Stormwater Management Report

Shantok Village

1758 Route 32, Montville, Connecticut

October 28, 2024
Revised December 6, 2024
Revised December 10, 2024

Prepared for

1758 RTE 32, LLC

24 Main Street

Centerbrook, CT 06409

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

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An Employee-Owned Company

Comm. No. 064MC4.01

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Table of Contents

1. INTRODUCTION

1.1 Background

This stormwater management report has been prepared by Loureiro Engineering Associates, Inc. (LEA) on behalf of 1758 RTE 32, LLC to provide a description and analysis of stormwater management for a new multifamily development. The new work will be completed at two parcels comprised of 1758 & 1790 Route 32, Montville, CT (hereinafter referred to as the "Site").

1.2 Physical Setting

The Site is 12.19 acres (ac) and is located in the R-20-M and the Route 32 Overlay zones. Both parcels comprising the Site are wooded and vacant. The Site slopes steeply east to west from Route 32, rising from approximately 258 feet to 365 feet (NAVD88). No inland wetlands or other bodies of water are on or are in the vicinity of the Site.

The eastern boundary of the Site is bordered by Route 32 (Norwich New London Turnpike). Wooded residential lots in the R-20 zone surround the Site to the north, west, and south. The Site location is depicted on the United States Geological Survey (USGS) map included as Appendix A.

1.3 Flood Plain and Soil Conditions

The National Resource Conservation Service (NRCS) Soil Survey for the State of Connecticut identified soils as Rainbow silt loam (map unit 44B), Narragansett silt loam of varying slope (66B & 68D), and Charlton-Chatfield complex of varying slopes (73C & 73E). Rainbow silt loam correspond with the Hydrologic Soil Group (HSG) rating D, while all other soil types correspond with the HSG rating B. Ruoff potential for the different HSG soil types varies on a scale with HSG A soils generally having the lowest runoff potential, and HSG D soils having the highest runoff potential.

Falling head permeability tests were run by LEA on representative samples taken from test pits excavated on November 6 & 7, 2023. The lowest permeability rate calculated was 21.6 in/hr. Applying a factor of safety of 50%, in accordance with the 2023 Connecticut Stormwater Quality Manual, a permeability of 10.8 in/hr. was used in drainage calculations. Appendix B includes the NRCS soil map for the site and permeability test results.

Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) Number 09011C0351G, effective July 18, 2011, for Town of

Montville identifies the entire Site as within Zone X and is designated as an area of minimal flood hazard. Appendix C includes the FEMA FIRM map for the Site.

2. EVALUATION OF EXISTING CONDITIONS

2.1 Overview

The Site currently consists of wooded slopes, and there are no existing buildings, structures, or other types of impervious coverages.

2.2 Existing Stormwater Management

The Site currently has no existing drainage or stormwater management features. Stormwater runoff is conveyed 100 percent (%) through surface runoff. Water travels downslope from the mostly wooded northern portion of the Site (and from adjoining properties upslope) and either flows west off-Site, or east, where it is captured by a 24-inch culvert south of the Site along Route 32. These points of compliance are identified in the drainage analysis as POC 1 and POC 2, respectively, to evaluate peak-flows leaving the Site.

2.3 Existing Subcatchment Areas

The total analyzed drainage area for the Site is approximately 17 acres. As previously mentioned, areas north off-Site runoff towards the Site, increasing the drainage analysis area. The area is divided into two (2) subcatchment areas. Subcatchment area 1 is comprised of the eastern portion of the Site, and flows southeast towards the Route 32 culvert (POC 1). Subcatchment area 2 consists of the western portion of the Site and flows southwest off-Site (POC 2). Both subcatchments are similarly sloped and wooded.

Based upon Site observations, the initial sheet flow is limited due to the slope of the Site, to less than 150 linear feet. Although there is evidence of channelized flow within some areas of the site, the majority of the runoff is expected to be shallow concentrated flow with the obvious channelization occurring in the southeast corner of the site with a southern gradient.

Through available mapping and survey information, both POCs ultimately convey towards Mohegan Brook, which is a tributary of the Thames River. The Existing subcatchment area boundaries are depicted on Drawing DA 1, Existing Drainage Areas.

3. NEW DEVELOPMENT

3.1 Overview

New development includes the construction of five (5) multifamily residences and a 3,500 sf community building. As the existing Site does not have any utilities or access, the development includes a driveway, curbing, lighting, and utilities.

