Peak Engineers, LLC

PROVIDING CIVIL ENGINEERING SERVICES
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August 31, 2023
Revised November 17, 2023

Frank Smeriglio, P.E.
Department of Public Works
Town of Wilton
Town Hall Annex
238 Danbury Road
Wilton, CT 06897

Re: 53 Sugar Loaf Drive, SDP #6-23
Robert Lupinski
53 Sugar Loaf Drive
Wilton, CT
Proposed Grading New Construction
Drainage Narrative

Dear Mr. Smeriglio:

This Drainage Narrative has been prepared to address comment No. 3 of your Memorandum to assistant town planner D. White on July 24, 2023. Comment No. 3. States:

Design engineer shall evaluate and submit calculations for pre-construction versus post construction storm runoff, as well as storm runoff generated during the construction phase of the project.

This project proposes the de-construction of a retaining wall along the north, west and south sides of the property and earthwork to regrade portions of the site.

This Drainage Narrative will describe the site and make comparisons to the post-construction (post-activity) site conditions and the pre-construction site condition. In April 2011 an application was submitted to the Planning and Zoning Commission for proposed grading on the site. Applications materials included an existing topo plan. Peak has utilized that 2011 plan as the pre-construction (pre-activity) site conditions for this report. On or about this time, 2011, Town agencies granted permission to add square

footage to the building increasing the roof area to 3,264 square feet and the gravel driveway area to 3,887 square feet.

Pre-Activity Condition

The entire site is approximately 1.0012 acres of residential property located on the west side of Sugar Loaf Drive. The entire property slopes to the west.

The State of Ct Web Soil Survey reveals that the majority of the site is Canton and Charlton fine sandy loams 8-15%. The western edge of the property is Charlton-Chatfield complex, 15-45% slopes. The flattest slopes are on the eastern property edge near the road. Please see the attached CT Web Soil report. The Hydrologic soil grouping corresponds with the slope of the land with the majority of the flatter slopes being Hydraulic Group B, mid-range slopes C and the steep western edge E.

Some of the property border areas are wooded.

The pre-activity house roof area is 2,168 square feet and the gravel driveway is 1,450 square feet.

The vast majority of the pre-activity site includes slopes exceeding 8% and the western edge exceeds 20%. Please see the attached plan titled *2011 Contour Sketch plan, Slope Study, G1.*

Deep soil testing, performed for a septic replacement area in 2011, reveal soils described as red brown fine sandy loams to 24" underlain with grey fine to medium sands to 72", and some broken rock was encountered from 3-6' depth. The soil percolation rate is 1"/10 minutes.

Current Site Conditions

On November 9, 2023, Peak Engineers, LLC performed deep soil testing and deep percolation testing for the design of a storm water infiltration system. The testing was performed in the northeast corner of the property.

Based on the soil testing the area has been worked and is described as:

0-6" of topsoil
6-30" moderately compact fill, silty brown fine sandy loam
30-62" bright red brown fine sandy loam, some broken rock
62-78" red brown fine sandy loam, lenses of tan sand
Roots to 60".

A percolation test was performed at 47", in the original red brown fine sandy loam. The test percolation rate is 1"/11.4 minutes.

The dwelling does not have any gutters, allowing water to drip to the building edge. The builder waterproofed the foundation walls and placed gravel against the walls with a footing drain. There is approximately 12" of topsoil above the gravel. Water from the roof drips and is absorbed in the topsoil and makes its way through the gravel to the footing drain pipe. The drains run to the northwest corner of the building. Until recently these pipes were connected and exited the retaining wall located on the western property line. The builder cut and capped the terminal pipe on November 8, 2023, at the building, effectively abandoning the discharge pipe.

Post-Activity Condition

This project proposes to deconstruct the wall, grade slopes down to the wall, meeting town zoning regulations and then provide flat areas west and north of the house for living areas. Please see plan titled *2023 Proposed Contour Sketch Plan, Slope Study, G2*, *revised November 17, 2023*. This plan demonstrates that the proposed grading will alter existing steep slopes north and west of the house and transform areas to living spaces with slopes of between 3 and 6%. These large flatter areas are effective in allowing water to infiltrate the ground.

Methodology and Calculations

Utilizing Technical Release 55 runoff curve numbers and HydroCad Storm water program we have calculated the Pre-Activity and Post-Activity peak design flows for the proposed improvements to the design Node. We utilized the CTDOT Engineering Bulletin EB-2015-2 Precipitation Frequency Estimates and the NOAA precipitation frequency data server interactive map to determine the precipitation frequency estimates. The design storm is the 25-year storm generating 6.63 inches of rain in a 24-hour period. Please see the attached page.

Proposed Drainage Facilities

The footing drain pipes will discharge into a sump pump pit at the northwest corner of the building. The HydroCad Software program has been utilized to size a gallery and stone infiltration system which will effectively store the water and then promote infiltration of the collected water from the roof. The calculations indicate that during the 25-year design storm the system will not overflow. A yard drain is proposed to allow the less frequent larger storms to overflow onto the upper lawn area.

Please see sheet 3 and 4 for a Summary of HydroCad output peak rate of flows and volumes generated by the sites 25 year design storm of 6.63" in a period or 24 hours.

	Pre-Activity Volume	Post-Activity Volume	Change Volume	% Change
Node	15,090 CF	11,475 CF	-3615 CF	-24%

	Pre-Activity Flow, CFS	Post-Activity Flow CFS	Change CFS	% Change
Node	4.53	2.69	-1.84 cfs	-40.6%

Design Considerations and Best Management Practices

The storm water management plan proposes to minimize the impacts of the roof water and driveway water by utilizing systems of best management practices to handle the sites storm water. The components of the system are described below.

1. BMP-no point discharge. The building will not have gutters. Through a series of facilities the roof water will enter an infiltration system.

2. BMP-disconnected impervious areas. Roof, driveway and other hard surfaces flow onto lawn area.

3. BMP-recharge soils. The site proposes a gravel driveway allowing water from minor storms to infiltrate the soils.

4. BMP- promote groundwater infiltration. Subsequent to 2011, grading was performed to dramatically flatten the sites slopes, especially in the large lawn area to the north of the house and to the west of the house. This grading allows water to infiltrate soils and decreases the time of concentration to the property line.

5. BMP-reduce erosion potential. The finished slope embankment includes a reverse bench mid-way down the slope. Reverse benches are effective in decreasing water flow velocity and limiting potential for erosion.

Construction Methodology to Mitigate Runoff During Construction.

The Site Development Plan-2 (LP.2), prepared by Environmental Land Solutions, includes a row of silt fence along the entire property width and a second row of silt fence inside the site. The location of this fence will prevent upstream water from entering the construction zone and dramatically reduce the chance of sediment transport. During the work, a swale will be constructed at the lowest limit of the work. This swale will act as a

landing point for the boulders as they are taken off the wall and the swale will also act as a temporary water and sediment storage area. Please see Cross Section B-B on plan LP.2.

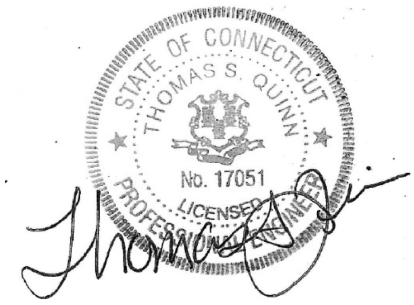
Conclusions

This project proposes a regrading of the site. When compared to the 2011 pre-construction site the post-construction site will have many areas of flatter gentler slopes that will allow water to infiltrate soils and slow water down as it crosses the site. The HydroCad study confirms that the site grading will effectivity decrease the peak rate of flow and peak volume of flow from the site.

