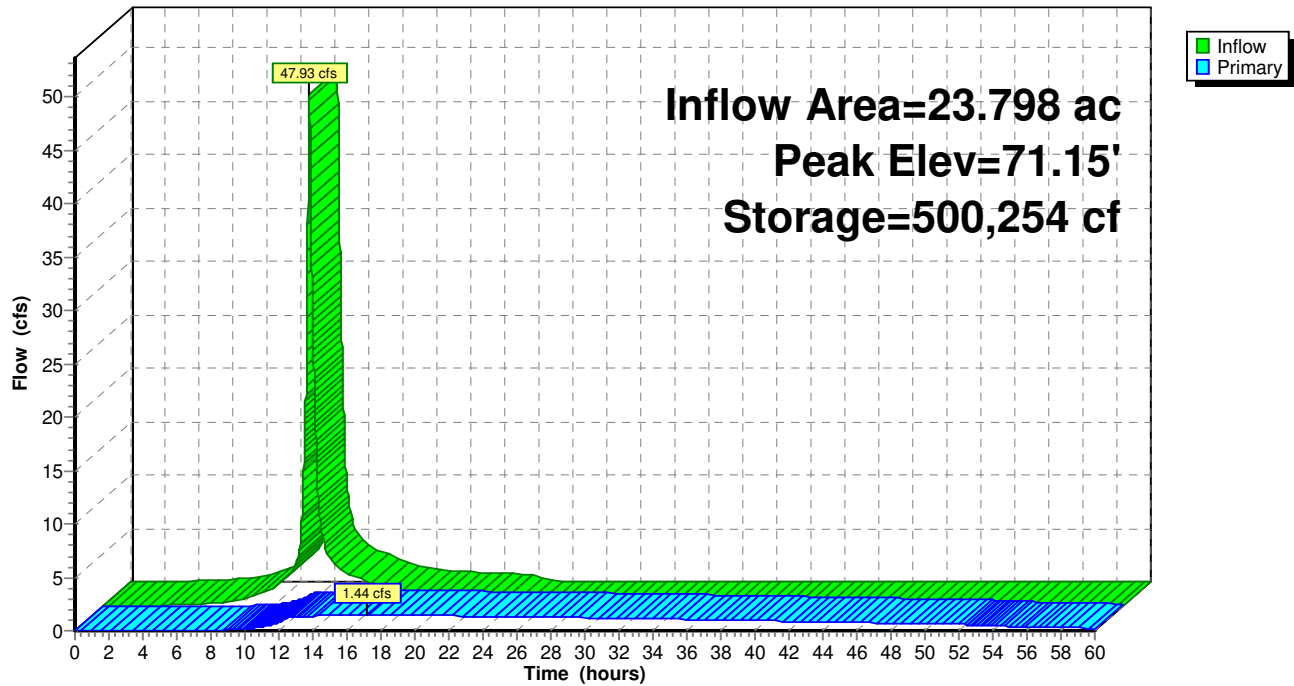
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Pond PP2: Water Quality Basin

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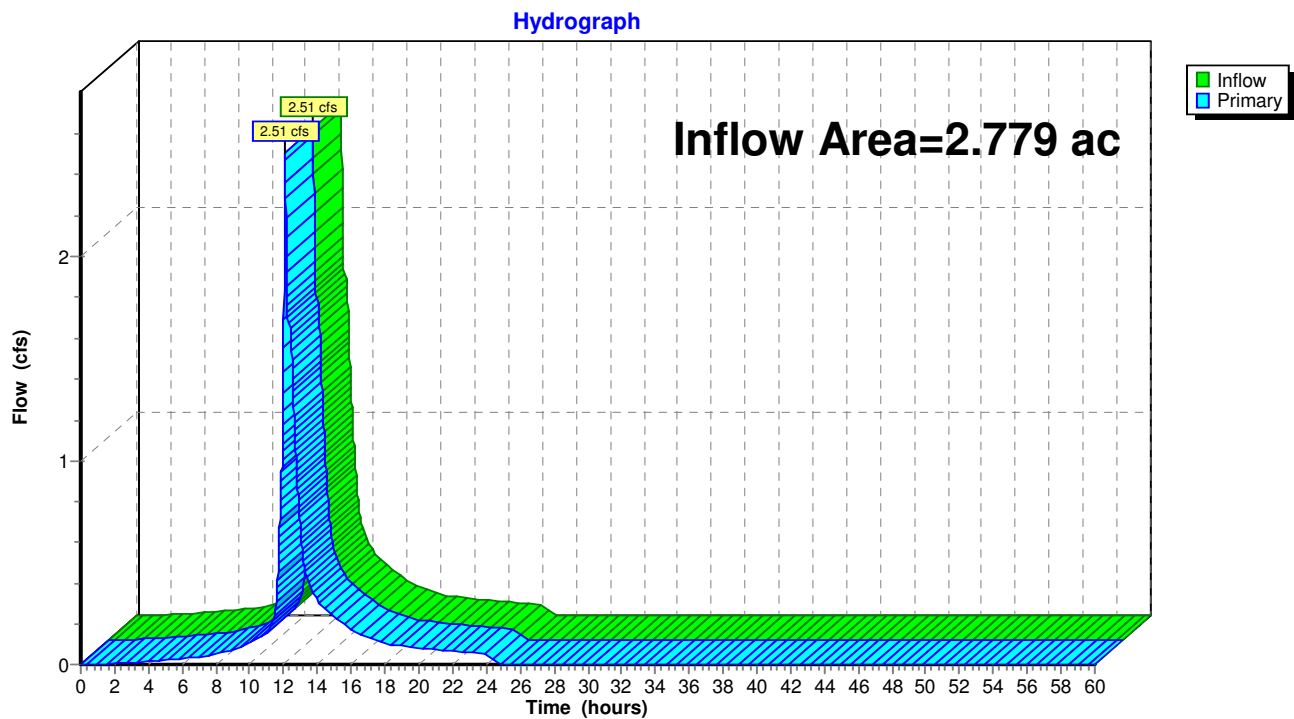
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Summary for Link 2L: DP2

Inflow Area = 2.779 ac, 27.31% Impervious, Inflow Depth = 1.40" for 2-yr event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.325 af
Primary = 2.51 cfs @ 12.09 hrs, Volume= 0.325 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 2L: DP2



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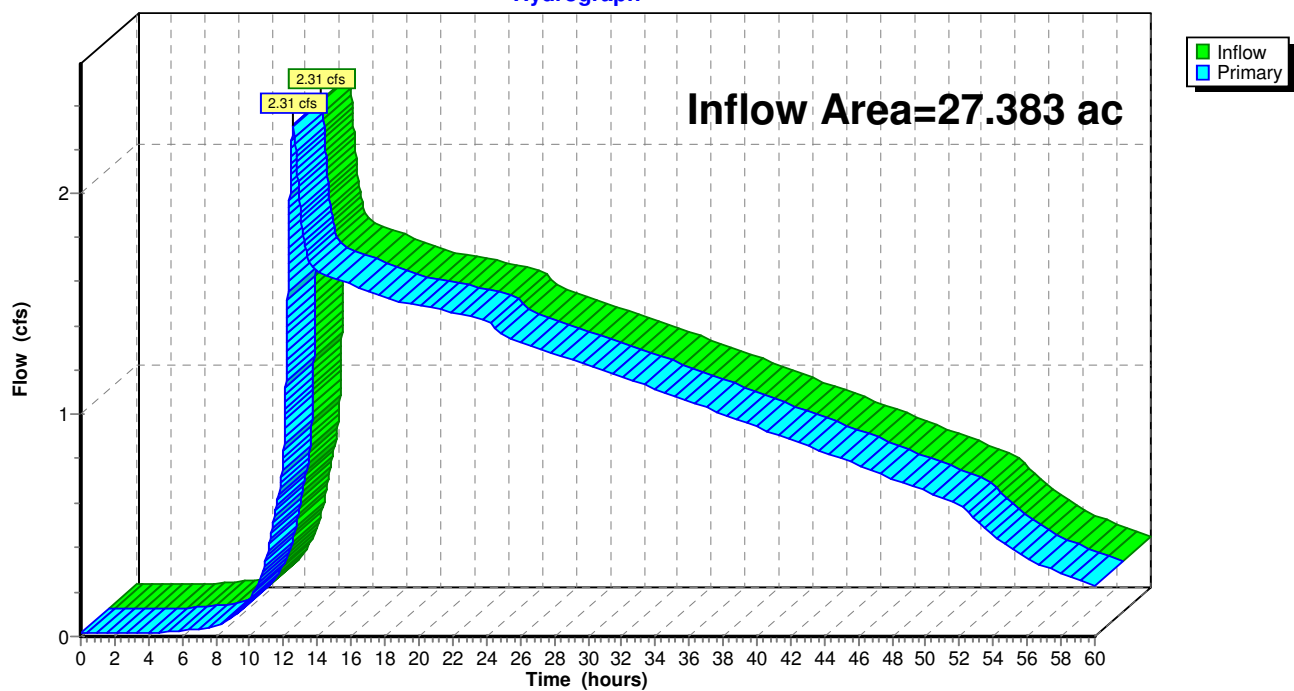
Summary for Link DP1: DP1

Inflow Area = 27.383 ac, 65.04% Impervious, Inflow Depth > 1.85" for 2-yr event
Inflow = 2.31 cfs @ 12.57 hrs, Volume= 4.212 af
Primary = 2.31 cfs @ 12.57 hrs, Volume= 4.212 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link DP1: DP1

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Type III 24-hr 10-yr Rainfall=4.99"

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Summary for Subcatchment P1: P1 (DP3)

Runoff = 2.82 cfs @ 12.47 hrs, Volume= 0.379 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
* 0.420	71	>75% Grass cover, Good, HSG B/D
0.160	74	>75% Grass cover, Good, HSG C
* 1.220	66	Woods, Good, HSG B/D
0.630	70	Woods, Good, HSG C
2.430	68	Weighted Average
2.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	28	0.2100	0.15		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
25.5	72	0.0067	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
4.0	98	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
32.5	198	Total			

Summary for Subcatchment P10: P10 (RB3)

Runoff = 3.64 cfs @ 12.08 hrs, Volume= 0.295 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
* 0.745	98	IMPERVIOUS
0.745		100.00% Impervious Area

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

Summary for Subcatchment P11: P11

Runoff = 11.24 cfs @ 12.08 hrs, Volume= 0.912 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

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Type III 24-hr 10-yr Rainfall=4.99"

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Area (ac)	CN	Description
* 2.302	98	IMPERVIOUS
2.302		100.00% Impervious Area

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

Summary for Subcatchment P2: P2

Runoff = 2.76 cfs @ 12.46 hrs, Volume= 0.357 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
* 0.300	71	>75% Grass cover, Good, HSG B/D
0.527	74	>75% Grass cover, Good, HSG C
* 0.014	98	IMPERVIOUS
* 0.380	66	Woods, Good, HSG B/D
0.813	70	Woods, Good, HSG C
2.034	71	Weighted Average
2.020		99.31% Pervious Area
0.014		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	100	0.0084	0.08		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
2.6	100	0.0084	0.64		Shallow Concentrated Flow, Grass SCF Short Grass Pasture Kv= 7.0 fps
6.9	190	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
1.3	124	0.0050	1.58	57.03	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050
30.9	514	Total			

Summary for Subcatchment P3: P3 (DP4)

Runoff = 1.99 cfs @ 12.61 hrs, Volume= 0.300 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

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Area (ac)	CN	Description
* 0.441	71	>75% Grass cover, Good, HSG B/D
0.064	74	>75% Grass cover, Good, HSG C
* 1.292	66	Woods, Good, HSG B/D
0.118	70	Woods, Good, HSG C
* 0.007	98	IMPERVIOUS
1.922	68	Weighted Average
1.915		99.64% Pervious Area
0.007		0.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	16	0.2800	0.23		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
25.7	84	0.0089	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
14.2	390	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
41.0	490	Total			

