Peak Engineers, LLC

PROVIDING CIVIL ENGINEERING SERVICES
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March 19, 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 (March 12, 2024 Grading Plan)

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 compare the sites Current condition and the proposed Post-Activity condition which is the March 12, 2024 Grading Plan. The March 12, 2024 Plan includes all drainage facilities indicated on the previously submitted and reviewed Plan and Drainage Narrative dated January 26, 2024..

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.

		March 12 Plan			Jan 26 Plan
	Current Volume	Post-Activity Volume	Change Volume	% Change	Post-Activity Volume
Node	13,859 CF	9,742 CF	-4,117 CF	-29.7%	9,622 CF
	Current Flow, CFS	Post-Activity Flow CFS	Change CFS	% Change	Post-Act Flow CFS
Node					
	3.06 cfs	2.54 cfs	-0.52 cfs	-17.0%	3.06 cfs

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.
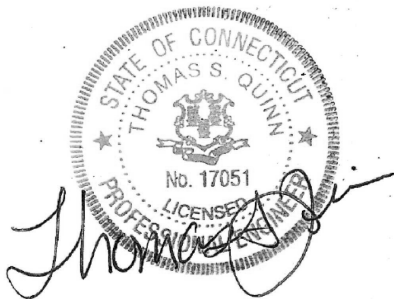
Conclusions

The HydroCad study confirms that the site grading will effectivity decrease the peak rate of flow and peak volume of flow from the site. The study also confirms that the March 12, 2024 grading plan is equally effective in reducing the sites peak rate of flow and peak volume of flow as the previously reviewed and approved plan dated January 26, 2024.

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.

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

Summary for Link 5: WEST PROPERTY LINE

Inflow Area =   43,612 sf,   7.48% Impervious, Inflow Depth =   2.68"   for 25 year WILTON NOAA e
Inflow   =   2.54 cfs @   12.26 hrs, Volume=   9,742 cf
Primary   =   2.54 cfs @   12.26 hrs, Volume=   9,742 cf, Atten= 0%, Lag= 0.0 min

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

SECTION AT Z-Z

EXISTING GRADE
FILL MATERIAL TO BE REMOVED
2011 GRADE
ROW OF RETAINING BOULDERS
PROPOSED GRAVEL SUMP
DOUBLE ROW OF SILT FENCE & TEMP. 4' CHAIN LINK FENCE BELOW WORK AREA
PROPERTY LINE
EXISTING TREE TO REMAIN

SECTION AT Y-Y

PROPOSED GRADE
EXISTING GRADE
FILL MATERIAL TO BE REMOVED
2011 GRADE
HOUSE BASEMENT
1 MAX
PROPOSED GRAVEL TRENCH
EXISTING SEPTIC GALLERY
WALL TO BE REMOVED
BASE STONES TO REMAIN
PROPERTY LINE

SECTION AT X-X

PROPOSED FINISHED GRADE
EXISTING GRADE
FILL MATERIAL TO BE REMOVED
2011 GRADE
HOUSE BASEMENT
1 MAX
WALL TO BE REMOVED
BASE STONES TO REMAIN
PROPOSED GRAVEL TRENCH
50' NO SUBSURFACE DRAINS
PROPOSED GRAVEL SUMP (2-3" STONE)
APPROVED B100 SEPTIC LOCATION
PROPERTY LINE

SECTION AT W-W

FILL MATERIAL TO BE REMOVED
2011 GRADE
EXISTING GRADE
PROPOSED FINISHED GRADE
PROPOSED GRAVEL TRENCH
WALL TO BE REMOVED
PROPOSED GRAVEL SUMP (2-3" STONE)
PROPERTY LINE