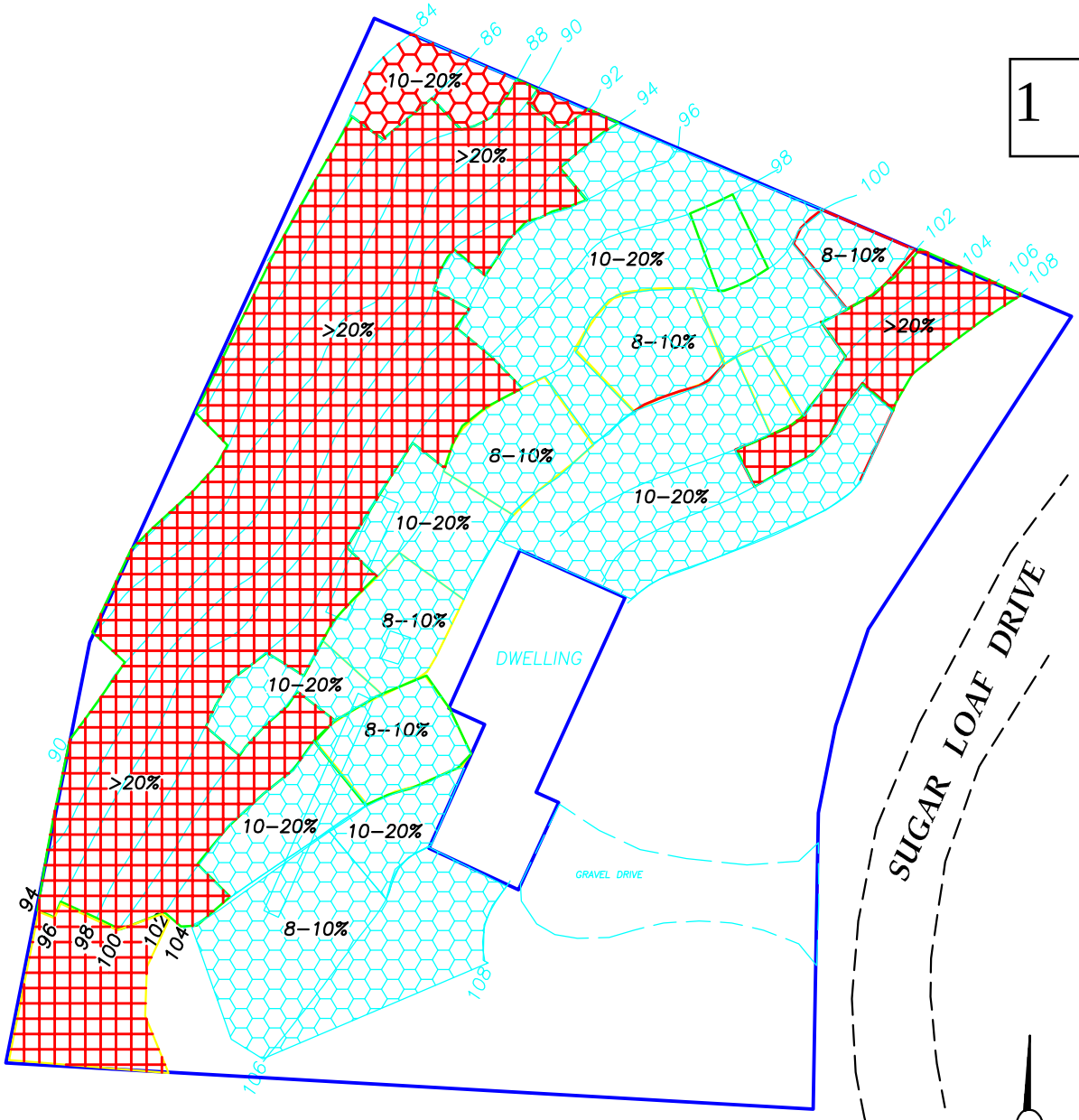
It is the opinion of Peak Engineers, LLC that the site can be developed in a manner that will not increase the design flow rate (25-year storm) or design flow volume from the property and will not generate drainage that will adversely impact the adjoining or downstream properties. The proposed grading will be performed in a manner that will not alter the existing drainage patterns.

The proper installation of temporary and well as permanent sediment and erosion controls, following the 2002 Connecticut Erosion and Sediment Guidelines, will help reduce the effects of the construction on the downstream properties. Peak Engineers, LLC recommends that a site monitor be required to perform weekly site observations as well as review immediately prior to an expected rain event.

Respectfully submitted,



For Peak Engineers, LLC, Thomas S. Quinn, P.E.



SLOPES 6 – 20%

SLOPES 20 – 50%

HISTORICAL TOPOGRAPHY, 2011

LEGEND

102 CONTOUR, CIRCA 2011

CONTOUR INTERVAL IS 2 FEET

Scale : 1”=20’

TOWN SIGNATURE BLOCK

PLAN NOTES

NOTE 1: PURPOSE

THE PURPOSE OF THIS PLAN IS TO INDICATE CONTOURS OF THE SITE IN THE YEAR 2011.

NOTE 2: SOURCE OF INFORMATION

THE BOUNDARY AND CONTOUR INFORMATION HAS BEEN DIGITIZED FROM A PLAN BY ENVIRONMENTAL LAND SOLUTIONS, SP–1, DATED JUNE 28, 2011.

FB
FB
FILE: 2011 TOPO.DWG
DRAWING #08312023
DWN BY: TS
DATE: AUGUST 31, 2023
REV:
REV:

STATE OF CONNECTICUT THOMAS S. QUINN No. 17051 LICENSED PROFESSIONAL ENGINEER

Thomas S. Quinn, P.E. 17051
THIS PRINT IS INVALID WITHOUT LIVE RED SEAL AND EMBOSSED SEAL

Peak Engineers, LLC
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16 Old Mill Road, Redding, CT 06896
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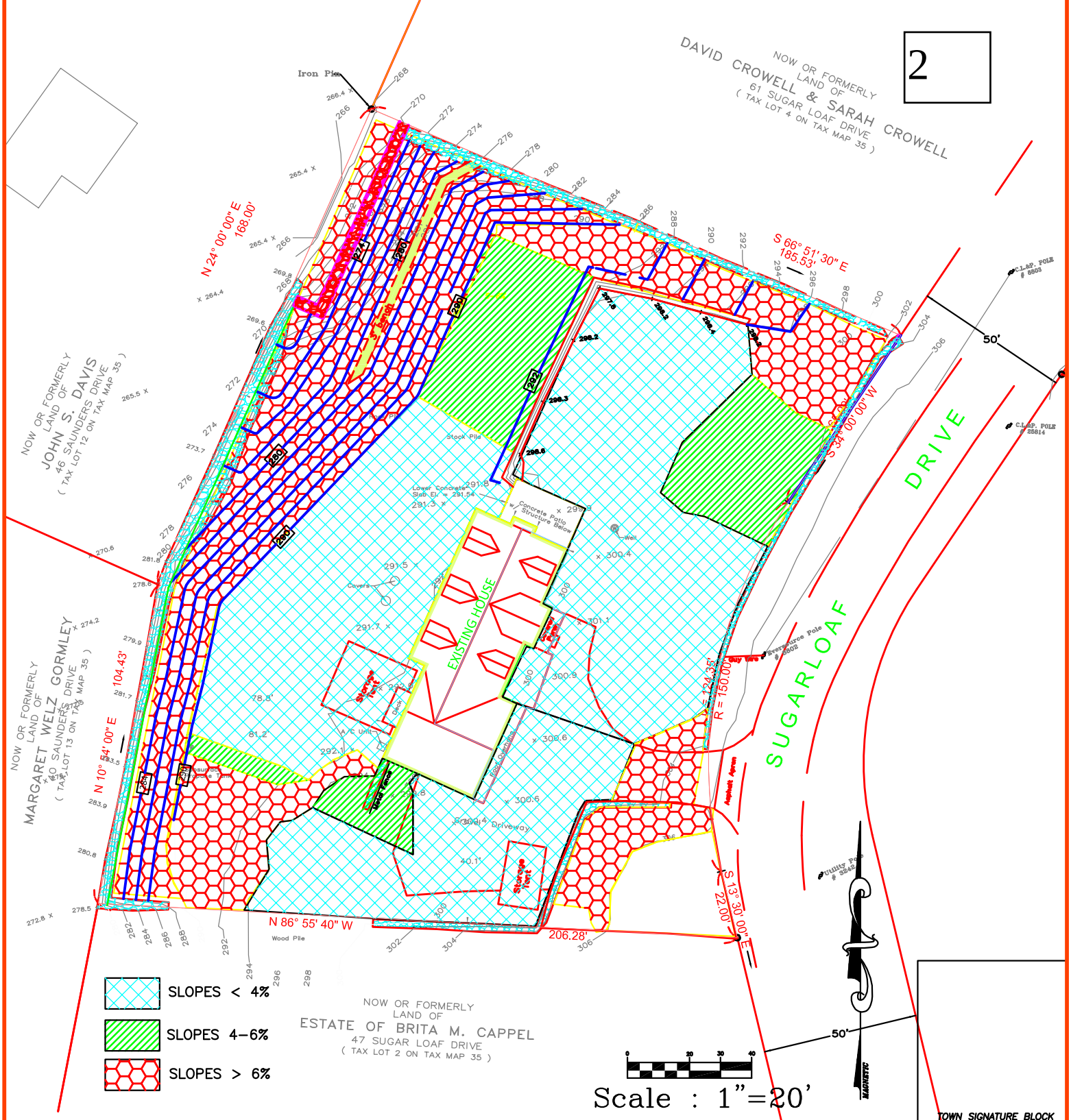
PREPARED FOR
Robert Lupinski
53 Sugar Loaf Drive
Wilton, CT 06897

