Stormwater Management Report

Windsor Federal Savings Bank
176 Deming Street
South Windsor, CT

Prepared for:

Windsor Federal Savings
250 Broad Street
Windsor, CT

Prepared by:

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

June 12, 2020
DPI No. 4337

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Introduction

Windsor Federal Savings is proposing to develop a 0.869± acre parcel of land located at 176 Deming Street, South Windsor, Connecticut. The property is referenced on the Town of South Windsor Tax Assessors map as GIS #15300395. The proposed development will include the construction of a 2,682± sf bank office. Associated site improvements will include, but not be limited to, new parking areas for standard vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMP's.

Of the 0.869± acre parcel, approximately 1.12± acres are proposed to be changed to impervious for the construction of the bank office. For more information, please refer to the plans entitled "Windsor Federal Savings Bank Site Plan ~ 176 Deming Street, South Windsor, CT ~ GIS #15300395" prepared by Design Professionals, Inc. and dated June 12, 2020, as amended.

Pre-Development Site Conditions

2016 areal imagery obtained from the University of Connecticut's, CT ECO website was utilized to evaluate the existing surficial characteristics of the property. Areal imagery from this time indicated that the site contained a house with a barn, and a paved parking lot area. The remaining portions of the site was maintained lawn. Review of the topography of the area indicated that all runoff leaving the site flows north east across its property boundary and parking lot of the Samsel and Carmon Funearl Home, to an existing catchbasin. This catchbasin was selected as design point 1 **(DP1)** in the drainage analysis. A second design point **(DP2)** was also selected to evaluate flows entering an existing catchbasin in Deming Street. No runoff from the site enters this catchbasin in the existing condition. This point was selected to assess the potential impacts of the proposed development on the stormwater collection system in Deming Street. The existing conditions watershed delineations and design points are identified in the Existing Condition Drainage Map located in **Appendix F**.

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

An evaluation was performed to quantify the peak rate of stormwater discharge offsite at **DP1** & **DP2**. The Natural Resources Conservation Service's TR-55 Manual was followed in predicting the peak rates of runoff and volumes. HydroCAD version 10.00-20 computer modeling software was utilized.

Peak rates of stormwater runoff discharging from the design point 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 subject project proposes the construction of a 2,682± sf bank office. All runoff generated from the banks roof, parking, and sidewalk areas will be collected in an underground storm water catchment system and be conveyed to an underground detention system (**Pond UGC-1**).

The underground detention system was designed to attenuate the increase in peak rates induced by the proposed impervious area. An outlet control structure with select orifices are proposed to restrict water flow leaving the chamber system. For more information, please refer to the enclosed Post-Development Drainage HydroCAD Report located in **Appendix B**. The proposed conditions watershed delineations and design points are also identified in the Proposed Condition Drainage Map located in **Appendix F**.

Analysis of Results

The pre-development and post-development conditions were analyzed using HydroCAD consistent with National Resource Conservation Service (NRCS) hydrology methods. The discharge locations identified as points of interest for assessing downstream effects.
The following tables contains the data generated from the HydroCAD software:

Reach	(cfs)	2 year	10 year	25 year	50 year	100 year
DP1 – Discharge to Samsel and Carmon CB	Pre	3.57	7.22	9.57	11.38	13.20
	Post	3.50	6.11	8.84	10.83	12.56
	Net Change	-0.07	-1.11	-0.73	-0.55	-0.64
DP2 – Discharge to Deming Street CB	Pre	0.64	1.03	1.27	1.45	1.63
	Post	0.64	1.09	1.37	1.58	1.79
	Net Change	0.00	+0.06	+0.10	+0.13	+0.16

As seen in the tables above, the proposed discharge to the CB at Samsel and Carmon (DP1) resulted in peak runoff rates that were less than the peak runoff rates of the existing condition for all design storms. The discharge to the CB in Deming street (DP2) is expected to increase slightly as a result of the proposed development. Although the peak discharge at DP2 increased, the total peak discharge leaving the site will remain less than existing conditions since reductions achieved at DP1 were larger than the increases observed at DP2.

Storm Sewer Collection System

The proposed subsurface stormwater collection and conveyance system was designed to adequately convey proposed runoff under 10- year storm event conditions. The design of the storm sewers followed the guidelines set forth in the Connecticut Department of Transportation's Drainage Manual. It is estimated that during a 10-year storm event, all proposed subsurface

culverts will convey storm runoff without resulting in any unacceptable flooding conditions. The computations are included as **Appendix D**.

Water Quality

All catchbasins are proposed with 2' sumps and trap hoods for preliminary stormwater treatment. The proposed Cultec underground drainage system is also proposed with an Isolator row to further address water quality for pavement surfaces draining to them. Based on the determined water quality flow and manufacturer's specifications for treated flow rate per chamber, the number of isolator rows provided will be more than adequate to treat the required water quality flow rate. See **Appendix E** for water quality flow calcs and Cultec Isolator row manufacture's specifications.

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 is consistent with Town and State requirements. The proposed development should not pose any detrimental impacts to the surrounding stormwater conditions

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

Subcat Reach Pond Link

Routing Diagram for 4337 - Drainage
Prepared by Design Professionals Inc. , Printed 6/8/2020

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

Subcatchment E1: Existing to Samsel and Runoff Area=2.185 ac 58.67% Impervious Runoff Depth=1.53"
Flow Length=597' Tc=8.2 min CN=83 Runoff=3.57 cfs 0.278 af

Subcatchment E2: Existing to Deming Runoff Area=0.219 ac 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=0.64 cfs 0.052 af

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

Subcatchment E1: Existing to Samsel and Runoff Area=2.185 ac 58.67% Impervious Runoff Depth=3.09"
Flow Length=597' Tc=8.2 min CN=83 Runoff=7.22 cfs 0.563 af

Subcatchment E2: Existing to Deming Runoff Area=0.219 ac 100.00% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=98 Runoff=1.03 cfs 0.085 af

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

Subcatchment E1: Existing to Samsel and Runoff Area=2.185 ac 58.67% Impervious Runoff Depth=4.13"
Flow Length=597' Tc=8.2 min CN=83 Runoff=9.57 cfs 0.752 af

Subcatchment E2: Existing to Deming Runoff Area=0.219 ac 100.00% Impervious Runoff Depth=5.80"
Tc=6.0 min CN=98 Runoff=1.27 cfs 0.106 af

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

Subcatchment E1: Existing to Samsel and Runoff Area=2.185 ac 58.67% Impervious Runoff Depth=4.94"
Flow Length=597' Tc=8.2 min CN=83 Runoff=11.38 cfs 0.900 af

Subcatchment E2: Existing to Deming Runoff Area=0.219 ac 100.00% Impervious Runoff Depth=6.67"
Tc=6.0 min CN=98 Runoff=1.45 cfs 0.122 af

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

Subcatchment E1: Existing to Samsel and Runoff Area=2.185 ac 58.67% Impervious Runoff Depth=5.77"
Flow Length=597' Tc=8.2 min CN=83 Runoff=13.20 cfs 1.050 af

Subcatchment E2: Existing to Deming Runoff Area=0.219 ac 100.00% Impervious Runoff Depth=7.54"
Tc=6.0 min CN=98 Runoff=1.63 cfs 0.138 af

Summary for Subcatchment E1: Existing to Samsel and Carmon CB (DP1)

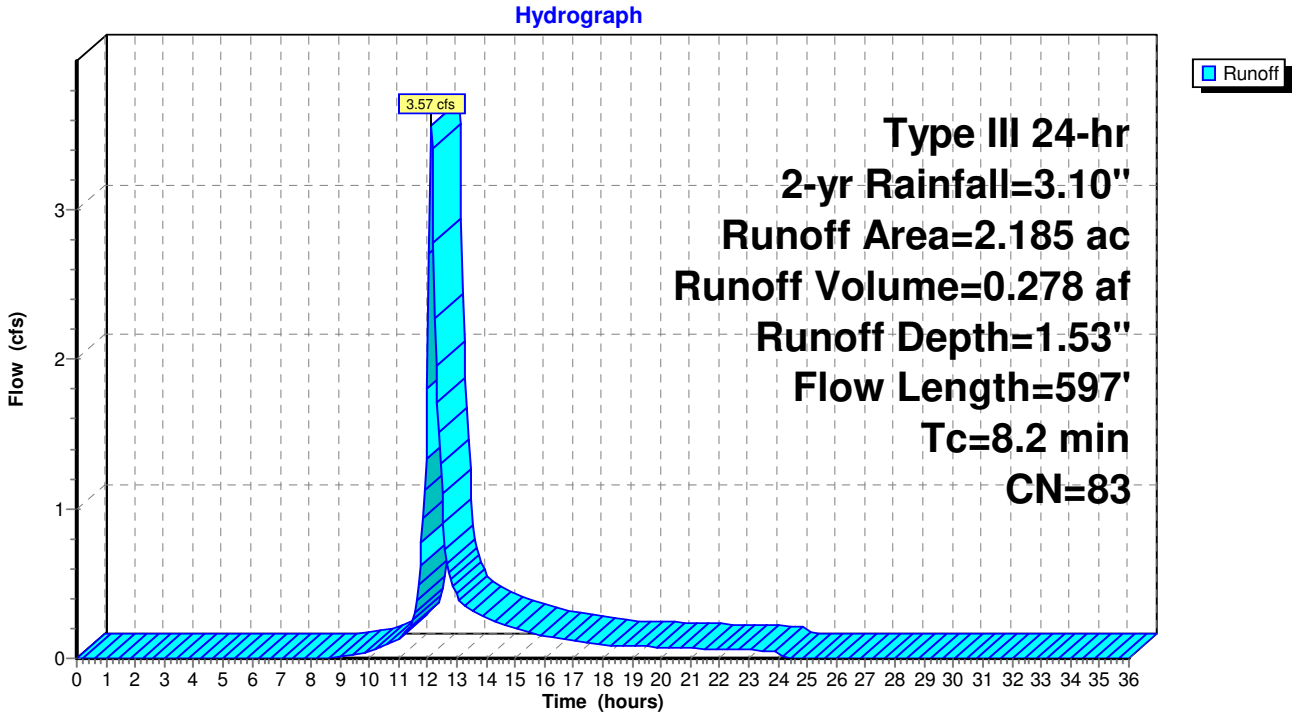
Runoff = 3.57 cfs @ 12.12 hrs, Volume= 0.278 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (ac)	CN	Description
	0.903	61	>75% Grass cover, Good, HSG B
*	1.282	98	Unconnected impervious, HSG B
	2.185	83	Weighted Average
	0.903		41.33% Pervious Area
	1.282		58.67% Impervious Area
	1.282		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	12	0.0379	0.14		**Sheet Flow, Grass S.F.** Grass: Short n= 0.150 P2= 3.10"
0.0	5	0.3840	2.42		**Sheet Flow, Sidewalk S.F.** Smooth surfaces n= 0.011 P2= 3.10"
4.8	76	0.0712	0.26		**Sheet Flow, Grass S.F.** Grass: Short n= 0.150 P2= 3.10"
0.9	201	0.0583	3.62		**Shallow Concentrated Flow, Grassed S.C.F.** Grassed Waterway Kv= 15.0 fps
1.1	303	0.0483	4.46		**Shallow Concentrated Flow, Paved S.C.F.** Paved Kv= 20.3 fps
8.2	597	Total			

Subcatchment E1: Existing to Samsel and Carmon CB (DP1)



Summary for Subcatchment E2: Existing to Deming Street CB (DP2)

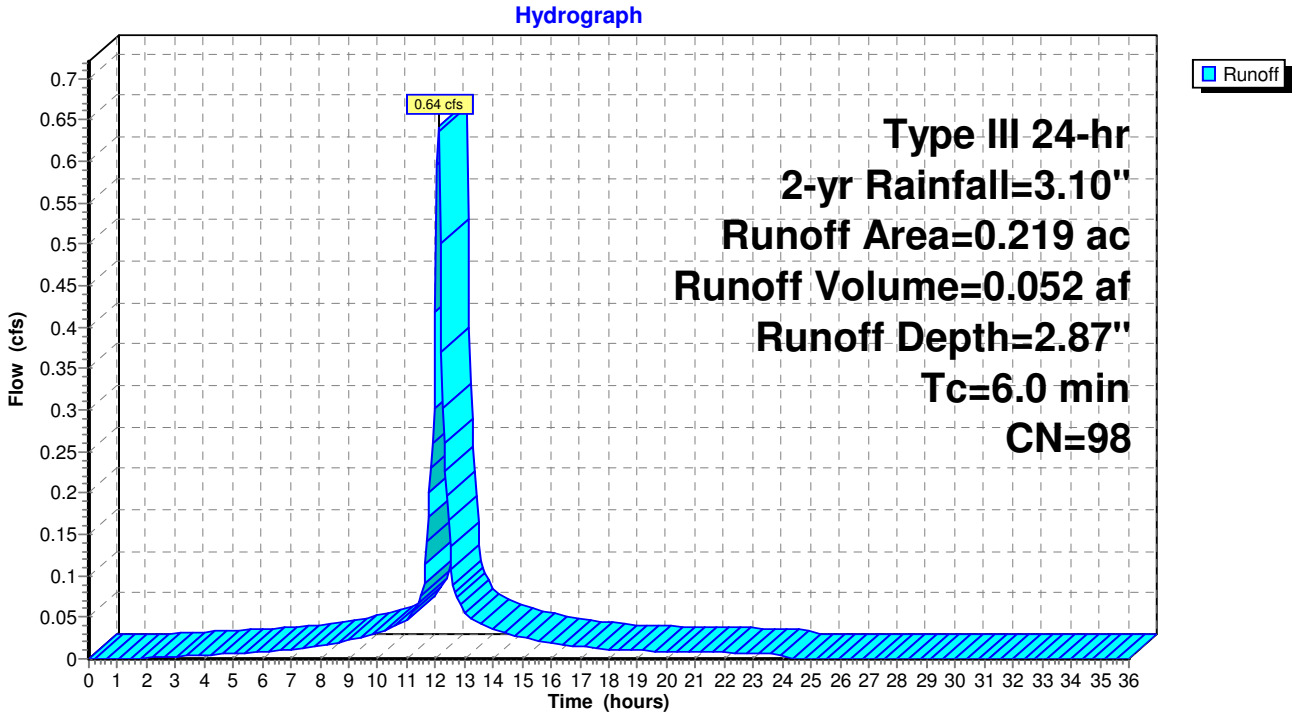
Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.052 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

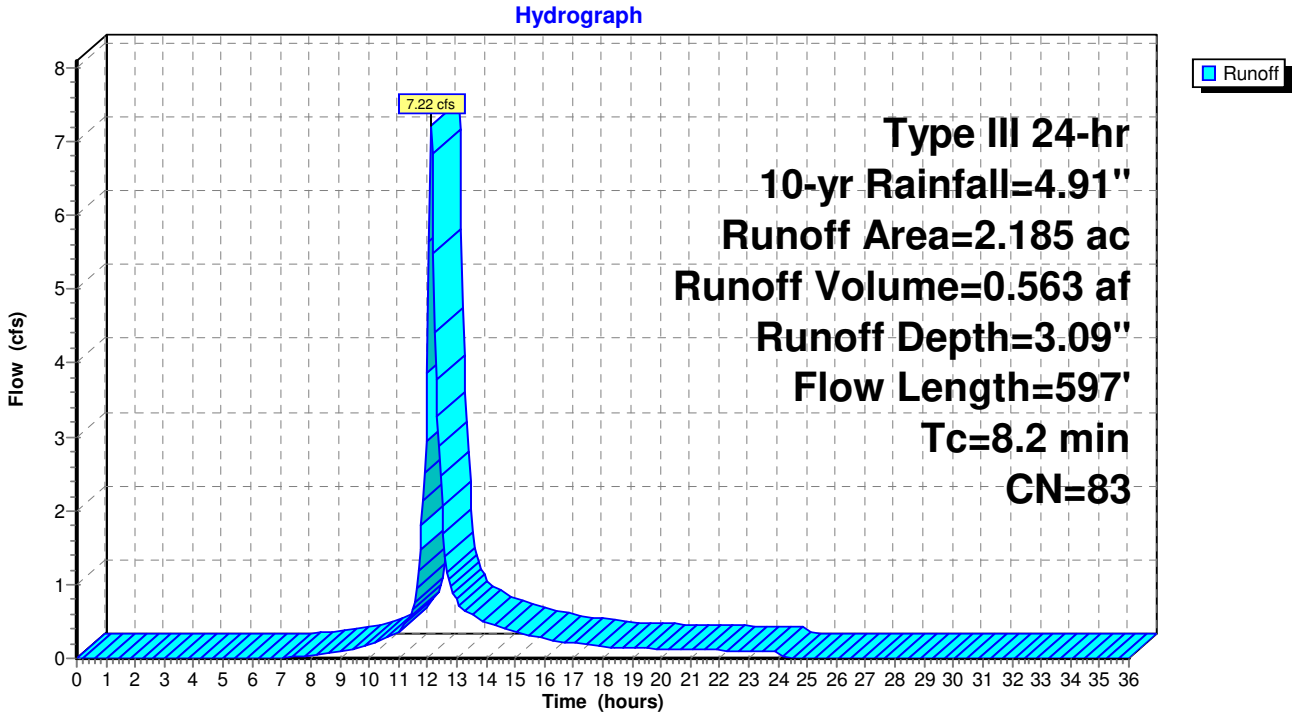
	Area (ac)	CN	Description
*	0.219	98	Unconnected impervious, HSG B
	0.219		100.00% Impervious Area
	0.219		100.00% Unconnected

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

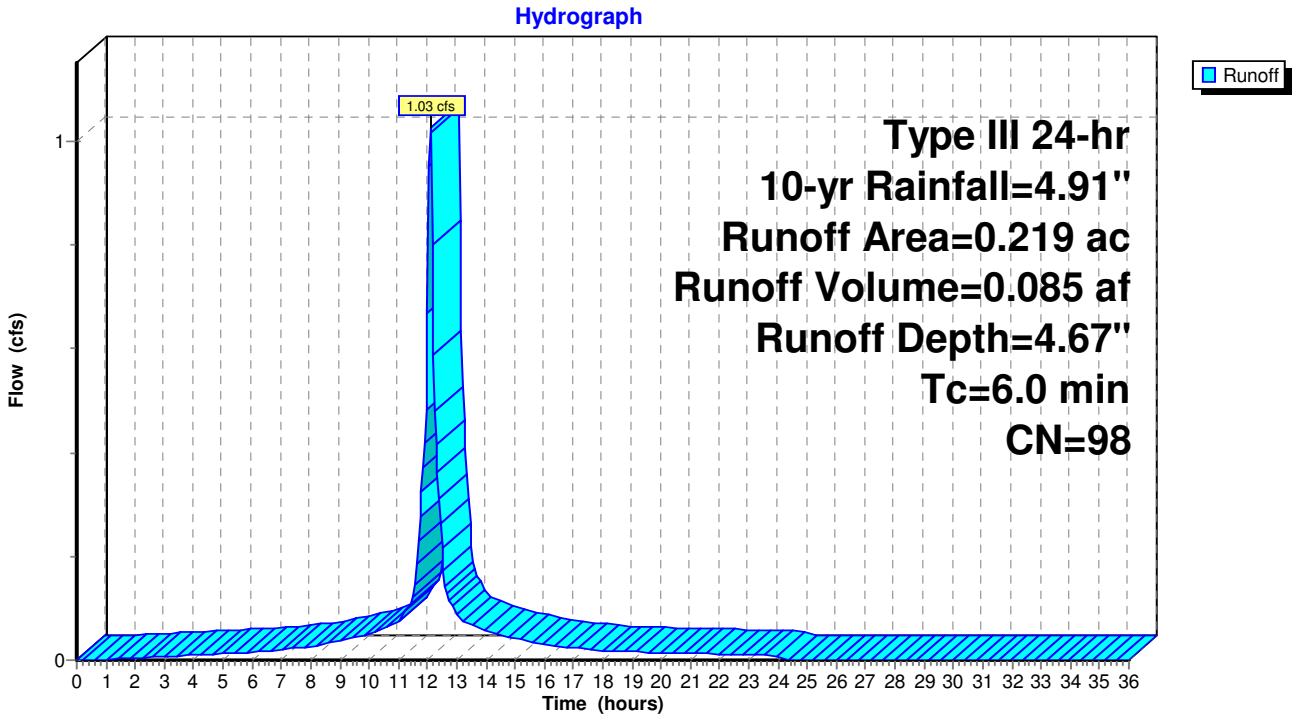
Subcatchment E2: Existing to Deming Street CB (DP2)



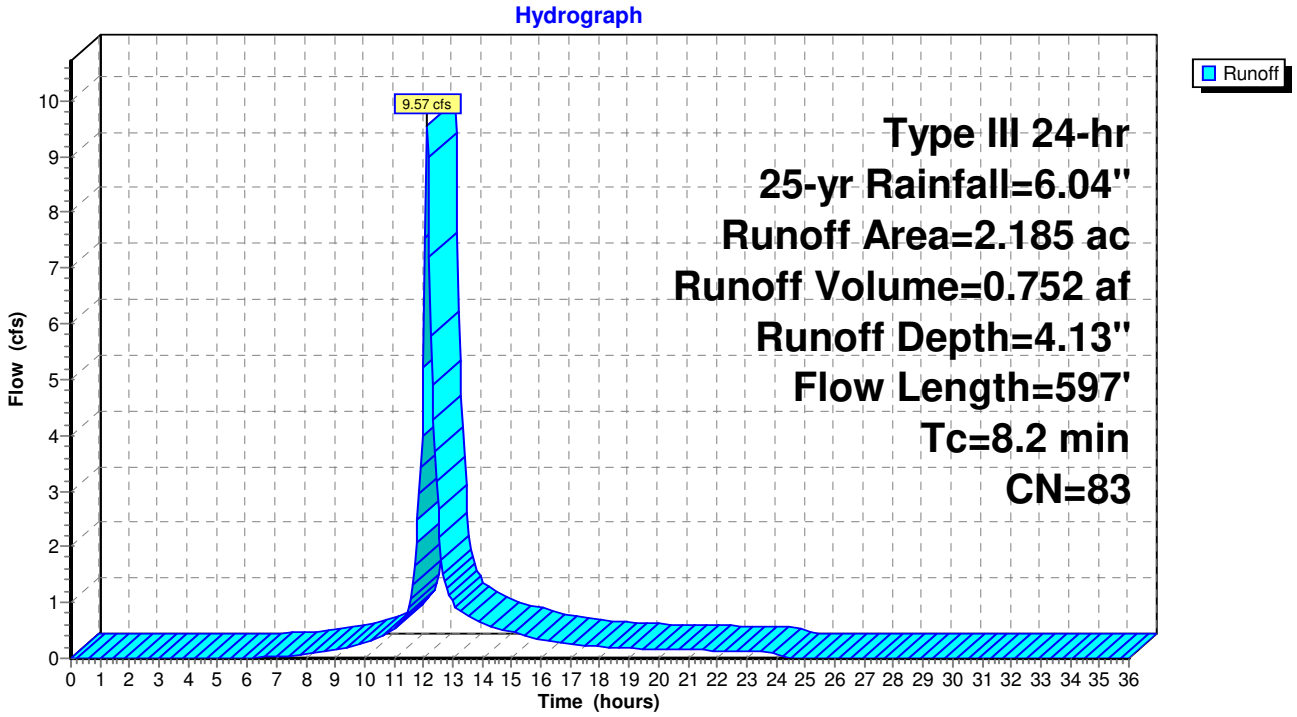
Subcatchment E1: Existing to Samsel and Carmon CB (DP1)



Subcatchment E2: Existing to Deming Street CB (DP2)



Subcatchment E1: Existing to Samsel and Carmon CB (DP1)



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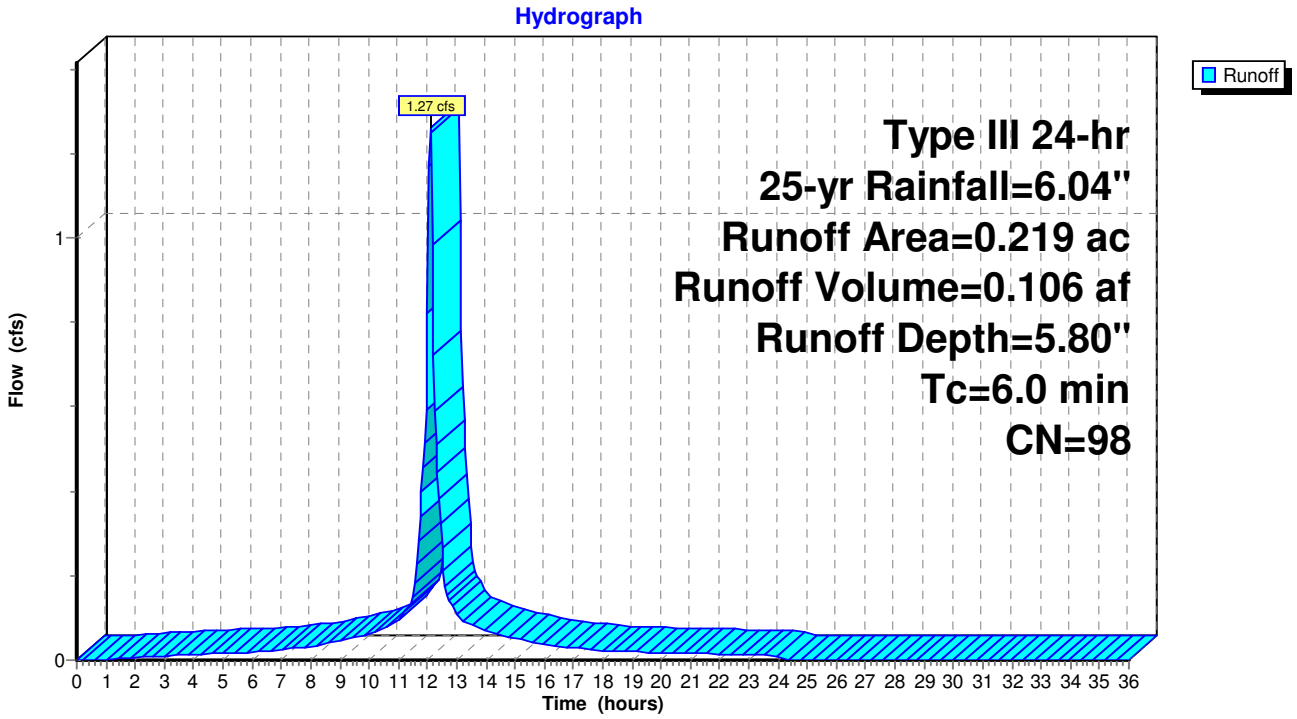
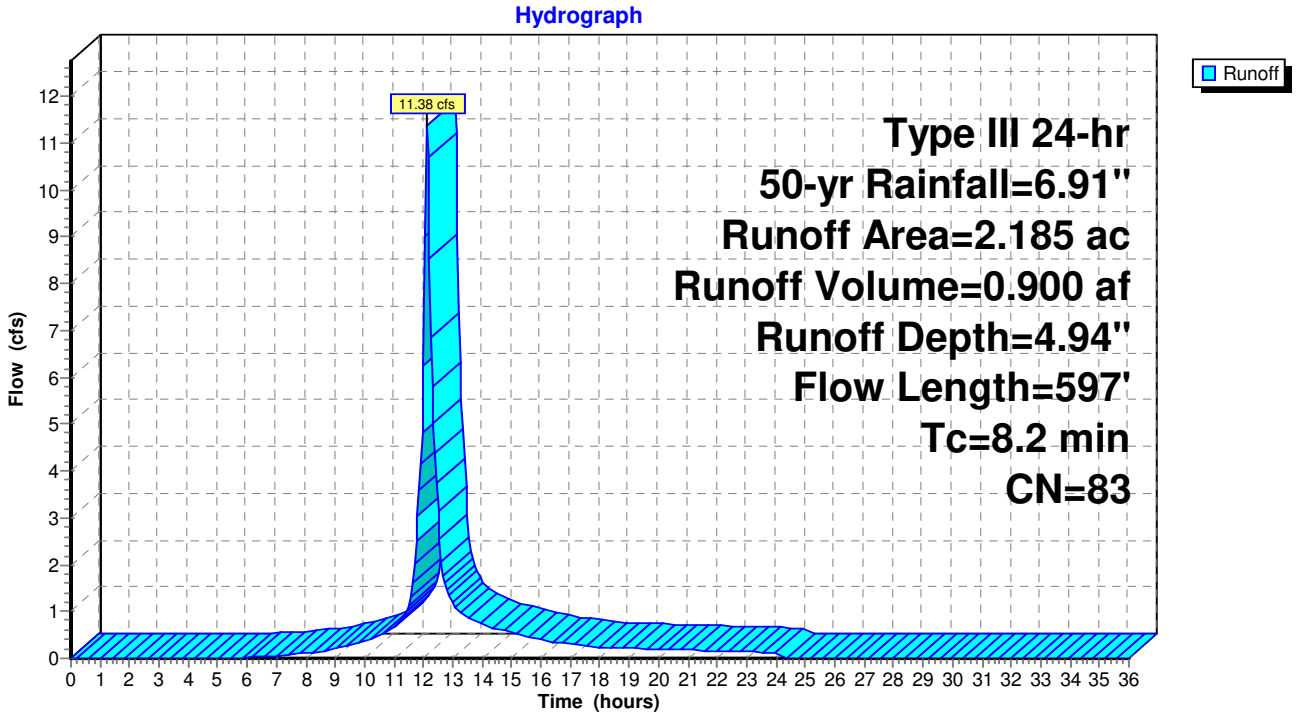


Subcatchment E1: Existing to Samsel and Carmon CB (DP1)



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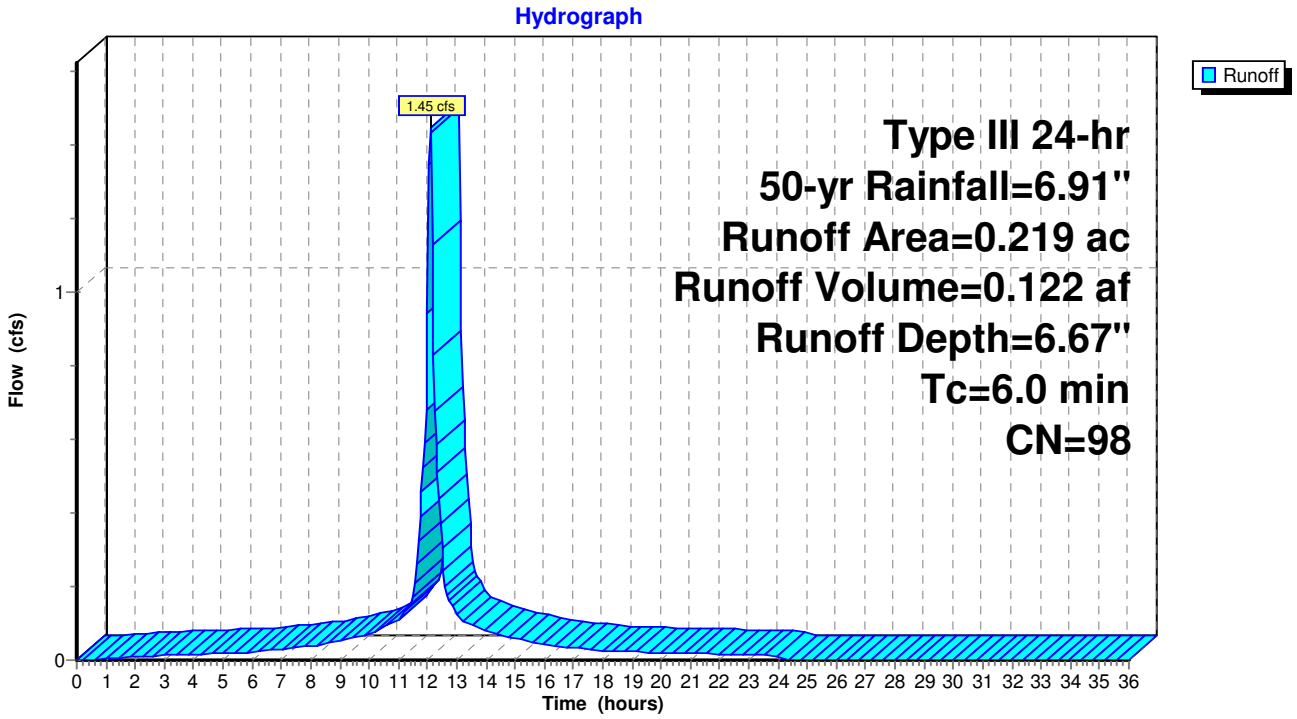
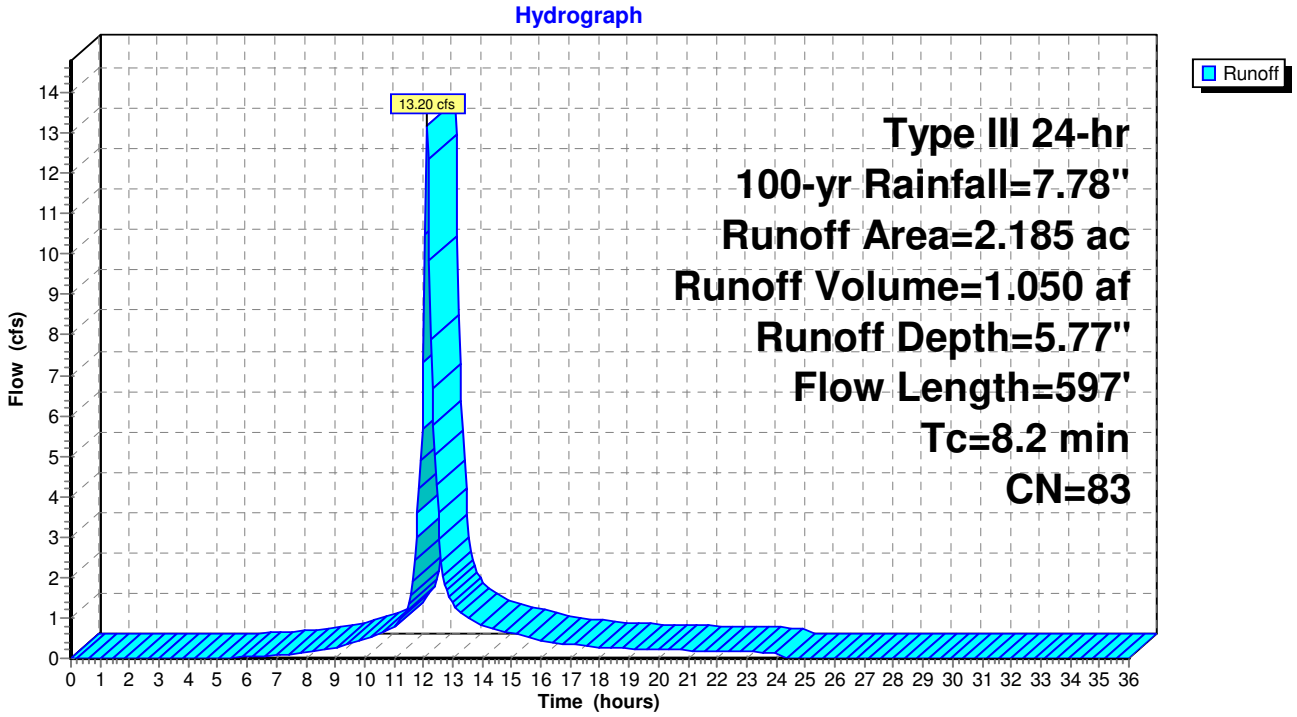
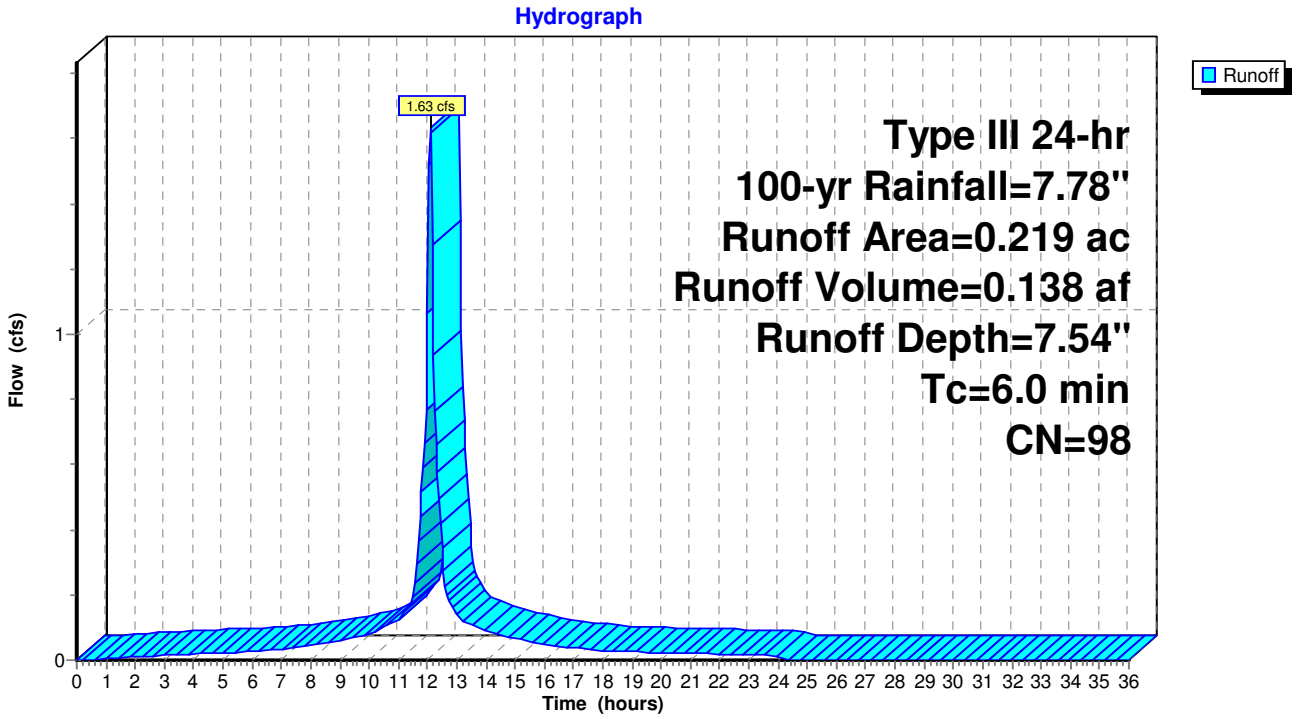