TEST HOLE DATA

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

TH A
0-6"   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)
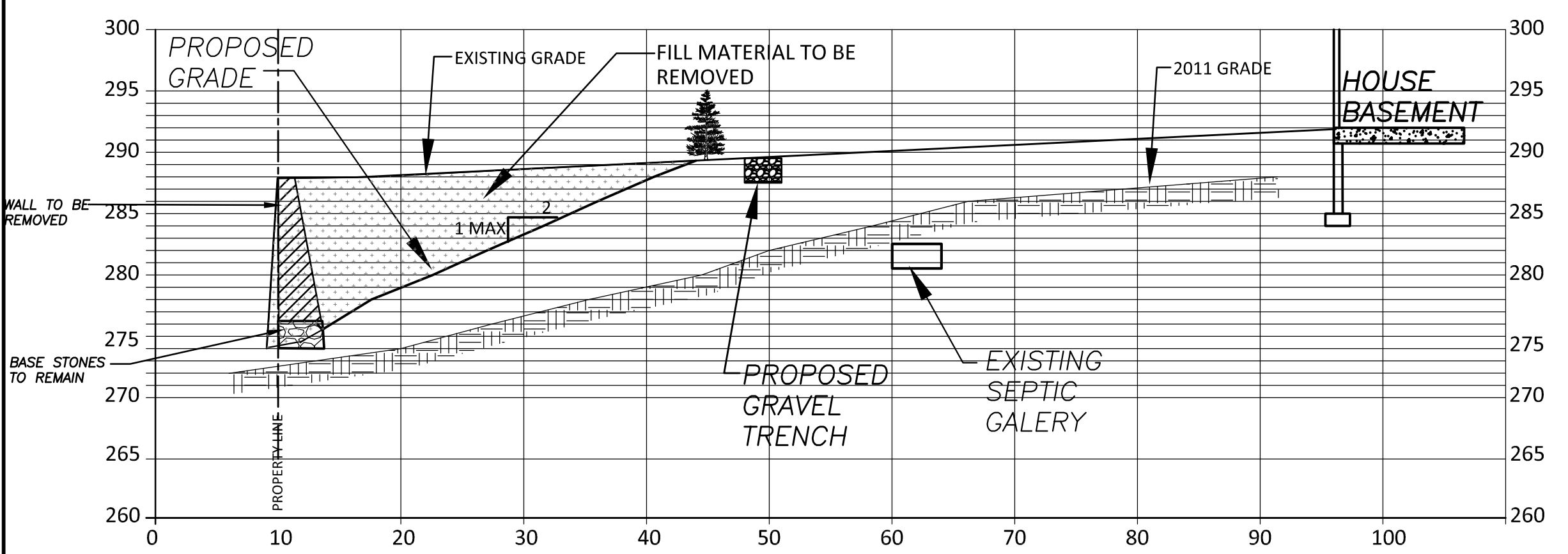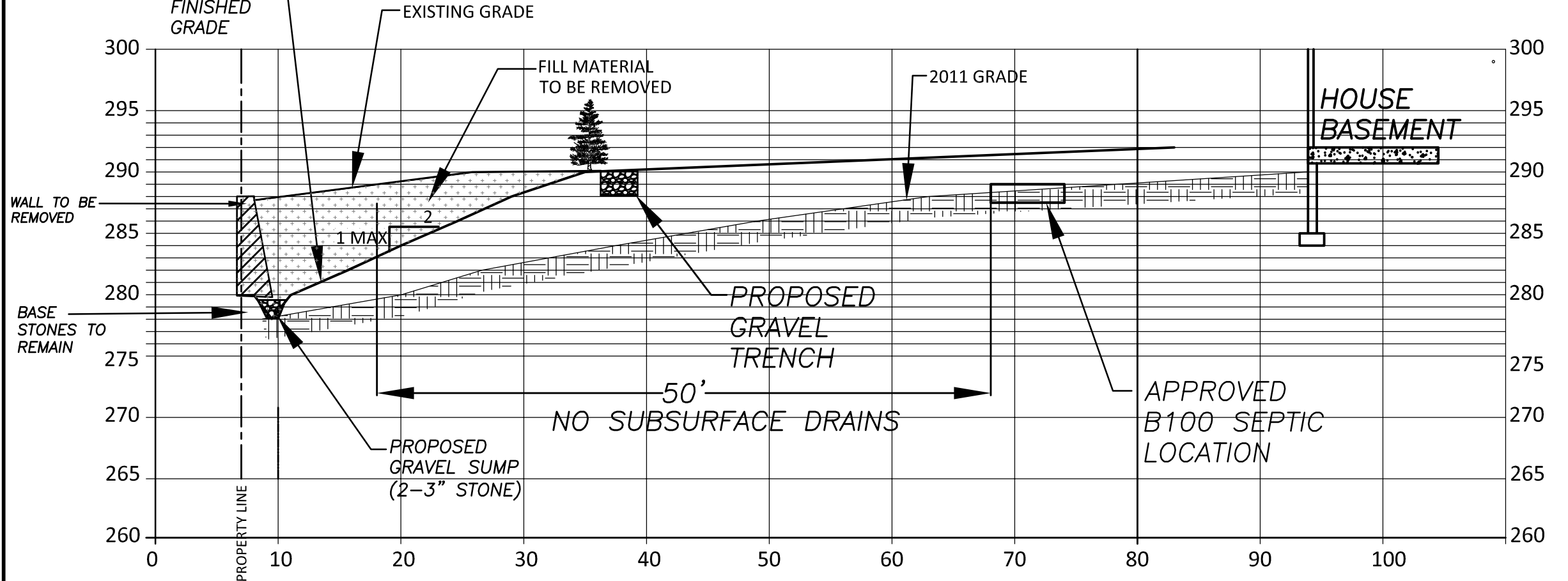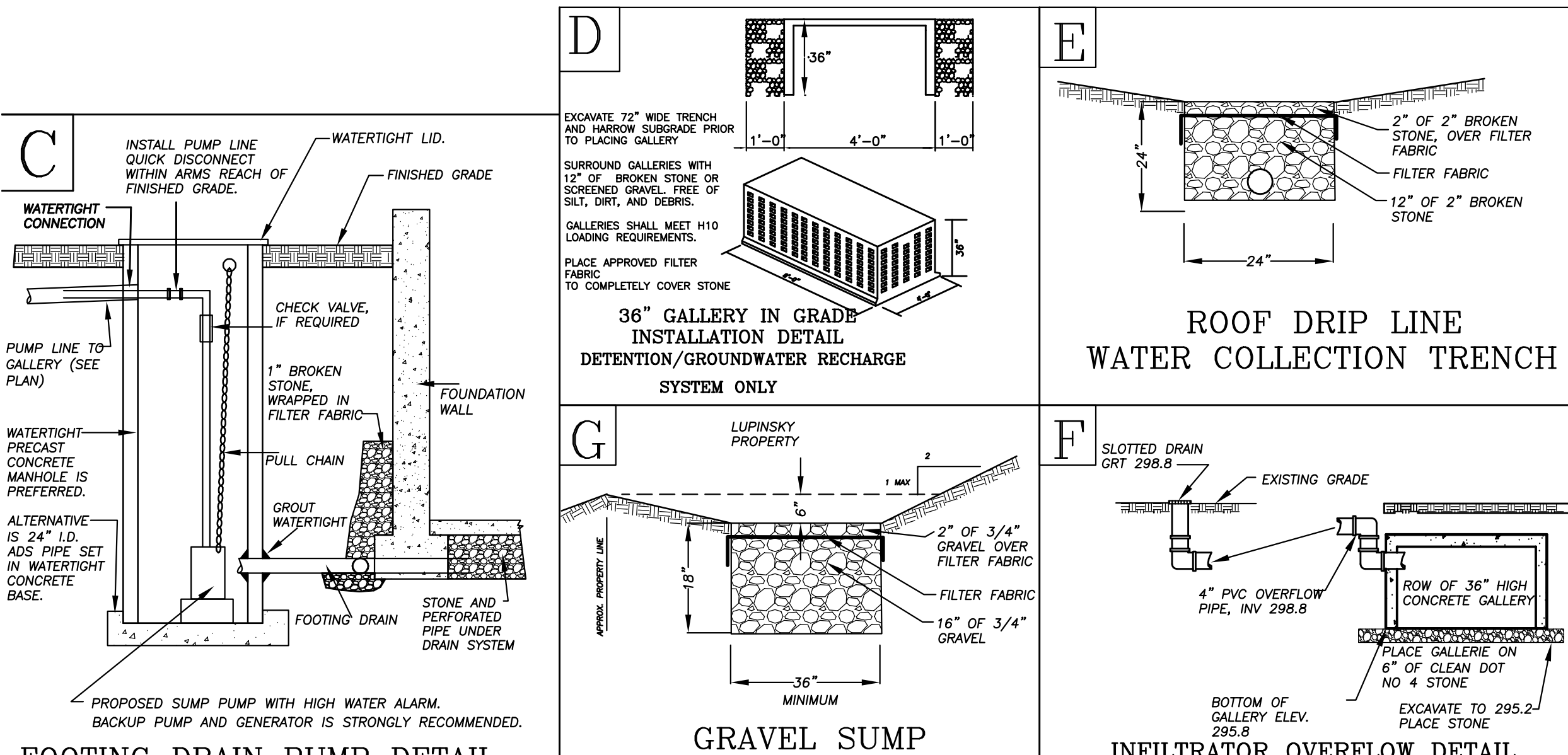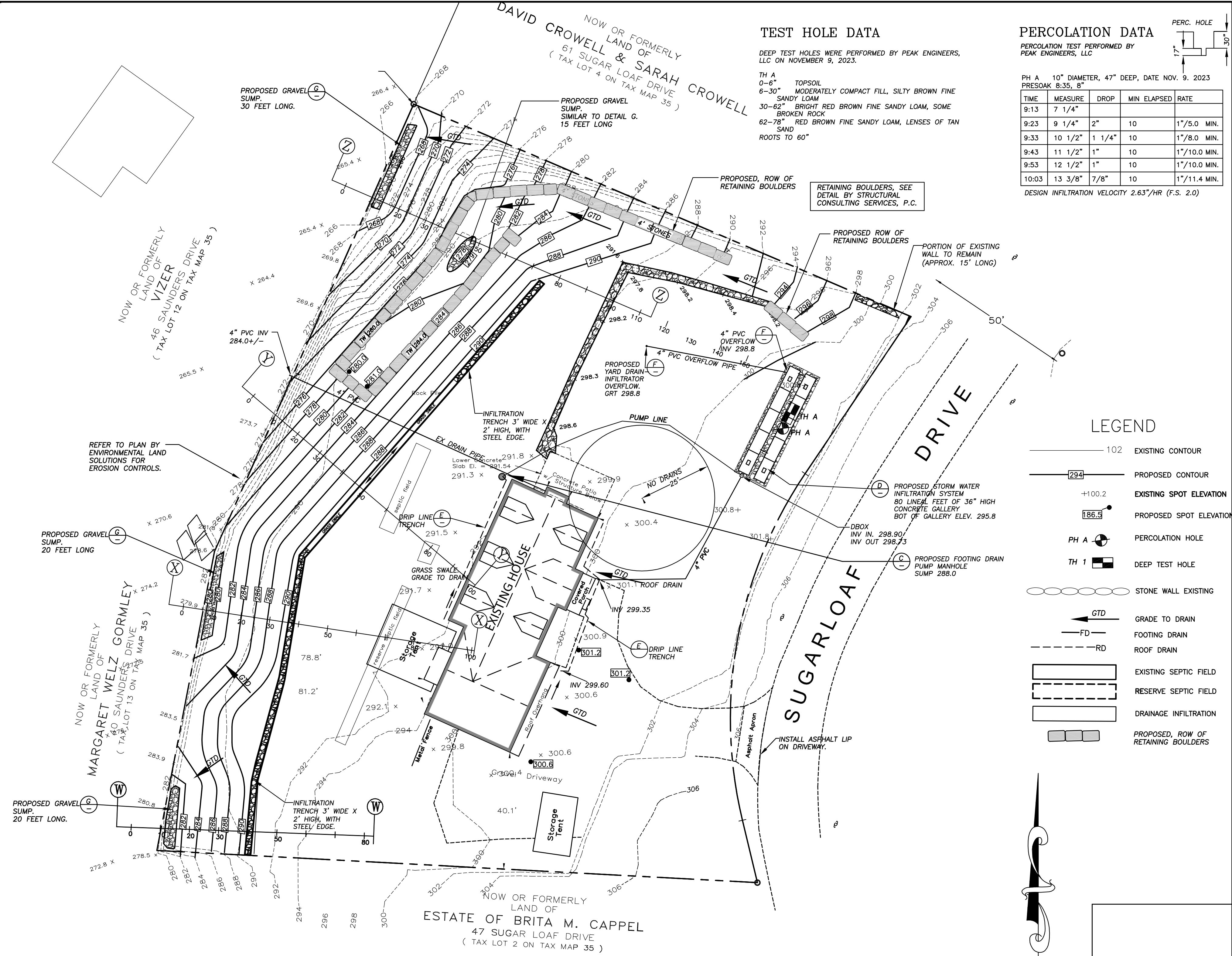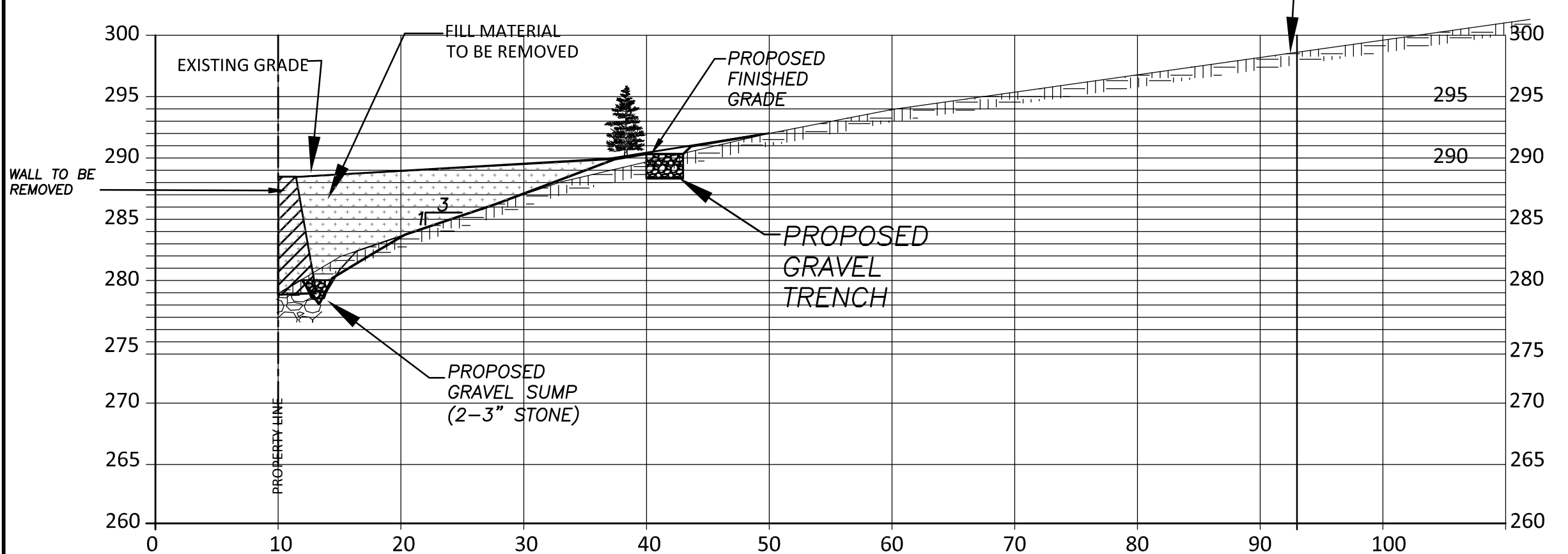
LEGEND

102	EXISTING CONTOUR
294	PROPOSED CONTOUR
+100.2	EXISTING SPOT ELEVATION
186.9	PROPOSED SPOT ELEVATION
PH A	PERCOLATION HOLE
TH 1	DEEP TEST HOLE
	STONE WALL EXISTING
GTD	GRADE TO DRAIN
FD	FOOTING DRAIN
RD	ROOF DRAIN
	EXISTING SEPTIC FIELD
	RESERVE SEPTIC FIELD
	DRAINAGE INFILTRATION
	PROPOSED, ROW OF RETAINING BOULDERS

NOW OR FORMERLY LAND OF DAVID CROWELL & SARAH CROWELL 61 SUGAR LOAF DRIVE (TAX LOT 4 ON TAX MAP 35)

NOW OR FORMERLY LAND OF VIZER 46 SAUNDERS DRIVE (TAX LOT 12 ON TAX MAP 35)

NOW OR FORMERLY LAND OF MARGARET WELZ GORMLEY 40 SAUNDERS DRIVE (TAX LOT 13 ON TAX MAP 35)

NOW OR FORMERLY LAND OF ESTATE OF BRITA M. CAPPEL 47 SUGAR LOAF DRIVE (TAX LOT 2 ON TAX MAP 35)

SUGARLOAF DRIVE

EXISTING HOUSE

PROPOSED GRAVEL SUMP, 30 FEET LONG.
PROPOSED GRAVEL SUMP, SIMILAR TO DETAIL G, 15 FEET LONG.
PROPOSED, ROW OF RETAINING BOULDERS
RETAINING BOULDERS, SEE DETAIL BY STRUCTURAL CONSULTING SERVICES, P.C.
PROPOSED ROW OF RETAINING BOULDERS
PORTION OF EXISTING WALL TO REMAIN (APPROX. 15' LONG)
4" PVC INV 284.0+/-
4" PVC OVERFLOW INV 298.8
4" PVC OVERFLOW PIPE
PROPOSED YARD DRAIN INFILTRATOR OVERFLOW. GRT 298.8
INFILTRATION TRENCH 3' WIDE X 2' HIGH, WITH STEEL EDGE.
REFER TO PLAN BY ENVIRONMENTAL LAND SOLUTIONS FOR EROSION CONTROLS.
PUMP LINE
PROPOSED STORM WATER INFILTRATION SYSTEM 80 LINEAL FEET OF 36" HIGH CONCRETE GALLERY BOT OF GALLERY ELEV. 295.8
DBOX INV IN 298.90 INV OUT 298.73
PROPOSED FOOTING DRAIN PUMP MANHOLE SUMP 288.0
PROPOSED GRAVEL SUMP. 20 FEET LONG.
DRIP LINE TRENCH
GRASS SWALE GRADE TO DRAIN
ROOF DRAIN
DRIP LINE TRENCH
INV 299.35
INV 299.60
INFILTRATION TRENCH 3' WIDE X 2' HIGH, WITH STEEL EDGE.
PROPOSED GRAVEL SUMP. 20 FEET LONG.
INSTALL ASPHALT LIP ON DRIVEWAY.
Storage Tent
Driveway

MAGNETIC

Scale : 1"=20'

C — FOOTING DRAIN PUMP DETAIL

INSTALL PUMP LINE QUICK DISCONNECT WITHIN ARMS REACH OF FINISHED GRADE.
WATERTIGHT LID.
FINISHED GRADE
WATERTIGHT CONNECTION
CHECK VALVE, IF REQUIRED
PUMP LINE TO GALLERY (SEE PLAN)
1" BROKEN STONE, WRAPPED IN FILTER FABRIC
WATERTIGHT PRECAST CONCRETE MANHOLE IS PREFERRED.
FOUNDATION WALL
FULL CHAIN
ALTERNATIVE IS 24" I.D. ADS PIPE SET IN WATERTIGHT CONCRETE BASE.
GROUT WATERTIGHT
STONE AND PERFORATED PIPE UNDER DRAIN SYSTEM
FOOTING DRAIN
PROPOSED SUMP PUMP WITH HIGH WATER ALARM. BACKUP PUMP AND GENERATOR IS STRONGLY RECOMMENDED.

