B20 D&E Cleanroom Space and Heavy Lab Shell

ENGINEERING REPORT

ASML US, Inc.
20 Westport Road
Wilton, Connecticut

February 7, 2024

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Abbreviations

cm	centimeters
CT	Connecticut
CTDEEP	Connecticut Department of Energy and Environmental Protection
CTDOT	Connecticut Department of Transportation
DCIA	Directly Connected Impervious Area
D&E	Design & Engineeringb
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
HSG	Hydrologic Soil Group
NDDB	Natural Diversity Database
NRCS	Natural Resources Conservation Service
RCP	Reinforced Concrete Pipe

Section 1
Introduction

1.1 Project Description

Tighe & Bond has prepared this engineering report in connection with the ASML B20 Cleanroom Project at ASML's campus located at 20 Westport Road in Wilton, Connecticut. ASML is expanding their D&E (Design and Engineering) activity at 20 Westport Road. The project will convert a portion of the existing enclosed loading dock to testing and research heavy lab and cleanroom lab space.

The project will convert 9,838 square feet of existing loading dock to heavy lab and cleanroom lab spaces, and remove 13 parking spaces inside the building to create a 1,947 square foot mechanical room, for a total addition of 11,785 square feet of gross floor area. Additionally, 1,573 square feet of shipping area will be transitioned to laboratory support space. The loading dock area will be reduced to 3,932 square feet accommodating two truck dock spaces.

Work outside of the building footprint includes an air handler that will be constructed on a platform outside the cleanroom space, along the Dudley Road frontage of the building, but outside of the 100 foot front yard. The existing walkway will be relocated to accommodate the air handling unit, and the existing stabilized turf accessway will be extended northeasterly toward the air handling unit to facilitate installation and servicing of the unit.

Refer to the Site Location Map, **Figure 1.**

1.2 Site Description

The 20 Westport Road parcel encompasses 24.673 acres bounded by Westport Road (Connecticut Route 33) to the south, the CTDOT right of way to the west, 10 Westport Road to the north, and Dudley Road to the east. The ground surface slopes gently from southeast to northwest. Chestnut Hill Brook winds through the property in a general north to south direction through the site. The property is located in Zoning District DE-10. Access to the 10 Westport Road office building is provided by the 20 Westport Road driveway network.

The existing development consists of two parallel office buildings with underground parking, a cafeteria and a parking garage.

1.3 Stormwater Management

A network of storm drains and catch basins carries stormwater runoff form the building to a biofiltration area, and ultimately to Chestnut Hill Brook.

Since the only exterior work proposed is for the proposed air handling unit, the additional runoff generated by the project will be deminimis in nature.

Stormwater runoff will discharge following the same general drainage patterns as the existing condition. The air handler will be on an elevated platform, over a crushed stone pad, which will allow runoff to infiltrate into the ground.

1.4 Floodplain Management

The Flood Insurance Study for Fairfield County, dated June 18, 2010 shows that the site is outside the Special Flood Hazard Area, Zone AE and floodway associated with the Norwalk River.

The site ground surface slopes gently from southeast to northwest toward Chestnut Hill Brook, which enters the northeastern portion of the site through a 36-inch diameter culvert under Raymond Lane. There is a tributary to the Chestnut Hill Brook which also enters the 10 Westport Road site to the north through a 42-inch diameter culvert under Raymond Lane. The two watercourses converge, and proceeds south where it is conveyed underneath the existing 10 Westport Road office building through three 36-inch diameter reinforced concrete pipes (RCP).

To the east of the existing office complex Chestnut Hill Brook forms a broad, densely vegetated marsh formed behind an existing weir. This results from water backing up behind a concrete weir and associated concrete dam.

After flowing across the concrete weir, Chestnut Hill Brook proceeds westerly into an existing pond. The pond has a concrete spillway structure that regulates the flow. The outlet from the pond proceeds westerly through four 15-inch tile pipes underneath a driveway. Chestnut Hill Brook continues west and south eventually outletting under Danbury Road through a 72- inch reinforced concrete culvert into the Norwalk River.