3.2 New Subcatchment Areas

The developed Site is divided into twenty-six (26) subcatchments. The majority of the new subcatchments will be captured or conveyed by a new catch basin and swale network. These new drainage features will convey runoff to new retain-it subsurface infiltration or detention systems. Three (3) subcatchments convey stormwater through overland flow and discharge off-Site without being captured by the new drainage system. Runoff from these subcatchments and any stormwater discharged by new infiltration systems will flow off-Site in a manner similar to existing conditions. The new development will result in an increase in impervious area for the drainage analysis area, from 0% to 33.72 %. The new subcatchment area boundaries are depicted on Drawing DA-2, New Drainage Areas plan.

3.3 Design Criteria & Proposed Stormwater Management Systems

The post-development stormwater runoff analysis was based on the 2-, 10, 25-, 50-, and 100-year 24-hour storm events. The increase in impervious area requires on-Site attenuation to meet or reduce the existing runoff rates as closely as possible.

The new drainage system for the Site will include a manhole, catch basin, and swale network to collect runoff from paved areas and buildings. An infiltration basin has also been designed to capture the large amount of runoff from landscaped sloped areas. The interconnected infiltration systems, using the high infiltration rate of the soils on Site, have been designed to reduce peak flows and the volume of runoff to the Points of Compliance.

To improve stormwater quality discharging from the Site, the infiltration systems have been sized to retain and infiltrate the full water quality volume (WQV). WQV calculations are provided in Appendix E.

4. STORMWATER MANAGEMENT EVALUATION

4.1 Stormwater Runoff Calculations

4.1.1 Design Criteria & Methodology

Site specific point precipitation frequency estimates used to generate peak stormwater flow were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10 Version 3: Precipitation-Frequency Atlas of the United States, Northeastern States (rev. 2015). Precipitation-frequency estimates are based upon frequency analysis of partial duration series with a 90% confidence interval of data largely from the National Centers for Environmental Information (NCEI).

The methods described in Urban Hydrology for Small Watersheds, 2nd Edition, (Technical Release Number 55 [TR-55]) from the Natural Resources Conservation Service formerly the Soil Conservation Service – [SCS], 1986) were used to calculate stormwater peak-flow generated from pre- and post-redevelopment conditions. These methods, which are incorporated into the HydroCAD computer software program, use well documented procedures to calculate stormwater runoff volume, peak-flow rate of discharge, hydrographs and storage volumes required for floodwater reservoirs in small watersheds. The method uses the SCS Runoff Curve Number method to estimate runoff volume, calculates times of concentration, produces tabular hydrographs and estimates basin storage capacity.

4.1.2 Curve Numbers

The curve numbers (CN) values utilized for the analysis of the existing and new conditions included:

Existing/Proposed:

- Woods, CN = 55 (Good woods cover, HSG B)
- Woods, CN = 77 (Good woods cover, HSG D)
- Grassed areas, CN=61 (Good grass cover, HSG B)
- Grassed areas, CN=80 (Good grass cover, HSG D)
- Impervious areas, CN = 98 (Paved parking, roofs, HSG D)

4.2 Existing and New Peak-Flow Comparison

As the result of incorporating subsurface infiltration systems into the new stormwater management system, increases in runoff are attenuated to all POC's for all storm events. The table below summarizes the pre- and post-redevelopment

Table 1 – Peak-Flow Comparison, Cubic Feet per Second (CFS)

	2-Year Event		10-Year Event		25-Year Event		50-year Event		100-year Event	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
West Off-Site (POC 1)	1.44	0.65	5.39	2.3	8.59	3.42	11.16	4.27	14.08	6.58
Rt. 32 Culvert (POC 2)	2.68	0.14	10.53	1.18	17.02	6.22	22.33	11.15	28.36	16.52
Total	4.12	0.79	15.92	3.48	25.61	9.64	33.49	15.42	42.44	23.1

The analysis indicates overall decreases in peak-flow rates of discharge to points of compliance for all design storms through the 100-year event. The new stormwater management system results in a quantitative and qualitative improvement in the peak flow rates and quality of stormwater discharge from the redeveloped Site. Appendix D includes the HydroCAD reports for both the existing and new conditions analyses.

4.3 Runoff Volume

Total runoff from the property was also analyzed volumetrically to ensure similar or lower runoff volumes under new conditions as volumes under existing conditions. The results for the 2-year and 100-year storm events for the total Site are below:

Table 2 – Total Runoff Volume Comparison, Cubic Feet

	Existing (cf)	New (cf)	Volume Infiltrated (cf)	Surface Runoff Volume (cf)
2-Year	25,422	84,190	63,180	21,010
100-year	175,953	287,738	159,096	128,642

The tables show that the new infiltration systems reduce total proposed runoff volume below that of existing conditions. Therefore, receiving areas will not receive increased runoff volumes and should not be negatively impacted. Additionally, new scour holes, riprap aprons, and flared end sections will reduce velocity of flow and ensure discharges are non-erosive. Appendix D includes the HydroCAD reports showing runoff volume calculations.