D — 36" GALLERY IN GRADE INSTALLATION DETAIL DETENTION/GROUNDWATER RECHARGE SYSTEM ONLY

EXCAVATE 72" WIDE TRENCH AND HARROW SUBGRADE PRIOR TO PLACING GALLERY.
SURROUND GALLERIES WITH 12" OF BROKEN STONE OR SCREENED GRAVEL, FREE OF SILT, DIRT, AND DEBRIS.
GALLERIES SHALL MEET H10 LOADING REQUIREMENTS.
PLACE APPROVED FILTER FABRIC TO COMPLETELY COVER STONE.

E — ROOF DRIP LINE WATER COLLECTION TRENCH

2" OF 2" BROKEN STONE, OVER FILTER FABRIC
FILTER FABRIC
12" OF 2" BROKEN STONE

G — GRAVEL SUMP

LUPINSKY PROPERTY
SLOTTED DRAIN
2" OF 3/4" GRAVEL OVER FILTER FABRIC
FILTER FABRIC
16" OF 3/4" GRAVEL

F — INFILTRATOR OVERFLOW DETAIL

SLOTTED DRAIN GRT 298.8
EXISTING GRADE
4" PVC OVERFLOW PIPE, INV 298.8
ROW OF 36" HIGH CONCRETE GALLERY
FILTER FABRIC
BOTTOM OF GALLERY ELEV. 295.8
PLACE GALLERIE ON 6" OF CLEAN DOT NO 4 STONE
EXCAVATE TO 295.2 PLACE STONE

TOWN SIGNATURE BLOCK

PREPARED FOR
Robert Lupinski
53 Sugar Loaf Drive
Wilton, CT 06897

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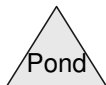Assessors Map 35, Lot 3. 1.0021 acres

TITLE
GRADING PLAN

STATE OF CONNECTICUT
THOMAS S. QUINN
No. 17051
Thomas S. Quinn, P.E. 17051
THIS PRINT IS INVALID WITHOUT LIVE RED SEAL AND EMBOSSED SEAL

GP-1

NOW OR FORMERLY
_L & SARAH CROWELL
(SUGAR LOAF DRIVE
(TAX LOT 4 ON TAX MAP 35)

266.4 x

S 66° 51' 30" E
185.53'

N 24° 00' 00" E
168.00'

265.4 x

265.4 x

BARE EARTH
2,227 SF
CN 83

55 LF GRASS
AT 5.5%

TT 30'

TT 90 LF GRASS AT 4.6%

NOW OR FORMERLY
LAND OF
JOHN S. DAVIS
(46 SAUNDERS DRIVE)
(TAX LOT 12 ON TAX MAP 35)

4" PVC INV
284.0+/-

4" PVC

Rock Pile

5

6

UPPER FLAT LAWN
CN 61

Stock Pile

298.3

298.6

CONCRETE
PATIO
335 SF
CN 98

EX DRAIN PIPE

CURRENT
AREA OF THICK
GRASSES
13,482 SF
CN 74

Lower Concrete
Slab El. 291.54

291.8 x

291.3 x

299.9

Concrete Patio
Structure Below

2

300.8+

HOUSE TO FOUNDATION
DRAIN
CN 98

300.4

300.8+

301.8

GRASS COVER CN 74
COMPACTED FILL
8,053 SF − 535
= 7,752 SF

1

291.5 x

EXISTING HOUSE

1

291.7 x

STORAGE
TENT
535 SF
CN 98

78.8

81.2'

292.1 x

300.9

301.2

4

300.6

3

Rock Overhang

1

294

4

301.2

4

300.6

UPPER FLAT LAWN
TO FOUNDATION DRAIN
CN 61

R = 150.00'

Guy Wire

NOW OR FORMERLY
LAND OF
MARGARET WELZ GORMLEY
(60 SAUNDERS DRIVE)
(TAX LOT 13 ON TAX MAP 35)

N 10° 54' 00" E

104.43'

274.2

279.9

281.7

283.5

283.9

GRAVEL DRIVE
TO FOUNDATION
DRAIN

Asphalt Driveway

L = 124.35'

R = 150.00'

300.6

299.8

Gravel Driveway

300.6

300.8

1

40.7

STORAGE
TENT
256 SF
CN 98

Storage
Tent

1

AREA OF WOODS
2,174 SF
CN 66

306

306

280.8

GRAVEL DRIVE

N 86° 55' 40" W

278.5

TT 137' GRASS AT 10%

Wood Pile

TT 58 LF WOODED
AT 3.4%

S 13° 30' 00" E

22.00'

N CAPPEL PROPERTY

WALL WITHIN CAPPEL PROPERTY

206.28'

52.5'

22.8'

NOW OR FORMERLY
LAND OF
ESTATE OF BRITA M. CAPPEL
47 SUGAR LOAF DRIVE
(TAX LOT 2 ON TAX MAP 35)

SUGARLOAF DRIVE

S 34° 00' 00" W

TOWN SIGN

50'

MAGNETIC

Scale : 1" = 40'

0   40   80

LUPINSKI
53 SUGAR LOAF DRIVE
WILTON, CT

— — — — — — TIME OF CONCENTRATION

———— CURRENT
WATERSHED BREAK

Current Watershed

Peak Engineers, LLC

PO BOX 312, Georgetown, CT 06829

3

HOUSE ROOF

5

4" PIPE THROUGH
WALL

4

GRAVEL DRIVE

6

WEST PROPERTY
LINE

1

CURRENT

2

UPPER FLAT LAWN

Subcat   Reach   Pond   Link

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
7,241	61	>75% Grass cover, Good, HSG B (2)
2,459	61	FLAT LAWN (4)
2,174	66	Woods, Poor, HSG B (1)
7,752	74	>75% Grass cover, Good, HSG B (1)
13,482	74	>75% Grass cover, Good, HSG C (1)
2,227	83	BARE EARTH (1)
2,123	85	Driveway, Gravel (1)
1,764	85	GRAVEL DRIVE (4)
3,264	98	HOUSE ROOF TO DRIP LINE (3)
1,126	98	TENTS AND PATIO (1)
43,612		**TOTAL AREA**

Summary for Subcatchment 1: CURRENT
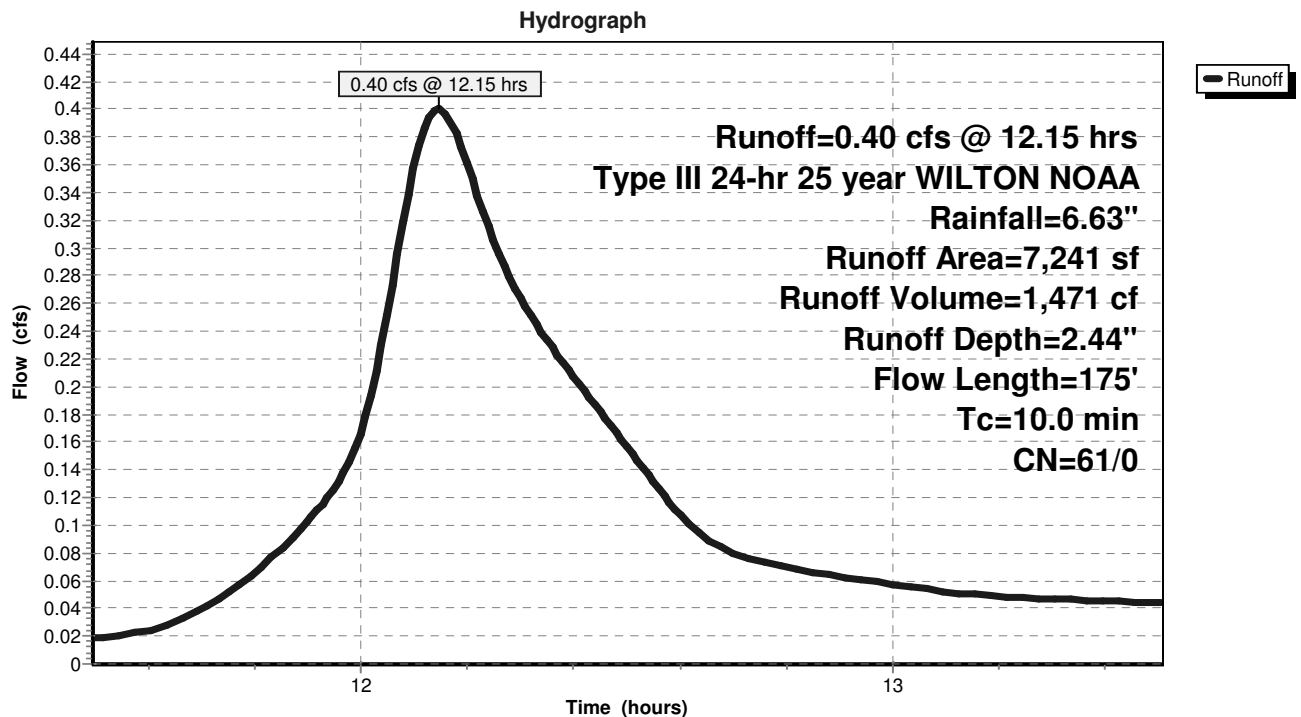
Runoff   =   2.19 cfs @   12.23 hrs, Volume=   9,448 cf, Depth= 3.93"

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
*	2,123	85	Driveway, Gravel
*	7,752	74	>75% Grass cover, Good, HSG B
	2,174	66	Woods, Poor, HSG B
	13,482	74	>75% Grass cover, Good, HSG C
*	2,227	83	BARE EARTH
*	1,126	98	TENTS AND PATIO
	28,884	76	Weighted Average
	27,758	75	Pervious Area
	1,126	98	Impervious 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"
6.3	137	0.1000	0.36		**Sheet Flow, sheet flow across grass**
					Grass: Short n= 0.150 P2= 3.57"
16.9	195	Total			

Subcatchment 1: CURRENT

Hydrograph

Runoff=2.19 cfs @ 12.23 hrs

Runoff=2.19 cfs @ 12.23 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=28,884 sf
Runoff Volume=9,448 cf
Runoff Depth=3.93"
Flow Length=195'
Tc=16.9 min
CN=75/98

