

Peak Engineers, LLC

PROVIDING CIVIL ENGINEERING SERVICES

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January 26, 2024

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, Current vs Post

Dear Mr. Smeriglio:

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 has been prepared to address a comment from the Planning and Zoning Commission at the public hearing of January 8, 2024. The commission requested a drainage analysis comparing the sites Current condition and the proposed Post-Activity condition.

The current condition is described as having; residential structure, several temporary tents, hardscape patio, areas of bare earth and steep slope.

The post-activity condition proposes several facilities to mitigate the sites drainage water.

1. A perimeter gravel trench and pipe will collect water from the residence roof , large portion of the gravel driveway and the eastern lawn and direct the water to a gallery and stone storm water infiltration system.
2. A gravel trench located at the top of the proposed slope will intercept sheet flow and allow the initial rain volumes to infiltrate the soils. A steel

garden edge will be installed to ensure sheet flow during occasions of larger storms.

3. The impervious tents and the side concrete patio will be removed.

This report will find that the proposed drainage facilities will effectively reduce the sites design storm peak flows and volumes below Current levels.

Description of the Property

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.

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.

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 and to the western property line.

Methodology and Calculations

Utilizing Technical Release 55 runoff curve numbers and HydroCad Storm water program we have calculated the Current 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 5 and 6 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.

	Current Volume	Post-Activity Volume	Change Volume	% Change
Node	13,859 CF	9,622 CF	-4,237 CF	-30.5%
	Current Flow, CFS	Post-Activity Flow CFS	Change CFS	% Change
Node	3.06 cfs	2.55 cfs	-0.51 cfs	-16.7%

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.

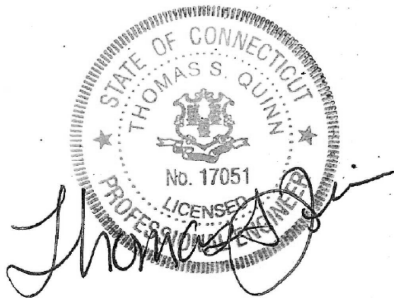
Conclusions

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 proposed drainage systems and grading will result in a decrease in the design flow rate (25-year storm) and design flow volume from the property when compared to the Current condition. The proposed grading will be performed in a manner that will not alter the existing or historical 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.