PROJECT LOCATION
53 Sugar Loaf Drive
Wilton, CT 06897
Assessors Map 35, Lot 3. 1.0021 acres

TITLE
2011 Contour Sketch Plan

Slope Study

G1



PLAN NOTES

NOTE 1: PURPOSE

THE PURPOSE OF THIS PLAN IS TO INDICATE PROPOSED RANGE OF FINISHED GRADES.

NOTE 2: SOURCE OF INFORMATION

ALL BASE INFORMATION TAKEN FROM A DIGITAL FILE PREPARED BY AND PROVIDED BY ENVIRONMENTAL LAND SOLUTIONS, LLC. TITLED 1118-PLAN-5r-PURGED FOR TOM.

TOWN SIGNATURE BLOCK

FB
FB
FILE: KATES PLAN NOV 10.DWG
DRAWING #08312023
DWN BY: TS
DATE: AUGUST 31, 2023
REV: NOV 17, 2023 update for proposed contours

STATE OF CONNECTICUT THOMAS S. QUINN No. 17051 LICENSED PROFESSIONAL ENGINEER

Thomas S. Quinn, P.E. 17051
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PREPARED FOR
Robert Lupinski
53 Sugar Loaf Drive
Wilton, CT 06897

PROJECT LOCATION
53 Sugar Loaf Drive
Wilton, CT 06897
Assessors Map 35, Lot 3. 1.0021 acres

TITLE
2023 Proposed Contour Sketch Plan
Slope Study

G2

Events for Link 2: WEST PROPERTY LINE

Event	Inflow (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)
2 YR WILTON NOAA	1.69	1.69	5,724	**0.00**
10 year WILTON NOAA	3.40	3.40	11,315	0.00
25 year WILTON NOAA	**4.53**	**4.53**	**15,090**	0.00

Events for Link 5: WEST PROPERTY LINE

Event	Inflow (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)
2 YR WILTON NOAA	0.84	0.84	3,779	**0.00**
10 year WILTON NOAA	1.93	1.93	8,299	0.00
25 year WILTON NOAA	**2.69**	**2.69**	**11,475**	0.00

NOAA Atlas 14, Volume 10, Version 3
Location name: Wilton, Connecticut, USA*
Latitude: 41.2225°, Longitude: -73.4311°
Elevation: 294 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	0.362 (0.278-0.464)	0.423 (0.324-0.542)	0.522 (0.399-0.670)	0.604 (0.459-0.779)	0.717 (0.529-0.955)	0.803 (0.580-1.09)	0.891 (0.625-1.24)	0.985 (0.661-1.40)	1.12 (0.723-1.63)	1.22 (0.771-1.82)
10-min	0.513 (0.394-0.657)	0.599 (0.459-0.767)	0.739 (0.565-0.950)	0.856 (0.651-1.10)	1.02 (0.749-1.35)	1.14 (0.822-1.54)	1.26 (0.886-1.76)	1.40 (0.937-1.99)	1.58 (1.02-2.31)	1.72 (1.09-2.57)
15-min	0.604 (0.464-0.773)	0.705 (0.541-0.903)	0.870 (0.665-1.12)	1.01 (0.766-1.30)	1.20 (0.881-1.59)	1.34 (0.967-1.81)	1.48 (1.04-2.07)	1.64 (1.10-2.34)	1.86 (1.20-2.72)	2.03 (1.28-3.02)
30-min	0.846 (0.650-1.08)	0.985 (0.755-1.26)	1.21 (0.927-1.56)	1.40 (1.06-1.81)	1.66 (1.22-2.21)	1.86 (1.34-2.51)	2.06 (1.44-2.85)	2.26 (1.52-3.22)	2.54 (1.64-3.72)	2.75 (1.74-4.10)
60-min	1.09 (0.836-1.39)	1.26 (0.970-1.62)	1.55 (1.19-2.00)	1.79 (1.36-2.31)	2.12 (1.56-2.82)	2.38 (1.71-3.20)	2.63 (1.84-3.64)	2.88 (1.94-4.11)	3.22 (2.09-4.72)	3.48 (2.20-5.18)
2-hr	1.40 (1.08-1.78)	1.65 (1.27-2.09)	2.05 (1.57-2.61)	2.38 (1.82-3.05)	2.84 (2.10-3.76)	3.18 (2.32-4.29)	3.54 (2.50-4.92)	3.94 (2.65-5.57)	4.50 (2.92-6.55)	4.94 (3.14-7.32)
3-hr	1.61 (1.25-2.04)	1.90 (1.47-2.42)	2.39 (1.84-3.03)	2.78 (2.14-3.56)	3.33 (2.48-4.41)	3.75 (2.74-5.04)	4.18 (2.97-5.81)	4.67 (3.15-6.59)	5.38 (3.50-7.81)	5.97 (3.80-8.81)
6-hr	2.02 (1.58-2.55)	2.42 (1.88-3.04)	3.05 (2.37-3.86)	3.58 (2.76-4.54)	4.31 (3.23-5.68)	4.86 (3.57-6.51)	5.43 (3.89-7.53)	6.11 (4.13-8.56)	7.10 (4.63-10.2)	7.93 (5.06-11.6)
12-hr	2.50 (1.96-3.12)	3.00 (2.35-3.75)	3.82 (2.98-4.79)	4.50 (3.49-5.67)	5.43 (4.09-7.11)	6.13 (4.53-8.17)	6.88 (4.95-9.47)	7.74 (5.26-10.8)	9.03 (5.91-12.9)	10.1 (6.46-14.7)
24-hr	2.94 (2.31-3.64)	3.57 (2.81-4.43)	4.60 (3.61-5.73)	5.45 (4.26-6.82)	6.63 (5.02-8.63)	7.51 (5.58-9.96)	8.45 (6.12-11.6)	9.56 (6.52-13.2)	11.2 (7.37-16.0)	12.6 (8.12-18.3)
2-day	3.30 (2.62-4.07)	4.08 (3.23-5.03)	5.34 (4.22-6.61)	6.39 (5.02-7.94)	7.83 (5.98-10.2)	8.90 (6.67-11.8)	10.1 (7.36-13.8)	11.5 (7.85-15.8)	13.7 (8.99-19.3)	15.5 (10.0-22.3)
3-day	3.58 (2.85-4.40)	4.43 (3.52-5.45)	5.82 (4.61-7.17)	6.97 (5.49-8.63)	8.56 (6.55-11.1)	9.73 (7.31-12.8)	11.0 (8.08-15.0)	12.6 (8.62-17.2)	15.0 (9.88-21.1)	17.1 (11.0-24.4)
4-day	3.85 (3.07-4.71)	4.74 (3.78-5.82)	6.21 (4.93-7.64)	7.43 (5.87-9.17)	9.11 (6.98-11.7)	10.3 (7.79-13.6)	11.7 (8.59-15.9)	13.3 (9.16-18.2)	15.9 (10.5-22.3)	18.0 (11.7-25.7)
7-day	4.61 (3.69-5.61)	5.59 (4.48-6.81)	7.20 (5.74-8.80)	8.53 (6.77-10.5)	10.4 (7.97-13.2)	11.7 (8.85-15.3)	13.2 (9.70-17.8)	14.9 (10.3-20.3)	17.6 (11.6-24.5)	19.8 (12.8-28.1)
10-day	5.35 (4.30-6.49)	6.39 (5.13-7.76)	8.09 (6.47-9.85)	9.49 (7.55-11.6)	11.4 (8.81-14.5)	12.9 (9.72-16.7)	14.4 (10.6-19.3)	16.2 (11.2-21.9)	18.8 (12.5-26.2)	21.0 (13.6-29.7)
20-day	7.58 (6.13-9.14)	8.75 (7.07-10.6)	10.7 (8.58-12.9)	12.2 (9.79-14.9)	14.4 (11.1-18.1)	16.1 (12.1-20.5)	17.8 (13.0-23.3)	19.6 (13.6-26.3)	22.2 (14.8-30.6)	24.2 (15.7-33.9)
30-day	9.42 (7.65-11.3)	10.7 (8.66-12.8)	12.7 (10.3-15.3)	14.4 (11.6-17.5)	16.8 (13.0-20.9)	18.6 (14.1-23.5)	20.4 (14.9-26.5)	22.3 (15.5-29.7)	24.7 (16.6-34.0)	26.6 (17.4-37.2)
45-day	11.7 (9.52-14.0)	13.0 (10.6-15.6)	15.3 (12.4-18.3)	17.1 (13.8-20.6)	19.7 (15.3-24.3)	21.6 (16.4-27.2)	23.6 (17.2-30.3)	25.5 (17.8-33.8)	27.9 (18.7-38.2)	29.7 (19.4-41.4)
60-day	13.6 (11.1-16.2)	15.0 (12.2-17.9)	17.4 (14.1-20.8)	19.3 (15.6-23.2)	22.0 (17.1-27.2)	24.1 (18.3-30.2)	26.2 (19.1-33.5)	28.1 (19.7-37.2)	30.6 (20.6-41.6)	32.3 (21.1-44.8)

