TOWN OF SALISBURY
CONNECTICUT

Conservation Commission

Town of Salisbury, Conservation Commission, Application for Regulated Activity Permit

1) Applicants name: Great Falls Construction

2) Applicants home address:

3) Applicants business address: 117 Dublin Road, Falls Village, CT 06031

4) Applicants Home Phone #: Business Phone #: 860-824-7128

5) Owner of property: Name: 280 BTLR, LLC
Address: 23721 NE 48th Ave, #H7
Phone #: Okeechobee, FL 34972

Signature of property owner consenting to this application:

6) Applicants interest in the land: Contractor

7) Geographical location of property: 280-300 Between the Lakes Road

Description of the land: two lots totalling 6.7+/- acres in the RR1 Zone

Computation of wetland area or watercourse disturbance:
There will be no wetland or watercourse disturbance. There will be 0.22 acres of disturbance in the upland review area.

8) Purpose and description of the proposed activity:
Construct a driveway in upland review area.

9) Alternatives considered by applicant:
The applicant considered constructing the driveway all on Lot 280, but that would result in a steeper driveway with more disturbance in the LPOD.

Why this proposal to alter wetlands was chosen:
No wetlands will be disturbed.

10) Site plan showing existing and proposed conditions in relation to wetlands and watercourses:
(Attach map and plans to application) See attached plan

11) Names and addresses of adjacent property owners:

North: See attached plans
South:
East:
West:

12) Certification that the applicant is familiar with all the information provided in the application and is aware of the penalties for obtaining a permit through inaccurate or misleading information:

Signature: 

13) Authorization for the commissioners and agents of the Commission to inspect the property, at reasonable times, both before and after a final decision has been issued:

Signature: 

14) DEEP Reporting Form 22A-39-14 provided by applicant (Rev. 3/2013)

15) Any other information the Commission deems necessary to the understanding of what the applicant is proposing:

16) Section 7.6 Requirements, if stipulated by agent

17) Filing Fee: As defined in current Regulations

18) For activities involving a significant activity as determined by the Commission and defined in Section 2 of the regulations the provisions of Article 7.6 must be submitted with the application. (Attach documents).

19) If the affected property is within 500 feet of an adjacent municipality the applicant is responsible for providing documentation that the provisions of 8.9 of the regulations have been satisfied: (Attach documents).

DATE FILED: _____

DATE RECEIVED BY COMMISSION: _____

ACTION: a) INSIGNIFICANT ACTIVITY

CONDITIONS:

DATE OF APPROVAL:

b) SIGNIFICANT ACTIVITY

PUBLIC HEARING DATE:

PUBLIC HEARING DATE + 65 DAYS:

CHECK LIST:

A. PUBLIC NOTICE: DATES PUBLISHED:

B. PROOF THAT APPLICANT HAS MAILED COPIES OF PUBLIC NOTICE TO ABUTTING PROPERTY OWNERS:

C. PROOF OF PROVISIONS OF SECTION 8.2 (IF APPLICABLE):

Introduction and Existing Conditions

This project is located at 280 Between the Lakes Road, which lies on the western side of the road. The property consists of 4.406 acres in the RR-1 Zone. There is a small, isolated wetlands area on the east side of the property. A significant portion of the property lies with the Town of Salisbury Lake Protective Overlay District (LPOD). The grades range from mild (3%) to moderate (13%). This parcel is predominately open meadow. A portion of the property is encumbered by a conservation easement.

The owner also owns the adjacent parcel, 300 Between the Lakes Road, which includes an existing house and garage on 2.262 acres. There is a wetlands area on the western side of the property. There is a mixture of open and wooded areas on this parcel.

Proposal

The applicant intends to construct a new house. Included in the proposal are typical features of a single-family lot development such as septic system, paved driveway, well, and associated earthwork. In addition, the house will use a geothermal heating system. The geothermal system requires several wells. All of the work except for a portion of the driveway will be on Lot 280.

All of the activity will take place outside of the wetlands, outside of the conservation easement area, and above the Ordinary High Water associated with Lake Washining. Only the septic system lies within the LPOD.

Impacts to Wetlands and Upland Review Area

The activity has no direct wetland impact. There will be 0.22 acres of impact within the upland review area. This work is associated with the driveway.

Impact within the Lake Protective Overlay District

All activity except for the septic system and some of the geothermal wells is outside of the LPOD. The septic system wells are over 260 feet away from the Ordinary High Water line, well beyond the 150-foot regulatory setback for the septic system. The area impacted within the LPOD is 5,200 SF.

Alternatives

The applicant considered constructing the driveway entirely on Lot 280, however that would result in a steeper driveway and more impact within the LPOD.

Erosion Control

The plan includes a detailed erosion control plan and narrative. Total disturbance is approximately 1.5 acres.

Stormwater Management

The work includes a rain garden to capture and treat runoff before it reaches the wetlands to the west of the activity. The rain garden is designed to hold the Water Quality Volume. A Stormwater report is attached.

State Reporting Form and Location Map

Connecticut Department of ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ___ ___ ___ ___ ___ ___ ___ ___ ___
For DEEP Use Only

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions.
If completing by hand - please print and use the pdf version.
Incomplete or incomprehensible forms will be mailed back to the municipal inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: **Click Here for Year** month: **Click Here for Month**
2. CHOOSE ACTION TAKEN (see instructions for code): **Click Here to Choose a Code**
3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:

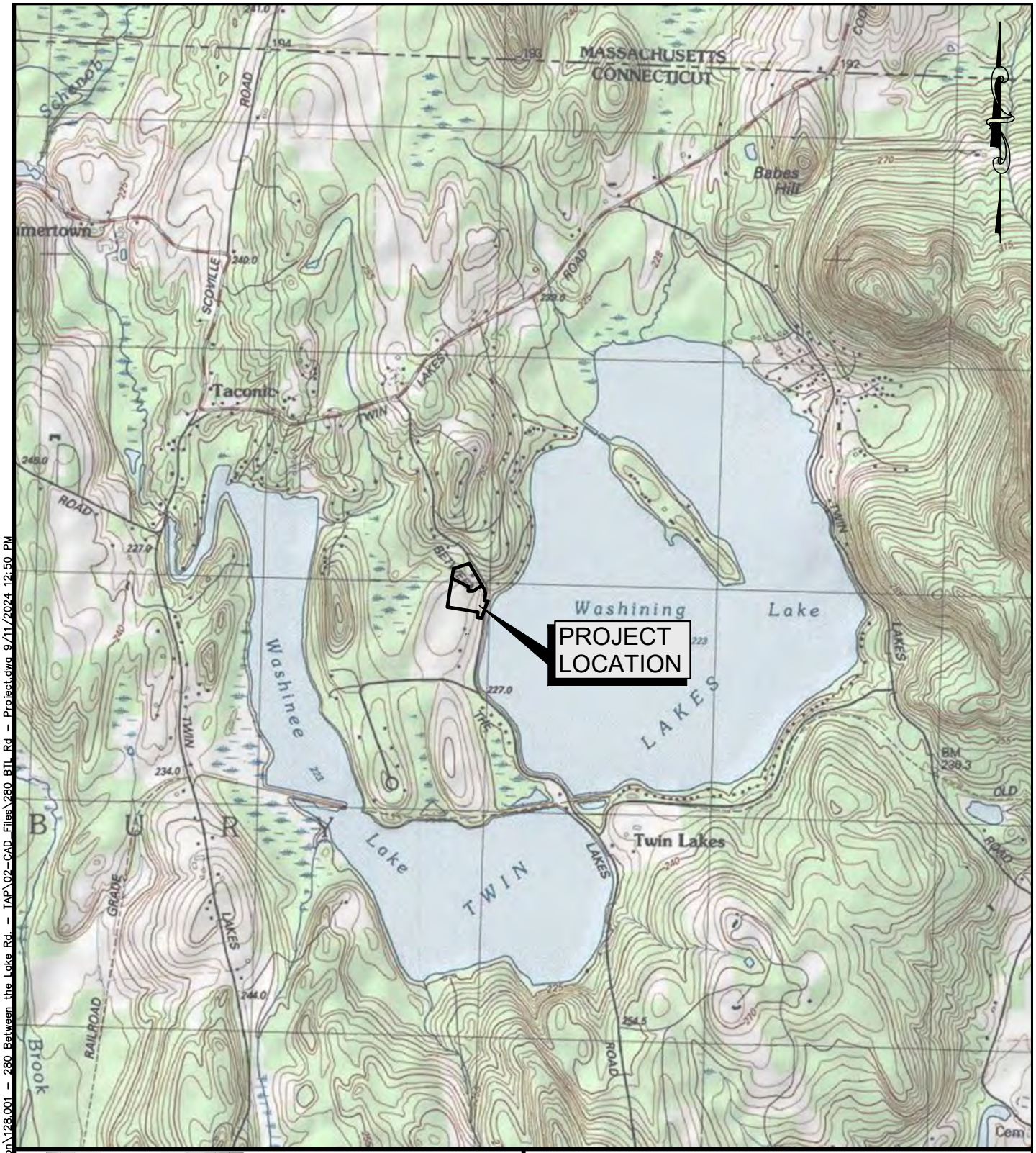
   (type name) _____ (signature) _____

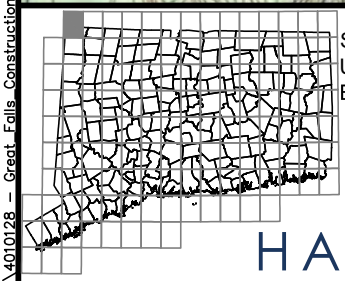
PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTIVITY IS OCCURRING (type name): **Salisbury**
   does this project cross municipal boundaries (check one)? yes ☐ no ☐
   if yes, list the other town(s) in which the activity is occurring (type name(s)): _____, _____
6. LOCATION (click on hyperlinks for information): USGS quad map name: **Bashi Bish Falls, MA** or quad number: **1**
   subregional drainage basin number: **6002**
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (type name): **Great Falls Construction**
8. NAME & ADDRESS OF ACTIVITY / PROJECT SITE (type information): **280-300 Between the Lakes Road, Salisbury**
   briefly describe the action/project/activity (check and type information): temporary ☐ permanent ☒ description: **Construct new house and driveway**
9. ACTIVITY *PURPOSE* CODE (see instructions for code): **B**
10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): **9**, **12**, **Click for Code**, **Click for Code**
11. WETLAND / WATERCOURSE AREA ALTERED (see instructions for explanation, type acres or linear feet as indicated):
    wetlands: **0.00** acres open water body: **0.00** acres stream: **0.00** linear feet
12. UPLAND AREA ALTERED (type acres as indicated): **0.22** acres
13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (type acres as indicated): **0.00** acres

DATE RECEIVED: **PART III: To Be Completed By The DEEP** DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO FORM CORRECTED / COMPLETED: YES NO





Source:
USGS TOPOGRAPHIC MAP
BASH BISH FALLS, MA QUADRANGLE

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
WWW.HALEYWARD.COM

LOCATION MAP

280 BTLR LLC

280-300 BETWEEN THE LAKE ROAD

SALISBURY CT

Scale 1:24000

P:\CT\4010128 – Great Falls Construction\128.001 – 280 Between the Lake Rd. – TAP\02-CAD Files\280 BTL Rd – Project.dwg 9/11/2024 12:50 PM

Soil Report

JAY FAIN & ASSOCIATES, LLC
Environmental Consulting Services

Jay Fain
Principal
elmst@optonline.net

Victoria Landau
Principal, ASLA
vplandau@optonline.net

2000 Post Road
Suite 201
Fairfield, CT 06824
203 254-3156
jfassociates@optonline.net

SOILS MAPPING & WETLAND/WATERCOURSE DELINEATION REPORT
300 BETWEEN THE LAKES RD, SALISBURY, CT 06068

PROPERTY LOCATION AND DESCRIPTION:

LAND USE: **Vacant/Small cottage/Open** ACRES: **6.0±**

ADDRESS: **300 Between the Lakes Rd. Salisbury, CT 06068**

REPORT COMPLETED FOR:

NAME: Lenore Mallett

MAILING ADDRESS: lmallett@wpsir.com

WETLANDS/WATERCOURSE JURISDICTION

The Inland Wetlands and Watercourses Act (Connecticut General Statutes §22a-38) define inland wetlands as "land, including submerged land, which consists of any soil types designated as poorly drained, very poorly drained, alluvial, and floodplain." Water courses are defined in the act as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof."

MAPPING AND DELINEATION METHODOLOGY

Soils analysis, as described in this report, is intended as an inventory and evaluation of the existing soil characteristics on the subject property. A first order soil survey in accordance with the principles and practices noted in the USDA publication *Soil Survey Manual* (1993) was completed at the site. Soil units mapped in the field correspond with those in the USDA publication *Soil Survey of Connecticut*.

Wetland identification was based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land (e.g. a pond). These and other soil types were identified by observation of soil morphology (soil texture, color, structure, etc.). To observe the morphology of the property's soils, numerous two-foot deep test pits and/or hand borings were completed throughout the site. Transects were located perpendicular to and at representative points along the perceived boundaries of the wetland areas identified on the property. Soil morphologies were observed at soil sampling points along the transects. Sampling began well outside the bounds of the wetland and continued towards it until inland wetland soils were observed. This point on each transect was marked (flagged) with an orange surveyor's tape labeled "Wetland Boundary". The complete boundary of every wetland area is located along the lines that connect these sequentially numbered boundary points.

Intermittent watercourses were delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation. Surveyor's tape, which was labeled "Wetland Boundary" and sequentially numbered, was placed at critical points to demarcate the boundary of each delineated watercourse.

The wetland and watercourse boundaries are subject to change until adopted by local or state regulatory agencies.

DATE AND CONDITIONS AT TIME OF INSPECTION

DATE: March 15, 2022 INSPECTED BY: Jay Fain

WEATHER: Warm, Sunny

SOIL MOISTURE CONDITIONS: ☐ DRY ☒ MOISTURE ☐ WET FROST DEPTH: N/A SNOW DEPTH: 0"

CERTIFICATION

JAY FAIN, PRINCIPAL, SOIL SCIENTIST

WETLAND/WATERCOURSE IDENTIFIED

FLAG NUMBERS	WETLAND TYPE	SOIL TYPE	COMMENTS
1-9	Scrub	Rn – Ridgebury, Leicester, and Whitman soils, extremely stony	-
25-32	Lake	Open Water	High Water
50-60	Swale	Rn – Ridgebury, Leicester, and Whitman soils, extremely stony	Along Road Frontage

SOIL MAP UNITS

Each soil map unit that was identified on the property represents a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of the map unit. The mapped units are identified in the following table by name and symbol and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope) of each unit are provided. These are generally the primary characteristics to be considered in land use planning and management. A narrative that defines each characteristic and describes their land use implications follows the table. Complete descriptions of each soil map unit can be found in the *Soil Survey of Connecticut*.

UPLAND SOILS

SOIL		PARENT MATERIAL	SLOPE %	DRAINAGE CLASS	HIGH WATER TABLE			DEPTH TO BEDROCK (in)
SYM.	NAME				DEPTH (ft)	KIND	MOS.	
90B	Stockbridge Loam	Coarse-Loamy Till Derived From Limestone and Dolomite and/or Schist	3-8	Well drained	>6.0	-	-	>72

WETLAND SOILS

SOIL		PARENT MATERIAL	SLOPE %	DRAINAGE CLASS	HIGH WATER TABLE			DEPTH TO BEDROCK (in)
SYM.	NAME				DEPTH (ft)	KIND	MOS.	
3 (Rn)	Ridgebury	Compact Glacial Till	0-8	Poorly Drained	0.0-1.5	Perched	Nov-May	>60
	Leicester							
	Whitman	Loose Glacial Till	0-3	Poorly Drained	0.0-1.5	Apparent	Nov-May	>60
	Extremely stony fine sandy loam	Compact Glacial Till	0-3	Very Poorly Drained	0.0-0.5	Perched	Sep-Jun	>60

SOIL CHARACTERISTICS: DEFINITIONS AND LAND USE IMPLICATIONS

PARENT MATERIAL: Parent material is the unconsolidated organic and mineral material in which soil forms. Soil inherits characteristics, such as mineralogy and texture, from its parent material. Glacial till is unsorted, nonstratified glacial drift consisting of clay, silt, sand and boulders transported and deposited by glacial ice. Glacial outwash consists of gravel, sand and silt, which is commonly stratified, deposited by glacial melt water. Alluvium is material such as sand, silt or clay deposited on land by streams. Organic deposits consist of decomposed plant and animal parts.

A soil's texture affects the ease of digging, filling and compacting and the permeability of a soil. Generally, sand and gravel soils, such as outwash soils, have higher permeability rates than most glacial till soils. Soil permeability affects the cost to design and construct subsurface sanitary disposal facilities and, if too slow or too fast, may preclude their use. Outwash soils are generally excellent sources of natural aggregates (sand and gravel) suitable for commercial use, such as construction subbase material. Organic layers in soils can cause movement of structural footings. Compacted glacial till layers make excavating more difficult and may preclude the use of subsurface sanitary disposal systems or increase their design and construction costs if fill material is required.

SLOPE: Generally, soils with steeper slopes increase construction costs, increase the potential for erosion and sedimentation impacts, and reduce the feasibility of locating subsurface sanitary disposal facilities.

DRAINAGE CLASS: Drainage class refers to the frequency and duration of periods of soil saturation or partial saturation during soil formation. Seven classes of natural drainage classes exist. They range from excessively drained, where water is removed from the soil very rapidly, to very poorly drained, where water is removed so slowly that free water remains at or near the soil surface during most of the growing season. Soil drainage affects the type and growth of plants found in an area. When landscaping or gardening, drainage class information can be used to assure that proposed plants are adapted to existing drainage conditions or that necessary alterations to drainage conditions (irrigation or drainage systems) are provided to assure plant survival.

HIGH WATER TABLE: High water table is the highest level of a saturated zone in the soil in most years. The water table can affect when shallow excavations can be made; the ease of the excavations, construction, and grading; and the supporting capacity of the soil. Shallow water tables may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

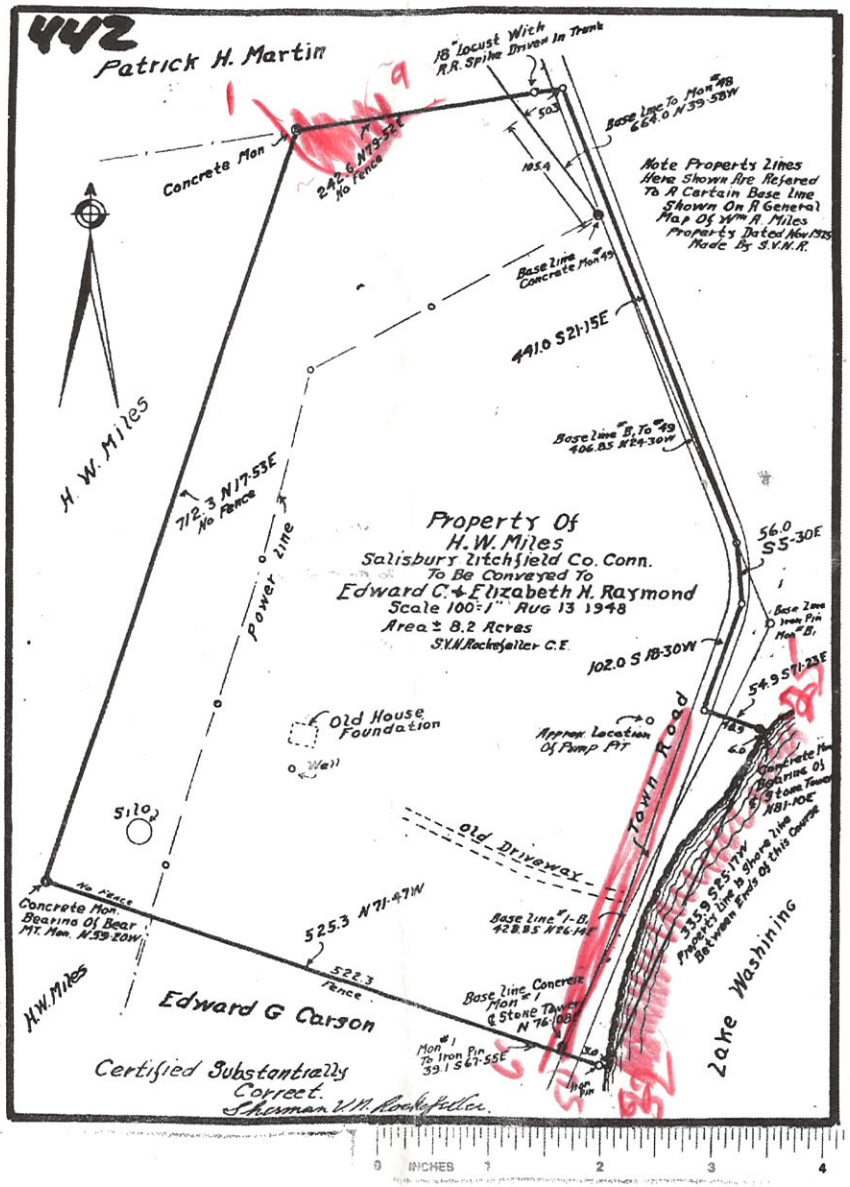
DEPTH TO BEDROCK: The depth to bedrock refers to the depth to fixed rock. Bedrock depth affects the ease and cost of construction, such as digging, filling, compacting and planting. Shallow depth bedrock may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

1 - 9

25 - 32 HW

50 - 60

INSTR#: 442 09/11/1948 MAP Image: 1 of 1

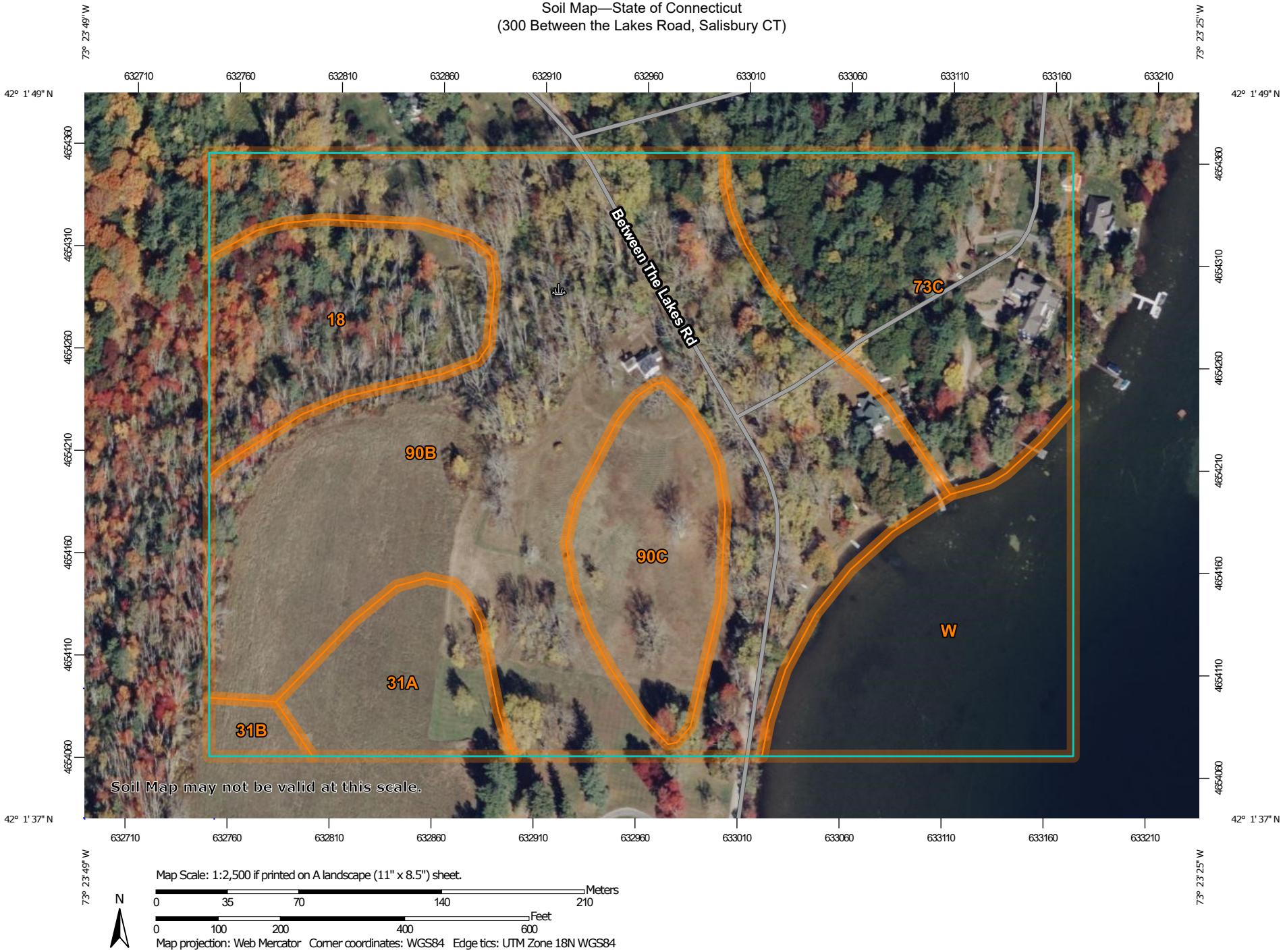


Wetland Sketch Map

JFA

3/14/22

Soil Map—State of Connecticut
(300 Between the Lakes Road, Salisbury CT)



Map Scale: 1:2,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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 21, Sep 7, 2021

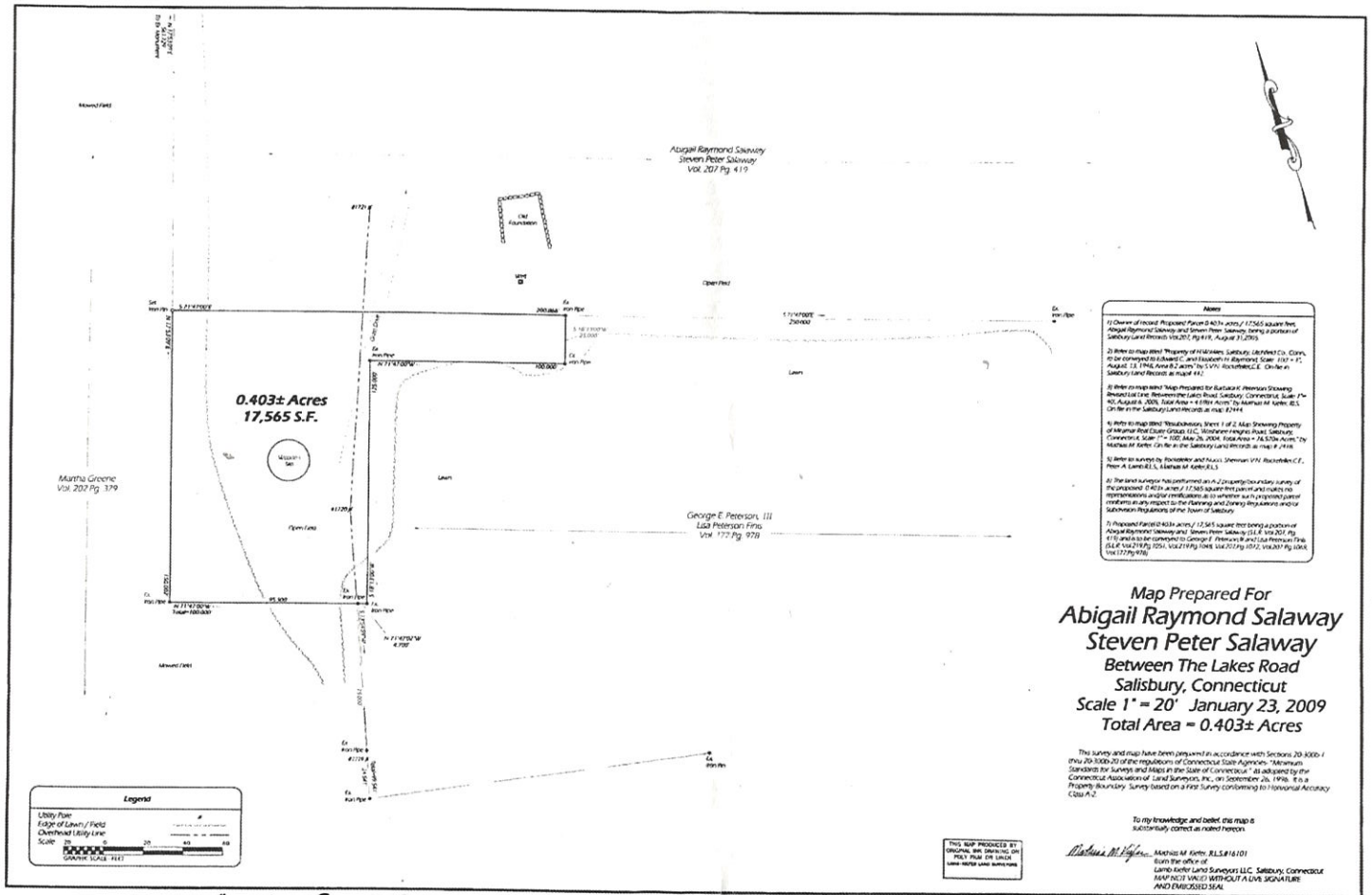
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

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
18	Catden and Freetown soils, 0 to 2 percent slopes	2.9	9.5%
31A	Copake fine sandy loam, 0 to 3 percent slopes	1.7	5.6%
31B	Copake fine sandy loam, 3 to 8 percent slopes	0.3	0.9%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	5.0	16.0%
90B	Stockbridge loam, 3 to 8 percent slopes	14.7	47.3%
90C	Stockbridge loam, 8 to 15 percent slopes	2.3	7.5%
W	Water	4.1	13.3%
Totals for Area of Interest		**31.0**	**100.0%**



DRAWING NUMBER 2548

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER 2548

MAP # 2548 Rec'd for Record March 11, 2009 RBLamb, Asst. T.C.

Drainage Calculations

HALEY WARD

ENGINEERING | ENVIRONMENTAL | SURVEYING

Stormwater Report

New Residence

280 Between the Lakes Road
Salisbury, Connecticut

PREPARED FOR:
Great Falls Construction

Corporate Office
One Merchants Plaza
Suite 701
Bangor, ME 04401
T: 207.989.4824
F: 207.989.4881

HALEYWARD.COM

September 10, 2024
JN: 4010128.001

Report Prepared By:
Haley Ward, Inc.
140 Willow Street, Suite 8 | Winsted, Connecticut 06098

STORMWATER REPORT
280 Between the Lakes Road,
Salisbury, CT

I. Introduction

The owner of 280-300 Between the Lakes Road in Salisbury, CT proposes to build new residence on the property. Haley Ward performed a hydrologic and hydraulic analysis to design a storm sewer pipe and rain garden. This report summarizes our design and calculations.

II. Post Development Hydrology

The proposed drainage system is made up of one storm sewer pipe and one rain garden. Accordingly, Haley Ward delineated watersheds for each. The watershed map can be found in Exhibit A.

Land cover categories were broken into the following classifications:

- Impervious
- Open Space (HSG-B)

We used the USDA-Natural Resources Conservation Resource, Web Soil Survey to establish the Hydrologic Soil Group (HSG) within each watershed. Haley Ward selected runoff coefficient that best suited either the HSG or land cover type. We used Section 6.9-5 of the ConnDOT *Drainage Manual* to appropriately choose runoff coefficients for this site. Exhibit C contains the runoff coefficients for each watershed.

Haley Ward downloaded extreme precipitation tables from NOAA Atlas 14 site. Exhibit B contains the precipitation data values we used in our analysis for the 2-year through 100-year recurrence intervals. We then utilized *Hydraflow Storm Sewers* IDF Curve generator tool to develop rainfall intensities for each recurrence interval. The following table summarizes the values we input into *Hydraflow Storm Sewers:*

Recurrence Interval	5 Minute Duration	15 Minute Duration	60 Minute Duration
2-Year	0.397 inches	0.662 inches	1.16 inches
100-Year	0.870 inches	1.45 inches	2.55 inches

Exhibit B contains the IDF curve that was used for our analysis.

The watersheds to the yard drain and rain garden are small enough to assume a time of concentration (Tc) of 5 minutes which is considered a minimum value in the ConnDOT Drainage Manual.

140 WILLOW ST STE 8, WINSTED, CT 06098 860.379.6669 | HALEYWARD.COM

III. Storm Sewer Design

Haley Ward used *Hydraflow Storm Sewers* software to design a storm sewer that will collect runoff from the roof and a portion of the driveway and convey it to the rain garden.

The Rational Method and methodology outlined in the ConnDOT *Drainage Manual* was utilized to predict peak discharge rates and model the hydraulic conditions in the pipe. The storm sewer is sized to collect and convey a 10-year flood, which is a standard in the industry.

Exhibit D contains our data input and the results of our hydraulic analysis.

IV. Rain Garden Design

Haley Ward referred to CTDEEP *Storm Water Quality Manual* for methodology on calculating the water quality volume (WQV) for each watershed.

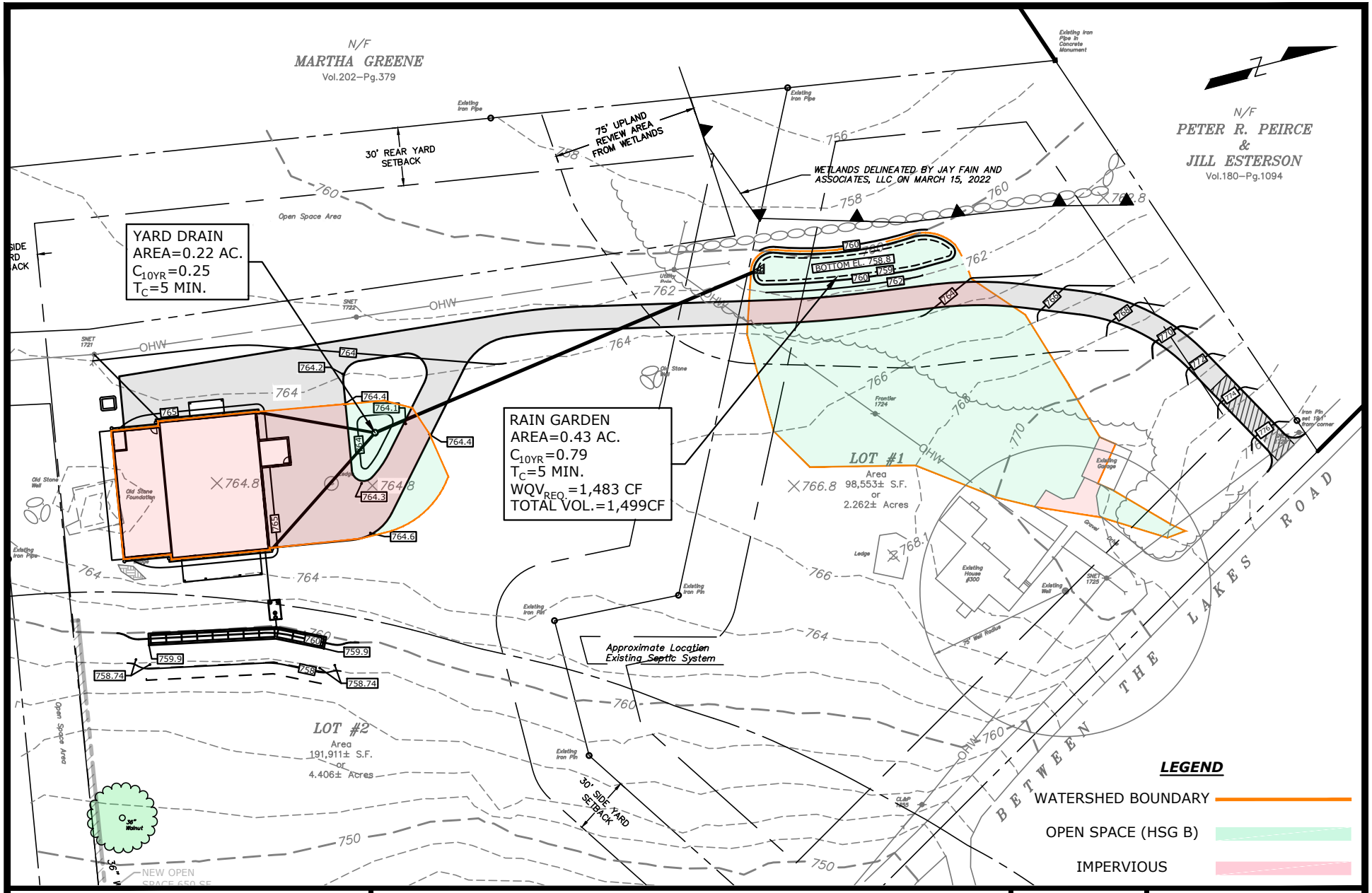
To achieve the required treatment volume, a trial-and-error process was applied. Contours were preliminarily drafted, and the areas were generated using *AutoCAD* software. The volume of each rain garden was calculated using the average-end-area method. Next, we adjusted the horizonal and vertical dimensions of the rain garden until the overall volume of the treatment system exceeded the WQV.

Exhibit E contains our calculations for determining WQV and rain garden volume.

EXHIBIT A

WATERSHED MAP

140 WILLOW ST STE 8, WINSTED, CT 06098 860.379.6669 | HALEYWARD.COM



FILE LOCATION: P:\CT\4010128 - GREAT_FALLS_CONSTRUCTION\128.001 - 280 BETWEEN THE LAKE RD. - TAP\02-CAD_FILES\280 BTL RD - PROJECT.DWG, 2024.09.10, 1:05 PM

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PROJECT	280 BETWEEN THE LAKES ROAD SALISBURY, CONNECTICUT
TITLE	WATERSHED MAP
DATE	2024.09.10
SCALE	AS NOTED
DRAWN BY	CG
PROJECT No.	4010128.001
DRAWING No.	**EXHIBIT A**

EXHIBIT B

NOAA Atlas 14 Data

140 WILLOW ST STE 8, WINSTED, CT 06098 860.379.6669 | HALEYWARD.COM

NOAA Atlas 14, Volume 10, Version 3
Location name: Salisbury, Connecticut, USA*
Latitude: 42.0259°, Longitude: -73.3937°
Elevation: 738 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 (0.259-0.438)	0.397 (0.306-0.518)	0.497 (0.382-0.650)	0.580 (0.443-0.763)	0.694 (0.513-0.952)	0.781 (0.566-1.09)	0.870 (0.612-1.26)	0.966 (0.649-1.44)	1.10 (0.711-1.70)	1.20 (0.761-1.90)
10-min	0.477 (0.367-0.620)	0.563 (0.433-0.734)	0.704 (0.540-0.920)	0.821 (0.626-1.08)	0.983 (0.727-1.35)	1.11 (0.802-1.55)	1.23 (0.867-1.79)	1.37 (0.919-2.04)	1.56 (1.01-2.41)	1.70 (1.08-2.69)
15-min	0.561 (0.432-0.730)	0.662 (0.510-0.863)	0.828 (0.635-1.08)	0.967 (0.738-1.27)	1.16 (0.855-1.59)	1.30 (0.942-1.82)	1.45 (1.02-2.10)	1.61 (1.08-2.40)	1.83 (1.18-2.83)	2.00 (1.27-3.17)
30-min	0.769 (0.592-1.00)	0.909 (0.700-1.18)	1.14 (0.874-1.49)	1.33 (1.02-1.75)	1.59 (1.18-2.18)	1.79 (1.30-2.51)	2.00 (1.40-2.90)	2.22 (1.49-3.31)	2.52 (1.63-3.90)	2.76 (1.75-4.37)
60-min	0.977 (0.753-1.27)	1.16 (0.890-1.51)	1.45 (1.11-1.90)	1.69 (1.29-2.23)	2.03 (1.50-2.78)	2.28 (1.66-3.20)	2.55 (1.79-3.69)	2.83 (1.90-4.22)	3.22 (2.08-4.97)	3.52 (2.23-5.57)
2-hr	1.28 (0.993-1.66)	1.49 (1.15-1.93)	1.82 (1.40-2.37)	2.10 (1.61-2.74)	2.48 (1.84-3.38)	2.77 (2.01-3.85)	3.06 (2.16-4.42)	3.38 (2.28-5.03)	3.82 (2.48-5.89)	4.17 (2.64-6.56)
3-hr	1.47 (1.14-1.90)	1.71 (1.32-2.20)	2.09 (1.61-2.71)	2.40 (1.85-3.13)	2.84 (2.12-3.86)	3.17 (2.31-4.41)	3.51 (2.49-5.07)	3.88 (2.62-5.76)	4.42 (2.88-6.80)	4.85 (3.08-7.62)
6-hr	1.80 (1.40-2.31)	2.13 (1.66-2.74)	2.67 (2.08-3.45)	3.12 (2.41-4.05)	3.74 (2.81-5.10)	4.20 (3.10-5.87)	4.70 (3.38-6.85)	5.29 (3.58-7.84)	6.20 (4.04-9.51)	6.97 (4.44-10.9)
12-hr	2.11 (1.65-2.69)	2.61 (2.04-3.34)	3.43 (2.68-4.40)	4.11 (3.19-5.31)	5.05 (3.82-6.90)	5.73 (4.27-8.05)	6.49 (4.75-9.58)	7.47 (5.07-11.0)	9.05 (5.91-13.9)	10.4 (6.68-16.3)
24-hr	2.41 (1.90-3.07)	3.09 (2.43-3.93)	4.20 (3.29-5.36)	5.11 (3.99-6.57)	6.38 (4.86-8.72)	7.29 (5.48-10.3)	8.32 (6.15-12.3)	9.70 (6.60-14.3)	12.0 (7.84-18.3)	14.0 (8.99-21.8)
2-day	2.75 (2.18-3.48)	3.55 (2.81-4.50)	4.85 (3.82-6.17)	5.93 (4.65-7.58)	7.41 (5.68-10.1)	8.48 (6.41-11.9)	9.70 (7.22-14.4)	11.3 (7.74-16.7)	14.1 (9.26-21.5)	16.6 (10.7-25.7)
3-day	3.01 (2.39-3.80)	3.87 (3.07-4.88)	5.27 (4.16-6.68)	6.43 (5.05-8.20)	8.02 (6.17-10.9)	9.18 (6.96-12.9)	10.5 (7.83-15.5)	12.3 (8.38-18.0)	15.2 (10.0-23.2)	17.9 (11.6-27.8)
4-day	3.24 (2.58-4.08)	4.14 (3.29-5.22)	5.61 (4.45-7.10)	6.84 (5.39-8.70)	8.52 (6.56-11.6)	9.74 (7.39-13.6)	11.1 (8.31-16.4)	13.0 (8.89-19.0)	16.1 (10.6-24.5)	18.9 (12.2-29.3)
7-day	3.86 (3.08-4.83)	4.86 (3.88-6.09)	6.49 (5.16-8.18)	7.85 (6.21-9.95)	9.72 (7.50-13.1)	11.1 (8.42-15.4)	12.6 (9.41-18.4)	14.6 (10.0-21.3)	18.0 (11.9-27.2)	21.0 (13.6-32.3)
10-day	4.49 (3.60-5.62)	5.54 (4.44-6.94)	7.26 (5.79-9.12)	8.68 (6.89-11.0)	10.6 (8.23-14.3)	12.1 (9.18-16.7)	13.7 (10.2-19.9)	15.8 (10.9-22.9)	19.1 (12.7-28.9)	22.1 (14.4-34.1)
20-day	6.55 (5.28-8.15)	7.65 (6.15-9.52)	9.43 (7.56-11.8)	10.9 (8.70-13.7)	13.0 (10.0-17.2)	14.5 (11.0-19.7)	16.1 (11.9-23.0)	18.1 (12.6-26.2)	21.3 (14.2-32.0)	24.0 (15.6-36.9)
30-day	8.29 (6.70-10.3)	9.41 (7.59-11.7)	11.2 (9.03-14.0)	12.7 (10.2-16.0)	14.8 (11.5-19.5)	16.4 (12.4-22.1)	18.0 (13.3-25.4)	20.0 (13.9-28.8)	22.8 (15.2-34.2)	25.2 (16.4-38.6)
45-day	10.4 (8.45-12.9)	11.6 (9.38-14.3)	13.5 (10.9-16.8)	15.1 (12.1-18.9)	17.3 (13.4-22.5)	18.9 (14.3-25.3)	20.6 (15.1-28.6)	22.4 (15.6-32.2)	24.8 (16.7-37.1)	26.7 (17.5-40.9)
60-day	12.2 (9.90-15.0)	13.4 (10.9-16.6)	15.4 (12.5-19.1)	17.1 (13.8-21.4)	19.4 (15.0-25.2)	21.2 (16.0-28.1)	23.0 (16.7-31.5)	24.6 (17.2-35.3)	26.7 (18.0-39.8)	28.2 (18.4-43.1)

[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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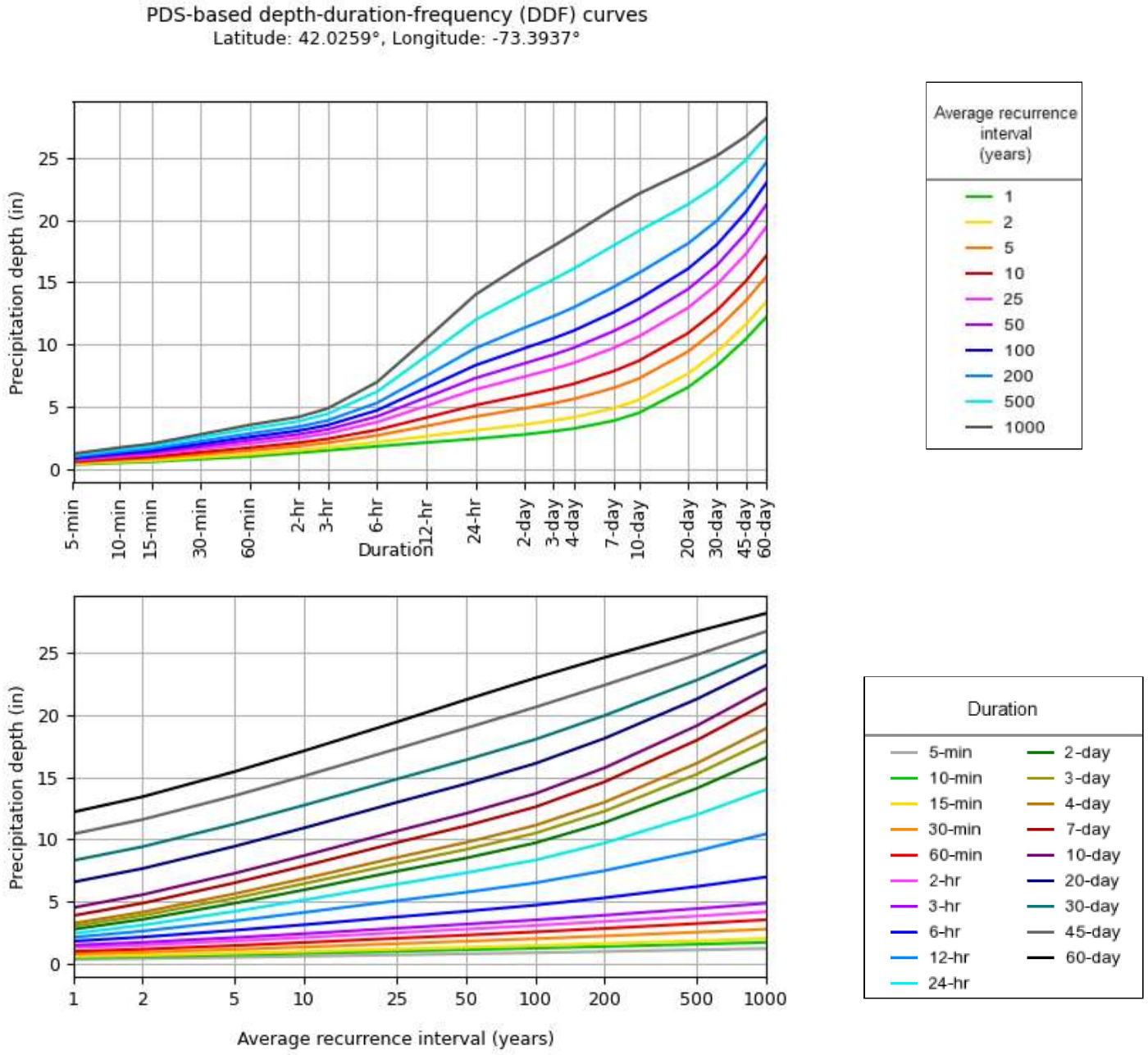
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed May 8 19:34:02 2024

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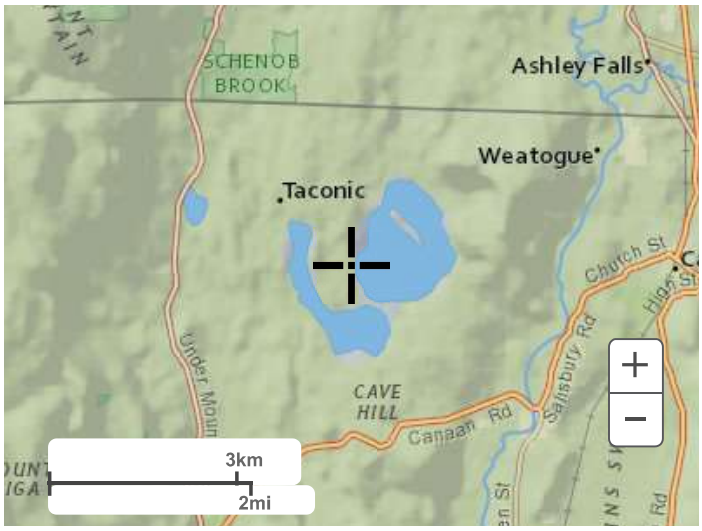
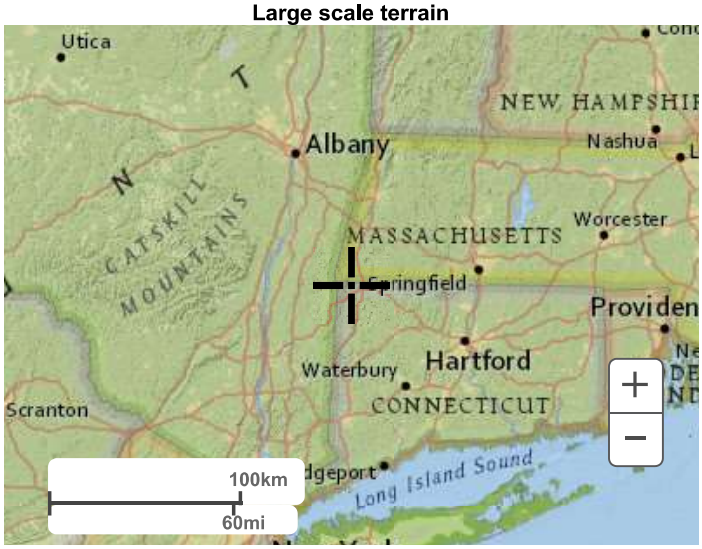
Maps & aerials

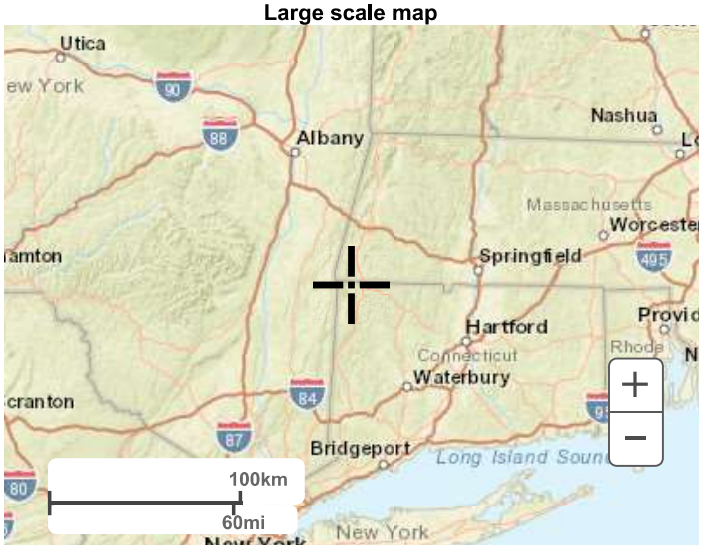
Small scale terrain



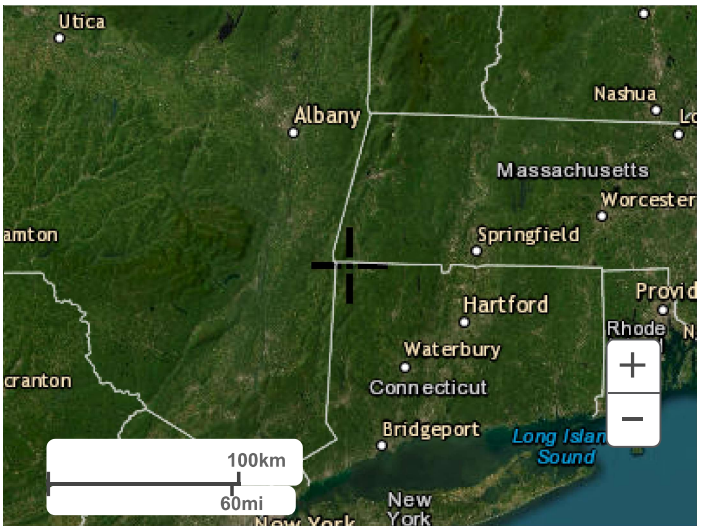
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Storm Sewer IDF Curves

IDF file: 280 Between The Lakes Rd., Salisbury, CT.IDF

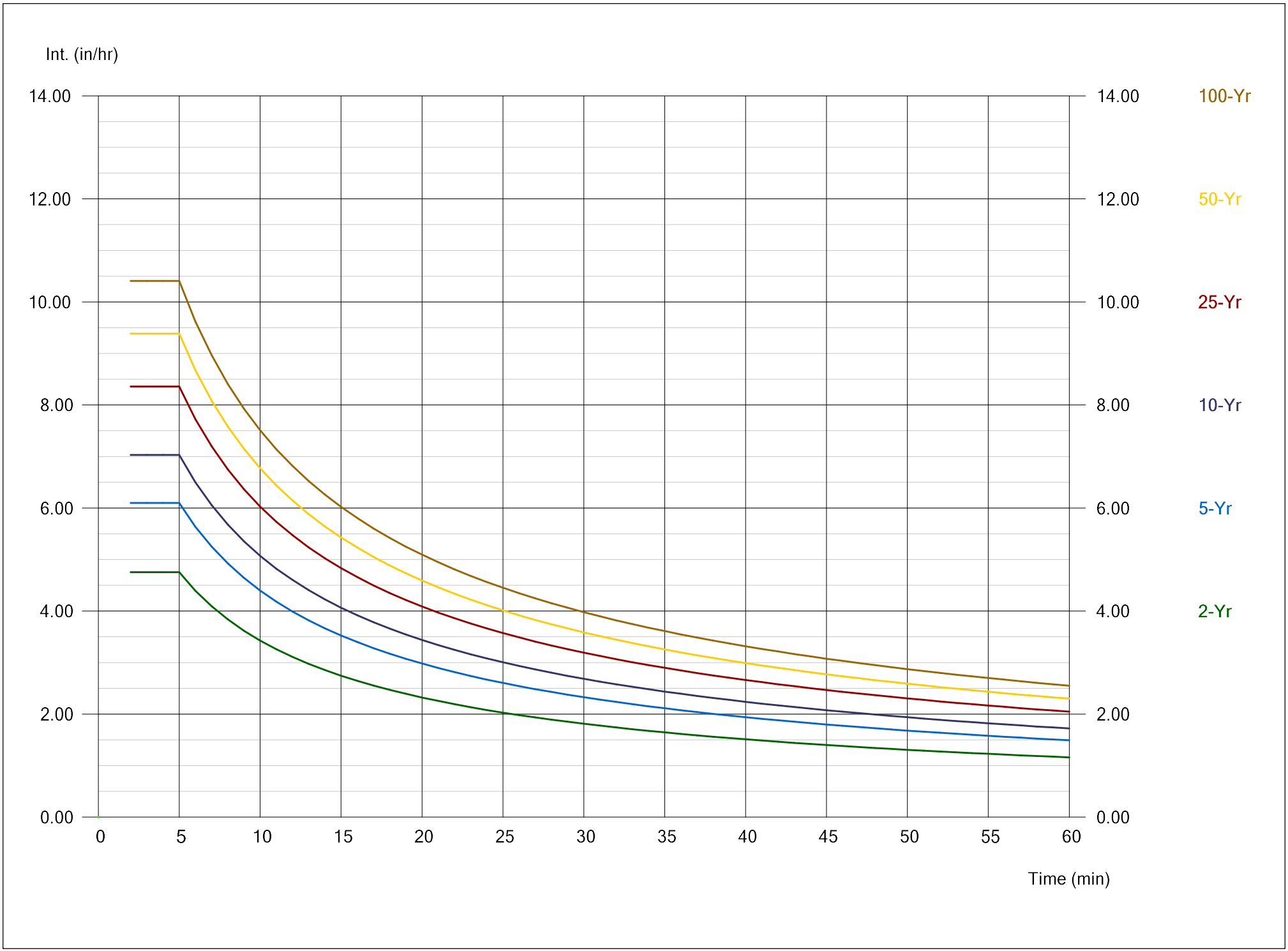

EXHIBIT C

Runoff Coefficient Calculations

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HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING

PROJECT: 280 Between The Lakes Road , Salisbury, CT

SUBJECT: Runoff Coefficient Worksheet

COMP. BY: CG CHK. BY: TAP DATE: 09/10/24

Runoff Coefficients per ConnDOT Drainage Manual - Chapter 6:

Table 6-3 - Recommended Coefficients for Pervious Areas:

	NRCS Hydrologic Soil Group			
Slope	**A**	**B**	**C**	**D**
Flat: (0%-1%)	0.04 - 0.09	0.07 - 0.12	0.11 - 0.16	0.15 - 0.20
Ave.: (2%-6%)	0.09 - 0.14	0.12 - 0.17	0.16 - 0.21	0.20 - 0.25
Steep: (> 6%)	0.13 - 0.18	0.18 - 0.24	0.23 - 0.31	0.28 - 0.38

Table 6-5 - Runoff Coefficients for Impervious Areas

Asphalt Streets	Concrete Streets	Drives & Walks	Roofs
0.70 - 0.95	0.80 - 0.95	0.75 - 0.85	0.75 - 0.95

Table 6-4 - Recommended Coefficients for Various Selected Land Uses:

Downtown Areas	Neighbor-hood Areas	Single Family Areas	Multi Units Detached	Multi Units Attached	Suburban	Resi-dential (>1.2 Ac.)	Apartment Dwelling Areas	Light Industrial Areas	Heavy Industrial Areas	Parks & Cemetery	Play-grounds	Rail Yard Areas	Un-Improved Areas
0.70 - 0.95	0.50 - 0.70	0.30 - 0.50	0.40 - 0.60	0.60 - 0.75	0.25 - 0.40	0.30 - 0.45	0.50 - 0.70	0.50 - 0.80	0.60 - 0.90	0.10 - 0.25	0.20 - 0.40	0.20 - 0.40	0.10 - 0.30

Calculate Composite Runoff Coefficient and Adjust for Infrequent Storms:

Area I.D.	Total Area (Acres)	Asphalt Streets (Acres) C = **0.90**	Grass HSG B (Acres) C = **0.17**	Woods HSG B (Acre) C = **0.22**	Water (Acre) C = **0.90**	Other (Acres) C =	Check S Area (Acres)	S A x C	Composite Runoff Coefficient C'	C_A - Runoff Coefficient Adjusted for Infrequent Storms: Recurrence Interval 2-Year C_F = **1.00**	5-Year C_F = **1.00**	10-Year C_F = **1.00**	25-Year Max.C_F = **1.10**	50-Year Max.C_F = **1.20**	100-Year Max.C_F = **1.25**
Yard Drain	0.26	0.22	0.04				0.26	0.205	0.79	0.79	0.79	0.79	0.87	0.95	0.98
Rain Garden	0.43	0.05	0.38				0.43	0.110	0.25	0.25	0.25	0.25	0.28	0.31	0.32
Total	0.69	0.27	0.42	0.00	0.00	0.00	0.69	0.314	0.46	0.46	0.46	0.46	0.50	0.55	0.57
% Impervious		39%													

(1) Area of individual cover types measured from plans

(2) Runoff coefficient for individual cover types selected from reference tables above.