1.4 Soils & Geology

Previous Geotechnical Investigations indicate the subsurface stratigraphy of the upland area consists of a thin layer of topsoil or fill, underlying light brown to brown coarse to fine sand and coarse gravel, with trace to some silt and with occasional to frequent cobbles and boulders.

Bedrock ranges from 4 feet to 26 feet below the existing ground level. Bedrock is a gray, hard fractured mixed felsic gneiss. Groundwater levels in glacial tills are subject to large seasonal fluctuations due to variations in precipitation. Groundwater consistent with the bedrock profile slopes down gradually from southeast to northwest.

1.4.1 Soil Identification

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil resource report for the site identified the hydrologic soil groups for the site to be mostly HSG A and HSG B.

Table 1-1
Hydrologic Soils Group

Description	HSG
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes (3)	D
Hinckley loamy sand, 3 to 15 percent slopes (38C)	A
Canton and Charlton fine sandy loans, 3 to 8 percent slopes (60B)	B
Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky (73C)	B
Rippowam fine sandy loam (103)	B/D

Rippowam Fine Sandy Loam 103)	B/D
Haven - Urban land complex, 0 to 8 percent slopes (232B)	B
Hinckley – Urban land complex, 3 to 15 percent slopes (238C)	A
Udorthents – Urban land complex	B
Have silt loam, 0 to 3 percent slopes	B

The NRCS Web Soil Survey Report is located in **Appendix A**.

1.4.2 Wetlands Soils

Rippowam fine sandy loam. This nearly level, poorly drained soil is on flood plains of major streams and their tributaries. The areas are long and narrow or irregularly shaped and mostly range from 3 to 30 acres. Slopes are less than 3 percent.

Typically, this soil has a surface layer of very dark grayish brown fine sandy loam 5 inches thick. The subsoil is brown and gray, mottled fine sandy loam and sandy loam 19 inches thick. The substratum is dark gray loamy sand and grayish brown gravelly sand to a depth of 60 inches or more.

Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in lodgment till derived mainly from granite, gneiss and/or schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in depressions in uplands. They also occur in drainageways in uplands, in toe of slope positions of hills, drumlins, and ground moraines, and in till plains. Slope ranges from 0 to 15 percent.

1.4.3 Non-Wetlands Soils

Canton and Charlton Fine Sandy Loams. This series consists of very deep, well drained and very stony soils, formed in a loamy mantle underlain by sandy till. They are on nearly level to very steep moraines, hills, and ridges. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum.

Charlton-Chatfield Complex. This unit consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 50 to 100 cm. Saturated hydraulic conductivity is moderately high or high in the mineral soil.

Haven Silt Loam. This is a very deep, gently sloping, well drained soil in broad areas on plains and terraces. Areas of the soil are irregular in shape and range from 6 to 50 acres.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsoil is yellowish brown very fine sandy loam in the upper part and light olive brown gravelly very fine sandy loam in the lower part. It is about 15 inches thick. The substratum is light olive brown, stratified very gravelly coarse sand to a depth of 60 inches or more. In some areas the substratum is very fine sandy loam or silt loam and permeability is slow.

Haven - Urban land. This unit consists of areas where urban structures cover more than 85 percent of the surface. Examples of such structures are roads, parking lots, shopping

and business centers, and industrial parks. The areas are commonly rectangular and range from 5 to 500 acres.

Slopes range from 0 to 8 percent but are dominantly less than 5 percent. Included with this unit in mapping are small areas of Udorthents and areas of excessively drained Hinckley soils; somewhat excessively drained Hollis soils.

Hinckley Loamy Sand. The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Saturated hydraulic conductivity is high or very high. Slope ranges from 0 to 60 percent

Hinckley - Urban land. This unit consists of areas where urban structures cover more than 85 percent of the surface. Examples of such structures are roads, parking lots, shopping and business centers, and industrial parks. The areas are commonly rectangular and range from 5 to 500 acres.

Slopes range from 0 to 15 percent but are dominantly less than 5 percent. Included with this unit in mapping are small areas of Udorthents and areas of excessively drained Hinckley soils; somewhat excessively drained Hollis soils.