Summary for Subcatchment P4: P4

Runoff = 7.50 cfs @ 12.14 hrs, Volume= 0.611 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
0.263	39	>75% Grass cover, Good, HSG A
* 0.792	71	>75% Grass cover, Good, HSG B/D
0.034	74	>75% Grass cover, Good, HSG C
* 1.300	98	IMPERVIOUS
2.389	82	Weighted Average
1.089		45.58% Pervious Area
1.300		54.42% Impervious Area

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

Summary for Subcatchment P5: P5

Runoff = 22.70 cfs @ 12.14 hrs, Volume= 1.869 af, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

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Area (ac)	CN	Description
* 0.052	60	>75% Grass cover, Good, HSG A/D
* 1.761	71	>75% Grass cover, Good, HSG B/D
1.267	74	>75% Grass cover, Good, HSG C
* 3.407	98	IMPERVIOUS
6.487	86	Weighted Average
3.080		47.48% Pervious Area
3.407		52.52% Impervious Area

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

Summary for Subcatchment P6: P6

Runoff = 27.81 cfs @ 12.14 hrs, Volume= 2.324 af, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
0.427	39	>75% Grass cover, Good, HSG A
* 0.012	60	>75% Grass cover, Good, HSG A/D
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.357	74	>75% Grass cover, Good, HSG C
* 5.372	98	IMPERVIOUS
7.411	89	Weighted Average
2.039		27.51% Pervious Area
5.372		72.49% Impervious Area

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

Summary for Subcatchment P7: P7

Runoff = 3.58 cfs @ 12.49 hrs, Volume= 0.492 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

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Area (ac)	CN	Description
* 0.550	60	>75% Grass cover, Good, HSG A/D
* 0.410	71	>75% Grass cover, Good, HSG B/D
0.335	74	>75% Grass cover, Good, HSG C
* 1.230	54	Woods, Good, HSG A/D
* 0.251	66	Woods, Good, HSG B/D
0.588	70	Woods, Good, HSG C
* 0.221	98	IMPERVIOUS
3.585	65	Weighted Average
3.364		93.84% Pervious Area
0.221		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	12	0.2600	0.21		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
21.6	88	0.0152	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"
10.0	371	0.0152	0.62		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
32.5	471	Total			

Summary for Subcatchment P8: P8

Runoff = 20.15 cfs @ 12.08 hrs, Volume= 1.635 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
* 4.128	98	IMPERVIOUS
4.128		100.00% Impervious Area

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

Summary for Subcatchment P9: P9

Runoff = 5.28 cfs @ 12.08 hrs, Volume= 0.428 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.99"

Area (ac)	CN	Description
* 1.081	98	IMPERVIOUS
1.081		100.00% Impervious Area

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

Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 4.12" for 10-yr event
 Inflow = 46.05 cfs @ 12.11 hrs, Volume= 3.959 af
 Outflow = 42.83 cfs @ 12.15 hrs, Volume= 3.958 af, Atten= 7%, Lag= 2.5 min
 Primary = 42.83 cfs @ 12.15 hrs, Volume= 3.958 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 72.68' @ 12.15 hrs Surf.Area= 8,790 sf Storage= 13,472 cf (11,090 cf above start)

Plug-Flow detention time= 43.1 min calculated for 3.903 af (99% of inflow)

Center-of-Mass det. time= 27.2 min (804.7 - 777.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

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Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#3	Primary	71.00'	30.0" Round UG1-OUTLET C L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=42.83 cfs @ 12.15 hrs HW=72.68' TW=71.02' (Dynamic Tailwater)

1=UG1-OUTLET A (Barrel Controls 14.38 cfs @ 5.79 fps)
 2=UG1-OUTLET B (Barrel Controls 14.28 cfs @ 5.75 fps)
 3=UG1-OUTLET C (Barrel Controls 14.16 cfs @ 5.71 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 3.92" for 10-yr event
 Inflow = 86.48 cfs @ 12.13 hrs, Volume= 7.778 af
 Outflow = 5.97 cfs @ 13.98 hrs, Volume= 7.350 af, Atten= 93%, Lag= 110.7 min
 Primary = 5.97 cfs @ 13.98 hrs, Volume= 7.350 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf

Peak Elev= 71.96' @ 13.98 hrs Surf.Area= 91,567 sf Storage= 571,542 cf (207,135 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 752.2 min (1,549.1 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

Device	Routing	Invert	Outlet Devices
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=5.97 cfs @ 13.98 hrs HW=71.96' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 5.97 cfs of 20.73 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.75 cfs @ 7.63 fps)
 3=Orifice/Grate (Orifice Controls 4.22 cfs @ 3.68 fps)
 4=Orifice/Grate (Controls 0.00 cfs)

Summary for Link 2L: DP2

Inflow Area = 2.779 ac, 27.31% Impervious, Inflow Depth = 2.82" for 10-yr event
 Inflow = 4.59 cfs @ 12.09 hrs, Volume= 0.653 af
 Primary = 4.59 cfs @ 12.09 hrs, Volume= 0.653 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link DP1: DP1

Inflow Area = 27.383 ac, 65.04% Impervious, Inflow Depth > 3.44" for 10-yr event
 Inflow = 8.64 cfs @ 12.57 hrs, Volume= 7.842 af
 Primary = 8.64 cfs @ 12.57 hrs, Volume= 7.842 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

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Summary for Subcatchment P1: P1 (DP3)

Runoff = 4.18 cfs @ 12.46 hrs, Volume= 0.551 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
* 0.420	71	>75% Grass cover, Good, HSG B/D
0.160	74	>75% Grass cover, Good, HSG C
* 1.220	66	Woods, Good, HSG B/D
0.630	70	Woods, Good, HSG C
2.430	68	Weighted Average
2.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	28	0.2100	0.15		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
25.5	72	0.0067	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
4.0	98	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
32.5	198	Total			

Summary for Subcatchment P10: P10 (RB3)

Runoff = 4.48 cfs @ 12.08 hrs, Volume= 0.366 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
* 0.745	98	IMPERVIOUS
0.745		100.00% Impervious Area

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

Summary for Subcatchment P11: P11

Runoff = 13.83 cfs @ 12.08 hrs, Volume= 1.130 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

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Area (ac)	CN	Description
* 2.302	98	IMPERVIOUS
2.302		100.00% Impervious Area

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

Summary for Subcatchment P2: P2

Runoff = 3.97 cfs @ 12.43 hrs, Volume= 0.509 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
* 0.300	71	>75% Grass cover, Good, HSG B/D
0.527	74	>75% Grass cover, Good, HSG C
* 0.014	98	IMPERVIOUS
* 0.380	66	Woods, Good, HSG B/D
0.813	70	Woods, Good, HSG C
2.034	71	Weighted Average
2.020		99.31% Pervious Area
0.014		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	100	0.0084	0.08		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
2.6	100	0.0084	0.64		Shallow Concentrated Flow, Grass SCF Short Grass Pasture Kv= 7.0 fps
6.9	190	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
1.3	124	0.0050	1.58	57.03	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050
30.9	514	Total			

Summary for Subcatchment P3: P3 (DP4)

Runoff = 2.94 cfs @ 12.58 hrs, Volume= 0.436 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

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Type III 24-hr 25-yr Rainfall=6.13"

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Area (ac)	CN	Description
* 0.441	71	>75% Grass cover, Good, HSG B/D
0.064	74	>75% Grass cover, Good, HSG C
* 1.292	66	Woods, Good, HSG B/D
0.118	70	Woods, Good, HSG C
* 0.007	98	IMPERVIOUS
1.922	68	Weighted Average
1.915		99.64% Pervious Area
0.007		0.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	16	0.2800	0.23		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
25.7	84	0.0089	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
14.2	390	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
41.0	490	Total			

Summary for Subcatchment P4: P4

Runoff = 9.97 cfs @ 12.14 hrs, Volume= 0.818 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
0.263	39	>75% Grass cover, Good, HSG A
* 0.792	71	>75% Grass cover, Good, HSG B/D
0.034	74	>75% Grass cover, Good, HSG C
* 1.300	98	IMPERVIOUS
2.389	82	Weighted Average
1.089		45.58% Pervious Area
1.300		54.42% Impervious Area

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

Summary for Subcatchment P5: P5

Runoff = 29.45 cfs @ 12.14 hrs, Volume= 2.451 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

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Type III 24-hr 25-yr Rainfall=6.13"

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Area (ac)	CN	Description
* 0.052	60	>75% Grass cover, Good, HSG A/D
* 1.761	71	>75% Grass cover, Good, HSG B/D
1.267	74	>75% Grass cover, Good, HSG C
* 3.407	98	IMPERVIOUS
6.487	86	Weighted Average
3.080		47.48% Pervious Area
3.407		52.52% Impervious Area

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

Summary for Subcatchment P6: P6

Runoff = 35.48 cfs @ 12.14 hrs, Volume= 3.002 af, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
0.427	39	>75% Grass cover, Good, HSG A
* 0.012	60	>75% Grass cover, Good, HSG A/D
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.357	74	>75% Grass cover, Good, HSG C
* 5.372	98	IMPERVIOUS
7.411	89	Weighted Average
2.039		27.51% Pervious Area
5.372		72.49% Impervious Area

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

Summary for Subcatchment P7: P7

Runoff = 5.48 cfs @ 12.46 hrs, Volume= 0.731 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

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Type III 24-hr 25-yr Rainfall=6.13"

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Area (ac)	CN	Description
* 0.550	60	>75% Grass cover, Good, HSG A/D
* 0.410	71	>75% Grass cover, Good, HSG B/D
0.335	74	>75% Grass cover, Good, HSG C
* 1.230	54	Woods, Good, HSG A/D
* 0.251	66	Woods, Good, HSG B/D
0.588	70	Woods, Good, HSG C
* 0.221	98	IMPERVIOUS
3.585	65	Weighted Average
3.364		93.84% Pervious Area
0.221		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	12	0.2600	0.21		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
21.6	88	0.0152	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"
10.0	371	0.0152	0.62		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
32.5	471	Total			

Summary for Subcatchment P8: P8

Runoff = 24.80 cfs @ 12.08 hrs, Volume= 2.027 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
* 4.128	98	IMPERVIOUS
4.128		100.00% Impervious Area

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

Summary for Subcatchment P9: P9

Runoff = 6.50 cfs @ 12.08 hrs, Volume= 0.531 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=6.13"

Area (ac)	CN	Description
* 1.081	98	IMPERVIOUS
1.081		100.00% Impervious Area

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Type III 24-hr 25-yr Rainfall=6.13"

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

Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 5.23" for 25-yr event
 Inflow = 57.95 cfs @ 12.11 hrs, Volume= 5.029 af
 Outflow = 54.43 cfs @ 12.15 hrs, Volume= 5.028 af, Atten= 6%, Lag= 2.3 min
 Primary = 54.43 cfs @ 12.15 hrs, Volume= 5.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 72.97' @ 12.15 hrs Surf.Area= 8,790 sf Storage= 15,163 cf (12,781 cf above start)

Plug-Flow detention time= 43.3 min calculated for 4.974 af (99% of inflow)

Center-of-Mass det. time= 30.0 min (802.5 - 772.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

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Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#3	Primary	71.00'	30.0" Round UG1-OUTLET C L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=54.39 cfs @ 12.15 hrs HW=72.96' TW=71.49' (Dynamic Tailwater)

1=UG1-OUTLET A (Barrel Controls 18.25 cfs @ 6.06 fps)
 2=UG1-OUTLET B (Barrel Controls 18.14 cfs @ 6.03 fps)
 3=UG1-OUTLET C (Barrel Controls 18.00 cfs @ 5.98 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 5.02" for 25-yr event
 Inflow = 110.61 cfs @ 12.13 hrs, Volume= 9.958 af
 Outflow = 8.81 cfs @ 13.56 hrs, Volume= 9.484 af, Atten= 92%, Lag= 86.1 min
 Primary = 8.81 cfs @ 13.56 hrs, Volume= 9.484 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3
 Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf
 Peak Elev= 72.50' @ 13.56 hrs Surf.Area= 96,025 sf Storage= 621,949 cf (257,543 cf above start)

Plug-Flow detention time= 2,527.9 min calculated for 1.118 af (11% of inflow)
 Center-of-Mass det. time= 657.9 min (1,451.1 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

