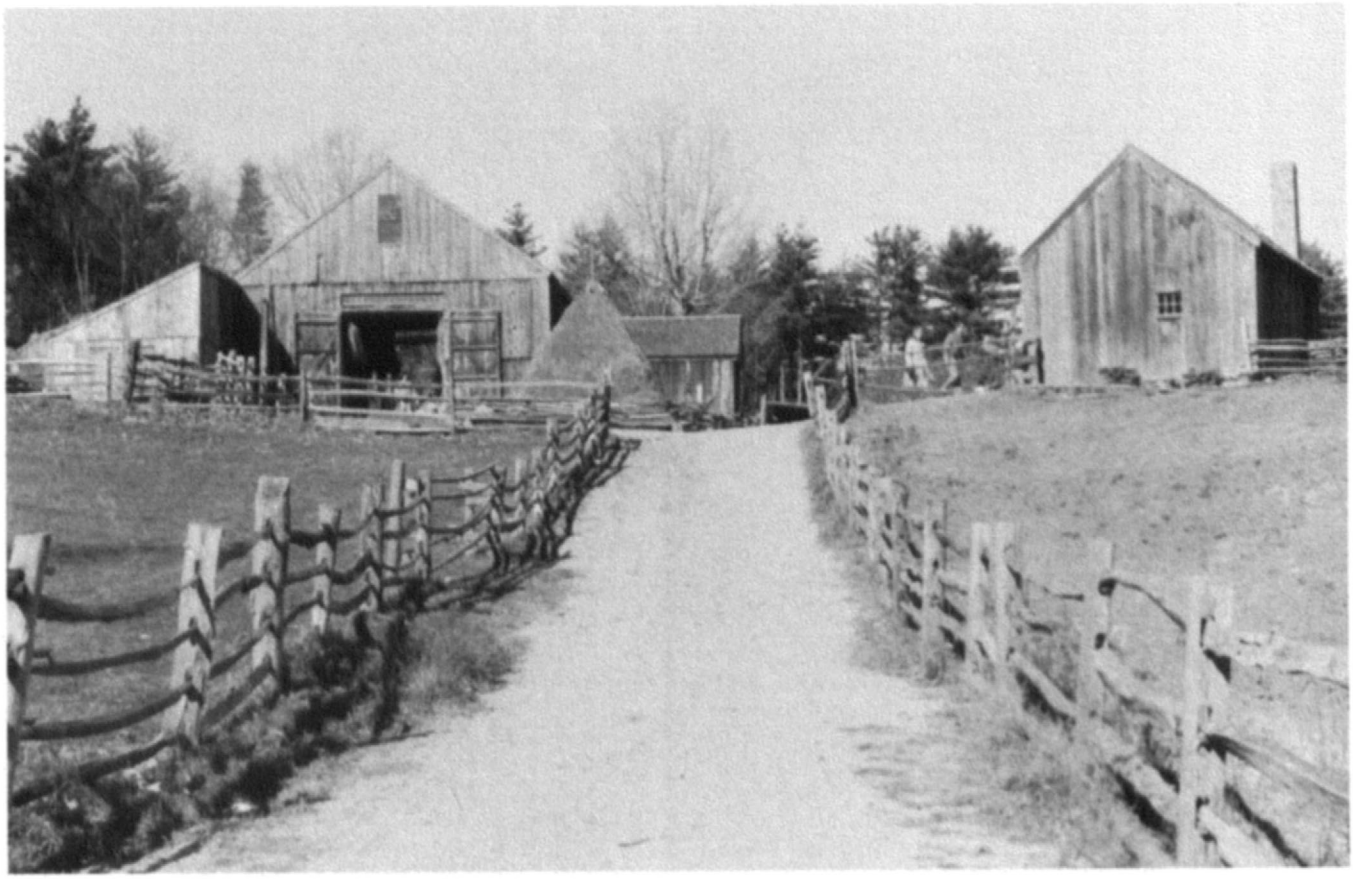
USDA United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the Massachusetts Agricultural Experiment Station

Soil Survey of Worcester County, Massachusetts, Southern Part



How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

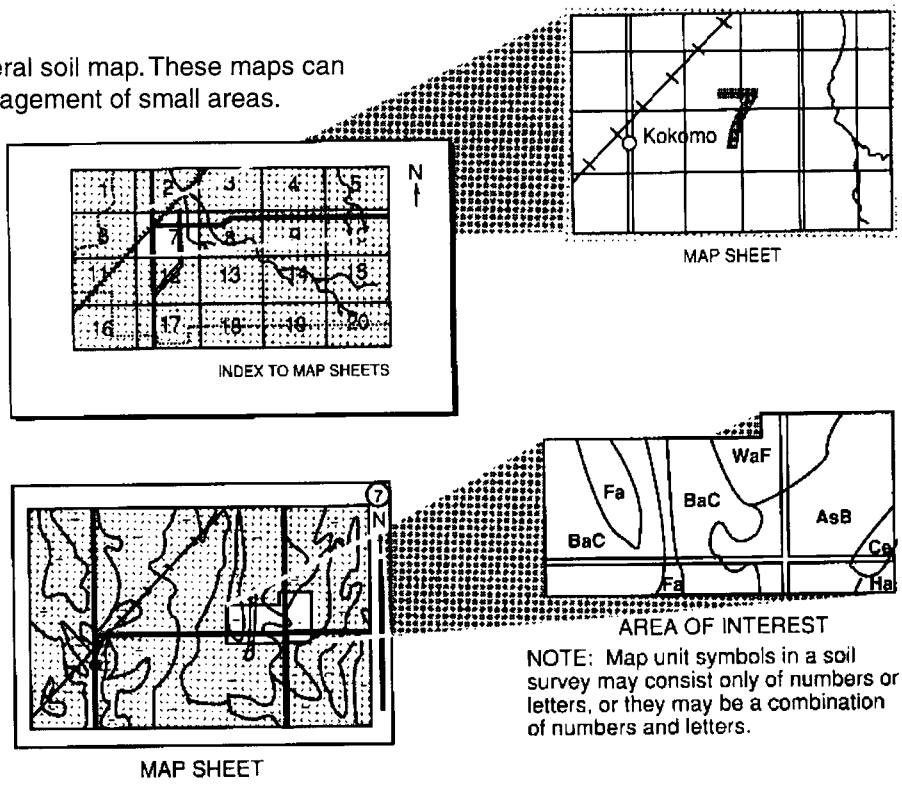
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map units symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources 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, handicap, or age.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This survey was made cooperatively by the Natural Resources Conservation Service and the Massachusetts Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Worcester County Conservation District. Financial assistance for the survey was provided by the Massachusetts Executive Office of Environmental Affairs through the Worcester County Conservation District. Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: A farmstead on Paxton fine sandy loam, 3 to 8 percent slopes, in Old Sturbridge Village,

Contents

Issued 1998

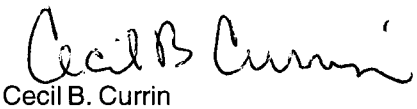
Foreword

This soil survey contains information that can be used in land-planning programs in Worcester County. The survey contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders and home buyers can use the survey to plan land use, select sites for construction and identify special practices needed to ensure proper performance. Conservationists, teachers, students and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

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

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 soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service (formerly the Soil Conservation Service) or the Cooperative Extension Service.



Cecil B. Currin
State Conservationist
Natural Resources Conservation Service

Soil Survey of Worcester County, Massachusetts, Southern Part

Communities of Auburn, Blackstone, Brookfield, Charlton, Douglas, Dudley, East Brookfield, Grafton, Hopedale, Leicester, Mendon, Milford, Millbury, Millville, North Brookfield, Northbridge, Oxford, Southbridge, Spencer, Sturbridge, Sutton, Upton, Uxbridge, Warren, Webster, and West Brookfield.

by William H. Taylor, Natural Resources Conservation Service

Fieldwork by John F. Handler, Charles F. Hotz, Everette L. Francis, Eric L. Swenson, Peter C. Fletcher, and William H. Taylor, Natural Resources Conservation Service

Mike Matthews, Shirley Mikelk, and Jackie Pashnik, Southern Worcester County Conservation District.

United States Department of Agriculture,
Natural Resources Conservation Service,
In cooperation with the
Massachusetts Agricultural Experiment Station

General Nature of the Survey Area

Worcester County is in the state's central upland that also is known as the Worcester Plateau (fig 1.) The area covered by this survey is 365,100 acres, or about 571 square miles. The four major waterways draining this survey area are the Blackstone, Quaboag, French, and Quinebaug Rivers. The rugged terrain that characterizes this area is dominated by ridgetops that have a uniform elevation of about 1,100 feet.

Dairy specialization, once the prominent agricultural activity in this area, has been reduced because of urban and industrial growth. Significant portions of this survey area are state forests and wildlife management areas.

This soil survey is an update of a survey of Worcester County published by the United States Department of Agriculture in 1927 *(5)*. This survey provides additional interpretive information and maps that show the soils in greater detail.

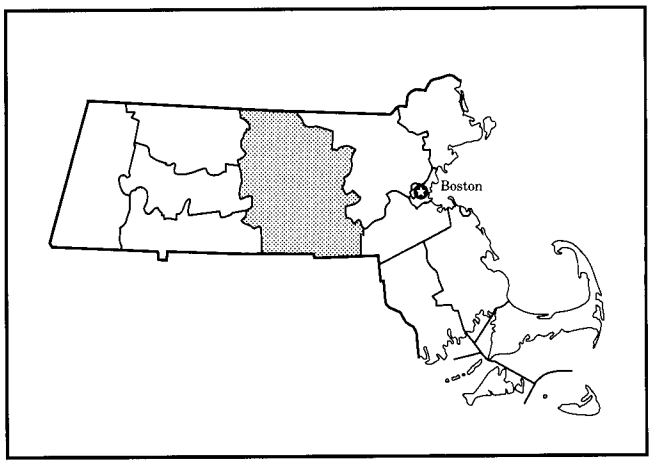


Figure 1.—Location of Worcester County in Massachusetts.

History and Development

Significant events and processes that have shaped the history and development of Worcester County can be divided into six periods: Contact and Plantation (1500-1675), Colonial (1675-1775), Federal (1775-1830), Early Industrial (1830-1870), Late Industrial (1870-1915) and Early Modern (1915-1940).

During the Contact and Plantation period, the Native Americans of the area were culturally transformed through exposure to European goods and trade,

reduced in numbers by the effects of disease and warfare, and finally emigrated from the region. The common tribe in the area was the Nipmuck, a subgroup of Southern New England Algonquins.

After the spring fish runs, the tribal groups commonly dispersed to smaller farmsteads where individual structures were surrounded by fields of corn, beans, squash, and tobacco. With European contact, this pattern underwent dramatic changes. The highly profitable fur trade and increasing competition created a tendency toward larger, fortified sites.

With the Great Migration to the Bay Colony in the 1630's, permanent and sustained contact between Native Americans and the colonial settlers expanded. During this period the colonial population grew rapidly and quickly expanded inland in search of more land. Shortly thereafter, acting on the petitions of the colonial settlers, the General Court established town grants. The most significant town grant in the survey area was in 1660 for the Quaboag (Brookfield) Plantation. Because it was on the colonial frontier, the Plantation was especially vulnerable to attacks by hostile Native Americans during King Philip's War. These attacks were so severe that by mid-1676, the Quaboag Plantation was abandoned.

During the Colonial period, King Philip's War ended and permanent settlement was firmly established. Re-establishment of the Quaboag Plantation took place; however, it was slow and not removed from the dangers of frontier warfare until 1713. In 1731 continued population growth and incorporation of new towns led to the establishment of Worcester County. Town formation, which was the primary political activity during this period, saw earlier large grants of land subdivided and new ones taken up in the process of locating the meeting house, dividing town lands, calling a minister, and forming a government. Since farming was the earliest and most dominant industry, most of the manufacturing, trade, and transportation were centered on farm products.

The American Revolution began the Federal period, and trade brought prosperity to the area by 1790, when the county's industries expanded to meet the demands from other areas and the needs of the coastal cities. With this expansion came the need for more transportation routes and more agricultural products. Subsequently, land was used more intensively and marginal areas were brought under cultivation. Of particular significance, was the increase in home manufactures of shoes and boots, straw braids and hats, and butter and cheese for outside the local economy. Stimulated by the Embargo Act of 1807, small-scale textile and manufacturing continued through the War of 1812. Both regional growth and the agricultural economy were curtailed during the postwar depression. Economic recovery was slow until the 1820s, when a second, stronger blossoming of textile manufacturing emerged. This emerging textile manufacturing created a need for further improvements in transportation, and in 1828 the Blackstone Canal was completed. Manufacturing created new opportunities for employment, and mill villages were developed amid an area still dominated by farmsteads.

Urban-industrial growth dominated Worcester County during the Early Industrial period. Manufacturing diversified and became increasingly important. The manufacture of textiles, boots and shoes, metals, machines, and machine tools grew, and farming declined and became specialized, mainly in the areas of dairying and market gardening.

In the Late Industrial period, after the Civil War, the development of Worcester County was concentrated physically and financially on manufacturing activities. Companies merged, capitalization increased, and technological innovations directed factory production. Increased production, largely in textiles, created jobs that were filled mainly by immigrants. Agriculture suffered from this industrial expansion as the farm population continued to decline. Agricultural production was increasingly oriented toward supplying the growing urban areas.

During the Early Modern period, the county's industries retooled to meet defense needs during World War I. General economic prosperity continued into the 1920s. However, as the industrial system of production continued to mature, trends toward support services started to emerge. The relocation of the cotton textile industry to the South during the 1920s marked the beginning of a deterioration in the industrial base of Worcester County. During the Great Depression of the 1930s, specialized textile centers were particularly hard hit, while more diversified centers fared better. Shifts from industrial production to support services, plus the greater mobility created by widespread use of the automobile, resulted in a shift in population growth, spawning the growth of suburbs.

Since 1940, five major processes have contributed to landscape modifications in the county: the construction of limited-access, interstate highway corridors and the upgrading and relocation of many state highway routes; suburban and exurban single-family residential development; the location of new industry in urban fringe areas and in suburban industrial parks; the concentration of commercial growth along highway corridors and in new regional shopping malls; and the continued decline of urban areas. Significant secondary factors that have affected the landscape are: the abandonment of rural farmsteads and agricultural

buildings, watershed management and flood-control projects, state forest development, sand and gravel quarrying, and rural recreation-facility development.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Winters in the survey area are cold, and summers are moderately warm, with occasional hot spells. The mountains are markedly cooler than the lowlands. Precipitation is well distributed throughout the year and is nearly always adequate for all common crops. Winter snows occur frequently, occasionally as blizzards, and cover the ground much of the time.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Worcester in the period 1951-86. 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 25 degrees F, and the average daily minimum temperature is 18 degrees. The lowest temperature on record, which occurred at Worcester on January 15, 1957, is -19 degrees. In summer the average temperature is 68 degrees, and the average daily maximum temperature is 77 degrees. The highest recorded temperature, which occurred at Worcester on September 2, 1953, is 93 degrees.

Growing degree days are shown in table 1. They 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 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 6.38 inches on August 19, 1955. Thunderstorms occur on about 22 days each year, and most occur in summer.

The average seasonal snowfall is 64 inches. The greatest snow depth at any one time during the period of record was 42 inches. On the average, 51 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in mid-afternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 75 percent. The sun shines 65 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 12 miles per hour, in spring.

Physiography, Relief, and Drainage

The survey area is in the Worcester Plateau, also called the central upland province of Southern New England. The plateau is divided into eastern and western sections by the Blackstone, Quinsigamond, and Nashua River valleys. Although the region is characterized by rugged terrain deeply dissected by numerous watercourses, it is classified as a plateau because of the general uniformity in elevation of the ridgetops and undissected surfaces.

A number of rivers cut into the uplands, where their headwaters are located. Many of the waterways in the survey area are swift-flowing streams fed by numerous swamps, ponds, and lakes, with abundant rapids and falls along their courses. The watersheds of the major rivers of the survey area are the Merrimack River Drainage, the Chicopee River Drainage, and the Thames River Drainage.

The Blackstone River drains the southeastern portion of the survey area. The Blackstone's three principal tributaries are the Quinsigamond River, which flows south from Lake Quinsigamond to its confluence with the Blackstone at Grafton; the Mumford River, which runs east and south from Sutton, meeting the Blackstone at Uxbridge; and the Mill River, which flows south from Mendon and empties into the Blackstone.

The Quaboag River is the southern branch of the upper Chicopee River Drainage. The Quaboag arises as two separate streams, the Fivemile and Sevenmile Rivers. These flow south from Spencer, unite in East Brookfield, and continue south a short distance to Quaboag Pond, the largest natural water body in the survey area, covering 541 acres. From the pond's outlet in Brookfield, the Quaboag River flows northwest as a wide, slow-moving river flanked by broad, open wetland meadows. Near Wickaboag Pond in West Brookfield, the Quaboag turns southwesterly, loses its wetland borders, and flows swiftly through a much narrower valley, exiting the survey area in Warren.

The southwestern portion of the survey area is drained by the French and Quinebaug Rivers, which are part of the Thames River Drainage. The French River flows south from its headwaters in the Leicester area through Webster, where it drains Lake Chaubunagungamaug into the Quinebaug River. From its headwaters west of the survey area, the Quinebaug River follows a looping course through the towns of Sturbridge and Southbridge. In this segment the river's

tributaries are generally small streams with a northeast/southwest orientation. From Southbridge, the Quinebaug flows southeast to the state border where it then flows south and empties into the Thames River.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations and management of the soils for specified uses. Soil scientists observed the steepness, length and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by their biologic activity.

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

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

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

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties, but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other

natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

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

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it 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 another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map 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 soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that effect management.

Soil Descriptions

1. Paxton-Woodbridge-Ridgebury

Nearly level to steep, very deep, well drained to poorly drained soils on glaciated uplands

This map unit consists of soils on upland hills and ridges dissected by many small drainageways. Stones cover more than 3 percent of the surface in most areas. The soils formed in glacial till derived from schist, gneiss, and granite.

This map unit makes up about 42 percent of the survey area. The unit is about 45 percent Paxton soils, 15 percent Woodbridge soils, 7 percent Ridgebury soils, and 33 percent soils of minor extent (fig. 2)

Paxton soils are well drained and are on hills and ridges. Permeability is moderate or slow in the surface layer and subsoil and very slow in the substratum. The substratum, which is at a depth of about 24 inches, is firm in the upper part and very firm in the lower part. The seasonal high water table is at a depth of 1.5 to 2.5 feet.

Woodbridge soils are moderately well drained and are on the top of hills and drumlins and on the toe slopes of ridges. Permeability is moderate or slow in the surface layer and subsoil and very slow in the substratum. The substratum, which is at a depth of about 22 inches, is very firm. The seasonal high water table is at a depth of 1.5 to 2.5 feet.

Ridgebury soils are somewhat poorly drained or poorly drained and are in flat or depressional areas. Permeability is moderate or moderately rapid in the surface layer and subsoil and very slow in the substratum. The substratum, which is at a depth of about 22 inches, is firm or very firm. The seasonal high water table is within a depth of 18 inches.

Of minor extent in this unit are the well drained Canton, Montauk, and Charlton soils; the moderately well drained Scituate soils; the shallow Hollis soils; the moderately deep Chatfield soils; and the very poorly drained Whitman and Swansea soils. Canton, Scituate, Montauk, and Charlton soils are on the toe slopes of ridges. Hollis and Chatfield soils are intermingled on the ridges with the well drained soils. Whitman and Swansea soils are in depressions and low areas in the uplands.

Most areas of this map unit are covered with and well suited to trees. Some areas are farmed. A few areas are used for urban development.

This map unit is suited to cultivated crops and to hay and pasture. The slope, the hazard of erosion, the stoniness, and the seasonal high water table are the main limitations in the farmed areas.

Slope, wetness, frost action, slow permeability in the substratum, the firm substratum, and the depth to bedrock in some of the minor soils are the major limitations affecting nonfarm uses.

2. Canton-Montauk-Scituate

Nearly level to steep, very deep, well drained soils on glaciated uplands

This map unit consists of soils on upland hills and rolling glacial till flats. It is dissected by broad drainageways that flatten out on the lower slopes.

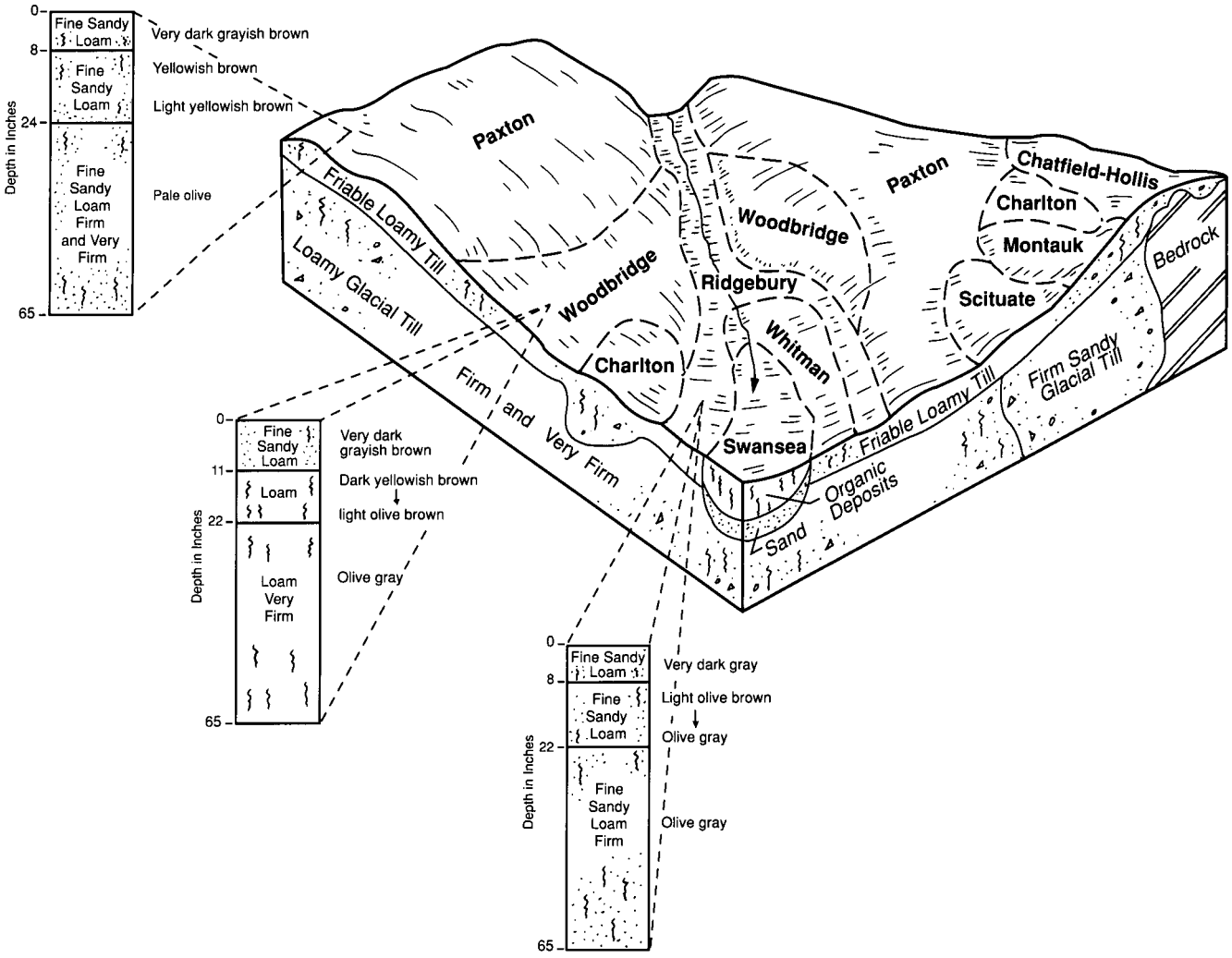


Figure 2.—Typical pattern of soils and underlying material in the Paxton-Woodbridge-Ridgebury association.

Stones cover more than 3 percent of the surface in most areas. The soils formed in friable glacial till.

This map unit makes up about 27 percent of the survey area. The unit is about 42 percent Canton soils, 15 percent Montauk soils, 14 percent Scituate soils, and 29 percent soils of minor extent.

Canton and Montauk soils are well drained and are on the upper slopes of hills and ridges. Scituate soils are moderately well drained and are on the lower slopes. Permeability is moderately rapid in the surface layer and subsoil of the Canton soils and rapid in the substratum. It is moderate or moderately rapid in the surface layer and subsoil of the Montauk soils and slow or moderately slow in the substratum. It is moderate in the surface layer and subsoil of the Scituate soils and slow or moderately slow in the substratum.

Of minor extent in this unit are the well drained Paxton soils and moderately well drained Woodbridge soils. These soils are intermingled with areas of the dominant soils on the hills and ridges. Also of minor extent are the somewhat poorly drained or poorly drained Ridgebury soils and very poorly drained Whitman soils in low areas and depressions.

Most areas of this unit are covered with and well suited to trees. Some areas are farmed. A few areas are used for urban development.

This map unit is suited to cultivated crops and to hay and pasture. The slope, stoniness, and wetness are limitations. Erosion is a hazard.

This map unit is well suited to most nonfarm uses. The slope is the major limitation. The Canton soils are limited as sites for septic tank absorption fields because of a poor filtering capacity in the substratum. Seepage of the effluent through the substratum can cause the pollution of ground water. The sides of excavations in the Canton soils are unstable.

3. Brookfield-Brimfield

Gently sloping to steep, very deep and shallow, well drained and somewhat excessively drained soils on glaciated uplands

This map unit consists of soils on upland hills and ridges that have rock exposures throughout. Stones cover more than 3 percent of the surface. The soils formed in glacial till derived from micaceous schist.

This map unit makes up about 2 percent of the survey area. The unit is about 62 percent Brookfield soils, 20 percent Brimfield soils, and 18 percent soils of minor extent.

Brookfield soils are well drained and are on sides of the hills and ridges. Permeability is moderate or moderately rapid throughout. The substratum is friable.

Brimfield soils are on the upper slopes of the ridges. Permeability is moderately rapid throughout. Bedrock is at a depth of 10 to 20 inches.

Of minor extent in this unit are Paxton, Montauk, Hollis, Chatfield, Canton, Ridgebury, Whitman, and Swansea soils. The well drained Paxton, Montauk, and Canton soils are intermingled with areas of the major soils. The poorly drained and very poorly drained Ridgebury, Whitman, and Swansea soils are in depressions and low areas. Rock outcrop is in most areas.

Most areas of this unit are covered with and well suited to trees. A few areas are farmed or are used for urban development.

This map unit generally is poorly suited to cultivated crops and to hay and pasture, although the Brookfield soils are suited to these uses. The slope, the stones, and the shallowness to bedrock are the major limitations. Erosion is a hazard.

The slope, the shallowness to bedrock, and the stones are the major limitations affecting nonfarm uses.

4. Chatfield-Hollis

Gently sloping to steep, moderately deep and shallow, well drained and somewhat excessively drained soils on glaciated uplands

This map unit consists of soils on hills and ridges that have bedrock exposures throughout. Stones cover more than 3 percent of the surface in most areas. The soils formed in glacial till.

This map unit makes up about 10 percent of the survey area. The unit is about 40 percent Chatfield soils, 25 percent Hollis soils, and 35 percent soils of minor extent (fig. 3).

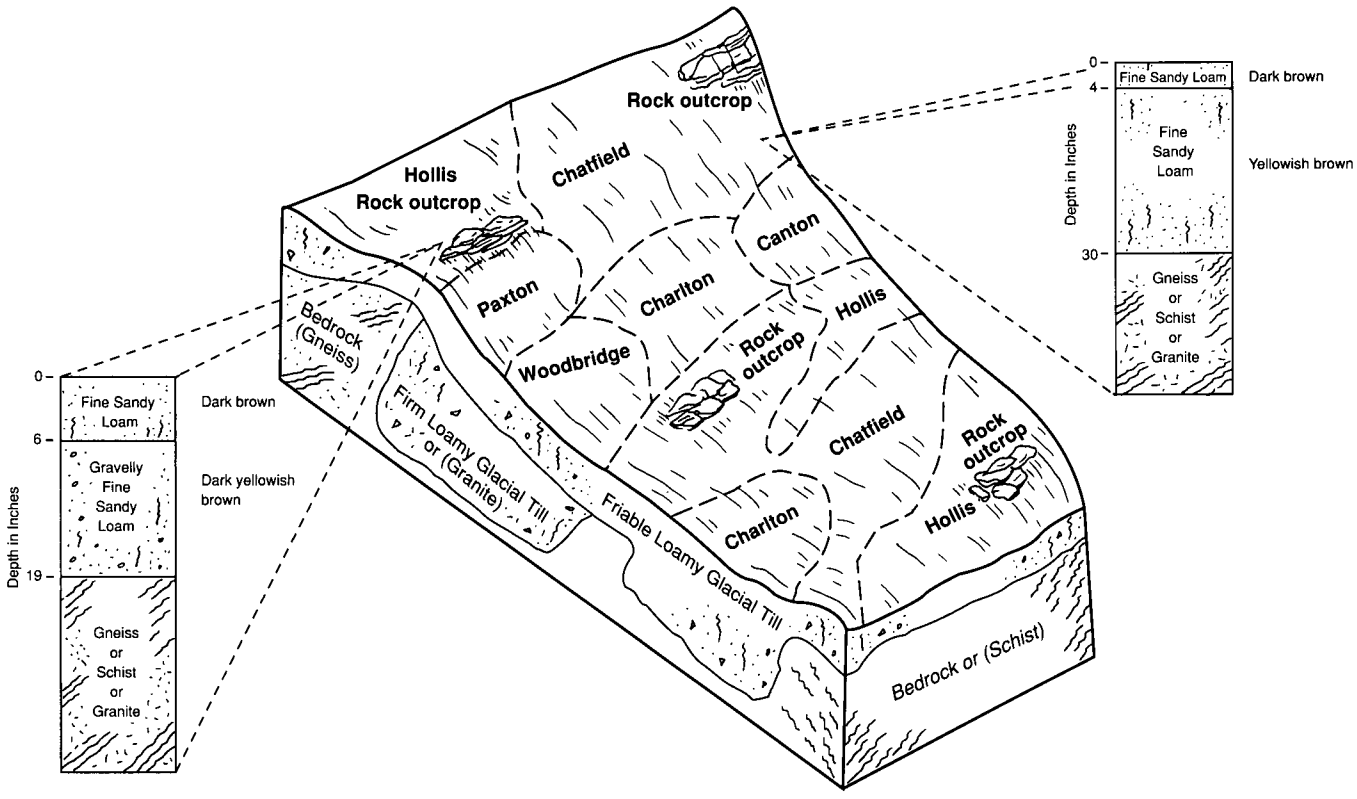


Figure 3.—Typical pattern of soils and underlying material in the Chatfield-Hollis association.