[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.

Back to Top

PF graphical

Soil Map—State of Connecticut
(53 Sugar Loaf Drive Wilton)

6

Map Scale: 1:529 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

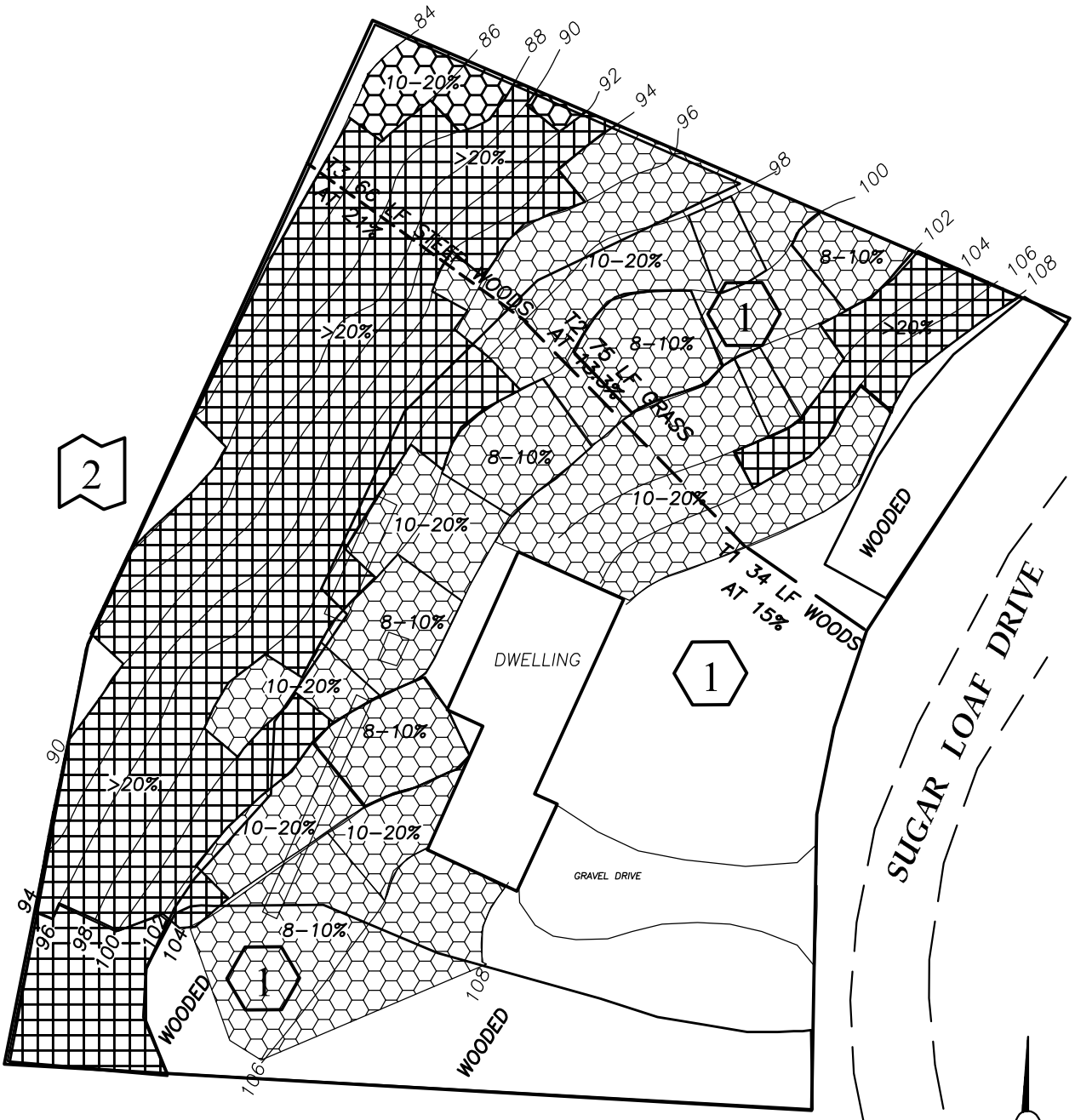
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

7

8

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	0.0	2.1%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	0.9	86.0%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.1	11.9%
Totals for Area of Interest		**1.0**	**100.0%**



SLOPES 6 – 20%

SLOPES 20 – 50%

HISTORICAL TOPOGRAPHY, 2011

0 40 80

PRE–ACTIVITY WATERSHED BREAK

TIME OF CONCENTRATION

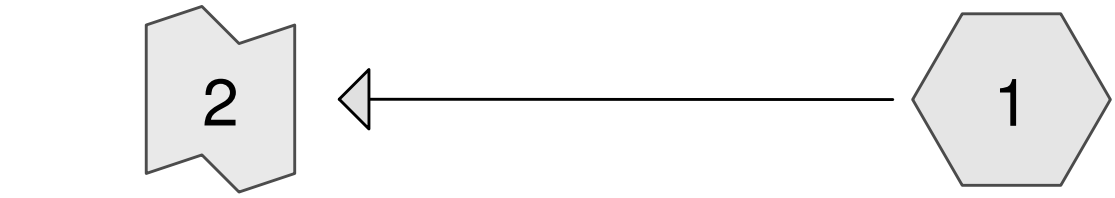
Scale : 1"=40'

Pre-Activity Watershed

LUPINSKI
53 SUGAR LOAF DRIVE
WILTON, CT

Peak Engineers, LLC

4 Old Mill Road, Redding, CT 06896



WEST PROPERTY LINE

PRE-ACTIVITY PROPERTY

Subcat Reach Pond Link

Drainage Diagram for PRE-ACTIVITY
Prepared by Peak Engineers, LLC, Printed 9/11/2023

