Stormwater Management Plan

Williamsburg MA 2, LLC

10 River Road,

Williamsburg, Massachusetts

June, 2019

DESIGN GROUP, INC.
CIVIL ENGINEERS • SURVEYORS • CONSULTANTS
Serving the Berkshires since 1979

Project Number: 180036

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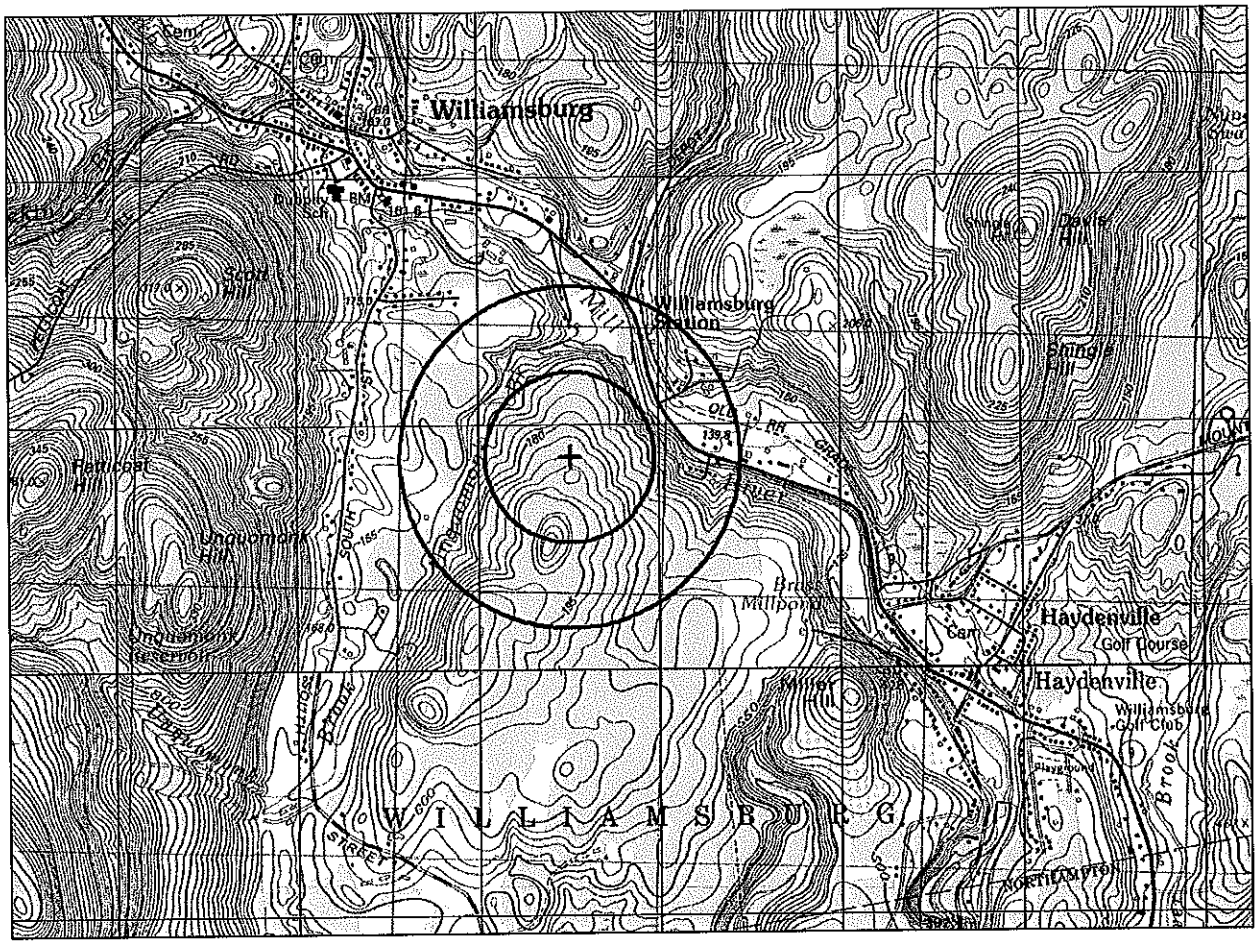
1.0 PROJECT OVERVIEW

The Applicant has retained SK Design Group, Inc (SK) for engineering services and the preparation of this Stormwater Management Plan associated with the proposed solar facility at 10 River Road, Williamsburg, Massachusetts.

The property is near the Lashway lumber yard and currently contains a single-family house and undeveloped woodland. The property is shown on the United States Geological Survey (USGS) Site Location Map below.

The proposed project consists of ground-mounted photovoltaic (PV) solar panel arrays supported by galvanized steel brackets above grade to support the solar panels and allow the required southerly exposure. The solar array will include inverters, transformers, utility interconnect and the like. A chain link security fence will enclose the entire array. Access to the solar facility will be via a new gravel (and paved) access road through the property.

Figure #1 – USGS Site Location Map



2.0 SITE DESCRIPTION

2.1 Existing Conditions

The property is located at the very end of River Rd. (a dead-end street). It is the larger of 3 adjoining parcels, all under the same ownership. The property contains frontage along River Rd. *and* Main St. and is approximately 61 acres in size. The property is located in a Rural Residential zoning district. It is bound by the Mill River (and Main St.) to the east, town-owned [1]land to the south and west, and private residential property to the north. It contains a vacant single-family home with several accessory structures. The northerly portion of the property contains large areas of open "floodplain" meadow. The southerly portion of the land is wooded. There are two perennial brooks that traverse the property. Mill River generally follows the easterly property line (along Main St.). Unquomonk Brook flows from west to east across the mid-portion of the property and eventually discharges into the Mill River near the southeast corner of the site. Unquomonk Brook essentially forms the boundary between the developed portion of the property (to the north) and the undeveloped portion (to the south); with approximately 2/3 of the property being *undeveloped.*

The topography of the northerly portion is relatively flat. Immediately south of Unquomonk Brook, the topography rises abruptly (within the riverine corridor) and then levels off beyond that point. An existing A,T&T easement flanks the southerly-most boundary of the property, running in an east-west direction.