Chatfield soils are on the lower slopes. Bedrock is at a depth of 20 to 40 inches. Permeability is moderate or moderately rapid.

Hollis soils are on the upper slopes on the ridges. Bedrock is at a depth of 10 to 20 inches. Permeability is moderate or moderately rapid.

The dominant minor soils in this map unit are the well drained Canton, Charlton, and Paxton soils; the poorly drained Ridgebury soils; and the very poorly drained Freetown, Swansea, and Whitman soils. Canton, Charlton, and Paxton soils are intermingled with areas of the Chatfield and Hollis soils. The other minor soils are in depressions and low areas.

Most areas of this unit are covered with trees. A few areas are used for urban development. Because of the depth to bedrock and the areas of exposed bedrock, this unit is poorly suited to farming and woodland.

The depth to bedrock and the exposures of bedrock are the major limitations affecting most kinds of urban development.

5. Merrimac-Hinckley-Windsor

Nearly level to steep, very deep, excessively drained and somewhat excessively drained soils on outwash plains

This map unit consists of soils on broad, flat plains and in rolling to steep areas throughout the survey area. The soils formed in water-sorted deposits of glacial outwash.

This map unit makes up about 14 percent of the survey area. The unit is about 32 percent Merrimac soils, 25 percent Hinckley soils, 7 percent Windsor soils, and 36 percent soils of minor extent (fig. 4).

Merrimac soils are somewhat excessively drained and are on the lower or flat parts on the outwash plains. Permeability is moderately rapid or rapid. Typically, these soils have 2 feet of loamy material underlain by sand and gravel. The content of gravel averages less than 35 percent.

Hinckley and Windsor soils are excessively drained and are on ridges on the outwash plains. Permeability

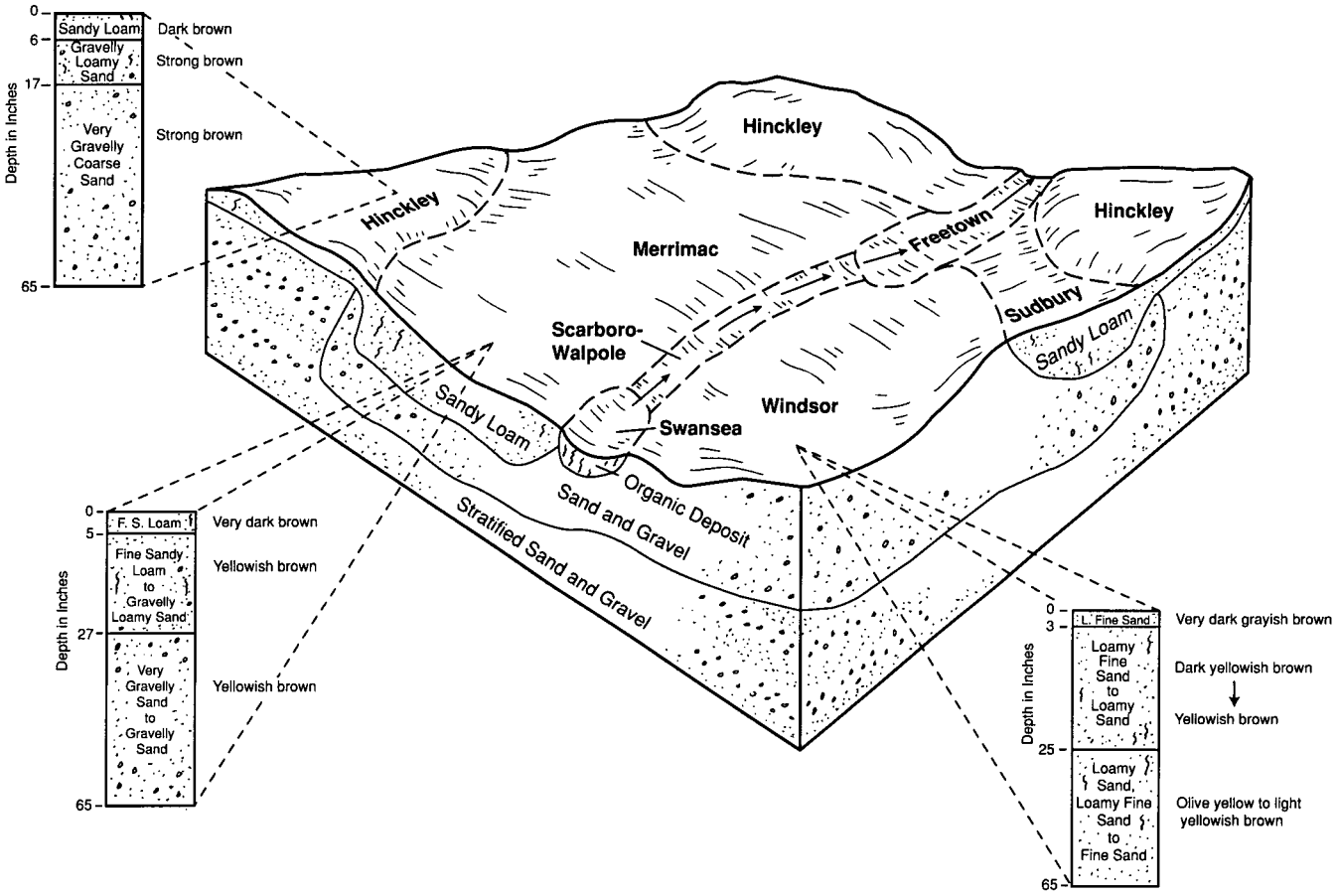


Figure 4.—Typical pattern of soils and underlying material in the Merrimac-Hinckley-Windsor association.

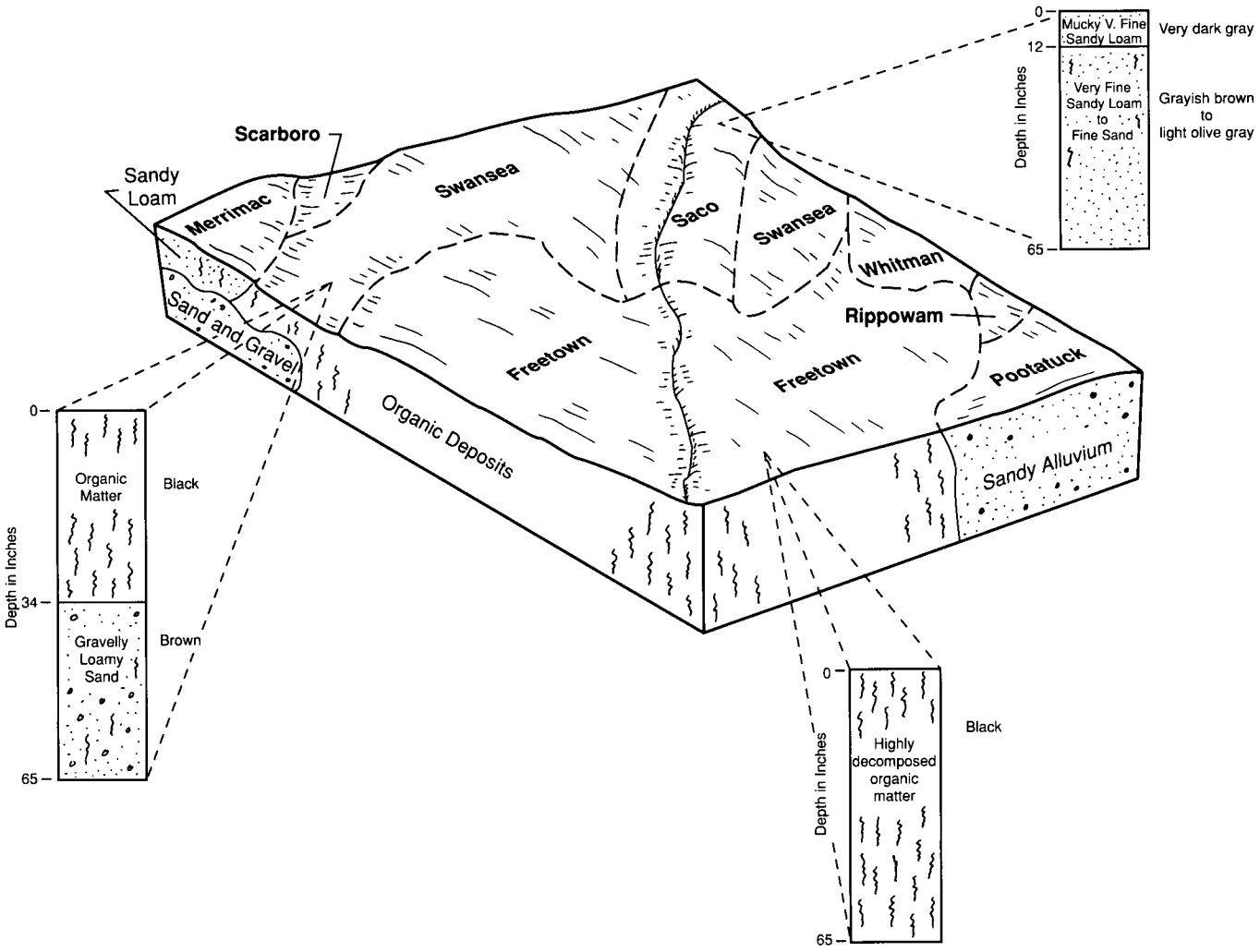


Figure 5.—Typical pattern of soils and underlying material in the Freetown-Swansea-Saco association.

is rapid or very rapid. Hinckley soils have a loamy surface layer underlain by stratified sand and gravel. Windsor soils typically are sandy throughout.

The common minor soils in this map unit are the moderately well drained Deerfield and Sudbury soils and the very poorly drained Scarboro soils. Deerfield and Sudbury soils are in shallow depressions, and Scarboro soils are in deep depressions.

Most areas this unit are farmed or are used for urban development. A few areas are covered with trees.

This map unit is suited to cultivated crops and to hay and pasture. Slope, droughtiness, and a low content of nutrients are limiting factors.

This map unit is suited to trees. The seedling mortality rate is high because of the lack of available moisture.

The slope is a limitation at sites for buildings and local roads and streets. The sides of excavations are unstable, and the steeper sides commonly collapse. The effluent in septic tank absorption fields can pollute ground water because of the rapid permeability and a poor filtering capacity in the soils.

6. Freetown-Swansea-Saco

Nearly level, very deep, very poorly drained soils on uplands, outwash plains, and flood plains

This map unit consists of soils on broad flats that have small depressions. These soils are in old glacial lakes or small ponds adjacent to streams. The soil formed in organic deposits and alluvium.

This map unit makes up about 5 percent of the survey area. The unit is about 55 percent Freetown soils, 25 percent Swansea soils, 4 percent Saco soils, and 16 percent soils of minor extent (fig. 5).

Freetown and Swansea soils are very poorly drained. They are in depressions adjacent to rivers and are in old glacial lakebeds. Permeability is moderate or rapid throughout the Freetown soils, the organic material is 51 inches thick or more, and the water table is at the

surface for most of the year. Some areas are ponded. Permeability is moderate in the surface layer and subsoil of the Swansea soils and very rapid in the substratum. The organic material is 16 to 51 inches thick.

Saco soils are very poorly drained and are in pockets and depressions along the river channels. Permeability is moderate or slow in the surface layer and subsoil and moderate or rapid in the substratum. These soils are frequently flooded, and the water table is at the surface for much of the year.

Of minor extent in this unit are the very poorly drained Scarboro and Whitman soils. These soils are intermingled throughout the map unit.

Most of the acreage in this map unit is idle land. Some areas are used for wildlife habitat. A few areas are farmed.

This map unit is suited to cultivated crops and to hay and pasture. Flooding and wetness are the major management concerns.

This map unit generally is suited to trees, but the Freetown soils are not suited. Flooding and the seasonal high water table in areas of the Freetown and Saco soils limit timber production for all but water-tolerant species.

Flooding, the organic material, and wetness are the major limitations affecting most nonfarm uses.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

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

Soils of one series can differ in texture of the surface layer or of the substratum. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Brookfield fine sandy loam, 3 to 8 percent slopes, is a phase of the Brookfield series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A soil complex consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Chatfield-Hollis-Rock outcrop complex, 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 similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Scarboro and Walpole soils is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

2—Pootatuck fine sandy loam

This very deep, nearly level, moderately well drained soil is on flood plains along rivers and streams. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is about 15 inches thick. The upper 8 inches is

dark brown to brown fine sandy loam. The lower 7 inches is dark yellowish brown sandy loam. The substratum to a depth of about 65 inches is olive brown and light olive brown loamy fine sand and gravelly coarse sand.

Included with this soil in mapping are areas of Rippowam and Whitman soils that are less than 3 acres each. Also included are areas of well drained soils. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil of the Pootatuck soil and rapid or very rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to slightly acid. The water table is at a depth of 1.5 to 3.0 feet in late fall and early spring.

Most areas are farmed. Some areas are used for pasture or are idle.

This map unit is well suited to cultivated crops, hay, and improved pasture. Unprotected areas are subject to brief local flooding when the stream stage is high, and flooding is the major factor limiting the use of this soil. Conservation tillage, cover crops, crop residue management, and legumes increase productivity and tilth.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation may be necessary for the optimum growth of newly established seedlings. Pruning can improve the quality of white pine.

This map unit is limited as a site for most kinds of urban development and sanitary waste disposal systems. The seasonal high water table and the hazard of flooding are the major limiting factors. The rapid or very rapid permeability in the sandy substratum results in a poor filtering capacity in septic tank absorption fields, causing a hazard of ground water contamination.

The capability subclass is IIw.

3—Scarboro and Walpole soils

These very deep, nearly level, poorly drained and very poorly drained soils are in low areas and depressions on stream terraces and outwash plains. The soils are along drainageways and range from 8 to 15 acres in size. This unit consists of 40 percent Scarboro soil, 30 percent Walpole soil, and 30 percent other soils. Some areas are mostly Walpole soil, and some are both Scarboro and Walpole soils. The two soils were mapped together because they could not be separated at the scale used for this survey.

Typically, the Scarboro soil has a surface layer of black mucky fine sandy loam about 6 inches thick. The upper part of the substratum is olive gray gravelly loamy sand about 10 inches thick. The lower part to a depth of about 65 inches is light olive gray loamy sand.

Typically, the Walpole soil has a surface layer of very dark gray fine sandy loam about 9 inches thick. The subsoil is dark grayish brown fine sandy loam about 8 inches thick. The substratum to a depth of about 65 inches is dark brown and olive gray gravelly sand.

Included with these soils in mapping are small areas of Swansea soils, poorly drained sand, and sandy areas that are ponded. Included areas make up about 30 percent of this unit.

Permeability is rapid or very rapid throughout the Scarboro soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The seasonal high water table is between the surface and a depth of 12 inches.

Permeability in the Walpole soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The seasonal high water table is between the surface and a depth of 12 inches.

Most areas of this unit are covered with brush.

The Walpole soil is suited to cultivated crops, hay, and improved pasture, but the Scarboro soil is poorly suited to those uses. Wetness is the major limitation. Drainage of these soils is limited by the lack of a suitable outlet. If a suitable outlet is available, the Walpole soil is very productive when drained.

Excess soil moisture, a high seedling mortality rate, and the hazard of windthrow are management concerns in the areas used as woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting, which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels, and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical.

Because of the high water table, these soils are poorly suited to most nonfarm uses.

The capability subclass is Vw in areas of the Scarboro soil and IVw in areas of the Walpole soil.

4—Rippowam fine sandy loam

This very deep, nearly level, poorly drained soil is on flood plains along rivers and streams. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is black fine sandy loam about 8 inches thick. The upper part of the substratum is very dark grayish brown and dark brown fine sandy loam about 18 inches thick. The lower part to a depth of about 65 inches is dark grayish brown and very dark grayish brown loamy fine sand and gravelly coarse sand.

Included with this soil in mapping are Saco and Pootatuck soils in areas less than 3 acres in each. Also included are areas of Walpole and Scarboro soils. Included areas make up about 15 percent of this unit.

Permeability is moderate or moderately rapid in the upper part of the Rippowam soil and rapid or very rapid in the lower part. Available water capacity is moderate. Reaction ranges from very strongly acid to slightly acid throughout the soil. The water table is within a depth of 18 inches in fall and spring.

Most of the acreage in this unit supports brush. Some of the acreage has been cleared and is used for pasture.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The seasonal high water table and a hazard of flooding are the major management concerns.

Excess soil moisture, a high seedling mortality rate, and windthrow hazard are the main management concerns in wooded areas. The use of equipment is limited because of low strength. The equipment should be used only during dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting that reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels and by limiting changes in stand density to 30 percent or less.

This map unit is limited as a site for most kinds of urban development and sanitary waste disposal systems by the seasonal high water table and the hazard of flooding.

The capability subclass is IVw.

5—Saco mucky very fine sandy loam

This very deep, nearly level, very poorly drained soil is in low areas on flood plains. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark gray mucky very fine sandy loam about 12 inches thick. The upper 8 inches of the substratum is grayish brown very fine sandy loam. The lower part to a depth of about 65 inches is light olive gray very fine sandy loam and fine sand.

Included with this soil in mapping are Swansea and Rippowam soils in areas generally less than 3 acres each. They make up about 15 percent of this unit.

Permeability in the Saco soil is moderate in the surface layer and upper part of the substratum and rapid in the lower part of the substratum. Available water capacity is high. Reaction ranges from strongly acid to neutral within a depth of 30 inches and from medium acid to neutral below that depth. The water table is within a depth of 6 inches in fall and spring.

Most of the acreage of this unit supports brush.

This map unit is poorly suited to farming, woodland, and community development. A high water table throughout the year and a hazard of flooding are the major management concerns. Most areas are protected by wetland legislation.

The capability subclass is VIw.

30—Raynham silt loam

This very deep, nearly level, poorly drained soil is in old glacial lakes and on terraces. The areas are irregularly shaped. They range from 5 to 15 acres in size.

Typically, the surface layer is dark brown silt loam about 10 inches thick. The subsoil is about 18 inches thick. The upper 6 inches is grayish brown silt loam, the middle 4 inches is olive gray silt loam, and the lower 8 inches is mottled, olive silt. The substratum to a depth of about 65 inches is olive silt and clay streaks.

Included with this soil in mapping are areas of moderately well drained soils and soils that have slopes of more than 3 percent. Included areas make up about 15 percent of this unit.

Permeability in the Raynham soil is moderate or moderately slow in the surface layer and subsoil and slow in the substratum. Available water capacity is

high. Reaction is strongly acid or neutral in the surface layer and subsoil and medium acid or neutral in the substratum. The water table is at a depth of 6 to 24 inches in fall and spring.

Most of the acreage of this unit is idle or forested. Some of the acreage has been developed for pasture.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Wetness is the major limitation. Excess water can be removed by a drainage system.

This map unit has many major limitations that restrict woodland management. Intensive management is needed for hardwoods or conifers. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting help to establish seedlings. Pruning can improve the quality of white pine.

This map unit is poorly suited to community development and waste-disposal facilities. The soil texture and the seasonal high water table are the major limiting factors.

The capability subclass is IVw.

51—Swansea muck

This very deep, nearly level, very poorly drained soil is in depressions and flat areas on outwash plains and till plains. It consists of highly decomposed organic material 16 to 51 inches deep over sandy mineral material. The areas are circular or irregularly shaped. They range from 5 to 20 acres in size.

Typically, the surface tier is black to dark reddish brown hemic and sapric material about 20 inches thick. The subsurface tier is black organic material about 14 inches thick. The substratum to a depth of about 65 inches is brown gravelly loamy sand.

Included with this soil in mapping are areas of Freetown, Scarboro, and Whitman soils in areas generally less than 3 acres each. They make up about 20 percent of this unit.

Permeability in the Swansea soil is moderate or moderately rapid in the surface and subsurface tiers and very rapid in the substratum. Available water capacity is high. Reaction is extremely acid to strongly acid. The water table is within 12 inches of the surface throughout the year.

Most areas of this unit support water-tolerant brush and grasses. A few areas are covered with trees.

This map unit is poorly suited to farming, forestry, and urban uses because of excessive wetness. The high water table throughout the year is the major limitation. Most of the acreage is protected by wetland legislation. Some of the acreage is managed for wildlife habitat.

The capability subclass is Vw.

52—Freetown muck

This very deep, nearly level, very poorly drained, organic soil is in depressions or flat areas on outwash plains and till plains. It consists of 51 inches or more of highly decomposed organic material. The areas are irregularly shaped. They range from 10 to 80 acres in size.

Typically, the surface tier is black sapric and hemic material about 20 inches thick. The subsurface tier is black sapric and hemic material about 15 inches thick. The bottom tier to a depth of about 65 inches is dark brown to black, mostly sapric material and some hemic material.

Included with this soil in mapping are Swansea, Scarboro, and Whitman soils in areas generally less than 3 acres each that make up about 20 percent of this unit.

Permeability is moderate or moderately rapid in the Freetown soil. Available water capacity is high. Reaction is extremely acid throughout the soil. The seasonal high water table is within 12 inches of the surface.

Most of the acreage of this unit is idle or covered with trees. Some of the acreage is managed for wildlife habitat. Most areas are protected by wetland legislation.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The content of organic matter and the wetness are the major limitations.

Excess soil moisture, a high seedling mortality rate, and the hazard of windthrow are management concerns in the areas used as woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting that reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

Wetness and low strength are the main limitations affecting building site development.

The capability subclass is Vw.

53—Freetown muck, ponded

This very deep, nearly level, very poorly drained, organic soil is in depressional or flat areas on outwash plains and till plains. It consists of 51 inches or more of highly decomposed organic material. It is covered with 1 to 24 inches of water. The areas are irregularly shaped. They range from 10 to 25 acres in size.

Typically, the surface tier is black sapric and hemic material about 20 inches thick. The subsurface tier is black sapric and hemic material about 15 inches thick. The bottom tier to a depth of about 65 inches is dark brown to black sapric material.

Included with this soil in mapping are Swansea, Scarboro, and Whitman soils in areas generally less than 3 acres in size that make up about 15 percent of this unit.

Permeability is moderate or moderately rapid in the Freetown soil. Available water capacity is high. Reaction is extremely acid throughout the soil. The water table is at or above the surface.

Most of the acreage in this unit is idle or covered with trees. Some of the acreage is managed for wildlife habitat. Most areas are protected by wetland legislation.

This map unit is poorly suited to cultivated crops, hay, or pasture. The organic material and the high water table are the major limitations.

Excess soil moisture, a high seedling mortality rate, and the hazard of windthrow are management concerns in the areas used as woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels, and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

Wetness and low strength are the main limitations affecting building site development.

The capability subclass is VIIw.

70A—Ridgebury fine sandy loam, 0 to 3 percent slopes

This very deep, nearly level, poorly drained soil is in low areas within drainageways of glacial till uplands. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark gray fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 14 inches thick. The upper 4 inches is light olive brown, and the lower 10 inches is olive gray. The substratum to a depth of about 65 inches is firm, olive gray fine sandy loam.

Included with this soil in mapping are Scituate, Whitman, and Woodbridge soils in areas generally less than 3 acres each. These inclusions make up about 15 percent of this unit.

Permeability in the Ridgebury soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is very low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the substratum 2 to 3 feet below the surface. A perched water table is within a depth of 18 inches in fall and spring.

Most areas of this unit are forested. Some areas have been cleared and are used as permanent pasture. Some areas are protected by wetland legislation.

This map unit is suited to cultivated crops, hay, and improved pasture. The seasonal high water table is the major limiting factor. The main management practices consist of installing field drains, timing of farming operations, and using suitable plant species. Conservation tillage, a proper crop rotation, cover crops, applications of animal manure, and legumes increase productivity and tilth.

Excess soil moisture, moderate seedling mortality, and severe windthrow hazard are management concerns in woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels, and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

This soil generally is not suitable for building site development. Constructing buildings without basements and a sufficient distance above the seasonal high water table, and landscaping to drained water away from buildings help to prevent damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. The seasonal high water table and the

restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIIw.

70B—Ridgebury fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, poorly drained soil is in low areas within drainageways of glacial till uplands. The areas are narrow and long or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark gray fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 14 inches thick. The upper 4 inches is light olive brown, and the lower 10 inches is olive gray. The substratum to a depth of about 65 inches is firm, olive gray fine sandy loam.

Included with this soil in mapping are areas of Scituate, Whitman, and Woodbridge soils. These areas generally are less than 3 acres each and make up about 20 percent of this unit.

Permeability in the Ridgebury soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is very low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the substratum 2 to 3 feet below the surface. A perched water table is within a depth of 18 inches in fall and spring.

Most areas of this unit are forested. Some areas have been cleared for permanent pasture. Some areas are protected by wetland legislation.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The seasonal high water table is the major limiting factor. The main management practices include installation of field drains, proper timing of farming operations, and the use of suitable plant species. Conservation tillage, a proper crop rotation, cover crops, applications of animal manure, and legumes increase productivity and tilth.

Excess soil moisture, moderate seedling mortality, and severe hazard of windthrow are management concerns for woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

This soil generally is not suitable for building site development. Constructing buildings without basements and a sufficient distance above the seasonal high water table and landscaping to drain surface water away from buildings help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIIw.

71A—Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony

This very deep, nearly level, poorly drained soil is in low areas within drainageways of glacial till uplands. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are long and narrow or irregularly shaped. They range from 10 to 25 acres in size.

Typically, the surface layer is very dark gray fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 14 inches thick. The upper 4 inches is light olive brown, and the lower 10 inches is olive gray. The substratum to a depth of about 65 inches is firm, olive gray fine sandy loam.

Included with this soil in mapping are areas of Scituate, Whitman, and Woodbridge soils. These areas generally are less than 3 acres each. They make up about 15 percent of this unit.

Permeability in the Ridgebury soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is very low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the substratum 2 to 3 feet below the surface. A perched water table is within a depth of 18 inches in fall and spring.

Most areas of this unit are forested. Some areas are protected by wetland legislation.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The seasonal high water table and surface stones are the major limiting factors. The main management practices include installation of field drains, proper timing of farming operations,

clearing surface stones, and using suitable plant species.

Excess soil moisture, moderate seedling mortality, and severe hazard of windthrow are management concerns for woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should be used only during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels, and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

This soil generally is not suitable for building site development. Constructing buildings without basements and a sufficient distance above the seasonal high water table and landscaping that drains surface water away from buildings help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the road damage caused by wetness and frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is VIIs.

71B—Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, poorly drained soil is in low areas and within drainageways of glacial till uplands. Stones are 2.5 to 5.0 feet apart and cover 3 to 15 percent of the surface. The areas are narrow and long or irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is very dark gray fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 14 inches thick. The upper 4 inches is light olive brown, and the lower 10 inches is olive gray. The substratum to a depth of about 65 inches is firm, olive gray fine sandy loam.

Included with this soil in mapping are areas of Scituate, Whitman, and Woodbridge soils. These areas generally are less than 3 acres each. They make up about 20 percent of this unit.

Permeability in the Ridgebury soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is very low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the substratum 2 to 3 feet below the surface. A perched water table is within a depth of 18 inches in fall and spring.

Most areas of this unit are forested.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The seasonal high water table and the surface stones are the major limiting factors.

Excess soil moisture, moderate seedling mortality, and severe hazard of windthrow are management concerns in the areas used as woodland. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. The equipment should only be used during very dry periods or when the ground is frozen. When the stands are thinned, windthrow can be minimized through cutting which reduces the effect of the wind by keeping the residual stand density at or slightly above standard stocking levels and by limiting changes in stand density to 30 percent or less. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

This soil generally is not suitable for building site development. Constructing buildings without basements and a sufficient distance above the seasonal high water table, and landscaping to drain surface water away from buildings help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the road damage caused by wetness and frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is VIIs.

72—Whitman sandy loam

This very deep, nearly level, very poorly drained soil is in long, narrow areas along drainageways. The areas are irregularly shaped. They range from 5 to 20 acres in size.