4.4 Water Quality

The methods described in the 2023 Connecticut Stormwater Quality Manual were utilized to calculate the WQV of the redevelopment. The WQV for the site is equivalent to the runoff generated with the first 1.3 inches of rainfall. The developed Site is approximately 17 ac and 34% impervious, resulting in a WQV of 26,266 cf. The infiltration systems provide a storage volume of approximately 52,000 cf below the high-level outlets. The infiltration system provides adequate amount of storage to store and infiltrate the WQV. Using permeability test results, the WQV is modelled to drain within 48 hours, meeting State requirements. The drainage system also leads to primary treatment units for treatment prior to entering subsurface infiltration systems. These units are designed to capture oil, trash, and floatables while removing total suspended solids and other pollutants. Appendix E includes the calculation worksheet for Water Quality Volume and Water Quality Flow for the developed catchment areas.

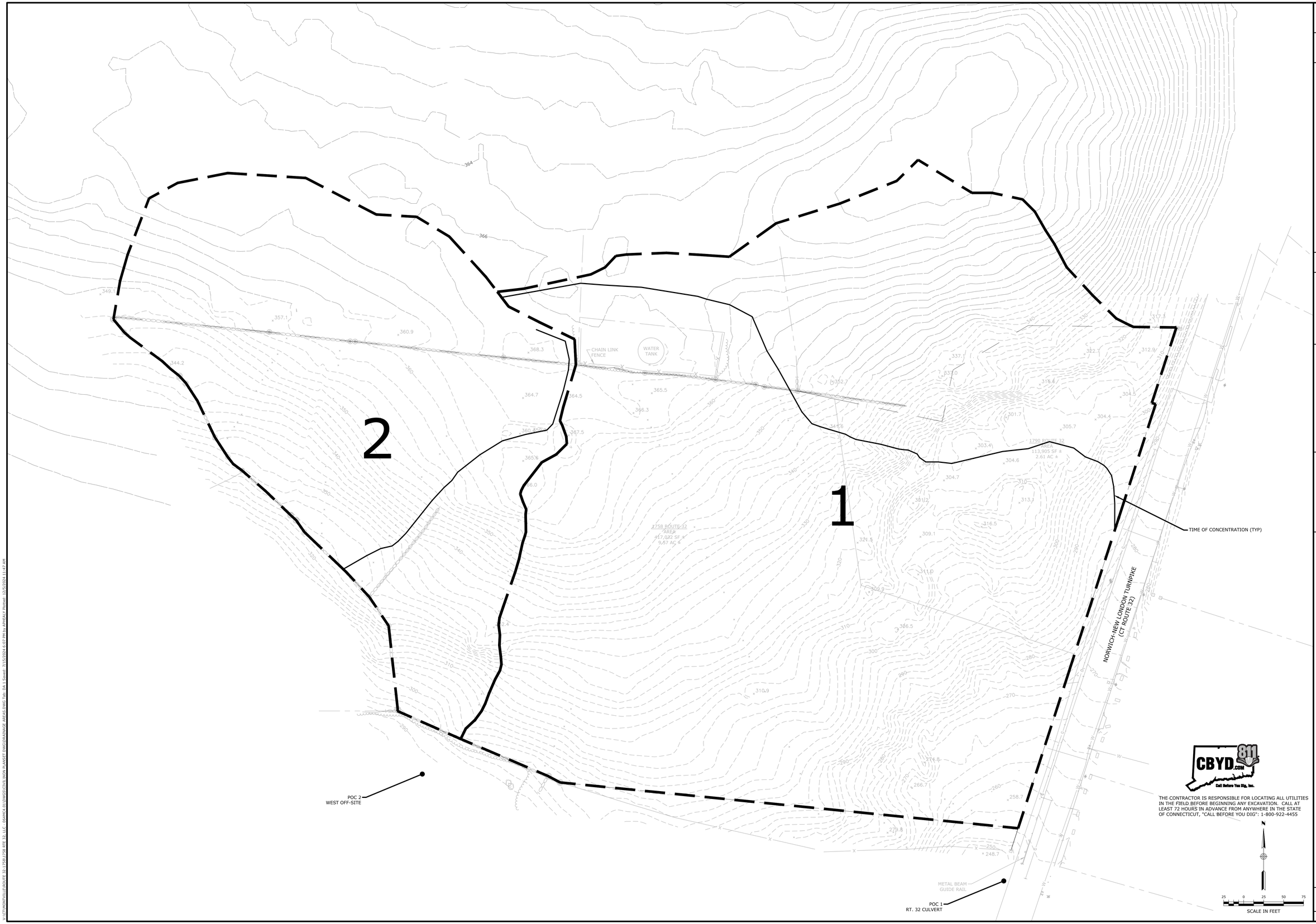
4.5 Stormwater System Maintenance Program