2.2 Inland Wetland Resource Areas

The property contains several areas of bordering vegetated wetlands. These have been flagged on the ground, surveyed, and identified on the plans. They are further described in the main body of the Notice of Intent.

There are significant areas of the property that contain Bordering Land Subject to Flooding (100-year floodplain) associated with Mill River *and* Unquomonk Brook. These are predominantly located on the northerly half of the property, in the low-lying portions along River Rd. These areas were delineated using the FEMA flood maps and topographic data obtained by field survey.

The mean annual high-water line of both brooks (in the vicinity of the proposed work) have been flagged on the ground, surveyed and identified on the plans. This establishes the inside edge of the 200-foot riverfront boundaries associated with the two perennial streams.

Finally, there are *Estimated Habitat* and *Priority Habitat* areas that are located along a narrow corridor of the Mill River (easterly boundary).

[1] Which is primarily undeveloped

3.0 PROJECT DESCRIPTION

3.1 Proposed Conditions

The Applicant intends to construct a ground-mounted PV solar facility at 11 River Road in Williamsburg, Massachusetts.

The proposed project consists of ground-mounted PV solar panel arrays supported by galvanized steel brackets above grade. The solar array includes approximately 19.5 acres of land that will be cleared and converted to meadow. This disturbance causes potential stormwater impact although the work creates no impervious areas other than the gravel access road and concrete equipment pads.

Stormwater improvements include the construction of two stormwater management basins at the northerly limit of work to provide peak-flow attenuation.

Overall, peak flows under post development conditions are reduced for the 2-, 10-, 25-, and 100-year events consistent with Massachusetts Stormwater Management Standards. MassDEP allows for reductions in structural stormwater Best Management Practice (BMP) requirements for water quantity and quality when certain criteria are met. The applicant is not requesting credit for LID measures for this Project

3.2 Erosion and Sedimentation Control

An erosion and sedimentation plan has been prepared and includes erosion controls to be installed and maintained throughout construction. The project will include the implementation of a construction-phase NPDES Stormwater Pollution Prevention Plan under the U.S. Environmental Protection Agency (EPA) Construction Stormwater General Permit. Erosion controls will be installed and maintained for the duration of construction as shown on the project plans.

4.0 STORMWATER MANAGEMENT

4.1 Existing Conditions

The array site is a hillside and drains radially to the north along the length of Unquomonk Brook. The hillside topography has a moderate slope in the development area and a steep slope along the down-gradient Mill River. Most of the development area is woodland.

4.2 Proposed Conditions

The installation of the solar array will require the clearing of the array and the trimming of trees in the southerly portions of the site to avoiding shading of the array. Proposed stormwater management improvements consisting of grass swales, two stormwater management basins, and enhanced grass cover throughout the site to attenuate the post development peak-flow runoff rates, thus mitigating impacts to downstream properties. Existing site drainage patterns will be generally maintained and directed to the north towards Unquomonk Brook.

Stormwater Best Management Practices (BMPs) utilize a nonstructural approach of disconnection of impervious runoff from the PV solar panels. Consistent with MDEP policy and guidance, solar arrays do not create impervious cover. Runoff from the elevated PV solar arrays will drain directly onto the meadow grasses where it can infiltrate into the existing soils, thus mimicking existing conditions. A conservation seed mix will be applied on all disturbed areas throughout the site. Steep slopes will not be encountered except for a portion of the access road construction.

4.3 Hydrologic Analysis

An analysis was conducted to determine peak-flow rates from the project site after development and to demonstrate mitigation of peak flows in accordance with the Massachusetts Stormwater Management Standards. Two design points were used to compare existing and proposed peak flows from the site as shown on the watershed plans. The design points for the two subareas drain to low areas consistent with existing drainage patterns. A third drainage area is upgradient and along the Mill River. The final design point is the confluence of Unquomonk Brook and Mill River downgradient of the development area.

Watershed areas encompassing the project site were used to determine the peak-flow rates based on the topography and drainage patterns to develop the existing conditions hydrology model. Similar drainage areas were used for the proposed conditions model, modified to reflect the proposed land cover, grading, and stormwater management. The total drainage area is similar under both existing and proposed conditions. A drainage area map for both existing and proposed conditions is appended hereto.

Peak flows were determined using the HydroCAD computer program. The program was used to conduct specific watershed modeling. HydroCAD is a computer-aided design (CAD) program used by civil engineers for modeling the hydrology and hydraulics (H&H) of stormwater runoff. Its use as a tool has grown in the U.S. as rules for managing stormwater have become more stringent.

The input data for rainfall events with statistical recurrence frequencies of 2, 10, 25, and 100 years was obtained from the Northeast Regional Climate Center. For analysis in Berkshire County, Massachusetts, the Type III rainfall pattern with a 24-hour duration is appropriate.

Table 1 – Extreme Precipitation Tables

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	72.720 degrees West
Latitude	42.385 degrees North
Elevation	0 feet
Date/Time	Tue, 28 May 2019 15:04:16 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.56	0.73	0.92	1.15	1yr	0.79	1.06	1.32	1.65	2.05	2.56	2.88	1yr	2.26	2.77	3.19	3.86	4.49	1y
2yr	0.35	0.53	0.66	0.87	1.10	1.38	2yr	0.95	1.27	1.59	1.99	2.47	3.07	3.46	2yr	2.72	3.33	3.85	4.58	5.26	2y
5yr	0.42	0.65	0.81	1.09	1.39	1.76	5yr	1.20	1.57	2.03	2.52	3.10	3.80	4.36	5yr	3.36	4.20	4.89	5.69	6.47	5y
10yr	0.47	0.75	0.94	1.28	1.67	2.12	10yr	1.44	1.85	2.45	3.02	3.68	4.46	5.20	10yr	3.95	5.00	5.85	6.70	7.58	10y
25yr	0.57	0.90	1.15	1.59	2.12	2.71	25yr	1.83	2.30	3.13	3.83	4.62	5.52	6.55	25yr	4.88	6.30	7.44	8.34	9.34	25y
50yr	0.65	1.05	1.35	1.89	2.54	3.26	50yr	2.19	2.72	3.76	4.59	5.49	6.48	7.82	50yr	5.74	7.52	8.93	9.83	10.95	50y
100yr	0.76	1.23	1.58	2.24	3.06	3.93	100yr	2.64	3.20	4.53	5.50	6.52	7.62	9.33	100yr	6.75	8.97	10.71	11.61	12.84	100
200yr	0.88	1.43	1.85	2.66	3.68	4.74	200yr	3.17	3.78	5.46	6.58	7.75	8.97	11.15	200yr	7.94	10.72	12.87	13.71	15.07	200
500yr	1.08	1.78	2.32	3.36	4.70	6.06	500yr	4.06	4.71	6.97	8.34	9.73	11.12	14.11	500yr	9.85	13.57	16.42	17.11	18.63	500

Land use and coverage for the analysis under existing and proposed conditions were determined from project base mapping and a site inspection. Land use types used in the analysis included woods, and impervious gravel surface cover. Soil types in the watershed were obtained from the NRCS Web Soil Survey for Berkshire County, Massachusetts. For this analysis, the study area was generally determined to contain hydrologic soil group "A" , "C" and "D" soils for the project area.

Peak rates of runoff were obtained from the hydrologic model results at the site analysis points (AP) as shown on the watershed maps and as follows:

Table 2

Peak Runoff Comparison Table at DP-1

Peak Flow Rates (cfs)

Storm Frequency	2 Year	10 Year	25 Year	100 Year
Pre-Development Conditions	14.38	34.43	51.93	89.55
Post-Development Conditions	13.36	30.82	43.42	83.09

4.4 Peak Flow Attenuation

The results of the analysis show a reduction in peak flows from the project that can be anticipated at design point #1 for all storm events modeled, which meets the Massachusetts Stormwater Management Standards. Reduction in peak-flow rate was attained by routing runoff from the facility to the two stormwater basins.

4.5 MassDEP Stormwater Management Guidelines

In accordance with the Massachusetts Stormwater Handbook, the project will meet the following Standards:

Standard #1: Untreated Stormwater

No new untreated stormwater is created by the solar array and thus no untreated stormwater will discharge to downstream properties. The only source of discharge is from the access road, which is captured and treated separately prior to discharge.

Standard #2: Post development Peak Discharge Rates

Overall peak flows from the site for all 24-hour storm events modeled will not exceed existing conditions. Supporting hydrologic models are included herein.

Standard #3: Recharge to Groundwater

The project will meet Standard #3 recognizing that there will be no change to the annual recharge to groundwater. The solar array is considered unconnected impervious areas and will mimic existing infiltration. The proposed driveway includes a roadside swale with drop inlets at regular intervals along the driveway. The soils in the riverfront area are predominately HSG "D" soils. A volume to recharge times total impervious area is 0.1 inches of runoff. The contributing area is the driveway surface which is 15 feet wide and conservatively 225 feet long (3375 sf).

Rv=F *impervious area

Rv=(0.1-in/12)*(3375/43560)=0.00645 acre feet= 28.1 cf

Install an infiltration trench 2'x2'*.4=1.6 cf per linear foot. (fill with crushed stone)

Therefore, (28.1 cf required)/(1.6 cf / lf) = 17.6 linear feet required. The plans call for an infiltration trench 260 ft. long x 3' deep. This trench will double as a curtain drain, which will protect the integrity of the road itself. The curtain drain will only run during periods of high ground water.

Standard #4: 80 Percent Total Suspended Solids (TSS) Removal

There is no impervious area or TSS loading associated with the solar array itself. Drainage associated with the proposed driveway will include collection of stormwater from the limited driveway surface area and be routed through a hydrodynamic separator. Other impervious areas are disconnected including the proposed concrete pads and not located in the buffer zone. Refer to the design plans for details. This standard is met.

Standard #5: Higher Potential Pollutant Loads

There are no high-potential pollutant loads within the project area.

Standard #6: Protection of Critical Areas

There are no documented critical areas near the project site.

Standard #7: Redevelopment Projects

This project is a new development and complies with the Stormwater Management Standards for a new site development project.

Standard #8: Erosion and Sedimentation Controls

Erosion controls will be implemented and maintained during construction and/or until all disturbed areas have been stabilized. The attached permit drawings show the location and construction details of all erosion control measures including a narrative description of inspection and maintenance procedures.

Standard #9: Operation and Maintenance (O&M) Plan

Refer to the O&M Plan section of this report for a description of the postconstruction maintenance.

Standard #10: Illicit Discharges to Stormwater Management Systems

There are no known illicit discharges within the project site.

5.0 WATER QUALITY MANAGEMENT

Water quality measures are included in the stormwater management design to maintain water quality both during construction and after completion of the project. An O&M Plan is included in this report for postconstruction maintenance of BMPs that describes the required frequency of inspections and maintenance procedures to sustain long-term functionality. Implementation of these measures will enhance protection of areas downgradient of the site.

An erosion control plan has been developed to mitigate the short-term impacts of the development during construction. The E&S Control Plan includes descriptive details and specifications concerning land grading, topsoiling, temporary vegetative cover, etc. Details have been provided for all erosion controls with respective symbols on the E&S control site plan. In all cases, the E&S Control Plan shall be implemented in accordance with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas* and the *Massachusetts Stormwater Handbook.*

6.0 STORMWATER MANAGEMENT

6.1 Responsible Parties

Operator(s): Williamsburg MA 2 LLC
361 Centennial Parkway
Louisville, CO 80027

Responsible Individuals: (to be determined).

6.2 Good Housekeeping Practices

1. Material Handling and Waste Management
    a. Generation of waste is not anticipated from the project after completion.

2. Site Maintenance/Cleanup

a. The site will be reviewed biannually for any generation of trash or debris that has accumulated. These materials will be collected and disposed of in a proper manner.

b. Williamsburg MA 2 LLC will be responsible for scheduling the activity each year.

3. Staff Training Program

a. Personnel should meet the minimum training requirements to conduct the respective O&M tasks.

b. Personnel should have the required training to effectively carry out the responsibilities of their positions.

6.3 Spill Prevention and Control Plan

1. Illicit Discharges

a. All illicit discharges to the stormwater management system are prohibited. These discharges include, but are not limited to, wastewater, stormwater contaminated by contact with process waste, raw materials, toxic pollutants, hazardous substances, oil, or grease. To my knowledge, there are no existing illicit discharges on the site.

I, ,hereby certify that I have read and understand that any illicit discharges to the stormwater management system are prohibited.

Signature: _____ Date:_____

6.4 Schedule for Inspection and Maintenance

This inspection and maintenance schedule has been prepared to ensure that the proposed stormwater management facility functions as designed according to the Stormwater Management Policy issued by the Massachusetts Department of Environmental Protection. The policy defines Stormwater Management Standards as guidelines for stormwater management. The standards address water quality and quantity using nonstructural measures, site planning, and BMPs. An inspection and maintenance schedule is necessary for the BMPs to continue to function properly and as designed.

During construction, stormwater management facilities will be cleaned/maintained as required based upon inspection. The cleaning and maintenance of all BMPs during construction includes removing sediment, replacing or repairing any damaged structure or pipe, and ensuring that soil erosion is kept to a minimum. Refer to the Stormwater Pollution Prevention Plan under separate cover. The project proponent will be responsible for inspection and maintenance during construction.

After construction is complete and the site has been stabilized, the following BMPs maintenance schedule is proposed.

Appendix 1

NRCS Web Soil Survey

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 Hampshire County, Massachusetts, Central Part

May 9, 2019

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

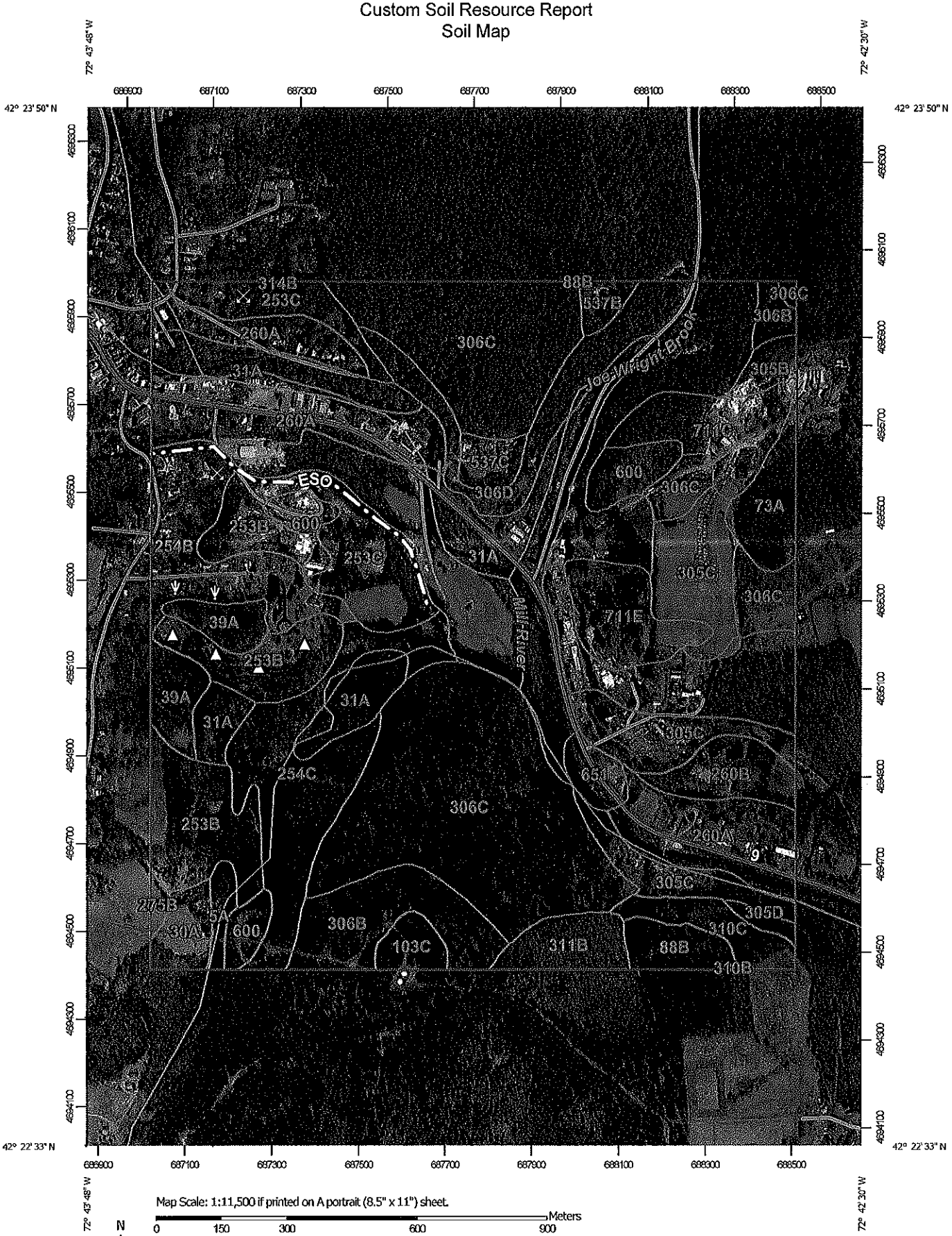
The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Custom Soil Resource Report
Soil Map



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

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5A	Saco silt loam, 0 to 3 percent slopes	2.7	0.5%
30A	Raynham silt loam, 0 to 3 percent slopes	5.6	1.0%
31A	Walpole sandy loam, 0 to 3 percent slopes	71.5	12.4%
39A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	10.8	1.9%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	8.8	1.5%
88B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	6.1	1.0%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	4.2	0.7%
253B	Hinckley loamy sand, 3 to 8 percent slopes	36.0	6.2%
253C	Hinckley loamy sand, 8 to 15 percent slopes	25.2	4.3%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	22.0	3.8%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	30.6	5.3%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	50.0	8.6%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	9.1	1.6%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	1.1	0.2%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	3.6	0.6%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	33.4	5.8%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	1.5	0.3%
306B	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	20.5	3.5%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	107.5	18.6%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	62.9	10.9%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	0.1	0.0%

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.

Swansea

Percent of map unit: 5 percent
Landform: Bogs
Hydric soil rating: Yes

30A—Raynham silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9b1h
Elevation: 50 to 500 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Raynham

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 37 inches: silt loam
H3 - 37 to 60 inches: stratified loamy fine sand to fine sandy loam to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 31 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly 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 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 10 percent
Landform: Deltas, outwash terraces, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 10 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

39A—Scarboro mucky fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svky
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Across-slope shape: Concave
Hydric soil rating: Yes

Walpole

Percent of map unit: 5 percent
Landform: Outwash plains, deltas, depressions, outwash terraces, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

73A—Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w695
Elevation: 0 to 1,580 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

Whitman, extremely stony, and similar soils: 81 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitman, Extremely Stony

Setting

Landform: Drumlins, depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 1 inches: peat
A - 1 to 10 inches: fine sandy loam
Bg - 10 to 17 inches: gravelly fine sandy loam
Cdg - 17 to 61 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 7 to 38 inches to densic material
Natural drainage class: Very poorly drained
Runoff class: Negligible

88B—Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xffx
Elevation: 40 to 1,320 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

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

Description of Ridgebury, Very Stony

Setting

Landform: Hills, ground moraines, depressions, drumlins, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Natural drainage class: Poorly 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Map Unit Composition

Charlton, extremely stony, and similar soils: 50 percent
Hollis, extremely stony, and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
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: 8 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural 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
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

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
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Across-slope shape: Linear
Hydric soil rating: No

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

Canton, extremely stony
Percent of map unit: 5 percent
Landform: Ridges, hills, moraines
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, extremely stony
Percent of map unit: 2 percent
Landform: Drainageways, hills, ground moraines, depressions, 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

253B—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

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

Landform: Outwash terraces, outwash deltas, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope, head slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Eskers, moraines, outwash terraces, outwash deltas, kame terraces, outwash plains, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

253C—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
Elevation: 0 to 1,480 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

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

Description of Hinckley

Setting

Landform: Outwash terraces, outwash deltas, kame terraces, outwash plains, kames, eskers, moraines
Landform position (two-dimensional): Shoulder, toeslope, footslope, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Linear, concave, convex
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 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

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

Description of Merrimac

Setting

Landform: Moraines, outwash terraces, outwash plains, kames, eskers
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Merrimac

Setting

Landform: Moraines, outwash plains, eskers, outwash terraces, kames
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Hinckley

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

Merrimac

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

Walpole

Percent of map unit: 5 percent
Landform: Terraces
Hydric soil rating: Yes

260B—Sudbury fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9b20
Elevation: 0 to 2,100 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

275B—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqx
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Agawam

Setting

Landform: Moraines, outwash terraces, kame terraces, kames, outwash plains
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, crest, tread, riser, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Very 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
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Map Unit Composition

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

Description of Paxton

Setting

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

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Natural drainage class: Well drained
Runoff class: Medium
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 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Ground moraines, hills, drainageways, depressions
Landform position (two-dimensional): Toeslope, backslope, footslope

Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Charlton
Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge
Percent of map unit: 6 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury
Percent of map unit: 2 percent
Landform: Drumlins, hills, ground moraines, depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

305D—Paxton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 2w67j
Elevation: 0 to 1,450 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

Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

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

306B—Paxton fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w673
Elevation: 0 to 1,340 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

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

Description of Paxton, Very Stony

Setting

Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Paxton, Very Stony

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Natural drainage class: Well drained
Runoff class: Medium
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 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Woodbridge, very stony

Percent of map unit: 8 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Natural drainage class: Well drained
Runoff class: 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 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Woodbridge, very stony

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

Charlton, very stony

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 1 percent
Landform: Drainageways, hills, ground moraines, depressions, 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

Minor Components

Paxton

Percent of map unit: 10 percent
Landform: Drumlins, ground moraines, hills
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 8 percent
Landform: Hills, drainageways, depressions, ground moraines
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

310C—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: Drumlins, hills, ground moraines
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

311B—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2t2qr
Elevation: 0 to 1,440 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

Woodbridge, very stony, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Very Stony

Setting

Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 9 inches: fine sandy loam
Bw1 - 9 to 20 inches: fine sandy loam
Bw2 - 20 to 32 inches: fine sandy loam
Cd - 32 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
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 19 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

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

A - 2 to 9 inches: fine sandy loam
Bw1 - 9 to 20 inches: fine sandy loam
Bw2 - 20 to 32 inches: fine sandy loam
Cd - 32 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Medium
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 19 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Paxton, stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Ridgebury, stony

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

Charlton, stony

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Charlton, stony
Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge, stony
Percent of map unit: 5 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury, stony
Percent of map unit: 3 percent
Landform: Hills, depressions, drumlins, ground moraines, drainageways
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

537C—Paxton fine sandy loam, 8 to 15 percent slopes, stony

Map Unit Setting
National map unit symbol: 2w681
Elevation: 100 to 1,170 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
Paxton, stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Stony

Setting
Landform: Ground moraines, drumlins, hills

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

600—Pits, gravel

Map Unit Setting

National map unit symbol: 9b19
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Parent material: Loose sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 6 inches: very gravelly sand
H2 - 6 to 60 inches: very gravelly sand

651—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9b23
Elevation: 0 to 3,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Granite and gneiss

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Hollis

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 19 inches: fine sandy loam
H3 - 19 to 23 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile
H1 - 0 to 7 inches: fine sandy loam
H2 - 7 to 13 inches: fine sandy loam
H3 - 13 to 22 inches: gravelly fine sandy loam
H4 - 22 to 60 inches: gravelly sandy loam

Properties and qualities
Slope: 25 to 45 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Rock Outcrop

Setting
Parent material: Granite and gneiss

Properties and qualities
Slope: 25 to 45 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Hollis

Setting
Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy basal till over granite and gneiss

Typical profile
H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 19 inches: fine sandy loam
H3 - 19 to 23 inches: bedrock

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Appendix 2

Watershed Maps

Appendix 3

Pre and Post-construction Ground Cover Areas

EXISTING		
		SUBAREA 1
	GRAVEL	10060
	WOODS	1469230
	MEADOW	20660
	BUILDING	0
	RIVER	21440
	TOTAL	1521390
	OVERALL TOTAL	1521390
SOIL A		
	GRAVEL	7200
	WOODS	63325
	MEADOW	0
	BUILDING	0
	RIVER	5250
	TOTAL	75775
SOIL C		
	GRAVEL	2770
	WOODS	1158495
	MEADOW	20660
	BUILDING	0
	RIVER	3400
	TOTAL	1185325
SOIL D		
	GRAVEL	90
	WOODS	247410
	MEADOW	0
	BUILDING	0
	RIVER	12790
	TOTAL	260290

PROPOSED				
		1A	2A	3A
	GRAVEL	995	9940	4910
	WOODS	469050	13235	13940
	MEADOW	137710	317860	449565
	BUILDING	0	0	0
	RIVER	21440	0	0
	PAVEMENT	4485	0	0
	CONCRETE	0	7500	0
	COPPICE CLEARING	0	0	70765
	TOTAL	633680	348535	539180
	OVERALL TOTAL	633680	348535	539180
SOIL A				
	GRAVEL	0	0	0
	WOODS	45205	1815	0
	MEADOW	5135	13410	0
	BUILDING	0	0	0
	RIVER	5250	0	0
	PAVEMENT	3055	0	0
	CONCRETE	0	0	0
	TOTAL	58645	15225	0
SOIL C				
	GRAVEL	995	9940	4910
	WOODS	215820	10130	13940
	MEADOW	117515	284145	449565
	BUILDING	0	0	0
	RIVER	3400	0	0
	PAVEMENT	1430	0	0
	CONCRETE	0	7500	0
	COPPICE CLEARING	0	0	70765
	TOTAL	339160	311715	539180
SOIL D				
	GRAVEL	0	0	0
	WOODS	208025	1290	0
	MEADOW	15060	20305	0
	BUILDING	0	0	0
	RIVER	12790	0	0
	PAVEMENT	0	0	0
	CONCRETE	0	0	0
	TOTAL	235875	21595	0

633680

Appendix 4

Post-construction Stormwater Management
Operation and Maintenance Plan

Operation and Maintenance Plan

of

The Stormwater System

For

Solar Array Project

Located at
10 River Rd.
Williamsburg, Massachusetts

June, 2019

Prepared by:

DESIGN GROUP, INC.
CIVIL ENGINEERS - SURVEYORS - CONSULTANTS
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Goals of this document

- **Section 1: Identify Facility Characteristics and Maintenance Needs**
- **Section 2: Outline Routine Inspections**
- **Section 3 Define Maintenance Tasks, for each BMP**
- **Section 4 Establish a Record Keeping Procedure**

SECTION #1

Identify Facility Characteristics and Maintenance Needs

Understand how the facility works and its specific maintenance needs. The system owner and the Best Management Practices (BMPs) included in the system are outlined below:

Stormwater Management System Operator: Williamsburg MA 2 LLC

- The owner of the property will be responsible for the operation and maintenance of the system. The maintenance will be performed by an appropriate contractor.
- Future property owners will be made aware of this Operation & Maintenance Plan by means of a condition in the Order of Conditions. The Condition attached to the deed will indicate that there is a long-term plan that must be followed in perpetuity.
- The following documentation describes the maintenance required for each stormwater best management practice (BMP). The BMPS are as follows:
    - Swales
    - Detention Basin
    - Rip-rap Outlets
    - Drop Inlets (catchbasins)
    - Hydrodynamic separator
- The project plans show the locations of the BMPs that must be maintained.

Note that all waste should be disposed in accordance with applicable local, state, and federal guidelines and regulations.

SECTION #2

Perform Routine Inspections

The frequency of required inspections is dependent upon the **BMP** and is outlined below. Inspections and maintenance of the stormwater system is the responsibility of the property owner and/or operator. BMPs will be visually inspected in accordance with the following chart

BMPs	Inspection Frequency	What to Look For							Remarks
		Erosion	Tree growth	Vegetation	Slope integrity	Trash Debris	Sediment accumulation	Outlet	
1. Drainage Channel/Swales	Semi-Annual	✔	✔	✔	✔	✔	✔	✔	Mow minimum once a year, keep free of debris
2. Detention Basins	Semi-Annual	✔		✔	✔	✔	✔	✔	Mow twice a year, inspect after large storm events
3. Rip-rap Outlets	Semi-Annual	✔		✔		✔		✔	Replace stones as necessary, inspect after large storm events
4. Drop Inlets (catchbasins)	Quarterly					✔	✔	✔	Remove sediment when level exceeds 2 ft. depth
5. Hydrodynamic separator	Quarterly					✔	✔		Clean per manufacture's recommendations

SECTION #3

Define Maintenance Tasks, for each BMP

Defining maintenance tasks and who will undertake these tasks – along with establishing a regular inspection program - is the core of a successful stormwater management facility maintenance program. Each BMP is outlined as follows:

- Section 3.1-Drainage Channel/Swales
- Section 3.2-Detention Basin
- Section 3.3-Rip-rap Outlet/Level Spreader
- Section 3.4-Drop Inlets / Catchbasins
- Section 3.5-Hydrodynamic separator

Section 3.1-Swales

Drainage Channel/Swale

Drainage channels and swales are an effective open best management practice (BMP) used in conveying stormwater along the surface. They alleviate the need for and underground piping while providing total suspended solids (TSS) removal. They are considered a low impact development (LID) feature and are becoming favored in controlling stormwater.

During Construction

- Inspect swales monthly. Remove sediment and debris as necessary.
- Inspect strawbale check dams in swales monthly. Replace as necessary. Remove sediment when accumulation builds up to 6" behind strawbales.
- Mow grass swales a minimum of once a year.
- Removal of sediment collected in drainage channels and swales will be disposed of in accordance with local and state regulations.

Post Construction

- Inspect swales semi-annually. Check for slope integrity, soil moisture, vegetation health, soil suitability, soil compactions, erosion, ponding and sediment.
- Mow grass swales a minimum of once a year. Grass should be longer than 4 inches.
- Sediment should be removed annually, if necessary. Sediment removal should be done manually.
- Repair, reseed, re-loam or replace stone as required.
- Keep swales free of trash, debris and excess vegetation
- Removal of sediment collected in drainage channels and swales will be disposed of in accordance with local and state regulations.

Section 3.2 – Detention Basin

The maintenance of the detention basins begin with regular inspections. Detention basins should be inspected at least once a year, preferably in the spring (April) to ensure that it is operating properly. Inspections should also be done in wet weather to determine if the basin is meeting the targeted detention times. The inspections should be performed to look for the following:

- Evidence of clogging and erosion. At both the inlet and the outlet.
- Evidence of sediment (subsidence) accumulation in the basin, around the inlet or outlet.
- Evidence of erosion, cracking, or tree growth on the embankment.
- Damage to the emergency spillway.
- Changes in the condition or location of the inlet and outlets.
- Adequacy of inlet and outlet erosion control measures.
- During the inspections, any changes to the detention basin, forebay, or contributing watershed should be noted.

The detention basins require regular maintenance which includes mowing and removal of accumulated sediment per the following schedule:

- The upper-stage, side slopes, embankment, and emergency spillway should be mowed at least twice a year, preferably in June and October. Remove all trash and debris at this time.
- Remove sediment waste in detention basins as needed. The waste shall be handled properly and disposed of in accordance with all local, state, and federal guidelines and regulations.