Typically, the surface layer is overlain by 5 inches of organic material. The surface layer is very dark gray sandy loam about 4 inches thick. The subsoil is light gray sandy loam and fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm gray and dark gray fine sandy loam.

Included with this soil in mapping are areas of

Ridgebury and Swansea soils. These areas are less than 3 acres each. Also included are areas of soils that are finer textured in the substratum than the Whitman soil. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil of the Whitman soil and slow in the substratum. Available water capacity is low. Reaction ranges from very strongly acid to slightly acid. The seasonal high water table is between the surface and a depth of 6 inches.

Most areas of this unit are idle or used for pasture. Some areas are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Wetness is a major limitation.

In the areas used as woodland, excess soil moisture, a high seedling mortality rate, and the hazard of windthrow are the main management concerns. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. Thinning generally should be avoided because of the hazard of windthrow. Onsite investigation may identify areas where planting is practical.

The seasonal high water table and the potential for frost action limit this unit as a site for dwellings and local roads and streets. The high water table and the slow or very slow permeability in the substratum limit the soil as a site for septic tank absorption fields.

The capability subclass is Vw.

73—Whitman sandy loam, extremely stony

This very deep, nearly level, very poorly drained soil is in long, narrow, flat areas adjacent to sloping and strongly sloping areas and along drainageways. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 5 to 20 acres in size.

Typically, the surface is overlain by 5 inches of organic material. The surface layer is very dark gray sandy loam about 4 inches thick. The subsoil is light gray sandy loam and fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm gray and dark gray fine sandy loam.

Included with this soil in mapping are areas of Ridgebury and Swansea soils. These areas are less than 3 acres each. Also included are areas of soils that are finer textured in the substratum than the Whitman soil and areas where stones 5 to 30 feet apart cover 1 to 3 percent of the surface. Included areas make up about 30 percent of this unit.

Permeability in the Whitman soil is moderate or moderately rapid in the surface layer and subsoil and slow in the substratum. Available water capacity is low. Reaction ranges from very strongly acid to slightly acid. The seasonal high water table is between the surface and a depth of 6 inches.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Wetness and stoniness are the major limitations.

In the areas used as woodland, excess soil moisture, a high seedling mortality rate, and the hazard of windthrow are the main management concerns. Optimum growth and survival are not expected. The use of equipment is limited because of low strength. Thinning generally should be avoided because of windthrow hazard. Onsite investigation may identify areas where planting is practical.

The seasonal high water table and the potential for frost action limit this unit as a site for dwellings and local roads and streets. The water table and the slow or very slow permeability in the substratum limit the soil as a site for septic tank absorption fields.

The capability subclass is VIIs.

100C—Brookfield-Brimfield-Rock outcrop complex, 3 to 15 percent slopes

This unit consists of very deep and shallow, gently sloping to strongly sloping, well drained and somewhat excessively drained soils on rolling ridges and hills. The areas are irregularly shaped. They range from 10 to 80 acres in size. This unit consists of 40 percent Brookfield soil, 30 percent Brimfield soil, 10 percent Rock outcrop, and 20 percent included soils. The Brookfield and Brimfield soils and Rock outcrop are in areas so closely intermingled that mapping them separately was not practical.

Typically, the Brookfield soil has a surface layer of dark brown fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam and gravelly loamy sand. The lower part to a depth of about 65 inches is grayish brown sandy loam that has yellowish red and red streaks.

Typically, the Brimfield soil has a surface layer of black fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 17 inches thick. Bedrock is at a depth of about 18 inches.

Included in this unit in mapping are areas of Chatfield and Hollis soils. These areas are less than 5 acres each. Also included are areas where stones

cover more than 3 percent of the surface. Included areas make up 20 percent of this unit.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Permeability is moderate or moderately rapid throughout the Brimfield soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted to the depth of bedrock.

Most areas of this unit are covered with trees. A few areas are used for urban development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The areas of exposed rock and the shallowness to bedrock are the major limitations.

In the areas used as woodland, the shallowness to bedrock and the low available water capacity are the main management concerns. Optimum growth and survival are not expected. The use of equipment may be limited because of the outcrops of bedrock. Thinning generally should be avoided because of a moderate hazard of windthrow. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Onsite investigation may identify areas where tree planting is practical if special treatment is applied.

Excavation for building site development may be difficult because of the underlying bedrock. In most areas the bedrock is not very hard, but heavy equipment is required for removal of the bedrock. The underlying bedrock hinders road construction, and heavy equipment generally is required if excavations are made during construction. The depth to bedrock is the main limitation at sites for septic tank absorption fields. The bedrock may hinder the installation of distribution lines.

The capability subclass is VIs.

101D—Brimfield-Brookfield-Rock outcrop complex, 15 to 35 percent slopes

This unit consists of shallow and very deep, moderately steep and steep, somewhat excessively drained and well drained soils on ridges. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 60 acres in size. This unit consists of 40 percent Brimfield soil, 30 percent Brookfield soil, 15 percent Rock outcrop, and 15 percent included soils. The Brimfield and Brookfield soils and Rock outcrop are in areas so closely intermingled that mapping them separately was not practical.

Typically, the Brimfield soil has a surface layer of black fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 17 inches thick. Bedrock is at a depth of about 18 inches.

Typically, the Brookfield soil has a surface layer of dark brown fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam and gravelly loamy sand. The lower part to a depth of about 65 inches is grayish brown sandy loam that has yellowish red and red streaks.

Included with these soils in mapping are areas of Chatfield and Hollis soils. These areas are less than 6 acres each. They make up about 15 percent of this unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil of the Brimfield soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid. The root zone is restricted to the depth of bedrock.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The areas of exposed rock, the shallowness to bedrock, the stoniness, and the slope are the major limitations.

In the areas used as woodland, the limited rooting depth caused by the bedrock results in a hazard of windthrow and the soil tends to be somewhat droughty. The hazard of erosion is moderate because of the slope. The seedling mortality rate is moderate. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation, conserve the limited amount of soil moisture, and help to control runoff and erosion. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Thinning generally should be avoided because of the hazard of windthrow. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Excavation for building site development may be difficult because of the underlying bedrock. In most areas the bedrock is very hard or cemented, and heavy equipment is required for removal of the bedrock. The underlying bedrock hinders road construction, and

heavy equipment generally is required if excavations are made during construction. The depth to bedrock is the main limitation at sites for septic tank absorption fields. The bedrock may hinder the installation of distribution lines.

The capability subclass is VIIs.

102C—Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes

This unit consists of moderately deep and shallow, gently sloping and strongly sloping, well drained and somewhat excessively drained soils on hills and ridges on glacial till uplands. The areas are irregularly shaped. They range from 10 to 120 acres in size. This unit consists of 40 percent Chatfield soil, 20 percent Hollis soil, 15 percent Rock outcrop, and 25 percent included soils. The Chatfield and Hollis soils and Rock outcrop are in areas so closely intermingled that mapping them separately was not practical.

Typically, the Chatfield soil is overlain by about 2 inches of organic material. The surface layer is dark brown fine sandy loam about 2 inches thick. The subsoil is yellowish brown fine sandy loam about 26 inches thick. Bedrock is at a depth of about 30 inches.

Typically, the Hollis soil has a surface layer of dark brown fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown gravelly fine sandy loam about 13 inches thick. Bedrock is at a depth of about 19 inches.

Included in this unit in mapping are areas of Canton and Charlton soils. These areas are less than 6 acres each. Also included are pockets of somewhat poorly drained soils. Included areas make up about 25 percent of this unit.

Permeability in the Chatfield and Hollis soils is moderate or moderately rapid throughout. Available water capacity is low in Chatfield soil and very low in the Hollis soil. Reaction in both soils ranges from very strongly acid to acid. The root zone is restricted by the bedrock.

Most areas of this unit are covered with trees. A few areas are used for pasture or residential development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The areas of exposed rock and the depth to bedrock are the major limitations.

In the areas used as woodland, the limited rooting depth caused by the bedrock results in a hazard of windthrow and the Hollis soil tends to be somewhat droughty. The hazard of erosion is slight. Seedling mortality is slight on the Chatfield soil and moderate on the Hollis soil. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Thinning generally should be avoided because of the hazard of windthrow. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Excavation for building site development is difficult because of the underlying bedrock. In most areas the bedrock is very hard or cemented, and heavy equipment is required for removal of the bedrock. The underlying bedrock hinders road construction, and heavy equipment generally is required if excavations are made during construction. The shallowness to bedrock is the main limitation at sites for septic tank absorption fields. The bedrock hinders the installation of distribution lines.

The capability subclass is VIs.

102D—Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes

This unit consists of moderately deep and shallow, moderately steep and steep, well drained and somewhat excessively drained soils on hills and ridges in the uplands. Stones are 5 to 30 feet apart and cover 1 to 3 percent of the surface. The areas are irregularly shaped. They range from 10 to 95 acres in size. This unit consists of 35 percent Chatfield soil, 30 percent Hollis soil, 20 percent Rock outcrop, and 15 percent included soils. The Chatfield and Hollis soils and Rock outcrop are in areas so closely intermingled that mapping them separately was not practical.

Typically, the Chatfield soil has a surface layer of dark brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown fine sandy loam about 26 inches thick. Bedrock is at a depth of 30 inches.

Typically, the Hollis soil has a surface layer of dark brown fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown gravelly fine sandy loam about 13 inches thick. Bedrock is at a depth of about 19 inches.

Included in this unit in mapping are areas of Canton and Charlton soils. These areas are less than 6 acres each. Also included are pockets of somewhat poorly drained soils. Included areas make up about 15 percent of this unit.

Permeability is moderate or moderately rapid throughout the Chatfield and Hollis soils. Available water capacity is low in the Chatfield soil and very low in the Hollis soil. Reaction in both soils ranges from very strongly acid to medium acid. The root zone is restricted by the bedrock.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope, the exposed rock, and the depth to bedrock are the main limitations.

In the areas used as woodland, the limited rooting depth caused by the bedrock results in a hazard of windthrow and the soil tends to be somewhat droughty. The hazard of erosion is moderate on the Hollis soil and slight on the Chatfield soil. The seedling mortality rate is slight on the Chatfield soil and moderate on the Hollis soil. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation, conserve the limited amount of soil moisture, and help to control runoff and erosion. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Thinning generally should be avoided because of the hazard of windthrow. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Excavation for building site development is difficult because of the underlying bedrock. In most areas the bedrock is very hard or cemented, and heavy equipment is required for removal of the bedrock. The underlying bedrock hinders road construction, and heavy equipment generally is required if excavations are made during construction. The depth to bedrock is the main limitation at sites for septic tank absorption fields. The bedrock hinders the installation of distribution lines.

The capability subclass is VIIs.

253A—Hinckley sandy loam, 0 to 3 percent slopes

This very deep, nearly level, excessively drained soil is on broad flat areas on outwash plains. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is dark brown sandy loam about 6 inches thick. The subsoil is strong brown gravelly loamy sand about 11 inches thick. The substratum to a depth of about 65 inches is strong brown very gravelly coarse sand.

Included with this soil in mapping are areas of Canton and Merrimac soils. These areas are less than 5 acres each. Also included are areas of Sudbury and Windsor soils. Included areas make up about 15 percent of this unit.

Permeability in the Hinckley soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is very low. Reaction ranges from extremely acid to medium acid. The root zone is confined to the surface layer and subsoil because of a scarcity of moisture in the substratum.

Most of the acreage of this unit is idle brushland. Some areas are used as urban centers. A few areas are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness and a low content of plant nutrients are the major limitations in the areas used as cropland. The rapid permeability cause nutrients and water to rapidly pass through the soil. Irrigation, applications of fertilizer, cover crops, and incorporation of crop residue and manure into the plow layer are needed. The droughtiness and low content of nutrients are management concerns, but are not major limitations in the areas used for hay and pasture. The major concern is the prevention of overgrazing, which reduces the hardiness and density of desirable plants.

In the areas used as woodland, seeding mortality is severe because of the moisture stress caused by droughtiness. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of soil moisture. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings.

This map unit is suitable for building development and as a site for local roads. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIIs.

253B—Hinckley sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, excessively drained soil is on broad flat areas on outwash plains. The areas are irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is dark brown sandy loam about 6 inches thick. The subsoil is strong brown gravelly loamy sand about 11 inches thick. The substratum to a depth of about 65 inches is strong brown very gravelly coarse sand.

Included with this soil in mapping are areas of Canton and Merrimac soils. These areas are less than

5 acres each. Also included are areas of Sudbury and Windsor soils. Included areas make up about 15 percent of this unit.

Permeability in the Hinckley soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is very low. Reaction ranges from extremely acid to medium acid. The root zone is confined to the surface layer and subsoil because of a scarcity of moisture in the substratum.

Most of the acreage of this unit is idle brushland. Some areas are used as urban centers or are mined. A few areas are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness and a low content of plant nutrients are the major limitations in the areas used as cropland. The rapid permeability causes nutrients and water to readily pass through the soil. Irrigation, applications of fertilizer, cover crops, and incorporation of crop residue and manure into the plow layer are needed. The droughtiness and low content of nutrients are management concerns, but are not major limitations in the areas used for hay and pasture. The major concern is the prevention of overgrazing, which reduces the hardiness and density of desirable plants.

In the areas used as woodland, seedling mortality is severe because of the moisture stress caused by droughtiness. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of soil moisture. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings.

This map unit is suitable for building development and as a site for local roads. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIIs.

253C—Hinckley sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, excessively drained soil is on eskers, kames, and ridges of outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 60 acres in size.

Typically, the surface layer is dark brown sandy loam about 6 inches thick. The subsoil is strong brown gravelly loamy sand about 11 inches thick. The substratum to a depth of about 65 inches is strong brown very gravelly coarse sand.

Included with this soil in mapping are areas of Canton and Merrimac soils. These areas are less than 5 acres each. Also included are areas of Windsor soils. Included areas make up about 20 percent of this unit.

Permeability in the Hinckley soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is very low. Reaction ranges from extremely acid to medium acid. The root zone is confined to the surface layer and subsoil because of a scarcity of moisture in the substratum.

Most of the acreage of this unit is idle brushland. Some areas are used as urban centers or are mined. A few areas are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness, the slope, and a low content of plant nutrients are the major limitations in the areas used as cropland. The rapid permeability cause nutrients and water to readily pass through the soil. Erosion is a hazard. Irrigation, applications of fertilizer, cover crops, and incorporation of crop residue and manure into the plow layer are needed. The droughtiness and low content of nutrients are management concerns, but are not major limitations in the areas used for hay and pasture. The major concern is the prevention of overgrazing, which reduces the hardiness and density of desirable plants.

In the areas used as woodland, seedling mortality is severe because of the moisture stress caused by droughtiness. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of soil moisture. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. Removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings.

The slope is a limitation on building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and

reduces the hazard of erosion in disturbed areas. Land shaping is needed in some areas. Constructing roads on the contour when possible and planting suitable grasses on roadbanks will help to reduce the hazard of erosion. This soil readily absorbs, but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IVs.

253D—Hinckley sandy loam, 15 to 35 percent slopes

This very deep, moderately steep to steep, excessively drained soil is on ridges on outwash plains. The areas are irregularly shaped. They range from 10 to 30 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 6 inches thick. The subsoil is strong brown gravelly loamy sand about 11 inches thick. The substratum to a depth of about 65 inches is strong brown very gravelly coarse sand.

Included with this soil in mapping are areas of Canton and Merrimac soils. These areas are less than 5 acres each. Also included are areas of Windsor soils. Included areas make up about 20 percent of this unit.

Permeability in the Hinckley soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is very low. Reaction ranges from extremely acid to medium acid. The root zone is confined to the surface layer and subsoil because of a scarcity of moisture in the substratum.

Most of the acreage of this unit is idle brushland. Some areas are covered with trees or are mined.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Droughtiness, the slope, and a low content of plant nutrients are the major limitations in the areas used as cropland. The rapid permeability causes nutrients and water to readily pass through the soil. Erosion is a hazard. Irrigation, applications of fertilizer, stripcropping, cover crops, incorporation of crop residue and manure into the plow layer, and other erosion-control measures are needed.

In the areas used as woodland, seedling mortality is severe because of the moisture stress caused by the limited available water capacity. Erosion is a hazard. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that can absorb precipitation and conserve the limited amount of soil moisture. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks will help to reduce the hazard of erosion. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines across the slope lessens the slope limitation, but additional precautionary measures are needed in some areas to reduce the hazard of pollution.

The capability subclass is VIs.

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

This very deep, nearly level, somewhat excessively drained soil is on broad flat areas on outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is yellowish brown and is 22 inches thick. It is fine sandy loam in the upper 12 inches and very gravelly loamy sand in the lower 10 inches. The substratum to a depth of about 65 inches is yellowish brown gravelly and very gravelly sand.

Included with this soil in mapping are areas of Hinckley, Sudbury, and Windsor soils. These areas are less than 5 acres each. They make up about 15 percent of this unit.

Permeability in the Merrimac soil is moderate in the surface layer and the upper part of the subsoil and moderately rapid or rapid in the lower part of the subsoil and in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by a scarcity of available water in the substratum.

Most areas of this unit are farmed. Some areas are used for building site development or commercial development.

This map unit is well suited to cultivated crops, hay, and improved pasture. Droughtiness is the major concern. Irrigation and increasing the organic matter content of the soil help to increase the moisture

Figure 6.—A golf fairway on Merrimac fine sandy loam, 3 to 8 percent slopes.

content of this soil. Proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

In the areas used as woodland, seedling mortality is moderate because of the moisture stress caused by the limited available water capacity. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and conserve the limited amount of soil moisture. The removal or control of understory vegetation that competes for the limited amount of available water increases the likelihood that the seedlings of preferred trees will survive.

This map unit is suitable for building development and as a site for local roads. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIs.

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

This very deep, gently sloping, somewhat excessively drained soil is on rolling areas on outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is yellowish brown and 22 inches thick. The upper 12 inches is fine sandy loam and the lower 10 inches is very gravelly loamy sand. The substratum to a depth of about 65 inches is yellowish brown gravelly and very gravelly sand.

Included with this soil in mapping are areas of Hinckley, Sudbury, and Windsor soils. These areas are less than 5 acres each. They make up about 20 percent of this unit.

Permeability in the Merrimac soil is moderate in the surface layer and upper part of the subsoil and moderately rapid or rapid in the lower part of the subsoil and in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by a scarcity of available water in the substratum.

Most areas of this unit are farmed. Some areas are used for building site development or commercial development (fig. 6).

This map unit is well suited to cultivated crops, hay, and improved pasture. Droughtiness is a management concern, and erosion is a hazard. Irrigation and increasing the organic content of the soil help to increase the moisture content of this soil. Proper stocking rates, deferred grazing, and pasture rotation

help to maintain desirable pasture plant species. Stripcropping, planting on the contour, and conservation tillage help to reduce the hazard of erosion.

Seedling mortality is moderate because of moisture stress caused by the limited available water capacity in the areas used for timber production. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and conserve the limited amount of soil moisture. The removal or control of understory vegetation that competes for the limited amount of available water increases the likelihood that the seedlings of preferred trees will survive.

This map unit is suitable for building development and as a site for local roads. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIs.

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, somewhat excessively drained soil is on rolling areas on outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is yellowish brown and is 22 inches thick. It is fine sandy loam in the upper 12 inches and very gravelly loamy sand in the lower 10 inches. The substratum to a depth of about 65 inches is yellowish brown gravelly and very gravelly sand.

Included with this soil in mapping are areas of Hinckley and Windsor soils. These areas are less than 5 acres each. They make up about 20 percent of this unit.

Permeability in the Merrimac soil is moderate in the surface layer and upper part of the subsoil and moderately rapid or rapid in the lower part of the subsoil and in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by a scarcity of available water in the substratum.

Most areas of this unit are farmed. Some areas are used for building site development or commercial development.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness is a management concern, and erosion is a hazard. Irrigation and increasing the organic content of the soil help to increase the moisture content of this soil. Proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species. Stripcropping, planting on the contour, and conservation tillage help to reduce the hazard of erosion.

Seedling mortality is moderate because of moisture stress caused by the limited available water capacity in the areas used for timber production. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and conserve the limited amount of soil moisture. The removal or control of understory vegetation that competes for the limited amount of available water increases the likelihood that the seedlings of preferred trees will survive.

The slope is a limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks help to reduce the hazard of erosion. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines across the slope lessens the slope limitation, but additional precautionary measures are needed in some areas to reduce the hazard of pollution.

The capability subclass is IIIe.

254D—Merrimac fine sandy loam, 15 to 35 percent slopes

This very deep, moderately steep, somewhat excessively drained soil is on rolling ridges on outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 25 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is yellowish brown and is about 22 inches thick. It is fine sandy loam in the upper 12 inches and very gravelly loamy sand in the lower 10 inches. The substratum to a depth of about 65 inches is yellowish brown gravelly and very gravelly sand.

Included with this soil in mapping are areas of Hinckley and Windsor soils. These areas are less than 5 acres each. They make up about 15 percent of this unit.

Permeability in the Merrimac soil is moderate in the surface layer and upper part of the subsoil and moderately rapid or rapid in the lower part of the subsoil and in the substratum. Available water capacity is

moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by a scarcity of available water in the substratum.

Most areas of this unit are covered with brush.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness is a management concern, and erosion is a hazard. Irrigation and increasing the organic content of the soil help to increase the moisture content of this soil. Proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species. Stripcropping, planting on the contour, and conservation tillage help to reduce the hazard of erosion.

The main management concerns in the areas used as woodland are the hazard of erosion and droughtiness. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Minimizing soil disturbance so that the spongelike mulch of leaves is retained, and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of soil moisture. Constructing access roads and trails with grades between 2 and 20 percent and installing water bars help to prevent excessive erosion.

The slope is the main limitation for building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks will help to reduce the hazard of erosion. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IVe.

255A—Windsor loamy fine sand, 0 to 3 percent slopes

This very deep, nearly level, excessively drained soil is on broad flat areas on outwash plains. The areas are irregularly shaped. They range from 10 to 30 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand about 3 inches thick. The subsoil is about 22 inches thick. The upper 2 inches is dark yellowish brown loamy fine sand, the next 8 inches is dark brown loamy sand, and the lower 12 inches is yellowish brown loamy sand. The substratum to a depth of about 60 inches is olive yellow to light yellowish brown loamy sand, loamy fine sand, and fine sand.

Included with this soil in mapping are areas of Hinckley and Merrimac soils. These areas are less than 3 acres each. Also included are areas of Sudbury soils. Included areas make up about 20 percent of this unit.

Permeability is rapid or very rapid throughout the Windsor soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit support brush or poor-quality trees. Some areas are used for residential and commercial development. A few areas are used as cropland.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness is the main limitation. The main management concerns are providing irrigation and fertilizer and increasing organic matter content. Mixing crop residue and manure into the surface layer increases the organic matter content and improves fertility.

The limited available water capacity is a management concern in the areas used as woodland. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation may be necessary for the optimum growth of newly established seedlings. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and precipitation is absorbed and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of available soil moisture.

This map unit is well suited to building development and sites for local roads. The sides of excavations in this soil are unstable, and steep sides commonly collapse. Some form of shoring is needed where deep cuts are made. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIIs.

Figure 7.—The sand and gravel pit on Windsor loamy fine sand, 3 to 8 percent slopes, is near an area of cultivated crops on Merrimac fine sandy loam, 0 to 3 percent slopes.

255B—Windsor loamy fine sand, 3 to 8 percent slopes

This very deep, gently sloping, excessively drained soil is on broad flat areas and rolling hills on outwash plains. The areas are irregularly shaped. They range from 10 to 65 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand about 3 inches thick. The subsoil is about 22 inches thick. The upper 2 inches is dark yellowish brown loamy fine sand, the next 8 inches is dark brown loamy sand, and the lower 12 inches is yellowish brown loamy sand. The substratum to a depth of about 65 inches is olive yellow to light yellowish brown loamy sand, loamy fine sand, and fine sand.

Included with this soil in mapping are areas of Hinckley and Merrimac soils (fig. 7). These areas are less than 3 acres each. Also included are areas of Sudbury soils. Included areas make up about 20 percent of this unit.

Permeability is rapid or very rapid throughout the Windsor soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit support brush or poor-quality trees. Some areas are used for residential and commercial development. A few areas are used as cropland or are mined.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness is the main limitation. The main management concerns are providing irrigation and fertilizer and increasing organic matter content. Mixing crop residue and manure into the surface layer increases the organic matter content and improves fertility.

The limited available water capacity is a management concern in the areas used as woodland. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting

facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and precipitation is absorbed, and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of available soil moisture.

This map unit is well suited to building site development and sites for local roads. The sides of excavations in this soil are unstable, and steep sides commonly collapse. Some form of shoring is needed where deep cuts are made. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IIIs.

255C—Windsor loamy fine sand, 8 to 15 percent slopes

This very deep, strongly sloping, excessively drained soil is on sides slopes of eskers and outwash plains. The areas are long and narrow or irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand about 3 inches thick. The subsoil is about 22 inches thick. The upper 2 inches is dark yellowish brown loamy fine sand, the next 8 inches is dark brown loamy sand, and the lower 12 inches is yellowish brown loamy sand. The substratum to a depth of about 65 inches is olive yellow to light yellowish brown loamy sand, loamy fine sand, and fine sand.

Included with this soil in mapping are areas of Hinckley and Merrimac soils. These areas are less than 3 acres each. They make up about 15 percent of this unit.

Permeability is rapid or very rapid throughout the Windsor soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit support brush or poor-quality trees. Some areas are used for urban development. A few areas are mined.

This map unit is suited to cultivated crops, hay, and improved pasture. Droughtiness is the main limitation. The management concerns are providing water and fertilizer. The organic matter content can be increased by mixing crop residue and manure into the surface layer. Erosion is a hazard.

The limited available water capacity is a management concern in the areas used as woodland. Thinning crowded stands to standard stocking levels results in more vigorous growth. Diseased, poorly formed, and otherwise undesirable trees should receive priority for removal when the stands are thinned. Shelterwood cutting, seed-tree cutting, and clearcutting facilitate regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Minimizing soil disturbance so that the spongelike mulch of leaves is retained and precipitation is absorbed, and designing regeneration cuts so that the optimal amount of shade is provided and the evapotranspiration rate is reduced will help to conserve the limited amount of available soil moisture.

The slope is a limitation for building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Land shaping is needed in some areas. Constructing roads on the contour where possible and planting suitable grasses on roadbanks will help to reduce the hazard of erosion. This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water.

The capability subclass is IVs.

255D—Windsor loamy fine sand, 15 to 25 percent slopes

This very deep, moderately stony, excessively drained soil is on the sides of eskers on outwash plains. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand about 3 inches thick. The subsoil is about 22 inches thick. The upper 2 inches is dark yellowish brown loamy fine sand, the next 8 inches is dark brown loamy sand, and the lower 12 inches is yellowish brown loamy sand. The substratum to a depth of 60 inches is olive yellow to light yellowish brown loamy sand, loamy fine sand, and fine sand.

Included with this soil in mapping are areas of Hinckley and Merrimac soils. These areas are less than 3 acres each. They make up about 15 percent of this unit.

Permeability is rapid or very rapid throughout the Windsor soil. Available water capacity is low. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit support brush or poor-quality trees. Some areas are mined.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope and droughtiness are the main limitations. Erosion is a hazard. The main management concerns are providing irrigation and

increasing organic matter content. Mixing crop residue and manure into the surface layer increases the organic matter content. Stripcropping and conservation tillage help to control erosion.

In the areas used as woodland, seedling mortality is moderate because of the moisture stress caused by the limited available water capacity. Erosion is a hazard. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and conserve the limited amount of soil moisture. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks will help to reduce the hazard of erosion. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines across the slope lessens the slope limitation, but additional precautionary measures are needed in some areas to reduce the hazard of pollution.

The capability subclass is VIs.

260A—Sudbury fine sandy loam, 0 to 3 percent slopes

This very deep, nearly level, moderately well drained soil is in shallow depressions on outwash plains and stream terraces. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark gray fine sandy loam about 2 inches thick. The subsoil is sandy loam about 18 inches thick. The upper 6 inches is very dark grayish brown, and the lower 12 inches is light olive brown. The substratum to a depth of about 65 inches is light olive brown gravelly loamy sand.

Included with this soil in mapping are areas of Merrimac and Walpole soils. These areas generally are less than 3 acres each. Also included are soils that are finer textured in the surface layer and subsoil than the Sudbury soil. Included areas make up about 25 percent of this unit.

Permeability in the Sudbury soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The seasonal high water table is 1.5 to 3.0 feet below the surface.

Most areas of this unit are farmed. Some areas have been developed for residential or commercial uses.

This map unit is well suited to cultivated crops, hay, and improved pasture. The seasonal high water table is the major limitation. Field drains can remove excess water where they are needed. Conservation tillage, contour farming, a proper crop rotation, crop residue management, and cover crops help to maintain productivity and control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning can improve the quality of white pine.

Constructing buildings without basements and a sufficient distance above the seasonal high water table, and landscaping to drain surface water away from buildings will help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the road damage caused by wetness and frost action. The seasonal high water table and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIw.

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

This very deep, gently sloping, moderately well drained soil is in shallow depressions on outwash plains and stream terraces. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark gray fine

sandy loam about 2 inches thick. The subsoil is sandy loam about 18 inches thick. The upper 6 inches is very dark grayish brown, and the lower 12 inches is light olive brown. The substratum to a depth of about 65 inches is light olive brown gravelly loamy sand.