1.4.4 Hydrologic Soil Groups

Soils are classified by the Natural Resource Conservation Service into four Hydrologic Soil Groups (HSG) based on the soil's runoff potential. The four Hydrologic Soils Groups are A, B, C and D. Group A soils generally have the smallest runoff potential, while Group D soils have the greatest runoff potential.

Group A. Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group B. Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group C. Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group D. Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have

greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential.

Dual Group Soils. Certain wet soils are placed in group D based solely on the presence of a water table within 24 inches of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups (A/D, B/D, and C/D) based on their saturated hydraulic conductivity and the water table depth when drained.

1.5 Earthwork Activities

The proposed project contains minor earthwork activities for the exterior improvement, such as excavation for the stabilized turf, crushed stone pad, new sidewalk, proposed piers, and new yard drain. The total amount of excavation will be approximately 106 cubic yards.

Section 2
Wetlands and Watercourses

2.1 Overview

The wetlands on-site were identified by William Kenny, Soil Scientist and located by the project surveyor.

No disturbance of wetlands is proposed, nor is any of the proposed work to occur in the upland review area.

2.2 Natural Diversity Communities

The Connecticut Department of Energy and Environmental Protection's Natural Diversity Database (NDDB) Map for the Town of Wilton, dated December 2023, shows no state endangered or threatened species on the site.

2.3 Aquifer Protection Areas

The proposed work is not located within a state Aquifer Protection Area as identified by CTDEEP.

The project is located in a municipal aquifer protection zone. The proposed project treats the water quality volume and disconnects the new impervious surfaces in accordance with the 2023 Connecticut Stormwater Quality Manual.

2.4 Floodplain Management

The Flood Insurance Study for Fairfield County, dated June 18, 2010, FIRM Panel No. 09001C0391F, shows that there is a shaded Zone X, located to the northeast of the building. Shaded Zone X corresponds to the 0.2% annual chance (500-year) flood. There are no regulatory requirements for shaded Zone X for this land use, and no work is proposed within the shaded Zone X..

Section 3
Stormwater Management

3.1 Overview

A network of storm drains and catch basins carries stormwater runoff from the building to an existing biofiltration area, and ultimately to Chestnut Hill Brook. The existing biofiltration area provides water quality treatment for the site.

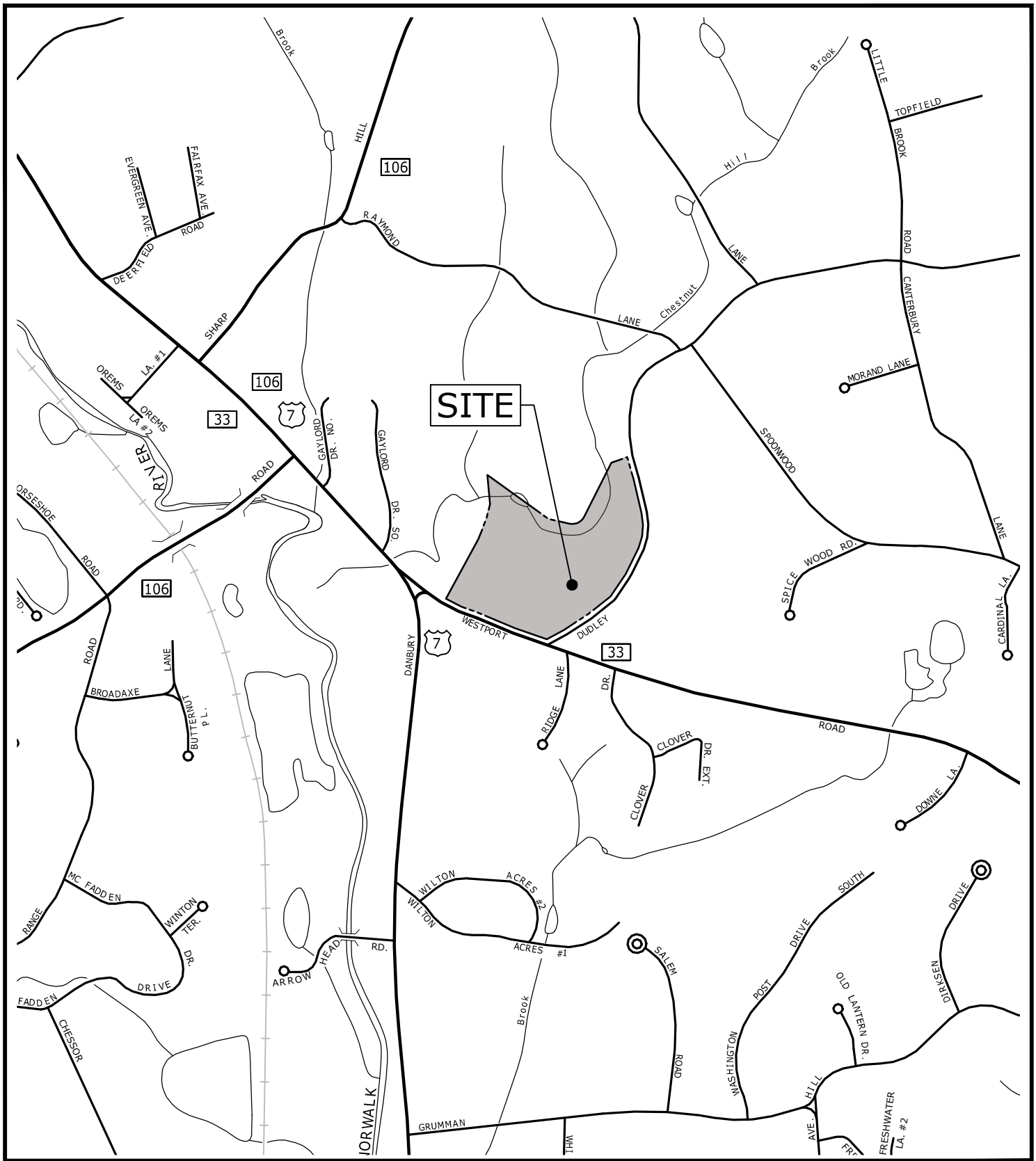
Stormwater runoff will discharge following the same general drainage patterns as the existing condition. The air handler will be on an elevated platform, over a crushed stone pad, which will allow runoff to infiltrate into the ground.