Summary for Subcatchment 1: PRE-ACTIVITY PROPERTY

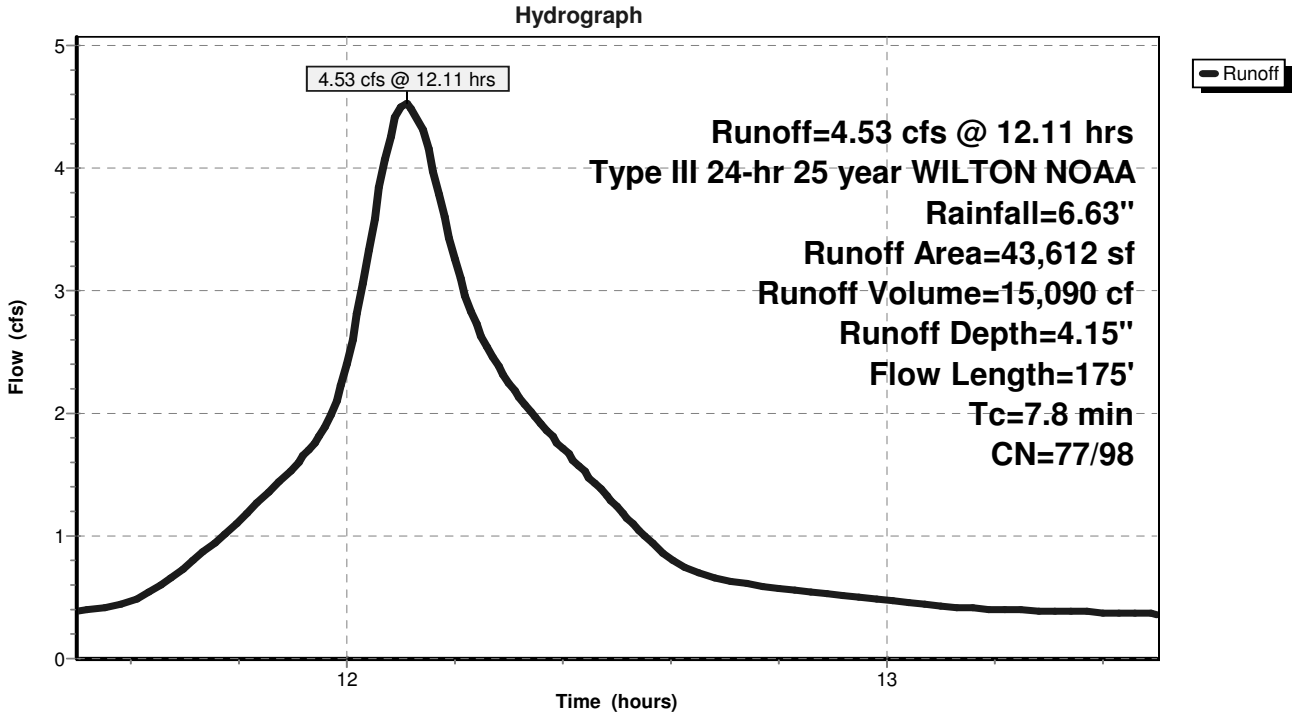
Runoff = 4.53 cfs @ 12.11 hrs, Volume= 15,090 cf, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year WILTON NOAA Rainfall=6.63"

	Area (sf)	CN	Description
*	2,168	98	HOUSE ROOF
*	1,450	85	Driveway gravel
	20,744	74	>75% Grass cover, Good, HSG C
	6,540	70	Woods, Good, HSG C
	12,710	83	Woods, Poor, HSG D
	43,612	78	Weighted Average
	41,444	77	Pervious Area
	2,168	98	Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	34	0.1500	0.15		**Sheet Flow, sheet lightwoods** Woods: Light underbrush n= 0.400 P2= 3.57"
3.5	75	0.1330	0.36		**Sheet Flow, sheet flow over grass** Grass: Short n= 0.150 P2= 3.57"
0.5	66	0.2100	2.29		**Shallow Concentrated Flow, shall conc woods** Woodland Kv= 5.0 fps
7.8	175	Total			