Included with this soil in mapping are areas of Merrimac and Walpole soils. These areas generally are less than 3 acres each. Also included are soils that are finer textured in the surface layer and subsoil than the Sudbury soil. Included areas make up about 20 percent of this unit.

Permeability in the Sudbury soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The seasonal high water table is 1.5 to 3.0 feet below the surface.

Most areas of this unit are farmed. Some areas have been developed for residential or commercial uses.

This map unit is well suited to cultivated crops, hay, and improved pasture. The seasonal high water table and the hazard of erosion are the major limitations. Field drains are used to remove excess water where needed. Minimum tillage, stripcropping, and cover crops aid in controlling erosion. A proper crop rotation, crop residue management, and use of manure, legumes, and green-manure crops help to maintain productivity and tilth.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning can improve the quality of white pine.

Constructing buildings without basements and a sufficient distance above the seasonal high water table, and landscaping to drain surface water away from the building will help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the road damage caused by wetness and frost action. The seasonal high water table and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIe.

300B—Montauk fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, well drained soil is on till plains and moraines. The areas are long and narrow, rectangular, or irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of about 65 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Canton, Paxton, Scituate, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas of stony soils. Included areas make up about 20 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are farmed. Some have been developed for residential use, and a few are covered with trees.

This map unit is well suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish seedlings. Pruning can improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table, and landscaping to drain surface water away from the building will help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the road damage caused by wetness and frost action. The

seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIe.

300C—Montauk fine sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, well drained soil is on till plains and moraines. The areas are long and narrow, rectangular, or irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of 60 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Canton, Paxton, Scituate, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas of stony soils. Included areas make up about 15 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are in pasture. Some have been developed for residential use, and a few are farmed.

This map unit is suited to cultivated crops, hay, and improved pasture. The slope is the major limiting factor. Erosion is a hazard. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting are used to establish seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table and landscaping to drain surface water away from the building will help to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Land shaping is necessary in some areas. Constructing roads on the contour and on well compacted, coarse textured base material helps to prevent the damage caused by wetness and frost action. Planting well suited grasses on roadbanks reduces the hazard of erosion. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIIe.

300D—Montauk fine sandy loam, 15 to 25 percent slopes

This very deep, moderately steep, well drained soil is on upland till plains and moraines. The areas are rectangular or irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of about 65 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Canton and Paxton soils. These areas are less than 5 acres each. Also included are areas of Charlton soils and stony soils. Included areas make up about 20 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are pastured or are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. The slope is the major limiting factor. Erosion is a hazard. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting is used to establish seedlings. Pruning can improve the quality of white pine.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses

on roadbanks will help to reduce the hazard of erosion. The slope and the restricted permeability are the main limitations at sites for septic tank absorption fields. Because of the restricted permeability, the soil does not readily absorb the effluent.

The capability subclass is IVe.

302B—Montauk fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, well drained soil is on upland till plains and moraines. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 120 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of about 65 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Charlton, Paxton, Scituate, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas of Canton soils and areas where stones cover less than 3 percent of the surface. Included areas make up about 25 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard. If feasible, clearing of stones and erosion-control measures are needed.

In the areas used as woodland, large stones and boulders on the surface are management concerns. They hinder the use of equipment and prevent its use in some areas. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Plant competition is moderate if conifers are grown. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. Thinning permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Wetness, frost action, and large stones are the major factors that affect the use of this unit as a site for buildings or local roads and streets. The wetness is a limitation only in winter and early spring. The firm substratum and the slow or moderately slow permeability limit this soil as a site for septic tank absorption fields.

The capability subclass is VIIs.

302C—Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony

This very deep, strongly sloping, well drained soil is on upland till plains and moraines. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 80 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of about 65 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Charlton, Paxton, Scituate, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas of Canton soils and areas where stones cover less than 3 percent of the surface. Included areas make up about 30 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard. If feasible, clearing of stones and some erosion control are needed.

In the areas used as woodland, large stones and boulders on the surface are management concerns. They hinder the use of equipment and prevent its use in some areas. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Plant competition is moderate if conifers are grown. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. Thinning permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Wetness, frost action, slope, and large stones are the major factors that affect the use of this soils as a site for buildings or local roads and streets. The wetness is a limitation only in winter and early spring. The firm substratum and the slow or moderately slow permeability limit this soil as a site for septic tank absorption fields.

The capability subclass is VIIs.

302D—Montauk fine sandy loam, 15 to 35 percent slopes, extremely stony

This very deep, moderately steep and steep, well drained soil is on upland till plains and moraines. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 75 acres in size.

Typically, the surface layer is very dark brown fine sandy loam about 5 inches thick. The subsoil is dark yellowish brown fine sandy loam about 22 inches thick. The substratum to a depth of about 65 inches is firm, light olive brown to olive loamy sand.

Included with this soil in mapping are areas of Charlton, Canton, and Paxton soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the firm substratum.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope and stoniness are the major limiting factors. Erosion is a hazard.

In the areas used as woodland, large stones and boulders on the surface and the slope are management concerns. They hinder the use of equipment and prevent its use in some areas. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Plant competition is moderate if conifers are grown. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. Thinning permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

Wetness, frost action, slope, and large stones are the major factors that affect the use of this soil as a site for buildings or local roads and streets. The wetness is a limitation only in winter and early spring. The firm substratum and the slow or moderately slow permeability limit this soil as a site for septic tank absorption fields.

The capability subclass is VIIs.

305B—Paxton fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, well drained soil is on drumlins and drumlinlike land features. The areas are oval, narrow, or irregularly shaped. They range from 10 to 70 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Canton, Charlton, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas of Ridgebury and Whitman soils in drainageways and depressions. Included areas make up about 20 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most of the acreage of this unit is used as cropland or hayland. Some of the acreage has been developed for residential uses. A few areas are covered with trees.

This map unit is well suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. Minimum tillage, cover crops, and stripcropping help to control erosion. A proper crop rotation, crop residue management, applications of manure, and legumes increase productivity and tilth.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used

to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning can improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Constructing roads on well compacted, coarse textured material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. Because of the slow or very slow permeability, the substratum does not readily absorb the effluent in septic tank absorption fields. Installing a drain field that is larger than average helps to overcome this limitation.

The capability subclass is IIe.

305C—Paxton fine sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, well drained soil is on drumlins and drumlinlike land features. The areas are oval, narrow, or irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Charlton and Canton soils. Also included are Ridgebury and Woodbridge soils. Included areas make up about 25 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most of the acreage of this unit is used as cropland or hayland. Some of the acreage has been developed for residential uses. A few areas are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. Minimum tillage, cover crops, and stripcropping help to control erosion. A proper crop rotation, crop residue management, applications of manure, and legumes increase productivity and tilth.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting are used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Land shaping is needed in some areas. Constructing roads on the contour and on well compacted, coarse textured base material helps to prevent the damage caused by wetness and frost action. Planting suitable grasses on roadbanks reduces the hazard of erosion. The slow and very slow permeability in the substratum is the main limitation at sites for septic tank absorption fields. Installing a drain field that is larger than average helps to overcome this limitation.

The capability subclass is IIIe.

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

This very deep, moderately steep, well drained soil is on drumlins and drumlinlike land features. The areas are oval, narrow, or irregularly shaped. They range from 10 to 25 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Woodbridge, Charlton, and Canton soils. Included areas make up about 20 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most of the acreage of this unit is used as cropland or permanent pasture. Some of the acreage is covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. The slope is the major limiting factor.

Erosion is a hazard. Minimum tillage, cover crops, and stripcropping help to control erosion. A proper crop rotation, crop residue management, applications of manure, and legumes increase productivity and tilth.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning can improve the quality of white pine.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Large amounts of cut and fill generally are needed in areas where roads are constructed. Building the roads on the contour and planting roadbanks reduce the hazard of erosion. The slope and the slow or very slow permeability in the substratum are the main limitations at sites for septic tank absorption fields. Because of the restricted permeability, the substratum does not readily absorb the effluent.

The capability subclass is IVe.

307B—Paxton fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, well drained soil is on drumlins and drumlinlike land features. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are oval or irregularly shaped. They range from 10 to 150 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Ridgebury and Whitman soils. These areas generally are less than 3 acres each. Also included are areas of Woodbridge, Charlton, and Canton soils and areas where stones cover less than 3 percent of the surface. Included areas make up about 25 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most of the acreage of this unit is covered with trees. A few areas are used for urban development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Surface stones and the hazard of erosion are the major limiting factors.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Constructing roads on well compacted, coarse textured material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. Because of the slow and very slow permeability, the substratum does not readily absorb the effluent in septic tank absorption fields. Installing a drain field that is larger than average helps to overcome this limitation.

The capability subclass is VIIs.

307C—Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony

This very deep, strongly sloping, well drained soil is on drumlins and drumlinlike land features. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are oval or irregularly shaped. They range from 10 to 85 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Woodbridge, Canton, and Charlton soils. These areas generally are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum.

Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most areas of this unit are covered with trees. A few areas are used for urban development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Surface stones, slope, and a hazard of erosion are the major limiting factors.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands at standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. Removal of control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Land shaping is needed in some areas. Constructing roads on the contour and on well compacted, coarse textured base material helps to prevent the damage caused by wetness and frost action. Planting suitable grasses on roadbanks reduces the hazard of erosion. The slow and very slow permeability in the substratum is the main limitation at sites for septic tank absorption fields. Installing a drain field that is larger than average helps to overcome this limitation.

The capability subclass is VIIs.

307D—Paxton fine sandy loam, 15 to 35 percent slopes, extremely stony

This very deep, moderately steep to steep, well drained soil is on drumlins and drumlinlike land features. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are long, narrow, or irregularly shaped. They range from 10 to 70 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum to a depth of about 65 inches is firm and very firm, dense, pale olive fine sandy loam.

Included with this soil in mapping are areas of Woodbridge soils. These areas generally are less than 5 acres each. Also included are areas of Scituate, Montauk, Canton, and Charlton soils and areas where stones cover less than 3 percent of the surface. Included areas make up about 35 percent of this unit.

Permeability is moderate in the subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Surface stones, slope, and a hazard of erosion are the major limiting factors.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks reduce the hazard of erosion. The slope and the slow or very slow permeability in the substratum are the main limitations at sites for septic tank absorption fields. Because of the restricted permeability, the substratum does not readily absorb the effluent. Installing a drain field that is larger than average helps to overcome this limitation.

The capability subclass is VIIs.

310A—Woodbridge fine sandy loam, 0 to 3 percent slopes

This very deep, nearly level, moderately well drained soil is on the top and sides of drumlins. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface is very dark grayish brown fine sandy loam about 11 inches thick. The subsoil is about 11 inches thick. The upper 5 inches is dark yellowish

Figure 8.—An area of Woodbridge fine sandy loam, 0 to 3 percent slopes.

brown loam, and the lower 6 inches is light olive brown loam that has common mottles. The substratum to a depth of about 65 inches is very firm, olive gray loam that has many mottles.

Included with this soil in mapping are areas of Canton, Paxton, and Ridgebury soils. These areas are less than 3 acres each. Also included are areas of soils that have friable material in the substratum or have stones on the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate in the surface layer and subsoil of the Woodbridge soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most areas of this unit are used as cropland. Some areas are used for residential development. A few areas are covered with trees (fig. 8).

This map unit is well suited to cultivated crops, hay, and improved pasture. This soil is wet until late spring, which restricts the use of heavy equipment. Drainage of some kind may be needed when these soils are used.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings without basements and a sufficient distance above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in

a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIw.

310B—Woodbridge fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, moderately well drained soil is on the top and toe slope of drumlins. The areas are irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface is very dark grayish brown fine sandy loam about 11 inches thick. The subsoil is about 11 inches thick. The upper 5 inches is dark yellowish brown loam, and the lower 6 inches is light olive brown loam that has common mottles. The substratum to a depth of about 65 inches is very firm, olive gray loam that has many mottles.

Included with this soil in mapping are areas of Canton, Paxton, and Ridgebury soils. These areas are less than 3 acres each. Also included are areas of soils that have friable material in the substratum or have stones on the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate in the surface layer and subsoil of the Woodbridge soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most areas of this unit are used as cropland. Some are used for residential development. A few areas are covered with trees.

This map unit is well suited to cultivated crops, hay, and improved pasture. This soil is wet until late spring, which restricts the use of heavy equipment. Drainage of some kind may be needed when these soils are used.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings without basements and a sufficient distance above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIw.

312B—Woodbridge fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, moderately well drained soil is on the top and sides of drumlins. Stones are 2 to 5 feet apart and cover 3 to 10 percent of the surface. The areas are irregularly shaped. They range from 10 to 150 acres in size.

Typically, the surface is very dark grayish brown fine sandy loam about 11 inches thick. The subsoil is about 11 inches thick. The upper 5 inches is dark yellowish brown loam, and the lower 6 inches is light olive brown loam that has common mottles. The substratum to a depth of about 65 inches is very firm, olive gray loam that has many mottles.

Included with this soil in mapping are areas of Canton, Paxton, and Ridgebury soils. These areas are less than 3 acres each. Also included are areas of soils that have friable material in the substratum and areas where stones 5 to 30 feet apart cover 1 to 3 percent of the surface. Included areas make up about 30 percent of this unit.

Permeability is moderate in the surface layer and subsoil of the Woodbridge soil and slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The seasonal high water table is at a depth of 1.5 to 2.5 feet.

Most areas of this unit are covered with trees. A few areas are used for urban development.

This map unit is poorly suited to cultivated crops, hay, and pasture. Stoniness is the major limitation (fig. 9). Wetness and erosion also are management concerns.

In the areas used as woodland, large stones and boulders on the surface and plant competition are main management concerns. The large stones and boulders may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation

Figure 9.—An area of Woodbridge fine sandy loam, 3 to 8 percent slopes, extremely stony.

permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

Constructing buildings without basements and a sufficient distance above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. The large stones in the soil may hinder excavation operations. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action. The large stones may hinder road construction. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. The large stones may hinder the installation of distribution lines. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is VIIs.

315A—Scituate fine sandy loam, 0 to 3 percent slopes

This very deep, nearly level, moderately well drained soil is on glacial till uplands. The areas are irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark grayish brown sandy loam about 4 inches thick. The subsoil is about 16 inches thick. The upper 6 inches is dark yellowish brown sandy loam. The middle 6 inches is yellowish brown gravelly sandy loam. The lower 4 inches is yellowish brown loamy sand. The substratum to a depth of about 65 inches is firm, olive brown to light olive brown gravelly loamy sand and loamy sand.

Included with this soil in mapping are areas of Ridgebury, Montauk, and Whitman soils. These areas are less than 3 acres each. Also included are areas where stones cover about 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate in the subsoil of the

Scituate soil and slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is above the substratum for brief periods in spring and fall.

Most areas of this unit are farmed. Some areas are used for urban development.

This map unit is well suited to cultivated crops, hay, and improved pasture. Wetness is a management concern; however, field drainage is usually not necessary. A proper crop rotation, crop residue management, applications of manure, and legumes increase productivity and tilth. Proper stocking rates and deferred and rotational grazing help to maintain desirable pasture plant species.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. The seasonal high water table and the restricted permeability are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIw.

315B—Scituate fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, moderately well drained soil is on hills within glacial till uplands. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark grayish brown sandy loam about 4 inches thick. The subsoil is about 16 inches thick. The upper 6 inches is dark yellowish brown sandy loam, the next 6 inches is yellowish brown gravelly sandy loam, and the lower 4 inches is yellowish brown loamy sand. The substratum to a depth of about 65 inches is firm, olive brown to light olive brown gravelly loamy sand and loamy sand.

Included with this soil in mapping are areas of Ridgebury and Montauk soils. These areas are less than 3 acres each. Also included are areas where stones cover about 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate in the subsoil of the Scituate soil and slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is above the substratum for brief periods in spring and fall.

Most areas of this unit are farmed. Some areas have been developed for urban use.

This map unit is well suited to cultivated crops, hay, and improved pasture. Wetness is a management concern; however, field drainage is usually not necessary. A proper crop rotation, crop residue management, applications of manure, and legumes increase productivity and tilth. Proper stocking rates and deferred and rotational grazing help to maintain desirable pasture plant species.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

Constructing buildings so that the lower or basement level is above the seasonal high water table helps to prevent the damage caused by excessive wetness. Tile drains around foundations help to remove excess subsurface water. Landscaping designed to drain surface water away from buildings helps to prevent the damage caused by wetness. Constructing roads on raised, coarse textured base material and providing adequate side ditches and culverts help to prevent the damage caused by wetness and frost action. The seasonal high water table and the slow permeability in the substratum are the main limitations at sites for septic tank absorption fields. Installing the distribution lines in a mound of suitable fill material helps to overcome these limitations.

The capability subclass is IIw.

317B—Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, moderately well drained soil is on hills within glacial till uplands. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 75 acres in size.

Typically, the surface layer is very dark grayish brown sandy loam about 4 inches thick. The subsoil is about 16 inches thick. The upper 6 inches is dark yellowish brown gravelly sandy loam, the next 6 inches is yellowish brown gravelly sandy loam, and the lower 4 inches is yellowish brown loamy sand. The substratum to a depth of about 65 inches is firm, olive brown to light olive brown gravelly loamy sand and loamy sand.

Included with this soil in mapping are areas of Montauk and Woodbridge soils on hilltops and ridges and Ridgebury soils in depressions and drainageways. These areas generally are less than 3 acres each. They make up about 25 percent of this unit.

Permeability is moderate in the subsoil of the Scituate soil and slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The root zone is restricted by the dense substratum. A perched seasonal high water table is above the substratum for brief periods in spring and fall.

Most areas of this unit are wooded. A few areas are used for homesites.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard.

Plant competition is the main management concern in wooded areas. The large stones and boulders may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

This map unit is limited as a site for most kinds of urban development and sanitary waste disposal facilities because of the slowly permeable substratum and the seasonal high water table.

The capability subclass is VIIs.

400B—Brookfield fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, well drained soil formed in glacial till on ridges and hills in the western part of the survey area. The areas are irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 2 inches thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam and gravelly loamy sand. The lower part to a depth of about 65 inches is grayish brown sandy loam that has yellowish red and red streaks.

Included with this soil in mapping are areas of Brimfield, Charlton, and Paxton soils. These areas are less than 5 acres each. Also included are areas of moderately deep soils and steeper soils. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Most of the acreage of this unit is farmed or in idle land. Some areas are covered with trees. A few areas are used for residential development.

This map unit is well suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting are used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

This map unit is suitable for building site development and as a site for septic tank absorption fields. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action.

The capability subclass is IIe.

402B—Brookfield fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, well drained soil formed in glacial till on ridges and hills in the western part of the survey area. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 70 acres in size.

Typically, the surface layer is covered by partially

decomposed leaf litter. The surface layer is dark brown fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam and gravelly loamy sand. The lower part to a depth of about 65 inches is grayish brown sandy loam that has yellowish red and red streaks.

Included with this soil in mapping are areas of Brimfield, Charlton, and Paxton soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 25 percent of this unit.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard.

In the areas used as woodland, large stones and boulders on the surface may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

This map unit is suitable for building site development and as septic tank absorption fields. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action.

The capability subclass is VIIs.

402C—Brookfield fine sandy loam, 8 to 15 percent slopes, extremely stony

This very deep, strongly sloping, well drained soil formed in glacial till on ridges and hills in the western part of the survey area. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface layer is covered by partially decomposed leaf litter. The surface layer is dark brown fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam and gravelly loamy sand. The lower part to a depth of about 60 inches is grayish brown sandy loam that has yellowish red and red streaks.

Included with this soil in mapping are areas of Brimfield, Charlton, and Paxton soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard.

In the areas used as woodland, large stones and boulders on the surface may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

The slope is a limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Constructing roads on the contour where possible and planting suitable grasses on roadbanks reduce the hazard of erosion. Constructing roads on well compacted, coarse textured base material helps to prevent the damage caused by frost action. Land shaping and installing the distribution lines across the slope generally are needed for the proper operation of septic tank absorption fields.

The capability subclass is VIIs.

402D—Brookfield fine sandy loam, 15 to 35 percent slopes, extremely stony

This very deep, moderately steep and steep, well drained soil formed in glacial till on ridges and hills in the western part of the survey area. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is covered by partially decomposed leaf litter. The surface layer is dark brown fine sandy loam about 1 inch thick. The subsoil is yellowish red gravelly fine sandy loam about 30 inches thick. The upper 9 inches of the substratum is strong brown and brownish yellow gravelly fine sandy loam

and gravelly loamy sand. The lower part to a depth of about 60 inches is grayish brown sandy loam and has yellowish red and red streaks.

Included with this soil in mapping are areas of Brimfield, Charlton, and Paxton soils. These areas are less than 8 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 15 percent of this unit.

Permeability is moderate or moderately rapid throughout the Brookfield soil. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope and stoniness are the major limiting factors. Erosion is a hazard.

The large stones and boulders, the slope, and the moderate hazard of erosion are the main management concerns. The large stones and boulders and the slope hinder the use of equipment in most areas, and hand planting generally is needed. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Plant competition is slight. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration of preferred trees. Thinning will also allow for restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour where possible and planting suitable grasses on roadbanks reduce the hazard of erosion. Land shaping and installing the distribution lines across the slope generally are needed for the proper operation of septic tank absorption fields.

The capability subclass is VIIs.

405B—Charlton fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, well drained soil formed in glacial till on ridges and hills. The areas are irregularly shaped. They range from 10 to 30 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 26 inches thick. The upper 6 inches is strong brown, and the lower 20 inches is yellowish brown. The substratum to a depth of about 65 inches is olive yellow sandy loam.

Included with this soil in mapping are areas of Canton, Paxton, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas where the texture is loamy sand below a depth of 40 inches. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid throughout the Charlton soil. Available water capacity is high. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are farmed. Some have been developed for residential uses. A few are covered with trees.

This map unit is well suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. Removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

This map unit is suitable for building site development and as a site for local roads and septic tank absorption fields.

The capability subclass is IIe.

405C—Charlton fine sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, well drained soil is on glacial till ridges and hills. The areas are irregularly shaped. They range from 10 to 15 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 26 inches thick. The upper 6 inches is strong brown, and the lower 20 inches, is yellowish brown. The substratum to a depth of about 65 inches is olive yellow sandy loam.

Included with this soil in mapping are areas of Canton, Paxton, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas

where the texture is loamy sand below a depth of 40 inches. Included areas make up about 20 percent of this unit.

Permeability is moderate or moderately rapid throughout the Charlton soil. Available water capacity is high. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are farmed. Some have been developed for residential uses. A few areas are covered with trees.

This map unit is suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. The slope is the major limiting factor. Conservation tillage, cover crops, and stripcropping help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

The slope is a limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Land shaping is necessary in some areas. Constructing roads on the contour where possible and planting suitable grasses on roadbanks reduce the hazard of erosion. Land shaping and installation of the distribution lines across the slope generally are needed at sites for septic tank absorption fields.

The capability subclass is IIIe.

407B—Charlton fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, well drained soil is on glacial till ridges and hills. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 75 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 26 inches thick. The upper 6 inches is strong brown, and the lower 20 inches is yellowish brown. The substratum to a depth of 60 inches is olive yellow sandy loam.

Included with this soil in mapping are areas of Canton, Paxton, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface and areas where the texture is loamy sand below a depth of 40 inches. Included areas make up about 30 percent of this unit.

Permeability is moderate or moderately rapid throughout the Charlton soil. Available water capacity is high. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Stoniness is the major limiting factor. Erosion is a hazard.

In the areas used as woodland, large stones and boulders on the surface are the main management concern. They may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

This map unit is suitable for building site development and as sites for local roads and septic tank absorption fields.

The capability subclass is VIIs.

407C—Charlton fine sandy loam, 8 to 15 percent slopes, extremely stony

This very deep, strongly sloping, well drained soil is on glacial till ridges and hills. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 26 inches thick. The upper 6 inches is strong brown, and the lower 20 inches is yellowish brown. The substratum to a depth of about 65 inches is olive yellow sandy loam.

Included with this soil in mapping are areas of Canton, Paxton, and Woodbridge soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface and areas where the texture is loamy sand below a depth of 40 inches. Included areas make up about 25 percent of this unit.

Permeability is moderate or moderately rapid throughout the Charlton soil. Available water capacity is high. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops,

hay, and improved pasture. The slope and stoniness are the major limiting factors. Erosion is a hazard.

In the areas used as woodland, large stones and boulders on the surface are the main management concern. They may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

The slope limits the use of this soil as site for septic tank absorption fields, dwellings, and local roads and streets.

The capability subclass is VIIs.

407D—Charlton fine sandy loam, 15 to 35 percent slopes, extremely stony

This very deep, moderately steep to steep, well drained soil is on glacial till ridges and hills. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is fine sandy loam about 26 inches thick. The upper 6 inches is strong brown, and the lower 20 inches is yellowish brown. The substratum to a depth of about 65 inches is olive yellow sandy loam.

Included with this soil in mapping are areas of Canton and Paxton soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface and areas where the texture is loamy sand below a depth of 40 inches. Included areas make up about 30 percent of this unit.

Permeability is moderate or moderately rapid throughout the Charlton soil. Available water capacity is high. Reaction ranges from very strongly acid to medium acid.

Most areas of this unit are covered with trees.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope and stoniness are the major limiting factors. Erosion is a hazard.

In woodland, the hazard of erosion and the operation of equipment are management concerns because of the slope. Plant competition is moderate if conifers are grown. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees on crowded areas permits more vigorous growth and regeneration of preferred trees. Thinning will also allow restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Hand planting may be necessary on steep and very steep slopes. Pruning can improve the quality of white pine and red pine.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour where possible and planting suitable grasses on roadbanks reduce the hazard of erosion. Land shaping and installing the distribution lines across the slope generally are needed for the proper operation of septic tank absorption fields.

The capability subclass is VIIs.

420B—Canton fine sandy loam, 3 to 8 percent slopes

This very deep, gently sloping, well drained soil is on the lower slopes of hills. The areas are irregularly shaped. They range from 10 to 40 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of about 65 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 8 acres each. Also included are areas of Montauk and Scituate soils. Included areas make up about 15 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are farmed. Some areas are covered with trees. A few areas are used for residential development.

This map unit is well suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. A protective

plant cover, crop residue management, conservation tillage, a proper crop rotation, and contour farming help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

This map unit has no limitations as a site for buildings and local roads and streets. The sides of excavations are unstable, and steep sides commonly collapse. Some form of shoring is needed. The rapid permeability in the substratum results in a poor filtering capacity in septic tank absorption fields. Seepage of the effluent through the substratum can result in the pollution of ground water.

The capability subclass is IIe.

420C—Canton fine sandy loam, 8 to 15 percent slopes

This very deep, strongly sloping, well drained soil is on the upper slopes of hills. The areas are irregularly shaped. They range from 10 to 30 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of about 65 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 5 acres each. Also included are areas of Montauk and Scituate soils. Included areas make up about 20 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are farmed. Some areas are covered with trees. A few areas are used for residential development.

This map unit is suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. A protective plant cover, crop residue management, conservation tillage, a proper crop rotation, and contour farming help to control erosion.

No major limitations restrict woodland management in areas of this map unit. Plant competition during periods of regeneration is moderate if conifers are grown. Thinning crowded stands to standard stocking levels results in more vigorous growth. Shelterwood cutting, seed-tree cutting, and clearcutting can be used to establish regeneration or provide suitable planting sites. The removal or control of competing vegetation is necessary for the optimum growth of newly established seedlings. Pruning is used to improve the quality of white pine.

The slope is the main limitation at sites for buildings and local roads and streets. Special designs, cutting and filling, and retaining walls help to overcome this limitation. The sides of excavations are unstable, and steep sides commonly collapse. Some form of shoring is needed. Building roads and streets on the contour helps to avoid the need for deep cuts. Maintaining a plant cover is difficult in areas where deep cuts have been made. A poor filtering capacity is a limitation at sites for septic tank absorption fields. Seepage of the effluent through the substratum can result in the pollution of ground water.

The capability subclass is IIIe.

420D—Canton fine sandy loam, 15 to 25 percent slopes

This very deep, moderately steep, well drained soil is on the sides of hills and the top of ridges. The areas are irregularly shaped. They range from 10 to 20 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of about 65 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 5 acres each. Also included are areas of Montauk and Paxton soils. Included areas make up about 15 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are covered with trees or brush. Some areas are used for pasture.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. The slope is the major limitation. Erosion is a hazard.

In woodland, the hazard of erosion and equipment operation are management concerns because of the slope. Plant competition is moderate if conifers are grown. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees on crowded areas permits more vigorous growth and regeneration of preferred trees. Thinning will also allow restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Hand planting may be necessary on steep and very steep slopes. Pruning can improve the quality of white pine and red pine.

The slope is the main limitation at building sites. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome this limitation and reduces the hazard of erosion in disturbed areas. Extensive land shaping generally is needed. Extensive cutting and filling generally are needed in areas where roads are constructed. Building the roads on the contour and planting suitable grasses on roadbanks reduce the hazard of erosion. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines across the slope lessens the slope limitation, but additional precautionary measures are needed in some areas to reduce the hazard of pollution.

The capability subclass is IVe.

422B—Canton fine sandy loam, 3 to 8 percent slopes, extremely stony

This very deep, gently sloping, well drained soil is on the lower slopes of hills and ridges. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 120 acres in size.