3.2 Water Quality

Since the only exterior work proposed is for the proposed air handling unit, the additional runoff generated by the project will be deminimis in nature. The project will add approximately 525 square feet of impervious surface, including the air handler, and the additional length from the sidewalk relocation. Runoff from the air handler will run off the edges of the platform onto the crushed stone pad below. The voids in the crushed stone provide 180 cubic feet of storage. The air handler covers approximately 426 square feet, inclusive of the platform. The water quality volume required for the air handler, based on 1.3 inches of rainfall, is 47 cubic feet. The available storage exceeds the water quality volume.

Stormwater from the sidewalk discharges to the lawn area, and into the wooded area, with a sufficiently long buffer to be considered disconnected.

The project will not increase directly connected impervious cover, nor will it increase directly connected impervious cover.



ASML

B20 D&E CLEANROOM SPACE AND HEAVY LAB SHELL

WILTON, CONNECTICUT

SITE LOCATION MAP

NORTH

1" = 1000'

FIGURE 1

0 1000' 2000'

SCALE: 1" = 1000'

Tighe&Bond

Feb 06, 2024-1:23pm Plotted By: SansoneM
Tighe & Bond, Inc. J:\A\A0969 ASML\042 B20 Generator\Drawings\AutoCAD\Figures\Figure 1 - Site Location.dwg

APPENDIX A

Hydrologic Soil Group—State of Connecticut, Western Part
(20 Westport Road)

Map Scale: 1:3,570 if printed on A portrait (8.5" x 11") 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, Western 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: Oct 21, 2022—Oct 27, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	0.1	0.4%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	4.0	14.3%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	3.3	11.7%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.1	0.2%
103	Rippowam fine sandy loam	B/D	6.8	24.4%
232B	Haven-Urban land complex, 0 to 8 percent slopes	B	1.1	4.0%
238C	Hinckley-Urban land complex, 3 to 15 percent slopes	A	5.9	21.0%
306	Udorthents-Urban land complex	B	0.9	3.3%
703A	Haven silt loam, 0 to 3 percent slopes	B	5.8	20.7%
Totals for Area of Interest			**28.0**	**100.0%**

Description

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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher