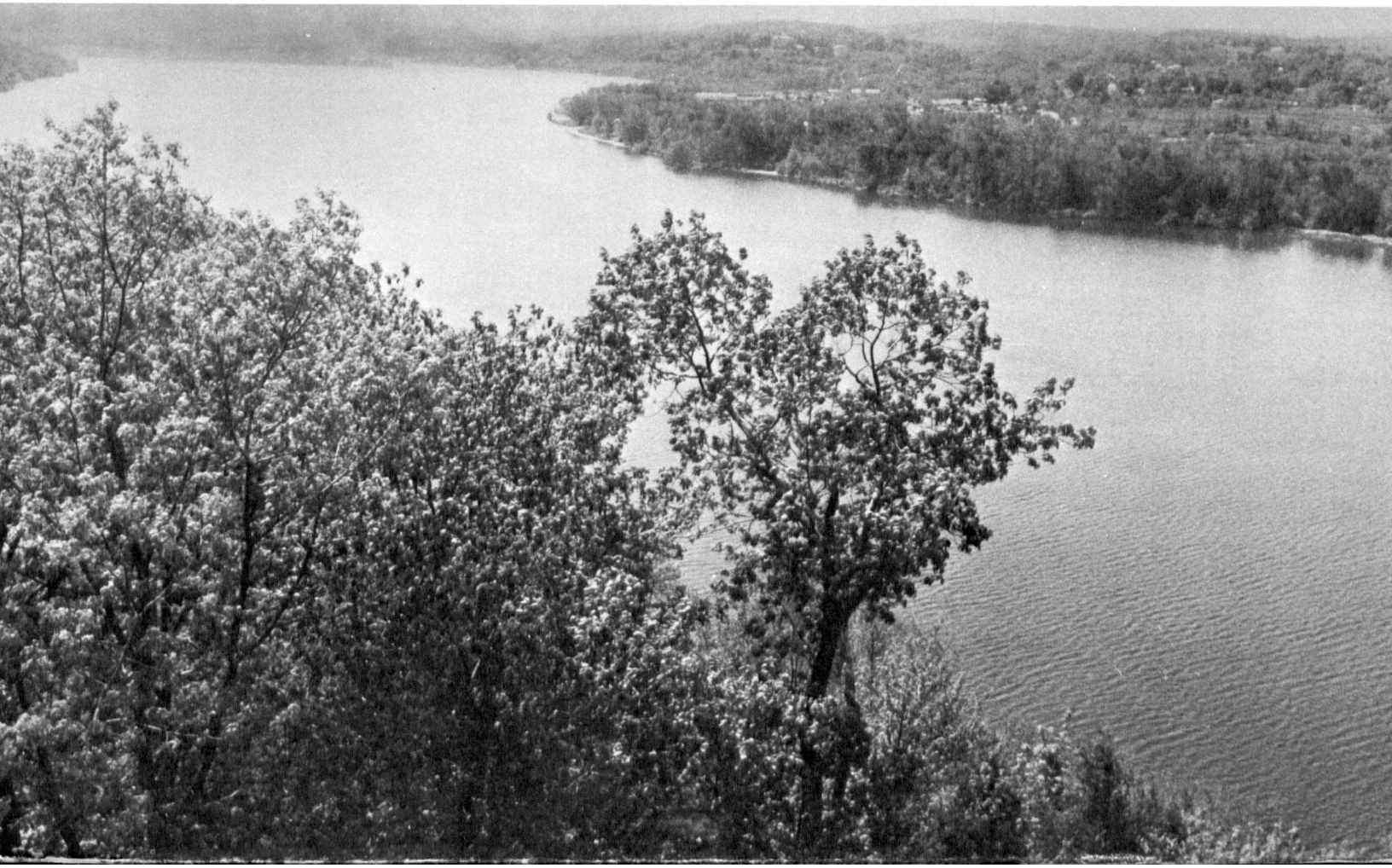
Soil Survey of Middlesex County, Connecticut

United States Department of Agriculture, Soil Conservation Service
in cooperation with
Connecticut Agricultural Experiment Station
Storrs Agricultural Experiment Station



HOW TO USE

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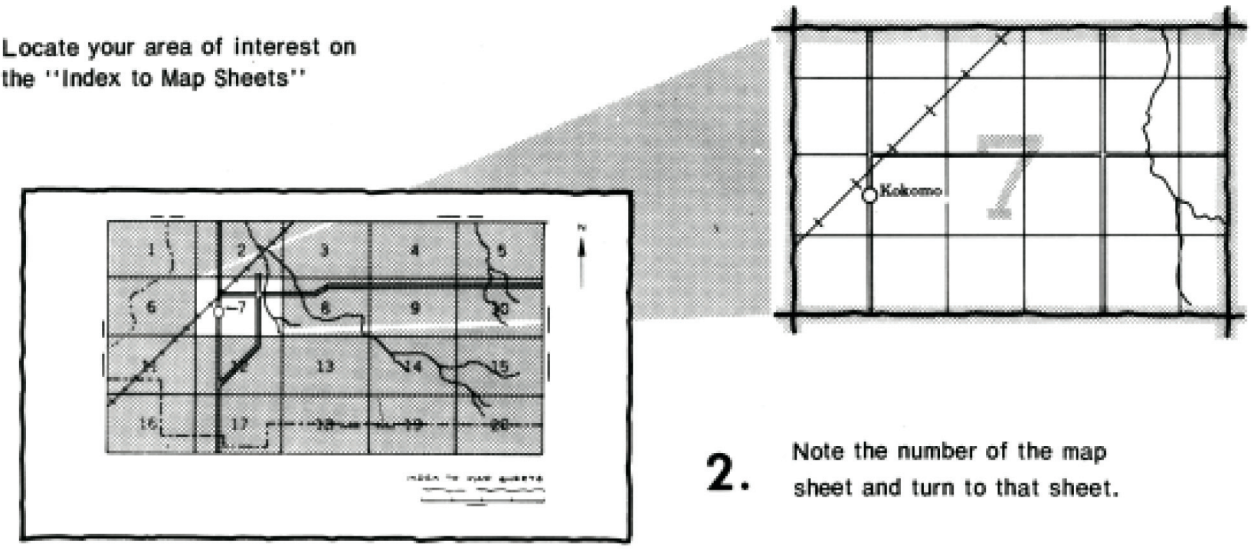

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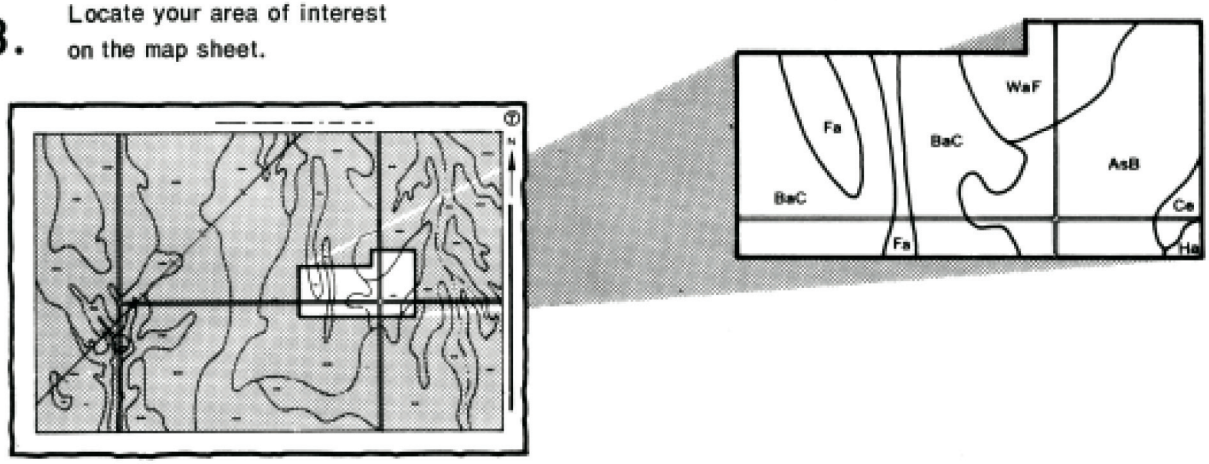

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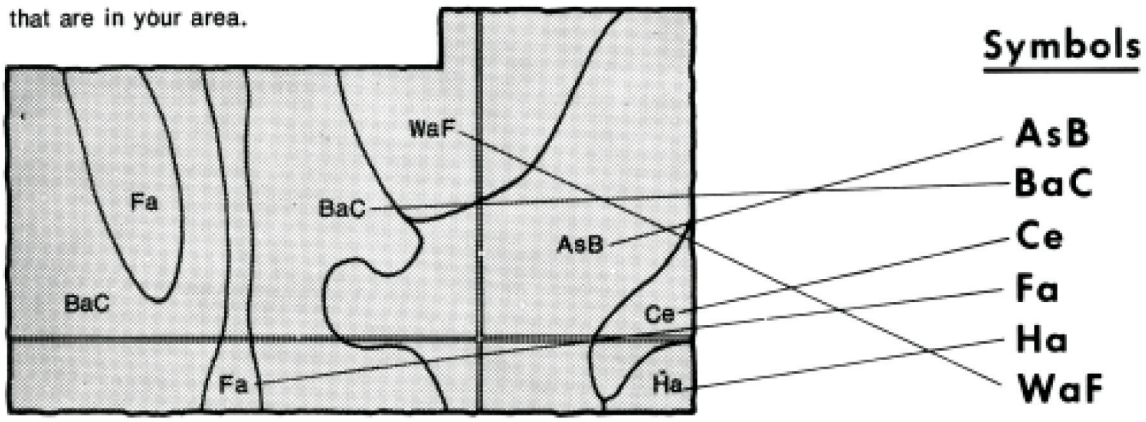

THIS SOIL SURVEY

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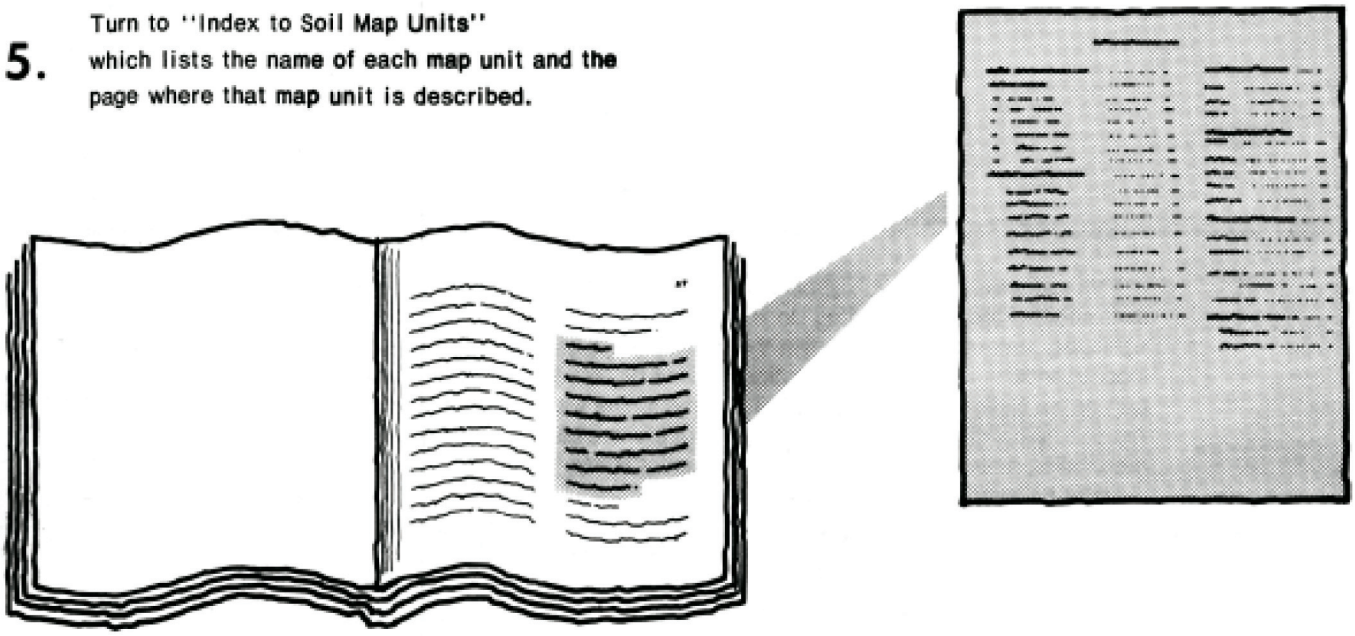
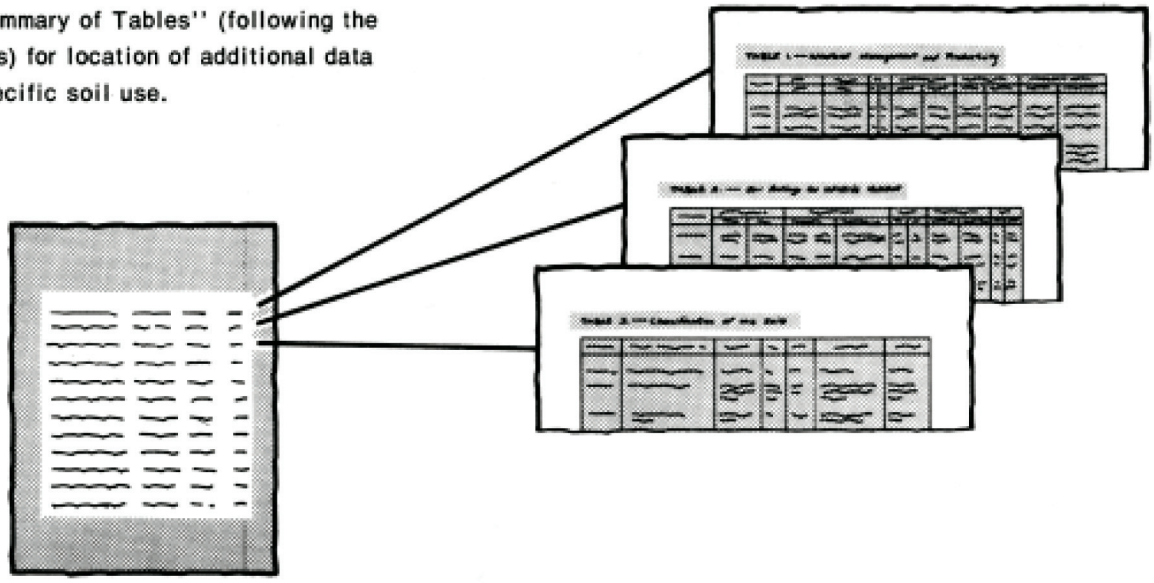


6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1972–76. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Connecticut Agricultural Experiment Station and the Storrs Agricultural Experiment Station. It is part of the technical assistance furnished to the Middlesex County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: The Connecticut River flows through the center of Middlesex County. Hollis and Charlton soils are on the hills in the background.

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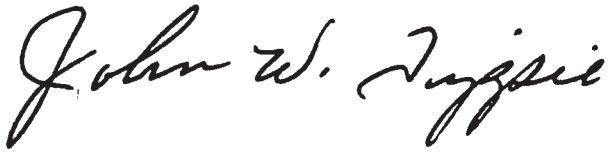
Foreword

This soil survey contains much information useful in land-planning programs in Middlesex County, Connecticut. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.



John W. Tippie
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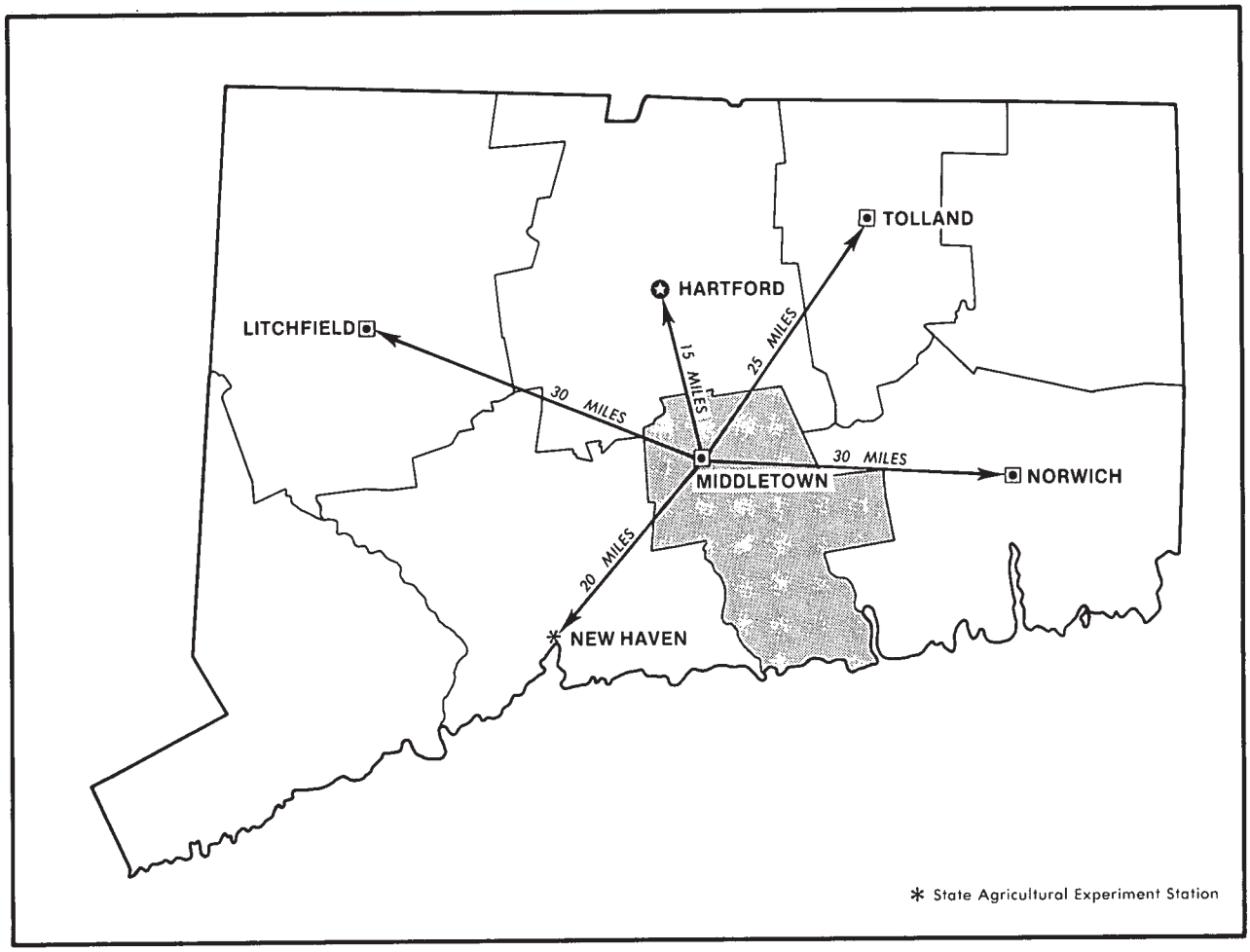

Location of Middlesex County in Connecticut.

Soil Survey of Middlesex County, Connecticut

By Charles A. Reynolds, Soil Conservation Service

Fieldwork by Charles A. Reynolds, Marc H. Crouch, Steven L. Elmer, Philip S. Gale, Dennis E. Hutchison, Plater T. Campbell, Gerald W. Crenwelge, Wesley L. Miller, and Jerry L. Rives, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
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MIDDLESEX COUNTY is in the south-central part of Connecticut. The county is drained by the Connecticut River and bordered on the south by Long Island Sound. Middlesex County is made up of 15 towns; it takes in an area of 237,400 acres, or 371 square miles. The county is in the New England physiographic province; the Connecticut Valley Lowlands are in the northwestern part of the county and the New England Uplands are in the other parts.

In 1970, the population of the county was 108,996. The largest city is Middletown, in the northwestern part of the county. It has a population of 40,050.

The economy of Middlesex County depends mainly on industry, commerce, farming, and recreation. Industry and commerce are centered mostly in the northwestern part of the county. Farming is a major part of the economy throughout the county and consists mainly of dairying, vegetable and tobacco production, and fruit cultivation. The major recreation facilities are near Long Island Sound and the Connecticut River.

General nature of the county

This section provides information about Middlesex County. It discusses settlement and development, farming and woodland, industries and transportation, and climate.

Settlement and development

In May 1785, the colonial legislature of Connecticut authorized the creation of Middlesex County. Farming was the major enterprise in the county until about 1900. Most farms were diversified and provided farm families with most of their necessities. Around 1900, farming became more specialized. The major farming enterprises were dairying and raising nursery stocks and fruit orchards.

Manufacturing began in the county in the late 1600's. Early manufacturing plants were small and near areas where water power was available. Most of the early plants were in the Middletown area on the Coginchaug River, Sumner and Fall Brooks, and Pameacha Creek. A few plants were built along streams in Haddam and East Hampton. When steam power was introduced in the mid 1800's, many industries located near railroad lines, which transported coal and raw materials. In 1970 more than 300 industrial firms were in Middlesex County.

Maritime trade became important to Middlesex County in the early 1800's. The Connecticut River provided shipping access to Long Island Sound and the Atlantic Ocean. Goods from Middletown and other local ports were shipped to areas along the Atlantic Coast and to overseas ports. As overland transportation improved, maritime shipping decreased, but some materials are still transported on the Connecticut River

Farming and woodland

Although farming has been decreasing in the county, it is still a major source of employment. Dairy products, fruits, nursery stock, vegetables, tobacco, and greenhouse crops are the major farm commodities in the county. Corn and legume- and grass-hay are grown extensively for dairy cattle. Many small vegetable farms produce much of the vegetables consumed in the area during summer and fall. Orchards, mostly in the northwestern part of the county, produce applies, peaches, pears, and some berries. Tobacco is a major crop in the northern part.

About 75 percent of the county is wooded. Except for the northwestern part of the county, where most of the land has been cleared, the forests are evenly distributed. Most forestland is privately owned; however, some large tracts are in State forests and parks. The major forest products are saw logs, firewood, and Christmas trees.

Industries and transportation

Commerce and industry are major sources of employment in the Middletown area and in towns bordering Long Island Sound from Clinton to Saybrook. There are small industries in other towns in the county. Some of the major goods produced are fabricated and primary metals, rubber and plastic products, electrical equipment, textiles, and stone, clay, and glass products. A large rock quarry in Durham provides crushed rock for local and out-of-state construction and for road building.

The main automotive routes in Middlesex County are Interstate Highway 91 and Connecticut Route 8, both of which run north-south, and Interstate Highway 95, which runs east-west near Long Island Sound. A number of other Federal and State highways cross the county. A major railroad runs east-west in the southern part of the county, and a small rail line on the west side of the Connecticut River connects Old Saybrook with Middletown and Hartford. The county is served by bus lines and numerous trucking firms. The Connecticut River provides water transportation and can handle the smaller ocean-going vessels the year round.

Climate

In Middlesex County, winters are cold and summers are warm. The start and the end of the warm period are influenced by the Atlantic Ocean. In winter, the ground is frequently, but not continuously, covered with snow. Total annual precipitation is nearly always adequate for crops that are suited to local temperatures.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Middletown, Connecticut, for the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 30 degrees F, and the average daily minimum temperature is 22 degrees. The lowest temperature on record, which occurred at Middletown on January 15, 1957, is -11 degrees. In summer the average temperature is 70 degrees, and the average daily maximum temperature is 80 degrees. The highest recorded temperature, which occurred on August 6, 1955, is 99 degrees.

Growing degree days, shown in table 1, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 24 inches, or 49 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 4.81 inches at Middletown on September 12, 1971. Thunderstorms occur on about 22 days each year, mostly in summer.

Average seasonal snowfall is 40 inches. The greatest snow depth at any one time during the period of record was 30 inches. On the average, 18 days have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The percentage of possible sunshine is 60 in summer and 50 in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in April.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to

meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of woodland, engineers, planners, developers and builders, and home buyers.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The eight map units in Middlesex County are in two major groups and are described in the following pages.

Soils of the New England Uplands that formed mainly in material that weathered from gneiss, schist, and granite

The soils that make up these map units are in all but the northwestern part of the county. Most of the soils formed in glacial till, but the soils of one map unit formed in glacial outwash. A considerable acreage of organic soils and alluvial soils is included in most of the map units. One of the units has a large acreage of soils in tidal marshes. Most of the woodland in the county and many scattered areas used for farming are in these units.

1. Canton-Hollis-Charlton

Gently sloping to steep, somewhat excessively drained and well drained, loamy soils; on glacial till uplands

This map unit makes up about 30 percent of the county. The unit is about 35 percent Canton soils, 25 percent Hollis soils, 20 percent Charlton soils, and 20 percent soils of minor extent.

The Canton soils are well drained. They formed in deep, friable, sandy glacial till. Typically, they have a surface layer of very dark grayish brown and dark brown fine sandy loam, a subsoil of dark brown and dark yellowish brown fine sandy loam, and a substratum of light brownish gray gravelly loamy sand.

The Hollis soils are somewhat excessively drained and shallow to bedrock. Typically, they have a surface layer of very dark grayish brown fine sandy loam and a subsoil of yellowish brown fine sandy loam. The underlying bedrock is hard, unweathered gneiss, schist, or granite.

The Charlton soils are well drained. They formed in deep, friable, loamy glacial till. Typically, they have a surface layer of dark brown fine sandy loam; a subsoil of dark yellowish brown, yellowish brown, and light olive brown fine sandy loam and light yellowish brown gravelly sandy loam; and a substratum of brown fine sandy loam.

The minor soils in this map unit are mainly well drained Paxton and Montauk soils on convex slopes of drumlins and glacial till plains, moderately well drained Woodbridge soils on concave slopes and small drainageways of drumlins and glacial till plains, poorly drained Leicester and Ridgebury soils and very poorly drained Whitman soils in upland depressions and drainageways, and very poorly drained Adrian and Carlisle soils in organic material in depressions.

Most areas of this unit are wooded. Some areas are farmed or used for community development.

The Canton and Charlton soils have good potential for most uses. The Hollis soils have poor potential for most uses because bedrock is at a depth of 10 to 20 inches. Most areas of this unit have stones, boulders, and rock outcrops on the surface.

2. Hollis-Charlton

Gently sloping to steep, somewhat excessively drained and well drained, loamy soils; on bedrock-controlled glacial till uplands

This map unit makes up about 15 percent of the county. The unit is about 40 percent Hollis soils, 35 percent Charlton soils, and 25 percent soils of minor extent (fig. 1).

The Hollis soils are somewhat excessively drained and shallow to bedrock. Typically, they have a surface layer of very dark grayish brown fine sandy loam, a subsoil of yellowish brown fine sandy loam, and underlying bedrock of hard, unweathered gneiss, schist, or granite.

The Charlton soils are well drained. They formed in deep, friable, loamy glacial till. Typically, they have a surface layer of dark brown fine sandy loam; a subsoil of dark yellowish brown, yellowish brown, and light olive brown fine sandy loam and light yellowish brown gravelly sandy loam; and a substratum of brown fine sandy loam.

The minor soils in this map unit are mainly well drained Paxton and Montauk soils on drumlins, well drained Canton soils on glacial till plains, moderately well drained Woodbridge soils on concave slopes of glacial till plains, poorly drained Leicester and Ridgebury soils and very poorly drained Whitman soils in drainageways and depressions of till plains, and very poorly drained Adrian and Carlisle soils that formed in organic deposits.

Most areas of this unit are wooded. A few areas are in cultivated crops or pasture, and some are used for community development.

The Hollis soils have poor potential for most uses and are limited by bedrock, which is at a depth of 10 to 20 inches. The Charlton soils have good potential for most uses. Many areas of this unit have stones, boulders, and rock outcrops on the surface.

3. Paxton-Woodbridge

Nearly level to steep, well drained and moderately well drained, loamy soils that have a compact substratum; on drumloidal glacial till uplands and broad glacial till plains.

This map unit makes up about 25 percent of the county. The unit is about 45 percent Paxton soils, 40 percent Woodbridge soils, and 15 percent soils of minor extent.

The Paxton soils are gently sloping to steep and are well drained. These soils are nonstony to extremely stony. Typically, they have a surface layer of very dark grayish brown fine sandy loam; a subsoil of brownish yellow and yellowish brown fine sandy loam; and a substratum of firm, dark grayish brown gravelly fine sandy loam.

The Woodbridge soils are nearly level to sloping and are moderately well drained. These soils are nonstony to extremely stony. Typically, they have a surface layer of dark brown fine sandy loam; a subsoil of dark yellowish brown and yellowish brown, mottled fine sandy loam; and a substratum of firm, olive, mottled fine sandy loam.

The minor soils of this map unit are mainly poorly drained Leicester and Ridgebury soils and very poorly drained Whitman soils in depressions and drainageways. Other minor soils are well drained Canton and Charlton soils on glacial till plains, somewhat excessively drained Hollis soils with bedrock at a depth of 10 to 20 inches, and very poorly drained Adrian and Carlisle soils that formed in organic deposits.

Most areas of this unit are wooded. Many scattered areas are used for farming, mainly dairying, and many of the large dairy farms in the county are in this map unit. A few areas are used for community development.

Paxton and Woodbridge soils have fair potential for most uses. Paxton soils are limited mainly by slow or very slow permeability in the substratum. Woodbridge soils are limited mainly by slow or very slow permeability in the substratum and by a seasonal high water table. Many areas of this unit have stones and boulders on the surface.

4. Hinckley-Agawam-Merrimac

Nearly level to steep, excessively drained to well drained, loamy and sandy soils; on glacial outwash plains and terraces

This map unit makes up about 5 percent of the county. The unit is about 30 percent Hinckley soils, 25 percent Agawam soils, 20 percent Merrimac soils, and 25 percent soils of minor extent (fig. 2).

The Hinckley soils are gently sloping to steep and are excessively drained. Typically, they have a surface layer of dark grayish brown gravelly sandy loam, a subsoil of brown gravelly loamy sand and yellowish brown gravelly sand, and a substratum of brown and light brownish gray very gravelly sand.

The Agawam soils are nearly level to gently sloping and are well drained. Typically, they have a surface layer of dark brown fine sandy loam, a subsoil of dark brown and strong brown fine sandy loam, and a substratum of dark brown and grayish brown, stratified sand.

The Merrimac soils are nearly level to gently sloping and are somewhat excessively drained. Typically, they have a surface layer of very dark grayish brown sandy loam, a subsoil of brown and dark yellowish brown sandy loam and dark yellowish brown gravelly loamy sand, and a substratum of dark yellowish brown very gravelly sand.

The minor soils in this map unit are mainly very poorly drained Westbrook soils in tidal marshes; excessively drained Windsor soils, moderately well drained Ninigret and Sudbury soils, and poorly drained Walpole soils on outwash terraces or plains; and Suncook, Podunk, Rumney, and Saco soils that formed in alluvial sediments on flood plains.

Most areas of this unit are used for community development or cultivated crops. A few areas are wooded, and a few are idle.

The soils of this unit have good potential for most uses. The Hinckley soils are droughty, and most crops and lawns need irrigation or watering during the summer.

Soils of the Connecticut Valley Lowlands that formed mainly in material that weathered from Triassic sandstone and conglomerate

The soils that make up these map units are mainly in the northwestern part of the county. Most of the soils formed in glacial till, but the soils of one map unit formed in glacial outwash and the soils of another formed in alluvial sediment. A considerable acreage of organic soils is included in most of these map units. Most of the urban population and many industries are concentrated in this

part of the county. Most of the orchards, vegetables, nursery stock, and tobacco are grown on the soils of these map units.

5. Rumney-Saco-Podunk

Nearly level, moderately well drained to very poorly drained, loamy soils; on flood plains

This map unit makes up about 5 percent of the county. The unit is about 40 percent Rumney soils, 20 percent Saco soils, 15 percent Podunk soils, and 25 percent soils of minor extent.

The Rumney soils are poorly drained. Typically, they have a surface layer of very dark brown fine sandy loam; a subsoil of dark grayish brown, mottled fine sandy loam and dark gray, mottled sandy loam; and a substratum of grayish brown, mottled sand.

The Saco soils are very poorly drained. Typically, they have a surface layer of very dark grayish brown mucky silt loam and a substratum of dark gray and very dark gray, mottled silt loam.

The Podunk soils are moderately well drained. Typically, they have a surface layer of dark brown fine sandy loam and dark grayish brown loamy fine sand; a subsoil of dark brown, mottled fine sandy loam; and a substratum of dark grayish brown and brown, mottled loamy fine sand.

The minor soils in this map unit are mainly somewhat excessively drained Merrimac soils on adjacent outwash plains and terraces, well drained Paxton and Canton soils on adjacent glacial till uplands, and somewhat excessively drained Hollis soils that have bedrock at a depth of 10 to 20 inches and that are on adjacent uplands.

Most areas of this map unit are cleared and used for pasture or are idle. A few areas are in cultivated crops. Many scattered areas are wooded. A few small areas are used for community development.

The soils of this map unit have poor potential for most uses. The main limitations are the hazard of flooding and wetness.

6. Holyoke-Wethersfield-Cheshire

Gently sloping to steep, somewhat excessively drained and well drained, loamy soils; on bedrock-controlled glacial till uplands

This map unit makes up about 5 percent of the county. The unit is about 30 percent Holyoke soils, 30 percent Wethersfield soils, 25 percent Cheshire soils, and 15 percent soils of minor extent.

The Holyoke soils are somewhat excessively drained. They have bedrock at a depth of 10 to 20 inches. Typically, they have a surface layer of very dark gray silt loam and a subsoil of dark reddish brown silt loam. The underlying bedrock is hard, unweathered basalt, conglomerate, sandstone, or shale. Many areas have rock outcrops.

The Wethersfield soils are well drained. Typically, they have a surface layer of dark brown loam, a subsoil of reddish brown and dark reddish brown loam, and a substratum of very firm, reddish brown gravelly loam.

The Cheshire soils are well drained. They formed in friable, glacial till. Typically, they have a surface layer of dark brown silt loam, a subsoil of yellowish red and reddish brown silt loam, and a substratum of dark reddish brown gravelly loam.

The minor soils in this map unit are mainly moderately well drained Ludlow soils and poorly drained Wilbraham soils on glacial till uplands, well drained Yalesville soils with bedrock at a depth of 20 to 40 inches, and well drained Branford soils and somewhat excessively drained Hartford soils on glacial outwash plains and terraces.

Most areas of this unit are wooded. Some areas are used for community development. A few scattered areas are cleared and farmed.

The Holyoke soils of this unit have poor potential for most uses. The main limitations are bedrock at a depth of 10 to 20 inches and steep slopes in places. The Cheshire and Wethersfield soils have fair potential for most uses. Cheshire soils are limited by steep slopes in places, and Wethersfield soils are limited mainly by a slowly permeable or very slowly permeable substratum. Many areas of this map unit have stones, boulders, and rock outcrops on the surface.

7. Wethersfield-Ludlow-Wilbraham

Nearly level to steep, well drained to poorly drained, loamy soils that have a compact substratum; on drumloidal glacial till uplands and broad glacial till plains.

This map unit makes up about 10 percent of the county. The unit is about 55 percent Wethersfield soils, 20 percent Ludlow soils, 10 percent Wilbraham soils, and 15 percent soils of minor extent (fig. 3).

The Wethersfield soils are gently sloping to steep and are well drained. They formed in firm, loamy glacial till. Typically, they have a surface layer of dark brown loam, a subsoil of reddish brown and dark reddish brown loam, and a substratum of very firm, reddish brown gravelly loam. These soils are nonstony to extremely stony.

The Ludlow soils are nearly level to sloping and are moderately well drained. They formed in firm, loamy glacial till. Typically, they have a surface layer of dark brown silt loam; a subsoil of reddish brown and dark reddish brown, mottled silt loam; and a substratum of dark reddish brown, mottled, firm gravelly loam.

The Wilbraham soils are nearly level and poorly drained. They formed in firm, loamy glacial till. Typically, they have a surface layer of very dark gray silt loam; a subsoil of reddish brown, mottled silt loam; and a substratum of very firm, dark reddish brown, mottled gravelly loam.

The minor soils in this map unit are mainly somewhat excessively drained Holyoke soils, which have bedrock at a depth of 10 to 20 inches; well drained Yalesville soils, which have bedrock at a depth of 20 to 40 inches; and well drained Cheshire soils, which formed in friable glacial

till. The other minor soils are very poorly drained Adrian and Carlisle soils formed in organic deposits.

Most areas of this unit are in cultivated crops. Scattered areas are used for community development. A few areas are used for orchards, are wooded, or are idle.

The Wethersfield and Ludlow soils have fair potential for most uses. The main limitations are slow or very slow permeability and steep slopes in places. Ludlow soils are also limited by a seasonal high water table. The Wilbraham soils have poor potential for most uses. The main limitations are slow or very slow permeability and a high water table. In places, the soils of this map unit have stones and boulders on the surface.

8. Hartford-Manchester-Penwood

Nearly level to sloping, excessively drained and somewhat excessively drained, sandy soils; on outwash plains and terraces

This map unit makes up about 5 percent of the county. The unit is about 35 percent Hartford soils, 25 percent Manchester soils, 15 percent Penwood soils, and 25 percent soils of minor extent.

The Hartford soils are nearly level to gently sloping and are somewhat excessively drained. Typically, they have a surface layer of brown sandy loam, a subsoil of yellowish red sandy loam and reddish brown loamy sand, and a substratum of reddish brown, stratified sand and gravel.

The Manchester soils are nearly level to sloping and are excessively drained. Typically, they have a surface layer of dark brown gravelly sandy loam, a subsoil of reddish brown gravelly loamy sand, and a substratum of reddish brown gravelly loamy sand and sand and gravel.

The Penwood soils are nearly level to gently sloping and are excessively drained. Typically, they have a surface layer of dark brown loamy sand, a subsoil of yellowish red loamy sand, and a substratum of reddish brown sand.

The minor soils in this map unit are mainly well drained Branford soils, moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Scarboro soils on glacial outwash plains and stream terraces. Other minor soils are moderately well drained Podunk soils and poorly drained Rumney and Rumney Variant soils on flood plains.

Areas of this map unit are mostly used for community development and cultivated crops, mainly vegetables, nursery stock, and tobacco. Some small areas are wooded.

The soils of this unit have good potential for most uses. If irrigated, the Hartford and Penwood soils are well suited to vegetables and tobacco.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have profiles that are almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. The Wethersfield series, for example, was named for the town of Wethersfield in Hartford County.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Branford silt loam is one of several phases within the Branford series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Charlton-Hollis very stony fine sandy loams, 3 to 15 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Canton and Charlton fine sandy loams, 3 to 8 percent slopes, is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit.

Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Pits, gravel, is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

The map units in this survey area have not all been mapped with the same degree of detail. Delineations of broadly defined units--indicated by a footnote on the soil legend at the back of this publication--are apt to be larger and vary more in composition than units mapped in greater detail. Composition has been controlled well enough, however, to be interpreted for the expected use of the soils.

Soil descriptions and potentials

Aa—Adrian muck. This nearly level, very poorly drained, organic soil is in low depressions of outwash terraces and glacial till plains. The areas of this soil are mainly round or irregular in shape and mostly range from 3 to 80 acres. Slopes are 0 to 2 percent but are dominantly less than 1 percent.

Typically, this soil has an organic layer 24 inches thick. The upper 8 inches of the organic layer is very dark brown muck, the next 12 inches is black muck, and the lower 4 inches is very dark grayish brown muck. The substratum is dark gray gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of very poorly drained Carlisle, Saco, Whitman, and Scarboro soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is rapid. The soil has moderate to high available water capacity. Runoff is very slow or ponded. This soil remains wet most of the year and is ponded for several weeks from fall through spring and after heavy rains in summer. Unlimed areas are very strongly acid to neutral in the organic layers.

This soil is mostly wooded, or it is in marsh grasses and sedges. A very small acreage has been cleared and drained, and a few small areas have been filled and used for community development.

This soil is poorly suited to cultivated crops because of wetness. Most areas are difficult to drain. If drained, the soil can be used to grow vegetables, but the water table needs to be carefully maintained to minimize subsidence and prevent excessive loss of organic material. If the soil is cultivated, cover crops are needed to prevent wind erosion.

This soil is poorly suited to trees, but most of the soil is wooded primarily with red maple, ash, and alder. Other common types of vegetation are sweet pepper brush, blueberry, viburnum, cinnamon fern, and royal fern. The use of equipment is difficult on this soil because of wetness. The soil has a severe windthrow hazard because the roots of trees are restricted by the high water table.

This soil has poor potential for community development. The major limitations are the high water table that is at or near the surface most of the year, frequent flooding or ponding, and the very low strength and poor stability of the organic layers. If fill is placed on top of the organic layers, it will settle. If the soil is drained, the organic material subsides and shrinks and the surface of the soil is lowered. Excavations are unstable. Onsite septic systems are not feasible on this soil. Capability subclass VIw; woodland suitability group 4w.

AfA—Agawam fine sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on outwash plains and stream terraces. The areas are dominantly irregular in shape and mostly range from 5 to 70 acres.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark brown and strong brown fine sandy loam 16 inches thick. The substratum is dark brown and grayish brown, stratified sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ninigret soils, somewhat excessively drained Merrimac soils, and excessively drained Hinckley and Windsor soils. Also included are a few areas of soils along the Connecticut River that have more red in the substratum than this Agawam soil. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up early in the spring. Unlimed areas are very strongly acid to medium acid.

Cleared areas of this soil are used for cultivated crops or hay. A small acreage is wooded or is idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. It is easy to till, and the hazard of erosion is slight. Minimum tillage, use of cover crops, and incorporating crop residue into the soil are suitable management practices.

This soil is suited to trees, but only a small acreage is wooded.

This soil has good potential for community development. Steep slopes of excavations are unstable. Onsite septic systems need careful design and installation to prevent pollution of ground water. Quickly establishing plant cover, mulching, and establishing siltation basins are suitable management practices during construction. Capability class I; woodland suitability group 4o.

AfB—Agawam fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on outwash plains and stream terraces. The areas are dominantly irregular in shape and mostly range from 5 to 70 acres.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark brown and strong brown fine sandy loam 16 inches thick. The substratum is dark brown and grayish brown, stratified sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ninigret soils, somewhat excessively drained Merrimac soils, and excessively drained Hinckley and Windsor soils. A few areas along the Connecticut River have more red in the substratum than this Agawam soil. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate. Runoff is medium. This soil dries out and warms up early in the spring. Unlimed areas are very strongly acid to medium acid.

Cleared areas of this soil are used for cultivated crops or hay. A small acreage is wooded or idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. It is easy to till, and the hazard of erosion is moderate. Minimum tillage, use of cover crops, and incorporating crop residue into the soil are suitable management practices.

This soil is suited to trees, but only a small acreage is wooded.

This soil has good potential for community development. Steep slopes of excavations are unstable. Onsite septic systems need careful design and installation to prevent pollution of ground water. Quickly establishing plant cover, mulching, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 4o.

Ba—Beaches-Udipsamments complex. This complex consists of sandy and gravelly beaches on the shore of Long Island Sound and sandy, smoothed areas adjacent to the beaches. The areas of this complex are long and narrow, generally less than 300 feet wide, and mostly range from 3 to 75 acres. Slopes range from 0 to 15 percent but are mainly less than 8 percent. This complex is about 45 percent Beaches, 40 percent Udipsamments, and 15 percent other soils. The soils are so intermingled that it was not practical to map them separately. Most of this complex is in the towns of Clinton, Old Saybrook, and Westbrook.

Beaches generally consist of deep sand or deposits of gravelly sand derived mainly from gneiss, schist, and granite. In this survey area, Udipsamments consist of sand and gravel, and 15 to 40 percent of the area is covered with cottages and small roads. Udipsamments are at a slightly higher elevation than Beaches and are 15 to 50 percent stone fragments.

Included with this complex in mapping are small, intermingled areas of Westbrook soils, Udorthents, Urban land, and a few rock outcrops. Also included are a few filled areas and a few small beaches that are underlain by organic tidal deposits at a depth of 3 feet or more.

The permeability of this unit is rapid or very rapid. Beaches are inundated daily during high tide. Udipsamments are subject to flooding by storm tides. Beaches have no vegetation, and Udipsamments are sparsely vegetated, mostly with salt-tolerant and drought-resistant grasses.

Beaches have poor potential for most uses except recreation, because of frequent tidal inundations. Most beaches are intensively used during summer by saltwater bathers but get little or no use during the remainder of the year. The areas of Udipsamments are used as sites for cottages, most of which are used only seasonally. Capability subclass and woodland suitability group not assigned.