Typically, the surface layer is covered by partially decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of about 65 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 25 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are covered with trees. Some areas are used for residential development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. The stones on the surface are the major limitation.

In the areas used as woodland, large stones and boulders on the surface are the main management concerns. They may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

This soil readily absorbs but does not adequately filter the effluent from septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. The large stones in this soil may hinder the installation of distribution lines.

The capability subclass is VIIs.

422C—Canton fine sandy loam, 8 to 15 percent slopes, extremely stony

This very deep, strongly sloping, well drained soil is on the sides of hills and the top of ridges. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 85 acres in size.

Typically, the surface layer is covered by partially decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of about 65 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 8 acres each. Also included are areas where stones

cover less than 3 percent of the surface. Included areas make up about 20 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are covered with trees. Some areas are used for residential development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. The stones on the surface are the major limitation.

In the areas used as woodland, large stones and boulders on the surface are the main management concern. They may hinder the use of harvesting and planting equipment. Hand planting is needed in some areas. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees. Pruning can improve the quality of white pine.

This soil readily absorbs but does not adequately filter the effluent in septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. The large stones in this soil may hinder the installation of distribution lines.

The capability subclass is VIIs.

422D—Canton fine sandy loam, 15 to 35 percent slopes, extremely stony

This very deep, moderately steep to steep, well drained soil is on the sides of hills and the top of ridges. Stones are 2 to 5 feet apart and cover 3 to 15 percent of the surface. The areas are irregularly shaped. They range from 10 to 75 acres in size.

Typically, the surface layer is covered by partially decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 13 inches thick, and the lower part is yellowish brown gravelly fine sandy loam about 4 inches thick. The substratum to a depth of 60 inches is grayish brown gravelly loamy sand.

Included with this soil in mapping are areas of Charlton and Hinckley soils. These areas are less than 5 acres each. Also included are areas where stones cover less than 3 percent of the surface. Included areas make up about 25 percent of this unit.

Permeability is moderately rapid in the surface layer and subsoil of the Canton soil and rapid in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid throughout the soil.

Most areas of this unit are covered with trees. Some areas are used for residential development.

This map unit is poorly suited to cultivated crops, hay, and improved pasture. Erosion is a hazard. The slope and the stones on the surface are the major limitation.

In the areas used as woodland, the large stones and boulders on the surface and the slope are management concerns. They hinder the use of equipment and prevent its use in some areas. Constructing access roads and trails on the contour and installing water bars help to prevent excessive erosion. Keeping soil disturbance to a minimum helps to retain the spongelike mulch of leaves that absorb precipitation and help to control runoff and erosion. Plant competition is moderate if conifers are grown. Thinning the stands of undesired stock, such as dead or diseased trees, or removing trees in crowded areas permits more vigorous growth and regeneration. Thinning permits restocking or replanting of preferred trees. The removal or control of competing understory vegetation permits the optimum growth of newly planted trees.

The slope and the large stones and boulders are the main limitations at building sites. Extensive land shaping generally is needed. Designing buildings and lots so that they conform to the natural slope of the land helps to overcome the slope and reduces the hazard of erosion in disturbed areas. The slope is the main limitation affecting road construction. Extensive cutting and filling generally are needed. The slope and a poor filtering capacity are the main limitations at sites for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. Installing the distribution lines across the slope lessens the slope limitation, but additional precautionary measures are needed in some areas to reduce the hazard of pollution. The large stones in this soil may hinder the installation of distribution lines.

The capability subclass is VIIs.

600—Pits, gravel

This map unit consists of excavations primarily in areas of gravelly and sandy glacial outwash. Some excavations, however, are in areas of loose, sandy glacial till. The pits were created when gravel or sand was removed for construction purposes. The pits are 3 to 50 feet deep. The sides generally are steep, and the floor is nearly level. Piles of stones and some boulders are commonly scattered on the floor, and small pools of water are in some pits. The excavations are commonly

irregularly shaped, depending on the nature of the deposits and ownership boundaries. The pits range from 5 to 50 acres in size.

The pits generally are devoid of vegetation, although some of the older ones have scattered brush, grass, and annuals. The pits are droughty because of a very low available water capacity. Permeability varies but generally is moderately rapid or very rapid.

The potential of these areas for urban and recreational uses ranges from good to poor. Onsite investigation is neccesary to determine the potential of each area for those uses.

These areas have poor potential for farming and woodland because of the very low available water capacity. In general, the potential for establishing wildlife habitat is poor, although some birds inhabit the areas.

No major limitations affect most urban uses. The pollution of ground water is a hazard at sites for sanitary waste disposal systems.

No capability subclass is assigned.

622—Paxton-Urban land complex, 8 to 15 percent slopes

This map unit consists mainly of a very deep, gently sloping and strongly sloping, well drained Paxton soil and areas that are used for parking lots, buildings, and other structures. The unit is on uplands. The areas are long and narrow or irregularly shaped and range from 20 to 100 acres in size. They are about 40 percent Paxton soil, 35 percent Urban land, and 25 percent included soils. The Paxton soil and Urban land are in areas so intermingled that mapping them separately was not practical.

Typically, the surface layer of the Paxton soil is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown to light yellowish brown fine sandy loam about 16 inches thick. The substratum is firm and very firm, pale olive fine sandy loam to a depth of about 65 inches.

Included in this unit in mapping are areas of Udorthents, Woodbridge, Ridgebury, and Canton soils. These areas generally are less than 3 acres each.

Permeability is moderate in the surface layer and subsoil of the Paxton soil and slow or very slow in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. A perched seasonal high water table is at a depth of 1.5 to 2.5 feet. The root zone is restricted by the dense substratum.

Most areas of this unit are used for residential or commercial development. The lack of open space is the main limitation affecting the use of this unit for cultivated crops or woodland. The Paxton soil is well suited to trees, shrubs, and small gardens. The seasonal high water table and the potential for frost action in the Paxton soil are the main limitations at sites for dwellings and local roads and streets. The slow or very slow permeability in the substratum is a limitation at sites for septic tank absorption fields.

No capability subclass is assigned.

625—Hinckley-Urban land complex, 0 to 15 percent slopes

This unit consists mainly of a very deep, nearly level to strongly sloping, excessively drained Hinckley soil and areas that are used for for parking lots, buildings, and other structures. The unit is on outwash plains. The areas are rectangular or irregularly shaped and range from 10 to 50 acres in size. They are about 45 percent Hinckley soil, 35 percent Urban land, and 20 percent included soils. The Hinckley soil and Urban land are in areas so intermingled that mapping them separately was not practical.

Typically, the surface layer of the Hinckley soil is dark brown sandy loam about 6 inches thick. The subsoil is strong brown gravelly loamy sand about 11 inches thick. The substratum is strong brown very gravelly coarse sand to a depth of about 65 inches.

Included with this unit in mapping are areas of Udorthents and Merrimac and Windsor soils. Also included are soils with slopes of more than 15 percent and moderately well drained soils.

Permeability is rapid in the surface layer and subsoil of the Hinckley soil and very rapid in the substratum. Available water capacity is very low. Reaction ranges from extremely acid to medium acid.

Most areas of this unit are used for residential or commercial development. A few areas support native vegetation. The lack of open space is the major limitation affecting the use of this unit for cultivated crops and woodland. The unit generally is suitable as a site for dwellings and local roads and streets. The sides of excavations in the Hinckley soil are unstable, and the steeper sides commonly collapse. A poor filtering capacity in the Hinckley soil is a limitation at sites for septic tank absorption fields. Seepage of the effluent through the substratum can result in the pollution of ground water.

No capability subclass is assigned.

651—Udorthents, smoothed

These very deep, nearly level to sloping, excessively drained to moderately well drained soils are areas from

which soil material has been excavated and nearby areas where the material has been deposited. The depth of excavation and fill ranges from 2 to 20 feet. The areas are long and narrow, irregularly shaped, or rectangular. They range from 5 to 20 acres in size.

Generally, the surface layer is dark brown fine sandy loam. The substratum to a depth of about 65 inches is olive gray fine sandy loam.

Included in this unit in mapping are areas of urban land and soils that are more sandy in the substratum than the Udorthents. These areas are less than 3 acres each. Also included are areas that have been filled with soil and other material. Included areas make up about 20 percent of this map unit.

The range in the properties and characteristics of this unit is so variable that onsite investigation is needed to determine the suitability of the unit for any use.

No capability subclass is assigned.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 69,229 acres in the survey area, or nearly 20 percent of the total acreage, meets the soil requirements for prime farmland. Areas of this land are throughout the survey area, but most are in the central part.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Row crops, hay, and pasture cover about 43,810 acres in the survey area. An estimated 60 percent of this acreage is used for hay and pasture and 40 percent for row crops, mainly silage corn, and for orchards, vegetables, and nursery plants. The acreages in crops and pasture have steadily declined since the 19th century, mostly because of the increased use of land for community and industrial development.

Erosion is a hazard on much of the farmland in the survey area, especially on soils where slopes exceed 3 percent. Productivity is reduced when the surface layer is eroded and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is particularly damaging to soils that have a restrictive layer, such as Paxton and Woodbridge soils. Soil erosion further results in sediments entering waterways, thereby lowering the water quality for municipal use, for recreation, and as habitat for fish and wildlife; reducing the storage capacity; and increasing the flooding potential.

Erosion control practices provide protective surface cover, help to control runoff, and increase the infiltration of water. A cropping system that keeps plant cover on the soil for extended periods can hold erosion loss to an amount that will not reduce the productivity of the soil. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system help to control erosion on sloping land and provide nitrogen and improved tilth for the next crop.

Other practices that help to control erosion are terracing, stripcropping, and using a conservation cropping system. Terraces and diversions are effective in erosion control, but many parts of the survey area

have short and irregular slopes that are not suited to terraces. Diversions are effective in intercepting water and thus protecting fields downslope. Stripcropping, a practice in which alternate strips of row crops and close-growing crops are planted across the slope, also is an effective practice in controlling erosion. Stripcropping is best suited to soils that have long, uniform slopes.

Conservation tillage — a system that leaves part or all of the previous crop residue on the surface — helps to maintain the content of organic matter, reduces soil erosion, and helps retain soil moisture by reducing evaporation.

A seasonal high water table is a major concern for many soils in the survey area. Some soils are naturally so wet that the production of crops common to this area is generally not feasible. The very poorly drained Whitman soil is an example of such a soil.

The poorly drained soils, for example, Ridgebury soils, are too wet for good crop production during most years. Random tile drainage, drainage ditches, and the use of moisture-tolerant crops are effective measures for farming these soils.

Natural fertility is low in the soils of the survey area. Most of the soils are naturally acid and require applications of lime for crops that are suited to slightly acid or neutral soils. The available phosphorus and potash levels also are naturally low, and fertilizer is required.

Tilth is important in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth have a surface layer that has granular structure, is friable, and is porous. Many of the soils in the survey area are light in color and low in organic matter content. Generally, the surface layer of these soils has good tilth. Regular additions of crop residue help to maintain structure, organic matter content, and water infiltration.

The special crops grown commercially in the survey area are apples, vegetables, and nursery plants. Orchards are on nearly level to sloping, well drained and moderately well drained soils. The most common vegetables grown are sweet corn and tomatoes. Deep, friable soils that have good natural drainage are especially well suited to vegetables and nursery crops. Some of these soils are droughty; however, and are suited only if irrigation is provided.

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 6. 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. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; 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 residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil 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 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

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 miscellaneous areas 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 very cold or very 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. 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 shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

The survey area contains approximately 236,606 acres of woodland, or 69 percent of the land area, that consists principally of oak-hickory stands. Other less extensive stands of pine, pine-hardwoods, hemlock, and hemlock-hardwoods also exist.

Before settlement, virtually all of the land in the survey area was forested. By the mid-19th century, 75 percent of this forested land had been cleared for farming. Some of this cleared land was later abandoned and, soon afterward, reverted to woodland. The trees in those areas have been harvested two or three times since settlement.

In the survey area, 10,171 acres is currently under private woodland management. Another 10,511 acres is owned and managed as state forestland by the Massachusetts Department of Environmental Management.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each suitable soil. Soils assigned the same ordination symbol require the same general 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. It is based on the site index of the species listed first in the common trees column. 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 r indicates steep slopes; x, stoniness or rockiness; w, excessive water in or on the soil; t, toxic substances in the soil; d, restricted rooting depth; c, clay in the upper part of the soil; s, sandy texture; and f, high content of coarse fragments in the soil profile. The letter a indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: r, x, w, t, d, c, s, and f.

In table 8, slight, moderate, and severe indicate the degree of the major soil limitations to be considered in management.

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 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 in equipment; and 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 to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of slight indicates that the expected mortality is less than 25 percent; moderate, 25 to 50 percent; and severe, more than 50 percent.

Ratings of plant competition indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of slight indicates little or no competition from other plants; moderate indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; severe indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The potential productivity of merchantable or 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 a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The productivity class, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand. One cubic meter per hectare equals 14.3 cubic feet per acre.

Trees to plant are those that are suited to the soils and to commercial wood production.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. Slight means that soil properties are generally favorable and that limitations are minor and easily overcome. Moderate means that 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 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the 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 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 campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for 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, stones or boulders that 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 and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and 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 have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Five wildlife management areas, operated by the Massachusetts Division of Fisheries and Game, provide excellent wildlife habitat in the survey area. The largest, the West Hill Wildlife Management Area, covers 475 acres in parts of Northbridge, Upton, Uxbridge, and Mendon. The West Hill Area is on land owned by the U.S. Army Corps of Engineers and is licensed by the state as a wildlife management area. Other wildlife management areas operated by the Massachusetts Division of Fisheries and Game include a great blue heron rookery. Wildlife habitat also is provided by privately owned land and other public and quasipublic lands.

Wildlife habitat suitable for the support of limited populations of rare and endangered wildlife species are in this survey area. Among these rare and endangered species in the area are the Henslow's sparrow; the pied-billed grebe; the American and least bittern; turtle species, such as the eastern box, wood, and spotted; and several species of salamanders, such as the Jefferson, blue-spotted, and marbled.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in 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 indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of fair indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of poor indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of very poor indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features 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 also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features 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 also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features 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 also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and gramagrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwoods and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive, autumn olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover 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. Submerged or floating aquatic plants are excluded. Soil properties and features 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, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife 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 wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, the shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreational uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered slight if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, the shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less that 6 feet. The ratings are based on soil properties, site features, and observed performances of the soils. Dept to bedrock or a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), the shrink-swell potential, frost-action, potential and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered slight if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of good indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; fair indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and poor indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the

effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the 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.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated good, fair, or poor as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing

engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and the shrink-swell potential.

Soils rated good contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated fair are more than 35 percent silt and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, the slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated poor have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated good have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated fair are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated poor are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered slight if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability in the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability in the aquifer, and quality of the water as inferred from the salinity of the soil. The depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to help to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given 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 the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*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 and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups 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 (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The

estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay in each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

The shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

The shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss

by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands,loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
4. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.
5. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
6. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.
7. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.
8. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.
9. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 17 are assigned to two hydrologic soil groups. Dual grouping is used for one of two reasons: (1) Some soils have a seasonal high water table but can be drained. In this instance the first letter applies to the drained condition of the soil and the second letter to the undrained condition. (2) In some soils that are less than 20 inches deep over bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface of the soil.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell

potential, soils that have a permanent high water table, soils that have a claypan or clay layer or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *Common* is used when classification as occasional or frequent does not affect interpretations. Duration is expressed as very brief (less than 2 days), brief (2 to 7 days), long (7 days to 1 month), and very long (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 18 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 highest. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

The depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or

weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(4)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is *Aquept* (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is *Haplaquepts* (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The *typic* is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group 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. An example is Aeric Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle—size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual *(3)*. Many of the technical terms used in the descriptions are defined in Soil Taxonomy *(4)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Brimfield Series

The Brimfield series consists of shallow, somewhat excessively drained soils on bedrock-controlled uplands. These soils formed in friable glacial till derived mainly from micaceous schist. Slopes range from 3 to 45 percent.

Brimfield soils are associated on the landscape with Brookfield soils. They are adjacent to Charlton and Hollis soils. Brimfield soils have bedrock within a depth of 20 inches, whereas Brookfield and Charlton soils have bedrock at a depth of more than 40 inches. Brimfield soils are redder than Hollis soils and formed in a different kind of parent material.

Typical pedon of Brimfield fine sandy loam, in an area of Brookfield-Brimfield-Rock outcrop complex, 3 to 15 percent slopes, 1 mile north on Wigwam Road from Route 67, about 300 feet west of Wigwam Road, 300 feet south of a power line, in the town of West Brookfield:

A—0 to 1 inch; black (5YR 2/1) fine sandy loam; weak very fine and fine granular structure; friable; many fine roots; about 5 percent rock fragments; very strongly acid; abrupt smooth boundary.
Bw1—1 to 10 inches; yellowish red (5YR 4/6) gravelly fine sandy loam; weak very fine and fine granular structure; friable; many fine and medium roots; about 20 percent rock fragments; very strongly acid; abrupt smooth boundary.
Bw2—10 to 18 inches; yellowish red (5YR 4/8) gravelly fine sandy loam; weak very fine and fine granular structure; friable; common fine and medium roots; about 30 percent rock fragments; strongly acid; abrupt smooth boundary.
R—18 inches; mica schist bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. The content of rock fragments ranges from 5 to 35 percent in the solum. Reaction ranges from very strongly acid to medium acid throughout the solum.

The A horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. It is sandy loam or fine sandy loam.

The B horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 4 to 8. It is fine sandy loam or sandy loam.

Brookfield Series

The Brookfield series consists of very deep, well drained soils on uplands. These soils formed in friable glacial till derived mainly from micaceous schist. Slopes range from 3 to 35 percent.

Brookfield soils are associated on the landscape with Brimfield, Canton, and Charlton soils. Brookfield soils have bedrock at a depth of more than 40 inches, whereas Brimfield soils have bedrock within a depth of 20 inches. Brookfield soils are redder and have a finer textured substratum than Canton soils. They have a redder subsoil than Charlton soils.

Typical pedon of Brookfield fine sandy loam, in an area of Brookfield-Brimfield-Rock outcrop complex, 3 to 15 percent slopes, 1,200 feet south on Molasses Hill Road from its intersection with Fiskdale Road, 30 feet west of Molasses Hill Road, in the town of Brookfield:

Oi—leaves and partially decayed leaves.
Oa—0 to 1 inch; decayed leaves.
A—1 to 2 inches: dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; many fine roots; about 5 percent rock fragments; very strongly acid; abrupt smooth boundary.
Bw1—2 to 15 inches; yellowish red (5YR 4/8) gravelly fine sandy loam; weak medium granular structure; friable; common fine and medium roots; about 15 percent rock fragments; very strongly acid; clear smooth boundary.
Bw2—15 to 31 inches; yellowish red (5YR 4/8) gravelly fine sandy loam; weak fine granular structure; friable; few medium roots; about 30 percent rock fragments; medium acid; abrupt wavy boundary.
C1—31 to 40 inches; strong brown (7.5YR 5/6) and brownish yellow (10YR 6/6) gravelly loamy sand and gravelly fine sandy loam; friable; about 30 percent rock fragments; medium acid; abrupt wavy boundary.
C2—40 to 65 inches; grayish brown (2.5Y 5/2) sandy loam that has yellowish red (5YR 5/6) and red (2.5YR 4/6) streaks; friable; about 10 percent rock fragments; medium acid.

The thickness of the solum ranges from 20 to 38 inches. The content of rock fragments ranges from 5 to 35 percent. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. It is loam or fine sandy loam. Some pedons have an Ap horizon, which has value of 3 or 4 and chroma of 2 to 4.

The upper part of the B horizon has hue of 2.5YR or 5YR, value of 3 to 6, and chroma of 4 to 8. The lower part has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. The B horizon is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. In the fine-earth fraction, it is fine sandy loam or sandy loam that has lenses of loamy sand.

Canton Series

The Canton series consists of very deep, well drained soils on glaciated uplands. These soils formed in friable glacial till derived mainly from gneiss and granite. Slopes range from 3 to 35 percent.

Canton soils are associated with Charlton, Montauk, and Scituate soils. They are adjacent to Brimfield soils. Canton soils have a contrasting texture, whereas Charlton soils have a uniform texture throughout. Canton soils do not have the firm consistence of Montauk and Scituate soils. They are yellower and more sandy than Brookfield soils.

Typical pedon of Canton fine sandy loam, 3 to 8 percent slopes, 150 feet south of the intersection of Southwest Main and Cedar Streets on Wallum Lake Road, in the town of Douglas:

Oi—2 inches to 0; partially decomposed leaf litter.
A—0 to 3 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; about 5 percent rock fragments; very strongly acid; abrupt smooth boundary.
Bw1—3 to 10 inches; yellowish brown (10YR 5/6) fine sandy loam; weak subangular blocky structure; friable; common fine and medium roots; about 5 percent rock fragments; very strongly acid; clear smooth boundary.
Bw2—10 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam; weak subangular blocky structure; friable; common fine and medium roots; about 5 percent rock fragments; strongly acid; clear smooth boundary.
Bw3—16 to 20 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam; weak subangular blocky structure; friable; few fine and medium roots; about 15 percent rock fragments; strongly acid; abrupt smooth boundary.
2C—20 to 65 inches; grayish brown (2.5Y 5/2) gravelly loamy sand; massive; friable; about 25 percent rock fragments; medium acid.

The thickness of the solum ranges from 18 to 36 inches and corresponds to the depth to coarse textured till. The content of rock fragments ranges from 5 to 25 percent in the solum and from 20 to 30 percent in the substratum. The content of stones ranges from 0 to 15 percent in the solum and from 0 to 10 percent in the substratum. Reaction ranges from extremely acid to medium acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is fine sandy loam, loam, or very fine sandy loam.

The Bw1 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The Bw2 and Bw3 horizons have hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 4 to 6. The B horizon is fine sandy loam, loam, very fine sandy loam, or the gravelly analogs of those textures.

The 2C horizon has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 2 or 3. It is the gravelly analogs of loamy sand, loamy fine sand, or loamy coarse sand.

Charlton Series

The Charlton series consists of very deep, well drained soils on till plains and uplands. These soils formed in friable glacial till derived mainly from granite, gneiss, or schist. Slopes range from 3 to 35 percent.

Charlton soils are associated with Canton soils. They are adjacent to Brookfield, Brimfield, and Paxton soils. Unlike Canton soils, Charlton soils have a uniform texture throughout. They are yellower than Brookfield soils. They are very deep, whereas Brimfield soils are shallow. Charlton soils are friable throughout, whereas Paxton soils have a very firm substratum.

Typical pedon of Charlton fine sandy loam, 3 to 8 percent slopes, 525 feet south of the intersection of Hall Road and Burlingame Road, 100 feet east of Burlingame Road, in the town of Charlton:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; few medium roots; about 5 percent rock fragments; very strongly acid; clear smooth boundary.
Bw1—8 to 14 inches; strong brown (7.5YR 4/6) fine sandy loam; weak very fine subangular blocky structure; very friable; few medium roots; about 5 percent rock fragments; very strongly acid; clear smooth boundary.
Bw2—14 to 34 inches; yellowish brown (10YR 5/6) fine sandy loam; weak very fine subangular blocky structure; very friable; few fine roots; about 10 percent rock fragments; very strongly acid; clear wavy boundary.
C—34 to 65 inches; olive yellow (2.5Y 6/6) sandy loam; massive; very friable; about 10 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 20 to 38 inches. The content of rock fragments ranges from 5 to 35 percent. Reaction ranges from very strongly acid to medium acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is sandy loam, fine sandy loam, or loam. Some pedons have an A horizon, which has value of 2 or 3 and chroma of 1 to 3.

The upper part of the B horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The lower part has hue of 10YR or 2.5Y and value and chroma of 4 to 6. The B horizon is fine sandy loam or sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 6. It is fine sandy loam or sandy loam.

Chatfield Series

The Chatfield series consists of moderately deep, well drained and somewhat excessively drained soils on uplands. These soils formed in friable glacial till underlain mainly by gneiss and schist. Slopes range from 3 to 35 percent.

Chatfield soils are associated on the landscape and mapped with Hollis soils. Chatfield soils are 20 to 40 inches deep over bedrock, whereas Hollis soils are less than 20 inches deep over bedrock.

Typical pedon of Chatfield fine sandy loam, in an area of Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes, 1,700 feet south of the intersection of East Charlton Road and Route 31, about 300 feet west of Route 31, in the town of Spencer:

Oa—0 to 2 inches; partially decomposed leaf mat and humus.
A—2 to 4 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; many fine roots; about 5 percent rock fragments; very strongly acid; abrupt smooth boundary.
Bw1—4 to 12 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; few medium roots; about 5 percent rock fragments; strongly acid; clear smooth boundary.
Bw2—12 to 30 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable; few medium roots; about 5 percent rock fragments; very strongly acid; clear wavy boundary.
R—30 inches; bedrock.

The thickness of the solum ranges from 16 to 36 inches, and the depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges from 5 to 35 percent throughout the profile. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is loam, very fine sandy loam, fine sandy loam, or sandy loam.

The Bw horizon has hue of 7.5YR to 2.5Y and value and chroma of 4 to 6. It is loam, very fine sandy loam, fine sandy loam, or sandy loam.

Some pedons have a C horizon. This horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 4 to 6.

Freetown Series

The Freetown series consists of very deep, very poorly drained, organic soils on till and outwash plains. Slopes range from 0 to 2 percent.

Freetown soils are associated with Swansea soils. Freetown soils have at least 51 inches of organic material, whereas Swansea soils have less than 51 inches.

Typical pedon of Freetown muck, 500 feet south of the Quaboag River, 1,000 feet west of Route 148, in the town of Brookfield:

Oe—0 to 2 inches; hemic material, black (N 2/0) broken face; about 75 percent fibers, 30 percent rubbed; massive; very friable; extremely acid; abrupt wavy boundary.
Oa1—2 to 8 inches; sapric material, black (N 2/0) broken face and rubbed; about 10 percent fibers, less than 3 percent rubbed; massive; very friable; extremely acid; abrupt wavy boundary.
Oa2—8 to 20 inches; sapric material, black (N 2/0) broken face and rubbed; about 10 percent fibers, less than 3 percent rubbed; massive; very friable; extremely acid; abrupt wavy boundary.
Oa3—20 to 30 inches; sapric material, black (N 2/0) broken face and rubbed; about 30 percent fibers, 10 percent rubbed; massive; very friable; extremely acid; abrupt wavy boundary.
Oa4—30 to 35 inches; brown and dark brown (7.5YR 4/4) sapric and hemic material; about 50 percent fibers, 20 percent rubbed; massive; very friable; about 20 percent woody fragments; extremely acid; abrupt wavy boundary.
Oa5—35 to 65 inches; sapric material, black (N 2/0) broken face and rubbed; about 15 percent fibers, less than 5 percent rubbed; massive; very friable; extremely acid.

The organic material extends to a depth of 51 inches or more. It is dominantly sapric material. The content of woody fragments consisting of twigs, branches, logs, and stumps ranges from 0 to 25 percent.

The surface and subsurface tiers have hue of 5YR to 10YR or are neutral in hue. The surface tier has value of 2 or 3 and chroma of 0 to 2. The subsurface tier has value of 2 to 4 and chroma of 0 to 4. The bottom tier has colors similar to those of the subsurface tier.

Hinckley Series

The Hinckley series consists of very deep, excessively drained soils on outwash plains. These soils formed in glacial outwash derived mainly from granite, gneiss, and schist. Slopes range from 0 to 35 percent.

Hinckley soils are associated with Merrimac and Windsor soils. Hinckley soils are more sandy in the solum than Merrimac soils and have more gravel than Windsor soils.

Typical pedon of Hinckley sandy loam, 3 to 8 percent slopes, 660 feet south of the intersection of

Brookfield Road and Sullivan Road, 100 feet east of Sullivan Road, in the town of Charlton:

Oe—1 inch to 0; partially decomposed leaf litter.
A—0 to 6 inches; dark brown (10YR 3/3) sandy loam; weak fine granular structure; very friable; many fine and very fine roots; about 15 percent rock fragments; extremely acid; clear smooth boundary.
Bw—6 to 17 inches; strong brown (7.5YR 4/6) gravelly loamy sand; massive; very friable; many fine and very fine roots; about 35 percent rock fragments; very strongly acid or strongly acid; clear smooth boundary.
2C—17 to 65 inches; strong brown (7.5YR 5/6) very gravelly coarse sand; massive; loose; about 65 percent rock fragments; strongly acid.

The thickness of the solum ranges from 12 to 30 inches. The content of rock fragments ranges from 10 to 50 percent in the solum and from 35 to 70 percent in the substratum. It averages more than 35 percent in the control section. Reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is loamy sand, sandy loam, or fine sandy loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam, loamy sand, or loamy fine sand to coarse sand.

The C horizon has hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 2 to 8. It ranges from loamy fine sand to coarse sand, or it is stratified sand and gravel.

Hollis Series

The Hollis series consists of shallow, well drained and somewhat excessively drained soils on uplands. These soils formed in a thin mantle of friable glacial till derived mainly from granite, gneiss, and schist. Slopes range from 3 to 45 percent.

Hollis soils are associated with Chatfield soils and are mapped with those soils in this survey area. They are adjacent to Brimfield soils. Hollis soils have bedrock at a depth of 10 to 20 inches, whereas Chatfield soils have bedrock at a depth of 20 to 40 inches. Hollis soils are yellower than Brimfield soils.