Subcatchment 1: PRE-ACTIVITY PROPERTY

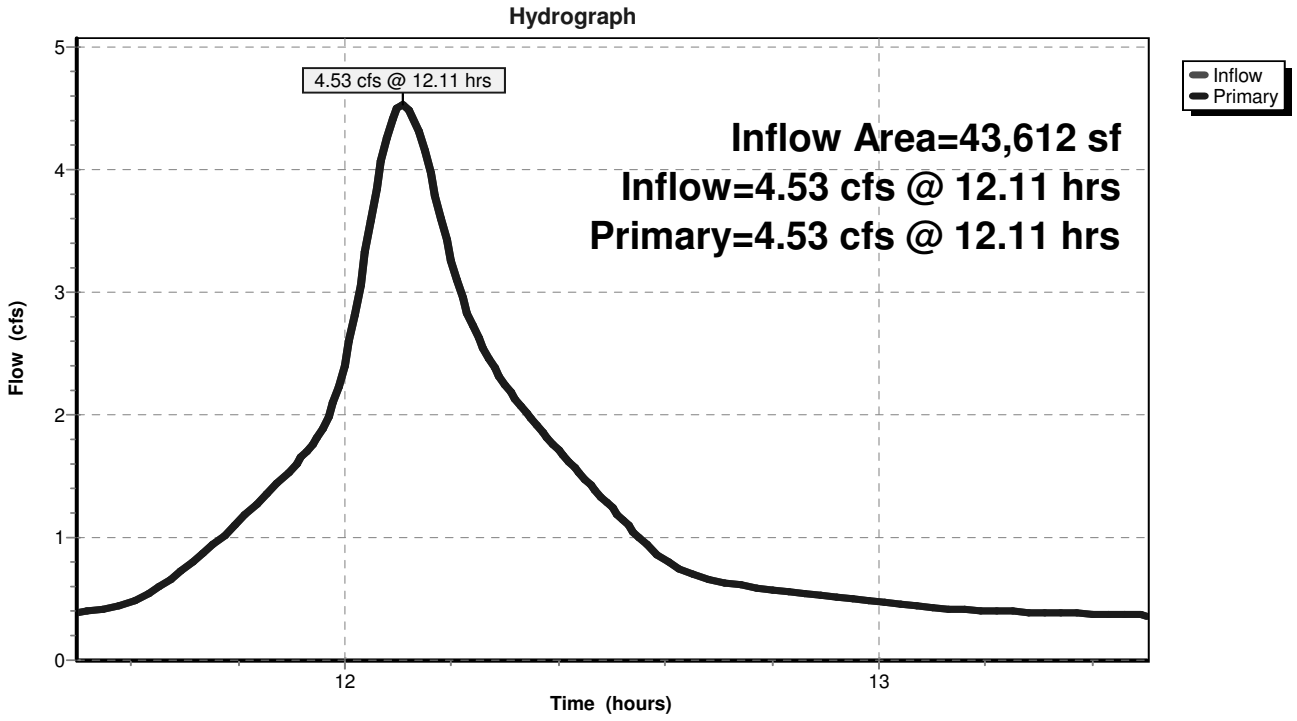


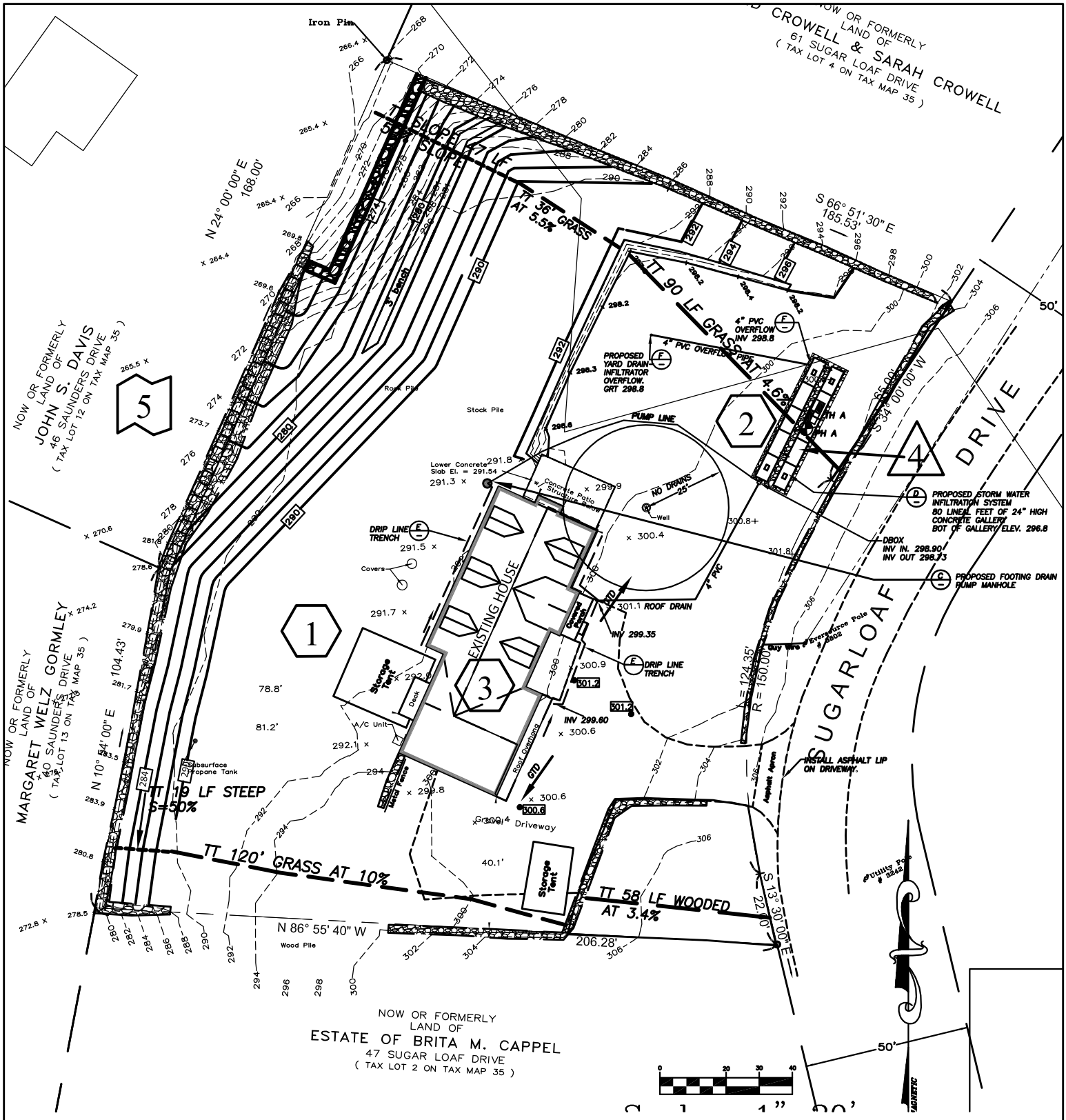
Summary for Link 2: WEST PROPERTY LINE

Inflow Area = 43,612 sf, 4.97% Impervious, Inflow Depth = 4.15" for 25 year WILTON NOAA e
Inflow = 4.53 cfs @ 12.11 hrs, Volume= 15,090 cf
Primary = 4.53 cfs @ 12.11 hrs, Volume= 15,090 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs

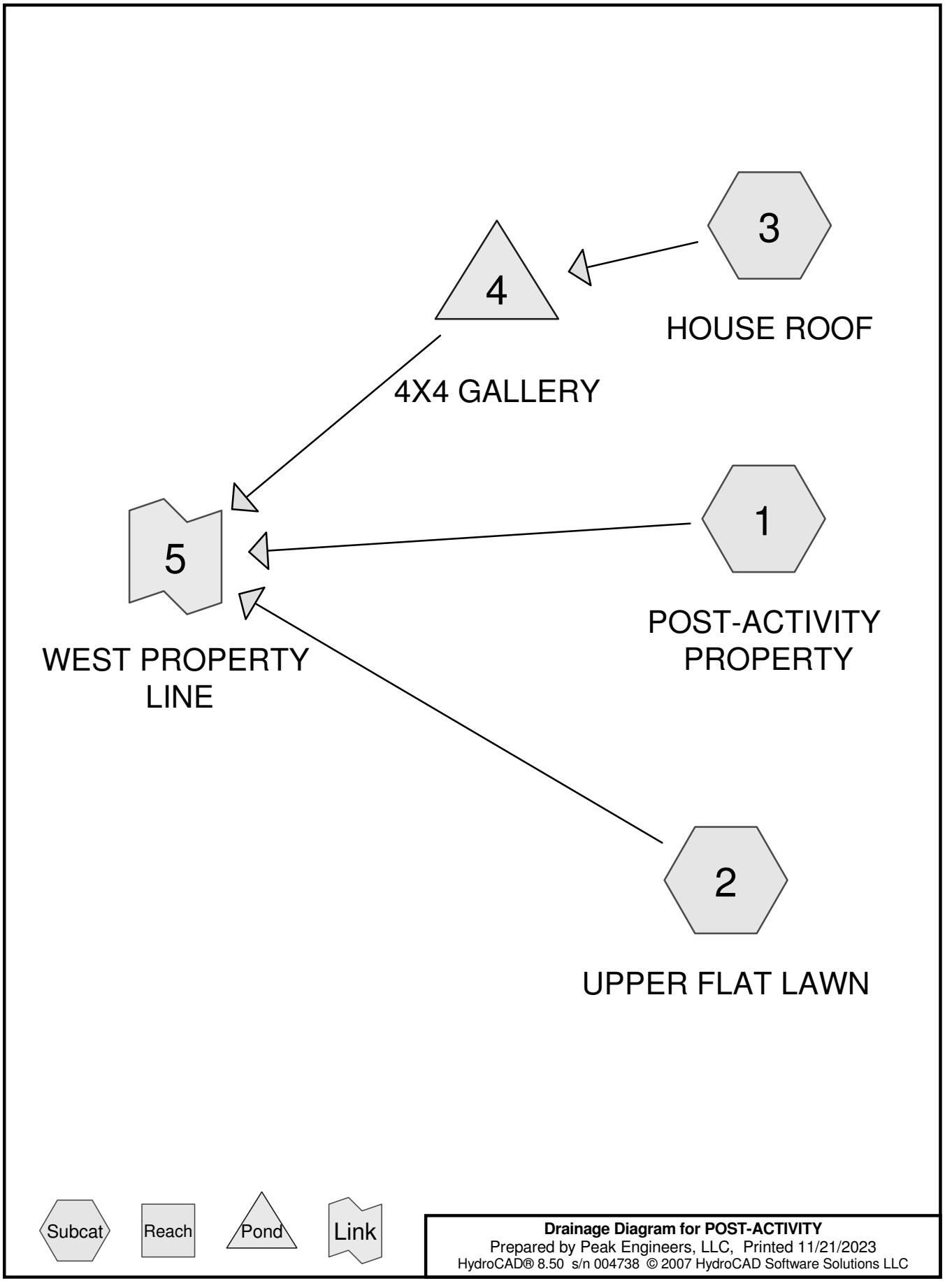
Link 2: WEST PROPERTY LINE





LUPINSKI
53 SUGAR LOAF DRIVE
WILTON, CT

Peak Engineers, LLC
PO BOX 312, Georgetown, CT 06829



Drainage Diagram for POST-ACTIVITY
Prepared by Peak Engineers, LLC, Printed 11/21/2023

Summary for Subcatchment 1: POST-ACTIVITY PROPERTY

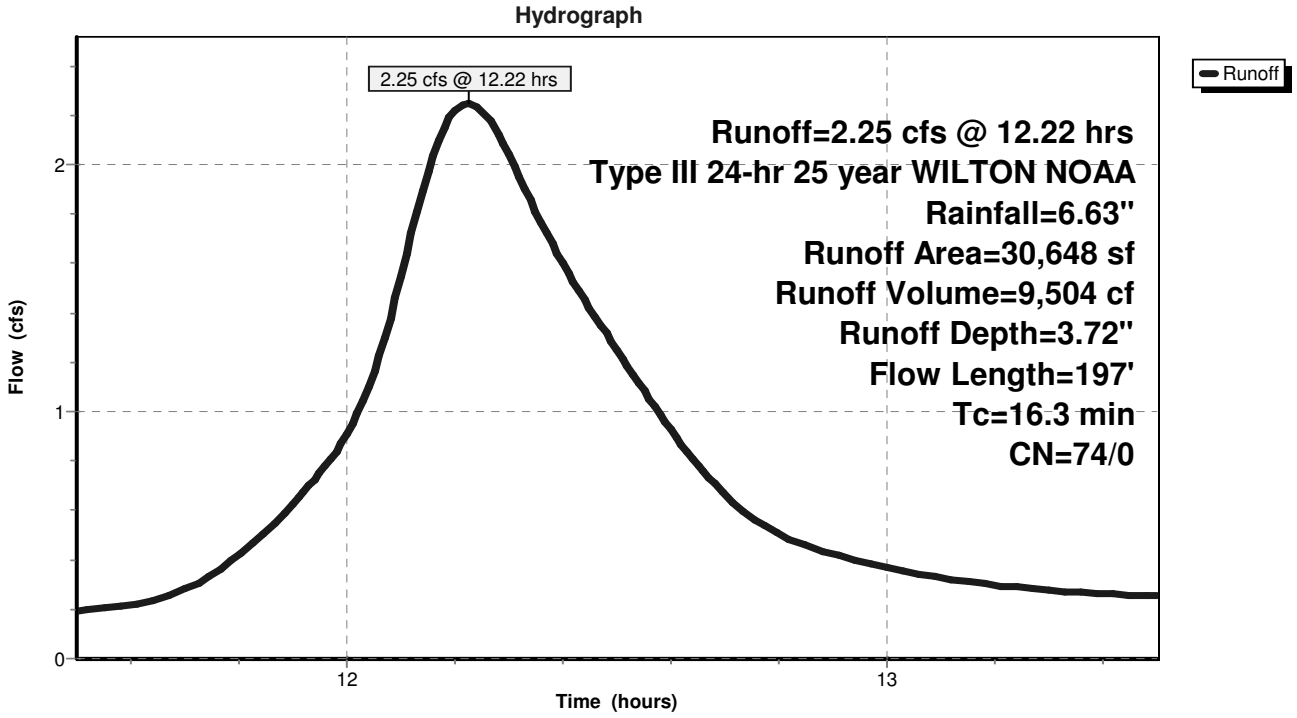
Runoff = 2.25 cfs @ 12.22 hrs, Volume= 9,504 cf, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year WILTON NOAA Rainfall=6.63"

	Area (sf)	CN	Description
*	3,887	85	Driveway, Gravel
	16,340	74	>75% Grass cover, Good, HSG C
	2,174	66	Woods, Poor, HSG B
	8,247	71	Pinyon/juniper range, Good, HSG D
	30,648	74	Weighted Average
	30,648	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	58	0.0340	0.09		**Sheet Flow, SHEET FLOW WOODS** Woods: Light underbrush n= 0.400 P2= 3.57"
5.6	120	0.1000	0.35		**Sheet Flow, sheet flow across grass** Grass: Short n= 0.150 P2= 3.57"
0.1	19	0.5000	4.95		**Shallow Concentrated Flow, SHAL CONC STEEP** Short Grass Pasture Kv= 7.0 fps
16.3	197	Total			

Subcatchment 1: POST-ACTIVITY PROPERTY



Summary for Subcatchment 2: UPPER FLAT LAWN

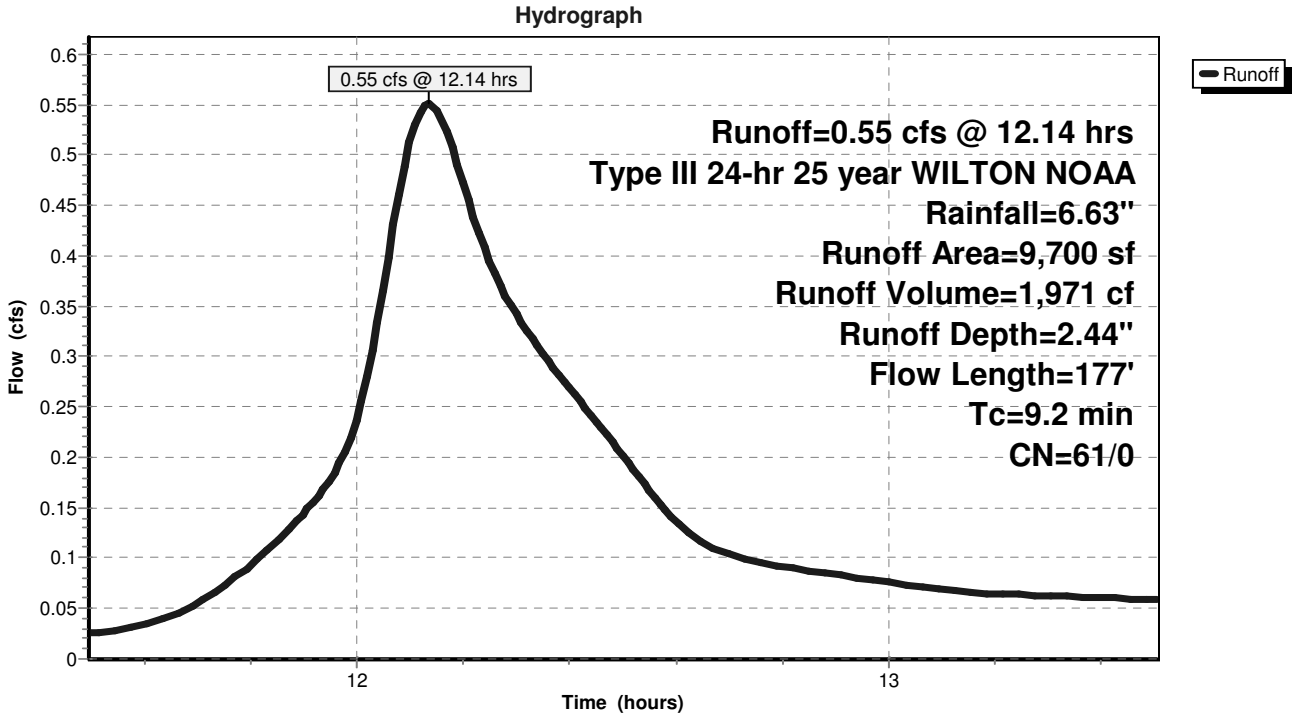
Runoff = 0.55 cfs @ 12.14 hrs, Volume= 1,971 cf, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year WILTON NOAA Rainfall=6.63"

Area (sf)	CN	Description
9,700	61	>75% Grass cover, Good, HSG B
9,700	61	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	94	0.0460	0.25		**Sheet Flow, SHEET FLOW UPPER LAWN** Grass: Short n= 0.150 P2= 3.57"
2.7	36	0.0550	0.22		**Sheet Flow, SHEET FLOW GRASS LOWER LAWN** Grass: Short n= 0.150 P2= 3.57"
0.2	47	0.5000	4.95		**Shallow Concentrated Flow, SHALL CONC FLOW STE** Short Grass Pasture Kv= 7.0 fps
9.2	177	Total			