Summary for Subcatchment 2: UPPER FLAT LAWN

Runoff   =   0.40 cfs @   12.15 hrs, Volume=   1,471 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
7,241	61	>75% Grass cover, Good, HSG B
7,241	61	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	90	0.0460	0.25		**Sheet Flow, SHEET FLOW UPPER LAWN**
					Grass: Short n= 0.150 P2= 3.57"
3.8	55	0.0550	0.24		**Sheet Flow, SHEET FLOW GRASS LOWER LAWN**
					Grass: Short n= 0.150 P2= 3.57"
0.1	30	0.5000	7.07		**Shallow Concentrated Flow, SHALL CONC FLOW STE**
					Nearly Bare & Untilled Kv= 10.0 fps
10.0	175				Total

Subcatchment 2: UPPER FLAT LAWN

Hydrograph

0.40 cfs @ 12.15 hrs

Runoff=0.40 cfs @ 12.15 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=7,241 sf
Runoff Volume=1,471 cf
Runoff Depth=2.44"
Flow Length=175'
Tc=10.0 min
CN=61/0

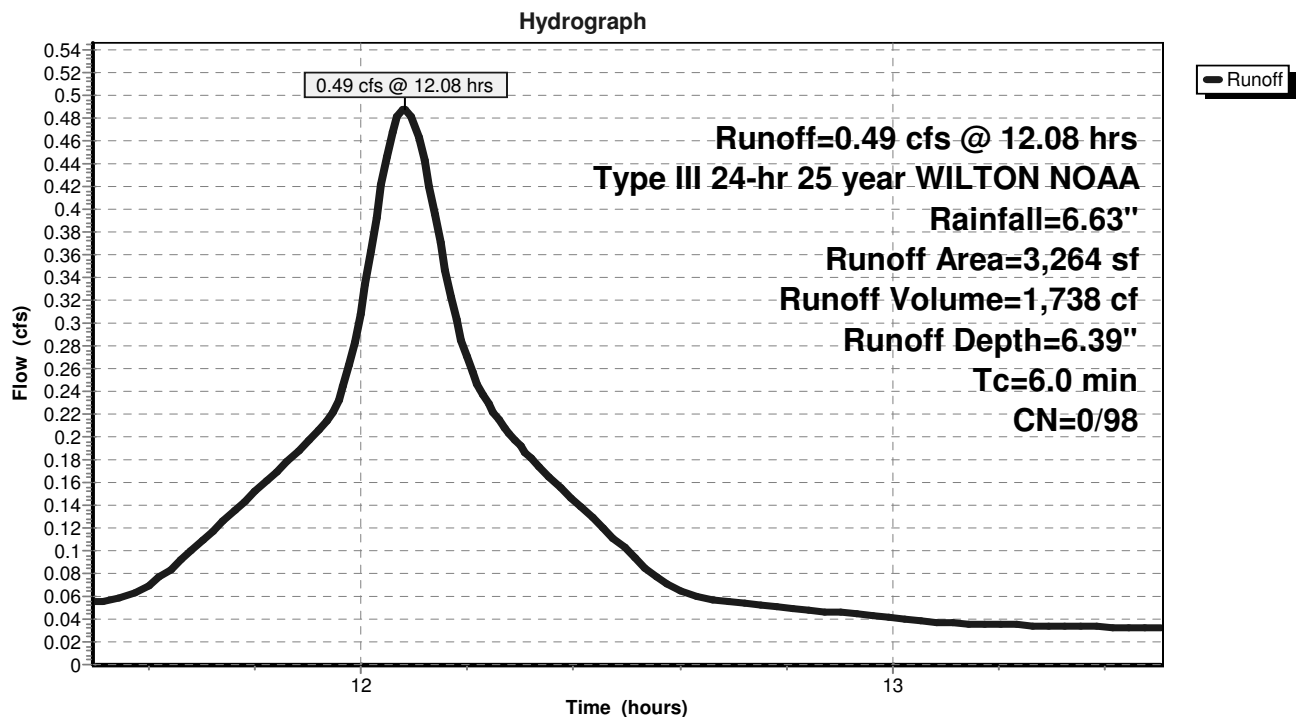## Summary for Subcatchment 3: HOUSE ROOF

Runoff   =   0.49 cfs @ 12.08 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
6.0					**Direct Entry, DIRECT FLOW**

Subcatchment 3: HOUSE ROOF

Hydrograph

0.49 cfs @ 12.08 hrs

Runoff=0.49 cfs @ 12.08 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=3,264 sf
Runoff Volume=1,738 cf
Runoff Depth=6.39"
Tc=6.0 min
CN=0/98

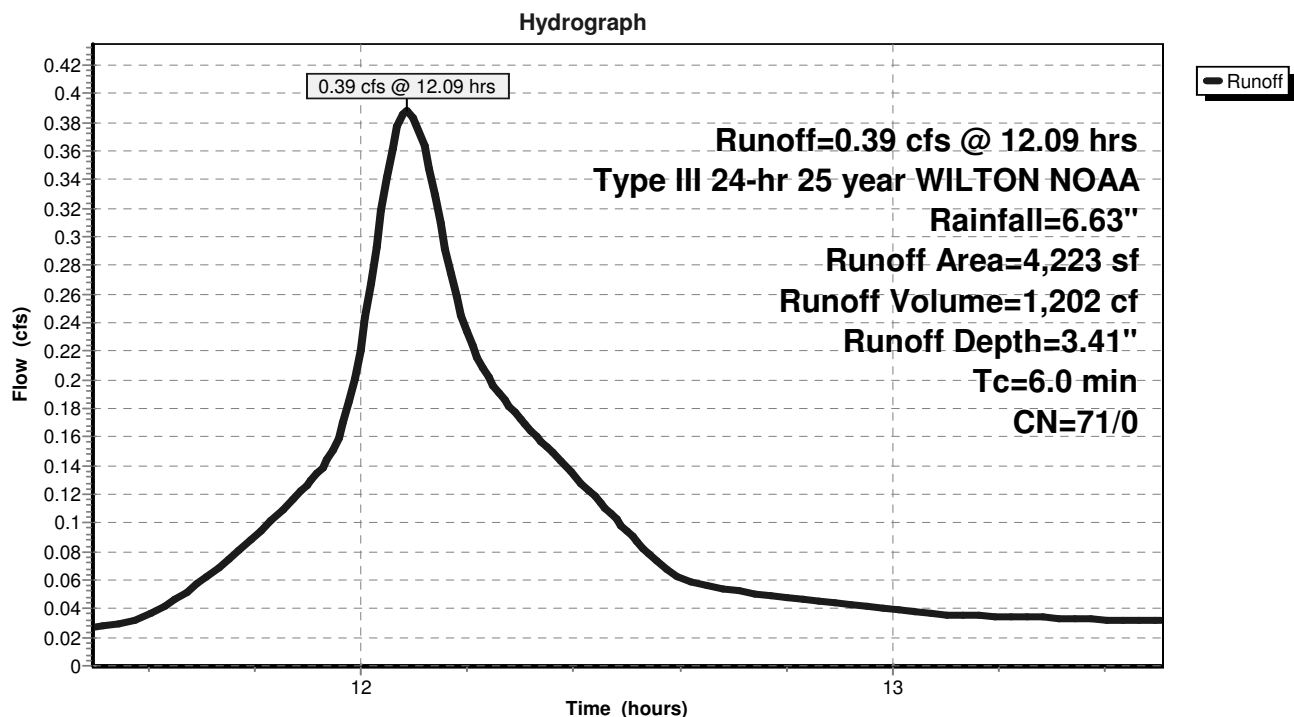## Summary for Subcatchment 4: GRAVEL DRIVE

Runoff   =   0.39 cfs @ 12.09 hrs, Volume=   1,202 cf, Depth= 3.41"

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
*	1,764	85	GRAVEL DRIVE
*	2,459	61	FLAT LAWN
	4,223	71	Weighted Average
	4,223	71	Pervious Area

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

Subcatchment 4: GRAVEL DRIVE

Hydrograph

0.39 cfs @ 12.09 hrs

Runoff=0.39 cfs @ 12.09 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=4,223 sf
Runoff Volume=1,202 cf
Runoff Depth=3.41"
Tc=6.0 min
CN=71/0

■ Runoff

Summary for Reach 5: 4" PIPE THROUGH WALL

Inflow Area =   7,487 sf, 43.60% Impervious, Inflow Depth =   4.71"   for 25 year WILTON NOAA e
Inflow   =   0.87 cfs @   12.09 hrs, Volume=   2,940 cf
Outflow   =   0.56 cfs @   12.01 hrs, Volume=   2,940 cf, Atten= 36%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.00 fps, Min. Travel Time= 0.2 min
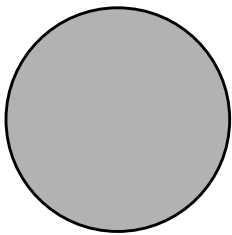Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.6 min

Peak Storage= 8 cf @ 12.02 hrs, Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.54 cfs

4.0" Diameter Pipe, n= 0.010
Length= 96.0'   Slope= 0.0469 '/'
Inlet Invert= 288.50', Outlet Invert= 284.00'