BcA—Berlin silt loam, 0 to 5 percent slopes. This nearly level to gently sloping, moderately well drained soil is on glacial lacustrine terraces near Middletown. This soil formed in silt and clay deposits. Areas are oblong or irregular in shape and mostly range from 10 to 40 acres. Slopes are smooth and less than 300 feet long.

Typically, the surface layer is dark brown silt loam 3 inches thick. The subsoil is 27 inches thick. In the upper 4 inches, the subsoil is reddish brown silt loam. In the middle 5 inches, it is reddish brown, mottled silty clay loam. In the lower 18 inches, it is reddish brown, mottled silty clay. The substratum is very firm, reddish brown silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Wethersfield soils, moderately well drained Ludlow soils, and poorly drained Rumney Variant soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer, moderate to slow in the subsoil, and very slow in the substratum. Available water capacity is high. Runoff is medium. The soil has a seasonal high water table at a depth of about 20 inches. The soil warms up and dries out slowly in the spring. Unlimed areas are strongly acid or medium acid in the surface layer and subsoil and are strongly acid to neutral in the substratum.

Most areas of this soil are idle or wooded. Some areas are used for community development. A small acreage is used for vegetables, nursery stock, and other cultivated

crops. A few small areas have been used as a source of material for making bricks.

This soil is suited to cultivated crops. Providing drainage helps dry the soil in spring and generally improves yields. Minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are suitable management practices.

This soil is well suited to trees. Machine planting is feasible in open areas.

This soil has fair potential for community development. The main limitations are the very slow permeability of the substratum and the seasonal high water table. If outlets are available, artificial drains can be used to help prevent wet basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 4o.

BoA—Branford silt loam, 0 to 3 percent slopes. This nearly level, well drained soil is on outwash plains and stream terraces in the northwestern part of the county. Areas are irregular in shape and range from 5 to 40 acres. Slopes are smooth and less than 200 feet long.

Typically, the surface layer is dark reddish brown silt loam 6 inches thick. The subsoil is 17 inches thick. The upper 11 inches is yellowish red very fine sandy loam, and the lower 6 inches is reddish brown gravelly very fine sandy loam. The substratum is dark reddish brown, stratified very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Hartford soils, well drained Cheshire soils, and moderately well drained Ellington soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is slow. This soil tends to dry out and warm up early in the spring. Unlimed areas range from very strongly acid to medium acid.

Most areas of this soil are in grass and alfalfa hay, vegetables, or nursery stock. Some scattered areas are used for community development. A few small areas are in woodland, are in pasture, or are idle.

This soil is well suited to cultivated crops. The hazard of erosion is slight. Minimum tillage and use of cover crops and legumes in the cropping system are suitable management practices.

This soil is well suited to trees, but only a small acreage is wooded.

This soil has good potential for community development. Steep slopes of excavations are unstable. In places, onsite septic sytems are a pollution hazard to ground water. Capability class I; woodland suitability group 3o.

BoB—Branford silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on outwash plains and stream terraces in the northwestern part of the county. Areas are irregular in shape and range from 5 to 50 acres. Slopes are smooth and less than 300 feet long.

Typically, the surface layer is dark reddish brown silt loam 6 inches thick. The subsoil is 17 inches thick. The upper 11 inches is yellowish red very fine sandy loam, and the lower 6 inches is reddish brown gravelly very fine sandy loam. The substratum is dark reddish brown, stratified very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Hartford soils, well drained Cheshire soils, and moderately well drained Ellington soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are in grass and alfalfa hay, vegetables, or nursery stock. Some scattered areas are used for community development. A few small areas are in woodland, are in pasture, or are idle.

This soil is well suited to cultivated crops. The hazard of erosion is moderate. The major management concerns are controlling runoff and erosion and maintaining good fertility. Minimum tillage and use of cover crops and legumes in the cropping system are suitable management practices.

This soil is well suited to trees, but only a small acreage is wooded.

This soil has good potential for community development. Steep slopes of excavations are unstable. In places, onsite septic systems are a pollution hazard to ground water. Capability subclass IIe; woodland suitability group 3o.

BoC—Branford silt loam, 8 to 15 percent slopes. This sloping and undulating, well drained soil is on outwash plains and stream terraces in the northwestern part of the county. Areas are irregular in shape and range from 5 to 40 acres. Slopes are smooth or complex and are less than 300 feet long.

Typically, the surface layer is dark reddish brown silt loam 6 inches thick. The subsoil is 17 inches thick. The upper 11 inches is yellowish red very fine sandy loam, and the lower 6 inches is reddish brown gravelly very fine sandy loam. The substratum is dark reddish brown, stratified very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Hartford soils, well drained Cheshire soils, and moderately well drained Ellington soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm

up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are in grass and alfalfa hay. Some scattered areas are used for community development. A few small areas are in woodland, are in pasture, or are idle.

This soil is suited to cultivated crops. The hazard of erosion is severe. The major management concern is controlling runoff and erosion. Minimum tillage, use of cover crops, and stripcropping are suitable management practices.

This soil is well suited to trees, but only a small acreage is wooded.

This soil has fair potential for community development. Slope is the main limitaion, and steep slopes of excavations are unstable. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface. In places, onsite septic systems are a pollution hazard to ground water. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIe; woodland suitability group 3r.

CbB—Canton and Charlton fine sandy loams, 3 to 8 percent slopes. These gently sloping, well drained soils are on upland hills, ridges, and glacial till plains. Areas of this unit are irregular in shape and mostly range from 5 to 100 acres. Slopes are smooth or undulating and are 100 to 300 feet long. Areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no significant differences that affect use and management. The acreage of this unit is about 45 percent Canton soils, 35 percent Charlton soils, and 20 percent other soils.

Typically, the surface layer of the Canton soils is very dark grayish brown and dark brown fine sandy loam 6 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 13 inches thick. The substratum is light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 6 inches thick. The subsoil is 30 inches thick. The upper 26 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of somewhat excessively drained Hollis soils, well drained Paxton and Montauk soils, moderately well drained Woodbridge soils, poorly drained Leicester and Ridgebury soils, and very poorly drained Whitman soils.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is medium. Canton soils warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

Permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is medium. Charlton soils warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this unit are cleared and used for crops or are idle. Some scattered areas are used for community development. The soils are suited to trees, and a few small areas are wooded.

These soils are well suited to cultivated crops. The soils have a moderate erosion hazard. Minimum tillage, use of cover crops, and stripcropping are suitable management practices.

These soils have good potential for community development. Onsite septic systems need careful design and installation. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 5o for Canton part, 4o for Charlton part.

CcB—Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes. These gently sloping, well drained soils are on hills and ridges of glacial till plains. Areas are irregular in shape and mostly range from 5 to 100 acres. Slopes are smooth. These soils have 0.1 to 3 percent of the surface covered with stones and boulders. Areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no significant differences that affect use and management. The acreage of this unit is about 45 percent Canton soils, 35 percent Charlton soils, and 20 percent other soils.

Typically, the surface layer of the Canton soils is very dark grayish brown and dark brown fine sandy loam 6 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 13 inches thick. The substratum is light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 6 inches thick. The subsoil is 30 inches thick. The upper 26 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of somewhat excessively drained Hollis soils, well drained Paxton and Montauk soils, moderately well drained Woodbridge soils, poorly drained Leicester and Ridgebury soils, and very poorly drained Whitman soils.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is medium. Canton soils warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate.

Runoff is medium. Charlton soils warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this unit are used for woodland or pasture. These soils are suited to trees. Some scattered areas of these soils are used for community development. A few areas are cleared and idle.

These soils are poorly suited to cultivated crops. Stoniness severely limits the use of farming equipment. If the stones and boulders are removed, these soils are well suited to cultivated crops, but stone removal is difficult. These soils have a moderate erosion hazard. If the soils are cultivated, minimum tillage and use of cover crops are suitable management practices.

These soils have good potential for community development. Stoniness is the major limitation. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 5o for Canton part, 4o for Charlton part.

CcC—Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes. These sloping, well drained soils are on hills and ridges of glacial till plains. Areas are irregular in shape and mostly range from 5 to 60 acres. Slopes are smooth. These soils have 0.1 to 3 percent of the surface covered with stones and boulders. Areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no significant differences that affect use and management. The acreage of this unit is about 45 percent Canton soils, 35 percent Charlton soils, and 20 percent other soils.

Typically, the surface layer of the Canton soils is very dark grayish brown and dark brown fine sandy loam 6 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 13 inches thick. The substratum is light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 6 inches thick. The subsoil is 30 inches thick. The upper 26 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of somewhat excessively drained Hollis soils, well drained Paxton and Montauk soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is medium to rapid. Canton soils warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is rapid. Charlton soils warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this unit are used for woodland or pasture. The soils are suited to trees. Some scattered areas of these soils are used for community development. A few areas are cleared and idle.

These soils are poorly suited to cultivated crops. Stoniness severely limits the use of farming equipment. These soils are suited to cultivated crops, if the stones and boulders are removed, but removal is difficult. These soils have a severe erosion hazard. If the soils are cultivated, minimum tillage and use of cover crops are suitable management practices.

These soils have good potential for community development. Stoniness and slope are the main limitations. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 5o for Canton part, 4o for Charlton part.

CdC—Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes. These gently sloping and sloping, well drained soils are on hills and ridges of glacial till plains. Areas are irregular in shape and mostly range from 5 to 150 acres. Slopes are smooth and 100 to 300 feet long. These soils have 3 to 15 percent of the surface covered with stones and boulders. Areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no significant differences that affect use and management. The acreage of this unit is about 45 percent Canton soils, 35 percent Charlton soils, and 20 percent other soils.

Typically, the surface layer of the Canton soils is very dark grayish brown fine sandy loam 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 17 inches thick. The substratum is light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 2 inches thick. The subsoil is 34 inches thick. The upper 30 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of somewhat excessively drained Hollis soils, well drained Paxton and Montauk soils, moderately well drained Woodbridge soils, poorly drained Leicester and Ridgebury soils, and very poorly drained Whitman soils.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substra-

tum. Available water capacity is moderate. Runoff is medium to rapid. Canton soils warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is medium to rapid. Charlton soils warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this unit are used for woodland or pasture. Some scattered areas are used for community development. A few areas are cleared and idle.

These soils are poorly suited to cultivated crops. Stoniness makes the use of farming equipment impractical, and stone removal is difficult. These soils have a moderate to severe erosion hazard. Establishment of permanent vegetative cover is a suitable management practice on these soils.

These soils are suited to trees. Stoniness limits the use of equipment, and machine planting is not practical.

These soils have fair potential for community development. They are limited mainly by stoniness and slope. The removal of stones is difficult. On the steeper slopes of this unit, onsite septic systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 5x for Canton part, 4x for Charlton part.

CdD—Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes. These moderately steep and steep, well drained soils are on the sides of hills and ridges of glacial till plains. Areas are irregular in shape and mostly range from 5 to 150 acres. Slopes are smooth and 100 to 400 feet long. These soils have 3 to 15 percent of the surface covered with stones and boulders. Areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no significant differences that affect use and management. The acreage of this unit is about 45 percent Canton soils, 35 percent Charlton soils, and 20 percent other soils.

Typically, the surface layer of the Canton soils is very dark grayish brown fine sandy loam 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 17 inches thick. The substratum is light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 2 inches thick. The subsoil is 34 inches thick. The upper 30 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of somewhat excessively drained Hollis soils, well drained Paxton and Montauk soils, and moderately well drained Woodbridge soils.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is rapid. Except for areas that have north-facing slopes, Canton soils warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is rapid. Except for areas that have north-facing slopes, Charlton soils tend to warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this unit are wooded or are cleared and idle. A few areas are in pasture.

These soils are poorly suited to cultivated crops because of stoniness and slope. The use of farming machinery is not practical, and stone removal is difficult. These soils have a severe erosion hazard. If the soils are cleared, a permanent vegetative cover is suitable for controlling erosion.

These soils are suited to trees. Stoniness and slope limit the use of equipment, and machine planting is not practical.

These soils have poor potential for community development. They are limited mainly by slope and stoniness. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface downslope. Controlling runoff and erosion is a major concern. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 5x for Canton part, 4x for Charlton part.

Ce—Carlisle muck. This nearly level, very poorly drained, organic soil is in low depressions of outwash terraces and glacial till plains throughout the county. Areas of this soil are circular or irregular in shape and mostly range from 5 to 200 acres. These soils have slopes of 0 to 2 percent, but slopes are dominantly less than 1 percent.

Typically, this soil is dark reddish brown and black muck to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of very poorly drained Adrian, Scarboro, and Whitman soils and poorly drained Leicester, Ridgebury, Raypol, and Walpole soils. Also included are a few areas of soils that are more acid than this Carlisle soil. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is high. Runoff is very slow. This soil is wet most of the year, and water is frequently ponded on the surface from autumn to spring and after heavy rains in summer. Unlimed areas are very strongly acid to medium acid.

Most of this soil is wooded. A few small areas have been cleared and drained. Cleared areas are used for vegetables or are idle.

This soil is poorly suited to cultivated crops because of wetness. Most areas are difficult to drain, but drained areas can be used for vegetables. If the soil is cultivated, use of cover crops and maintaining a proper water table level help to minimize subsidence and control wind erosion.

This soil is poorly suited to trees, but most areas are wooded mainly with red maple, ash, and alder. Other common types of vegetation are sweet pepper brush, blueberry, viburnum, cinnamon fern, and royal fern. This soil is limited mainly by wetness. The organic material will not support heavy equipment. Tree windthrow is common because the high water table restricts rooting depth.

This soil has poor potential for most types of community development. The soil is limited by a high water table most of the year and by ponding. The organic layers have very low strength and will not support structures. In some places the organic layers are too deep to be removed. If the soil is drained, the organic layers subside or shrink and lower the surface of the soil. Side slopes of excavations are very unstable and slump. Onsite septic systems are not practical in this soil. Capability subclass VIw; woodland suitability group 4w.

CrC—Charlton-Hollis very stony fine sandy loams, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, well drained and somewhat excessively drained soils on ridges where the relief is affected by the underlying bedrock and on upland glacial till plains. These soils formed in glacial till derived from gneiss, schist, and granite. Areas are oblong or irregular in shape and range from 5 to 250 acres. Slopes are smooth or complex and mostly 100 to 300 feet long. Stones and boulders cover 0.1 to 3 percent of the surface. This complex is about 50 percent Charlton soils, 30 percent Hollis soils, and 20 percent other soils and bedrock outcrops. The soils of this complex are in such an intricate pattern that it was not practical to map them separately.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 2 inches thick. The subsoil is 34 inches thick. The upper 30 inches is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is brown fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Hollis soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is yellowish brown fine sandy loam 11 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Included with this complex in mapping are small, intermingled areas of well drained Canton, Montauk, and Paxton soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils; and very poorly drained Adrian and Whitman soils. Also included are bedrock outcrops and a few areas where the stones and boulders have been cleared from the surface.

The permeability of the Charlton soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is medium to rapid. Unlimed areas of the Charlton soils are very strongly acid to medium acid.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is medium to rapid. Unlimed areas of the Hollis soils are very strongly acid to medium acid.

Most areas of this complex are wooded. Some small areas have been cleared and are used for pasture or are idle. Some scattered areas are used for community development, and a few areas are in orchards.

This complex is poorly suited to cultivated crops. It is limited mainly by stoniness, bedrock outcrops, and the shallow depth to bedrock in many places. The complex is suited to orchards and pasture. It has a moderate to severe erosion hazard, and minimum tillage and maintaining permanent vegetative cover help to control erosion.

This complex is suited to trees. Trees on the Hollis soil are subject to windthrow because of the shallow rooting zone above the bedrock.

This complex has fair potential for community development. The shallow depth to bedrock in the Hollis soils and the bedrock outcrops make excavation difficult. Onsite septic systems require very careful design and installation, and an area of more than 2 acres is sometimes needed as a suitable site for an onsite septic system. In a few areas, bedrock outcrops have esthetic value for homesites. Capability subclass VIs; woodland suitability group 4o for Charlton part, 5d for Hollis part.

CsB—Cheshire silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops and ridgetops in the northwestern part of the county. Areas are irregular in shape and mostly range from 5 to 75 acres. Slopes are smooth and convex and are as much as 300 feet long.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is yellowish red and reddish brown silt loam 18 inches thick. The substratum is dark reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Wethersfield and Yalesville soils and moderately well drained Ludlow soils. Also included are areas of soils with a fine sandy loam surface layer, a few areas with slopes of less than 3 percent, and a few small areas where as much as 3 percent of the surface is covered with stones and boulders. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most of this soil is cleared and farmed or is used for community development. A small acreage is idle or wooded.

This soil is suited to cultivated crops. The hazard of erosion is moderate. Minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are suitable management practices.

This soil is suited to trees, but only a small acreage is wooded.

This soil has good potential for community development. Onsite septic systems need careful design and installation. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 4o.

CsC—Cheshire silt loam, 8 to 15 percent slopes. This sloping, well drained soil is on broad hilltops and ridgetops in the northwestern part of the county. Areas are irregular in shape and mostly range from 5 to 40 acres. Slopes are smooth and convex and are as much as 300 feet long.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is yellowish red and reddish brown silt loam 18 inches thick. The substratum is dark reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Wethersfield and Yalesville soils and moderately well drained Ludlow soils. Also included are areas of soils with a fine sandy loam surface layer and a few areas of soils with slopes of more than 15 percent. Included areas make up 5 to 20 percent of this map unit.

Permeability of this soil is moderate or moderately rapid. Available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most of this soil is cleared and farmed or is in orchards or pasture. Some scattered areas are used for community development. A few small areas are in woodland or are idle.

This soil is suited to cultivated crops. The hazard of erosion is severe. Minimum tillage, use of cover crops, and stripcropping are suitable management practices if this soil is farmed.

This soil is suited to trees, but only a small acreage is wooded.

This soil has fair potential for community development. The main limitation is slope. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIe; woodland suitability group 4o.

CyC—Cheshire-Holyoke very stony silt loams, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, well drained and somewhat excessively drained soils on ridges where the relief is affected by the underlying bedrock and on upland till plains in the northwestern part of the county. These soils formed in glacial till derived from conglomerate, sandstone, shale, and basalt. Areas are oblong or irregular in shape and range from 5 to 250 acres. Slopes are smooth or complex and are mostly 100 to 300 feet long. Stones and boulders cover 0.1 to 3 percent of the surface. This complex is about 45 percent Cheshire soils, 30 percent Holyoke soils, and 25 percent other soils and bedrock outcrops. The soils of this complex are in such an intricate pattern that it was not practical to map them separately.

Typically, the surface layer of the Cheshire soils is dark brown silt loam 8 inches thick. The subsoil is yellowish red and reddish brown silt loam 18 inches thick. The substratum is dark reddish brown gravelly loam to a depth of 60 inches or more.

Typically, the surface layer of the Holyoke soils is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown silt loam 9 inches thick. Hard, unweathered basalt bedrock is at a depth of 13 inches.

Included with these soils in mapping are small, intermingled areas of well drained Wethersfield and Yalesville soils, moderately well drained Ludlow soils, poorly drained Wilbraham soils, and very poorly drained Adrian soils. Also included are areas of soils that have a fine sandy loam surface layer and a few areas where the stones have been cleared from the surface.

Permeability of the Cheshire soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is medium to rapid. Cheshire soils tend to warm up and dry out early in the spring. Unlimed areas are very strongly acid to medium acid.

The permeability of the Holyoke soils is moderate. Available water capacity is low. Runoff is medium to rapid. Holyoke soils tend to warm up and dry out early in the spring. Unlimed areas are extremely acid to medium acid.

Most areas of this complex are wooded. Some small areas have been cleared and are used for pasture or are idle. Some scattered areas are used for community development, and a few areas are in orchards.

This complex is poorly suited to cultivated crops. It is limited by stoniness, bedrock outcrops, and the shallow depth to bedrock in many places. The complex is suited to orchards and pasture. The erosion hazard is moderate to severe. Minimum tillage and maintaining a permanent vegetative cover are suitable management practices.

This complex is suited to trees. Trees on the Holyoke soils are subject to windthrow because of the shallow rooting depth.

This complex has fair potential for community development. Shallowness to bedrock in the Holyoke soils and the bedrock outcrops make excavation difficult. Onsite septic systems require very careful design and installation. Larger than normal areas are sometimes needed for onsite septic systems. A few areas of bedrock outcrops provide a scenic and picturesque setting for homesites.

Capability subclass VIs; woodland suitability group 4o for Cheshire part, 5d for Holyoke part.

EfA—Ellington fine sandy loam, 0 to 5 percent slopes. This moderately well drained and nearly level to gently sloping soil is in slight depressional areas of broad outwash terraces and narrow stream valleys throughout the northwestern part of the county. These areas are dominantly irregular in shape and mostly range from 3 to 25 acres. Slopes are smooth and concave and are mostly less than 250 feet long.

Typically, the surface layer is dark reddish brown and dark brown fine sandy loam 6 inches thick. The subsoil is 23 inches thick. The upper 7 inches is brown fine sandy loam. The lower 16 inches is brown and reddish brown, mottled sandy loam. The substratum is 7 inches of reddish brown, mottled loamy sand over reddish brown, mottled coarse sand that extends to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Branford soils and poorly drained Raypol soils. Also included are a few larger areas of soils that have a silt loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a seasonal high water table at a depth of about 20 inches from late fall through early spring. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to medium acid.

This soil is used mostly for cropland. A few areas are idle or wooded. A few scattered areas are used for community development.

This soil is well suited to cultivated crops. Wetness is the major limitation. Artificial drainage enables earlier tillage in the spring. This soil remains wet for several days after heavy rains during summer, restricting the use of farming equipment. Minimum tillage, artificial drainage, and the use of cover crops are suitable management practices for farming .

This soil is suited to trees, but only a small acreage is in woodland.

This soil has fair potential for community development. The main limitation is the seasonal high water table. Steep side slopes of excavations are unstable. Onsite septic systems require careful design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

HfA—Hartford sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on glacial outwash plains and stream terraces in the northwestern part of the county. Areas are irregular in shape and range from 5 to 300 acres. Slopes are smooth.

Typically, the surface layer is dark brown sandy loam 9 inches thick. The subsoil is 15 inches thick. The upper 7 inches is yellowish red sandy loam, and the lower 8 inches is reddish brown loamy sand. The substratum is reddish brown, stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Manchester soils, well drained Branford soils, and moderately well drained Ellington soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are in nursery stock and other cultivated crops (fig. 4). A few areas are wooded. Scattered areas are used for community development.

This soil is suited to farming. Droughtiness is the major limitation. The erosion hazard is slight. Irrigation, use of cover crops, and returning crop residue to the soil are suitable management practices on this soil.

This soil is suited to trees. The major limitation is droughtiness.

This soil has good potential for community development. Droughtiness is the major limitation. Onsite sewage systems need careful design and installation. Steep side slopes of excavations are unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. Quickly establishing plant cover is a suitable management practice during construction. Capability subclass IIs; woodland suitability group 4s.

HfB—Hartford sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on glacial outwash plains and stream terraces in the northwestern part of the county. Areas are irregular in shape and range from 5 to 75 acres. Slopes are mostly smooth.

Typically, the surface layer is dark brown sandy loam 9 inches thick. The subsoil is 15 inches thick. The upper 7 inches is yellowish red sandy loam, and the lower 8 inches is reddish brown loamy sand. The substratum is reddish brown, stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Manchester soils, well drained Branford soils, and moderately well drained Ellington soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is medium. This soil dries out and warms up early in the spring. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are in nursery stock and other cultivated crops. A few areas are wooded. Some scattered areas are used for community development.

This soil is suited to cultivated crops. Droughtiness and a moderate hazard of erosion are the major limitations. Irrigation, minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices on this soil.

This soil is suited to trees. The major limitation is droughtiness.

This soil has good potential for community development. Droughtiness is the major limitation. Onsite sewage systems need careful design and installation, and steep side slopes of excavations are unstable. Lawn grasses, shallow-rooted trees, and shrubs need watering in the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIs; woodland suitability group 4s.

HkC—Hinckley gravelly sandy loam, 3 to 15 percent slopes. This excessively drained and gently sloping to sloping or undulating soil is on stream terraces, kames, and eskers. The areas are irregular in shape and mostly range from 5 to 100 acres. Slopes are smooth or complex and are mostly less than 200 feet long.

Typically, the surface layer is dark grayish brown gravelly sandy loam 8 inches thick. The subsoil is 19 inches thick. In the upper 12 inches it is brown gravelly loamy sand, and in the lower 7 inches it is yellowish brown gravelly sand. The substratum is brown and light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Included areas make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. The available water capacity is low. Runoff is slow to medium. This soil dries out and warms up early in spring. Unlimed areas are extremely acid to medium acid.

Cleared areas of this soil are used for pasture, hay, or cropland. A few areas are idle or wooded. Many scattered areas are used for community development.

This soil is poorly suited to cultivated crops. Droughtiness and slope are the main limitations. Irrigation is difficult on the steeper slopes. Minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices.

This soil is suited to trees, but only a small acreage is wooded. The major limitation is droughtiness.

This soil has good potential for community development. The soil is limited mainly by slope and droughtiness. Steep side slopes of excavations are unstable, and onsite sewage disposal systems need careful design and installation. Lawns have many pebbles on the surface. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. Quickly establishing plant cover is a suitable management practice during construction. Capability subclass IVs; woodland suitability group 5s.

HME—Hinckley and Manchester soils, 15 to 45 percent slopes. These soils are moderately steep to very steep and excessively drained. They are on kames and eskers of outwash terraces and plains. Areas are irregular in shape and range from 5 to 200 acres. Slopes are smooth or complex. Approximately 45 percent of the total acreage of this unit is Hinckley soils, 30 percent is Manchester soils, and 25 percent is other soils. The areas of this unit consist of Hinckley soils or Manchester soils or both. The Hinckley soils are throughout most of the county. The Manchester soils are in the northwestern part of the county. These soils were mapped together because they react similarly to use and management.

Typically, the surface layer of the Hinckley soils is dark grayish brown gravelly sandy loam 5 inches thick. The subsoil is 22 inches thick. The upper 15 inches is brown gravelly loamy sand, and the lower 7 inches is yellowish brown gravelly sand. The substratum is brown and light brownish gray very gravelly sand to a depth of 60 inches or more.

Typically, the surface layer of the Manchester soils is dark brown gravelly sandy loam 4 inches thick. The subsoil is reddish brown gravelly loamy sand 14 inches thick. The substratum is reddish brown very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are areas that are as much as 7 acres of excessively drained Penwood and Windsor soils, somewhat excessively drained Hartford and Merrimac soils, and well drained Branford and Agawam soils.

The permeability of these soils is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low. Runoff is rapid. Unlimed areas of the Hinckley soils are extremely acid to medium acid. Unlimed areas of the Manchester soils are very strongly acid to medium acid.

Most areas of this unit are wooded. A few areas are idle or are cleared and used for pasture. A few small, scattered areas are used for community development.

These soils are poorly suited to cultivated crops because of the steep slopes. The soils have a severe erosion hazard, and maintaining permanent plant cover helps to control erosion.

These soils are suited to trees. Steep slopes and droughtiness are the main limitations.

These soils have poor potential for community development. They are limited mainly by steep slopes. Steep slopes of excavations are unstable. Onsite septic systems need very careful and often special design and installation to insure that effluent does not seep to the surface. Lawns, shallow-rooted trees, and shrubs need watering in summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are

suitable management practices during construction. Capability subclass VIs; woodland suitability group 5s.

HpE—Hollis-Charlton extremely stony fine sandy loams, 15 to 40 percent slopes. This complex consists of moderately steep to very steep, somewhat excessively drained and well drained soils on ridges where the relief is affected by the underlying bedrock on upland glacial till plains. These soils formed in glacial till derived mostly from granite, gneiss, and schist. Areas of this complex are irregular in shape and range from 5 to 250 acres. Slopes are smooth or complex and are mostly 100 to 800 feet long. The areas have a rough surface with bedrock outcrops; narrow, intermittent drainageways; and small, wet depressions. In most areas 3 to 5 percent of the surface is covered with stones and boulders. The total acreage of this complex is about 40 percent Hollis soils, 35 percent Charlton soils, and 25 percent other soils and bedrock outcrops. The soils of this complex are in such an intricate pattern that it was not practical to map them separately.

Typically, the surface layer of the Hollis soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is friable, yellowish brown fine sandy loam 11 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Typically, the surface layer of the Charlton soils is dark brown fine sandy loam 2 inches thick. The subsoil is 34 inches thick. The upper 30 inches is dark yellowish brown, and light olive brown fine sandy loam. The lower 4 inches is light yellowish brown gravelly sandy loam. The substratum is friable, brown fine sandy loam to a depth of 60 inches or more.

Included with this complex in mapping are small, intermingled areas of well drained Canton, Montauk, and Paxton soils and moderately well drained Woodbridge soils. Also included are bedrock outcrops, areas of soils with slopes of less than 15 percent, and a few nonstony areas.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is rapid. Unlimed areas of the Hollis soils are very strongly acid to medium acid.

The permeability of the Charlton soils is moderate or moderately rapid. Unlimed areas of the Charlton soils are very strongly acid to medium acid.

Most areas of this complex are wooded. A few small areas are cleared and used for pasture or are idle.

This complex is not suited to cultivated crops. The steep slopes, stoniness, shallow depth to bedrock in many places, and bedrock outcrops are the main limitation. The erosion hazard is severe, and establishing permanent plant cover helps to control erosion.

This complex is poorly suited to trees, but it is better suited to woodland than to most other uses. The complex is limited for woodland mainly by the steep slopes, bedrock outcrops, stoniness, and shallow depth to bedrock. Tree windthrow is a concern on the Hollis soils because of the shallow rooting depth above the bedrock. Equipment is difficult to use because of stoniness, steep slopes, and outcrops. Logging roads and trails need careful layout to prevent erosion.

This complex has poor potential for community development. The soils are limited mainly by the steep slopes, shallowness to bedrock, rock outcrops, and stoniness. Excavation is difficult because of the shallow depth to bedrock in many places. Onsite septic systems require very careful and often special design and installation. Many areas of this complex provide a scenic and picturesque setting for homes. The rock outcrops, stones, and boulders have esthetic value and are sometimes left undisturbed. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass VIIs; woodland suitability group 5d for Hollis part, 4x for Charlton part.

HrC—Hollis-Rock outcrop complex, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, somewhat excessively drained soils and areas of Rock outcrop. This complex is on uplands where the relief is affected by the underlying bedrock. Areas are irregular in shape and range from 5 to 150 acres. Slopes are mainly 100 to 400 feet long. The areas have a rough surface with bedrock outcrops; a few narrow, intermittent drainageways; and small, wet depressions. In most areas 3 to 25 percent of the surface is covered with stones and boulders. This complex is about 50 percent Hollis soils, 30 percent Rock outcrop, and 20 percent other soils. The Hollis soils and Rock outcrop are in such an intricate pattern that it was not practical to map them separately.

Typically, the surface layer of the Hollis soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is yellowish brown fine sandy loam 11 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Rock outcrop consists of exposed bedrock that is mainly schist, gneiss, and granite.

Included with this complex in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, poorly drained Leicester and Ridgebury soils, and very poorly drained Adrian and Whitman soils. Also included are small areas where bedrock is 20 to 40 inches below the surface and areas where less than 3 percent of the surface is covered by stones and boulders.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is medium to rapid. Unlimed areas of the Hollis soils are very strongly acid to medium acid. The areas of Rock outcrop have very rapid runoff.

Most areas of this complex are wooded. A few small areas are cleared and idle or used for pasture. A few small, scattered areas are used for community development.

This soil is not suited to cultivated crops. It is limited by rock outcrops, shallow depth to bedrock, and stoniness.

This complex is poorly suited to trees, but it is better suited to woodland than to most other uses. It is limited for woodland mainly by shallow depth to bedrock, stoniness, and the areas of Rock outcrop. Tree windthrow is a major concern because of the shallow rooting zone above the bedrock. Rock outcrops and stoniness limit the use of equipment. Machine planting is not feasible.

This complex has poor potential for community development. The complex is limited mainly by shallow depth to bedrock, rock outcrops, and stoniness. Excavation is difficult, and blasting is required in most places. Onsite sewage disposal systems need very careful and often special design and installation. An area of 5 acres or more is commonly needed as a suitable site for an onsite septic system. This complex is used for homesites. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass VIIs; Hollis part in woodland suitability group 5d, Rock outcrop part not assigned to woodland group.

HSE—Hollis-Rock outcrop complex, 15 to 40 percent slopes. This complex consists of moderately steep to very steep, somewhat excessively drained soils and areas of Rock outcrop. The complex is glacial till uplands where the relief is affected by the underlying bedrock. Areas are long and narrow or irregular in shape and range from 5 to 150 acres. Slopes are mainly 100 to 700 feet long. The areas have a rough surface with bedrock outcrops; a few narrow, intermittent drainageways; and small, wet depressions. In most areas 3 to 25 percent of the surface is covered with stones and boulders. This complex is about 50 percent Hollis soils, 30 percent Rock outcrop, and 20 percent other soils. The Hollis soils and Rock outcrop are in such an intermingled pattern on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Hollis soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is yellowish brown fine sandy loam 11 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Rock outcrop consists of exposed bedrock that is mainly schist, gneiss, and granite.

Included with this complex in mapping are areas that are made up of as much as 5 acres of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and soils that have bedrock at a depth of 20 to 40 inches. Also included are a few areas of soils that have slopes of as much as 90 percent.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is rapid. The Hollis soils are very strongly acid to medium acid. The areas of rock outcrop have very rapid runoff.

Most areas of this complex are wooded. A few small, cleared areas are idle or used for pasture. A few very small areas are used for community development.

This complex is not suited to cultivated crops. It is limited by steep slopes, Rock outcrop, stoniness, and shallow depth to bedrock.

This complex is poorly suited to trees, but it is better suited to woodland than to most other uses. It is limited for use as woodland mainly by the steep slopes, Rock outcrop, shallowness to bedrock, and stoniness. Tree windthrow is a major concern because of the shallow root zone. Rock outcrop, stoniness, and steep slopes hinder the use of most equipment. Machine planting of seedlings is not feasible.

This complex has poor potential for community development mainly because of shallowness to bedrock, steep slopes, Rock outcrop, and stoniness. Excavation is difficult, and blasting is required in most places. Onsite septic systems require special design and installation. The complex is used for homesites. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; Hollis part in woodland suitability group 5d, Rock outcrop part not assigned to woodland group.

HuD—Holyoke-Cheshire very stony silt loams, 15 to 35 percent slopes. This complex consists of moderately steep and steep somewhat excessively drained soils on glacial till uplands where the relief is affected by the underlying bedrock. Areas are dominantly long and narrow or irregular in shape and mostly range from 3 to 200 acres. Slopes are mostly 100 to 800 feet long. The areas of this complex have a rough surface with bedrock outcrops; a few narrow, intermittent drainageways; and small, wet depressions. This complex has 0.1 to 3 percent of the surface covered with stones and boulders. The complex is about 40 percent Holyoke silt loam, 35 percent Cheshire silt loam, and 25 percent other soils and rock outcrops. The Holyoke and Cheshire soils are in such an intermingled pattern that it was not practical to map them separately.

Typically, the surface layer of the Holyoke soils is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown silt loam 9 inches thick. Hard, unweathered basalt bedrock is at a depth of 13 inches.

Typically, the surface layer of the Cheshire soils is dark brown fine sandy loam 3 inches thick. The subsoil is yellowish red and reddish brown silt loam 23 inches thick. The substratum is dark reddish brown gravelly loam to a depth of 60 inches or more.

Included with this complex in mapping are small, intermingled areas of well drained Wethersfield and Yalesville soils, moderately well drained Ludlow soils, and bedrock outcrops. Also included are a few nonstony areas.

The permeability of the Holyoke soils is moderate above the bedrock. Available water capacity is low. Runoff is rapid. Unlimed areas of the Holyoke soils are extremely acid to medium acid.

The permeability of the Cheshire soils is moderate or moderately rapid. Available water capacity is moderate.

Runoff is rapid. Unlimed areas of the Cheshire soils are extremely acid to medium acid.

Most of this complex is wooded. A few small areas are cleared and used for pasture or orchards or are idle. A few scattered areas are used for community development.

This complex is poorly suited to cultivated crops. The soils are limited mainly by the steep slopes, shallow depth to bedrock, rock outcrops, and stoniness.

This complex is suited to trees. The major limitations are steep slopes, bedrock outcrops, and shallow depth to bedrock. Tree windthrow is a concern on the Holyoke soils because of the shallow rooting depth above the bedrock. Equipment is difficult to use. Logging roads and trails need careful layout to prevent erosion. Machine planting of trees is generally not practical.

This complex has poor potential for community development. The soils are limited mainly by the steep slopes, shallow depth to bedrock, rock outcrops, and stoniness. Excavation is difficult because of the shallow depth to bedrock in many places. Onsite septic systems require careful and often special design and installation. An area of more than 2 acres is generally needed as a suitable site for an onsite septic system. Many areas of this complex provide a scenic and picturesque setting for homes. Rock outcrops, stones, and boulders have esthetic value and are sometimes left undisturbed. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass VIs; woodland suitability group 5d for Holyoke part, 4r for Cheshire part.

HyC—Holyoke-Rock outcrop complex, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, somewhat excessively drained soils and areas of bare, exposed bedrock. The complex is on uplands where the relief is affected by the underlying bedrock. Areas are irregular in shape and range from 5 to 60 acres. Slopes are mainly 100 to 400 feet long. The areas have a rough surface with bedrock outcrops; a few narrow, intermittent drainageways; and small, wet depressions. Most areas have 0.1 to 3 percent of the surface covered with stones and boulders. This complex is about 50 percent Holyoke silt loam, 30 percent Rock outcrop, and 20 percent other soils. The Holyoke soils and Rock outcrop are in such an intricate pattern that it was not practical to map them separately.

Typically, the surface layer of the Holyoke soils is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown silt loam 9 inches thick. Hard, unweathered basalt bedrock is at a depth of 13 inches.

Included with this complex in mapping are small areas of well drained Yalesville, Wethersfield, and Cheshire soils; moderately well drained Ludlow soils; poorly drained Wilbraham soils; and very poorly drained Adrian soils. Also included are small areas where bedrock is at a depth of less than 10 inches and a few extremely stony areas.

The permeability of the Holyoke soils is moderate above the bedrock. Available water capacity is low. Runoff is medium to rapid. Unlimed areas of Holyoke soils are extremely acid to medium acid. The areas of Rock outcrop have very rapid runoff.

Most of this complex is wooded. A few small areas are cleared and are idle or used for pasture. A few scattered areas are used for community development.

This complex is not suited to cultivated crops. It is limited mainly by Rock outcrop, shallow depth to bedrock, and stoniness.

This complex is poorly suited to trees, but it is better suited to woodland than to most other uses. It is limited for woodland mainly by shallow depth to bedrock and by Rock outcrop. Tree windthrow is a major concern because of the shallow rooting zone above the bedrock. Rock outcrop hinders the use of equipment. Machine planting is not practical.

This complex has poor potential for community development. It is limited mainly by shallowness and by rock outcrops. Excavation is difficult, and blasting is required in most places. Onsite sewage disposal systems require very careful and often special design and installation. An area of 5 acres or more is commonly needed for use as a suitable site for an onsite septic system. This complex is used as sites for houses. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass VIIs; woodland suitability group 5d for Holyoke part, Rock outcrop part not assigned to woodland group.

HZE—Holyoke-Rock outcrop complex, 15 to 40 percent slopes. This complex consists of moderately steep to very steep, somewhat excessively drained soils and areas of exposed hard bedrock on glacial till uplands where the relief is affected by the underlying bedrock. Areas of this complex are long and narrow or irregular in shape and range from 3 to 150 acres. Slopes are mainly 100 to 700 feet long. The areas have a rough surface with bedrock outcrops and a few narrow, intermittent drainageways. In most areas 0.1 to 3 percent of the surface is covered with stones and boulders. This complex is about 50 percent Holyoke silt loam, 30 percent Rock outcrop, and 20 percent other soils. The Holyoke soils and Rock outcrop are in such an intricate pattern on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Holyoke soils is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown silt loam 9 inches thick. Hard, unweathered basalt bedrock is at a depth of 13 inches.

Included with this complex in mapping are areas that consist of as much as 5 acres of well drained Cheshire, Wethersfield, and Yalesville soils; moderately well drained Ludlow soils; and soils with bedrock at a depth of less than 10 inches. Also included are a few areas of soils that have slopes of as much as 90 percent.

The permeability of the Holyoke soils is moderate above the bedrock. Available water capacity is low. Runoff is rapid. Unlimed areas of Holyoke soils are extremely acid

to medium acid. Runoff is very rapid in areas of Rock outcrop.

Most of this complex is wooded. A few small, cleared areas are idle or used for pasture. A few scattered areas are used for community development.

This complex is not suited to cultivated crops. Steep slopes, Rock outcrop, stoniness, and shallowness to bedrock are the major limitations.

This complex is poorly suited to trees, but it is better suited to woodland use than to most other uses. This complex is limited for woodland use mainly because of steep slopes, rock outcrops, and shallowness to bedrock. Tree windthrow is a major concern because of the shallow root zone. Rock outcrops and steep slopes hinder the use of equipment. Machine planting of seedlings is not practical.

This complex has poor potential for community development. The complex is limited mainly by shallowness to bedrock, steep slopes, and rock outcrops. Excavation is difficult, and blasting is required in most places. Onsite septic systems require special design and installation. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass VIIs; woodland suitability group 5d for Holyoke part, Rock outcrop part not assigned to woodland group.

LG—Leicester, Ridgebury, and Whitman extremely stony fine sandy loams. This unit consists of nearly level to gently sloping, poorly drained and very poorly drained soils in drainageways and depressions of glacial till uplands. Areas are long and narrow or irregular in shape and range from 3 to 200 acres. Slopes range from 0 to 5 percent and are mostly 50 to 300 feet long. This unit has more than 3 percent of the surface covered with stones and boulders. The total acreage of this unit is about 40 percent Leicester soils, 25 percent Ridgebury soils, 15 percent Whitman soils and 20 percent other soils. The soils of this unit were mapped together because they react similarly to most uses and to management. Some areas of this unit contain only one of the major soils, and some areas contain two or three.

Typically, the surface layer of the Leicester soils is very dark brown fine sandy loam 7 inches thick. The subsoil is grayish brown and brown, mottled fine sandy loam 26 inches thick. The substratum is 9 inches of brown, mottled fine sandy loam over yellowish brown, mottled gravelly sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Ridgebury soils is very dark gray fine sandy loam 7 inches thick. The subsoil is 17 inches thick. The upper 8 inches is grayish brown, mottled fine sandy loam, and the lower 9 inches is grayish brown and brown, mottled sandy loam. The substratum is brown, mottled, firm fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Whitman soils is black fine sandy loam 5 inches thick. The subsoil is dark gray, grayish brown, and light brownish gray, mottled fine sandy loam 17 inches thick. The substratum is light brownish gray, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas that are made up of as much as 5 acres of moderately well drained Woodbridge soils, poorly drained Walpole soils, and very poorly drained Adrian soils. Also included are a few small areas of soils that have slopes of as much as 10 percent.

The permeability of the Leicester soils is moderate or moderately rapid. Available water capacity is moderate. Runoff is slow. Unlimed areas of the Leicester soils are very strongly acid or strongly acid above a depth of 40 inches and very strongly to medium acid below 40 inches.

The permeability of the Ridgebury soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas of the Ridgebury soils are very strongly acid to medium acid.

The permeability of the Whitman soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is very slow or ponded. Unlimed areas of the Whitman soils are very strongly acid to slightly acid.

Most areas of this unit are wooded (fig. 5). A few small areas are used for pasture, and a few are idle. A few small, scattered areas are filled and used for community development.

The soils of this unit are poorly suited to cultivated crops. Stoniness and wetness are the major limitations. Farming is not practical on these soils.

The soils of this unit are suited to trees. The shallow rooting zone above the high water table causes tree windthrow. The use of equipment is limited by stones and wetness.

These soils have poor potential for community development. Wetness, stoniness, and the slow to very slow permeability of the substratum in the Ridgebury and Whitman soils are major limitations. These soils are not suited to community development unless they are extensively filled. Where practical, artificial drains help prevent unstable footings and wet basements. If the soils are cleared, removing stones and boulders is often difficult. In places, onsite septic systems are not feasible; in other places they require very careful design and installation. Capability subclass VIIs; woodland suitability group 4x for Leicester and Ridgebury parts, 5x for Whitman part.