CURRENT WITH PIPE*Type III 24-hr 25 year WILTON NOAA Rainfall=6.63"*

Prepared by Peak Engineers, LLC

Printed 2/2/2024

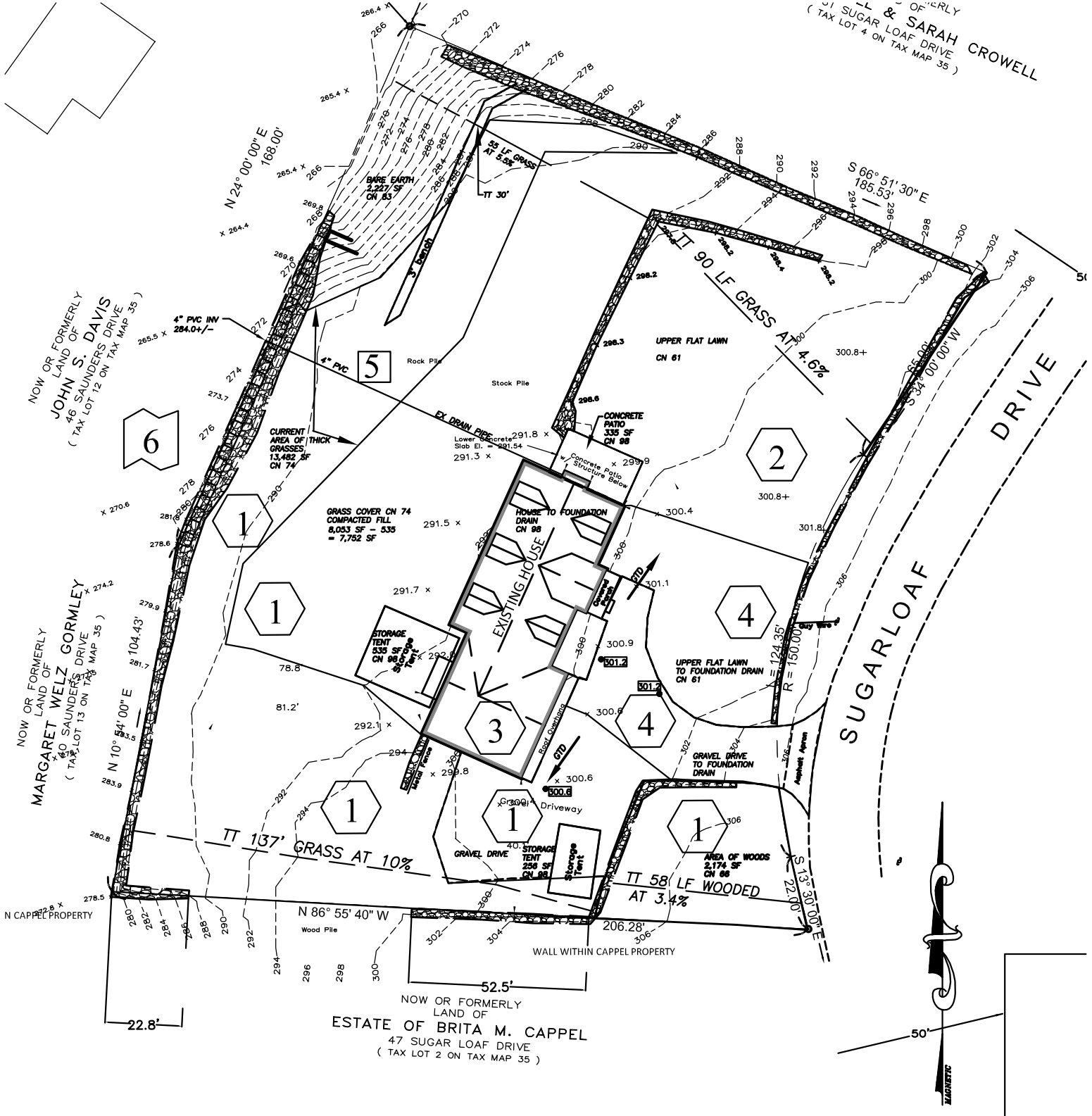
HydroCAD® 8.50 s/n 004738 © 2007 HydroCAD Software Solutions LLC

Events for Link 6: WEST PROPERTY LINE

Event	Inflow (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)
2 YR WILTON NOAA	1.04	1.04	5,102	0.00
10 year WILTON NOAA	2.40	2.40	10,288	0.00
25 year WILTON NOAA	3.06	3.06	13,859	0.00

Events for Link 5: WEST PROPERTY LINE

Event	Inflow (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)
2 YR WILTON NOAA	1.04	1.04	2,499	0.00
10 year WILTON NOAA	1.69	1.69	6,371	0.00
25 year WILTON NOAA	2.55	2.55	9,622	0.00

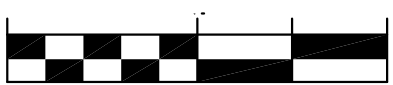


Current Watershed

Peak Engineers, LLC

PO BOX 312, Georgetown, CT 06829

LUPINSKI
53 SUGAR LOAF DRIVE
WILTON, CT



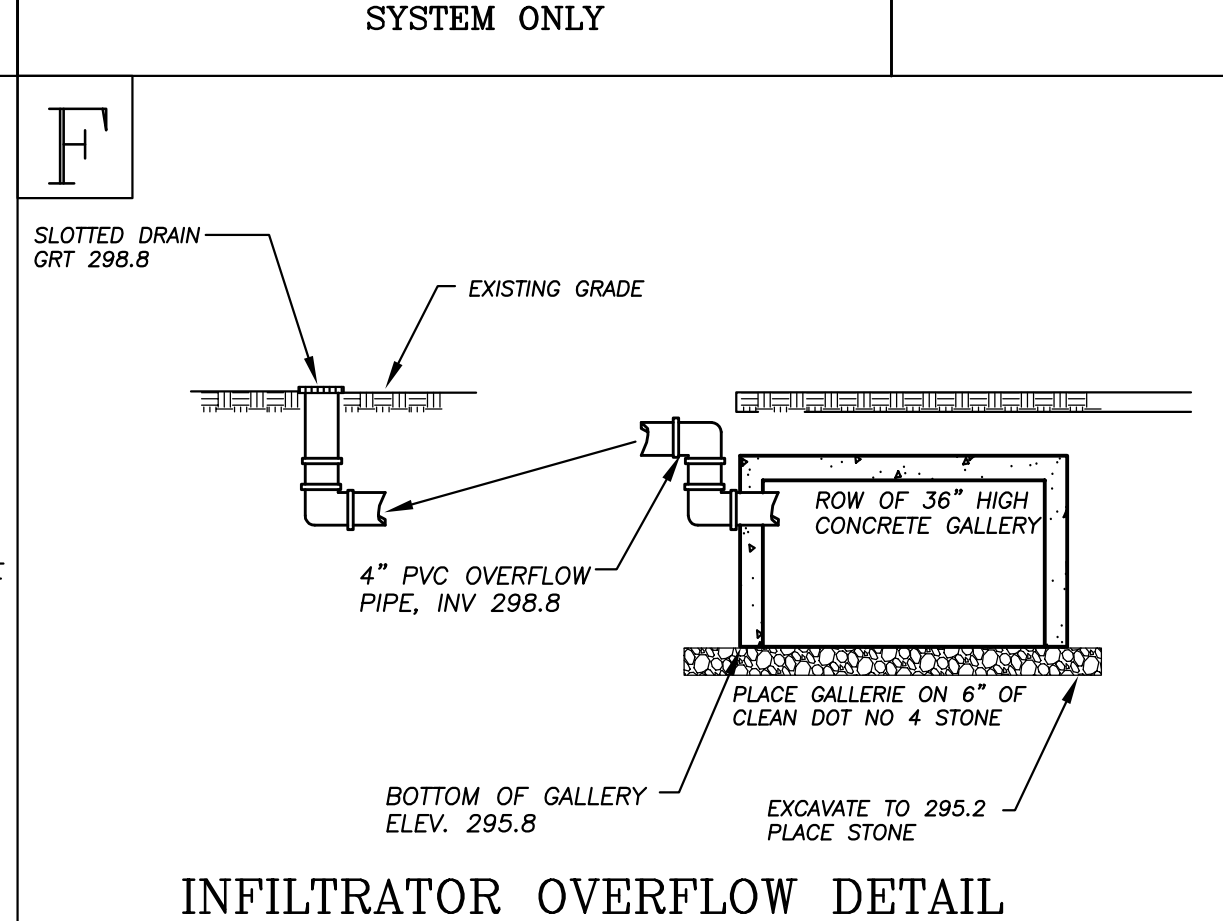
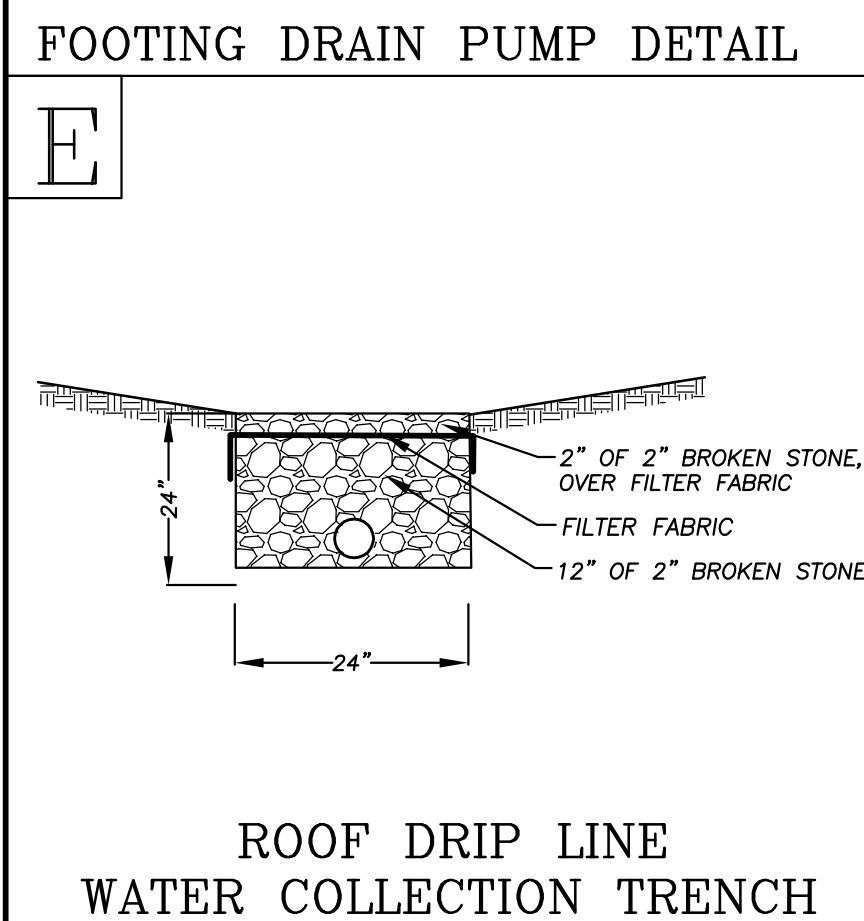
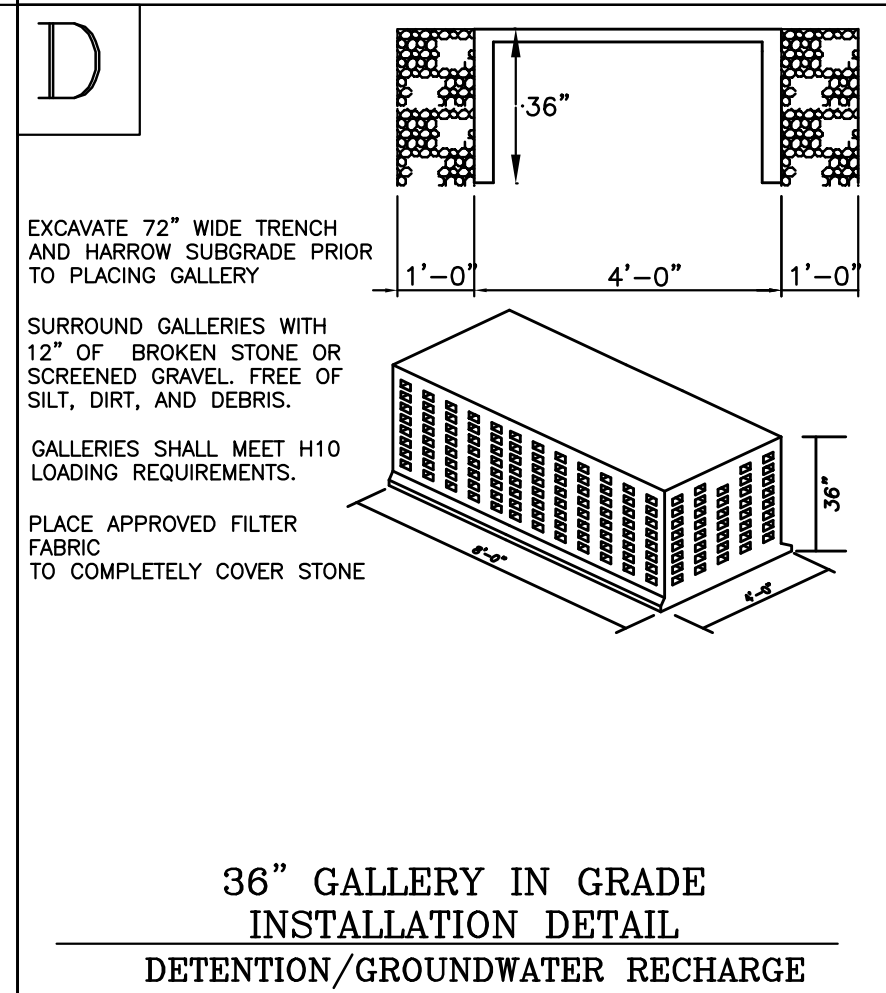
