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August 25, 2021

Jeff Doolittle, P.E.
Town Engineer
1540 Sullivan Ave.
South Windsor, CT 06074

Re: Stormwater Management Report Supplemental
Analysis of Results & Storm Sewer Analysis
App. #21-36P ~ 25 Talbot Lane Site Plan

Dear Mr. Doolittle:

This letter is intended to serve as a supplemental to the **Analysis of Results, Storm Sewer Analysis (Storm Sewer Collection System), and Water Quality** sections of our previously submitted Stormwater Management Report for App. #21-36P entitled *"Stormwater Management Report ~ 25 Talbot Lane ~ 5 & 25 Talbot Lane and 475 & 551 Governor's Highway ~ South Windsor, Connecticut ~ Dated July 2, 2021"*. Results of peak flows and new Storm Sewer Analysis results considering changes to site grading and utilities are discussed. 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" prepared by Design Professionals, Inc., and dated July 2, 2021, as amended to August 25, 2021.*

Analysis of Results

The pre-development and post-development conditions were analyzed using HydroCAD consistent with National Resource Conservation Service (NRCS) hydrology methods. The discharge locations 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	2.36	8.02	12.87	15.93	20.43
DP#2 – 24" RCP To Cody Circle	**Pre**	2.85	8.66	12.87	16.15	19.89
	Post	2.37	4.35	5.67	6.67	7.80
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	0.67	2.02	2.98	3.74	4.60

As seen in the table above, most of the storm events evaluated for the proposed development 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 minor 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. The revised Post-Development Drainage HydroCAD Report is included as **Attachment A**. The Existing Drainage Map and revised Proposed Drainage Map are included as **Attachment D**.

Storm Sewer Collection System

The existing storm pipe to remain and new proposed roof leader were 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. These Storm Sewer Analysis Results computations are included as **Attachment B**.

Water Quality

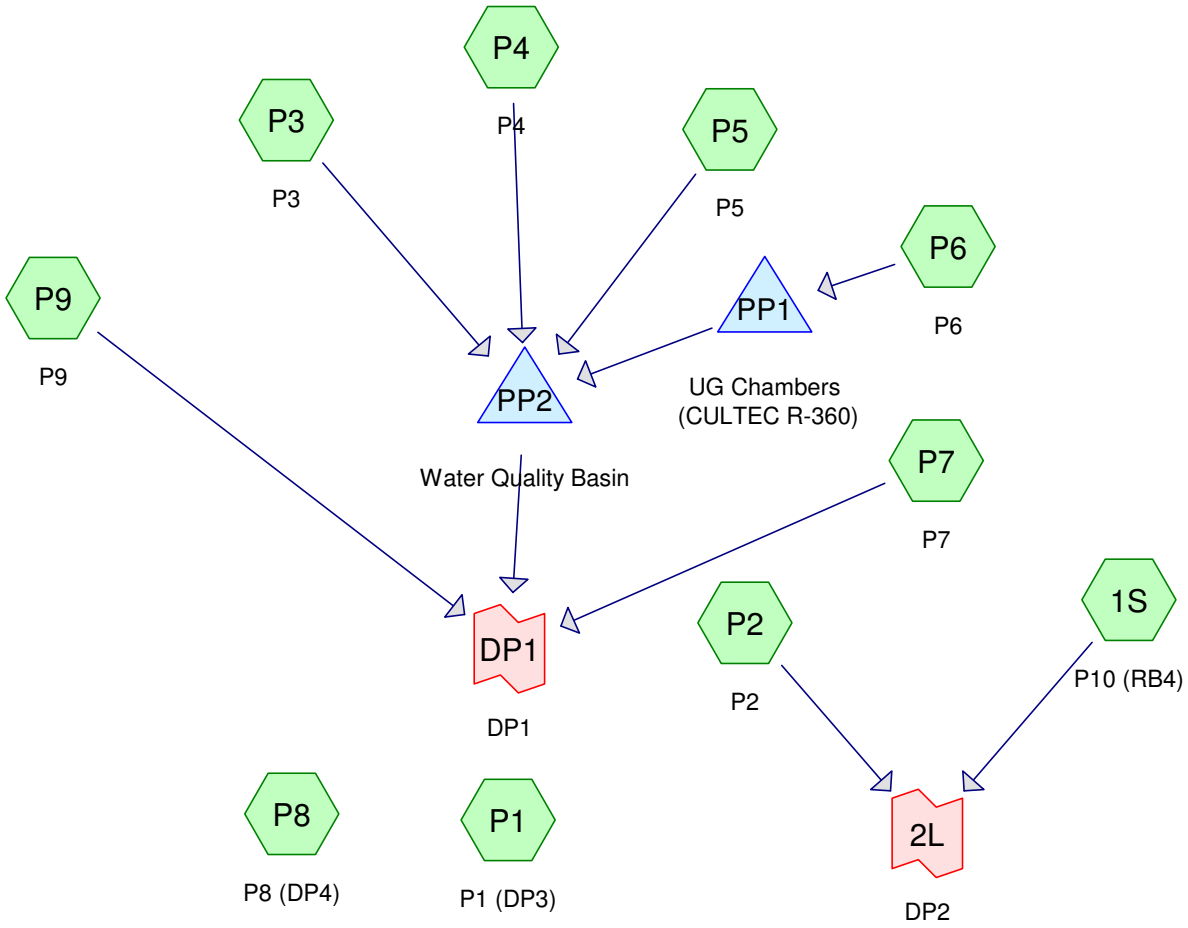
The proposed water quality basin and forebay were sized to treat a 3.10" rain event (per NOAA's Atlas 14 Point Precipitation Frequency Estimate for a 2-year, 24-hr storm) instead of 1" as recommended in the 2004 Connecticut Stormwater Quality Manual, per your recommendation. The proposed forebay was sized to store over 10% of this water quality volume as recommended by the 2004 Connecticut Stormwater Quality Manual. 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.

Please contact us with any questions.

Sincerely,
DESIGN PROFESSIONALS, INC.

Daniel H. Jameson, P.E.
Project Manager

Attachment A
(In Place of July 2, 2021 Report Appendix B)
Post-Development Drainage HydroCAD Report



Subcat Reach Pond Link

Routing Diagram for 1976.U Hydrocad
Prepared by Design Professionals, Inc. , Printed 8/25/2021

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: P10 (RB4) Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=2.14 cfs 0.170 af

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 P2: P2 Runoff Area=2.000 ac 0.50% Impervious Runoff Depth=0.85"
Flow Length=514' Tc=30.9 min CN=71 Runoff=1.00 cfs 0.141 af

Subcatchment P3: P3 Runoff Area=9.760 ac 66.80% Impervious Runoff Depth=1.95"
Tc=10.0 min CN=88 Runoff=19.47 cfs 1.588 af

Subcatchment P4: P4 Runoff Area=3.360 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=10.27 cfs 0.817 af

Subcatchment P5: P5 Runoff Area=3.460 ac 100.00% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=98 Runoff=10.58 cfs 0.841 af

Subcatchment P6: P6 Runoff Area=7.030 ac 68.42% Impervious Runoff Depth=1.95"
Tc=10.0 min CN=88 Runoff=14.03 cfs 1.144 af

Subcatchment P7: P7 Runoff Area=3.120 ac 0.00% Impervious Runoff Depth=0.46"
Flow Length=471' Tc=32.5 min CN=62 Runoff=0.65 cfs 0.120 af

Subcatchment P8: P8 (DP4) Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=0.71"
Flow Length=490' Tc=41.0 min CN=68 Runoff=0.67 cfs 0.115 af

Subcatchment P9: P9 Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=2.92"
Tc=35.0 min CN=98 Runoff=1.17 cfs 0.175 af

Pond PP1: UG Chambers (CULTEC R-360) Peak Elev=71.78' Storage=10,201 cf Inflow=14.03 cfs 1.144 af
Outflow=11.82 cfs 1.020 af

Pond PP2: Water Quality Basin Peak Elev=71.78' Storage=523,806 cf Inflow=47.31 cfs 4.266 af
Outflow=0.68 cfs 2.161 af

Link 2L: DP2 Inflow=2.37 cfs 0.312 af
Primary=2.37 cfs 0.312 af

Link DP1: DP1 Inflow=2.36 cfs 2.456 af
Primary=2.36 cfs 2.456 af

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: P10 (RB4) Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=3.42 cfs 0.277 af

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 P2: P2 Runoff Area=2.000 ac 0.50% Impervious Runoff Depth=2.11"
Flow Length=514' Tc=30.9 min CN=71 Runoff=2.71 cfs 0.351 af

Subcatchment P3: P3 Runoff Area=9.760 ac 66.80% Impervious Runoff Depth=3.66"
Tc=10.0 min CN=88 Runoff=35.82 cfs 2.976 af

Subcatchment P4: P4 Runoff Area=3.360 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=16.40 cfs 1.331 af

Subcatchment P5: P5 Runoff Area=3.460 ac 100.00% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=98 Runoff=16.89 cfs 1.371 af

Subcatchment P6: P6 Runoff Area=7.030 ac 68.42% Impervious Runoff Depth=3.66"
Tc=10.0 min CN=88 Runoff=25.80 cfs 2.144 af

Subcatchment P7: P7 Runoff Area=3.120 ac 0.00% Impervious Runoff Depth=1.43"
Flow Length=471' Tc=32.5 min CN=62 Runoff=2.63 cfs 0.372 af

Subcatchment P8: P8 (DP4) Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=1.87"
Flow Length=490' Tc=41.0 min CN=68 Runoff=2.02 cfs 0.304 af

Subcatchment P9: P9 Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=4.75"
Tc=35.0 min CN=98 Runoff=1.88 cfs 0.285 af

Pond PP1: UG Chambers (CULTEC R-360) Peak Elev=72.53' Storage=13,504 cf Inflow=25.80 cfs 2.144 af
Outflow=21.90 cfs 1.998 af

Pond PP2: Water Quality Basin Peak Elev=72.52' Storage=590,316 cf Inflow=85.26 cfs 7.676 af
Outflow=5.09 cfs 5.211 af

Link 2L: DP2 Inflow=4.35 cfs 0.629 af
Primary=4.35 cfs 0.629 af

Link DP1: DP1 Inflow=8.02 cfs 5.869 af
Primary=8.02 cfs 5.869 af

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: P10 (RB4) Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=5.89"
Tc=6.0 min CN=98 Runoff=4.21 cfs 0.344 af

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 P2: P2 Runoff Area=2.000 ac 0.50% Impervious Runoff Depth=3.00"
Flow Length=514' Tc=30.9 min CN=71 Runoff=3.91 cfs 0.501 af

Subcatchment P3: P3 Runoff Area=9.760 ac 66.80% Impervious Runoff Depth=4.75"
Tc=10.0 min CN=88 Runoff=45.95 cfs 3.864 af

Subcatchment P4: P4 Runoff Area=3.360 ac 100.00% Impervious Runoff Depth=5.89"
Tc=6.0 min CN=98 Runoff=20.19 cfs 1.650 af

Subcatchment P5: P5 Runoff Area=3.460 ac 100.00% Impervious Runoff Depth=5.89"
Tc=6.0 min CN=98 Runoff=20.79 cfs 1.699 af

Subcatchment P6: P6 Runoff Area=7.030 ac 68.42% Impervious Runoff Depth=4.75"
Tc=10.0 min CN=88 Runoff=33.10 cfs 2.783 af

Subcatchment P7: P7 Runoff Area=3.120 ac 0.00% Impervious Runoff Depth=2.18"
Flow Length=471' Tc=32.5 min CN=62 Runoff=4.17 cfs 0.567 af

Subcatchment P8: P8 (DP4) Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=2.72"
Flow Length=490' Tc=41.0 min CN=68 Runoff=2.98 cfs 0.442 af

Subcatchment P9: P9 Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=5.89"
Tc=35.0 min CN=98 Runoff=2.31 cfs 0.354 af

Pond PP1: UG Chambers (CULTEC R-360) Peak Elev=73.10' Storage=15,439 cf Inflow=33.10 cfs 2.783 af
Outflow=28.44 cfs 2.634 af

Pond PP2: Water Quality Basin Peak Elev=73.10' Storage=644,260 cf Inflow=108.96 cfs 9.847 af
Outflow=7.33 cfs 7.320 af

Link 2L: DP2 Inflow=5.67 cfs 0.844 af
Primary=5.67 cfs 0.844 af

Link DP1: DP1 Inflow=12.87 cfs 8.240 af
Primary=12.87 cfs 8.240 af

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: P10 (RB4) Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=6.73"
Tc=6.0 min CN=98 Runoff=4.79 cfs 0.393 af

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 P2: P2 Runoff Area=2.000 ac 0.50% Impervious Runoff Depth=3.70"
Flow Length=514' Tc=30.9 min CN=71 Runoff=4.83 cfs 0.616 af

Subcatchment P3: P3 Runoff Area=9.760 ac 66.80% Impervious Runoff Depth=5.56"
Tc=10.0 min CN=88 Runoff=53.38 cfs 4.526 af

Subcatchment P4: P4 Runoff Area=3.360 ac 100.00% Impervious Runoff Depth=6.73"
Tc=6.0 min CN=98 Runoff=22.98 cfs 1.885 af

Subcatchment P5: P5 Runoff Area=3.460 ac 100.00% Impervious Runoff Depth=6.73"
Tc=6.0 min CN=98 Runoff=23.66 cfs 1.941 af

Subcatchment P6: P6 Runoff Area=7.030 ac 68.42% Impervious Runoff Depth=5.56"
Tc=10.0 min CN=88 Runoff=38.45 cfs 3.260 af

Subcatchment P7: P7 Runoff Area=3.120 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=471' Tc=32.5 min CN=62 Runoff=5.42 cfs 0.723 af

Subcatchment P8: P8 (DP4) Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=3.39"
Flow Length=490' Tc=41.0 min CN=68 Runoff=3.74 cfs 0.550 af

Subcatchment P9: P9 Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=6.73"
Tc=35.0 min CN=98 Runoff=2.63 cfs 0.404 af

Pond PP1: UG Chambers (CULTEC R-360) Peak Elev=73.52' Storage=16,595 cf Inflow=38.45 cfs 3.260 af
Outflow=33.01 cfs 3.108 af

Pond PP2: Water Quality Basin Peak Elev=73.52' Storage=685,780 cf Inflow=126.10 cfs 11.459 af
Outflow=9.26 cfs 8.884 af

Link 2L: DP2 Inflow=6.67 cfs 1.009 af
Primary=6.67 cfs 1.009 af

Link DP1: DP1 Inflow=15.93 cfs 10.010 af
Primary=15.93 cfs 10.010 af

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: P10 (RB4) Runoff Area=0.700 ac 100.00% Impervious Runoff Depth=7.66"
Tc=6.0 min CN=98 Runoff=5.43 cfs 0.447 af

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 P2: P2 Runoff Area=2.000 ac 0.50% Impervious Runoff Depth=4.49"
Flow Length=514' Tc=30.9 min CN=71 Runoff=5.87 cfs 0.749 af

Subcatchment P3: P3 Runoff Area=9.760 ac 66.80% Impervious Runoff Depth=6.47"
Tc=10.0 min CN=88 Runoff=61.57 cfs 5.263 af

Subcatchment P4: P4 Runoff Area=3.360 ac 100.00% Impervious Runoff Depth=7.66"
Tc=6.0 min CN=98 Runoff=26.06 cfs 2.145 af

Subcatchment P5: P5 Runoff Area=3.460 ac 100.00% Impervious Runoff Depth=7.66"
Tc=6.0 min CN=98 Runoff=26.83 cfs 2.209 af

Subcatchment P6: P6 Runoff Area=7.030 ac 68.42% Impervious Runoff Depth=6.47"
Tc=10.0 min CN=88 Runoff=44.35 cfs 3.791 af

Subcatchment P7: P7 Runoff Area=3.120 ac 0.00% Impervious Runoff Depth=3.48"
Flow Length=471' Tc=32.5 min CN=62 Runoff=6.86 cfs 0.905 af

Subcatchment P8: P8 (DP4) Runoff Area=1.950 ac 0.00% Impervious Runoff Depth=4.15"
Flow Length=490' Tc=41.0 min CN=68 Runoff=4.60 cfs 0.675 af

Subcatchment P9: P9 Runoff Area=0.720 ac 100.00% Impervious Runoff Depth=7.66"
Tc=35.0 min CN=98 Runoff=2.98 cfs 0.460 af

Pond PP1: UG Chambers (CULTEC R-360) Peak Elev=73.96' Storage=16,719 cf Inflow=44.35 cfs 3.791 af
Outflow=40.41 cfs 3.636 af

Pond PP2: Water Quality Basin Peak Elev=73.95' Storage=730,018 cf Inflow=145.31 cfs 13.252 af
Outflow=12.17 cfs 10.634 af

Link 2L: DP2 Inflow=7.80 cfs 1.196 af
Primary=7.80 cfs 1.196 af

Link DP1: DP1 Inflow=20.43 cfs 11.998 af
Primary=20.43 cfs 11.998 af

Summary for Subcatchment 1S: P10 (RB4)

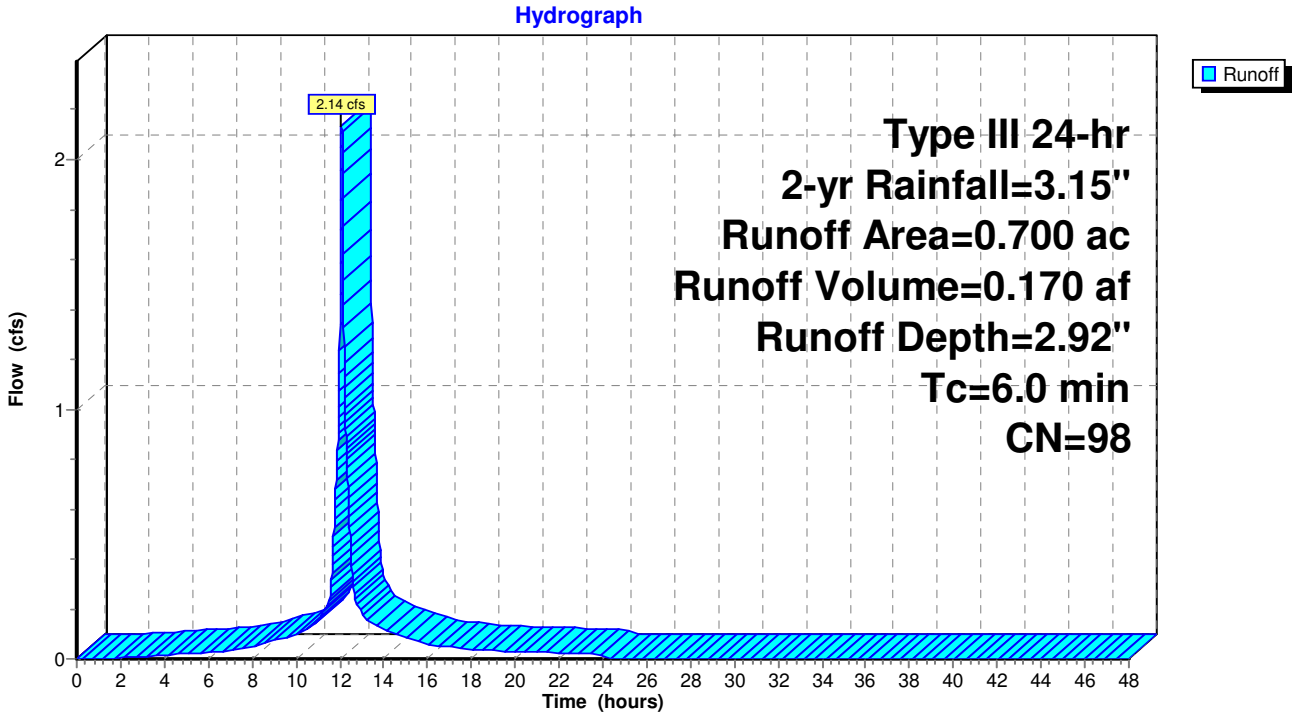
Runoff = 2.14 cfs @ 12.08 hrs, Volume= 0.170 af, Depth= 2.92"

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
*	0.700	98	IMPERVIOUS
	0.700		100.00% Impervious Area

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

Subcatchment 1S: P10 (RB4)



Summary for Subcatchment P1: P1 (DP3)

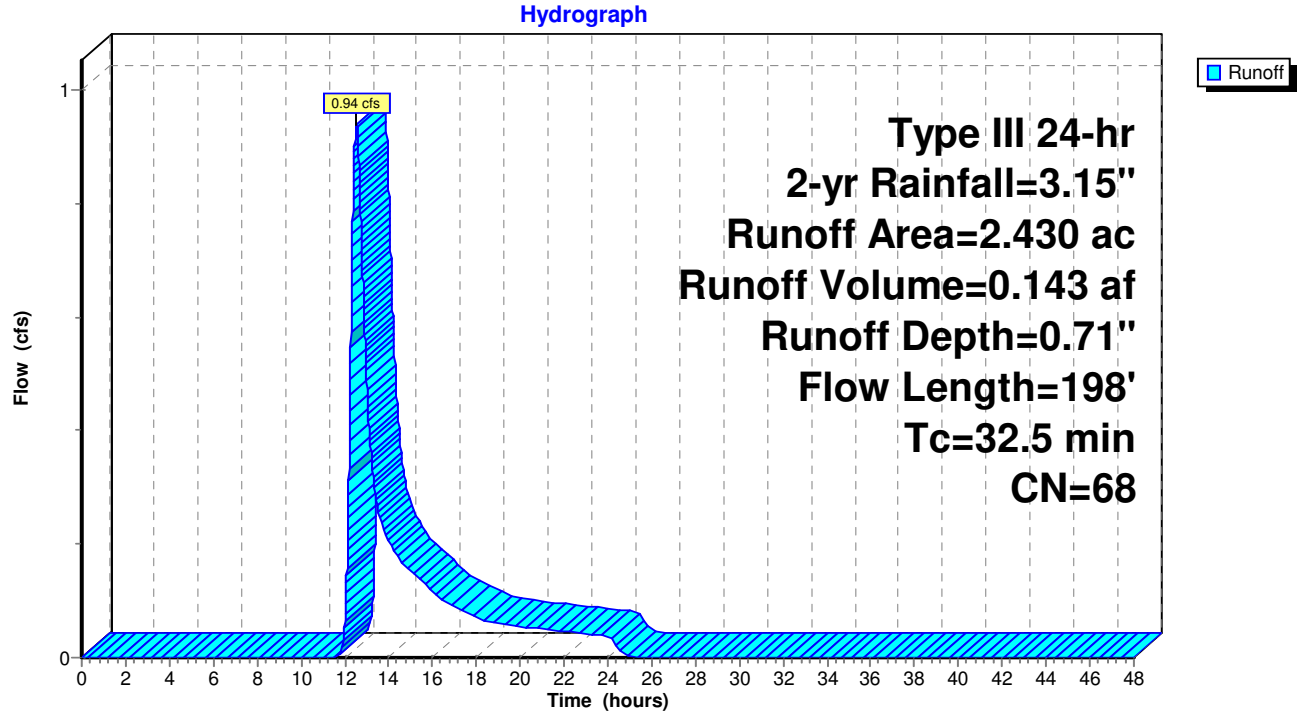
Runoff = 0.94 cfs @ 12.53 hrs, Volume= 0.143 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 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)



Summary for Subcatchment P2: P2

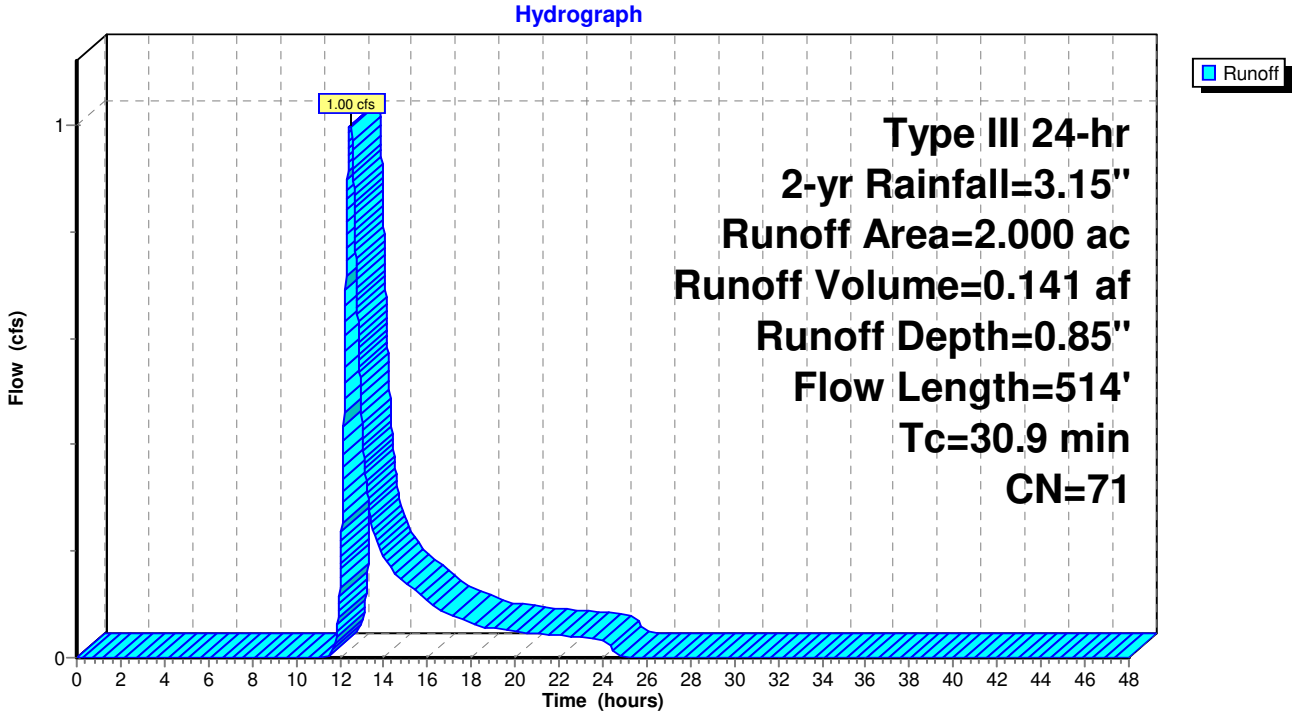
Runoff = 1.00 cfs @ 12.47 hrs, Volume= 0.141 af, Depth= 0.85"

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
*	0.280	71	>75% Grass cover, Good, HSG B/D
	0.520	74	>75% Grass cover, Good, HSG C
*	0.010	98	IMPERVIOUS
*	0.380	66	Woods, Good, HSG B/D
	0.810	70	Woods, Good, HSG C
	2.000	71	Weighted Average
	1.990		99.50% Pervious Area
	0.010		0.50% 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			

Subcatchment P2: P2



Summary for Subcatchment P3: P3

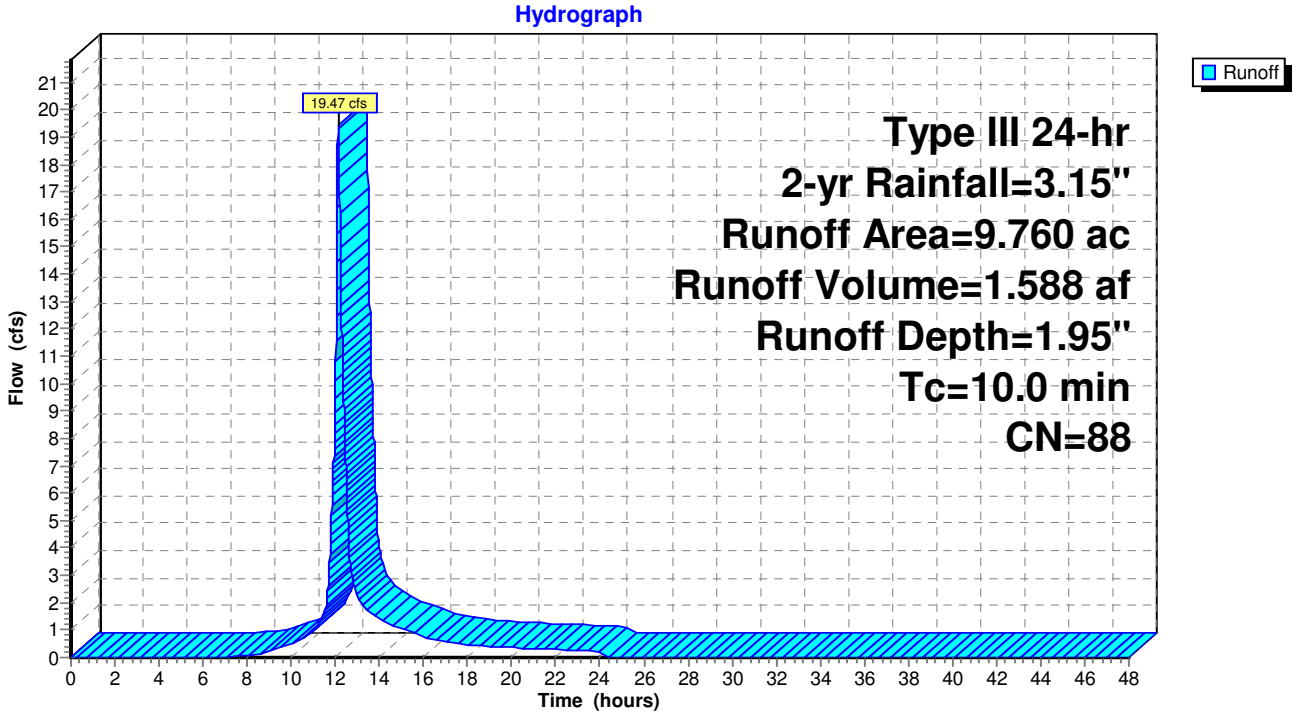
Runoff = 19.47 cfs @ 12.14 hrs, Volume= 1.588 af, Depth= 1.95"

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
	0.290	39	>75% Grass cover, Good, HSG A
*	0.030	60	>75% Grass cover, Good, HSG A/D
*	1.800	71	>75% Grass cover, Good, HSG B/D
	1.120	74	>75% Grass cover, Good, HSG C
*	6.520	98	IMPERVIOUS
	9.760	88	Weighted Average
	3.240		33.20% Pervious Area
	6.520		66.80% Impervious Area

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

Subcatchment P3: P3



Summary for Subcatchment P4: P4

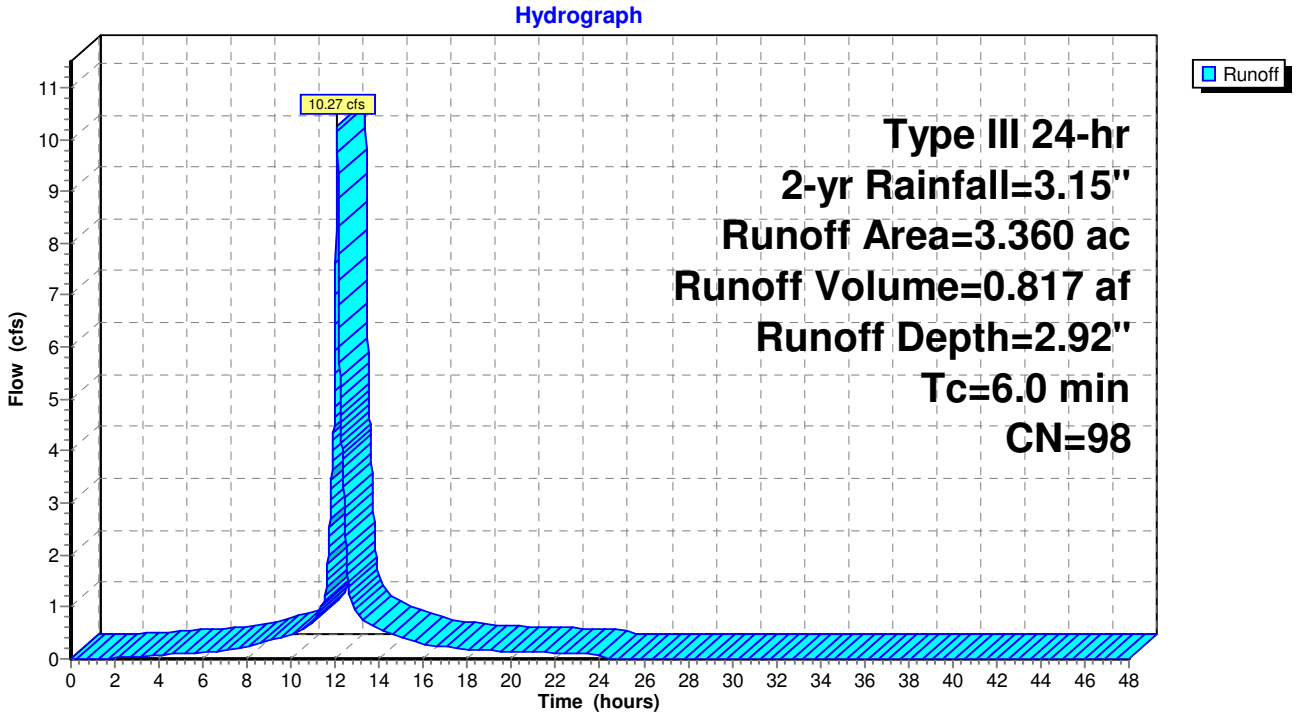
Runoff = 10.27 cfs @ 12.08 hrs, Volume= 0.817 af, Depth= 2.92"

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
*	3.360	98	IMPERVIOUS
	3.360		100.00% Impervious Area