Reach 5: 4" PIPE THROUGH WALL

Hydrograph
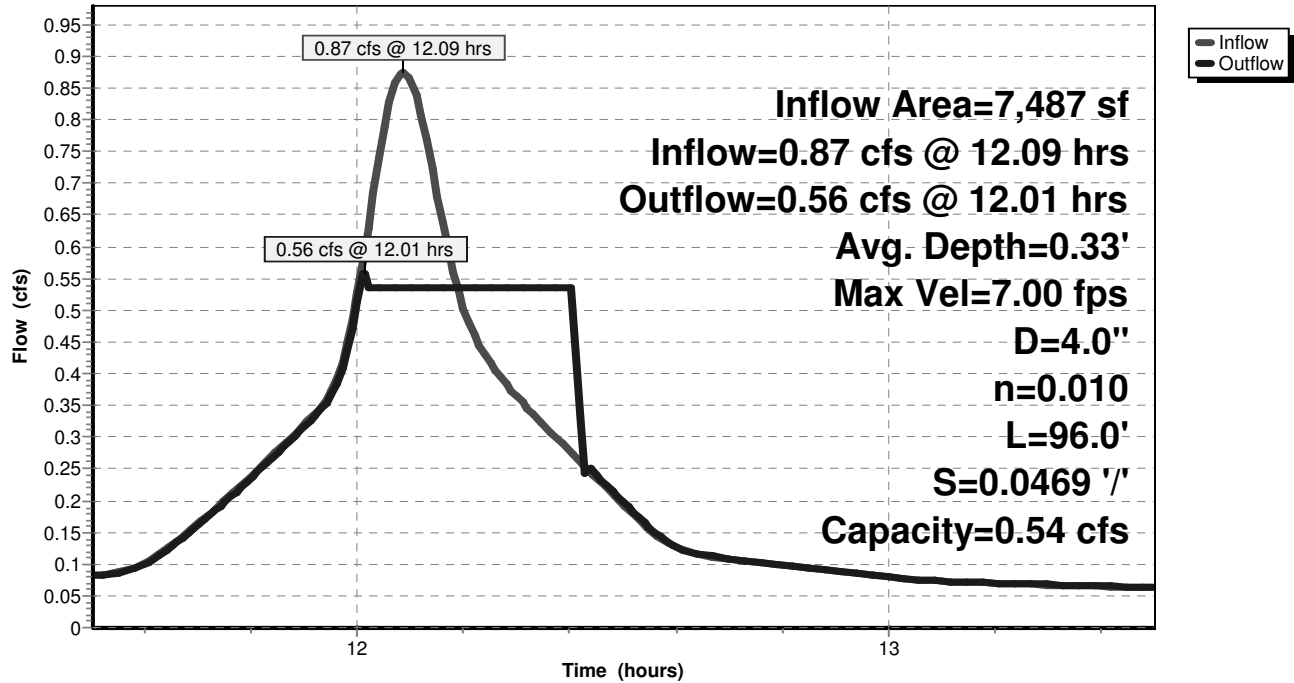
Inflow
Outflow

0.87 cfs @ 12.09 hrs

0.56 cfs @ 12.01 hrs

Inflow Area=7,487 sf
Inflow=0.87 cfs @ 12.09 hrs
Outflow=0.56 cfs @ 12.01 hrs
Avg. Depth=0.33'
Max Vel=7.00 fps
D=4.0"
n=0.010
L=96.0'
S=0.0469 '/'
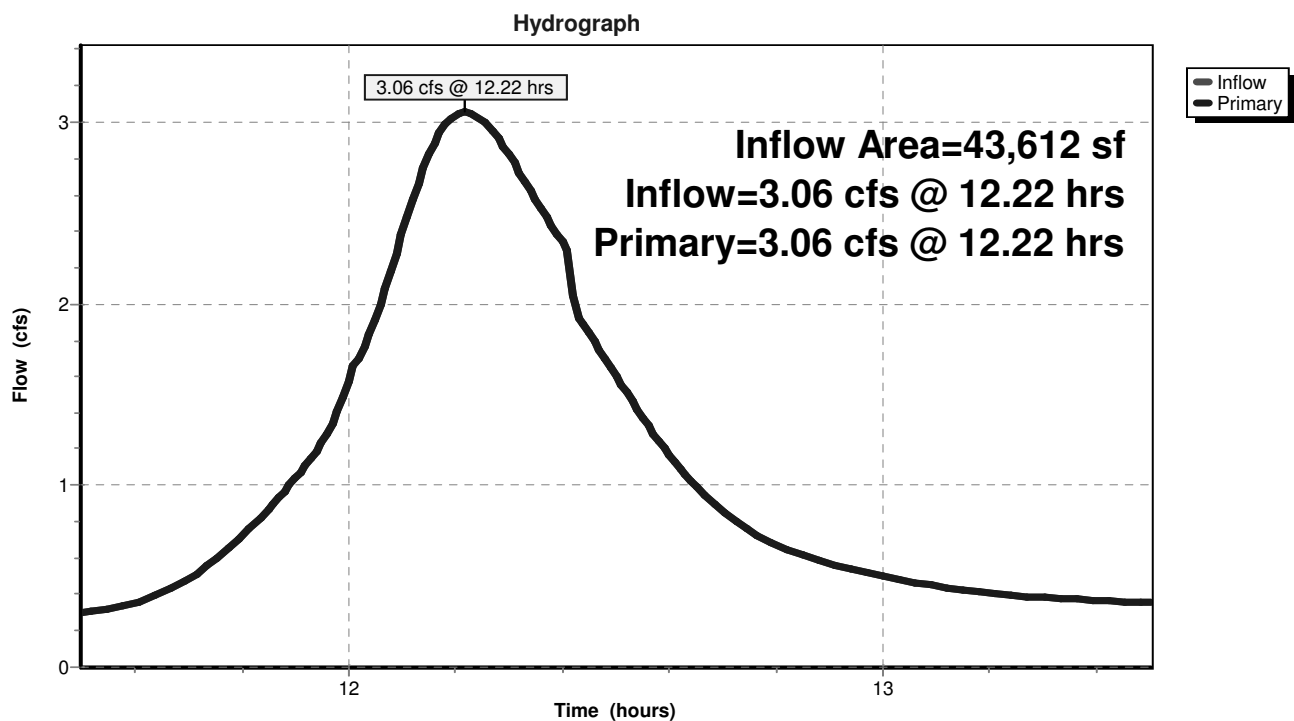**Capacity=0.54 cfs**

Flow (cfs)

Time (hours)

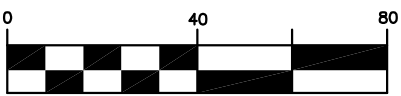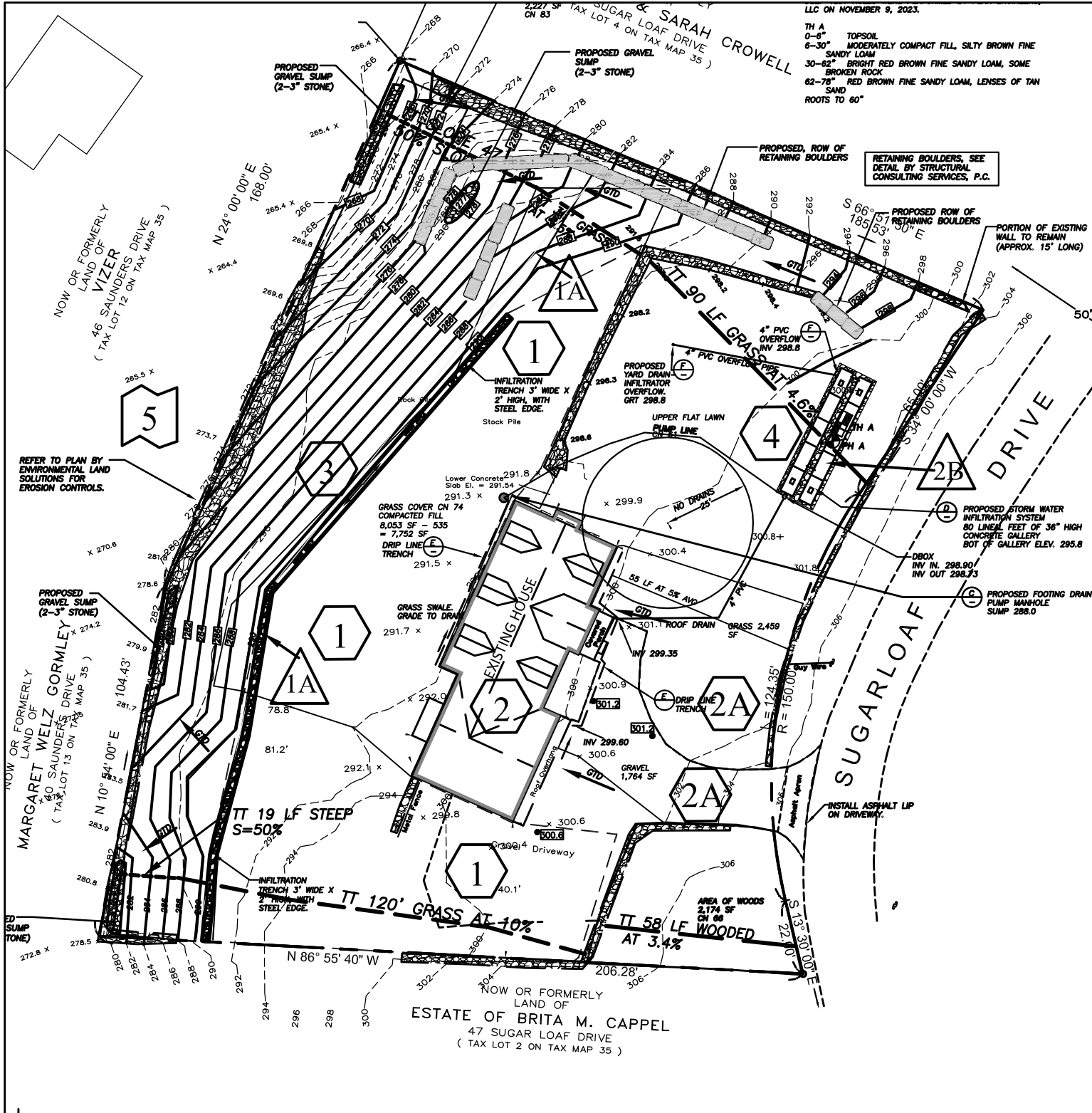## Summary for Link 6: WEST PROPERTY LINE

Inflow Area =   43,612 sf, 10.07% Impervious, Inflow Depth = 3.81"   for 25 year WILTON NOAA e
Inflow   =   3.06 cfs @   12.22 hrs, Volume=   13,859 cf
Primary   =   3.06 cfs @   12.22 hrs, Volume=   13,859 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
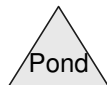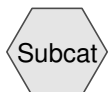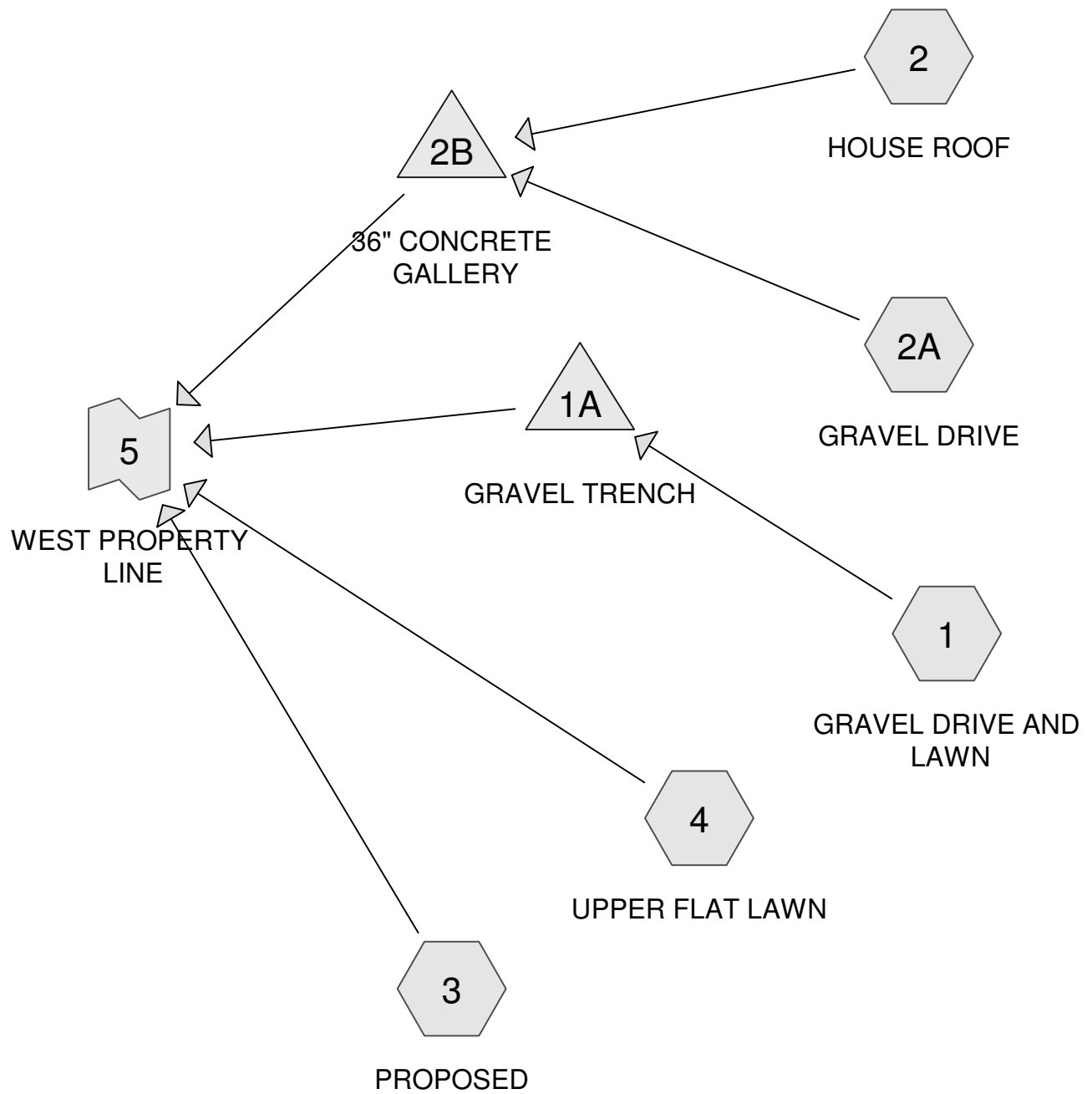
Link 6: WEST PROPERTY LINE

LLC ON NOVEMBER 9, 2023.

TH A
0-6"   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"

PROPOSED
GRAVEL SUMP
(2-3" STONE)

PROPOSED GRAVEL
SUMP
(2-3" STONE)

PROPOSED, ROW OF
RETAINING BOULDERS

RETAINING BOULDERS, SEE
DETAIL BY STRUCTURAL
CONSULTING SERVICES, P.C.

PROPOSED ROW OF
RETAINING BOULDERS

PORTION OF EXISTING
WALL TO REMAIN
(APPROX. 15' LONG)

4" PVC
OVERFLOW
INV 298.8

PROPOSED
YARD DRAIN
INFILTRATOR
OVERFLOW.
GRT 298.8

UPPER FLAT LAWN
PUMP LINE

INFILTRATION
TRENCH 3' WIDE X
2' HIGH, WITH
STEEL EDGE.

Stock Pile

PROPOSED STORM WATER
INFILTRATION SYSTEM
80 LINEAL FEET OF 36" HIGH
CONCRETE GALLERY
BOT OF GALLERY ELEV. 295.8

REFER TO PLAN BY
ENVIRONMENTAL LAND
SOLUTIONS FOR
EROSION CONTROLS.

DBOX
INV IN. 298.90
INV OUT 298.73

PROPOSED
GRAVEL SUMP
(2-3" STONE)

DRIP LINE
TRENCH

PROPOSED FOOTING DRAIN
PUMP MANHOLE
SUMP 288.0

GRASS COVER CN 74
COMPACTED FILL
8,053 SF - 535
= 7,752 SF

Lower Concrete
Slab El. = 291.54
291.3 x

EXISTING HOUSE

GRASS SWALE.
GRADE TO DRAIN

55 LF AT 5% AVG.

ROOF DRAIN   GRASS 2,459
                          SF
INV 299.35

DRIP LINE
TRENCH

INSTALL ASPHALT LIP
ON DRIVEWAY.

INV 299.60

GRAVEL
1,764 SF

TT 19 LF STEEP
S=50%

AREA OF WOODS
2,174 SF
CN 66

INFILTRATION
TRENCH 3' WIDE X
2' HIGH WITH
STEEL EDGE.

TT 120' GRASS AT 10%

Gravel Driveway

TT 58 LF WOODED
AT 3.4%

N 86° 55' 40" W
206.28'

NOW OR FORMERLY
LAND OF
ESTATE OF BRITA M. CAPPEL
47 SUGAR LOAF DRIVE
(TAX LOT 2 ON TAX MAP 35)

NOW OR FORMERLY LAND OF
VIZER
(46 SAUNDERS DRIVE
TAX LOT 12 ON TAX MAP 35)

NOW OR FORMERLY
LAND OF
MARGARET WELZ GORMLEY
50 SAUNDERS DRIVE
(TAX LOT 13 ON TAX MAP 35)

SUGARLOAF DRIVE

0   40   80

—————————— TIME OF CONCENTRATION

——————— POST-ACTIVITY
WATERSHED BREAK

2
HOUSE ROOF

2B
36" CONCRETE
GALLERY

2A
GRAVEL DRIVE

1A
GRAVEL TRENCH

5
WEST PROPERTY
LINE

1
GRAVEL DRIVE AND
LAWN

4
UPPER FLAT LAWN

3
PROPOSED

Subcat Reach Pond Link

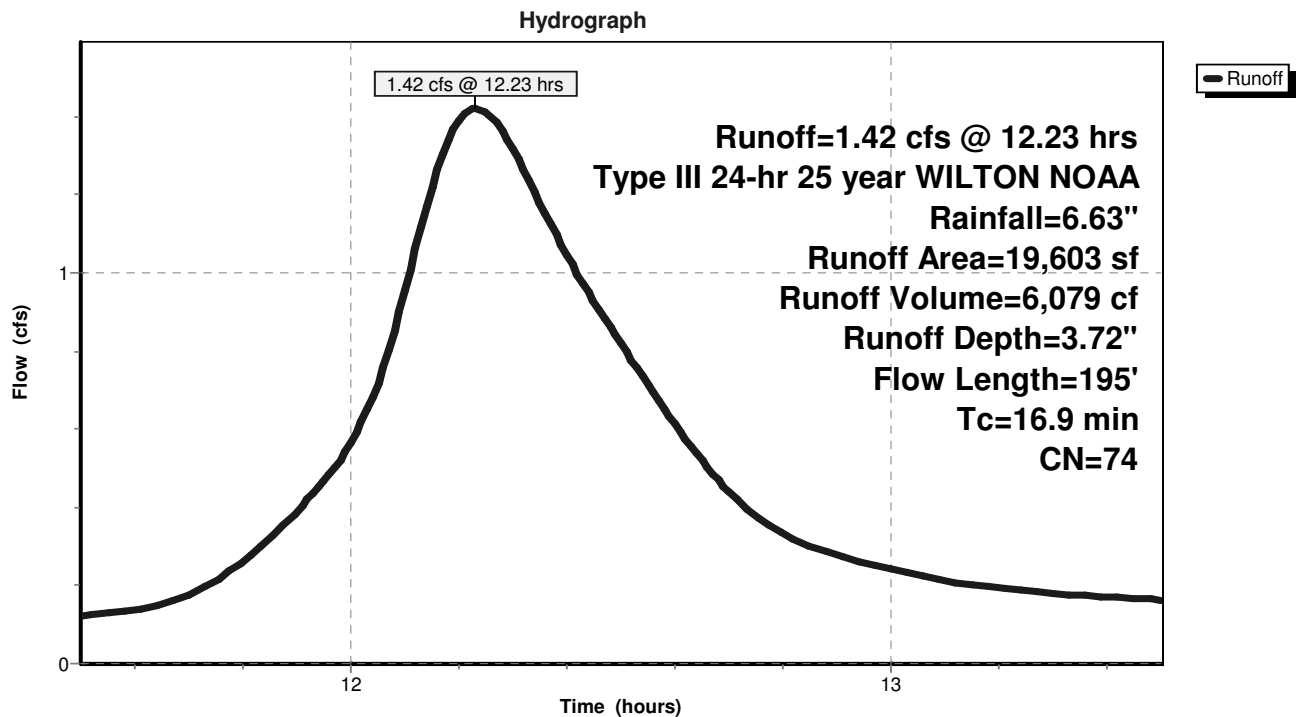## Summary for Subcatchment 1: GRAVEL DRIVE AND LAWN

Runoff   =   1.42 cfs @ 12.23 hrs, Volume=   6,079 cf, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, 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
*	2,123	85	Driveway, Gravel
*	7,752	74	>75% Grass cover, Good, HSG B
	7,554	74	>75% Grass cover, Good, HSG C
	2,174	66	Woods, Poor, HSG B
	19,603	74	Weighted Average
	19,603		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"
6.3	137	0.1000	0.36		**Sheet Flow, sheet flow across grass**
					Grass: Short n= 0.150 P2= 3.57"
16.9	195	Total			

Subcatchment 1: GRAVEL DRIVE AND LAWN

Hydrograph

Runoff=1.42 cfs @ 12.23 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=19,603 sf
Runoff Volume=6,079 cf
Runoff Depth=3.72"
Flow Length=195'
Tc=16.9 min
CN=74

1.42 cfs @ 12.23 hrs

Runoff

Summary for Pond 1A: GRAVEL TRENCH

Inflow Area =   19,603 sf,   0.00% Impervious, Inflow Depth = 3.72"   for 25 year WILTON NOAA e
Inflow   =   1.42 cfs @ 12.23 hrs, Volume=   6,079 cf
Outflow   =   1.49 cfs @ 12.24 hrs, Volume=   6,079 cf, Atten= 0%, Lag= 0.6 min
Discarded   =   0.02 cfs @   9.52 hrs, Volume=   1,568 cf
Primary   =   1.47 cfs @ 12.24 hrs, Volume=   4,511 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Peak Elev= 290.11' @ 12.24 hrs   Surf.Area= 636 sf   Storage= 350 cf
Flood Elev= 290.40'   Surf.Area= 636 sf   Storage= 350 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
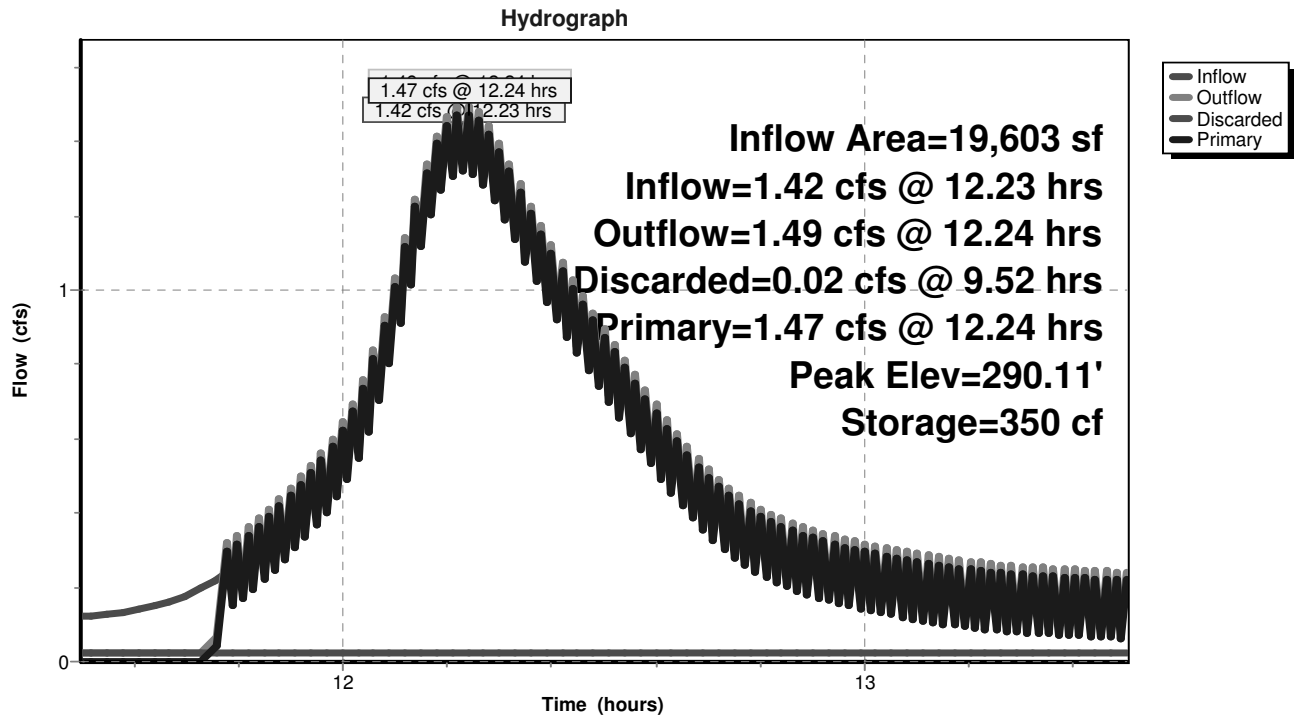Center-of-Mass det. time= 52.7 min (887.1 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1	288.00'	3 cf	**3.00'W x 135.00'L x 2.00'H Prismatoid STONE TRENCH**
			810 cf Overall x 0.4% Voids
#2	288.50'	347 cf	**3.00'W x 77.00'L x 1.50'H Prismatoid GRASS SWALE**
		350 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	290.10'	**285.0' long Sharp-Crested Rectangular Weir**
			2 End Contraction(s) 0.5' Crest Height
#2	Discarded	288.00'	**1.500 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.02 cfs @ 9.52 hrs HW=288.50'   (Free Discharge)
└—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.47 cfs @ 12.24 hrs HW=290.11' TW=0.00' (Dynamic Tailwater)
└—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.47 cfs @ 0.38 fps)

Pond 1A: GRAVEL TRENCH

Hydrograph

Legend:
- Inflow
- Outflow
- Discarded
- Primary

1.47 cfs @ 12.24 hrs
1.42 cfs @ 12.23 hrs

Inflow Area=19,603 sf
Inflow=1.42 cfs @ 12.23 hrs
Outflow=1.49 cfs @ 12.24 hrs
Discarded=0.02 cfs @ 9.52 hrs
Primary=1.47 cfs @ 12.24 hrs
Peak Elev=290.11'
Storage=350 cf

Flow (cfs)

Time (hours)

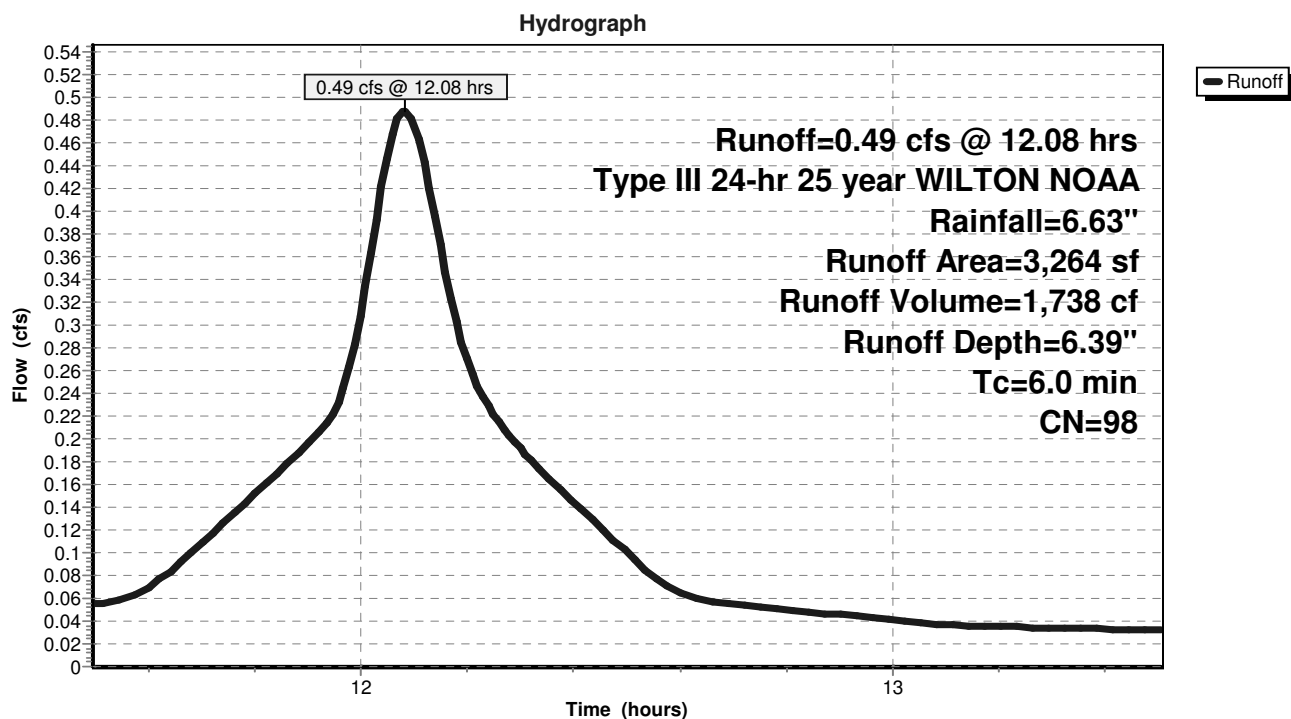## Summary for Subcatchment 2: HOUSE ROOF

Runoff   =   0.49 cfs @   12.08 hrs, Volume=   1,738 cf, Depth= 6.39"

Runoff by SCS TR-20 method, UH=SCS, 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		Impervious Area

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

Subcatchment 2: HOUSE ROOF

Hydrograph

Runoff=0.49 cfs @ 12.08 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=3,264 sf
Runoff Volume=1,738 cf
Runoff Depth=6.39"
Tc=6.0 min
CN=98

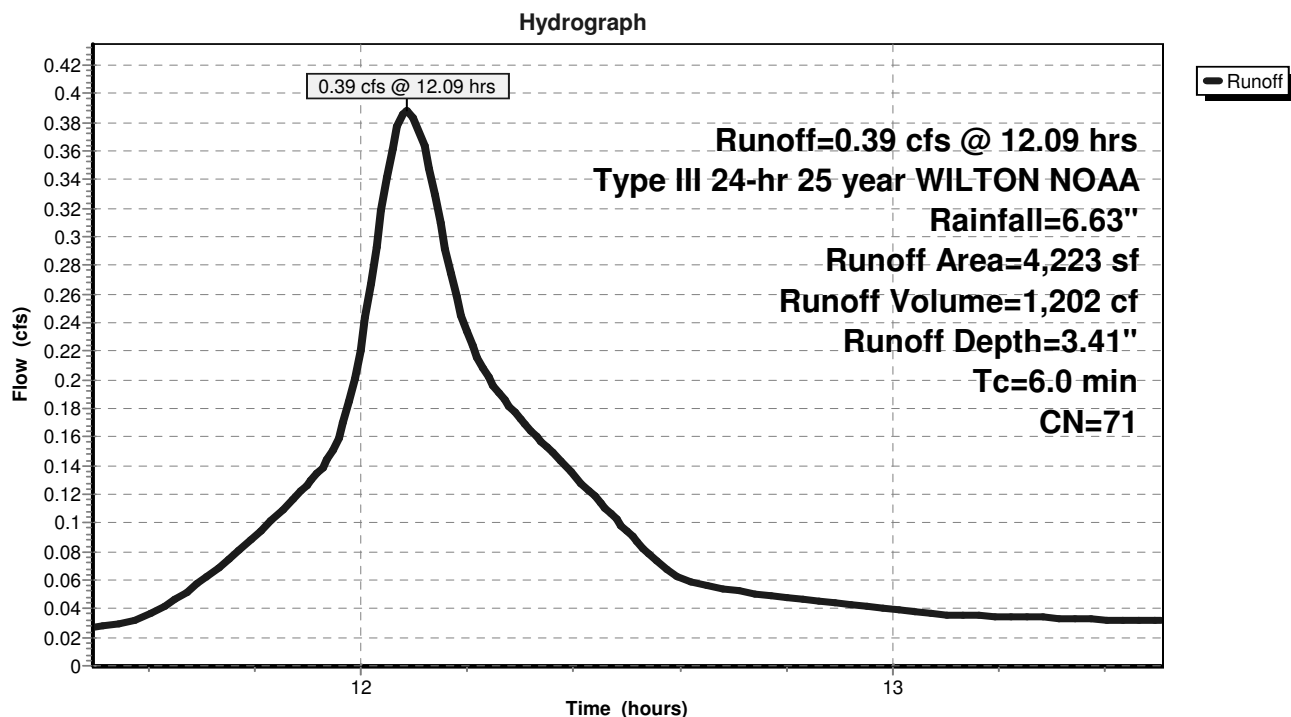## Summary for Subcatchment 2A: GRAVEL DRIVE

Runoff   =   0.39 cfs @ 12.09 hrs, Volume=   1,202 cf, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, 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
*	1,764	85	GRAVEL DRIVE
*	2,459	61	FLAT LAWN
	4,223	71	Weighted Average
	4,223		Pervious Area

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

Subcatchment 2A: GRAVEL DRIVE

Hydrograph

Runoff=0.39 cfs @ 12.09 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=4,223 sf
Runoff Volume=1,202 cf
Runoff Depth=3.41"
Tc=6.0 min
CN=71

Summary for Pond 2B: 36" CONCRETE GALLERY

Inflow Area =   7,487 sf, 43.60% Impervious, Inflow Depth = 4.71"   for 25 year WILTON NOAA e
Inflow   =   0.87 cfs @ 12.09 hrs, Volume=   2,940 cf
Outflow   =   0.49 cfs @ 12.27 hrs, Volume=   2,940 cf, Atten= 44%, Lag= 11.0 min
Discarded =   0.03 cfs @ 10.66 hrs, Volume=   2,383 cf
Primary   =   0.46 cfs @ 12.27 hrs, Volume=   557 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.05-36.00 hrs, dt= 0.01 hrs
Peak Elev= 299.98' @ 12.27 hrs   Surf.Area= 504 sf   Storage= 1,004 cf
Flood Elev= 300.00'   Surf.Area= 504 sf   Storage= 1,004 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
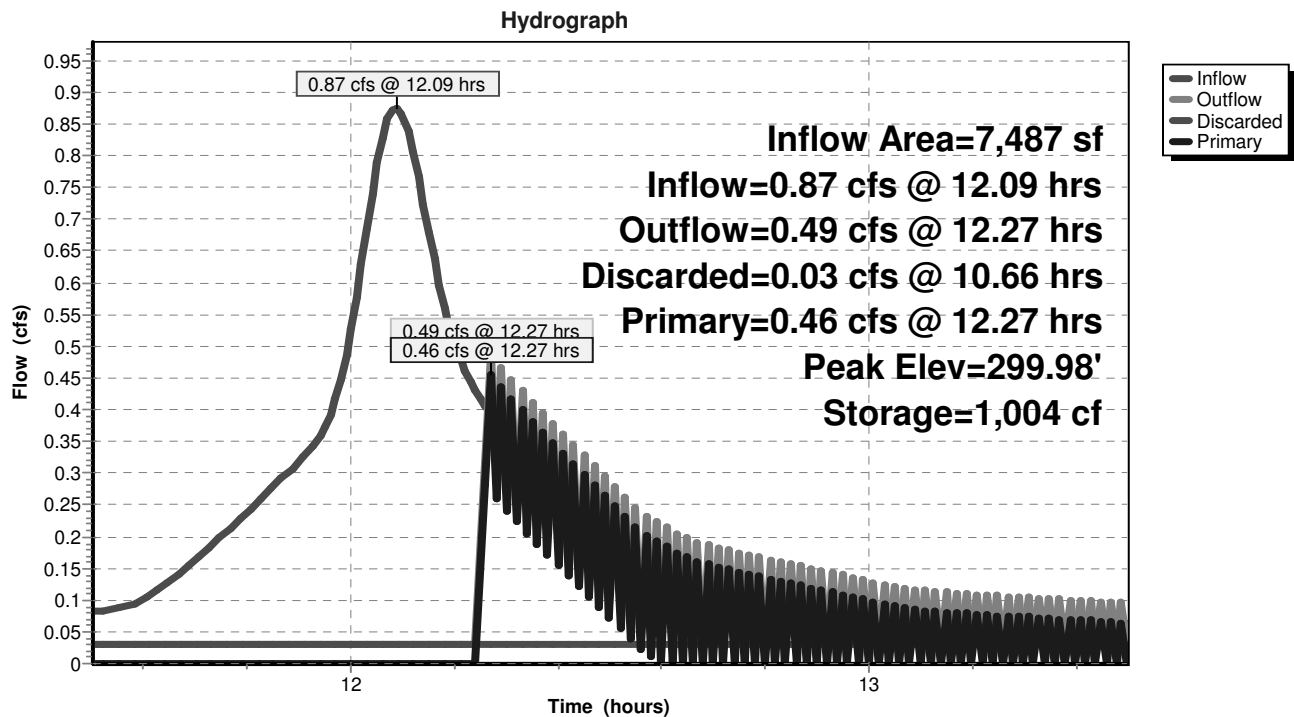Center-of-Mass det. time= 243.8 min (1,023.2 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	295.20'	380 cf	**6.00'W x 8.40'L x 3.60'H Prismatoid** x 10
			1,814 cf Overall - 865 cf Embedded = 950 cf x 40.0% Voids
#2	295.80'	624 cf	**48.0"W x 36.0"H x 8.00'L Galley 4x4x3** x 10 Inside #1
		1,004 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	295.20'	**2.630 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.03 cfs @ 10.66 hrs HW=295.25'   (Free Discharge)
└—**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.46 cfs @ 12.27 hrs HW=299.98' TW=0.00' (Dynamic Tailwater)
└—**1=Orifice/Grate** (Orifice Controls 0.46 cfs @ 5.23 fps)

Pond 2B: 36" CONCRETE GALLERY

Hydrograph

Legend: Inflow, Outflow, Discarded, Primary

0.87 cfs @ 12.09 hrs

0.49 cfs @ 12.27 hrs
0.46 cfs @ 12.27 hrs

Inflow Area=7,487 sf
Inflow=0.87 cfs @ 12.09 hrs
Outflow=0.49 cfs @ 12.27 hrs
Discarded=0.03 cfs @ 10.66 hrs
Primary=0.46 cfs @ 12.27 hrs
Peak Elev=299.98'
Storage=1,004 cf

Flow (cfs)

Time (hours)

Summary for Subcatchment 3: PROPOSED
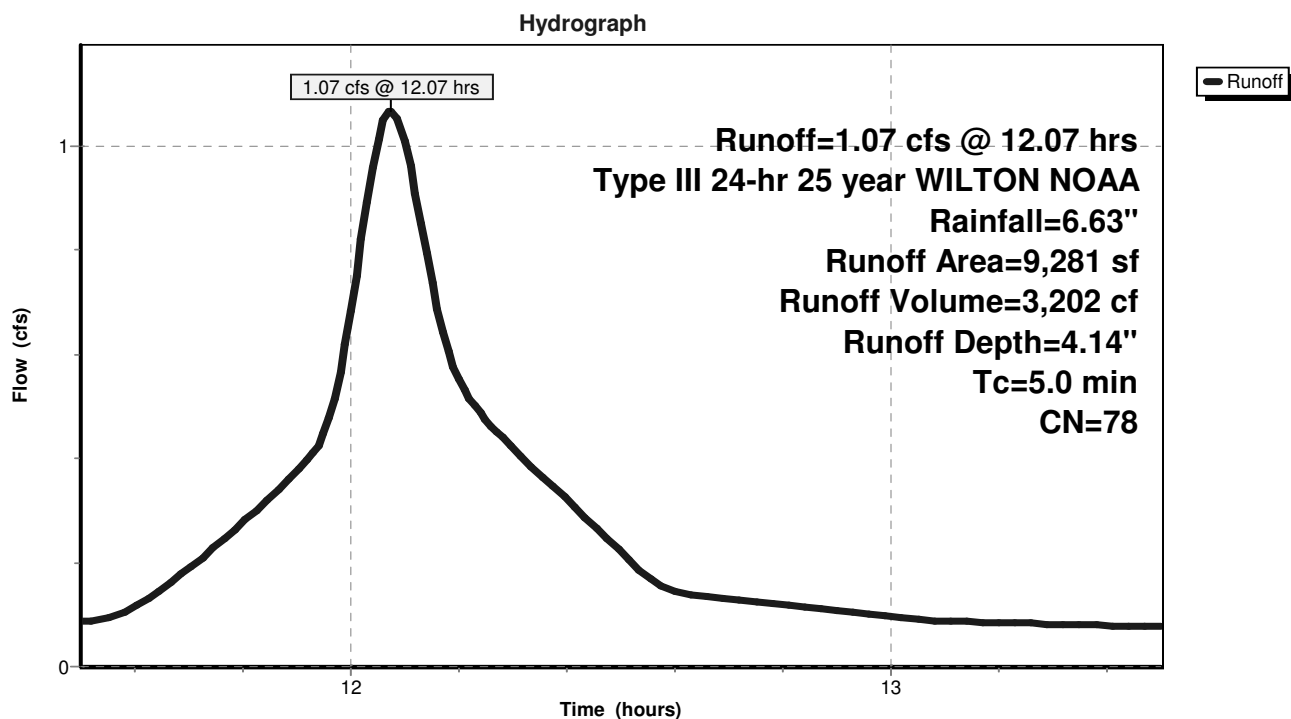
Runoff   =   1.07 cfs @   12.07 hrs, Volume=   3,202 cf, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, 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
*	9,281	78	2:1 SLOPE VEGETATED
	9,281		Pervious Area

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

Subcatchment 3: PROPOSED

Hydrograph

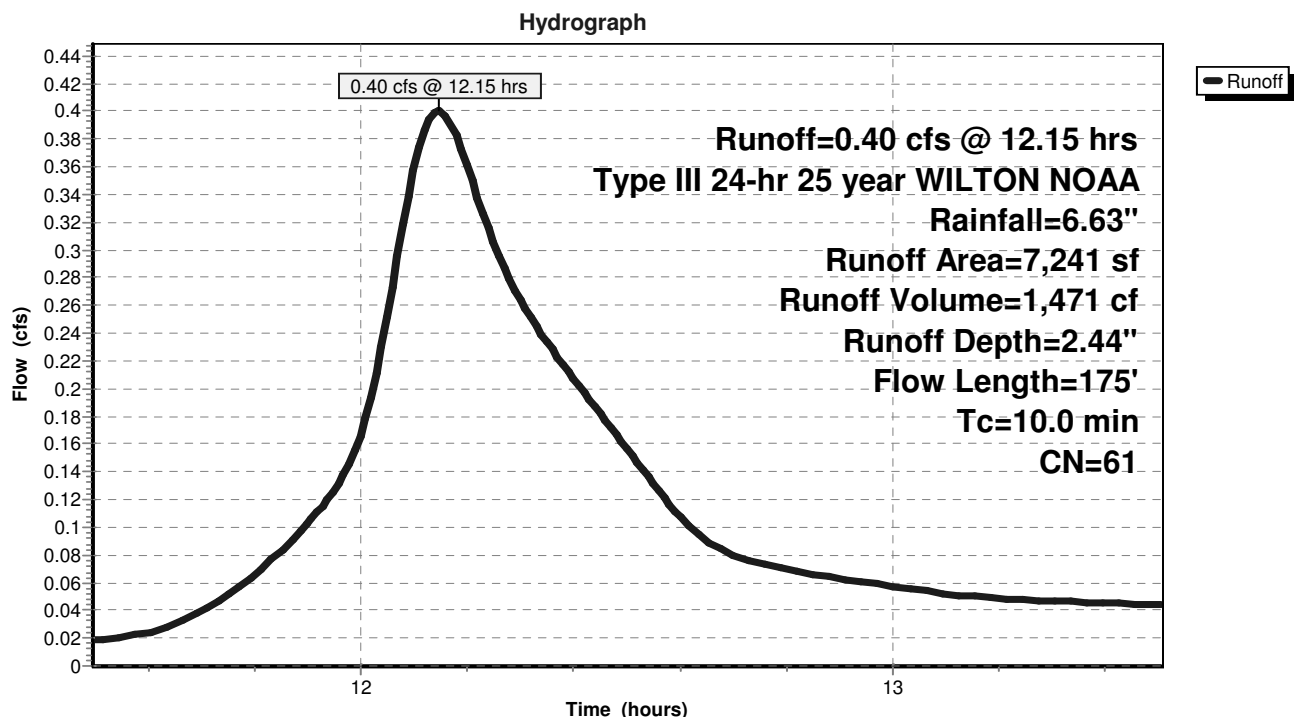## Summary for Subcatchment 4: UPPER FLAT LAWN

Runoff   =   0.40 cfs @ 12.15 hrs, Volume=   1,471 cf, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, 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
7,241	61	>75% Grass cover, Good, HSG B
7,241		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	90	0.0460	0.25		**Sheet Flow, SHEET FLOW UPPER LAWN**
					Grass: Short n= 0.150 P2= 3.57"
3.8	55	0.0550	0.24		**Sheet Flow, SHEET FLOW GRASS LOWER LAWN**
					Grass: Short n= 0.150 P2= 3.57"
0.1	30	0.5000	7.07		**Shallow Concentrated Flow, SHALL CONC FLOW STE**
					Nearly Bare & Untilled Kv= 10.0 fps
10.0	175	Total			

Subcatchment 4: UPPER FLAT LAWN

Runoff=0.40 cfs @ 12.15 hrs
Type III 24-hr 25 year WILTON NOAA
Rainfall=6.63"
Runoff Area=7,241 sf
Runoff Volume=1,471 cf
Runoff Depth=2.44"
Flow Length=175'
Tc=10.0 min
CN=61

Summary for Link 5: WEST PROPERTY LINE

Inflow Area =   43,612 sf,   7.48% Impervious, Inflow Depth =   2.68"   for 25 year WILTON NOAA e
Inflow   =   2.54 cfs @   12.26 hrs, Volume=   9,742 cf
Primary   =   2.54 cfs @   12.26 hrs, Volume=   9,742 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