LpA—Ludlow silt loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on the top of drumlins, in slight depressions of glacial till plains, and near the base of drumlins and ridges. Areas are oblong or irregular in shape and range from 3 to 20 acres. Slopes are smooth and mostly concave.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is 18 inches thick. The upper 12 inches is reddish brown silt loam. The lower 6 inches is dark reddish brown, mottled silt loam. The substratum is

dark reddish brown, very firm, mottled gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire, Yalesville, and Wethersfield soils and poorly drained Wilbraham soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum. This soil has a seasonal high water table at a depth of about 20 inches from late autumn until midspring.

Most areas of this soil are cleared and farmed or are idle. A few areas are in woodland. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. Erosion is easy to control. Wetness is the major limitation, but artificial drainage enables tilling of the soil earlier in spring and after heavy rains.

This soil is suited to trees. Machine planting is practical in cleared areas.

This soil has fair potential for community development. The slowly permeable or very slowly permeable substratum and the seasonal high water table are the major limitations. Onsite septic systems need careful design and installation. Artificial drains help prevent wet basements. Steep slopes of excavations tend to slump when saturated. Lawns are wet and soft in spring and autumn and for several days after heavy rains in the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

LpB—Ludlow silt loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on drumlins and concave slopes of glaciated uplands. Areas are oblong or irregular in shape and range from 3 to 100 acres. Slopes are smooth and concave and 100 to 500 feet long.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is 18 inches thick. The upper 12 inches is reddish brown silt loam. The lower 6 inches is dark reddish brown, mottled silt loam. The substratum is dark reddish brown, very firm, mottled gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Wethersfield soils and poorly drained Wilbraham soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum. This soil has a seasonal high water table at a depth of about 20 inches from late autumn until midspring.

Most of this soil is cleared and farmed or is idle. A few small areas are wooded. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. Wetness is the major limitation, but artificial drainage enables tilling of the soil earlier in the spring and after heavy rains. The hazard of erosion is moderate. If the soil is cultivated, artificial drainage, minimum tillage, use of cover crops, and stripcropping are suitable management practices.

This soil is suited to trees. Machine planting is practical in cleared areas.

This soil has fair potential for community development. The slowly permeable or very slowly permeable substratum and the seasonal high water table are the major limitations. Onsite septic systems need careful design and installation. Artificial drains help prevent wet basements. Steep slopes of excavations tend to slump when saturated. Lawns are wet and soft in spring and autumn and for several days after heavy rains in the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

LuB—Ludlow very stony silt loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on drumlins and concave slopes of glaciated uplands. Areas are oblong or irregular in shape and range from 3 to 100 acres. Slopes are smooth and concave. This soil has 0.1 to 3 percent of the surface covered with stones and boulders.

Typically, the surface layer is dark brown silt loam 6 inches thick. The subsoil is 20 inches thick. The upper 14 inches is reddish brown silt loam. The lower 6 inches is dark reddish brown, mottled silt loam. The substratum is dark reddish brown, very firm, mottled gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire, Yalesville, and Wethersfield soils and poorly drained Wilbraham soils. Also included are areas of nonstony soils and nearly level soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum. This soil has a seasonal high water table at a depth of about 20 inches from autumn until midspring.

Most of this soil is cleared and farmed or is idle. A few small areas are wooded. Scattered areas are used for community development. The soil is suited to trees.

This soil is not suited to cultivated crops. Stoniness is the major limitation, and removal of stones is difficult. The erosion hazard is moderate, and use of permanent plant cover is a suitable management practice.

This soil has fair potential for community development. The slowly permeable or very slowly permeable substratum and the seasonal high water table are the major limitations. Onsite septic systems need careful design and installation. Artificial drains help prevent wet basements. Steep slopes of excavations tend to slump when saturated. Lawns are wet and soft in spring and autumn and for several days after heavy rains in the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 3o.

LvC—Ludlow extremely stony silt loam, 3 to 15 percent slopes. This gently sloping to sloping, moderately well drained soil is on concave slopes of drumlins and in slight depressions in glaciated uplands. This soil formed in glacial till derived mainly from reddish shale, sandstone, conglomerate, and basalt. The areas are irregular in shape and range from 5 to 100 acres. Slopes are smooth or concave. This soil has 3 to 15 percent of the surface covered with stones and boulders.

Typically, the surface layer is dark brown silt loam 2 inches thick. The subsoil is 24 inches thick. The upper 18 inches is reddish brown silt loam. The lower 6 inches is dark reddish brown, mottled silt loam. The substratum is dark reddish brown, mottled, very firm gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire, Yalesville, and Wethersfield soils and poorly drained Wilbraham soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium to rapid. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum. This soil has a seasonal high water table at a depth of about 20 inches from autumn until midspring.

Most of this soil is in woodland. A few small areas are cleared and used for pasture or are idle. Some scattered areas are used for community development.

This soil is not suited to cultivated crops. Stoniness is the major limitation. The use of farming machinery is not practical. Removal of the stones and boulders is difficult. If the soil is cleared, the hazard of erosion is moderate to severe and maintaining a permanent plant cover is a suitable management practice.

This soil is suited to trees. Stoniness is the major limitation. Machine planting is not practical, and the use of harvesting equipment is difficult.

This soil has fair potential for community development. The soil is limited mainly by the seasonal high water table, the slowly permeable or very slowly permeable substratum, and stoniness. Onsite septic systems need careful design and installation. Artificial drains help prevent wet basements. Steep slopes of excavations tend to slump when saturated. Disposal of stones and boulders is difficult in places. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

MgA—Manchester gravelly sandy loam, 0 to 3 percent slopes. This nearly level excessively drained soil is on glacial outwash plains and stream terraces in the northwestern part of the county. This soil formed in water-sorted deposits of sand, gravel, and cobbles derived mainly from conglomerate, sandstone, shale, and basalt. Areas are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is dark brown gravelly sandy loam 9 inches thick. The subsoil is reddish brown gravelly loamy sand 9 inches thick. The substratum is reddish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Penwood soils, somewhat excessively drained Hartford soils, well drained Branford soils, and moderately well drained Ellington soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low. Runoff is slow. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are cleared and used for hay, pasture, and nursery stock. A few areas are forested or idle. Some scattered areas are used for community development, and many areas have small gravel pits.

This soil is poorly suited to cultivated crops. Droughtiness is the major limitation. Irrigation is needed. The gravelly surface layer hinders the use of some farming equipment. Minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices.

This soil is suited to trees. Droughtiness is the major limitation. Seedlings are difficult to establish.

This soil has good potential for community development. Steep slopes of excavations are unstable. Caution is needed to prevent pollution of ground water by onsite septic systems. Lawns, shallow-rooted trees, and shrubs need watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIs; woodland suitability group 5s.

MgC—Manchester gravelly sandy loam, 3 to 15 percent slopes. This gently sloping to sloping, excessively drained soil is on glacial outwash plains, stream terraces, kames, and eskers. The soil formed in water-sorted deposits of sand, gravel, and cobbles derived mainly from

sandstone, shale, and basalt. Areas are irregular in shape and range from 5 to 75 acres. Slopes are smooth or complex.

Typically, the surface layer is dark brown gravelly sandy loam 9 inches thick. The subsoil is reddish brown gravelly loamy sand 9 inches thick. The substratum is reddish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Penwood soils, somewhat excessively drained Hartford soils, well drained Branford soils, and moderately well drained Ellington soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low. Runoff is medium. Unlimed areas are very strongly acid to medium acid.

Most areas of this soil are cleared and used for hay or pasture. A few areas are used for community development, and many areas have small gravel pits.

This soil is poorly suited to cultivated crops. Droughtiness and steep slopes are the major limitations. Irrigation is difficult because of the steep slopes. The gravelly surface layer hinders the use of some farming equipment. The erosion hazard is moderate. If the soils are farmed, minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices.

This soil is suited to trees. Droughtiness is the major limitation. Seedlings are difficult to establish.

This soil has good potential for community development. The soil is limited mainly by slopes and droughtiness. Onsite septic systems need careful design and installation, especially on steeper slopes. Caution is needed to prevent pollution of ground water by septic systems. Lawns, shallow-rooted trees, and shrubs need watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IVs; woodland suitability group 5s.

MyA—Merrimac sandy loam, 0 to 3 percent slopes. This nearly level, somewhat excessively drained soil is on outwash plains and stream terraces of water-sorted sand and gravel derived mainly from granite, gneiss, and schist. Areas are irregular in shape and range from 5 to 75 acres.

Typically, the surface layer is very dark grayish brown sandy loam 9 inches thick. The subsoil is 13 inches thick. The upper 9 inches is brown and dark yellowish brown sandy loam. The lower 4 inches is dark yellowish brown gravelly loamy sand. The substratum is dark yellowish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Hinckley and Windsor soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderately rapid or rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are extremely acid to medium acid.

Most areas of this soil are cultivated. A few areas are wooded or idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. It is droughty for short periods during the summer. Irrigation is needed for vegetables and other specialized crops. This soil dries out and warms up early in the spring. The soil is easy to till. The erosion hazard is slight. Minimum tillage and use of cover crops are suitable management practices.

This soil is suited to trees. Many seedlings do not survive dry periods during the summer.

This soil has good potential for community development. Onsite septic systems cause pollution of ground water in places. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIs; woodland suitability group 4s.

MyB—Merrimac sandy loam, 3 to 10 percent slopes. This gently sloping, somewhat excessively drained soil is on outwash plains and stream terraces of water-sorted sand and gravel derived mainly from granite, gneiss, and schist. Areas are irregular in shape and range from 5 to 75 acres. Slopes are as much as 300 feet long.

Typically, the surface layer is very dark grayish brown sandy loam 9 inches thick. The subsoil is 13 inches thick. The upper 9 inches is brown and dark yellowish brown sandy loam. The lower 4 inches is dark yellowish brown gravelly loamy sand. The substratum is dark yellowish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Hinckley and Windsor soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up 5 to 20 percent of this map unit.

The permeability of this soil is moderately rapid or rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is slow to medium. Unlimed areas are extremely acid to medium acid.

Most areas of this soil are cultivated. A few areas are wooded or idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. It is droughty for short periods during the summer. Irrigation is needed for vegetables and other specialized crops. This soil dries out and warms up early in the spring and is easy to till. The erosion hazard is moderate. Minimum tillage and use of cover crops are suitable management practices.

This soil is suited to trees. Droughtiness is the major limitation. Many seedlings do not survive dry periods during the summer.

This soil has good potential for community development. Onsite septic systems cause pollution of ground water in places. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIs; woodland suitability group 4s.

NnA—Ninigret fine sandy loam, 0 to 5 percent slopes. This nearly level, moderately well drained soil is on outwash plains and stream terraces. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 9 inches thick. The subsoil is 16 inches thick. The upper 5 inches is dark yellowish brown silt loam. The next 6 inches is yellowish brown very fine sandy loam. The lower 5 inches is dark brown fine sandy loam. The substratum is brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Sudbury soils, and poorly drained Raypol and Walpole soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is slow to medium. Unlimed areas are very strongly acid to medium acid. This soil has a seasonal high water table at a depth of about 20 inches from late autumn until midspring.

Most areas of this soil are used for cultivated crops. Scattered areas are used for community development. A few areas are wooded, and the soil is suited to trees.

This soil is well suited to cultivated crops. Wetness in early spring is the major limitation. This soil dries out and warms up slowly in the spring. The hazard of erosion is slight. Artificial drainage, minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices.

This soil has fair potential for community development. The soil is limited mainly by a seasonal high water table. Steep slopes of excavations are unstable. Onsite septic systems need careful design and installation, and in places they cause pollution of ground water. If suitable outlets are available, artificial drains can be used to help prevent wet basements. Lawns are generally wet and soft from late autumn until midspring. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass IIw; woodland suitability group 3o.

PbB—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes. These gently sloping, well drained soils are on drumlins and till plains of glaciated uplands. Areas are oblong or irregular in shape and range from 3 to 85 acres. Slopes are smooth and convex and are mostly 100 to 300 feet long. Areas of this unit consist of either Paxton soils or Montauk soils or both. The soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 10 inches thick. The subsoil is brownish yellow and yellowish brown sandy loam 22 inches thick. The substratum is dark grayish brown, firm, gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 7 inches thick. The subsoil is 23 inches thick. The upper 13 inches is dark yellowish brown fine sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Cleared areas of these soils are used for hay, silage corn, orchards, pasture, and some vegetables and nursery stock. A few areas are idle or wooded. Some small, scattered areas are used for community development. The soils are suitable for trees.

These soils are well suited to cultivated crops. The soils warm up slowly in the spring. The erosion hazard is moderate. Minimum tillage, use of cover crops, and stripcropping are suitable management practices on these soils.

These soils have fair potential for community development. They are mainly limited by the slowly permeable or very slowly permeable substratum. Onsite septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Artificial drains help prevent wet basements. Lawns are often wet and soft in autumn and spring. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 3o.

PbC—Paxton and Montauk fine sandy loams, 8 to 15 percent slopes. These sloping, well drained soils are on drumlins and glacial till plains of glaciated uplands. Areas are oblong or irregular in shape and range from 3 to 75 acres. Slopes are smooth and convex and are 100 to 500

feet long. Areas of this unit consist of either Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 10 inches thick. The subsoil is brownish yellow and yellowish brown fine sandy loam 22 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 7 inches thick. The subsoil is 23 inches thick. The upper 13 inches is dark yellowish brown fine sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Cleared areas of these soils are used for hay, silage corn, pasture, and orchards. A few areas are idle or wooded, and the soils are suited to trees. Small, scattered areas are used for community development.

These soils are suited to cultivated crops. The soils warm up slowly in the spring. The erosion hazard is severe. Minimum tillage, use of cover crops, and stripcropping are suitable management practices on these soils.

These soils have fair potential for community development. They are mainly limited by the steep slopes and the slowly permeable or very slowly permeable substratum. Onsite septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Artificial drains help prevent wet basements. Lawns are often wet and soft in autumn and spring. Erosion is a major concern in unvegetated areas. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIe; woodland suitability group 3o.

PbD—Paxton and Montauk fine sandy loams, 15 to 25 percent slopes. These moderately steep, well drained soils are on the sides of drumlins and glaciated uplands. Areas are oblong or irregular in shape and range from 3 to 50 acres. Slopes are smooth and convex and are mostly 100 to 600 feet long. Areas of this unit consist of Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 10 inches thick. The subsoil is brownish yellow and yellowish brown fine sandy loam 22 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 7 inches thick. The subsoil is 23 inches thick. The upper 13 inches is dark yellowish brown fine sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils and moderately well drained Woodbridge soils.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Cleared areas of these soils are used mainly for pasture and orchards or are idle. Many small areas are wooded. A few scattered areas are used for community development.

These soils are suited to cultivated crops. The soils warm up slowly in the spring. The erosion hazard is severe, and a permanent plant cover is needed. These soils are suited to hay and pasture. Minimum tillage is a suitable management practice.

These soils are suited to trees. The use of equipment is limited by steep slopes.

These soils have poor potential for community development. They are limited mainly by the steep slopes and the slowly permeable or very slowly permeable substratum. Onsite septic systems require very careful design and installation to prevent effluent from coming to the surface of downslope areas. Steep slopes of excavations slump when saturated. Lawns frequently have wet spots near the base of excavated slopes. Controlling erosion is a major concern in unvegetated areas. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IVe; woodland suitability group 3r.

PdB—Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes. These gently sloping, well drained soils are on drumlins and till plains of glaciated uplands. The soils have 0.1 to 3 percent of the surface covered with stones and boulders. Areas are oblong or irregular in shape and range from 5 to 200 acres. Slopes are smooth and convex and are mostly 100 to 300 feet long. The unit consists of Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 6 inches thick. The subsoil is brownish yellow and yellowish brown fine sandy loam 26 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 6 inches thick. The subsoil is 24 inches thick. The upper 14 inches is dark yellowish brown, firm sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils. Also included are a few small areas of nonstony soils and a few areas of soils near the Connecticut River that have more red in the substratum than the major soils in this unit.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Most areas of these soils were cleared and used for crops or pasture, but many have grown back to woodland or are idle. Some of the stones and smaller boulders were removed in many places. A few areas are used for pasture or hay. Some small, scattered areas are used for community development.

These soils are poorly suited to cultivated crops because of stoniness. The use of farming machinery is not practical. These soils are well suited to cultivated crops if the stones and boulders are removed, but removal is difficult. These soils are suited to pasture. The hazard of erosion is moderate. Minimum tillage and the use of permanent vegetation are suitable management practices.

These soils are suited to trees. Machine planting is feasible, but the stones and boulders are a limitation in places.

These soils have fair potential for community development. They are mainly limited by the slowly permeable or very slowly permeable substratum. Onsite septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Artificial drains help prevent wet basements. Lawns are often wet and soft in autumn and spring. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IVs; woodland suitability group 3o.

PdC—Paxton and Montauk very stony fine sandy loams, 8 to 15 percent slopes. These sloping, well drained soils are on drumlins and glacial till plains of glaciated uplands. The soils have 0.1 to 3 percent of the surface covered with stones and boulders. Areas are oblong or irregular in shape and range from 5 to 100 acres. Slopes are smooth and convex and are mostly 100 to 800 feet long. This unit consists of Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 6 inches thick. The subsoil is brownish yellow and yellowish brown sandy loam 26 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 6 inches thick. The subsoil is 24 inches thick. The upper 14 inches is dark yellowish brown, firm sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils. Also included are a few small areas of nonstony soils and a few areas of soils near the Connecticut River that have more red in the substratum than the major soils in this unit.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Most areas of these soils were cleared and are used as cropland or pasture, but many have reverted to woods or are idle. Some of the stones and smaller boulders have been removed in most places. A few areas are used for pasture or hay. Some small, scattered areas are used for community development.

These soils are poorly suited to cultivated crops because of stoniness. The soils are suited to pasture. The use of farming machinery is not practical. The hazard of erosion is severe, and minimum tillage and use of permanent plant cover are suitable management practices.

These soils are suited to trees. Machine planting is feasible, but the stones and boulders are a limitation in places.

These soils have fair potential for community development. They are mainly limited by the slowly permeable or very slowly permeable substratum. Onsite septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Artificial drains help prevent wet basements. Lawns are often wet and soft in autumn and spring. Erosion is a major concern in unprotected areas of these soils. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 3o.

PeC—Paxton and Montauk extremely stony fine sandy loams, 3 to 15 percent slopes. These gently sloping to sloping, well drained soils are on drumlins and glacial till plains of glaciated uplands. About 3 to 15 percent of the surface of these soils is covered with stones and boulders. Areas are oblong or irregular in shape and range from 3 to 100 acres. Slopes are smooth and convex and are mostly 100 to 500 feet long. Areas of this unit consist of Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is brownish yellow and yellowish brown fine sandy loam 29 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 3 inches thick. The subsoil is 27 inches thick. The upper 17 inches is dark yellowish brown, firm sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils. Also included are a few small areas of nonstony soils and a few areas of soils near the Connecticut River that have a redder substratum than the major soils in this unit.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Most areas of these soils are wooded. A few areas are cleared and used for pasture or are idle. Some scattered areas are used for community development.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. Maintaining permanent vegetation is a suitable management practice.

These soils are suited to trees. Stoniness limits the use of equipment. Machine planting is generally not practical.

These soils have fair potential for community development. They are limited mainly by steep slopes, the slowly permeable or very slowly permeable substratum, and stoniness. Onsite septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Artificial drains help prevent wet basements. In places, disposal of stones and boulders is difficult. Lawns are often wet and soft in autumn and spring. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

PeD—Paxton and Montauk extremely stony fine sandy loams, 15 to 35 percent slopes. These moderately steep to steep, well drained soils are on hillsides of drumlins and glacial till plains of glaciated uplands. These soils have 3 to 15 percent of the surface covered with stones and boulders. Areas are oblong or irregular in shape and range from 3 to 85 acres. Slopes are smooth and convex and are mostly 100 to 600 feet long. Areas of this unit consist of Paxton soils or Montauk soils or both. These soils were mapped together because there is no significant difference that affects their use and management. The mapped acreage of this unit is about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils.

Typically, the surface layer of the Paxton soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is brownish yellow and yellowish brown fine sandy loam 29 inches thick. The substratum is dark grayish brown, firm gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Montauk soils is dark brown fine sandy loam 3 inches thick. The subsoil is 27 inches thick. The upper 17 inches is dark yellowish brown,

firm sandy loam. The lower 10 inches is dark yellowish brown and yellowish brown sandy loam. The substratum is dark yellowish brown, firm sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small, intermingled areas of well drained Canton and Charlton soils and moderately well drained Woodbridge soils. Also included are a few areas of soils near the Connecticut River that have a redder substratum than the major soils of this unit.

The permeability of the Paxton soils is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. Unlimed areas of the Paxton soils are strongly acid to slightly acid.

The permeability of the Montauk soils is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas of the Montauk soils are extremely acid to medium acid.

Most areas of these soils are wooded. A few areas are cleared and used for pasture or are idle. Some scattered areas are used for community development.

These soils are not suited to cultivated crops. Stoniness and steep slopes make the use of farming equipment impractical. Maintaining permanent plant cover is a suitable management practice.

These soils are suited to trees. Stoniness and steep slopes limit the use of equipment.

These soils have poor potential for community development. They are limited mainly by steep slopes, the slowly permeable or very slowly permeable substratum, and stoniness. Onsite septic systems need very careful design and installation to prevent effluent from coming to the surface of downslope areas. Steep slopes of excavations slump when saturated. In places, disposal of stones and boulders is difficult. Lawns commonly have wet spots near the base of excavated slopes. Erosion is a major concern in unprotected areas of these soils. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

PnA—Penwood loamy sand, 0 to 3 percent slopes. This nearly level, excessively drained soil is on outwash plains and high stream terraces. This soil consists of loamy sand and sand derived mainly from reddish sandstone, conglomerate, shale, and basalt. Areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The subsoil is yellowish red loamy sand 20 inches thick. The substratum is reddish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Manchester soils, somewhat excessively drained Hartford soils, well drained Branford soils, and moderately well drained Sudbury and Ellington soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low. Runoff is slow. This soil tends to dry out and warm up early in the spring. Unlimed areas are very strongly acid to slightly acid.

Most areas of this soil are in cultivated crops or hay. A few areas are wooded or idle. Some scatterd areas are used for community development.

This soil is poorly suited to cultivated crops because it is droughty. Irrigation is needed. This soil dries out and warms up early in the spring and is easy to work. Minimum tillage, use of cover crops, and incorporating crop residue into the soil are suitable management practices.

This soil is poorly suited to trees. It is limited mainly by droughtiness. Many seedlings do not survive dry summer periods.

This soil has good potential for community development. Onsite septic systems cause pollution of ground water in places. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering in the summer. Quickly establishing plant cover is a suitable management practice during construction. Capability subclass IIIs; woodland suitability group 5s.

PnB—Penwood loamy sand, 3 to 8 percent slopes. This gently sloping, excessively drained soil is on outwash plains and high stream terraces. The soil consists of loamy sand and sand derived mainly from reddish sandstone, conglomerate, shale, and basalt. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The subsoil is yellowish red loamy sand 20 inches thick. The substratum is reddish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Manchester soils, somewhat excessively drained Hartford soils, well drained Branford soils, and moderately well drained Sudbury and Ellington soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low. Runoff is slow. This soil tends to dry out and warm up early in the spring. Unlimed areas are very strongly acid to slightly acid.

Most areas of this soil are in cultivated crops or hay. A few areas are wooded or are idle. Some scattered areas are used for community development.

This soil is poorly suited to cultivated crops because it is droughty. Irrigation is needed, but steep slopes make irrigation difficult in most places. This soil is easy to work. Minimum tillage, use of cover crops, and incorporating crop residue into the soil are suitable management practices.

This soil is poorly suited to trees mainly because of droughtiness. Many seedlings do not survive dry periods in summer.

This soil has good potential for community development. Onsite septic systems cause pollution of ground water in places. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering in the summer. Quickly establishing plant cover and using siltation basins are suitable management practices during construction. Capability subclass IIIs; woodland suitability group 5s.

Pr—Pits, gravel. This unit consists of areas that have been excavated for sand or gravel. The areas are mostly on broad outwash plains and terraces of stream valleys. These areas generally have no vegetation except for a few sparse, drought-resistant plant species. The areas mostly range from 3 to 30 acres. Slopes generally range from 0 to 25 percent, but slopes are steeper on some escarpments along the edges of pits.

Included with this unit in mapping are small, intermingled areas of Udorthents and excessively drained Hinckley, Manchester, and Penwood soils. Also included are a few areas that have bedrock outcrops or small bodies of water and a few areas used for community development.

The permeability of this unit is rapid or very rapid. In places the water table is at or near the surface most of the year. A few areas are adjacent to streams and are subject to flooding.

Areas of this unit require onsite investigation and evaluation for most land-use decisions. Capability subclass and woodland suitability group not assigned.

Ps—Podunk fine sandy loam. This nearly level, moderately well drained soil is on flood plains of the major streams and their tributaries. Areas are dominantly long and narrow or irregular in shape and mostly range from 3 to 60 acres.

Typically, the surface layer is dark brown fine sandy loam and dark grayish brown loamy fine sand 11 inches thick. The subsoil is dark brown, mottled fine sandy loam 21 inches thick. The substratum is dark grayish brown and brown loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Suncook soils and poorly drained Rumney soils. Also included are a few areas of soils that have a sandy loam surface layer and subsoil, a few areas in the northwestern part of the county of soils that are more red than this Podunk soil, and a few small areas of well drained soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late autumn until midspring. The soil is subject to frequent flooding. Permeability is moderately rapid or rapid. Available water capacity is moderate. Runoff is slow. Unlimed areas are very strongly acid to slightly acid.

This soil is mostly wooded and is suited to trees. A few areas are cleared and used for cultivated crops. A few areas are idle, and a few scattered areas are used for community development.

This soil is suited to crops. Wetness and flooding are the major limitations, and drainage is needed. This soil occasionally floods during the summer, damaging most crops. The soil warms up and dries out slowly in the spring. Minimum tillage and use of cover crops are suitable management practices.

This soil has poor potential for community development. The soil is limited mainly by wetness and the hazard of flooding. Steep slopes of excavations are unstable. Sediment deposited by flooding damages lawns, shrubs, and other types of landscaping. Quickly establishing plant cover and using siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

Rb—Raypol silt loam. This nearly level, poorly drained soil is in depressional areas of broad outwash plains and stream terraces. Areas are dominantly irregular in shape and mostly range from 3 to 30 acres. Slopes are 0 to 3 percent.

Typically, the surface layer is very dark grayish brown silt loam 10 inches thick. The subsoil is 14 inches thick. The upper 9 inches is grayish brown and light brownish gray, mottled silt loam. The lower 5 inches is brown, mottled very fine sandy loam. The substratum is brown, mottled sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ellington and Ninigret soils and poorly drained Walpole soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and very rapid or rapid in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to strongly acid at a depth of less than 40 inches and strongly acid to slightly acid at a depth of more than 40 inches. This soil has a high water table at a depth of about 10 inches from fall until spring.

Most of this soil is wooded, or it is cleared and idle. A few areas are in cultivated crops, and a few scattered areas are used for community development.

This soil is poorly suited to cultivated crops. Wetness is the major limitation, and drainage is needed. Even if drained, this soil is wet for several days after heavy rains. Minimum tillage and use of cover crops are suitable management practices.

This soil is suited to trees. The major limitation is wetness. The use of equipment is restricted during the wetter times of the year. Tree windthrow, caused by the shallow rooting depth to the high water table, is common. Machine planting is difficult because of wetness.

This soil has poor potential for community development. Wetness is the major limitation. Onsite septic systems need very careful design and installation and require filling. Steep slopes of excavations are unstable. If suitable outlets are available, artificial drains can be used to help prevent wet basements. Lawns are soft and soggy from

autumn until late spring. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIw; woodland suitability group 4w.

Rp—Rock outcrop-Hollis complex. This complex consists of areas of hard, exposed bedrock and gently sloping to very steep, somewhat excessively drained soils on glacial uplands where the relief is affected by the underlying bedrock. Most areas have a rough surface with bedrock outcrops and a few narrow, intermittent drainageways and small, wet depressions. Slopes range from 3 to 45 percent and are mostly 100 to 500 feet long. This complex has 3 to 25 percent of the surface covered with stones and boulders. Areas are dominantly long and narrow, oval, or irregular in shape. Most areas range from 3 to 80 acres. Approximately 65 percent of this complex is Rock outcrop, 20 percent is Hollis soils, and 15 percent is other soils. Rock outcrop and Hollis soils are so intermingled that it was not practical to map them separately.

Typically, the surface layer of the Hollis soils is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is yellowish brown fine sandy loam 11 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Included with this unit in mapping are small areas of well drained Yalesville, Canton, Cheshire, and Charlton soils; poorly drained Leicester and Ridgebury soils; very poorly drained Whitman soils; and areas of soils with bedrock at a depth of 20 to 40 inches. Also included are a few areas of soils that have slopes ranging to as much as 90 percent.

The permeability of the Hollis soils is moderate or moderately rapid above the bedrock. Available water capacity is low. Runoff is rapid. Unlimed areas are very strongly acid to medium acid. Rock outcrop has very rapid runoff.

Most of this complex is wooded. A few small, cleared areas are idle or used for pasture, and a few small, isolated areas are used for community development.

This complex is not suited to crops because of rock outcrops, stoniness, shallow depth to bedrock, and steep slopes.

This complex is poorly suited to trees because of the shallow depth to bedrock and the rock outcrops. Seedlings are difficult to establish because of droughtiness. Tree windthrow, which is caused by the shallow rooting zone, is common. Rock outcrops, stoniness, and steep slopes hinder the use of equipment. Machine planting of seedlings is not practical.

This complex has poor potential for community development. It is limited mainly by rock outcrops, shallow depth to bedrock, and steep slopes. Excavation is very difficult, and blasting is required in most places. Onsite septic systems require very careful design and installation. In most places such systems are not practical because effluent seeps into cracks in the bedrock and contaminates ground water. Also, an area of more than 5 acres is generally needed for an onsite septic system. In places this complex provides sites for homes. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group not assigned to Rock outcrop, 5d for Hollis part.

Ru—Rumney fine sandy loam. This nearly level, poorly drained soil is on flood plains of the major streams and their tributaries. Areas are dominantly long and narrow or irregular in shape and range from 3 to 120 acres. Slopes are 0 to 3 percent.

Typically, the surface layer is very dark brown fine sandy loam 4 inches thick. The subsoil is 27 inches thick. The upper 15 inches is dark grayish brown, mottled fine sandy loam. The lower 12 inches is very dark gray, mottled sandy loam. The substratum is grayish brown, mottled sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Suncook soils, moderately well drained Podunk soils, and poorly drained Rumney Variant soils. Also included are a few areas of soils that have a sandy loam surface layer and subsoil and areas of soils in the northwestern part of the county that have more red than this Rumney soil. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 10 inches from late fall until midspring. The soil is subject to frequent flooding, mostly from fall through spring. The permeability is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are very strongly acid to slightly acid.

This soil is mostly wooded. A few areas are cleared and used for cultivated crops, and a few are idle. Some small, scattered areas are used for community development.

This soil is poorly suited to cultivated crops. Wetness and flooding are the major limitations. Artificial drainage is needed. The soil remains wet for several days after heavy rains, restricting the use of farming equipment. Crops are usually damaged if this soil is flooded during the growing season. Minimum tillage and use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is difficult when the soil is wet. Wetness and flooding restrict the use of equipment.

This soil has poor potential for community development. The soil is limited mainly by the hazard of flooding and a high water table. Steep slopes of excavations are unstable. Onsite septic systems require extensive filling and careful design and installation. In places, onsite septic systems cause pollution of ground water. This soil is poorly suited for homesites because of flooding and a high water table. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIw; woodland suitability group 4w.

Rv—Rumney Variant silt loam. This nearly level, poorly drained soil is on flood plains of the Coginchaug River and its tributaries. Areas are dominantly long and narrow or irregular in shape and range from 3 to 80 acres. Slopes range from 0 to 3 percent but are mostly less than 1 percent.

Typically, the surface layer is dark brown silt loam 11 inches thick. The subsoil is reddish brown, mottled silt loam 17 inches thick. The substratum is reddish brown, mottled silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Podunk soils, poorly drained Raypol soils, and very poorly drained Adrian and Saco soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 10 inches from late fall until midspring. The soil is subject to frequent flooding, mostly from fall through late spring. The permeability is moderate or moderately slow. Available water capacity is high. Runoff is slow or ponded. This soil dries out and warms up slowly in the spring. Unlimed areas are strongly acid to medium acid.

This soil is mostly wooded. A few areas are cleared and used for cultivated crops and pasture, and a few areas are idle. A few small, scattered areas are filled and used for community development.

This soil is poorly suited to cultivated crops. Wetness and flooding are the major limitations. Artificial drainage is needed. Even if drained, this soil remains wet for several days after heavy rains, restricting the use of farming equipment. Some crops are damaged or destroyed by flooding during the growing season. Artificial drainage, minimum tillage, and use of cover crops are suitable management practices.

This soil is suited to trees. Wetness and flooding restrict the use of equipment. Tree windthrow, which is caused by the shallow rooting zone above the water table, is common.

This soil has poor potential for community development. The soil is limited by frequent flooding and a high water table. Steep slopes of excavations are unstable. Sediment deposited by flooding damages many kinds of landscaping. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIw; woodland suitability group 4w.

Sb—Saco silt loam. This nearly level, very poorly drained soil is on low flood plains adjacent to streams and rivers. Most areas are near the Connecticut River. The soils formed in silty alluvial sediments. Areas are dominantly long and narrow and range from 5 to 100 acres. Slopes are 0 to 2 percent.

Typically, the surface layer is very dark grayish brown mucky silt loam 6 inches thick. The substratum is dark gray and very dark gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Podunk soils, poorly drained Rumney and Rumney Variant soils, and very poorly drained Westbrook soils. Included areas make up about 10 percent of this map unit.

This soil is subject to frequent flooding. Areas adjacent to the Connecticut River in the southern part of the county are subject to daily freshwater flooding caused by the tide. The permeability of this soil is moderate. Available water capacity is high. Runoff is slow or very slow, and water covers some areas from late fall through early spring. The soil is strongly acid to neutral at a depth of less than 30 inches and medium acid to neutral at a depth of more than 30 inches.

Most areas of this soil are wooded or idle. A few small areas are in pasture.

This soil is poorly suited to cultivated crops because of wetness and frequent flooding (fig. 6). The soil is difficult to drain for crop production. Frequent flooding severely damages or destroys some crops. Wetness severely restricts the use of farming equipment.

This soil is not suited to commercial timber production because of wetness and frequent flooding.

This soil has poor potential for community development. The soil is limited mainly by the high water table and frequent flooding. Use of this soil for community development is not feasible unless the soil is extensively filled. Capability subclass VIw; woodland suitability group not assigned.

Sc—Scarboro mucky loamy fine sand. This nearly level, very poorly drained soil is in depressions of broad glacial outwash terraces. Areas are dominantly irregular in shape and range from 3 to 90 acres.

Typically, the surface layer is 3 inches of very dark brown muck over 6 inches of black mucky loamy fine sand. The next 8 inches is black loamy fine sand. The substratum is grayish brown and dark grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Adrian soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at the surface from fall until late spring. The permeability of the soil is rapid or very rapid. Available water capacity is low. Runoff is slow or very slow. Unlimed areas are very strongly acid to medium acid.

This soil is mostly wooded, or it is cleared and idle. A few areas are used for pasture.

This soil is poorly suited to cultivated crops because of wetness. Artificial drainage is needed, but suitable outlets are not available in most places.

This soil is poorly suited to trees, but it is better suited to woodland than to most other uses. Wetness restricts the use of equipment and causes high seedling mortality

and tree windthrow. Machine planting is not practical when the soil is wet.

This soil has poor potential for community development because of the high water table. Steep slopes of excavations are unstable. Extensive filling is needed in areas of this soil used for community development. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass Vw; woodland suitability group 5w.

SgA—Sudbury sandy loam, 0 to 5 percent slopes. This nearly level, moderately well drained soil is in slight depressions of broad outwash terraces and narrow stream valleys. Areas are dominantly irregular in shape and range from 3 to 40 acres. Slopes are smooth and are mainly less than 200 feet long.

Typically, the surface layer is very dark grayish brown sandy loam 9 inches thick. The subsoil is 25 inches thick. The upper 9 inches is dark yellowish brown sandy loam. The middle 10 inches is dark yellowish brown, mottled loamy sand. The lower 6 inches is yellowish brown, mottled gravelly loamy sand. The substratum is light yellowish brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Merrimac soils, moderately well drained Ninigret soils, and poorly drained Walpole soils. Also included are a few areas of soils that have a fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in autumn until midspring. The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are extremely acid to medium acid.

This soil is mostly in cropland. A few areas are in woodland or are idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. The soil is limited mainly by wetness and is slow to warm up and dry out in the spring. Artificial drainage helps to dry out the soil earlier in the spring, but even if drained, this soil remains wet for a few days after heavy rains. Artificial drainage, minimum tillage, and use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is practical in open areas.

This soil has fair potential for community development. The seasonal high water table is the major limitation. Steep slopes of excavations are unstable. Onsite septic systems need very careful design and installation, and sites generally require filling. In places, such systems cause pollution of ground water. If suitable outlets are available, artificial drains can be used to help prevent wet basements. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass IIw; woodland suitability group 4o.

St—Suncook loamy sand. This nearly level to gently sloping, excessively drained soil is on flood plains mainly near the Connecticut River. These soils formed in recent sandy alluvium derived mainly from gneiss, schist, and granite. The areas are irregular in shape and range from 3 to 60 acres. Slopes range from 0 to 5 percent.

Typically, the surface layer is dark brown loamy sand 10 inches thick. The substratum is 14 inches of grayish brown sand over dark grayish brown and brown loamy fine sand that extends to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Podunk soils, poorly drained Rumney and Rumney Variant soils, and very poorly drained Saco soils. Included areas make up 5 to 15 percent of this map unit.

This soil is subject to flooding. The permeability of this soil is rapid to very rapid. Available water capacity is low. Runoff is slow. Unlimed areas are very strongly acid to slightly acid.

Most areas of this soil are wooded or in pasture. A few areas are in cultivated crops. Some small, scattered areas are in community development.

This soil is poorly suited to cultivated crops. Droughtiness is the major limitation, and irrigation is needed. This soil seldom floods during the growing season. Minimum tillage, irrigation, and use of cover crops are suitable management practices.

This soil is suited to trees. Many seedlings do not survive dry summer periods. Machine planting is practical.

This soil is poorly suited to community development. The soil is limited mainly by the hazard of flooding. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs require watering during the summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIs; woodland suitability group 5s.

UD—Udorthents-Urban land complex. This complex consists of moderately well drained to excessively drained soils that have been disturbed by cutting or filling and areas that are covered with buildings and pavement. The areas are mostly larger than 5 acres. This complex is about 60 percent Udorthents, 30 percent Urban land, and 10 percent other soils. The areas of Udorthents and Urban land are so intermingled that it was not practical to map them separately.

Udorthents are in areas that have been cut to a depth of 2 feet or more or are in areas with more than 2 feet of fill. Udorthents consist primarily of moderately coarse textured soil material, but a few small areas have some medium textured material.

Included with this complex in mapping are small, intermingled areas of undisturbed soils. Also included are a few areas that are made up entirely of Udorthents. Included areas make up 10 percent of this map unit.

Most cut areas of this unit were used as a source for fill material. In some areas, cuts were made to level sites for buildings, recreation facilities, and roads. Most filled areas are used as sites for urban development. In some places fill has been used to build up recreation areas and highways.

The permeability and stability of the soils in this unit are variable. The unit requires onsite investigation and evaluation for most uses. Capability subclass and woodland suitability group not assigned.

Ur—Urban land. This unit consists of areas mostly covered by buildings, paved roads, and parking lots. Most of these areas are in intensively built-up parts of Middletown and Portland. These areas are mostly rectangular and range from 5 to 100 acres. Slopes ranges from 0 to 10 percent but are dominantly 0 to 5 percent.

Included with this unit in mapping are small, intermingled areas of Udorthents, excessively drained Penwood soils, somewhat excessively drained Hartford soils, well drained Wethersfield and Branford soils, and moderately well drained Ludlow and Berlin soils. Included areas make up 5 to 20 percent of this map unit.

Areas of Urban land require onsite investigation and evaluation for most land-use decisions. Capability subclass and woodland suitability group not assigned.

Wd—Walpole sandy loam. This nearly level, poorly drained soil is in depressions of glacial outwash plains and terraces. Areas are dominantly irregular in shape and mostly range from 3 to 30 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is black sandy loam 10 inches thick. The subsoil is 13 inches thick. The upper 2 inches is brown sandy loam, and the lower 11 inches is dark grayish brown, mottled sandy loam. The substratum is grayish brown, mottled sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ninigret and Sudbury soils, poorly drained Raypol soils, and very poorly drained Scarboro soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a high water table at a depth of about 10 inches from autumn until spring. The permeability of the soil is moderately rapid in the surface layer and subsoil and is rapid or very rapid in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are very strongly acid to medium acid.

This soil is mostly wooded, or it is cleared and idle. A few areas are in cultivated crops. Some scattered areas are used for community development.

This soil is poorly suited to cultivated crops because of wetness. The soil dries out and warms up slowly in the spring, and artificial drainage is needed. Even if drained, this soil remains wet for several days after heavy rains, restricting the use of farming equipment. Minimum tillage and use of cover crops are suitable management practices.

This soil is suited to trees. It is limited mainly by wetness, which restricts the use of equipment and makes machine planting impractical. Tree windthrow is a hazard caused by the shallow rooting zone above the water table.

This soil has poor potential for community development. The soil is limited mainly by a high water table. Steep slopes of excavations are unstable. Onsite septic systems need very careful design and installation, and sites generally require extensive filling. If suitable outlets are available, artificial drains can be used to help prevent wet basements, but many places do not have suitable outlets. During construction, quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices. Capability subclass IIIw; woodland suitability group 4w.

We—Westbrook mucky peat. This nearly level, very poorly drained soil is in tidal marshes bordering Long Island Sound. The areas are mainly irregular in shape. They mostly range from 3 to 150 acres. Slopes are less than 1 percent.

Typically, the surface layer of this soil is an organic layer of very dark gray and dark olive gray mucky peat 48 inches thick. The underlying material is very dark gray and dark gray silt loam to a depth of more than 60 inches.

Included with this soil in mapping are a few areas of soils with an organic layer thicker than 51 inches. Also included are a few small areas of very poorly drained Scarboro soils, Rock outcrops, and Beaches. Included areas make up 5 to 10 percent of this map unit.

This soil is subject to tidal flooding twice daily. The permeability of the soil is moderate to rapid in the organic layer and moderate in the underlying material. Runoff is very slow. Available water capacity is high. This soil is strongly acid to neutral in its natural condition and is extremely acid if drained.

Most areas of this soil are undisturbed. A few areas are used for saltgrass hay. Some small, scattered areas have been filled and used for community development.

This soil generally is not suited to cultivated crops, woodland, or community development because of wetness, daily tidal flooding, and a high salt content. Capability subclass VIIIw; woodland suitability group not assigned.

Wh—Westbrook mucky peat, low salt. This nearly level, very poorly drained soil is in tidal marshes near the mouth of the major streams entering Long Island Sound. Most of the areas are near the Connecticut River. The areas are mostly irregular in shape and range from 3 to 75 acres. Slopes are less than 1 percent.

Typically, the surface layer of this soil is an organic layer of very dark gray and dark olive gray mucky peat 48 inches thick. The underlying material is very dark gray and dark gray silt loam to a depth of more than 60 inches.

Included with this soil in mapping are a few areas of soils with an organic layer thicker than 51 inches, areas of very poorly drained Scarboro and Saco soils, and Rock outcrops. Included areas make up 5 to 20 percent of this map unit.

This soil is subject to tidal flooding twice daily. The permeability of the soil is moderate to rapid in the organic layer and moderate in the underlying material. Runoff is very slow. Available water capacity is high. This soil is strongly acid to neutral in its natural condition and extremely acid if drained.

Most areas of this soil are undisturbed. Some small, scattered areas have been filled and used for community development.

These soils are not suited to cultivated crops, woodland, or community development because of wetness, daily tidal flooding, and a high salt content. Capability subclass VIIIw; woodland suitability group not assigned.

WkB—Wethersfield loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on drumlims and hilltops of glacial till uplands. Areas are oblong or irregular in shape and mostly range from 3 to 150 acres. Slopes are smooth and mostly 100 to 300 feet long.