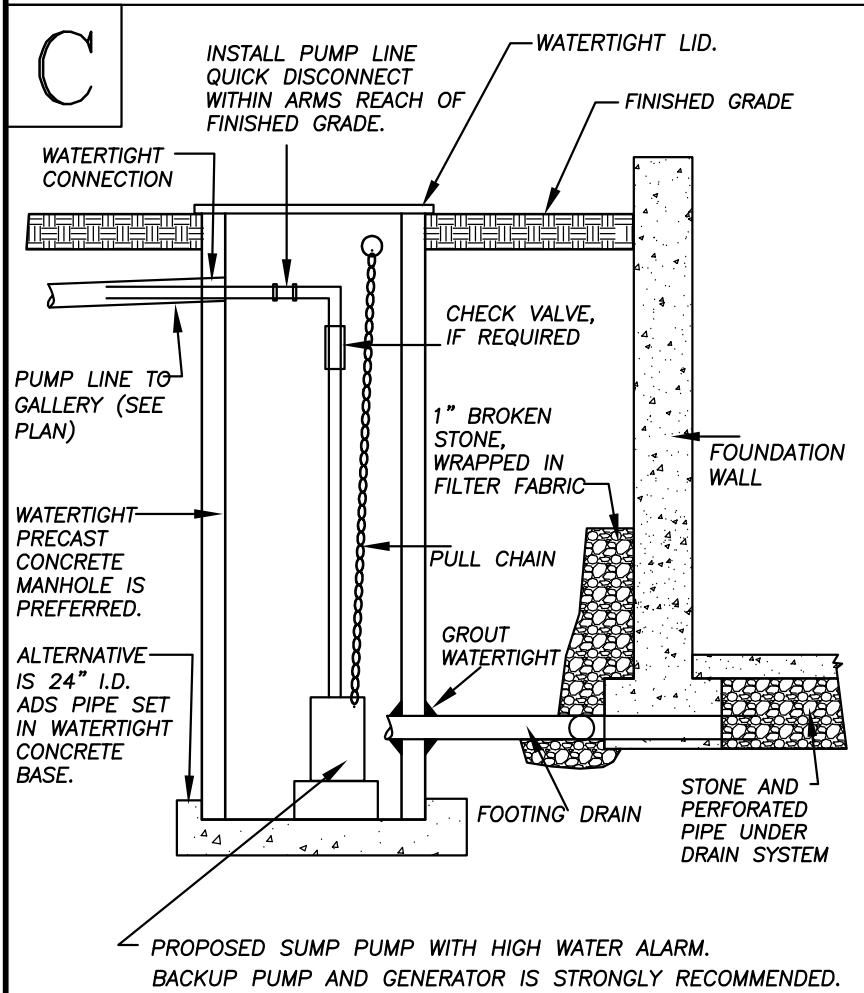
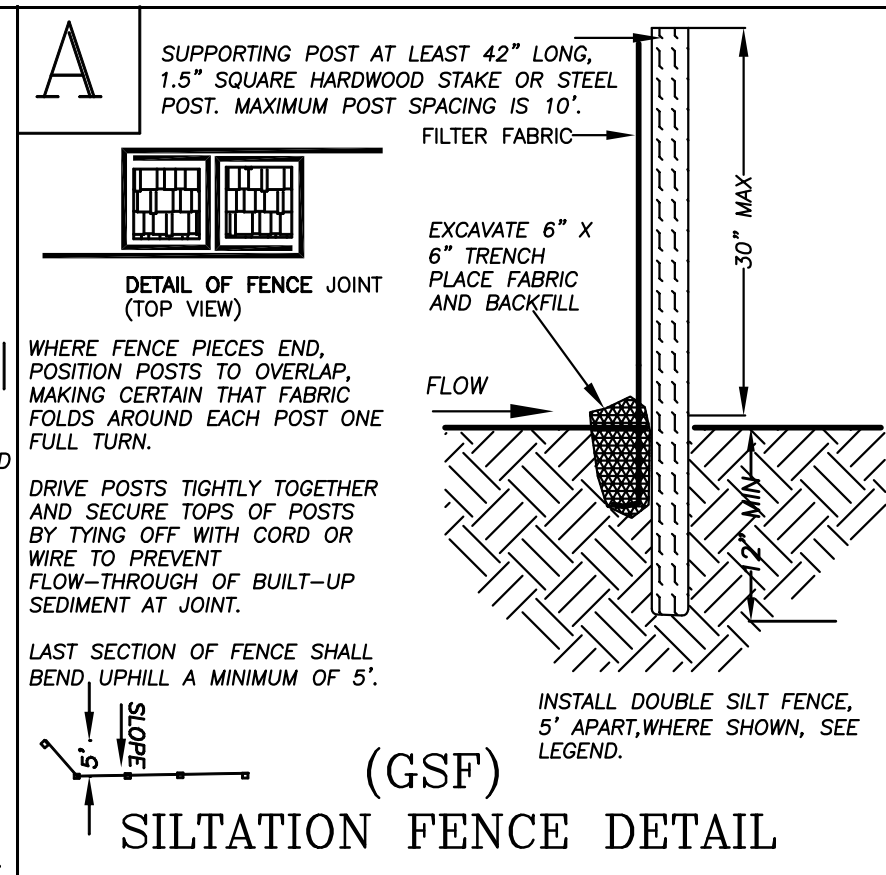
**POST-ACTIVITY
WATERSHED BREAK**