Device	Routing	Invert	Outlet Devices
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=8.81 cfs @ 13.56 hrs HW=72.50' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 8.81 cfs of 25.87 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.93 cfs @ 8.41 fps)
 3=Orifice/Grate (Orifice Controls 5.85 cfs @ 5.11 fps)
 4=Orifice/Grate (Orifice Controls 1.03 cfs @ 2.26 fps)

Summary for Link 2L: DP2

Inflow Area = 2.779 ac, 27.31% Impervious, Inflow Depth = 3.78" for 25-yr event
 Inflow = 5.97 cfs @ 12.09 hrs, Volume= 0.875 af
 Primary = 5.97 cfs @ 12.09 hrs, Volume= 0.875 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link DP1: DP1

Inflow Area = 27.383 ac, 65.04% Impervious, Inflow Depth > 4.48" for 25-yr event
 Inflow = 13.20 cfs @ 12.54 hrs, Volume= 10.215 af
 Primary = 13.20 cfs @ 12.54 hrs, Volume= 10.215 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

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Type III 24-hr 50-yr Rainfall=6.97"

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Summary for Subcatchment P1: P1 (DP3)

Runoff = 5.24 cfs @ 12.46 hrs, Volume= 0.686 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
* 0.420	71	>75% Grass cover, Good, HSG B/D
0.160	74	>75% Grass cover, Good, HSG C
* 1.220	66	Woods, Good, HSG B/D
0.630	70	Woods, Good, HSG C
2.430	68	Weighted Average
2.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	28	0.2100	0.15		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
25.5	72	0.0067	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
4.0	98	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
32.5	198	Total			

Summary for Subcatchment P10: P10 (RB3)

Runoff = 5.09 cfs @ 12.08 hrs, Volume= 0.418 af, Depth= 6.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
* 0.745	98	IMPERVIOUS
0.745		100.00% Impervious Area

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

Summary for Subcatchment P11: P11

Runoff = 15.74 cfs @ 12.08 hrs, Volume= 1.291 af, Depth= 6.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

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Type III 24-hr 50-yr Rainfall=6.97"

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Area (ac)	CN	Description
* 2.302	98	IMPERVIOUS
2.302		100.00% Impervious Area

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

Summary for Subcatchment P2: P2

Runoff = 4.91 cfs @ 12.43 hrs, Volume= 0.627 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
* 0.300	71	>75% Grass cover, Good, HSG B/D
0.527	74	>75% Grass cover, Good, HSG C
* 0.014	98	IMPERVIOUS
* 0.380	66	Woods, Good, HSG B/D
0.813	70	Woods, Good, HSG C
2.034	71	Weighted Average
2.020		99.31% Pervious Area
0.014		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	100	0.0084	0.08		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
2.6	100	0.0084	0.64		Shallow Concentrated Flow, Grass SCF Short Grass Pasture Kv= 7.0 fps
6.9	190	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
1.3	124	0.0050	1.58	57.03	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050
30.9	514	Total			

Summary for Subcatchment P3: P3 (DP4)

Runoff = 3.69 cfs @ 12.57 hrs, Volume= 0.542 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

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Type III 24-hr 50-yr Rainfall=6.97"

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Area (ac)	CN	Description
* 0.441	71	>75% Grass cover, Good, HSG B/D
0.064	74	>75% Grass cover, Good, HSG C
* 1.292	66	Woods, Good, HSG B/D
0.118	70	Woods, Good, HSG C
* 0.007	98	IMPERVIOUS
1.922	68	Weighted Average
1.915		99.64% Pervious Area
0.007		0.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	16	0.2800	0.23		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
25.7	84	0.0089	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
14.2	390	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
41.0	490	Total			

Summary for Subcatchment P4: P4

Runoff = 11.80 cfs @ 12.14 hrs, Volume= 0.973 af, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
0.263	39	>75% Grass cover, Good, HSG A
* 0.792	71	>75% Grass cover, Good, HSG B/D
0.034	74	>75% Grass cover, Good, HSG C
* 1.300	98	IMPERVIOUS
2.389	82	Weighted Average
1.089		45.58% Pervious Area
1.300		54.42% Impervious Area

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

Summary for Subcatchment P5: P5

Runoff = 34.41 cfs @ 12.14 hrs, Volume= 2.885 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

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Type III 24-hr 50-yr Rainfall=6.97"

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Area (ac)	CN	Description
* 0.052	60	>75% Grass cover, Good, HSG A/D
* 1.761	71	>75% Grass cover, Good, HSG B/D
1.267	74	>75% Grass cover, Good, HSG C
* 3.407	98	IMPERVIOUS
6.487	86	Weighted Average
3.080		47.48% Pervious Area
3.407		52.52% Impervious Area

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

Summary for Subcatchment P6: P6

Runoff = 41.10 cfs @ 12.14 hrs, Volume= 3.507 af, Depth= 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
0.427	39	>75% Grass cover, Good, HSG A
* 0.012	60	>75% Grass cover, Good, HSG A/D
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.357	74	>75% Grass cover, Good, HSG C
* 5.372	98	IMPERVIOUS
7.411	89	Weighted Average
2.039		27.51% Pervious Area
5.372		72.49% Impervious Area

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

Summary for Subcatchment P7: P7

Runoff = 6.98 cfs @ 12.46 hrs, Volume= 0.920 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

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Area (ac)	CN	Description
* 0.550	60	>75% Grass cover, Good, HSG A/D
* 0.410	71	>75% Grass cover, Good, HSG B/D
0.335	74	>75% Grass cover, Good, HSG C
* 1.230	54	Woods, Good, HSG A/D
* 0.251	66	Woods, Good, HSG B/D
0.588	70	Woods, Good, HSG C
* 0.221	98	IMPERVIOUS
3.585	65	Weighted Average
3.364		93.84% Pervious Area
0.221		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	12	0.2600	0.21		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
21.6	88	0.0152	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"
10.0	371	0.0152	0.62		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
32.5	471	Total			

Summary for Subcatchment P8: P8

Runoff = 28.23 cfs @ 12.08 hrs, Volume= 2.315 af, Depth= 6.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
* 4.128	98	IMPERVIOUS
4.128		100.00% Impervious Area

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

Summary for Subcatchment P9: P9

Runoff = 7.39 cfs @ 12.08 hrs, Volume= 0.606 af, Depth= 6.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.97"

Area (ac)	CN	Description
* 1.081	98	IMPERVIOUS
1.081		100.00% Impervious Area

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

Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 6.06" for 50-yr event
 Inflow = 66.68 cfs @ 12.11 hrs, Volume= 5.823 af
 Outflow = 62.97 cfs @ 12.15 hrs, Volume= 5.822 af, Atten= 6%, Lag= 2.2 min
 Primary = 62.97 cfs @ 12.15 hrs, Volume= 5.822 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 73.17' @ 12.15 hrs Surf.Area= 8,790 sf Storage= 16,323 cf (13,941 cf above start)

Plug-Flow detention time= 42.8 min calculated for 5.767 af (99% of inflow)

Center-of-Mass det. time= 31.1 min (800.6 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

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Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#3	Primary	71.00'	30.0" Round UG1-OUTLET C L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=62.91 cfs @ 12.15 hrs HW=73.17' TW=71.82' (Dynamic Tailwater)

1=UG1-OUTLET A (Barrel Controls 21.10 cfs @ 6.24 fps)
 2=UG1-OUTLET B (Barrel Controls 20.98 cfs @ 6.21 fps)
 3=UG1-OUTLET C (Barrel Controls 20.83 cfs @ 6.16 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 5.84" for 50-yr event
 Inflow = 128.40 cfs @ 12.13 hrs, Volume= 11.578 af
 Outflow = 11.25 cfs @ 13.27 hrs, Volume= 11.074 af, Atten= 91%, Lag= 68.5 min
 Primary = 11.25 cfs @ 13.27 hrs, Volume= 11.074 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf

Peak Elev= 72.88' @ 13.27 hrs Surf.Area= 99,258 sf Storage= 659,361 cf (294,954 cf above start)

Plug-Flow detention time= 1,909.9 min calculated for 2.708 af (23% of inflow)

Center-of-Mass det. time= 608.1 min (1,398.6 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)

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Type III 24-hr 50-yr Rainfall=6.97"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

Device	Routing	Invert	Outlet Devices
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=11.25 cfs @ 13.27 hrs HW=72.88' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 11.25 cfs of 29.46 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.04 cfs @ 8.92 fps)
 3=Orifice/Grate (Orifice Controls 6.78 cfs @ 5.92 fps)
 4=Orifice/Grate (Orifice Controls 2.43 cfs @ 3.01 fps)

Summary for Link 2L: DP2

Inflow Area = 2.779 ac, 27.31% Impervious, Inflow Depth = 4.51" for 50-yr event
 Inflow = 7.01 cfs @ 12.10 hrs, Volume= 1.045 af
 Primary = 7.01 cfs @ 12.10 hrs, Volume= 1.045 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link DP1: DP1

Inflow Area = 27.383 ac, 65.04% Impervious, Inflow Depth > 5.26" for 50-yr event
 Inflow = 17.10 cfs @ 12.53 hrs, Volume= 11.994 af
 Primary = 17.10 cfs @ 12.53 hrs, Volume= 11.994 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

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Summary for Subcatchment P1: P1 (DP3)

Runoff = 6.45 cfs @ 12.46 hrs, Volume= 0.841 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
* 0.420	71	>75% Grass cover, Good, HSG B/D
0.160	74	>75% Grass cover, Good, HSG C
* 1.220	66	Woods, Good, HSG B/D
0.630	70	Woods, Good, HSG C
2.430	68	Weighted Average
2.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	28	0.2100	0.15		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
25.5	72	0.0067	0.05		Sheet Flow, Woodland SF
					Woods: Light underbrush n= 0.400 P2= 3.22"
4.0	98	0.0067	0.41		Shallow Concentrated Flow, Woodland SCF
					Woodland Kv= 5.0 fps
32.5	198	Total			

Summary for Subcatchment P10: P10 (RB3)

Runoff = 5.78 cfs @ 12.08 hrs, Volume= 0.476 af, Depth= 7.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
* 0.745	98	IMPERVIOUS
0.745		100.00% Impervious Area

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

Summary for Subcatchment P11: P11

Runoff = 17.85 cfs @ 12.08 hrs, Volume= 1.469 af, Depth= 7.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

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Area (ac)	CN	Description
* 2.302	98	IMPERVIOUS
2.302		100.00% Impervious Area

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

Summary for Subcatchment P2: P2

Runoff = 5.97 cfs @ 12.43 hrs, Volume= 0.761 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
* 0.300	71	>75% Grass cover, Good, HSG B/D
0.527	74	>75% Grass cover, Good, HSG C
* 0.014	98	IMPERVIOUS
* 0.380	66	Woods, Good, HSG B/D
0.813	70	Woods, Good, HSG C
2.034	71	Weighted Average
2.020		99.31% Pervious Area
0.014		0.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	100	0.0084	0.08		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
2.6	100	0.0084	0.64		Shallow Concentrated Flow, Grass SCF Short Grass Pasture Kv= 7.0 fps
6.9	190	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
1.3	124	0.0050	1.58	57.03	Channel Flow, Channel Flow Area= 36.0 sf Perim= 55.0' r= 0.65' n= 0.050
30.9	514	Total			

Summary for Subcatchment P3: P3 (DP4)

Runoff = 4.54 cfs @ 12.57 hrs, Volume= 0.665 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
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Area (ac)	CN	Description
* 0.441	71	>75% Grass cover, Good, HSG B/D
0.064	74	>75% Grass cover, Good, HSG C
* 1.292	66	Woods, Good, HSG B/D
0.118	70	Woods, Good, HSG C
* 0.007	98	IMPERVIOUS
1.922	68	Weighted Average
1.915		99.64% Pervious Area
0.007		0.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	16	0.2800	0.23		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
25.7	84	0.0089	0.05		Sheet Flow, Woodland SF Woods: Light underbrush n= 0.400 P2= 3.22"
14.2	390	0.0084	0.46		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
41.0	490	Total			