Typically, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown and dark reddish brown loam 18 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are small areas with a few stones and boulders on the surface and a few areas of soils that have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. This soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Cleared areas of this soil are mostly in cultivated crops. A few small areas are wooded or idle. Many small, scattered areas are used for community development.

This soil is well suited to cultivated crops. The erosion hazard is moderate. Minimum tillage, use of cover crops, and stripcropping are suitable management practices.

The soil is suited to trees. Machine planting is practical.

This soil has fair potential for community development. The soil is limited mainly by the slow or very slow permeability of the substratum. Onsite septic systems need careful design and installation. Steep slopes of excavations slump when saturated. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 3o.

WkC—Wethersfield loam, 8 to 15 percent slopes. This sloping, well drained soil is on drumlins and side slopes of glacial till uplands. Areas are oblong or irregular in shape and mostly range from 3 to 50 acres. Slopes are mostly 100 to 400 feet long.

Typically, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown and dark reddish brown loam 18 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are a few small areas with stones and boulders on the surface and a few areas of soils that have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. This soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Cleared areas of this soil are mostly in cultivated crops. Some small areas are wooded or idle, and many small, scattered areas are used for community development.

The soil is suited to cultivated crops. The erosion hazard is severe. Minimum tillage, use of cover crops, and stripcropping are suitable management practices.

This soil is suited to trees. Machine planting is practical.

This soil has fair potential for community development. The soil is limited mainly by the steep slopes and the slowly permeable or very slowly permeable substratum. Onsite septic systems need careful design and installation. Steep slopes of excavations slump when saturated. Erosion is a major concern in unprotected areas of this soil. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIe; woodland suitability group 3o.

WkD—Wethersfield loam, 15 to 35 percent slopes. This steep, well drained soil is on hillsides of drumlims and glacial till uplands. Areas are long and narrow or irregular in shape and range from 3 to 50 acres. Slopes are mostly 100 to 400 feet long.

Typically, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown and dark reddish brown loam 18 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Holyoke soils, well drained Cheshire and Yalesville soils, and moderately well drained Ludlow soils. Also included are a few areas where as much as 5 percent of the surface is covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. This soil is very strongly acid or strongly acid in the surface

layer and subsoil and very strongly acid to medium acid in the substratum.

Most areas of this soil are wooded or are cleared and used for pasture. A few small areas are used for hay or community development.

This soil is poorly suited to cultivated crops because of the steep slopes. The erosion hazard is severe, and this soil needs permanent plant cover. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and stripcropping are suitable management practices.

This soil is suited to trees. Machine planting is practical but is limited by the steep slopes.

This soil has poor potential for community development. The soil is limited mainly by the steep slopes and the slowly permeable or very slowly permeable substratum. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface of downslope areas. Controlling erosion is a major concern during construction, and quickly establishing plant cover, providing diversions, and establishing siltation basins are suitable management practices. Capability subclass IVe; woodland suitability group 3r.

WmB—Wethersfield very stony loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on drumlins and hilltops of glacial till uplands. Stones and boulders cover 0.1 to 3 percent of the surface. Areas are oblong or irregular in shape and mostly range from 3 to 100 acres. Slopes are mostly 100 to 300 feet long.

Typically, the surface layer is dark brown loam 2 inches thick. The subsoil is reddish brown and dark reddish brown loam 24 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are a few small nonstony areas and a few areas of soils that have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. This soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Most areas of this soil are in woodland or pasture. A few cleared areas are used for cropland. Some small, scattered areas are used for community development.

This soil is poorly suited to cultivated crops because of stoniness. Stones and boulders severely hinder the use of most farming equipment. This soil has a moderate erosion hazard. Minimum tillage, maintaining permanent plant cover, and use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is hindered by stones and boulders but is practical in most places.

This soil has fair potential for community development. The soil is limited mainly by the slow or very slow permeability of the substratum. Onsite septic systems need careful design and installation. Steep slopes of excavations slump when saturated. Removal of stones and boulders is necessary for landscaping. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 3o.

WmC—Wethersfield very stony loam, 8 to 15 percent slopes. This sloping, well drained soil is on drumlins and side slopes of glacial till uplands. Stones and boulders cover 0.1 to 3 percent of the surface. Areas are oblong or irregular in shape and mainly range from 3 to 50 acres. Slopes are mostly 100 to 400 feet long.

Typically, the surface layer is dark brown loam 2 inches thick. The subsoil is reddish brown and dark reddish brown loam 24 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are a few small nonstony areas and a few areas of soils that have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is rapid. This soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Most areas of this soil are wooded or in pasture. A few areas are used for hay. Some small, scattered areas are used for community development.

This soil is poorly suited to cultivated crops because of stoniness. Stones and boulders severely hinder the use of most farming equipment. This soil has a severe erosion hazard. Minimum tillage, maintaining permanent plant cover, and use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is hindered by stones and boulders but is practical in most places.

This soil has fair potential for community development. The soil is limited mainly by the slow or very slow permeability of the substratum. Onsite septic systems need careful design and installation. Steep slopes of excavations slump when saturated. Removal of stones and boulders is necessary for landscaping. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 3o.

WnC—Wethersfield extremely stony loam, 3 to 15 percent slopes. This gently sloping and sloping, well drained soil is on drumlins and side slopes of glacial till uplands. Stones and boulders cover 3 to 15 percent of the surface. Areas are irregular in shape and mainly range from 3 to 85 acres. Slopes are mostly 100 to 400 feet long.

Typically, the surface layer is dark brown loam 2 inches thick. The subsoil is reddish brown and dark reddish brown loam 24 inches thick. The substratum is very firm, reddish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are a few small nonstony areas. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium to rapid. This soil is very strongly acid or strongly acid in the surface layer and very strongly acid to medium acid in the substratum.

Most areas of this soil are wooded. Cleared areas are mainly in pasture. A few small, scattered areas are used for community development.

This soil is not suited to cultivated crops because of stoniness. Stones and boulders make the use of farming equipment impractical. This soil has a moderate to severe erosion hazard. Maintaining permanent plant cover is a suitable management practice.

This soil is suited to trees. Stoniness limits the use of some equipment and makes machine planting impractical.

This soil has fair potential for community development. The soil is limited mainly by the slow or very slow permeability and surface stoniness. The removal of stones and boulders is necessary for most uses. Onsite septic systems need careful design and installation. Steep slopes of excavations slump when saturated. The large boulders sometimes have esthetic value for landscaping. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

Wr—Wilbraham silt loam. This nearly level to gently sloping, poorly drained soil is in drainageways and depressions of glacial till uplands. Areas are dominantly long and narrow or irregular in shape and mostly range from 3 to 50 acres. Slopes range from 0 to 5 percent and are smooth and concave.

Typically, the surface layer is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown and reddish brown, mottled silt loam 16 inches thick. The substratum is dark reddish brown, mottled gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ludlow soils and very poorly drained Adrian soils. Also included are a few areas where as much as 3 percent of the surface is covered with stones and boulders and a few areas of soils have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from autumn until midspring. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Most of this soil is in woodland. A few small areas have been cleared and are in cropland and pasture. A few scattered areas are used for community development.

This soil is suited to cultivated crops. Wetness is the major limitation, and artificial drainage is needed. Even if drained, this soil remains wet for several days after heavy rains, restricting the use of most kinds of farming equipment.

This soil is suited to trees. Wetness makes machine planting impractical. Tree windthrow is a common hazard because of the shallow rooting depth above the water table.

This soil has poor potential for community development. The soil is limited mainly by the high water table and the slowly permeable or very slowly permeable substratum. Artificial drains help prevent wet basements. Onsite septic systems need very careful design and installation, and areas generally require extensive filling. Steep slopes of excavations slump when saturated. Lawns are wet and soggy in the spring and for several days after summer rains. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable managemement practices during construction. Capability subclass IIIw; woodland suitability group 4w.

Wt—Wilbraham extremely stony silt loam. This nearly level to gently sloping, poorly drained soil is in drainageways and depressions of glacial till uplands. Areas are dominantly long and narrow or irregular in shape and mostly range from 3 to 100 acres. Slopes range from 0 to 5 percent and are smooth and concave. Stones and boulders cover 3 to 15 percent of the surface.

Typically, the surface layer is very dark gray silt loam 4 inches thick. The subsoil is dark reddish brown and reddish brown, mottled silt loam 16 inches thick. The substratum is dark reddish brown, mottled gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of moderately well drained Ludlow soils and very poorly drained Adrian soils. Also included are small areas where less than 3 percent of the surface is covered with stones and boulders, a few areas of soils that have a friable and moderately permeable substratum, and small areas of very poorly drained soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from autumn until midspring. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. Unlimed areas are very strongly acid to strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

Most of this soil is in woodland. A few small areas have been cleared and are in pasture or cropland. Some small, scattered areas are used for community development.

This soil is poorly suited to cultivated crops because of wetness and surface stoniness. Stones and boulders make the use of farming equipment impractical. Unless drained, this soil is too wet for the use of equipment from autumn until midspring. Even if drained, the soil remains wet for several days after heavy summer rains. Maintaining permanent plant cover and using artificial drainage are suitable management practices.

This soil is suited to trees. It is limited mainly by wetness and stoniness. Stoniness limits the use of some equipment and makes machine planting impractical. Wetness limits the use of equipment during the wet parts of the year. Tree windthrow is a hazard caused by the shallow rooting zone above the high water table.

This soil has poor potential for community development. The soil is limited mainly by wetness, stoniness, and the slow or very slow permeability of the substratum. Artificial drains help prevent wet basements. Onsite septic systems need very careful design and installation, and sites generally require extensive filling. Steep slopes of excavations slump when saturated. Lawns are wet and soggy in autumn and spring and after heavy summer rains. Most uses of this soil require the removal of stones and boulders. The large boulders have esthetic value for landscaping. Capability subclass VIIs; woodland suitability group 4x.

WvA—Windsor loamy sand, 0 to 3 percent slopes. This nearly level, excessively drained soil is on broad glacial outwash plains and stream terraces. Areas are irregular in shape and range from 3 to 50 acres.

Typically, the surface layer is very dark grayish brown and dark yellowish brown loamy sand 7 inches thick. The subsoil is strong brown and brown loamy sand 25 inches thick. The substratum is brown loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low. Runoff is slow. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

Most areas of this soil are in cultivated crops. A few areas are wooded or idle. Some scattered areas are used for community development.

This soil is poorly suited to cultivated crops because it is droughty. Irrigation is needed. This soil dries out and warms up early in the spring and is easy to work. If irrigated, this soil is well suited to vegetables. Minimum tillage, returning crop residue to the soil, and the use of cover crops are suitable management practices.

This soil is suited to trees. Drought is the major limitation. Many seedlings do not survive dry periods during the summer.

This soil has good potential for community development. Steep slopes of excavations are unstable. Onsite septic systems are a pollution hazard to ground water in places. Lawns, shallow-rooted trees, and shrubs need watering in summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIs; woodland suitability group 5s.

WvB—Windsor loamy sand, 3 to 8 percent slopes. This gently sloping, excessively drained soil is on broad glacial outwash plains and stream terraces. Areas are irregular in shape and range from 3 to 100 acres. Slopes are smooth and 75 to 250 feet long.

Typically, the surface layer is very dark yellowish brown and dark yellowish brown loamy fine sand 7 inches thick. The subsoil is strong brown and brown loamy sand 25 inches thick. The substratum is brown loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Ninigret and Sudbury soils. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low. Runoff is slow. Unlimed areas are very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

Most of this soil is in cultivated crops or grass-hay. A few areas are wooded or idle. Some small, scattered areas are used for community development.

This soil is poorly suited to cultivated crops because it is droughty. Irrigation is needed. The steep slopes make the use of most irrigation equipment difficult. This soil warms up and dries out quickly in the spring and is easy to work. Unprotected areas of this soil are subject to wind erosion. Minimum tillage, incorporating crop residue into the soil, and the use of cover crops are suitable management practices.

This soil is poorly suited to trees. Drought is the major limitation. Many seedlings do not survive dry periods during the summer.

This soil has good potential for community development. Steep slopes of excavations are unstable. Onsite

septic systems are a pollution hazard to ground water in places. Lawns, shallow-rooted trees, and shrubs need watering in summer. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIs; woodland suitability group 5s.

WxA—Woodbridge fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on the top of drumlins and concave side slopes of glacial till uplands. Areas are oval or irregular in shape and range from 3 to 75 acres.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is 20 inches thick. The upper 7 inches is dark yellowish brown fine sandy loam. The lower 13 inches is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches from autumn until midspring. The permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are strongly acid or medium acid.

Most areas of this soil are cleared and in cultivated crops. A few small areas are wooded or idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. Wetness is the major limitation, and artificial drainage is needed. Even if drained, this soil remains wet for several days after heavy summer rains. Artificial drainage, minimum tillage, and the use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is practical.

This soil has fair potential for community development. The soil is limited mainly by wetness and the slowly permeable or very slowly permeable substratum. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Artificial drains help prevent wet basements. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

WxB—Woodbridge fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on side slopes of drumlins and glacial till uplands. Areas are oblong or irregular in shape and range from 3 to 150 acres. Slopes are mostly concave and are 100 to 500 feet long.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is 20 inches thick. The upper 7 inches is dark yellowish brown fine sandy loam. The lower 13 inches is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches from autumn until midspring. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas are strongly acid or medium acid.

Most areas of this soil are cleared and in cultivated crops. A few small areas are wooded or idle. Some scattered areas are used for community development.

This soil is well suited to cultivated crops. Wetness is the major limitation, and artificial drainage is needed. Even if drained, this soil remains wet for several days after heavy summer rains. Artificial drainage, minimum tillage, and the use of cover crops are suitable management practices.

This soil is suited to trees. Machine planting is practical.

This soil has fair potential for community development. The soil is limited mainly by wetness and the slowly permeable or very slowly permeable substratum. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns and basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIw; woodland suitability group 3o.

WyA—Woodbridge very stony fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on top of drumlins and concave side slopes of glacial till uplands. Areas are oval or irregular in shape and range from 3 to 85 acres. Stones and boulders cover 0.1 to 3 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 3 inches thick. The subsoil is 25 inches thick. The upper 12 inches is dark yellowish brown fine sandy loam. The lower 13 inches is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and

Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches from autumn until midspring. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are strongly acid or medium acid.

Most of this soil is wooded. Cleared areas are used mainly for pasture or are idle. A few small areas are used for crops, mainly hay. A few areas are used for community development.

This soil is poorly suited for cropland because of the surface stoniness. Stones and boulders severely hinder the use of farming equipment. This soil is wet from late autumn until midspring and for several days after heavy summer rains. Minimum tillage and maintaining permanent plant cover are suitable management practices.

This soil is suited to trees. Machine planting is hindered by stones and boulders but is practical in most places.

This soil has fair potential for community development. The soil is limited mainly by wetness and the slowly permeable or very slowly permeable substratum. Onsite septic systems need very careful design and installation, and sites require filling in places. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns and basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass Vs; woodland suitability group 3o.

WyB—Woodbridge very stony fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on side slopes of drumlins and glacial till uplands. Areas are oblong or irregular in shape and range from 3 to 200 acres. Stones and boulders cover 0.1 to 3 percent of the surface. Slopes are mostly concave and are 100 to 400 feet long.

Typically, the surface layer is dark brown fine sandy loam 3 inches thick. The subsoil is 25 inches thick. The upper 12 inches is dark yellowish brown fine sandy loam. The lower 13 inches is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches from autumn until midspring. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium. Unlimed areas are strongly acid or medium acid.

Most of this soil is wooded. Cleared areas are used mainly for pasture or are idle. A few areas are used for crops, mainly hay. Some scattered areas are used for community development.

This soil is poorly suited to cropland because of stoniness. Stones and boulders severely hinder the use of farming equipment. The soil is wet from late autumn until midspring and for several days after heavy summer rains. Minimum tillage and maintaining permanent plant cover are suitable management practices.

This soil is suited to trees. Machine planting is hindered by stones and boulders but is practical in most places.

This soil has fair potential for community development. The soil is limited mainly by wetness and the slowly permeable or very slowly permeable substratum. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns and basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIs; woodland suitability group 3o.

WzA—Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on the top of drumlins and side slopes of glacial till uplands. Areas are oval or irregular in shape and range from 3 to 100 acres. Stones and boulders cover 3 to 15 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 3 inches thick. The subsoil is 25 inches thick. The upper 12 inches is dark yellowish brown fine sandy loam. The lower 13 inches is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substatum and a few small areas where less than 3 percent of the surface is covered by stones. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches. The permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is slow. Unlimed areas are strongly acid or medium acid.

Most of this soil is wooded. Cleared areas are mostly in pasture or are idle. Some small, scattered areas are used for community developmemt.

This soil is poorly suited to cropland because of stoniness. The use of modern farming equipment is not practi-

cal. Maintaining permanent plant cover is a suitable management practice.

This soil is suited to trees. Stoniness limits the use of some equipment and makes machine planting impractical.

This soil has fair potential for community development. The soil is limited mainly by wetness, the slowly permeable or very slowly permeable substratum, and stoniness. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Removal of stones and boulders is necessary for most uses. Lawns are wet and soggy from late autumn until midspring and for several days after heavy summer rains; artificial drains and land shaping help prevent wet lawns and basements. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

WzC—Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, moderately well drained soil is on side slopes of drumlins and glacial till uplands. Areas are oblong or irregular in shape and range from 3 to 150 acres. Stones and boulders cover 3 to 15 percent of the surface. Slopes are 100 to 400 feet long.

Typically, the surface layer is dark brown fine sandy loam 3 inches thick. The subsoil is 25 inches thick. In the upper 12 inches it is dark yellowish brown fine sandy loam. In the lower 13 inches it is yellowish brown and olive, mottled fine sandy loam. The substratum is olive, mottled, firm fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small, intermingled areas of well drained Paxton, Montauk, Charlton, and Canton soils and poorly drained Ridgebury and Leicester soils. Also included are a few areas of soils that have a friable and moderately permeable substratum. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. Unlimed areas are strongly acid or medium acid.

Most areas of this soil are wooded. Cleared areas are mostly in pasture or are idle. Some small scattered areas are used for community development.

This soil is poorly suited to use as cropland because of stoniness. The use of farming equipment is not practical. Maintaining permanent plant cover is a suitable management practice.

This soil is suited to trees. Stoniness limits the use of some equipment and makes machine planting impractical.

This soil has fair potential for community development. The main limitations are wetness, the slowly permeable or very slowly permeable substratum, and stoniness. Steep slopes of excavations slump when saturated. Onsite septic systems need very careful design and installation, and sites require filling in places. Removal of stones and boulders is necessary for most uses. Lawns are wet and soggy from autumn until midspring and for several days after heavy summer rains. Artificial drains help prevent wet basements and lawns. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass VIIs; woodland suitability group 3x.

YaB—Yalesville fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on hills and ridges of glacial till plains where the relief is affected by the underlying bedrock. This soil formed in a mantle of till 20 to 40 inches thick over bedrock. The till is derived from reddish sandstone, conglomerate, shale, and basalt. Areas are irregular in shape and range from 5 to 75 acres. Slopes are smooth and 100 to 300 feet long.

Typically, the surface layer is dark brown fine sandy loam 10 inches thick. The subsoil is yellowish red and reddish brown fine sandy loam 20 inches thick. Reddish brown sandstone bedrock is at a depth of 30 inches.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Holyoke soils, well drained Cheshire and Wethersfield soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are a few areas of soils that have a silt loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate to moderately rapid above the bedrock. Available water capacity is moderate. Runoff is medium. Unlimed areas are very strongly acid to medium acid.

Most of this soil is in cultivated crops. Some scattered areas are used for community development. A few small areas are wooded or idle.

This soil is suited to cultivated crops. The erosion hazard is moderate. Minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are suitable mangement practices.

This soil is suited to trees (fig. 7). The shallow rooting depth above the bedrock causes tree windthrow. Machine planting is practical.

This soil has fair potential for community development. It is limited mainly by shallowness to bedrock, which makes excavation difficult. Onsite septic systems need careful design and installation, and sites require filling in many places. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIe; woodland suitability group 4o.

YaC—Yalesville fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on hills and ridges of bedrock-controlled glacial till plains. This soil formed in a mantle of till 20 to 40 inches thick over bedrock. The till is derived from reddish sandstone, conglomerate, shale, and basalt. Areas are irregular in shape

and range from 5 to 75 acres. Slopes are smooth and 100 to 300 feet long.

Typically, the surface layer is dark brown fine sandy loam 10 inches thick. The subsoil is yellowish red and reddish brown fine sandy loam 20 inches thick. Reddish brown sandstone bedrock is at a depth of 30 inches.

Included with this soil in mapping are small, intermingled areas of somewhat excessively drained Holyoke soils, well drained Cheshire and Wethersfield soils, and moderately well drained Ludlow soils. Also included are a few areas of soils that have a silt loam surface layer. Included areas make up 5 to 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid above the bedrock. Available water capacity is high. Runoff is rapid. Unlimed areas are very strongly acid to medium acid.

Most of this soil is in cultivated crops. Some scattered areas are used for community development. A few small areas are wooded or idle.

This soil is suited to cultivated crops. The erosion hazard is severe. Minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are suitable management practices.

This soil is suited to trees. The shallow rooting depth above the bedrock causes tree windthrow. Machine planting is practical.

This soil has fair potential for community development. The soil is limited mainly by the shallow depth to bedrock and the steep slopes. Bedrock makes deep excavation difficult. Onsite septic systems need careful design and installation, and sites require filling in places. Quickly establishing plant cover, providing temporary diversions, and establishing siltation basins are suitable management practices during construction. Capability subclass IIIe; woodland suitability group 4o.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops, pasture, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

In this section the system of land capability classification used by the Soil Conservation Service is explained (*6*) and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the soil is not suited to the crop or the crop is not commonly grown on the soil.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varie-

ties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except those named at a level higher than the series are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil map unit in the section "Soil maps for detailed planning."

Woodland management and productivity

Table 7 contains information useful to woodland owners or forest managers planning to use the soils for wood crops. Only those soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or

rockiness; *w*, excessive water in or on the soil; *d*, restricted root depth; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, d, s, and r.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Considered in the ratings of *windthrow hazard* are characteristics of the soil that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that trees in wooded areas are not expected to be blown down by commonly occurring winds; *moderate*, that some trees are blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. Site index is listed for trees that woodland managers generally favor for wood crop production. These trees are the most important species in regard to growth rate, quality, value, and marketability. Other tree species that commonly occur on the soil are also listed regardless of potential value and growth potential.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

Whitney T. Ferguson, Jr., state conservation engineer, Soil Conservation Service, Storrs, Connecticut, assisted in preparing this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational areas; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil

properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, and *poor*, which mean about the same as *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system(*3*).

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard if the seasonal high water table is above the level of the lagoon floor. If the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction material. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the surface and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low frost action potential, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can restrict plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils that have suitable layers less than 8 inches thick; soils that have large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of the soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 11 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility

to flooding; salinity and alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They should have a surface that is free of stones and boulders and have moderate slopes. Suitability of the soil for traps, tees, or greens was not considered in rating the soils. Irrigation is an assumed management practice.

Wildlife habitat

Timothy N. Dodge, biologist, Soil Conservation Service, assisted in preparing this section.

Wildlife resources in Middlesex County are an important part of the natural environment. They fullfill a variety of human needs, including recreation, esthetics, and education.

In Middlesex County, as elsewhere, the pressures of urbanization and the resultant loss of openland and woodland are reducing the quality and quantity of available wildlife habitat. Land-use changes are causing a change in the wildlife population toward smaller animal species, primarily songbirds. The population of songbirds and small animals, including cottontail rabbit, raccoon, skunk, opposum, chipmunk, and squirrels, is generally high. White-tail deer, fox, ruffed grouse, woodchuck, bobwhite quail, owl, and hawk also inhabit the area.

Waterfowl, including ducks, geese, and shorebirds, are common on the many ponds, lakes, and streams in the county. In addition, the waters of Long Island Sound and its environs provide wintering areas for many of these birds.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of hardwood plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses,

legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, raccoon, and deer.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features.

Engineering properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon .s given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in

liquid limit and in plasticity index is estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. 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 that have a layer that impedes the downward movement of water or soils that have 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 clay soils that have a high shrink-swell potential, soils that have a permanent 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.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods, after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of

the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Potential frost action refers to the likelihood of damage to pavements and other structures by frost heaving and low soil strength after thawing. Frost action results from the movement of soil moisture into the freezing temperature zone in the soil, which causes ice lenses to form. Soil texture, temperature, moisture content, porosity, permeability, and content of organic matter are the most important soil properties that affect frost action. It is assumed that the soil is not covered by insulating vegetation or snow and is not artificially drained. Silty and clayey soils that have a high water table in winter are most susceptible to frost action. Well drained very gravelly or sandy soils are the least susceptible.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Formation of the soils

David E. Hill, associate soil scientist, Connecticut Agricultural Experiment Station, assisted in the preparation of this section.

Soil is produced by physical and chemical processes acting on geologic material. Some processes are seasonal; others are continuous. The degree to which the geologic material is modified is influenced by five interactive factors of soil formation—parent material, climate, living organisms, relief, and time (*4*).

Climate and living organisms are the dominant active factors that modify parent material. In Middlesex County these active forces have influenced soil formation for the 10,000 years or more since the last glacial period.

Glacial ice broke up the local bedrock and moved the fragments to different locations. Glacial meltwater transported and segregated the finer particles. Thus, new landscapes were formed. Strong winds redistributed fine soil particles before vegetation became established. As the climate warmed and vegetation became established, the chemical processes of weathering began to exert an increasing influence on soil formation.

The differences between soils in Middlesex County are primarily attributed to differences in parent material, relief, and time. The influence of climate and living organisms has been relatively uniform throughout the county and does not account for major differences in soils. Rocks pulverized by the glacier have provided the parent material. Relief has influenced soil formation through differences in slope and drainage. Soils formed in recent sediment on flood plains have had less time to be influenced by soil-forming processes.

The soil forming factors, as they apply to the soils in Middlesex County, are discussed in the following pages.

Climate

The climate of Middlesex County is modified by Long Island Sound and the Atlantic Ocean. The average annual precipitation of 48 inches is fairly evenly distributed

throughout the year. Detailed information on climate is given in the section "General nature of the county."

Temperature and precipitation are the elements of climate that most affect soil formation. These elements act directly on parent material and indirectly on living organisms. Water moving through a soil alters the chemical composition of the soil over a period of time. The rate at which soluble chemicals are leached from the soil is related to the amount of precipitation. Rainfall erodes unprotected soils.

Temperature influences the native vegetation that covers the landscape, the living organisms in the soil, and the rate of chemical weathering. The mean annual temperature of 50 degrees F in the county causes high biological activity and rapid decomposition of organic matter if the soils are well aerated. In poorly drained areas where the soil is saturated for long periods, biological activity is low and organic matter accumulates.

The action of frost affects soil structure and increases the aggregation of soil particles within the frost zone. Increased aggregation increases the rate of water movement through the soil and increases leaching of soluble chemicals.

Parent Material

Soils inherit characteristics from the parent material. For example, the reddish Triassic sandstones and shales of the Connecticut Valley Lowlands in the northwestern part of the county formed reddish soils; the grayish gneisses, schists, and granites in other parts of the county formed soils with a grayish or olive-colored substratum.

Parent material influences the mineral content and texture of the soil. Rock fragments contain many kinds of minerals. If the rock fragments are pulverized to sand, silt, and clay particles, they are often reduced to individual mineral particles. Soil minerals in Middlesex County are mainly quartz, feldspar, and mica. Other minerals are hornblende, tourmaline, epidote, magnetite, augite, and garnet. Vermiculite and illite are the dominant clay minerals in most of the soils. Small smounts of chlorite, kaolinite, and hydrated iron oxides are in the clay fraction of some soils.

The soils in the county formed in glacial drift of many textures. Glacial till ranges in size from large boulders to clay-size particles. Glacial till overlies bedrock at a depth ranging from a few inches to 100 feet or more. Glacial outwash was deposited where water from the melting glacier laid down stratified deposits of sand, gravel, and in many places cobbles. Glacial outwash is primarily in the valleys, but some deposits are high above the valley on kames or ice-contact deposits.

The substratum of most of the soils in the survey area has the same texture as that of the material deposited by the glacier. The surface layer and subsoil have been more influenced by soil-forming factors and generally have smaller particle sizes and finer textures than the substratum.

The youngest soils in the county formed in alluvial sediment on flood plains. In most places these soils receive annual deposits of sediment.

Other young soils in the county are in tidal marshes near Long Island Sound. These areas receive small deposits of silt and clay from daily tidal inundation and from surrounding uplands. The sediments are deposited with the remains of salt-tolerant plants in the marshes.

Living organisms

One of the common features that distinguishes a soil from the parent material from which it formed is the organic constituents, or the plants and animals and their decayed or decaying remains, that are in the soil. Such organisms as bacteria and fungi had an early influence on the formation of the soils in the county. Later these simple life forms were supplemented with a more complex plant and animal life. In Middlesex County, the dominant plant life is forest vegetation—mainly oak, hickory, maple hemlock, white pine, and mountain laurel.

Although vegetation is the most common type of living organism on the soils, soil formation is strongly influenced by animals. These are mainly micro-organisms, earthworms, larvae, burrowing animals, and man. They are important in the cycle of decaying and regenerating vegetation which produces organic matter and nutrients. Nutrients absorbed by plants are returned to the soil by leaf fall and by decay of the plant itself. Organic matter is mixed into the soil by earthworms, burrowing animals, and decaying roots. Tree windthrow and activities of man hasten soil mixing.

Man's activities have had an effect on soil formation during the last few centuries. Clearing of the land, cultivation, use of lime and fertilizers, artificial drainage, grading, and the introduction of new plants are several ways man has affected soil formation and soil characteristics.

Relief

The effect of relief on soil formation is primarily expressed in terms of slope gradient, aspect, and elevation. In places where parent materials are similar, soils that formed on steep slopes have a thinner solum and less developed form and structure than soils that formed on more gentle slopes.

On landforms with steep slopes, the direction in which the slope faces, or the aspect, has an effect on vegetation. South-facing slopes are warmer and dryer; north-facing slopes are cooler and wetter. These differences affect plant species and the kinds of animals living in and on the soil.

Elevation in Middlesex County ranges from sea level to about 900 feet in the northern part of the county. Within 10 miles of Long Island Sound, only a few hills exceed an elevation of 150 feet.

Relief influences the drainage of soils. Poorly drained and very poorly drained soils are in nearly level or concave positions and depressions on the landscape. Moderately well drained soils are on nearly level to sloping, generally concave positions. Well drained to excessively drained soils are on convex slopes and the higher parts of the landscape, where runoff cannot accumulate.

Time

The degree of profile expression is dependent not only on the intensity of soil-forming processes, but also on the duration of these processes. In terms of pedological time, the soils of Middlesex County are relatively young. These comparatively young soils have layers that, except for color, are weakly developed. In the New England Upland area, where the parent material is gneiss, schist, and granite, color is well developed in the subsoil. In soils developed in reddish Triassic sandstone and conglomerate, color development is somewhat masked by the inherited reddish color of the parent material.

The soils of recent alluvial origin are younger than the soils formed in glacial drift. The recent alluvial soils lack even the color development that characaterizes the soils formed in glacial drift. Many soils of alluvial origin continue to receive sediment. This is especially true of soils in tidal marshes, which receive annual increments of silt, clay, and organic matter eroded from surrounding uplands or winnowed from the bottom of Long Island Sound and deposited on the marsh surface by daily tides.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*5*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Adrian series

The Adrian series consists of sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists. The soils are very poorly drained. Adrian soils formed in organic material from herbaceous and woody plants over sand or sand and gravel derived mainly from gneiss, schist, granite, sandstone, and conglomerate. These soils are in low depressions and along small, slow-moving streams. Slopes range from 0 to 2 percent but are dominantly less than 1 percent.

Adrian soils are associated on the landscape with very poorly drained Scarboro soils, poorly drained Walpole soils, and excessively drained Hinckley and Manchester soils. Adrian soils formed in deposits of organic material that are thicker than those in which Scarboro soils formed.

Typical pedon of Adrian muck, in the town of Chester, 1,000 feet south of the Haddam town line, and 100 feet east of Cedar Lake Road, on the south side of Great Brook:

Oa1—0 to 8 inches, very dark brown (10YR 2/2) muck (sapric material); 12 percent fiber, 5 percent rubbed; moderate medium granular structure; very friable; many fine and very fine roots; strongly acid; clear smooth boundary.

Oa2—8 to 20 inches, black (5YR 2/1) muck (sapric material); 10 percent fiber, 5 percent rubbed; strongly acid; gradual smooth boundary.

Oa3—20 to 24 inches, dark grayish brown (10YR 3/2) muck (sapric material); 5 percent fiber, 2 percent rubbed; moderate medium granular structure; very friable; medium acid; gradual wavy boundary.

IIC—24 to 60 inches, dark gray (10YR 4/1) gravelly sand; single grained; loose; 20 percent coarse fragments; neutral.

The organic layer is 16 to 50 inches thick and is as much as 15 percent woody fragments. Coarse fragments make up as much as 50 percent of the IIC horizon. Unlimed areas of the soil are strongly acid to neutral, but in some pedons some parts of the organic layer are very strongly acid.

The Oa1 horizon has hue of 10YR, value of 2, and chroma of 0 through 2.

The Oa2 and Oa3 horizons have hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. Structure is granular or weak, thick, platy, or the layers are massive. Some pedons have a hemic layer as much as 10 inches thick or a fibric layer as much as 5 inches thick.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2. This horizon is loamy sand, sand, or their gravelly analogs.

Agawam series

The Agawam series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. Agawam soils are well drained. The soils formed in glacial outwash derived mainly from granite, gneiss, and schist. Agawam soils are on glacial outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Agawam soils are associated on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, moderately well drained Ninigret

soils, poorly drained Walpole soils, and very poorly drained Scarboro soils.

Typical pedon of Agawam fine sandy loam, 0 to 3 percent slopes, in the town of Essex, 2,500 feet southeast of the intersection of Bokum Road and Plains Road, and 400 feet north of the railroad:

Ap—0 to 8 inches, dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; common fine roots; neutral; clear smooth boundary.

B21—8 to 14 inches, dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; medium acid; gradual wavy boundary.

B22—14 to 24 inches, strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; medium acid; clear wavy boundary.

IIC—24 to 60 inches, dark brown (7.5YR 4/4) and grayish brown (10YR 5/2) stratified sand; single grained; loose; 5 percent coarse fragments; medium acid.

The solum is 15 to 35 inches thick. Coarse fragments make up as much as 10 percent of the solum, as much as 30 percent of the IIC horizon above a depth of 40 inches, and as much as 60 percent of the IIC horizon below a depth of 40 inches. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 through 3. Consistence is friable or very friable.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. The horizon is fine sandy loam, very fine sandy loam, or loam.

The IIC horizon has hue of 7.5YR through 5Y, value of 3 through 7, and chroma of 1 through 4. The horizon is loamy fine sand, loamy sand, fine sand, sand, coarse sand, or their gravelly or very gravelly analogs.

Berlin series

The Berlin series consists of fine, illitic, mesic Aquic Dystrochrepts. These soils are moderately well drained. Berlin soils are on lacustrine terraces. Slopes range from 0 to 5 percent. In this survey area, the Berlin soils are a taxadjunct because they do not have low-chroma mottles at a depth of less than 24 inches.

Berlin soils are associated on the landscape with well drained Wethersfield soils, moderately well drained Ludlow soils, and poorly drained Rumney Variant soils. The Berlin soils are finer textured than the Ludlow soils.

Typical pedon of Berlin silt loam, 0 to 5 percent slopes, in the town in Middletown, 150 feet west of Middletown High School:

A1—0 to 3 inches, dark brown (7.5YR 3/2) silt loam; weak medium granular structure; friable; common fine roots; strongly acid; clear wavy boundary.

B21—3 to 7 inches, reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; firm; common fine roots; strongly acid; clear wavy boundary.

B22—7 to 12 inches, reddish brown (5YR 4/4) silty clay loam; few fine faint strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; common fine roots; strongly acid; clear wavy boundary.

B23—12 to 30 inches, reddish brown (2.5YR 4/4) silty clay; few fine faint strong brown (7.5YR 5/6) and light brown (7.5YR 6/4) mottles; weak coarse subangular blocky structure; firm; few fine roots; strongly acid; gradual wavy boundary.

C—30 to 60 inches, reddish brown (2.5YR 4/4) silty clay loam; varved; very firm; neutral.

The solum is 24 to 38 inches thick. Coarse fragments make up as much as 10 percent of the solum and as much as 2 percent of the C horizon. Unlimed areas of the soil are strongly acid or medium acid at a depth of less than 30 inches and strongly acid to neutral at a depth of more than 30 inches.

The A horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. Structure is weak or moderate medium or coarse granular.

The B horizon has hue of 5YR or 2.5YR, value of 3 through 5, and chroma of 3 through 6. The B21 and B22 horizons are silt loam or silty clay loam. The B23 horizon is silty clay loam or silty clay. The B horizon has weak to strong, medium or coarse, subangular blocky structure. Consistence is friable or firm.

The C horizon has hue of 5YR or 2.5YR, value of 3 or 4, and chroma of 3 or 4. The horizon is varved silty clay, silty clay loam, clay, and thin lenses of silt loam, silt, and very fine sand. Consistence is firm or very firm.

Branford series

The Branford series consists of coarse-loamy over sandy or sandy skeletal, mixed, mesic Typic Dystrochrepts. These soils are well drained. They are derived mainly from sandstone, conglomerate, shale, and some basalt. Branford soils are on outwash plains and stream terraces. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Branford soils are in a drainage sequence with moderately well drained Ellington soils. Branford soils are associated on the landscape with excessively drained Penwood soils and somewhat excessively drained Hartford soils.

Typical pedon of Branford silt loam, 0 to 3 percent slopes, in the town of Cromwell, 700 feet west of Edgewood Country Club and 300 feet south of Golf Club Road, in a field of nursery stock:

Ap—0 to 6 inches, dark reddish brown (5YR 3/3) silt loam; weak medium granular structure; friable;

common fine roots; 10 percent coarse fragments; strongly acid; abrupt wavy boundary.
B21—6 to 17 inches, yellowish red (5YR 4/6) very fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; very strongly acid; gradual wavy boundary.
B22—17 to 23 inches, reddish brown (5YR 4/4) gravelly very fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 25 percent coarse fragments; very strongly acid; gradual wavy boundary.
IIC—23 to 60 inches, dark reddish brown (2.5YR 4/4) very gravelly sand; single grained; loose; stratified; very few fine roots; 60 percent coarse fragments; very strongly acid.

The solum is 20 to 40 inches thick, and the depth to sand and gravel is also 20 to 40 inches. Coarse fragments make up 5 to 25 percent of the solum and 10 to 70 percent of the substratum. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 5YR through 10YR, value of 2 or 3, and chroma of 1 through 3. Structure is weak medium or coarse granular.

The B horizon has hue of 5YR, value of 3 through 5, and chroma of 3 through 6. This horizon is silt loam, very fine sandy loam, fine sandy loam, or their gravelly analogs. Structure is weak medium or coarse subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 5YR or 2.5YR, value of 4 through 6, and chroma of 3 through 6. This horizon is gravelly sand or very gravelly sand.

Canton series

The Canton series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These soils are well drained and nonstony to extremely stony. They formed in glacial till derived mainly from gneiss, schist, and granite. Canton soils are on broad till plains, hills, and ridges. Slopes range from 3 to 35 percent.

Canton soils are associated on the landscape with somewhat excessively drained Hollis soils; well drained Charlton, Paxton, and Montauk soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils; and very poorly drained Whitman soils. Canton soils have a coarser textured substratum than that of Charlton soils and a more friable substratum than that of Paxton and Montauk soils.

Typical pedon of Canton fine sandy loam, in an area of Canton very stony fine sandy loam, 3 to 8 percent slopes, in the town of Killingworth, 650 feet north of Killingworth Reservoir, and 20 feet east of the gravel pit along Reservoir Road:

O2— 1 inch to 0, leaf litter.
A1—0 to 2 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; abrupt smooth boundary.
Ap—2 to 6 inches, dark brown (10YR 3/3) fine sandy loam; weak subangular blocky structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; abrupt wavy boundary.
B21—6 to 11 inches, dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
B22—11 to 19 inches, dark yellowish brown (10YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
IIC—19 to 60 inches, light brownish gray (10YR 6/2) gravelly loamy sand; single grained; loose; few medium roots; 20 percent coarse fragments; medium acid.

The solum is 18 to 36 inches thick. Rock fragments make up 5 to 30 percent of the solum and 20 to 60 percent of the substratum. Unlimed areas of the soil are extremely acid through medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 through 3. Consistence is friable or very friable.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. The B22 horizon has hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 4 through 6. The B horizon is fine sandy loam, loam, very fine sandy loam, or their gravelly analogs. Structure is weak granular or weak subangular blocky, or the horizon is massive. Consistence is very friable or friable.

The IIC horizon has hue of 10YR through 5Y, value of 5 through 7, and chroma of 2 through 6. This horizon is gravelly loamy fine sand, gravelly loamy sand, gravelly loamy coarse sand, or their very gravelly analogs. The horizon is single grained or massive. Consistence is very friable, friable, or loose. Thin lenses or small pockets of firm or very firm, finer textured material are common at a depth of more than 40 inches.

Carlisle series

The Carlisle series consists of euic, mesic Typic Medisaprists. These soils are very poorly drained. They formed in decomposed organic material in low depressions of outwash terraces and glacial till plains. Slopes range from 0 to 2 percent but are dominantly less than 1 percent.

Carlisle soils are associated on the landscape with poorly drained Walpole, Leicester, and Ridgebury soils and very poorly drained Adrian, Scarboro, and Whitman soils. Carlisle soils formed in deposits of organic material thicker than those in which Adrian, Scarboro, and Whitman soils formed.

Typical pedon of Carlisle muck, in the town of Old Saybrook, about 3,000 feet north of Interstate Route 95, on Ingham Hill Road, and 1,650 feet west of Chalkers Mill Pond, in Cedar Swamp:

O1—2 inches to 0, partially decomposed leaves and twigs.
Oa1—0 to 3 inches, dark reddish brown (5YR 3/3) muck (sapric material) broken face, dark reddish brown (5YR 2/2) rubbed; 35 percent fibers, 5 percent rubbed; weak medium granular structure; very friable; many fine roots; few woody fragments 1/4 inch to 6 inches in diameter; very strongly acid; clear smooth boundary.
Oa2—3 to 8 inches, black (5YR 2/1) broken face and rubbed muck (sapric material); about 3 percent fibers, 1 percent rubbed; moderate medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; clear smooth boundary.
Oa3—8 to 24 inches, dark reddish brown (5YR 2/2) muck (sapric material) broken face, black (5YR 2/1) rubbed; about 30 percent fibers, 1 percent rubbed; moderate medium subangular blocky structure; friable; common fine and medium roots; 10 percent woody fragments 1/4 inch to 6 inches in diameter; very strongly acid; gradual smooth boundary.
Oa4—24 to 60 inches, dark reddish brown (5YR 2/2) broken face and rubbed muck (sapric material); about 10 percent fibers, 1 percent rubbed; weak coarse subangular blocky structure; friable; few fine roots; thin lenses of sand and gravel; about 10 percent mineral material; very strongly acid.

The organic layers are more than 51 inches thick. Woody fragments of twigs, branches, and logs 1/4 inch to 6 inches in diameter make up as much as 10 percent, by volume, of the organic layers. The soil is very strongly acid through medium acid.

The surface layer has hue of 5YR through 10YR, value of 2 or 3, and chroma of 1 through 3. Structure is weak, medium, granular or moderate, medium, subangular blocky.

The subsurface layer has hue of 5YR through 10YR, value of 2 or 3, and chroma of 1 or 2. Structure is medium subangular blocky.

The bottom layer has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. Structure is weak, coarse, subangular blocky or weak, thick, platy, or the layer is massive.

Charlton series

The Charlton series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are well drained and nonstony to extremely stony. They formed in glacial till derived mainly from gneiss, schist, and granite. Charlton soils are on broad till plains, ridgetops, and side slopes of glacial uplands. Slopes range from 3 to 40 percent but are dominantly 3 to 15 percent.

The Charlton soils are associated on the landscape with somewhat excessively drained Hollis soils; well drained Canton, Paxton, and Montauk soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils; and very poorly drained Whitman soils. Charlton soils have a finer textured substratum than Canton soils and a more friable substratum than Paxton or Montauk soils.

