Stormwater Management Report

Medical Office Building
1300 Sullivan Ave
South Windsor, CT

Prepared for:

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162 Cornerstone Drive
South Windsor, CT

Prepared by:

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

March 28, 2024

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Introduction

Dr. Vasanth Kainkaryam is proposing to develop a 4.78± acre tract comprising two properties, 8 Collins Lane & 1300 Sullivan Ave in South Windsor, Connecticut. The properties are referenced on the Town of South Windsor Tax Assessors map as GIS PIN: 21900008 & 87301300 for the two properties respectively. The proposed development will include renovation and re-purposing of the existing house located on the 8 Collins Lane Parcel to a Medical Office. A 900±sf addition is also proposed as Phase 2 of the project. A 1,000± sf Barn is also proposed in the future. Associated site improvements will include, but not be limited to, a new parking area for standard vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMPs.

Of the 4.47± acre tract, approximately 1.1± acres are proposed to be disturbed for improvements to the site. For more information, please refer to the plans entitled "Medical Office Building ~ 1300 Sullivan Avenue (Formally 8 Collins Lane) ~ South Windsor, CT" prepared by Design Professionals, Inc. and dated March 27th, 2024, as amended.

Pre-Development Site Conditions

The existing surface characteristics of the site can be described as a residential lot surrounded by woodlands. The front of the site along Sullivan Avenue is mostly grass with an existing house and driveway. North of the existing house and driveway are woodland areas that span to the north, east, and west property lines of the 8 Collins Lane Parcel.

Collins Lane approaches the site from the east and connects to the existing driveway for the house. The area remaining south of Collins Lane and east of the existing driveway is the parcel known as 1300 Sullivan Avenue. This area is an existing drainage depression with a 15 "culvert connected to the Sullivan Avenue storm sewer system. A review of site survey topography and available online surface data indicated that the watershed for the depression is separate from the watershed draining through the proposed development area. With this, this area was excluded from the analysis. The hydrologic study focused only on the stormwater that was determined to pass through the development area.

A review of offsite GIS topography showed a portion of land from the abutting property to the east drains through the development site on the 8 Collins Lane parcel. This area is mostly woodland with some farmland area at the top of the delineated watershed. All runoff passing through the development area flows southwest across the site toward Sullivan Avenue. The south-western corner of the property was selected as the Design Boundary for the drainage study and is indicated as **DP1** in the drainage area maps.

Existing conditions watershed delineations are identified in the Existing Conditions Drainage Map located in **Appendix F**. Pre-Development Drainage HydroCAD Report data is located in **Appendix A**.

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

An evaluation was performed to quantify the peak rate of stormwater discharge offsite at **DP1**. The NRCS TR-55 method was utilized to predict peak rates of runoff and volumes. Peak rates of stormwater runoff discharging to the design point were evaluated for the 2-, 10-, 25-, 50- and 100-year storm events. NOAA Atlas 14 precipitation data was obtained to determine precipitation depths for each rain event. The NOAA Type D rainfall distribution was used for modeling design storms as recommended in the 2024 Connecticut Stormwater Manual. NOAA Atlas 14 precipitation data for the site is included as **Appendix D**.

Post-Development Site Conditions

The proposed development will include renovation and re-purposing of the existing house located on the 8 Collins Lane parcel, to a Medical Office. There are also plans for a 900±sf addition and a 1,000±sf Barn in the future.

Test pits were conducted in potential basin locations to determine the depth of the seasonal high groundwater table and suitable stormwater BMP measures. The exposed underlying soil strata were observed to identify changes in soil composition and mottling of the soil if encountered. Test pit locations and data are included on the Grading Plan Sheet of the previously referenced plan set. Test pit results indicated no mottling in the planned area for collecting runoff generated from the proposed medical office, building addition, parking areas, and sidewalks around the medical office. Mottling was observed in the planned area for collecting runoff from the proposed driveway and other sidewalks that would sheet flow to it. Runoff from other areas of the site not collected in the basins, will continue to drain towards Sullivan Avenue (**DP1**) as it does today.

Based on test pit data, a water quality infiltration basin is proposed to treat and detain runoff from the parking area where no groundwater was observed. Test Pit-A conducted in this area was excavated to a depth of 78" (ELEV 110.7±) and no mottling was observed. The bottom of the water quality infiltration basin is proposed at ELEV 115.0, more than 3' above the bottom of the observed test pit. A water quality basin is proposed to treat and detain runoff from the driveway where high groundwater was observed. Test Pit-B conducted in this basin location showed mottling at a depth of 33" (ELEV 113.25±). The bottom of the water quality basin is proposed just above this elevation at ELEV 113.50.

The Adjusted Curve Number Method as outlined in Chapter 4 of the 2024 Connecticut Stormwater Manual was used for modeling the watershed area draining to the proposed infiltration basin. The adjusted curve number considering the stored water quality volume provided in the water quality infiltration basin, was determined for 2-yr through 100-yr, 24-hr storm events. Stormwater runoff volumes using the Conventional TR-55 method were also evaluated to determine pre-reduction runoff volumes for these storm events. Conventional TR-55 method Runoff Volumes and Adjusted Curve Number calculation results are included in **Appendix B** and **Appendix E** respectively. The determined 100-yr Curve Number reduction was used for all storm events in the final proposed condition model.

Water quality infiltration basin drain calculation showing the proposed basin geometry and depth allow a drain time of less than 48 hours is included in **Appendix E**. The Proposed Conditions

Drainage Map for the site is located in **Appendix F**. The Post-Development Drainage HydroCAD Report is located in **Appendix B**.

Analysis of Results

The pre-development and post-development conditions were analyzed using HydroCAD modeling software using National Resource Conservation Service (NRCS) hydrology methods. The discharge location identified as points of interest for assessing downstream effects were modeled to compare existing and proposed site conditions. The following table contains the data generated from the HydroCAD software. Proposed conditions results consider reduced CN results discussed in the Post-Development Site Conditions section above:

Reach	(cfs)	2 year	10 year	25 year	50 year	100 year
DP#1 - Sheet Flow to Sullivan Ave	Pre	0.55	4.38	7.65	10.30	13.43
	Post	0.55	3.87	6.86	10.11	13.32

As seen in the table above, the project will result in peak runoff rates in the proposed condition that are equal to or less than peak runoff rates of the existing condition for all design storms.

Stormwater Management Standard 2 of the 2024 Connecticut Stormwater Quality Manual recommends a 50% reduction of the 2-yr 24hr storm. The proposed condition for the site was not able to meet this requirement due to limitations in outlet configuration flexibility with the proposed earthen spillway type outlets. The earthen outlets are proposed to maintain the existing drainage condition of sheet flow across the front lawn of the property before entering the storm drainage system in Sullivan Avenue. A piped connection to the drainage system in Sullivan ave would provide more outlet flexibility, but would lose the benefit of the low impact development provided with the spillways. The proposed Directly Connected Impervious Area (DCIA) is approximately 820 SF. The 2024 Water Quality Manual allows the 50% reduction to be waived when outlet limitation prevent meeting this condition when the sites DCIA is less than 1 acre.

Water Quality

The proposed water quality infiltration basin was sized to retain the determined water quality volume for the entire development area to meet Stormwater Management Standard 1. A permanent pool volume below the spillway of the water quality basin was also provided to store the water quality volume for the proposed driveway area. No credit was taken for this permanent pool volume for meeting Standard 1.

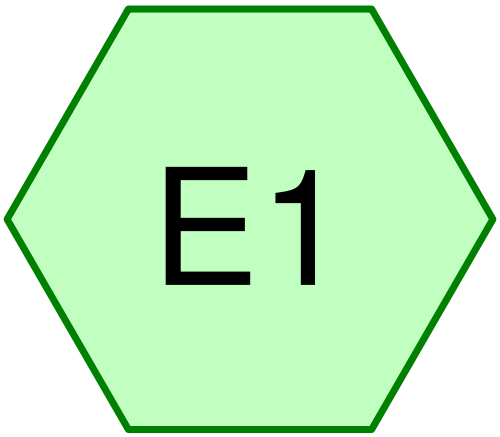
Both basins are designed with sediment forebays capable of storing over 10% of the water quality volume draining to them for pretreatment of runoff. Water Quality Volume and Stage storage results for both basins and forebays are included in **Appendix E.**

The proposed site plan includes an erosion and sedimentation control plan designed following the 2024 Connecticut Guidelines for Soil Erosion and Sediment Control. Silt fencing, anti-tracking pads, temporary sediment traps, and other E&S measures are proposed to control sediment from construction activities. Refer to the site plan entitled "Medical Office Building ~ 1300 Sullivan Avenue ~ South Windsor, CT" prepared by Design Professionals, Inc. and dated March 27th, 2024, as amended for erosion control plans, construction sequence, and post-construction stormwater maintenance requirements. The enclosed plans were developed to meet Stormwater Management Standards 3 - 5.

Conclusion

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

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



Existing Conditions

Subcat Reach Pond Link

Routing Diagram for 5195 HydroCAD-CN
Prepared by Daniel Jameson, Printed 3/10/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr 24 HR-D	NOAA 24-hr	D	Default	24.00	1	3.13	2
2	10-yr 24 HR-D	NOAA 24-hr	D	Default	24.00	1	4.95	2
3	25-yr 24 HR-D	NOAA 24-hr	D	Default	24.00	1	6.09	2
4	50-yr 24 HR-D	NOAA 24-hr	D	Default	24.00	1	6.92	2
5	100-yr 24 HR-D	NOAA 24-hr	D	Default	24.00	1	7.84	2

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Conditions Runoff Area=247,509 sf 5.11% Impervious Runoff Depth=0.29"
Flow Length=1,080' Tc=15.8 min CN=57 Runoff=0.55 cfs 0.136 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.136 af Average Runoff Depth = 0.29"
94.89% Pervious = 5.392 ac 5.11% Impervious = 0.290 ac

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Conditions Runoff Area=247,509 sf 5.11% Impervious Runoff Depth=1.08"
Flow Length=1,080' Tc=15.8 min CN=57 Runoff=4.37 cfs 0.510 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.510 af Average Runoff Depth = 1.08"
94.89% Pervious = 5.392 ac 5.11% Impervious = 0.290 ac

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Conditions Runoff Area=247,509 sf 5.11% Impervious Runoff Depth=1.73"
Flow Length=1,080' Tc=15.8 min CN=57 Runoff=7.64 cfs 0.820 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.820 af Average Runoff Depth = 1.73"
94.89% Pervious = 5.392 ac 5.11% Impervious = 0.290 ac

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Conditions Runoff Area=247,509 sf 5.11% Impervious Runoff Depth=2.26"
Flow Length=1,080' Tc=15.8 min CN=57 Runoff=10.30 cfs 1.070 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.070 af Average Runoff Depth = 2.26"
94.89% Pervious = 5.392 ac 5.11% Impervious = 0.290 ac

Time span=0.00-36.00 hrs, dt=0.03 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Existing Conditions Runoff Area=247,509 sf 5.11% Impervious Runoff Depth=2.89"
Flow Length=1,080' Tc=15.8 min CN=57 Runoff=13.42 cfs 1.368 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.368 af Average Runoff Depth = 2.89"
94.89% Pervious = 5.392 ac 5.11% Impervious = 0.290 ac

Summary for Subcatchment E1: Existing Conditions

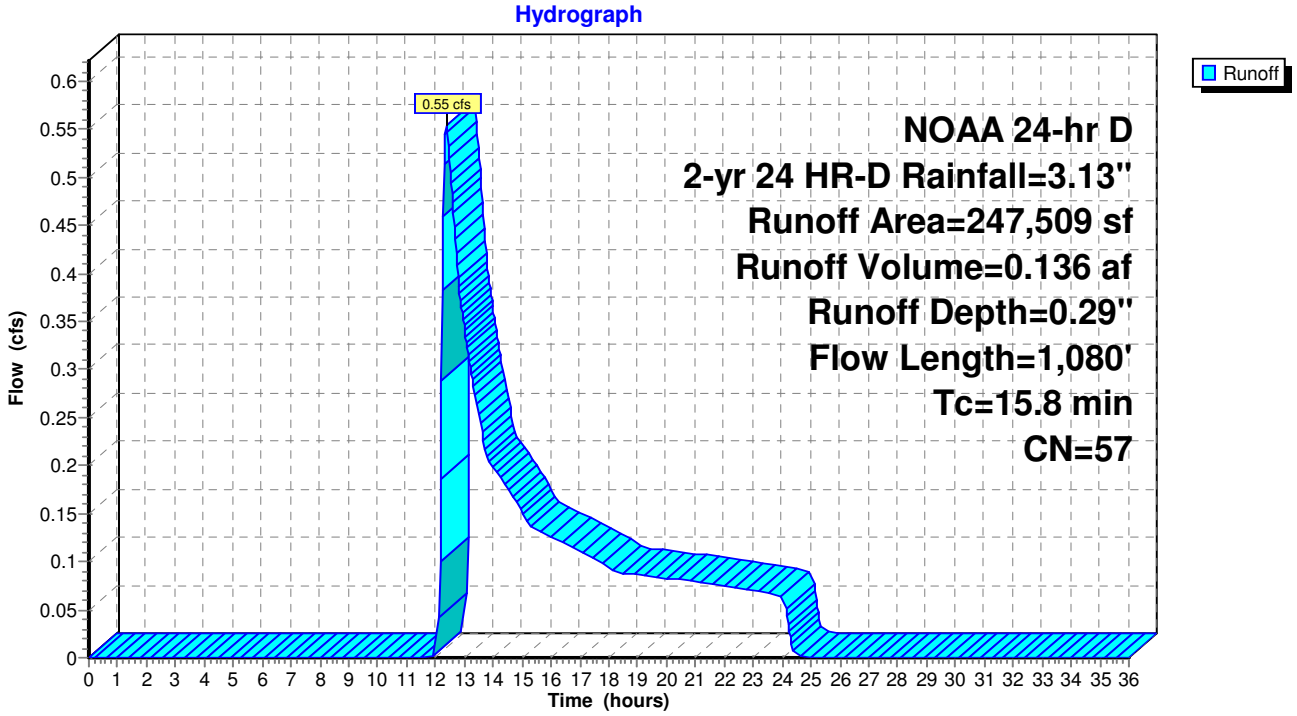
Runoff = 0.55 cfs @ 12.37 hrs, Volume= 0.136 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.03 hrs
NOAA 24-hr D 2-yr 24 HR-D Rainfall=3.13"

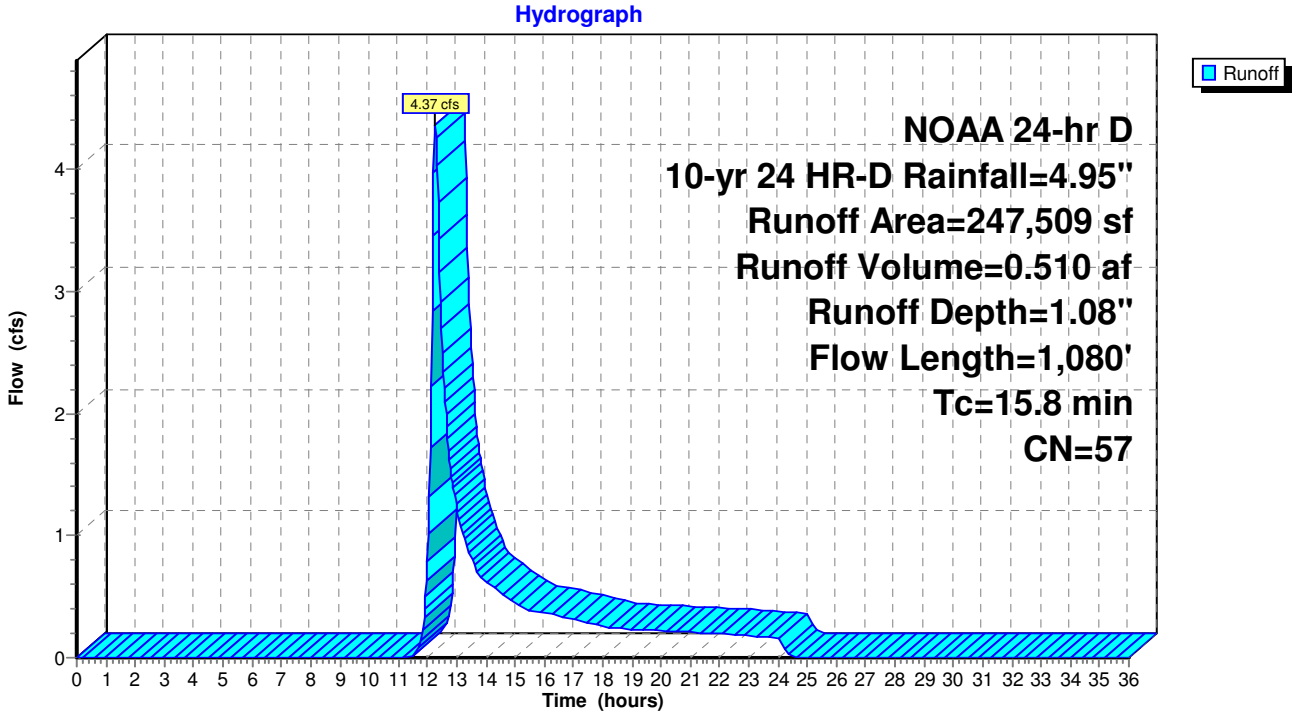
	Area (sf)	CN	Description
	189	30	Brush, Good, HSG A
	22,574	48	Brush, Good, HSG B
	763	39	>75% Grass cover, Good, HSG A
	75,401	61	>75% Grass cover, Good, HSG B
	26,156	58	Meadow, non-grazed, HSG B
	20,395	30	Woods, Good, HSG A
	89,382	55	Woods, Good, HSG B
*	12,649	98	IMPERVIOUS
	247,509	57	Weighted Average
	234,860		94.89% Pervious Area
	12,649		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	100	0.0419	0.47		**Sheet Flow, Farmland SF** Cultivated: Residue<=20% n= 0.060 P2= 3.13"
1.1	102	0.0316	1.60		**Shallow Concentrated Flow, Farmland SCF** Cultivated Straight Rows Kv= 9.0 fps
10.8	836	0.0671	1.30		**Shallow Concentrated Flow, Woodland SCF** Woodland Kv= 5.0 fps
0.4	42	0.0671	1.81		**Shallow Concentrated Flow, Grass SCF** Short Grass Pasture Kv= 7.0 fps
15.8	1,080	Total			

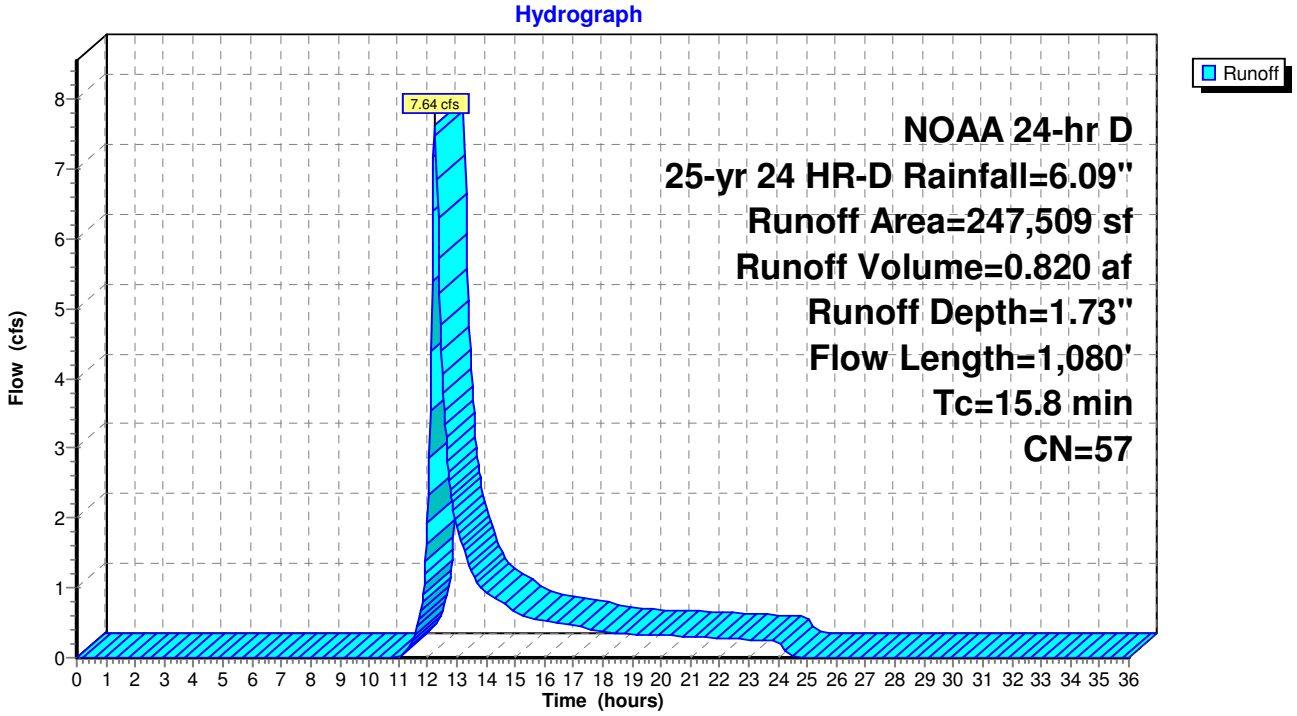
Subcatchment E1: Existing Conditions



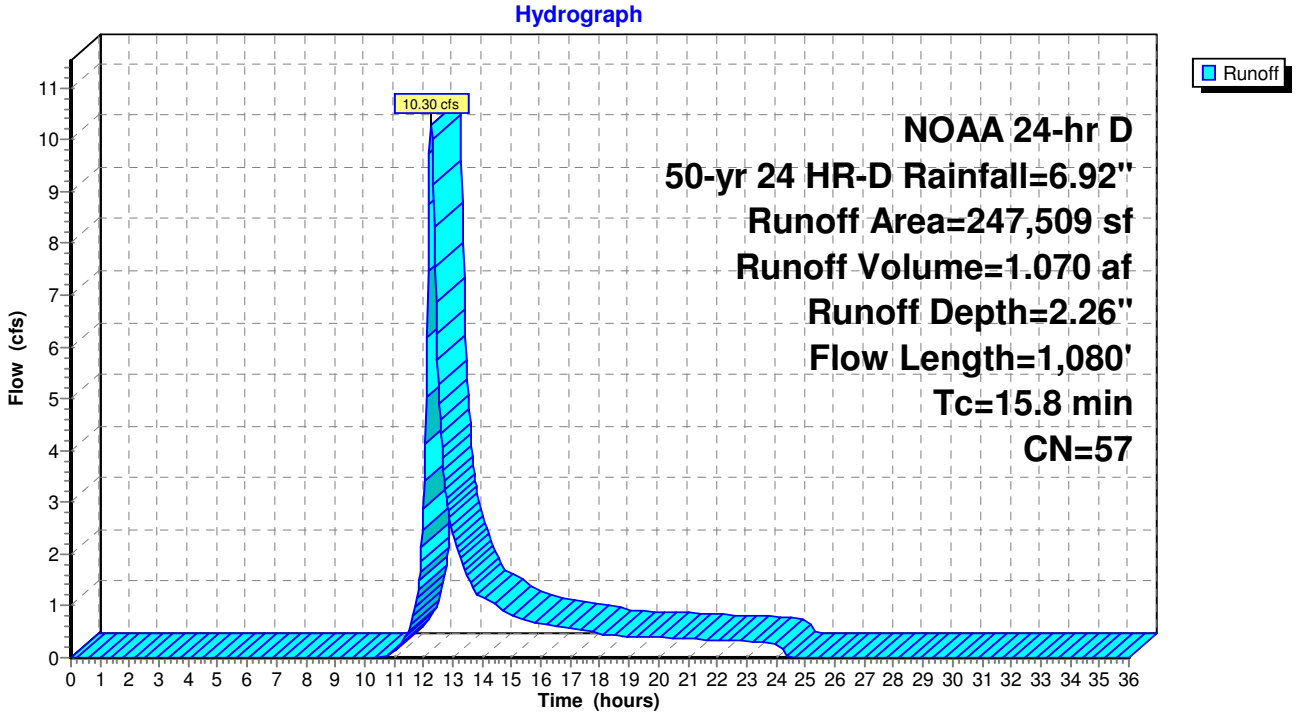
Subcatchment E1: Existing Conditions



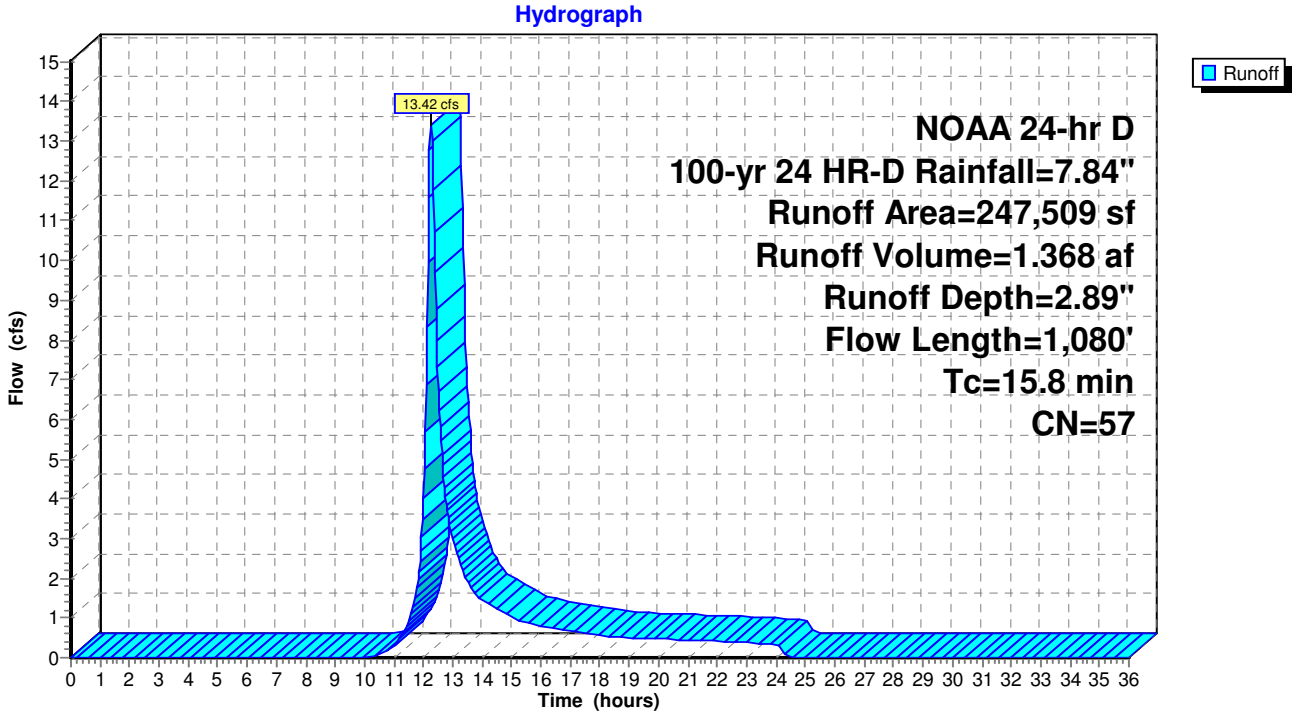
Subcatchment E1: Existing Conditions



Subcatchment E1: Existing Conditions

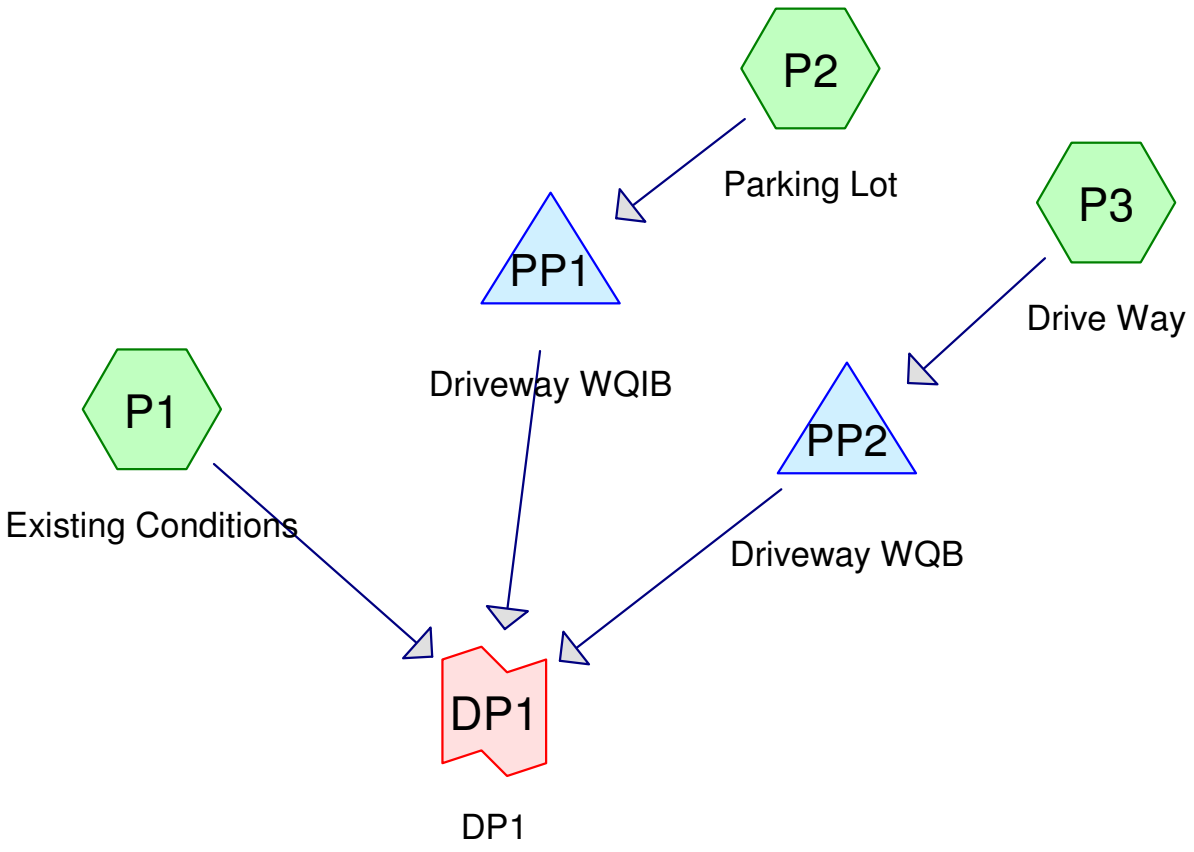


Subcatchment E1: Existing Conditions



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

CONVENTION TR-55



Subcat Reach Pond Link

Routing Diagram for 5195 HydroCAD-CN
Prepared by Daniel Jameson, Printed 3/26/2024

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=0.23"
Tc=15.4 min CN=55 Runoff=0.30 cfs 0.097 af

Subcatchment P2: Parking Lot Runoff Area=13,858 sf 76.67% Impervious Runoff Depth=2.02"
Tc=6.0 min CN=89 Runoff=0.74 cfs 0.053 af

Subcatchment P3: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=1.41"
Tc=6.0 min CN=81 Runoff=0.55 cfs 0.039 af

Pond PP1: Driveway WQIB Peak Elev=116.91' Storage=1,948 cf Inflow=0.74 cfs 0.053 af
Outflow=0.02 cfs 0.009 af

Pond PP2: Driveway WQB Peak Elev=114.86' Storage=1,099 cf Inflow=0.55 cfs 0.039 af
Outflow=0.52 cfs 0.039 af

Link DP1: DP1 Inflow=0.55 cfs 0.145 af
Primary=0.55 cfs 0.145 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.189 af Average Runoff Depth = 0.40"
89.65% Pervious = 5.094 ac 10.35% Impervious = 0.588 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=0.96"
Tc=15.4 min CN=55 Runoff=3.29 cfs 0.401 af

Subcatchment P2: Parking Lot Runoff Area=13,858 sf 76.67% Impervious Runoff Depth=3.72"
Tc=6.0 min CN=89 Runoff=1.32 cfs 0.099 af

Subcatchment P3: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=81 Runoff=1.13 cfs 0.081 af

Pond PP1: Driveway WQIB Peak Elev=116.97' Storage=2,034 cf Inflow=1.32 cfs 0.099 af
Outflow=0.65 cfs 0.054 af

Pond PP2: Driveway WQB Peak Elev=114.90' Storage=1,143 cf Inflow=1.13 cfs 0.081 af
Outflow=1.09 cfs 0.081 af

Link DP1: DP1 Inflow=4.53 cfs 0.536 af
Primary=4.53 cfs 0.536 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.580 af Average Runoff Depth = 1.23"
89.65% Pervious = 5.094 ac 10.35% Impervious = 0.588 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=1.57"
Tc=15.4 min CN=55 Runoff=6.05 cfs 0.659 af

Subcatchment P2: Parking Lot Runoff Area=13,858 sf 76.67% Impervious Runoff Depth=4.82"
Tc=6.0 min CN=89 Runoff=1.69 cfs 0.128 af

Subcatchment P3: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=81 Runoff=1.51 cfs 0.109 af

Pond PP1: Driveway WQIB Peak Elev=117.02' Storage=2,114 cf Inflow=1.69 cfs 0.128 af
Outflow=1.62 cfs 0.083 af

Pond PP2: Driveway WQB Peak Elev=114.92' Storage=1,168 cf Inflow=1.51 cfs 0.109 af
Outflow=1.47 cfs 0.109 af

Link DP1: DP1 Inflow=7.95 cfs 0.851 af
Primary=7.95 cfs 0.851 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.895 af Average Runoff Depth = 1.89"
89.65% Pervious = 5.094 ac 10.35% Impervious = 0.588 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=2.07"
Tc=15.4 min CN=55 Runoff=8.32 cfs 0.870 af

Subcatchment P2: Parking Lot Runoff Area=13,858 sf 76.67% Impervious Runoff Depth=5.63"
Tc=6.0 min CN=89 Runoff=1.95 cfs 0.149 af

Subcatchment P3: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=4.73"
Tc=6.0 min CN=81 Runoff=1.79 cfs 0.130 af

Pond PP1: Driveway WQIB Peak Elev=117.04' Storage=2,134 cf Inflow=1.95 cfs 0.149 af
Outflow=1.89 cfs 0.105 af

Pond PP2: Driveway WQB Peak Elev=114.93' Storage=1,185 cf Inflow=1.79 cfs 0.130 af
Outflow=1.74 cfs 0.130 af

Link DP1: DP1 Inflow=10.53 cfs 1.104 af
Primary=10.53 cfs 1.104 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.149 af Average Runoff Depth = 2.43"
89.65% Pervious = 5.094 ac 10.35% Impervious = 0.588 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=2.68"
Tc=15.4 min CN=55 Runoff=11.01 cfs 1.122 af

Subcatchment P2: Parking Lot Runoff Area=13,858 sf 76.67% Impervious Runoff Depth=6.53"
Tc=6.0 min CN=89 Runoff=2.24 cfs 0.173 af

Subcatchment P3: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=81 Runoff=2.09 cfs 0.154 af

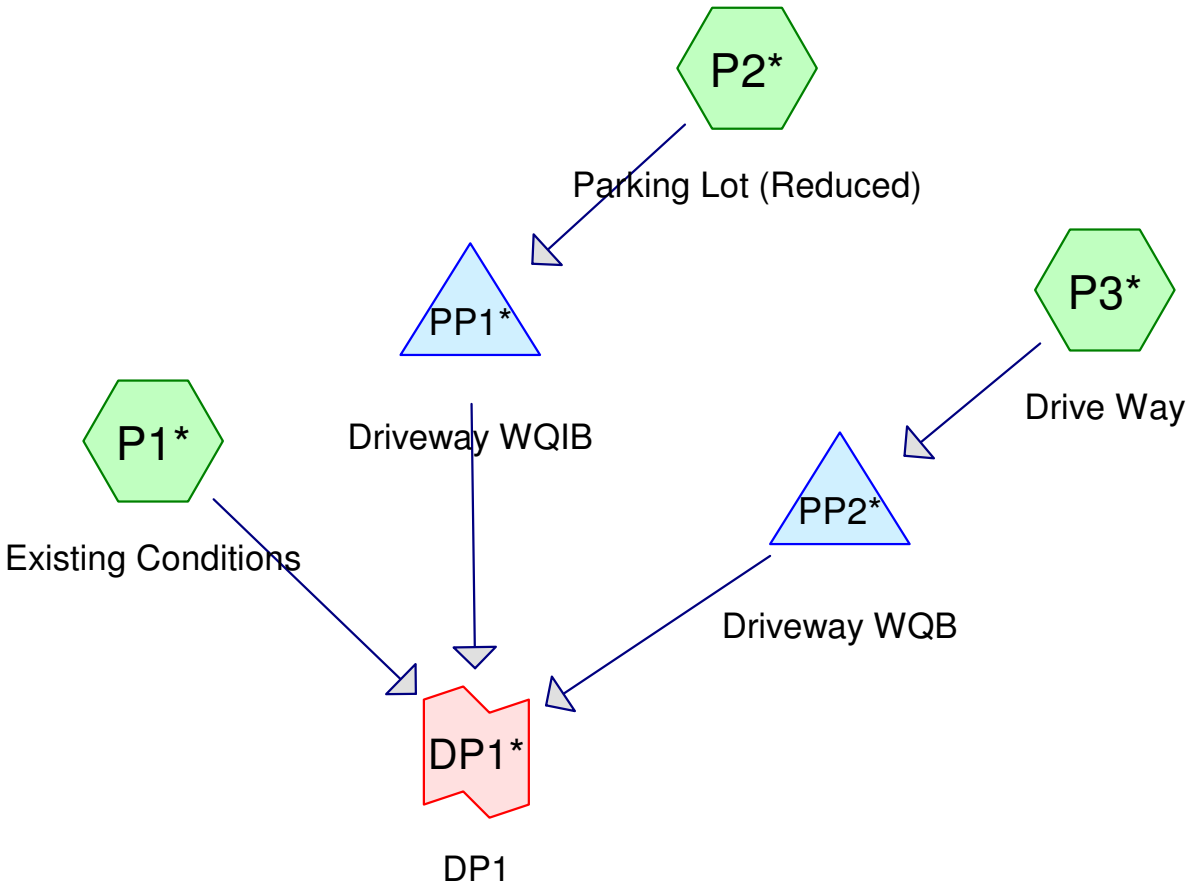
Pond PP1: Driveway WQIB Peak Elev=117.05' Storage=2,154 cf Inflow=2.24 cfs 0.173 af
Outflow=2.18 cfs 0.129 af

Pond PP2: Driveway WQB Peak Elev=114.95' Storage=1,203 cf Inflow=2.09 cfs 0.154 af
Outflow=2.04 cfs 0.154 af

Link DP1: DP1 Inflow=13.56 cfs 1.405 af
Primary=13.56 cfs 1.405 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.449 af Average Runoff Depth = 3.06"
89.65% Pervious = 5.094 ac 10.35% Impervious = 0.588 ac

*REDUCED CN (CT 2024 WQ Manual)



Subcat Reach Pond Link

Routing Diagram for 5195 HydroCAD-CN
Prepared by Daniel Jameson, Printed 3/26/2024

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1*: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=0.23"
Tc=15.4 min CN=55 Runoff=0.30 cfs 0.097 af

Subcatchment P2*: Parking Lot (Reduced) Runoff Area=13,858 sf 0.00% Impervious Runoff Depth=1.16"
Tc=6.0 min CN=77 Runoff=0.43 cfs 0.031 af

Subcatchment P3*: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=1.41"
Tc=6.0 min CN=81 Runoff=0.55 cfs 0.039 af

Pond PP1*: Driveway WQIB Peak Elev=116.44' Storage=1,342 cf Inflow=0.43 cfs 0.031 af
Outflow=0.00 cfs 0.000 af

Pond PP2*: Driveway WQB Peak Elev=114.86' Storage=1,099 cf Inflow=0.55 cfs 0.039 af
Outflow=0.52 cfs 0.039 af

Link DP1*: DP1 Inflow=0.55 cfs 0.136 af
Primary=0.55 cfs 0.136 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.166 af Average Runoff Depth = 0.35"
93.94% Pervious = 5.338 ac 6.06% Impervious = 0.344 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1*: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=0.96"
Tc=15.4 min CN=55 Runoff=3.29 cfs 0.401 af

Subcatchment P2*: Parking Lot (Reduced) Runoff Area=13,858 sf 0.00% Impervious Runoff Depth=2.58"
Tc=6.0 min CN=77 Runoff=0.97 cfs 0.068 af

Subcatchment P3*: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=81 Runoff=1.13 cfs 0.081 af

Pond PP1*: Driveway WQIB Peak Elev=116.91' Storage=1,959 cf Inflow=0.97 cfs 0.068 af
Outflow=0.06 cfs 0.024 af

Pond PP2*: Driveway WQB Peak Elev=114.90' Storage=1,142 cf Inflow=1.13 cfs 0.081 af
Outflow=1.09 cfs 0.081 af

Link DP1*: DP1 Inflow=3.87 cfs 0.505 af
Primary=3.87 cfs 0.505 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.550 af Average Runoff Depth = 1.16"
93.94% Pervious = 5.338 ac 6.06% Impervious = 0.344 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1*: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=1.57"
Tc=15.4 min CN=55 Runoff=6.05 cfs 0.659 af

Subcatchment P2*: Parking Lot (Reduced) Runoff Area=13,858 sf 0.00% Impervious Runoff Depth=3.56"
Tc=6.0 min CN=77 Runoff=1.32 cfs 0.094 af

Subcatchment P3*: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=81 Runoff=1.51 cfs 0.109 af

Pond PP1*: Driveway WQIB Peak Elev=116.94' Storage=1,996 cf Inflow=1.32 cfs 0.094 af
Outflow=0.31 cfs 0.050 af

Pond PP2*: Driveway WQB Peak Elev=114.92' Storage=1,167 cf Inflow=1.51 cfs 0.109 af
Outflow=1.47 cfs 0.109 af

Link DP1*: DP1 Inflow=6.86 cfs 0.817 af
Primary=6.86 cfs 0.817 af

Total Runoff Area = 5.682 ac Runoff Volume = 0.862 af Average Runoff Depth = 1.82"
93.94% Pervious = 5.338 ac 6.06% Impervious = 0.344 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1*: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=2.07"
Tc=15.4 min CN=55 Runoff=8.32 cfs 0.870 af

Subcatchment P2*: Parking Lot (Reduced) Runoff Area=13,858 sf 0.00% Impervious Runoff Depth=4.29"
Tc=6.0 min CN=77 Runoff=1.59 cfs 0.114 af

Subcatchment P3*: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=4.73"
Tc=6.0 min CN=81 Runoff=1.79 cfs 0.130 af

Pond PP1*: Driveway WQIB Peak Elev=116.98' Storage=2,053 cf Inflow=1.59 cfs 0.114 af
Outflow=0.85 cfs 0.069 af

Pond PP2*: Driveway WQB Peak Elev=114.93' Storage=1,183 cf Inflow=1.79 cfs 0.130 af
Outflow=1.74 cfs 0.130 af

Link DP1*: DP1 Inflow=10.11 cfs 1.069 af
Primary=10.11 cfs 1.069 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.114 af Average Runoff Depth = 2.35"
93.94% Pervious = 5.338 ac 6.06% Impervious = 0.344 ac

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1*: Existing Conditions Runoff Area=219,293 sf 3.37% Impervious Runoff Depth=2.68"
Tc=15.4 min CN=55 Runoff=11.01 cfs 1.122 af

Subcatchment P2*: Parking Lot (Reduced) Runoff Area=13,858 sf 0.00% Impervious Runoff Depth=5.13"
Tc=6.0 min CN=77 Runoff=1.88 cfs 0.136 af

Subcatchment P3*: Drive Way Runoff Area=14,361 sf 53.02% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=81 Runoff=2.09 cfs 0.154 af

Pond PP1*: Driveway WQIB Peak Elev=117.03' Storage=2,120 cf Inflow=1.88 cfs 0.136 af
Outflow=1.70 cfs 0.091 af

Pond PP2*: Driveway WQB Peak Elev=114.94' Storage=1,201 cf Inflow=2.09 cfs 0.154 af
Outflow=2.04 cfs 0.154 af

Link DP1*: DP1 Inflow=13.32 cfs 1.367 af
Primary=13.32 cfs 1.367 af

Total Runoff Area = 5.682 ac Runoff Volume = 1.412 af Average Runoff Depth = 2.98"
93.94% Pervious = 5.338 ac 6.06% Impervious = 0.344 ac

Summary for Subcatchment P1*: Existing Conditions

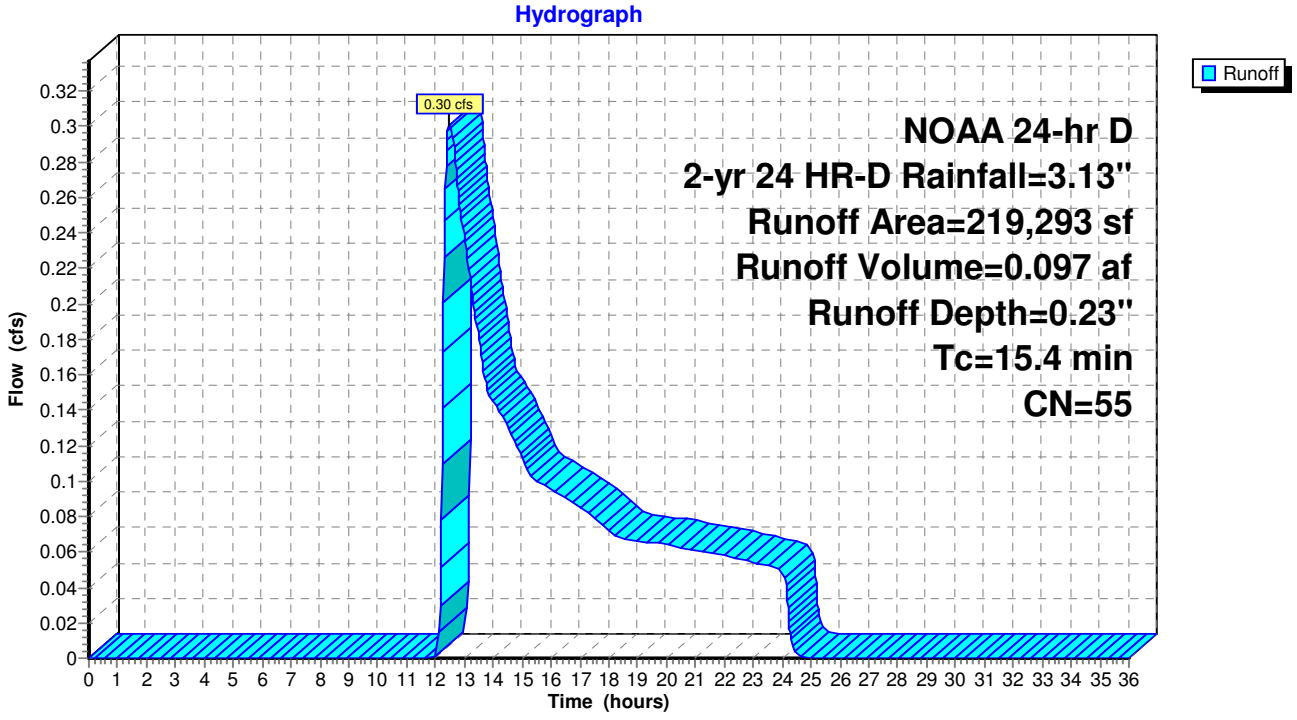
Runoff = 0.30 cfs @ 12.48 hrs, Volume= 0.097 af, Depth= 0.23"
Routed to Link DP1* : DP1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NOAA 24-hr D 2-yr 24 HR-D Rainfall=3.13"

	Area (sf)	CN	Description
	189	30	Brush, Good, HSG A
	21,601	48	Brush, Good, HSG B
	763	39	>75% Grass cover, Good, HSG A
	53,830	61	>75% Grass cover, Good, HSG B
	26,156	58	Meadow, non-grazed, HSG B
	20,395	30	Woods, Good, HSG A
	88,971	55	Woods, Good, HSG B
*	7,388	98	IMPERVIOUS
	219,293	55	Weighted Average
	211,905		96.63% Pervious Area
	7,388		3.37% Impervious Area

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

Subcatchment P1*: Existing Conditions



Summary for Subcatchment P2*: Parking Lot (Reduced)

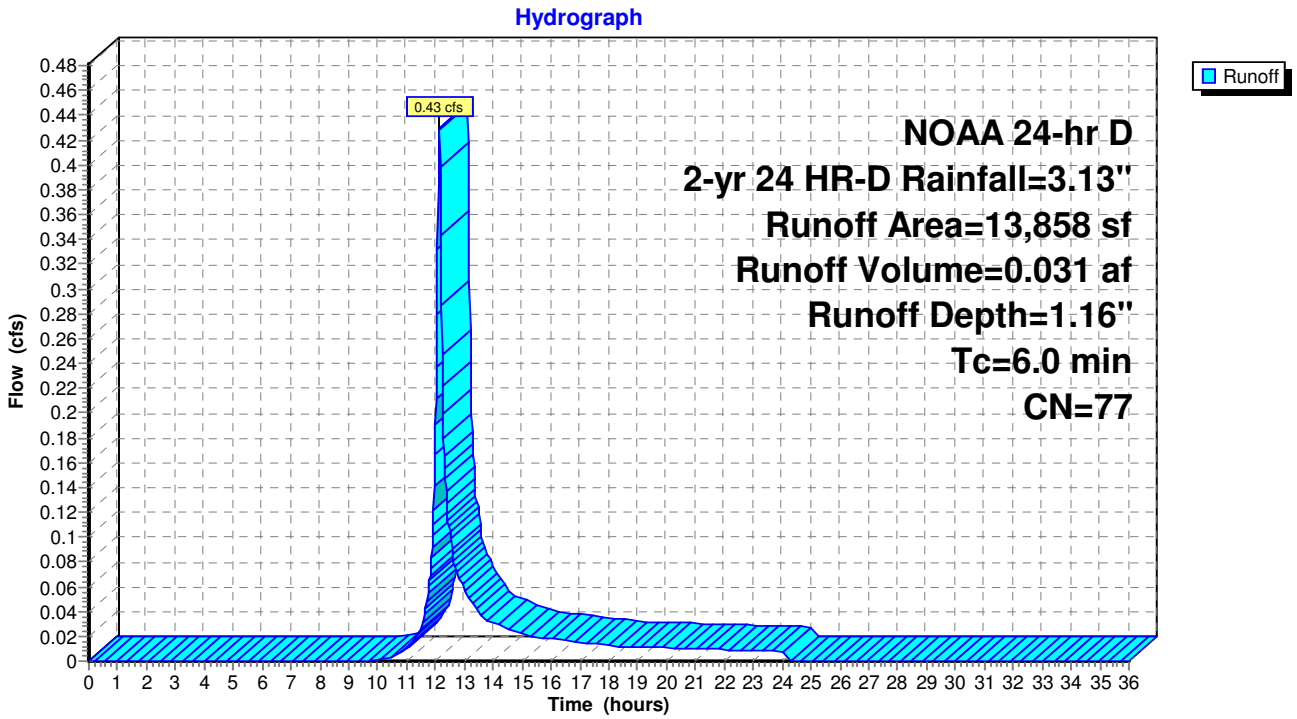
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.031 af, Depth= 1.16"
Routed to Pond PP1* : Driveway WQIB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NOAA 24-hr D 2-yr 24 HR-D Rainfall=3.13"

	Area (sf)	CN	Description
*	13,858	77	
	13,858		100.00% Pervious Area

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

Subcatchment P2*: Parking Lot (Reduced)



Summary for Subcatchment P3*: Drive Way

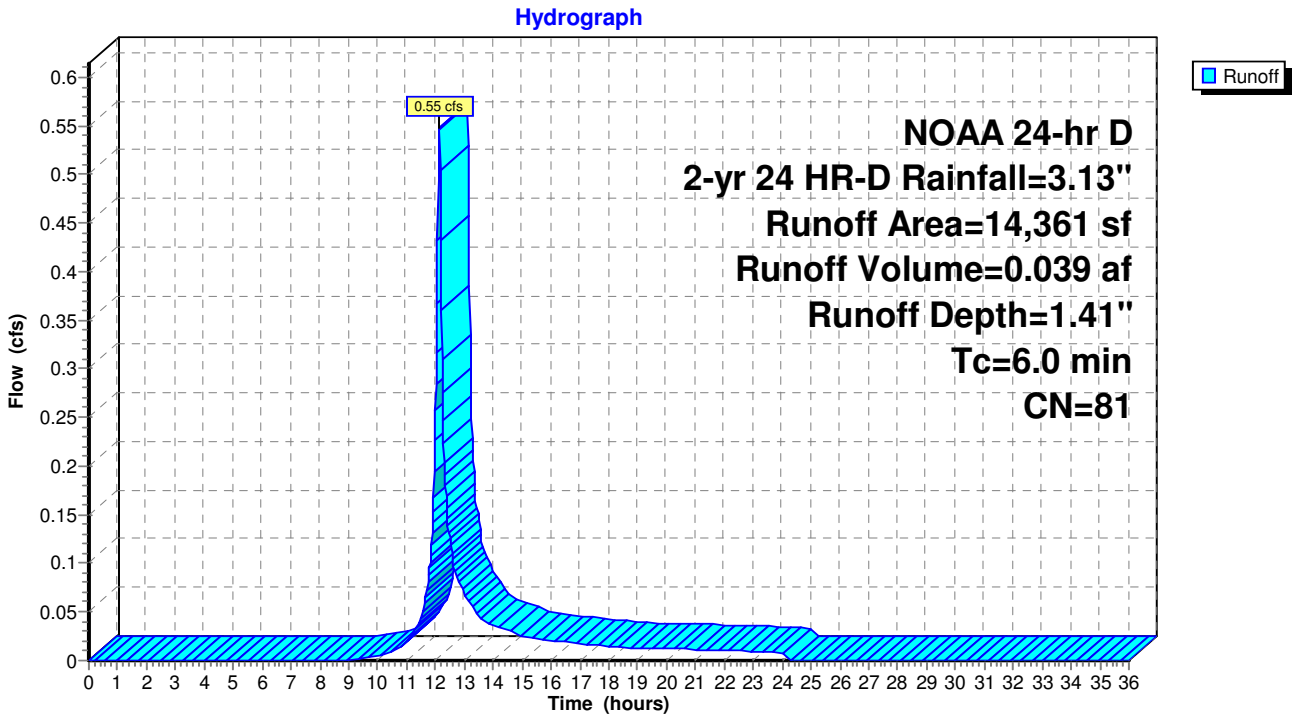
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.039 af, Depth= 1.41"
Routed to Pond PP2* : Driveway WQB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NOAA 24-hr D 2-yr 24 HR-D Rainfall=3.13"

	Area (sf)	CN	Description
	6,747	61	>75% Grass cover, Good, HSG B
*	7,614	98	IMPERVIOUS
	14,361	81	Weighted Average
	6,747		46.98% Pervious Area
	7,614		53.02% Impervious Area

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

Subcatchment P3*: Drive Way



Summary for Pond PP1*: Driveway WQIB

Inflow Area = 0.318 ac, 0.00% Impervious, Inflow Depth = 1.16" for 2-yr 24 HR-D event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.031 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP1* : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 116.44' @ 24.36 hrs Surf.Area= 1,202 sf Storage= 1,342 cf

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

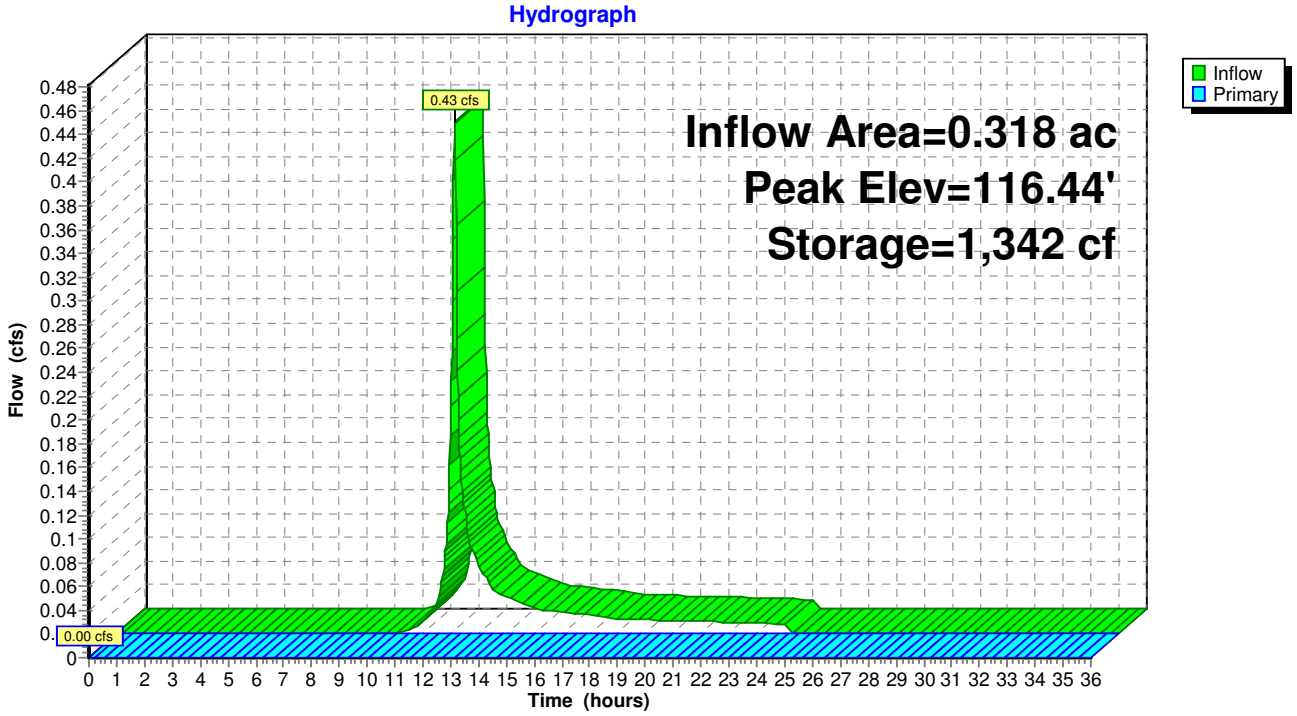
Volume	Invert	Avail.Storage	Storage Description
#1	115.00'	2,960 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
115.00	682	0	0	682
116.00	1,032	851	851	1,047
117.00	1,438	1,229	2,080	1,471
117.50	2,100	879	2,960	2,138

Device	Routing	Invert	Outlet Devices
#1	Primary	116.90'	**15.0' long + 3.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=115.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PP1*: Driveway WQIB



Summary for Pond PP2*: Driveway WQB

Inflow Area = 0.330 ac, 53.02% Impervious, Inflow Depth = 1.41" for 2-yr 24 HR-D event
Inflow = 0.55 cfs @ 12.13 hrs, Volume= 0.039 af
Outflow = 0.52 cfs @ 12.15 hrs, Volume= 0.039 af, Atten= 5%, Lag= 1.2 min
Primary = 0.52 cfs @ 12.15 hrs, Volume= 0.039 af
Routed to Link DP1* : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 114.80' Surf.Area= 1,129 sf Storage= 1,032 cf
Peak Elev= 114.86' @ 12.15 hrs Surf.Area= 1,163 sf Storage= 1,099 cf (67 cf above start)

Plug-Flow detention time= 336.7 min calculated for 0.015 af (39% of inflow)
Center-of-Mass det. time= 4.7 min (856.3 - 851.6)

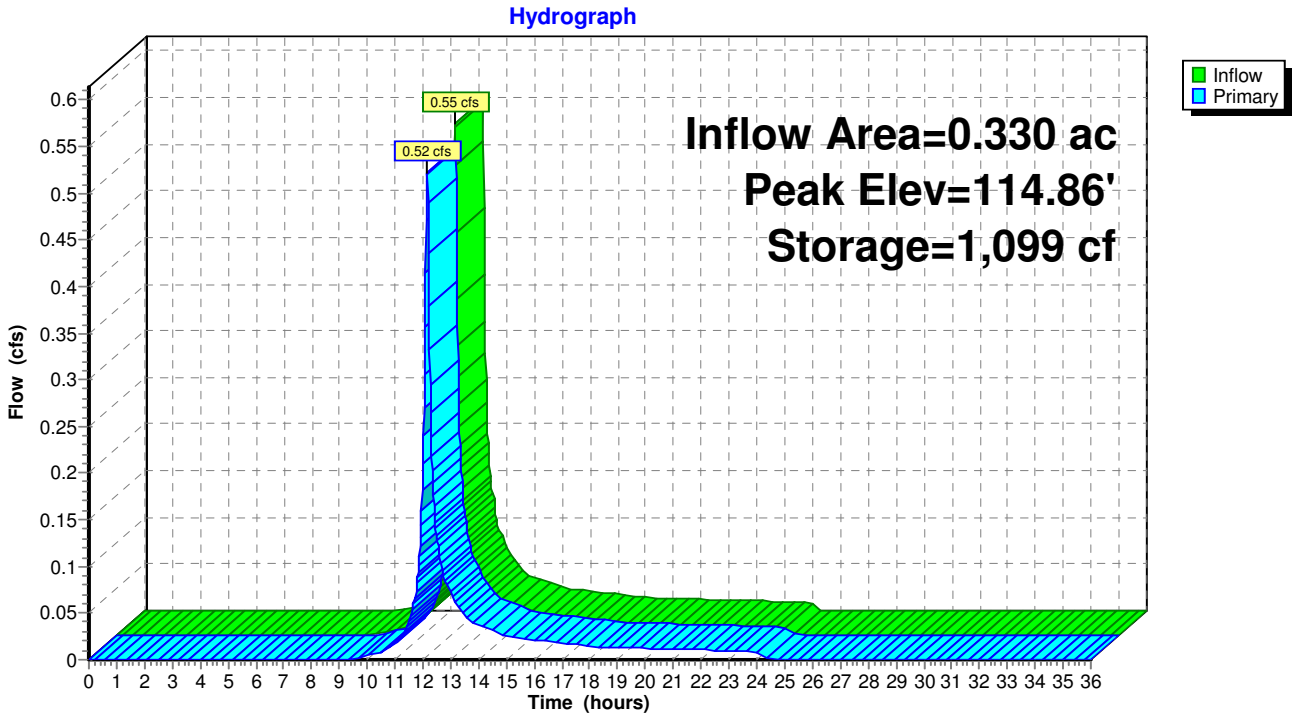
Volume	Invert	Avail.Storage	Storage Description
#1	113.50'	1,976 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
113.50	507	0	0	507
114.00	710	303	303	715
115.00	1,249	967	1,270	1,265
115.50	1,582	706	1,976	1,604

Device	Routing	Invert	Outlet Devices
#1	Primary	114.80'	**15.0' long + 3.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.52 cfs @ 12.15 hrs HW=114.86' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.52 cfs @ 0.59 fps)

Pond PP2*: Driveway WQB

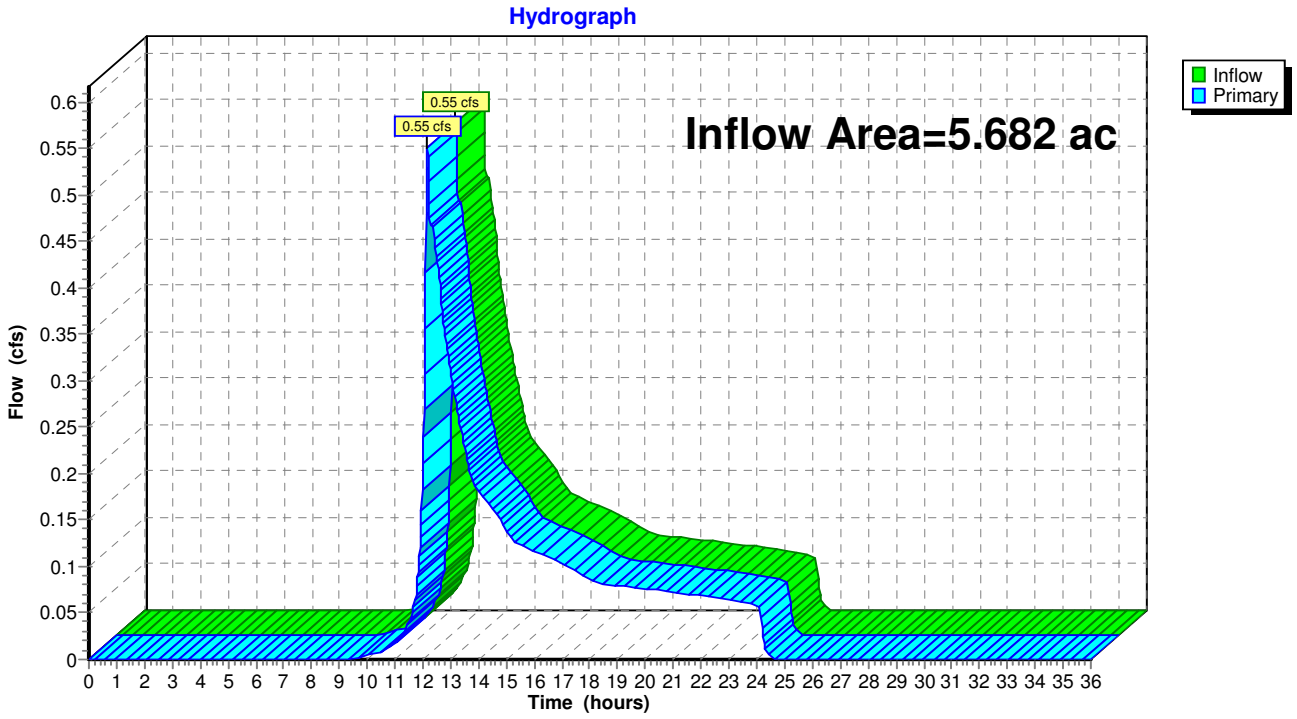


Summary for Link DP1*: DP1

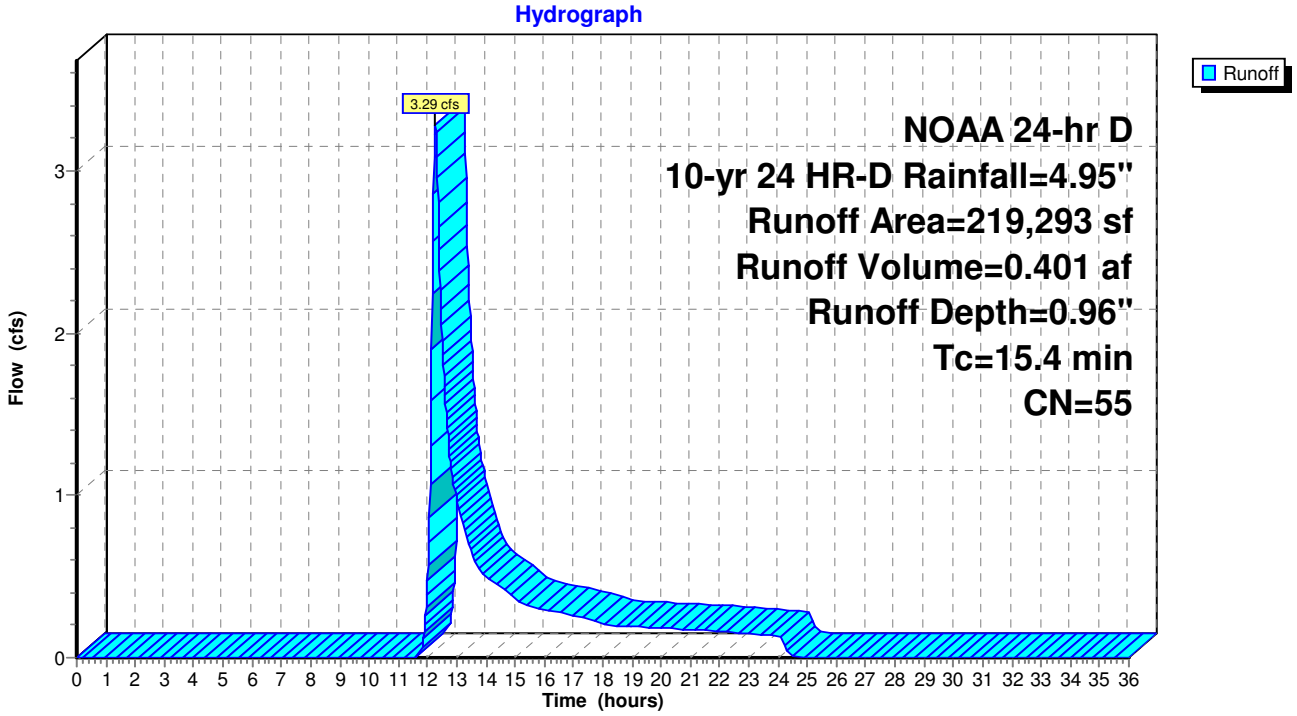
Inflow Area = 5.682 ac, 6.06% Impervious, Inflow Depth = 0.29" for 2-yr 24 HR-D event
Inflow = 0.55 cfs @ 12.16 hrs, Volume= 0.136 af
Primary = 0.55 cfs @ 12.16 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

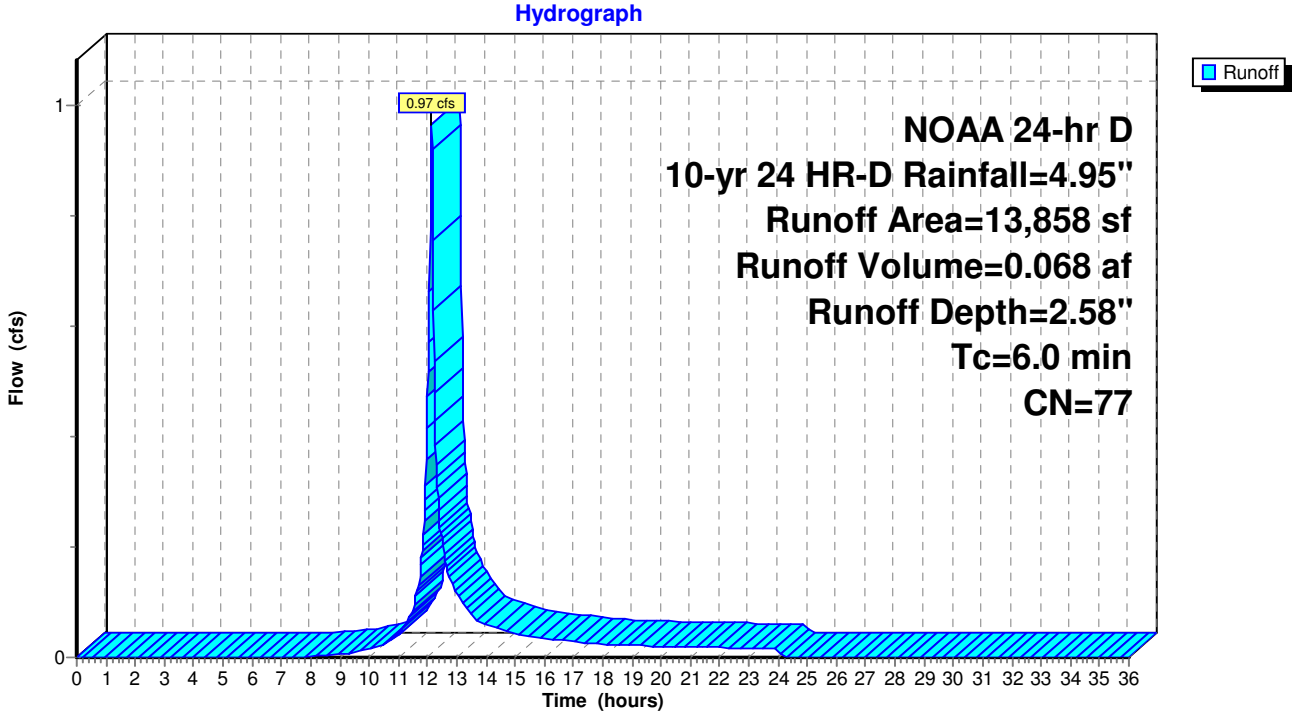
Link DP1*: DP1



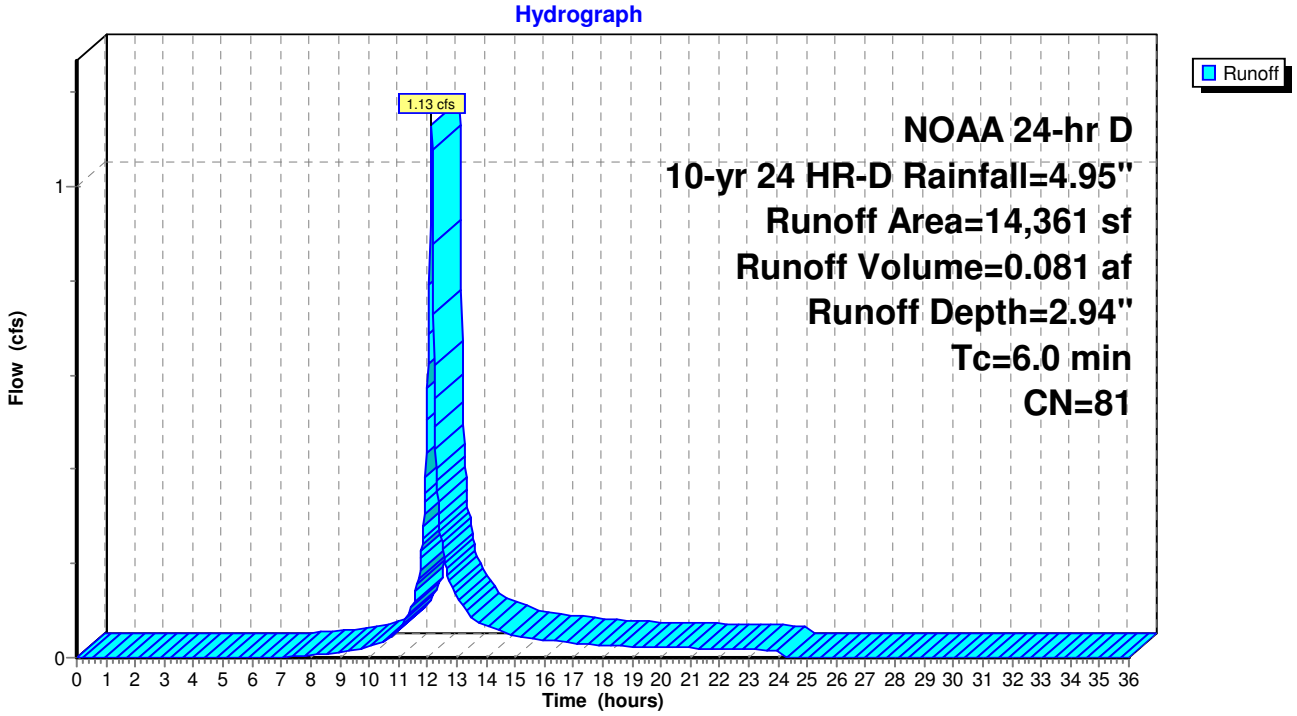
Subcatchment P1*: Existing Conditions



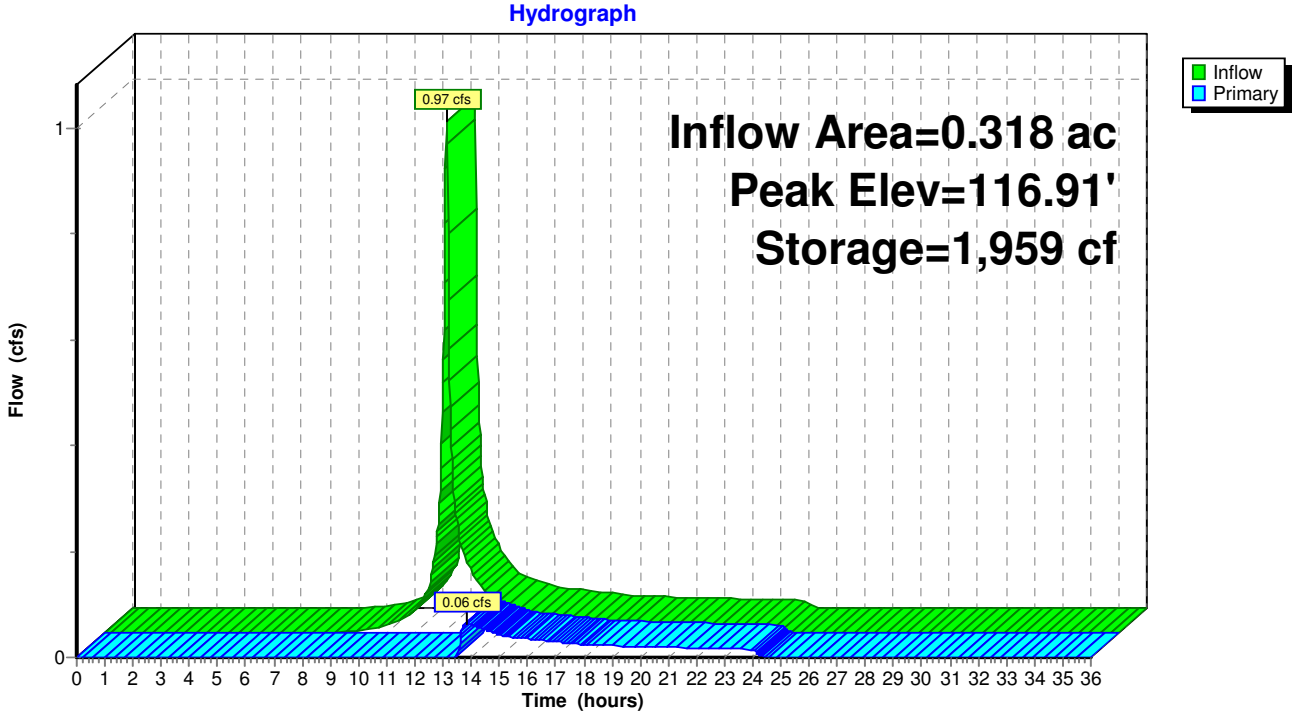
Subcatchment P2*: Parking Lot (Reduced)



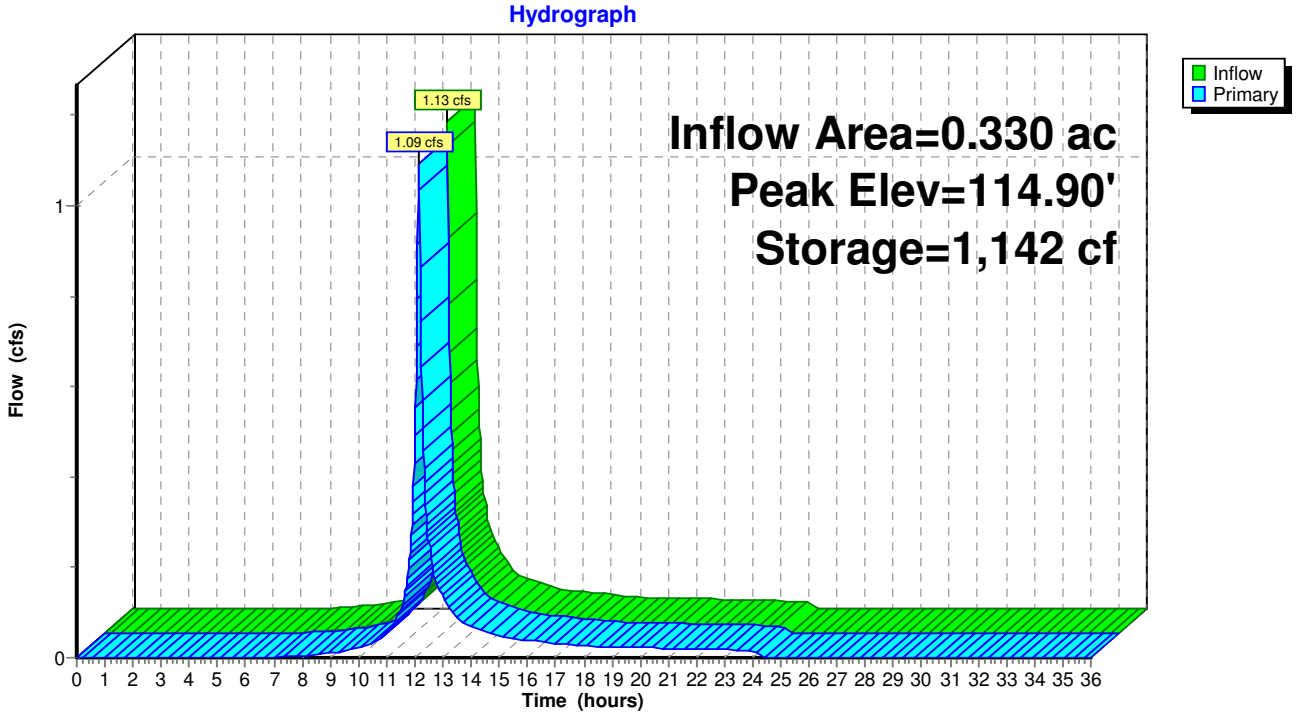
Subcatchment P3*: Drive Way



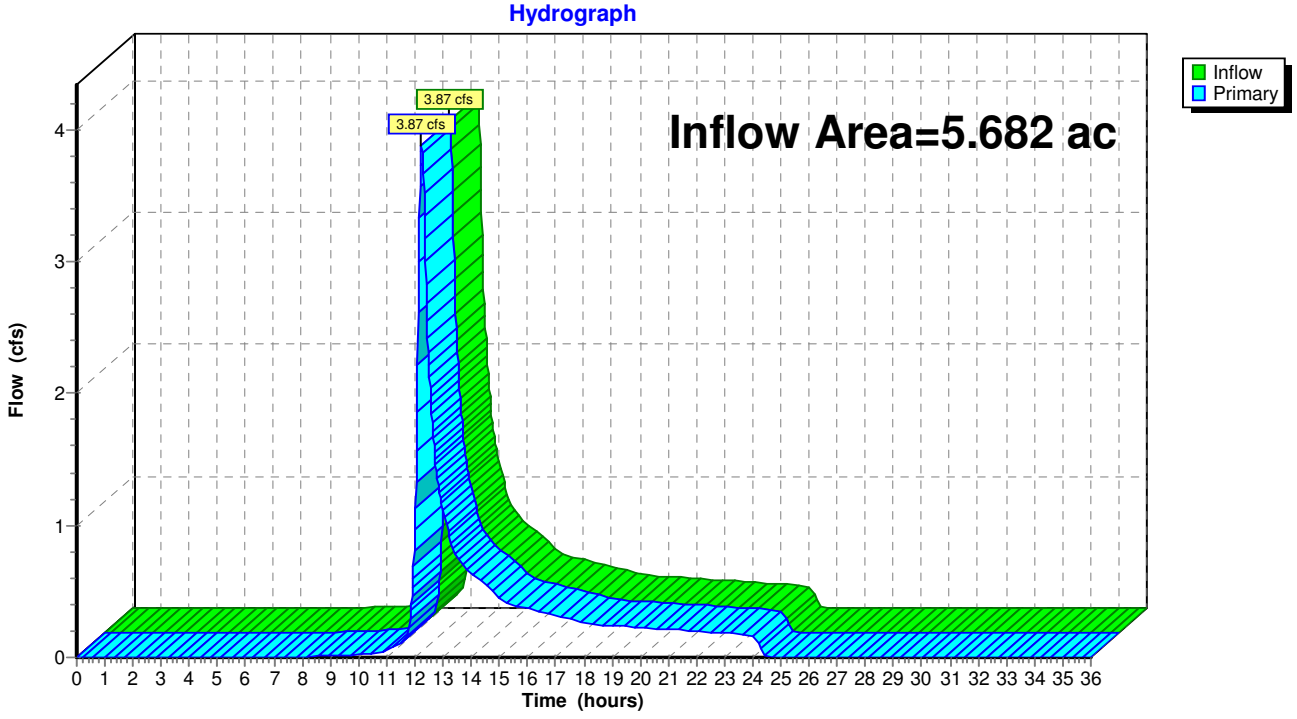
Pond PP1*: Driveway WQIB



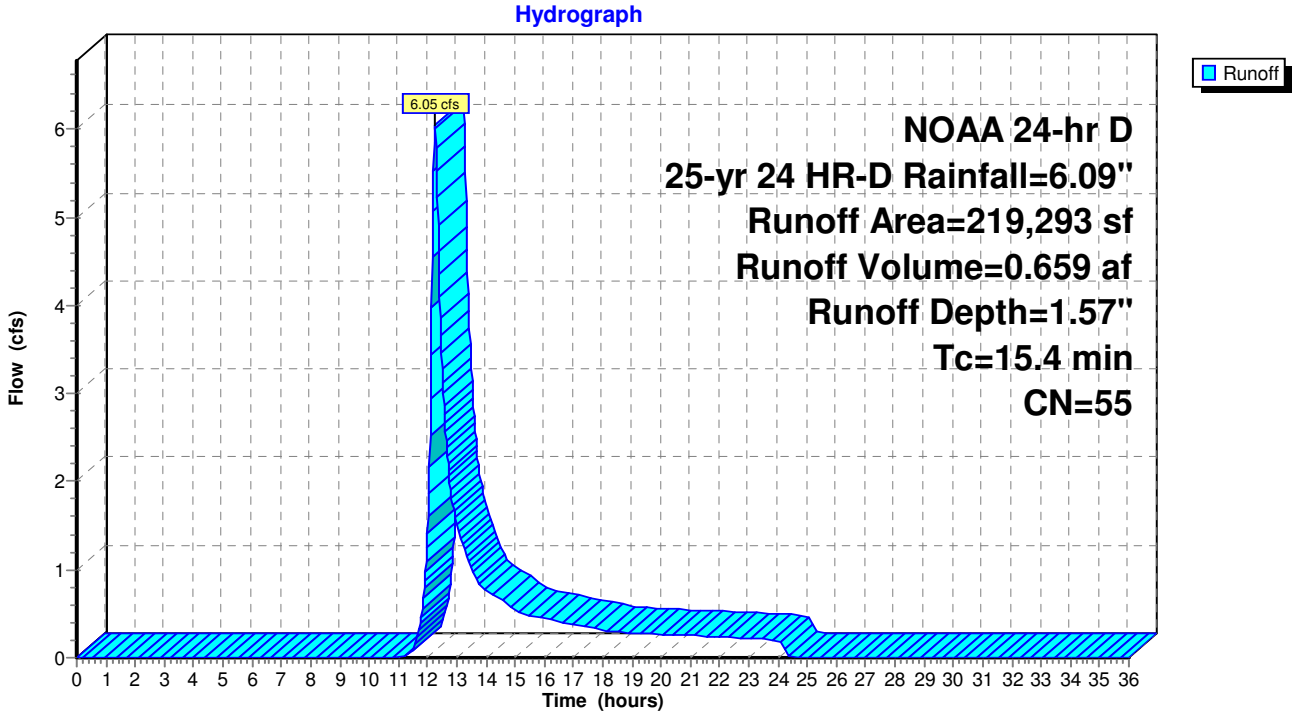
Pond PP2*: Driveway WQB



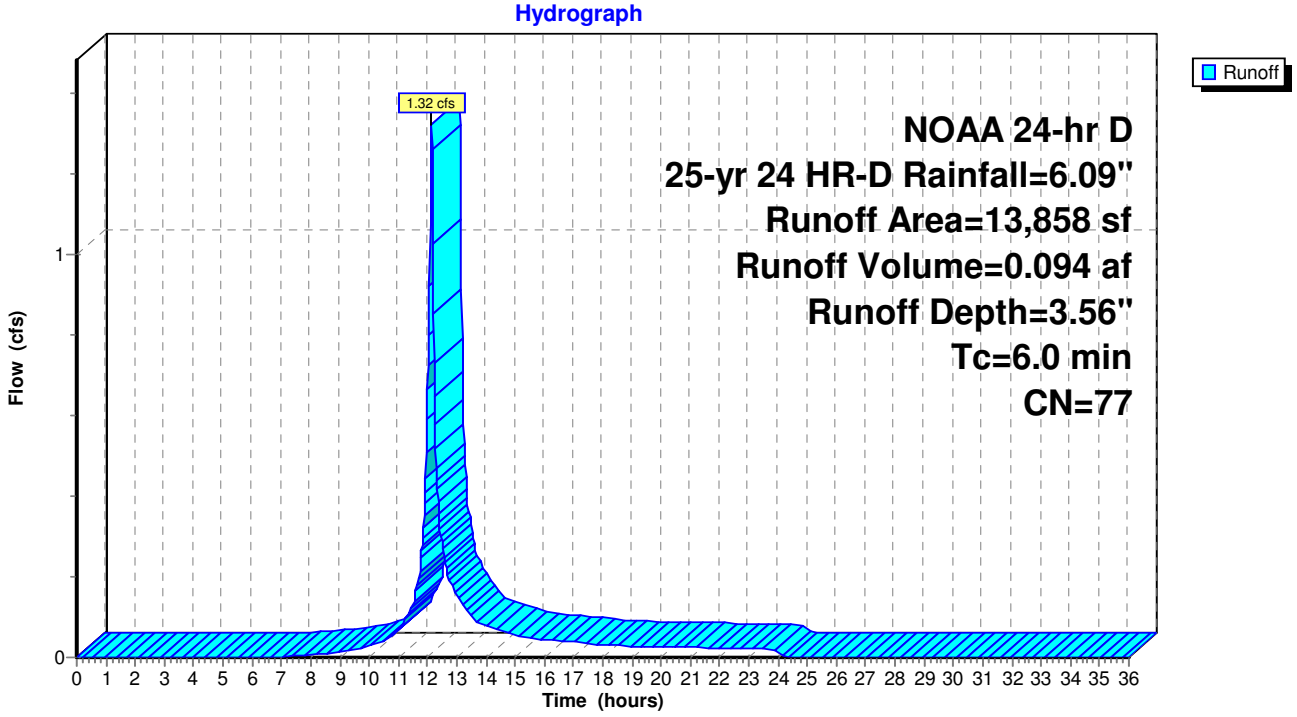
Link DP1*: DP1



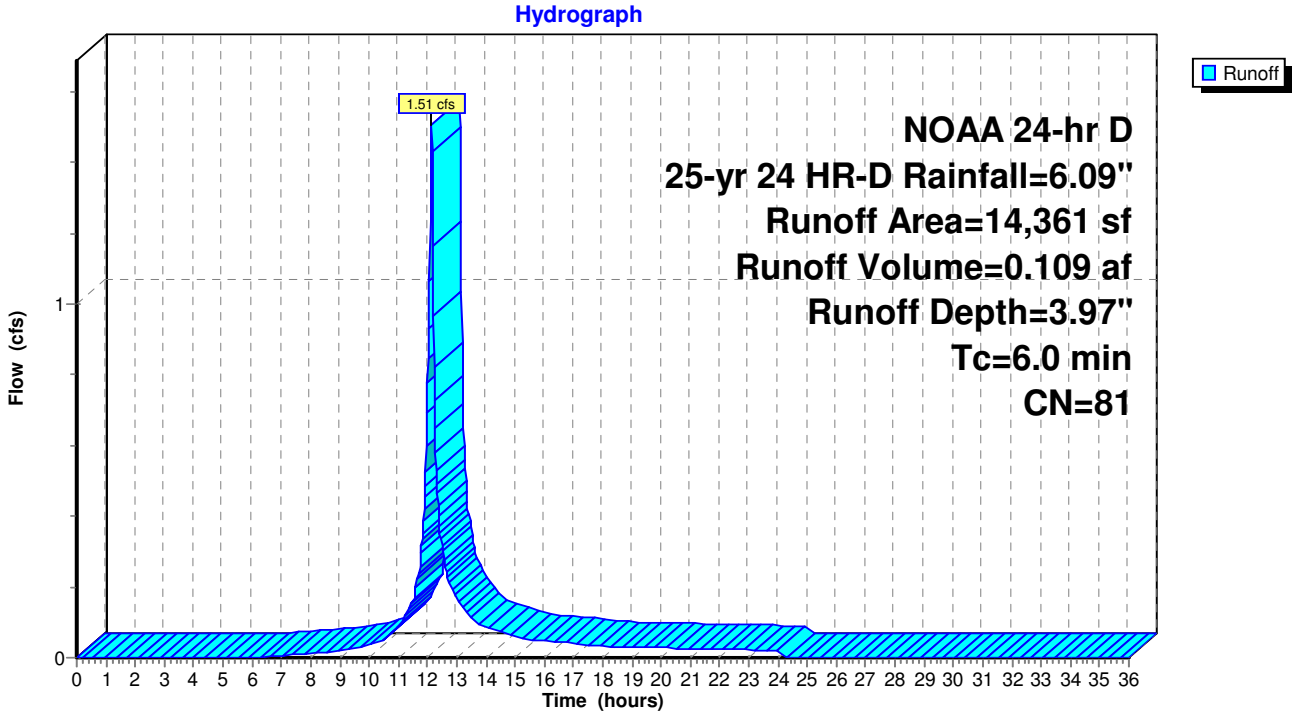
Subcatchment P1*: Existing Conditions



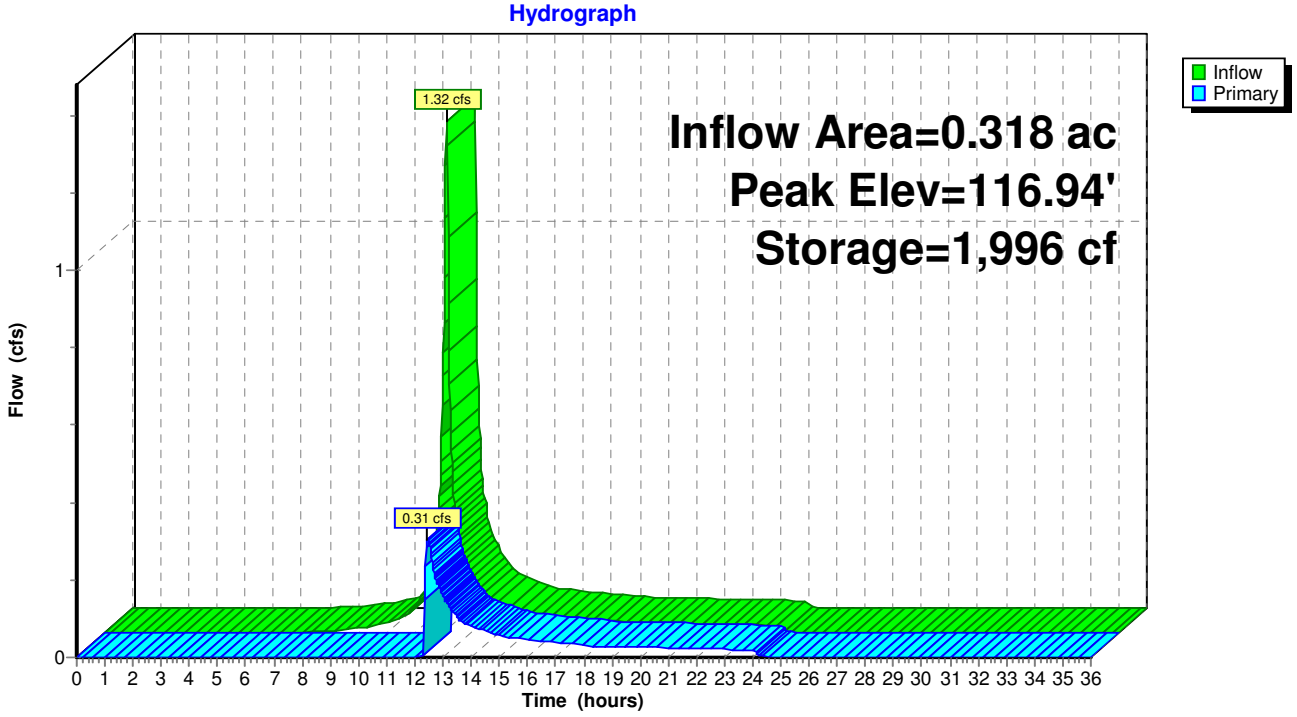
Subcatchment P2*: Parking Lot (Reduced)



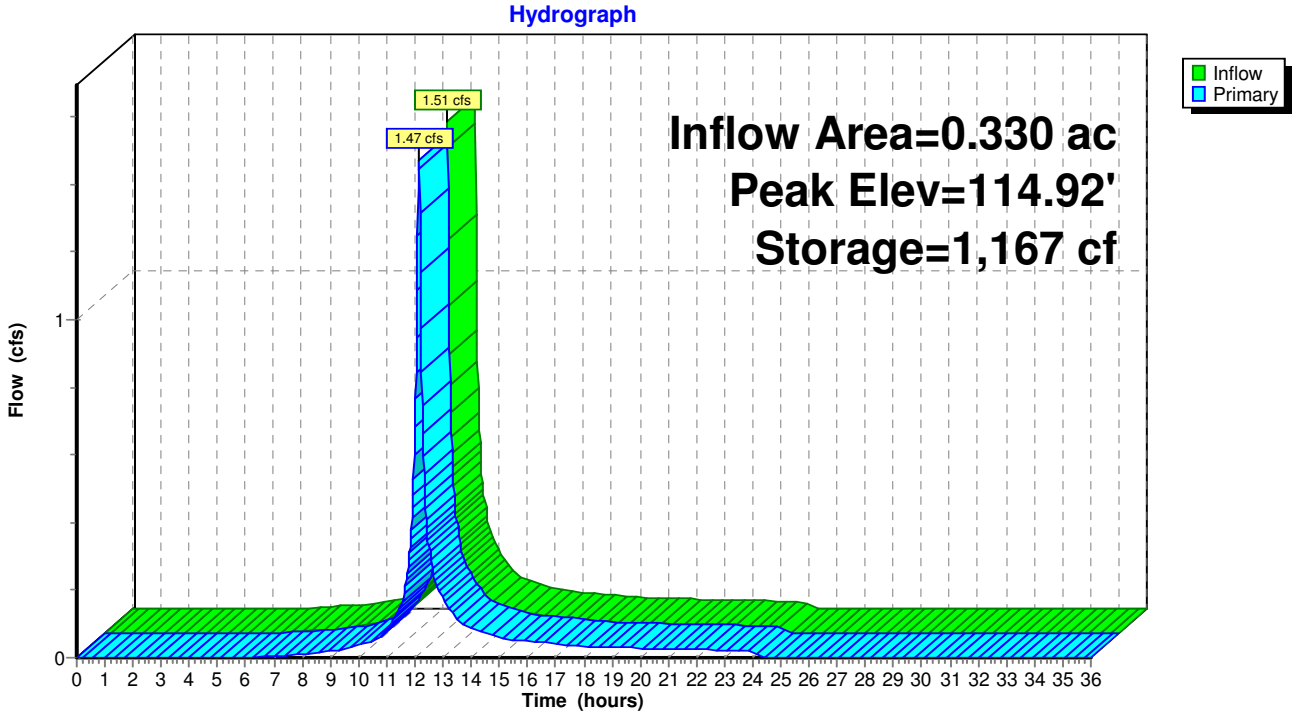
Subcatchment P3*: Drive Way



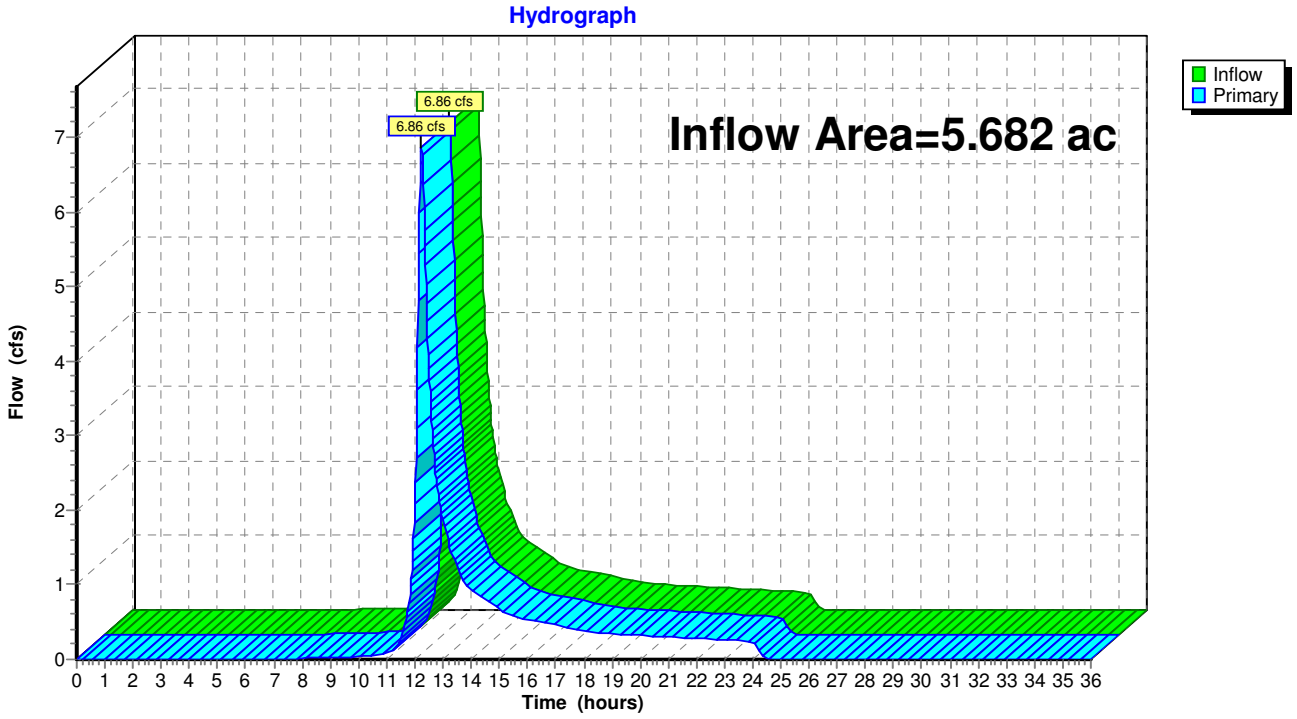
Pond PP1*: Driveway WQIB



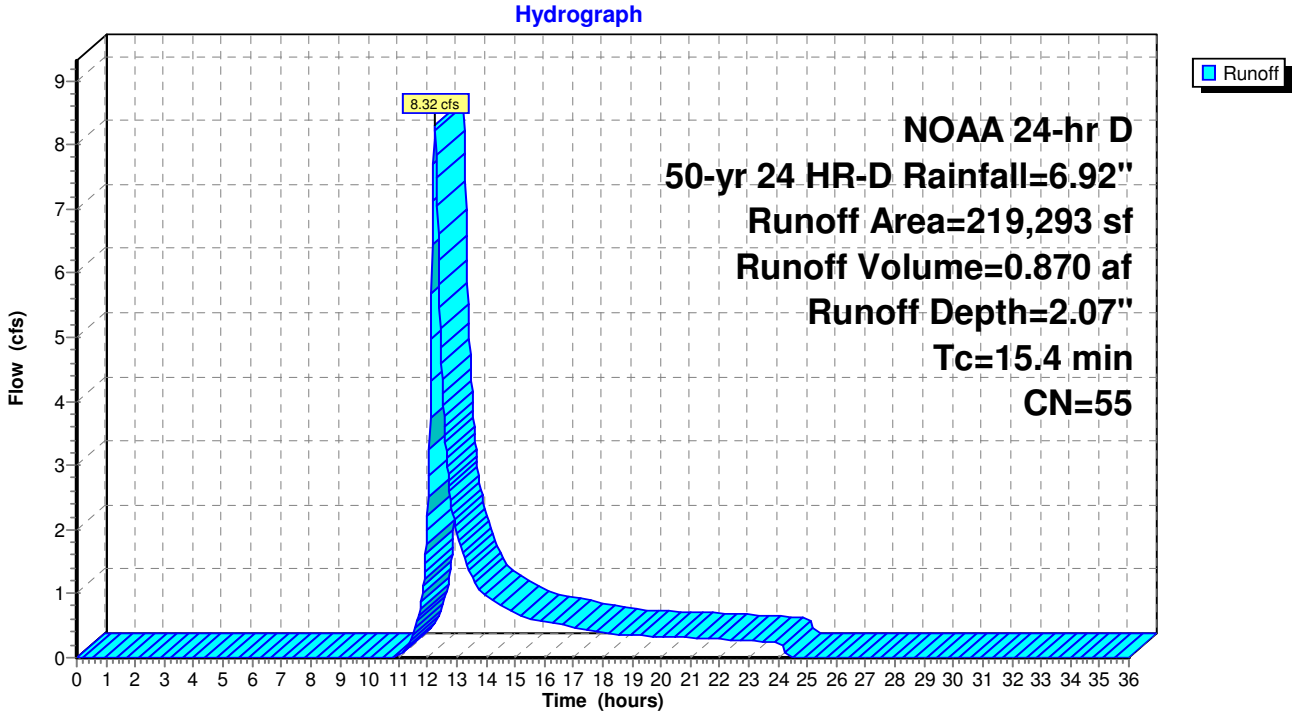
Pond PP2*: Driveway WQB



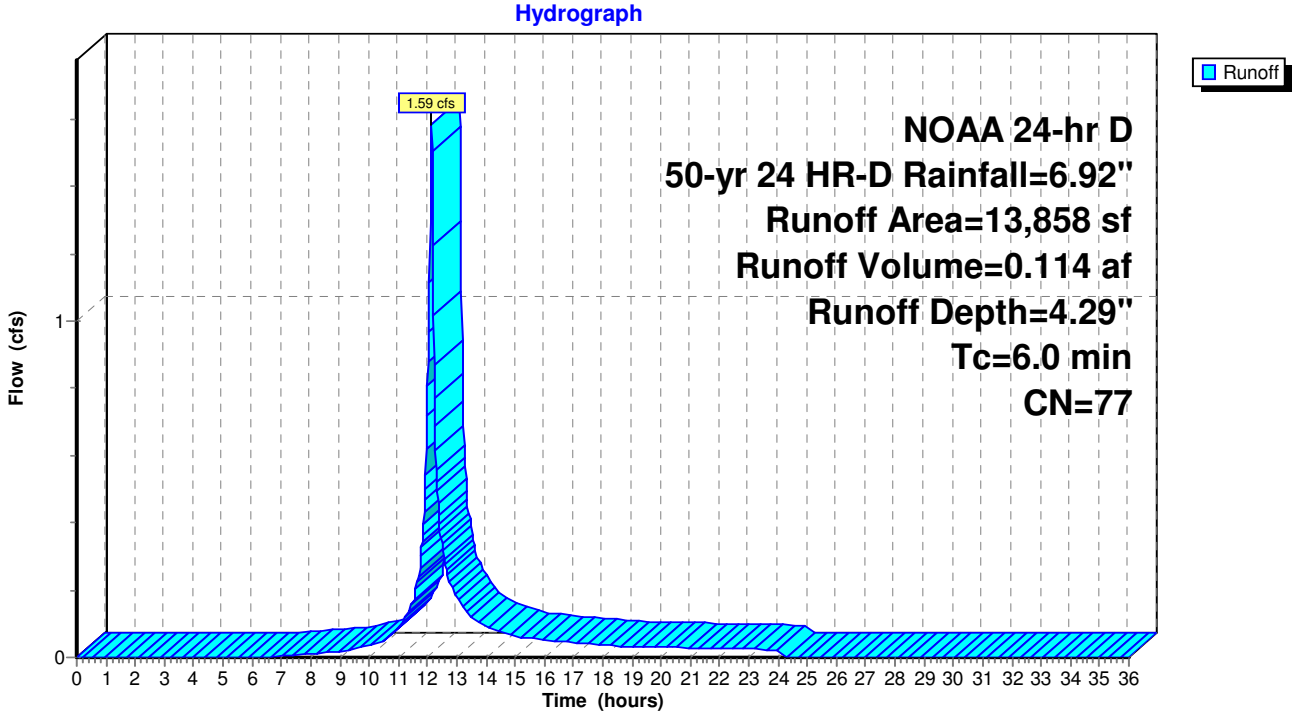
Link DP1*: DP1



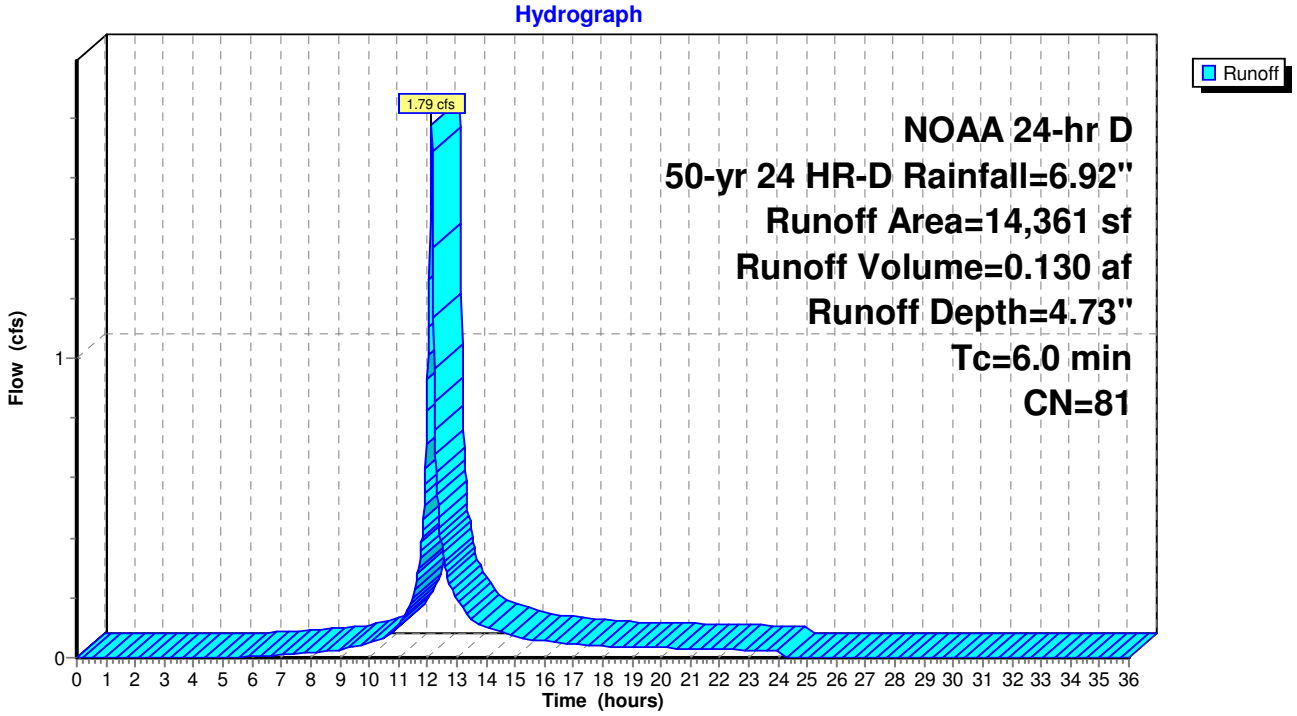
Subcatchment P1*: Existing Conditions



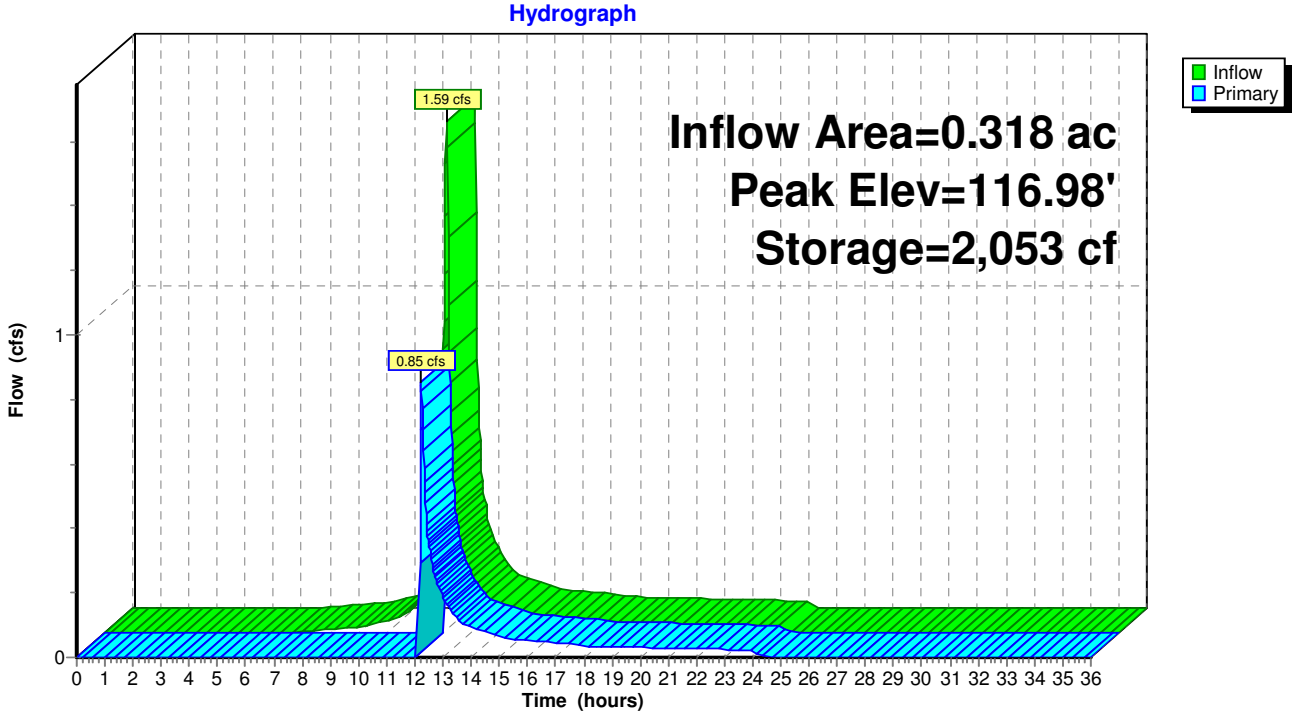
Subcatchment P2*: Parking Lot (Reduced)



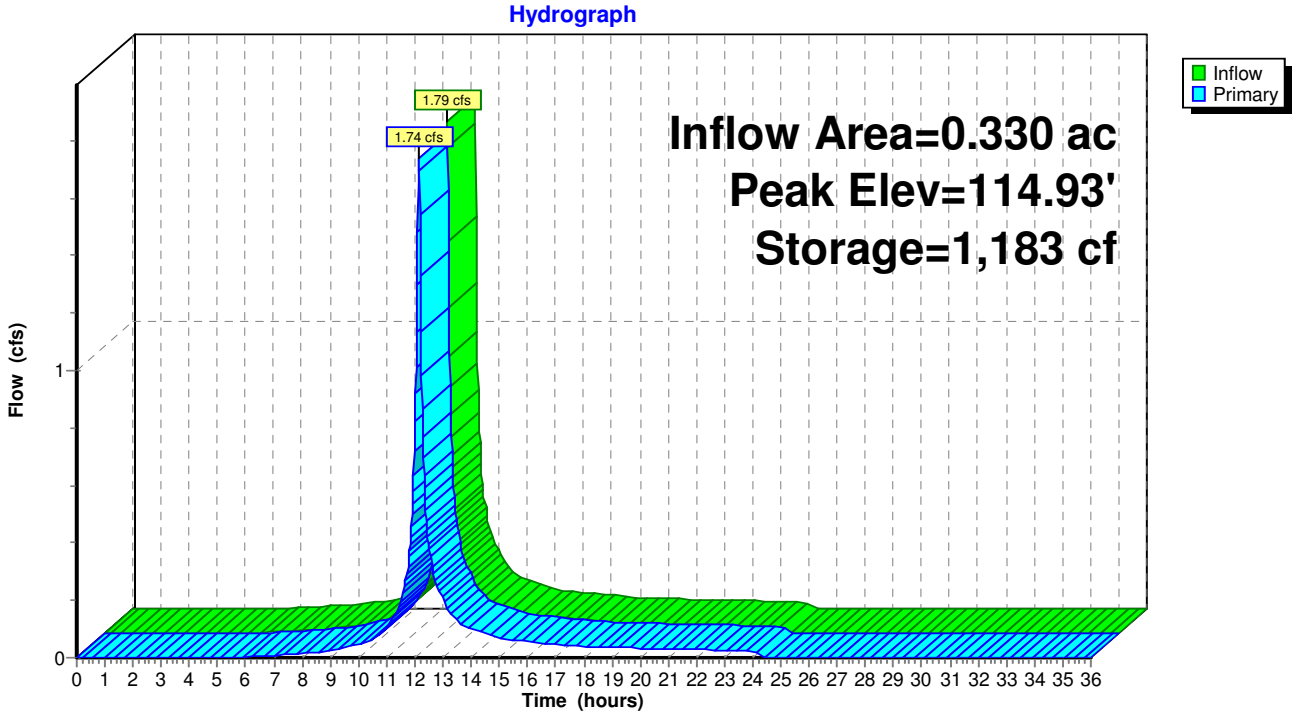
Subcatchment P3*: Drive Way



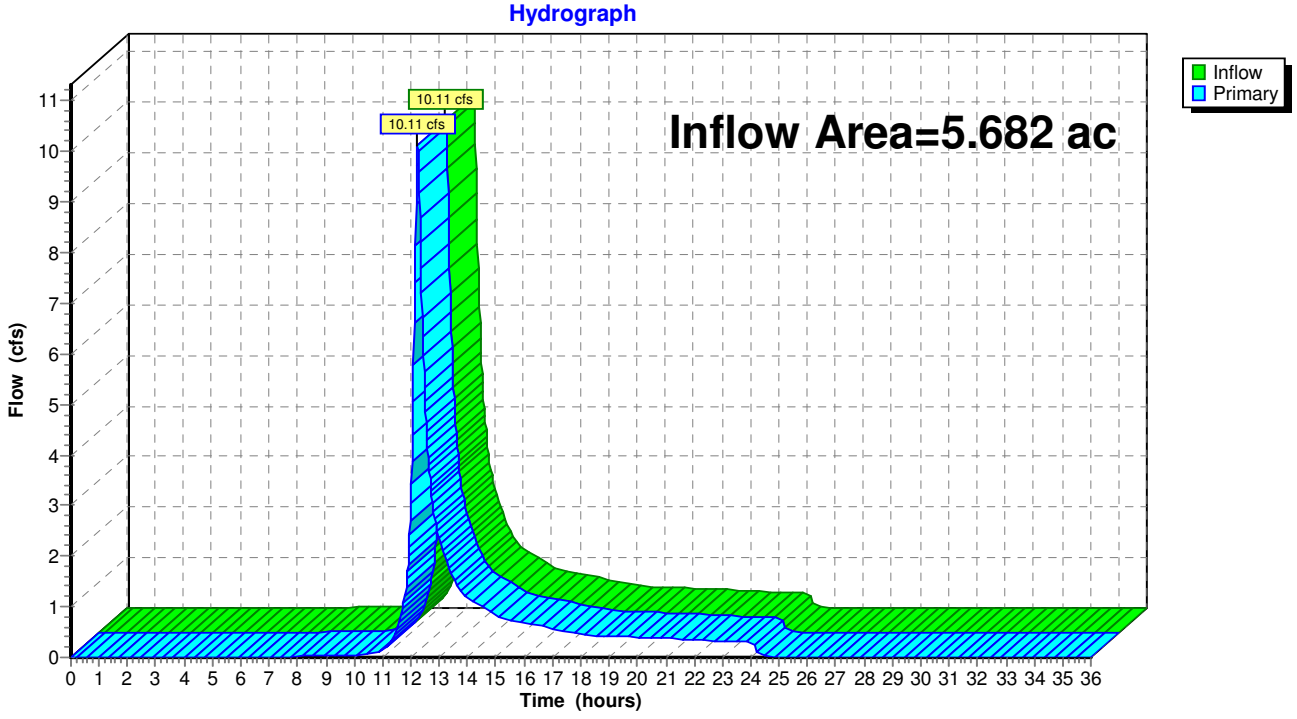
Pond PP1*: Driveway WQIB



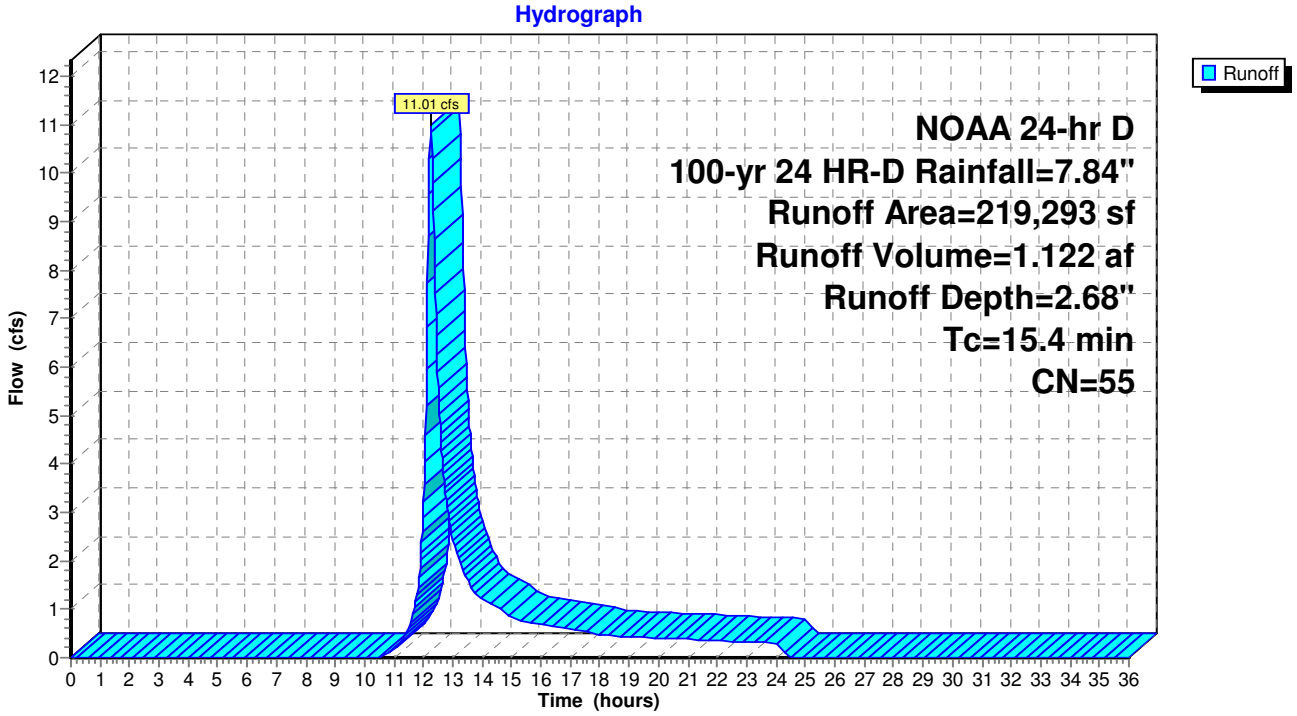
Pond PP2*: Driveway WQB



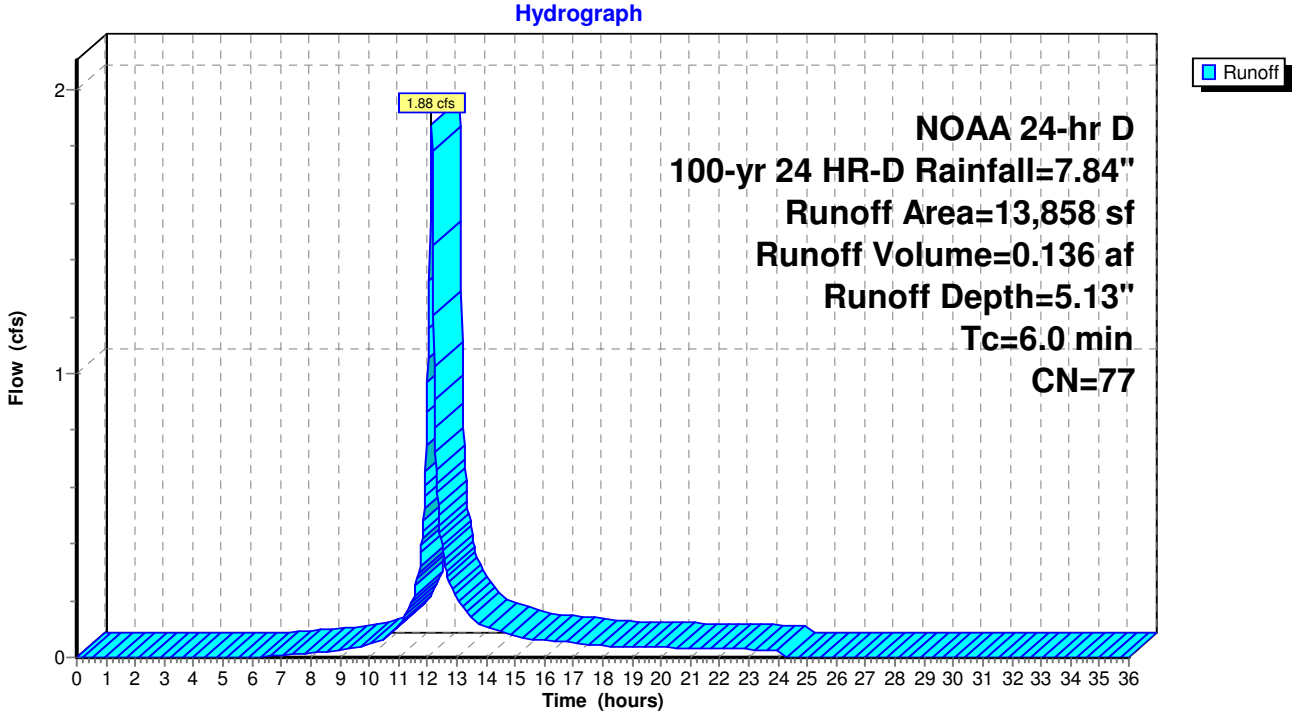
Link DP1*: DP1



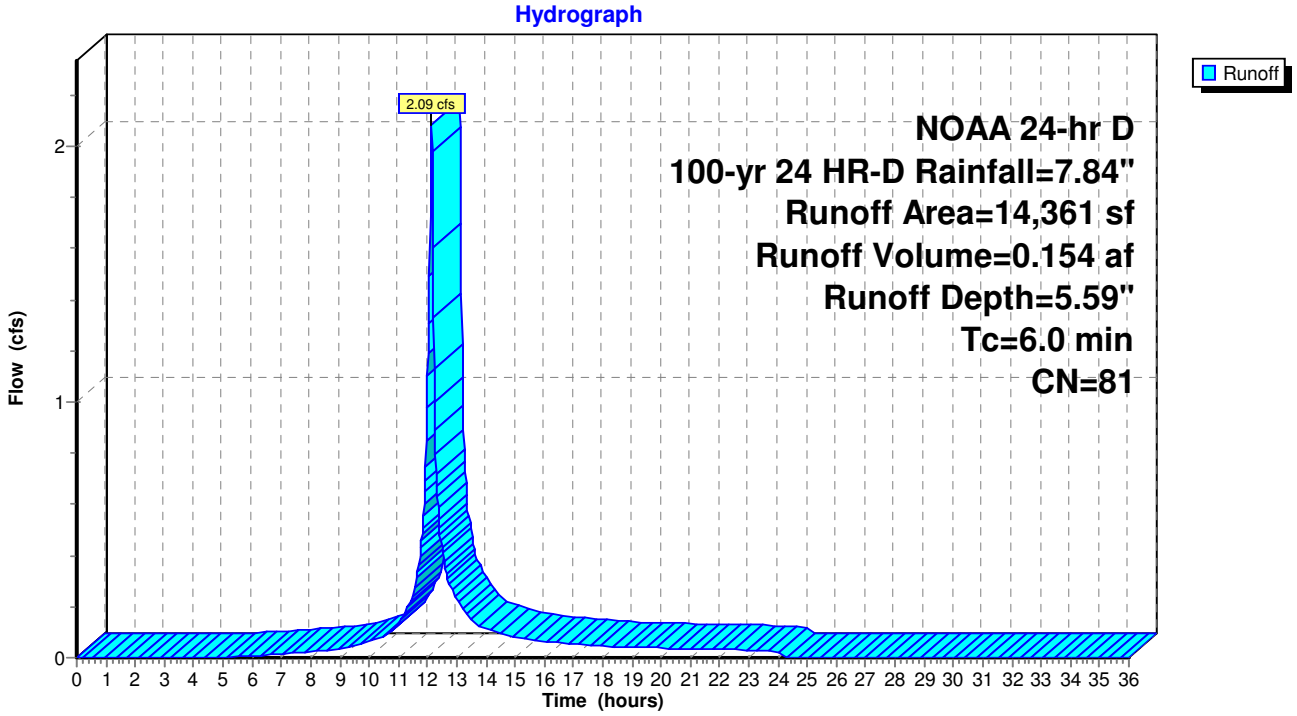
Subcatchment P1*: Existing Conditions



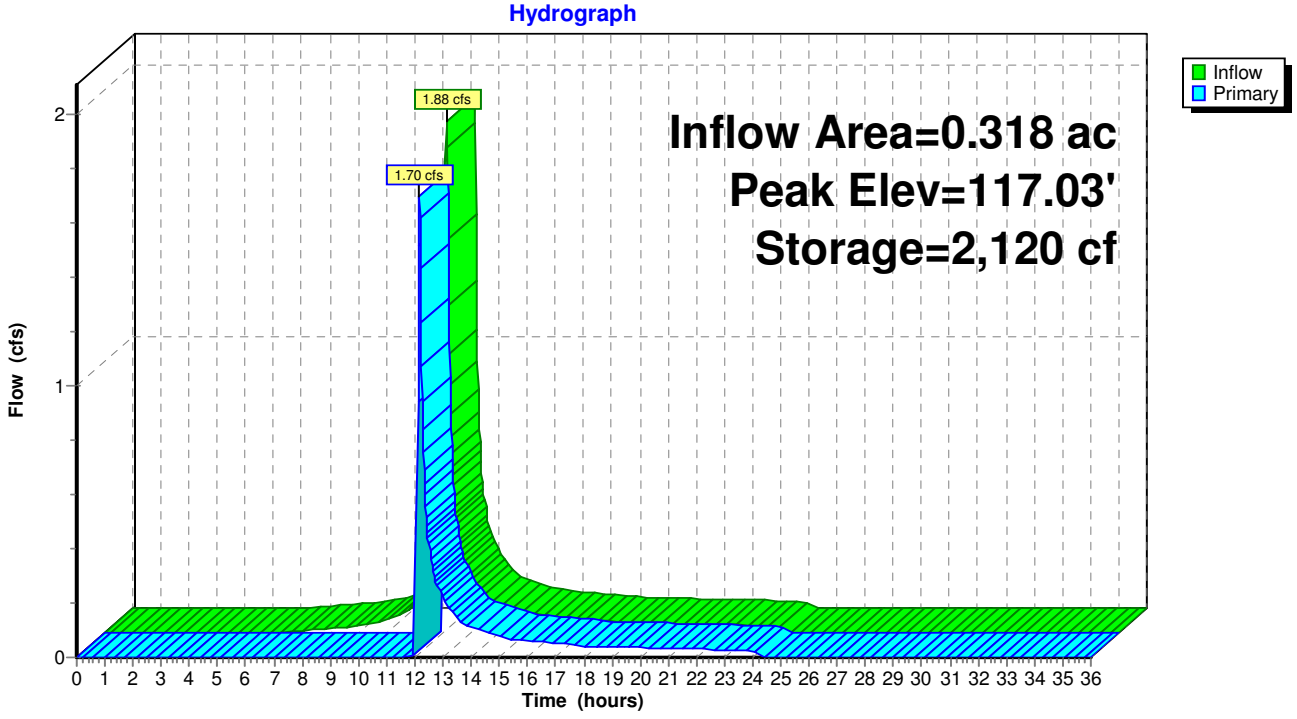
Subcatchment P2*: Parking Lot (Reduced)



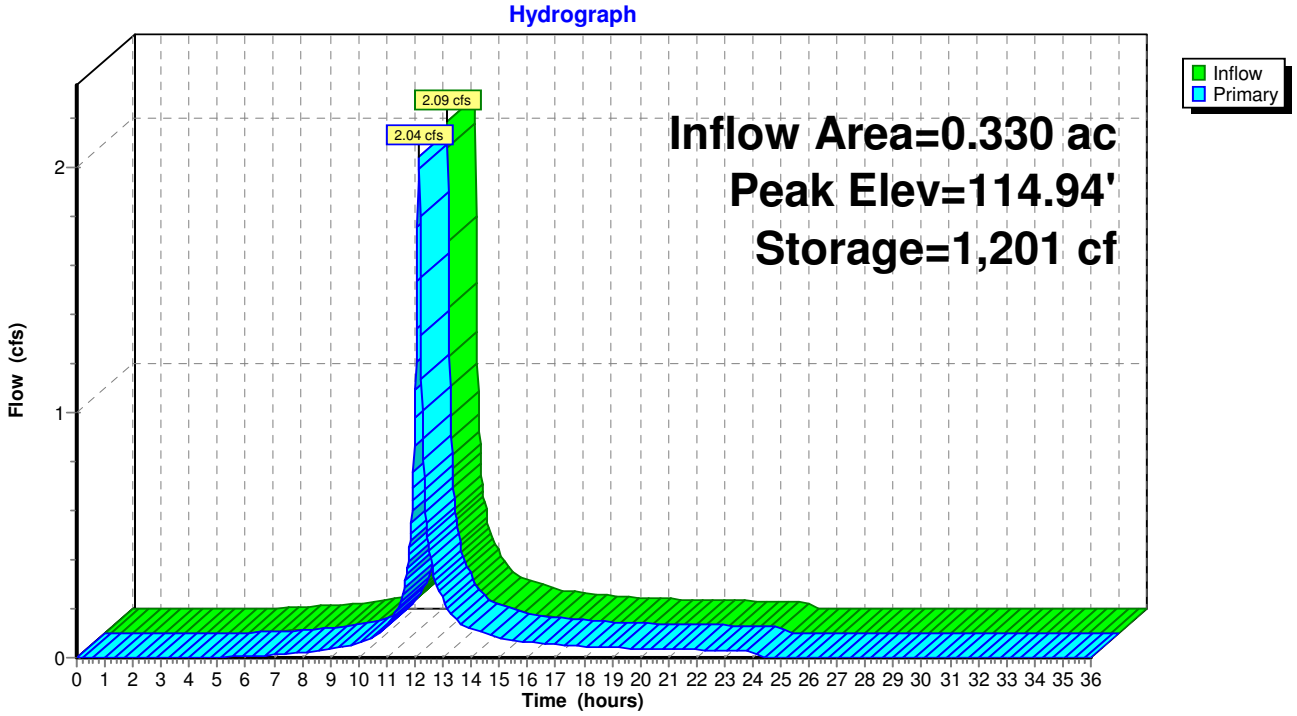
Subcatchment P3*: Drive Way



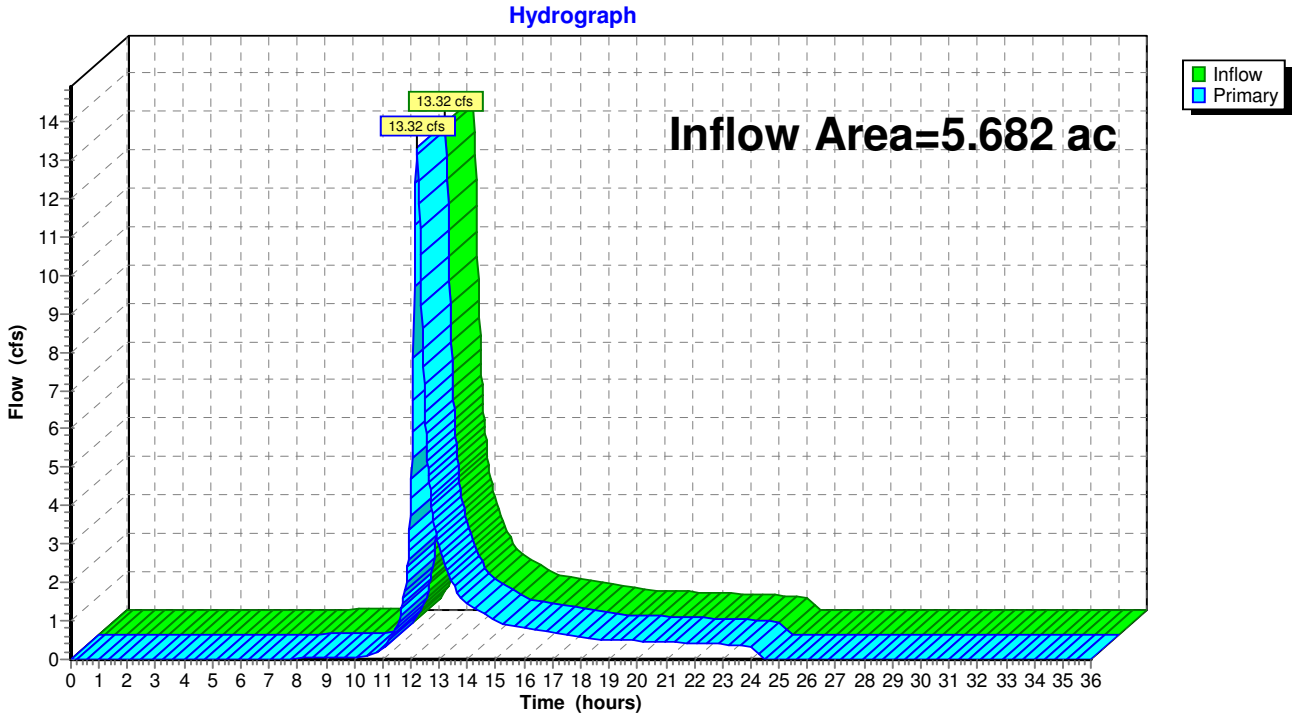
Pond PP1*: Driveway WQIB



Pond PP2*: Driveway WQB



Link DP1*: DP1



Summary for Pond PP1*: Driveway WQIB

Inflow Area = 0.318 ac, 0.00% Impervious, Inflow Depth = 5.13" for 100-yr 24 HR-D event
Inflow = 1.88 cfs @ 12.13 hrs, Volume= 0.136 af
Outflow = 1.70 cfs @ 12.16 hrs, Volume= 0.091 af, Atten= 10%, Lag= 2.0 min
Primary = 1.70 cfs @ 12.16 hrs, Volume= 0.091 af
Routed to Link DP1* : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 117.03' @ 12.16 hrs Surf.Area= 1,471 sf Storage= 2,120 cf

Plug-Flow detention time= 180.8 min calculated for 0.091 af (67% of inflow)
Center-of-Mass det. time= 74.3 min (892.7 - 818.3)

Volume	Invert	Avail.Storage	Storage Description
#1	115.00'	2,960 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)
115.00	682	0	0	682
116.00	1,032	851	851	1,047
117.00	1,438	1,229	2,080	1,471
117.50	2,100	879	2,960	2,138

Device	Routing	Invert	Outlet Devices
#1	Primary	116.90'	**15.0' long + 3.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.68 cfs @ 12.16 hrs HW=117.03' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 1.68 cfs @ 0.86 fps)

Summary for Pond PP2*: Driveway WQB

Inflow Area = 0.330 ac, 53.02% Impervious, Inflow Depth = 5.59" for 100-yr 24 HR-D event
Inflow = 2.09 cfs @ 12.13 hrs, Volume= 0.154 af
Outflow = 2.04 cfs @ 12.14 hrs, Volume= 0.154 af, Atten= 2%, Lag= 0.8 min
Primary = 2.04 cfs @ 12.14 hrs, Volume= 0.154 af
Routed to Link DP1* : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 114.80' Surf.Area= 1,129 sf Storage= 1,032 cf
Peak Elev= 114.94' @ 12.14 hrs Surf.Area= 1,215 sf Storage= 1,201 cf (169 cf above start)

Plug-Flow detention time= 111.2 min calculated for 0.130 af (85% of inflow)
Center-of-Mass det. time= 3.1 min (811.1 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1	113.50'	1,976 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)
113.50	507	0	0	507
114.00	710	303	303	715
115.00	1,249	967	1,270	1,265
115.50	1,582	706	1,976	1,604

Device	Routing	Invert	Outlet Devices
#1	Primary	114.80'	**15.0' long + 3.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=2.03 cfs @ 12.14 hrs HW=114.94' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 2.03 cfs @ 0.92 fps)

APPENDIX C
NRCS Soil Map & Data

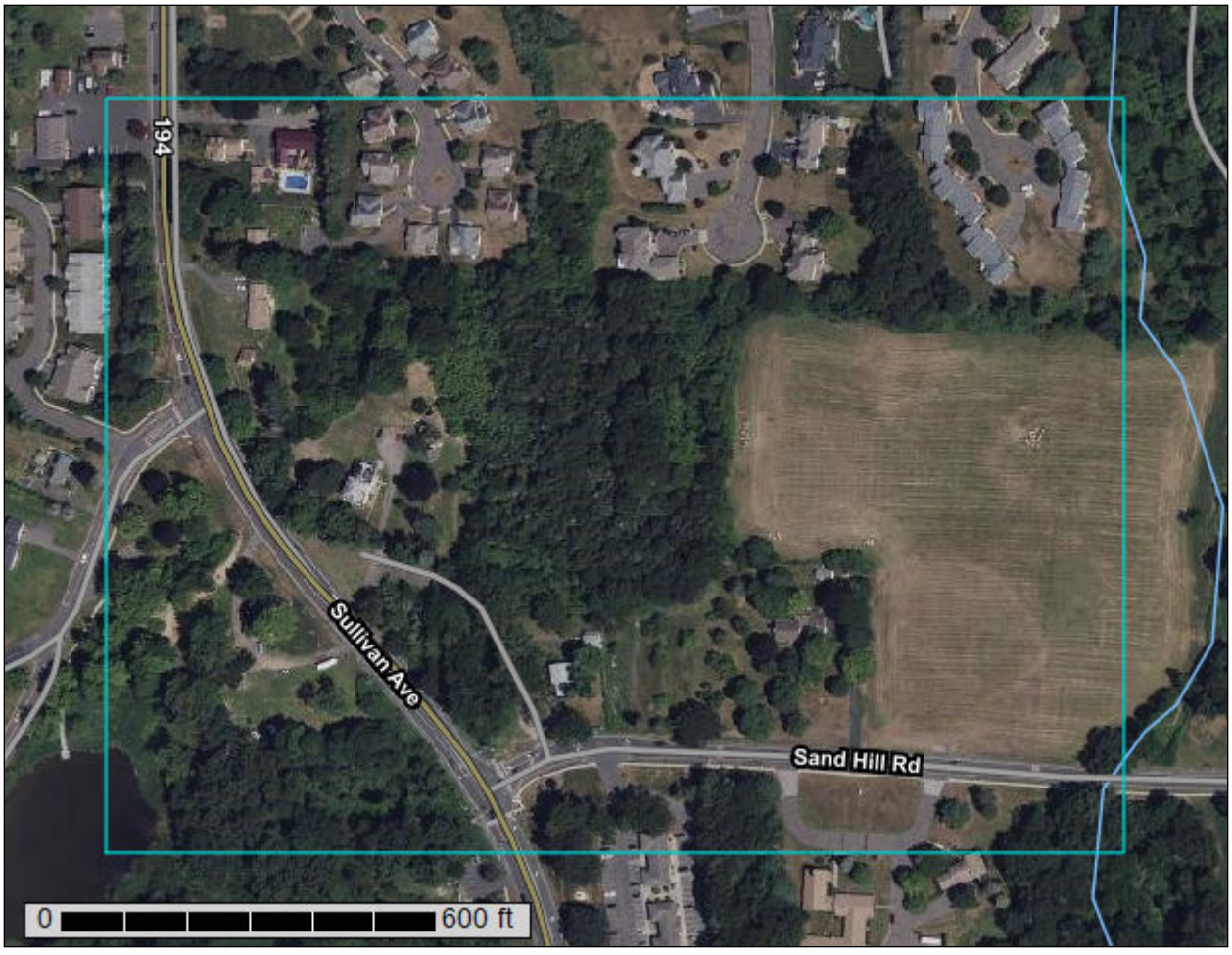
United States Department of Agriculture

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, Western Part



February 19, 2024

Preface

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

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

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

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

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

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

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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: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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
28A	Elmridge fine sandy loam, 0 to 3 percent slopes	4.7	10.5%
30A	Branford silt loam, 0 to 3 percent slopes	1.2	2.7%
37E	Manchester gravelly sandy loam, 15 to 45 percent slopes	4.1	9.0%
108	Saco silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	0.2	0.5%
306	Udorthents-Urban land complex	3.2	7.2%
308	Udorthents, smoothed	3.4	7.6%
702A	Tisbury silt loam, 0 to 3 percent slopes	0.3	0.6%
704A	Enfield silt loam, 0 to 3 percent slopes	15.6	34.6%
704B	Enfield silt loam, 3 to 8 percent slopes	9.1	20.1%
704C	Enfield silt loam, 8 to 15 percent slopes	3.2	7.2%
Totals for Area of Interest		**45.2**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

State of Connecticut, Western Part

28A—Elmridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9lm0
Elevation: 0 to 1,260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Elmridge

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy eolian sands over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bw1 - 6 to 10 inches: fine sandy loam
Bw2 - 10 to 18 inches: fine sandy loam
Bw3 - 18 to 25 inches: sandy loam
2C - 25 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Ninigret

Percent of map unit: 4 percent
Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F144AY026CT - Moist Silty Outwash
Hydric soil rating: No

Brancroft

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F145XY005MA - Moist Lake Plain
Hydric soil rating: No

Belgrade

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Scitico

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Shaker

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Berlin

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Maybid

Percent of map unit: 1 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

30A—Branford silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9lmk
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

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

Description of Branford

Setting

Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from sandstone and shale and/or basalt

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 18 inches: loam
Bw2 - 18 to 24 inches: gravelly loam
2C - 24 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
Drainage class: Well drained
Runoff class: Very 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 supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Haven

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
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

Ellington

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

Manchester

Percent of map unit: 3 percent
Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartford

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

37E—Manchester gravelly sandy loam, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 9ln7
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

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

Description of Manchester

Setting

Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from sandstone and shale and/or basalt

Typical profile

Ap - 0 to 9 inches: gravelly sandy loam
Bw - 9 to 18 inches: gravelly loamy sand
C - 18 to 65 inches: stratified extremely gravelly coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

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

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

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

Walpole
Percent of map unit: 3 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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

108—Saco silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded

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: 82 percent

Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saco

Setting

Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty alluvium over sandy 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
Drainage class: Very poorly drained
Runoff class: Negligible
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
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY015NY - Wet Silty Low Floodplain
Hydric soil rating: Yes

Minor Components

Lim

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY015NY - Wet Silty Low Floodplain
Hydric soil rating: Yes

Bash

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY015NY - Wet Silty Low Floodplain
Hydric soil rating: Yes

Rippowam

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F144AY014CT - Wet Sandy Low Floodplain
Hydric soil rating: Yes

Winooski

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F145XY002MA - Silty Low Floodplain
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

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

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 39 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Parent material: Human-transported material

Typical profile

^A - 0 to 5 inches: loam
^C1 - 5 to 21 inches: gravelly loam
^C2 - 21 to 79 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 6 inches: cemented material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents, wet substratum

Percent of map unit: 9 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

308—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9lmj
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: 87 percent
Minor components: 13 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: Human-transported material

Typical profile

^A - 0 to 5 inches: loam
^C1 - 5 to 21 inches: gravelly loam
^C2 - 21 to 79 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Udorthents, wet substratum

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

Urban land

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

Rock outcrop

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

702A—Tisbury silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07g
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 plains, deltas, outwash terraces
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: 0 to 3 percent
Depth to restrictive feature: 24 to 36 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Ecological site: F144AY026CT - Moist Silty Outwash

Hydric soil rating: No

Minor Components

Merrimac

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

Agawam

Percent of map unit: 5 percent
Landform: Kames, moraines, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ninigret

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

Raypol

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

704A—Enfield silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07p
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: 0 to 3 percent
Depth to restrictive feature: 16 to 39 inches to strongly contrasting textural stratification
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 supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
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: Outwash plains, deltas, valley trains, outwash terraces
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: Kames, moraines, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Raypol

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

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
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 supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Haven

Percent of map unit: 5 percent
Landform: Outwash plains, outwash terraces
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: Outwash plains, deltas, valley trains, outwash terraces
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: Kames, moraines, outwash terraces, outwash plains, kame terraces
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: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

704C—Enfield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2y07r
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

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): Riser
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: 8 to 15 percent
Depth to restrictive feature: 16 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
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 supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F145XY009CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Haven

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

Tisbury

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

Raypol

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

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

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

Hydrologic Soil Group

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

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

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

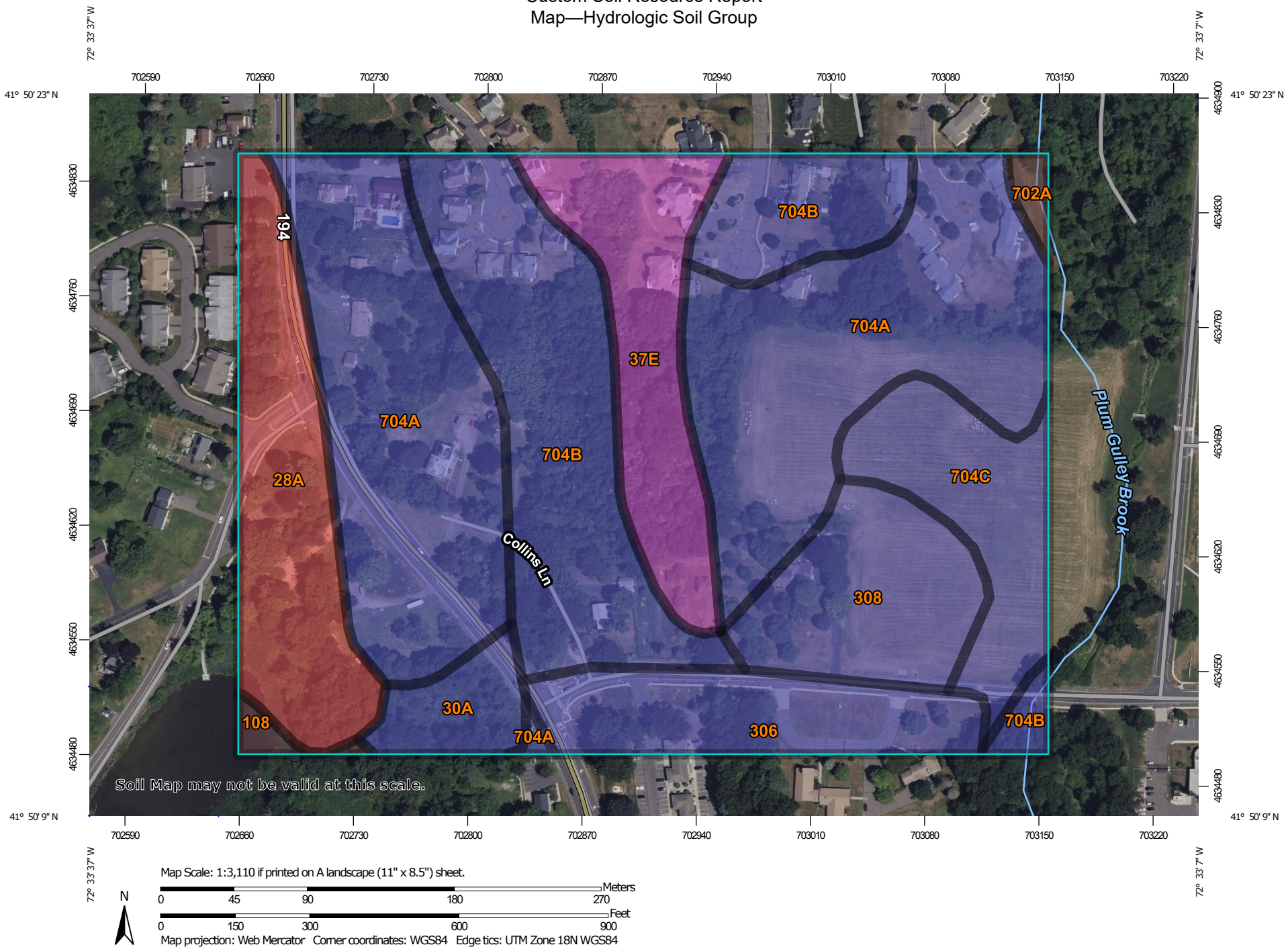
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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
28A	Elmridge fine sandy loam, 0 to 3 percent slopes	D	4.7	10.5%
30A	Branford silt loam, 0 to 3 percent slopes	B	1.2	2.7%
37E	Manchester gravelly sandy loam, 15 to 45 percent slopes	A	4.1	9.0%
108	Saco silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	B/D	0.2	0.5%
306	Udorthents-Urban land complex	B	3.2	7.2%
308	Udorthents, smoothed	B	3.4	7.6%
702A	Tisbury silt loam, 0 to 3 percent slopes	B/D	0.3	0.6%
704A	Enfield silt loam, 0 to 3 percent slopes	B	15.6	34.6%
704B	Enfield silt loam, 3 to 8 percent slopes	B	9.1	20.1%
704C	Enfield silt loam, 8 to 15 percent slopes	B	3.2	7.2%
Totals for Area of Interest			**45.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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APPENDIX D
NOAA Atlas 14 Precipitation Data

NOAA Atlas 14, Volume 10, Version 3
Location name: South Windsor, Connecticut, USA*
Latitude: 41.8379°, Longitude: -72.5578°
Elevation: 121 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.336** (0.259-0.435)	**0.407** (0.314-0.527)	**0.523** (0.402-0.681)	**0.620** (0.474-0.811)	**0.753** (0.558-1.03)	**0.853** (0.621-1.19)	**0.958** (0.678-1.39)	**1.08** (0.723-1.60)	**1.25** (0.806-1.92)	**1.39** (0.877-2.17)
10-min	**0.475** (0.367-0.616)	**0.576** (0.444-0.747)	**0.741** (0.569-0.964)	**0.878** (0.671-1.15)	**1.07** (0.791-1.46)	**1.21** (0.878-1.69)	**1.36** (0.960-1.97)	**1.52** (1.02-2.26)	**1.77** (1.14-2.71)	**1.96** (1.24-3.08)
15-min	**0.559** (0.432-0.724)	**0.678** (0.523-0.879)	**0.872** (0.670-1.13)	**1.03** (0.789-1.35)	**1.26** (0.930-1.72)	**1.42** (1.03-1.99)	**1.60** (1.13-2.32)	**1.79** (1.20-2.66)	**2.08** (1.34-3.19)	**2.31** (1.46-3.62)
30-min	**0.752** (0.580-0.973)	**0.913** (0.704-1.18)	**1.18** (0.904-1.53)	**1.40** (1.07-1.83)	**1.70** (1.26-2.32)	**1.93** (1.40-2.69)	**2.16** (1.53-3.14)	**2.43** (1.63-3.61)	**2.82** (1.82-4.33)	**3.13** (1.98-4.92)
60-min	**0.944** (0.728-1.22)	**1.15** (0.885-1.49)	**1.48** (1.14-1.93)	**1.76** (1.35-2.30)	**2.14** (1.59-2.93)	**2.43** (1.77-3.40)	**2.73** (1.94-3.97)	**3.07** (2.06-4.56)	**3.56** (2.30-5.47)	**3.96** (2.51-6.21)
2-hr	**1.22** (0.946-1.57)	**1.48** (1.14-1.90)	**1.89** (1.46-2.45)	**2.24** (1.72-2.92)	**2.72** (2.03-3.71)	**3.07** (2.25-4.29)	**3.45** (2.47-5.02)	**3.90** (2.63-5.76)	**4.58** (2.97-7.00)	**5.15** (3.27-8.02)
3-hr	**1.40** (1.09-1.80)	**1.70** (1.32-2.18)	**2.18** (1.69-2.81)	**2.57** (1.98-3.34)	**3.12** (2.34-4.25)	**3.52** (2.59-4.91)	**3.96** (2.85-5.76)	**4.49** (3.03-6.61)	**5.30** (3.45-8.08)	**6.00** (3.82-9.31)
6-hr	**1.76** (1.38-2.25)	**2.14** (1.67-2.73)	**2.75** (2.14-3.53)	**3.26** (2.52-4.20)	**3.96** (2.98-5.37)	**4.47** (3.31-6.22)	**5.04** (3.65-7.31)	**5.74** (3.88-8.39)	**6.82** (4.45-10.3)	**7.76** (4.95-12.0)
12-hr	**2.16** (1.70-2.74)	**2.64** (2.07-3.36)	**3.43** (2.69-4.38)	**4.09** (3.18-5.24)	**4.99** (3.78-6.74)	**5.66** (4.21-7.82)	**6.39** (4.65-9.22)	**7.30** (4.96-10.6)	**8.72** (5.70-13.1)	**9.95** (6.37-15.2)
24-hr	**2.52** (1.99-3.18)	**3.13** (2.47-3.95)	**4.12** (3.24-5.23)	**4.95** (3.87-6.31)	**6.09** (4.64-8.18)	**6.92** (5.19-9.54)	**7.84** (5.76-11.3)	**9.01** (6.14-13.0)	**10.9** (7.14-16.3)	**12.5** (8.03-19.0)
2-day	**2.83** (2.25-3.56)	**3.57** (2.83-4.49)	**4.77** (3.78-6.02)	**5.77** (4.54-7.32)	**7.14** (5.48-9.58)	**8.14** (6.15-11.2)	**9.26** (6.87-13.4)	**10.7** (7.34-15.4)	**13.1** (8.65-19.5)	**15.3** (9.85-23.1)
3-day	**3.08** (2.46-3.86)	**3.89** (3.10-4.88)	**5.21** (4.14-6.55)	**6.30** (4.98-7.97)	**7.81** (6.02-10.4)	**8.90** (6.75-12.2)	**10.1** (7.54-14.6)	**11.8** (8.06-16.9)	**14.5** (9.53-21.4)	**16.9** (10.9-25.4)
4-day	**3.31** (2.65-4.14)	**4.17** (3.33-5.22)	**5.58** (4.44-7.00)	**6.74** (5.34-8.51)	**8.35** (6.44-11.1)	**9.51** (7.22-13.0)	**10.8** (8.07-15.6)	**12.6** (8.62-17.9)	**15.4** (10.2-22.8)	**18.0** (11.6-27.0)
7-day	**3.94** (3.16-4.90)	**4.91** (3.94-6.10)	**6.49** (5.18-8.10)	**7.80** (6.20-9.79)	**9.60** (7.44-12.7)	**10.9** (8.31-14.9)	**12.4** (9.25-17.7)	**14.3** (9.85-20.3)	**17.5** (11.6-25.6)	**20.3** (13.1-30.2)
10-day	**4.57** (3.68-5.66)	**5.59** (4.50-6.94)	**7.27** (5.82-9.05)	**8.66** (6.90-10.8)	**10.6** (8.19-13.9)	**12.0** (9.11-16.2)	**13.5** (10.1-19.1)	**15.5** (10.7-21.9)	**18.7** (12.4-27.4)	**21.5** (14.0-32.1)
20-day	**6.57** (5.32-8.10)	**7.66** (6.20-9.45)	**9.44** (7.61-11.7)	**10.9** (8.74-13.6)	**12.9** (10.0-16.8)	**14.4** (11.0-19.2)	**16.1** (11.9-22.2)	**18.0** (12.5-25.3)	**21.0** (14.0-30.4)	**23.5** (15.3-34.7)
30-day	**8.29** (6.74-10.2)	**9.40** (7.63-11.6)	**11.2** (9.07-13.8)	**12.7** (10.2-15.8)	**14.8** (11.5-19.1)	**16.4** (12.4-21.5)	**18.0** (13.2-24.5)	**19.8** (13.8-27.7)	**22.5** (15.0-32.4)	**24.6** (16.0-36.2)
45-day	**10.4** (8.52-12.8)	**11.6** (9.44-14.2)	**13.5** (10.9-16.6)	**15.0** (12.1-18.6)	**17.2** (13.3-22.0)	**18.8** (14.3-24.5)	**20.5** (15.0-27.5)	**22.1** (15.5-30.7)	**24.4** (16.4-35.0)	**26.1** (17.0-38.3)
60-day	**12.3** (10.0-15.0)	**13.4** (11.0-16.4)	**15.4** (12.5-18.9)	**17.0** (13.7-20.9)	**19.2** (14.9-24.4)	**20.9** (15.9-27.1)	**22.6** (16.5-30.1)	**24.2** (16.9-33.4)	**26.1** (17.6-37.4)	**27.5** (18.0-40.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

APPENDIX E
Water Quality Calculations

8 Collins Lane - WQV & CN Reduction

Water Quality Volume - Proposed Area 2 - Parking Lot

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

P = **1.3** in (90th Percentile Precipitation Depth)

Drainage Area A = **13,208** sqft **0.303** ac **0.0005** sqmi

R = volumetric runoff coefficient

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

I = **80** %

R = 0.05 + 0.009(I)

R = 0.05 + 0.009 x **80**

R = **0.770**

A = drainage area in acres = **0.303** ac

WQV = (P)(R)(A)/12

$$WQV = \frac{1.3 \text{ in} \times 0.770 \times 0.303 \text{ ac}}{12}$$

WQV = **0.025** acre-feet **1101.77** cft

Proposed

As shown on the enclosed stage storage report, the proposed water quality infiltration basin was sized to store over 100% of the determined water quality volume. 10% of the WQV is also proposed to be stored in proposed forebays for pre-treatment. The water quality basin and forebay will provide 1939 cft and 129 cft respectivey. The Water Quality Volume provided is enough to satify the required 1921 cft water quality volume for the entire site (+820 CFT from Watershed Area P3). See Stage storage reports for both the Water qualty basin and the forebay included in this appendix.

Drain Time

Td = [V / (K x A)] x 12 in / ft

Td = Drain Time

V= Desing Infiltration Volume = 1939

k = Desing Infiltration Rate = 0.52

A = Average Surface Area = 1013 @ ELEV 115.95

Td = 44

Compliant (Less than 48 hours)

Reduced CN For Infiltration Basin Calculation

Original CN	91
Proposed Water Quality Volume (cft)	1939

	2yr	10yr	25yr	50yr	100yr
Watershed Runoff Volume (af)	0.053	0.099	0.128	0.149	0.173
Difference in volume (cft)	369.68	2373.44	3636.68	4551.44	5596.8
Modified Q (in)	0.34	2.16	3.30	4.14	5.08
24Hr Design Storm P (in)	3.13	4.95	6.09	6.92	7.84
Reduced CN	59	72	74	76	77

$$CN = \frac{1000}{\left[10 + 5P + 10Q - 10 * (Q^2 + 1.25 * Q * P)^{1/2}\right]}$$

8 Collins Lane - WQV & CN Reduction

Water Quality Volume - Proposed Area 3 - Driveway

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

P = 1.3 in (90th Percentile Precipitation Depth)

Drainage Area A = 14,362 sqft 0.330 ac 0.0005 sqmi

R = volumetric runoff coefficient

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

I = 53 %

R = 0.05 + 0.009(I)

R = 0.05 + 0.009 x 53

R = 0.527

A = drainage area in acres = 0.330 ac

WQV = (P)(R)(A)/12

$$WQV = \frac{1.3 \text{ in} \times 0.527 \times 0.330 \text{ ac}}{12}$$

WQV = 0.019 acre-feet 819.93 cft

Proposed

As shown on the enclosed stage storage report, the proposed water quality basin was sized to store 100% of the determined water quality volume. 10% of the WQV is also proposed to be stored in proposed forebays for pre-treatment. The water quality basin and forebays will provide 912.97 cft and 147 cft respectivey. See Stage storage reports for both the Water qualty basin and the forebay included in this appendix.

1922

Reduced CN For Infiltration Basin Calculation

Original CN	81
Proposed Water Quality Volume (cft)	1032

	2yr	10yr	25yr	50yr	100yr
Watershed Runoff Volume (af)	0.039	0.081	0.109	0.13	0.154
Difference in volume (cft)	666.84	2496.36	3716.04	4630.80	5676.2
Modified Q (in)	0.56	2.09	3.10	3.87	4.74
24Hr Design Storm P (in)	3.13	4.95	6.09	6.92	7.84
Reduced CN	65	71	72	73	74

$$CN = \frac{1000}{\left[10 + 5P + 10Q - 10 * (Q^2 + 1.25 * Q * P)^{1/2}\right]}$$

STAGE STORAGE TABLE						
WATER QUALITY INFILTRATION BASIN						
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.)
115.00	682.03	N/A	N/A	0.00	N/A	0.00
115.95	1,013.52	0.95	805.39	805.39	800.21	800.21
116.00	1,032.32	0.05	51.15	856.53	51.15	851.35
116.90	1,394.89	0.90	1092.25	1948.78	1088.16	1939.51
117.00	1,437.60	0.10	141.62	2090.40	141.62	2081.13
117.50	2,099.59	0.50	884.30	2974.70	879.09	2960.22

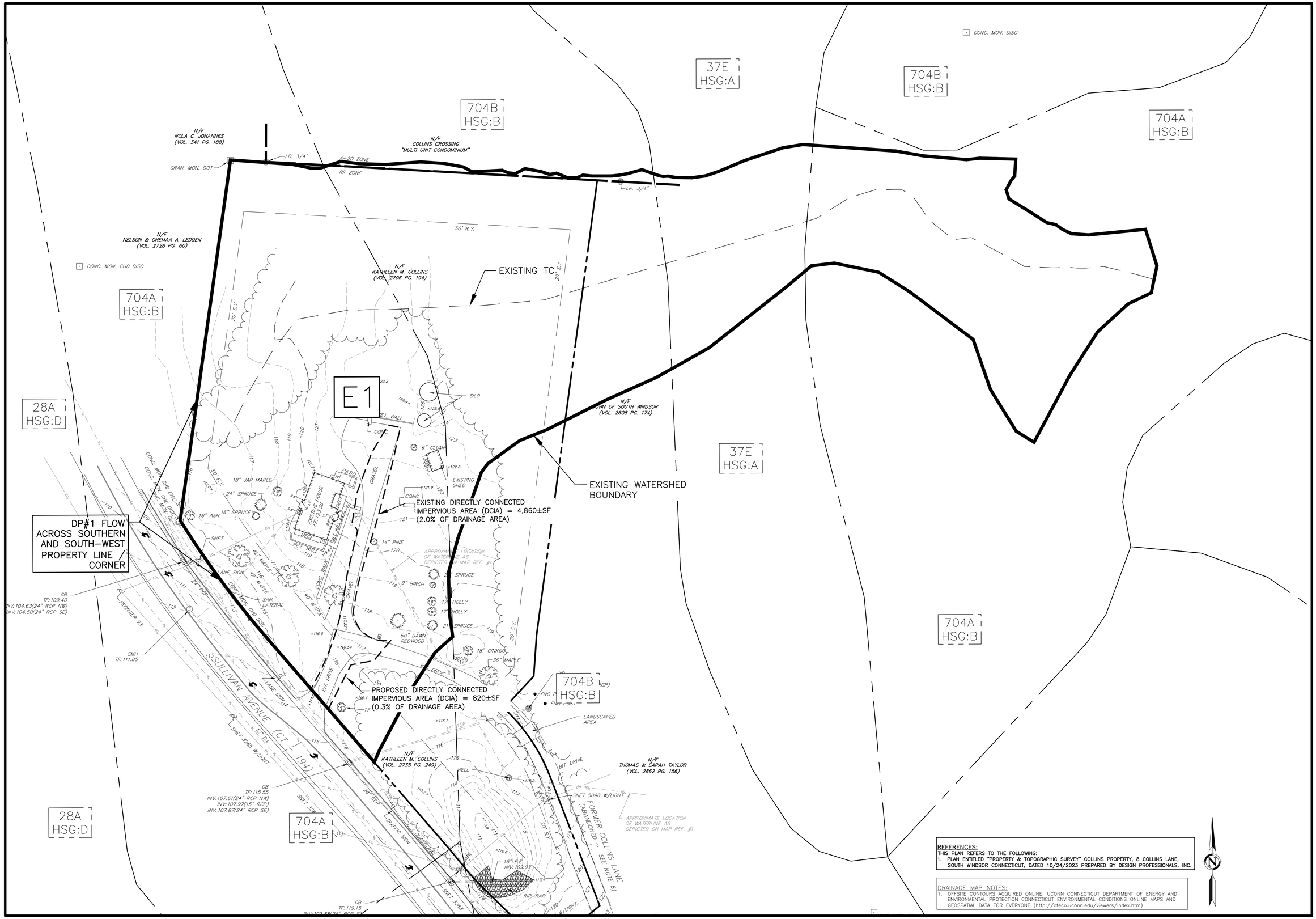
STAGE STORAGE TABLE						
FOREBAY 1						
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
116.00	44.15	N/A	N/A	0.00	N/A	0.00
117.00	240.68	1.00	142.42	142.42	129.31	129.31

STAGE STORAGE TABLE						
WATER QUALITY BASIN						
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.)
113.50	507.46	N/A	N/A	0.00	N/A	0.00
114.00	650.68	0.50	289.54	289.54	288.80	288.80
114.80	917.38	0.80	627.23	916.76	624.18	912.97
115.00	989.18	0.20	190.66	1107.42	190.61	1103.59
115.50	1,178.57	0.50	541.94	1649.36	541.25	1644.83

STAGE STORAGE TABLE						
FOREBAY 2						
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.)
114.00	26.55	N/A	N/A	0.00	N/A	0.00
115.00	130.93	1.00	78.74	78.74	72.15	72.15
115.50	204.41	0.50	83.84	162.58	83.16	155.30

STAGE STORAGE TABLE						
FOREBAY 3						
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.)
114.00	32.51	N/A	N/A	0.00	N/A	0.00
115.00	129.14	1.00	80.83	80.83	75.48	75.48
115.50	199.15	0.50	82.07	162.90	81.44	156.93

APPENDIX F
Drainage Area Maps



REFERENCES:
THIS PLAN REFERS TO THE FOLLOWING:
1. PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY" COLLINS PROPERTY, 8 COLLINS LANE, SOUTH WINDSOR CONNECTICUT, DATED 10/24/2023 PREPARED BY DESIGN PROFESSIONALS, INC.

DRAINAGE MAP NOTES:
1. OFFSITE CONTOURS ACQUIRED ONLINE; UCONN CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION CONNECTICUT ENVIRONMENTAL CONDITIONS ONLINE MAPS AND GEOSPATIAL DATA FOR EVERYONE (http://cteco.uconn.edu/viewers/index.htm)

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PROJECT NO.: 5195
DATE: 3/27/24
DESIGNED BY: CMM
DRAWN BY: CMM
CHECKED BY: AK

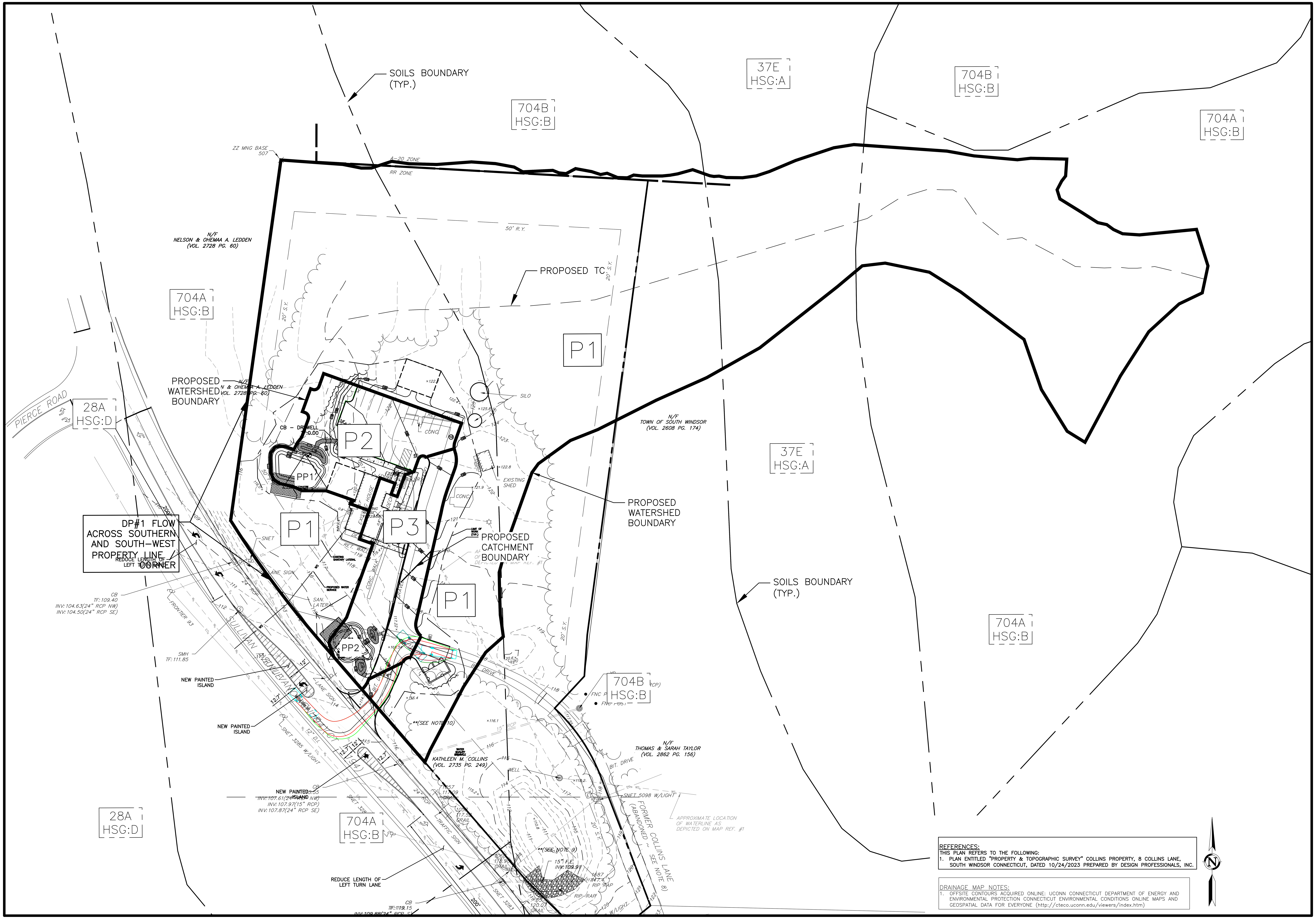
MEDICAL OFFICE BUILDING
1300 SULLIVAN AVENUE
(FORMERLY 8 COLLINS LANE)
SOUTH WINDSOR, CONNECTICUT

NO.	DATE	REVISIONS	BY

OVERALL DRAINAGE AREA MAP

SCALE: 1" = 500' — 0, 250', 500', 1000'

SHEET
C-DA1



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REVISIONS

OVERALL DRAINAGE AREA MAP

SCALE: 1" = 500'

SHEET
C-DA2