P0 BOX 312, Georgetown, CT 06829

SEDIMENTATION AND EROSION CONTROL NOTES

1. NATURAL VEGETATION TO BE KEPT WHERE POSSIBLE; SEEDING, MULCHING, AND FINAL GRADING TO BE DONE AS SOON AS POSSIBLE.
2. ALL SEDIMENTATION AND EROSION CONTROL MEASURES WILL BE INSTALLED PRIOR TO ANY CONSTRUCTION, OR PRIOR TO ANY EQUIPMENT BROUGHT ONTO SITE.
3. ALL SEDIMENTATION AND EROSION CONTROL MEASURES WILL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL — 2002 EDITION.
4. ALL CONTROL STRUCTURES WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL THE SITE IS STABILIZED. ALL WORK SHALL BE PER THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL — 2002 EDITION.
5. SEDIMENT REMOVED FROM CONTROL STRUCTURES SHALL BE DISPOSED OF IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THIS PLAN.
6. THIS PLAN INDICATES MINIMUM REQUIRED CONTROL STRUCTURES. ADDITIONAL CONTROL STRUCTURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD IF NECESSARY OR REQUIRED.
7. THE OWNER MUST TAKE RESPONSIBILITY FOR THE EROSION CONTROLS OR ASSIGN THE RESPONSIBILITY TO ANOTHER PARTY.

THE RESPONSIBLE PARTY MUST IMPLEMENT THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFYING THE CONSERVATION COMMISSION OFFICE OF ANY TRANSFER OF THIS RESPONSIBILITY, AND CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.



TEST HOLE DATA

DEEP TEST HOLES WERE PERFORMED BY PEAK ENGINEERS, LLC ON NOVEMBER 9, 2023.

TH A

0-5" 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"

PERCOLATION DATA

PERCOLATION TEST PERFORMED BY PEAK ENGINEERS, LLC

PH A 10" DIAMETER, 47" DEEP, DATE NOV. 9, 2023

PRESOAK 8:35, 8"

TIME	MEASURE	DROP	MIN ELAPSED	RATE
9:13	7 1/4"			
9:23	9 1/4"	2"	10	1"/5.0 MIN.
9:33	10 1/2"	1 1/4"	10	1"/8.0 MIN.
9:43	11 1/2"	1"	10	1"/10.0 MIN.
9:53	12 1/2"	1"	10	1"/10.0 MIN.
10:03	13 3/8"	7/8"	10	1"/11.4 MIN.