Typical pedon of Charlton fine sandy loam, in an area of Charlton very stony fine sandy loam, 8 to 15 percent slopes, in the town of East Hampton, 2,000 feet south of Loos Pond, and 3,000 feet north of the intersection of White Birch Road and Lake Drive:

O2—2 inches to 0, litter of pine needles.
A1—0 to 2 inches, dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; 5 percent coarse fragments; strongly acid; abrupt wavy boundary.
B21—2 to 10 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
B22—10 to 24 inches, yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
B23—24 to 32 inches, light olive brown (2.5Y 5/4) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
B3—32 to 36 inches, light yellowish brown (2.5Y 6/4) gravelly sandy loam; massive; very friable; 20 percent coarse fragments; medium acid; gradual wavy boundary.
C—36 to 60 inches, brown (10YR 5/3) fine sandy loam; massive; very friable; 10 percent coarse fragments; medium acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the pedon. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 2 through 4.

The upper part of the B horizon has hue of 7.5YR or 10YR and value and chroma of 4 through 6. The lower part of the B horizon has hue of 10YR or 2.5Y and value and chroma of 4 through 6. The B horizon is fine sandy loam, loam, sandy loam, or their gravelly analogs. Structure is weak subangular blocky, or the horizon is massive. Consistence is very friable or friable.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. This horizon is fine sandy loam, sandy loam, or their gravelly analogues. Consistence is very friable or friable, with firm pockets or lenses in places.

Cheshire series

The Cheshire series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are well drained and nonstony to very stony. They formed in glacial till derived mainly from sandstone, conglomerate, shale, and some basalt. Cheshire soils are on broad hilltops, ridgetops, and side slopes of glacial till. Slopes range from 3 to 35 percent but are dominantly 3 to 15 percent.

Cheshire soils are associated on the landscape with somewhat excessively drained Holyoke soils, well drained Wethersfield and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Cheshire soils have a more friable sustratum than Wethersfield soils and are deeper to bedrock than Yalesville soils.

Typical pedon of Cheshire silt loam, 3 to 8 percent slopes, in the town of Middlefield, 200 feet west and 50 feet north of the intersection of Lake Road and Lakeshore Drive:

Ap—0 to 8 inches, dark brown (7.5YR 4/2) silt loam; weak medium granular structure; friable; common fine and medium roots; 10 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21—8 to 16 inches, yellowish red (5YR 4/6) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

B22—16 to 26 inches, reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.

C—26 to 60 inches, dark reddish brown (5YR 3/4) gravelly loam; massive; friable; few fine and medium roots; 25 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the pedon. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 5YR through 10YR, value of 3 or 4, and chroma of 2 or 3. It is dominantly silt loam but includes fine sandy loam.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 through 6. It is fine sandy loam, loam, or silt loam. Structure is weak subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 2.5YR or 5YR and value and chroma of 3 or 4. It is fine sandy loam, sandy loam, loam, or their gravelly analogs. Structure is weak, thick, platy, or the horizon is massive. Consistence is very friable or friable. Many pedons have discontinuous, firm layers as much as 2 inches thick.

Ellington series

The Ellington series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained. They formed in a loamy mantle over outwash sand and gravel derived mainly from sandstone, conglomerate, shale, and basalt. Ellington soils are on outwash terraces of stream valleys. Slopes range from 0 to 5 percent. In this survey area these soils are a taxadjunct because they do not have the contrasting textures typical of the soils in the Ellington series.

Ellington soils are in a drainage sequence with well drained Branford soils. Ellington soils are associated on the landscape with excessively drained Manchester soils, somewhat excessively drained Hartford soils, and poorly drained Raypol and Walpole soils.

Typical pedon of Ellington fine sandy loam, 0 to 5 percent slopes, in the town of Middlefield, 600 feet west of Connecticut Highway 17, 1,300 feet north of the Durham town line, and 200 feet west of the Middletown town line:

A1—0 to 2 inches, dark reddish brown (5YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine and very fine roots; 5 percent coarse fragments; very strongly acid; abrupt smooth boundary.

Ap—2 to 6 inches, dark brown (7.5YR 4/2) fine sandy loam; weak medium subangular blocky structure; friable; many fine and very fine roots; 5 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21—6 to 13 inches, dark brown (7.5YR 4/4) fine sandy loam; massive; friable; few fine and medium roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.

B22—13 to 26 inches, dark brown (7.5YR 4/4) sandy loam; few medium distinct yellowish red (5YR 5/6) and brown (7.5YR 5/2) mottles; few fine and medium roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.

B23—26 to 29 inches, reddish brown (5YR 5/3) sandy loam; many medium prominent pinkish gray (5YR 6/2), strong brown (7.5YR 5/6), and pale red (2.5YR 6/2) mottles; massive; friable; 10 percent coarse fragments; very strongly acid; clear smooth boundary.

IIC1—29 to 36 inches, reddish brown (5YR 4/3) loamy sand; few medium distinct yellowish red (5YR 5/6) mottles; massive; very friable; 10 percent coarse fragments; very strongly acid; clear smooth boundary.

IIC2—36 to 60 inches, reddish brown (5YR 4/4) coarse sand; few fine faint yellowish red (5YR 4/6) mottles; single grained; loose; 5 percent coarse fragments; very strongly acid.

The solum is 18 to 40 inches thick. Coarse fragments make up 3 to 35 percent of the solum and 5 to 60 percent of the IIC horizon. Unlimed areas of the soil are very strongly acid to medium acid.

The A horizon has hue of 5YR through 10YR, value of 3 or 4, and chroma of 2 through 4. This horizon is fine sandy loam or silt loam.

The B horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 through 6. In some pedons this horizon has hue of 7.5YR The B horizon is silt loam, loam, fine sandy loam, or sandy loam. Structure is weak, medium, subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. This horizon is loamy sand to sand or their gravelly and very gravelly analogs.

Hartford series

The Hartford series consists of sandy, mixed, mesic Typic Dystrochrepts. These soils are somewhat excessively drained. They formed in glacial outwash derived mainly from sandstone, conglomerate, shale, and basalt. Hartford soils are on outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Hartford soils are associated on the landscape with excessively drained Manchester soils, well drained Branford soils, moderately well drained Ellington soils, poorly drained Walpole soils, and very poorly drained Scarboro soils.

Typical pedon of Hartford sandy loam, 0 to 3 percent slopes, in the town of Cromwell, about 400 feet north and 150 feet east of the intersection of Court and Woodside Streets:

Ap—0 to 9 inches, dark brown (7.5YR 4/4) sandy loam; weak fine granular structure; very friable; few medium roots; 5 percent coarse fragments; slightly acid; clear wavy boundary.

B21—9 to 16 inches, yellowish red (5YR 4/6) sandy loam; weak fine subangular blocky structure; very friable; few medium roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.

B22—16 to 24 inches, reddish brown (5YR 4/4) loamy sand; weak fine subangular blocky structure; very friable; 10 percent coarse fragments; medium acid; clear wavy boundary.

IIC—24 to 60 inches, reddish brown (5YR 4/4) stratified sand and gravel; single grained; loose; 35 percent coarse fragments; medium acid.

The solum is 18 to 30 inches thick. Coarse fragments make up 5 to 25 percent of the solum and 35 to 60 percent of the IIC horizon. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 5YR and value and chroma of 4 through 6. This horizon is sandy loam in the upper part and sandy loam or loamy sand in the lower part. Structure is weak, subangular blocky or weak, granular, or the horizon is massive.

The IIC horizon has hue of 2.5YR or 5YR, value of 4 through 6, and chroma of 3 through 6. This horizon is stratified sand and gravel.

Hinckley series

The Hinckley series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These soils are excessively drained. Hinckley soils are on stream terraces, kames, and eskers. These soils formed in water-sorted sand, gravel, and cobblestones derived mainly from granite, gneiss, and schist. Slopes range from 3 to 45 percent but are dominantly 3 to 15 percent.

Hinckley soils are associated on the landscape with excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Sudbury and Ninigret soils, poorly drained Walpole soils, and very poorly drained Scarboro soils. Hinckley soils have more coarse fragments than Windsor soils.

Typical pedon of Hinckley gravelly sandy loam, 3 to 15 percent slopes, in the town of East Haddam, 100 feet north of the powerline, 1/4 mile southeast of the junction of Connecticut Highways 149 and 151:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) gravelly sandy loam; weak coarse granular structure; friable; many fine and medium roots; 20 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—8 to 20 inches, brown (7.5YR 5/4) gravelly loamy sand; weak fine granular structure; very friable; common fine and medium roots; 40 percent coarse fragments; strongly acid; clear wavy boundary.

B22—20 to 27 inches, yellowish brown (10YR 5/4) gravelly sand; single grained; loose; few fine roots; 45 percent coarse fragaments; strongly acid; clear wavy boundary.

C1—27 to 42 inches, brown (10YR 5/3) very gravelly sand; single grained; loose; 50 percent coarse fragments; strongly acid; clear wavy boundary.

C2—42 to 60 inches, light brownish gray (10YR 6/2) very gravelly sand; single grained; loose; 60 percent coarse fragments; strongly acid.

The solum is 12 to 30 inches thick. Coarse fragments make up 10 to 50 percent of the solum and 35 to 70 percent of the C horizon. Unlimed areas of the soil are extremely acid through medium acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A1 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Consistence is friable or very friable.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. The lower part of the B horizon has hue of 10YR or 2.5Y and value and chroma of 4 through 6. The B horizon to a depth of 10 inches ranges from fine sandy loam to loamy coarse sand or their gravelly analogs. At a depth of more

than 10 inches the horizon is gravelly loamy sand or gravelly loamy coarse sand. Structure is weak, fine, granular or single grained. Consistence is very friable or loose.

The C horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 2 through 6. It is gravelly or very gravelly sand or gravelly loamy fine sand.

Hollis series

The Hollis series consists of loamy, mixed, mesic Lithic Dystrochrepts. These soils are somewhat excessively drained. Hollis soils formed in a mantle of glacial till derived mainly from granite, gneiss, and schist. The soils are on hilltops, ridges, and knolls of bedrock-controlled glacial till plains. Slopes range from 3 to 45 percent.

Hollis soils are associated on the landscape with well drained Canton, Charlton, Montauk, and Paxton soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils, and very poorly drained Whitman soils.

Typical profile of Hollis fine sandy loam in an area of Charlton-Hollis very stony fine sandy loams, 3 to 15 percent slopes, in the town of Westbrook, 2,000 feet south-southeast of Dee Pond, and 300 feet south of Interstate 95:

O2—1 inch to 0, leaf litter.
A1—0 to 3 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; 5 percent coarse fragments; common fine roots; slightly acid; abrupt smooth boundary.
B21—3 to 7 inches, yellowish brown (10YR 3/2) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent coarse fragments; common fine roots; medium acid; clear smooth boundary.
B22—7 to 14 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; 15 percent coarse fragments; medium acid; abrupt smooth boundary.
R—14 inches, hard unweathered schist bedrock.

The solum is 10 to 20 inches thick, and the depth to bedrock is also 10 to 20 inches. Coarse fragments make up 2 to 25 percent of this soil. Unlimed areas of the soil are very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. This horizon is fine sandy loam, sandy loam, or their gravelly analogs. Structure is weak, granular, or weak, subangular blocky, or the horizon is massive. Consistence is very friable or friable.

Holyoke series

The Holyoke series consists of loamy, mixed, mesic Lithic Dystrochrepts. These soils are somewhat excessively drained. They formed in loamy glacial till derived mainly from conglomerate, sandstone, shale, and basalt. Holyoke soils are on hilltops, ridges, and knolls of bedrock-controlled glacial till uplands. Slopes range from 3 to 40 percent.

The Holyoke soils are associated on the landscape with well drained Cheshire, Wethersfield, and Yalesville soils; moderately well drained Ludlow soils; and poorly drained Wilbraham soils.

Typical pedon of Holyoke silt loam, in an area of Holyoke-Cheshire very stony silt loams, 15 to 35 percent slopes, in the town of Middlefield, 50 feet north of Kickapoo Road, and 300 feet east of the cliff:

O2—1 inch to 0, fresh and partially decomposed leaf litter.
A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam; weak medium granular structure; friable; 5 percent coarse fragments; many fine and medium roots; extremely acid; clear wavy boundary.
B2—4 to 13 inches, dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; 15 percent coarse fragments; very strongly acid.
R—13 inches, hard, unweathered basalt bedrock.

The solum is 10 to 20 inches thick, and the depth to bedrock is also 10 to 20 inches. Rock fragments make up 5 to 30 percent of the soil. Unlimed areas of the soil are extremely acid through medium acid.

The A horizon has hue of 5YR through 10YR, value of 3 or 4, and chroma of 1 through 3. Consistence is very friable or friable.

The B horizon has hue of 2.5YR through 7.5YR, value of 3 through 6, and chroma of 4 through 6. It is silt loam, very fine sandy loam, loam, fine sandy loam, or their gravelly analogs. This horizon has weak, granular or weak, medium, subangular blocky structure, or the horizon is massive. Consistence is very friable or friable.

Leicester series

The Leicester series consists of coarse-loamy, mixed, acid, mesic Aeric Haplaquepts. These soils are poorly drained. Leicester soils formed in loamy glacial till derived mainly from granite, gneiss, and schist. These soils are in low depressions between drumlins and on glacial till plains. Slopes range from 0 to 5 percent but are dominantly less than 2 percent.

Leicester soils are associated on the landscape with well drained Canton and Charlton soils, moderately well drained Woodbridge soils, poorly drained Ridgebury soils, and very poorly drained Adrian, Whitman, and Carlisle soils. Leicester soils have a more friable substratum than Ridgebury soils.

Typical pedon of Leicester fine sandy loam, in an area of Leicester, Ridgebury, and Whitman extremely stony fine sandy loams, in the town of Portland, 80 feet south of Stephan Town Road, and 1,500 feet west of Great Hill Road:

A1—0 to 7 inches, very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; common fine and coarse roots; 15 percent coarse fragments; very strongly acid; gradual wavy boundary.
B21—7 to 18 inches, grayish brown (10YR 5/2) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and coarse roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.
B22—18 to 33 inches, brown (10YR 5/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and olive yellow (2.5Y 6/6) mottles; weak medium subangular blocky structure; friable; few fine roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.
C1—33 to 42 inches, brown (7.5YR 5/4) fine sandy loam; many medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; massive; friable; 15 percent coarse fragments; strongly acid; clear wavy boundary.
C2—42 to 60 inches, yellowish brown (10YR 5/4) gravelly sandy loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; massive; friable; 25 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 30 percent of the solum and 10 to 35 percent of the C horizon. Unlimed areas of the soil are very strongly acid or strongly acid at a depth of less than 40 inches and very strongly acid through medium acid at a depth of more than 40 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR through 2.5Y, value of 4 through 6, and chroma of 1 through 3. The horizon is sandy loam, fine sandy loam, loam, or their gravelly analogs. This horizon has weak, subangular blocky or weak, granular structure, or it is massive. Mottles are distinct or prominent.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 4. The horizon is fine sandy loam, sandy loam, or their gravelly analogs. Consistence is friable to firm. Mottles are distinct or prominent.

Ludlow series

The Ludlow series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are moderately well drained and are nonstony to extremely stony. Ludlow soils formed in compact, loamy glacial till derived mainly from sandstone, conglomerate, shale, and basalt. The soils are on hilltops and slightly concave lower slopes of drumlins and ridges. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Ludlow soils are in a drainage sequence with well drained Wethersfield soils and poorly drained Wilbraham soils. Ludlow soils are associated on the landscape with well drained Cheshire and Yalesville soils.

Typical pedon of Ludlow silt loam, 3 to 8 percent slopes, in the town of Middletown, 0.85 mile southwest of Long Hill School on Connecticut Route 17, and 200 feet south of a barn on the south side of an east-west road:

Ap—0 to 8 inches, dark brown (7.5YR 3/2) silt loam; weak coarse granular structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
B21—8 to 20 inches, reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
B22—20 to 26 inches, dark reddish brown (5YR 3/4) silt loam; common medium distinct pinkish gray (5YR 6/2) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
Cx—26 to 60 inches, dark reddish brown (2.5YR 3/4) gravelly loam; few fine distinct reddish gray (5YR 5/2) mottles; weak thick platy structure; very firm, brittle; 20 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 25 percent of the solum and 10 to 35 percent of the Cx horizon. Unlimed areas of the soil are very strongly acid to medium acid in the solum and very strongly acid to slightly acid in the Cx horizon.

The A horizon has hue of 5YR or 7.5YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 5YR and value and chroma of 3 or 4. This horizon is silt loam, loam, fine sandy loam, or their gravelly analogs. Structure is weak subangular blocky, or the horizon is massive.

The Cx horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 2 through 4. It is loam, silt loam, fine sandy loam, or their gravelly analogs. Structure is weak, thick, platy, or the horizon is massive. Consistence is firm or very firm and brittle.

Manchester series

The Manchester series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These soils are excessively drained. They formed in glacial outwash derived mainly from sandstone, conglomerate, shale, and basalt. Manchester soils are on broad outwash plains and narrow stream terraces. Slopes range from 0 to 45 percent.

Manchester soils are associated on the landscape with excessively drained Penwood soils, somewhat excessively drained Hartford soils, well drained Branford soils, and moderately well drained Ellington soils. The Manchester soils contain more gravel than the Penwood soils.

Typical pedon of Manchester gravelly sandy loam, 0 to 3 percent slopes, in the town of Portland, 4,600 feet east

of the Connecticut River, and 2,300 feet south of the Hartford County Line:

Ap—0 to 9 inches, dark brown (7.5YR 3/2) gravelly sandy loam; weak medium granular structure; very friable; many fine and medium roots; 20 percent coarse fragments; strongly acid; abrupt smooth boundary.
B2—9 to 18 inches, reddish brown (5YR 4/3) gravelly loamy sand; weak medium granular structure; very friable; few fine roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.
C—18 to 60 inches, reddish brown (5YR 4/4) very gravelly sand; single grained; loose; 50 percent coarse fragments; very strongly acid.

The solum is 12 to 22 inches thick. Coarse fragments make up 15 to 35 percent of the solum and 35 to 70 percent of the C horizon. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 5YR through 10YR, value of 3 or 4, and chroma of 2 through 4. The horizon is gravelly sandy loam or sandy loam.

The B horizon has hue of 5YR, value of 4 or 5, and chroma of 3 through 6. This horizon is sandy loam, loamy sand, or their gravelly analogs in the upper part, and it is loamy sand, sand, or their gravelly analogs in the lower part. Structure is weak, medium, granular, or the horizon is single grained. Consistence is very friable or loose.

The C horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 through 6. This horizon is gravelly sand or very gravelly sand.

Merrimac series

The Merrimac series consists of sandy, mixed, mesic Typic Dystrochrepts. These soils are somewhat excessively drained. Merrimac soils formed in glacial outwash derived mainly from granite, gneiss, and schist. These soils are on outwash plains, stream terraces, kames, and eskers. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Merrimac soils are associated on the landscape with excessively drained Hinckley and Windsor soils, well drained Agawam soils, moderately well drained Ninigret and Sudbury soils, and poorly drained Walpole soils.

Typical pedon of Merrimac sandy loam, 0 to 3 percent slopes, in the town of Killingworth, 150 feet east of the junction of Green Hill Road and Paper Mill Road and 30 feet west of a sand and gravel pit, in a cultivated field:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) sandy loam; weak medium granular structure; friable; 10 percent coarse fragments; neutral; abrupt wavy boundary.
B21—9 to 13 inches, dark brown (7.5YR 4/4) sandy loam; weak medium granular structure; friable; 10 percent coarse fragments; medium acid; gradual wavy boundary.
B22—13 to 18 inches, dark yellowish brown (10YR 4/6) sandy loam; weak medium granular structure; friable; 10 percent coarse fragments; medium acid; gradual wavy boundary.
B3—18 to 22 inches, dark yellowish brown (10YR 4/4) gravelly loamy sand; single grained; friable; 30 percent coarse fragments; medium acid; gradual wavy boundary.
IIC—22 to 60 inches, dark yellowish brown (10YR 4/4) very gravelly sand; single grained; friable; 50 percent coarse fragments; medium acid.

The solum is 18 to 30 inches thick. Coarse fragments make up 5 to 20 percent of the upper part of the solum, 5 to 30 percent of the lower part of the solum, and 30 to 70 percent of the IIC horizon. Unlimed areas of the soil are extremely acid through medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 7.5YR or 10YR in the upper part and 7.5YR through 2.5Y in the lower part, value of 3 through 6, and chroma of 3 through 8. The upper part of the B horizon is fine sandy loam, sandy loam, or their gravelly analogs. The lower part of the B horizon is sandy loam, loamy sand, or their gravelly analogs.

The IIC horizon has hue of 10YR or 2.5Y, value of 3 through 6, and chroma of 3 through 8. This horizon is gravelly sand or very gravelly sand.

Montauk series

The Montauk series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are well drained and nonstony to extremely stony. They formed in compact glacial till derived mainly from schist, gneiss, and granite. Montauk soils are on broad drumlins, hilltops, ridgetops, and side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

The Montauk soils are associated on the landscape with well drained Paxton, Charlton, and Canton soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils; and very poorly drained Whitman soils. Montauk soils have a more compact and firmer substratum than Charlton and Canton soils and a coarser textured substratum than Paxton soils.

Typical pedon of Montauk very stony fine sandy loam, 3 to 8 percent slopes, in the town of Haddam, 660 feet south of Jericho Road, 800 feet west of Mottland Road, and 20 feet west of dirt road:

O2—3 inches to 0, undecomposed needles, roots, leaves, and twigs.
Ap—0 to 7 inches, dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; common fine and medium roots; 5 percent rock fragments; strongly acid; clear smooth boundary.
B21—7 to 20 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky

structure; friable; few fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.
B22—20 to 25 inches, dark yellowish brown (10YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.
B23—25 to 30 inches, yellowish brown (10YR 5/4) sandy loam; massive; friable; 15 percent rock fragments; strongly acid; clear smooth boundary.
Cx—30 to 60 inches, dark yellowish brown (10YR 4/4) sandy loam; massive; firm; 15 percent rock fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 3 to 20 percent of the solum and 5 to 50 percent of the Cx horizon. Unlimed areas of the soil are extremely acid through medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 2 through 4. Consistence is very friable or friable.

The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. This horizon is fine sandy loam or sandy loam. Structure is weak, subangular blocky, or the horizon is massive.

The Cx horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 6. This horizon is fine sandy loam to loamy sand or their gravelly analogs. Structure is weak, platy, or the horizon is massive. Consistence is firm or very firm and brittle.

Ninigret series

The Ninigret series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained. Ninigret soils formed in glacial outwash derived mainly from granite, gneiss, and schist. They are in slight depressions and in the lower areas of outwash plains and stream terraces. Slopes range from 0 to 5 percent.

Ninigret soils are associated on the landscape with well drained Agawam soils, moderately well drained Sudbury soils, and poorly drained Walpole and Raypol soils. Ninigret soils have a finer textured solum than Sudbury soils.

Typical pedon of Ninigret silt loam, 0 to 5 percent slopes, in the town of Essex, 1,600 feet north of Connecticut Route 153, and 100 feet west of Plains Road:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; medium acid; abrupt smooth boundary.
B21—9 to 14 inches, dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.
B22—14 to 20 inches, yellowish brown (10YR 5/6) very fine sandy loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; medium acid; clear wavy boundary.
B23—20 to 25 inches, dark brown (7.5YR 4/4) fine sandy loam; few medium faint yellowish red (5YR 5/6) and few common distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few fine roots; medium acid; abrupt wavy boundary.
IIC—25 to 60 inches, brown (10YR 5/3) gravelly sand; few fine faint yellowish red (5YR 5/6) mottles; single grained; loose; 30 percent coarse fragments; medium acid.

The solum is 18 to 34 inches thick and the depth to contrasting sand and gravel is also 18 to 34 inches. Coarse fragments make up as much as 10 percent of the solum, 30 percent of the IIC horizon at a depth of less than 40 inches, and 60 percent of the IIC horizon at a depth of more than 40 inches. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 4 through 6. The B22 horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 6. The B horizon is silt loam, fine sandy loam, or very fine sandy loam and includes layers of sandy loam as much as 5 inches thick. Structure is weak, subangular blocky, or the horizon is massive.

The IIC horizon has hue of 10YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. The horizon is sand, gravelly sand, or very gravelly sand.

Paxton series

The Paxton series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are well drained and nonstony to extremely stony. Paxton soils formed in compact glacial till derived mainly from gneiss, schist, and granite. The soils are on broad hilltops, ridgetops, and side slopes of glacial uplands. Slopes range from 3 to 35 percent.

Paxton soils are in a drainage sequence with moderately well drained Woodbridge soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. Paxton soils are associated on the landscape with somewhat excessively drained Hollis soils and well drained Canton and Charlton soils. Paxton soils have a more compact and firmer substratum than Charlton and Canton soils.

Typical pedon of Paxton fine sandy loam, in an area of Paxton very stony fine sandy loam, 3 to 8 percent slopes, in the town of Chester, 2,200 feet northwest of the intersection of Goose Hill Road and Kings Highway, in an idle field about 500 feet west of Waterhouse Brook:

Ap—0 to 10 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable;

5 percent rock fragments; many fine roots; medium acid; abrupt smooth boundary.

B21—10 to 22 inches, brownish yellow (10YR 6/6) fine sandy loam; weak medium subangular blocky structure; friable; 5 percent rock fragments; common fine roots; medium acid; gradual wavy boundary.

B22—22 to 29 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent rock fragments; few fine roots; medium acid; gradual wavy boundary.

B23—29 to 32 inches, yellowish brown (10YR 5/6) fine sandy loam; weak coarse subangular blocky structure; friable; 10 percent rock fragments; few fine roots; medium acid; clear wavy boundary.

Cx—32 to 60 inches, dark grayish brown (2.5Y 4/2) gravelly fine sandy loam; weak thick platy structure; firm, brittle; 20 percent rock fragments; medium acid.

The solum is 15 to 36 inches thick, and the depth to the fragipan is also 15 to 36 inches. Rock fragments make up 5 to 30 percent of the soil. Unlimed areas are strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 4. Structure is weak, fine or medium, granular.

The B21 horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 through 8. The B22 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 through 6. The B horizon is fine sandy loam, loam, sandy loam, or their gravelly analogs. Structure is weak, granular or is weak, subangular blocky. Some pedons have a few mottles above the fragipan.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. This horizon is fine sandy loam, loam, sandy loam, or their gravelly analogs. Structure is weak or moderate, thick, platy, or the horizon is massive. Consistence is firm or very firm and brittle.

Penwood series

The Penwood series consists of mixed, mesic Typic Udipsamments. These soils are excessively drained. They formed in glacial outwash derived mainly from reddish sandstone, conglomerate, shale, and basalt. Penwood soils are on outwash plains and high stream terraces. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Penwood soils are associated on the landscape with excessively drained Manchester soils, somewhat excessively drained Hartford soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Penwood soils do not contain as much gravel as Manchester soils.

Typical pedon of Penwood loamy sand, 3 to 8 percent slopes, in a sand pit on the west side of Connecticut Route 9A, across from the Haddam Landfill, in the town of Haddam:

Ap—0 to 8 inches, dark brown (7.5YR 3/2) loamy sand; weak medium granular structure; very friable; many roots; strongly acid; abrupt smooth boundary.

B21—8 to 15 inches, yellowish red (5YR 4/8) loamy sand; weak medium granular structure; very friable; many roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—15 to 28 inches, yellowish red (5YR 5/6) loamy sand; single grained; loose; many roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

C—28 to 60 inches, reddish brown (5YR 5/4) sand; single grained; loose; stratified; few roots; 10 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Coarse fragments make up as much as 5 percent of the solum and 10 percent of the substratum. Unlimed areas of the soil are very strongly acid through slightly acid.

The A horizon has hue of 7.5YR or 10YR and value and chroma of 2 through 4. Consistence is very friable or loose.

The B horizon has hue of 5YR, value of 4 through 6, and chroma of 4 through 8. This horizon is loamy sand, loamy fine sand, or sand.

The C horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 through 6. This horizon is sand or fine sand.

Podunk series

The Podunk series consists of coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts. These soils are moderately well drained. Podunk soils formed in alluvial sediments derived mainly from gneiss, schist, and granite. Slopes range from 0 to 3 percent. These soils are flooded at least once a year.

Podunk soils are associated on the landscape with well drained Suncook soils, poorly drained Rumney soils, and very poorly drained Saco soils.

Typical pedon of Podunk fine sandy loam, 1,500 feet south of the Hadlyme ferry dock, and 400 feet west of the Connecticut River, in the town of Chester:

Ap—0 to 8 inches, dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; common fine roots; very strongly acid; abrupt smooth boundary.

A1—8 to 11 inches, dark grayish brown (10YR 4/2) loamy fine sand; moderate fine granular structure; friable; common fine roots; very strongly acid; clear wavy boundary.

B21—11 to 22 inches dark brown (10YR 4/3) fine sandy loam; common medium distinct dark gray (10YR 4/1) and yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; common fine roots; very strongly acid; gradual wavy boundary.

B22—22 to 32 inches, dark brown (10YR 4/3) fine sandy loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; moderate fine granular structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

C1—32 to 50 inches, dark grayish brown (2.5Y 4/2) loamy fine sand; common medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; very strongly acid; gradual wavy boundary.

C2—50 to 60 inches, brown (10YR 4/3) loamy fine sand; common medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/6) mottles; massive; friable; thin sand lenses; very strongly acid.

The solum is 20 to 40 inches thick. Unlimed areas of the soil are very strongly acid to slightly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 through 4. This horizon has weak or moderate, fine, granular structure.

The B horizon has hue of 10YR through 5Y and value and chroma of 3 through 6. This horizon is dominantly fine sandy loam, but in some pedons there is sandy loam. It has weak or moderate, granular or subangular blocky structure.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 6. Mottles are distinct or prominent and fine to coarse. This horizon is dominantly loamy fine sand, but some pedons contain sand and loamy sand.

Raypol series

The Raypol series consists of coarse-loamy over sandy or sandy-skeletal, mixed, acid, mesic Aeric Haplaquepts. These soils are poorly drained. They formed in glacial outwash derived mainly from gneiss, schist, and granite. Raypol soils are in depressions on outwash plains and stream terraces. Slopes are less than 5 percent. In this survey area, these soils are a taxadjunct because they are more alkaline than the range described for the Raypol series.

Raypol soils are associated on the landscape with moderately well drained Ninigret soils and poorly drained Walpole soils. Raypol soils have a finer textured solum than Walpole soils.

Typical pedon of Raypol silt loam, in the town of Middletown, 100 feet east of Mill Brook Road, and 200 feet north of Ridge Road:

Ap—0 to 10 inches, very dark grayish brown (10YR 3/2) silt loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B21—10 to 16 inches, grayish brown (2.5Y 5/2) silt loam; common fine prominent yellowish brown (10YR 5/6) and many medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

B22—16 to 19 inches, light brownish gray (10YR 6/2) silt loam; many medium prominent yellowish brown (10YR 5/8) and brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

B23—19 to 24 inches, brown (7.5YR 4/4) very fine sandy loam; many medium prominent strong brown (7.5YR 5/6) mottles; massive; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—24 to 60 inches, brown (7.5YR 4/4) sand; few fine faint yellowish brown mottles; single grained; loose 10 percent coarse fragments; medium acid.

The solum is 18 to 36 inches thick. Coarse fragments make up as much as 10 percent of the solum and 10 to 50 percent of the substratum. Unlimed areas of the soil are very strongly acid through medium acid above a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. Structure is weak, medium, subangular blocky, or the horizon is massive. This horizon is silt loam, loam, or very fine sandy loam. Consistence is friable or very friable. Mottles are faint to prominent.

The IIC horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. Mottles are faint to prominent. This horizon is sand or gravelly sand.

Ridgebury series

The Ridgebury series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These soils are poorly drained. Ridgebury soils formed in compact glacial till derived mainly from gneiss, schist, and granite. The soils are in low depressions and drainageways of drumlins and glacial till plains. Slopes range from 0 to 5 percent but are dominantly 0 to 2 percent.

Ridgebury soils are associated on the landscape with well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; poorly drained Leicester soils; and very poorly drained Whitman, Adrian, and Carlisle soils. Ridgebury soils have a more compact and more slowly permeable substratum than Leicester soils.

Typical pedon of Ridgebury fine sandy loam, in an area of Leicester, Ridgebury, and Whitman extremely stony fine sandy loams, in the town of Haddam, 400 feet east of Haddam Neck Road, and 100 feet north of the firehouse at the south edge of the power line:

Ap—0 to 7 inches, very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; friable;

common fine and medium roots; 10 percent rock fragments; slightly acid; clear wavy boundary.

B21—7 to 15 inches, grayish brown (2.5Y 5/2) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine roots; 10 percent rock fragments; medium acid; clear wavy boundary.

B22—15 to 20 inches, grayish brown (2.5Y 5/2) sandy loam; common medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; 5 percent rock fragments; strongly acid; gradual wavy boundary.

B23—20 to 24 inches, brown (10YR 5/3) sandy loam; many medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; 5 percent rock fragments; strongly acid; clear wavy boundary.

Cx—24 to 60 inches, brown (10YR 5/3) fine sandy loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak thick platy structure; firm; brittle; 5 percent rock fragments; strongly acid.

The solum is 10 to 30 inches thick. Rock fragments make up 5 to 35 percent of this soil. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 10YR through 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 3. This horizon is sandy loam, fine sandy loam, loam, or their gravelly analogs. Structure is weak, medium, subangular blocky, or the horizon is massive. Consistence is very friable or friable.

The Cx horizon has hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 1 through 3. This horizon is sandy loam, fine sandy loam, loam, or their gravelly analogs. Consistence is firm or very firm and brittle.

Rumney series

The Rumney series consists of coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents. These soils are poorly drained. Rumney soils formed in alluvial sediments derived mainly from gneiss, schist, and granite. Rumney soils are on flood plains of the larger streams and their tributaries. Slopes range from 0 to 3 percent but are dominantly less than 1 percent.

Rumney soils are in a drainage sequence with moderately well drained Podunk soils. Rumney soils are associated on the landscape with very poorly drained Saco and Scarboro soils.

Typical pedon of Rumney fine sandy loam, in the town of Haddam, 100 feet southeast of Candlewood Hill Road, and 200 feet west of Priess Pond:

A1—0 to 4 inches, very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

B21—4 to 19 inches, dark grayish brown (2.5Y 4/2) fine sandy loam; few fine distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine roots; medium acid; abrupt smooth boundary.

B22—19 to 31 inches, very dark gray (5Y 3/1) sandy loam; common medium distinct weak red (2.5YR 4/2) mottles; weak medium subangular blocky structure; few fine roots; medium acid; abrupt smooth boundary.

IIC—31 to 60 inches, grayish brown (10YR 5/2) sand; few medium prominent olive gray (5Y 5/2) and yellowish brown (10YR 5/4) mottles; single grained; loose; medium acid.

The solum is 20 to 36 inches thick. Coarse fragments make up as much as 10 percent of the solum and 5 to 40 percent of the IIC horizon. Unlimed areas of the soil are mainly very strongly acid through slightly acid, but parts of the B and IIC horizons are medium acid or slightly acid at a depth of less than 40 inches.

The A horizon has hue of 10YR or 2.5Y, value of 2 through 4, and chroma of 1 or 2. Structure is weak or moderate, fine or medium granular.

The B horizon mainly has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 or 2. Some parts have hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 2. Mottles range from common to many, fine to coarse, and distinct to prominent. This horizon is fine sandy loam, loam, or sandy loam. Thin lenses or discontinuous horizons of contrasting texture are common.

The IIC horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 through 3 This horizon is loamy sand, sand, or their gravelly analogs. In places there are thin layers of fine sand or very fine sand or organic layers.

Rumney Variant

The Rumney Variant consists of coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts. These soils are nearly level and poorly drained. They formed in alluvial sediments on flood plains. Rumney Variant soils are derived mainly from sandstone, shale, conglomerate, and some basalt.

Rumney Variant soils are associated on the landscape with moderately well drained Podunk soils, poorly drained Rumney soils, and very poorly drained Saco and Adrian soils. Rumney Variant soils are finer textured than Rumney soils.

Typical pedon of Rumney Variant silt loam, in the town of Middlefield, 100 feet south of Connecticut Highway 147, and 200 feet west of the Coginchaug River:

Ap—0 to 11 inches, dark brown (7.5YR 4/2) silt loam; weak fine granular structure; many fine roots; medium acid; abrupt smooth boundary.

B21—11 to 21 inches, reddish brown (5YR 4/3) silt loam; common medium prominent yellowish red (5YR 5/6) and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; medium acid; clear wavy boundary.

B22—21 to 28 inches, reddish brown (5YR 4/3) silt loam; common medium distinct yellowish red (5YR 4/6) and dark red (2.5YR 3/6) mottles; weak medium subangular blocky structure; friable; medium acid; clear wavy boundary.

C—28 to 60 inches, reddish brown (5YR 4/3) silt loam; common medium distinct yellowish red (5YR 4/6) mottles; massive; friable; strongly acid.

The solum is 24 to 40 inches thick. Depth to stratified sand and gravel is more than 40 inches. Coarse fragments make up as much as 15 percent of the solum and 30 percent of the C horizon. The IIC horizon, where present, is 10 to 65 percent coarse fragments. Unlimed areas of the soil are strongly acid to medium acid.

The A horizon has hue of 5YR or 7.5YR, value of 2 through 4, and chroma of 2 through 4.

The B horizon has hue of 5YR or 7.5YR, value of 3 through 6, and chroma of 3 or 4. It is silt loam or very fine sandy loam.

The C horizon has hue of 2.5YR or 5YR, value of 3 through 6, and chroma of 3 or 4. It is silt loam, loam, or very fine sandy loam. The IIC horizon, where present, is sand, gravelly sand, or very gravelly sand.

Saco series

The Saco series consists of coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts. These soils are very poorly drained. Saco soils formed in alluvial sediments derived mainly from gneiss, schist, and granite. The soils are on low flood plains along streams and rivers and are frequently flooded. Slopes range from 0 to 2 percent. Saco soils are a taxadjunct in this survey area because they have a thinner surface layer and are more alkaline than is described in the range for the Saco series.

Saco soils are associated on the landscape with excessively drained Suncook soils, moderately well drained Podunk soils, and poorly drained Rumney soils.

Typical pedon of Saco silt loam, in the town of Cromwell, 300 feet north of River Road, and 2,700 feet east of Connecticut Route 9A:

A1—0 to 6 inches, very dark grayish brown (10YR 3/2) mucky silt loam; weak fine granular structure; friable; slightly acid; gradual wavy boundary.

C1g—6 to 18 inches, dark gray (5Y 4/1) silt loam; few fine distinct light olive brown (2.5Y 5/6) mottles; massive; friable; neutral; gradual wavy boundary.

C2g—18 to 60 inches, very dark gray (5Y 3/1) silt loam; massive; friable; neutral.

Coarse fragments make up as much as 5 percent of the soil above a depth of 40 inches and as much as 50 percent below a depth of 40 inches. This soil is strongly acid to neutral above a depth of 30 inches and medium acid to neutral below a depth of 30 inches.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 through 3. Structure is weak, granular, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 0 or 1. This horizon is silt loam or very fine sandy loam with lenses of loamy fine sand and very fine sand in places. Consistence is friable or very friable.

Scarboro series

The Scarboro series consists of sandy, mixed, mesic Histic Humaquepts. These soils are very poorly drained. Scarboro soils formed in glacial outwash derived mainly from gneiss, schist, and granite. They are in low depressions of glacial outwash terraces. Slopes range from 0 to 3 percent.

Scarboro soils are associated on the landscape with excessively drained Hinckley soils, moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Adrian soils.

Typical pedon of Scarboro mucky loamy fine sand, in the town of Westbrook, 30 feet north of a dirt road north of Vincent Pond, and 3,300 feet east of east Pond Meadow Road:

Oa1—3 inches to 0, very dark brown (10YR 2/2) muck; massive; friable; strongly acid; clear smooth boundary.

A11—0 to 6 inches, black (10YR 2/1) mucky loamy fine sand; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.

A12—6 to 14 inches, black (10YR 2/1) loamy fine sand; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.

C1g—14 to 22 inches, dark grayish brown (10YR 4/2) sand; few fine prominent dark yellowish brown (10YR 4/4) mottles; single grained; loose; strongly acid.

C2g—22 to 60 inches, dark grayish brown (2.5Y 4/2) sand; few fine prominent dark yellowish brown (10YR 4/4) mottles; single grained; loose; strongly acid.

Coarse fragments make up as much as 10 percent of this soil. Layers 3 to 5 inches thick at a depth of more than 30 inches are as much as 50 percent gravel. Unlimed areas of this soil are very strongly acid through medium acid.

The O horizon, where present, is as much as 16 inches thick and has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. This horizon is sapric material.

The A horizon has hue of 7.5YR through 2.5Y, value of 2 or 3, and chroma of 0 or 1. This horizon is loamy fine sand, sandy loam, fine sandy loam, or their mucky analogs.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 0 through 2. Mottles are faint to prominent. This horizon is sand, loamy sand, or their gravelly analogs.

Sudbury series

The Sudbury series consists of sandy, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained. Sudbury soils formed in slight depressions of glacial outwash plains derived primarily from gneiss, schist, and granite. Slopes range from 0 to 3 percent. Sudbury soils in this survey area are a taxadjunct because they do not have low-chroma mottles at a depth of less than 24 inches as is described in the range for the Sudbury series.

Sudbury soils are associated on the landscape with somewhat excessively drained Merrimac soils, moderately well drained Ninigret soils, poorly drained Walpole and Raypol soils, and very poorly drained Scarboro soils. Sudbury soils have a coarser textured solum than Ningret soils.

Typical pedon of Sudbury sandy loam, 0 to 5 percent slopes, in the town of Killingworth, 100 feet north of Connecticut Route 80 and 0.3 mile west of the intersection of Route 80 and Roast Meat Hill Road:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) sandy loam; weak medium granular structure; friable; very strongly acid; abrupt smooth boundary.

B21—9 to 18 inches, dark yellowish brown (10YR 4/6) sandy loam; weak medium subangular blocky structure; friable; 5 percent coarse fragments; medium acid; clear wavy boundary.

B22—18 to 28 inches, dark yellowish brown (10YR 4/6) loamy sand; few medium distinct yellowish brown (10YR 5/4) and light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; very friable; 5 percent coarse fragments; medium acid; clear wavy boundary.

B23—28 to 34 inches, yellowish brown (10YR 5/4) gravelly loamy sand; common medium distinct strong brown (7.5YR 5/8) and grayish brown (10YR 5/2) mottles; single grained; loose; 20 percent coarse fragments; medium acid; clear wavy boundary.

IIC—34 to 60 inches, light yellowish brown (10YR 6/4) gravelly sand; common medium distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; single grained; loose; medium acid.

The solum is 18 to 36 inches thick, and the depth to stratified sand and gravel is also 18 to 36 inches. Coarse fragments make up as much as 30 percent of the solum and 20 to 50 percent of the IIC horizon. Unlimed areas of the soil are extremely acid through medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4. It is sandy loam or fine sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 3 through 6. The upper part of the B horizon is fine sandy loam or sandy loam, and the lower part is sandy loam to coarse sand. The B horizon has granular or subangular blocky structure, or it is single grained.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma and 2 through 4. The IIC horizon is stratified sand and gravel.

Suncook series

The Suncook series consists of mixed, mesic Typic Udipsamments. These soils are excessively drained. They formed in sandy alluvial sediments derived mainly from gneiss, schist, and granite. Suncook soils are on the higher parts of broad flood plains mainly along the Connecticut River. Slopes range from 0 to 5 percent.

Suncook soils are associated on the landscape with moderately well drained Podunk soils, poorly drained Rumney soils, and very poorly drained Saco soils.

Typical pedon of Suncook loamy sand, in the town of Haddam, in Haddam Meadows State Park, 2,350 feet north of the intersection of Jail House Road and Connecticut Route 9A, and 80 feet west of the Connecticut River.

A1—0 to 10 inches, dark brown (10YR 3/3) loamy sand; weak medium granular structure; very friable; many fine roots; medium acid; clear wavy boundary.

C1—10 to 24 inches, grayish brown (2.5Y 5/2) sand; single grained; loose; few fine and medium roots; medium acid; clear wavy boundary.

C2—24 to 28 inches, dark grayish brown (10YR 4/2) loamy fine sand; thin lenses of brown (10YR 5/3) fine and medium sand; single grained; loose; few fine and medium roots; medium acid; gradual wavy boundary.

C3—28 to 45 inches, dark grayish brown (10YR 4/2) loamy fine sand; single grained; loose; few fine roots; medium acid; gradual wavy boundary.

C4—45 to 60 inches, brown (10YR 5/3) loamy fine sand; thin lenses of grayish brown (2.5Y 5/2) fine and medium sand; single grained; loose; few fine roots; medium acid.

Coarse fragments make up as much as 10 percent of this soil at a depth of less than 20 inches, 20 percent between depths of 20 and 40 inches, and 40 percent at a depth of more than 40 inches. Unlimed areas of the soil are very strongly acid through slightly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. This horizon is loamy sand or loamy fine sand.

The C horizon has hue of 10YR or 2.5Y, value of 3 through 6, and chroma of 2 or 3. This horizon is loamy fine sand, loamy sand, sand, or their gravelly analogs.

Udipsamments

Udipsamments in this survey area consist of moderately well drained to excessively drained soils in areas that have been disturbed by leveling and other construction activities to the extent that a soil profile is not recognizable. The soils formed in sandy outwash. They are adjacent to beaches and sand dunes on the shore of Long Island Sound. The areas are subject to tidal flooding during storms. Slopes range from 0 to 8 percent.

Udipsamments are associated on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, very poorly drained Westbrook soils, Beaches, and Urban land.

Coarse fragments make up as much as 25 percent of Udipsamments. The soils are sand or gravelly sand.

Udorthents

Udorthents in this survey area consist of moderately well drained to excessively drained soils. They are in areas where more than 2 feet of the upper part of the original soil has been removed, or areas that have been covered by more than 2 feet of fill material. Udorthents formed in loamy glacial till and in gravelly outwash with a loamy mantle. They are on glacial till plains and outwash terraces. Slopes range from 0 to 15 percent.

Udorthents are on the landscape with well drained Wethersfield, Yalesville, Charlton, Canton, Paxton, Montauk, Agawam, and Branford soils and moderately well drained Ludlow and Woodbridge soils. Udorthents and Urban land are in a complex pattern on the landscape.

Coarse fragments make up as much as 45 percent of Udorthents. The soils are extremely acid to medium acid. They are dominantly sandy loam, fine sandy loam, loam, or their gravelly analogs. In places, they are gravelly sand.

Walpole series

The Walpole series consists of sandy, mixed, mesic Aeric Haplaquepts. These soils are poorly drained. Walpole soils formed in depressions of glacial outwash plains and terraces. Slopes range from 0 to 3 percent.

Walpole soils are associated on the landscape with somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Sudbury and Ninigret soils, and poorly drained Scarboro soils. Walpole soils have a coarser textured solum than Raypol soils.

Typical pedon of Walpole sandy loam, in the town of Killingworth, 330 feet north of Connecticut Route 80, and 1,800 feet west of Roast Meat Hill Road:

A1—0 to 10 inches, black (10YR 2/1) sandy loam; moderate medium granular structure; very strongly acid; clear smooth boundary.

B21—10 to 12 inches, brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; friable; common dark brown (7.5YR 3/2) organic stains; strongly acid; abrupt wavy boundary.

B22—12 to 23 inches, dark grayish brown (2.5Y 4/2) sandy loam; common medium prominent brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; 5 percent coarse fragments; medium acid; gradual wavy boundary.

IIC—23 to 60 inches, grayish brown (2.5Y 5/2) sand; single grained; loose; thin lenses of light olive gray (5Y 6/2) sandy loam and fine sandy loam; medium acid.

The solum is 18 to 28 inches thick. Coarse fragments make up as much as 25 percent of the solum and 50 percent of the IIC horizon. Unlimed areas of the soil are very strongly acid through medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 3. This horizon is sandy loam, fine sandy loam, or their gravelly analogs. Structure is weak, granular or subangular blocky, or the horizon is massive.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. The IIC horizon dominantly is gravelly sand, gravelly loamy sand, sand, or loamy sand. Some pedons have thin strata of fine sandy loam or gravel.

Westbrook series

The Westbrook series consists of euic, mesic Typic Sulfihemists. These are very poorly drained organic soils. They are subject to daily tidal inundation by saltwater. Westbrook soils formed in organic material derived from salt-tolerant herbaceous plants over silty sediments. These soils are on tidal flats on Long Island Sound and at the mouth of major rivers. Slopes are less than 1 percent.

Westbrook soils are associated on the landscape with Beaches; well drained Agawam, Canton, and Charlton soils; and somewhat excessively drained Hollis and Merrimac soils.

Typical pedon of Westbrook mucky peat, in the town of Westbrook, 250 feet south of U. S. Highway 1, and 500 feet west of the south end of Hammock Road and Hammock Dock:

Oe1—0 to 10 inches, very dark gray (10YR 3/1) mucky peat, dark gray (10YR 4/1) dry; 65 percent fiber, 30

percent rubbed; dense mat of roots, stems, and leaves; massive; slightly sticky; many large and fine roots; sodium pyrophosphate extract color light gray (10YR 7/1); herbaceous fibers; thin lenses and coatings of silt; 45 percent organic matter; salt content 37,440 parts per million; strongly acid; clear wavy boundary.

Oe2—10 to 40 inches, very dark gray (10YR 3/1) mucky peat, dark gray (10YR 4/1) dry; 50 percent fiber, 25 percent rubbed; massive; slightly sticky; few large medium and fine roots; sodium pyrophosphate extract color light gray (10YR 7/1); herbaceous fibers; thin lenses and coatings of silt; 44 percent organic matter; salt content 22,100 parts per million; slightly acid; gradual wavy boundary.

Oe3—40 to 48 inches, dark olive gray (5Y 3/2) mucky peat, dark gray (10YR 4/1) dry; 35 percent fibers, 25 percent rubbed; massive; slightly sticky; sodium pyrophosphate extract color light gray (10YR 7/1); herbaceous fibers; 24 percent organic matter; salt content 23,400 parts per million; neutral; clear wavy boundary.

IIC1—48 to 62 inches, very dark gray (5Y 3/1) silt loam dark gray (10YR 4/1) dry; massive; slightly sticky; 12 percent organic matter; salt content 18,200 parts per million; slightly acid; diffuse wavy boundary.

IIC2—62 to 99 inches, dark gray (N/4) silt loam, dark gray (10YR 4/1) dry; massive; slightly sticky; 10 percent organic matter; few small shell fragments; salt content 20,100 parts per million; slightly acid.

The organic layers are 16 to 51 inches thick. The soil is strongly acid through neutral in its natural condition and extremely acid if drained. Total salt content ranges from 1,000 to 35,000 parts per million. Many pedons have thin layers of silt in the organic layers.

The surface layer has hue of 10YR through 5Y, value of 2 through 4, and chroma of 0 through 2. Organic matter content ranges from 20 to 70 percent.

The subsurface and bottom layers have hue of 10YR through 5Y, value of 2 through 5, and chroma of 0 through 3. Organic matter content ranges from 20 to 70 percent. Layers of fibric or sapric material as much as 6 inches thick are common in places.

The IIC horizon has hue of 10YR through 5GY, value of 2 through 5, and chroma of 0 through 2. It is silt loam, silt, or very fine sandy loam. The horizon is 0 to 5 percent shell fragments and herbaceous fibers.

Wethersfield series

The Wethersfield series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are well drained, and the surface ranges from nonstony to extremely stony. Wethersfield soils formed in compact glacial till derived from reddish sandstone, conglomerate, shale, and basalt. The soils are on drumlins, broad hilltops, and side slopes of glacial till plains. Slopes range from 3 to 35 percent.

Wethersfield soils are in a drainage sequence with moderately well drained Ludlow soils and poorly drained Wilbraham soils. Wethersfield soils are associated with somewhat well drained Holyoke soils and well drained Cheshire and Yalesville soils. Wethersfield soils have a more compact and firmer substratum than Cheshire soils and are deeper to bedrock than Yalesville soils.

Typical pedon of Wethersfield loam, in an area of Wethersfield very stony loam, 3 to 8 percent slopes, in the town of Middlefield, about 50 feet south of Connecticut Route 66, and 500 feet west of Mt. Higby Reservoir:

O2—2 inches to 0, raw pine needles and partially decomposed and well decomposed forest litter.

A1—0 to 2 inches, dark brown (7.5YR 3/2) loam; moderate medium granular structure; friable; many fine and medium roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

B21—2 to 12 inches, reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

B22—12 to 26 inches, dark reddish brown (5YR 3/3) loam; weak medium subangular blocky structure; friable; few medium roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—26 to 60 inches, reddish brown (2.5YR 4/4) gravelly loam; weak thick platy structure; very firm, brittle; few silt films and black coatings on some breakage faces; 20 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick, and the depth to the fragipan is also 20 to 36 inches. Rock fragments make up 5 to 25 percent of the solum and 10 to 35 percent of the Cx horizon. Unlimed areas of the soil are very strongly acid to strongly acid in the solum and very strongly acid to medium acid in the Cx horizon.

The A horizon has hue of 5YR through 10YR, value of 2 through 4, and chroma of 1 through 4. This horizon is loam, silt loam, or fine sandy loam.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. This horizon is silt loam, loam, or fine sandy loam. Structure is weak or moderate, medium subangular blocky. Some pedons have few faint mottles above the fragipan.

The Cx horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 2 through 6. This horizon is silt loam, loam, fine sandy loam, or their gravelly analogs. Structure is weak, thick, platy, or the horizon is massive.

Whitman series

The Whitman series consists of coarse-loamy, mixed, mesic, Typic Fragiaquepts. These soils are very poorly drained and extremely stony. They formed in compact glacial till derived from gneiss, schist, and granite. Whitman soils are in depressions and drainageways of glacial till uplands. Slopes range from 0 to 3 percent.

Whitman soils form a drainage sequence with well drained Paxton soils and poorly drained Ridgebury soils. Whitman soils are associated on the landscape with well drained Montauk soils and very poorly drained Adrian and Carlisle soils. Whitman soils do not have the organic layers of the Adrian and Carlisle soils.

Typical pedon of Whitman fine sandy loam, in an area of Leicester, Ridgebury, and Whitman extremely stony fine sandy loams, in the town of East Haddam, 1,000 feet southwest of Connecticut Route 82, 900 feet northwest of River Road, 200 feet northwest of a grove of hemlocks, and 200 feet north of a wire fence:

A1—0 to 5 inches, black (10YR 2/1) fine sandy loam; weak fine granular structure; friable; many fine roots; 10 percent coarse fragments; very strongly acid; clear smooth boundary.

B21g—5 to 8 inches, dark gray (10YR 4/1) fine sandy loam; few fine distinct reddish brown (5YR 4/3) mottles; weak medium subangular blocky structure; friable; many fine roots; 10 percent coarse fragments; very strongly acid; clear wavy boundary.

B22g—8 to 10 inches, grayish brown (2.5Y 5/2) fine sandy loam; few medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; 10 percent coarse fragments; strongly acid clear wavy boundary.

B23—10 to 22 inches, light brownish gray (2.5Y 6/2) fine sandy loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; massive; friable; 10 percent coarse fragments; medium acid; clear wavy boundary.

Cx—22 to 60 inches, light brownish gray 92.5Y 6/2) sandy loam; common medium prominent strong brown (7.5YR 5/8), brown (10YR 5/3), and light gray (10YR 6/1) mottles; firm, brittle; 15 percent coarse fragments; medium acid.

The solum is 15 to 30 inches thick, and the depth to the fragipan is also 15 to 30 inches. Rock fragments make up 5 to 25 percent of the solum and 10 to 35 percent of the Cx horizon. Unlimed areas of the soil are very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 0 or 2. This horizon is fine sandy loam or silt loam.

The B horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 0 through 2. This horizon is fine sandy loam, sandy loam, loam, or their gravelly analogs. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y and value of 4 through 6, and chroma is 0 through 3, with chroma of 3 only at a depth greater than 30 inches. Mottles are few to many. This horizon is fine sandy loam, sandy loam, loam, or their gravelly analogs. Consistence is firm or very firm and brittle.

Wilbranam series

The Wilbraham series consists of coarse-loamy, mixed, mesic Aquic Fragiochrepts. These soils are poorly drained and nonstony to extremely stony. Wilbraham soils are derived mainly from reddish sandstone, shale, and conglomerate. The soils are in depressions and drainageways of glacial till uplands. Slopes range from 0 to 5 percent.

Wilbraham soils form a drainage sequence with well drained Wethersfield soils and moderately well drained Ludlow soils. Wilbraham soils are associated on the landscape with well drained Cheshire and Yalesville soils and somewhat excessively drained Holyoke soils.

Typical pedon of Wilbraham silt loam, in an area of Wilbraham extremely stony silt loam, in the town of Middlefield, 0.35 mile west of the northwest corner of Laurel Brook Reservoir:

A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam; weak medium granular structure; very friable; many fine roots; 5 percent coarse fragments; strongly acid.

B21—4 to 8 inches, dark reddish brown (5YR 3/3) silt loam; common medium distinct pinkish gray (7.5YR 6/2) mottles; weak coarse subangular blocky structure; very friable; few fine roots; 10 percent coarse fragments; strongly acid.

B22—8 to 20 inches, reddish brown (5YR 4/4) silt loam; common distinct reddish gray (5YR 5/2) mottles; weak coarse subangular blocky structure; friable; few fine roots; 15 percent coarse fragments; strongly acid.

Cx—20 to 60 inches, dark reddish brown (5YR 3/3) gravelly loam; many medium distinct brown (7.5YR 5/2) and dark brown (7.5YR 4/4) mottles; silt films and black coatings on some breakage faces; weak thick platy structure; very firm; brittle; 25 percent coarse fragments; strongly acid.

The solum is 16 to 32 inches thick. Rock fragments make up 5 to 25 percent of the solum and 10 to 35 percent of the Cx horizon. Unlimed areas of the soil are very strongly acid or strongly acid in the solum and very strongly acid to medium acid in the Cx horizon.

The A horizon has hue of 5YR through 10YR, value of 2 through 4, and chroma of 1 through 3. Structure is weak, medium or coarse, granular. Consistence is friable or very friable.

The B21 horizon has hue of 5YR or 7.5YR, value of 3 through 5, and chroma of 3 or 4. The B22 horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. The B horizon is loam, silt loam, or their gravelly analogs.

The Cx horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. The Cx horizon is mottled. It is loam, silt loam, fine sandy loam, or their gravelly analogs. Consistence is firm or very firm and brittle.

Windsor series

The Windsor series consists of mixed, mesic Typic Udipsamments. These soils are excessively drained. They formed in glacial outwash derived mainly from gneiss, schist, and granite. Windsor soils are on high, broad outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Windsor soils are associated on the landscape with somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret and Sudbury soils, poorly drained Walpole soils, and very poorly drained Scarboro soils.

Typical pedon of Windsor loamy sand, 0 to 3 percent slopes, in the town of Old Saybrook, on the south side of a gravel pit in the Otter Cave Estates subdivision:

A1—0 to 2 inches, very dark grayish brown (10YR 3/2) loamy sandy; weak moderate granular structure; very friable; many fine and common roots; very strongly acid; abrupt smooth boundary.

Ap—2 to 7 inches, dark yellowish brown (10YR 3/4) loamy sand; weak medium subangular blocky structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

B21—7 to 18 inches, strong brown (7.5YR 5/6) loamy sand; weak medium subangular blocky structure; very friable; many fine and common medium roots; strongly acid; gradual wavy boundary.

B22—18 to 32 inches, brown (7.5YR 5/4) loamy sand; weak medium subangular blocky structure; very friable; few fine roots; medium acid; gradual wavy boundary.

C—32 to 60 inches, brown (7.5YR 4/4) loamy sand; single grained; loose; few fine roots; medium acid.

The solum is 20 to 32 inches thick. Coarse fragments make up as much as 10 percent of the solum and 15 percent of the C horizon. Unlimed areas of the soil are very strongly acid through medium acid in the solum and very strongly acid through slightly acid in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 through 4.

The upper part of the B horizon has hue of 7.5YR through 2.5Y and value and chroma of 4 through 6. It is loamy sand or loamy fine sand. The lower part of the B horizon has hue of 7.5YR through 5Y, value of 5 or 6, and chroma of 2 through 6. It is loamy sand, loamy fine sand, fine sand, or sand. The B horizon has weak, subangular blocky structure, or the horizon is massive.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 7, and chroma of 2 through 6. This horizon is sand, fine sand, or loamy sand.

Woodbridge series

The Woodbridge series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are moderately well drained and nonstony to extremely stony. Woodbridge soils formed in compact glacial till derived from gneiss, schist, and granite. The soils are on broad hilltops and concave side slopes of drumlins and glacial till plains. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Woodbridge soils are on the landscape in a drainage sequence with well drained Paxton soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. Woodbridge soils are associated on the landscape with well drained Montauk soils and poorly drained Leicester soils.

Typical pedon of Woodbridge fine sandy loam, 0 to 3 percent slopes, in the town of Haddam, 1,500 feet southeast of the intersection of Connecticut Route 81 and Hidden Lake Road:

Ap—0 to 8 inches thick, dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; 5 percent rock fragments; common fine roots; medium acid; abrupt smooth boundary.

B21—8 to 15 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; 10 percent rock fragments; few fine roots; medium acid; gradual wavy boundary.

B22—15 to 24 inches, yellowish brown (10YR 5/4) fine sandy loam; few fine distinct strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; 10 percent rock fragments; few medium roots; medium acid; clear wavy boundary.

A'2—24 to 28 inches, olive (5Y 5/3) fine sandy loam; common medium distinct yellowish red (5YR 5/80 and light brownish gray (2.5Y 6/2) mottles; massive; friable; 5 percent rock fragments; few medium roots; medium acid; gradual wavy boundary.

Cx—28 to 60 inches, olive (5Y 5/4) fine sandy loam; few fine distinct reddish brown (5YR 4/4) mottles; weak thick platy structure; firm, brittle; 10 percent rock fragments; medium acid.

The solum is 18 to 36 inches thick, and the depth to the fragipan is 18 to 36 inches. Rock fragments make up 5 to 30 percent of this soil. Unlimed areas of these soils are strongly acid or medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3. Structure is weak, fine, or medium, granular.

The B21 horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 3 through 8. The B22 horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 through 6. The B horizon is fine sandy loam, loam, sandy loam, or their gravelly analogs.

The A'2 horizon, where present, has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. This horizon is fine

sandy loam, loam, sandy loam, or their gravelly analogues. Structure is weak, thick, or medium platy. Consistence is firm or very firm and brittle.

Yalesville series

The Yalesville series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are well drained. They formed in glacial till derived mainly from sandstone, conglomerate, shale, and basalt. Yalesville soils are on bedrock-controlled glacial till plains. Slopes range from 3 to 15 percent.

Yalesville soils are associated on the landscape with somewhat excessively drained Holyoke soils, well drained Cheshire and Wethersfield soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Yalesville soils have bedrock nearer the surface than Cheshire and Wethersfield soils.

Typical pedon of Yalesville fine sandy loam, 3 to 8 percent slopes, in the town of Durham, 1,500 feet west-northwest of the intersection of Connecticut Route 17 and Little Lane, near power line pole 1975:

Ap—0 to 10 inches, dark brown (7.5YR 4/2) fine sandy loam; weak fine granular structure; friable; few fine roots; 5 percent coarse fragments; neutral; clear wavy boundary.

B21—10 to 20 inches, yellowish red (5YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—20 to 30 inches, reddish brown (5YR 4/4) fine sandy loam; massive; friable; few medium roots; 15 percent coarse fragments; strongly acid; abrupt wavy boundary.

R—30 inches, hard, unweathered, reddish brown Triassic sandstone bedrock.

The solum is 18 to 34 inches thick. The depth to bedrock ranges from 20 to 40 inches. Coarse fragments make up 2 to 35 percent of the solum and as much as 80 percent of the C horizon. Unlimed areas of the soil are very strongly acid to medium acid.

The A horizon has hue of 5YR through 10YR, value of 2 through 4, and chroma of 2 or 3. This horizon is fine sandy loam or silt loam.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 through 6. This horizon is sandy loam, fine sandy loam, loam, or their gavelly analogues. Structure is weak, subangular blocky, or the horizon is massive. Consistence is friable or very friable.

In some places there is a C horizon. This horizon has hue of 10R through 5YR, value of 3 through 5, and chroma of 3 through 6. This horizon is sandy loam, fine sandy loam, loam, or their gravelly or very gravelly analogues. Consistence is friable or firm.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*7*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 17, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent

cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 25 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough periods during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts. Excess water soluble salts. Excessive salts restrict the growth of most plants.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of oc-

currence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action. Freezing and thawing of soil moisture. Frost action can damage structures and plant roots.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the assorted and unassorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by melt water as it flows from glacial ice.

Glacial till (geology). Unassorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor

aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial ice. Glacial outwash is commonly in valleys on landforms known as valley trains, outwash terraces, eskers, kame terraces, kames, outwash fans, or deltas.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Illustrations

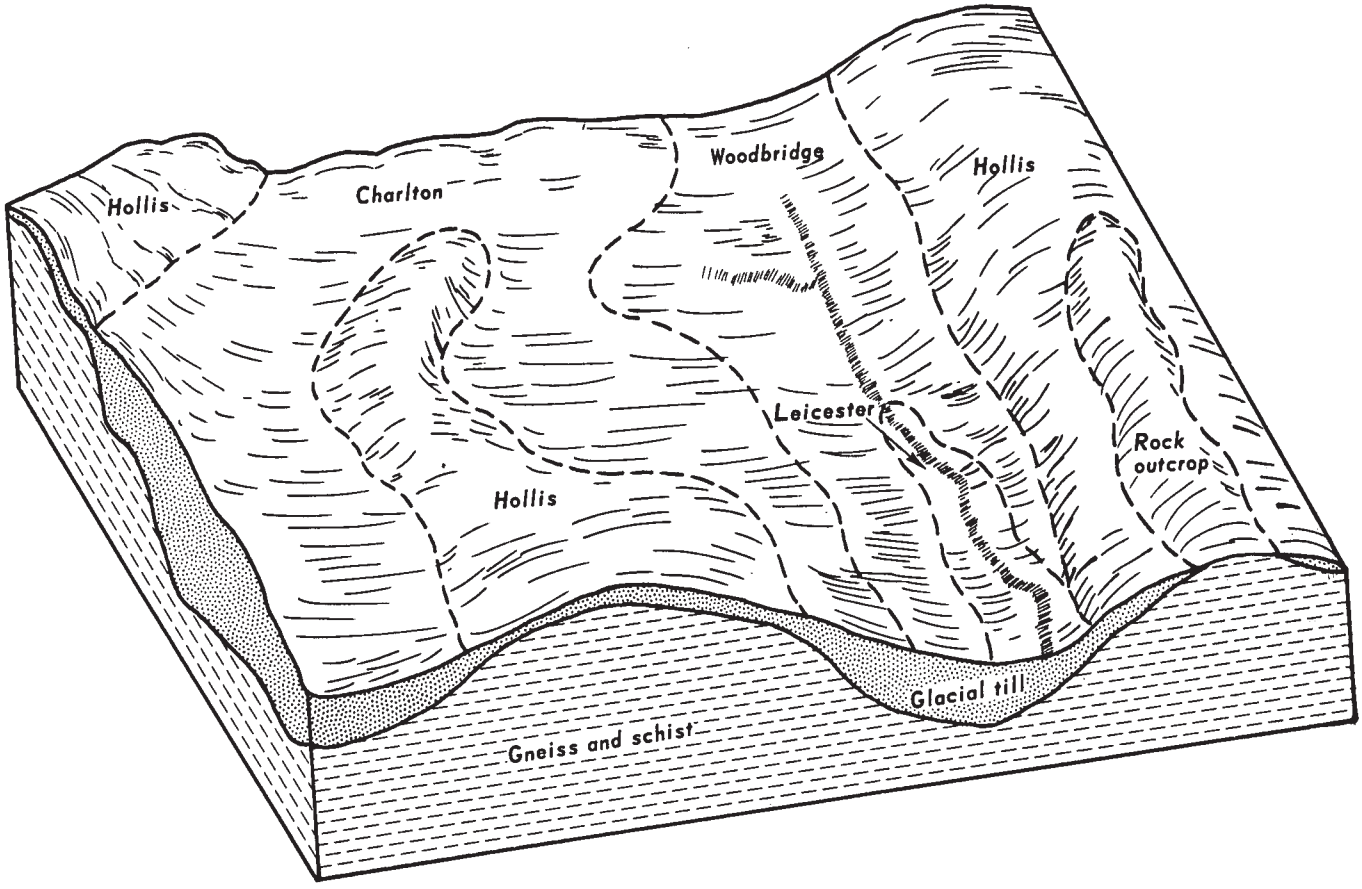

Figure 1.—Typical pattern of soils and parent material in the Hollis-Charlton unit.

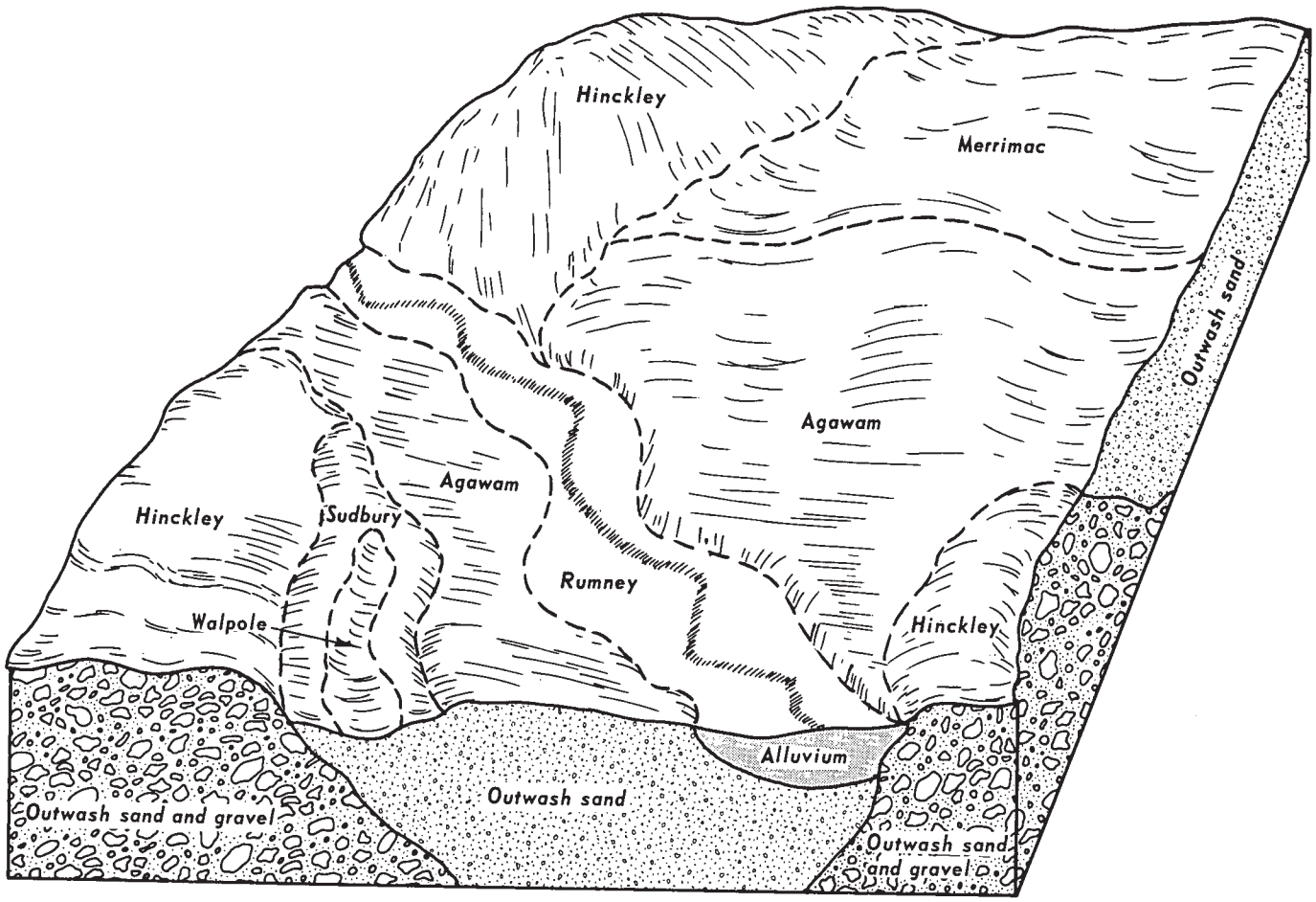

Figure 2.—Typical pattern of soils and parent material in the Hinckley-Agawam-Merrimac unit.

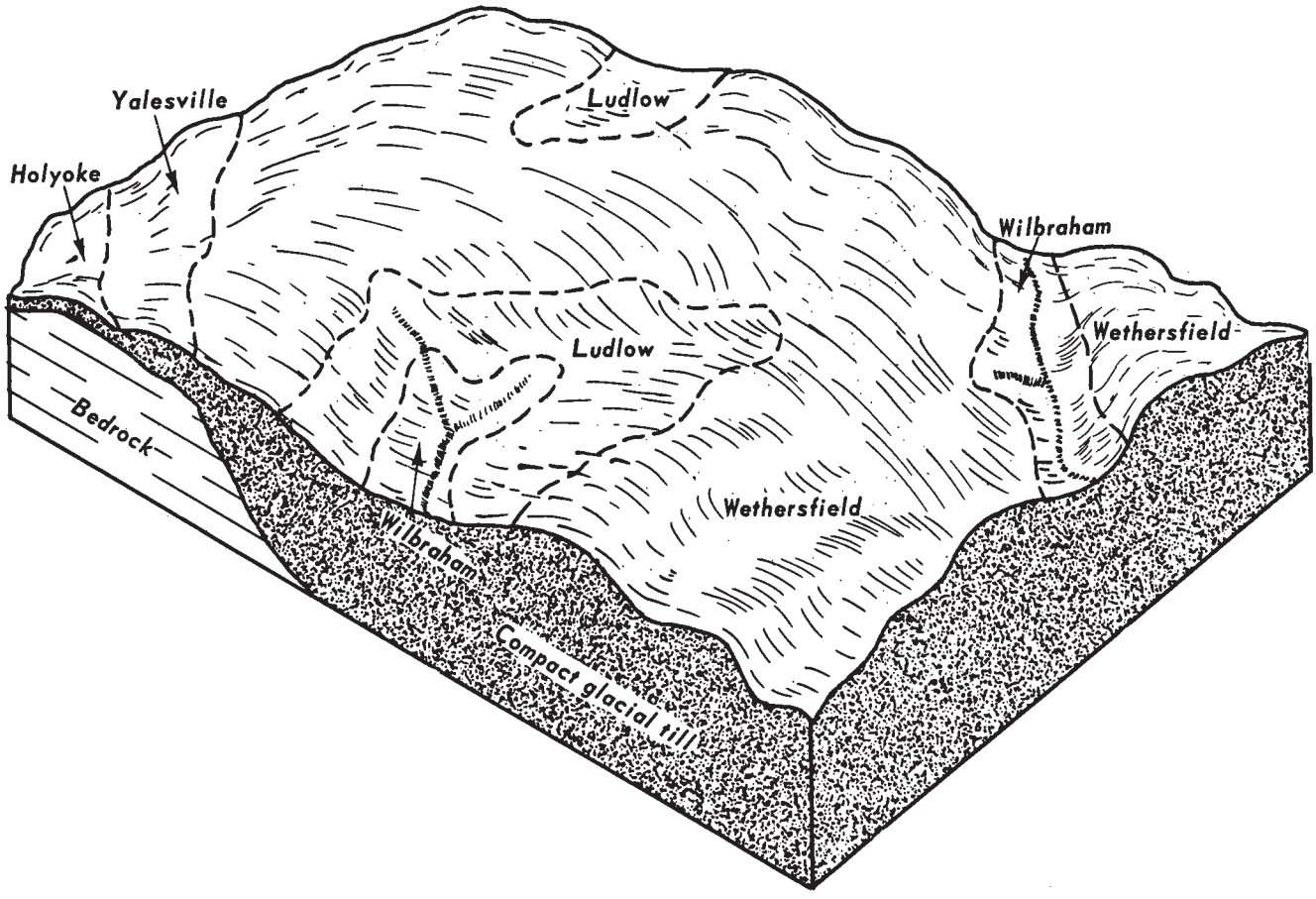

Figure 3.—Typical pattern of soils and parent material in the Wethersfield-Ludlow-Wilbraham unit.

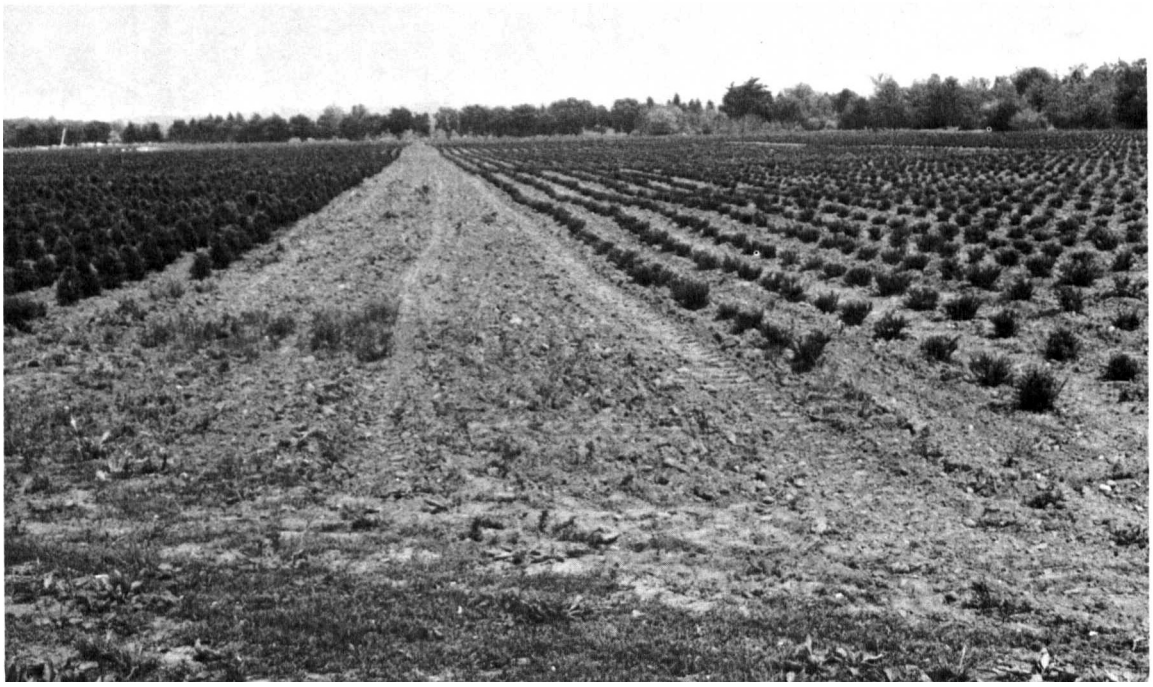

Figure 4.—Nursery stock in an area of Hartford sandy loam, 0 to 3 percent slopes.

Figure 5.—An area of Leicester, Ridgebury, and Whitman extremely stony fine sandy loams.

Figure 6.—A flooded area of Saco silt loam.

Figure 7.—Tree nursery in an area of Yalesville fine sandy loam, 3 to 8 percent slopes.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	35.2	19.9	27.6	57	-5	15	3.26	1.67	4.55	6	9.9
February---	37.6	21.7	29.7	57	-5	18	3.66	2.49	4.73	6	10.6
March------	45.1	28.8	37.0	68	9	56	4.36	2.83	5.74	7	9.5
April------	58.5	38.5	48.5	81	22	269	4.35	2.53	5.84	8	1.2
May--------	68.8	47.4	58.1	88	32	561	3.93	2.31	5.37	8	.0
June-------	78.1	57.1	67.6	94	40	828	3.62	1.76	5.14	7	.0
July-------	82.6	62.6	72.6	95	48	1,011	3.66	2.17	4.99	6	.0
August-----	80.2	61.2	70.7	92	44	952	4.02	2.09	5.60	6	.0
September--	72.8	54.0	63.4	90	32	702	4.29	2.39	5.84	6	.0
October----	62.9	44.4	53.7	81	25	425	3.82	1.61	5.60	5	.1
November---	51.1	35.2	43.2	68	16	129	4.74	3.07	6.24	8	1.5
December---	39.2	24.7	32.0	61	2	40	4.78	2.66	6.51	8	7.4
Year-----	59.3	41.3	50.3	96	-8	5,006	48.49	42.23	54.56	81	40.2

[1]Recorded in the period 1951-73 at Middletown, Conn.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 8	April 19	May 12
2 years in 10 later than--	April 4	April 15	May 5
5 years in 10 later than--	March 28	April 6	April 22
First freezing temperature in fall:			
1 year in 10 earlier than--	October 31	October 10	September 27
2 years in 10 earlier than--	November 6	October 16	October 3
5 years in 10 earlier than--	November 17	October 28	October 15

[1]Recorded in the period 1951-73 at Middletown, Conn.

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	212	183	147
8 years in 10	219	190	156
5 years in 10	233	204	174
2 years in 10	247	218	192
1 year in 10	255	225	202

[1]Recorded in the period 1951-73 at Middletown, Conn.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Aa	Adrian muck	3,280	1.4
AfA	Agawam fine sandy loam, 0 to 3 percent slopes	2,160	0.9
AfB	Agawam fine sandy loam, 3 to 8 percent slopes	3,820	1.6
Ba	Beaches-Udipsamments complex	310	0.1
BcA	Berlin silt loam, 0 to 5 percent slopes	250	0.1
BoA	Branford silt loam, 0 to 3 percent slopes	360	0.2
BoB	Branford silt loam, 3 to 8 percent slopes	1,460	0.6
BoC	Branford silt loam, 8 to 15 percent slopes	330	0.1
CbB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	2,115	0.9
CcB	Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes	6,455	2.7
CcC	Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes	5,100	2.1
CdC	Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes	6,540	2.8
CdD	Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes	3,670	1.5
Ce	Carlisle muck	2,460	1.0
CrC	Charlton-Hollis very stony fine sandy loams, 3 to 15 percent slopes	32,880	13.8
CsB	Cheshire silt loam, 3 to 8 percent slopes	520	0.2
CsC	Cheshire silt loam, 8 to 15 percent slopes	220	0.1
CyC	Cheshire-Holyoke very stony silt loams, 3 to 15 percent slopes	3,410	1.4
EfA	Ellington fine sandy loam, 0 to 5 percent slopes	1,120	0.5
HfA	Hartford sandy loam, 0 to 3 percent slopes	970	0.4
HfB	Hartford sandy loam, 3 to 8 percent slopes	1,250	0.5
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes	3,320	1.4
HME	Hinckley and Manchester soils, 15 to 45 percent slopes	3,720	1.6
HpE	Hollis-Charlton extremely stony fine sandy loams, 15 to 40 percent slopes	21,930	9.2
HrC	Hollis-Rock outcrop complex, 3 to 15 percent slopes	2,620	1.1
HSE	Hollis-Rock outcrop complex, 15 to 40 percent slopes	7,060	3.0
HuD	Holyoke-Cheshire very stony silt loams, 15 to 35 percent slopes	2,980	1.3
HyC	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	440	0.2
HZE	Holyoke-Rock outcrop complex, 15 to 40 percent slopes	1,140	0.5
LG	Leicester,Ridgebury, and Whitman extremely stony fine sandy loams	13,600	5.7
LpA	Ludlow silt loam, 0 to 3 percent slopes	490	0.2
LpB	Ludlow silt loam, 3 to 8 percent slopes	2,980	1.3
LuB	Ludlow very stony silt loam, 3 to 8 percent slopes	440	0.2
LvC	Ludlow extremely stony silt loam, 3 to 15 percent slopes	530	0.2
MgA	Manchester gravelly sandy loam, 0 to 3 percent slopes	460	0.2
MgC	Manchester gravelly sandy loam, 3 to 15 percent slopes	1,270	0.5
MyA	Merrimac sandy loam, 0 to 3 percent slopes	1,560	0.7
MyB	Merrimac sandy loam, 3 to 10 percent slopes	2,250	0.9
NnA	Ninigret fine sandy loam, 0 to 5 percent slopes	930	0.4
PbB	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	3,695	1.6
PbC	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	900	0.4
PbD	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	380	0.2
PdB	Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes	9,605	4.0
PdC	Paxton and Montauk very stony fine sandy loams, 8 to 15 percent slopes	4,080	1.7
PeC	Paxton and Montauk extremely stony fine sandy loams, 3 to 15 percent slopes	2,980	1.3
PeD	Paxton and Montauk extremely stony fine sandy loams, 15 to 35 percent slopes	3,740	1.6
PnA	Penwood loamy sand, 0 to 3 percent slopes	350	0.1
PnB	Penwood loamy sand, 3 to 8 percent slopes	560	0.2
Pr	Pits, gravel	820	0.3
Ps	Podunk fine sandy loam	920	0.4
Rb	Raypol silt loam	1,390	0.6
Rp	Rock outcrop-Hollis complex	640	0.3
Ru	Rumney fine sandy loam	1,990	0.8
Rv	Rumney Variant silt loam	1,280	0.5
Sb	Saco silt loam	1,670	0.7
Sc	Scarboro mucky loamy fine sand	1,100	0.5
SgA	Sudbury sandy loam, 0 to 5 percent slopes	1,490	0.6
St	Suncook loamy sand	610	0.3
UD	Udorthents-Urban land complex	3,090	1.3
Ur	Urban land	580	0.2
Wd	Walpole sandy loam	1,820	0.8
We	Westbrook mucky peat	1,640	0.7
Wh	Westbrook mucky peat, low salt	1,650	0.7
WkB	Wethersfield loam, 3 to 8 percent slopes	9,250	3.9
WkC	Wethersfield loam, 8 to 15 percent slopes	2,900	1.2
WkD	Wethersfield loam, 15 to 35 percent slopes	2,270	1.0
WmB	Wethersfield very stony loam, 3 to 8 percent slopes	500	0.2
WmC	Wethersfield very stony loam, 8 to 15 percent slopes	640	0.3
WnC	Wethersfield extremely stony loam, 3 to 15 percent slopes	320	0.1
Wr	Wilbraham silt loam	410	0.2
Wt	Wilbraham extremely stony silt loam	1,720	0.7
WvA	Windsor loamy sand, 0 to 3 percent slopes	390	0.2

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
WvB	Windsor loamy sand, 3 to 8 percent slopes	830	0.3
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes	855	0.4
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes	2,990	1.3
WyA	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes	1,205	0.5
WyB	Woodbridge very stony fine sandy loam, 3 to 8 percent slopes	8,000	3.4
WzA	Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes	630	0.3
WzC	Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes	7,120	3.0
YaB	Yalesville fine sandy loam, 3 to 8 percent slopes	780	0.3
YaC	Yalesville fine sandy loam, 8 to 15 percent slopes	970	0.4
W	Water	2,280	1.0
	Total	237,440	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management. Absence of yield figure indicates that the soil is not suited to the crop or the crop is not commonly grown on the soil]

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
Aa. Adrian	---	---	---	---	---	---
AfA---------- Agawam	24	330	5.0	4.0	3.5	8.5
AfB---------- Agawam	24	330	5.0	4.0	3.5	8.5
Ba---------- Beaches	---	---	---	---	---	---
BcA---------- Berlin	22	---	3.5	3.5	4.5	6.5
BoA---------- Branford	24	330	4.5	4.0	3.5	8.5
BoB---------- Branford	24	330	4.5	4.0	3.5	8.5
BoC---------- Branford	22	300	4.0	3.5	3.5	7.5
CbB---------- Canton	24	315	4.5	4.5	4.0	8.5
CcB, CcC---------- Canton	---	---	---	---	---	---
CdC, CdD---------- Canton	---	---	---	---	---	---
Ce---------- Carlisle	---	---	---	---	---	---
CrC---------- Charlton	---	---	---	---	---	---
CsB---------- Cheshire	24	300	4.5	4.0	4.0	8.5
CsC---------- Cheshire	22	270	4.5	4.0	4.0	8.5
CyC---------- Cheshire	---	---	---	---	---	---
EfA---------- Ellington	24	330	4.5	4.0	3.5	8.5
HfA, HfB---------- Hartford	18	270	4.0	3.0	2.5	7.5
HkC---------- Hinckley	---	---	---	---	---	---
HME---------- Hinckley	---	---	---	---	---	---
HpE---------- Hollis	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
HrC---- Hollis	---	---	---	---	---	---
HSE---- Hollis	---	---	---	---	---	---
HuD---- Holyoke	---	---	---	---	---	---
HyC---- Holyoke	---	---	---	---	---	---
HZE---- Holyoke	---	---	---	---	---	---
LG---- Leicester	---	---	---	---	---	---
LpA, LpB---- Ludlow	24	300	4.0	4.0	3.5	7.5
LuB---- Ludlow	---	---	---	---	---	---
LvC---- Ludlow	---	---	---	---	---	---
MgA---- Manchester	12	---	2.5	2.0	2.0	5.0
MgC---- Manchester	---	---	---	---	---	---
MyA, MyB---- Merrimac	18	270	4.0	3.0	2.5	5.5
NnA---- Ninigret	22	330	4.0	3.5	4.0	7.5
PbB---- Paxton	23	315	4.5	4.0	4.0	8.5
PbC---- Paxton	21	285	4.5	4.0	4.0	8.5
PbD---- Paxton	19	---	4.0	3.5	3.5	7.5
PdB, PdC---- Paxton	---	---	---	---	---	---
PeC, PeD---- Paxton	---	---	---	---	---	---
PnA, PnB---- Penwood	14	---	3.0	2.5	2.0	5.5
Pr[1] Pits	---	---	---	---	---	---
Ps---- Podunk	24	300	4.0	4.5	4.5	8.5
Rb---- Raypol	20	---	---	3.5	3.5	6.0
Rp---- Rock outcrop	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
Ru---------- Rumney	20	---	---	3.5	4.0	6.5
Rv---------- Rumney Variant	24	---	---	3.5	3.5	7.0
Sb---------- Saco	---	---	---	---	---	---
Sc---------- Scarboro	---	---	---	---	---	---
SgA---------- Sudbury	18	270	3.5	4.0	4.0	7.0
St---------- Suncook	12	240	2.5	2.0	2.0	5.0
UD---------- Udorthents	---	---	---	---	---	---
Ur[2] Urban land	---	---	---	---	---	---
Wd---------- Walpole	18	---	---	3.0	3.0	5.5
We, Wh---------- Westbrook	---	---	---	---	---	---
WkB---------- Wethersfield	22	300	4.5	4.0	4.0	8.5
WkC---------- Wethersfield	20	270	4.0	3.5	3.5	7.5
WkD---------- Wethersfield	18	---	3.5	3.5	3.5	7.0
WmB, WmC---------- Wethersfield	---	---	---	---	---	---
WnC---------- Wethersfield	---	---	---	---	---	---
Wr---------- Wilbraham	16	---	---	3.5	4.0	6.5
Wt---------- Wilbraham	---	---	---	---	---	---
WvA, WvB---------- Windsor	14	---	3.0	2.5	2.0	5.5
WxA---------- Woodbridge	24	270	4.0	4.0	4.0	8.0
WxB---------- Woodbridge	24	270	4.0	4.0	4.0	8.0
WyA---------- Woodbridge	---	---	---	---	---	---
WyB---------- Woodbridge	---	---	---	---	---	---
WzA, WzC---------- Woodbridge	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
YaB---------- Yalesville	19	---	4.0	4.0	3.5	7.5
YaC---------- Yalesville	18	---	4.0	4.0	3.5	7.5

[1]Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.
[2]See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas excluded. Absence of an entry means no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	2,520	---	---	---
II	39,695	21,640	12,025	6,030
III	15,410	5,320	6,890	3,200
IV	7,240	2,650	---	4,590
V	2,305	---	1,100	1,205
VI	85,220	---	7,410	77,810
VII	74,680	---	---	74,680
VIII	3,290	---	3,290	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Aa---------- Adrian	4w	Slight	Severe	Severe	Severe	Red maple----------	46	
						Silver maple--------	---	
						White ash----------	---	
AfA, AfB---------- Agawam	4o	Slight	Slight	Slight	Slight	Eastern white pine--	70	Eastern white pine, white spruce, Norway spruce.
						Northern red oak----	65	
						Sugar maple---------	---	
BcA---------- Berlin	4o	Slight	Slight	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
						Northern red oak----	60	
BoA, BoB---------- Branford	3o	Slight	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine.
						Northern red oak----	70	
BoC---------- Branford	3r	Moderate	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine.
						Northern red oak----	70	
CbB[1], CcB[1], CcC[1]: Canton----------	5o	Slight	Slight	Slight	Slight	Eastern white pine--	58	Eastern white pine, white spruce.
						Northern red oak----	52	
Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak----	65	Eastern white pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	
						Shagbark hickory----	---	
CdC[1], CdD[1]: Canton----------	5x	Slight	Moderate	Slight	Slight	Eastern white pine--	58	Eastern white pine, white spruce.
						Northern red oak----	52	
Charlton----------	4x	Slight	Moderate	Slight	Slight	Northern red oak----	65	Eastern white pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	
						Shagbark hickory----	55	
Ce---------- Carlisle	4w	Slight	Severe	Severe	Severe	Red maple----------	46	Northern white-cedar, Austrian pine, eastern white pine.
						White ash----------	---	
						Swamp white oak-----	---	
CrC[1]: Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak----	65	Eastern white pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	
						Shagbark hickory----	55	
Hollis----------	5d	Slight	Slight	Severe	Moderate	Northern red oak----	47	Eastern white pine.
						Eastern white pine--	55	
						Sugar maple---------	56	
						White spruce--------	60	
CsB, CsC---------- Cheshire	4o	Slight	Slight	Slight	Slight	Northern red oak----	60	Eastern white pine, white spruce, eastern hemlock.
						Eastern white pine--	65	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CyC[1]:								
Cheshire	4o	Slight	Slight	Slight	Slight	Northern red oak	60	Eastern white pine, white spruce, eastern hemlock.
						Eastern white pine	65	
Holyoke	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						White ash	---	
EfA	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine.
Ellington						Northern red oak	70	
HfA, HfB	4s	Slight	Slight	Moderate	Slight	Eastern white pine	65	Eastern white pine, white spruce.
Hartford						Northern red oak	59	
HkC	5s	Slight	Slight	Severe	Slight	Northern red oak	49	Eastern white pine, European larch.
Hinckley						Eastern white pine	60	
						Sugar maple	57	
HME[1]:								
Hinckley	5s	Slight	Moderate	Severe	Slight	Northern red oak	49	Eastern white pine, European larch.
						Eastern white pine	60	
						Sugar maple	57	
Manchester	5s	Slight	Moderate	Severe	Slight	Northern red oak	50	Eastern white pine.
						Eastern white pine	55	
HpE[1]:								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
						White spruce	60	
Charlton	4x	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine, white spruce, eastern hemlock, European larch.
						Eastern white pine,	65	
						Shagbark hickory	55	
HrC[1]:								
Hollis	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
						White spruce	60	
Rock outcrop.								
HSE[1]:								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
						White spruce	60	
Rock outcrop.								
HuD[1]:								
Holyoke	5d	Moderate	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						White ash	---	
Cheshire	4r	Slight	Moderate	Slight	Slight	Northern red oak	60	Eastern white pine, white spruce, eastern hemlock.
						Eastern white pine	65	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
HyC[1]:								
Holyoke	5d	Slight	Slight	Severe	Moderate	Northern red oak Eastern white pine White ash	47 55 ---	Eastern white pine.
Rock outcrop.								
HZE[1]:								
Holyoke	5d	Moderate	Moderate	Severe	Moderate	Northern red oak Eastern white pine White ash	47 55 ---	Eastern white pine.
Rock outcrop.								
LG[1]:								
Leicester	4x	Slight	Severe	Severe	Severe	Northern red oak Eastern white pine	56 69	Eastern white pine, white spruce.
Ridgebury	4x	Slight	Severe	Severe	Severe	Northern red oak Eastern white pine Sugar maple	57 52 63	Eastern white pine, white spruce.
Whitman	5x	Slight	Severe	Severe	Severe	Eastern white pine Red maple	56 55	
LpA, LpB, LuB Ludlow	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine	70 75	Eastern white pine, European larch.
LvC Ludlow	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine	70 75	Eastern white pine, European larch.
MgA, MgC Manchester	5s	Slight	Slight	Severe	Slight	Northern red oak Eastern white pine	50 55	Eastern white pine.
MyA, MyB Merrimac	4s	Slight	Slight	Moderate	Slight	Northern red oak Eastern white pine Sugar maple	51 64 58	Eastern white pine.
NnA Ninigret	3o	Slight	Slight	Slight	Slight	Eastern white pine Northern red oak	75 50	Eastern white pine, white spruce.
PbB[1], PbC[1]:								
Paxton	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, white spruce, European larch.
Montauk	3o	Slight	Slight	Slight	Slight	Sugar maple Northern red oak Eastern white pine	65 70 75	White spruce, European larch, eastern white pine.
PbD[1]:								
Paxton	3r	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, white spruce, pine, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
PbD[1]:								
Montauk	3r	Slight	Moderate	Slight	Slight	Sugar maple Northern red oak Eastern white pine	65 70 75	White spruce, European larch, eastern white pine.
PdB[1], PdC[1]:								
Paxton	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, white spruce, European larch.
Montauk	3o	Slight	Slight	Slight	Slight	Sugar maple Northern red oak Eastern white pine	65 70 75	White spruce, eastern white pine, European larch.
PeC[1]:								
Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, white spruce, European larch.
Montauk	3x	Slight	Moderate	Slight	Slight	Sugar maple Northern red oak Eastern white pine	65 70 75	White spruce, eastern white pine, European larch.
PeD[1]:								
Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, white spruce, European larch.
Montauk	3x	Slight	Moderate	Slight	Slight	Sugar maple Northern red oak Eastern white pine	65 70 75	White spruce, eastern white pine, European larch.
PnA, PnB Penwood	5s	Slight	Slight	Severe	Slight	Eastern white pine Northern red oak Pitch pine	55 50 50	Eastern white pine.
Ps Podunk	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, white spruce.
Rb Raypol	4w	Slight	Severe	Severe	Severe	Eastern white pine Red maple	68 75	Eastern white pine, eastern hemlock, white spruce.
Rp[1]: Rock outcrop.								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak Eastern white pine Sugar maple White spruce	47 55 56 60	Eastern white pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Ru---------- Rumney	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	59 65	Eastern white pine, white spruce.
Rv---------- Rumney Variant	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	65 75	Eastern white pine, white spruce,
Sc---------- Scarboro	5w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	55 55	Northern white-cedar.
SgA---------- Sudbury	4o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	60 45	Eastern white pine, European larch, white spruce.
St---------- Suncook	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Black oak---------- Northern red oak---- Red maple----------	55 50 50 50	Eastern white pine.
Wd---------- Walpole	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	68 75	Eastern white pine, white spruce, northern white-cedar.
WkB, WkC---------- Wethersfield	3o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Sugar maple--------- Yellow-poplar-------	74 75 63 87	Eastern white pine.
WkD---------- Wethersfield	3r	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine-- Sugar maple--------- Yellow-poplar-------	74 75 63 87	Eastern white pine.
WmB, WmC---------- Wethersfield	3o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Sugar maple--------- Yellow-poplar-------	74 75 63 87	Eastern white pine.
WnC---------- Wethersfield	3x	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine-- Sugar maple--------- Yellow poplar-------	74 75 63 87	Eastern white pine.
Wr---------- Wilbraham	4w	Slight	Severe	Severe	Severe	Northern red oak---- Eastern white pine-- Sugar maple--------- Red maple----------	63 65 55 70	Eastern white pine, white spruce.
Wt---------- Wilbraham	4x	Slight	Severe	Severe	Severe	Northern red oak---- Eastern white pine-- Sugar maple--------- Red maple----------	63 65 55 70	Eastern white pine, white spruce.
WvA, WvB---------- Windsor	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	57 52 55	Eastern white pine.
WxA, WxB---------- Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
WyA, WyB---------- Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.
WzA, WzC---------- Woodbridge	3x	Moderate	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.
YaB, YaC---------- Yalesville	4o	Slight	Slight	Slight	Moderate	Northern red oak---- Eastern white pine-- Sugar maple---------	60 65 ---	Eastern white pine.

[1] See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Aa Adrian	Severe: wetness, cutbanks cave, floods.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: wetness, floods, low strength.	Severe: excess humus, floods, wetness.
AfA Agawam	Slight	Slight	Slight	Slight	Slight	Slight.
AfB Agawam	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Ba[1]: Beaches.						
Udipsamments.						
BcA Berlin	Severe: too clayey, wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action, low strength.	Slight.
BoA Branford	Severe: small stones, cutbanks cave.	Moderate: frost action.	Slight	Moderate: frost action.	Moderate: frost action.	Slight.
BoB Branford	Severe: small stones, cutbanks cave.	Moderate: frost action.	Slight	Moderate: slope, frost action.	Moderate: frost action.	Slight.
BoC Branford	Severe: small stones, cutbanks cave.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
CbB[1]: Canton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
Charlton	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
CcB[1]: Canton	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Slight	Moderate: large stones.
Charlton	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Slight	Moderate: large stones.
CcC[1]: Canton	Severe: cutbanks cave.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
CdC[1]: Canton	Severe: cutbanks cave, large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: large stones.	Severe: large stones.
Charlton	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: large stones.	Severe: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CdD[1]:						
Canton	Severe: slope, cutbanks cave, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Charlton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Ce	Severe: floods, wetness, excess humus.	Severe: wetness, low strength, floods.	Severe: wetness, low strength, floods.	Severe: wetness, low strength, floods.	Severe: low strength, wetness, floods.	Severe: excess humus, wetness, floods.
Carlisle						
CrC[1]:						
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
CsB	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Cheshire						
CsC	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Cheshire						
CyC[1]:						
Cheshire	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
Holyoke	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
EfA	Severe: wetness, small stones, cutbanks cave.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
Ellington						
HfA	Severe: cutbanks cave, small stones.	Slight	Slight	Slight	Slight	Moderate: droughty.
Hartford						
HfB	Severe: cutbanks cave, small stones.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Hartford						
HkC	Severe: small stones, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
Hinckley						
HME[1]:						
Hinckley	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.
Manchester	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HpE[1]:						
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Charlton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
HrC[1]:						
Hollis	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: depth to rock, large stones.
Rock outcrop.						
HSE[1]:						
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Rock outcrop.						
HuD[1]:						
Holyoke	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Cheshire	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HyC[1]:						
Holyoke	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
HZE[1]:						
Holyoke	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rock outcrop.						
LG[1]:						
Leicester	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.
Ridgebury	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.
Whitman	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.
LpA, LpB Ludlow	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
LuB Ludlow	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Moderate: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LvC---------- Ludlow	Severe: large stones, wetness.	Severe: large stones, frost action.	Severe: large stones, wetness.	Severe: slope, large stones, frost action.	Severe: frost action.	Severe: large stones.
MgA---------- Manchester	Severe: small stones, cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: small stones, droughty.
MgC---------- Manchester	Severe: small stones, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
MyA---------- Merrimac	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
MyB---------- Merrimac	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
NnA---------- Ninigret	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, wetness.	Slight.
PbB[1]: Paxton----------	Slight---------	Moderate: frost action.	Slight---------	Moderate: frost action, slope.	Moderate: frost action.	Slight.
Montauk----------	Slight---------	Moderate: frost action.	Slight---------	Moderate: slope, frost action.	Moderate: frost action.	Slight.
PbC[1]: Paxton----------	Moderate: slope.	Moderate: frost action, slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
Montauk----------	Moderate: slope.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
PbD[1]: Paxton----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Montauk----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PdB[1]: Paxton----------	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: large stones.	Moderate: frost action, slope.	Moderate: frost action.	Moderate: large stones.
Montauk----------	Moderate: large stones.	Moderate: large stones, frost action.	Moderate: large stones.	Moderate: slope, frost action.	Moderate: frost action.	Moderate: large stones.
PdC[1]: Paxton----------	Moderate: slope, large stones.	Moderate: frost action, slope.	Moderate: slope, large stones.	Severe: slope.	Moderate: frost action, slope.	Moderate: large stones, slope.
Montauk----------	Moderate: slope, large stones.	Moderate: slope, frost action.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
PeC[1]: Paxton----------	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: frost action, large stones, slope.	Severe: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PeC[1]: Montauk	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: slope, frost action, large stones.	Severe: large stones.
PeD[1]: Paxton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Montauk	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
PnA--- Penwood	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Slight---	Severe: too sandy, droughty.
PnB--- Penwood	Severe: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight---	Severe: too sandy, droughty.
Pr[1]. Pits						
Ps--- Podunk	Severe: floods, wetness.	Severe: floods.	Severe: floods wetness.	Severe: floods.	Severe: floods.	Severe: floods.
Rb--- Raypol	Severe: wetness, small stones, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Rp[1]: Rock outcrop.						
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Ru--- Rumney	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Rv--- Rumney Variant	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Sb--- Saco	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Sc--- Scarboro	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SgA--- Sudbury	Severe: wetness, cutbanks cave, small stones.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Slight.
St--- Suncook	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: too sandy.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
UD[1]: Udorthents. Urban land.						
Ur[1]. Urban land						
Wd---------- Walpole	Severe: wetness, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
We, Wh---------- Westbrook	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: floods, corrosive, excess humus.	Severe: wetness, low strength, floods.	Severe: wetness, floods, excess salt.
WkB---------- Wethersfield	Slight---------	Moderate: frost action.	Slight---------	Moderate: frost action.	Moderate: frost action.	Slight.
WkC---------- Wethersfield	Moderate: slope.	Moderate: frost action, slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
WkD---------- Wethersfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WmB---------- Wethersfield	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: large stones.	Moderate: slope, frost action, large stones.	Moderate: frost action.	Moderate: large stones.
WmC---------- Wethersfield	Moderate: slope, large stones.	Moderate: slope, frost action, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
WnC---------- Wethersfield	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: slope, frost action, large stones.	Severe: large stones.
Wr---------- Wilbraham	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Wt---------- Wilbraham	Severe: wetness, large stones.	Severe: wetness, large stones, frost action.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
WvA---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: too sandy, droughty.
WvB---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: too sandy, droughty.
WxA, WxB---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
WyA, WyB---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Moderate: large stones.
WzA---------- Woodbridge	Severe: wetness, large stones.	Severe: frost action, large stones.	Severe: wetness, large stones.	Severe: frost action, large stones.	Severe: frost action.	Severe: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WzC---------- Woodbridge	Severe: wetness, large stones.	Severe: frost action, large stones.	Severe: wetness, large stones.	Severe: slope, frost action, large stones.	Severe: frost action.	Severe: large stones.
YaB---------- Yalesville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.
YaC---------- Yalesville	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: slope, depth to rock.

[1] See the description of the map unit for the composition and behavior characteristics of the entire unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," and "fair." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Aa Adrian	Severe: wetness, floods.	Severe: wetness, seepage, floods.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Poor: wetness, excess humus.
AfA, AfB Agawam	Slight[1]	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
Ba[2]: Beaches.					
Udipsamments.					
BcA Berlin	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey.
BoA, BoB Branford	Slight[1]	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
BoC Branford	Moderate:[1] slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, area reclaim.
CbB[2]: Canton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones, thin layer.
Charlton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
CcB[2]: Canton	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones, thin layer.
Charlton	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones.
CcC[2]: Canton	Moderate: slope, large stones.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones, thin layer.
Charlton	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
CdC[2]: Canton	Severe: large stones.	Severe: slope, seepage.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
Charlton	Severe: large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CdD[2]:					
Canton	Severe: slope, large stones.	Severe: slope, seepage.	Severe: seepage, large stones.	Severe: slope, seepage.	Poor: slope, large stones.
Charlton	Severe: slope, large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage, slope.	Poor: slope, large stones.
Ce	Severe: floods, wetness.	Severe: wetness, excess humus, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness, excess humus.
Carlisle					
CrC:					
Charlton	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
Hollis	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
CsB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
Cheshire					
CsC	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
Cheshire					
CyC[2]:					
Cheshire	Moderate: large stones, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: large stones, slope.
Holyoke	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
EfA	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Fair: thin layer, area reclaim.
Ellington					
HfA, HfB	Slight[1]	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, area reclaim.
Hartford					
HkC	Moderate:[1] slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, area reclaim.
Hinckley					
HME[2]:					
Hinckley	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, too sandy, area reclaim
Manchester	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, too sandy, area reclaim.
HpE[2]:					
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HpE2:					
Charlton	Severe: slope, large stones.	Severe: seepage, slope.	Severe: slope, seepage, large stones.	Severe: seepage, slope.	Poor: slope, large stones.
HrC2:					
Hollis	Severe: depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: thin layer, area reclaim, large stones.
Rock outcrop.					
HSE2:					
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.
Rock outcrop.					
HuD2:					
Holyoke	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Cheshire	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
HyC2:					
Holyoke	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
Rock outcrop.					
HZE2:					
Holyoke	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
LG2:					
Leicester	Severe: large stones, wetness.	Severe: wetness, seepage.	Severe: large stones, wetness, seepage.	Severe: wetness, seepage.	Poor: large stones, wetness.
Ridgebury	Severe: large stones, percs slowly, wetness.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Whitman	Severe: wetness, percs slowly.	Moderate: large stones.	Severe: wetness.	Severe: wetness.	Poor: wetness.
LpA Ludlow	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: area reclaim.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LpB---------- Ludlow	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: area reclaim.
LuB---------- Ludlow	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: large stones, area reclaim.
LvC---------- Ludlow	Severe: percs slowly, wetness, large stones.	Severe: slope.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones.
MgA---------- Manchester	Slight[1]----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, too sandy, area reclaim.
MgC---------- Manchester	Moderate:[1] slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, too sandy, area reclaim.
MyA, MyB---------- Merrimac	Slight[1]----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, area reclaim.
NnA---------- Ninigret	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: thin layer, area reclaim.
PbB[2]: Paxton----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: small stones.
Montauk----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Fair: small stones.
PbC[2]: Paxton----------	Severe: percs slowly.	Severe: slope.	Slight----------	Moderate: slope.	Fair: small stones.
Montauk----------	Severe: percs slowly.	Severe: slope.	Slight----------	Moderate: slope.	Fair: small stones.
PbD[2]: Paxton----------	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
Montauk----------	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
PdB[2]: Paxton----------	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight----------	Fair: large stones.
Montauk----------	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight----------	Fair: large stones.
PdC[2]: Paxton----------	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: large stones, slope.
Montauk----------	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: slope, large stones.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PeC[2]: Paxton	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
Montauk	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
PeD[2]: Paxton	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: large stones.	Severe: slope.	Poor: slope, large stones.
Montauk	Severe: slope, large stones, percs slowly.	Severe: slope.	Severe: large stones.	Severe: slope.	Poor: slope, large stones.
PnA, PnB Penwood	Slight[1]	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, area reclaim.
Pr[2]. Pits					
Ps Podunk	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, seepage.	Severe: floods, wetness, seepage.	Good.
Rb Raypol	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: wetness, small stones.
Rp[2]: Rock outcrop.					
Hollis	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.
Ru Rumney	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Rv Rumney Variant	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Sb Saco	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Sc Scarboro	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness.
SgA Sudbury	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage.	Severe: wetness, seepage.	Poor: thin layer, area reclaim.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
St Suncook	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Poor: area reclaim. too sandy.
UD[2]: Udorthents.					
Urban land.					
Ur[2]. Urban land					
Wd Walpole	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
We, Wh Westbrook	Severe: wetness, floods.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods.	Poor: excess humus, wetness.
WkB Wethersfield	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Fair: small stones.
WkC Wethersfield	Severe: percs slowly.	Severe: slope.	Slight	Moderate: slope.	Fair: small stones.
WkD Wethersfield	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
WmB Wethersfield	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight	Fair: large stones.
WmC Wethersfield	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: slope, large stones.
WnC Wethersfield	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
Wr Wilbraham	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Wt Wilbraham	Severe: wetness, percs slowly, large stones.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
WvA, WvB Windsor	Slight[1]	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, area reclaim.
WxA Woodbridge	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: small stones.
WxB Woodbridge	Severe: percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WyA, WyB Woodbridge	Severe: percs slowly.	Moderate: large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones.
WzA Woodbridge	Severe: percs slowly.	Severe: large stones.	Severe: wetness.	Severe: wetness.	Poor: large stones.

See footnotes at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WzC---------- Woodbridge	Severe: percs slowly.	Severe: slope, large stones.	Severe: wetness.	Severe: wetness.	Poor: large stones.
YaB---------- Yalesville	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock.	Severe: seepage.	Fair: thin layer, area reclaim.
YaC---------- Yalesville	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock.	Severe: seepage.	Fair: slope, thin layer, area reclaim.

[1] Because of rapid permeability ground water may become polluted.
[2] See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Aa Adrian	Poor: excess humus, wetness.	Poor: excess humus.	Poor: excess fines, excess humus.	Poor: wetness, excess humus.
AfA, AfB Agawam	Good	Good	Good	Fair: area reclaim.
Ba[1]: Beaches.				
Udipsamments.				
BcA Berlin	Poor: frost action, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
BoA, BoB Branford	Good	Good	Good	Fair: area reclaim.
BoC Branford	Good	Good	Good	Fair: slope, area reclaim.
CbB[1]: Canton	Good	Poor: excess fines.	Poor: excess fines.	Poor: small stones.
Charlton	Good	Poor: excess fines.	Poor: excess fines.	Fair: small stones.
CcB[1], CcC[1]: Canton	Good	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
Charlton	Good	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
CdC[1]: Canton	Fair: large stones.	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
Charlton	Fair: large stones.	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
CdD[1]: Canton	Fair: slope, large stones.	Poor: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Charlton	Fair: slope, large stones.	Poor: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Ce Carlisle	Poor: low strength, wetness, excess humus.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
CrC[1]: Charlton	Good	Poor: excess fines.	Poor: excess fines.	Poor large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CrC[1]:				
Hollis	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
CsB, CsC	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
Cheshire				
CyC[1]:				
Cheshire	Good	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
Holyoke	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim.
EfA	Fair: frost action.	Good	Good	Fair: area reclaim.
Ellington				
HfA, HfB	Good	Good	Good	Fair: thin layer, area reclaim.
Hartford				
HkC	Good	Good	Good	Poor: too sandy, area reclaim.
Hinckley				
HME[1]:				
Hinckley	Poor: slope.	Good	Good	Poor: slope, too sandy, area reclaim.
Manchester	Poor: slope.	Good	Good	Poor: slope, too sandy, area reclaim.
HpE[1]:				
Hollis	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Charlton	Poor: slope.	Poor: excess fines.	Poor: excess fines.	Poor: slope, large stones.
HrC[1]:				
Hollis	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
Rock outcrop.				
HSE[1]:				
Hollis	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HuD[1]:				
Holyoke	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim.
Cheshire	Fair: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones, slope.
HyC[1]:				
Holyoke	Poor: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Poor: thin layer, area reclaim.
Rock outcrop.				
HZE[1]:				
Holyoke	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Unsuited: thin layer. area reclaim.	Poor: slope, thin layer, area reclaim.
Rock outcrop.				
LG[1]:				
Leicester	Poor: wetness, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
Ridgebury	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, large stones.
Whitman	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, large stones.
LpA, LpB Ludlow	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
LuB, LvC Ludlow	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
MgA, MgC Manchester	Good	Good	Good	Poor: too sandy, area reclaim.
MyA, MyB Merrimac	Good	Good	Good	Fair: thin layer, area reclaim.
NnA Ninigret	Fair: frost action.	Good	Good	Fair. area reclaim.
PbB[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
PbC[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones, slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PbC:[1]				
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: slope, small stones.
PbD[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
PdB[1], PdC[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones, slope.
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones, slope.
PeC[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
PeD[1]:				
Paxton	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Montauk	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
PnA, PnB Penwood	Good	Good	Poor: excess fines.	Poor: too sandy, area reclaim.
Pr[1]. Pits				
Ps Podunk	Good	Fair: excess fines.	Poor: excess fines.	Good.
Rb Raypol	Poor: wetness, frost action.	Fair: excess fines.	Fair: excess fines.	Poor: wetness.
Rp[1]:				
Rock outcrop.				
Hollis	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: slope, thin layer, area reclaim.
Ru Rumney	Poor: wetness.	Fair: excess fines.	Poor: excess fines.	Poor: wetness.
Rv Rumney Variant	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Sb Saco	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Sc---------- Scarboro	Poor: wetness.	Good----------	Poor: excess fines.	Poor: wetness, too sandy.
SgA---------- Sudbury	Fair: wetness.	Good----------	Good----------	Fair: small stones, area reclaim.
St---------- Suncook	Good----------	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
UD[1]: Udorthents. Urban land.				
Ur[1]. Urban land				
Wd---------- Walpole	Poor: wetness.	Good----------	Fair: excess fines.	Poor: wetness.
We, Wh---------- Westbrook	Poor: excess humus, wetness.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess salt.
WkB---------- Wethersfield	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
WkC---------- Wethersfield	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: slope, small stones.
WkD---------- Wethersfield	Fair: slope, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
WmB, WmC---------- Wethersfield	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
WnC---------- Wethersfield	Fair: frost action, large stones.	Unsuited: excess fines, large stones.	Poor: excess fines.	Poor: large stones.
Wr---------- Wilbraham	Poor: frost action, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Wt---------- Wilbraham	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, large stones.
WvA, WvB---------- Windsor	Good----------	Good----------	Poor: excess fines.	Poor: too sandy, area reclaim.
WxA, WxB---------- Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
WyA, WyB, WzA, WzC---- Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
YaB---------- Yalesville	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines.	Fair: small stones.
YaC---------- Yalesville	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines.	Fair: slope, thin layer, small stones.

[1] See description of the map unit for the composition and behavior characteristics of the entire map unit.

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Aa Adrian	Seepage	Seepage, wetness, hard to pack.	Favorable	Floods, excess humus.	Not needed	Wetness.
AfA, AfB Agawam	Slope, seepage.	Seepage, piping.	No water	Not needed	Slope, erodes easily.	Slope, erodes easily.
Ba[1]: Beaches.						
Udipsamments.						
BcA Berlin	Slope	Low strength, erodes easily.	Deep to water	Slope, percs slowly, frost action.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
BoA, BoB, BoC Branford	Seepage, slope.	Seepage, piping.	No water	Not needed	Slope, erodes easily.	Slope, erodes easily.
CbB[1]: Canton	Slope, seepage.	Seepage	No water	Not needed	Slope, small stones, too sandy.	Slope, erodes easily.
Charlton	Seepage, slope.	Seepage	No water	Not needed	Slope, erodes easily, small stones.	Slope, erodes easily.
CcB[1], CcC[1], CdC[1], CdD[1]: Canton	Slope, seepage.	Seepage, large stones.	No water	Not needed	Slope, large stones, too sandy.	Slope, large stones, erodes easily.
Charlton	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope, erodes easily.	Large stones, slope, erodes easily.
Ce Carlisle	Seepage	Excess humus, wetness, hard to pack.	Favorable	Excess humus, floods.	Not needed	Wetness.
CrC[1]: Charlton	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope, erodes easily.	Large stones, slope, erodes easily.
Hollis	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
CsB, CsC Cheshire	Seepage, slope.	Seepage	No water	Not needed	Slope	Slope.
CyC[1]: Cheshire	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.
Holyoke	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
EfA---------- Ellington	Slope, seepage.	Seepage, piping.	Deep to water, cutbanks cave.	Wetness, slope, cutbanks cave.	Seepage, slope, erodes easily.	Slope, erodes easily, seepage.
HfA, HfB---------- Hartford	Slope, seepage.	Seepage--------	No water-------	Not needed-----	Slope----------	Slope, droughty.
HkC---------- Hinckley	Slope, seepage.	Thin layer, seepage.	No water-------	Not needed-----	Slope, too sandy.	Slope, droughty.
HME[1]: Hinckley---------	Slope, seepage.	Thin layer, seepage.	No water-------	Not needed-----	Slope, too sandy.	Slope, droughty.
Manchester-------	Slope, seepage.	Seepage, thin layer.	No water-------	Not needed-----	Slope, too sandy.	Slope, droughty.
HpE[1]: Hollis----------	Slope, depth to rock, seepage.	Thin layer, seepage, large stones.	No water, depth to rock.	Not needed-----	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
Charlton---------	Seepage, slope.	Seepage, large stones.	No water-------	Not needed-----	Large stones, slope, erodes easily.	Large stones, slope, erodes easily.
HrC[1], HSE[1]: Hollis----------	Slope, depth to rock, seepage.	Thin layer, seepage, large stones.	No water, depth to rock.	Not needed-----	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
Rock outcrop.						
HuD[1]: Holyoke----------	Slope, depth to rock, seepage.	Thin layer, piping, seepage, large stones.	No water, depth to rock.	Not needed-----	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
Cheshire---------	Seepage, slope.	Seepage, large stones.	No water-------	Not needed-----	Large stones, slope.	Large stones, slope.
HyC[1], HZE[1]: Holyoke----------	Slope, depth to rock, seepage.	Thin layer, piping, seepage, large stones.	No water, depth to rock.	Not needed-----	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
Rock outcrop.						
LG[1]: Leicester--------	Seepage, slope.	Seepage, large stones.	Large stones---	Wetness--------	Wetness, large stones.	Wetness, large stones.
Ridgebury--------	Slope----------	Large stones---	Large stones---	Wetness, percs slowly.	Wetness, large stones, percs slowly.	Wetness, large stones, percs slowly.
Whitman----------	Favorable------	Large stones---	Large stones---	Wetness, percs slowly.	Large stones, wetness, percs slowly.	Large stones, wetness, percs slowly.
LpA, LpB---------- Ludlow	Slope----------	Favorable------	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
LuB, LvC---------- Ludlow	Slope----------	Large stones---	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
MgA, MgC---------- Manchester	Slope, seepage.	Seepage, thin layer.	No water-------	Not needed-----	Slope, too sandy, complex slope.	Slope, droughty.
MyA, MyB---------- Merrimac	Slope, seepage.	Seepage--------	No water-------	Not needed-----	Slope, too sandy.	Slope, droughty.
NnA---------- Ninigret	Slope, seepage.	Seepage--------	Deep to water, cutbanks cave.	Wetness, slope, cutbanks cave.	Slope, wetness.	Slope, wetness.
PbB[1], PbC[1], PbD[1]: Paxton----------	Favorable, slope.	Favorable------	No water-------	Not needed-----	Percs slowly, erodes easily.	Percs slowly, slope, erodes easily.
Montauk----------	Slope, seepage.	Piping---------	No water-------	Not needed-----	Percs slowly, erodes easily, slope.	Percs slowly, slope, erodes easily.
PdB[1], PdC[1], PeC[1], PeD[1]: Paxton----------	Slope----------	Large stones---	No water-------	Not needed-----	Large stones, percs slowly, slope.	Large stones, percs slowly, slope.
Montauk---------	Slope----------	Large stones, piping.	No water-------	Not needed-----	Large stones, percs slowly, slope.	Large stones, percs slowly, slope.
PnA, PnB---------- Penwood	Seepage, slope.	Seepage--------	No water-------	Not needed-----	Too sandy, slope.	Droughty, slope.
Pr[1]. Pits						
Ps---------- Podunk	Floods, seepage.	Seepage, erodes easily.	Floods, deep to water.	Poor outlets, floods.	Not needed-----	Not needed.
Rb---------- Raypol	Seepage--------	Seepage, piping.	Favorable------	Wetness--------	Wetness, erodes easily.	Wetness, erodes easily.
Rp[1]: Rock outcrop.						
Hollis----------	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed-----	Slope, depth to rock, rooting depth, large stones.	Slope, droughty, rooting depth, large stones.
Ru---------- Rumney	Floods---------	Seegage--------	Favorable------	Wetness, floods, poor outlets.	Not needed-----	Not needed.
Rv---------- Rumney Variant	Seepage, floods.	Piping, seepage.	Floods---------	Floods, wetness.	Not needed-----	Wetness.
Sb---------- Saco	Seepage--------	Piping, wetness.	Favorable------	Floods, frost action.	Not needed-----	Wetness, erodes easily.
Sc---------- Scarboro	Seepage--------	Hard to pack, seepage.	Favorable------	Cutbanks cave, wetness.	Not needed-----	Wetness.
SgA---------- Sudbury	Slope, seepage.	Seepage--------	Deep to water, cutbanks cave.	Cutbanks cave.	Slope, too sandy.	Wetness, slope.
St---------- Suncook	Seepage, floods.	Seepage, erodes easily.	Deep to water	Not needed-----	Not needed-----	Not needed.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
UD[1]: Udorthents. Urban land.						
Ur[1]. Urban land						
Wd---------- Walpole	Seepage--------	Hard to pack, seepage.	Favorable------	Wetness--------	Wetness, piping.	Wetness.
We, Wh---------- Westbrook	Excess humus, seepage, floods.	Hard to pack, excess humus, seepage.	Salty water----	Floods, wetness, excess salt.	Not needed-----	Not needed.
WkB, WkC, WkD----- Wethersfield	Slope----------	Favorable------	No water-------	Not needed-----	Slope, erodes easily.	Slope, erodes easily.
WmB, WmC, WnC----- Wethersfield	Slope, large stones.	Large stones---	No water-------	Not needed-----	Slope, large stones, erodes easily.	Slope, large stones, erodes easily.
Wr---------- Wilbraham	Slope----------	Favorable------	Favorable------	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Wt---------- Wilbraham	Slope----------	Large stones---	Large stones---	Wetness, percs slowly.	Wetness, large stones, percs slowly.	Wetness, large stones, percs slowly.
WvA, WvB---------- Windsor	Seepage, slope.	Seepage--------	No water-------	Not needed-----	Slope, too sandy.	Droughty, slope.
WxA, WxB---------- Woodbridge	Slope----------	Favorable------	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
WyA, WyB, WzA, WzC---------- Woodbridge	Slope, large stones.	Large stones---	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.
YaB, YaC---------- Yalesville	Seepage, depth to rock, slope.	Seepage, thin layer.	No water-------	Not needed-----	Depth to rock, slope.	Slope, rooting depth.

[1] See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Aa Adrian	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
AfA Agawam	Slight	Slight	Slight	Slight	Slight.
AfB Agawam	Slight	Slight	Moderate: slope.	Slight	Slight.
Ba[1]: Beaches.					
Udipsamments.					
BcA Berlin	Moderate: wetness, percs slowly.	Moderate: too clayey.	Moderate: percs slowly, too clayey.	Slight	Slight.
BoA Branford	Slight	Slight	Slight	Slight	Slight.
BoB Branford	Slight	Slight	Moderate: slope.	Slight	Slight.
BoC Branford	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CbB[1]: Canton	Slight	Slight	Moderate: slope.	Slight	Slight.
Charlton	Slight	Slight	Moderate: slope.	Slight	Slight.
CcB[1]: Canton	Moderate: large stones.	Slight	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
Charlton	Moderate: large stones.	Slight	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
CcC[1]: Canton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
Charlton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
CdC[1]: Canton	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CdC[1]:					
Charlton	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
CdD[1]:					
Canton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
Charlton	Severe: large stones, slope.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
Ce	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
Carlisle					
CrC[1]:					
Charlton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
Hollis	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: large stones.	Severe: depth to rock.
CsB	Slight	Slight	Moderate: slope.	Slight	Slight.
Cheshire					
CsC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Cheshire					
CyC[1]:					
Cheshire	Moderate: large stones, slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
Holyoke	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: large stones.	Severe: depth to rock.
EfA	Slight	Slight	Moderate: wetness.	Slight	Slight.
Ellington					
HfA	Slight	Slight	Slight	Slight	Moderate: droughty.
Hartford					
HfB	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Hartford					
HkC	Moderate: too sandy, small stones.	Moderate: too sandy, small stones.	Severe: slope, small stones.	Moderate: too sandy, small stones.	Severe: small stones, droughty.
Hinckley					
HME[1]:					
Hinckley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones, droughty.
Manchester	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones, droughty.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HpE[1]:					
Hollis	Severe: slope, large stones.	Severe: slope.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.
Charlton	Severe: large stones, slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
HrC[1]:					
Hollis	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.
Rock outcrop.					
HSE[1]:					
Hollis	Severe: slope, large stones.	Severe: slope.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.
Rock outcrop.					
HuD[1]:					
Holyoke	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope, large stones.	Severe: slope, depth to rock.
Cheshire	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: slope.
HyC[1]:					
Holyoke	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: large stones.	Severe: depth to rock, large stones.
Rock outcrop.					
HZE[1]:					
Holyoke	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					
LG[1]:					
Leicester	Severe: large stones, wetness.	Severe: wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.
Ridgebury	Severe: wetness, large stones.	Severe: wetness.	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: large stones, wetness.
Whitman	Severe: wetness, large stones.	Severe: wetness.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: large stones, wetness.
LpA Ludlow	Moderate: percs slowly.	Slight	Moderate: percs slowly, wetness.	Slight	Slight.
LpB Ludlow	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly, wetness.	Slight	Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LuB---------- Ludlow	Moderate: large stones, percs slowly.	Slight----------	Moderate: slope, percs slowly, large stones, wetness.	Moderate: large stones.	Moderate: large stones.
LvC---------- Ludlow	Severe: large stones.	Moderate: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
MgA---------- Manchester	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Severe: small stones, droughty.
MgC---------- Manchester	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones, droughty.
MyA---------- Merrimac	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
MyB---------- Merrimac	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
NnA---------- Ninigret	Slight----------	Slight----------	Moderate: wetness.	Slight----------	Slight.
PbB[1]: Paxton----------	Moderate: percs slowly.	Slight----------	Moderate: percs slowly, slope.	Slight----------	Slight.
Montauk----------	Moderate: percs slowly.	Slight----------	Moderate: slope, percs slowly.	Slight----------	Slight.
PbC[1]: Paxton----------	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Montauk----------	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
PbD[1]: Paxton----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Montauk----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PdB[1]: Paxton----------	Moderate: percs slowly, large stones.	Slight----------	Moderate: percs slowly, slope, large stones.	Moderate: large stones.	Moderate: large stones.
Montauk----------	Moderate: large stones, percs slowly.	Slight----------	Moderate: percs slowly, slope, large stones.	Moderate: large stones.	Moderate: large stones.
PdC[1]: Paxton----------	Moderate: percs slowly, large stones. slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.

See footnote at end of table.

TABLE 12--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PdC:[1] Montauk	Moderate: slope, large stones, percs slowly.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
PeC[1]: Paxton	Severe: large stones.	Moderate: large stones, slope.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Montauk	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
PeD[1]: Paxton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
Montauk	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
PnA, PnB Penwood	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
Pr[1]. Pits					
Ps Podunk	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Rb Raypol	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Rp[1]: Rock outcrop.					
Hollis	Severe: slope, large stones.	Severe: slope.	Severe: slope, depth to rock, large stones.	Severe: large stones.	Severe: slope, depth to rock.
Ru Rumney	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.
Rv Rumney Variant	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.
Sb Saco	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.
Sc Scarboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SgA Sudbury	Slight	Slight	Moderate: wetness.	Slight	Slight.
St Suncook	Moderate: too sandy, floods.	Moderate: too sandy, floods.	Moderate: too sandy, floods.	Moderate: too sandy.	Moderate: too sandy.
UD[1]: Udorthents.					
Urban land.					

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ur[1]. Urban land					
Wd Walpole	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
We, Wh Westbrook	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess salt.
WkB Wethersfield	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
WkC Wethersfield	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
WkD Wethersfield	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WmB Wethersfield	Moderate: percs slowly, large stones.	Slight	Moderate: slope, percs slowly, large stones.	Moderate: large stones.	Moderate: large stones.
WmC Wethersfield	Moderate: slope, percs slowly, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
WnC Wethersfield	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Wr Wilbraham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wt Wilbraham	Severe: wetness, large stones.	Severe: wetness.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
WvA, WvB Windsor	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
WxA Woodbridge	Moderate: percs slowly.	Slight	Moderate: percs slowly, wetness.	Slight	Slight.
WxB Woodbridge	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope, wetness.	Slight	Slight.
WyA Woodbridge	Moderate: percs slowly.	Slight	Moderate: percs slowly, wetness.	Moderate: large stones.	Moderate: large stones.
WyB Woodbridge	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope, wetness.	Moderate: large stones.	Moderate: large stones.
WzA Woodbridge	Severe: large stones.	Moderate: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of the table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WzC---------- Woodbridge	Severe: large stones.	Moderate: large stones, slope.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones, slope.
YaB---------- Yalesville	Slight----------	Slight----------	Moderate: slope, depth to rock.	Slight----------	Moderate: depth to rock.
YaC---------- Yalesville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, depth to rock.

[1] See the description of the map unit for the composition and behavior characteristics of the entire unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Aa---------- Adrian	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
AfA---------- Agawam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AfB---------- Agawam	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ba[1]: Beaches.										
Udipsamments.										
BcA---------- Berlin	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
BoA---------- Branford	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BoB---------- Branford	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BoC---------- Branford	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CbB[1]: Canton----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Charlton----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CcB[1]: Canton----------	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
Charlton----------	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
CcC[1]: Canton----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Charlton----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CdC[1], CdD[1]: Canton----------	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Charlton----------	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ce---------- Carlisle	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
CrC[1]: Charlton----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CrC[1]:										
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CsB---------- Cheshire	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CsC---------- Cheshire	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CyC[1]:										
Cheshire	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Holyoke	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
EfA---------- Ellington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HfA, HfB---------- Hartford	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
HkC---------- Hinckley	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HME[1]:										
Hinckley	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Manchester	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HpE[1]:										
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Charlton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
HrC[1]:										
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
HSE[1]:										
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
HuD[1]:										
Holyoke	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Cheshire	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
HyC[1]:										
Holyoke	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HZE[1]:										
Holyoke	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
LG[1]:										
Leicester	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Ridgebury	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Whitman	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
LpA---- Ludlow	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LpB---- Ludlow	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LuB---- Ludlow	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
LvC---- Ludlow	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
MgA, MgC. Manchester	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MyA, MyB---- Merrimac	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
NnA---- Ninigret	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
PbB[1]:										
Paxton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Montauk	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PbC[1]:										
Paxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Montauk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PbD[1]:										
Paxton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Montauk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PdB[1]:										
Paxton	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
Montauk	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
PdC[1]:										
Paxton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Montauk	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
PeC[1], PeD[1]:										
Paxton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Montauk	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
PnA, PnB Penwood	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Pr[1]. Pits										
Ps Podunk	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Rb Raypol	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Rp[1]: Rock outcrop.										
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Ru Rumney	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Rv Rumney Variant	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Sb Saco	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Sc Scarboro	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
SgA Sudbury	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
St Suncook	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
UD[1]: Udorthents. Urban land.										
Ur[1]. Urban land										
Wd Walpole	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
We, Wh Westbrook	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
WkB Wethersfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
WkC---- Wethersfield	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WkD---- Wethersfield	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WmB---- Wethersfield	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
WmC---- Wethersfield	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
WnC---- Wethersfield	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Wr---- Wilbraham	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Wt---- Wilbraham	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
WvA, WvB---- Windsor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
WxA---- Woodbridge	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WxB---- Woodbridge	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WyA---- Woodbridge	Very poor.	Poor	Good	Good	Good	Poor	Poor	Poor	Good	Poor.
WyB---- Woodbridge	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
WzA---- Woodbridge	Very poor.	Very poor.	Good	Good	Good	Poor	Poor	Poor	Fair	Poor.
WzC---- Woodbridge	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
YaB---- Yalesville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
YaC---- Yalesville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Aa	0-24	Muck	Pt	A-8	---	---	---	---	---	---	---
Adrian	24-60	Sand, loamy sand, gravelly loamy sand.	SP, SM	A-2, A-3, A-1	0	80-100	60-100	35-75	0-30	---	NP[1]
AfA, AfB	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	85-100	40-65	---	---
Agawam	8-14	Fine sandy loam, very fine sandy loam, loam.	SM, ML	A-4	0	95-100	85-100	80-100	40-65	---	---
	14-24	Fine sandy loam	SM, SP-SM	A-2, A-3, A-4	0	90-100	85-100	75-95	5-45	---	---
	24-60	Stratified fine sand to very gravelly loamy sand.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	30-100	15-80	5-35	---	---
Ba[2]: Beaches.											
Udipsamments.											
BcA	0-12	Silt loam	ML, CL, OL	A-4, A-6, A-7	0	90-100	85-100	80-100	65-90	30-50	4-15
Berlin	12-30	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML	A-4, A-6, A-7	0	90-100	85-100	80-100	65-90	15-40	4-18
	30-60	Silty clay, clay, silty clay loam.	CL, ML, CL-ML	A-6, A-7	0	100	100	100	90-100	25-45	5-20
BoA, BoB, BoC	0-6	Silt loam	ML, SM	A-4	0	95-100	70-95	60-90	40-80	<25	NP-5
Branford	6-23	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0	80-100	60-95	40-90	30-80	<25	NP-3
	23-60	Stratified sand to gravel.	GP, SP	A-1, A-3	0-25	35-95	25-80	10-55	0-10	---	NP
CbB[2]:											
Canton	0-19	Fine sandy loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	19-60	Gravelly loamy fine sand, gravelly loamy coarse sand, gravelly loamy sand.	SP, SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton	0-10	Fine sandy loam	SM, ML	A-2, A-4	5-10	75-95	70-90	60-85	30-70	---	NP-5
	10-32	Fine sandy loam, gravelly sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	32-60	Gravelly sandy loam, gravelly fine sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CcB2, CcC2:											
Canton	0-2	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-25	80-100	65-95	45-90	25-70	<18	NP
	2-19	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	19-60	Gravelly loamy sand, gravelly loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton	0-10	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-85	30-70	---	NP-5
	10-32	Fine sandy loam, gravelly sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	32-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
CdC2, CdD2:											
Canton	0-2	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-30	80-95	60-90	40-85	25-70	<15	NP
	2-19	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	19-60	Gravelly loamy sand, gravelly loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton	0-10	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-85	30-70	---	NP-5
	10-32	Fine sandy loam, gravelly sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	32-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
Ce	0-60	Muck	Pt	A-8	---	---	---	---	---	---	---
Carlisle											
CrC2:											
Charlton	0-10	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-85	30-70	---	NP-5
	10-32	Fine sandy loam, gravelly sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	32-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CrC2:											
Hollis	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	3-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CsB, CsC	0-8	Silt loam	SM, ML	A-2, A-4	0-10	85-95	80-95	60-85	30-70	<25	NP-5
Cheshire	8-26	Fine sandy loam, silt loam, loam.	SM, ML	A-2, A-4	0-10	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-55	15-45	---	NP
CyC2:											
Cheshire	0-8	Very stony silt loam.	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-70	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	15-45	---	NP
Holyoke	0-4	Silt loam	ML, SM, CL-ML	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	4-13	Silt loam, loam, gravelly fine sandy loam.	ML, SM	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
EfA	0-6	Fine sandy loam	ML, SM	A-4	0	95-100	75-95	55-95	40-95	<35	NP-7
Ellington	6-29	Silt loam, loam, fine sandy loam.	ML, SM	A-2, A-4	0	75-100	50-95	35-95	20-85	<25	NP-5
	29-60	Gravelly sand, very gravelly sand, loamy sand.	SP, GP	A-1	5-30	30-70	20-60	15-45	0-10	---	NP
HfA, HfB	0-9	Sandy loam	SM, ML	A-2, A-4	0-5	85-100	75-95	50-90	25-60	<25	NP-3
Hartford	9-24	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM	A-2	0-10	65-95	65-90	40-60	10-35	---	NP
	24-60	Gravelly sand, very gravelly sand.	SP, GP	A-1	5-30	40-65	35-55	5-45	0-10	---	NP
HkC	0-8	Gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-20	60-95	40-85	20-80	6-55	---	NP
Hinckley	8-20	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, GM, GP-GM	A-1, A-2	0-20	50-95	30-85	15-70	2-30	---	NP
	20-60	Stratified gravelly loamy fine sand to very cobbly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-45	40-75	20-50	10-40	0-20	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HME[2]:											
Hinckley----------	0-8	Gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-20	60-95	40-85	20-80	6-55	---	NP
	8-20	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, GM, GP-GM	A-1, A-2	0-20	50-95	30-85	15-70	2-30	---	NP
	20-60	Stratified gravelly loamy fine sand to very cobbly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	0-45	40-75	20-50	10-40	0-20	---	NP
Manchester--------	0-9	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-20	70-95	60-75	30-60	15-40	---	NP
	9-22	Gravelly sandy loam, gravelly loamy sand.	SM, GM	A-1, A-2	0-20	50-90	50-70	25-50	10-30	---	NP
	22-60	Stratified sand to gravel.	SP, GW	A-1	5-30	30-70	20-55	10-35	0-10	---	NP
HpE[2]:											
Hollis------------	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	3-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Charlton----------	0-10	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-85	30-70	---	NP-5
	10-32	Fine sandy loam, gravelly sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	32-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
HrC[2], HSE[2]:											
Hollis------------	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	3-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
HuD[2]:											
Holyoke-----------	0-4	Silt loam-------	ML, SM, CL-ML	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	4-13	Silt loam, loam, gravelly fine sandy loam.	ML, SM	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HuD2:											
Cheshire	0-8	Very stony silt loam.	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-70	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	15-45	---	NP
HyC2, HZE2:											
Holyoke	0-4	Silt loam	ML, SM, CL-ML	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	4-13	Silt loam, loam, gravelly fine sandy loam.	ML, SM	A-4	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
LG2:											
Leicester	0-7	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-25	70-95	70-90	45-85	25-70	<25	NP-5
	7-33	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	5-10	70-90	60-85	40-75	20-50	---	NP
	33-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	65-90	55-85	35-70	20-45	---	NP
Ridgebury	0-7	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-30	70-100	60-95	45-85	25-65	---	NP
	7-24	Sandy loam, gravelly loam, fine sandy loam	SM, GM, ML	A-1, A-2, A-4	10-30	65-95	55-90	40-80	20-60	---	NP
	24-60	Sandy loam, gravelly loam.	SM, GM, ML	A-1, A-2, A-4	10-30	65-95	55-90	35-80	20-60	---	NP
Whitman	0-5	Extremely stony fine sandy loam	SM, ML, OL	A-2, A-4	5-35	85-95	70-90	55-90	25-75	---	NP
	5-22	Sandy loam, fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-25	70-95	60-90	45-80	20-65	---	NP
	22-60	Sandy loam, fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-20	70-95	60-90	45-80	20-65	---	NP
LpA, LpB	0-8	Silt loam	ML	A-4	0-5	80-95	70-90	65-85	55-70	<45	NP-8
Ludlow	8-26	Loam, silt loam, gravelly loam.	ML	A-4	0-5	80-95	70-90	65-85	55-70	<45	NP-7
	26-60	Loam, gravelly fine sandy loam, silt loam.	ML	A-4	0-10	70-90	65-85	60-80	50-65	<35	NP-7

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LuB---------- Ludlow	0-8	Very stony silt loam.	ML	A-4	2-10	80-95	70-90	65-85	55-70	<45	NP-8
	8-26	Loam, silt loam, gravelly loam.	ML	A-4	0-10	80-95	70-90	65-85	55-70	<45	NP-7
	26-60	Loam, gravelly fine sandy loam, silt loam.	ML	A-4	5-15	70-90	65-85	60-80	55-65	<35	NP-7
LvC---------- Ludlow	0-8	Extremely stony silt loam.	ML	A-4	0-10	80-95	70-90	65-85	55-70	<45	NP-8
	8-26	Loam, silt loam, gravelly loam.	ML	A-4	0-10	80-95	70-90	65-85	55-70	<45	NP-7
	26-60	Loam, gravelly fine sandy loam, silt loam	ML	A-4	5-15	70-90	65-85	60-80	55-65	<35	NP-7
MgA, MgC---------- Manchester	0-9	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-20	70-95	60-75	30-60	15-40	---	NP
	9-22	Gravelly sandy loam, gravelly loamy sand.	SM, GM	A-1, A-2	0-20	50-90	50-70	25-50	10-30	---	NP
	22-60	Stratified sand to gravel.	SP, GW	A-1	5-30	30-70	20-55	10-35	0-10	---	NP
MyA, MyB---------- Merrimac	0-9	Sandy loam------	SM, ML	A-2, A-4	0	85-95	70-90	40-85	20-55	<20	NP
	9-18	Sandy loam------	SM	A-2	0	75-95	70-90	40-60	20-35	<25	NP
	18-22	Gravelly loamy sand, sandy loam, gravelly sandy loam.	SP, SP-SM, GP, GP-GM	A-1, A-2	0	65-95	55-90	30-60	0-35	<25	NP
	22-60	Stratified sand to very gravelly sand.	GP, SP, SP-SM, GP-GM	A-1	5-25	40-65	30-60	15-40	0-10	---	NP
NnA---------- Ninigret	0-9	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	70-95	40-65	<25	NP-3
	9-25	Fine sandy loam, sandy loam, silt loam.	SM	A-2, A-4	0	95-100	90-100	65-85	20-50	---	NP
	25-60	Loamy sand, sand, gravelly sand.	SP, SM, GM	A-1, A-2, A-3	0-10	60-100	45-100	25-75	0-30	---	NP
PbB[2], PbC[2] PbD[2]: Paxton----------	0-10	Fine sandy loam	SM, ML	A-2, A-4	0-10	80-95	75-90	60-85	30-65	<30	NP-10
	10-32	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	65-90	55-85	25-65	<30	NP-10
	32-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	60-85	55-75	20-60	<30	NP-10
Montauk----------	0-15	Fine sandy loam	ML, SM	A-4, A-2	0	90-100	85-95	55-90	30-85	<20	NP-4
	15-31	Fine sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4, A-1	0-5	80-100	70-95	40-90	20-80	<20	NP-4
	31-60	Sandy loam, fine sandy loam, gravelly loamy sand.	SM, SP-SM	A-2, A-1, A-4	0-5	65-100	55-95	30-80	10-50	<15	NP-2

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PdB2, PdC2:											
Paxton	0-10	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-20	80-95	75-90	60-85	30-65	<30	<10
	10-32	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	<10
	32-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	55-75	20-60	<30	<10
PdB2, PdC2:											
Montauk	0-15	Very stony fine sandy loam.	SM, ML	A-1, A-2, A-4	2-6	80-90	65-75	40-70	20-55	<20	NP-4
	15-31	Fine sandy loam, gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-5	80-100	70-95	40-90	20-80	<20	NP-4
	31-60	Sandy loam, fine sandy loam, gravelly loamy sand.	SM	A-1, A-2, A-4	0-5	65-95	55-90	30-80	10-50	<15	NP-2
PeC2, PeD2:											
Paxton	0-10	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-25	80-90	70-85	60-80	30-65	<30	<10
	10-32	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	<10
	32-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	55-75	20-60	<30	<10
Montauk	0-15	Extremely stony fine sandy loam.	SM, ML	A-1, A-2, A-4	5-25	70-100	55-75	35-70	20-55	<20	NP-4
	15-31	Fine sandy loam, gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-5	80-100	70-95	40-90	20-80	<20	NP-4
	31-60	Sandy loam, fine sandy loam, gravelly loamy sand.	SM	A-1, A-2, A-4	0-5	65-95	55-90	30-80	10-50	<15	NP-2
PnA, PnB	0-8	Loamy sand	SM	A-2	0	95-100	90-100	75-95	20-30	---	NP
Penwood	8-28	Loamy sand, loamy fine sand, sand.	SP, SM	A-2, A-3	0	95-100	90-100	65-95	0-30	---	NP
	28-60	Sand, fine sand	SP, SM	A-2, A-3	0	90-100	85-100	60-90	0-20	---	NP
Pr2.											
Pits											
Ps	0-11	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	60-100	30-75	---	NP
Podunk	11-32	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	100	95-100	60-85	30-50	---	NP
	32-60	Loamy fine sand, loamy sand, coarse sand.	SP-SM, SM	A-2, A-1	0	90-100	80-100	40-85	5-25	---	NP
Rb	0-10	Silt loam	ML	A-4	0	90-100	85-100	75-100	65-90	<30	NP-7
Raypol	10-24	Silt loam. fine sandy loam, loam.	ML	A-4	0	90-100	85-100	75-100	65-90	<25	NP-5
	24-60	Gravelly sand, sand.	SP, GP	A-1, A-3, A-2	0-20	45-90	35-85	15-60	0-10	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Rp[2]: Rock outcrop.											
Hollis	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	3-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ru	0-19	Fine sandy loam	SM, ML	A-2, A-4	0	100	85-100	50-85	25-55	<40	NP
Rumney	19-31	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	85-100	50-95	25-75	<40	NP
	31-60	Stratified loamy sand to gravelly sand.	SP, SM	A-1, A-2, A-3	0	80-100	55-95	25-70	5-30	<40	NP
Rv	0-12	Silt loam	ML	A-4	0-3	95-100	95-100	90-100	65-90	<30	NP-5
Rumney Variant	12-28	Silt loam	ML	A-4	0-3	95-100	95-100	85-100	65-95	<30	NP-5
	28-60	Silt loam, very fine sandy loam, loam.	ML	A-4	0-5	95-100	95-100	80-100	55-95	<30	NP-5
Sb	0-6	Mucky silt loam	ML, OL	A-4	0	100	100	95-100	70-95	<40	NP-10
Saco	6-18	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-95	<40	NP-10
	18-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	90-100	50-95	<25	NP-5
Sc	0-14	Mucky loamy fine sand.	SM	A-2, A-4	0	90-100	80-100	65-95	25-50	---	NP
Scarboro	14-60	Loamy sand, sand	SM, SP	A-1, A-2	0	85-100	70-100	45-90	0-25	---	NP
SgA	0-9	Sandy loam	SM, ML	A-2, A-4	0-5	85-100	60-100	40-90	20-55	<25	NP
Sudbury	9-18	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-80	20-50	<25	NP
	18-36	Gravelly coarse sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	60-100	30-70	5-35	<25	NP
	36-60	Stratified sand and gravel.	SP, SP-SM, GP, GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	---	NP
St	0-10	Loamy sand	SM	A-2	0	95-100	85-100	65-70	15-35	---	NP
Suncook	10-60	Stratified loamy fine sand to coarse sand.	SP, SM	A-1, A-2, A-3	0	60-100	45-100	20-95	0-35	---	NP
UD[2]: Udorthents.											
Urban land.											
Ur[2]. Urban land											

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wd	0-10	Sandy loam	SM, OL	A-2, A-4	0-5	90-100	85-100	70-100	30-50	<25	NP-3
Walpole	10-23	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-95	25-50	---	NP
	23-60	Gravelly loamy sand, gravelly sand, sand.	SP, SM, GP	A-1, A-2, A-3	0-20	55-100	50-100	25-90	0-25	---	NP
We, Wh	0-48	Mucky peat	Pt	A-8	0	---	---	---	---	---	NP
Westbrook	48-99	Silt loam, very fine sandy loam, silt.	ML, CL-ML, OL	A-4	0	95-100	95-100	95-100	85-100	<25	NP-5
WkB, WkC, WkD	0-12	Loam	ML	A-4, A-5	0-5	85-95	80-95	65-85	55-70	<45	NP-8
Wethersfield	12-26	Loam, silt loam, fine sandy loam.	ML	A-4, A-5	0-5	85-95	80-95	65-85	55-70	<45	NP-7
	26-60	Gravelly loam, loam, gravelly fine sandy loam.	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
WmB, WmC	0-12	Very stony loam	ML	A-4, A-5	10-20	85-95	80-95	65-85	55-70	<45	NP-8
Wethersfield	12-26	Loam, silt loam, fine sandy loam.	ML	A-4, A-5	5-15	85-95	80-95	65-85	55-70	<45	NP-7
	26-60	Loam, gravelly loam, gravelly fine sandy loam.	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
WnC	0-12	Extremely stony loam.	ML	A-4, A-5	10-25	85-95	80-95	65-85	55-70	<45	NP-8
Wethersfield	12-26	Loam, silt loam, fine sandy loam.	ML	A-4, A-5	5-15	85-95	80-95	65-85	55-70	<45	NP-7
	26-60	Loam, gravelly loam, gravelly fine sandy loam.	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
Wr	0-4	Silt loam	ML	A-4, A-5	0-5	80-95	70-95	65-85	55-70	<45	NP-8
Wilbraham	4-20	Loam, silt loam, gravelly loam.	ML	A-4, A-5	0-5	80-95	70-95	65-85	55-70	<45	NP-7
	20-60	Loam, gravelly loam, silt loam.	ML	A-4	0-10	70-90	65-85	60-80	55-65	<35	NP-7
Wt	0-4	Extremely stony silt loam.	ML	A-4, A-5	5-15	80-95	70-95	65-85	55-70	<45	NP-8
Wilbraham	4-20	Loam, silt loam, gravelly loam.	ML	A-4, A-5	0-10	80-95	70-95	65-85	55-70	<45	NP-7
	20-60	Loam, gravelly loam, silt loam.	ML	A-4	0-10	70-90	65-85	60-80	55-65	<35	NP-7
WvA, WvB	0-7	Loamy sand	SM	A-2	0	95-100	85-100	35-85	20-35	---	NP
Windsor	7-32	Loamy sand, loamy fine sand, sand.	SW-SM, SM	A-2, A-3	0	95-100	85-100	45-95	10-30	---	NP
	32-60	Sand, fine sand, loamy sand.	SP-SM, SM	A-2, A-3	0	90-100	75-100	40-95	5-20	---	NP

See footnotes at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
WxA, WxB---------- Woodbridge	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	70-90	60-85	30-65	<30	NP-10
	8-28	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC	A-2, A-4	0-15	75-95	65-90	55-85	25-60	<30	NP-10
	28-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC	A-2, A-4	5-15	70-90	60-90	50-85	25-60	<30	NP-10
WyA, WyB---------- Woodbridge	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-10	85-95	70-90	60-85	30-65	<30	NP-10
	8-28	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-10	75-95	65-90	55-85	25-60	<30	NP-10
	28-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-15	70-90	60-90	50-85	25-60	<30	NP-10
WzA, WzC---------- Woodbridge	0-8	Extremely stony sandy loam.	SM, ML	A-2, A-4	5-15	85-95	70-90	60-85	30-65	<30	NP-10
	8-28	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-10	75-95	65-90	55-85	25-60	<30	NP-10
	28-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-15	70-90	60-90	50-85	25-60	<30	NP-10
YaB, YaC---------- Yalesville	0-10	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-95	75-95	50-85	30-70	---	NP
	10-20	Fine sandy loam, silt loam, gravelly fine sandy loam.	SM, ML, GM	A-2, A-4	0-10	60-95	50-95	35-85	25-70	---	NP
	20-30	Fine sandy loam, loam, gravelly sandy loam.	SM, GM	A-2, A-4	0-20	50-90	40-80	25-65	15-45	---	NP
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

[1] NP means nonplastic.
[2] See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "erosion factors-(T)" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
Aa	0-24	0.2-6.0	0.35-0.45	5.1-7.3		0.10	5
Adrian	24-60	6.0-20	0.03-0.08	6.1-7.3	Low	---	
AfA, AfB	0-8	2.0-6.0	0.13-0.25	4.5-6.0	Low	0.28	3
Agawam	8-14	2.0-6.0	0.11-0.21	4.5-6.0	Low	0.43	
	14-24	2.0-20	0.11-0.18	4.5-6.0	Low	0.43	
	24-60	6.0-20	0.01-0.09	4.5-6.0	Low	0.17	
Ba[1]:							
Beaches.							
Udipsamments.							
BcA	0-12	0.2-2.0	0.14-0.30	5.1-6.0	Low	0.49	3
Berlin	12-30	0.06-2.0	0.11-0.26	5.1-6.0	Low	0.43	
	30-60	<0.06	0.09-0.18	5.1-7.3	Low	0.28	
BoA, BoB, BoC	0-6	0.6-6.0	0.11-0.28	4.5-6.0	Low	0.24	3
Branford	6-23	0.6-6.0	0.11-0.24	4.5-6.0	Low	0.43	
	23-60	>6.0	0.01-0.06	4.5-6.0	Low	0.17	
CbB[1]:							
Canton	0-19	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.24	3
	19-60	6.0-20.0	0.13-0.20	3.6-6.0	Low	0.37	
Charlton	0-10	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.20	3
	10-32	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	32-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
CcB[1], CcC[1]:							
Canton	0-2	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.24	3
	2-19	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.37	
	19-60	6.0-20	0.04-0.08	3.6-6.0	Low	0.17	
Charlton	0-10	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.17	3
	10-32	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	32-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
CdC[1], CdD[1]:							
Canton	0-2	2.0-6.0	0.13-0.17	3.6-6.0	Low	0.24	3
	2-19	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.37	
	19-60	6.0-20	0.04-0.08	3.6-6.0	Low	0.17	
Charlton	0-10	0.6-6.0	0.05-0.15	4.5-6.0	Low	0.17	3
	10-32	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	32-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
Ce	0-60	0.6-6.0	0.35-0.45	4.5-6.0		---	---
Carlisle							
CrC[1]:							
Charlton	0-10	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.17	3
	10-32	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	32-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
Hollis	0-3	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	14	---	---	---		---	
CsB, CsC	0-8	0.6-6.0	0.11-0.28	4.5-6.0	Low	0.20	3
Cheshire	8-26	0.6-6.0	0.08-0.24	4.5-6.0	Low	0.43	
	26-60	0.6-6.0	0.05-0.15	4.5-6.0	Low	0.43	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
CyC[1]:							
Cheshire--------	0-8	0.6-6.0	0.11-0.28	4.5-6.0	Low----------	0.20	3
	8-26	0.6-6.0	0.08-0.24	4.5-6.0	Low----------	0.43	
	26-60	0.6-6.0	0.05-0.15	4.5-6.0	Low----------	0.43	
Holyoke---------	0-4	0.6-2.0	0.12-0.22	3.6-6.0	Low----------	0.24	2
	4-13	0.6-2.0	0.11-0.22	3.6-6.0	Low----------	0.43	
	13	---	---	---	----------	---	
EfA----------	0-6	0.6-2.0	0.15-0.22	4.5-6.0	Low----------	0.24	3
Ellington	6-29	0.6-2.0	0.13-0.22	4.5-6.0	Low----------	0.64	
	29-60	>6.0	0.01-0.06	4.5-6.0	Low----------	0.17	
HfA, HfB---------	0-9	2.0-6.0	0.08-0.25	4.5-6.0	Low----------	0.17	3
Hartford	9-24	2.0-6.0	0.07-0.17	4.5-6.0	Low----------	0.28	
	24-60	>6.0	0.01-0.06	4.5-6.0	Low----------	0.17	
HkC----------	0-8	6.0-20	0.03-0.23	3.6-6.0	Low----------	0.17	3
Hinckley	8-20	6.0-20	0.01-0.11	3.6-6.0	Low----------	0.17	
	20-60	>20	0.01-0.06	3.6-6.0	Low----------	0.15	
HME[1]:							
Hinckley--------	0-8	6.0-20	0.03-0.23	3.6-6.0	Low----------	0.17	3
	8-20	6.0-20	0.01-0.11	3.6-6.0	Low----------	0.17	
	20-60	>20	0.01-0.06	3.6-6.0	Low----------	0.15	
Manchester------	0-9	6.0-20.0	0.03-0.20	4.5-6.0	Low----------	0.17	3
	9-22	6.0-20.0	0.01-0.11	4.5-6.0	Low----------	0.17	
	22-60	>20.0	0.01-0.06	4.5-6.0	Low----------	0.17	
HpE[1]:							
Hollis----------	0-3	0.6-6.0	0.10-0.21	4.5-6.0	Low----------	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.43	
	14	---	---	---	----------	---	
Charlton--------	0-10	0.6-6.0	0.05-0.15	4.5-6.0	Low----------	0.17	3
	10-32	0.6-6.0	0.05-0.20	4.5-6.0	Low----------	0.43	
	32-60	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.43	
HrC[1], HSE[1]:							
Hollis----------	0-3	0.6-6.0	0.10-0.21	4.5-6.0	Low----------	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.43	
	14	---	---	---	----------	---	
Rock outcrop.							
HuD[1]:							
Holyoke---------	0-4	0.6-2.0	0.12-0.22	3.6-6.0	Low----------	0.24	2
	4-13	0.6-2.0	0.11-0.22	3.6-6.0	Low----------	0.43	
	13	---	---	---	----------	---	
Cheshire--------	0-8	0.6-6.0	0.11-0.28	4.5-6.0	Low----------	0.20	3
	8-26	0.6-6.0	0.08-0.24	4.5-6.0	Low----------	0.43	
	26-60	0.6-6.0	0.05-0.15	4.5-6.0	Low----------	0.43	
HyC[1], HZE[1]:							
Holyoke---------	0-4	0.6-2.0	0.12-0.22	3.6-6.0	Low----------	0.24	2
	4-13	0.6-2.0	0.11-0.22	3.6-6.0	Low----------	0.43	
	13	---	---	---	----------	---	
Rock outcrop.							
LG[1]:							
Leicester-------	0-7	0.6-6.0	0.06-0.28	4.5-5.5	Low----------	0.17	3
	7-33	0.6-6.0	0.05-0.16	4.5-5.5	Low----------	0.43	
	33-60	0.6-6.0	0.04-0.16	4.5-6.0	Low----------	0.43	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
LG[1]:							
Ridgebury	0-7	0.6-6.0	0.06-0.24	4.5-6.0	Low	0.24	---
	7-24	0.6-6.0	0.04-0.20	4.5-6.0	Low	0.24	
	24-60	<0.2	---	4.5-6.0	Low	0.24	
Whitman	0-5	0.6-6.0	0.08-0.28	4.5-6.0	Low	0.24	3
	5-22	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.24	
	22-60	<0.2	---	4.5-6.0	Low	0.24	
LpA, LpB	0-8	0.6-2.0	0.11-0.28	4.5-6.0	Low	0.24	3
Ludlow	8-26	0.6-2.0	0.09-0.24	4.5-6.0	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.5	Low	0.17	
LuB	0-8	0.6-2.0	0.11-0.28	4.5-6.0	Low	0.17	3
Ludlow	8-26	0.6-2.0	0.09-0.24	4.5-6.0	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.5	Low	0.17	
LvC	0-8	0.6-2.0	0.11-0.28	4.5-6.0	Low	0.17	---
Ludlow	8-26	0.6-2.0	0.09-0.24	4.5-6.0	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.5	Low	0.17	
MgA, MgC	0-9	6.0-20.0	0.03-0.20	4.5-6.0	Low	0.17	3
Manchester	9-22	6.0-20.0	0.01-0.11	4.5-6.0	Low	0.17	
	22-60	>20.0	0.01-0.06	4.5-6.0	Low	0.17	
MyA, MyB	0-9	2.0-20.0	0.18-0.19	3.6-6.0	Low	0.17	3
Merrimac	9-18	2.0-20.0	0.15-0.17	3.6-6.0	Low	0.24	
	18-22	2.0-20.0	0.03-0.15	3.6-6.0	Low	0.17	
	22-60	6.0-20.0	0.01-0.06	3.6-6.0	Low	0.17	
NnA	0-9	2.0-6.0	0.13-0.25	4.5-6.0	Low	0.28	3
Ninigret	9-25	2.0-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	25-60	6.0-20	0.01-0.13	4.5-6.0	Low	0.17	
PbB[1], PbC[1], PbD[1]:							
Paxton	0-10	0.60-6.0	0.08-0.23	4.5-6.5	Low	0.24	3
	10-32	0.60-6.0	0.06-0.20	5.1-6.5	Low	0.43	
	32-60	<0.2	0.05-0.12	5.1-6.5	Low	0.17	
Montauk	0-15	0.6-6.0	0.16-0.20	3.6-6.0	Low	0.43	3
	15-31	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.24	
	31-60	0.06-0.6	0.02-0.08	3.6-6.0	Low	0.20	
PdB[1], PdC[1]:							
Paxton	0-10	0.60-6.0	0.08-0.23	5.1-6.5	Low	0.24	3
	10-32	0.60-6.0	0.06-0.20	5.1-6.5	Low	0.43	
	32-60	<0.2	0.05-0.12	5.1-6.5	Low	0.17	
Montauk	0-15	0.6-6.0	0.11-0.15	3.6-6.0	Low	0.28	3
	15-31	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.28	
	31-60	0.06-0.6	0.02-0.16	3.6-6.0	Low	0.24	
PeC[1], PeD[1]:							
Paxton	0-10	0.60-6.0	0.05-0.15	5.1-6.5	Low	0.24	3
	10-32	0.60-6.0	0.06-0.20	5.1-6.5	Low	0.43	
	32-60	<0.2	0.05-0.12	5.1-6.5	Low	0.17	
Montauk	0-15	0.6-6.0	0.11-0.15	3.6-6.0	Low	0.28	3
	15-31	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.28	
	31-60	0.06-0.6	0.02-0.16	3.6-6.0	Low	0.24	
PnA, PnB	0-8	6.0-20	0.08-0.15	4.5-6.5	Low	0.17	5
Penwood	8-28	6.0-20	0.02-0.13	4.5-6.5	Low	0.17	
	28-60	6.0-20	0.01-0.08	4.5-6.5	Low	0.17	
Pr[1].							
Pits							

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
Ps	0-11	2.0-20	0.11-0.24	4.5-6.5	Low	---	---
Podunk	11-32	2.0-20	0.09-0.18	4.5-6.5	Low	---	
	32-60	2.0-20	0.01-0.13	4.5-6.5	Low	---	
Rb	0-10	0.6-2.0	0.15-0.28	4.5-5.5	Low	0.49	3
Raypol	10-24	0.6-2.0	0.15-0.26	4.5-5.5	Low	0.49	
	24-60	>6.0	0.06-0.10	5.1-6.5	Low	0.17	
Rp[1]:							
Rock outcrop.							
Hollis	0-3	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	14	---	---	---	---	---	
Ru	0-19	2.0-6.0	0.11-0.20	4.5-6.5	Low	---	---
Rumney	19-31	2.0-6.0	0.11-0.19	4.5-6.5	Low	---	
	31-60	>6.0	0.01-0.13	4.5-6.5	Low	---	
Rv	0-12	0.2-2.0	0.20-0.24	5.1-6.0	Low	0.43	4
Rumney Variant	12-28	0.2-2.0	0.20-0.24	5.1-6.0	Low	0.43	
	28-60	0.2-2.0	0.20-0.24	5.1-6.0	Low	0.43	
Sb	0-6	0.6-2.0	0.17-0.30	5.1-7.3	Low	---	---
Saco	6-18	0.6-2.0	0.15-0.26	5.1-7.3	Low	0.64	
	18-60	0.6-2.0	0.10-0.26	5.6-7.3	Low	0.64	
Sc	0-14	>6.0	0.07-0.23	4.5-6.0	Low	---	---
Scarboro	14-60	>6.0	0.01-0.13	4.5-6.0	Low	---	
SgA	0-9	2.0-6.0	0.10-0.25	3.6-6.0	Low	0.17	3
Sudbury	9-18	2.0-6.0	0.07-0.18	3.6-6.0	Low	0.17	
	18-36	2.0-20	0.01-0.15	3.6-6.0	Low	0.17	
	36-60	6.0-20	0.01-0.06	3.6-6.0	Low	0.17	
St	0-10	>6.0	0.07-0.15	4.5-6.5	Low	---	---
Suncook	10-60	>6.0	0.01-0.13	4.5-6.5	Low	---	
UD[1]:							
Udorthents.							
Urban land.							
Ur[1].							
Urban land							
Wd	0-10	2.0-6.0	0.10-0.23	4.5-6.0	Low	0.20	3
Walpole	10-23	2.0-6.0	0.07-0.18	4.5-6.0	Low	0.28	
	23-60	>6.0	0.01-0.13	4.5-6.0	Low	0.17	
We, Wh	0-48	0.6-20	0.18-0.35	4.5-7.3	Low	---	---
Westbrook	48-99	0.6-2.0	0.16-0.26	5.6-7.3	Low	0.64	
WkB, WkC, WkD	0-12	0.6-2.0	0.11-0.28	4.5-5.5	Low	0.24	3
Wethersfield	12-26	0.6-2.0	0.09-0.24	4.5-5.5	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.0	Low	0.17	
WmB, WmC	0-12	0.6-2.0	0.11-0.28	4.5-5.5	Low	0.17	3
Wethersfield	12-26	0.6-2.0	0.09-0.24	4.5-5.5	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.0	Low	0.17	
WnC	0-12	0.6-2.0	0.11-0.28	4.5-5.5	Low	0.17	3
Wethersfield	12-26	0.6-2.0	0.09-0.24	4.5-5.5	Low	0.43	
	26-60	<0.2	0.08-0.12	4.5-6.0	Low	0.17	
Wr	0-4	0.6-2.0	0.12-0.28	4.5-5.5	Low	0.24	3
Wilbraham	4-20	0.6-2.0	0.10-0.26	4.5-5.5	Low	0.43	
	20-60	<0.2	0.08-0.12	4.5-6.0	Low	0.17	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
Wt	0-4	0.6-2.0	0.12-0.28	4.5-5.5	Low	0.17	3
Wilbraham	4-20	0.6-2.0	0.10-0.26	4.5-5.5	Low	0.43	
	20-60	<0.2	0.08-0.12	4.5-6.0	Low	0.17	
WvA, WvB	0-7	6.0->20	0.08-0.12	4.5-6.0	Low	0.17	5
Windsor	7-32	6.0->20	0.02-0.12	4.5-6.0	Low	0.17	
	32-60	6.0->20	0.01-0.08	4.5-6.5	Low	0.17	
WxA, WxB	0-8	0.60-6.0	0.08-0.23	5.1-6.0	Low	0.24	3
Woodbridge	8-28	0.60-6.0	0.06-0.20	5.1-6.0	Low	0.43	
	28-60	<0.6	0.05-0.12	5.1-6.0	Low	0.17	
WyA, WyB	0-8	0.6-6.0	0.08-0.23	5.1-6.0	Low	0.24	3
Woodbridge	8-28	0.6-6.0	0.06-0.20	5.1-6.0	Low	0.43	
	28-60	<0.6	0.05-0.12	5.1-6.0	Low	0.17	
WzA, WzC	0-8	0.6-6.0	0.08-0.23	5.1-6.0	Low	0.24	3
Woodbridge	8-28	0.6-6.0	0.06-0.20	5.1-6.0	Low	0.43	
	28-60	<0.6	0.05-0.12	5.1-6.0	Low	0.17	
YaB, YaC	0-10	0.6-6.0	0.11-0.28	4.5-6.0	Low	0.28	3
Yalesville	10-20	0.6-6.0	0.08-0.24	4.5-6.0	Low	0.43	
	20-30	0.6-6.0	0.05-0.15	4.5-6.0	Low	0.43	
	30	---	---	---	---	---	

[1] See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 16.--SOIL AND WATER FEATURES

[Absence of an entry indicates that the feature is not a concern. See text and the Glossary for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Aa---------- Adrian	D	Frequent----	Long------	Nov-May	0-1.0	Apparent	Nov-May	>60	---	High-----	High-----	Moderate.
AfA, AfB---------- Agawam	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Ba[1]: Beaches.												
Udipsamments.												
BcA---------- Berlin	C	None--------	---	---	1.5-3.5	Perched	Nov-Apr	>60	---	High-----	Moderate	Moderate.
BoA, BoB, BoC----- Branford	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
CbB[1], CcB[1], CcC[1], CdC[1], CdD[1]: Canton----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Charlton--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Ce---------- Carlisle	D	Frequent----	Long------	Nov-May	0-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	Low.
CrC[1]: Charlton---------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Hollis----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
CsB, CsC---------- Cheshire	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
CyC[1]: Cheshire---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
Holyoke----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
EfA---------- Ellington	B	None--------	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	High-----	Low------	High.
HfA, HfB---------- Hartford	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HkC---------- Hinckley	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HmE[1]: Hinckley---------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
HME[1]: Manchester	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
HpE[1]: Hollis	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Charlton	B	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
HrC[1], HSE[1]: Hollis	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Rock outcrop.												
HuD[1]: Holyoke	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Cheshire	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
HyC[1], HZE[1]: Holyoke	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Rock outcrop.												
LG[1]: Leicester	C	None	---	---	0-1.5	Apparent	Nov-Mar	>60	---	High	Low	High.
Ridgebury	C	None	---	---	0-1.5	Perched	Nov-May	>60	---	High	High	High.
Whitman	D	None	---	---	0-0.5	Perched	Sep-Jun	>60	---	High	High	High.
LpA, LpB, LuB, LvC---- Ludlow	C	None	---	---	1.5-3.5	Perched	Nov-Apr	>60	---	High	Low	Moderate.
MgA, MgC---- Manchester	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
MyA, MyB---- Merrimac	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
NnA---- Ninigret	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	Moderate	Low	High.
PbB[1], PbC[1], PbD[1]: Paxton	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
Montauk	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Pd[1], PdC[1], PeC[1], PeD[1]: Paxton	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
Montauk	C	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
PnA, PnB---------- Penwood	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Pr[1]. Pits												
Ps---------- Podunk	B	Frequent----	Brief-----	Nov-May	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	Moderate.
Rb---------- Raypol	C	None--------	---	---	0-1.0	Apparent	Nov-May	>60	---	High-----	High-----	Moderate.
Rp[1]: Rock outcrop.												
Hollis----------	C/D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
Ru---------- Rumney	C	Frequent----	Brief-----	Oct-May	0-1.5	Apparent	Nov-Jun	>60	---	High-----	High-----	High.
Rv---------- Rumney Variant	C	Frequent----	Brief-----	Nov-May	0-1.0	Apparent	Nov-Apr	>60	---	High-----	High-----	Moderate.
Sb---------- Saco	D	Frequent----	Brief-----	Nov-May	0-0.5	Apparent	Nov-Apr	>60	---	High-----	Low------	Moderate.
Sc---------- Scarboro	D	Rare--------	---	---	0-1.0	Apparent	Jan-Dec	>60	---	High-----	Moderate	High.
SgA---------- Sudbury	B	None--------	---	---	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	Low------	High.
St---------- Suncook	A	Common------	Brief-----	Mar-May	3.0-6.0	Apparent	Jan-Apr	>60	---	Low------	Low------	High.
UD[1]: Udorthents.												
Urban land.												
Ur[1]: Urban land.												
Wd---------- Walpole	C	None--------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High-----	Low------	High.
We, Wh---------- Westbrook	D	Frequent----	Very brief	Jan-Dec	+1-0.0	Apparent	Jan-Dec	>60	---	---	High-----	High.
WkB, WkC, WkD, WmB, WmC, WnC---- Wethersfield	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Wr---------- Wilbraham	C	None--------	---	---	0.5-1.5	Perched	Nov-Apr	>60	---	High-----	High-----	Moderate.
Wt---------- Wilbraham	C	None--------	---	---	0.5-1.5	Perched	Nov-Apr	>60	---	High-----	Low------	Moderate.
WvA, WvB---------- Windsor	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
WxA, WxB, WyA, WyB, WzA, WzC---- Woodbridge	C	None--------	---	---	1.5-3.0	Perched	Nov-Mar	>60	Hard	High-----	Moderate	Moderate.
YaB, YaC---------- Yalesville	C	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	Low------	High.

[1] See description of the map unit for composition and behavior characteristics of the entire map unit.

TABLE 17.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
Agawam	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
*Berlin	Fine, illitic, mesic Aquic Dystrochrepts
Branford	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Canton	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Carlisle	Euic, mesic Typic Medisaprists
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Cheshire	Coarse-loamy, mixed, mesic Typic Dystrochrepts
*Ellington	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
Hartford	Sandy, mixed, mesic Typic Dystrochrepts
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hollis	Loamy, mixed, mesic Lithic Dystrochrepts
Holyoke	Loamy, mixed, mesic Lithic Dystrochrepts
Leicester	Coarse-loamy, mixed, acid, mesic Aeric Haplaquepts
Ludlow	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Manchester	Sandy-skeletal, mixed, mesic Typic Udorthents
Merrimac	Sandy, mixed, mesic Typic Dystrochrepts
Montauk	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Ninigret	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
Paxton	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Penwood	Mixed, mesic Typic Udipsamments
Podunk	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
*Raypol	Coarse-loamy over sandy or sandy-skeletal, mixed, acid, mesic Aeric Haplaquepts
Ridgebury	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Rumney	Coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Rumney Variant	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
*Saco	Coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts
Scarboro	Sandy, mixed, mesic Histic Humaquepts
*Sudbury	Sandy, mixed, mesic Aquic Dystrochrepts
Suncook	Mixed, mesic Typic Udipsamments
Walpole	Sandy, mixed, mesic Aeric Haplaquepts
Westbrook	Euic, mesic Typic Sulfihemists
Wethersfield	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Whitman	Coarse-loamy, mixed, mesic Typic Fragiaquepts
Wilbraham	Coarse-loamy, mixed, mesic Aquic Fragiochrepts
Windsor	Mixed, mesic Typic Udipsamments
Woodbridge	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Yalesville	Coarse-loamy, mixed, mesic Typic Dystrochrepts

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