To help facilitate the function and longevity of the stormwater management system, maintenance requirements have been provided in Appendix F. The maintenance includes periodic inspections, scheduled cleanings and details on identifying signs of failures in the system. A full checklist of system features shall be completed to provide a log of inspections, cleanings, repairs, and any important information regarding the system. The program will be implemented after installation with more frequent inspections early and fewer inspections after a year or when the system function becomes more predictable. The program, checklist, and past inspection/maintenance logs will be provided to the current or future owners and necessary facility personnel.

5. CONCLUSION

The new development includes a new stormwater management system for the primary conveyance of the stormwater discharging from the Site. The proposed system provides attenuation and treatment of all stormwater events leaving the Site, managing post-development runoff rates and allowing for potential groundwater recharge. The new infiltration systems include sufficient storage capacity for the WQV to offer treatment of Site stormwater, along with treatment of WQF provided by hydrodynamic separators. Overall, the new drainage system will improve water quality discharging from the property while providing lower flow rates and volume to receiving waters.

DRAWINGS



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REV.	DESCRIPTION OF REVISION	DATE	APPR.
1	REVISIONS PER COMMENTS	12/6/2024	GFA

STAMP

Loureiro
Engineering Associates, LLC
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SCALE: 1"=50'
COMP. NO. 064HC4-01
DRAWN BY: APH — DATE: 7/15/2024
APPROVED BY: GFA — DATE: 7/15/2024

EXISTING DRAINAGE AREAS

SHANTOK VILLAGE
1758 ROUTE 32, MONTVILLE CT 06382
PREPARED FOR:
1758 RTE 32, LLC
24 MAIN STREET, CENTERBROOK, CT 06409

DRAWING
DA 1

SHEET NO. 1 — NO. OF SHEETS 2

TIME OF CONCENTRATION (TYP)

POC 2
WEST OFF-SITE

POC 1
RT. 32 CULVERT

METAL BEAM GUIDE RAIL

NORWICH-NEW LONDON TURNPIKE (CT ROUTE 32)

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25 0 25 50 75
SCALE IN FEET

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FOR COORDINATION ONLY.
12/10/2024 2:57:50 PM

NO.	REVISIONS PER COMMENTS	12/6/2024	GFA
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SCALE: 1"=50'
COMM. NO.: 064HC4.01
DRAWN BY: APH — DATE: 7/15/2024
APPROVED BY: GFA — DATE: 7/15/2024

NEW DRAINAGE AREAS

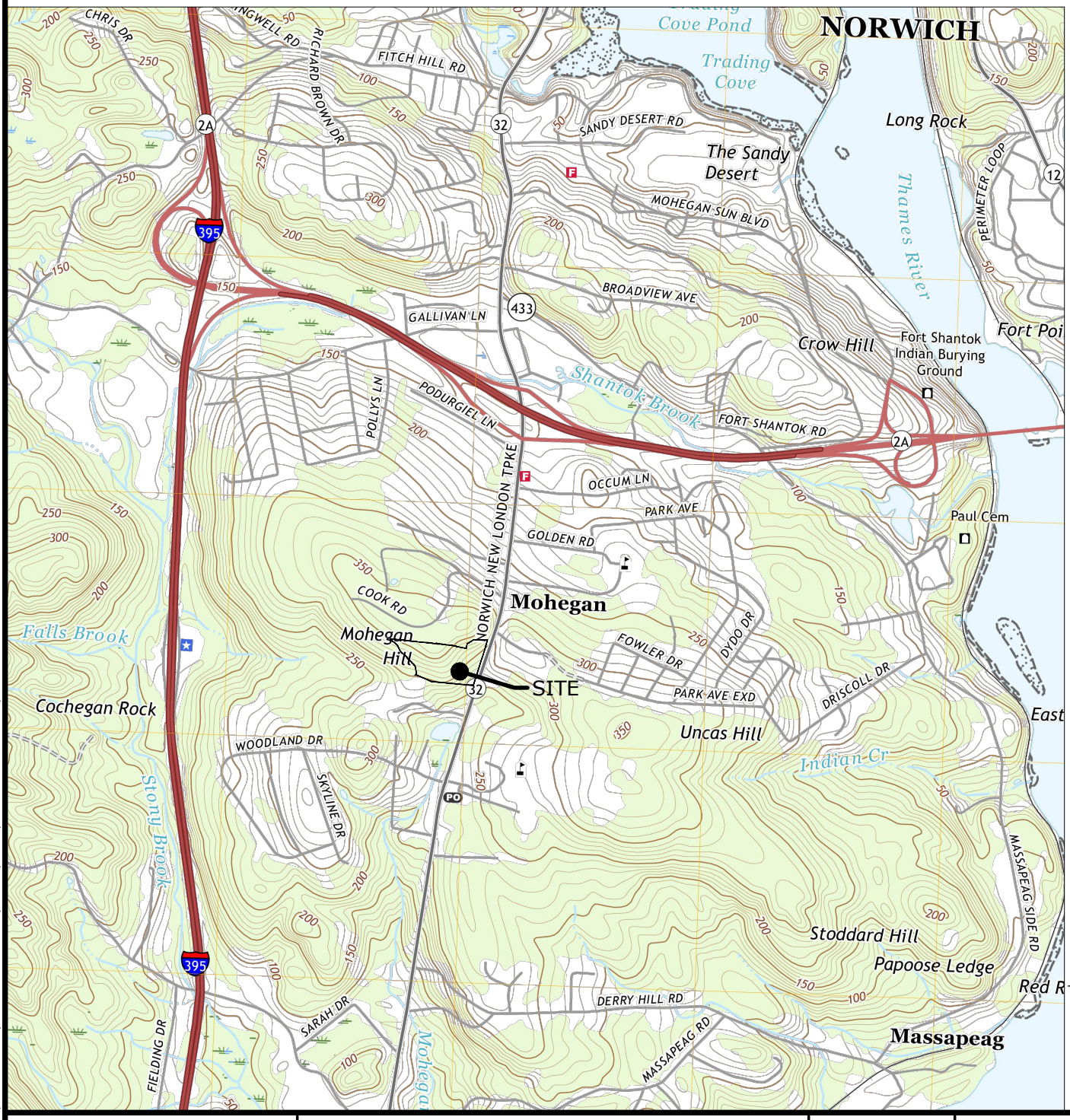
SHANTOK VILLAGE
1758 ROUTE 32, MONTVILLE CT 06382
PREPARED FOR
1758 RTE 32, LLC
24 MAIN STREET, CENTERBROOK, CT 06409

DRAWING
DA 2

SHEET NO. 2 — NO. OF SHEETS 2

APPENDIX A

USGS Site Location Map



V:\CT\MONTVILLE\ROUTE 32-1758\1758 RTE 32, LLC - 064MC4.01\DWGS\CIVIL\NON PLANSET DWG\USGS LOCATION MAP.DWG

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SITE LOCATION MAP

SHANTOK VILLAGE
1758 ROUTE 32, MONTVILLE, CT 06382
PREPARED FOR:
1758 RTE 32, LLC
24 MAIN STREET, CENTERBROOK, CT 06409

SCALE
1"= 2000'

COMM. NO.
064MC4.01

DATE
07/12/2024

DRAWING
FIG 1

APPENDIX B

Soil Data

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut, Eastern Part

June 14, 2024

Preface

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

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

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

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

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

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

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,520 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Eastern Part
Survey Area Data: Version 1, Sep 15, 2023

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
44B	Rainbow silt loam, 2 to 8 percent slopes, very stony	2.7	8.6%
45C	Woodbridge fine sandy loam, 8 to 15 percent slopes	0.0	0.0%
50A	Sutton fine sandy loam, 0 to 3 percent slopes	0.6	1.9%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	1.3	4.0%
66B	Narragansett silt loam, 2 to 8 percent slopes	3.4	10.6%
68D	Narragansett silt loam, 15 to 25 percent slopes, extremely stony	4.8	14.9%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	2.8	8.8%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	15.5	48.4%
74C	Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky	0.9	2.9%
Totals for Area of Interest		**32.0**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

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

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

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

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

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

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

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

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

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

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

State of Connecticut, Eastern Part

44B—Rainbow silt loam, 2 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 9lnp
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Rainbow

Setting

Landform: Hills, drumlins
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Eolian deposits over coarse-loamy lodgment till derived from gneiss and/or schist and/or sandstone and/or basalt

Typical profile

Ap - 0 to 6 inches: silt loam
Bw1 - 6 to 18 inches: silt loam
Bw2 - 18 to 26 inches: silt loam
2Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Sutton, very stony

Percent of map unit: 5 percent

Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Broadbrook

Percent of map unit: 5 percent
Landform: Till plains, hills, drumlins
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Narragansett

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

Ridgebury

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

Unnamed, nonstony surface

Percent of map unit: 2 percent
Hydric soil rating: No

Wilbraham

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

Woodbridge

Percent of map unit: 2 percent
Landform: Hills, drumlins
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

45C—Woodbridge fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w689
Elevation: 0 to 1,370 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodbridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 10 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 4 percent

Landform: Depressions, ground moraines, hills, drainageways, drumlins
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton

Percent of map unit: 1 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

50A—Sutton fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xffg
Elevation: 0 to 1,240 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sutton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sutton

Setting

Landform: Ground moraines, ridges, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 5 inches: fine sandy loam
Bw1 - 5 to 17 inches: fine sandy loam
Bw2 - 17 to 25 inches: sandy loam
C1 - 25 to 39 inches: gravelly sandy loam
C2 - 39 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 12 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

Leicester

Percent of map unit: 5 percent
Landform: Ground moraines, hills, drainageways, depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Ground moraines, ridges, hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Canton

Percent of map unit: 4 percent
Landform: Hills, moraines, ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Whitman

Percent of map unit: 1 percent
Landform: Ground moraines, drumlins, hills, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

60C—Canton and Charlton fine sandy loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w81z
Elevation: 0 to 1,620 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canton and similar soils: 50 percent
Charlton and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills, moraines, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: gravelly fine sandy loam
2C - 26 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Charlton

Setting

Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Leicester

Percent of map unit: 5 percent
Landform: Ground moraines, drainageways, depressions, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton

Percent of map unit: 5 percent
Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear

Hydric soil rating: No

Chatfield

Percent of map unit: 5 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

66B—Narragansett silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lq3
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Narragansett

Setting

Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly melt-out till derived from gneiss and/or schist and/or sandstone and shale

Typical profile

Ap - 0 to 6 inches: silt loam
Bw1 - 6 to 15 inches: silt loam
Bw2 - 15 to 24 inches: silt loam
Bw3 - 24 to 28 inches: gravelly silt loam
2C - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Broadbrook

Percent of map unit: 5 percent
Landform: Till plains, hills, drumlins
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Leicester

Percent of map unit: 3 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Canton

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

Unnamed, red parent material

Percent of map unit: 2 percent
Hydric soil rating: No

Wapping

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

Sutton

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

68D—Narragansett silt loam, 15 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 9lq8
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Narragansett

Setting

Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly melt-out till derived from gneiss and/or schist and/or sandstone and shale

Typical profile

Ap - 0 to 6 inches: silt loam
Bw1 - 6 to 15 inches: silt loam
Bw2 - 15 to 24 inches: silt loam
Bw3 - 24 to 28 inches: gravelly silt loam
2C - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Broadbrook

Percent of map unit: 5 percent
Landform: Till plains, hills, drumlins
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Leicester

Percent of map unit: 3 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Wapping

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

Canton

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

Unnamed, red parent material

Percent of map unit: 2 percent
Hydric soil rating: No

Sutton, extremely stony

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

73C—Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2w698
Elevation: 0 to 1,550 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton, very stony, and similar soils: 50 percent
Chatfield, very stony, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Sutton, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

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

Hollis, very stony

Percent of map unit: 5 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, very stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 9lql
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 45 percent
Chatfield and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 45 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 15 inches: gravelly fine sandy loam
Bw2 - 15 to 29 inches: gravelly fine sandy loam
2R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop
Percent of map unit: 10 percent
Hydric soil rating: No

Leicester
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton, very stony
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hollis
Percent of map unit: 3 percent
Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed, sandy subsoil
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, red parent material
Percent of map unit: 1 percent
Hydric soil rating: No

74C—Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky

Map Unit Setting
National map unit symbol: 9lqm
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Narragansett and similar soils: 55 percent
Hollis and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Narragansett

Setting

Landform: Till plains, hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly melt-out till derived from gneiss and/or schist and/or sandstone and shale