DESIGN INFILTRATION VELOCITY 2.63"/HR (F.S. 2.0)

LEGEND

----- 102 EXISTING CONTOUR

----- 290 PROPOSED CONTOUR

PLAN NOTES

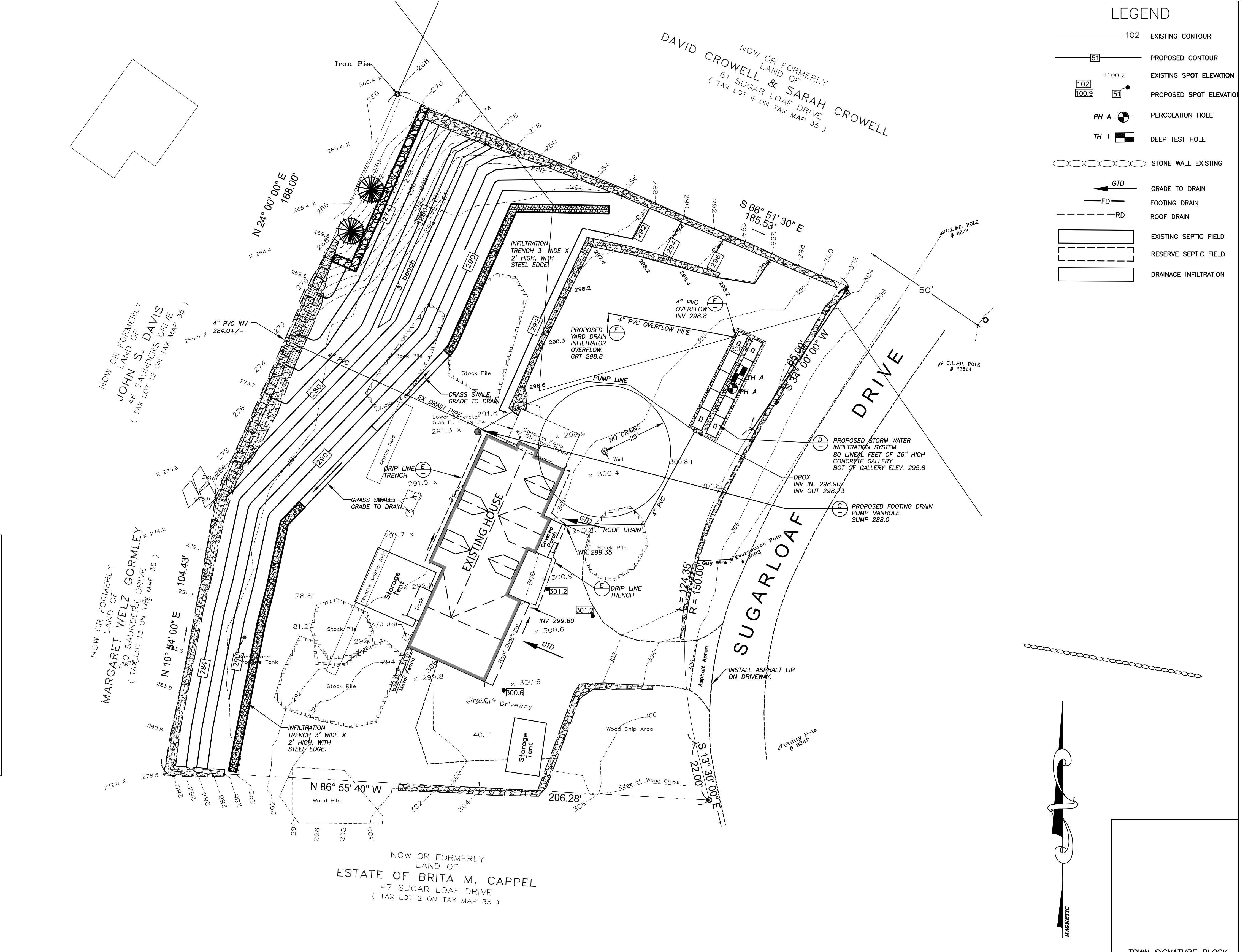
NOTE 1: PURPOSE

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. RECEIVED AUGUST 31, 2023.

PEAK ENGINEERS, LLC TAKES NO RESPONSIBILITY TO ANY DAMAGE CAUSED TO THE STRUCTURE OR SUPPORTING MEMBERS AS RELATED TO ANY TEMPORARY REPAIR OR FIX TO THE DRAINAGE SYSTEM.



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Site, Septic, and Drainage, Feasibility and Design

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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

FOOTING DRAIN INFILTRATION SYSTEM

DP-1