(3) Composite Runoff Coefficient C' = S(A x C) / SA

(4) Frequency Factors (C_F) from ConnDOT Drainage Manual 2000 - Table 6-2

(5) Per ConnDOT Drainage Manual 2000 Section 6.9.5: $C_A = 1.00$ where $C' * C_F >= 1.00$ $C_A = C' * C_F$ where $C' * C_F < 1.00$

(6) Watershed 1 will be directed away from the lake.

(7) Watershed 5 does not drain to the stormwater basins.

EXHIBIT D

Storm Sewers Profile And Reports

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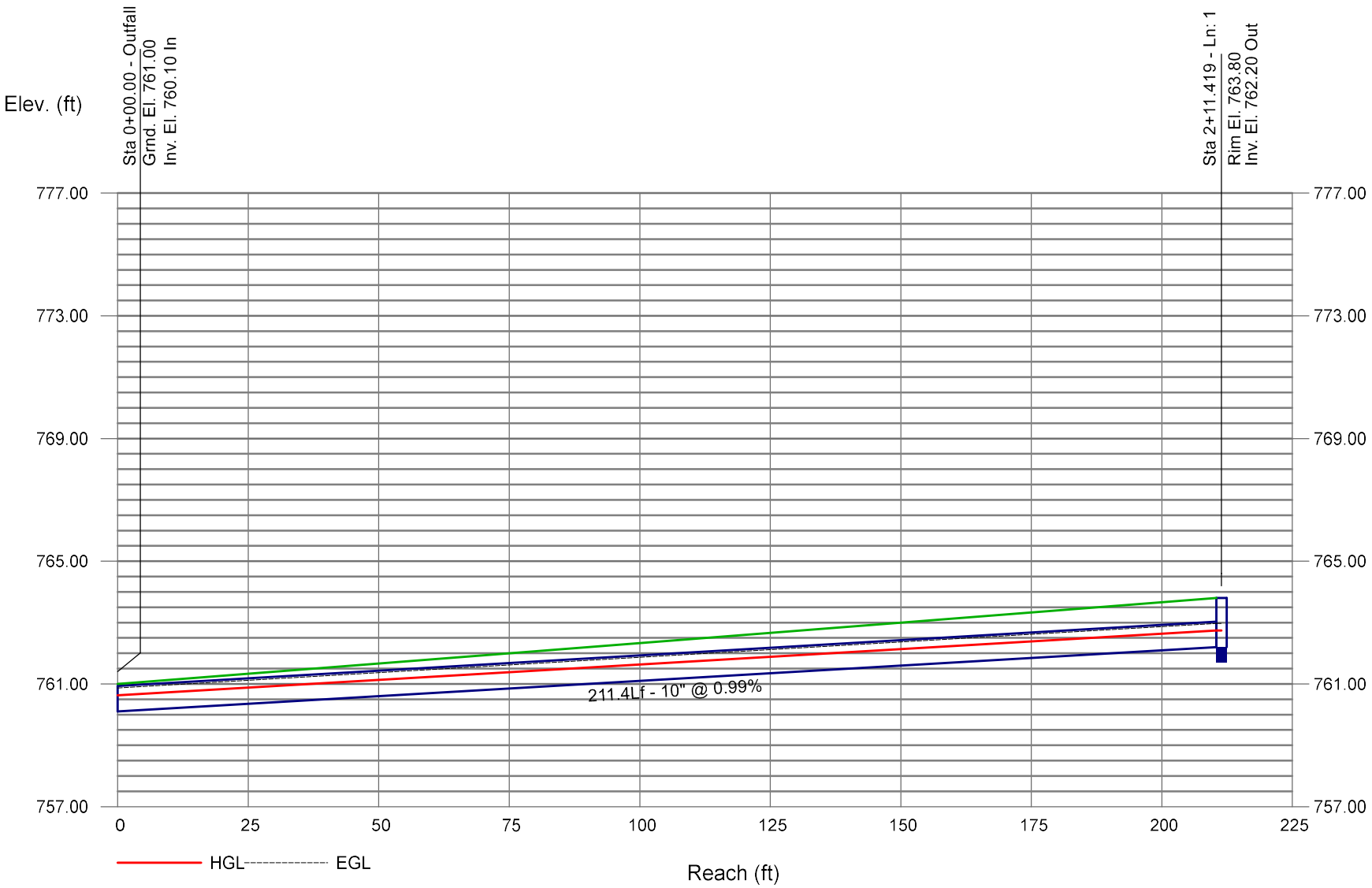
Storm Sewer Profile

Proj. file: 128.001 Barn and Driveway Yard Drain.stm



Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	211.4	0.26	0.26	0.79	0.21	0.21	5.0	5.0	7.0	1.44	2.36	3.91	10	0.99	760.10	762.20	760.63	762.74	761.00	763.80	Pipe from Yard Dr

Project File: 128.001 Barn and Driveway Yard Drain.stm

Number of lines: 1

Run Date: 9/10/2024

NOTES:Intensity = 30.48 / (Inlet time + 3.30) ^ 0.69; Return period =Yrs. 10 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	Yard Drain	1.44	0.00	1.44	0.00	DrGrt	0.0	0.00	3.12	2.31	1.35	Sag	2.00	0.020	0.020	0.013	0.16	18.28	0.16	18.28	0.0	Off

Project File: 128.001 Barn and Driveway Yard Drain.stm | Number of lines: 1 | Run Date: 9/10/2024

NOTES: Inlet N-Values = 0.016; Intensity = 30.48 / (Inlet time + 3.30) ^ 0.69; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

EXHIBIT E

Water Quality Volume
&
Rain Garden Calculations

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HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING

PROJECT: 280 Between The Lakes Road , Salisbury, CT

SUBJECT: Water Quality Volume and Flow Calculations

COMP. BY: CG CHK. BY: TAP DATE: 09/10/24

I. Determine Volume of Water Quality Basin

WQV = (1.3"(R)(A))/12 Where:

WQV	=	Water Quality Volume (ac-ft)
R	=	Volumetric Runoff Coefficient
	=	0.05+0.009(I)
I	=	Percent Impervious Cover (whole number)
A	=	Site Area (acres) = Watershed area excluding bottom of basin

Watershed	Area (acres)	Impervious	Coefficient	Volume (ac-ft)	Volume (CF)
Barn & Drive	0.69	39	0.46	0.0341	1,484

GRV = ((D)(A)(I))/12 Where:

GRV	=	Groundwater Recharge Volume
D	=	Depth of Runoff to be Recharged (Table 7.4 of Stormwater Quality Manual)
A	=	Site Area (acres)
I	=	Percent Impervious Cover (decimal)

Watershed Number	Watershed Area (acres)	Percent Impervious	Groundwater Recharge Depth (D)	Groundwater Recharge Volume (ac.ft)	Groundwater Recharge Volume (CF)
					-
Barn & Drive	0.69	0.39	0.25	0.0056	245

Table 7.4

NRCS Hydrologic Soil Group	Average Annual Recharge	Groundwater Recharge Depth (D)
A	18 in/year	0.4 inch
B	12 in/year	0.25 inch
C	6 in/year	0.1 inch
D	3 in/year	0 inch

For Hydrologic Soil Group, see Web Soil Survey
The majority of development occurs over soil with hydrologic group B
For Design Use WQV since it is higher than GRV

Volume of Proposed Water QualityBasin For Barn & Driveway

Contour Elevation	Elevation Difference (ft)	Area (sq. ft.)	Volume (CF)	Cumulative Volume (CF)
758.8	-	988		
759.0	0.2	1,073	206	
760.0	1.0	1,512	1,293	1,499