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

Subcatchment P4: P4



Summary for Subcatchment P5: P5

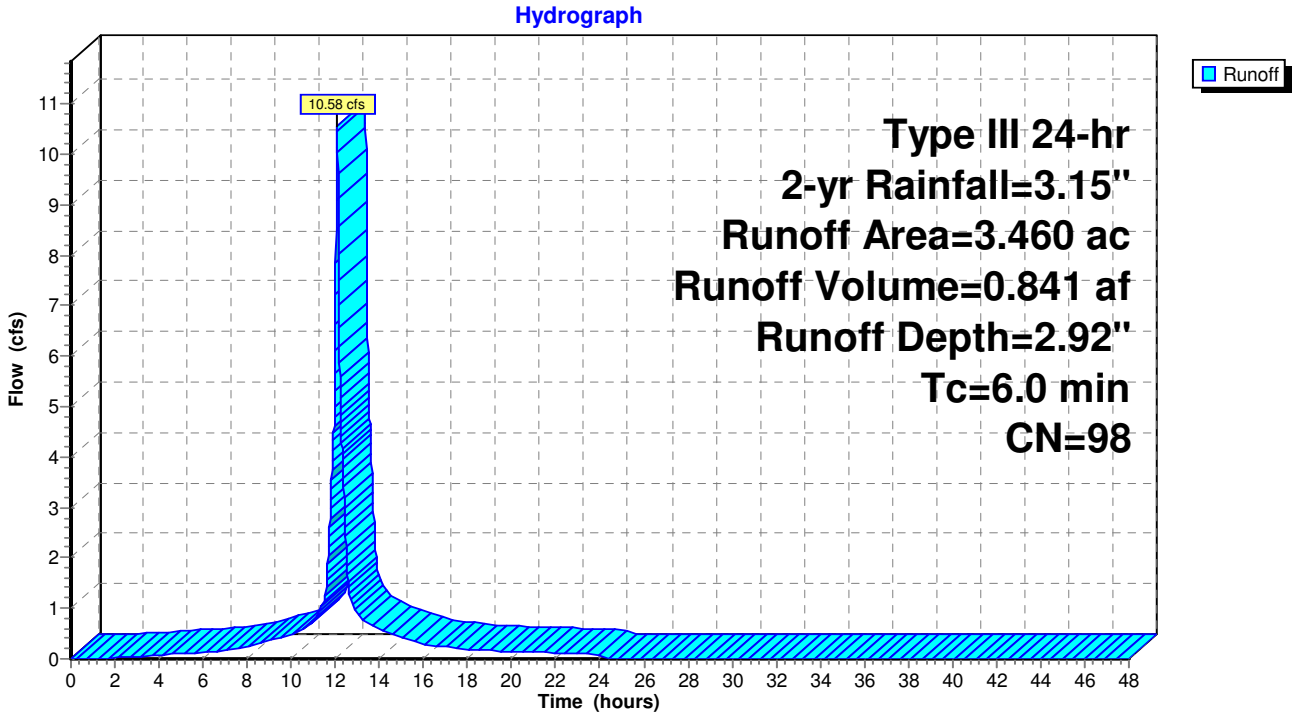
Runoff = 10.58 cfs @ 12.08 hrs, Volume= 0.841 af, Depth= 2.92"

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
*	3.460	98	IMPERVIOUS
	3.460		100.00% Impervious Area

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

Subcatchment P5: P5



Summary for Subcatchment P6: P6

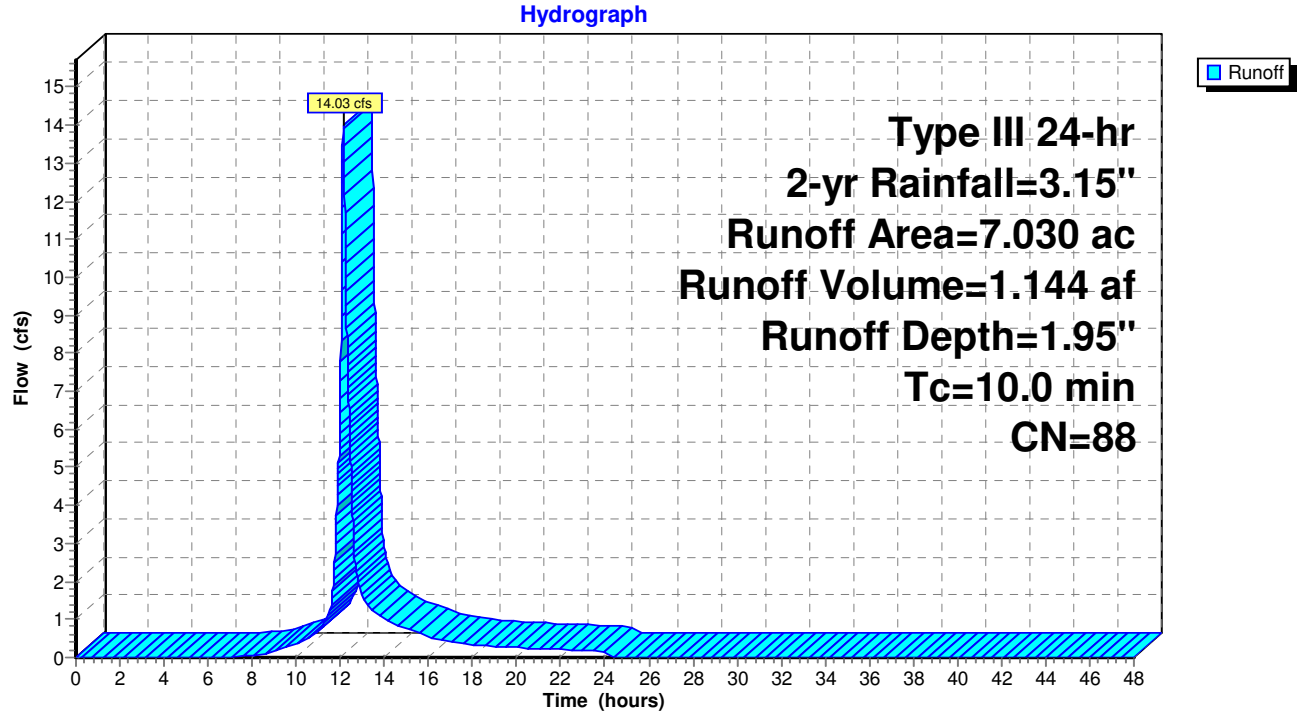
Runoff = 14.03 cfs @ 12.14 hrs, Volume= 1.144 af, Depth= 1.95"

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
	0.320	39	>75% Grass cover, Good, HSG A
*	0.060	60	>75% Grass cover, Good, HSG A/D
*	1.170	71	>75% Grass cover, Good, HSG B/D
	0.670	74	>75% Grass cover, Good, HSG C
*	4.810	98	IMPERVIOUS
	7.030	88	Weighted Average
	2.220		31.58% Pervious Area
	4.810		68.42% Impervious Area

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

Subcatchment P6: P6



Summary for Subcatchment P7: P7

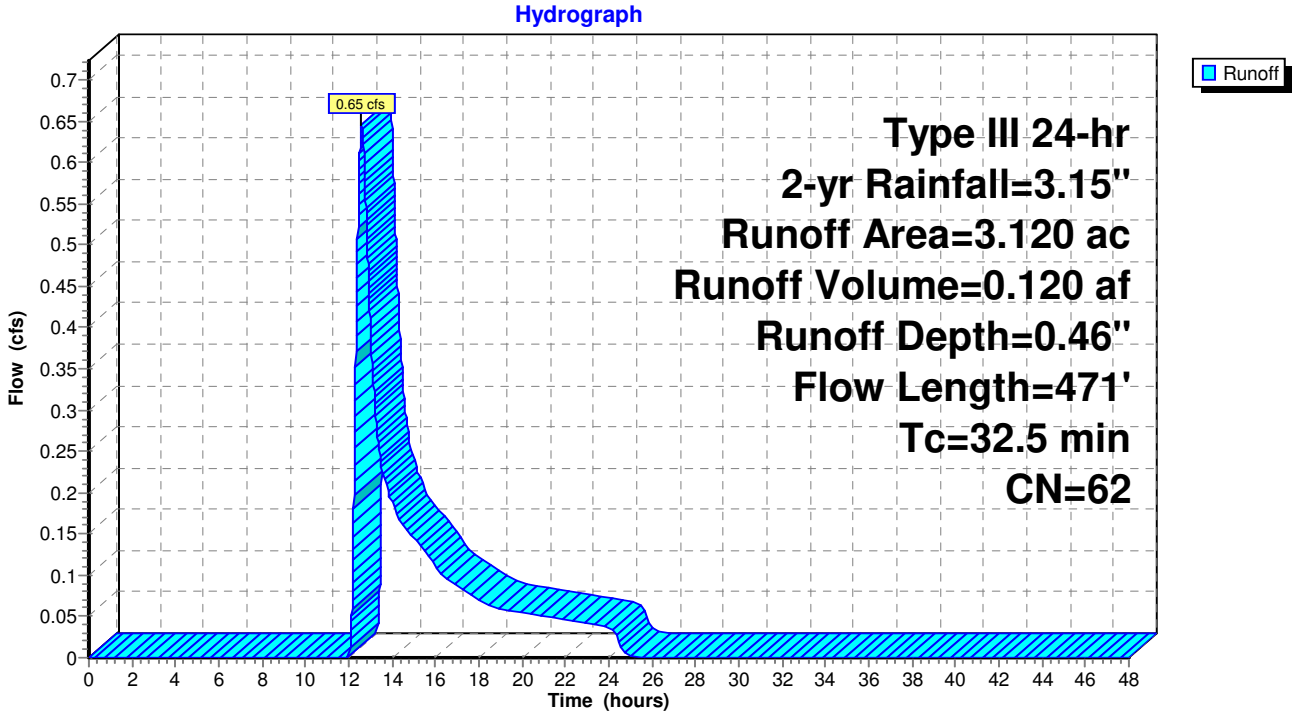
Runoff = 0.65 cfs @ 12.60 hrs, Volume= 0.120 af, Depth= 0.46"

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
*	0.560	60	>75% Grass cover, Good, HSG A/D
*	0.200	71	>75% Grass cover, Good, HSG B/D
	0.310	74	>75% Grass cover, Good, HSG C
*	1.200	54	Woods, Good, HSG A/D
*	0.250	66	Woods, Good, HSG B/D
	0.600	70	Woods, Good, HSG C
	3.120	62	Weighted Average
	3.120		100.00% Pervious 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			

Subcatchment P7: P7



Summary for Subcatchment P8: P8 (DP4)

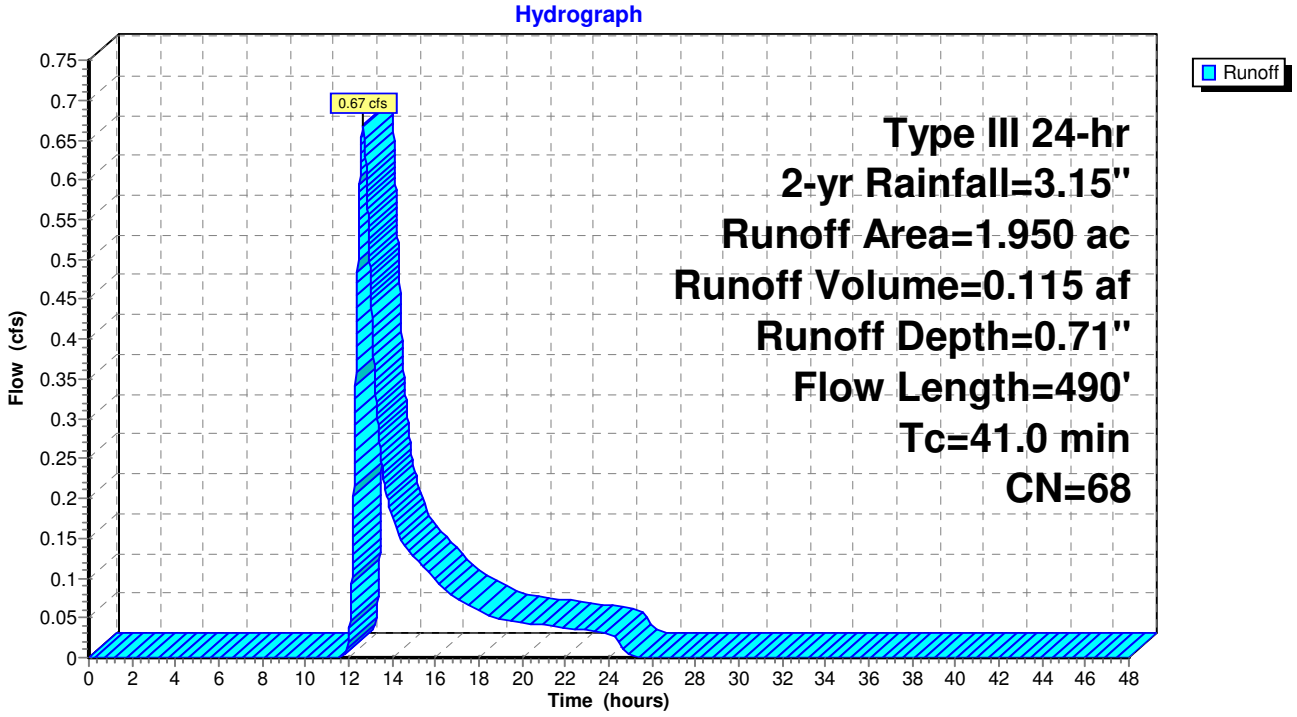
Runoff = 0.67 cfs @ 12.66 hrs, Volume= 0.115 af, Depth= 0.71"

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
*	0.570	71	>75% Grass cover, Good, HSG B/D
	0.050	74	>75% Grass cover, Good, HSG C
*	1.210	66	Woods, Good, HSG B/D
	0.120	70	Woods, Good, HSG C
	1.950	68	Weighted Average
	1.950		100.00% Pervious 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			

Subcatchment P8: P8 (DP4)



Summary for Subcatchment P9: P9

0.92 Acres (2 ~ 0.46 acre areas) of Roof selected to allow room to detain peak flows to basin for 2 year storm.

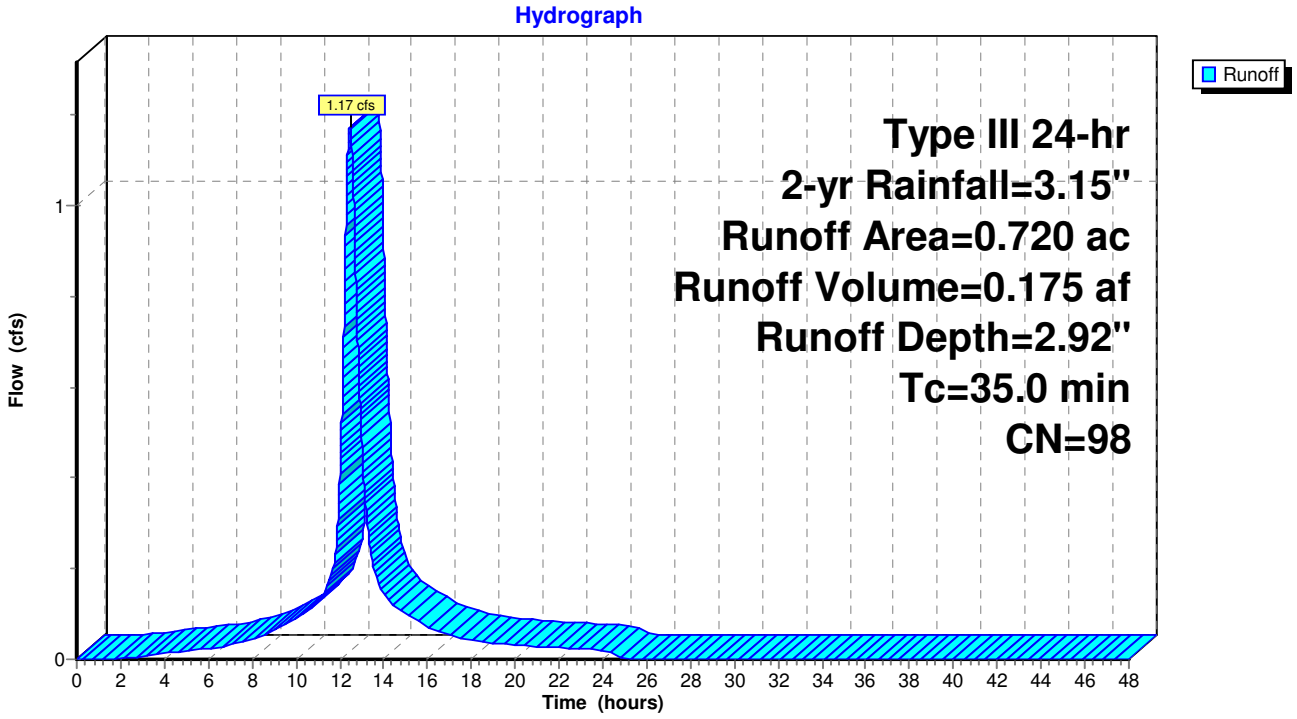
Runoff = 1.17 cfs @ 12.48 hrs, Volume= 0.175 af, Depth= 2.92"

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
*	0.720	98	IMPERVIOUS
	0.720		100.00% Impervious Area

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

Subcatchment P9: P9



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

Inflow Area = 7.030 ac, 68.42% Impervious, Inflow Depth = 1.95" for 2-yr event
Inflow = 14.03 cfs @ 12.14 hrs, Volume= 1.144 af
Outflow = 11.82 cfs @ 12.21 hrs, Volume= 1.020 af, Atten= 16%, Lag= 4.1 min
Primary = 11.82 cfs @ 12.21 hrs, Volume= 1.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 70.15' Surf.Area= 6,813 sf Storage= 1,846 cf
Peak Elev= 71.78' @ 22.98 hrs Surf.Area= 6,813 sf Storage= 10,201 cf (8,355 cf above start)

Plug-Flow detention time= 180.6 min calculated for 0.978 af (85% of inflow)
Center-of-Mass det. time= 104.1 min (923.5 - 819.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.56'	3,505 cf	**7.00'W x 484.83'L x 4.00'H Field A** 13,575 cf Overall - 4,813 cf Embedded = 8,762 cf x 40.0% Voids
#2A	70.06'	4,813 cf	**Cultec R-360HD** x 131 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	69.56'	3,531 cf	**7.00'W x 488.50'L x 4.00'H Field B** 13,678 cf Overall - 4,850 cf Embedded = 8,828 cf x 40.0% Voids
#4B	70.06'	4,850 cf	**Cultec R-360HD** x 132 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	73.56'	45 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#6	74.50'	1,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		18,652 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)
73.56	48	0	0
74.50	48	45	45

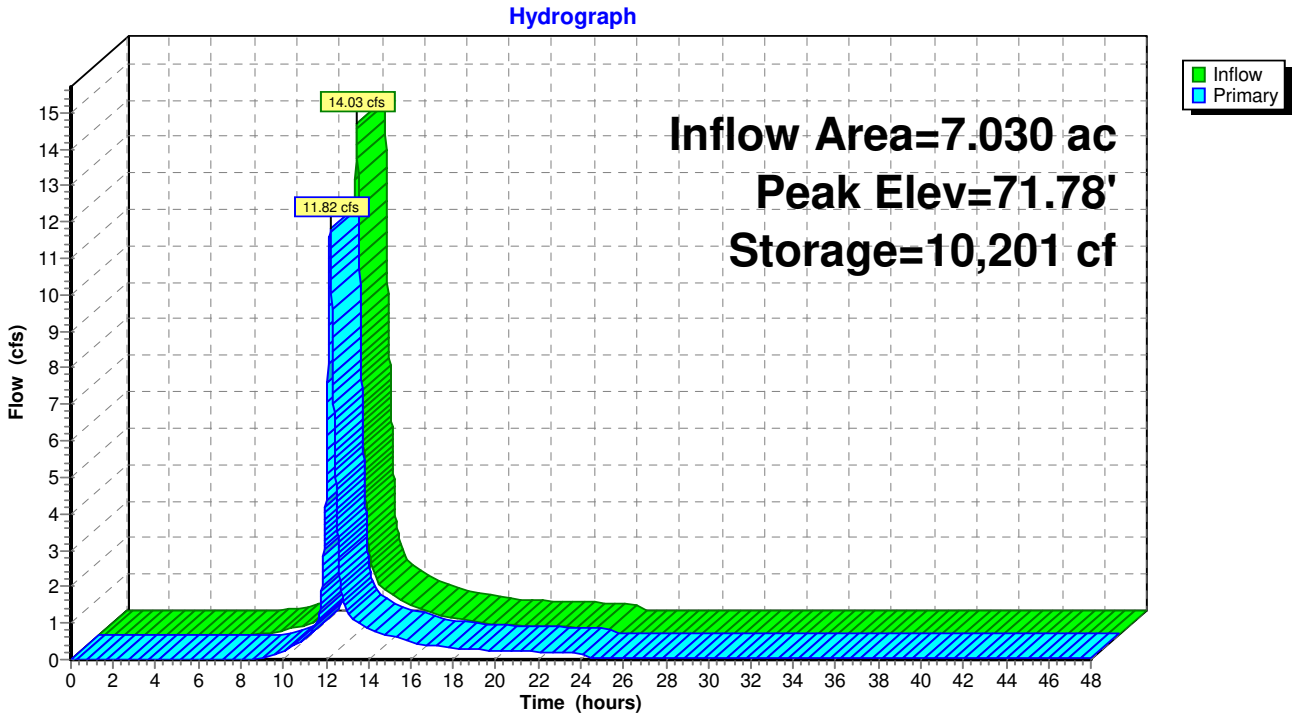
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.50	5	0	0
75.00	422	107	107
76.00	3,180	1,801	1,908

Device	Routing	Invert	Outlet Devices
#1	Primary	70.15'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.15' / 70.11' S= 0.0080 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

#2 Primary 70.15' **30.0" Round Culvert**
L= 40.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 70.15' / 70.00' S= 0.0038 '/' Cc= 0.900
n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=11.81 cfs @ 12.21 hrs HW=71.33' TW=70.88' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.81 cfs @ 3.73 fps)
2=Culvert (Barrel Controls 6.00 cfs @ 3.85 fps)

Pond PP1: UG Chambers (CULTEC R-360)



Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.610 ac, 76.87% Impervious, Inflow Depth > 2.17" for 2-yr event
Inflow = 47.31 cfs @ 12.12 hrs, Volume= 4.266 af
Outflow = 0.68 cfs @ 22.97 hrs, Volume= 2.161 af, Atten= 99%, Lag= 651.2 min
Primary = 0.68 cfs @ 22.97 hrs, Volume= 2.161 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 70.00' Surf.Area= 73,658 sf Storage= 381,019 cf
Peak Elev= 71.78' @ 22.97 hrs Surf.Area= 86,793 sf Storage= 523,806 cf (142,787 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 786.6 min (1,606.5 - 819.9)

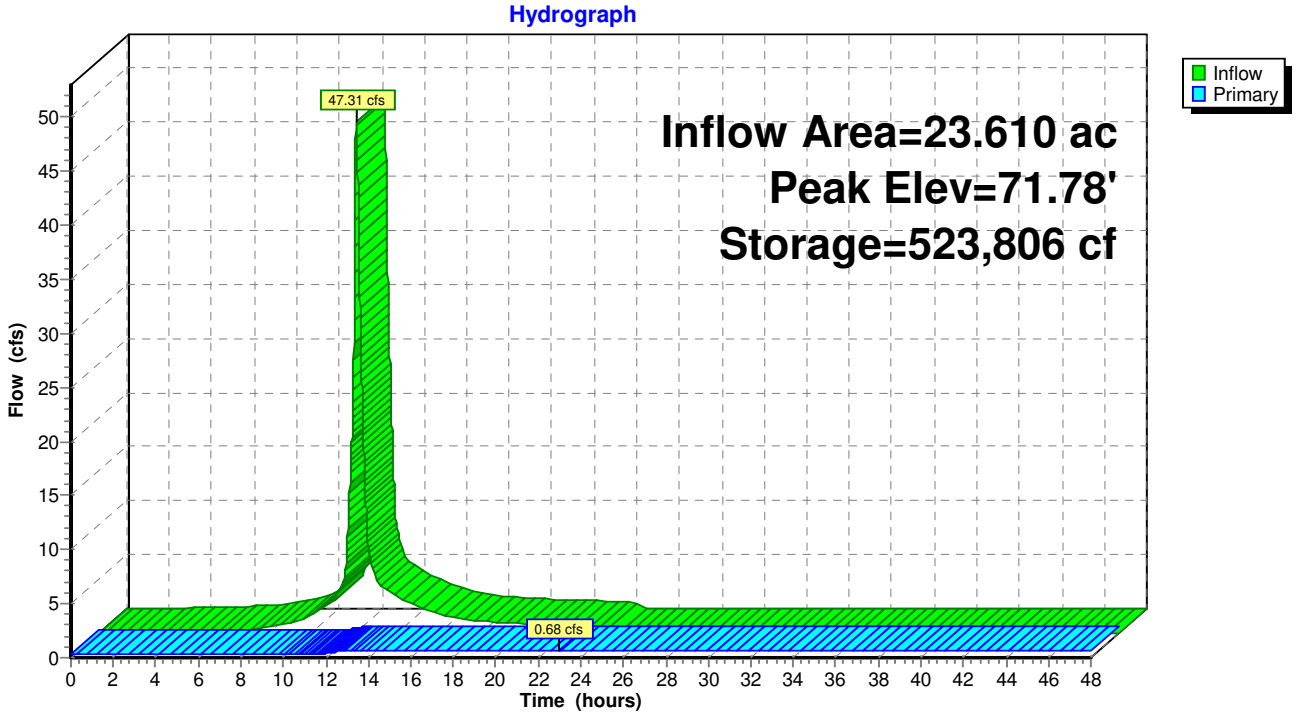
Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	956,853 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
61.00	21,077	0	0	21,077
62.00	24,085	22,564	22,564	24,132
63.00	27,233	25,643	48,207	27,331
64.00	36,998	31,991	80,198	37,116
65.00	40,596	38,783	118,981	40,781
66.00	44,283	42,426	161,407	44,540
67.00	48,018	46,138	207,545	48,352
68.00	50,712	49,359	256,904	51,158
69.00	62,108	56,314	313,218	62,585
70.00	73,658	67,801	381,019	74,172
72.00	88,475	161,907	542,926	89,126
74.00	103,518	191,796	734,722	104,328
76.00	118,788	222,131	956,853	119,780

Device	Routing	Invert	Outlet Devices
#1	Primary	69.59'	**24.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.59' / 69.25' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	69.59'	**7.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	71.85'	**38.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	73.20'	**14.0" W x 11.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.68 cfs @ 22.97 hrs HW=71.78' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.68 cfs of 14.63 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 6.99 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond PP2: Water Quality Basin

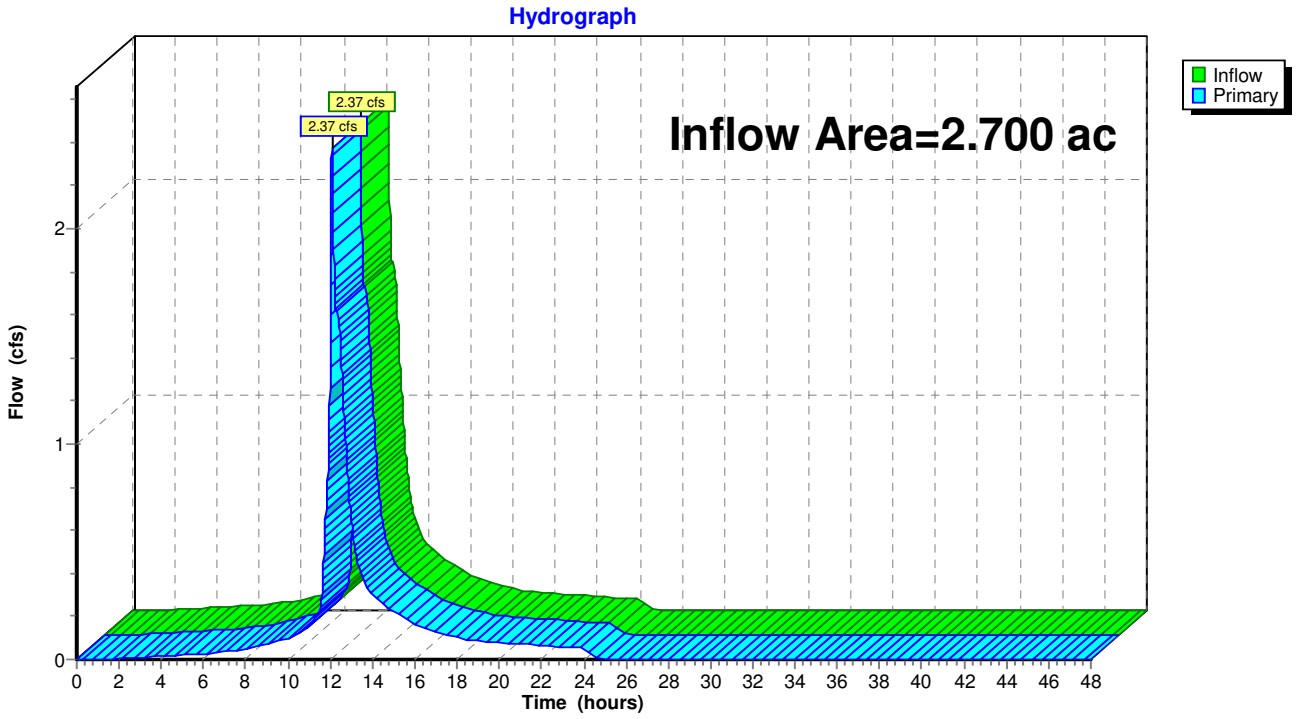


Summary for Link 2L: DP2

Inflow Area = 2.700 ac, 26.30% Impervious, Inflow Depth = 1.38" for 2-yr event
Inflow = 2.37 cfs @ 12.09 hrs, Volume= 0.312 af
Primary = 2.37 cfs @ 12.09 hrs, Volume= 0.312 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 2L: DP2

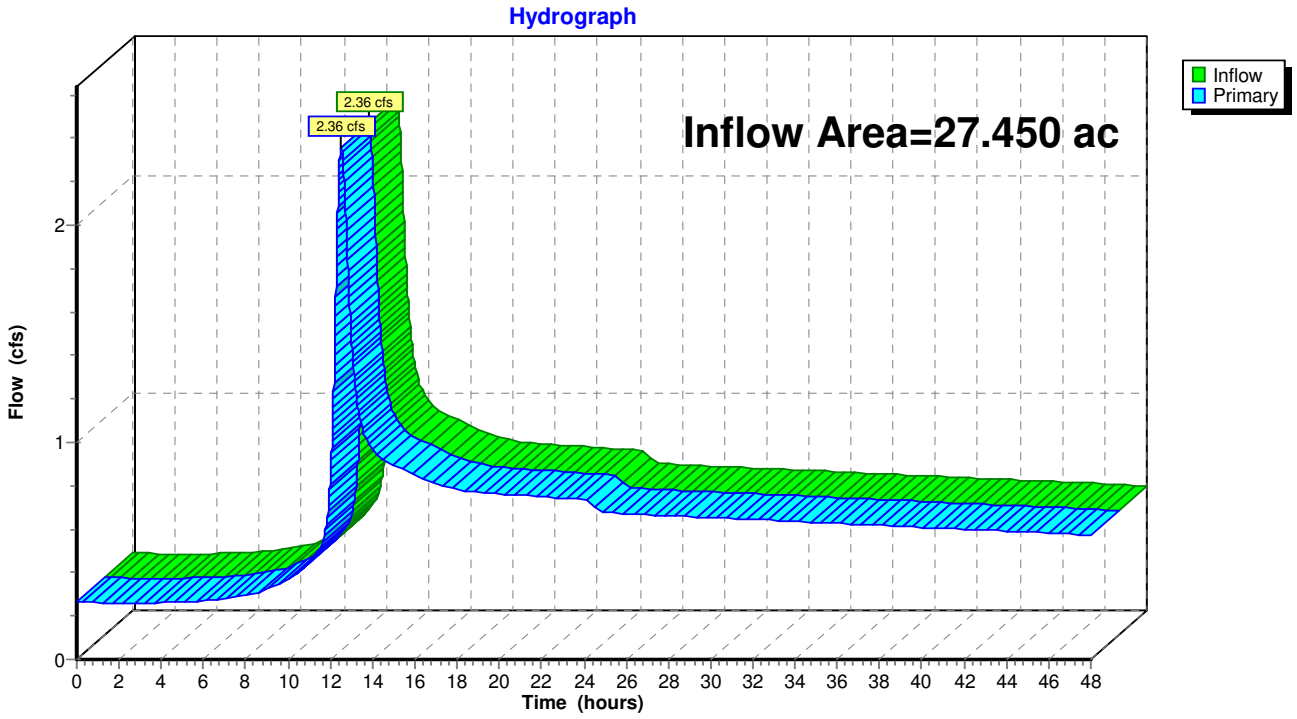


Summary for Link DP1: DP1

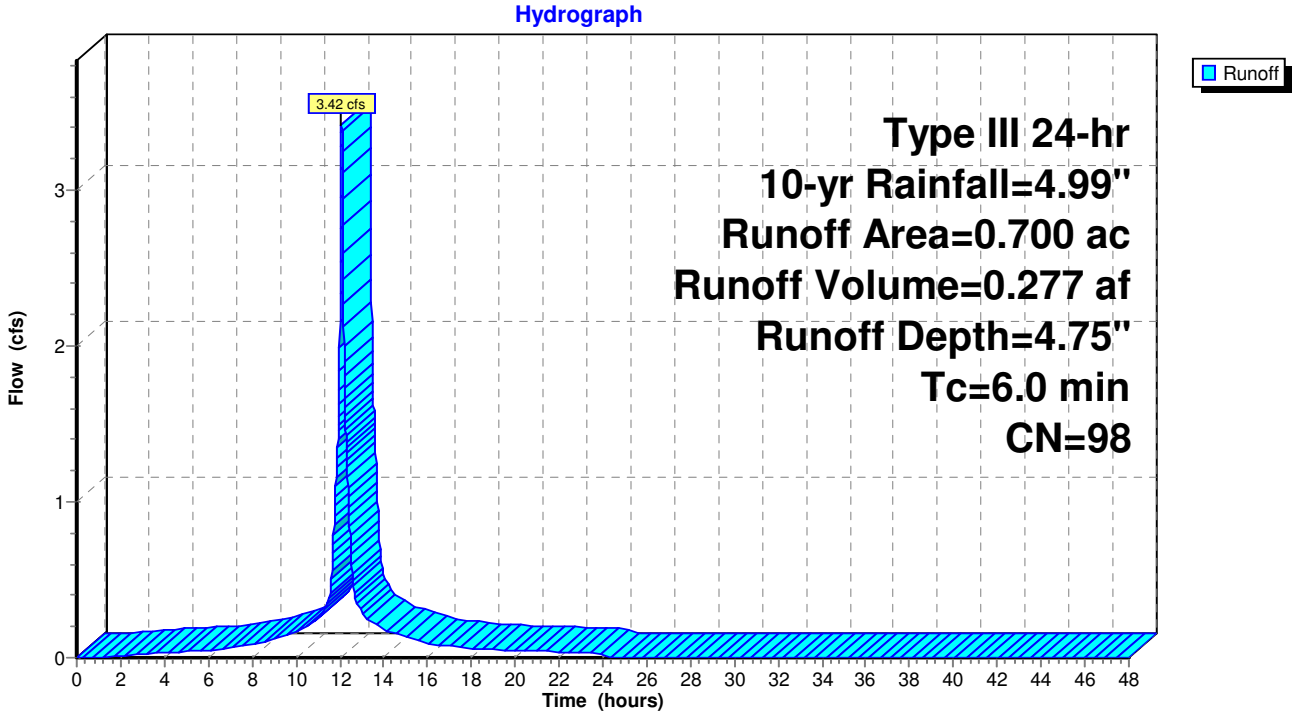
Inflow Area = 27.450 ac, 68.74% Impervious, Inflow Depth > 1.07" for 2-yr event
Inflow = 2.36 cfs @ 12.52 hrs, Volume= 2.456 af
Primary = 2.36 cfs @ 12.52 hrs, Volume= 2.456 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