Typical profile

Ap - 0 to 6 inches: silt loam
Bw1 - 6 to 15 inches: silt loam
Bw2 - 15 to 24 inches: silt loam
Bw3 - 24 to 28 inches: gravelly silt loam
2C - 28 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 9 inches: channery fine sandy loam
Bw2 - 9 to 15 inches: gravelly fine sandy loam
2R - 15 to 80 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 6 percent
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Chatfield

Percent of map unit: 5 percent
Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Leicester

Percent of map unit: 3 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Wapping

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

Canton

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

Sutton, very stony

Percent of map unit: 2 percent

Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

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

Hydrologic Soil Group

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

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

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

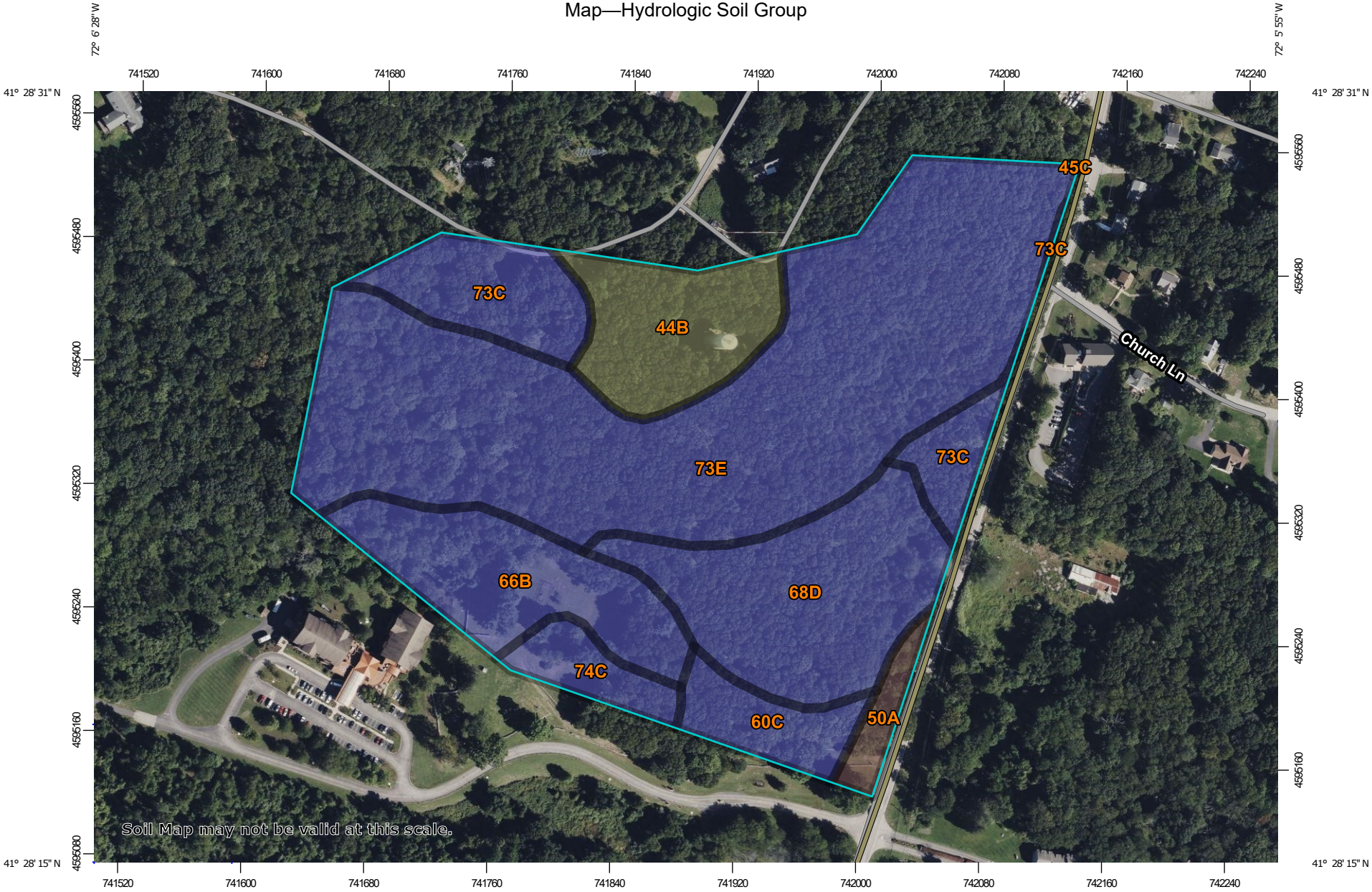
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:3,520 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

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

MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Eastern Part
Survey Area Data: Version 1, Sep 15, 2023

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

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

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
44B	Rainbow silt loam, 2 to 8 percent slopes, very stony	C/D	2.7	8.6%
45C	Woodbridge fine sandy loam, 8 to 15 percent slopes	C/D	0.0	0.0%
50A	Sutton fine sandy loam, 0 to 3 percent slopes	B/D	0.6	1.9%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	B	1.3	4.0%
66B	Narragansett silt loam, 2 to 8 percent slopes	B	3.4	10.6%
68D	Narragansett silt loam, 15 to 25 percent slopes, extremely stony	B	4.8	14.9%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	2.8	8.8%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	15.5	48.4%
74C	Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky	B	0.9	2.9%
Totals for Area of Interest			**32.0**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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Notes & Computations

Comm No. 064MC4.01 Page 1 of 2
By Alex Healy, E.I.T. Date 11/9/23
Approved By George Andrews Date 11/10/23
Project The Villages at Shantock Hill

Falling Head Permeability Test

TP-1

- Sample taken 11/6/23 from 4'-100' layer

$$K = \frac{(H_1 - H_2) \cdot L}{t \cdot \frac{(H_1 + H_2)}{2}} \qquad K = \frac{(12' - 10') \cdot 7'}{0.95\ \text{Min} \cdot \frac{(12' + 10')}{2}} = \frac{14'}{10.45\ \text{min}} = \boxed{1.3\ \text{in/min}}$$

$L = 7'$
$H_1 = 12'$
$H_2 = 10'$
$t = 0.95$ minutes (57 seconds)

TP-17A

- Sample taken 11/6/23 from 36'-74' layer

$L = 7.5'$
$H_1 = 12'$
$H_2 = 9.5'$
$t = 1.22$ min (1 minute, 13 seconds)

$$K = \frac{(12' - 9.5') \cdot 7.5'}{1.22\ \text{min} \cdot \frac{(12' + 9.5')}{2}} = \frac{18.75'}{13.12\ \text{min}} = \boxed{1.43\ \text{in/min}}$$

TP-14

- Sample taken 11/6/23 from 40'-100' layer

$L = 2'$
$H_1 = 12'$
$H_2 = 8.75'$
$t = 1.72$ minutes (103 seconds)

$$K = \frac{(12' - 8.75') \cdot 2'}{1.72\ \text{min} \cdot \frac{(12' + 8.75')}{2}} = \frac{6.5'}{17.845\ \text{min}} = \boxed{0.36\ \text{in/min}}$$

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By Alex Healy, E.I.T. Date 11/9/23
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Project The Villages at Shantock Hill

TP-10

- Sample taken 11/7/23 from 28"-84" layer

$L = 7"$
$H_1 = 12"$
$H_2 = 11"$
$t = 1.31$ min (68 seconds)

$$K = \frac{(12" - 11") \cdot 7"}{1.31 \text{ min} \cdot \frac{(12" + 11")}{2}} = \frac{7"}{13 \text{ min.}} = \boxed{0.54 \text{ in/min}}$$

TP-12

- Sample taken 11/7/23 from 32"-96" layer

$L = 7.5"$
$H_1 = 12"$
$H_2 = 10.75"$
$t = 0.824$ min (49 seconds)

$$K = \frac{(12" - 10.75") \cdot 7.5"}{0.824 \text{ min} \cdot \frac{(12" + 10.75")}{2}} = \frac{9.375"}{9.375 \text{ min}} = \boxed{1.0 \text{ in/min}}$$

TP-6

- Sample taken 11/7/23 from 46"-99" layer

$L = 8.5"$
$H_1 = 12"$
$H_2 = 11"$
$t = 0.654$ min (39 seconds)

$$K = \frac{(12" - 11") \cdot 8.5"}{0.654 \text{ min} \cdot \frac{(12" + 11")}{2}} = \frac{8.5"}{7.5 \text{ min}} = \boxed{1.13 \text{ in/min}}$$

TP-21

- Sample taken 11/7/23 from 30"-78" layer

$L = 6.5"$
$H_1 = 12"$
$H_2 = 6.5"$
$t = 1.71$ min (103 seconds)

$$K = \frac{(12" - 6.5") \cdot 6.5"}{1.71 \text{ min} \cdot \frac{(12" + 6.5")}{2}} = \frac{35.75"}{15.82 \text{ min}} = \boxed{2.26 \text{ in/min}}$$

APPENDIX C

FEMA Flood Map