Subcatchment 2: UPPER FLAT LAWN



Summary for Subcatchment 3: HOUSE ROOF

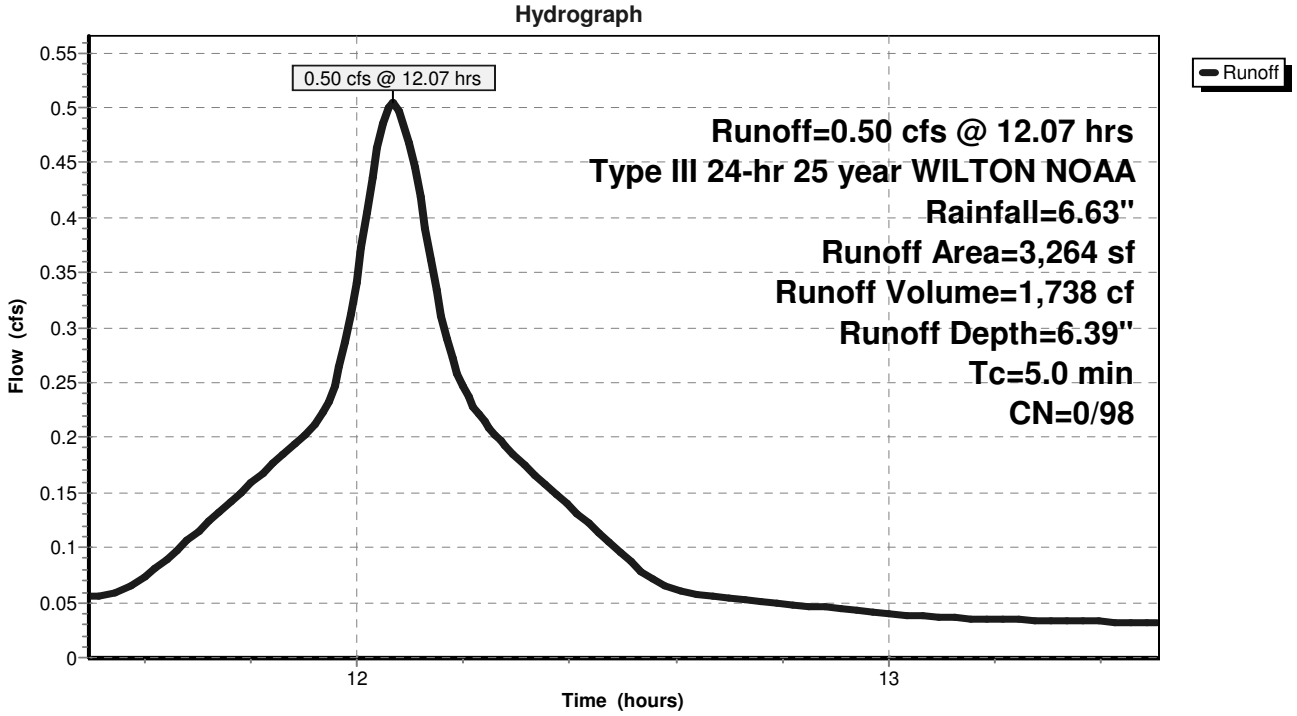
Runoff = 0.50 cfs @ 12.07 hrs, Volume= 1,738 cf, Depth= 6.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year WILTON NOAA Rainfall=6.63"

	Area (sf)	CN	Description
*	3,264	98	HOUSE ROOF TO DRIP LINE
	3,264	98	Impervious Area

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

Subcatchment 3: HOUSE ROOF



Summary for Pond 4: 4X4 GALLERY

Inflow Area = 3,264 sf,100.00% Impervious, Inflow Depth = 6.39" for 25 year WILTON NOAA e
Inflow = 0.50 cfs @ 12.07 hrs, Volume= 1,738 cf
Outflow = 0.03 cfs @ 10.70 hrs, Volume= 1,738 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.03 cfs @ 10.70 hrs, Volume= 1,738 cf
Primary = 0.00 cfs @ 0.05 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Peak Elev= 298.67' @ 13.56 hrs Surf.Area= 504 sf Storage= 694 cf
Flood Elev= 300.00' Surf.Area= 504 sf Storage= 724 cf

Plug-Flow detention time= 172.6 min calculated for 1,738 cf (100% of inflow)
Center-of-Mass det. time= 172.5 min (915.3 - 742.8)

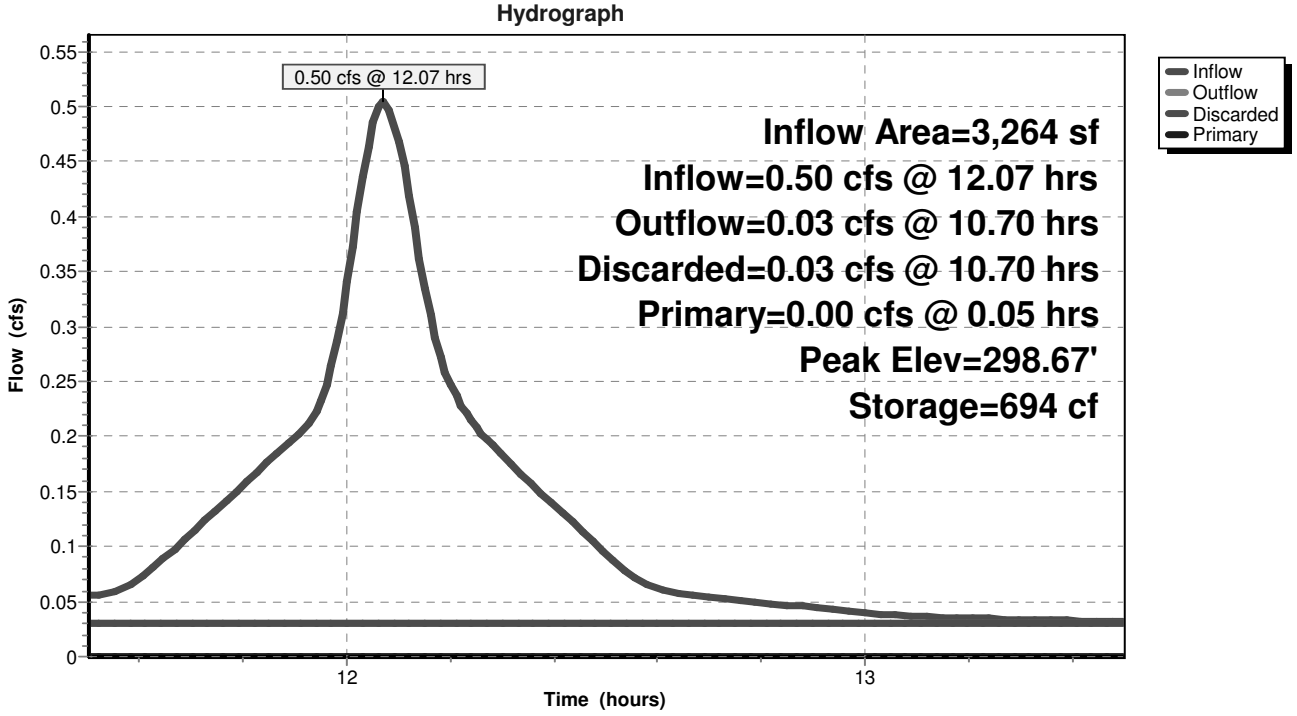
Volume	Invert	Avail.Storage	Storage Description
#1	296.30'	271 cf	**6.00'W x 8.40'L x 2.60'H Prismatoid** x 10 1,310 cf Overall - 634 cf Embedded = 677 cf x 40.0% Voids
#2	296.80'	453 cf	**48.0''W x 24.0''H x 8.00'L Galley 4x8x2** x 10 Inside #1
		724 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	298.80'	**4.0'' Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#2	Discarded	296.30'	**2.630 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.03 cfs @ 10.70 hrs HW=296.34' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.05 hrs HW=296.30' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 4: 4X4 GALLERY



Summary for Link 5: WEST PROPERTY LINE

Inflow Area = 43,612 sf, 7.48% Impervious, Inflow Depth = 3.16" for 25 year WILTON NOAA e
Inflow = 2.69 cfs @ 12.21 hrs, Volume= 11,475 cf
Primary = 2.69 cfs @ 12.21 hrs, Volume= 11,475 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs

Link 5: WEST PROPERTY LINE