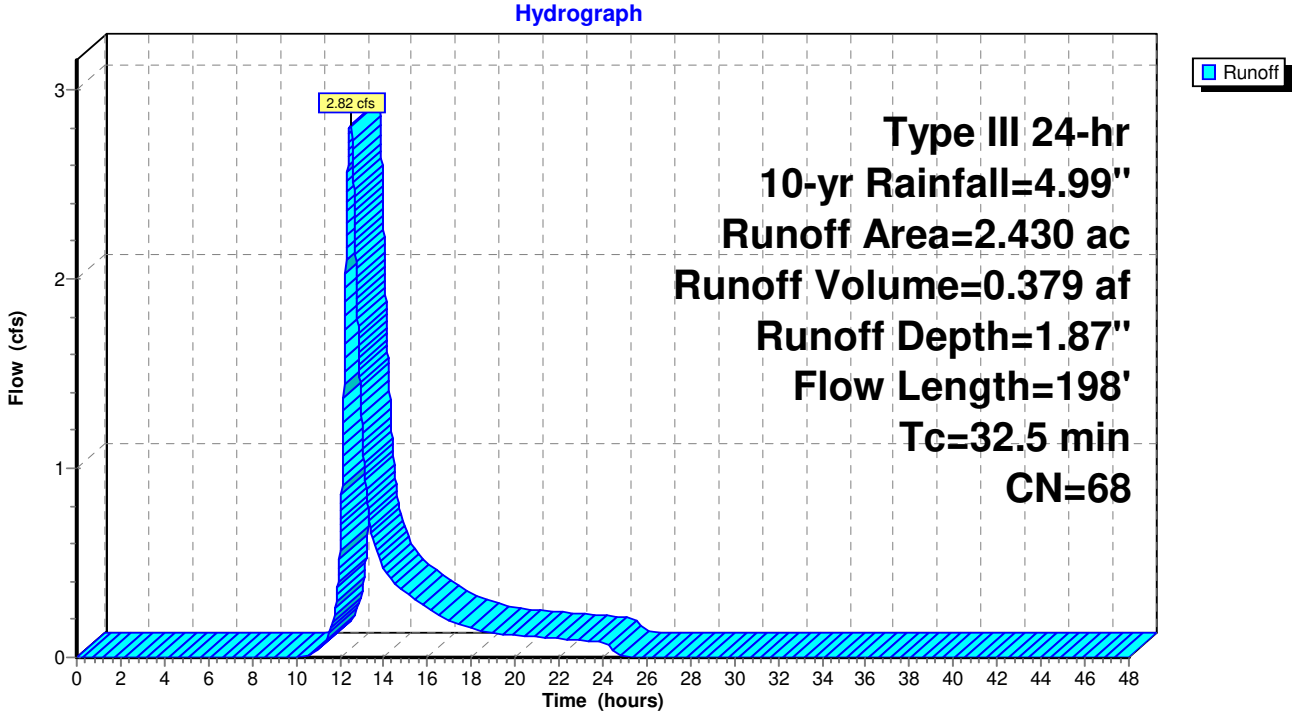
Link DP1: DP1



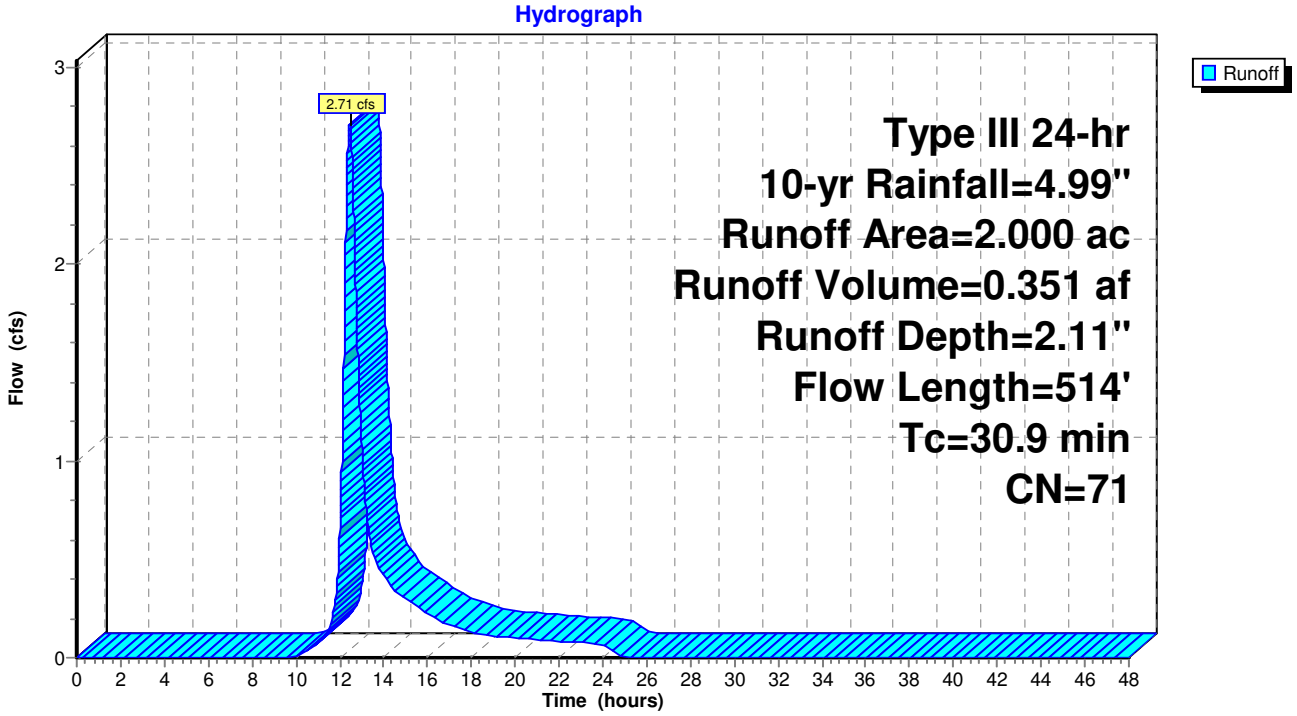
Subcatchment 1S: P10 (RB4)



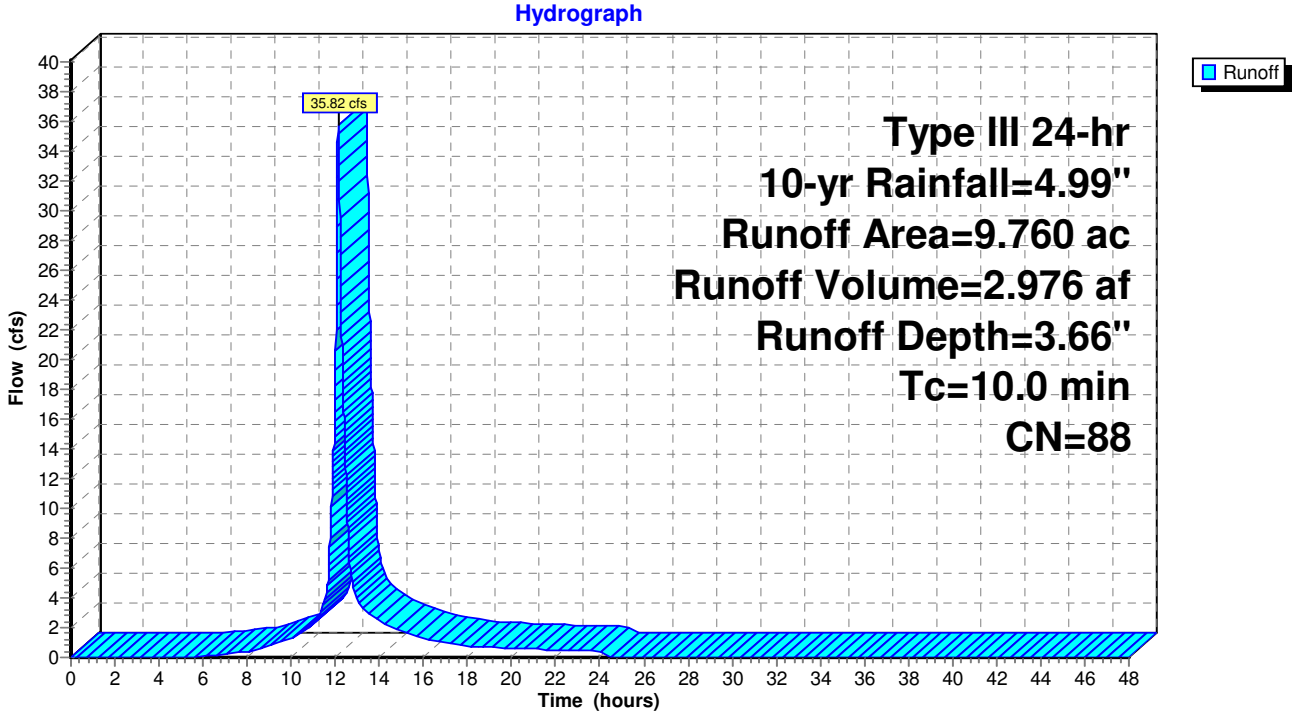
Subcatchment P1: P1 (DP3)



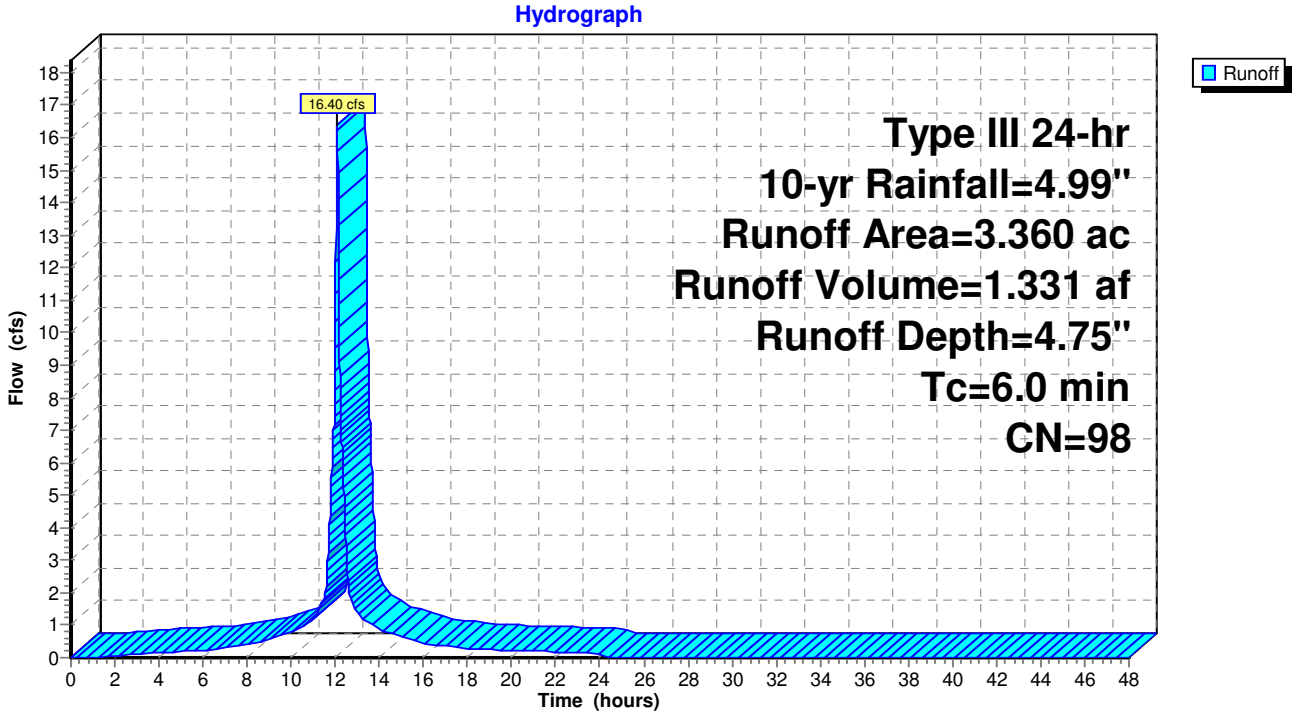
Subcatchment P2: P2



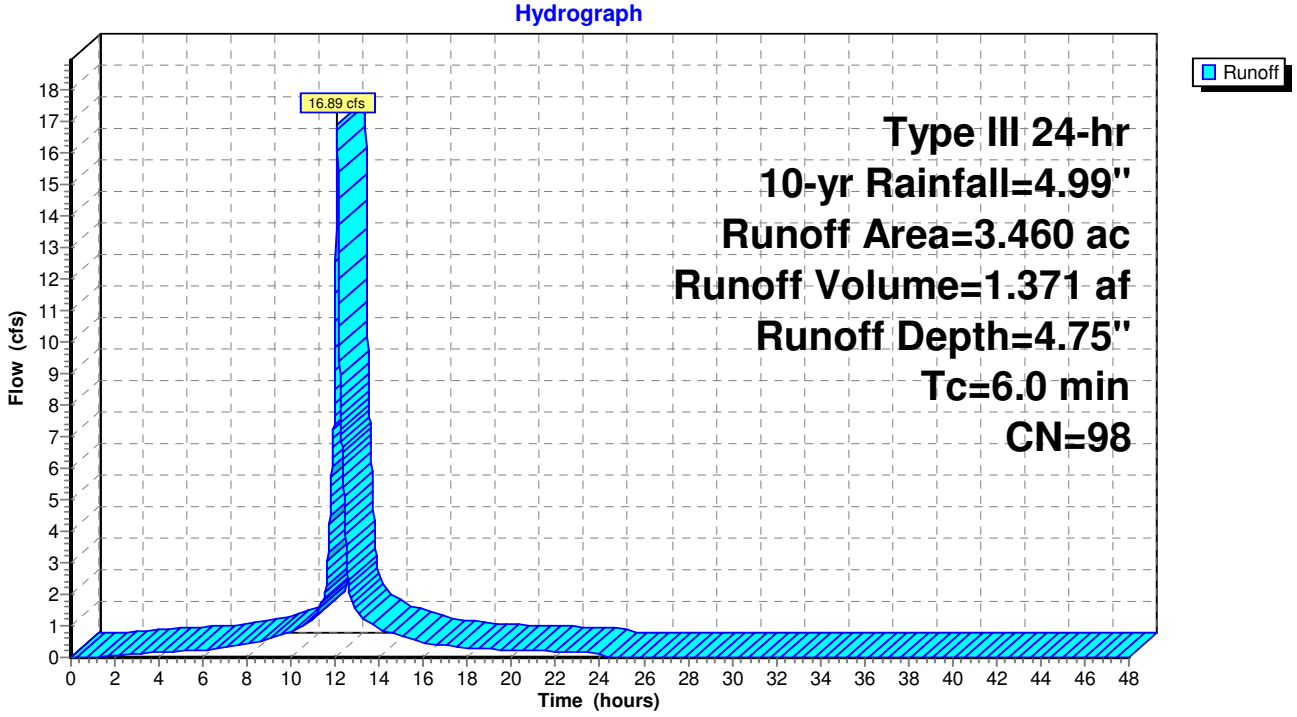
Subcatchment P3: P3



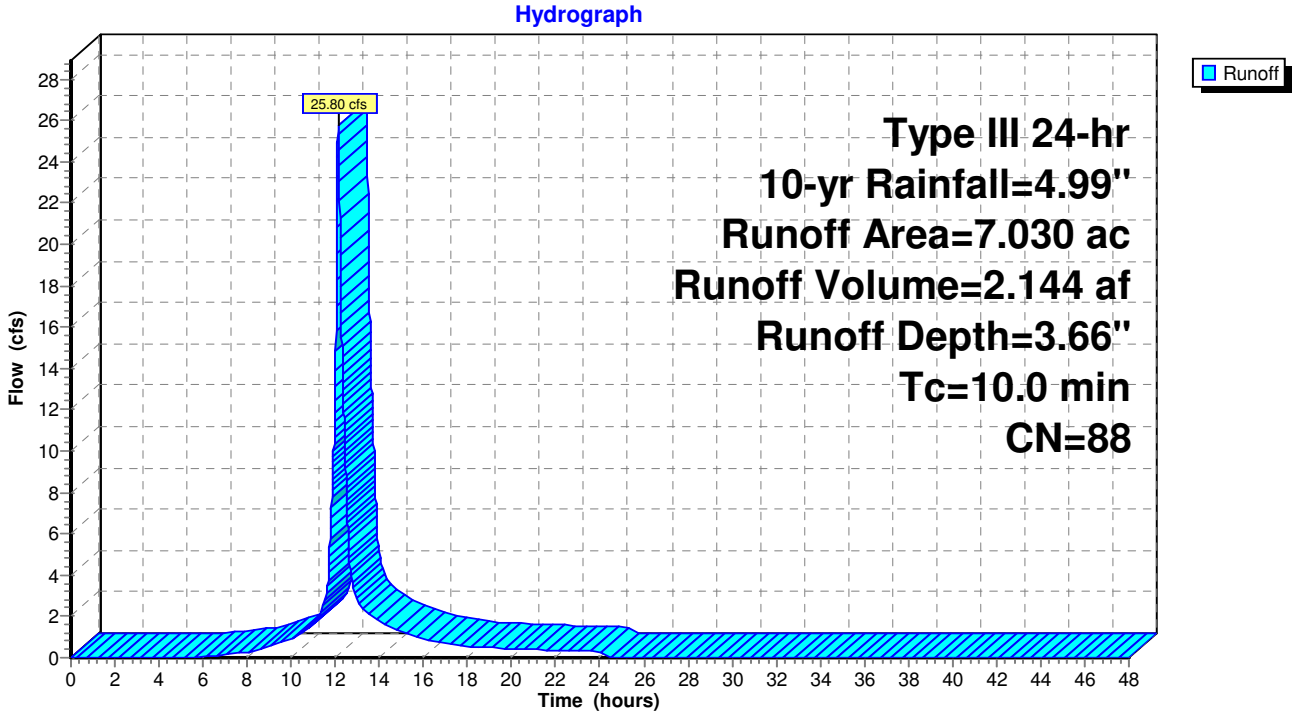
Subcatchment P4: P4



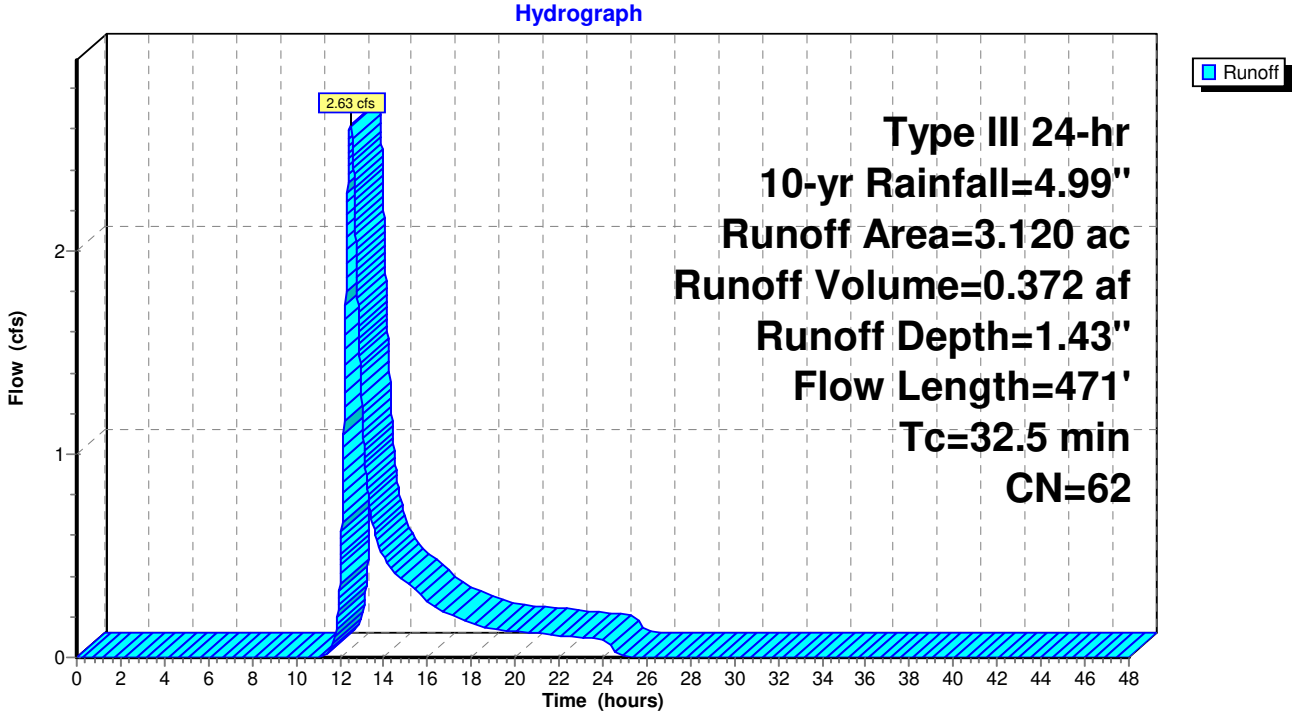
Subcatchment P5: P5



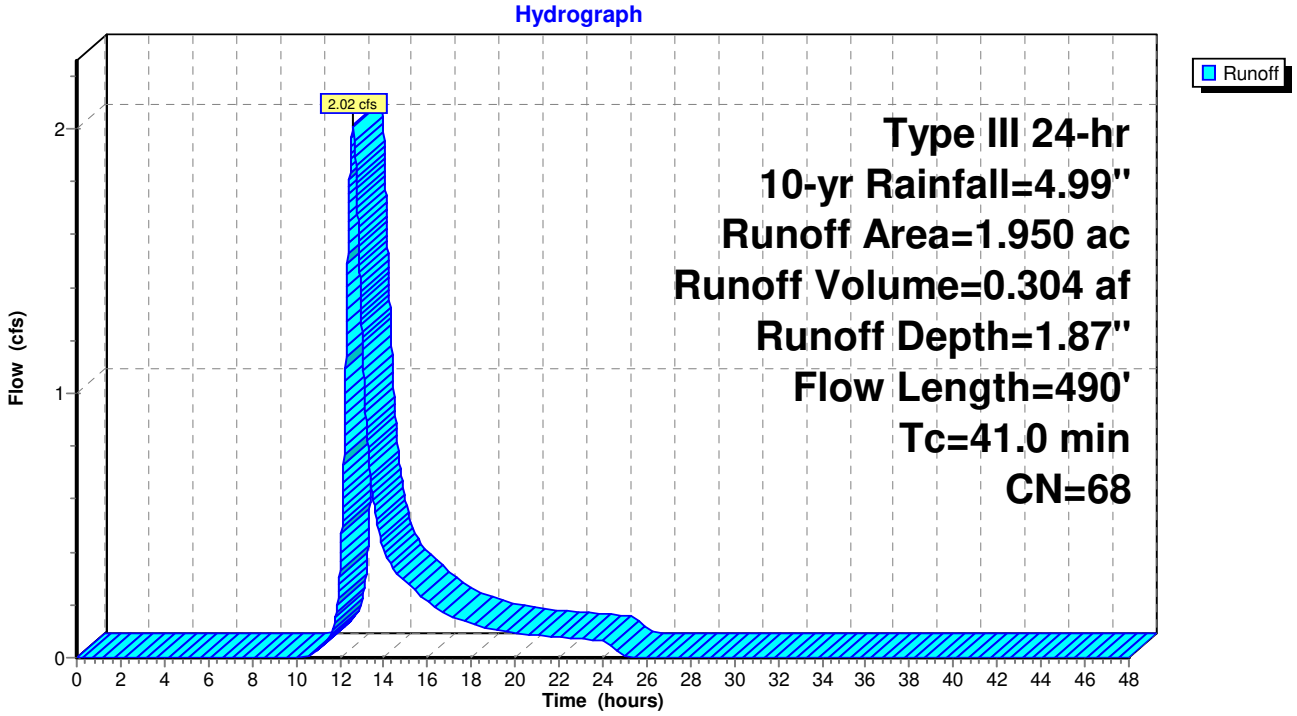
Subcatchment P6: P6



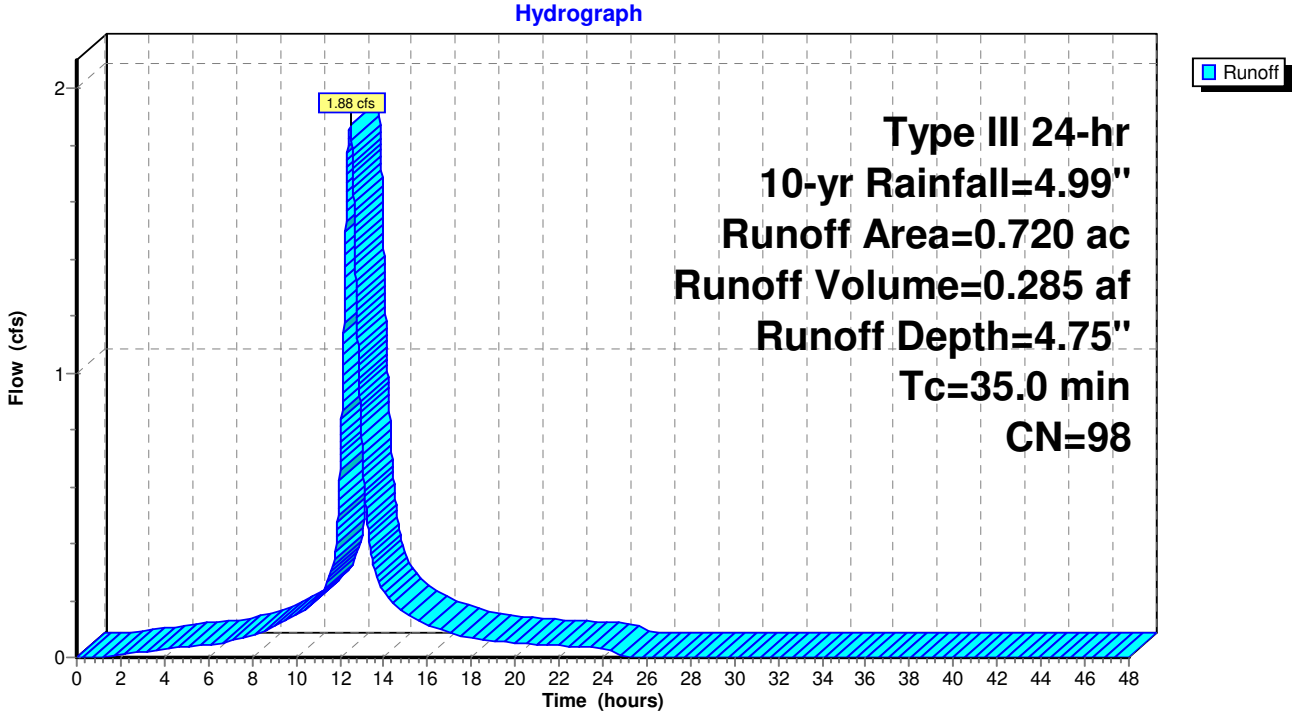
Subcatchment P7: P7



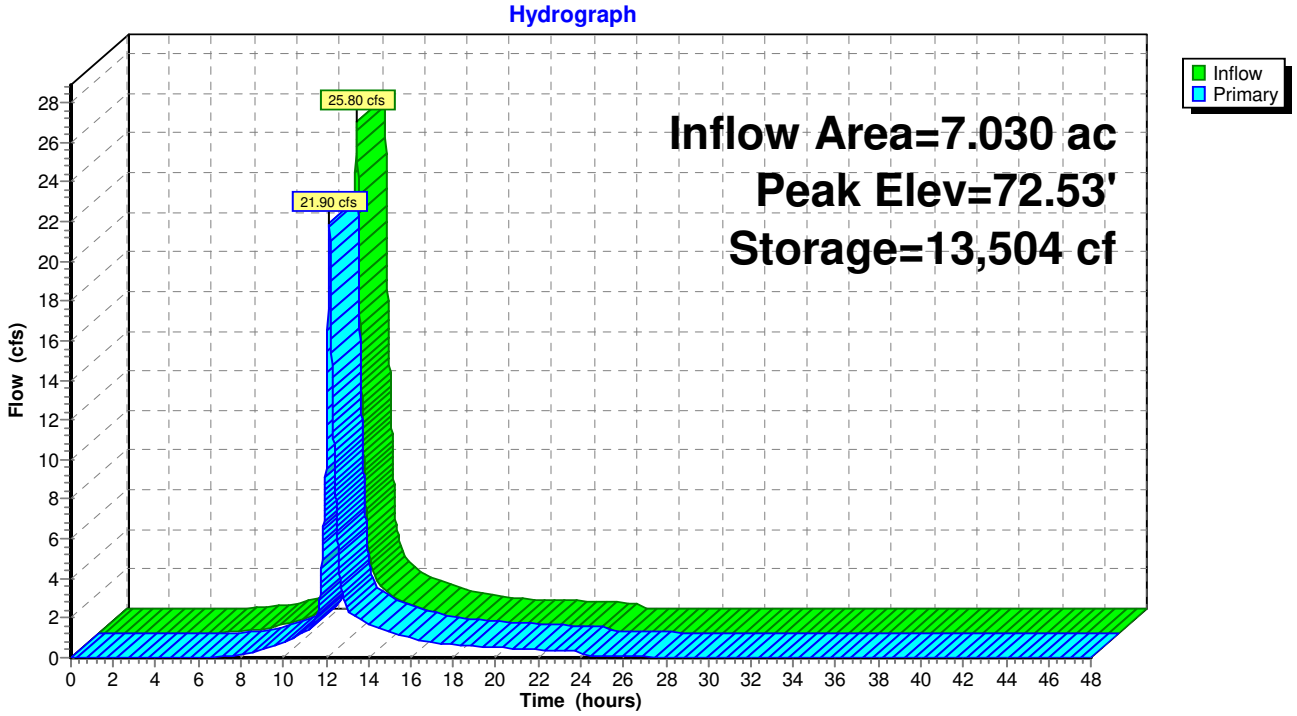
Subcatchment P8: P8 (DP4)



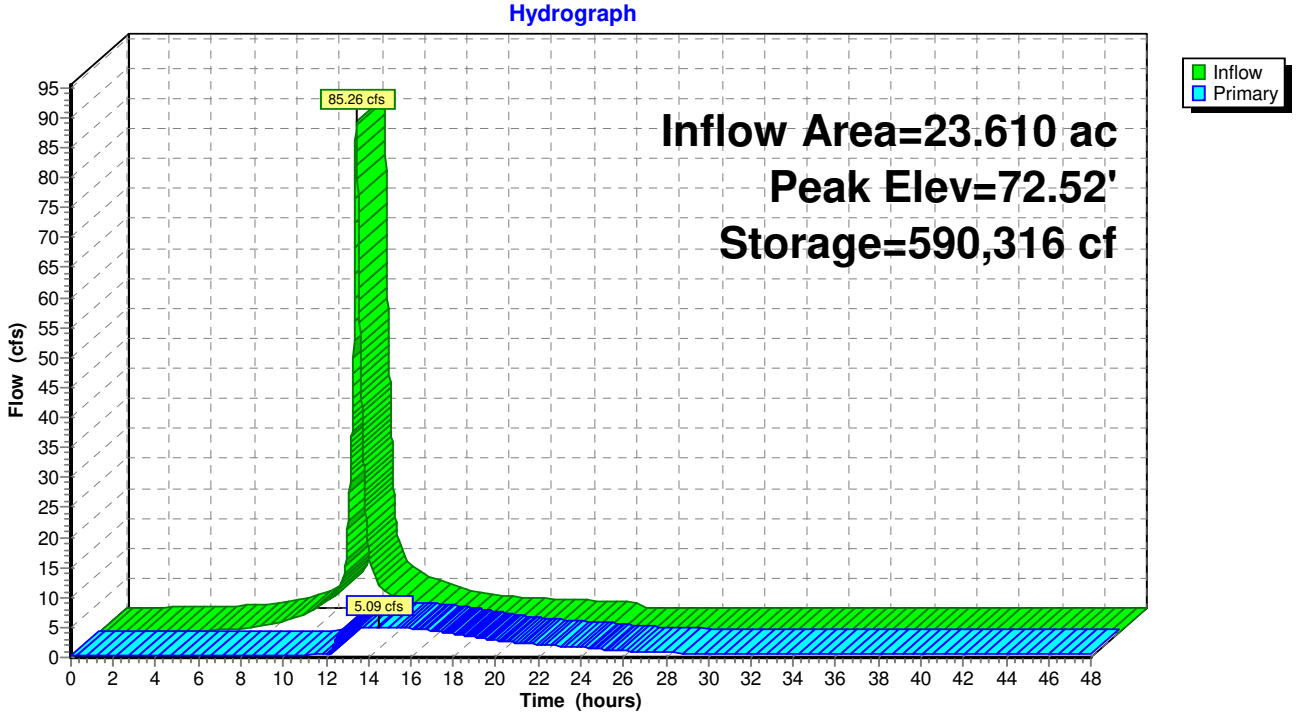
Subcatchment P9: P9



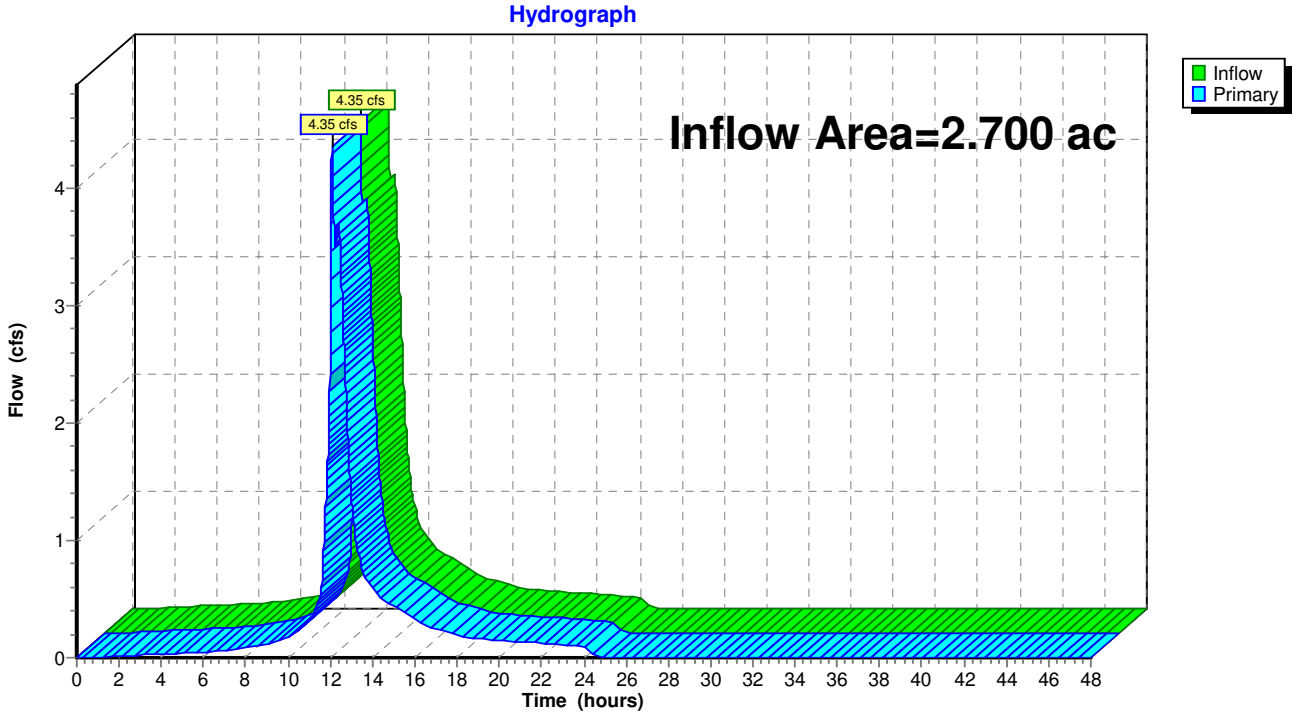
Pond PP1: UG Chambers (CULTEC R-360)



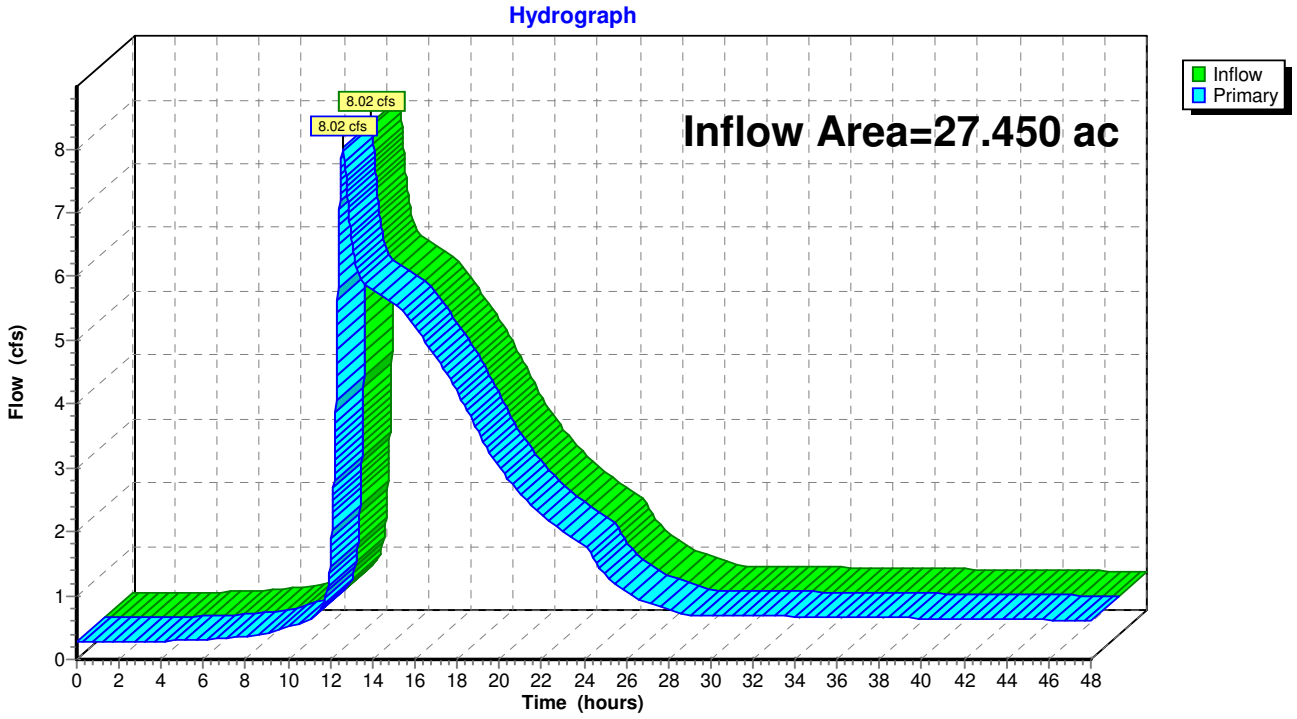
Pond PP2: Water Quality Basin



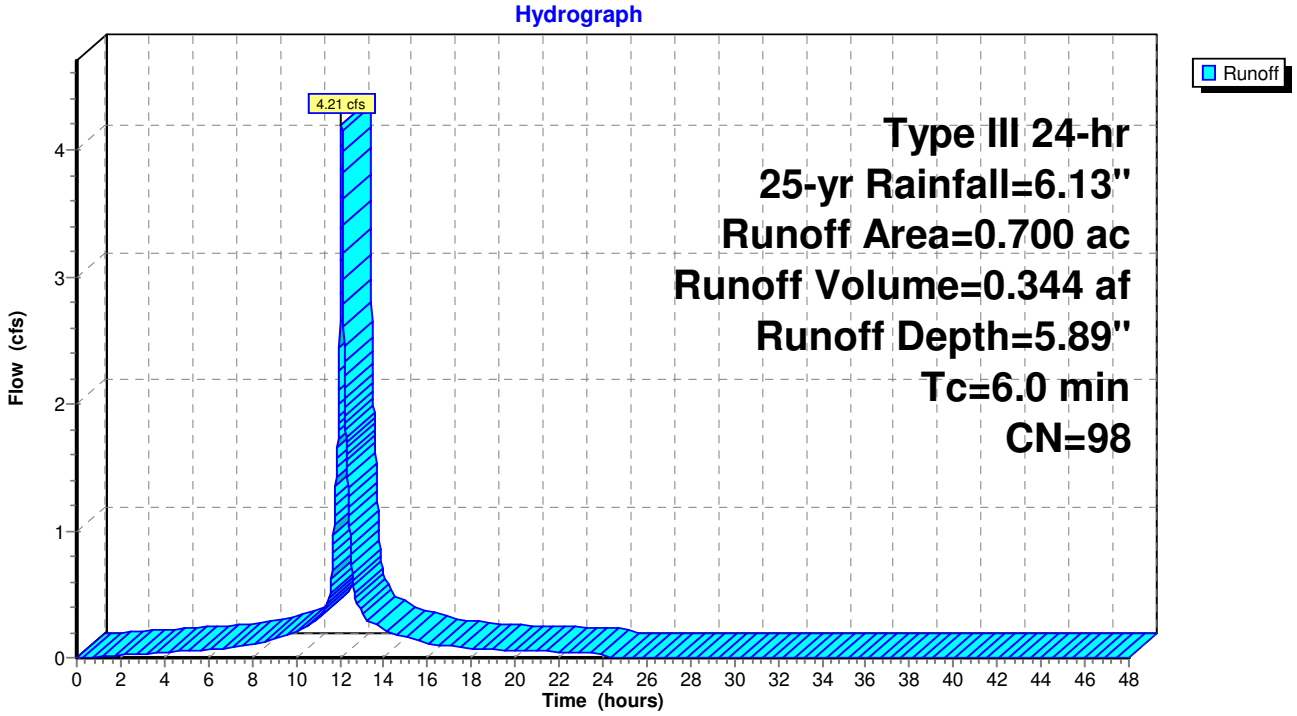
Link 2L: DP2



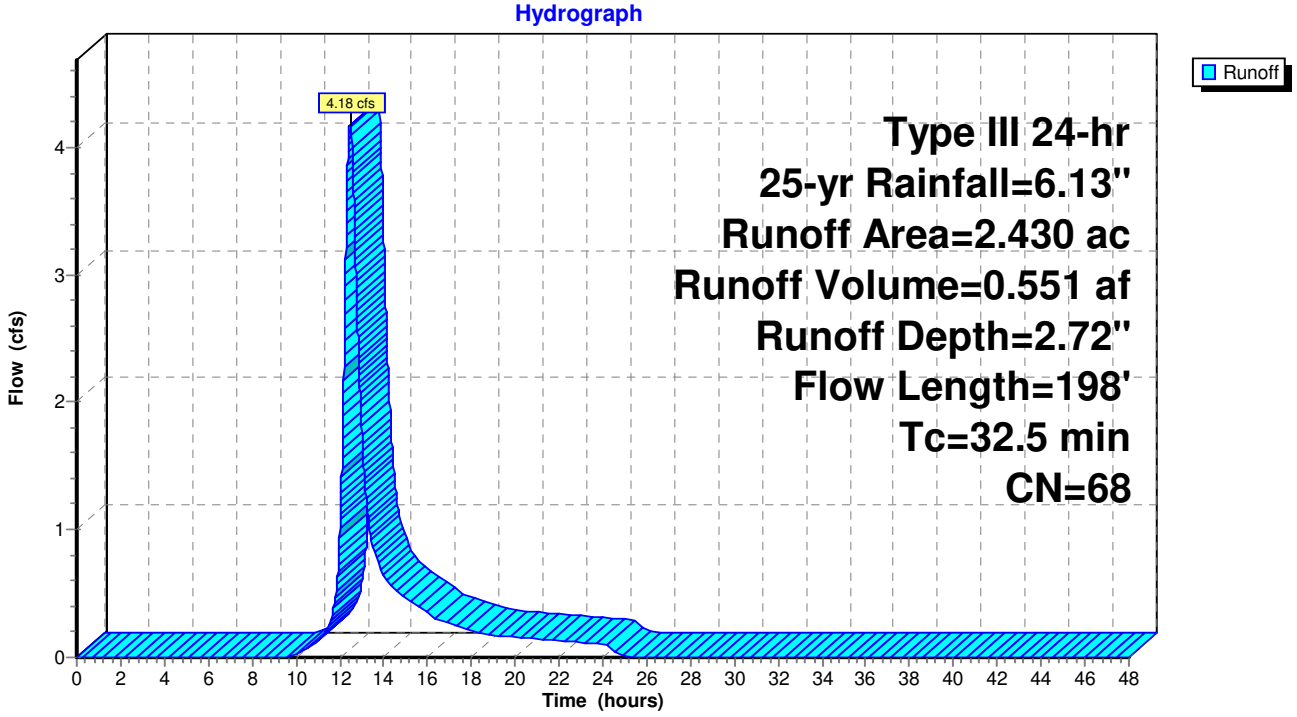
Link DP1: DP1



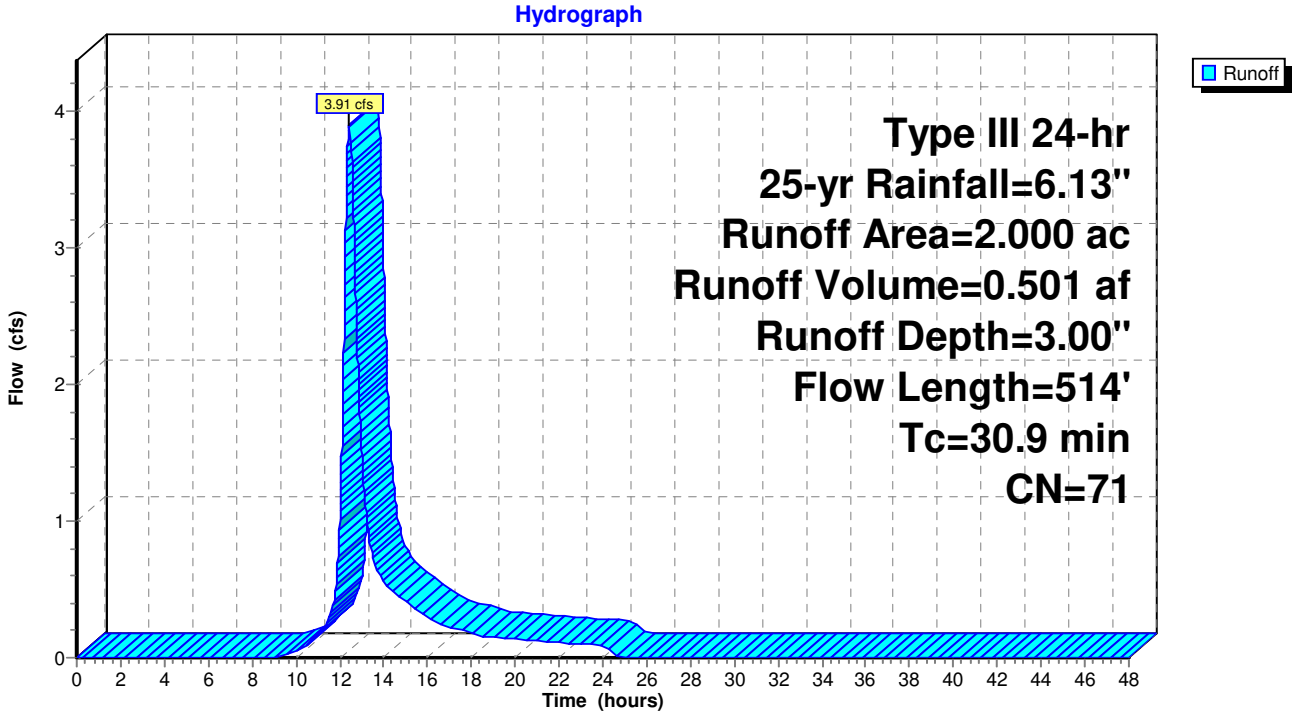
Subcatchment 1S: P10 (RB4)



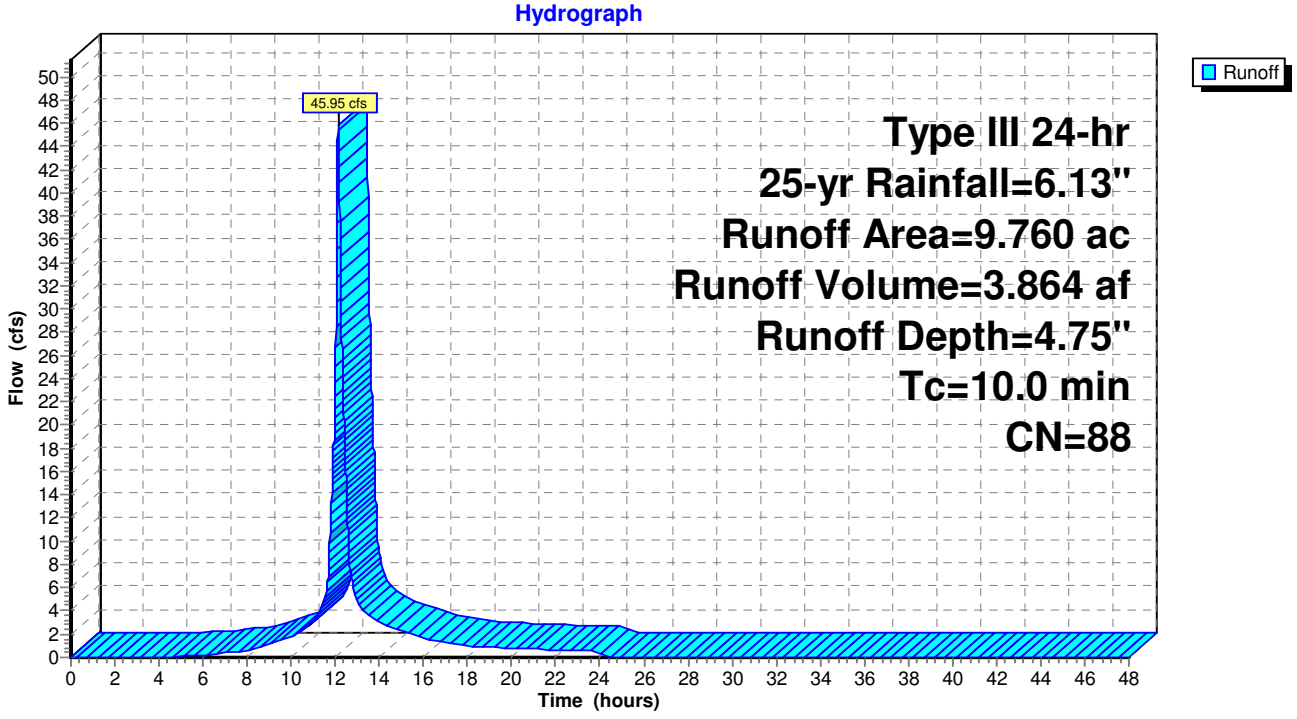
Subcatchment P1: P1 (DP3)



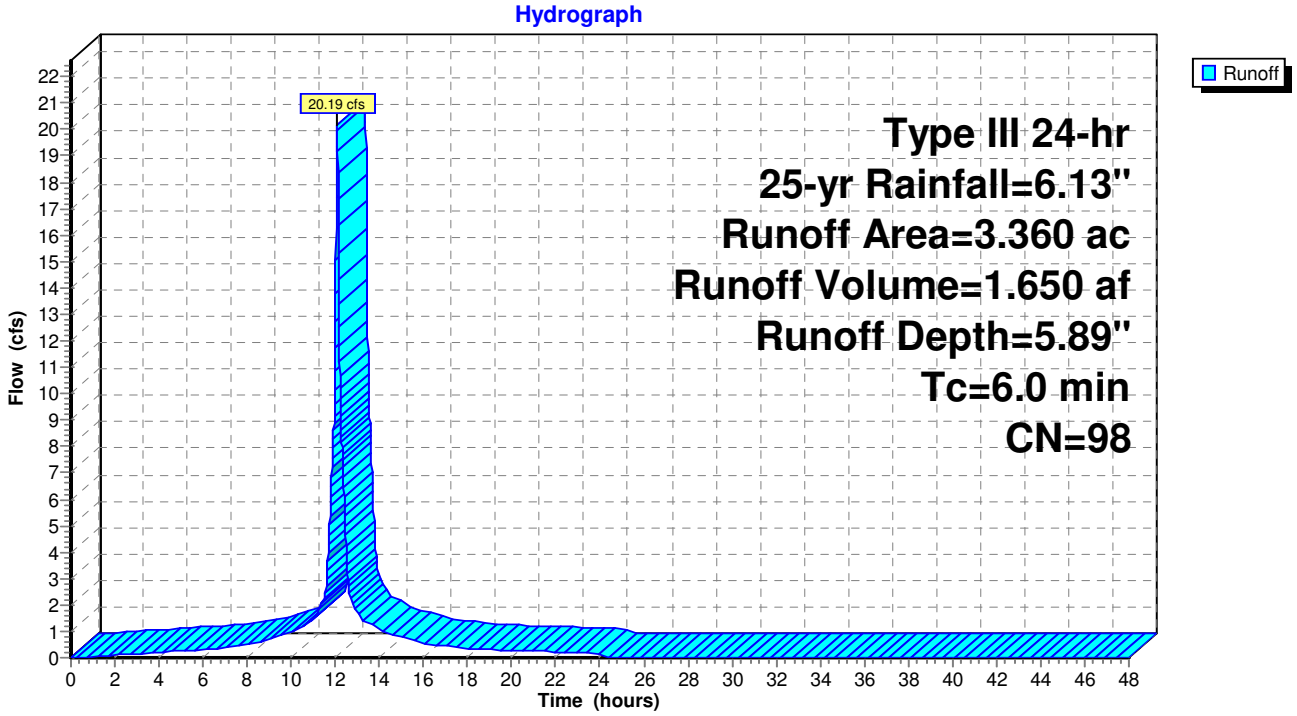
Subcatchment P2: P2



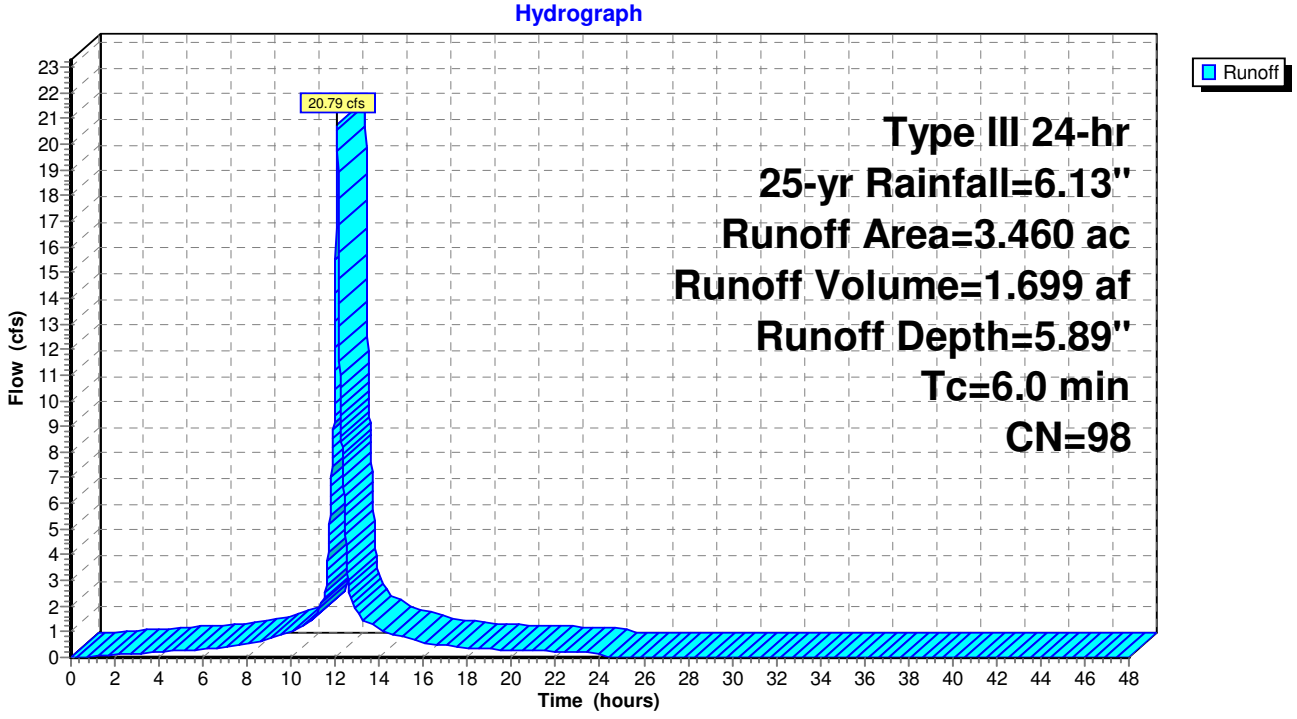
Subcatchment P3: P3



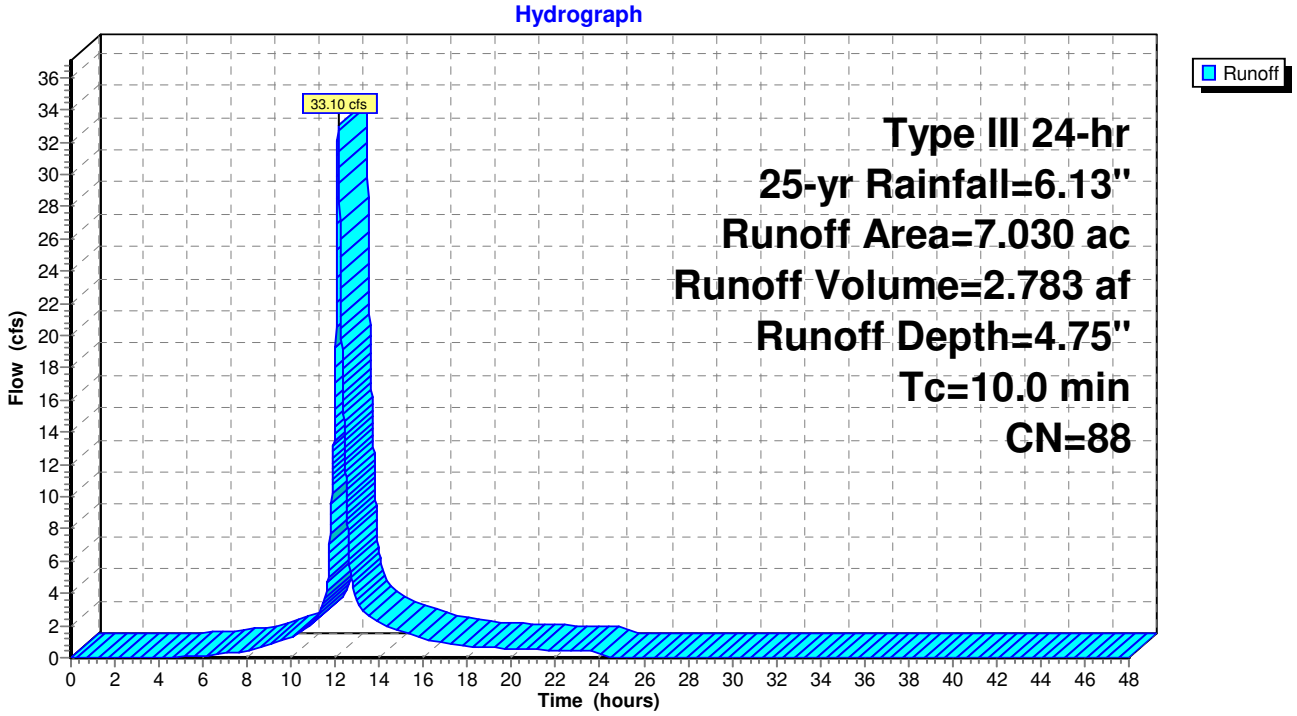
Subcatchment P4: P4



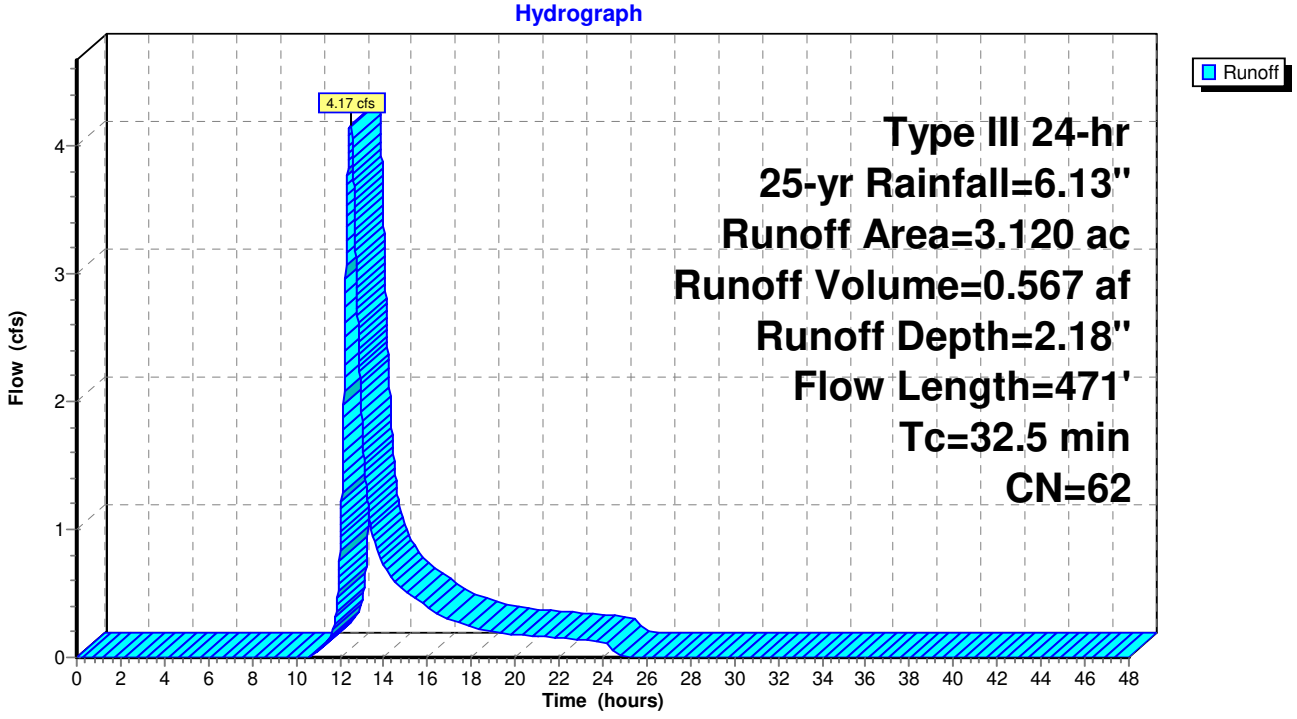
Subcatchment P5: P5



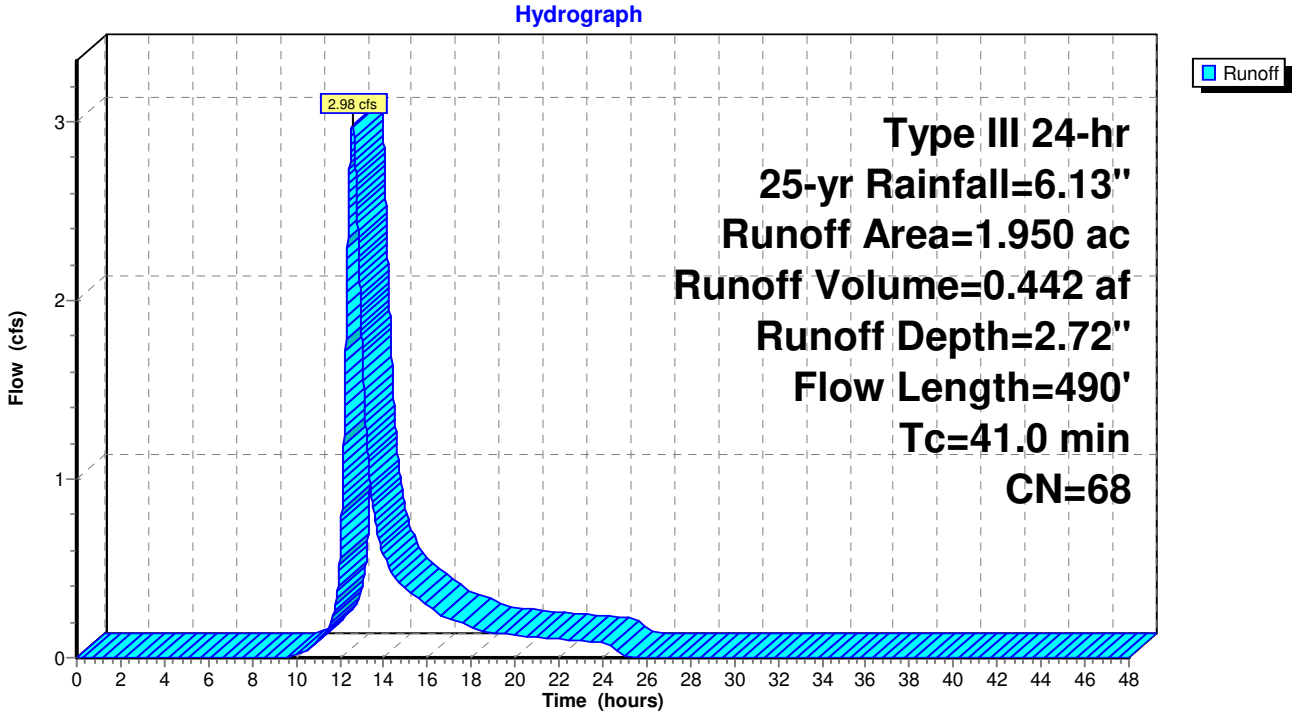
Subcatchment P6: P6



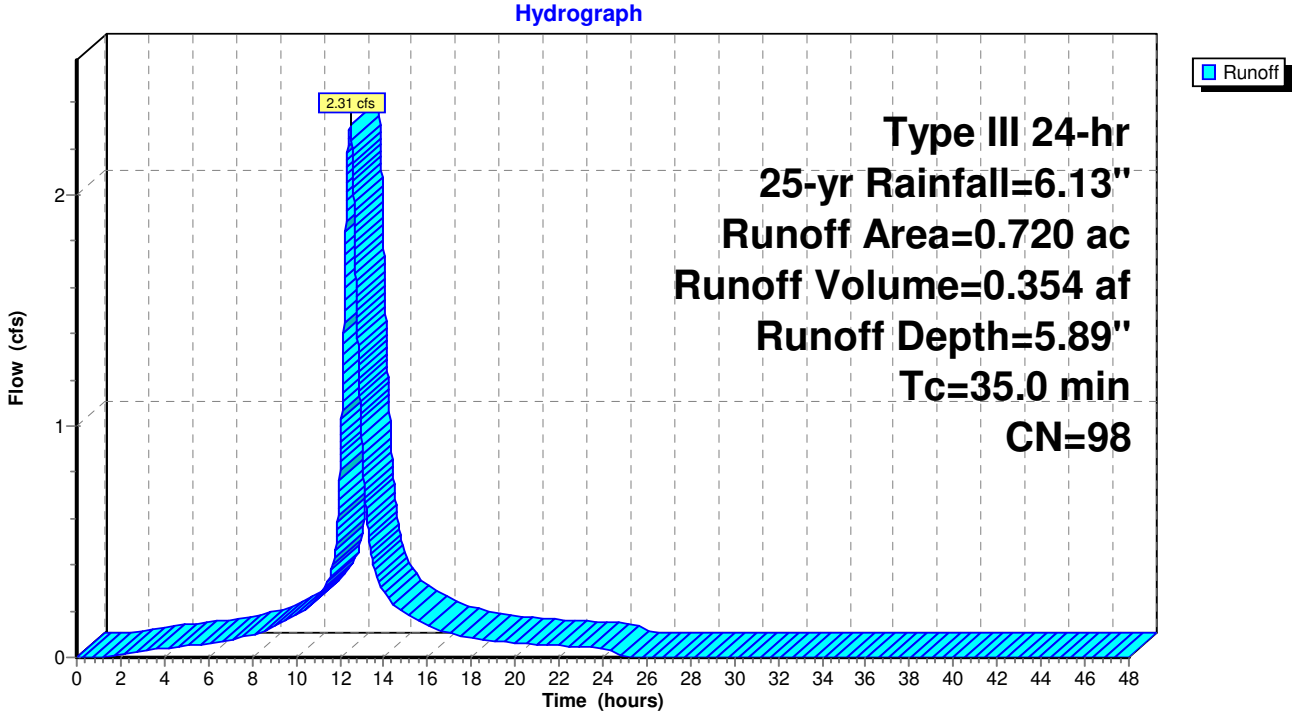
Subcatchment P7: P7



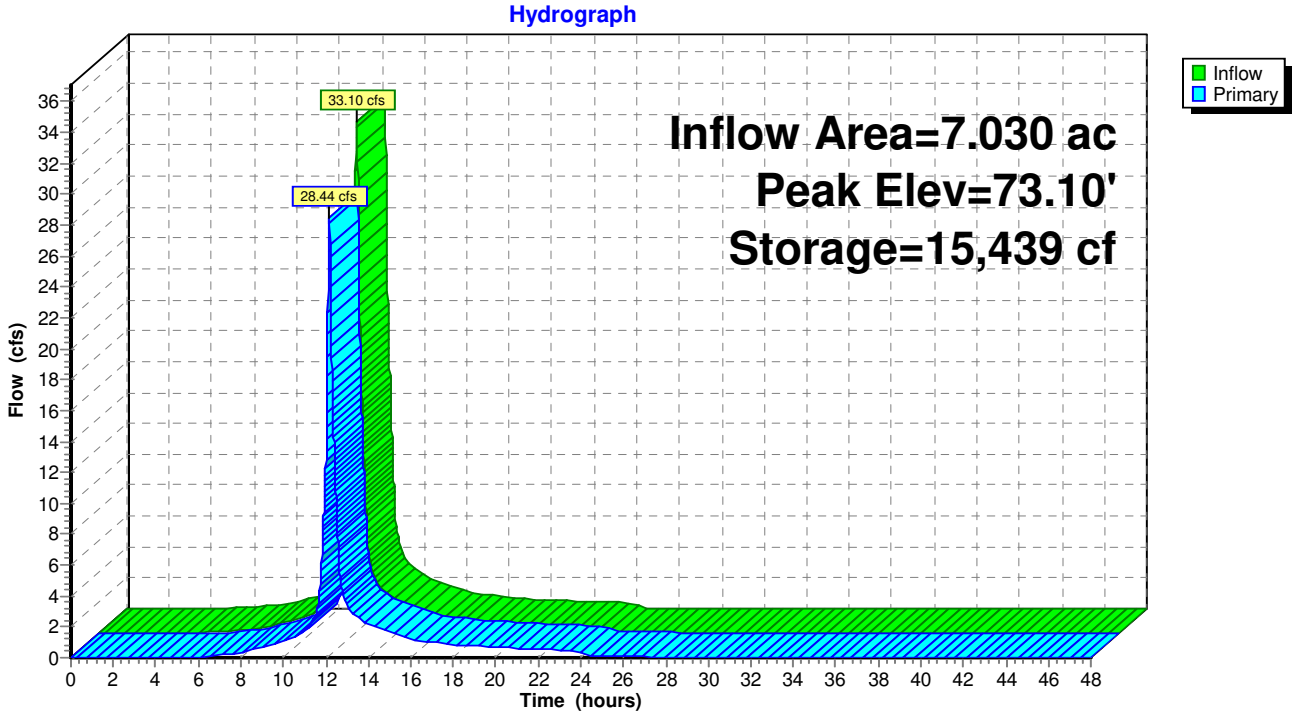
Subcatchment P8: P8 (DP4)



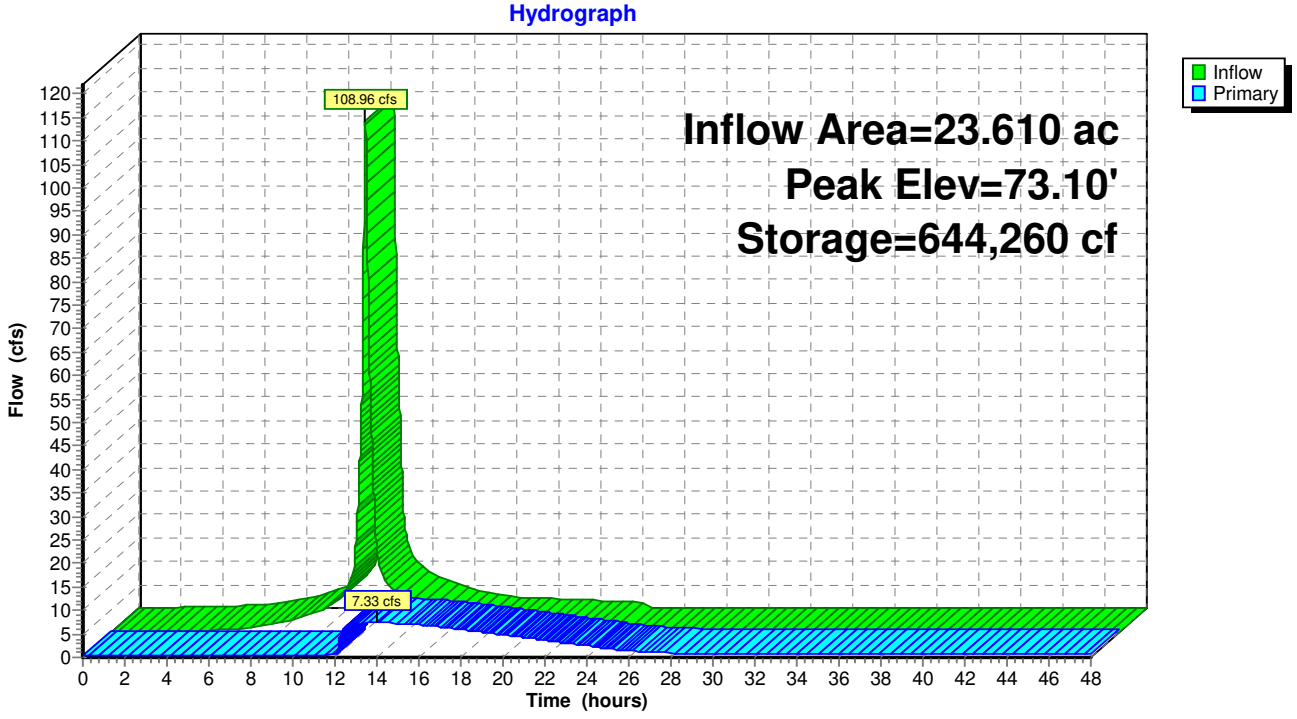
Subcatchment P9: P9



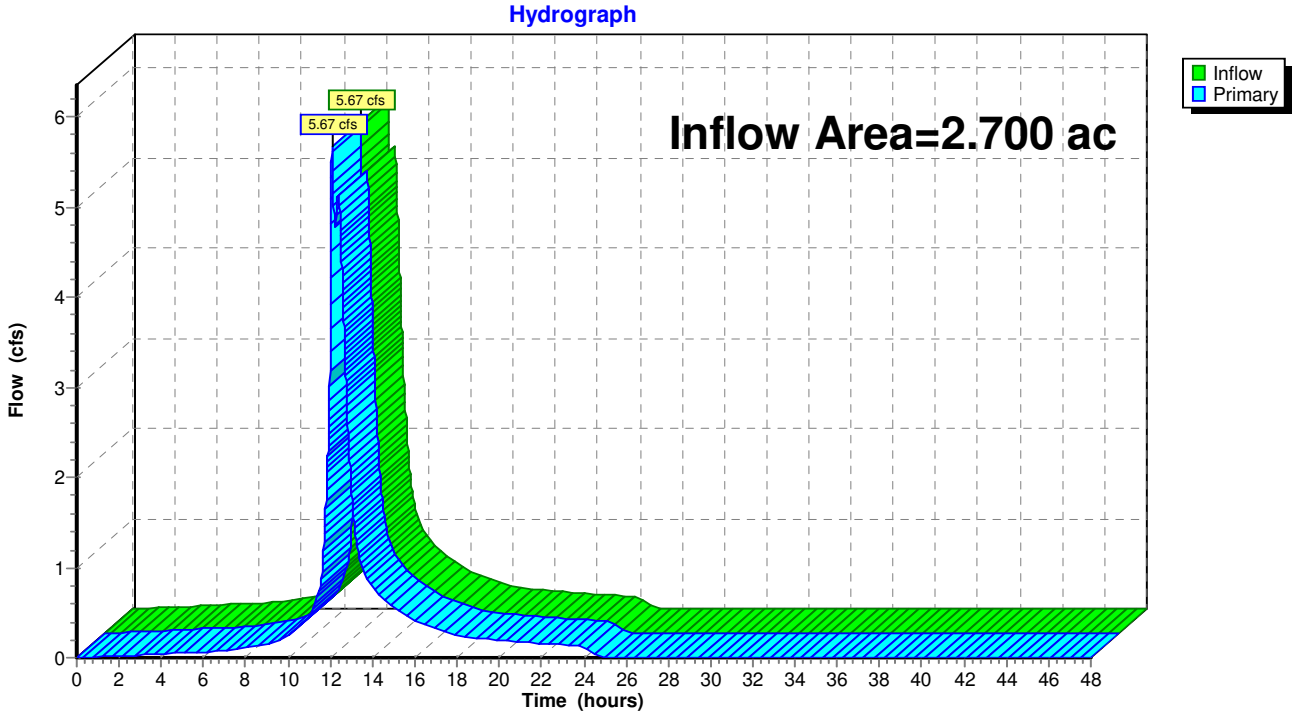
Pond PP1: UG Chambers (CULTEC R-360)



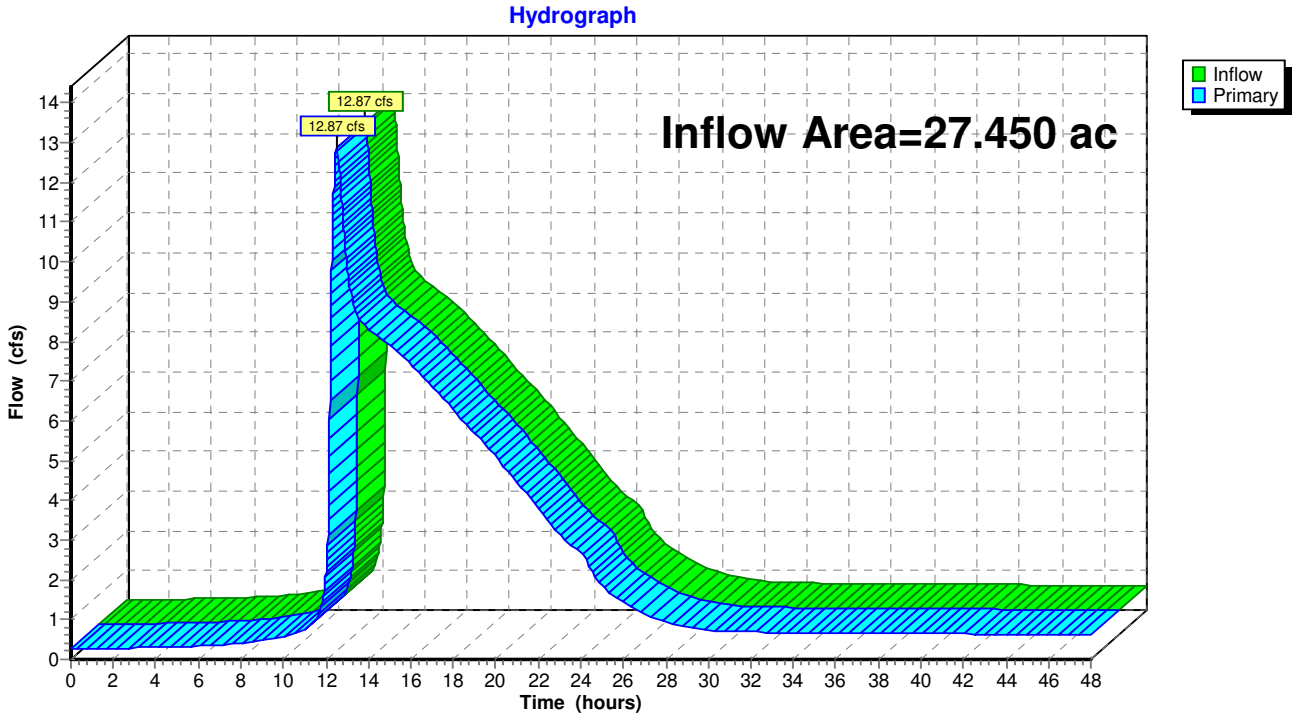
Pond PP2: Water Quality Basin



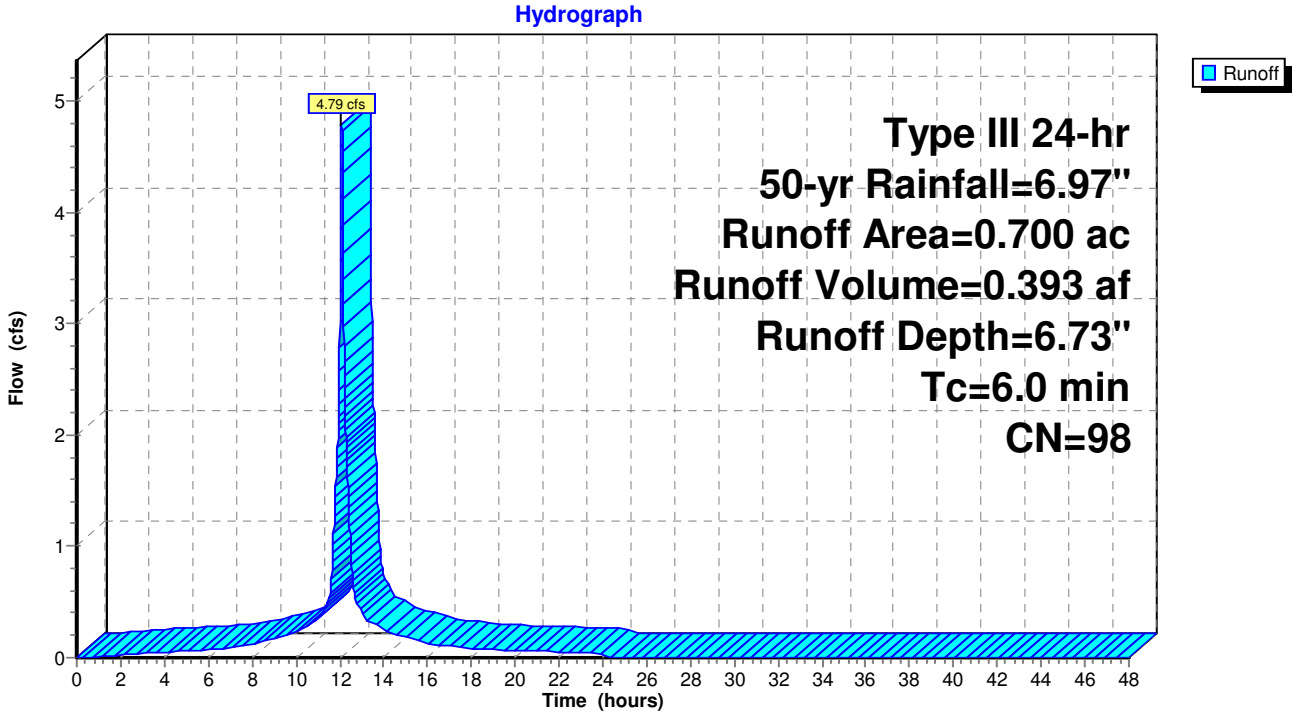
Link 2L: DP2



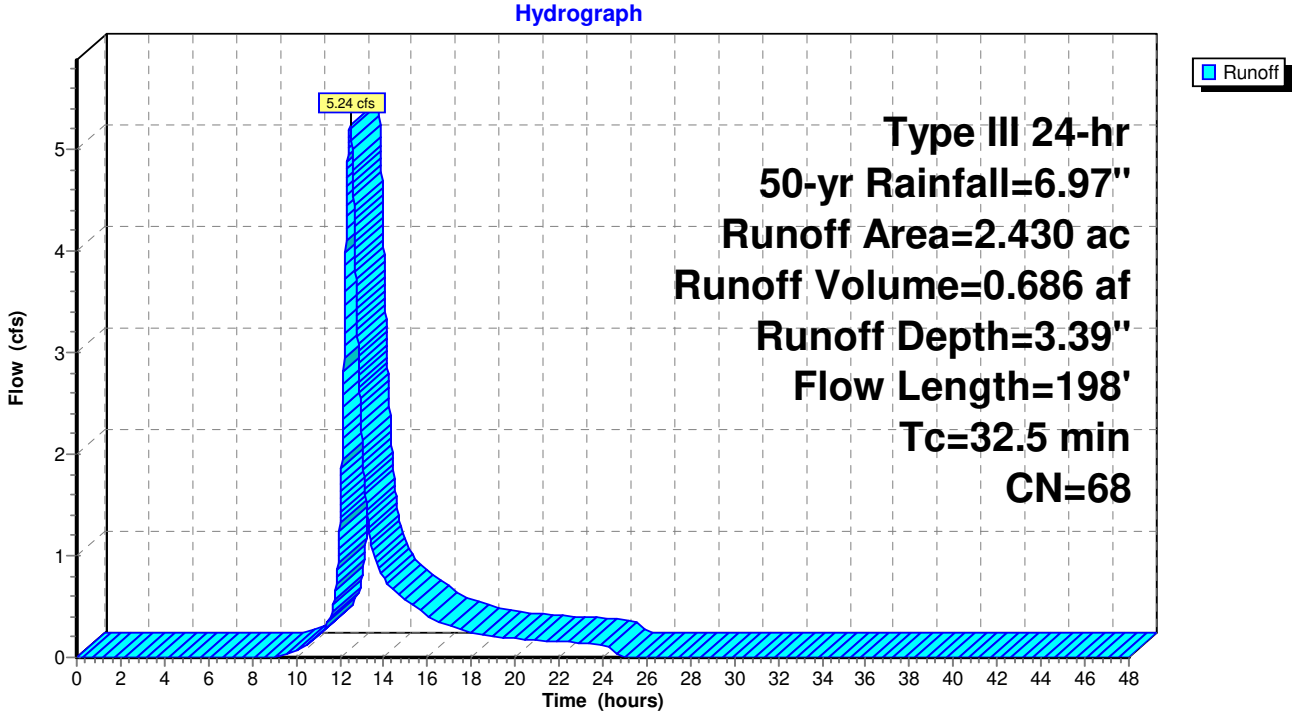
Link DP1: DP1



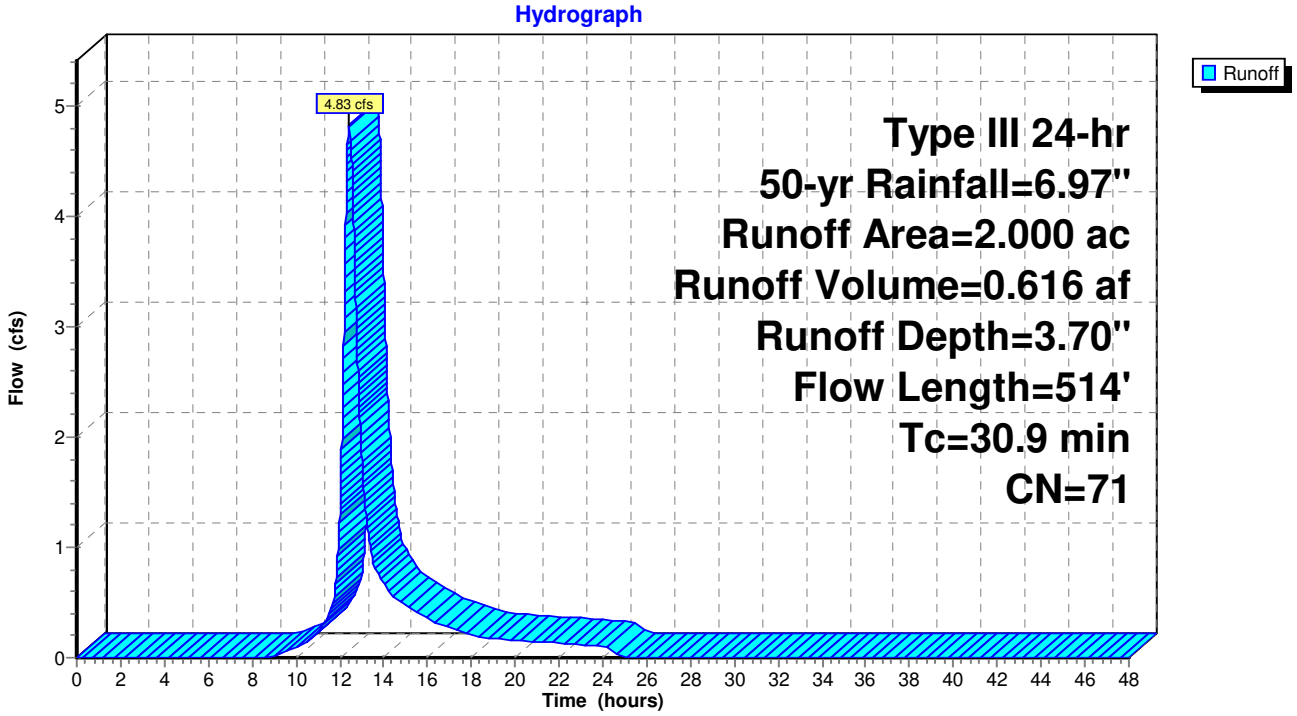
Subcatchment 1S: P10 (RB4)



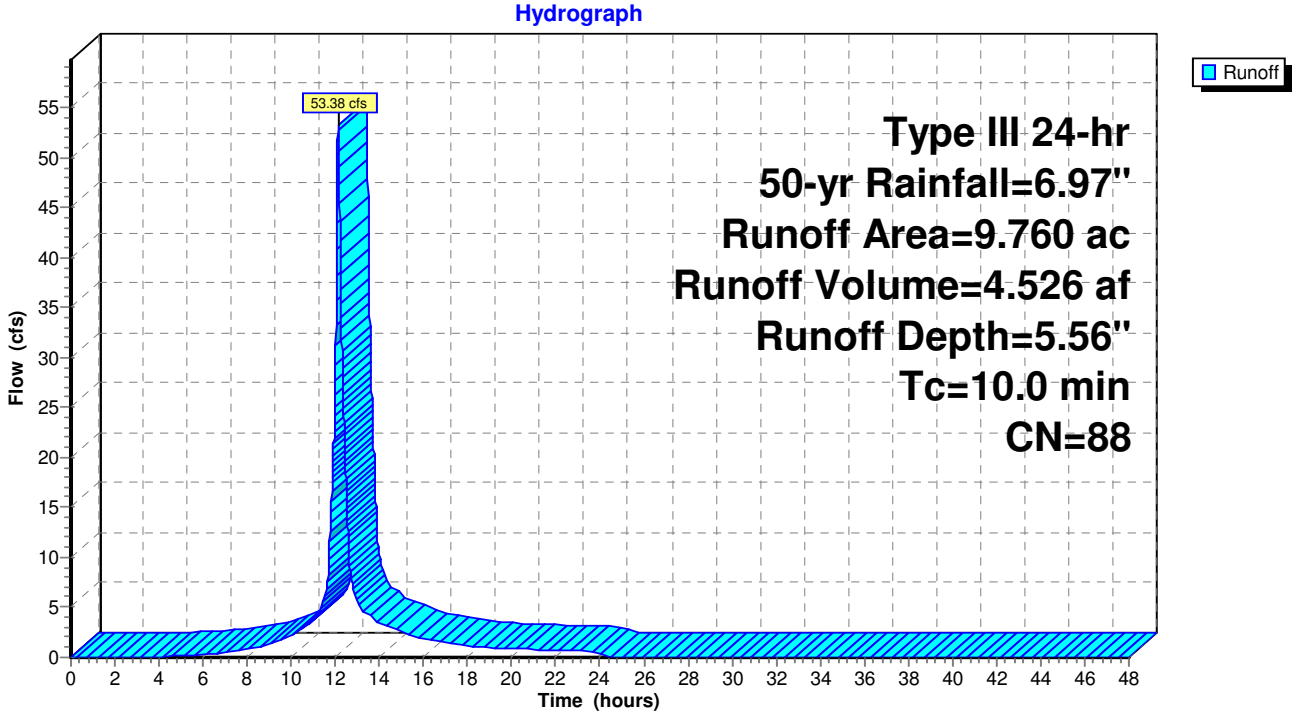
Subcatchment P1: P1 (DP3)



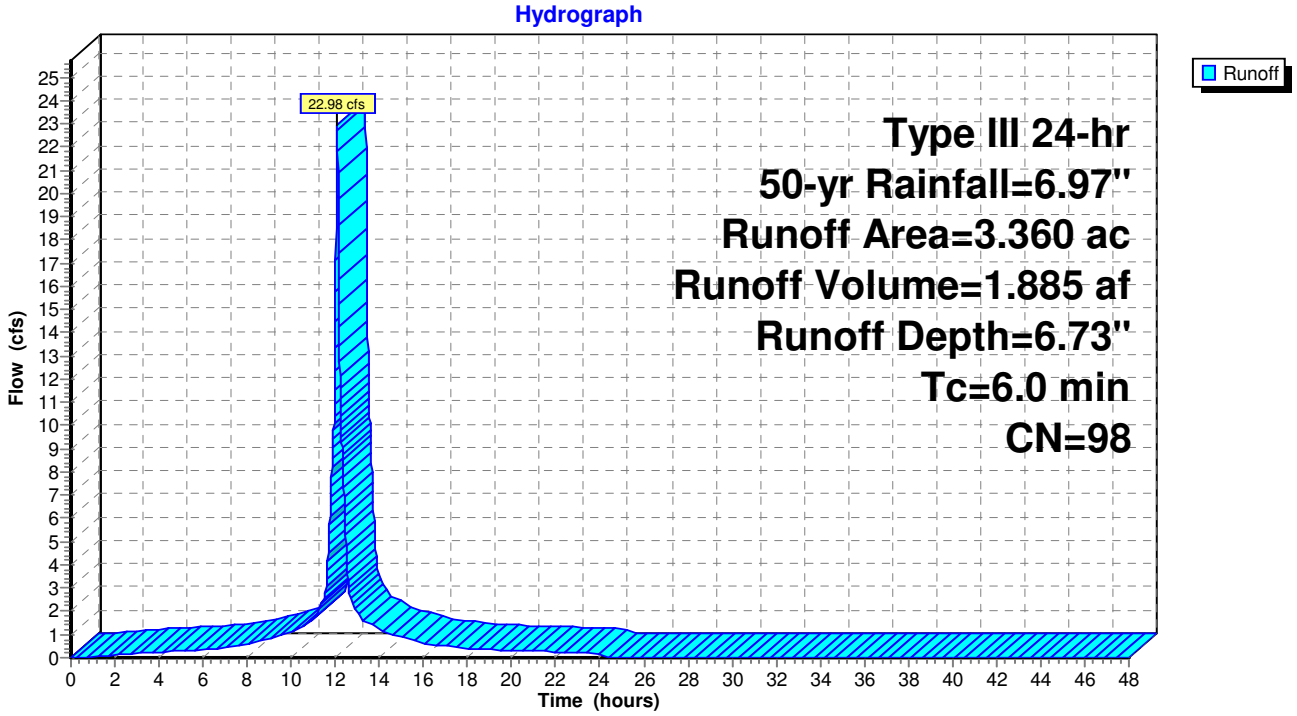
Subcatchment P2: P2



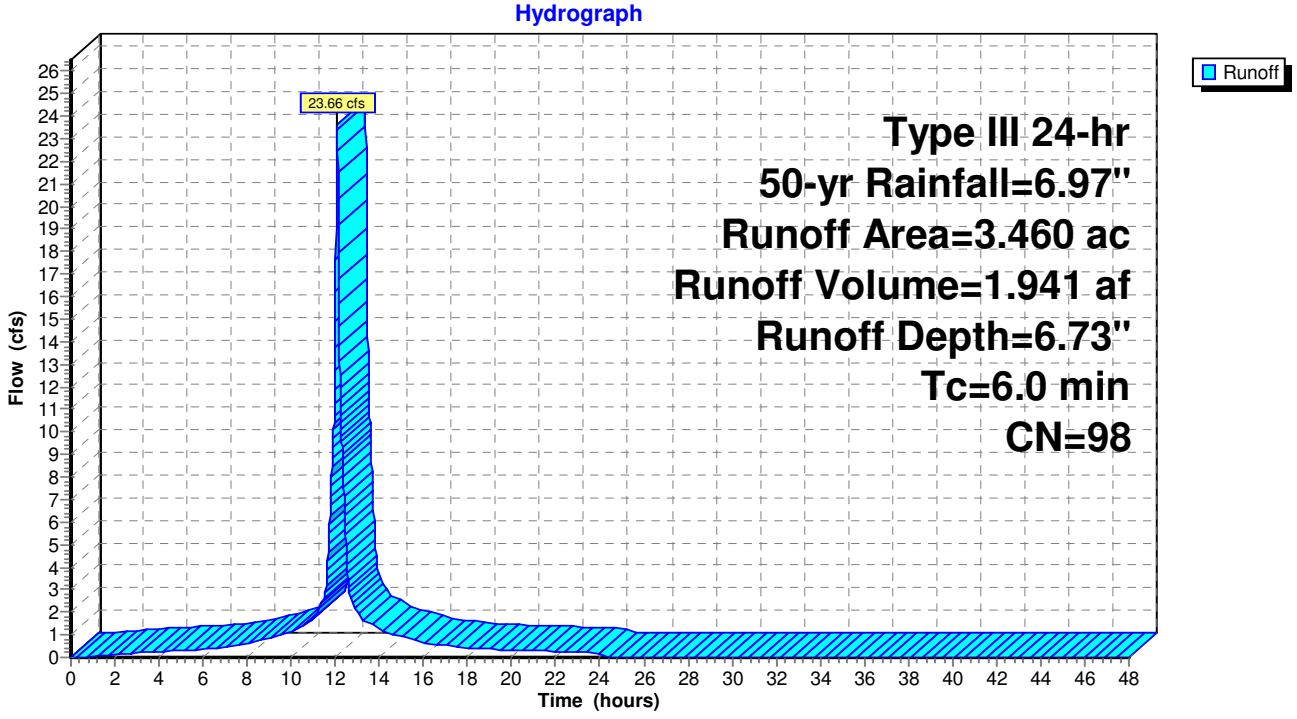
Subcatchment P3: P3



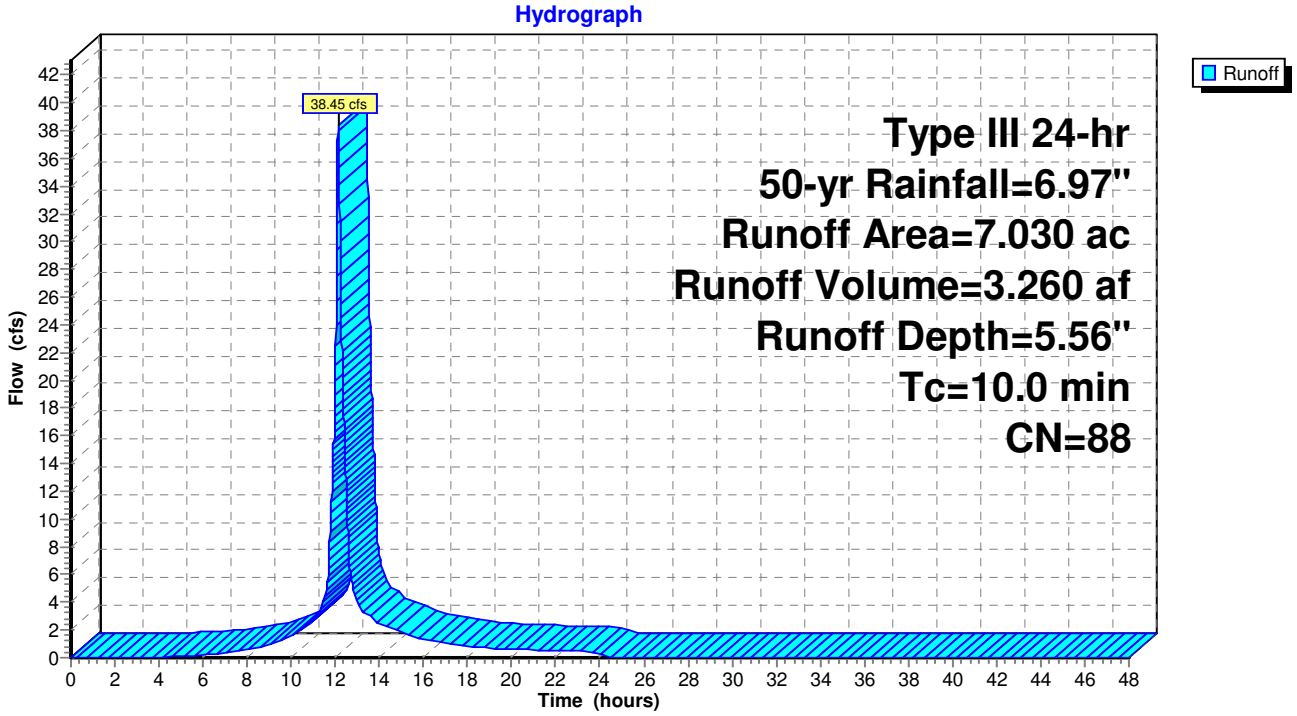
Subcatchment P4: P4



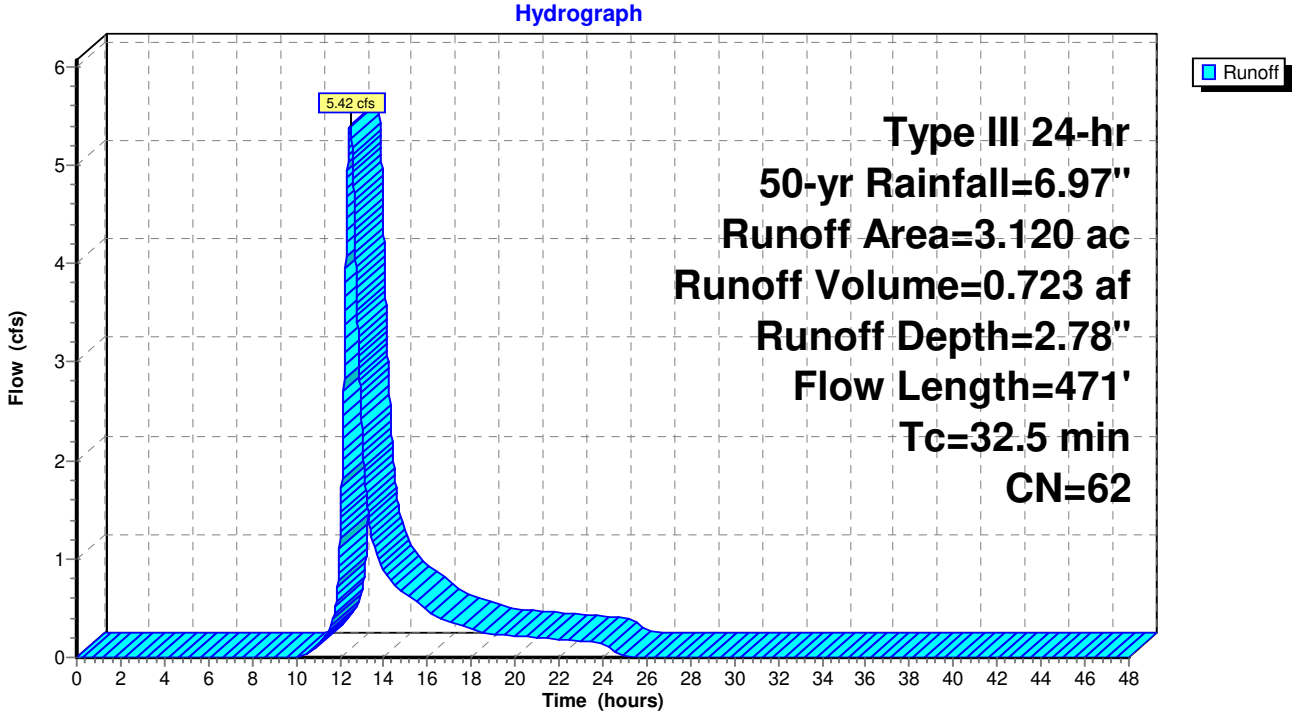
Subcatchment P5: P5



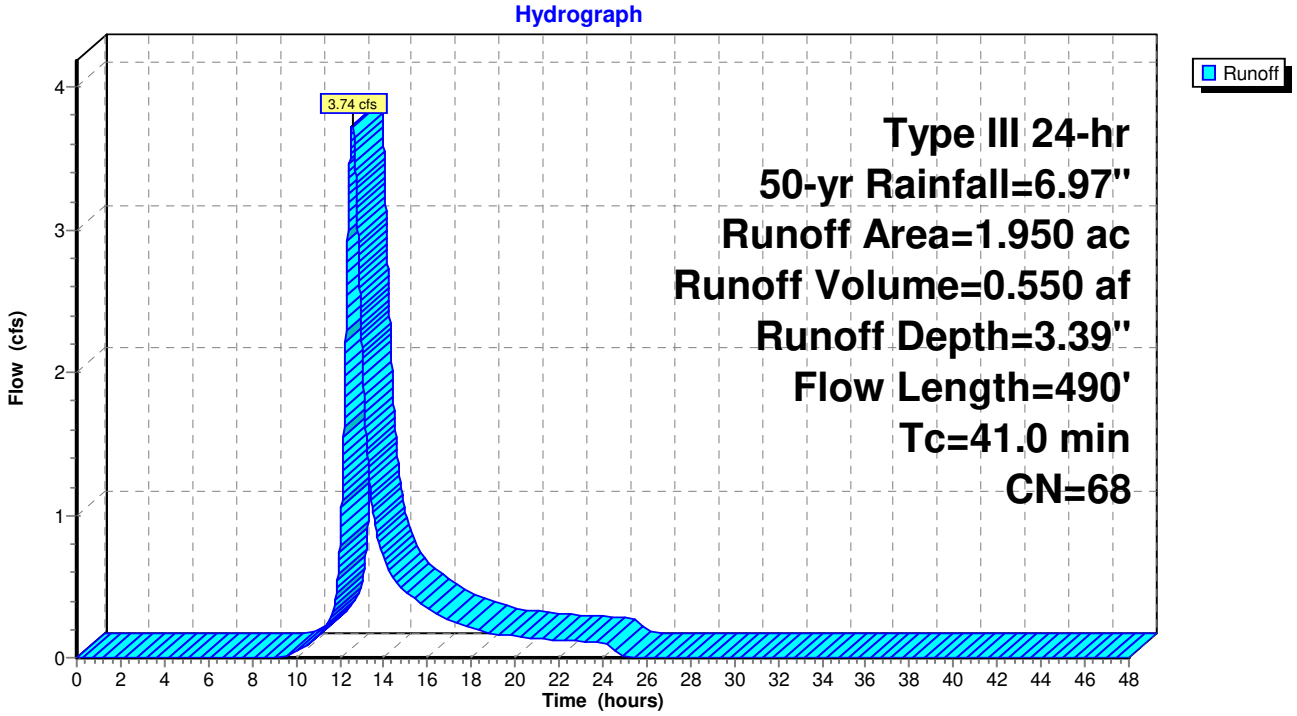
Subcatchment P6: P6



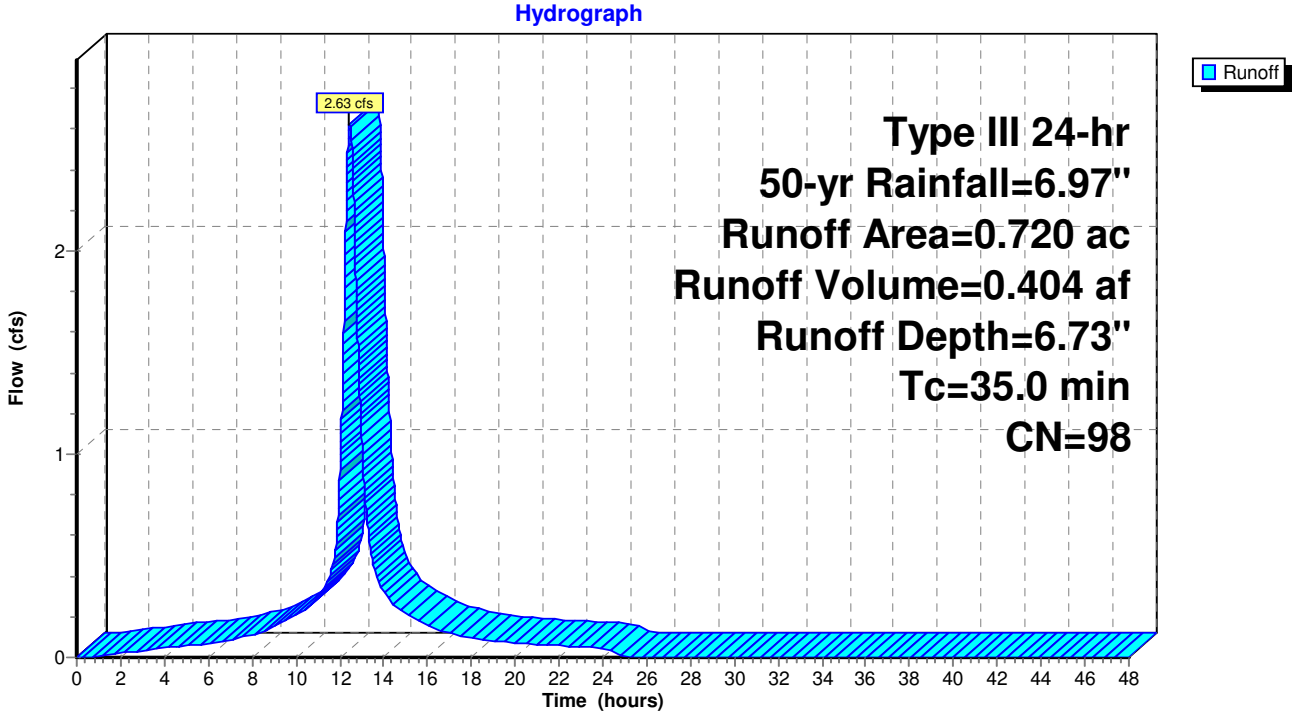
Subcatchment P7: P7



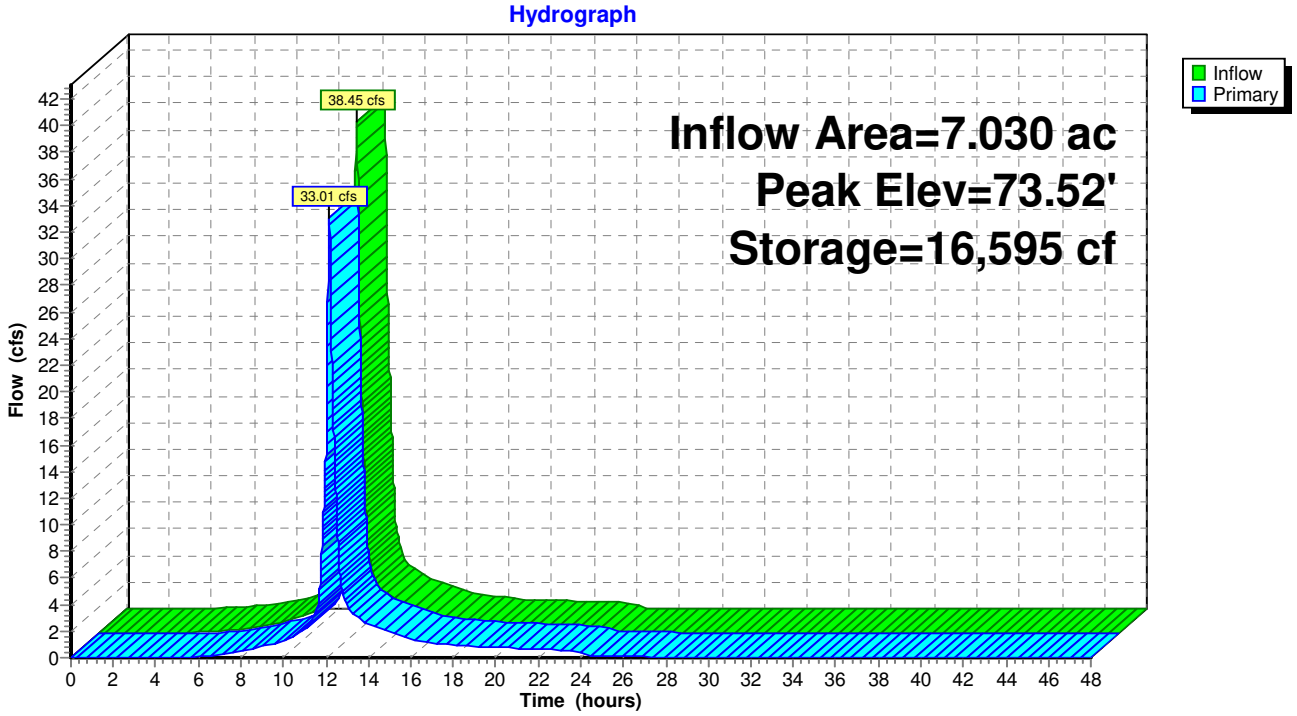
Subcatchment P8: P8 (DP4)



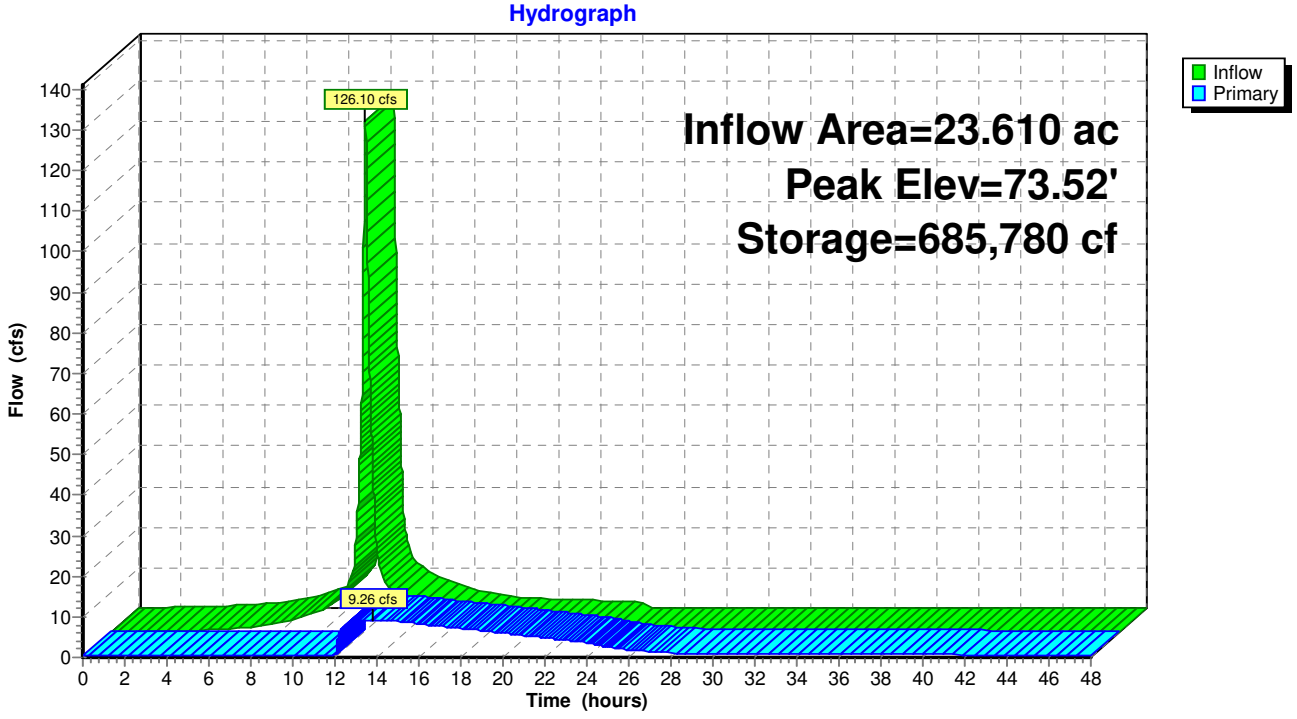
Subcatchment P9: P9



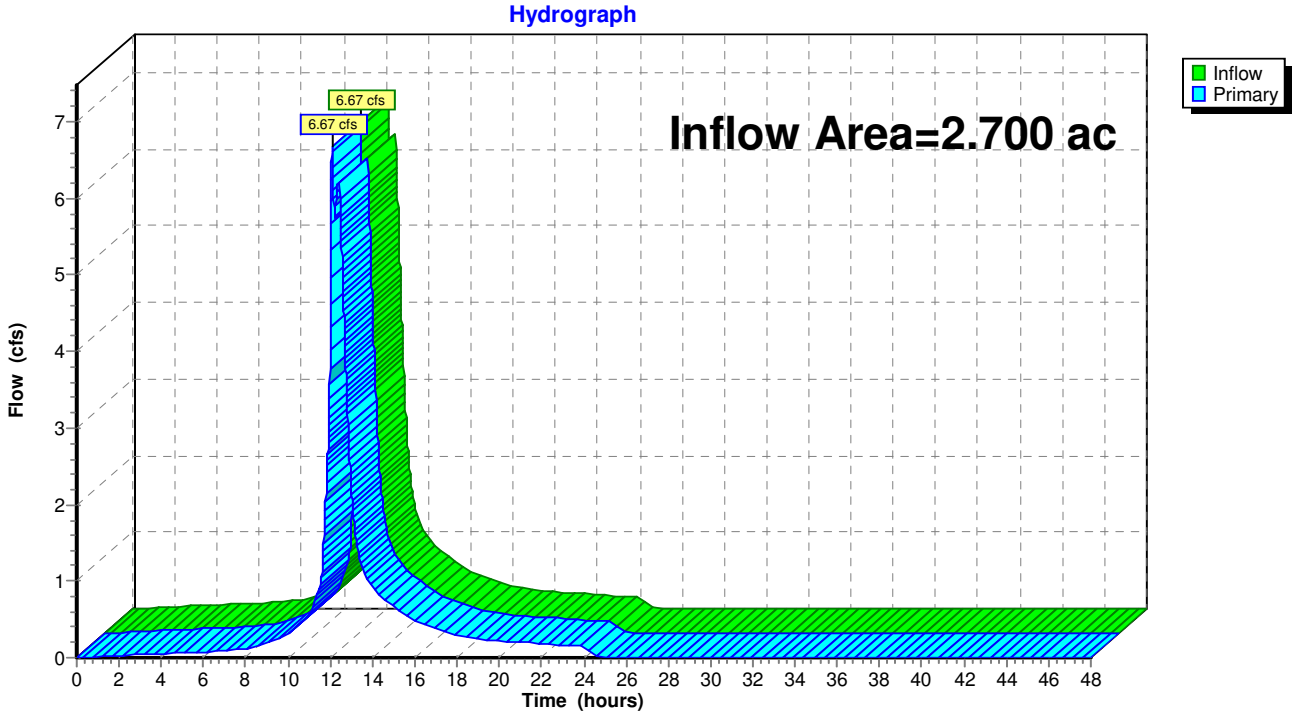
Pond PP1: UG Chambers (CULTEC R-360)



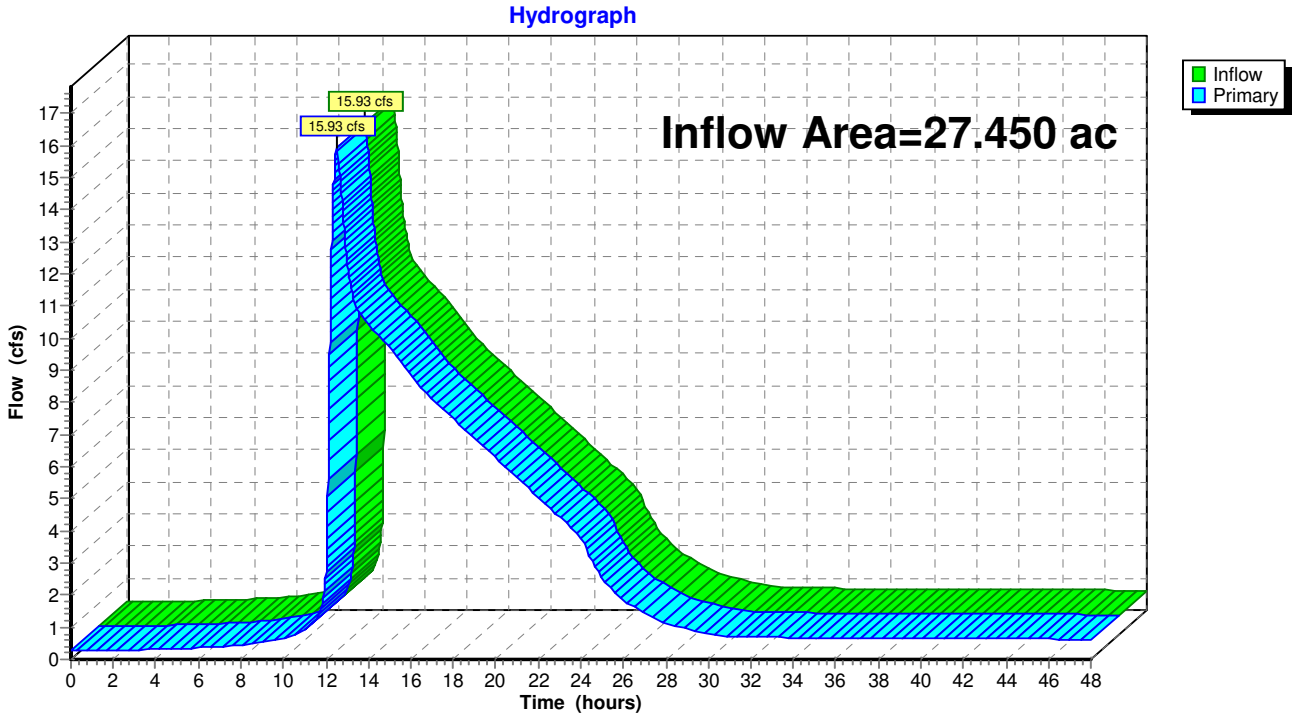
Pond PP2: Water Quality Basin



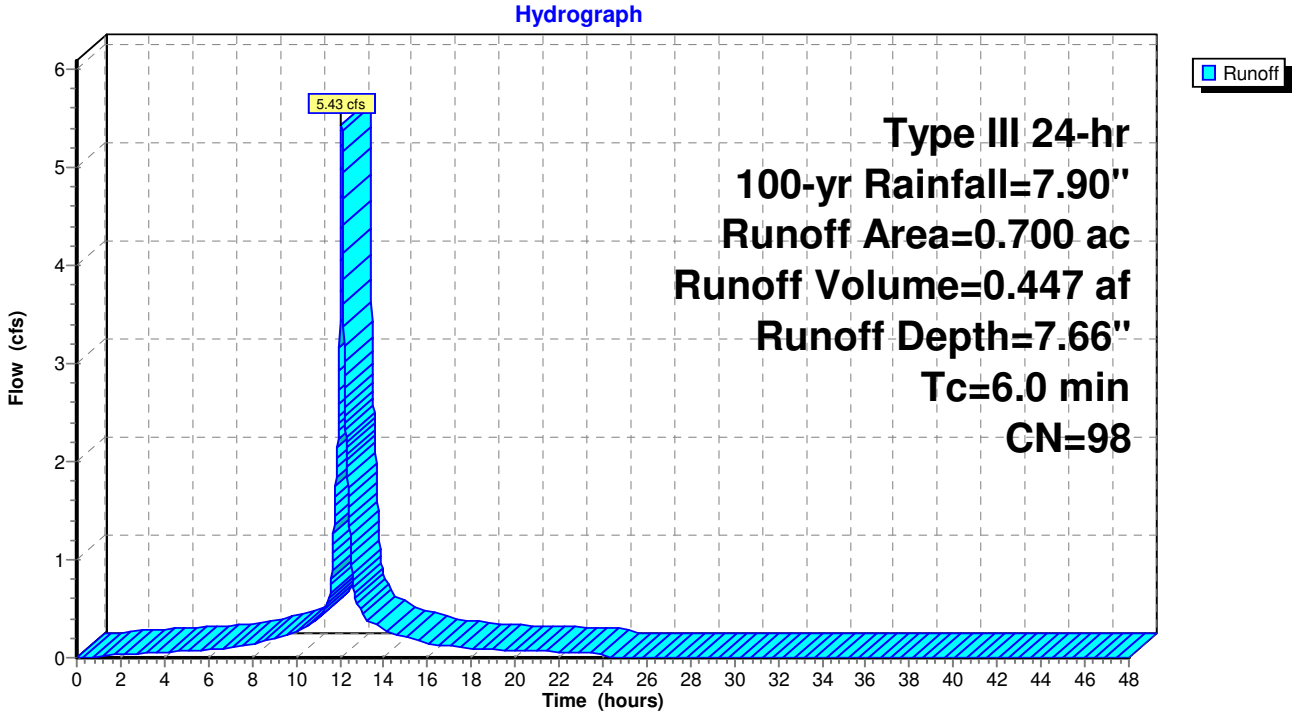
Link 2L: DP2



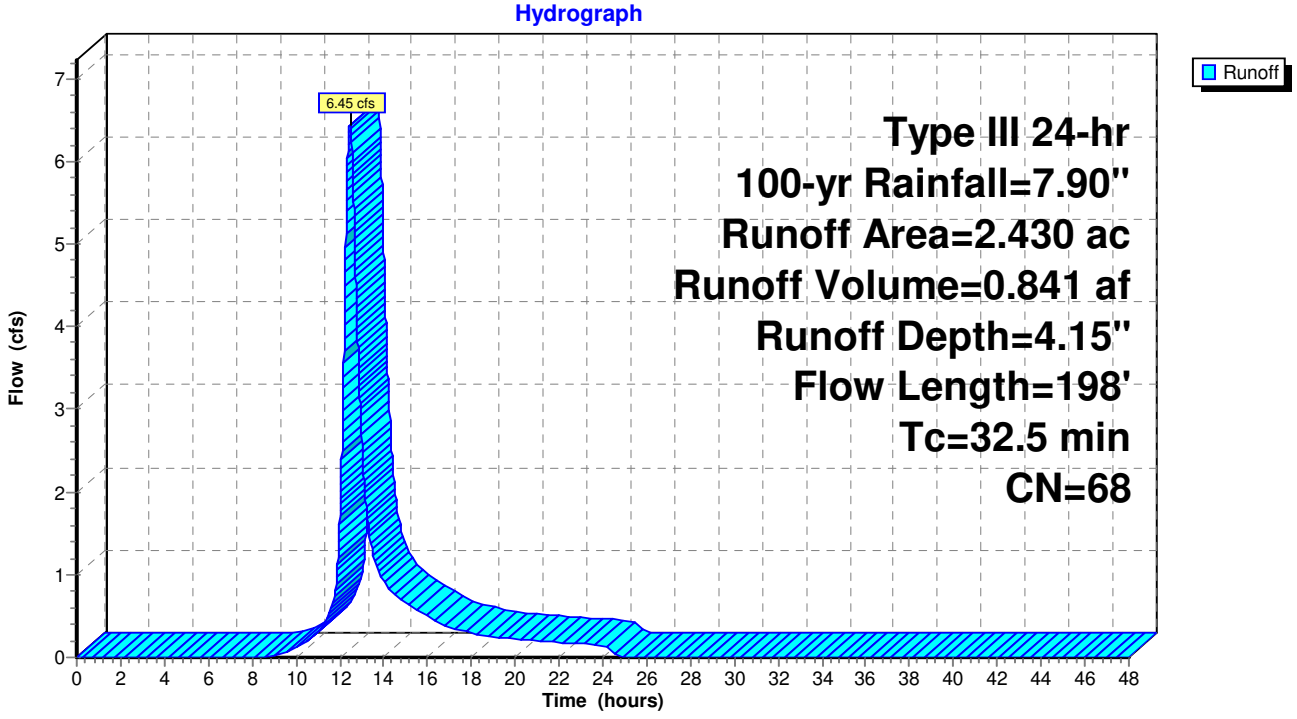
Link DP1: DP1



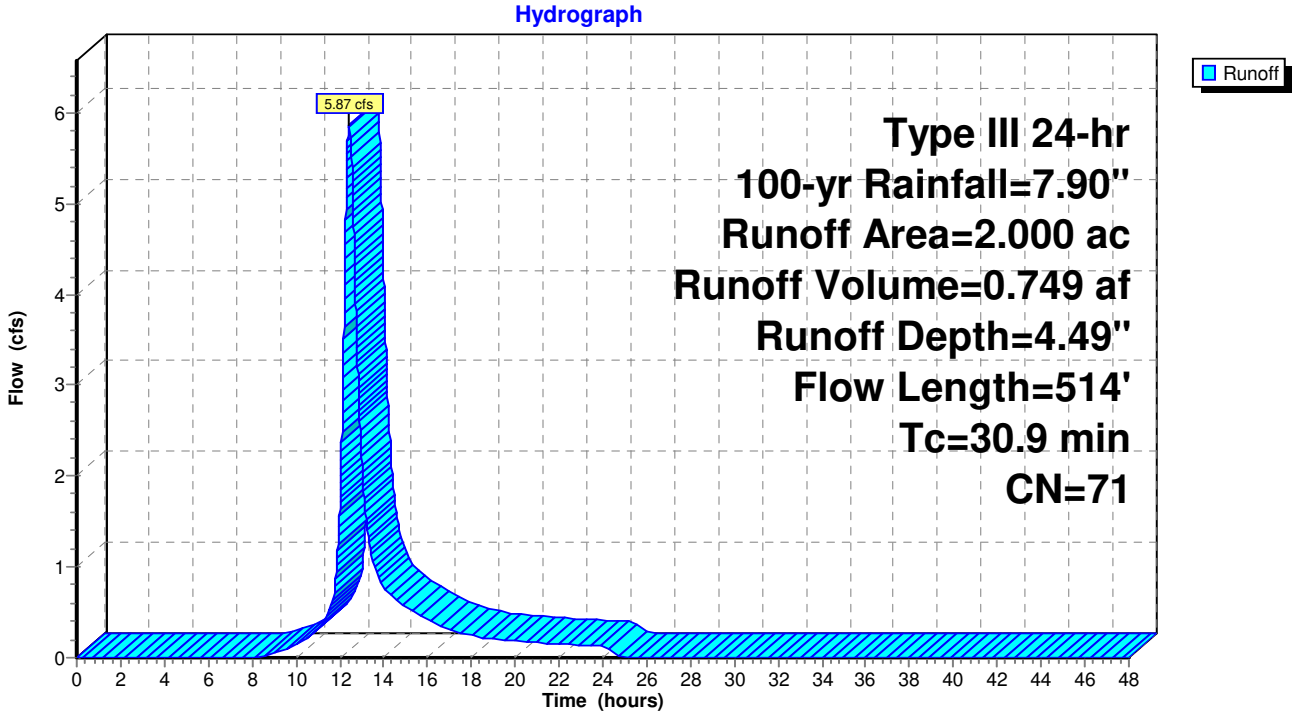
Subcatchment 1S: P10 (RB4)



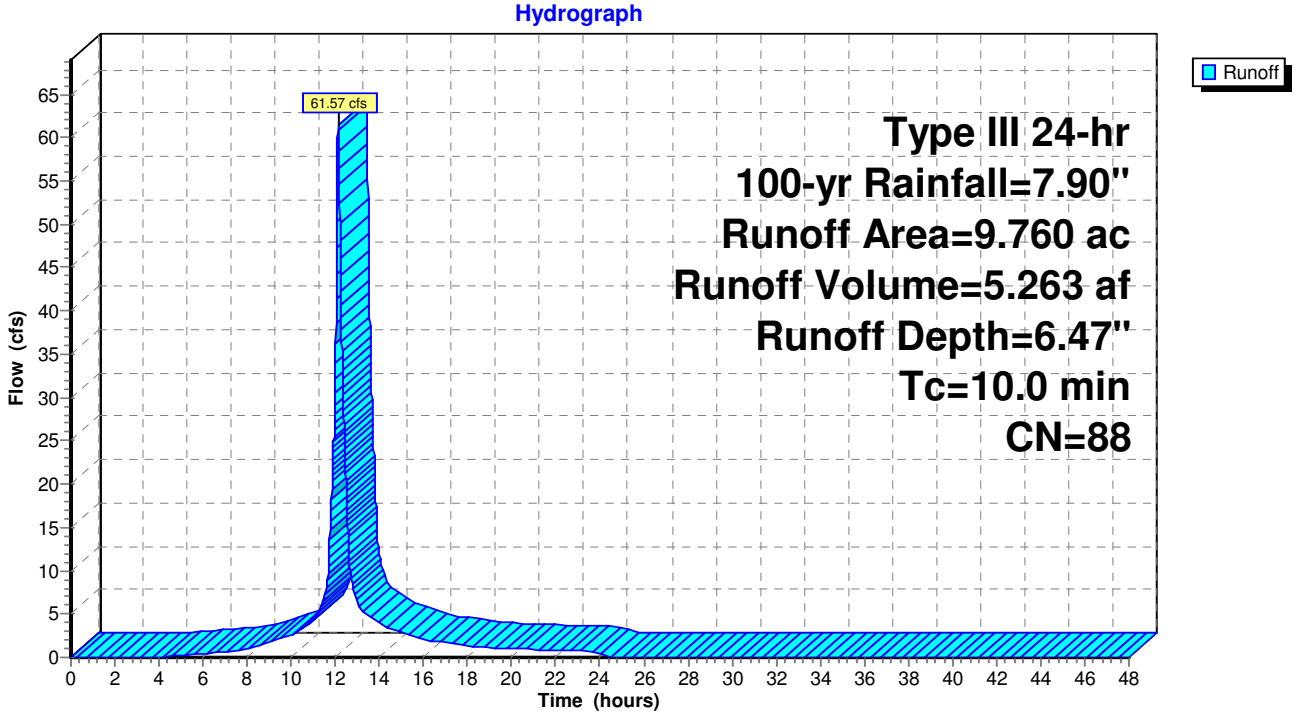
Subcatchment P1: P1 (DP3)