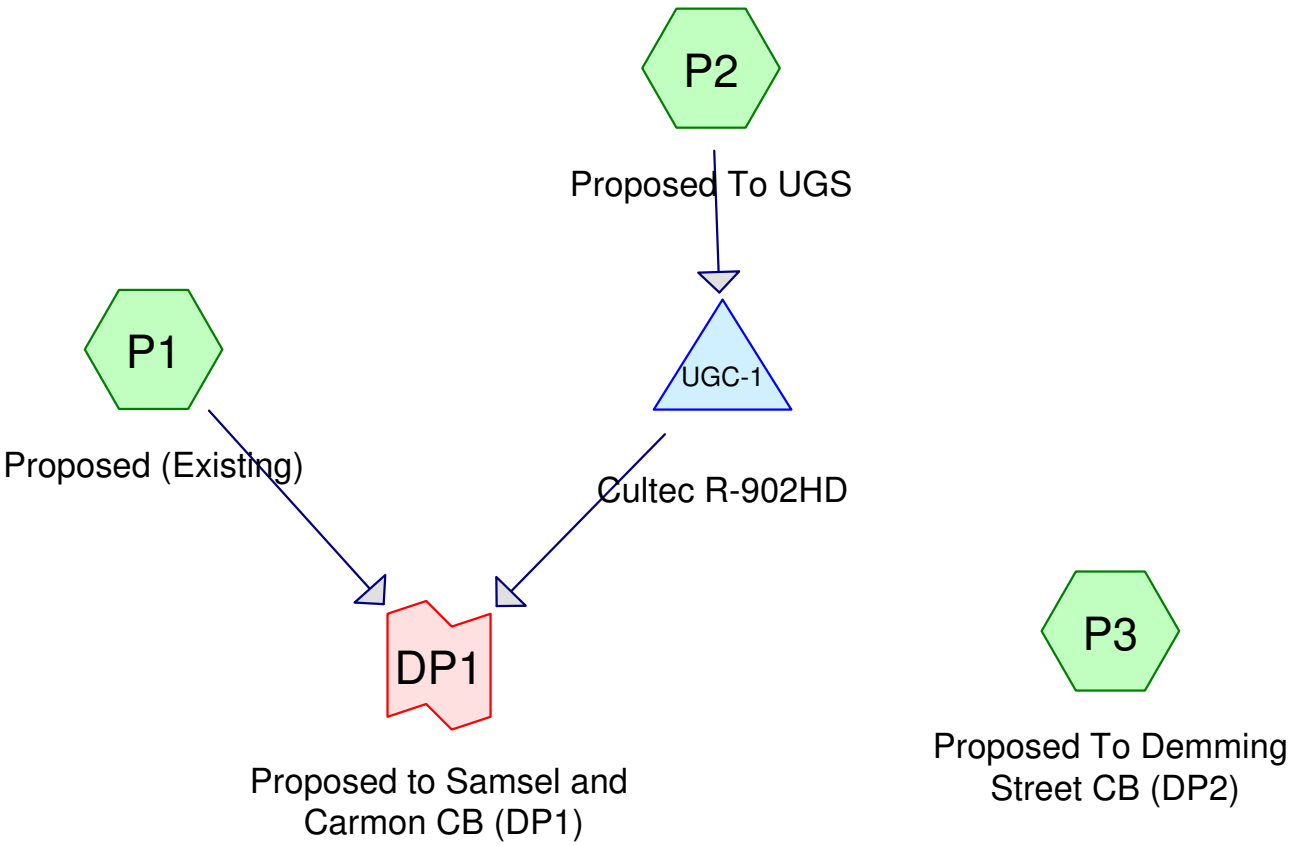
Subcatchment E1: Existing to Samsel and Carmon CB (DP1)



Subcatchment E2: Existing to Deming Street CB (DP2)



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



Subcat Reach Pond Link

Routing Diagram for 4337 - Drainage
Prepared by Design Professionals Inc. , Printed 6/11/2020

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

Subcatchment P1: Proposed (Existing) Runoff Area=1.374 ac 77.29% Impervious Runoff Depth=2.08"
Tc=6.0 min CN=90 Runoff=3.24 cfs 0.238 af

Subcatchment P2: Proposed To UGS Runoff Area=0.802 ac 68.70% Impervious Runoff Depth=1.75"
Tc=8.0 min CN=86 Runoff=1.51 cfs 0.117 af

Subcatchment P3: Proposed To Demming Runoff Area=0.252 ac 86.90% Impervious Runoff Depth=2.35"
Tc=7.0 min CN=93 Runoff=0.64 cfs 0.049 af

Pond UGC-1: Cultec R-902HD Peak Elev=97.37' Storage=1,602 cf Inflow=1.51 cfs 0.117 af
Outflow=0.35 cfs 0.128 af

Link DP1: Proposed to Samsel and Carmon CB (DP1) Inflow=3.50 cfs 0.366 af
Primary=3.50 cfs 0.366 af

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

Subcatchment P1: Proposed (Existing) Runoff Area=1.374 ac 77.29% Impervious Runoff Depth=3.79"
Tc=6.0 min CN=90 Runoff=5.76 cfs 0.434 af

Subcatchment P2: Proposed To UGS Runoff Area=0.802 ac 68.70% Impervious Runoff Depth=3.38"
Tc=8.0 min CN=86 Runoff=2.90 cfs 0.226 af

Subcatchment P3: Proposed To Demming Runoff Area=0.252 ac 86.90% Impervious Runoff Depth=4.11"
Tc=7.0 min CN=93 Runoff=1.09 cfs 0.086 af

Pond UGC-1: Cultec R-902HD Peak Elev=98.62' Storage=2,528 cf Inflow=2.90 cfs 0.226 af
Outflow=1.70 cfs 0.237 af

Link DP1: Proposed to Samsel and Carmon CB (DP1) Inflow=6.11 cfs 0.671 af
Primary=6.11 cfs 0.671 af

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

Subcatchment P1: Proposed (Existing) Runoff Area=1.374 ac 77.29% Impervious Runoff Depth=4.88"
Tc=6.0 min CN=90 Runoff=7.33 cfs 0.559 af

Subcatchment P2: Proposed To UGS Runoff Area=0.802 ac 68.70% Impervious Runoff Depth=4.45"
Tc=8.0 min CN=86 Runoff=3.77 cfs 0.297 af

Subcatchment P3: Proposed To Demming Runoff Area=0.252 ac 86.90% Impervious Runoff Depth=5.22"
Tc=7.0 min CN=93 Runoff=1.37 cfs 0.110 af

Pond UGC-1: Cultec R-902HD Peak Elev=99.23' Storage=2,927 cf Inflow=3.77 cfs 0.297 af
Outflow=2.56 cfs 0.309 af

Link DP1: Proposed to Samsel and Carmon CB (DP1) Inflow=8.84 cfs 0.868 af
Primary=8.84 cfs 0.868 af

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

Subcatchment P1: Proposed (Existing) Runoff Area=1.374 ac 77.29% Impervious Runoff Depth=5.73"
Tc=6.0 min CN=90 Runoff=8.52 cfs 0.657 af

Subcatchment P2: Proposed To UGS Runoff Area=0.802 ac 68.70% Impervious Runoff Depth=5.28"
Tc=8.0 min CN=86 Runoff=4.44 cfs 0.353 af

Subcatchment P3: Proposed To Demming Runoff Area=0.252 ac 86.90% Impervious Runoff Depth=6.08"
Tc=7.0 min CN=93 Runoff=1.58 cfs 0.128 af

Pond UGC-1: Cultec R-902HD Peak Elev=99.86' Storage=3,232 cf Inflow=4.44 cfs 0.353 af
Outflow=3.20 cfs 0.364 af

Link DP1: Proposed to Samsel and Carmon CB (DP1) Inflow=10.83 cfs 1.021 af
Primary=10.83 cfs 1.021 af

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

Subcatchment P1: Proposed (Existing) Runoff Area=1.374 ac 77.29% Impervious Runoff Depth=6.59"
Tc=6.0 min CN=90 Runoff=9.71 cfs 0.754 af

Subcatchment P2: Proposed To UGS Runoff Area=0.802 ac 68.70% Impervious Runoff Depth=6.12"
Tc=8.0 min CN=86 Runoff=5.10 cfs 0.409 af

Subcatchment P3: Proposed To Demming Runoff Area=0.252 ac 86.90% Impervious Runoff Depth=6.94"
Tc=7.0 min CN=93 Runoff=1.79 cfs 0.146 af

Pond UGC-1: Cultec R-902HD Peak Elev=100.56' Storage=3,509 cf Inflow=5.10 cfs 0.409 af
Outflow=3.76 cfs 0.420 af

Link DP1: Proposed to Samsel and Carmon CB (DP1) Inflow=12.56 cfs 1.175 af
Primary=12.56 cfs 1.175 af

Summary for Subcatchment P1: Proposed (Existing)

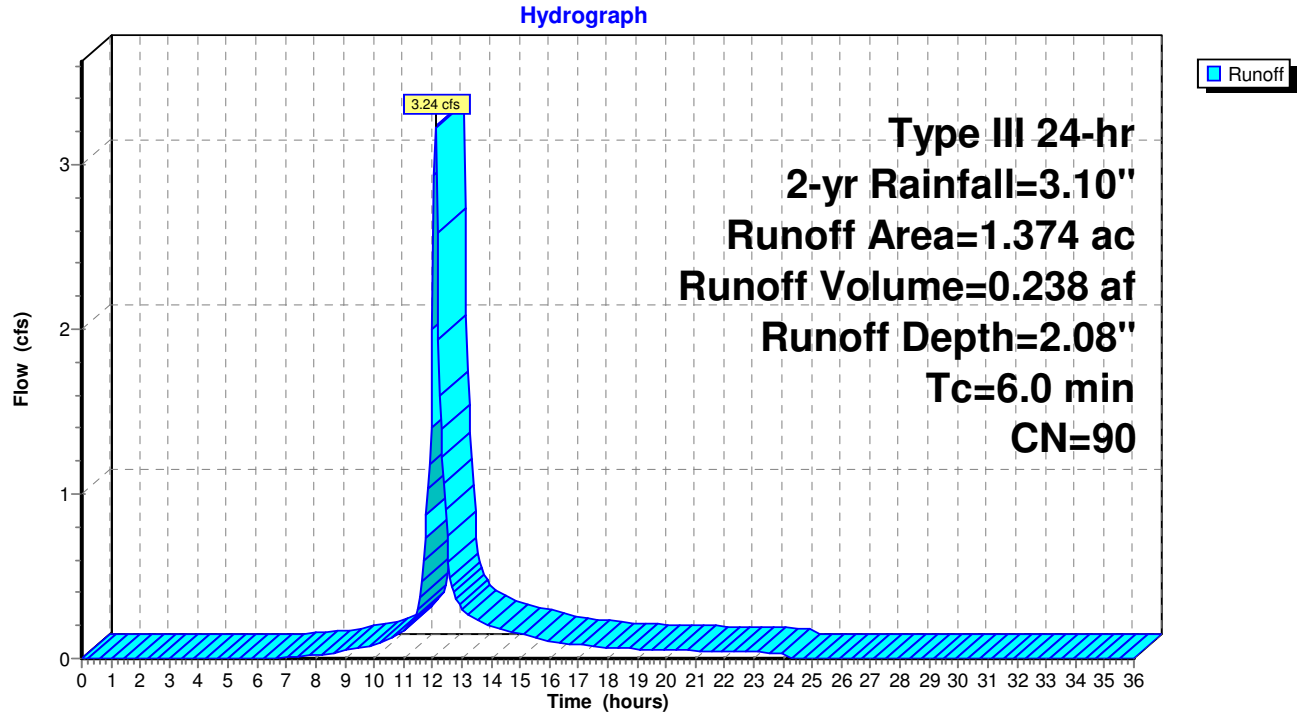
Runoff = 3.24 cfs @ 12.09 hrs, Volume= 0.238 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (ac)	CN	Description
	0.312	61	>75% Grass cover, Good, HSG B
*	1.062	98	IMPERVIOUS
	1.374	90	Weighted Average
	0.312		22.71% Pervious Area
	1.062		77.29% Impervious Area

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

Subcatchment P1: Proposed (Existing)



Summary for Subcatchment P2: Proposed To UGS

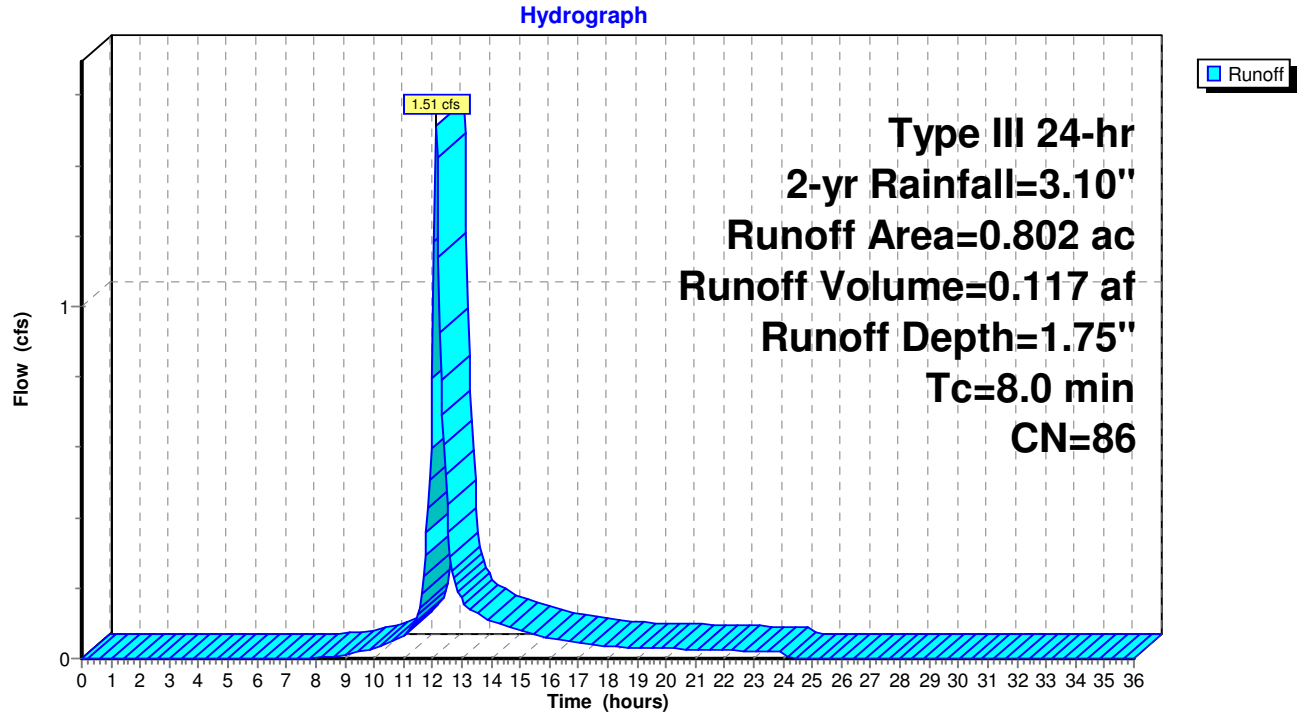
Runoff = 1.51 cfs @ 12.12 hrs, Volume= 0.117 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (ac)	CN	Description
	0.251	61	>75% Grass cover, Good, HSG B
*	0.551	98	IMPERVIOUS
	0.802	86	Weighted Average
	0.251		31.30% Pervious Area
	0.551		68.70% Impervious Area

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

Subcatchment P2: Proposed To UGS



Summary for Subcatchment P3: Proposed To Demming Street CB (DP2)

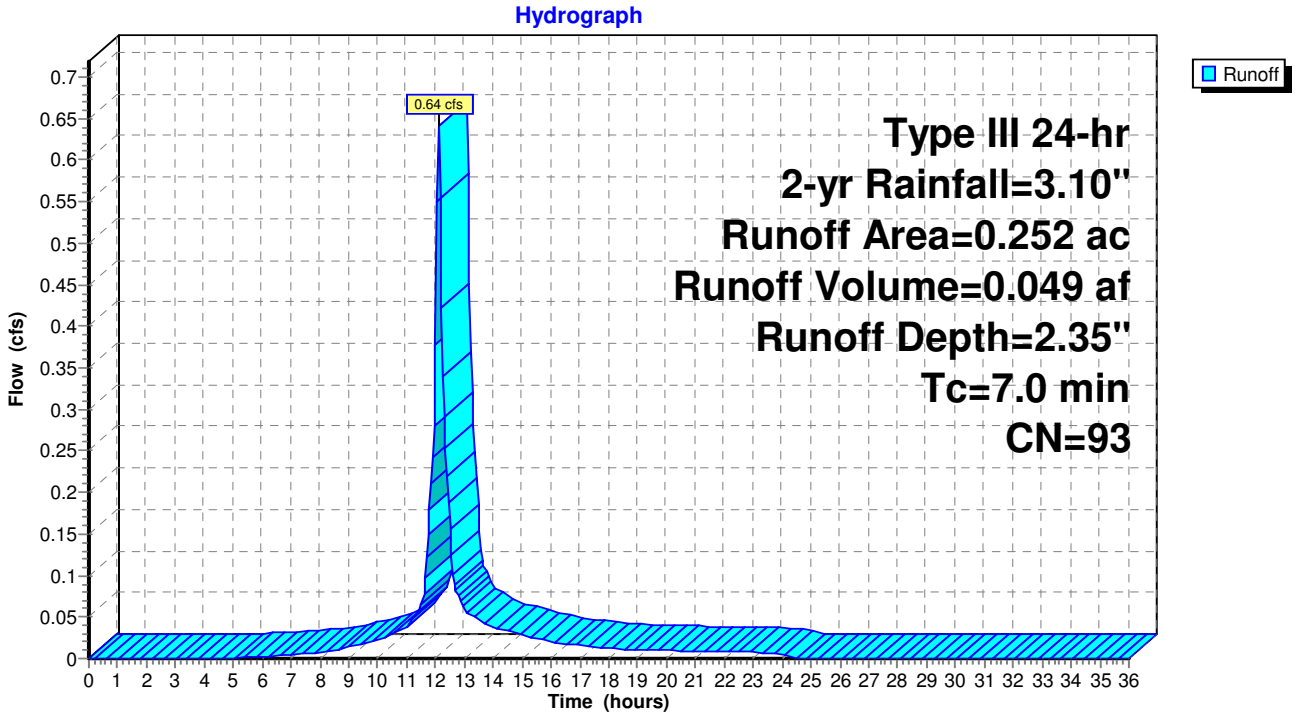
Runoff = 0.64 cfs @ 12.10 hrs, Volume= 0.049 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

	Area (ac)	CN	Description
	0.033	61	>75% Grass cover, Good, HSG B
*	0.219	98	IMPERVIOUS
	0.252	93	Weighted Average
	0.033		13.10% Pervious Area
	0.219		86.90% Impervious Area

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

Subcatchment P3: Proposed To Demming Street CB (DP2)



Summary for Pond UGC-1: Cultec R-902HD

Inflow Area = 0.802 ac, 68.70% Impervious, Inflow Depth = 1.75" for 2-yr event
Inflow = 1.51 cfs @ 12.12 hrs, Volume= 0.117 af
Outflow = 0.35 cfs @ 12.56 hrs, Volume= 0.128 af, Atten= 77%, Lag= 26.4 min
Primary = 0.35 cfs @ 12.56 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Starting Elev= 95.96' Surf.Area= 997 sf Storage= 472 cf
Peak Elev= 97.37' @ 12.56 hrs Surf.Area= 997 sf Storage= 1,602 cf (1,130 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

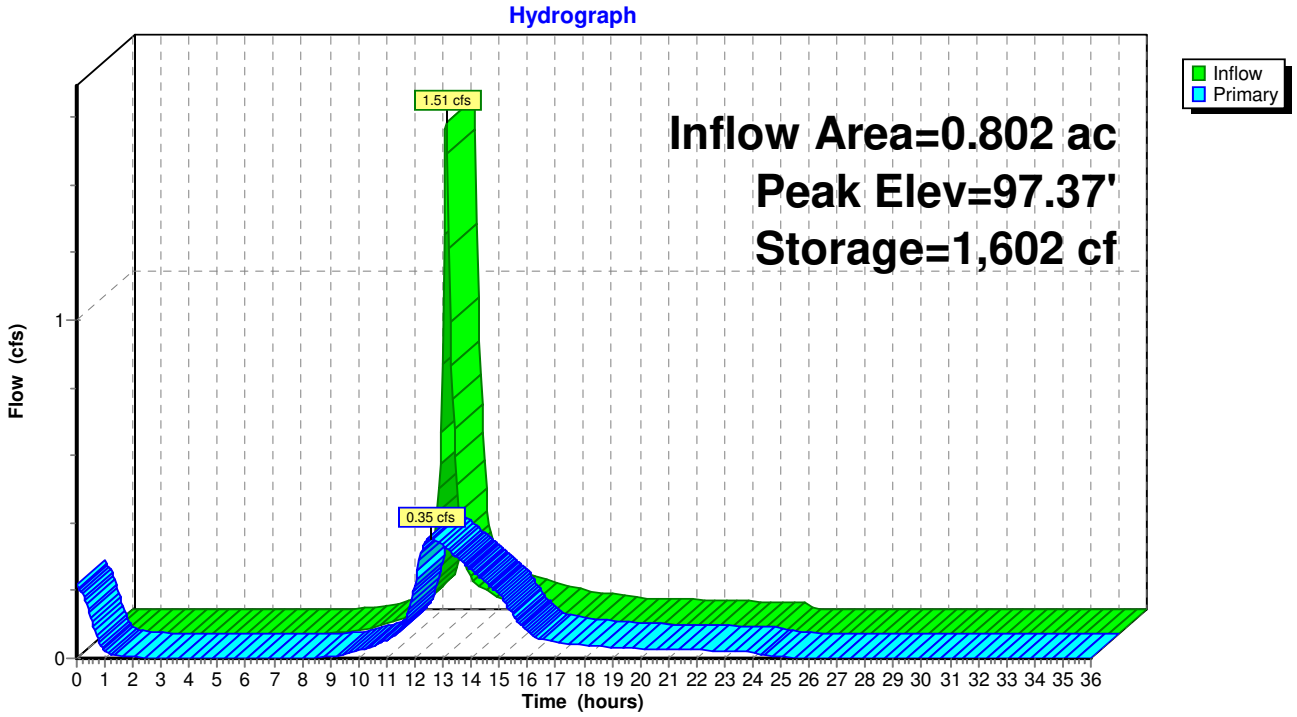
Volume	Invert	Avail.Storage	Storage Description
#1A	95.00'	1,433 cf	**23.00'W x 43.37'L x 5.75'H Field A** 5,735 cf Overall - 2,153 cf Embedded = 3,582 cf x 40.0% Voids
#2A	95.75'	2,153 cf	**Cultec R-902HD** x 33 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 33 Chambers in 3 Rows Cap Storage= +2.8 cf x 2 x 3 rows = 16.6 cf
		3,586 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**12.0" Round Culvert** L= 283.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.00' / 87.50' S= 0.0265 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	95.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	97.90'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.35 cfs @ 12.56 hrs HW=97.37' (Free Discharge)
└**1=Culvert** (Passes 0.35 cfs of 5.17 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 7.22 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond UGC-1: Cultec R-902HD

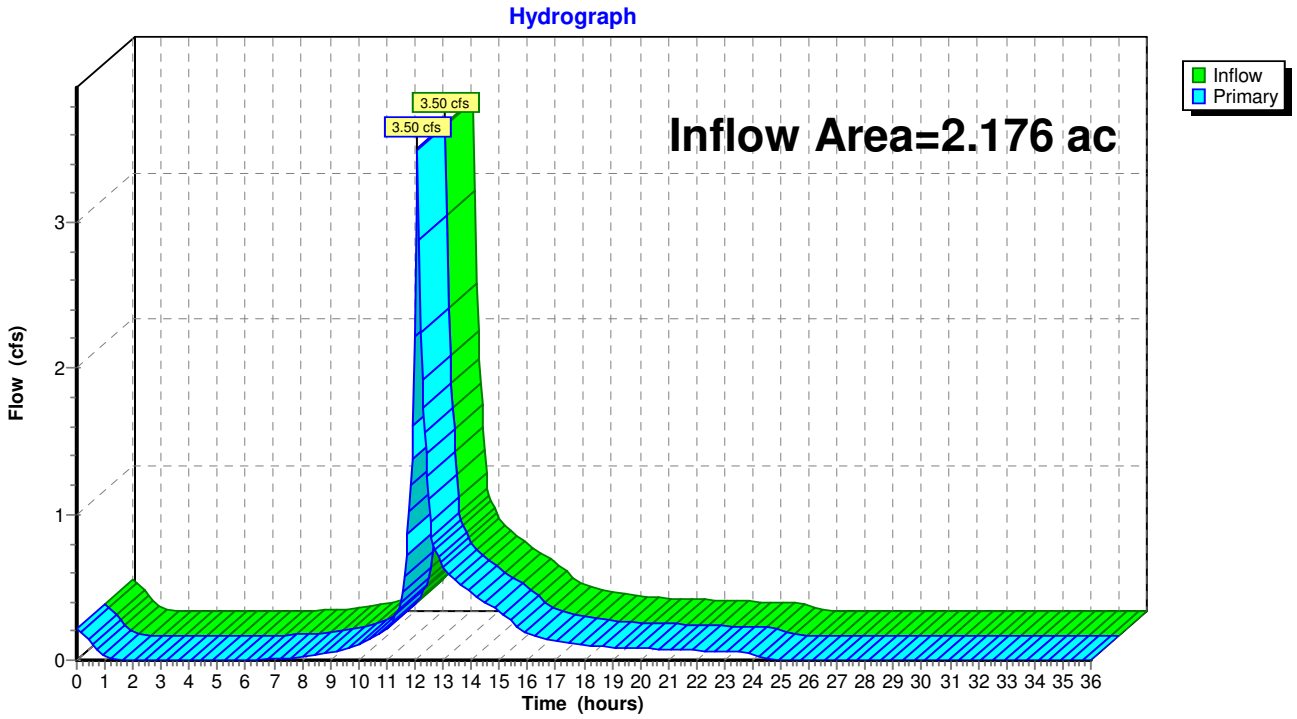


Summary for Link DP1: Proposed to Samsel and Carmon CB (DP1)

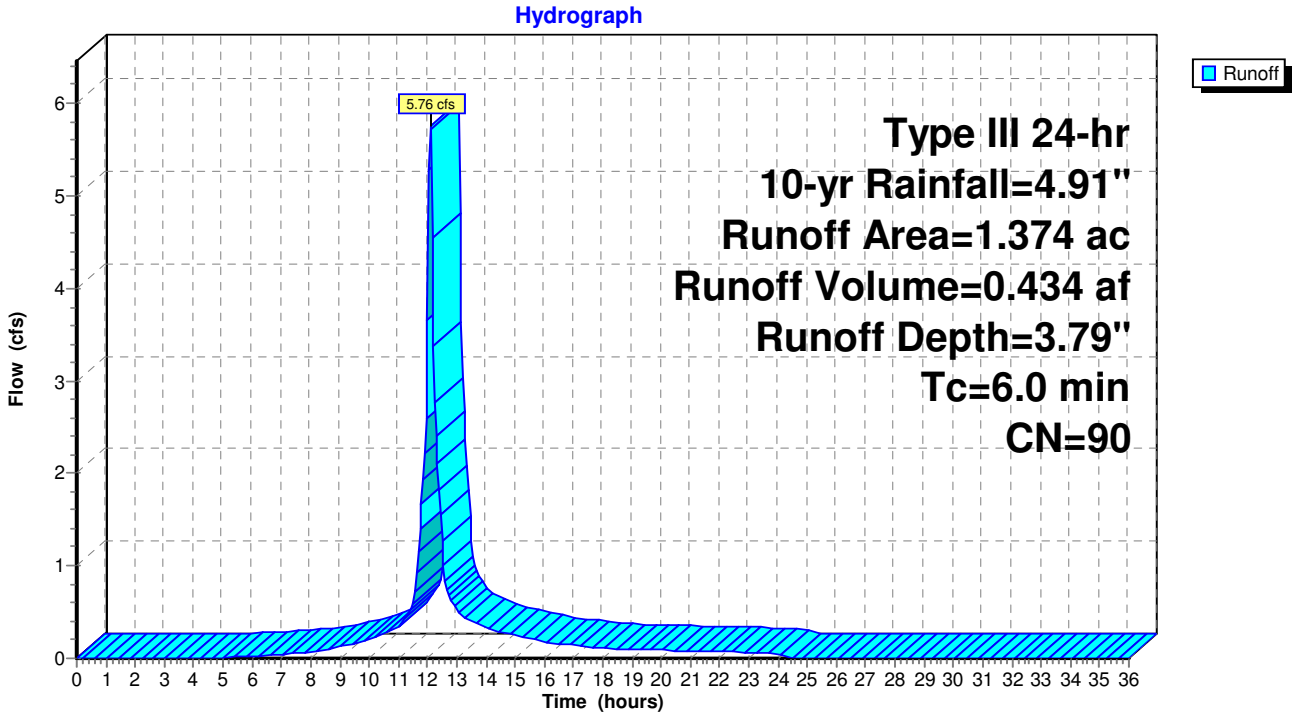
Inflow Area = 2.176 ac, 74.13% Impervious, Inflow Depth = 2.02" for 2-yr event
Inflow = 3.50 cfs @ 12.09 hrs, Volume= 0.366 af
Primary = 3.50 cfs @ 12.09 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min

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

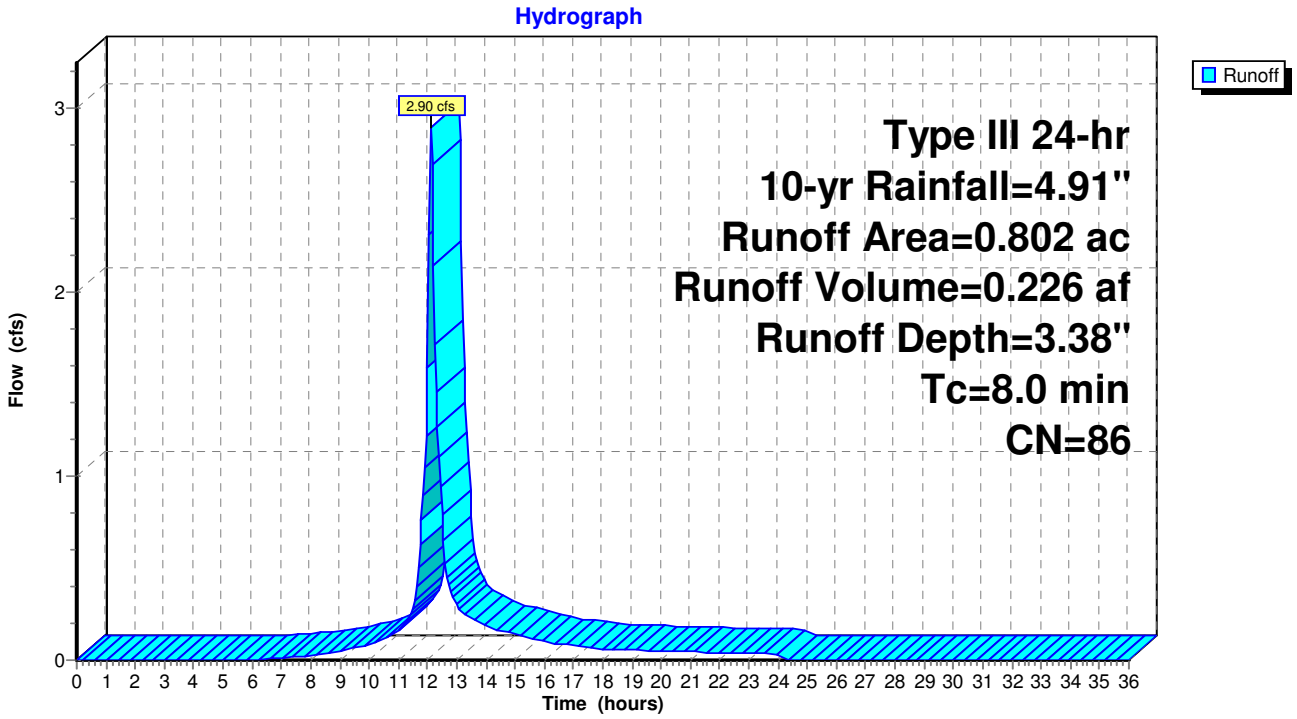
Link DP1: Proposed to Samsel and Carmon CB (DP1)



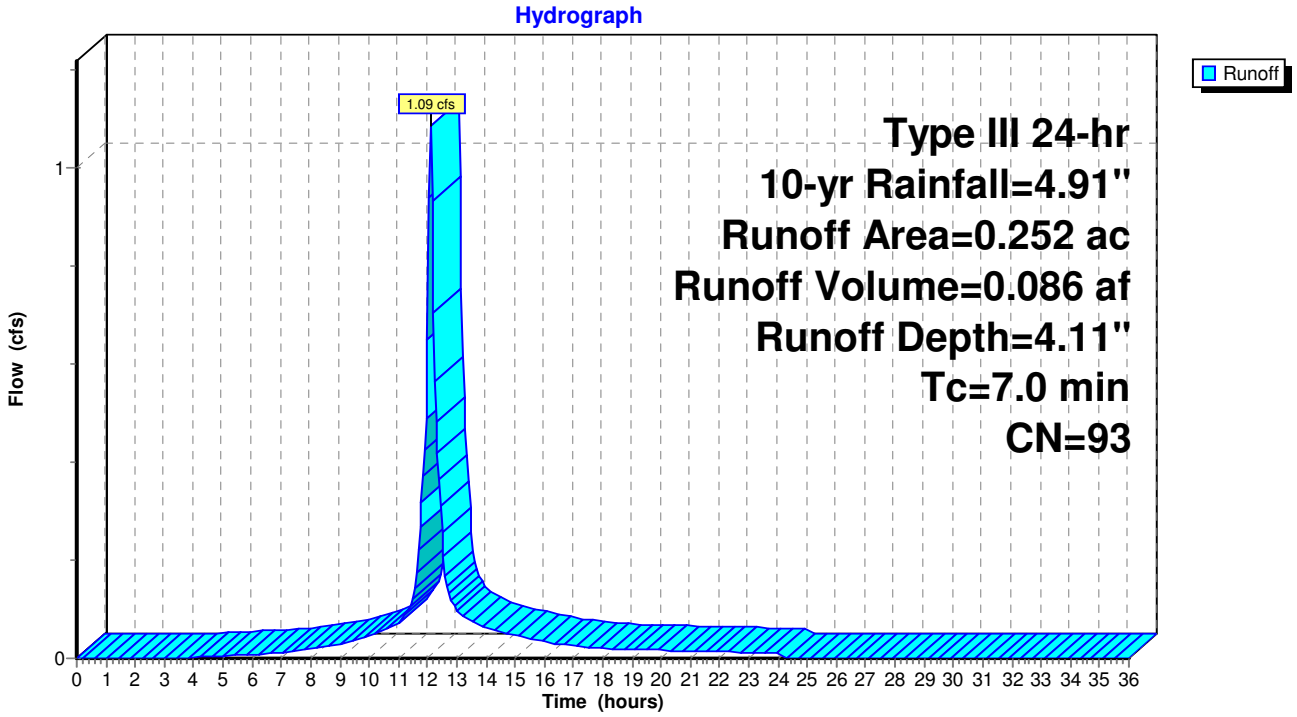
Subcatchment P1: Proposed (Existing)



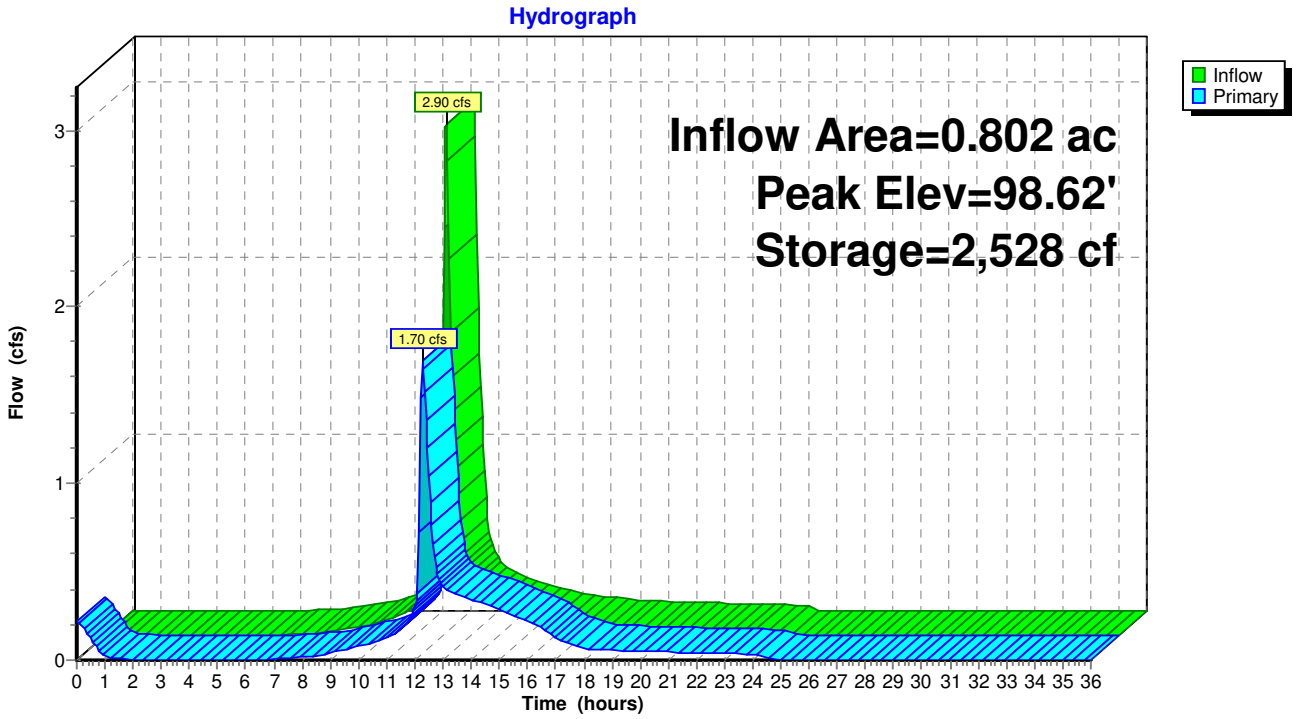
Subcatchment P2: Proposed To UGS



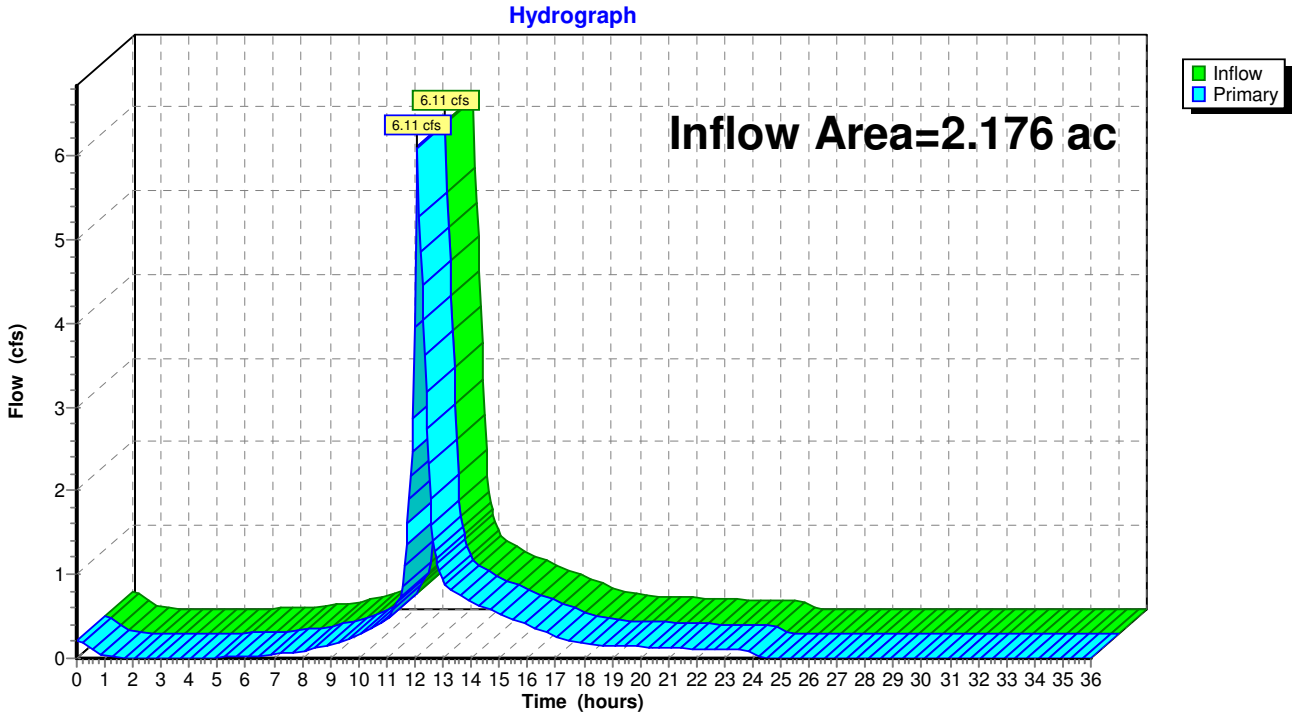
Subcatchment P3: Proposed To Demming Street CB (DP2)



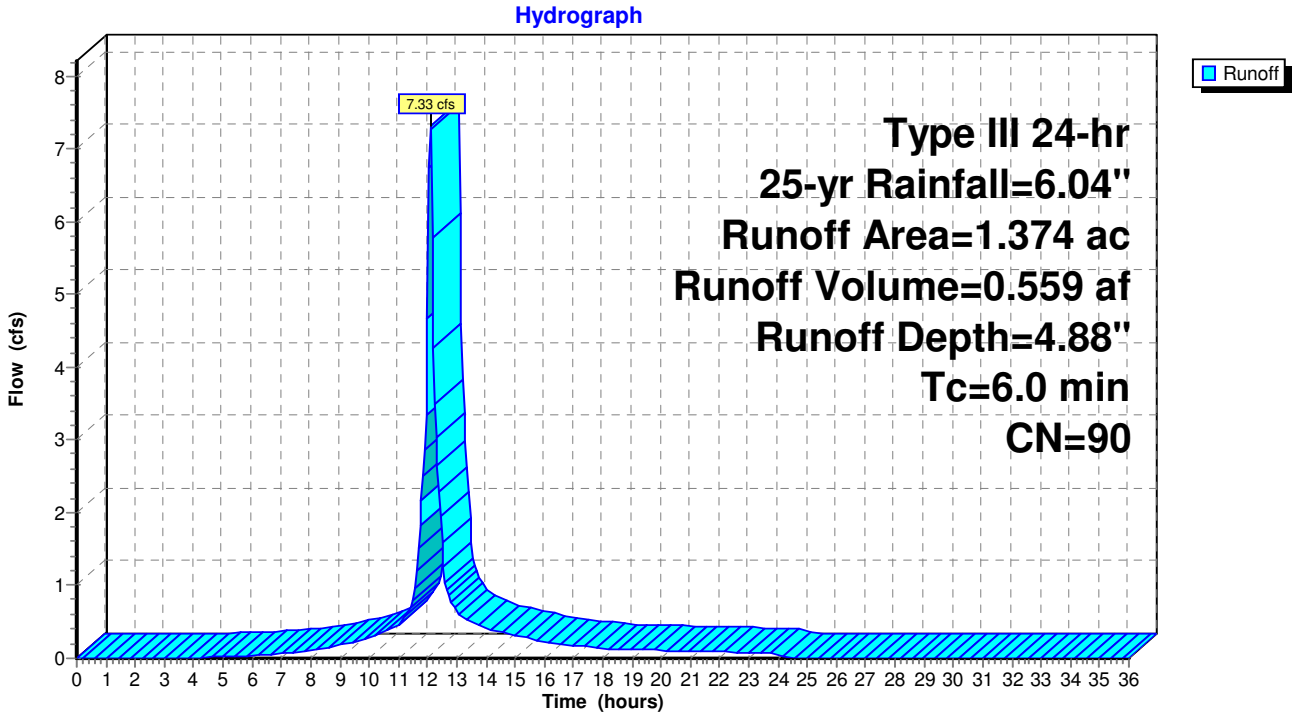
Pond UGC-1: Cultec R-902HD



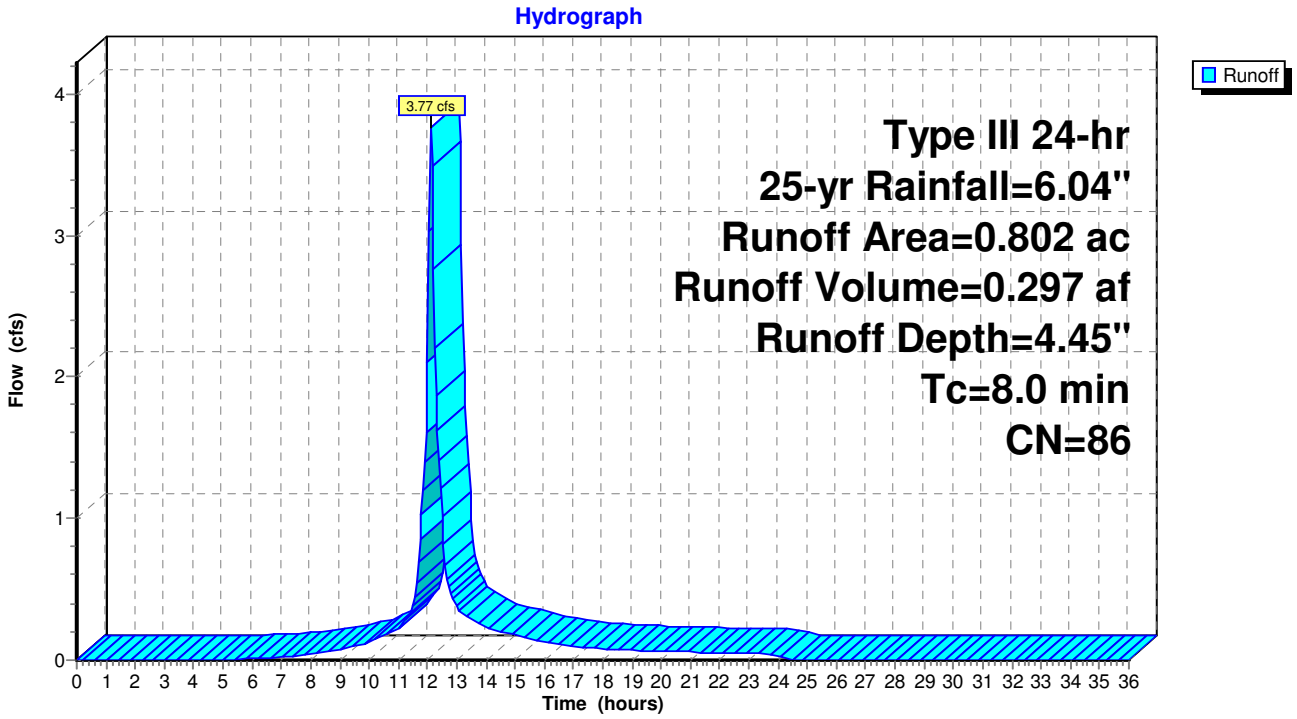
Link DP1: Proposed to Samsel and Carmon CB (DP1)



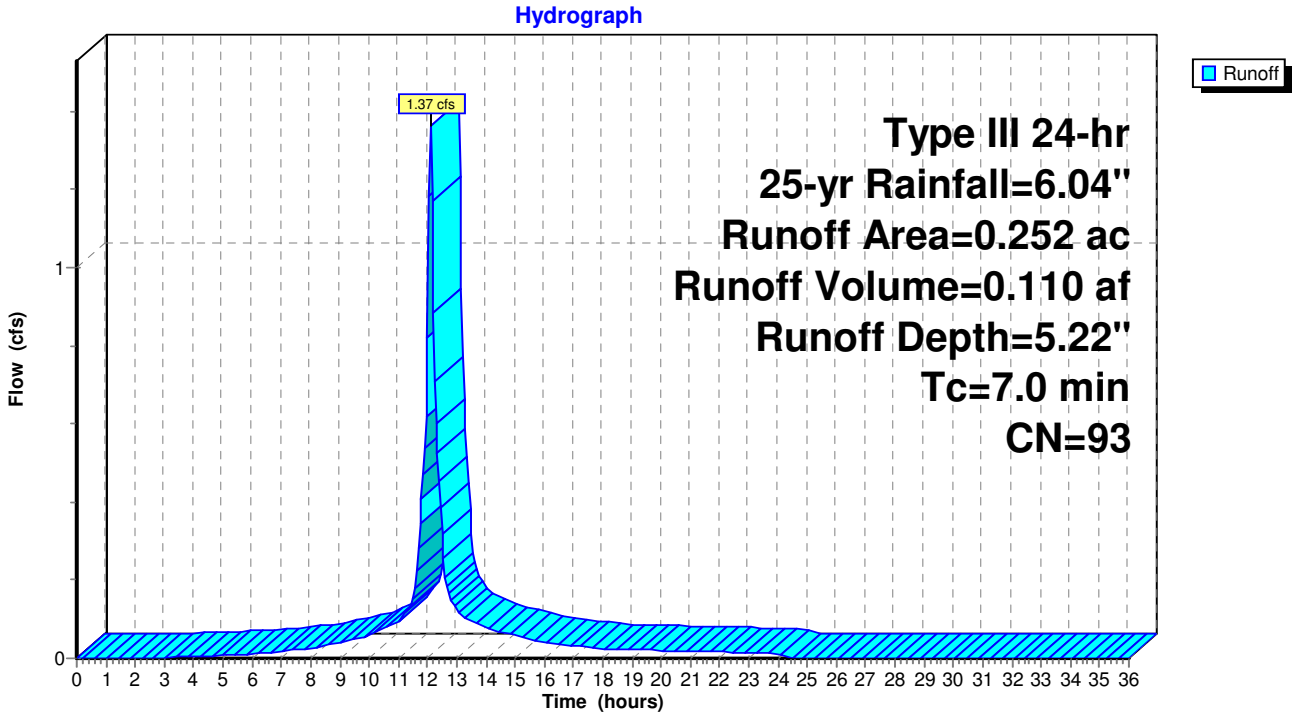
Subcatchment P1: Proposed (Existing)



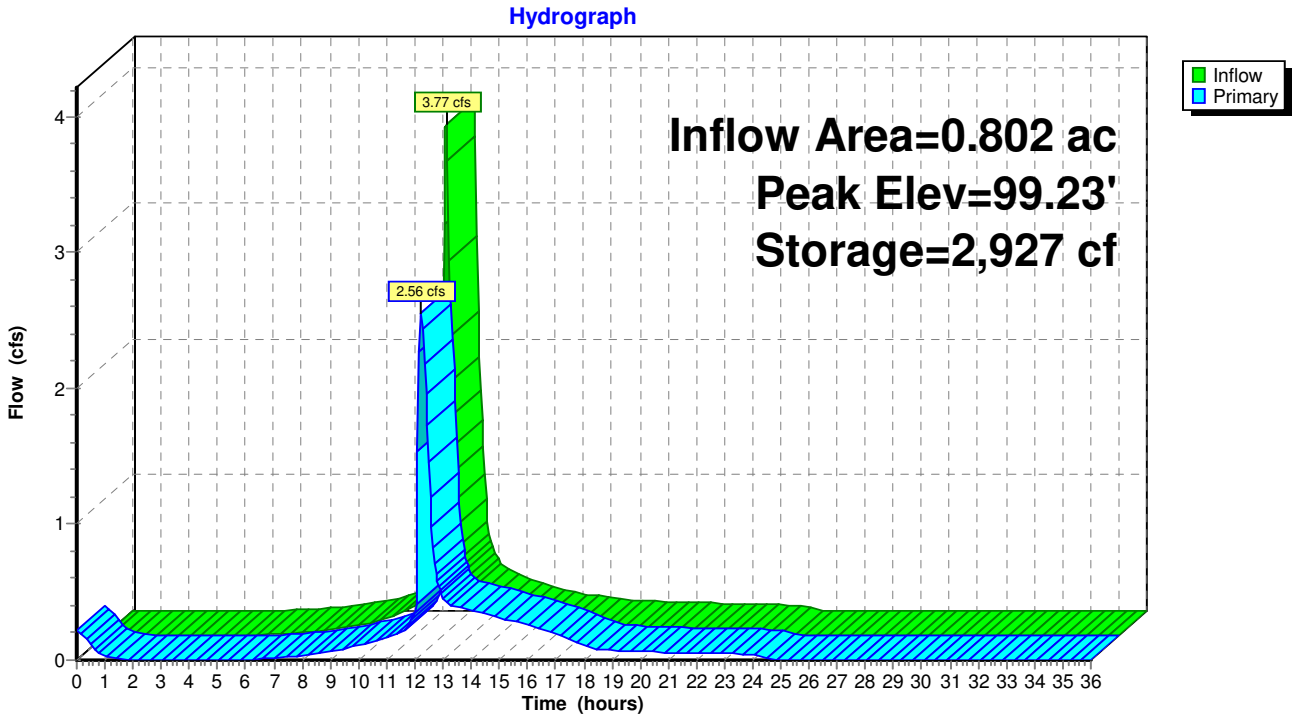
Subcatchment P2: Proposed To UGS



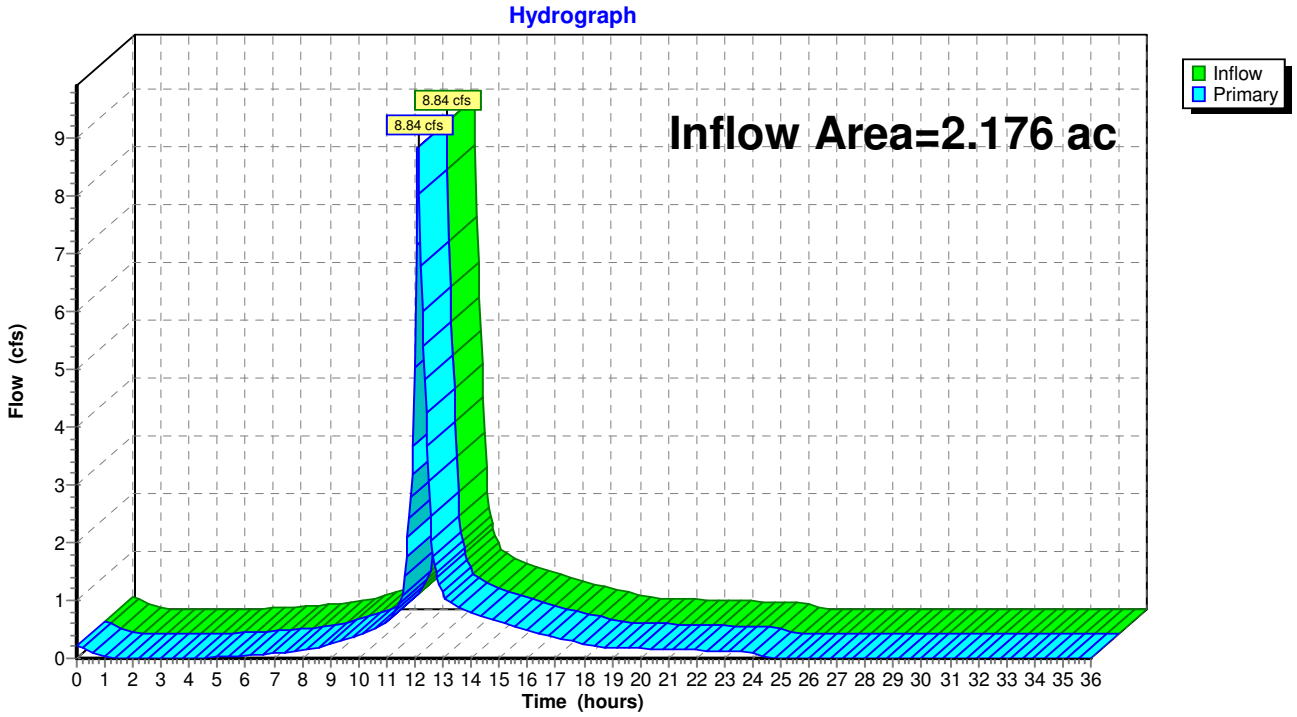
Subcatchment P3: Proposed To Demming Street CB (DP2)



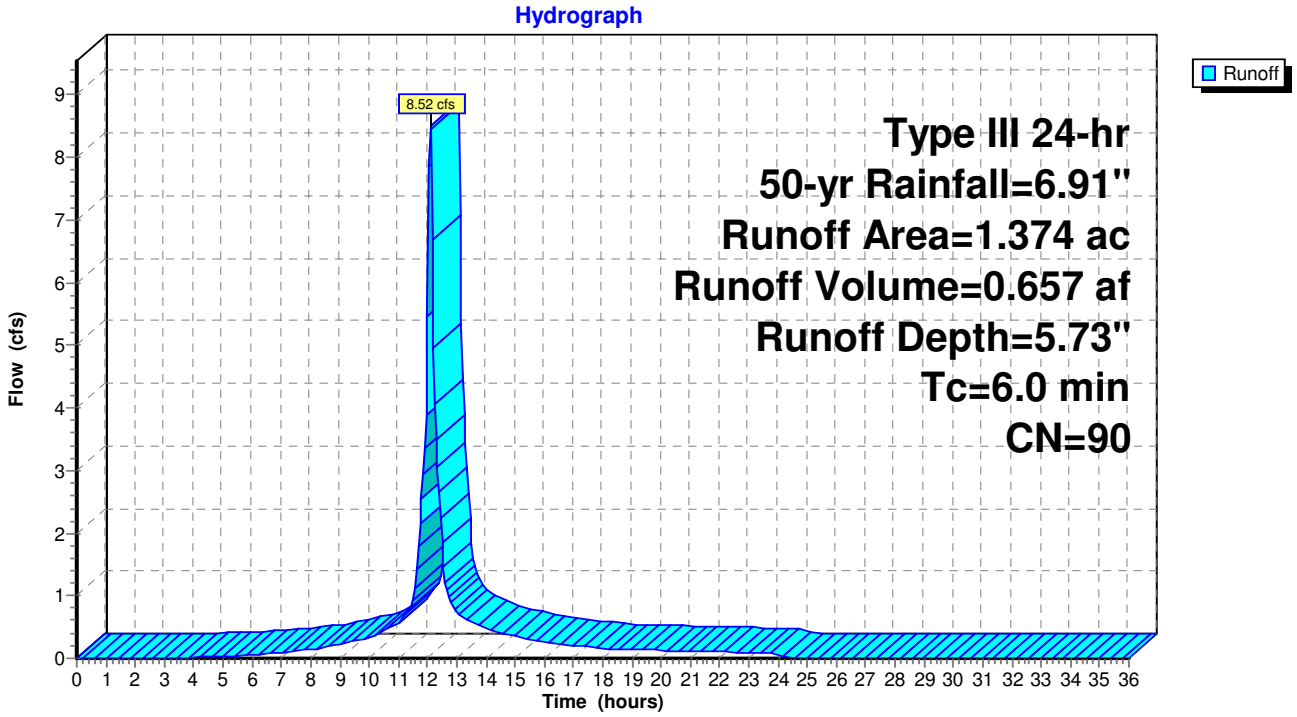
Pond UGC-1: Cultec R-902HD



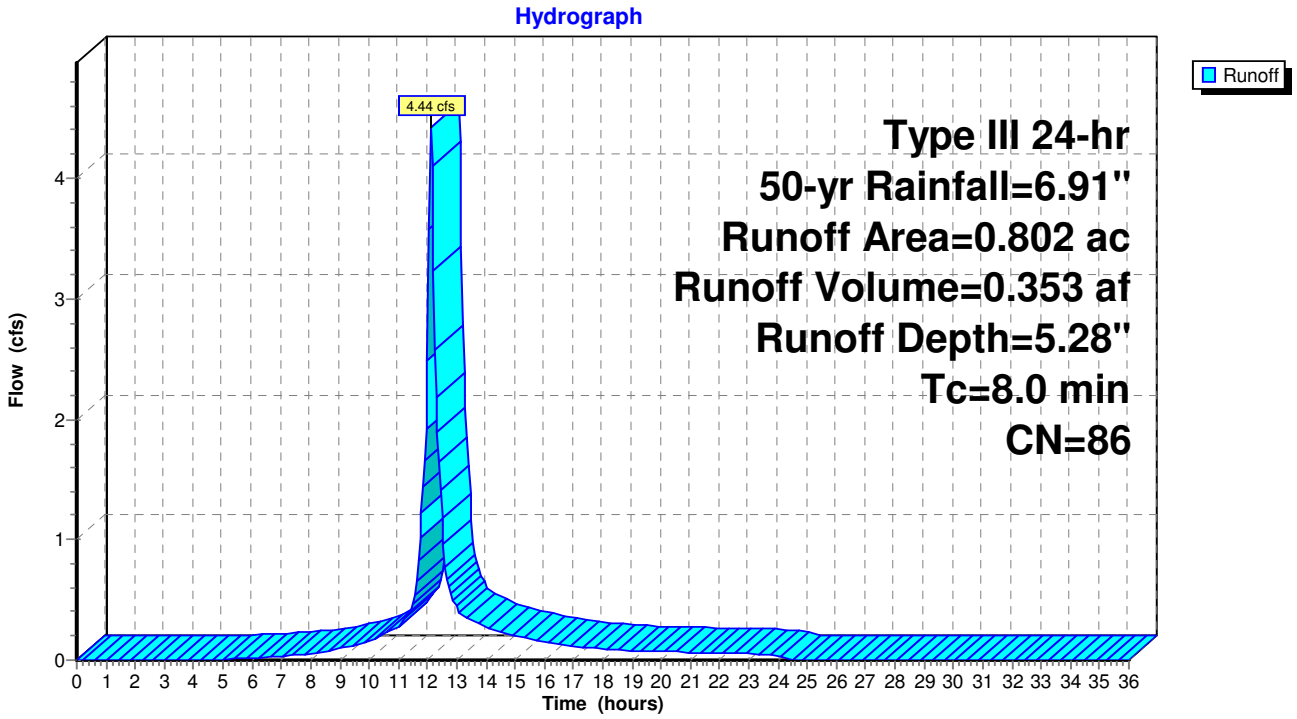
Link DP1: Proposed to Samsel and Carmon CB (DP1)



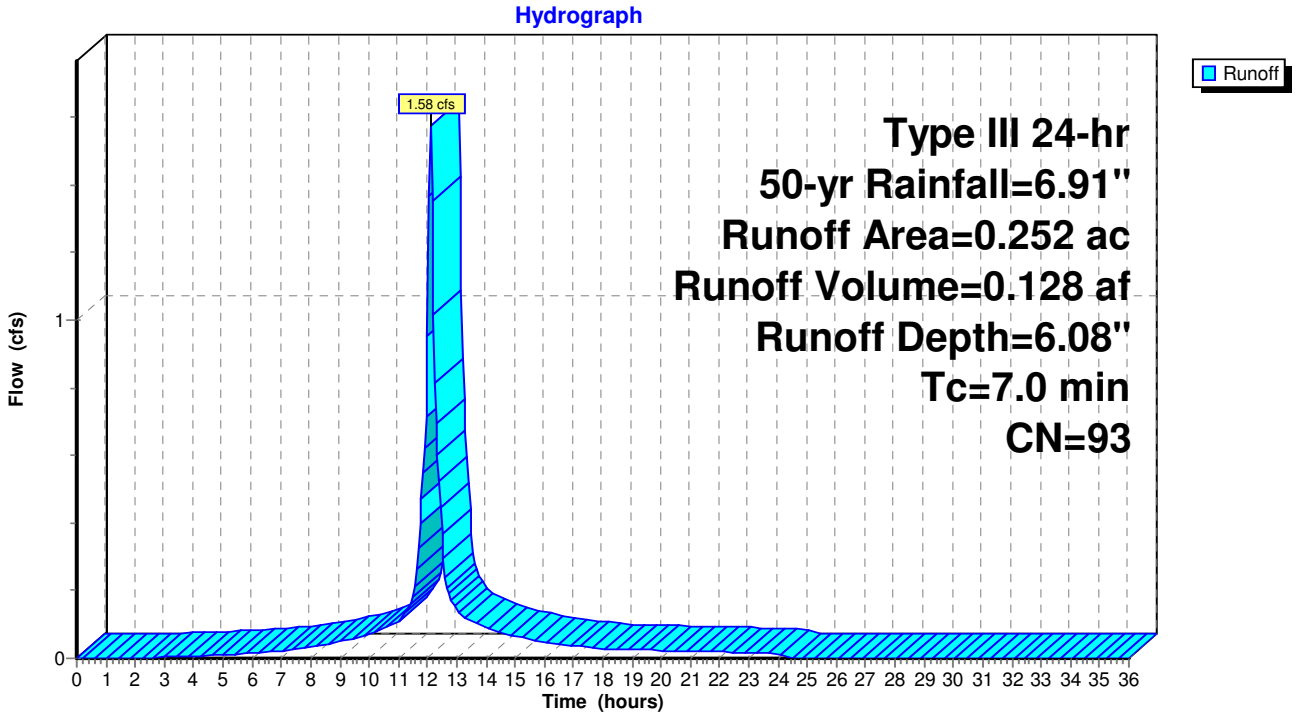
Subcatchment P1: Proposed (Existing)



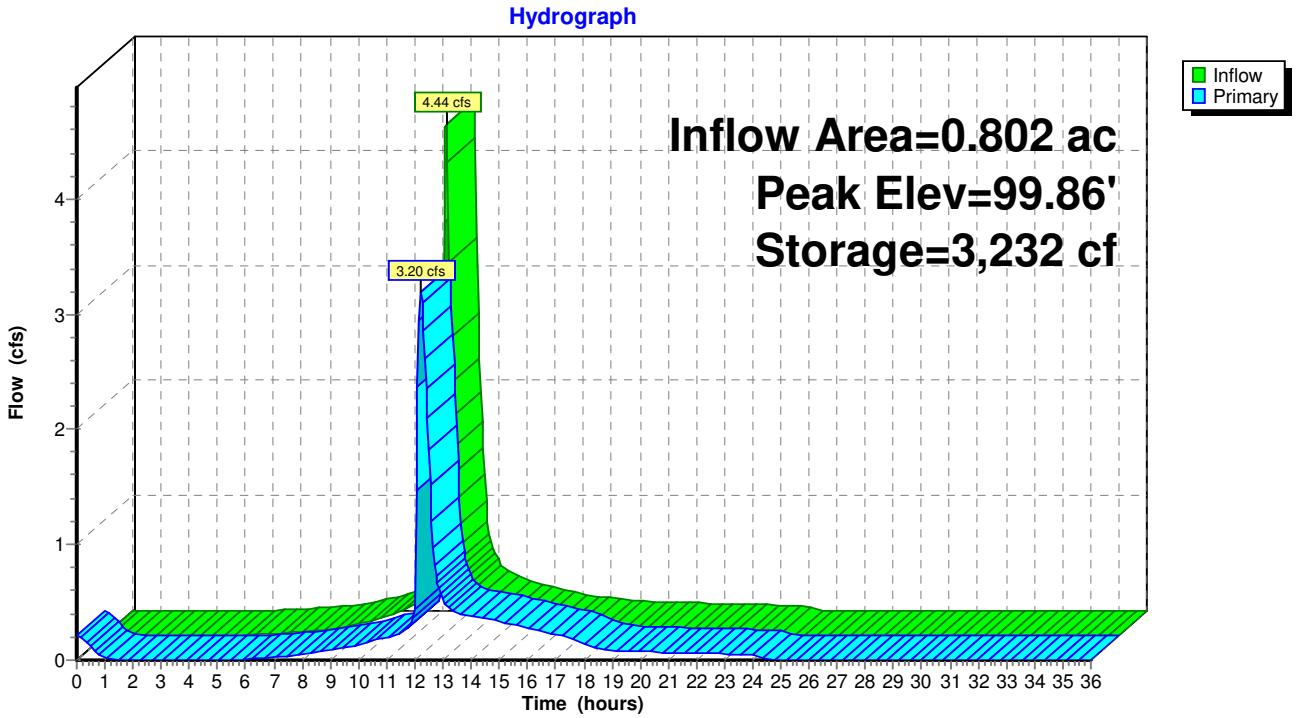
Subcatchment P2: Proposed To UGS



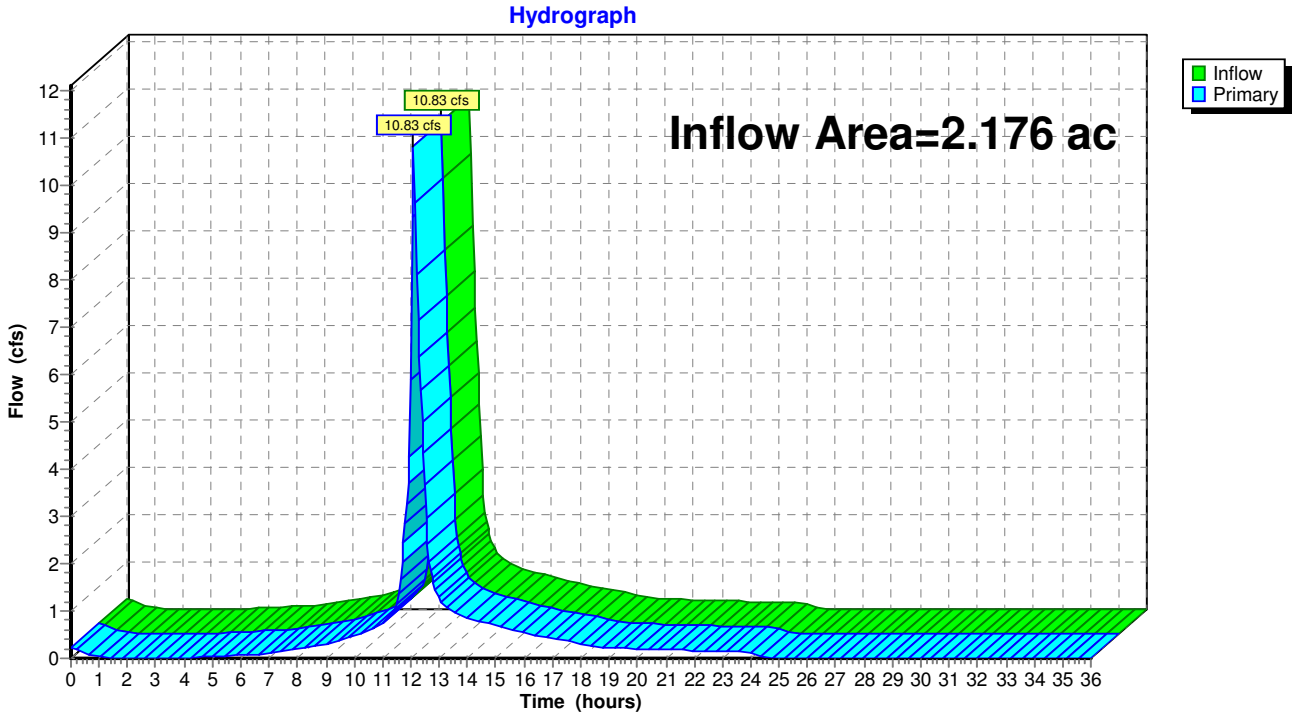
Subcatchment P3: Proposed To Demming Street CB (DP2)



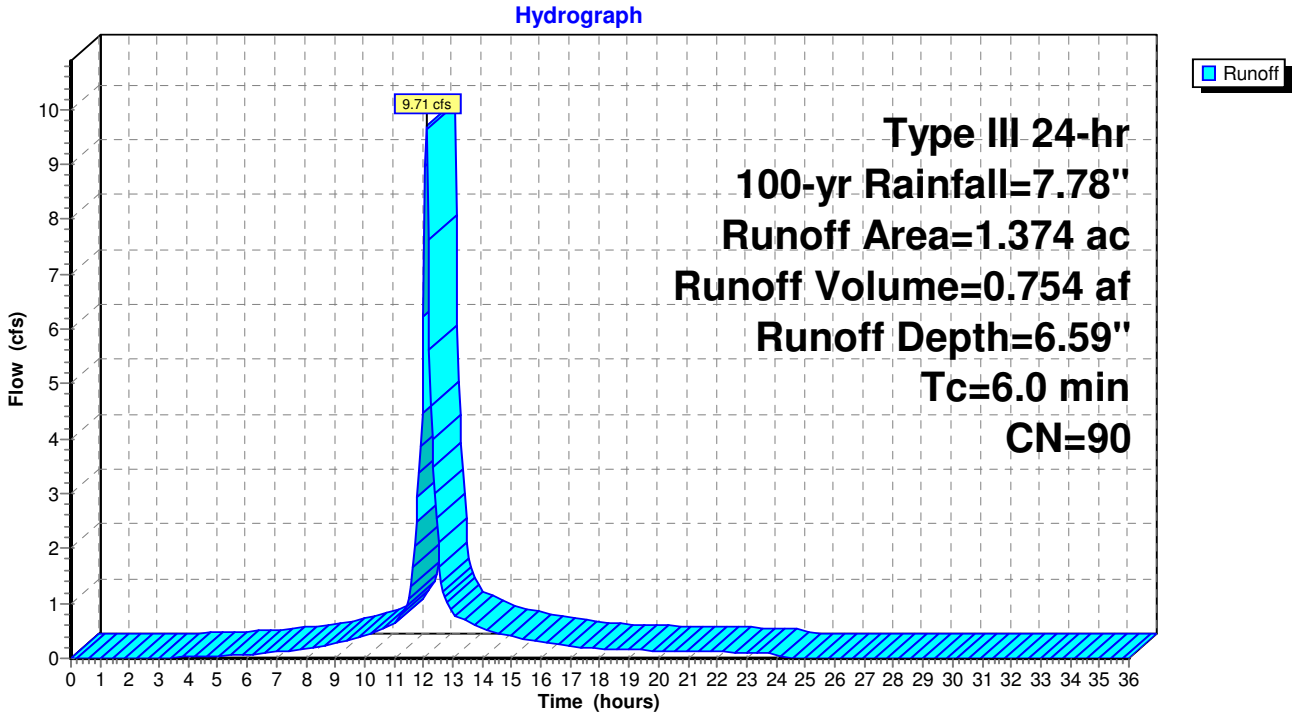
Pond UGC-1: Cultec R-902HD



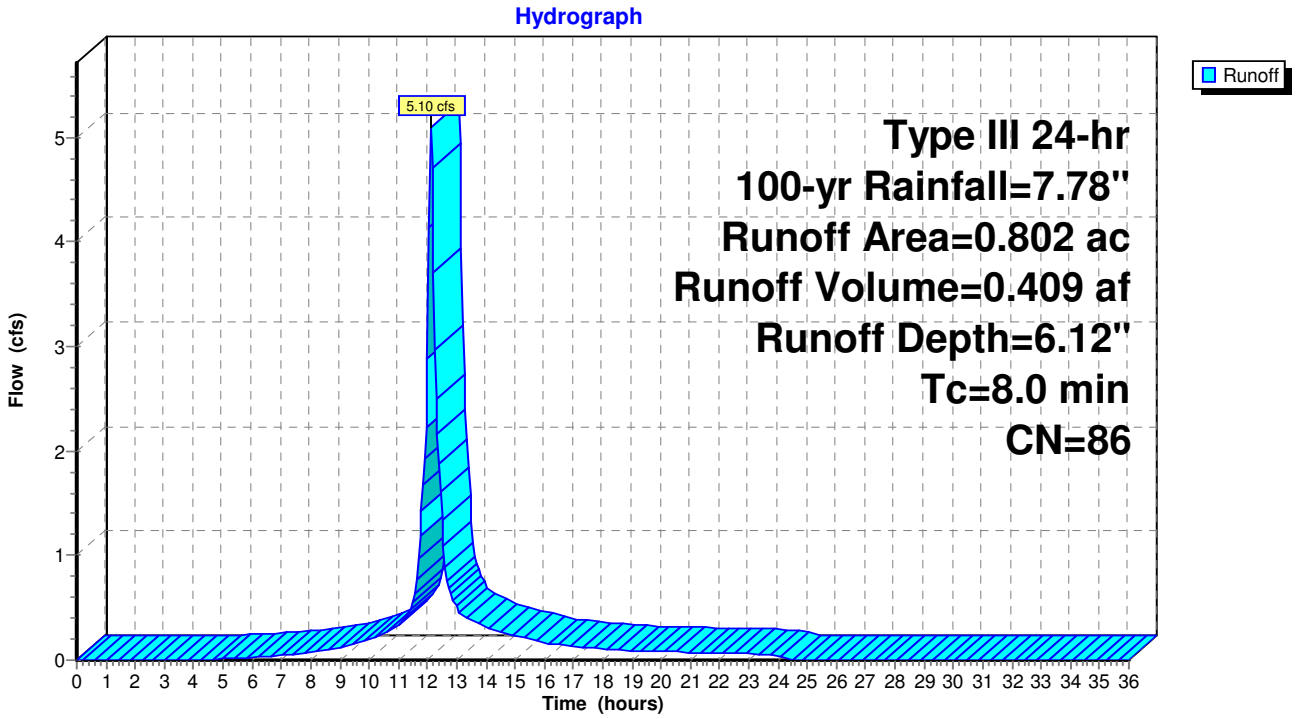
Link DP1: Proposed to Samsel and Carmon CB (DP1)



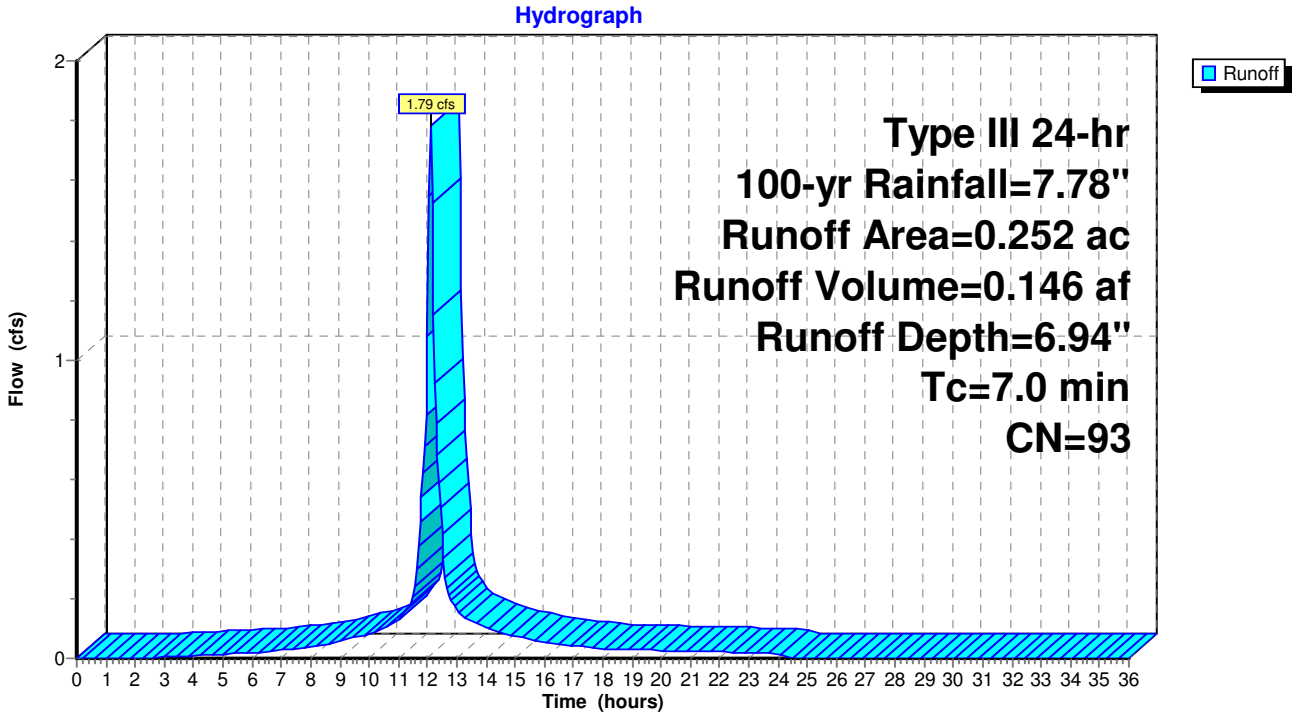
Subcatchment P1: Proposed (Existing)



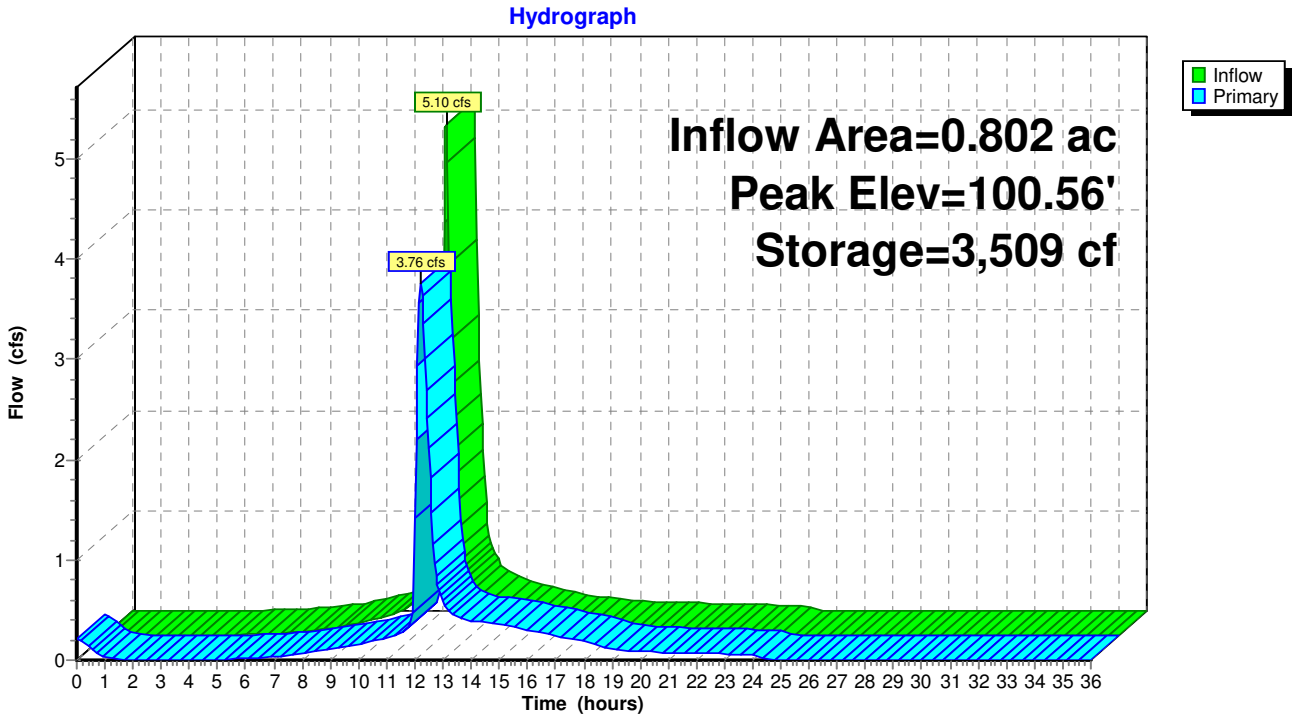
Subcatchment P2: Proposed To UGS



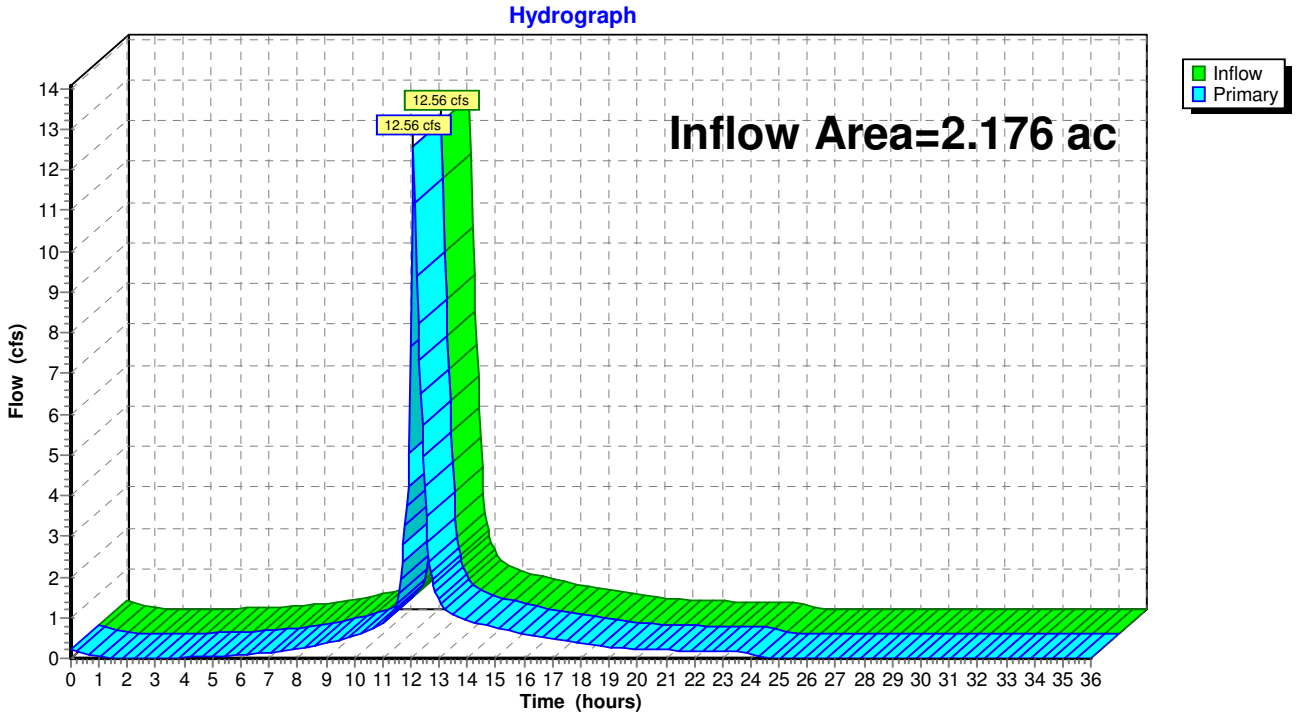
Subcatchment P3: Proposed To Demming Street CB (DP2)



Pond UGC-1: Cultec R-902HD



Link DP1: Proposed to Samsel and Carmon CB (DP1)



Summary for Pond UGC-1: Cultec R-902HD

Inflow Area = 0.802 ac, 68.70% Impervious, Inflow Depth = 6.12" for 100-yr event
Inflow = 5.10 cfs @ 12.11 hrs, Volume= 0.409 af
Outflow = 3.76 cfs @ 12.21 hrs, Volume= 0.420 af, Atten= 26%, Lag= 5.6 min
Primary = 3.76 cfs @ 12.21 hrs, Volume= 0.420 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Starting Elev= 95.96' Surf.Area= 997 sf Storage= 472 cf
Peak Elev= 100.56' @ 12.20 hrs Surf.Area= 997 sf Storage= 3,509 cf (3,037 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.0 min (808.5 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.00'	1,433 cf	**23.00'W x 43.37'L x 5.75'H Field A** 5,735 cf Overall - 2,153 cf Embedded = 3,582 cf x 40.0% Voids
#2A	95.75'	2,153 cf	**Cultec R-902HD** x 33 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 33 Chambers in 3 Rows Cap Storage= +2.8 cf x 2 x 3 rows = 16.6 cf
		3,586 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**12.0" Round Culvert** L= 283.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.00' / 87.50' S= 0.0265 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	95.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	97.90'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.75 cfs @ 12.21 hrs HW=100.54' (Free Discharge)
└**1=Culvert** (Passes 3.75 cfs of 6.79 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.55 cfs @ 11.20 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.20 cfs @ 7.24 fps)

APPENDIX C
NRCS Soil Map & Data

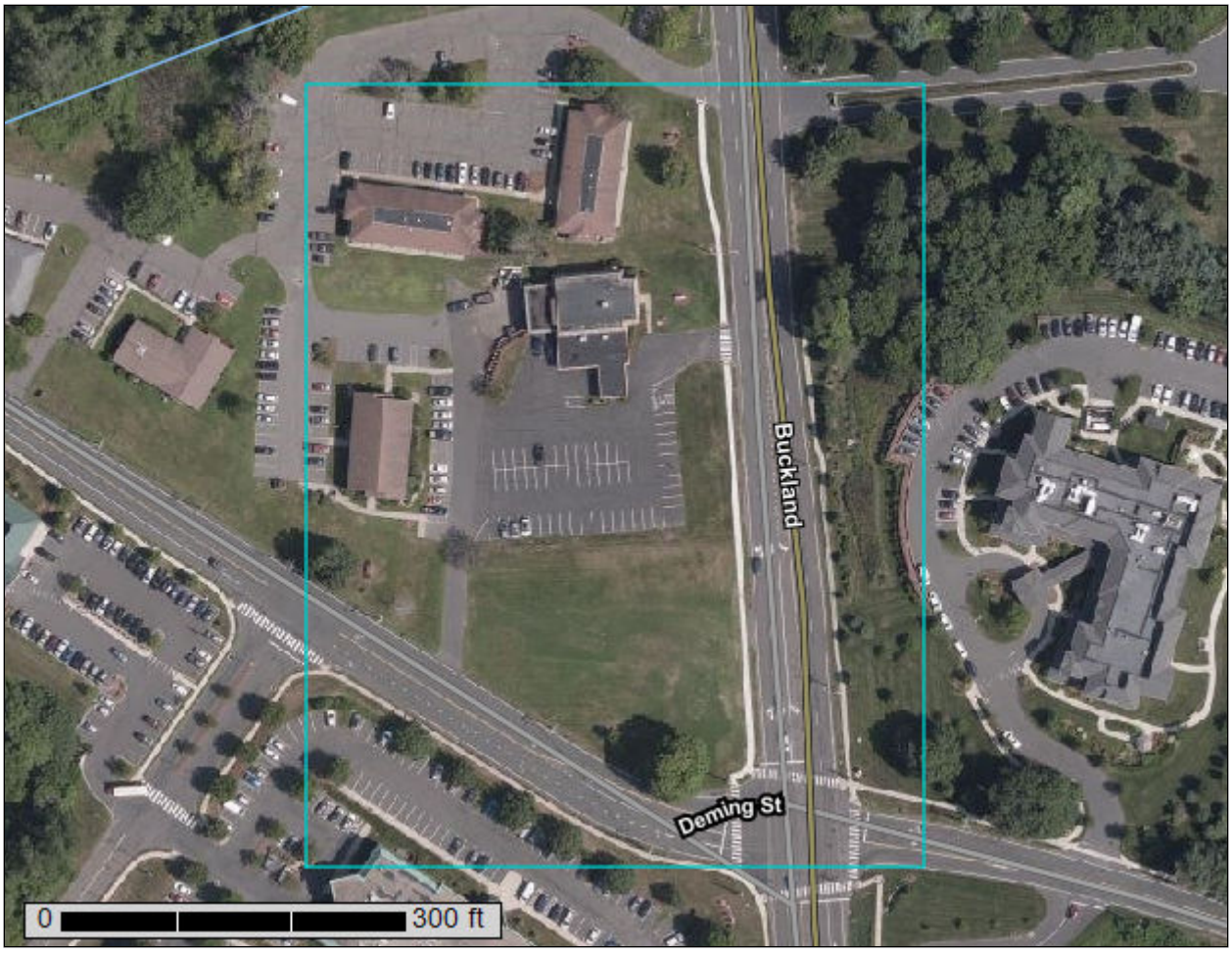
United States Department of Agriculture

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



February 11, 2020

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

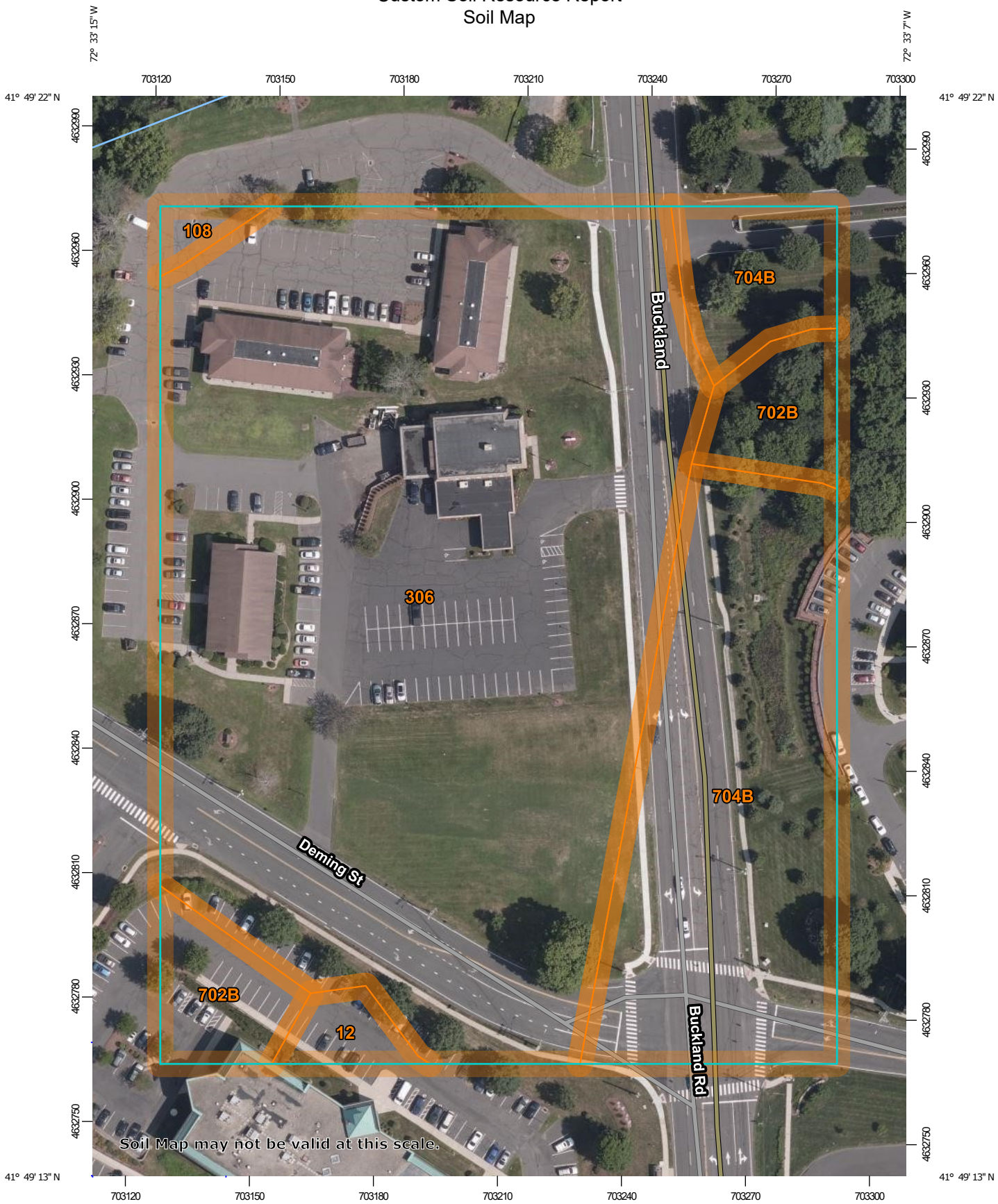
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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



Map Scale: 1:1,270 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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 19, Sep 13, 2019

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
12	Raypol silt loam	0.1	1.3%
108	Saco silt loam	0.1	0.7%
306	Udorthents-Urban land complex	5.7	67.7%
702B	Tisbury silt loam, 3 to 8 percent slopes	0.5	5.9%
704B	Enfield silt loam, 3 to 8 percent slopes	2.0	24.4%
Totals for Area of Interest		**8.4**	**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

12—Raypol silt loam

Map Unit Setting

National map unit symbol: 9ljx
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Raypol

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 8 inches: silt loam
Bg1 - 8 to 12 inches: very fine sandy loam
Bg2 - 12 to 20 inches: silt loam
Bw1 - 20 to 26 inches: silt loam
Bw2 - 26 to 29 inches: very fine sandy loam
2C1 - 29 to 52 inches: stratified very gravelly coarse sand to loamy fine sand
2C2 - 52 to 65 inches: stratified very gravelly coarse sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Haven
Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Enfield
Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ninigret
Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

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

Tisbury
Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Walpole
Percent of map unit: 2 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, loamy substratum
Percent of map unit: 1 percent

108—Saco silt loam

Map Unit Setting
National map unit symbol: 9ljv

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Saco

Setting

Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty alluvium

Typical profile

A - 0 to 12 inches: silt loam
Cg1 - 12 to 32 inches: silt loam
Cg2 - 32 to 48 inches: silt loam
2Cg3 - 48 to 60 inches: stratified very gravelly coarse sand to loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Lim

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Limerick

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Winooski

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Rippowam

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Hadley

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Bash

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

306—Udorthents-Urban land complex

Map Unit Setting

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

Map Unit Composition

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

Description of Udorthents

Setting

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

Parent material: Drift

Typical profile

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

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: 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

702B—Tisbury silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2y07h
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

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

Description of Tisbury

Setting

Landform: Valley trains, outwash terraces, outwash plains, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite, schist, and/or gneiss

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 18 inches: silt loam
Bw2 - 18 to 26 inches: silt loam
2C - 26 to 65 inches: extremely gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 24 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent
Landform: Outwash plains, kame terraces, outwash terraces, kames, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit, toeslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, moraines, eskers, outwash terraces
Landform position (two-dimensional): Backslope, footslope, shoulder, summit, toeslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ninigret

Percent of map unit: 3 percent
Landform: Outwash plains, kame terraces, outwash terraces, kames, moraines
Landform position (two-dimensional): Footslope, backslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

Raypol

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

704B—Enfield silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2y07q
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Enfield

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite, schist, and/or gneiss

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 25 inches: silt loam
2C - 25 to 60 inches: stratified very gravelly coarse sand to loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 16 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Haven

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

Tisbury

Percent of map unit: 5 percent
Landform: Valley trains, outwash terraces, outwash plains, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Outwash plains, kame terraces, outwash terraces, kames, moraines
Landform position (two-dimensional): Backslope, shoulder, footslope, summit, toeslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
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:

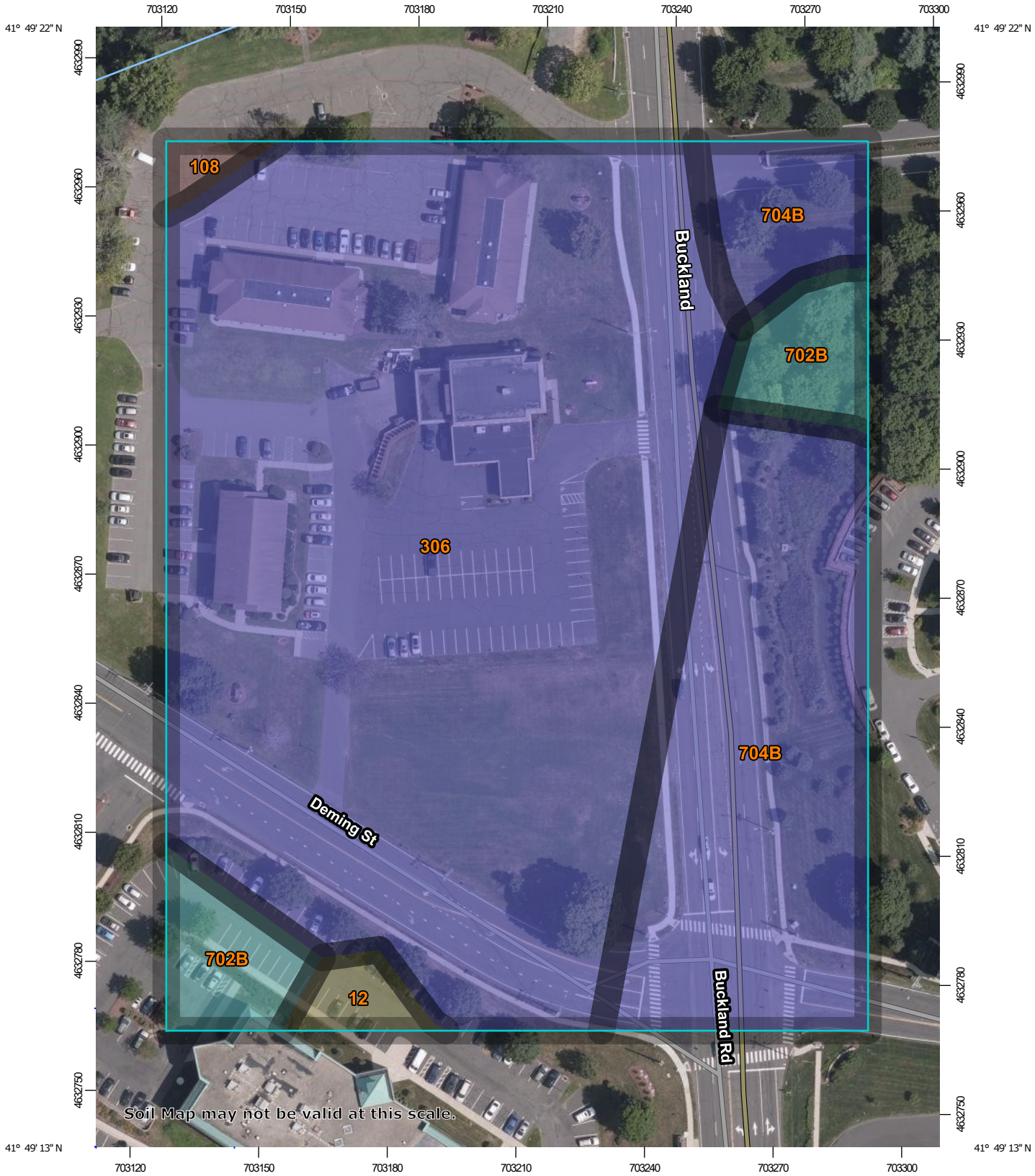
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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.

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.



Map Scale: 1:1,270 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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 19, Sep 13, 2019

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
12	Raypol silt loam	C/D	0.1	1.3%
108	Saco silt loam	B/D	0.1	0.7%
306	Udorthents-Urban land complex	B	5.7	67.7%
702B	Tisbury silt loam, 3 to 8 percent slopes	C	0.5	5.9%
704B	Enfield silt loam, 3 to 8 percent slopes	B	2.0	24.4%
Totals for Area of Interest			**8.4**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX D
Storm Sewers Analysis

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	0.11	0.7800	0.68	0.53	0.06	0.58	0 00:06:00
Sub-CB-2	0.12	0.7400	0.68	0.50	0.06	0.60	0 00:06:00
Sub-CB-3	0.25	0.5800	0.86	0.50	0.12	0.74	0 00:10:00
Sub-CB-4	0.14	0.7100	0.77	0.55	0.08	0.58	0 00:08:00
Sub-CB-5	0.18	0.7900	0.73	0.57	0.10	0.88	0 00:07:00

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	Total Time Surcharged
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)	(ft/sec)	(ft)	(min)
CB-2	CB-3	30.00	101.60	101.30	1.0000	12.000	0.0130	1.15	3.56	4.05	0.39	0.00
CB-3	CB-4	59.00	101.30	100.75	0.9300	12.000	0.0130	1.61	3.44	4.32	0.48	0.00
CB-4	DMH-1	68.00	100.75	99.95	1.1800	12.000	0.0130	2.08	3.86	5.01	0.52	0.00
DMH-3	Out-1Pipe - (7)	285.00	95.00	87.50	2.6300	12.000	0.0130	2.06	5.78	6.73	0.41	0.00
CB-5	Out-1Pipe - (8)	34.00	98.70	98.42	0.8200	12.000	0.0130	0.88	3.23	4.00	0.36	0.00
CB-1	CB-2	83.00	102.45	101.60	1.0200	12.000	0.0130	0.57	3.61	4.91	0.27	0.00

Junction Input

Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)
CB-1	102.45	105.70
CB-2	101.60	105.71
CB-3	101.30	105.87
CB-4	100.75	106.08
CB-5	98.70	101.30
DMH-3	95.00	104.25

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	0.58	0.58	102.72	2.98	0 00:06
CB-2	1.15	0.60	101.99	3.72	0 00:06
CB-3	1.62	0.74	101.78	4.09	0 00:06
CB-4	2.08	0.57	101.27	4.81	0 00:06
CB-5	0.88	0.88	99.06	2.24	0 00:07
DMH-3	2.06	2.06	95.41	8.84	0 00:00

APPENDIX E
Water Quality Calculations

395 Buckland Road - DPI No.4337
June 12, 2020

WQF To Underground Chamber System – Watershed P2
To find Unit Peak Discharge qu with Exhibit 4-III, the following is needed:
Time of Concentration (Tc):
8 mins = 0.13 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 = 86
Ia = 0.326 inches
Design Precipitation (P) = 1" for water quality storms per Appendix B
Ia/P = 0.326
Unit Peak Discharge qu = 270 cfs/mi^2/inch

Drainage Area A = 34,935.12 sf = 0.802 acres = 0.0013 mi^2

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

Water Quality Volume (WQV) = (1")(R)(A)/12, where:
R = volumetric runoff coefficient
= 0.05 + 0.009(I), where I = percent impervious cover = 68.7%
R = 0.05 + 0.009(I)
R = 0.05 + 0.009(68.7)
R = 0.668

A = drainage area in acres = 0.802 acres

WQV = (1")(R)(A)/12
WQV = (1")(0.668)(0.802 acres) / 12 in/ft
WQV = 0.0446 acre-feet

Q = (WQV X 12 in/ft)/Drainage Area
Q = (0.0446 acre-feet x 12 in/ft) / 0.802 acres
Q = 0.668 in

WQF = qu x A x Q
WQF = 270 cfs/mi^2/inch x 0.0013 mi^2 x 0.668 in
WQF = **0.23 cfs required**

Proposed BMP
As shown on the enclosed water quality per unit sizing report, the proposed Cultec Isolator row (utilizing at least **2 ~ 902HD** chambers @ **0.133 cfs** treated flow rate per chamber) is rated for 80% TSS removal for the required **0.23 cfs** water quality flow. The current design plan proposes **11** isolator row chambers for the subject area, providing **0.58 cfs** of WQF. See isolator row sizing chart included in the appendix.

CULTEC Separator Row Sizing Tables (Imperial)

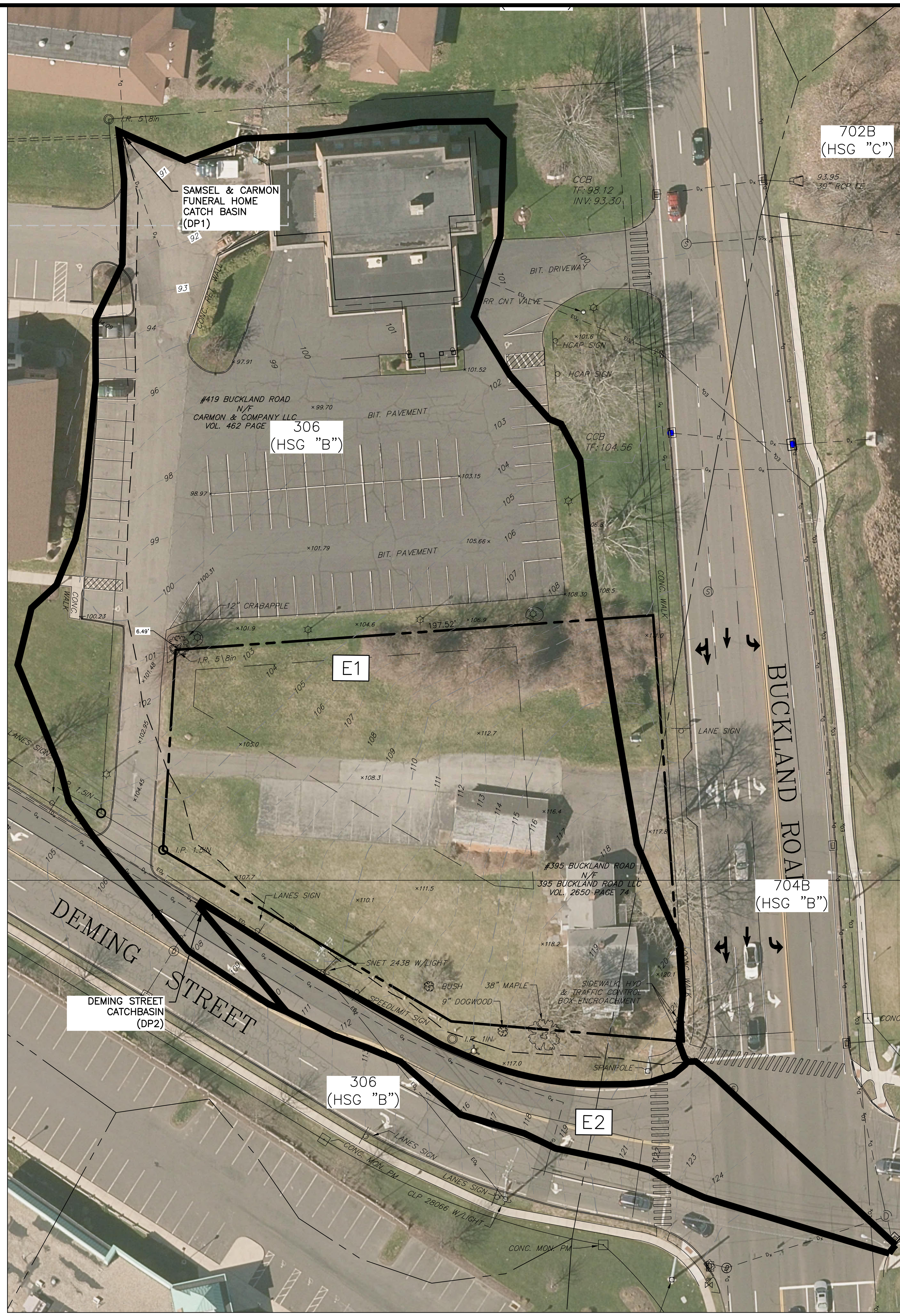
Maine DEP / ADS Equivalent Sizing (OK 110 Particle Distribution)

	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

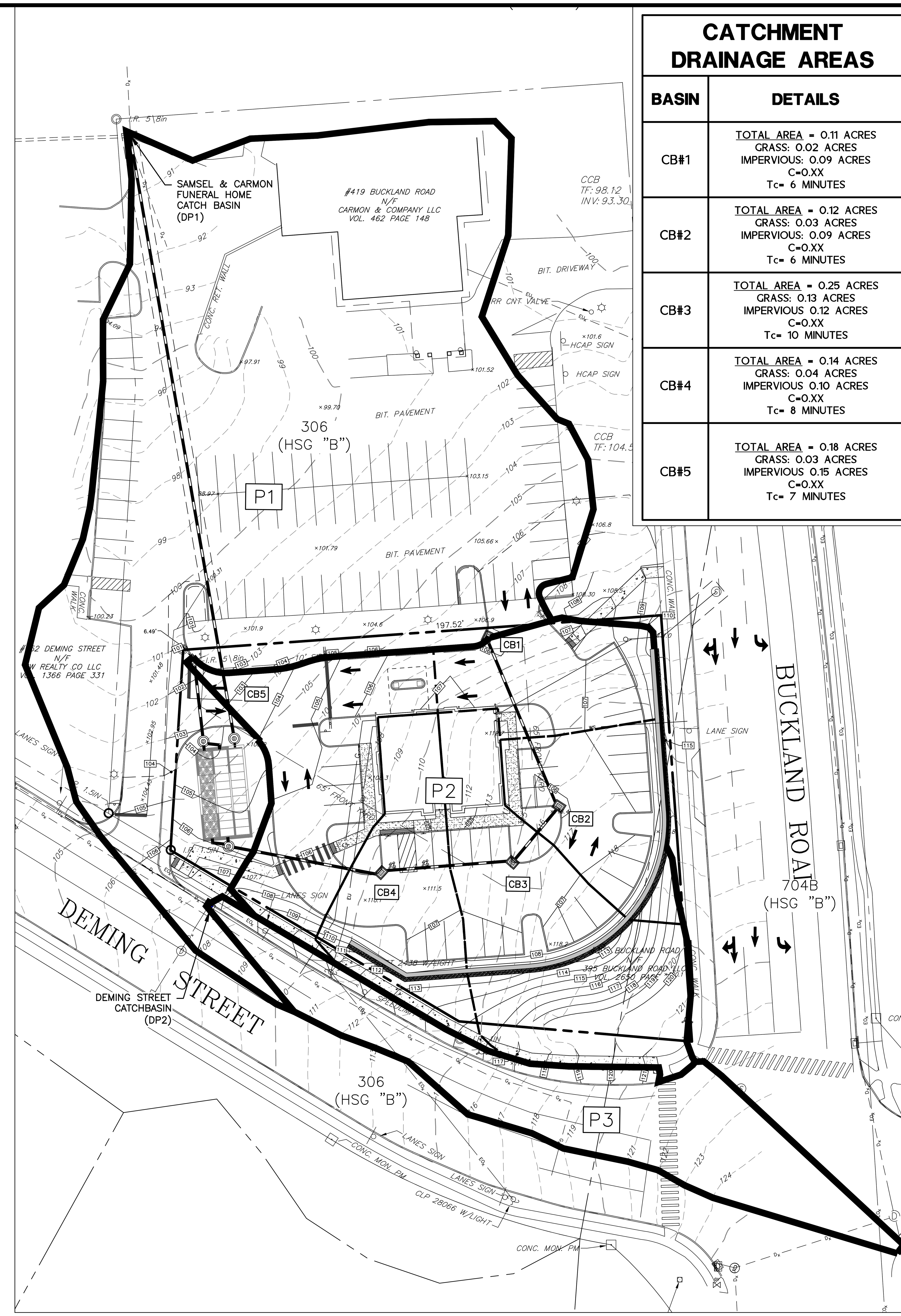
ETV (ETV / NJDEP Particle Distribution)

	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



**EXISTING CONDITION
DRAINAGE AREA MAPS**



**PROPOSED CONDITION
DRAINAGE AREA MAPS**

CATCHMENT DRAINAGE AREAS

BASIN	DETAILS
CB#1	TOTAL AREA = 0.11 ACRES GRASS: 0.02 ACRES IMPERVIOUS: 0.09 ACRES C=0.XX Tc= 6 MINUTES
CB#2	TOTAL AREA = 0.12 ACRES GRASS: 0.03 ACRES IMPERVIOUS: 0.09 ACRES C=0.XX Tc= 6 MINUTES
CB#3	TOTAL AREA = 0.25 ACRES GRASS: 0.13 ACRES IMPERVIOUS 0.12 ACRES C=0.XX Tc= 10 MINUTES
CB#4	TOTAL AREA = 0.14 ACRES GRASS: 0.04 ACRES IMPERVIOUS 0.10 ACRES C=0.XX Tc= 8 MINUTES
CB#5	TOTAL AREA = 0.18 ACRES GRASS: 0.03 ACRES IMPERVIOUS 0.15 ACRES C=0.XX Tc= 7 MINUTES

REFERENCES:
THIS PLAN REFERS TO THE FOLLOWING:
1. PLAN ENTITLED "PROPERTY & TOPOGRAPHIC PLAN, 395 BUCKLAND ROAD, SOUTH WINDSOR, CONNECTICUT" DATED 10/04/2019 PREPARED BY DESIGN PROFESSIONALS, INC.

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PROJECT NO.: 4337
DATE: 6/12/2020
DESIGN BY: BDC
DRAWN BY: REM
CHECKED BY: DHJ

WINDSOR FEDERAL SITE PLAN

176 DEMING STREET
SOUTH WINDSOR, CONNECTICUT
GIS #15300395

Windsor Federal
Neighbors Helping Neighbors Since 1936!

NO.	DATE	REVISIONS	BY

SITE PLAN

SCALE: 1" = 30'
0 15' 30' 60'

SHEET
C-DA1
SHEET 1 OF 1