Summary for Subcatchment P4: P4

Runoff = 13.83 cfs @ 12.14 hrs, Volume= 1.148 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
0.263	39	>75% Grass cover, Good, HSG A
* 0.792	71	>75% Grass cover, Good, HSG B/D
0.034	74	>75% Grass cover, Good, HSG C
* 1.300	98	IMPERVIOUS
2.389	82	Weighted Average
1.089		45.58% Pervious Area
1.300		54.42% Impervious Area

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

Summary for Subcatchment P5: P5

Runoff = 39.88 cfs @ 12.14 hrs, Volume= 3.370 af, Depth= 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

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Area (ac)	CN	Description
* 0.052	60	>75% Grass cover, Good, HSG A/D
* 1.761	71	>75% Grass cover, Good, HSG B/D
1.267	74	>75% Grass cover, Good, HSG C
* 3.407	98	IMPERVIOUS
6.487	86	Weighted Average
3.080		47.48% Pervious Area
3.407		52.52% Impervious Area

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

Summary for Subcatchment P6: P6

Runoff = 47.29 cfs @ 12.13 hrs, Volume= 4.069 af, Depth= 6.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
0.427	39	>75% Grass cover, Good, HSG A
* 0.012	60	>75% Grass cover, Good, HSG A/D
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.357	74	>75% Grass cover, Good, HSG C
* 5.372	98	IMPERVIOUS
7.411	89	Weighted Average
2.039		27.51% Pervious Area
5.372		72.49% Impervious Area

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

Summary for Subcatchment P7: P7

Runoff = 8.70 cfs @ 12.46 hrs, Volume= 1.139 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

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Area (ac)	CN	Description
* 0.550	60	>75% Grass cover, Good, HSG A/D
* 0.410	71	>75% Grass cover, Good, HSG B/D
0.335	74	>75% Grass cover, Good, HSG C
* 1.230	54	Woods, Good, HSG A/D
* 0.251	66	Woods, Good, HSG B/D
0.588	70	Woods, Good, HSG C
* 0.221	98	IMPERVIOUS
3.585	65	Weighted Average
3.364		93.84% Pervious Area
0.221		6.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	12	0.2600	0.21		Sheet Flow, Grass SF Grass: Dense n= 0.240 P2= 3.22"
21.6	88	0.0152	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"
10.0	371	0.0152	0.62		Shallow Concentrated Flow, Woodland SCF Woodland Kv= 5.0 fps
32.5	471	Total			

Summary for Subcatchment P8: P8

Runoff = 32.02 cfs @ 12.08 hrs, Volume= 2.635 af, Depth= 7.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
* 4.128	98	IMPERVIOUS
4.128		100.00% Impervious Area

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

Summary for Subcatchment P9: P9

Runoff = 8.38 cfs @ 12.08 hrs, Volume= 0.690 af, Depth= 7.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.90"

Area (ac)	CN	Description
* 1.081	98	IMPERVIOUS
1.081		100.00% Impervious Area

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

Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 6.97" for 100-yr event
 Inflow = 76.32 cfs @ 12.11 hrs, Volume= 6.704 af
 Outflow = 72.44 cfs @ 12.14 hrs, Volume= 6.704 af, Atten= 5%, Lag= 2.1 min
 Primary = 72.44 cfs @ 12.14 hrs, Volume= 6.704 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 73.40' @ 12.14 hrs Surf.Area= 8,790 sf Storage= 17,539 cf (15,157 cf above start)

Plug-Flow detention time= 42.0 min calculated for 6.648 af (99% of inflow)

Center-of-Mass det. time= 31.9 min (798.6 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

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Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#3	Primary	71.00'	30.0" Round UG1-OUTLET C L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=72.36 cfs @ 12.14 hrs HW=73.39' TW=72.18' (Dynamic Tailwater)

1=UG1-OUTLET A (Barrel Controls 24.27 cfs @ 6.43 fps)
 2=UG1-OUTLET B (Barrel Controls 24.13 cfs @ 6.39 fps)
 3=UG1-OUTLET C (Barrel Controls 23.96 cfs @ 6.35 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 6.75" for 100-yr event
 Inflow = 148.08 cfs @ 12.13 hrs, Volume= 13.381 af
 Outflow = 13.53 cfs @ 13.16 hrs, Volume= 12.843 af, Atten= 91%, Lag= 61.8 min
 Primary = 13.53 cfs @ 13.16 hrs, Volume= 12.843 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3
 Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf
 Peak Elev= 73.31' @ 13.16 hrs Surf.Area= 102,843 sf Storage= 702,630 cf (338,223 cf above start)

Plug-Flow detention time= 1,482.2 min calculated for 4.476 af (33% of inflow)
 Center-of-Mass det. time= 567.6 min (1,355.6 - 788.0)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

Device	Routing	Invert	Outlet Devices
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=13.53 cfs @ 13.16 hrs HW=73.31' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 13.53 cfs of 34.59 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 2.17 cfs @ 9.46 fps)
 3=Orifice/Grate (Orifice Controls 7.68 cfs @ 6.70 fps)
 4=Orifice/Grate (Orifice Controls 3.68 cfs @ 4.38 fps)

Summary for Link 2L: DP2

Inflow Area = 2.779 ac, 27.31% Impervious, Inflow Depth = 5.34" for 100-yr event
 Inflow = 8.19 cfs @ 12.10 hrs, Volume= 1.237 af
 Primary = 8.19 cfs @ 12.10 hrs, Volume= 1.237 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link DP1: DP1

Inflow Area = 27.383 ac, 65.04% Impervious, Inflow Depth > 6.13" for 100-yr event
 Inflow = 21.33 cfs @ 12.52 hrs, Volume= 13.982 af
 Primary = 21.33 cfs @ 12.52 hrs, Volume= 13.982 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

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Summary for Pond PP1: UG Chambers (CULTEC R-360)

Inflow Area = 11.539 ac, 82.33% Impervious, Inflow Depth = 6.97" for 100-yr event
 Inflow = 76.32 cfs @ 12.11 hrs, Volume= 6.704 af
 Outflow = 72.44 cfs @ 12.14 hrs, Volume= 6.704 af, Atten= 5%, Lag= 2.1 min
 Primary = 72.44 cfs @ 12.14 hrs, Volume= 6.704 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 71.00' Surf.Area= 8,790 sf Storage= 2,382 cf

Peak Elev= 73.40' @ 12.14 hrs Surf.Area= 8,790 sf Storage= 17,539 cf (15,157 cf above start)

Plug-Flow detention time= 42.0 min calculated for 6.648 af (99% of inflow)

Center-of-Mass det. time= 31.9 min (798.6 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	70.41'	4,508 cf	7.00'W x 624.17'L x 4.00'H Field A 17,477 cf Overall - 6,206 cf Embedded = 11,271 cf x 40.0% Voids
#2A	70.91'	6,206 cf	Cultec R-360HD x 169 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#3B	70.41'	4,561 cf	7.00'W x 631.50'L x 4.00'H Field B 17,682 cf Overall - 6,279 cf Embedded = 11,403 cf x 40.0% Voids
#4B	70.91'	6,279 cf	Cultec R-360HD x 171 Inside #3 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap Cap Storage= +6.5 cf x 2 x 1 rows = 12.9 cf
#5	74.41'	72 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#6	75.90'	1,752 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		23,378 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.41	48	0	0
75.90	48	72	72

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75.90	5	0	0
77.00	3,180	1,752	1,752

Device	Routing	Invert	Outlet Devices
#1	Primary	71.00'	30.0" Round UG1-OUTLET A L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0147 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Primary	71.00'	30.0" Round UG1-OUTLET B

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#3 Primary 71.00' L= 37.0' CPP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0135 '/' Cc= 0.900
 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
30.0" Round UG1-OUTLET C
 L= 41.0' CPP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 71.00' / 70.50' S= 0.0122 '/' Cc= 0.900
 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=72.36 cfs @ 12.14 hrs HW=73.39' TW=72.18' (Dynamic Tailwater)

1=UG1-OUTLET A (Barrel Controls 24.27 cfs @ 6.43 fps)

2=UG1-OUTLET B (Barrel Controls 24.13 cfs @ 6.39 fps)

3=UG1-OUTLET C (Barrel Controls 23.96 cfs @ 6.35 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.798 ac, 73.91% Impervious, Inflow Depth = 6.75" for 100-yr event
 Inflow = 148.08 cfs @ 12.13 hrs, Volume= 13.381 af
 Outflow = 13.53 cfs @ 13.16 hrs, Volume= 12.843 af, Atten= 91%, Lag= 61.8 min
 Primary = 13.53 cfs @ 13.16 hrs, Volume= 12.843 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 3

Starting Elev= 69.40' Surf.Area= 70,371 sf Storage= 364,407 cf

Peak Elev= 73.31' @ 13.16 hrs Surf.Area= 102,843 sf Storage= 702,630 cf (338,223 cf above start)

Plug-Flow detention time= 1,482.2 min calculated for 4.476 af (33% of inflow)

Center-of-Mass det. time= 567.6 min (1,355.6 - 788.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	61.00'	1,010,167 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	23,792	0	0	23,792
62.00	27,841	25,790	25,790	27,881
63.00	31,986	29,890	55,680	32,071
64.00	36,230	34,086	89,766	36,365
65.00	40,581	38,385	128,150	40,771
66.00	45,053	42,798	170,948	45,303
67.00	50,959	47,976	218,924	51,260
68.00	59,020	54,940	273,864	59,363
69.00	67,150	63,041	336,905	67,542
70.00	75,343	71,207	408,112	75,789
71.00	83,598	79,435	487,547	84,104
72.00	91,912	87,722	575,269	92,485
73.00	100,282	96,067	671,336	100,926
74.00	108,710	104,468	775,804	109,432
75.00	117,193	112,925	888,729	117,998
76.00	125,734	121,438	1,010,167	126,628

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Device	Routing	Invert	Outlet Devices
#1	Primary	69.32'	30.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.32' / 69.25' S= 0.0011 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf
#2	Device 1	69.32'	11.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#3	Device 1	71.16'	33.0" W x 5.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	72.00'	11.0" W x 11.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=13.53 cfs @ 13.16 hrs HW=73.31' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 13.53 cfs of 34.59 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.17 cfs @ 9.46 fps)
- 3=Orifice/Grate (Orifice Controls 7.68 cfs @ 6.70 fps)
- 4=Orifice/Grate (Orifice Controls 3.68 cfs @ 4.38 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



June 29, 2021

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
13	Walpole sandy loam, 0 to 3 percent slopes	20.6	42.8%
15	Scarboro muck, 0 to 3 percent slopes	2.1	4.4%
36B	Windsor loamy sand, 3 to 8 percent slopes	1.9	4.0%
306	Udorthents-Urban land complex	3.2	6.6%
308	Udorthents, smoothed	1.5	3.1%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	18.8	39.1%
Totals for Area of Interest		48.2	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

13—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkl

Elevation: 0 to 1,020 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 250 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Walpole and similar soils: 80 percent

Minor components: 20 percent

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

Description of Walpole

Setting

Landform: Outwash terraces, outwash plains, depressions, deltas, depressions

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread, dip, talf

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 1 inches: mucky peat

A - 1 to 7 inches: sandy loam

Bg - 7 to 21 inches: sandy loam

BC - 21 to 25 inches: gravelly sandy loam

C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very high

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 0 to 4 inches

Frequency of flooding: None

Frequency of ponding: None

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

Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: B/D

Ecological site: F144AY028MA - Wet Outwash

Hydric soil rating: Yes

Minor Components

Sudbury

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

Scarboro

Percent of map unit: 10 percent
Landform: Outwash terraces, deltas, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

15—Scarboro muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkt
Elevation: 0 to 1,350 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: Not prime farmland

Map Unit Composition

Scarboro and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro

Setting

Landform: Outwash deltas, depressions, drainageways, outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Parent material: Sandy glaciofluvial deposits derived from schist and/or gneiss and/or granite

Typical profile

Oa - 0 to 8 inches: muck
A - 8 to 14 inches: mucky fine sandy loam
Cg1 - 14 to 22 inches: sand