Section 3.3 - RipRap Outlet/Level Spreader

Inspect rip-rap outlets monthly and after large storm events. Inspect for:

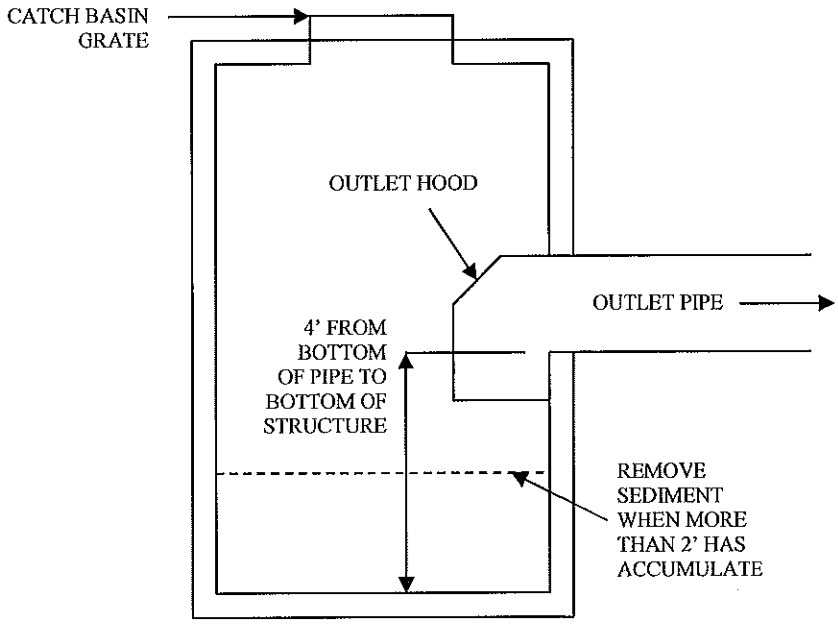
- Sediment accumulation
- Erosion
- Bare spots, low spots
- Stabilization

Section 3.4 – Drop Inlets (catchbasins)

- Inspect 4 times per year for sediment (and debris) accumulation and integrity of structure(s). The outlet hood should be inspected to ensure that it is still attached properly.

- Cleaned a minimum of once per year or if sediment accumulation is greater than 50% within sump.

- The sump in the catch basin is four feet deep; therefore if there is less than two feet of capacity beneath the pipe the accumulated sediment should be removed. The availability capacity of the sump can be checked by using a measuring tape and measuring from the catch basin grate as a reference point. The distance between the bottom of the pipe and the accumulated sediment should be at least two feet, but it is difficult to measure this distance because of the outlet hood. A conservative approach is to measure the distance from the bottom of the hood to the accumulated sediment, which if this distance is less than 2 feet then the sediment should be removed.



- The sediment should be removed by means of a vacuum pump or clamshell bucket. The vacuum pump should be used at least once per year, as it is generally more effective than a clamshell bucket.

- All waste from catch basins should be treated as solid waste and disposed in accordance with applicable local, state, and federal guidelines and regulations.

- Clean snow and ice during winter.

Section 3.5 – Hydrodynamic separator

The effectiveness of the **hydrodynamic** units depends upon regular maintenance. Regular maintenance includes scheduled inspections and sediment removal.

- Inspect separator units monthly for sediment (and debris) accumulation and integrity of structure(s).
- The units should be cleaned two times per year or if sediment accumulation is greater than 15% within sump.
- The sediment should be removed by means of a vacuum pump. Oil is removed through the 6" diameter inspection/oil port, while the sediment is removed from the 24" diameter drop outlet pipe.

The removed waste shall be handled properly and disposed of in accordance with all local, state, and federal guidelines and regulations.

SECTION #4

Establish a Record Keeping Procedure

Establishing a record keeping procedure will help to define chronic maintenance problems and aid in future budget preparation. A periodic examination of maintenance practices will assist in identifying persistent problems early.

Attached is a sample Stormwater Inspection Form.

Stormwater Inspection Form

(to be filled out for each drainage area)

Project:_____

Inspector Name:_____ Weather:_____

Date: _____ Time: _____

Drainage Area

1. Swales

Is vegetation healthy?	Yes	No
Is vegetation maintained?	Yes	No
Is grass shorter than 4-inches?	Yes	No
Is trash present?	Yes	No
Is standing water visible after 48 hours?	Yes	No

Action Required: _____

_____

_____

_____

*Attach additional copies of this page as necessary.

2. Infiltration Basin:

	Good Condition	Poor Condition	Comments
Basin			
Inlet			
Outlet			
Spillway			

Embankment (tree growth) Yes No Comment:_____

Mowed (circle one) Yes (date)_____ No (why)_____

Depth of sediment (ft): _____

Action Required:_____

_____

_____

*Attach additional pages as necessary.

3. Rip Rap Outlet

Sediment Accumulation (circle one) Yes No

Comment:_____

Erosion Observed Yes No

Comment:_____

*Attach additional pages as necessary.

4. Drop Inlets (catchbasins)

Sediment Accumulation (circle one) Yes No

Comment:_____

Depth of sediment (ft): _____

Action Required:_____

_____

_____

*Attach additional pages as necessary.

5. Hydrodynamic Separator

Time since last inspection: _____ days

Depth of sediment – less than 12-inches Yes No Depth:_____

Structural Integrity: Good Poor

Action Required:_____

_____

_____

*Attach additional pages as necessary.

Statement of Compliance

Based on the above observations, this report can serve as confirmation that the stormwater system **is** being maintained and operated in general conformance with the approved plans and the discharge permit referenced above, and that the stormwater system is in good operating condition.

_____ _____

Signature Date

_____

Print or Type Name

Record Keeping:

A copy of this Inspection Form and any supporting documents, including but not limited to, photographs, vendor receipts, notes or other records, must be kept on file at the premises for a minimum of three (3) years.

Appendix 5
Hydro Cad Calculations