Typical pedon of Hollis fine sandy loam, in an area of Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes, Wheelock Road, 1,000 feet south of the Spencer town line, west side of road, near Jones Pond, in the town of Charlton:

Oe—1 inch to 0; decomposed leaf material.
A—0 to 6 inches; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; moderate fine subangular blocky structure; very friable; many fine roots; about 5 percent rock fragments; very strongly acid; clear smooth boundary.
Bw1—6 to 12 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak fine subangular blocky structure; very friable; many fine and medium roots; about 15 percent rock fragments; strongly acid; clear smooth boundary.
Bw2—12 to 19 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak fine subangular blocky structure; very friable; common fine and medium roots; about 20 percent rock fragments; medium acid; abrupt wavy boundary.
R—19 inches; bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. The content of rock fragments ranges from 5 to 35 percent. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 2 or 3. It is sandy loam, fine sandy loam, or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The underlying bedrock is hard, unweathered schist, gneiss, or granite.

Merrimac Series

The Merrimac series consists of very deep, somewhat excessively drained soils on outwash plains. These soils formed in glacial outwash derived mainly from granite, gneiss, and schist. Slopes range from 0 to 35 percent.

Merrimac soils are associated on the landscape with Hinckley and Windsor soils. They are adjacent to Sudbury soils. Merrimac soils are finer textured in the solum than Windsor and Hinckley soils. Merrimac soils have no mottles in the solum, whereas Sudbury soils are mottled.

Typical pedon of Merrimac fine sandy loam, 0 to 3 percent slopes, 300 feet southwest of Kitteridge Road, at the Spencer-North Brookfield town line, in the town of Spencer:

Oe—1 inch to 0; undecomposed organic material.
Ap—0 to 5 inches; very dark brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; about 5 percent rock fragments; extremely acid; abrupt smooth boundary.
Bw1—5 to 17 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky

structure; friable; common fine roots; about 5 percent rock fragments; strongly acid; clear wavy boundary.

Bw2—17 to 27 inches; yellowish brown (10YR 5/6) gravelly loamy sand; single grain; loose; few fine roots; about 30 percent rock fragments; medium acid; clear smooth boundary.

2C1—27 to 42 inches; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; about 40 percent rock fragments; medium acid; clear smooth boundary.

2C2—42 to 65 inches; yellowish brown (10YR 5/6) gravelly sand; single grain; loose; about 30 percent rock fragments; medium acid.

The thickness of the solum and the depth to stratified sand and gravel range from 18 to 30 inches. The content of rock fragments ranges from 5 to 30 percent in the solum and from 25 to 55 percent in the substratum. Reaction ranges from extremely acid to medium acid.

The Ap horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. Some pedons have an A horizon, which has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. The Ap and A horizons are very fine sandy loam, fine sandy loam, or sandy loam.

The Bw1 horizon has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 3 to 8, and the Bw2 horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 8. The Bw1 horizon is very fine sandy loam, fine sandy loam, or sandy loam, and the Bw2 horizon is sandy loam, loamy sand, coarse sandy loam, loamy coarse sand, or gravelly loamy sand.

The 2C horizon has hue of 10YR to 5Y and value and chroma of 3 to 6. It is stratified sand and gravel, gravelly sand, or very gravelly sand.

Montauk Series

The Montauk series consists of very deep, well drained soils on glaciated uplands. These soils formed in firm glacial till derived mainly from granitic rocks. Slopes range from 3 to 35 percent.

Montauk soils are associated on the landscape with Scituate soils. They are adjacent to Canton and Paxton soils. Unlike Canton soils, Montauk soils have a firm substratum. Unlike Scituate soils, they do not have low-chroma mottles in the solum. They are coarser textured in the substratum than Paxton soils.

Typical pedon of Montauk fine sandy loam, 8 to 15 percent slopes, 2,125 feet south of the intersection of Barnett Road and Whitin Road, 450 feet west on a logging road, in the town of Sutton:

A—0 to 5 inches; very dark brown (10YR 2/2) fine sandy loam; moderate very fine granular structure; very friable; common very fine roots; about 3 percent rock fragments; extremely acid; clear smooth boundary.

Bw1—5 to 10 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate very fine granular structure; very friable; common fine and medium roots; about 5 percent rock fragments; extremely acid; clear smooth boundary.

Bw2—10 to 27 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak very fine subangular blocky structure; very friable; common fine and medium roots; about 10 percent rock fragments; very strongly acid; clear wavy boundary.

Cd1—27 to 40 inches; light olive brown (2.5Y 5/4) loamy sand; common medium prominent yellowish red (5YR 4/6) mottles; massive; firm; few fine roots; about 5 percent rock fragments; very strongly acid; clear wavy boundary.

Cd2—40 to 65 inches; olive (5Y 5/4) loamy sand; many medium prominent yellowish red (5YR 5/8) mottles; massive; firm; about 5 percent rock fragments; strongly acid.

The thickness of the solum ranges from 18 to 38 inches and generally corresponds to the depth to firm glacial till. The content of rock fragments ranges from 3 to 35 percent in the solum and from 5 to 50 percent in the substratum. Reaction ranges from extremely acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 1 to 4. It is loam, fine sandy loam, or sandy loam.

The Bw1 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8. The Bw2 horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. The Bw horizon is loam, fine sandy loam, or sandy loam.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 6. It is firm or very firm and is brittle. It is loamy coarse sand to fine sandy loam. One of the subhorizons is loamy fine sand or coarser textured material.

Paxton Series

The Paxton series consists of very deep, well drained soils on glacial till uplands. The soils formed in

firm and very firm glacial till derived from schist, gneiss, and granite. Slopes range from 3 to 35 percent.

Paxton soils are associated with Woodbridge and Ridgebury soils and are commonly adjacent to Charlton and Montauk soils. Paxton soils do not have the low-chroma mottles that are typical of Woodbridge and Ridgebury soils. Paxton soils have a dense substratum, whereas Charlton soils have a friable or loose substratum. Paxton soils are finer textured in the substratum than Montauk soils.

Typical pedon of Paxton fine sandy loam, 3 to 8 percent slopes, 0.4 mile east on River Road from its intersection with Route 146, about 30 feet south of the road, in a roadbank, in the town of Uxbridge:

A—0 to 8 inches; very darkish brown (10YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine roots; about 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bw1—8 to 15 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; many fine roots; about 5 percent rock fragments; strongly acid; clear smooth boundary.

Bw2—15 to 24 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine subangular blocky structure; friable; common fine roots; about 5 percent rock fragments; medium acid; clear smooth boundary.

Cd1—24 to 29 inches; pale olive (5Y 6/3) fine sandy loam; moderate fine subangular blocky structure; firm; few medium roots; about 10 percent rock fragments; medium acid; clear smooth boundary.

Cd2—29 to 65 inches; pale olive (5Y 6/3) fine sandy loam; massive; very firm; about 10 percent rock fragments; medium acid.

The thickness of the solum ranges from 18 to 38 inches and typically corresponds to the depth to a dense substratum. The content of rock fragments ranges from 5 to 35 percent in the solum and from 5 to 40 percent in the substratum. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Some pedons have an Ap horizon, which has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. The Ap or A horizon is loam, fine sandy loam, or sandy loam. Some pedons have a thin E horizon below the A horizon. The E horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. Its textures are like those of the A horizon.

The Bw1 horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The Bw2 horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. The B horizon is loam, fine sandy loam, or sandy loam.

The Cd horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is loam, fine sandy loam, sandy loam, or coarse sandy loam.

Pootatuck Series

The Pootatuck series consists of very deep, moderately well drained soils on flood plains. These soils formed in alluvial sediments derived mainly from gneiss, schist, or granite. Slopes range from 0 to 3 percent.

Pootatuck soils are associated with Rippowam and Saco soils. Pootatuck soils are browner than Rippowam and Saco soils and contain less silt than Saco soils.

Typical pedon of Pootatuck fine sandy loam, 0 to 3 percent slopes, 750 feet south on Oak Street from its junction with Hartford Road, 700 feet east of Oak Street and 500 feet south of the entrance road to a pasture, in the town of Uxbridge:

Oa—0 to 2 inches; very dark grayish brown (10YR 3/2) partially decomposed leaf material; many fine and very fine roots; abrupt smooth boundary.

Ap—2 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; common fine and very fine roots; slightly acid; abrupt smooth boundary.

Bw1—10 to 15 inches; dark brown (10YR 3/3) fine sandy loam; massive; friable; few fine and very fine roots; slightly acid; abrupt smooth boundary.

Bw2—15 to 18 inches; dark brown and brown (10YR 4/3) fine sandy loam; massive; friable; slightly acid; clear smooth boundary.

Bw3—18 to 25 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; friable; slightly acid; clear smooth boundary.

2C1—25 to 27 inches; olive brown (2.5Y 4/4) loamy fine sand; single grain; loose; about 10 percent rock fragments; slightly acid; abrupt smooth boundary.

2C2—27 to 65 inches; light olive brown (2.5Y 5/4) gravelly coarse sand; single grain; loose; about 30 percent rock fragments; medium acid.

The thickness of the solum ranges from 20 to 40 inches. The content of rock fragments ranges from 0 to 15 percent in the solum and from 0 to 40 percent in the substratum. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR to 5Y and value and chroma of 3 to 6. It is fine sandy loam or sandy loam.

The 2C horizon has hue of 10YR to 5Y, value of 4 to

6, and chroma of 1 to 6. It is dominantly loamy fine sand to coarse sand in the fine-earth fraction. In some pedons, however, it has thin strata of sandy loam, gravel, or silt loam.

Raynham Series

The Raynham series consists of very deep, poorly drained soils in old lakebeds. These soils formed in wind- or water-deposited material high in content of silt and very fine sand. Slopes range from 0 to 3 percent.

Raynham soils are adjacent to the soils that formed in outwash and glacial till in the survey area. They have no competing series in the survey area.

Typical pedon of Raynham silt loam, 0 to 3 percent slopes, 50 feet west on Larnard Road from the intersection of Larnard Road and Harwood Street, 150 feet south of Larnard Road, in the town of Oxford:

Ap—0 to 10 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—10 to 16 inches; grayish brown (2.5Y 5/2) silt loam; weak thin platy structure; firm; very few fine roots; medium acid; clear smooth boundary.

Bg—16 to 20 inches; olive gray (5Y 5/2) silt loam; weak thin platy structure; firm; very few fine roots; medium acid; clear smooth boundary.

Bw2—20 to 28 inches; olive (5Y 5/3) silt; few medium distinct yellowish brown (10YR 5/2), few fine faint light olive gray (5Y 6/2) and few fine distinct light olive brown (2.5Y 5/4) mottles; massive, firm; medium acid; clear smooth boundary.

C—28 to 65 inches; olive (5Y 5/3) silt that has thin layers of clay; few fine faint light olive gray (5Y 6/2) and few fine distinct light olive brown (2.5Y 5/4) mottles; massive; firm; slightly acid.

The thickness of solum ranges from 16 to 37 inches. The content of rock fragments is 0 to 2 percent throughout the profile. Reaction ranges from strongly acid to neutral.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is silt loam, silt, or very fine sandy loam.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is silt loam, silt, or very fine sandy loam.

The C horizon has hue of 2.5Y to 5Y, value of 4 to 6, and chroma of 1 to 3. It is silt loam or very fine sandy loam.

Ridgebury Series

The Ridgebury series consists of very deep, poorly drained and somewhat poorly drained soils on glacial till uplands. These soils formed in glacial till derived mainly from schist, gneiss, or granite. Slopes range from 0 to 8 percent.

Ridgebury soils are associated with Whitman soils and are commonly adjacent to Woodbridge, Paxton, and Scituate soils. Ridgebury soils have a surface layer that is thinner and lighter colored than that of Whitman soils. They are grayer in the upper part of the solum than Woodbridge, Paxton, and Scituate soils.

Typical pedon of Ridgebury fine sandy loam, 0 to 3 percent slopes, 430 feet south on Hill Road from its junction with McClellan Road, 75 feet east of Hill Road, in the town of Sutton:

Ap—0 to 8 inches; very dark gray (10YR 3/1) fine sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine and medium roots; about 5 percent rock fragments; medium acid; abrupt smooth boundary.

Bw—8 to 12 inches; light olive brown (5Y 5/3) fine sandy loam; weak fine granular structure; friable; common fine roots; about 10 percent rock fragments; medium acid; clear smooth boundary.

Bg—12 to 22 inches; olive gray (5Y 5/2) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) and few fine faint light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots; about 10 percent rock fragments; strongly acid; abrupt wavy boundary.

Cd—22 to 65 inches; olive gray (5Y 5/2) fine sandy loam; massive; firm; about 5 percent rock fragments; medium acid.

The thickness of the solum ranges from 14 to 30 inches and closely corresponds to the depth to firm or very firm glacial till. The content of rock fragments ranges from 5 to 35 percent. The soils have varying amounts of gravel, cobbles, and stones. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is sandy loam, fine sandy loam, or loam. Some pedons have a thin E horizon. This horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. Its textures are the same as those of the A horizon.

The B horizon is neutral in hue or has hue of 7.5YR to 5Y. It has value of 4 to 6 and chroma of 0 to 3. It is sandy loam to loam.

The Cd horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It is coarse sandy loam to loam.

Rippowam Series

The Rippowam series consists of very deep, poorly drained soils on flood plains. These soils formed in alluvial sediments derived mainly from gneiss, granite, or schist. Slopes range from 0 to 3 percent.

Rippowam soils are associated with Pootatuck and Saco soils. They are grayer than Pootatuck soils and have less silt than Saco soils.

Typical pedon of Rippowam fine sandy loam, 0 to 3 percent slopes, from the junction of Route 122 and Blackstone Street, 1,000 feet north on Route 122 to a railroad track, 3,000 feet north along the track, 50 feet east of the track, in the town of Uxbridge:

Oa—0 to 9 inches; black (N 2/0), decomposed leaf litter; many roots of all sizes; clear smooth boundary.

A—9 to 17 inches; black (N 2/0) fine sandy loam, light brownish gray (10YR 6/2) dry; few fine faint very dark grayish brown (2.5Y 3/2) mottles; weak fine granular structure; very friable; common coarse and medium and many fine and very fine roots; strongly acid; abrupt smooth boundary.

C1—17 to 27 inches; very dark grayish brown (10YR 3/2) fine sandy loam, pale brown (10YR 6/3) dry; many common distinct dark yellowish brown (10YR 4/4) mottles; massive; very friable; few fine and very fine roots; slightly acid; gradual smooth boundary.

C2—27 to 35 inches; dark brown (10YR 3/3) fine sandy loam; many common prominent yellowish red (5YR 4/6) mottles; massive; very friable; medium acid; gradual smooth boundary.

Cg1—35 to 39 inches; dark grayish brown (2.5Y 4/2) loamy fine sand; massive; very friable; slightly acid; clear smooth boundary.

Cg2—39 to 45 inches; dark grayish brown (2.5Y 4/2) sand; massive; very friable; slightly acid; abrupt smooth boundary.

Cg3—45 to 65 inches; very dark grayish brown (2.5Y 3/2) gravelly coarse sand; single grain; loose; about 15 percent rock fragments; slightly acid.

Depth to the coarse textured substratum ranges from 20 to 40 inches. The content of gravel ranges from 0 to 15 percent in the loamy part of the profile and from 0 to 40 percent in the substratum. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. It is very fine sandy loam, fine sandy loam, or sandy loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 3. The upper part of this horizon is fine sandy loam or sandy loam. The lower part generally is loamy fine sand to coarse sand in the fine-earth fraction. In some pedons, however, it has thin strata of loam or gravel.

Saco Series

The Saco series consists of very deep, very poorly drained soils on flood plains. These soils formed in recently deposited alluvial sediments derived mainly from schist or gneiss. Slopes range from 0 to 3 percent.

Saco soils are associated with Rippowam and Pootatuck soils. They are grayer than Rippowam and Pootatuck soils.

Typical pedon of Saco mucky very fine sandy loam, 0 to 3 percent slopes, 800 feet south of Mellen Street, 300 feet west of the Milford town line, in the city of Hopedale:

A—0 to 12 inches; very dark gray (10YR 3/1) mucky very fine sandy loam; weak fine granular structure; very friable; many roots; slightly acid; abrupt smooth boundary.

Cg1—12 to 20 inches; grayish brown (2.5Y 5/2) very fine sandy loam; common fine distinct dark yellowish brown (10YR 4/6) and olive gray (5Y 5/2) mottles; massive; very friable; many fine roots; slightly acid; clear smooth boundary.

Cg2—20 to 40 inches; light olive gray (5Y 6/2) very fine sandy loam; common coarse distinct light olive brown (2.5Y 5/6) mottles; massive; very friable; neutral; abrupt smooth boundary.

Cg—40 to 65 inches; light olive gray (5Y 6/2) fine sand; many coarse prominent brown (7.5YR 4/4) and common fine distinct light brownish gray (2.5Y 6/2) mottles; single grain; loose; slightly acid.

The depth to sand or sand and gravel ranges from 50 to 60 inches. The content of rock fragments ranges from 0 to 5 percent within a depth of 40 inches and from 0 to 35 percent below that depth. Reaction ranges from strongly acid to neutral to a depth of 30 inches and from medium acid to neutral below that depth.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is mucky silt loam, silt loam, very fine sandy loam, or mucky very fine sandy loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is mucky silt loam, silt

loam, very fine sandy loam, or mucky very fine sandy loam.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 3 to 6 and chroma of 0 or 1. It is silt loam or very fine sandy loam.

The 2Cg horizon has hue of 2.5Y or 5Y or is neutral in hue. It has value of 3 to 6 and chroma of 0 or 1. It is fine sand, loamy fine sand, or sand.

Scarboro Series

The Scarboro series consists of very deep, very poorly drained soils in low areas on stream terraces and outwash plains. These soils formed in glacial outwash derived mainly from gneiss, schist, or granite. Slopes range from 0 to 3 percent.

Scarboro soils are associated with Walpole soils. They have a mucky surface layer and are grayer than Walpole soils.

Typical pedon of Scarboro mucky fine sandy loam, in an area of Scarboro and Walpole soils, 0 to 3 percent slopes, 3,000 feet northeast on Lackey Dam Road to a power line from Route 146, about 100 feet west of the road, in the town of Northbridge:

Oe—0 to 2 inches; black (5Y 2/1), partially decomposed organic material; abrupt smooth boundary.

Oa—2 to 4 inches; black (5Y 2/1), decomposed organic material; abrupt smooth boundary.

A—4 to 10 inches; black (N 2/0) mucky fine sandy loam; massive; very friable; many roots of all sizes; very strongly acid; abrupt smooth boundary.

2Cg1—10 to 16 inches; olive gray (5Y 5/2) gravelly loamy sand; common medium faint olive (5Y 5/4) mottles; massive; very friable; about 15 percent rock fragments; strongly acid; clear smooth boundary.

2Cg2—16 to 65 inches; light olive gray (5Y 6/2) loamy sand; massive; very friable; about 5 percent rock fragments; strongly acid.

The content of rock fragments ranges from 0 to 20 percent within a depth of 30 inches and from 0 to 50 percent below that depth. Reaction ranges from very strongly acid to medium acid.

The Oa horizon is mucky peat or muck. It is 2 to 6 inches thick.

The A horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand, fine sandy loam, loamy sand, sandy loam, loamy fine sand, or the mucky analogs of those textures.

Some pedons have an E horizon. This horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It is fine sandy loam, sandy loam, loamy fine sand, fine sand, or sand.

The 2Cg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is loamy fine sand, loamy sand, fine sand, sand, loamy coarse sand, or coarse sand in the fine-earth fraction.

Scituate Series

The Scituate series consists of very deep, moderately well drained soils on glacial till uplands. These soils formed in friable glacial till underlain by firm glacial till derived mainly from granite and gneiss. Slopes range from 0 to 8 percent.

Scituate soils are associated with Canton and Montauk soils and are commonly adjacent to Ridgebury soils. Unlike Canton soils, Scituate soils have a firm substratum. Unlike Montauk soils, they are mottled in the solum. They are browner in the solum than Ridgebury soils.

Typical pedon of Scituate fine sandy loam, 3 to 8 percent slopes, 0.6 mile north on East Street and 300 feet from the Millville town line, in the town of Uxbridge:

Ap—0 to 4 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; friable; many fine roots; about 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bw1—4 to 10 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; friable; common roots; about 10 percent rock fragments; medium acid; abrupt smooth boundary.

Bw2—10 to 16 inches; yellowish brown (10YR 5/6) gravelly sandy loam; few fine faint light yellowish brown (10YR 6/4) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few roots; about 15 percent rock fragments; medium acid; clear wavy boundary.

BC—16 to 20 inches; yellowish brown (10YR 5/4) loamy sand; many medium faint pale brown (10YR 6/3) and dark yellowish brown (10YR 4/6) mottles; massive; friable; about 5 percent rock fragments; medium acid; clear wavy boundary.

2Cd1—20 to 30 inches; olive brown (2.5Y 4/4) loamy sand; many fine distinct dark yellowish brown (10YR 4/6) mottles; massive; firm; about 10 percent rock fragments; strongly acid; clear wavy boundary.

2Cd2—30 to 65 inches; light olive brown (2.5Y 5/4) gravelly loamy sand; many fine and medium distinct yellowish brown (10YR 5/6) and light

yellowish brown (2.5Y 6/2) mottles; massive; firm; about 15 percent rock fragments; medium acid.

The thickness of the solum ranges from 20 to 30 inches and corresponds to the depth to dense till. The content of rock fragments ranges from 5 to 30 percent in the solum and from 10 to 35 percent in the substratum. Reaction is strongly acid or medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam.

The Bw1 horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 6. The Bw2 horizon has hue of 10YR to 5Y and value and chroma of 4 to 6. The Bw horizon is fine sandy loam, sandy loam, or loam in the fine-earth fraction.

The BC horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 3 or 4. It is loamy sand or gravelly loamy sand.

The 2Cd horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is loamy sand, loamy fine sand, or loamy coarse sand in the fine-earth fraction.

Sudbury Series

The Sudbury series consists of very deep, moderately well drained and somewhat poorly drained soils on outwash plains and high stream terraces. These soils formed in glacial outwash deposits derived mainly from granite, gneiss, and schist. Slopes range from 0 to 8 percent.

Sudbury soils are associated with Walpole and Windsor soils and are adjacent to Merrimac soils. Unlike Merrimac and Windsor soils, Sudbury soils have low-chroma mottles in the solum. They have mottles lower in the solum than Walpole soils.

Typical pedon of Sudbury fine sandy loam, 0.6 mile north of the intersection of George Vinton Road and Route 20, about 250 feet into a wooded area, in the town of Sturbridge:

O—2 inches to 0; leaf litter of pine and oak leaves; abrupt smooth boundary.

A—0 to 2 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; many roots; extremely acid; abrupt smooth boundary.

Bw1—2 to 8 inches; very dark grayish brown (2.5Y 3/2) sandy loam; moderate fine subangular blocky structure; friable; common roots; about 10 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—8 to 20 inches; light olive brown (10YR 5/6) sandy loam; dark reddish gray mottles (5YR 4/2); moderate medium subangular blocky structure; friable; common roots; about 20 percent rock fragments; strongly acid; clear wavy boundary.

2C—20 to 65 inches; light olive brown (10YR 5/6) gravelly loamy sand; common medium distinct yellowish red (10YR 5/8) mottles; single grain; loose; few roots; about 30 percent rock fragments; very strongly acid.

The thickness of the solum and the depth to stratified sand and gravel range from 18 to 30 inches. The content of rock fragments ranges from 0 to 30 percent in the solum and from 25 to 75 percent in the substratum. Reaction ranges from extremely acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is fine sandy loam, sandy loam, or very fine sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 8. It is fine sandy loam or sandy loam in the upper part and sandy loam to coarse sand in the lower part.

The 2C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 2 to 8. It is gravelly sand to very gravelly coarse sand and typically is stratified.

Swansea Series

The Swansea series consists of very deep, very poorly drained, organic soils on till and outwash plains. These soils formed in 16 to 51 inches of highly decomposed organic material, which is underlain by sandy material. Slopes range from 0 to 3 percent.

Swansea soils are associated with Freetown soils and are commonly adjacent to Whitman soils. Swansea soils have thinner deposits of organic material than Freetown soils and thicker deposits of organic material than Whitman soils.

Typical pedon of Swansea muck, 600 feet northeast on Bond Street from its junction with Moose Hill Road, 600 feet south of Bond Street, in the town of Leicester:

Oi—0 to 1 inch; sphagnum moss; abrupt wavy boundary.

Oe—1 to 3 inches; muck, dark reddish brown (5YR 2/2) broken face and rubbed; about 40 percent fibers, 10 percent rubbed; massive; friable; partially decomposed sedges and wetland grasses; extremely acid; abrupt smooth boundary.

Oa1—3 to 20 inches; muck, black (N 2/0) broken face and rubbed; about 10 percent fibers, 1 percent rubbed; massive; friable; extremely acid; abrupt wavy boundary.

Oa2—20 to 34 inches; muck, black (N 2/0) broken face

and rubbed; about 10 percent fibers, 2 percent rubbed; massive; friable; extremely acid; abrupt wavy boundary.
C—34 to 65 inches; brown (10YR 5/3) gravelly loamy sand; common medium distinct brown (7.5YR 5/4) mottles; single grain; loose; about 15 percent gravel; strongly acid.

The thickness of the organic material ranges from 16 to 51 inches. The content of woody fragments ranges from 0 to 25 percent. The content of gravel ranges from 0 to 40 percent in the sandy horizons. Reaction is less than 4.5 in 0.01 molar calcium chloride throughout the organic material and ranges from extremely acid to strongly acid in the sandy horizons.

The surface tier has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly sapric material.

The subsurface and bottom tiers have hue of 5YR to 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 3. They are mainly sapric material, but in some pedons they have various proportions of hemic material.

The 2C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It is coarse sand to loamy fine sand in the fine-earth fraction.

Udorthents

Udorthents consist of excavated or filled areas used for nonfarm projects, such as athletic fields and highways. These soils are near or adjacent to most of the other soils in the survey area.

The Udorthents in this survey area consist of many different kinds of pedons, none of which is considered typical. A pedon used as a reference is in an area of Udorthents, smoothed, approximately 1 mile north on Route 12 from its intersection with Millbury Road, 450 feet east of Route 12, in the town of Oxford:

A—0 to 6 inches; dark brown (10YR 3/3) fine sandy loam.
C1—6 to 30 inches; olive gray fine sandy loam mixed with material that has other colors and textures.
C2—30 to 60 inches; olive gray sandy loam; massive; firm; about 10 percent rock fragments; medium acid.

The C1 horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It is loam, fine sandy loam, sandy loam, or loamy fine sand.

The C2 horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 6. It is dominantly loam, fine sandy loam, or sandy loam. In some pedons, however, it has thin layers of loamy sand.

Walpole Series

The Walpole series consists of very deep, poorly drained soils on stream terraces and outwash plains. These soils formed in outwash deposits derived mainly from gneiss and granite. Slopes range from 0 to 3 percent.

Walpole soils are associated with Sudbury and Scarboro soils. Walpole soils have low-chroma mottles and grayer colors higher in the profile than Sudbury soils. They are browner than Scarboro soils.

Typical pedon of Walpole fine sandy loam, in an area of Scarboro and Walpole soils, 0 to 3 percent slopes, 1,650 feet south on Cross Street from its junction with Grafton Street, 220 feet west of Cross Street, in the town of Millbury:

O1—0 to 1 inch; partially decomposed leaf material; abrupt smooth boundary.
A—1 to 10 inches; very dark gray (10YR 3/1) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; common fine and medium roots; about 5 percent rock fragments; strongly acid; abrupt smooth boundary.
Bg—10 to 18 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; friable; few fine roots; about 5 percent rock fragments; strongly acid; clear smooth boundary.
2C1—18 to 25 inches; brown (10YR 4/3) gravelly sand; single grain; loose; about 20 percent rock fragments; medium acid; clear smooth boundary.
2C2—24 to 65 inches; olive gray (5Y 5/2) gravelly sand; single grain; loose; about 30 percent rock fragments; medium acid.

The thickness of the solum ranges from 18 to 28 inches and corresponds closely to the depth to the coarser textured material. The content of rock fragments ranges from 0 to 25 percent in the solum and from 0 to 50 percent in the substratum. Reaction ranges from very strongly acid to medium acid.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 3. It is fine sandy loam or sandy loam.

The 2C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 to 4. It is sand or loamy sand in the fine-earth fraction.

Whitman Series

The Whitman series consists of very deep, very poorly drained soils on glacial till uplands. These soils

formed in firm glacial till derived mainly from schist and gneiss. Slopes range from 0 to 5 percent.

Whitman soils are associated with Swansea soils. They are adjacent to Paxton, Woodbridge, and Ridgebury soils. Whitman soils have less organic material in the solum than Swansea soils. They are grayer than the well drained Paxton soils, the moderately well drained Woodbridge soils, and the poorly drained Ridgebury soils.

Typical pedon of Whitman mucky sandy loam, 0 to 3 percent slopes, in the town of Sturbridge, 200 feet west of George Vinton Road, 800 feet north of Route 20:

Oi—5 to 2 inches; partly decomposed grasses, sedges, and bushes; common roots; clear smooth boundary.

Oa—2 inches to 0; black (10YR 2/1) muck; common roots; about 3 percent rock fragments; clear wavy boundary.

A—0 to 3 inches; very dark gray (10YR 3/1) sandy loam; common fine faint dark brown (10YR 4/3) and dark grayish brown (10YR 4/2) mottles; moderate fine granular structure; very friable; common roots; about 5 percent rock fragments; strongly acid; clear smooth boundary.

Cg1—3 to 6 inches; light gray (10YR 6/1) sandy loam; many medium distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; very friable; about 10 percent rock fragments; medium acid; clear wavy boundary.

Cg2—6 to 20 inches; light gray (10YR 6/1) fine sandy loam; many medium distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; about 10 percent rock fragments; medium acid.

Cd1—20 to 32 inches; gray (10YR 5/1) fine sandy loam; many coarse distinct dark brown (7.5YR 4/4) and yellowish red (5YR 5/6) mottles; massive; firm; about 10 percent rock fragments; slightly acid.

Cd2—32 to 65 inches; dark gray (N 4/0) fine sandy loam; common medium faint yellowish brown (10YR 5/4) mottles; massive; very firm; about 10 percent rock fragments; slightly acid.

The depth to firm or very firm till ranges from 12 to 30 inches. The content of rock fragments ranges from 5 to 40 percent. Reaction ranges from very strongly acid to slightly acid.

The A horizon is neutral in hue or has hue of 10YR. It has value of 2 or 3 and chroma of 0 to 2. It is sandy loam, fine sandy loam, loam, or silt loam. An organic layer as much as 5 inches thick overlies the A horizon.

Some pedons have a B horizon that is neutral in hue or has hue of 10YR to 5Y. It has value of 4 to 6 and chroma of 0 to 2. It is fine sandy loam or sandy loam.

The C horizon is neutral in hue or has hue of 10YR, 2.5Y, or 5Y. It has value of 4 to 6 and chroma of 0 to 2. It is fine sandy loam or sandy loam.

Windsor Series

The Windsor series consists of very deep, excessively drained soils on terraces and outwash plains. These soils formed in glacial outwash derived mainly from gneiss, schist, and granite. Slopes range from 0 to 35 percent.

Windsor soils are associated with Hinckley, Merrimac, and Sudbury soils. They have a lower content of rock fragments than Hinckley soils and are more sandy in the solum than Merrimac and Sudbury soils.

Typical pedon of Windsor loamy fine sand, 3 to 8 percent slopes, in the town of Spencer, 150 feet east of Cranberry Meadow Road, 600 feet south of Lyford Road:

Oi—1 inch to 0; dead grass, tree leaves, humus, and root mat.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) loamy fine sand; massive; loose; common fine roots; very strongly acid; abrupt wavy boundary.

Bw1—3 to 5 inches; dark yellowish brown (10YR 4/4) loamy fine sand; very weak fine and medium granular structure; very friable; common fine roots; very strongly acid; abrupt wavy boundary.

Bw2—5 to 13 inches; dark brown (7.5YR 4/4) loamy sand; very weak coarse granular structure; very friable; about 5 percent rock fragments; few fine roots; very strongly acid; abrupt wavy boundary.

Bw3—13 to 25 inches; yellowish brown (10YR 5/6) loamy sand; weak medium granular structure; very friable; about 5 percent rock fragments; few fine roots; very strongly acid; clear wavy boundary.

C1—25 to 33 inches; olive yellow (2.5Y 6/6) loamy sand; single grain; loose; about 5 percent rock fragments; few fine roots; very strongly acid; abrupt irregular boundary.

C2—33 to 38 inches; light yellowish brown (2.5Y 6/4) loamy fine sand; single grain; loose; very strongly acid; abrupt wavy boundary.

C3—38 to 65 inches; pale yellow (2.5Y 7/4) fine sand; massive; loose; very strongly acid.

The thickness of the solum ranges from 19 to 36 inches. The content of rock fragments ranges from 0 to 10 percent in the solum and from 0 to 15 percent in the substratum. Reaction ranges from very strongly acid to

medium acid in the solum and from very strongly acid to slightly acid in the substratum.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. It is loamy fine sand or loamy sand.

The Bw1 horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The Bw2 and Bw3 horizons have hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 6. The Bw horizon is loamy sand or loamy fine sand in the upper part and loamy fine sand, loamy sand, fine sand, or sand in the lower part.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 7, and chroma of 1 to 6. It is sand, fine sand, loamy fine sand, or loamy sand.

Woodbridge Series

The Woodbridge series consists of very deep, moderately well drained soils on uplands. These soils formed in firm, compacted glacial till derived mainly from gneiss, schist, or granite. Slopes range from 0 to 15 percent.

Woodbridge soils are associated with Paxton and Ridgebury soils. Unlike Paxton soils, Woodbridge soils are mottled. They are browner than Ridgebury soils.

Typical pedon of Woodbridge fine sandy loam, 3 to 8 percent slopes, in the town of Charlton, 60 feet west of Carpenter Hill Road, 3,300 feet south of Route 20:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; about 5 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw1—11 to 16 inches; dark yellowish brown (10YR 4/4) loam; weak medium granular structure; friable; about 5 percent rock fragments; slightly acid; gradual smooth boundary.

Bw2—16 to 22 inches; light olive brown (2.5Y 5/4) loam; many medium distinct dark yellowish brown (10YR 4/4) and dark reddish gray (5YR 4/2) mottles; weak medium granular structure; friable; slightly acid; 5 percent rock fragments; clear smooth boundary.

Cd—22 to 65 inches; olive gray (5Y 4/2) loam; many medium prominent dark grayish brown (2.5Y 4/2) and yellowish red (5YR 5/6) mottles; massive; very firm; about 10 percent rock fragments; medium acid.

The thickness of the solum and the depth to firm or very firm material ranges from 18 to 38 inches. The content of rock fragments ranges from 5 to 35 percent in the solum and from 5 to 40 percent in the substratum. Reaction ranges from very strongly acid to slightly acid.

The Ap horizon has hue of 10YR, value of 3 or 4, chroma of 2 to 4. It is fine sandy loam, loam, or sandy loam.

The Bw1 horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 8. The Bw2 and Bw3 horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. The Bw horizon is loam, fine sandy loam, or sandy loam.

The Cd horizon has hue of 5Y or 2.5Y, value of 4 to 6, and chroma of 1 to 4. It is sandy loam, loam, fine sandy loam, or coarse sandy loam.

Formation of the Soils

The major factors of soil formation are *parent material, climate, topography, time,* and *living organisms.* In this survey area, parent material and topography are the primary factors.

The parent material in this survey area consists of glacial till and glacial outwash derived from crystalline rocks, geologically recent alluvial deposits, and, in wet areas, thick deposits of decomposed organic matter. Glacial till consists of unstratified, unsorted clay, silt, sand, and boulders that were moved and deposited by a glacier. The till is dominantly sandy or loamy but has variable amounts of gravel, stones, and boulders. The consistence of the till ranges from friable to very firm. The glacial outwash consists of sorted, stratified gravel, sand, and silt deposited by glacial meltwaters. The recent materials deposited by stream overflow are on flood plains of streams and consist of gravel, sand, silt, and clay in various combinations.

Topography, specifically the position and relief of the landform on which the soil forms, causes differences in soils formed in parent material of the same age and composition. Generally, soils formed on steep slopes will have a thinner solum than soils on level or nearly level slopes. The position of the soil on the landscape and the relationship to the water table will further influence formation. Soils at lower positions generally are wetter and slower to warm up in the spring.

Climate affects the chemical and physical reactions that regulate soil formation. Rainfall provides water for plants and animals that add organic matter to the soil, dissolves soluble elements, and leaches soluble elements to other parts of the soil. Frost action breaks apart soil and rock fragments. Changes in temperature affect the rate of chemical and physical reactions.

Plant roots physically and chemically promote soil aggregation, and when the plants die they add organic matter to the soil. Small animals and insects are continually digging and churning the soil. Humans, while establishing farms, homesites, and industrial areas, have in many places significantly altered the shape and nature of landforms, thereby altering the nature of soils formed on and near these landforms.

Most of the soils in this survey area are of the same age, except for soils formed in recent deposits on flood plains and thick organic deposits. All soil materials that were on the landscape before glaciation were remixed, reworked, and redeposited during the period of glaciation which ended about 16,000 years ago.

References

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

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 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Calcareous soil. A soil containing enough calcium

carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

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.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

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.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse 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.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

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.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

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.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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 (in tables). The walls of excavations tend to cave in or slough.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to bedrock (in tables). Bedrock is too near the surface for 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 they are wet 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 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.

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

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 (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, 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.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to

grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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 overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

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.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually

expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

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 1-5 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. (See Sapric soil material)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial meltwater.

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.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

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.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Iow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range in moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed

depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure 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 pH values are defined as follows:

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

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

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.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can

damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It 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.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediments of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or 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).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

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 and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--Temperature and Precipitation

(Recorded in the period 1951-86 at Worcester, Mass.)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	o F	o F	o F	o F	o F	Units	In	In	In		In
January	30.6	15.3	23.9	57	-8	6	3.74	1.67	5.50	8	15.7
February	33.5	17.4	25.5	59	-7	8	3.52	2.19	4.70	6	16.0
March	41.4	25.3	31.4	70	3	26	4.12	2.48	5.59	8	13.0
April	54.8	35.6	45.2	82	19	179	3.91	2.46	5.21	8	3.3
May	66.1	45.7	55.9	88	30	493	4.10	2.38	5.63	8	.4
June	74.4	54.8	64.6	92	41	738	3.78	1.94	5.38	7	.0
July	79.2	60.7	70.0	92	49	930	3.83	2.01	5.42	7	.0
August	77.0	59.1	68.8	90	44	871	4.21	2.05	6.07	7	.0
September	69.5	51.4	60.5	88	36	615	3.95	1.76	5.82	6	.0
October	59.3	41.4	50.4	80	24	329	4.17	2.41	5.73	6	.5
November	47.1	32.2	39.7	69	13	84	4.55	2.75	6.14	8	3.3
December	35.1	20.6	27.9	62	-4	18	4.24	2.33	5.93	7	12.2
Yearly:											
Average	55.7	38.3	47.0	---	---	---	---	---	---	---	---
Extreme	---	---	---	93	-11	---	---	---	---	---	---
Total	---	---	---	---	---	4,293	48.12	40.96	55.02	86	64.4

* 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 degrees F).

TABLE 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1951-86 at Worcester, Mass.)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 16	Apr. 26	May 10
2 years in 10 later than--	Apr. 11	Apr. 22	May 5
5 years in 10 later than--	Apr. 4	Apr. 14	Apr. 27
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 26	Oct. 11	Oct. 2
2 years in 10 earlier than--	Oct. 31	Oct. 16	Oct. 7
5 years in 10 earlier than--	Nov. 10	Oct. 24	Oct. 16

TABLE 3.--Growing Season

(Recorded in the period 1951-86 at Worcester, Mass.)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	202	175	151
8 years in 10	208	182	158
5 years in 10	219	194	172
2 years in 10	231	206	186
1 year in 10	237	213	193

TABLE 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2	Pootatuck fine sandy loam	746	0.2
3	Scarboro and Walpole soils	4,413	1.2
4	Rippowam fine sandy loam	759	0.2
5	Saco mucky very fine sandy loam	887	0.2
30	Raynham silt loam	208	0.1
51	Swansea muck	5,331	1.4
52	Freetown muck	11,673	3.1
53	Freetown muck, ponded	2,445	0.6
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	1,110	0.3
70B	Ridgebury fine sandy loam, 3 to 8 percent slopes	451	0.1
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	4,386	1.2
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	6,176	1.6
72	Whitman sandy loam	336	0.1
73	Whitman sandy loam, extremely stony	11,592	3.0
100C	Brookfield-Brimfield-Rock outcrop complex, 3 to 15 percent slopes	2,907	0.8
101D	Brimfield-Brookfield-Rock outcrop complex, 15 to 35 percent slopes	2,805	0.7
102C	Chatfield-Hollis-Rock outcrop complex, 3 to 15 percent slopes	32,022	8.4
102D	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	10,722	2.8
253A	Hinckley sandy loam, 0 to 3 percent slopes	526	0.1
253B	Hinckley sandy loam, 3 to 8 percent slopes	6,827	1.8
253C	Hinckley sandy loam, 8 to 15 percent slopes	4,378	1.2
253D	Hinckley sandy loam, 15 to 35 percent slopes	2,222	0.6
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	2,380	0.6
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	14,222	3.7
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	1,102	0.3
254D	Merrimac fine sandy loam 15 to 35 percent slopes	226	0.1
255A	Windsor loamy fine sand, 0 to 3 percent slopes	561	0.1
255B	Windsor loamy fine sand, 3 to 8 percent slopes	2,376	0.6
255C	Windsor loamy fine sand, 8 to 15 percent slopes	534	0.1
255D	Windsor loamy fine sand, 15 to 25 percent slopes	379	0.1
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	1,209	0.3
260B	Sudbury fine sandy loam,3 to 8 percent slopes	806	0.2
300B	Montauk fine sandy loam, 3 to 8 percent slopes	2,917	0.8
300C	Montauk fine sandy loam, 8 to 15 percent slopes	1,010	0.3
300D	Montauk fine sandy loam, 15 to 25 percent slopes	383	0.1
302B	Montauk fine sandy loam, 3 to 8 percent slopes, extremely stony	6,273	1.6
302C	Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony	4,871	1.3
302D	Montauk fine sandy loam, 15 to 35 percent slopes, extremely stony	1,153	0.3
305B	Paxton fine sandy loam, 3 to 8 percent slopes	15,878	4.2
305C	Paxton fine sandy loam, 8 to 15 percent slopes	11,043	3.0
305D	Paxton fine sandy loam, 15 to 25 percent slopes	3,983	1.0
307B	Paxton fine sandy loam, 3 to 8 percent slopes, extremely stony	16,826	4.4
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	18,265	4.8
307D	Paxton fine sandy loam, 15 to 35 percent slopes, extremely stony	12,641	3.3
310A	Woodbridge fine sandy loam, 0 to 3 percent slopes	1,170	0.3
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	10,791	2.8
312B	Woodbridge fine sandy loam, 3 to 8 percent slopes, extremely stony	13,253	3.5
315A	Scituate fine sandy loam, 0 to 3 percent slopes	1,393	0.4
315B	Scituate fine sandy loam, 3 to 8 percent slopes	3,939	1.0
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	8,817	2.3
400B	Brookfield fine sandy loam, 3 to 8 percent slopes	344	0.1
402B	Brookfield fine sandy loam, 3 to 8 percent slopes, extremely stony	1,335	0.4
402C	Brookfield fine sandy loam, 8 to 15 percent slopes, extremely stony	1,684	0.4
402D	Brookfield fine sandy loam, 15 to 35 percentslopes, extremely stony	818	0.2
405B	Charlton fine sandy loam, 3 to 8 percent slopes	3,336	0.9
405C	Charlton fine sandy loam, 8 to 15 percent slopes	918	0.2
407B	Charlton fine sandy loam, 3 to 8 percent slopes, extremely stony	4,997	1.3
407C	Charlton fine sandy loam, 8 to 15 percent slopes, extremely stony	2,810	0.7
407D	Charlton fine sandy loam, 15 to 35 percent slopes, extremely stony	1,232	0.3
420B	Canton fine sandy loam, 3 to 8 percent slopes	10,098	2.7
420C	Canton fine sandy loam, 8 to 15 percent slopes	1,958	0.5

TABLE 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
420D	Canton fine sandy loam, 15 to 25 percent slopes	588	0.2
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	22,451	6.0
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	10,268	2.7
422D	Canton fine sandy loam,15 to 35 percent slopes, extremely stony	3,761	1.0
600	Pits, gravel	3,073	0.8
622	Paxton-Urban land complex, 8 to 15 percent slopes	3,716	1.0
625	Hinckley-Urban land complex, 0 to 15 percent slopes	1,734	0.5
651	Udorthents, smoothed	6,504	1.7
W	Water	27,382	7.2
	Total	380,330	100.0

TABLE 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
2	Pootatuck fine sandy loam
254A	Merrimac fine sandy loam, 0 to 3 percent slopes
254B	Merrimac fine sandy loam, 3 to 8 percent slopes
260A	Sudbury fine sandy loam, 0 to 3 percent slopes
260B	Sudbury fine sandy loam,3 to 8 percent slopes
300B	Montauk fine sandy loam, 3 to 8 percent slopes
305B	Paxton fine sandy loam, 3 to 8 percent slopes
310A	Woodbridge fine sandy loam, 0 to 3 percent slopes
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes
315A	Scituate fine sandy loam, 0 to 3 percent slopes
315B	Scituate fine sandy loam, 3 to 8 percent slopes
400B	Brookfield fine sandy loam, 3 to 8 percent slopes
405B	Charlton fine sandy loam, 3 to 8 percent slopes
420B	Canton fine sandy loam, 3 to 8 percent slopes

TABLE 6.--Land Capability Classes and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn silage	Alfalfa hay	Grass-clover	Corn, sweet
		Tons	Tons	AUM*	Tons
2 Pootatuck	IIw	24	4.0	7.5	6.3
3: Scarboro	Vw	---	---	---	
Walpole	IVw	---	---	4.7	
4 Rippowam	IVw	---	---	3.5	---
5 Saco	VIw	---	---	---	---
30 Raynham	IVw	---	---	---	---
51 Swansea	Vw	---	---	---	---
52 Freetown	Vw	---	---	---	---
53 Freetown	VIIw	---	---	---	---
70A, 70B Ridgebury	IIIw	---	---	5.0	
71A, 71B Ridgebury	VIIs	---	---	---	---
72 Whitman	Vw	---	---	---	---
73 Whitman	VIIs	---	---	---	---
100C Brookfield-Brimfield-Rock outcrop	VIs	---	---	---	---
101D Brimfield-Brookfield-Rock outcrop	VIIs	---	---	---	---
102C Chatfield-Hollis-Rock outcrop	VIs	---	---	---	---
102D Chatfield-Hollis-Rock outcrop	VIIs	---	---	---	---
253A, 253B Hinckley	IIIs	12	2.5	3.6	4.5

See footnote at end of table.

TABLE 6.--Land Capability Classes and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn silage	Alfalfa hay	Grass-clover	Corn, sweet
		Tons	Tons	AUM*	Tons
253C---------- Hinckley	IVs	---	---	2.5	---
253D---------- Hinckley	VIs	---	---	---	---
254A, 254B---------- Merrimac	IIs	18	4	5.7	6.1
254C---------- Merrimac	IIIe	16	4	5.7	6.0
254D---------- Merrimac	IVe	14	3.5	4.8	---
255A, 255B---------- Windsor	IIIs	14	3.0	5.5	---
255C---------- Windsor	IVs	12	3.0	5.0	---
255D---------- Windsor	VIs	---	2.5	4.5	---
260A---------- Sudbury	IIw	18	3.5	7.6	5.9
260B---------- Sudbury	IIe	18	3.5	7.6	5.9
300B---------- Montauk	IIe	22	4.0	6.5	---
300C---------- Montauk	IIIe	20	4.0	6.5	---
300D---------- Montauk	IVe	18	3.5	5.5	---
302B, 302C, 302D---------- Montauk	VIIs	---	---	---	---
305B---------- Paxton	IIe	24	4.5	7.5	5.9
305C---------- Paxton	IIIe	22	4.5	7.5	---
305D---------- Paxton	IVe	18	4.0	6.5	---
307B, 307C, 307D---------- Paxton	VIIs	---	---	---	---
310A---------- Woodbridge	IIw	24	4.0	7.5	5.6
310B---------- Woodbridge	IIe	24	4.0	7.5	5.6

See footnote at end of table.

TABLE 6.--Land Capability Classes and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn silage	Alfalfa hay	Grass-clover	Corn, sweet
		Tons	Tons	AUM*	Tons
312B---------- Woodbridge	VIIs	---	---	---	---
315A, 315B---------- Scituate	IIw	24	4.0	6.5	---
317B---------- Scituate	VIIs	---	---	---	---
400B---------- Brookfield	IIe	24	4.5	7.5	---
402B, 402C, 402D---------- Brookfield	VIIs	---	---	---	---
405B---------- Charlton	IIe	24	5.0	7.5	5.9
405C---------- Charlton	IIIe	22	5.0	6.6	5.3
407B, 407C, 407D---------- Charlton	VIIs	---	---	---	---
420B---------- Canton	IIe	22	4.5	8.5	---
420C---------- Canton	IIIe	20	4.5	7.5	---
420D---------- Canton	IVe	18	4.0	6.5	---
422B, 422C, 422D---------- Canton	VIIs	---	---	---	---
600**---------- Pits, gravel	VIIIs	---	---	---	---
622---------- Paxton-Urban land	---	---	---	---	---
625---------- Hinckley-Urban land	---	---	---	---	---
651---------- Udorthents	---	---	---	---	---

* 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 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--Capability Classes and Subclasses

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	---	---	---	---
II	69,229	44,170	8,457	16,602
III	29,261	18,000	---	11,261
IV	12,730	4,954	2,864	4,912
V	19,855	---	19,855	---
VI	10,327	---	887	9,440
VII	194,142	227	2,445	191,470
VIII	5,581	---	---	5,581

TABLE 8.--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	Plant competition	Common trees	Site index	Productivity class*	
2---------- Pootatuck	10A	Slight	Slight	Slight	Moderate	Eastern white pine--	75	10	Eastern white pine, white spruce.
						Red pine----------	75	10	
						Red maple----------	60	3	
						Yellow birch--------	60	3	
3**:									
Scarboro-------	6W	Slight	Severe	Severe	Moderate	Eastern white pine--	55	6	Northern whitecedar.
						Red maple----------	55	2	
						Atlantic white-cedar	45	--	
Walpole--------	3W	Slight	Severe	Severe	Severe	Red maple----------	75	3	Eastern white pine, white spruce, northern whitecedar, Norway spruce.
						White ash----------	61	3	
						Eastern hemlock-----	54	8	
						Eastern white pine--	68	8	
4---------- Rippowam	3W	Slight	Severe	Severe	Severe	Red maple----------	75	3	Eastern white pine, white spruce.
						Eastern white pine--	65	8	
5---------- Saco	6W	Slight	Severe	Severe	Severe	Eastern white pine--	50	6	
						Red maple----------	50	2	
						Northern whitecedar-	45	5	
30---------- Raynham	3W	Slight	Severe	Moderate	Severe	Red maple----------	65	3	Eastern white pine, white spruce.
						Eastern white pine--	65	8	
						White spruce--------	55	9	
						Red spruce----------	45	7	
						Elm-----------------	---	--	
						Eastern hemlock-----	---	--	
						Gray birch----------	---	--	
						Sugar maple---------	---	--	
						Balsam fir----------	---	--	
						Tamarack------------	---	--	
51---------- Swansea	2W	Slight	Severe	Severe	Severe	Red maple----------	50	2	White spruce, eastern hemlock, balsam fir.
						Atlantic white-cedar	60	--	
						Eastern hemlock-----	55	--	
						Green ash----------	35	2	
						American elm--------	55	--	
						Red spruce----------	50	8	
						Balsam fir----------	45	6	
52---------- Freetown	2W	Slight	Severe	Severe	Severe	Red maple----------	50	2	White spruce, eastern hemlock, balsam fir.
						Atlantic white-cedar	60	--	
						Eastern hemlock-----	55	--	
						Green ash----------	35	2	
						American elm--------	55	--	
						Red spruce----------	50	8	
						Balsam fir----------	45	6	

See footnote at end of table.

TABLE 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
70A, 70B-------- Ridgebury	3W	Slight	Severe	Severe	Moderate	Northern red oak---- Red spruce---------- Eastern white pine-- Sugar maple---------	57 47 63 52	3 7 8 2	Eastern white pine, white spruce.
71A, 71B-------- Ridgebury	3X	Slight	Severe	Severe	Moderate	Northern red oak---- Red spruce---------- Eastern white pine-- Sugar maple---------	57 47 63 52	3 7 8 2	Eastern white pine, white spruce.
72, 73---------- Whitman	2W	Slight	Severe	Severe	Moderate	Red maple---------- Eastern white pine-- Red spruce----------	55 56 44	2 7 6	
100C**:									
Brookfield----- 	3A	Slight	Slight	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine--	65 55 65	3 2 8	Eastern white pine, eastern hemlock, European larch.
Brimfield------ 	2D	Slight	Slight	Moderate	Slight	Northern red oak---- Eastern white pine-- Red pine----------	47 55 55	2 6 5	Eastern white pine.
Rock outcrop.									
101D**:									
Brimfield------ 	2X	Moderate	Moderate	Moderate	Slight	Northern red oak---- Eastern white pine-- Red pine----------	47 55 55	2 6 5	Eastern white pine.
Brookfield----- 	3X	Moderate	Moderate	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine--	65 55 65	3 2 8	Eastern white pine, eastern hemlock, European larch.
Rock outcrop.									
102C**:									
Chatfield------ 	3X	Slight	Moderate	Slight	Slight	Sugar maple--------- Northern red oak---- White ash----------	65 70 75	3 4 3	Eastern white pine, red pine, European larch, Norway spruce.
Hollis--------- 	2X	Slight	Moderate	Moderate	Slight	Northern red oak---- Eastern white pine-- Sugar maple---------	47 55 56	2 6 2	Eastern white pine.
Rock outcrop.									

See footnote at end of table.

TABLE 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
102D**:									
Chatfield	3X	Slight	Moderate	Slight	Slight	Sugar maple	65	3	Eastern white pine, red pine, European larch, Norway spruce.
						Northern red oak	70	4	
						White ash	75	3	
Hollis	2X	Moderate	Moderate	Moderate	Slight	Northern red oak	47	2	Eastern white pine.
						Eastern white pine	55	6	
						Sugar maple	56	2	
Rock outcrop.									
253A, 253B, 253C----- Hinckley	7S	Slight	Slight	Severe	Slight	Eastern white pine	60	7	Eastern white pine, European larch.
						Northern red oak	49	2	
						Red pine	58	7	
						Sugar maple	57	2	
253D----- Hinckley	7S	Moderate	Moderate	Severe	Slight	Eastern white pine	60	7	Eastern white pine, European larch.
						Northern red oak	49	2	
						Red pine	58	7	
						Sugar maple	57	2	
254A, 254B, 254C----- Merrimac	2S	Slight	Slight	Moderate	Moderate	Northern red oak	51	2	Eastern white pine, red pine.
						Eastern white pine	64	8	
						Sugar maple	58	3	
254D----- Merrimac	2S	Slight	Moderate	Moderate	Moderate	Northern red oak	51	2	Eastern white pine, red pine.
						Eastern white pine	64	8	
						Sugar maple	58	3	
255A, 255B, 255C----- Windsor	7S	Slight	Slight	Severe	Slight	Eastern white pine	57	7	Eastern white pine, red pine, Norway spruce.
						Northern red oak	52	2	
						Red pine	61	7	
						Sugar maple	55	2	
255D----- Windsor	7S	Moderate	Moderate	Severe	Slight	Eastern white pine	57	7	Eastern white pine, red pine, Norway spruce.
						Northern red oak	52	2	
						Red pine	61	7	
						Sugar maple	55	2	
260A, 260B----- Sudbury	7A	Slight	Slight	Slight	Moderate	Eastern white pine	60	7	Eastern white pine, red pine, European larch, white spruce, Norway spruce.
						Northern red oak	45	2	
						Red spruce	47	7	
						Red pine	60	6	
300B, 300C----- Montauk	3A	Slight	Slight	Slight	Moderate	Sugar maple	65	3	Norway spruce, white spruce, European larch.
						Northern red oak	70	4	
						Red pine	75	8	
						Eastern white pine	75	10	

See footnote at end of table.

TABLE 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
300D---------- Montauk	3R	Slight	Moderate	Slight	Moderate	Sugar maple---------	65	3	Norway spruce,
						Northern red oak----	70	4	white spruce,
						Red pine----------	75	8	European
						Eastern white pine--	75	10	larch.
302B, 302C------ Montauk	3X	Slight	Moderate	Slight	Moderate	Sugar maple---------	65	3	Eastern white
						Northern red oak----	70	4	pine, Norway
						Eastern white pine--	75	10	spruce, red
									pine, European
									larch.
302D---------- Montauk	3X	Slight	Moderate	Slight	Moderate	Sugar maple---------	65	3	Eastern white
						Northern red oak----	70	4	pine, Norway
						Eastern white pine--	75	10	spruce, red
									pine, European
									larch.
305B, 305C------ Paxton	3D	Slight	Slight	Moderate	Moderate	Northern red oak----	65	3	Red pine,
						Red pine----------	67	8	eastern white
						Eastern white pine--	66	8	pine, Norway
						Sugar maple---------	75	3	spruce,
									European
									larch.
305D---------- Paxton	3R	Moderate	Moderate	Moderate	Moderate	Northern red oak----	65	3	Red pine,
						Red pine----------	67	8	eastern white
						Eastern white pine--	66	8	pine, Norway
						Sugar maple---------	75	3	spruce,
									European
									larch.
307B, 307C------ Paxton	3X	Slight	Moderate	Slight	Moderate	Northern red oak----	65	3	Red pine,
						Eastern white pine--	66	8	Norway spruce,
						Red pine----------	67	8	eastern white
						Sugar maple---------	75	3	pine, European
									larch.
307D---------- Paxton	3R	Moderate	Moderate	Slight	Moderate	Northern red oak----	65	3	Red pine,
						Eastern white pine--	66	8	Norway spruce,
						Red pine----------	67	8	eastern white
						Sugar maple---------	75	3	pine, European
									larch.
310A, 310B------ Woodbridge	4D	Slight	Slight	Slight	Moderate	Northern red oak----	72	4	Eastern white
						Eastern white pine--	67	8	pine, red
						Red pine----------	65	8	pine, European
						Red spruce----------	50	8	larch.
						Sugar maple---------	65	3	
312B---------- Woodbridge	4X	Moderate	Moderate	Slight	Moderate	Northern red oak----	72	4	Eastern white
						Red pine----------	65	8	pine, European
						Eastern white pine--	67	8	larch, red
						Red spruce----------	50	8	pine.
						Sugar maple---------	65	3	

See footnote at end of table.