Custom Soil Resource Report

Cg2 - 22 to 65 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

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

Depth to water table: About 0 to 2 inches

Frequency of flooding: None

Frequency of ponding: Frequent

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

Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: F144AY031MA - Very Wet Outwash

Hydric soil rating: Yes

Minor Components

Timakwa

Percent of map unit: 10 percent

Landform: Swamps

Landform position (two-dimensional): Toeslope

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

Down-slope shape: Linear, concave

Across-slope shape: Linear, concave

Hydric soil rating: Yes

Walpole

Percent of map unit: 8 percent

Landform: Deltas, outwash terraces, depressions, outwash plains, depressions

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread, tal, dip

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Deerfield

Percent of map unit: 2 percent

Landform: Outwash plains, terraces

Landform position (three-dimensional): Tread, dip

Down-slope shape: Linear

Across-slope shape: Concave

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

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

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

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

308—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9lmj

Elevation: 0 to 2,000 feet

Custom Soil Resource Report

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: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear

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 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 to 54 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): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 7 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 7 percent
Hydric soil rating: No

Urban land

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

701A—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07d

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

Landform position (two-dimensional): Footslope, toeslope

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

Down-slope shape: Linear, convex

Across-slope shape: Concave, convex

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: 0 to 3 percent

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

Drainage class: Moderately well drained

Runoff class: Very 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

Custom Soil Resource Report

Ecological site: F144AY026CT - Moist Silty Outwash

Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent

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

Landform position (two-dimensional): Shoulder, summit

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

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Agawam

Percent of map unit: 5 percent

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

Landform position (two-dimensional): Shoulder, summit

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

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent

Landform: Outwash terraces, outwash plains, deltas, valley trains

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

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
13	Walpole sandy loam, 0 to 3 percent slopes	B/D	20.6	42.8%
15	Scarboro muck, 0 to 3 percent slopes	A/D	2.1	4.4%
36B	Windsor loamy sand, 3 to 8 percent slopes	A	1.9	4.0%
306	Udorthents-Urban land complex	B	3.2	6.6%
308	Udorthents, smoothed	C	1.5	3.1%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	C	18.8	39.1%
Totals for Area of Interest			48.2	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

Subbasin Summary

Subbasin ID	Area	Weighted Runoff Coefficient	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
	(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
Sub-CB-1	0.40	0.7800	0.68	0.53	0.21	2.11	0 00:06:00
Sub-CB-10	0.46	0.9000	0.68	0.61	0.28	2.81	0 00:06:00
Sub-CB-11	0.20	0.9000	0.68	0.61	0.12	1.23	0 00:06:00
Sub-CB-12	0.51	0.8900	0.68	0.60	0.30	3.05	0 00:06:00
Sub-CB-13	0.54	0.7900	0.68	0.53	0.29	2.87	0 00:06:00
Sub-CB-14	0.26	0.8100	0.68	0.55	0.14	1.40	0 00:06:00
Sub-CB-2	0.50	0.8000	0.68	0.54	0.27	2.70	0 00:06:00
Sub-CB-20	0.25	0.5000	0.68	0.34	0.09	0.86	0 00:06:00
Sub-CB-21 (double type ii)	0.30	0.5200	0.73	0.38	0.11	0.97	0 00:07:00
Sub-CB-22 (double type ii)	0.34	0.5400	0.73	0.39	0.13	1.13	0 00:07:00
Sub-CB-23	0.57	0.6200	0.77	0.48	0.27	2.05	0 00:08:00
Sub-CB-3	0.26	0.5800	0.77	0.45	0.12	0.87	0 00:08:00
Sub-CB-4	0.16	0.4700	0.73	0.34	0.06	0.48	0 00:07:00
Sub-CB-5 (double type ii)	0.46	0.4300	0.77	0.33	0.15	1.14	0 00:08:00
Sub-CB-6 (double type ii)	0.44	0.4300	0.77	0.33	0.15	1.09	0 00:08:00
Sub-CB-7	0.37	0.6400	0.77	0.49	0.18	1.37	0 00:08:00
Sub-CB-8	0.29	0.7200	0.73	0.52	0.15	1.28	0 00:07:00
Sub-CB-9	0.57	0.9000	0.68	0.61	0.34	3.44	0 00:06:00
Sub-RA1	0.36	0.9000	0.68	0.61	0.22	2.16	0 00:06:00
Sub-RA2	0.73	0.9000	0.68	0.61	0.44	4.41	0 00:06:00
Sub-RA3	0.74	0.9000	0.68	0.61	0.45	4.53	0 00:06:00
Sub-RA4	0.72	0.9000	0.68	0.61	0.43	4.35	0 00:06:00
Sub-RA5	0.69	0.9000	0.68	0.61	0.42	4.18	0 00:06:00
Sub-RA6	0.48	0.9000	0.68	0.61	0.29	2.89	0 00:06:00
Sub-RA7	0.42	0.9000	0.68	0.61	0.26	2.56	0 00:06:00
Sub-RB1	0.36	0.9000	0.68	0.61	0.22	2.16	0 00:06:00
Sub-RB2	0.73	0.9000	0.68	0.61	0.44	4.41	0 00:06:00
Sub-RB3	0.75	0.9000	0.68	0.61	0.45	4.53	0 00:06:00
Sub-RB4	0.72	0.9000	0.68	0.61	0.43	4.35	0 00:06:00
Sub-RB5	0.69	0.9000	0.68	0.61	0.42	4.18	0 00:06:00
Sub-RB6	0.47	0.9000	0.68	0.61	0.29	2.89	0 00:06:00
Sub-RB7	0.42	0.9000	0.68	0.61	0.26	2.57	0 00:06:00
Sub-YD-1 (12 NYLOPLAST)	0.11	0.2500	0.77	0.19	0.02	0.16	0 00:08:00
Sub-YD-2 (24 NYLOPLAST)	0.19	0.2500	0.77	0.19	0.04	0.27	0 00:08:00
Sub-YD-3 (12 NYLOPLAST)	0.06	0.2500	0.77	0.19	0.01	0.09	0 00:08:00
Sub-YD-4 (12 NYLOPLAST)	0.06	0.2500	0.77	0.19	0.01	0.08	0 00:08:00
Sub-YD-6 (24 NYLOPLAST)	0.41	0.2500	0.86	0.21	0.09	0.53	0 00:10:00
Sub-YD-7 (24 NYLOPLAST)	0.45	0.2500	0.86	0.21	0.10	0.58	0 00:10:00

Link Summary

From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow Velocity	Peak Flow Depth
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)	(ft/sec)	(ft)
CB-11	CB-10	124.00	73.30	72.68	0.5000	10.000	0.0120	1.08	1.68	2.50	0.74
CB-8	CB-10	146.00	72.90	72.28	0.4200	15.000	0.0120	1.71	4.94	2.15	1.05
UG1-OUTLET C	FE-6	41.00	71.00	70.50	1.2200	30.000	0.0120	22.03	49.07	6.93	1.92
RA6	TEE-3	16.00	75.60	71.42	26.1200	12.000	0.0120	2.88	19.73	5.22	0.66
RB4	FE-12	159.00	78.40	74.00	2.7700	12.000	0.0120	4.30	6.71	8.56	0.61
RB6	FE-3	160.00	78.40	74.00	2.7500	12.000	0.0120	2.85	6.69	7.82	0.47
RB3	CLEANOUT	141.00	78.40	76.71	1.2000	12.000	0.0120	4.07	4.13	5.21	0.99
RB5	FE-2	159.00	78.40	74.00	2.7700	12.000	0.0120	4.14	6.71	8.50	0.60
RB2	CB-3	118.00	78.60	77.20	1.1900	12.000	0.0120	3.91	4.20	5.63	0.88
RB1	CB-3	95.00	78.60	77.20	1.4700	12.000	0.0120	2.11	4.69	5.41	0.50
YD-7 (24 NYLOPLAST)	CB-14	36.00	72.70	72.51	0.5300	10.000	0.0120	0.62	1.72	2.61	0.82
RA1	DMH-1	22.00	75.60	75.35	1.1400	12.000	0.0120	2.14	4.11	4.46	0.59
RA7	DMH-4	14.00	75.60	75.35	1.7900	12.000	0.0120	2.55	5.16	5.16	0.60
RB7	FE-4	160.00	78.40	74.00	2.7500	12.000	0.0120	2.54	6.69	7.61	0.44
CLEANOUT	DMH-6 (15 NYLOPLAST)	141.00	76.71	76.01	0.5000	15.000	0.0120	4.01	5.01	4.29	0.93
DMH-6 (15 NYLOPLAST)	DMH-8 (15 NYLOPLAST)	362.00	76.01	74.22	0.4900	15.000	0.0120	4.00	4.98	4.13	0.94
DMH-8 (15 NYLOPLAST)	FE-11	43.00	74.22	74.00	0.5100	15.000	0.0120	3.88	5.08	4.04	0.91
CB-4	CB-3	103.00	74.56	74.04	0.5000	15.000	0.0120	2.01	4.99	2.34	1.13
CB-1	FE-1	63.00	72.41	72.10	0.4900	30.000	0.0120	13.13	31.33	5.24	1.27
YD-6 (24 NYLOPLAST)	CB-8	136.00	73.70	73.01	0.5100	8.000	0.0120	0.52	0.93	2.53	0.50
TEE-2	DMH-3	130.00	72.75	72.09	0.5100	24.000	0.0120	13.13	17.46	4.28	1.92
RA4	TEE-2	17.00	75.60	72.75	16.7600	12.000	0.0120	4.32	15.80	9.33	0.77
UG1-OUTLET A	FE-10	34.00	71.00	70.50	1.4700	30.000	0.0120	22.19	53.89	6.97	1.92
CB-13	CB-12	122.00	71.89	71.28	0.5000	18.000	0.0120	4.11	5.09	2.34	1.46
CB-5 (double type ii)	CB-4	131.00	75.24	74.56	0.5200	10.000	0.0120	1.32	1.71	3.00	0.77
CB-23	CB-2	56.00	73.00	72.70	0.5400	30.000	0.0120	9.64	32.52	3.36	1.43
CB-2	CB-1	56.00	72.70	72.41	0.5200	30.000	0.0120	11.55	31.80	3.96	1.44
CB-3	CB-23	204.00	74.04	73.00	0.5100	18.000	0.0120	7.65	8.13	4.41	1.43
CB-10	CB-9	121.00	72.28	71.68	0.5000	18.000	0.0120	4.69	8.03	2.66	1.48
CB-6 (double type ii)	CB-7	124.00	74.00	73.36	0.5200	10.000	0.0120	1.45	1.71	3.04	0.68
CB-7	CB-9	110.00	73.30	72.75	0.5000	15.000	0.0120	2.77	4.95	3.84	0.72
CB-9	CB-12	117.00	71.68	71.10	0.5000	30.000	0.0120	9.74	19.87	3.29	1.60
CB-12	Out-1Pipe - (36)	6.00	71.10	71.06	0.6700	30.000	0.0120	16.11	138.15	5.05	1.55
CB-14	CB-13	124.00	72.51	71.89	0.5000	15.000	0.0120	1.68	4.95	1.84	1.11
UG1-OUTLET B	FE-7	37.00	71.00	70.50	1.3500	30.000	0.0120	22.02	51.65	6.95	1.94
YD-1 (12 NYLOPLAST)	CB-5 (double type ii)	123.00	77.06	76.44	0.5000	8.000	0.0120	0.15	0.93	1.93	0.18
YD-3 (12 NYLOPLAST)	YD-2 (24 NYLOPLAST)	98.00	75.12	74.62	0.5100	8.000	0.0120	0.16	0.94	1.62	0.22
YD-4 (12 NYLOPLAST)	YD-3 (12 NYLOPLAST)	83.00	75.55	75.12	0.5200	8.000	0.0120	0.08	0.94	1.23	0.16
YD-5 (12 NYLOPLAST)	CB-8	48.00	75.55	73.80	3.6500	8.000	0.0120	0.00	2.50	0.00	0.03
YD-2 (24 NYLOPLAST)	CB-6 (double type ii)	57.00	74.62	74.00	1.0900	8.000	0.0120	0.41	1.37	1.64	0.46
FE-8	OCS-1 (60 INSIDE %%C)	65.00	69.38	69.32	0.0900	30.000	0.0120	8.93	19.87	5.40	1.18
OCS-1 (60 INSIDE %%C)	FE-9	75.00	69.32	69.25	0.0900	30.000	0.0120	5.97	19.87	3.45	0.96
CB-21 (double type ii)	CB-22 (double type ii)	242.64	72.70	71.50	0.4900	12.000	0.0120	0.92	2.71	2.07	0.55
CB-22 (double type ii)	FE-5	20.00	71.50	71.40	0.5000	15.000	0.0120	1.99	4.95	3.22	0.63
CB-20	DMH-5	56.00	73.50	73.21	0.5200	12.000	0.0120	0.83	2.78	2.86	0.40
DMH-1	TEE-1	117.00	74.83	74.23	0.5100	18.000	0.0120	1.95	8.15	2.03	0.90
TEE-1	DMH-2	146.00	74.23	73.49	0.5100	18.000	0.0120	5.88	8.10	3.71	1.31
DMH-2	TEE-2	147.00	73.49	72.75	0.5000	24.000	0.0120	9.66	17.39	3.72	1.67
DMH-3	TEE-3	131.00	72.09	71.42	0.5100	30.000	0.0120	16.81	31.78	3.82	2.11
TEE-3	DMH-4	51.00	71.42	71.16	0.5100	30.000	0.0120	19.29	31.73	4.22	2.20
DMH-4	DMH-7	79.00	71.16	71.00	0.2000	36.000	0.0120	21.51	32.52	4.42	1.95
RA2	TEE-1	16.00	75.60	74.23	8.5600	12.000	0.0120	4.38	11.29	7.34	0.86
RA3	DMH-2	14.00	75.60	75.35	1.7900	12.000	0.0120	4.53	5.16	6.28	0.86
RA5	DMH-3	15.00	75.60	75.35	1.6700	12.000	0.0120	4.18	4.98	5.87	0.85

[illegible]

Junction Input

Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)
CB-1	72.41	77.00
CB-10	72.28	75.40
CB-11	73.30	75.50
CB-12	71.70	75.90
CB-13	71.89	75.60
CB-14	72.51	75.50
CB-2	72.70	77.00
CB-20	73.50	75.80
CB-21 (double type ii)	72.70	75.10
CB-22 (double type ii)	71.50	75.10
CB-23	73.00	77.00
CB-3	74.04	79.90
CB-4	74.56	79.71
CB-5 (double type ii)	75.24	78.38
CB-6 (double type ii)	74.00	77.70
CB-7	73.30	76.00
CB-8	73.01	75.60
CB-9	71.68	75.90
CLEANOUT	76.78	79.16
DMH-1	74.83	77.75
DMH-2	73.49	77.75
DMH-3	72.09	77.75
DMH-4	71.16	77.75
DMH-6 (15 NYLOPLAST)	76.06	78.43
DMH-8 (15 NYLOPLAST)	74.23	77.00
FE-8	69.38	71.88
OCS-1 (60 INSIDE %%C)	69.32	75.90
RA1	75.60	77.70
RA2	75.60	77.70
RA3	75.60	77.70
RA4	75.60	76.76
RA5	75.60	81.10
RA6	75.60	78.10
RA7	75.60	78.10
RB1	75.60	77.75
RB2	75.60	77.70
RB3	77.50	79.60
RB4	78.80	80.90
RB5	78.80	79.90
RB6	78.80	77.96
RB7	78.80	77.96
TEE-1	74.23	76.00
TEE-2	72.75	75.06
TEE-3	71.42	74.34
UG1-OUTLET A	71.00	77.30
UG1-OUTLET B	71.00	77.30
UG1-OUTLET C	71.00	77.30
YD-1 (12 NYLOPLAST)	77.06	79.06
YD-2 (24 NYLOPLAST)	74.62	77.26
YD-3 (12 NYLOPLAST)	75.12	77.26
YD-4 (12 NYLOPLAST)	75.55	77.35
YD-5 (12 NYLOPLAST)	75.55	77.35
YD-6 (24 NYLOPLAST)	73.70	75.50
YD-7 (24 NYLOPLAST)	72.70	74.70

Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Min Freeboard Attained	Time of Max HGL Occurrence
	(cfs)	(cfs)	(ft)	(ft)	(days hh:mm)
CB-1	13.12	2.11	73.83	3.17	0 00:07
CB-10	4.75	2.80	73.75	1.65	0 00:07
CB-11	1.23	1.23	73.94	1.56	0 00:07
CB-12	16.11	3.04	73.15	2.75	0 00:07
CB-13	4.18	2.87	73.37	2.23	0 00:06
CB-14	1.65	1.40	73.47	2.03	0 00:06
CB-2	11.54	2.70	74.18	2.82	0 00:07
CB-20	0.86	0.86	73.92	1.88	0 00:06
CB-21 (double type ii)	0.97	0.97	73.10	2.00	0 00:07
CB-22 (double type ii)	2.02	1.12	72.20	2.90	0 00:07
CB-23	9.60	2.05	74.39	2.61	0 00:07
CB-3	7.82	0.87	75.50	4.40	0 00:07
CB-4	1.67	0.48	75.58	4.13	0 00:07
CB-5 (double type ii)	1.28	1.14	75.95	2.43	0 00:08
CB-6 (double type ii)	1.50	1.09	74.66	3.04	0 00:08
CB-7	2.77	1.37	74.06	1.94	0 00:08
CB-8	1.63	1.28	73.86	1.74	0 00:07
CB-9	9.70	3.44	73.45	2.45	0 00:07
CLEANOUT	4.07	0.00	77.76	1.39	0 00:06
DMH-1	2.14	0.00	75.47	2.28	0 00:06
DMH-2	10.21	0.00	74.95	2.80	0 00:07
DMH-3	16.87	0.00	74.04	3.71	0 00:07
DMH-4	21.46	0.00	73.30	4.45	0 00:06
DMH-6 (15 NYLOPLAST)	4.01	0.00	76.94	1.49	0 00:07
DMH-8 (15 NYLOPLAST)	4.00	0.00	75.26	1.74	0 00:08
FE-8	5.97	5.97	70.72	1.17	0 00:00
OCS-1 (60 INSIDE %%C)	8.93	0.00	70.44	5.46	0 00:01
RA1	2.16	2.16	76.27	1.44	0 00:06
RA2	4.41	4.41	76.32	1.39	0 00:06
RA3	4.52	4.52	76.88	0.82	0 00:06
RA4	4.34	4.34	76.13	0.63	0 00:06
RA5	4.18	4.18	76.76	4.34	0 00:06
RA6	2.89	2.89	75.93	2.18	0 00:06
RA7	2.56	2.56	76.31	1.80	0 00:06
RB1	2.16	2.16	79.13	0.47	0 00:06
RB2	4.41	4.41	79.60	0.00	0 00:06
RB3	4.52	4.52	79.60	0.00	0 00:05
RB4	4.34	4.34	79.44	1.46	0 00:06
RB5	4.18	4.18	79.43	0.48	0 00:06
RB6	2.88	2.88	79.29	0.51	0 00:06
RB7	2.57	2.57	79.26	0.54	0 00:06
TEE-1	6.22	0.00	75.40	0.60	0 00:06
TEE-2	13.79	0.00	74.63	0.43	0 00:07
TEE-3	19.26	0.00	73.69	0.66	0 00:07
UG1-OUTLET A	18.32	14.38	73.42	3.88	0 00:00
UG1-OUTLET B	18.09	14.28	73.42	3.88	0 00:00
UG1-OUTLET C	17.86	14.16	73.42	3.88	0 00:00
YD-1 (12 NYLOPLAST)	0.16	0.16	77.24	1.82	0 00:08
YD-2 (24 NYLOPLAST)	0.42	0.27	74.87	2.39	0 00:08
YD-3 (12 NYLOPLAST)	0.17	0.09	75.31	1.95	0 00:08
YD-4 (12 NYLOPLAST)	0.08	0.08	75.68	1.67	0 00:08
YD-5 (12 NYLOPLAST)	0.00	0.00	75.55	1.80	0 00:00
YD-6 (24 NYLOPLAST)	0.53	0.53	74.05	1.45	0 00:10
YD-7 (24 NYLOPLAST)	0.58	0.58	73.50	1.20	0 00:06

APPENDIX E
Water Quality Calculations

25 Talbot Lane – DPI Project No.:1976.U

October 15, 2021

Water Quality Volume Calculations

Per 2004 Connecticut Stormwater Quality Manual, Section 7.4.1:

Areas for Calculation: On Site to Forebay (P3)

	P4 & P5
Impervious	4.707
Pervious	4.169
Total Area	8.876
% Impervious	53.03%

Water Quality Volume (WQV) = $(3.10'')^1(R)(A)/12$, where:

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

I = percent impervious cover of drainage area = 53.03%

R = $0.05 + 0.009(I)$

R = $0.05 + 0.009(53.03)$

R = 0.527

A = drainage area in acres = 8.876 acres

WQV = $(3.10'')(R)(A \text{ acres})/12$ inches per foot

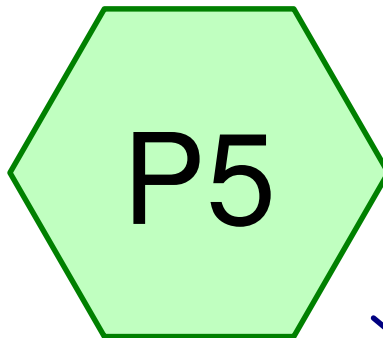
WQV = $(3.10'')(0.527)(8.876 \text{ acres})/12$ inches per foot

WQV = 1.21 acre-feet required = 52,707.6 cft

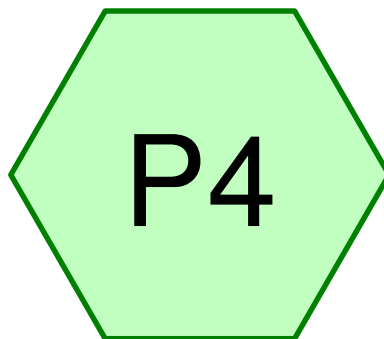
Proposed BMP

The proposed water quality basin and forebay are proposed to provide **7,047 cft** (below basin outlet FE-8 @ Elev. 69.4) and **357,360 cft+** (below spillway at Elev. 69.40) of water quality storage, respectively. The forebay will provide storage for more than 10% of the determined water quality volume draining to the basin. The forebay in combination with the proposed wet pool of the water quality basin will provide a total water quality storage volume of **364,407 cft**; more than 100% of the water quality volume. Water quality basin and forebay stage storage reports are included as a part of this appendix.

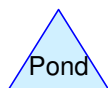
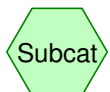
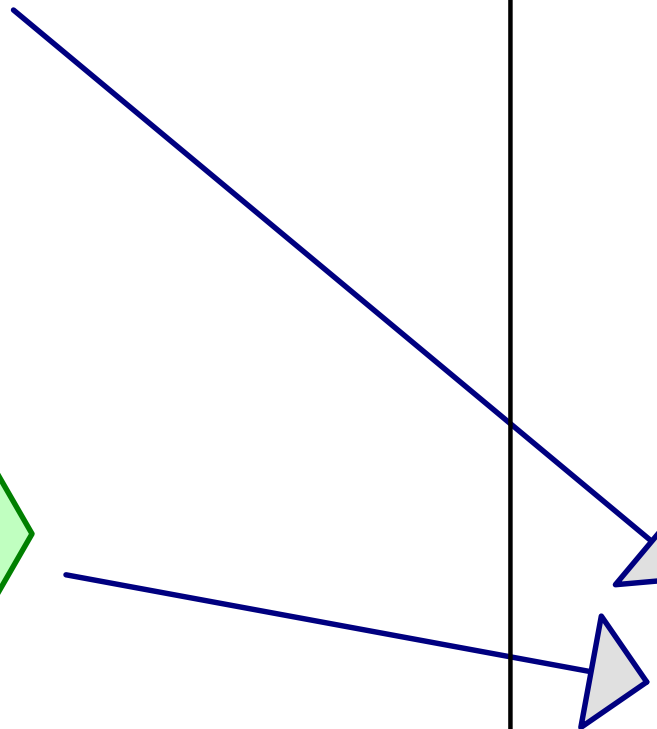
¹ NOAA's Atlas 14 Point Precipitation Frequency Estimates, predicts a 2-year, 24-hr storm onsite will generate 3.10" of rain. WQV was calculated based on the 2-year, 24 Hour storm condition instead of 1" as recommended by the 2004 Water Quality Manual per comments from the Town Engineer.



P5



P4



Routing Diagram for 1976.U Hydrocad

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1976.U Hydrocad

Prepared by Design Professionals, Inc.

Printed 10/15/2021

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Page 2

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.315	2.553	1.301	0.000	0.000	4.169	>75% Grass cover, Good	P4, P5
0.000	0.000	0.000	0.000	4.707	4.707	IMPERVIOUS	P4, P5
0.315	2.553	1.301	0.000	4.707	8.876	TOTAL AREA	

1976.U Hydrocad

Prepared by Design Professionals, Inc.

Type III 24-hr 2-yr Rainfall=3.15"

Printed 10/15/2021

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Stage-Area-Storage for Pond PP2: Water Quality Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
61.00	23,792	0	68.80	65,482	323,642
61.15	24,379	3,613	68.95	66,731	333,558
61.30	24,973	7,314	69.10	67,948	343,660
61.45	25,575	11,105	69.25	69,154	353,943
61.60	26,183	14,987	69.40	70,371	364,407
61.75	26,799	18,960	69.55	71,598	375,054
61.90	27,422	23,027	69.70	72,836	385,887
62.05	28,041	27,187	69.85	74,084	396,905
62.20	28,647	31,439	70.00	75,343	408,112
62.35	29,259	35,781	70.15	76,554	419,505
62.50	29,878	40,217	70.30	77,774	431,079
62.65	30,503	44,745	70.45	79,005	442,837
62.80	31,134	49,368	70.60	80,245	454,781
62.95	31,772	54,086	70.75	81,494	466,911
63.10	32,399	58,899	70.90	82,753	479,230
63.25	33,022	63,805	71.05	84,004	491,737
63.40	33,652	68,806	71.20	85,229	504,430
63.55	34,287	73,901	71.35	86,463	517,306
63.70	34,929	79,092	71.50	87,706	530,369
63.85	35,577	84,380	71.65	88,957	543,619
64.00	36,230	89,766	71.80	90,218	557,057
64.15	36,867	95,248	71.95	91,487	570,684
64.30	37,509	100,826	72.10	92,733	584,501
64.45	38,157	106,501	72.25	93,970	598,504
64.60	38,811	112,273	72.40	95,216	612,693
64.75	39,470	118,144	72.55	96,470	627,069
64.90	40,135	124,115	72.70	97,733	641,635
65.05	40,799	130,185	72.85	99,003	656,390
65.20	41,457	136,354	73.00	100,282	671,336
65.35	42,120	142,622	73.15	101,525	686,471
65.50	42,788	148,990	73.30	102,775	701,794
65.65	43,461	155,459	73.45	104,033	717,304
65.80	44,140	162,029	73.60	105,298	733,004
65.95	44,824	168,701	73.75	106,571	748,894
66.10	45,627	175,482	73.90	107,852	764,976
66.25	46,495	182,391	74.05	109,127	781,249
66.40	47,372	189,431	74.20	110,381	797,712
66.55	48,256	196,603	74.35	111,643	814,364
66.70	49,149	203,908	74.50	112,912	831,206
66.85	50,050	211,348	74.65	114,188	848,238
67.00	50,959	218,924	74.80	115,471	865,462
67.15	52,130	226,655	74.95	116,761	882,880
67.30	53,315	234,563	75.10	118,034	900,490
67.45	54,513	242,650	75.25	119,300	918,290
67.60	55,725	250,918	75.40	120,573	936,280
67.75	56,949	259,368	75.55	121,853	954,462
67.90	58,187	268,004	75.70	123,140	972,837
68.05	59,414	276,825	75.85	124,434	991,404
68.20	60,604	285,826	76.00	125,734	1,010,167
68.35	61,806	295,007			
68.50	63,019	304,368			
68.65	64,245	313,913			

25 Talbot Lane – DPI Project No.:1976.U

August 25, 2021

Water Quality Flow Calculations

Per 2004 Connecticut Stormwater Quality Manual

Per Appendix B page B-3:

Water Quality Flow (WQF) = (qu)(A)(Q), where:

qu = unit peak discharge (cfs/mi²/inch) per Exhibit 4-III

A = drainage area (mi²)

Q = runoff depth (in watershed inches)

= [Water Quality Volume (WQV) (in acre-feet)] x [12 inches/foot] / drainage area (acres)

ISOLATION ROW-4 (CB9 – CB18)

To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:

Time of Concentration (Tc):

6 mins = 0.10 hours

Initial Abstraction (Ia) in inches / Design Precipitation (P) in inches:

Initial abstraction (Ia) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

CN = 88

Ia = 0.273 inches

Design Precipitation (P) = **3.10" (2-yr, 24-Hr) for water quality storms per NOAA Atlas 14¹**

Ia/P = 0.273

Unit Peak Discharge qu = 625 cfs/mi²/inch

Drainage Area A = 242,629.2 sf = 5.57 acres = 0.0087 mi²

Runoff Depth Q = WQV (acre-feet) x 12 / drainage area (acres)

Water Quality Volume (WQV) = (3.10") (R)(A)/12, where:

R = volumetric runoff coefficient

= 0.05 + 0.009(I), where I = percent impervious cover = 68.04%

R = 0.05 + 0.009(I)

R = 0.05 + 0.009(68.04)

R = 0.662

A = drainage area in acres = 5.57 acres

WQV = (3.15")(R)(A)/12

WQV = (1")(0.662)(5.57 acres) / 12 in/ft

WQV = 0.968 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area

Q = (0.968 acre-feet x 12 in/ft) / 5.57 acres

Q = 2.085 in

WQF = qu x A x Q

WQF = 625 cfs/mi²/inch x 0.0087 mi² x 2.085 in

WQF = **11.337 cfs required**

Proposed

The proposed **112** chamber **R-360HD** Cultec Isolator row (@ **0.102 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **11.337 cfs** water quality flow. The current design plan will provide **11.424 cfs** of WQF. See isolator row sizing chart included in the appendix.

¹ NOAA's Atlas 14 Point Precipitation Frequency Estimates, predicts a 2-year, 24-hr storm onsite will generate 3.10" of rain. WQV was calculated based on the 2-year, 24 Hour storm condition instead of 1" as recommended by the 2004 Water Quality Manual per comments from the Town Engineer.

25 Talbot Lane – DPI Project No.:1976.U

August 25, 2021

Water Quality Flow Calculations

Per 2004 Connecticut Stormwater Quality Manual

Per Appendix B page B-3:

Water Quality Flow (WQF) = (qu)(A)(Q), where:

qu = unit peak discharge (cfs/mi²/inch) per Exhibit 4-III

A = drainage area (mi²)

Q = runoff depth (in watershed inches)

= [Water Quality Volume (WQV) (in acre-feet)] x [12 inches/foot] / drainage area (acres)

ISOLATION ROW-3 (CB20)

To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:

Time of Concentration (Tc):

6 mins = 0.10 hours

Initial Abstraction (Ia) in inches / Design Precipitation (P) in inches:

Initial abstraction (Ia) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

CN = 88

Ia = 0.273 inches

Design Precipitation (P) = **3.10" (2-yr, 24-Hr) for water quality storms per NOAA Atlas 14²**

Ia/P = 0.273

Unit Peak Discharge qu = 625 cfs/mi²/inch

Drainage Area A = 25,264.8 sf = 0.58 acres = 0.00084 mi²

Runoff Depth Q = WQV (acre-feet) x 12 / drainage area (acres)

Water Quality Volume (WQV) = (3.10")(R)(A)/12, where:

R = volumetric runoff coefficient

= 0.05 + 0.009(I), where I = percent impervious cover = 60.34%

R = 0.05 + 0.009(I)

R = 0.05 + 0.009(60.34)

R = 0.593

A = drainage area in acres = 0.58 acres

WQV = (3.10")(R)(A)/12

WQV = (3.10")(0.593)(0.58 acres) / 12 in/ft

WQV = 0.089 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area

Q = (0.089 acre-feet x 12 in/ft) / 0.58 acres

Q = 1.841 in

WQF = qu x A x Q

WQF = 625 cfs/mi²/inch x 0.00084 mi² x 1.841 in

WQF = **0.966 cfs required**

Proposed

The proposed **10** chamber **R-360HD** Cultec Isolator row (@ **0.102 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **0.97 cfs** water quality flow. The current design plan will provide **1.02 cfs** of WQF. See isolator row sizing chart included in the appendix.

² NOAA's Atlas 14 Point Precipitation Frequency Estimates, predicts a 2-year, 24-hr storm onsite will generate 3.10" of rain. WQV was calculated based on the 2-year, 24 Hour storm condition instead of 1" as recommended by the 2004 Water Quality Manual per comments from the Town Engineer.

25 Talbot Lane – DPI Project No.:1976.U

August 25, 2021

Water Quality Flow Calculations

Per 2004 Connecticut Stormwater Quality Manual

Per Appendix B page B-3:

Water Quality Flow (WQF) = (qu)(A)(Q), where:

qu = unit peak discharge (cfs/mi²/inch) per Exhibit 4-III

A = drainage area (mi²)

Q = runoff depth (in watershed inches)

= [Water Quality Volume (WQV) (in acre-feet)] x [12 inches/foot] / drainage area (acres)

ISOLATION ROW-2 (CB21)

To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:

Time of Concentration (Tc):

6 mins = 0.10 hours

Initial Abstraction (Ia) in inches / Design Precipitation (P) in inches:

Initial abstraction (Ia) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

CN = 92

Ia = 0.174 inches

Design Precipitation (P) = **3.10" (2-yr, 24-Hr) for water quality storms per NOAA Atlas 14³**

Ia/P = 0.174

Unit Peak Discharge qu = 630 cfs/mi²/inch

Drainage Area A = 18,295.2 sf = 0.42 acres = 0.00066 mi²

Runoff Depth Q = WQV (acre-feet) x 12 / drainage area (acres)

Water Quality Volume (WQV) = (3.10")(R)(A)/12, where:

R = volumetric runoff coefficient

= 0.05 + 0.009(I), where I = percent impervious cover = 76.19%

R = 0.05 + 0.009(I)

R = 0.05 + 0.009(76.19)

R = 0.736

A = drainage area in acres = 0.42 acres

WQV = (3.10")(R)(A)/12

WQV = (3.10")(0.736)(0.42 acres) / 12 in/ft

WQV = 0.080 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area

Q = (0.080 acre-feet x 12 in/ft) / 0.42 acres

Q = 2.286 in

WQF = qu x A x Q

WQF = 630 cfs/mi²/inch x 0.00066 mi² x 2.286 in

WQF = **0.951 cfs required**

Proposed

The proposed **10** chamber **R-360HD** Cultec Isolator row (@ **0.102 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **0.951 cfs** water quality flow. The current design plan will provide **1.02 cfs** of WQF. See isolator row sizing chart included in the appendix.

³ NOAA's Atlas 14 Point Precipitation Frequency Estimates, predicts a 2-year, 24-hr storm onsite will generate 3.10" of rain. WQV was calculated based on the 2-year, 24 Hour storm condition instead of 1" as recommended by the 2004 Water Quality Manual per comments from the Town Engineer.