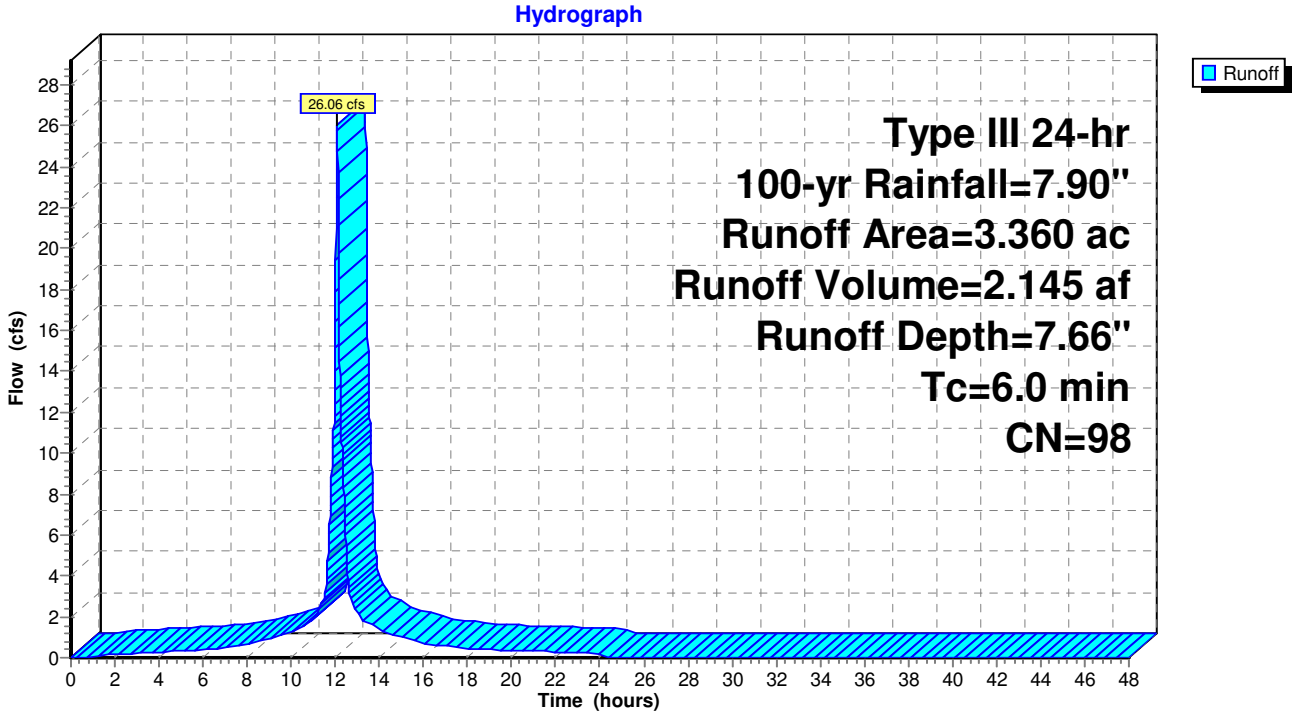
Subcatchment P2: P2



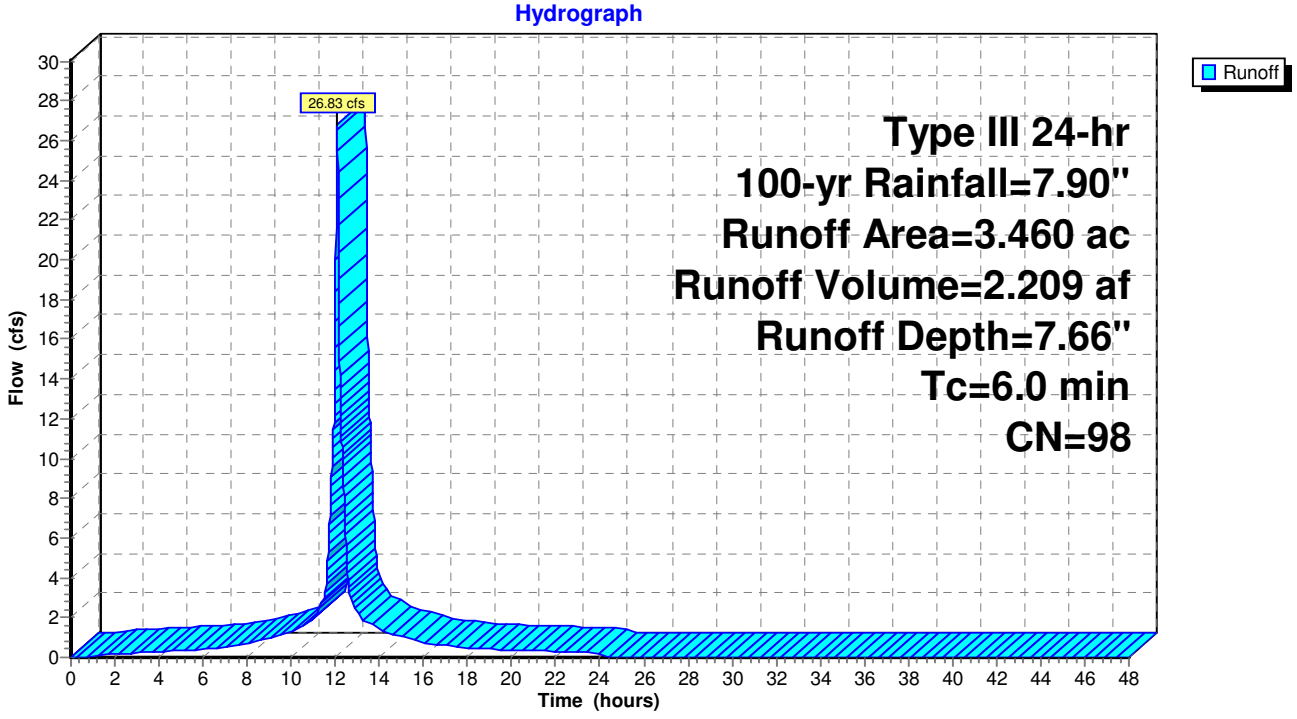
Subcatchment P3: P3



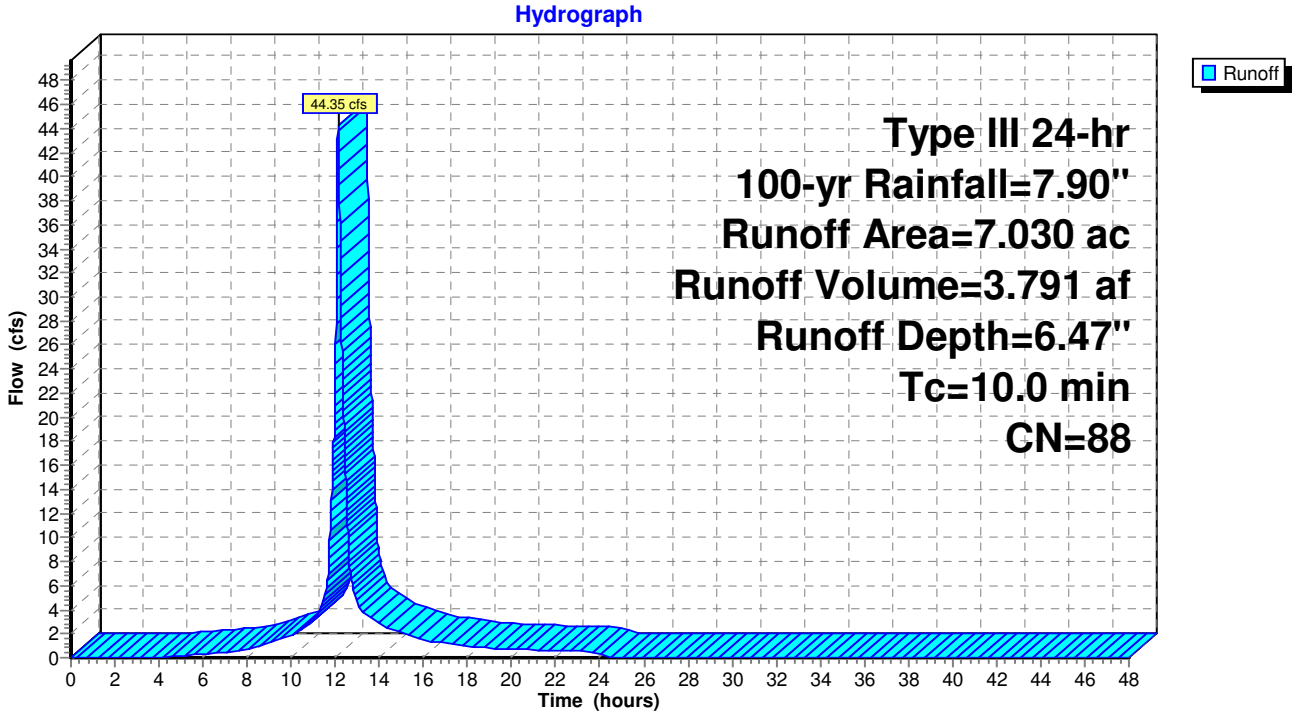
Subcatchment P4: P4



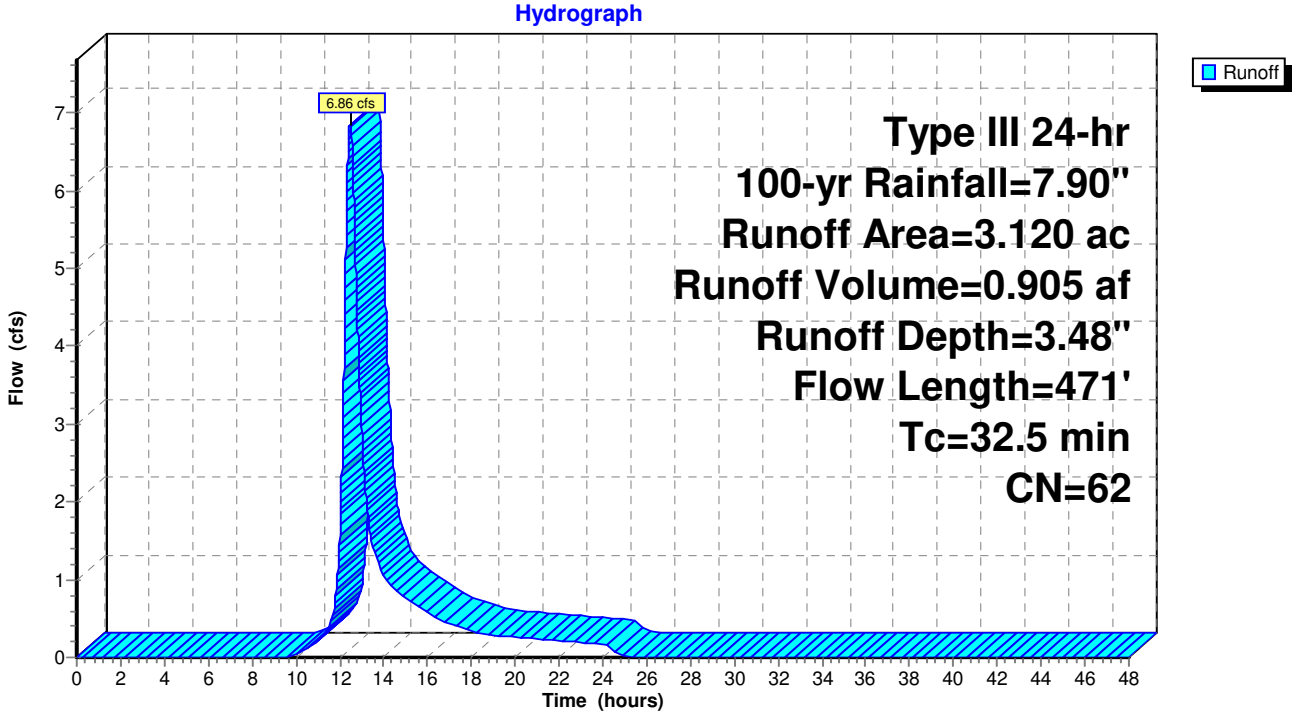
Subcatchment P5: P5



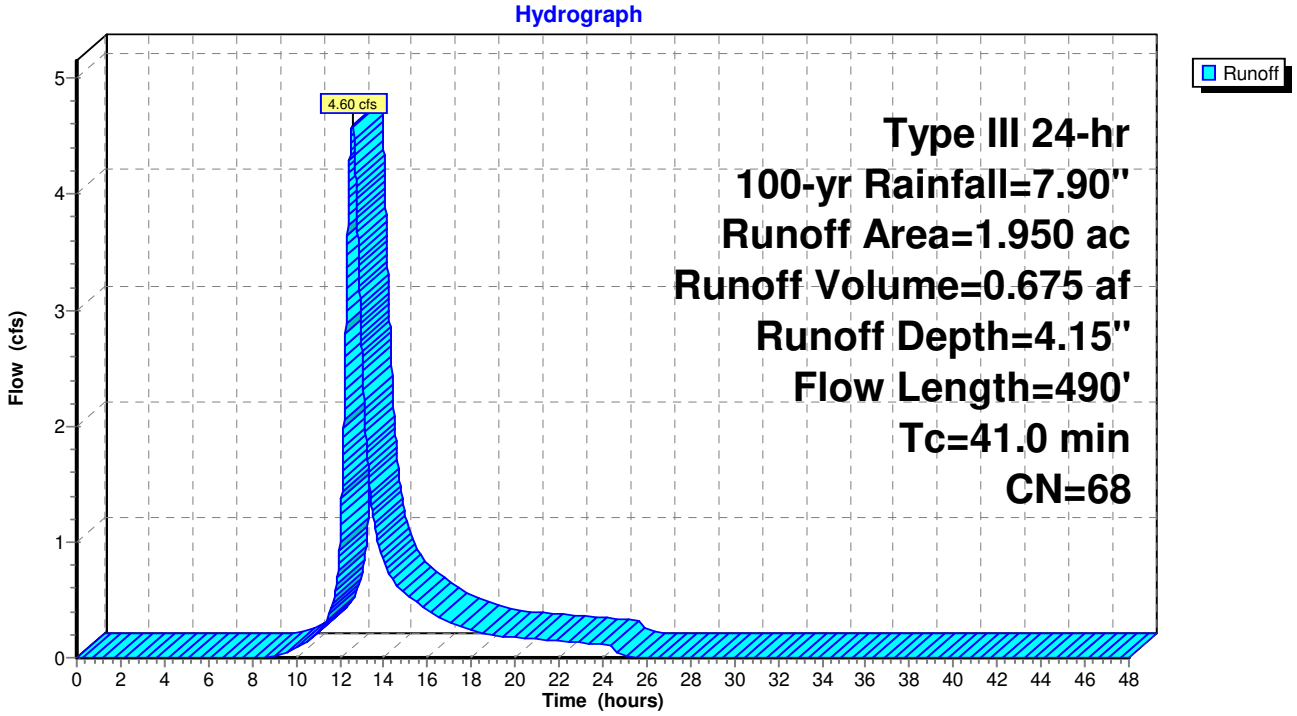
Subcatchment P6: P6



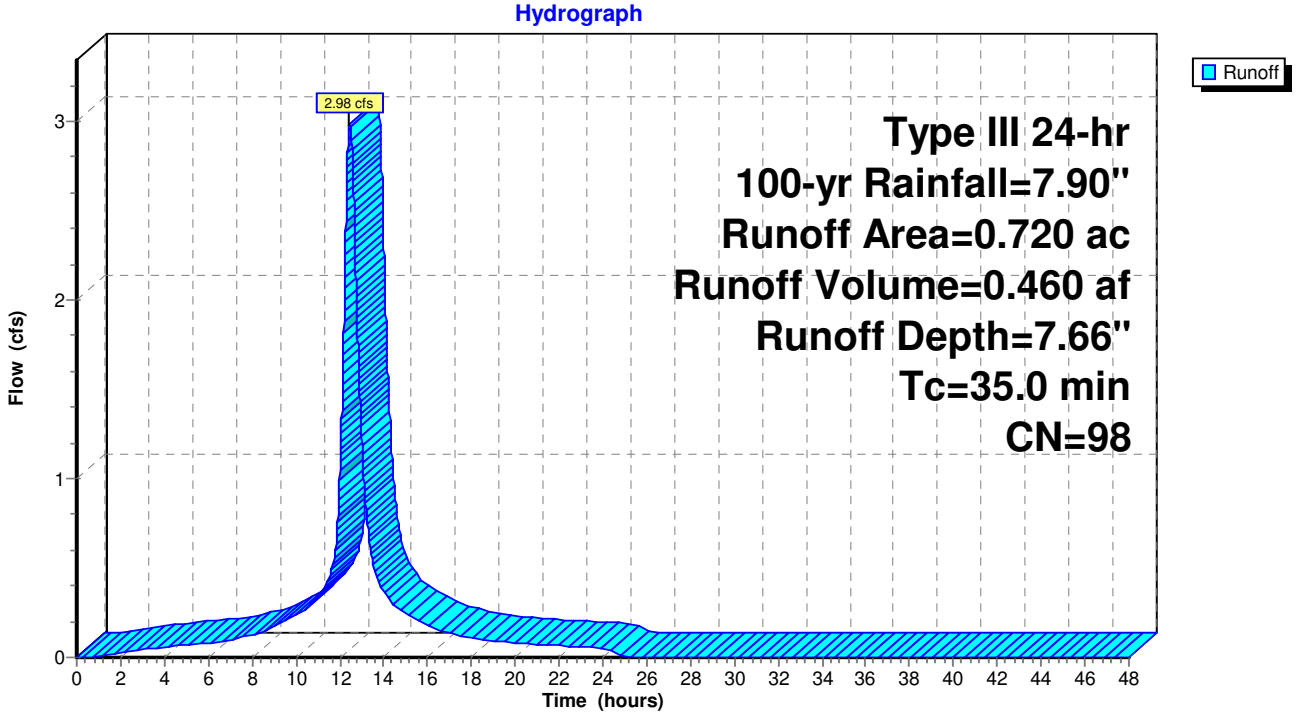
Subcatchment P7: P7



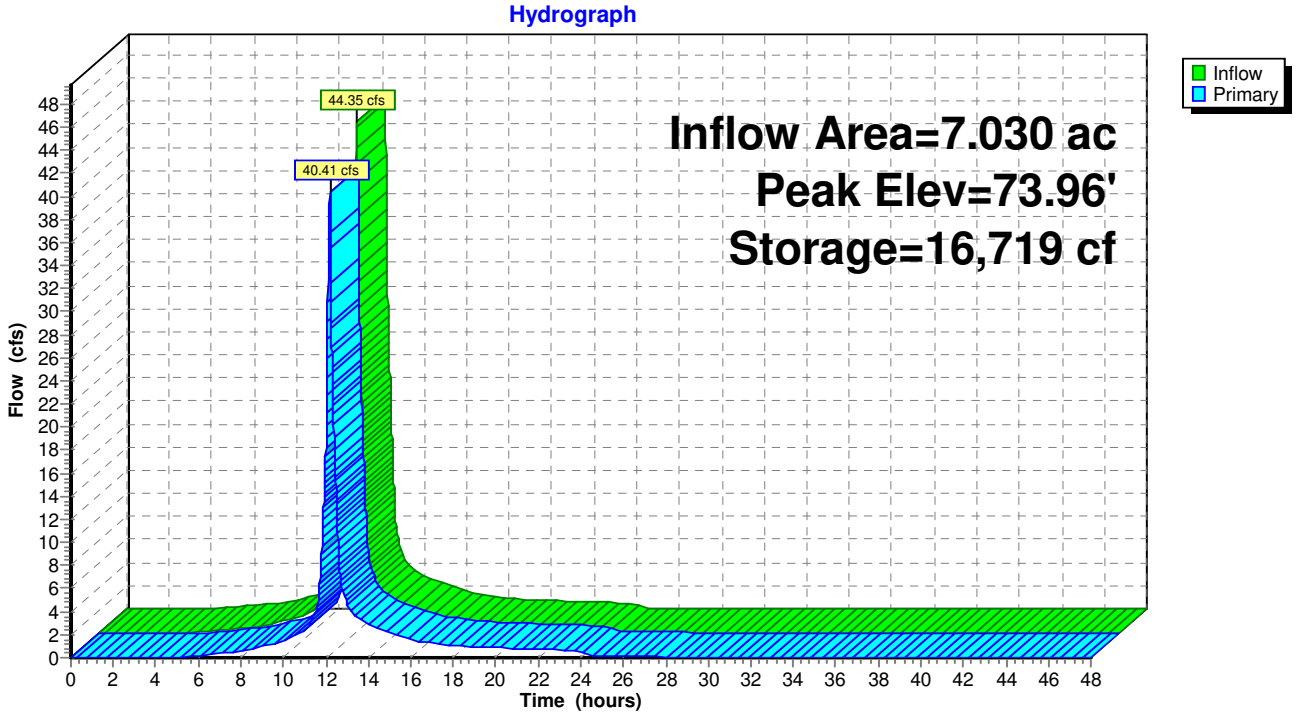
Subcatchment P8: P8 (DP4)



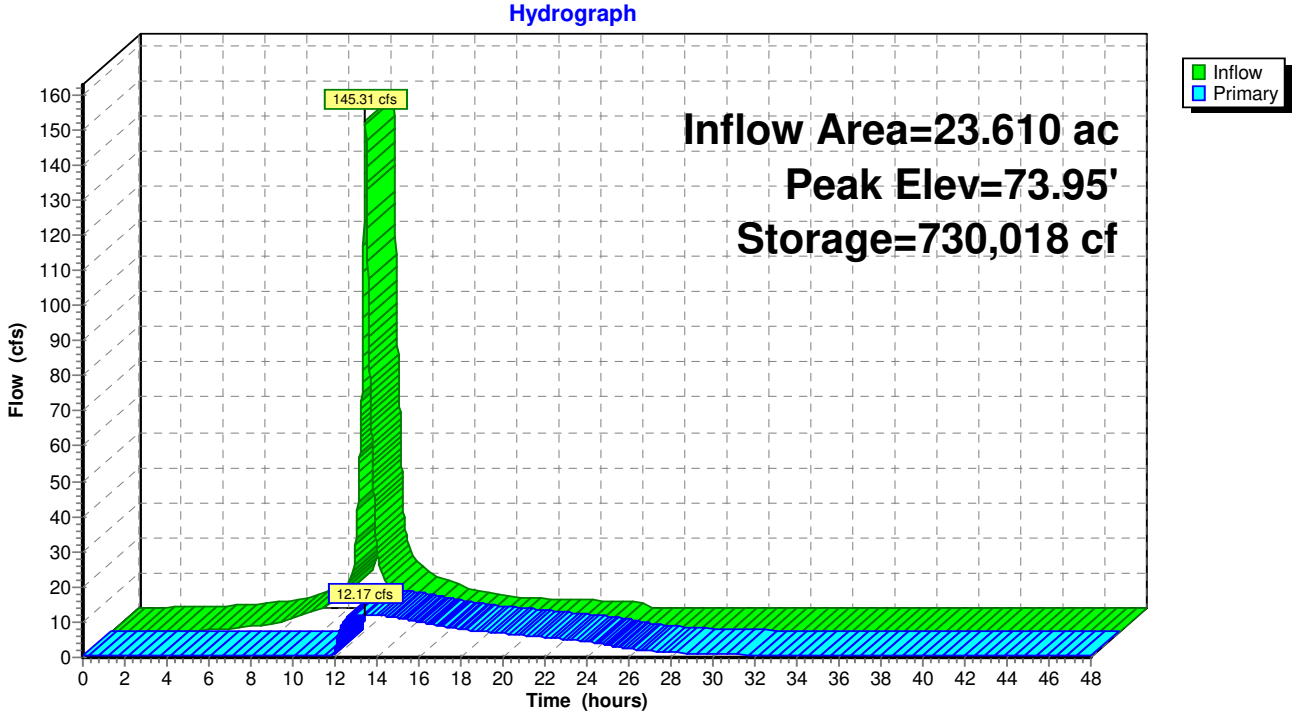
Subcatchment P9: P9



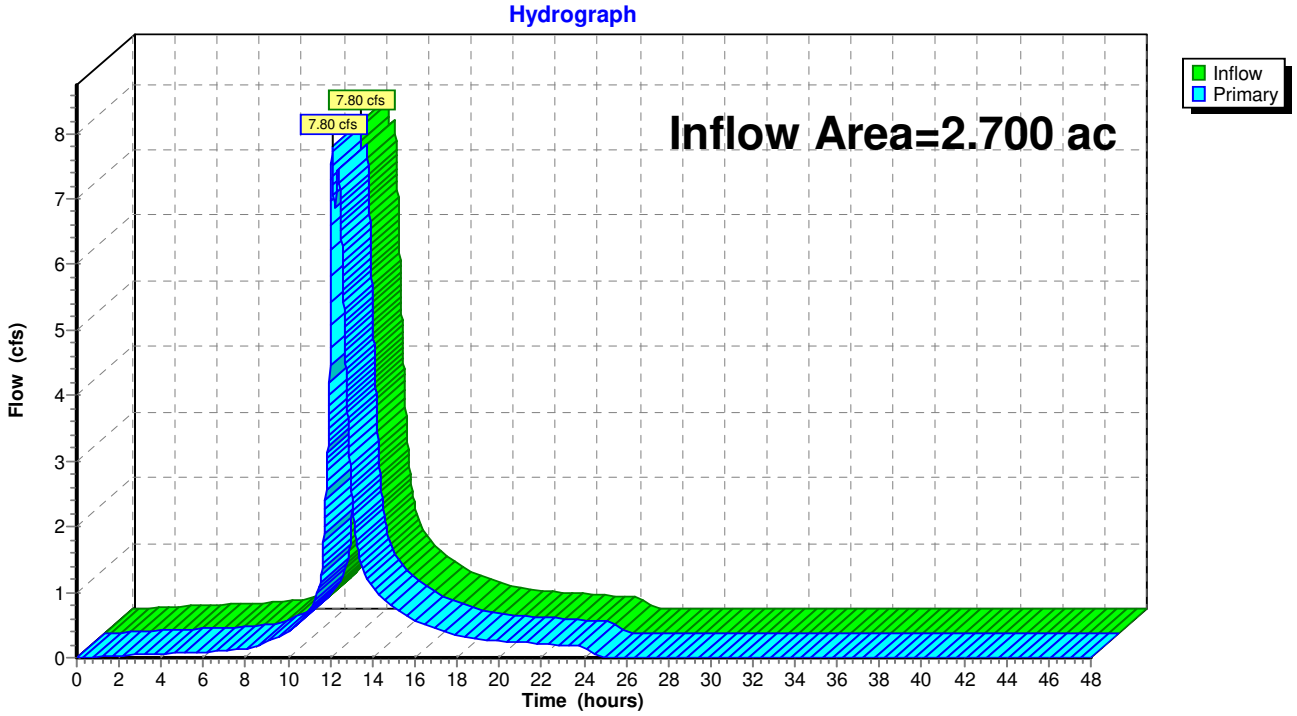
Pond PP1: UG Chambers (CULTEC R-360)



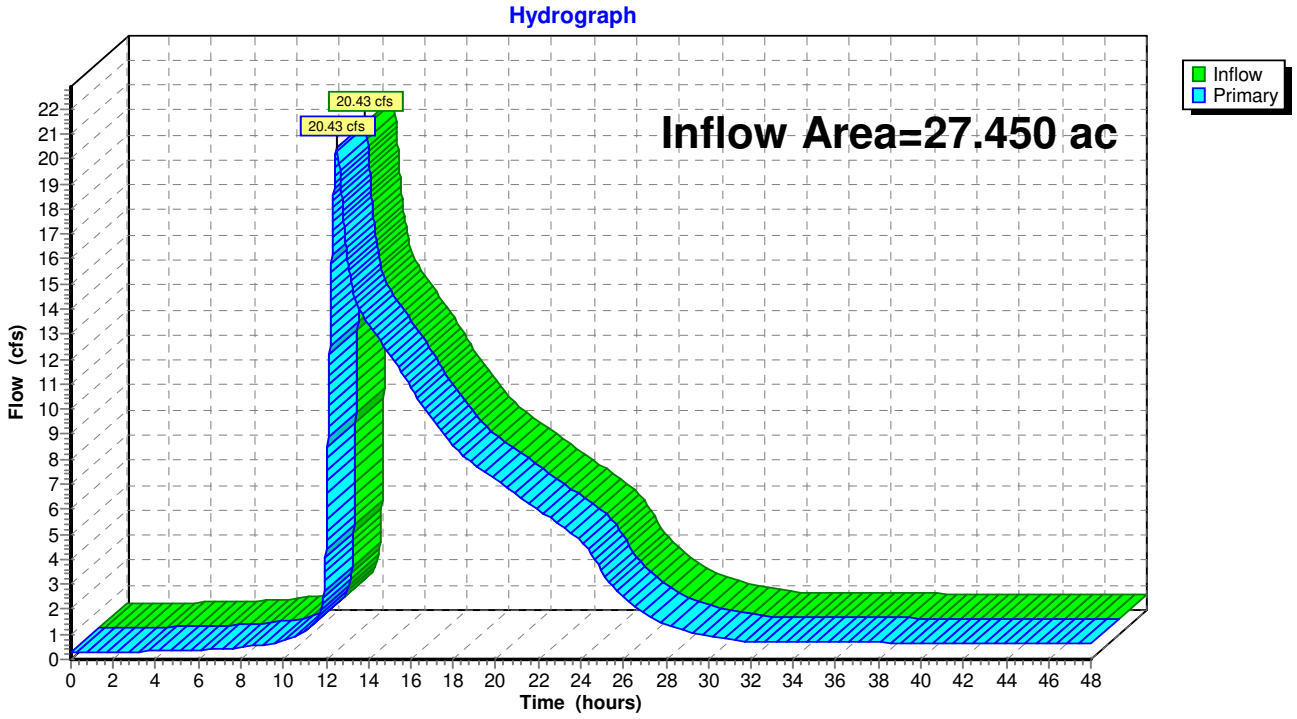
Pond PP2: Water Quality Basin



Link 2L: DP2



Link DP1: DP1



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

Inflow Area = 7.030 ac, 68.42% Impervious, Inflow Depth = 6.47" for 100-yr event
Inflow = 44.35 cfs @ 12.14 hrs, Volume= 3.791 af
Outflow = 40.41 cfs @ 12.19 hrs, Volume= 3.636 af, Atten= 9%, Lag= 3.2 min
Primary = 40.41 cfs @ 12.19 hrs, Volume= 3.636 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 70.15' Surf.Area= 6,813 sf Storage= 1,846 cf
Peak Elev= 73.96' @ 13.39 hrs Surf.Area= 6,861 sf Storage= 16,719 cf (14,872 cf above start)

Plug-Flow detention time= 90.1 min calculated for 3.593 af (95% of inflow)
Center-of-Mass det. time= 55.8 min (842.0 - 786.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	69.56'	3,505 cf	**7.00'W x 484.83'L x 4.00'H Field A** 13,575 cf Overall - 4,813 cf Embedded = 8,762 cf x 40.0% Voids
#2A	70.06'	4,813 cf	**Cultec R-360HD** x 131 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	69.56'	3,531 cf	**7.00'W x 488.50'L x 4.00'H Field B** 13,678 cf Overall - 4,850 cf Embedded = 8,828 cf x 40.0% Voids
#4B	70.06'	4,850 cf	**Cultec R-360HD** x 132 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	73.56'	45 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#6	74.50'	1,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		18,652 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)
73.56	48	0	0
74.50	48	45	45

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.50	5	0	0
75.00	422	107	107
76.00	3,180	1,801	1,908

Device	Routing	Invert	Outlet Devices
#1	Primary	70.15'	**30.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.15' / 70.11' S= 0.0080 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

#2	Primary	70.15'	**30.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 70.15' / 70.00' S= 0.0038 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=38.76 cfs @ 12.19 hrs HW=73.64' TW=72.97' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 19.38 cfs @ 3.95 fps)
└─**2=Culvert** (Inlet Controls 19.38 cfs @ 3.95 fps)

Summary for Pond PP2: Water Quality Basin

Inflow Area = 23.610 ac, 76.87% Impervious, Inflow Depth > 6.74" for 100-yr event
Inflow = 145.31 cfs @ 12.12 hrs, Volume= 13.252 af
Outflow = 12.17 cfs @ 13.41 hrs, Volume= 10.634 af, Atten= 92%, Lag= 77.5 min
Primary = 12.17 cfs @ 13.41 hrs, Volume= 10.634 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 70.00' Surf.Area= 73,658 sf Storage= 381,019 cf
Peak Elev= 73.95' @ 13.41 hrs Surf.Area= 103,162 sf Storage= 730,018 cf (348,998 cf above start)

Plug-Flow detention time= 1,474.7 min calculated for 1.887 af (14% of inflow)
Center-of-Mass det. time= 396.2 min (1,183.0 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	956,853 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	21,077	0	0	21,077
62.00	24,085	22,564	22,564	24,132
63.00	27,233	25,643	48,207	27,331
64.00	36,998	31,991	80,198	37,116
65.00	40,596	38,783	118,981	40,781
66.00	44,283	42,426	161,407	44,540
67.00	48,018	46,138	207,545	48,352
68.00	50,712	49,359	256,904	51,158
69.00	62,108	56,314	313,218	62,585
70.00	73,658	67,801	381,019	74,172
72.00	88,475	161,907	542,926	89,126
74.00	103,518	191,796	734,722	104,328
76.00	118,788	222,131	956,853	119,780

Device	Routing	Invert	Outlet Devices
#1	Primary	69.59'	**24.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.59' / 69.25' S= 0.0052 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	69.59'	**7.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	71.85'	**38.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	73.20'	**14.0" W x 11.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=12.17 cfs @ 13.41 hrs HW=73.95' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 12.17 cfs of 27.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.97 cfs @ 9.96 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 8.74 cfs @ 6.63 fps)
  └─**4=Orifice/Grate** (Orifice Controls 2.45 cfs @ 2.79 fps)

Attachment B
(In Place of July 2, 2021 Report Appendix D)
Storm Sewer Analysis Results

Subbasin Summary

Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-CB-1	0.26	0.7600	0.73	0.56	0.14	1.19	0 00:07:12
Sub-CB-10	0.48	0.8800	0.68	0.59	0.28	2.83	0 00:06:00
Sub-CB-11	0.20	0.9000	0.68	0.61	0.12	1.19	0 00:06:00
Sub-CB-12	0.52	0.9000	0.68	0.61	0.32	3.15	0 00:06:00
Sub-CB-13	0.44	0.4400	0.77	0.34	0.15	1.14	0 00:07:48
Sub-CB-14 (double type ii)	0.52	0.5200	0.77	0.40	0.21	1.60	0 00:07:48
Sub-CB-15	0.51	0.8800	0.68	0.59	0.30	3.01	0 00:06:00
Sub-CB-16	0.47	0.8600	0.68	0.58	0.27	2.71	0 00:06:00
Sub-CB-17	0.22	0.9000	0.68	0.61	0.13	1.31	0 00:06:00
Sub-CB-18 (DOUBLE TYPE II)	0.88	0.6900	0.77	0.53	0.46	3.55	0 00:07:48
Sub-CB-19 (double type ii)	0.43	0.6900	0.73	0.51	0.22	1.83	0 00:07:12
Sub-CB-2	0.48	0.7900	0.73	0.58	0.28	2.33	0 00:07:12
Sub-CB-22	0.45	0.7700	0.73	0.56	0.25	2.12	0 00:07:12
Sub-CB-23 (double type ii)	0.31	0.5900	0.77	0.45	0.14	1.09	0 00:07:48
Sub-CB-24 (double type ii)	0.34	0.5800	0.77	0.44	0.15	1.17	0 00:07:48
Sub-CB-3	0.49	0.7500	0.73	0.55	0.27	2.23	0 00:07:12
Sub-CB-4	0.24	0.8500	0.68	0.57	0.14	1.37	0 00:06:00
Sub-CB-5	0.51	0.9000	0.68	0.61	0.31	3.09	0 00:06:00
Sub-CB-6	0.52	0.9000	0.68	0.61	0.32	3.16	0 00:06:00
Sub-CB-7	0.61	0.7800	0.73	0.57	0.35	2.93	0 00:07:12
Sub-CB-8 (double type ii)	0.49	0.5300	0.78	0.42	0.20	1.47	0 00:08:24
Sub-CB-9	0.34	0.6700	0.73	0.49	0.16	1.38	0 00:07:12
Sub-RA1	0.36	0.9000	0.68	0.61	0.22	2.19	0 00:06:00
Sub-RA2	0.74	0.9000	0.68	0.61	0.45	4.48	0 00:06:00
Sub-RA3	0.75	0.9000	0.68	0.61	0.46	4.58	0 00:06:00
Sub-RA4	0.69	0.9000	0.68	0.61	0.42	4.21	0 00:06:00
Sub-RA6	0.48	0.9000	0.68	0.61	0.29	2.90	0 00:06:00
Sub-RA7	0.42	0.9000	0.68	0.61	0.26	2.57	0 00:06:00
Sub-RB1	0.34	0.9000	0.68	0.61	0.21	2.08	0 00:06:00
Sub-RB2	0.71	0.9000	0.68	0.61	0.43	4.33	0 00:06:00
Sub-RB3	0.73	0.9000	0.68	0.61	0.44	4.43	0 00:06:00
Sub-RB4	0.70	0.9000	0.68	0.61	0.43	4.26	0 00:06:00
Sub-RB5	0.68	0.9000	0.68	0.61	0.41	4.13	0 00:06:00
Sub-RB6	0.47	0.9000	0.68	0.61	0.29	2.86	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 (24 NYLOPLAST)	0.07	0.3000	0.85	0.25	0.02	0.11	0 00:09:36
Sub-YD-2 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-3 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-4 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-5 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-6 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-7 (24 NYLOPLAST)	0.05	0.3000	0.85	0.25	0.01	0.08	0 00:09:36
Sub-YD-8 (24 NYLOPLAST)	0.05	0.3000	0.86	0.26	0.01	0.08	0 00:10:12
Sub-YD-9	0.41	0.3000	0.86	0.26	0.11	0.63	0 00:10:12

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	73.07	72.45	0.5000	10.000	0.0120	1.15	1.68	5.36	0.51
CB-9	CB-10	146.00	73.18	72.45	0.5000	12.000	0.0120	1.44	2.72	3.57	0.51
RA6	TEE-2	16.00	76.00	71.03	31.0600	12.000	0.0120	2.90	21.51	19.12	0.25
RB4	CLEANOUT	185.00	75.60	75.11	0.2600	12.000	0.0120	2.15	1.99	6.19	1.00
RB6	FE-3	163.00	75.86	73.00	1.7500	12.000	0.0120	2.80	5.11	9.78	0.53
RB3	CB-5	125.00	75.60	73.40	1.7600	12.000	0.0120	4.38	5.12	10.16	0.71
RB5	FE-2	163.00	75.86	73.00	1.7500	12.000	0.0120	4.05	5.11	10.54	0.67
RB2	CB-6	129.00	75.60	73.40	1.7100	12.000	0.0120	4.27	5.04	10.07	0.70
RB1	CB-6	208.00	75.60	73.40	1.0600	12.000	0.0120	2.00	3.97	8.30	0.50
YD-9	CB-17	27.00	72.75	72.50	0.9300	8.000	0.0120	0.63	1.26	3.61	0.33
RA1	DMH-1	21.00	75.60	75.12	2.2900	12.000	0.0120	2.18	5.84	6.89	0.42
RA7	TEE-3	17.00	76.00	70.74	30.9400	12.000	0.0120	2.56	21.47	18.38	0.23
RB7	FE-4	164.00	75.86	73.00	1.7400	12.000	0.0120	2.51	5.10	9.54	0.49
CLEANOUT	DMH-6 (15 NYLOPLAST)	142.00	75.11	74.73	0.2700	15.000	0.0120	2.09	3.62	3.23	0.67
DMH-6 (15 NYLOPLAST)	DMH-8 (15 NYLOPLAST)	232.00	74.73	74.11	0.2700	15.000	0.0120	2.08	3.62	3.38	0.67
DMH-8 (15 NYLOPLAST)	FE-11	41.00	74.11	74.00	0.2700	15.000	0.0120	2.08	3.62	3.08	0.68
CB-16	CB-15	122.00	71.88	71.27	0.5000	15.000	0.0120	4.19	4.95	4.59	0.88
CB-8 (double type ii)	CB-7	153.00	75.00	72.89	1.3800	10.000	0.0120	1.59	2.79	5.33	0.45
CB-6	CB-5	104.00	72.25	71.73	0.5000	24.000	0.0120	12.66	17.33	6.04	1.27
CB-5	CB-4	107.00	71.73	71.19	0.5000	30.000	0.0120	19.76	31.48	6.80	1.44
CB-4	CB-1	109.00	71.19	70.70	0.4500	30.000	0.0120	20.93	29.88	6.62	1.54
CB-3	CB-2	139.00	73.00	72.30	0.5000	12.000	0.0120	2.18	2.74	5.99	0.67
CB-2	CB-1	107.00	71.69	71.15	0.5000	15.000	0.0120	4.40	4.97	4.63	0.91
CB-1	FE-1	39.00	70.70	70.50	0.5100	30.000	0.0120	26.03	31.82	7.23	1.72
CB-7	CB-6	128.00	72.89	72.25	0.5000	15.000	0.0120	4.17	4.96	4.56	0.88
CB-10	CB-12	121.00	72.45	71.85	0.5000	18.000	0.0120	4.99	8.03	4.82	0.86
CB-14 (double type ii)	CB-13	124.00	73.56	72.40	0.9400	10.000	0.0120	1.80	2.30	4.70	0.55
CB-13	CB-12	110.00	72.40	71.85	0.5000	15.000	0.0120	2.88	4.95	4.22	0.68
CB-12	CB-15	117.00	71.85	71.27	0.5000	24.000	0.0120	10.06	17.26	5.71	1.10
CB-15	CB-18 (DOUBLE TYPE II)	192.00	71.27	70.30	0.5100	30.000	0.0120	16.78	21.98	5.00	1.63
CB-17	CB-16	124.00	72.50	71.88	0.5000	10.000	0.0120	1.63	1.68	3.57	0.66
CB-19 (double type ii)	CB-18 (DOUBLE TYPE II)	217.00	72.90	71.85	0.4800	12.000	0.0120	1.75	2.68	6.26	0.59
CB-18 (DOUBLE TYPE II)	DMH-9 (30 NYLOPLAST)	7.00	70.30	70.23	1.0000	30.000	0.0120	21.66	126.80	19.27	0.70
UG1-OUTLET B	DMH-7	5.00	70.15	70.11	0.8000	30.000	0.0120	11.20	39.74	7.03	0.89
DMH-7	FE-6	36.00	70.11	70.00	0.3100	36.000	0.0120	25.82	39.94	6.01	1.76
UG1-OUTLET A	FE-7	40.00	70.15	70.00	0.3800	30.000	0.0120	10.07	27.21	5.12	1.05
YD-1 (24 NYLOPLAST)	CB-8 (double type ii)	75.00	76.15	75.00	1.5300	8.000	0.0120	0.18	1.62	3.07	0.15
YD-2 (24 NYLOPLAST)	YD-1 (24 NYLOPLAST)	97.00	76.65	76.15	0.5200	8.000	0.0120	0.07	0.94	2.57	0.13
YD-3 (24 NYLOPLAST)	YD-4 (24 NYLOPLAST)	97.00	76.05	75.55	0.5200	8.000	0.0120	0.08	0.94	2.61	0.13
YD-4 (24 NYLOPLAST)	YD-5 (24 NYLOPLAST)	97.00	75.55	75.05	0.5200	8.000	0.0120	0.16	0.94	2.02	0.18
YD-6 (24 NYLOPLAST)	YD-5 (24 NYLOPLAST)	82.00	74.60	74.10	0.6100	8.000	0.0120	0.08	1.02	2.61	0.12
YD-8 (24 NYLOPLAST)	CB-9	51.00	74.65	73.51	2.2400	8.000	0.0120	0.16	1.96	3.36	0.13
YD-7 (24 NYLOPLAST)	YD-8 (24 NYLOPLAST)	87.00	75.10	74.65	0.5200	8.000	0.0120	0.08	0.94	2.53	0.13
YD-5 (24 NYLOPLAST)	CB-14 (double type ii)	52.00	74.10	73.56	1.0400	8.000	0.0120	0.31	1.33	3.12	0.22
FE-8	OCS-1	62.00	70.00	69.59	0.6600	24.000	0.0120	5.09	19.93	5.30	0.69
OCS-1	FE-9	75.00	69.59	69.25	0.4500	24.000	0.0120	5.09	16.50	4.62	0.76
CB-23 (double type ii)	CB-24 (double type ii)	236.00	72.70	71.49	0.5100	12.000	0.0120	1.04	2.76	5.76	0.42
CB-24 (double type ii)	FE-5	23.00	71.49	71.30	0.8300	12.000	0.0120	2.14	3.51	4.69	0.56
CB-22	DMH-5	66.00	72.10	71.76	0.5200	12.000	0.0130	2.09	2.56	4.89	0.68
DMH-1	TEE-1	117.00	74.75	74.15	0.5100	18.000	0.0120	2.13	8.15	4.22	0.52
TEE-1	DMH-2	146.00	74.15	73.50	0.4500	18.000	0.0120	6.42	7.59	4.92	1.05
DMH-2	DMH-4	277.00	73.50	71.76	0.6300	24.000	0.0120	10.54	19.41	6.45	1.05
DMH-4	TEE-2	131.00	71.76	71.03	0.5600	24.000	0.0120	10.49	18.34	6.08	1.08
TEE-2	TEE-3	53.00	71.03	70.74	0.5500	24.000	0.0120	12.86	18.13	6.27	1.24
TEE-3	DMH-7	109.00	70.74	70.11	0.5800	24.000	0.0120	14.95	18.63	6.64	1.36
RA2	TEE-1	16.00	75.60	74.15	9.0600	12.000	0.0120	4.48	11.62	13.84	0.43
RA3	DMH-2	14.00	75.60	73.50	15.0000	12.000	0.0120	4.58	14.95	16.73	0.38
RA4	DMH-3	35.00	79.60	78.87	2.0900	12.000	0.0120	4.19	5.57	7.95	0.65
DMH-3	FE-10	132.00	78.87	76.00	2.1700	12.000	0.0120	4.14	5.69	7.99	0.63
RA5	DMH-4	14.00	79.00	76.24	19.7100	12.000	0.0120	0.00	17.14	0.00	0.00

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Junction Input

Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)
CB-1	70.70	75.40
CB-10	72.45	75.40
CB-11	73.07	75.50
CB-12	71.85	75.90
CB-13	72.40	76.00
CB-14 (double type ii)	73.56	77.70
CB-15	71.27	75.90
CB-16	71.88	75.60
CB-17	72.50	75.50
CB-18 (DOUBLE TYPE II)	70.80	75.10
CB-19 (double type ii)	72.90	75.30
CB-2	71.69	75.40
CB-22	72.10	74.40
CB-23 (double type ii)	72.70	75.10
CB-24 (double type ii)	71.49	75.10
CB-3	73.00	75.40
CB-4	71.19	75.90
CB-5	71.73	75.80
CB-6	72.25	75.80
CB-7	72.89	75.60
CB-8 (double type ii)	75.00	77.70
CB-9	73.18	75.60
CLEANOUT	75.11	77.80
DMH-1	74.75	77.75
DMH-2	73.50	76.67
DMH-3	78.87	81.20
DMH-4	71.76	78.84
DMH-6 (15 NYLOPLAST)	74.73	78.50
DMH-7	70.11	74.40
DMH-8 (15 NYLOPLAST)	74.11	77.80
FE-8	70.00	72.28
OCS-1	69.59	75.90
RA1	75.60	77.69
RA2	75.60	77.71
RA3	75.60	77.71
RA4	79.60	79.55
RA5	79.00	81.39
RA6	76.00	77.71
RA7	76.00	-0.06
RB1	75.60	77.75
RB2	75.60	77.49
RB3	75.60	77.75
RB4	75.60	77.75
RB5	75.86	77.75
RB6	75.86	77.75
RB7	75.86	0.00
TEE-1	74.15	76.60
TEE-2	71.03	73.33
TEE-3	70.74	76.67
UG1-OUTLET A	70.15	73.05
UG1-OUTLET B	70.15	73.05
YD-1 (24 NYLOPLAST)	76.15	79.80
YD-2 (24 NYLOPLAST)	76.65	78.80
YD-3 (24 NYLOPLAST)	76.05	77.80
YD-4 (24 NYLOPLAST)	75.55	77.26
YD-5 (24 NYLOPLAST)	74.10	77.00
YD-6 (24 NYLOPLAST)	74.60	77.35
YD-7 (24 NYLOPLAST)	75.10	77.35
YD-8 (24 NYLOPLAST)	74.65	77.35
YD-9	72.75	74.50

Junction Results

Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Min Freeboard Attained (ft)	Time of Max HGL Occurrence (days hh:mm)
CB-1	26.03	1.19	72.42	2.98	0 00:07
CB-10	5.03	2.83	73.31	2.09	0 00:06
CB-11	1.19	1.19	73.59	1.91	0 00:06
CB-12	10.09	3.15	72.95	2.95	0 00:06
CB-13	2.91	1.14	73.09	2.91	0 00:08
CB-14 (double type ii)	1.83	1.60	74.12	3.58	0 00:08
CB-15	16.96	3.01	72.92	2.98	0 00:06
CB-16	4.24	2.71	72.77	2.83	0 00:06
CB-17	1.68	1.31	73.18	2.32	0 00:06
CB-18 (DOUBLE TYPE II)	21.66	3.55	72.44	2.66	0 00:07
CB-19 (double type ii)	1.83	1.83	73.51	1.79	0 00:07
CB-2	4.43	2.33	72.97	2.43	0 00:07
CB-22	2.12	2.12	72.79	1.61	0 00:07
CB-23 (double type ii)	1.09	1.09	73.14	1.96	0 00:08
CB-24 (double type ii)	2.14	1.17	72.05	3.05	0 00:08
CB-3	2.23	2.23	73.69	1.71	0 00:07
CB-4	21.00	1.37	72.74	3.16	0 00:06
CB-5	19.80	3.09	74.11	1.69	0 00:06
CB-6	12.71	3.16	74.11	1.69	0 00:06
CB-7	4.23	2.93	73.78	1.82	0 00:07
CB-8 (double type ii)	1.62	1.47	75.46	2.24	0 00:08
CB-9	1.49	1.38	73.71	1.89	0 00:07
CLEANOUT	2.15	0.00	76.11	1.69	0 00:04
DMH-1	2.18	0.00	75.54	2.21	0 00:06
DMH-2	10.74	0.00	74.56	2.10	0 00:06
DMH-3	4.19	0.00	79.52	1.68	0 00:06
DMH-4	10.54	0.00	76.24	2.60	0 00:00
DMH-6 (15 NYLOPLAST)	2.09	0.00	75.41	3.09	0 00:10
DMH-7	25.83	0.00	71.87	2.53	0 00:07
DMH-8 (15 NYLOPLAST)	2.08	0.00	74.79	3.01	0 00:11
FE-8	5.09	5.09	70.69	1.59	0 00:00
OCS-1	5.09	0.00	70.35	5.55	0 00:03
RA1	2.18	2.18	76.02	1.67	0 00:06
RA2	4.48	4.48	76.03	1.68	0 00:06
RA3	4.58	4.58	75.98	1.73	0 00:06
RA4	4.21	4.21	80.25	0.35	0 00:06
RA5	0.00	0.00	79.00	2.39	0 00:00
RA6	2.90	2.90	76.25	1.46	0 00:06
RA7	2.57	2.57	76.23	0.77	0 00:06
RB1	2.08	2.08	76.11	1.64	0 00:06
RB2	4.33	4.33	76.32	1.18	0 00:06
RB3	4.43	4.43	76.32	1.43	0 00:06
RB4	4.26	4.26	77.75	0.00	0 00:02
RB5	4.12	4.12	76.54	1.21	0 00:06
RB6	2.86	2.86	76.40	1.36	0 00:06
RB7	2.57	2.57	76.36	0.50	0 00:06
TEE-1	6.52	0.00	75.22	1.38	0 00:06
TEE-2	12.87	0.00	72.28	1.05	0 00:07
TEE-3	14.96	0.00	72.10	4.57	0 00:07
UG1-OUTLET A	10.07	10.07	71.20	1.85	0 00:00
UG1-OUTLET B	10.88	10.88	71.04	2.01	0 00:00
YD-1 (24 NYLOPLAST)	0.18	0.11	76.30	3.50	0 00:09
YD-2 (24 NYLOPLAST)	0.07	0.07	76.78	2.02	0 00:09
YD-3 (24 NYLOPLAST)	0.08	0.08	76.18	1.62	0 00:09
YD-4 (24 NYLOPLAST)	0.16	0.08	75.73	1.53	0 00:10
YD-5 (24 NYLOPLAST)	0.31	0.08	75.23	1.77	0 00:10
YD-6 (24 NYLOPLAST)	0.08	0.08	74.72	2.63	0 00:09
YD-7 (24 NYLOPLAST)	0.08	0.08	75.23	2.12	0 00:09
YD-8 (24 NYLOPLAST)	0.16	0.08	74.78	2.57	0 00:10
YD-9	0.63	0.63	73.08	1.42	0 00:10

Attachment C
(In Place of July 2, 2021 Report Appendix F)
Water Quality Calculations

25 Talbot Lane – DPI Project No.:1976.U
August 25, 2021

Water Quality Volume Calculations
Per 2004 Connecticut Stormwater Quality Manual, Section 7.4.1:

Areas for Calculation: On Site to Forebay (P3)

	P3
Impervious	6.52
Pervious	3.24
Total Area	9.76
% Impervious	66.80%

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 = 66.80%
R = 0.05 + 0.009(I)
R = 0.05 + 0.009(66.80)
R = 0.651

A = drainage area in acres = 9.76 acres

WQV = (3.10")(R)(A acres)/12 inches per foot
WQV = (3.10")(0.651)(9.76 acres)/12 inches per foot
WQV = 1.641 acre-feet required = 71,498.9 cft

Proposed BMP
The proposed water quality basin and forebay are proposed to provide **4,269 cft** (below basin outlet FE-8 @ Elev. 70) and **370,252 cft+** (below check dam spillway at Elev. 70.50) 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 **422,661 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.

WATER QUALITY BASIN STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
69.00	3,068.10	N/A	N/A	0.00	N/A	0.00
70.00	5,595.91	1.00	4332.00	4332.00	4269.18	4269.18
71.00	8,068.48	1.00	6832.19	11164.19	6794.60	11063.77
72.00	10,569.32	1.00	9318.90	20483.09	9290.81	20354.58
73.00	13,098.44	1.00	11833.88	32316.97	11811.30	32165.88
74.00	15,655.84	1.00	14377.14	46694.11	14358.15	46524.02
75.00	18,241.50	1.00	16948.67	63642.78	16932.21	63456.23
76.00	20,855.45	1.00	19548.48	83191.26	19533.90	82990.13

FOREBAY STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
61.00	20,582.95	N/A	N/A	0.00	N/A	0.00
62.00	23,525.46	1.00	22054.21	22054.21	22037.83	22037.83
63.00	26,600.45	1.00	25062.95	47117.16	25047.22	47085.05
64.00	36,283.86	1.00	31442.16	78559.32	31317.15	78402.20
65.00	39,793.30	1.00	38038.58	116597.90	38025.08	116427.28
66.00	43,384.26	1.00	41588.78	158186.67	41575.85	158003.13
67.00	47,025.69	1.00	45204.97	203391.65	45192.75	203195.88
68.00	50,711.55	1.00	48868.62	252260.27	48857.03	252052.92
68.90	54,453.96	0.90	47324.48	299584.75	47314.49	299367.40
69.00	62,108.42	0.10	5828.12	305412.87	5823.93	305191.33
70.00	68,059.12	1.00	65083.77	370496.64	65061.09	370252.42
71.00	72,965.69	1.00	70512.41	441009.04	70498.18	440750.59
72.00	77,900.54	1.00	75433.12	516442.16	75419.66	516170.26
73.00	82,863.67	1.00	80382.10	596824.27	80369.33	596539.59
74.00	87,855.06	1.00	85359.37	682183.63	85347.20	681886.79
75.00	92,874.74	1.00	90364.90	772548.53	90353.28	772240.07
76.00	97,922.68	1.00	95398.71	867947.24	95387.58	867627.65

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/mi^2/inch) per Exhibit 4-III
A = drainage area (mi^2)
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 14[1]**
Ia/P = 0.273
Unit Peak Discharge qu = 625 cfs/mi^2/inch

Drainage Area A = 242,629.2 sf = 5.57 acres = 0.0087 mi^2

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/mi^2/inch x 0.0087 mi^2 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/mi^2/inch) per Exhibit 4-III
A = drainage area (mi^2)
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 14[2]**
Ia/P = 0.273
Unit Peak Discharge qu = 625 cfs/mi^2/inch

Drainage Area A = 25,264.8 sf = 0.58 acres = 0.00084 mi^2

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/mi^2/inch x 0.00084 mi^2 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/mi^2/inch) per Exhibit 4-III
A = drainage area (mi^2)
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 14[3]**
Ia/P = 0.174
Unit Peak Discharge qu = 630 cfs/mi^2/inch

Drainage Area A = 18,295.2 sf = 0.42 acres = 0.00066 mi^2

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/mi^2/inch x 0.00066 mi^2 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/mi^2/inch) per Exhibit 4-III
A = drainage area (mi^2)
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 14[4]**
Ia/P = 0.198
Unit Peak Discharge qu = 630 cfs/mi^2/inch

Drainage Area A = 19,602 sf = 0.45 acres = 0.0007 mi^2

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/mi^2/inch x 0.0007 mi^2 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.

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

Attachment D
(In Place of July 2, 2021 Report 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 PREPARED BY DESIGN PROFESSIONALS, INC.
13 HSG: B/D
36B HSG: A
GOVERNOR'S HIGHWAY
TALBOT LANE
EXISTING DRAINAGE AREA 1
EXISTING DRAINAGE AREA 2
EXISTING DRAINAGE AREA 3
EXISTING DRAINAGE AREA 4
701A HSG: C
15 HSG: A/D
308 HSG: C
DRAINAGE AREA BOUNDARY (TYPICAL)
EXISTING DRAINAGE SWALE
DESIGN POINT 1 EXISTING STILLING BASIN
DESIGN POINT 2 24" RCP TO CODY CIRCLE
DESIGN POINT 3 SOUTH EAST OVERFLOW
DESIGN POINT 4 15" RCP TO TEMPLE BETH HILLEL
CODY CIRCLE
WATER ELEV. 69.2'
35' FRONT YARD
80.0' UPLAND REVIEW AREA
12" WATER MAIN
6" GAS MAIN
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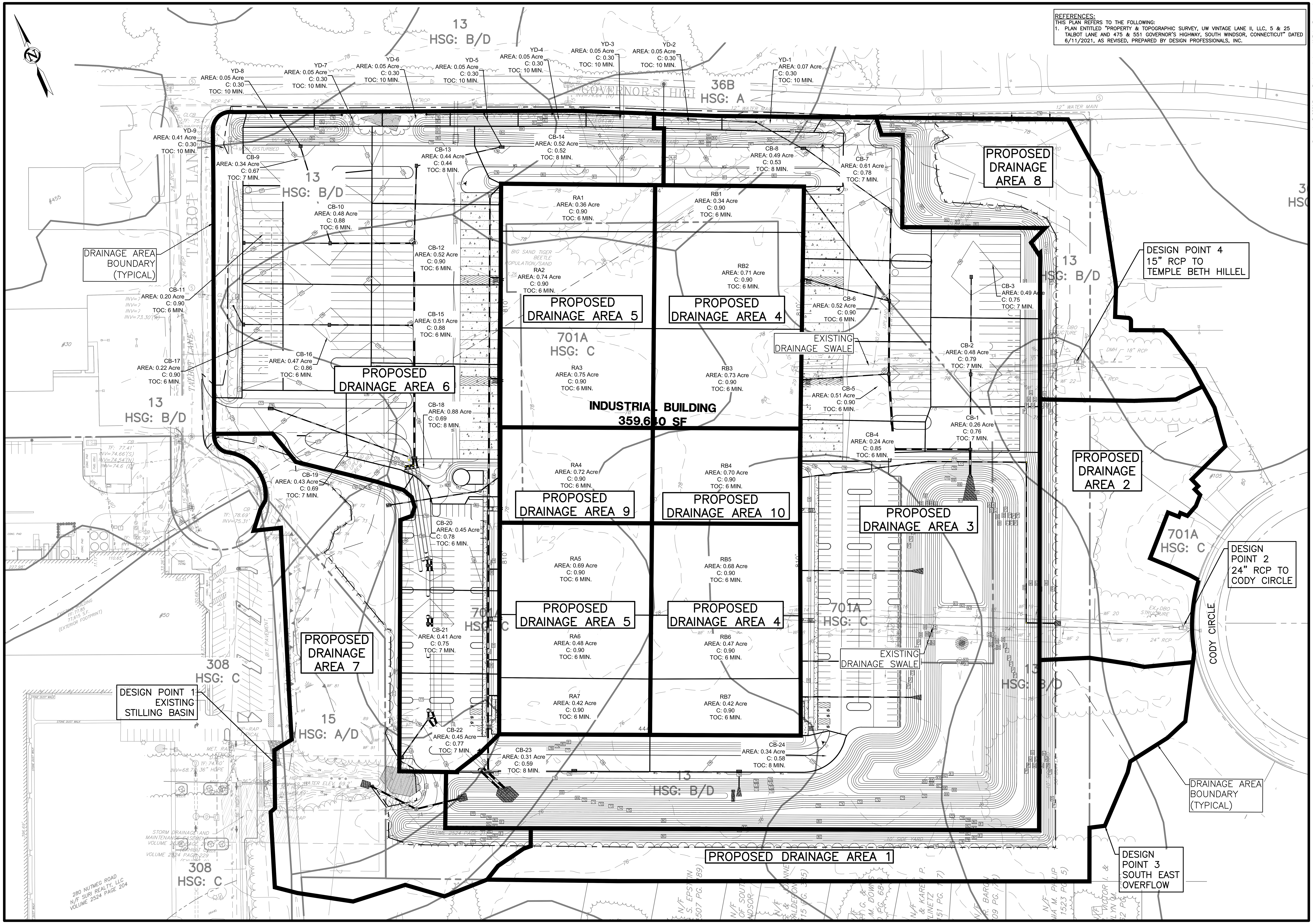
CIVIL & TRAFFIC ENGINEERS / LAND SURVEYORS
PLANNERS / LANDSCAPE ARCHITECTS
PREPARED FOR:
UW Vintage Lane II, LLC
PO Box 504
South Glastonbury, CT
06073
860-268-2452 T
PROJECT NO.: 1976U
DATE: 07/02/21
DESIGN BY: BPW
DRAWN BY: BPW
CHECKED BY: DHJ
25 TALBOT LANE
SITE PLAN APPLICATION
5 & 25 TALBOT ROAD &
475 & 551 GOVERNOR'S HIGHWAY
SOUTH WINDSOR, CONNECTICUT
GIS Nos. 88900005, 88900025, 36900475, 36900551
REVISIONS
NO. DATE BY
EXISTING DRAINAGE MAP
SCALE: 1" = 60'
SHEET
C-DA1
SHEET 1 OF 2



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.
13
HSG: B/D
36B
HSG: A
YD-1
AREA: 0.07 Acre
C: 0.30
TOC: 10 MIN.
YD-2
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-3
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-4
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-5
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-6
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-7
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-8
AREA: 0.05 Acre
C: 0.30
TOC: 10 MIN.
YD-9
AREA: 0.41 Acre
C: 0.30
TOC: 10 MIN.
CB-9
AREA: 0.34 Acre
C: 0.67
TOC: 7 MIN.
CB-13
AREA: 0.44 Acre
C: 0.44
TOC: 8 MIN.
CB-14
AREA: 0.52 Acre
C: 0.52
TOC: 8 MIN.
CB-8
AREA: 0.49 Acre
C: 0.53
TOC: 8 MIN.
CB-7
AREA: 0.61 Acre
C: 0.78
TOC: 7 MIN.
PROPOSED DRAINAGE AREA 8
13
HSG: B/D
CB-10
AREA: 0.48 Acre
C: 0.88
TOC: 6 MIN.
RA1
AREA: 0.36 Acre
C: 0.90
TOC: 6 MIN.
RB1
AREA: 0.34 Acre
C: 0.90
TOC: 6 MIN.
DRAINAGE AREA BOUNDARY (TYPICAL)
CB-12
AREA: 0.52 Acre
C: 0.90
TOC: 6 MIN.
RA2
AREA: 0.74 Acre
C: 0.90
TOC: 6 MIN.
RB2
AREA: 0.71 Acre
C: 0.90
TOC: 6 MIN.
DESIGN POINT 4
15" RCP TO TEMPLE BETH HILLEL
13
HSG: B/D
CB-11
AREA: 0.20 Acre
C: 0.90
TOC: 6 MIN.
PROPOSED DRAINAGE AREA 5
PROPOSED DRAINAGE AREA 4
CB-6
AREA: 0.52 Acre
C: 0.90
TOC: 6 MIN.
CB-3
AREA: 0.49 Acre
C: 0.75
TOC: 7 MIN.
CB-15
AREA: 0.51 Acre
C: 0.88
TOC: 6 MIN.
701A
HSG: C
EXISTING DRAINAGE SWALE
CB-16
AREA: 0.47 Acre
C: 0.86
TOC: 6 MIN.
CB-17
AREA: 0.22 Acre
C: 0.90
TOC: 6 MIN.
PROPOSED DRAINAGE AREA 6
RA3
AREA: 0.75 Acre
C: 0.90
TOC: 6 MIN.
RB3
AREA: 0.73 Acre
C: 0.90
TOC: 6 MIN.
CB-2
AREA: 0.48 Acre
C: 0.79
TOC: 7 MIN.
CB-5
AREA: 0.51 Acre
C: 0.90
TOC: 6 MIN.
13
HSG: B/D
CB-18
AREA: 0.88 Acre
C: 0.69
TOC: 8 MIN.
INDUSTRIAL BUILDING
359,640 SF
CB-1
AREA: 0.26 Acre
C: 0.76
TOC: 7 MIN.
CB-4
AREA: 0.24 Acre
C: 0.85
TOC: 6 MIN.
PROPOSED DRAINAGE AREA 2
CB-19
AREA: 0.43 Acre
C: 0.69
TOC: 7 MIN.
RA4
AREA: 0.72 Acre
C: 0.90
TOC: 6 MIN.
RB4
AREA: 0.70 Acre
C: 0.90
TOC: 6 MIN.
PROPOSED DRAINAGE AREA 9
PROPOSED DRAINAGE AREA 10
PROPOSED DRAINAGE AREA 3
CB-20
AREA: 0.45 Acre
C: 0.78
TOC: 6 MIN.
701A
HSG: C
DESIGN POINT 2
24" RCP TO CODY CIRCLE
RA5
AREA: 0.69 Acre
C: 0.90
TOC: 6 MIN.
RB5
AREA: 0.68 Acre
C: 0.90
TOC: 6 MIN.
701A
HSG: C
PROPOSED DRAINAGE AREA 5
PROPOSED DRAINAGE AREA 4
701A
HSG: C
CODY CIRCLE
CB-21
AREA: 0.41 Acre
C: 0.75
TOC: 7 MIN.
RA6
AREA: 0.48 Acre
C: 0.90
TOC: 6 MIN.
RB6
AREA: 0.47 Acre
C: 0.90
TOC: 6 MIN.
PROPOSED DRAINAGE AREA 7
EXISTING DRAINAGE SWALE
308
HSG: C
13
HSG: B/D
DESIGN POINT 1
EXISTING STILLING BASIN
RA7
AREA: 0.42 Acre
C: 0.90
TOC: 6 MIN.
RB7
AREA: 0.42 Acre
C: 0.90
TOC: 6 MIN.
15
HSG: A/D
CB-22
AREA: 0.45 Acre
C: 0.77
TOC: 7 MIN.
CB-23
AREA: 0.31 Acre
C: 0.59
TOC: 8 MIN.
CB-24
AREA: 0.34 Acre
C: 0.58
TOC: 8 MIN.
13
HSG: B/D
DRAINAGE AREA BOUNDARY (TYPICAL)
PROPOSED DRAINAGE AREA 1
DESIGN POINT 3
SOUTH EAST OVERFLOW
308
HSG: C
280 NUTMEG ROAD
N/F SURI REALTY, LLC
VOLUME 2524 PAGE 204
TALBOT LANE
GOVERNOR'S HIGHWAY

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South Glastonbury, CT 06073
860-268-2452 T

PROJECT NO. 1976U
DATE: 07/02/21
DESIGN BY: BPW
DRAWN BY: BPW
CHECKED BY: DHJ

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

REVISIONS

NO.	DATE		BY
1	8/25/2021	REVISED PER TOWN COMMENTS	DHJ

PROPOSED DRAINAGE MAP

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

SHEET
C-DA2
SHEET 2 OF 2

File: C:\jobs\1976\1976U\Engineering\Stormwater\1976U – Drainage.dwg Layout: 02 – C-DA2 Plotted: 8/25/2021 1:58 PM Last Saved: 8/23/2021 9:28 AM Last Saved By: RachelMeier