25 Talbot Lane – DPI Project No.:1976.U

August 25, 2021

Water Quality Flow Calculations

Per 2004 Connecticut Stormwater Quality Manual

Per Appendix B page B-3:

Water Quality Flow (WQF) = (qu)(A)(Q), where:

qu = unit peak discharge (cfs/mi²/inch) per Exhibit 4-III

A = drainage area (mi²)

Q = runoff depth (in watershed inches)

= [Water Quality Volume (WQV) (in acre-feet)] x [12 inches/foot] / drainage area (acres)

ISOLATION ROW-1 (CB22)

To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:

Time of Concentration (Tc):

6 mins = 0.10 hours

Initial Abstraction (Ia) in inches / Design Precipitation (P) in inches:

Initial abstraction (Ia) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

CN = 91

Ia = 0.198 inches

Design Precipitation (P) = **3.10" (2-yr, 24-Hr) for water quality storms per NOAA Atlas 14⁴**

Ia/P = 0.198

Unit Peak Discharge qu = 630 cfs/mi²/inch

Drainage Area A = 19,602 sf = 0.45 acres = 0.0007 mi²

Runoff Depth Q = WQV (acre-feet) x 12 / drainage area (acres)

Water Quality Volume (WQV) = (3.10")(R)(A)/12, where:

R = volumetric runoff coefficient

= 0.05 + 0.009(I), where I = percent impervious cover = 77.78%

R = 0.05 + 0.009(I)

R = 0.05 + 0.009(77.78)

R = 0.750

A = drainage area in acres = 0.45 acres

WQV = (3.10")(R)(A)/12

WQV = (3.10")(0.750)(0.45 acres) / 12 in/ft

WQV = 0.087 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area

Q = (0.087 acre-feet x 12 in/ft) / 0.45 acres

Q = 2.32 in

WQF = qu x A x Q

WQF = 630 cfs/mi²/inch x 0.0007 mi² x 2.32 in

WQF = **1.023 cfs required**

Proposed

The proposed **11** chamber **R-360HD** Cultec Isolator row (@ **0.102 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **1.023 cfs** water quality flow. The current design plan will provide

1.12 cfs of WQF. See isolator row sizing chart included in the appendix.

⁴ NOAA's Atlas 14 Point Precipitation Frequency Estimates, predicts a 2-year, 24-hr storm onsite will generate 3.10" of rain. WQV was calculated based on the 2-year, 24 Hour storm condition instead of 1" as recommended by the 2004 Water Quality Manual per comments from the Town Engineer.

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Proposed Conditions

Type III 24-hr 2-yr Rainfall=3.15"

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Page 1

Summary for Subcatchment 7S: ISO-7 (CB 6-14 & YD 2-7)

Runoff = 9.21 cfs @ 12.12 hrs, Volume= 0.701 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
0.431	39	>75% Grass cover, Good, HSG A
* 1.243	71	>75% Grass cover, Good, HSG B/D
0.288	74	>75% Grass cover, Good, HSG C
* 2.945	98	IMPERVIOUS
4.907	85	Weighted Average
1.962		39.98% Pervious Area
2.945		60.02% Impervious Area

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

Summary for Subcatchment 8S: ISO-6 (CB-15)

Runoff = 1.08 cfs @ 12.08 hrs, Volume= 0.081 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
0.048	74	>75% Grass cover, Good, HSG C
* 0.326	98	IMPERVIOUS
0.374	95	Weighted Average
0.048		12.83% Pervious Area
0.326		87.17% Impervious Area

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

Summary for Subcatchment 9S: ISO-5 (CB-16)

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 0.088 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

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Proposed Conditions

Type III 24-hr 2-yr Rainfall=3.15"

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Area (ac)	CN	Description
0.025	74	>75% Grass cover, Good, HSG C
* 0.364	98	IMPERVIOUS
0.389	96	Weighted Average
0.025		6.43% Pervious Area
0.364		93.57% Impervious Area

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

Summary for Subcatchment 10S: ISO-4 (CB-17)

Runoff = 1.56 cfs @ 12.08 hrs, Volume= 0.124 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.510	98	IMPERVIOUS
0.510		100.00% Impervious Area

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

Summary for Subcatchment 11S: ISO-3 (CB-18)

Runoff = 1.53 cfs @ 12.08 hrs, Volume= 0.121 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.499	98	IMPERVIOUS
0.499		100.00% Impervious Area

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

Summary for Subcatchment 13S: ISO-2 (CB-19)

Runoff = 1.57 cfs @ 12.08 hrs, Volume= 0.125 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

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Type III 24-hr 2-yr Rainfall=3.15"

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Area (ac)	CN	Description
* 0.514	98	IMPERVIOUS
0.514		100.00% Impervious Area

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

Summary for Subcatchment 15S: ISO-1 (CB-20)

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.15"

Area (ac)	CN	Description
* 0.014	60	>75% Grass cover, Good, HSG A/D
0.026	74	>75% Grass cover, Good, HSG C
* 0.214	98	IMPERVIOUS
0.254	93	Weighted Average
0.040		15.75% Pervious Area
0.214		84.25% Impervious Area

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

CULTEC Separator Row Sizing Tables (Imperial)

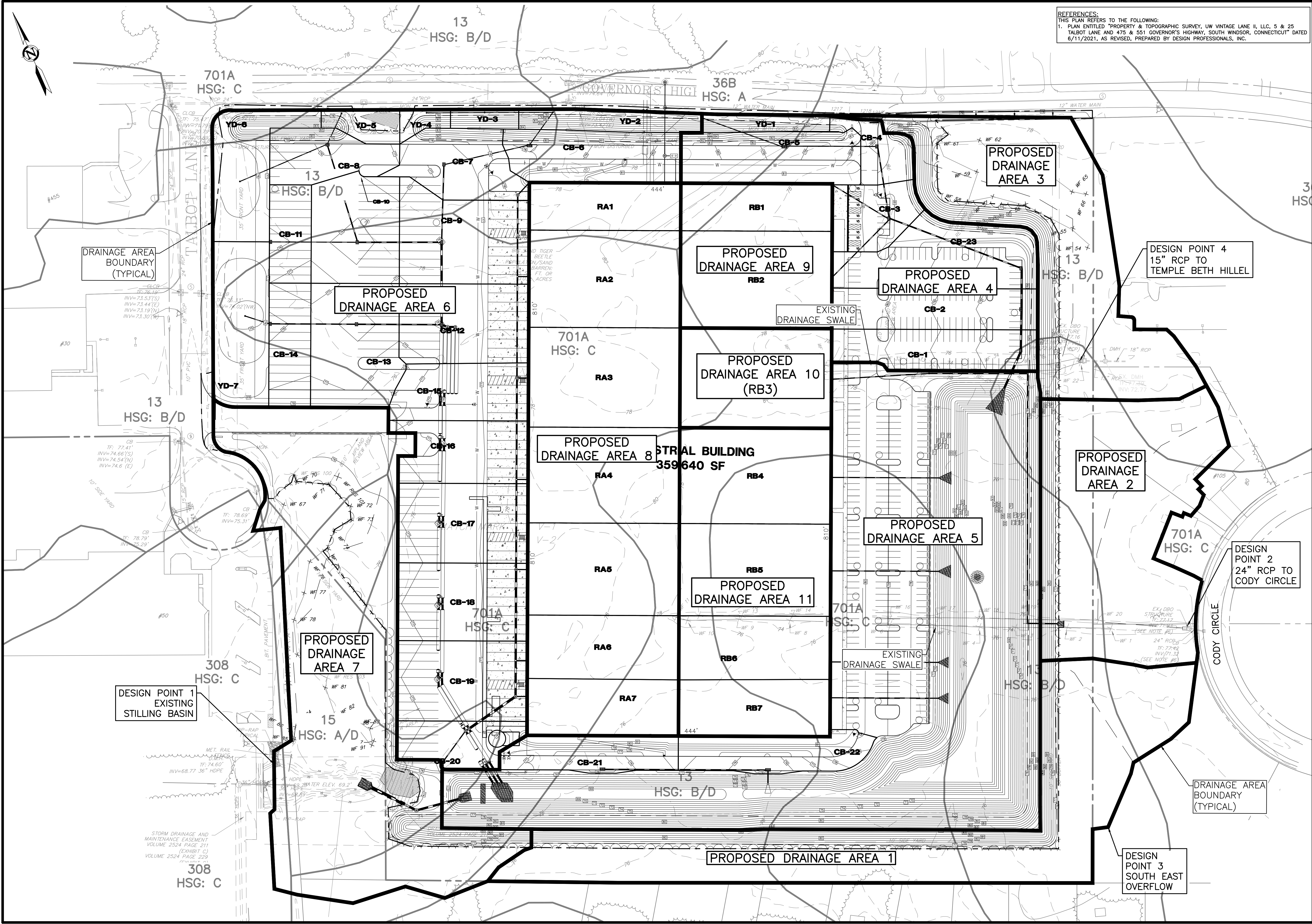
Maine DEP / ADS Equivalent Sizing (OK 110 Particle Distribution)

	80% TSS Flow Rate (Maine DEP)	Chamber Width	Installed Chamber Length	Bottom Area	Treatment Rate / Chamber
CONTACTOR 100HD	2.5 gpm/sf	3.00'	7.5'	22.50 s.f.	0.125 cfs
RECHARGER 150XLHD	2.5 gpm/sf	2.75'	10.25'	28.18 s.f.	0.157 cfs
RECHARGER 180HD	2.5 gpm/sf	3.00'	6.33'	18.99 s.f.	0.106 cfs
RECHARGER 280HD	2.5 gpm/sf	3.91'	7.00'	27.37 s.f.	0.152 cfs
RECHARGER 330XLHD	2.5 gpm/sf	4.33'	7.00'	31.31 s.f.	0.174 cfs
RECHARGER 360HD	2.5 gpm/sf	5.00'	3.67'	18.35 s.f.	0.102 cfs
RECHARGER 902HD	2.5 gpm/sf	6.50'	3.67'	23.86 s.f.	0.133 cfs

ETV (ETV / NJDEP Particle Distribution)

	80% TSS Flow Rate (ETV)	Chamber Width	Installed Chamber Length	Bottom Area	Treatment Rate / Chamber
CONTACTOR 100HD	1.0 gpm/sf	3.00'	7.5'	22.50 s.f.	0.050 cfs
RECHARGER 150XLHD	1.0 gpm/sf	2.75'	10.25'	28.18 s.f.	0.063 cfs
RECHARGER 180HD	1.0 gpm/sf	3.00'	6.33'	18.99 s.f.	0.042 cfs
RECHARGER 280HD	1.0 gpm/sf	3.91'	7.00'	27.37 s.f.	0.061 cfs
RECHARGER 330XLHD	1.0 gpm/sf	4.33'	7.00'	31.31 s.f.	0.070 cfs
RECHARGER 360HD	1.0 gpm/sf	5.00'	3.67'	18.35 s.f.	0.041 cfs
RECHARGER 902HD	1.0 gpm/sf	6.50'	3.67'	23.86 s.f.	0.053 cfs

APPENDIX F
Drainage Area Maps



REFERENCES:
THIS PLAN REFERS TO THE FOLLOWING:
1. PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, UW VINTAGE LANE II, LLC, 5 & 25 TALBOT LANE AND 475 & 551 GOVERNOR'S HIGHWAY, SOUTH WINDSOR, CONNECTICUT" DATED 6/11/2021, AS REVISED, PREPARED BY DESIGN PROFESSIONALS, INC.

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www.designprofessionals.com

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CIVIL & TRAFFIC ENGINEERS / LAND SURVEYORS
PLANNERS / LANDSCAPE ARCHITECTS

PREPARED FOR:
UW Vintage Lane II, LLC
PO Box 504
South Glastonbury, CT 06073
860-268-2452 T

PROJECT NO.:
1976U
DATE:
07/02/21
DESIGN BY:
BPM
CHECKED BY:
DHI

**25 TALBOT LANE
SITE PLAN APPLICATION**

5 & 25 TALBOT ROAD &
475 & 551 GOVERNOR'S HIGHWAY
SOUTH WINDSOR, CONNECTICUT
GIS Nos. 88900005, 88900025, 36900475, 36900551

NO.	DATE	REVISIONS	BY
1	6/25/2021	REVISED PER TOWN COMMENTS	DHI
1	10/15/2021	REVISED PER NEW SITE LAYOUT	DHI

**PROPOSED
DRAINAGE MAP**

SCALE: 0 30' 60' 120'
1" = 60'

SHEET
C-DA2
SHEET 2 OF 2