TABLE 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
315A, 315B---------- Scituate	3A	Slight	Slight	Slight	Moderate	Northern red oak----	61	3	Eastern white pine, white spruce.
						Eastern white pine--	65	8	
						Sugar maple---------	55	2	
						Red pine------------	70	9	
317B---------- Scituate	3X	Slight	Slight	Slight	Moderate	Northern red oak----	61	3	Eastern white pine, white spruce.
						Eastern white pine--	65	8	
						Sugar maple---------	55	2	
						Red pine------------	70	9	
400B---------- Brookfield	3A	Slight	Slight	Slight	Slight	Northern red oak----	65	3	Eastern white pine, European larch, eastern hemlock.
						Sugar maple---------	55	2	
						Eastern white pine--	65	8	
						Red pine------------	65	8	
402B, 402C---------- Brookfield	3X	Slight	Moderate	Slight	Slight	Northern red oak----	65	3	Eastern white pine, eastern hemlock, European larch.
						Sugar maple---------	55	2	
						Eastern white pine--	65	8	
402D---------- Brookfield	3X	Moderate	Moderate	Slight	Slight	Northern red oak----	65	3	Eastern white pine, eastern hemlock, European larch.
						Sugar maple---------	55	2	
						Eastern white pine--	65	8	
405B, 405C---------- Charlton	3A	Slight	Slight	Slight	Slight	Northern red oak----	65	3	Eastern white pine, red pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	8	
						Red pine------------	70	9	
						Red spruce----------	50	8	
						Red maple-----------	55	2	
						Shagbark hickory----	---	--	
						Sugar maple---------	55	2	
407B, 407C---------- Charlton	3X	Slight	Moderate	Slight	Slight	Northern red oak----	65	3	Eastern white pine, red pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	8	
						Red pine------------	70	9	
						Red spruce----------	50	8	
						Red maple-----------	55	2	
						Shagbark hickory----	---	--	
						Sugar maple---------	55	2	
407D---------- Charlton	3X	Moderate	Moderate	Slight	Slight	Northern red oak----	65	3	Eastern white pine, red pine, white spruce, eastern hemlock, European larch.
						Eastern white pine--	65	8	
						Red pine------------	70	9	
						Red spruce----------	50	8	
						Red maple-----------	55	2	
						Shagbark hickory----	---	--	
						Sugar maple---------	55	2	

See footnote at end of table.

TABLE 8.--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	Plant competition	Common trees	Site index	Productivity class*	
420B, 420C----- Canton	7A	Slight	Slight	Slight	Slight	Eastern white pine--	58	7	Eastern white pine, white spruce.
						Northern red oak----	52	2	
420D----- Canton	7R	Slight	Moderate	Slight	Slight	Eastern white pine--	58	7	Eastern white pine, white spruce.
						Northern red oak----	52	2	
422B, 422C, 422D----- Canton	7X	Slight	Moderate	Slight	Slight	Eastern white pine--	58	7	Eastern white pine, white spruce.
						Northern red oak----	52	2	
622**: Paxton---------	3D	Slight	Slight	Moderate	Moderate	Northern red oak----	65	3	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine----------	67	8	
						Eastern white pine--	66	8	
						Sugar maple--------	75	3	
Urban land.									
625**: Hinckley-------	7S	Slight	Slight	Severe	Slight	Eastern white pine--	60	7	Eastern white pine, European larch.
						Northern red oak----	49	2	
						Red pine----------	58	7	
						Sugar maple--------	57	2	
625**: Urban land.									

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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
2---- Pootatuck	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
3*:					
Scarboro----	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Walpole----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
4---- Rippowam	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
5---- Saco	Severe: flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
30---- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
51---- Swansea	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
52---- Freetown	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
53---- Freetown	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
70A, 70B---- Ridgebury	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
71A, 71B---- Ridgebury	Severe: large stones, wetness, percs slowly.	Severe: large stones, wetness, percs slowly.	Severe: wetness, large stones, small stones.	Severe: wetness.	Severe: wetness.
72---- Whitman	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
73---- Whitman	Severe: large stones, ponding.	Severe: large stones, ponding.	Severe: ponding, large stones.	Severe: ponding.	Severe: large stones, ponding.
100C*:					
Brookfield----	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Slight----	Moderate: large stones, slope.

See footnote at end of table.

TABLE 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
100C*:					
Brimfield	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, depth to rock.	Slight	Severe: thin layer.
Rock outcrop.					
101D*:					
Brimfield	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, depth to rock.	Severe: slope.	Severe: slope, thin layer.
Brookfield	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: large stones, slope.
Rock outcrop.					
102C*:					
Chatfield	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.
Hollis	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones, slope, depth to rock.	Slight	Severe: depth to rock.
Rock outcrop.					
102D*:					
Chatfield	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Hollis	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					
253A Hinckley	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
253B Hinckley	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
253C Hinckley	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
253D Hinckley	Moderate: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
254A---- Merrimac	Slight	Slight	Moderate: small stones.	Slight	Slight.
254B---- Merrimac	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
254C---- Merrimac	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
254D---- Merrimac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255A---- Windsor	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
255B---- Windsor	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
255C---- Windsor	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
255D---- Windsor	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.
260A---- Sudbury	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, small stones.	Slight	Slight.
260B---- Sudbury	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness, small stones.	Slight	Slight.
300B---- Montauk	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Slight	Severe: droughty.
300C---- Montauk	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Slight	Severe: droughty.
300D---- Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: droughty, slope.
302B---- Montauk	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Slight	Moderate: small stones, large stones.
302C---- Montauk	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.

See footnote at end of table.

TABLE 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
302D--- Montauk	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
305B--- Paxton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight---	Slight.
305C--- Paxton	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight---	Moderate: slope.
305D--- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
307B--- Paxton	Severe: large stones.	Severe: large stones.	Severe: large stones.	Slight---	Moderate: large stones.
307C--- Paxton	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Slight---	Moderate: large stones, slope.
307D--- Paxton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
310A--- Woodbridge	Moderate: wetness.	Moderate: wetness.	Moderate: small stones.	Moderate: wetness.	Moderate: wetness.
310B--- Woodbridge	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Moderate: wetness.	Moderate: wetness.
312B--- Woodbridge	Severe: large stones.	Severe: large stones.	Severe: large stones.	Moderate: wetness.	Moderate: large stones, wetness.
315A, 315B--- Scituate	Moderate: small stones, wetness.	Moderate: wetness, small stones.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
317B--- Scituate	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Moderate: large stones, wetness.	Severe: large stones.
400B--- Brookfield	Slight---	Slight---	Moderate: slope, small stones.	Slight---	Slight.
402B--- Brookfield	Severe: large stones.	Severe: large stones.	Severe: large stones.	Slight---	Moderate: large stones.
402C--- Brookfield	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Slight---	Moderate: large stones, slope.

See footnote at end of table.

TABLE 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
402D---------- Brookfield	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: large stones, slope.
405B---------- Charlton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
405C---------- Charlton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
407B---------- Charlton	Severe: large stones.	Severe: large stones.	Severe: large stones.	Slight----------	Moderate: large stones.
407C---------- Charlton	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Slight----------	Moderate: large stones, slope.
407D---------- Charlton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
420B---------- Canton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Moderate: large stones.
420C---------- Canton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: large stones, slope.
420D---------- Canton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
422B---------- Canton	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Slight----------	Moderate: large stones.
422C---------- Canton	Severe: large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Slight----------	Moderate: large stones, slope.
422D---------- Canton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope.
600*---------- Pits, gravel	Severe: small stones, too sandy.	Severe: too sandy, small stones.	Severe: small stones, too sandy.	Severe: too sandy, small stones.	Severe: small stones, droughty, too sandy.
622*:					
Paxton----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
Urban land----------	Variable--------	Variable--------	Variable--------	Variable--------	Variable.

TABLE 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
625*:					
Hinckley	Slight	Slight	Severe: slope.	Slight	Moderate: droughty.
Urban land	Variable	Variable	Variable	Variable	Variable.
651 Udorthents	Variable	Variable	Variable	Variable	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--Wildlife Habitat

(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
2---- Pootatuck	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3*:										
Scarboro----	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
Walpole----	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
4---- Rippowam	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
5---- Saco	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
30---- Raynham	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
51---- Swansea	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
52---- Freetown	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
53---- Freetown	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
70A---- Ridgebury	Poor	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
70B---- Ridgebury	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
71A---- Ridgebury	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
71B---- Ridgebury	Very poor.	Very poor.	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
72---- Whitman	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
73---- Whitman	Very poor.	Very poor.	Poor	Poor	Poor	Good	Fair	Very poor.	Poor	Fair.
100C*:										
Brookfield----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Brimfield----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 10.--Wildlife Habitat--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
101D*:										
Brimfield	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Brookfield	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
102C*, 102D*:										
Chatfield	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
Hollis	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Rock outcrop.										
253A, 253B, 253C---Hinckley	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
253D---Hinckley	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
254A, 254B, 254C---Merrimac	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
254D---Merrimac	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
255A, 255B, 255C, 255D---Windsor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
260A---Sudbury	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
260B---Sudbury	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
300B---Montauk	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
300C---Montauk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
300D---Montauk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
302B---Montauk	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
302C, 302D---Montauk	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
305B---Paxton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--Wildlife Habitat--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
305C---------- Paxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
305D---------- Paxton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
307B---------- Paxton	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
307C, 307D---------- Paxton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
310A---------- Woodbridge	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
310B---------- Woodbridge	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
312B---------- Woodbridge	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
315A---------- Scituate	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
315B---------- Scituate	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
317B---------- Scituate	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
400B---------- Brookfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
402B---------- Brookfield	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
402C, 402D---------- Brookfield	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
405B---------- Charlton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
405C---------- Charlton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
407B---------- Charlton	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
407C, 407D---------- Charlton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
420B---------- Canton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
420C---------- Canton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--Wildlife Habitat--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
420D---------- Canton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
422B---------- Canton	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
422C, 422D--------- Canton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
600*---------- Pits, gravel	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
622*: Paxton----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land--------	---	---	---	---	---	---	---	---	---	---
625*: Hinckley----------	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land--------	---	---	---	---	---	---	---	---	---	---
651. Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2---- Pootatuck	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
3*:						
Scarboro----	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
Walpole----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
4---- Rippowam	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
5---- Saco	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
30---- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
51---- Swansea	Severe: wetness, excess humus, cutbanks cave.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness, low strength, frost action.	Severe: wetness, excess humus.
52---- Freetown	Severe: wetness, excess humus.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength, frost action.	Severe: wetness, excess humus.
53---- Freetown	Severe: ponding, excess humus.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength, frost action.	Severe: ponding, excess humus.
70A, 70B, 71A, 71B---- Ridgebury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
72---- Whitman	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.

See footnote at end of table.

TABLE 11.--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
73---------- Whitman	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, ponding.	Severe: large stones, ponding.
100C*:						
Brookfield-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
Brimfield--------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.
Rock outcrop.						
101D*:						
Brimfield--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
Brookfield-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
Rock outcrop.						
102C*:						
Chatfield--------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope, large stones.	Moderate: slope, depth to rock, frost action.	Moderate: small stones, large stones, slope.
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.
Rock outcrop.						
102D*:						
Chatfield--------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope, large stones.	Severe: slope.	Severe: slope.
Hollis-----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
253A---------- Hinckley	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
253B---------- Hinckley	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
253C---------- Hinckley	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.

See footnote at end of table.

TABLE 11.--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
253D---------- Hinckley	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
254A---------- Merrimac	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
254B---------- Merrimac	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
254C---------- Merrimac	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
254D---------- Merrimac	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255A---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
255B---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
255C---------- Windsor	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
255D---------- Windsor	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
260A---------- Sudbury	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.
260B---------- Sudbury	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: wetness, frost action.	Slight.
300B---------- Montauk	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Severe: droughty.
300C---------- Montauk	Severe: cutbanks cave, wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Severe: droughty.
300D---------- Montauk	Severe: cutbanks cave, wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
302B---------- Montauk	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: small stones, large stones.

See footnote at end of table.

TABLE 11.--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
302C---------- Montauk	Severe: cutbanks cave, wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, large stones, slope.
302D---------- Montauk	Severe: cutbanks cave, wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
305B---------- Paxton	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
305C---------- Paxton	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
305D---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
307B---------- Paxton	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: large stones.
307C---------- Paxton	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: large stones, slope.
307D---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
310A---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
310B---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
312B---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: large stones, wetness.
315A---------- Scituate	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: small stones, wetness.
315B---------- Scituate	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: small stones, wetness.
317B---------- Scituate	Severe: wetness.	Moderate: wetness, large stones.	Severe: wetness.	Moderate: wetness, slope, large stones.	Moderate: wetness, frost action.	Severe: large stones.

See footnote at end of table.

TABLE 11.--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
400B---------- Brookfield	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
402B---------- Brookfield	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: large stones.
402C---------- Brookfield	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
402D---------- Brookfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
405B---------- Charlton	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
405C---------- Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
407B---------- Charlton	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: large stones.
407C---------- Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
407D---------- Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
420B---------- Canton	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: large stones.
420C---------- Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
420D---------- Canton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
422B---------- Canton	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: large stones.
422C---------- Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
422D---------- Canton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
600*---------- Pits, gravel	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: small stones, droughty, too sandy.

See footnote at end of table.

TABLE 11.--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
622*:						
Paxton	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
625*:						
Hinckley	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
651 Udorthents	Variable	Variable	Variable	Variable	Variable	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2---------- Pootatuck	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
3*:					
Scarboro----------	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, small stones.
Walpole----------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
4---------- Rippowam	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
5---------- Saco	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness.
30---------- Raynham	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
51---------- Swansea	Severe: wetness, poor filter.	Severe: wetness, excess humus, seepage.	Severe: wetness, too sandy, seepage.	Severe: wetness, seepage.	Poor: wetness, excess humus, seepage.
52---------- Freetown	Severe: wetness.	Severe: wetness, excess humus, seepage.	Severe: wetness, excess humus, seepage.	Severe: wetness, seepage.	Poor: excess humus, wetness.
53---------- Freetown	Severe: ponding.	Severe: ponding, excess humus, seepage.	Severe: ponding, excess humus, seepage.	Severe: ponding, seepage.	Poor: ponding, excess humus.
70A---------- Ridgebury	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
70B---------- Ridgebury	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--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
71A---------- Ridgebury	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
71B---------- Ridgebury	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
72, 73---------- Whitman	Severe: percs slowly, ponding.	Slight----------	Severe: ponding.	Severe: ponding.	Poor: ponding.
100C*:					
Brookfield---------	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Brimfield----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, thin layer.
Rock outcrop.					
101D*:					
Brimfield----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope, thin layer.
Brookfield---------	Severe: large stones, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Rock outcrop.					
102C*:					
Chatfield----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
Hollis----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, thin layer.
Rock outcrop.					
102D*:					
Chatfield----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.

See footnote at end of table.

TABLE 12.--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
102D*:					
Hollis	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope, thin layer.
Rock outcrop.					
253A, 253B Hinckley	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
253C Hinckley	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
253D Hinckley	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, too sandy, slope.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
254A, 254B Merrimac	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
254C Merrimac	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
254D Merrimac	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, seepage, too sandy.
255A, 255B Windsor	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
255C Windsor	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
255D Windsor	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
260A, 260B Sudbury	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

TABLE 12.--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
300B---------- Montauk	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too sandy.	Moderate: wetness.	Poor: seepage, small stones.
300C---------- Montauk	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too sandy.	Moderate: wetness, slope.	Poor: seepage, small stones.
300D---------- Montauk	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: seepage, small stones, slope.
302B---------- Montauk	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, too sandy.	Severe: seepage.	Poor: seepage.
302C---------- Montauk	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Moderate: wetness, slope, too sandy.	Severe: seepage.	Poor: seepage.
302D---------- Montauk	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: seepage, slope.	Poor: seepage, slope.
305B---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
305C---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
305D---------- Paxton	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
307B---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
307C---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
307D---------- Paxton	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
310A---------- Woodbridge	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.

See footnote at end of table.

TABLE 12.--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
310B, 312B Woodbridge	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
315A Scituate	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Moderate: wetness.	Poor: small stones.
315B Scituate	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Poor: small stones.
317B Scituate	Severe: wetness, percs slowly.	Moderate: slope, large stones.	Severe: wetness.	Moderate: wetness.	Poor: small stones.
400B, 402B Brookfield	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
402C Brookfield	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
402D Brookfield	Severe: large stones, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
405B Charlton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
405C Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
407B Charlton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
407C Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
407D Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
420B Canton	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
420C Canton	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
420D Canton	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.

See footnote at end of table.

TABLE 12.--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
422B---------- Canton	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
422C---------- Canton	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
422D---------- Canton	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, slope.
600*---------- Pits, gravel	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Slight----------	Poor: seepage, too sandy, small stones.
622*: Paxton----------	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
Urban land---------	Variable---------	Variable---------	Variable---------	Variable---------	Variable.
625*: Hinckley----------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Urban land---------	Variable---------	Variable---------	Variable---------	Variable---------	Variable.
651---------- Udorthents	Variable---------	Variable---------	Variable---------	Variable---------	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2--- Pootatuck	Fair: wetness.	Probable---	Improbable: too sandy.	Fair: thin layer.
3*:				
Scarboro---	Poor: wetness.	Probable---	Improbable: too sandy.	Poor: too sandy, small stones, area reclaim.
Walpole---	Poor: wetness.	Probable---	Probable---	Poor: small stones, area reclaim, wetness.
4--- Rippowam	Poor: wetness.	Probable---	Improbable: too sandy.	Poor: wetness.
5--- Saco	Poor: wetness.	Probable---	Improbable: too sandy.	Poor: wetness.
30--- Raynham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
51--- Swansea	Poor: wetness.	Probable---	Improbable: excess humus.	Poor: wetness, excess humus.
52--- Freetown	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
53--- Freetown	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
70A, 70B, 71A, 71B--- Ridgebury	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, small stones, area reclaim.
72--- Whitman	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones, area reclaim.
73--- Whitman	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, large stones, area reclaim.
100C*:				
Brookfield---	Good---	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.

See footnote at end of table.

TABLE 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
100C*:				
Brimfield	Poor: area reclaim, thin layer.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: area reclaim, thin layer.
Rock outcrop.				
101D*:				
Brimfield	Poor: area reclaim, thin layer, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: area reclaim, thin layer, slope.
Brookfield	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rock outcrop.				
102C*:				
Chatfield	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hollis	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
Rock outcrop.				
102D*:				
Chatfield	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Hollis	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop.				
253A, 253B, 253C--- Hinckley	Good	Probable	Probable	Poor: too sandy, area reclaim, small stones.
253D--- Hinckley	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, slope.
254A, 254B, 254C--- Merrimac	Good	Probable	Probable	Poor: small stones, area reclaim.
254D--- Merrimac	Poor: slope.	Probable	Probable	Poor: slope, small stones, area reclaim.
255A, 255B, 255C--- Windsor	Good	Probable	Improbable: too sandy.	Poor: too sandy.

See footnote at end of table.

TABLE 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
255D---------- Windsor	Fair: slope.	Probable----------	Improbable: too sandy.	Poor: too sandy, slope.
260A, 260B---------- Sudbury	Fair: wetness.	Probable----------	Probable----------	Poor: small stones, too sandy, area reclaim.
300B, 300C---------- Montauk	Fair: wetness.	Probable----------	Probable----------	Poor: area reclaim, small stones.
300D---------- Montauk	Fair: wetness, slope.	Probable----------	Probable----------	Poor: area reclaim, small stones, slope.
302B, 302C---------- Montauk	Fair: wetness.	Probable----------	Probable----------	Poor: small stones.
302D---------- Montauk	Poor: slope.	Probable----------	Probable----------	Poor: small stones, slope.
305B---------- Paxton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
305C---------- Paxton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
305D---------- Paxton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
307B---------- Paxton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
307C---------- Paxton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
307D---------- Paxton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
310A, 310B, 312B------ Woodbridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
315A, 315B---------- Scituate	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
317B---------- Scituate	Fair: large stones, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
400B, 402B---------- Brookfield	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
402C---------- Brookfield	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
402D---------- Brookfield	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
405B---------- Charlton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
405C---------- Charlton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
407B---------- Charlton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
407C---------- Charlton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
407D---------- Charlton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
420B, 420C---------- Canton	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
420D---------- Canton	Fair: slope.	Probable----------	Probable----------	Poor: small stones, area reclaim, slope.
422B, 422C---------- Canton	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
422D---------- Canton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
600*---------- Pits, gravel	Good----------	Probable----------	Probable----------	Poor: too sandy, small stones, area reclaim.
622*: Paxton----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
Urban land----------	Variable----------	Variable----------	Variable----------	Variable.

See footnote at end of table.

TABLE 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
625*:				
Hinckley	Good	Probable	Probable	Poor: too sandy, area reclaim, small stones.
Urban land	Variable	Variable	Variable	Variable.
651 Udorthents	Variable	Variable	Variable	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--Water Management

(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 evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
2---------- Pootatuck	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, too sandy.	Favorable.
3*:						
Scarboro---------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, frost action, cutbanks cave.	Ponding, too sandy.	Wetness, droughty.
Walpole----------	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Wetness.
4---------- Rippowam	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Wetness, too sandy, poor outlets.	Wetness.
5---------- Saco	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, poor outlets.	Wetness, poor outlets.	Wetness.
30---------- Raynham	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
51---------- Swansea	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave, frost action.	Wetness, too sandy.	Wetness.
52---------- Freetown	Severe: seepage.	Severe: excess humus, wetness.	Slight---------	Frost action---	Wetness--------	Wetness.
53---------- Freetown	Severe: seepage.	Severe: excess humus, ponding.	Slight---------	Frost action, ponding.	Ponding--------	Wetness.
70A---------- Ridgebury	Slight---------	Severe: wetness, piping.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly, rooting depth.
70B---------- Ridgebury	Moderate: slope.	Severe: wetness, piping.	Severe: no water.	Slope, percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly, rooting depth.
71A---------- Ridgebury	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly, rooting depth.

See footnote at end of table.

TABLE 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
71B---------- Ridgebury	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Slope, percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly, rooting depth.
72---------- Whitman	Slight---------	Severe: piping, ponding.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Wetness, percs slowly, rooting depth.
73---------- Whitman	Slight---------	Severe: piping, ponding.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, large stones.	Large stones, wetness, percs slowly.
100C*:						
Brookfield-------	Severe: seepage, slope.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.
Brimfield--------	Severe: depth to rock, slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
101D*:						
Brimfield--------	Severe: depth to rock, slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Brookfield-------	Severe: seepage, slope.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.
Rock outcrop.						
102C*, 102D*:						
Chatfield--------	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Hollis-----------	Severe: depth to rock, slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
253A, 253B-------- Hinckley	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
253C, 253D-------- Hinckley	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, slope, droughty.
254A, 254B-------- Merrimac	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Favorable.
254C, 254D-------- Merrimac	Severe: slope, seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, too sandy.	Slope.

See footnote at end of table.

TABLE 14.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
255A, 255B-------- Windsor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy------	Droughty.
255C, 255D-------- Windsor	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy.	Slope, droughty.
260A-------------- Sudbury	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Too sandy, wetness.	Favorable.
260B-------------- Sudbury	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Too sandy, wetness.	Favorable.
300B-------------- Montauk	Moderate: slope.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope, cutbanks cave.	Wetness, too sandy.	Droughty, rooting depth.
300C, 300D-------- Montauk	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope, cutbanks cave.	Slope, wetness, too sandy.	Slope, droughty, rooting depth.
302B-------------- Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope, cutbanks cave.	Wetness, too sandy.	Droughty, rooting depth.
302C, 302D-------- Montauk	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope, cutbanks cave.	Slope, wetness, too sandy.	Slope, droughty, rooting depth.
305B-------------- Paxton	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly---	Rooting depth, percs slowly.
305C, 305D-------- Paxton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, rooting depth, percs slowly.
307B-------------- Paxton	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly---	Rooting depth, percs slowly.
307C, 307D-------- Paxton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, rooting depth, percs slowly.
310A-------------- Woodbridge	Slight---------	Severe: piping.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Rooting depth, percs slowly.
310B, 312B-------- Woodbridge	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Rooting depth, percs slowly.
315A-------------- Scituate	Slight---------	Moderate: piping.	Severe: no water.	Percs slowly---	Large stones, wetness, percs slowly.	Droughty, rooting depth.

See footnote at end of table.

TABLE 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
315B---------- Scituate	Moderate: slope.	Moderate: piping.	Severe: no water.	Percs slowly, slope.	Large stones, wetness, percs slowly.	Droughty, rooting depth.
317B---------- Scituate	Moderate: slope.	Severe: seepage.	Severe: no water.	Percs slowly, slope.	Large stones, wetness, percs slowly.	Large stones, droughty, rooting depth.
400B, 402B-------- Brookfield	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
402C, 402D-------- Brookfield	Severe: seepage, slope.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.
405B---------- Charlton	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
405C---------- Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.
407B---------- Charlton	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
407C, 407D-------- Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.
420B---------- Canton	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
420C, 420D-------- Canton	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, slope, droughty.
422B---------- Canton	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones.
422C, 422D-------- Canton	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, slope.
600*---------- Pits, gravel	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
622*: Paxton----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, rooting depth, percs slowly.
Urban land-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.

See footnote at end of table.

TABLE 14.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
625*:						
Hinckley	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
651 Udorthents	Variable	Variable	Variable	Variable	Variable	Variable.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--Engineering Index Properties

(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		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
2----------	0-10	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	80-100	55-95	30-75	<25	NP-4
Pootatuck	10-25	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	95-100	80-100	55-85	30-50	<20	NP-2
	25-65	Stratified loamy fine sand to very gravelly coarse sand.	SP, SP-SM, SM	A-1, A-2, A-3	0-15	70-100	45-100	25-75	0-25	---	NP
3*:											
Scarboro--------	0-4	Mucky fine sandy loam.	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	85-100	45-85	5-50	---	NP
	4-10	Loamy sand, fine sand, sand.	SM, SP-SM	A-1, A-2, A-3	0	95-100	85-100	45-80	5-35	---	NP
	10-16	Loamy sand, sand, coarse sand.	SM, SP-SM, SP	A-1, A-2, A-3	0	95-100	70-100	30-80	2-35	---	NP
	16-65	Stratified loamy fine sand to gravelly coarse sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	70-100	35-100	15-80	0-35	---	NP
Walpole---------	0-1	Very fine sandy loam.	SM, ML	A-2, A-4	0-5	90-100	75-100	55-90	25-60	<25	NP-3
	1-18	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-85	20-50	---	NP
	18-65	Stratified loamy fine sand to very gravelly coarse sand.	SP, SM, GP, GM	A-1, A-2, A-3	0-20	55-100	50-100	25-80	2-30	---	NP
4----------	0-17	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	80-100	55-95	30-75	<25	NP-4
Rippowam	17-35	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	95-100	80-100	55-85	30-50	<20	NP-2
	35-65	Stratified loamy fine sand to very gravelly coarse sand.	SP, SP-SM, SM	A-1, A-2, A-3	0-10	70-100	45-100	25-75	0-25	---	NP
5----------	0-12	Mucky very fine sandy loam.	OL, ML	A-4, A-7	0	100	100	95-100	70-95	<50	5-20
Saco	12-20	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	70-95	<40	NP-10
	20-40	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	90-100	70-95	<40	NP-10
	40-65	Stratified loamy fine sand to very gravelly coarse sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	80-100	45-100	25-85	0-30	---	NP

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
30---------- Raynham	0-10	Very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	<25	NP-5
	10-28	Silt loam, silt, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	<25	NP-5
	28-65	Silt loam, silt, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	70-95	<25	NP-5
51---------- Swansea	0-3	Muck----------	PT	A-8	---	---	---	---	---	---	---
	3-34	Sapric material, hemic material.	PT	A-8	---	---	---	---	---	---	---
	34-65	Sand, loamy coarse sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	0	55-100	45-100	30-70	5-30	---	NP
52---------- Freetown	0-8	Muck----------	PT	A-8	---	---	---	---	---	---	---
	8-65	Sapric material, hemic material.	PT	A-8	---	---	---	---	---	---	---
53---------- Freetown	0-65	Muck----------	PT	A-8	---	---	---	---	---	---	---
70A, 70B--------- Ridgebury	0-8	Fine sandy loam	SM, ML	A-1, A-2, A-4	0-5	80-100	75-90	40-90	20-70	---	NP
	8-22	Sandy loam, gravelly loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	22-65	Sandy loam, gravelly loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	55-90	35-80	20-60	---	NP
71A, 71B--------- Ridgebury	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-30	70-100	50-85	30-80	15-65	---	NP
	8-22	Sandy loam, gravelly loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	22-65	Sandy loam, gravelly loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	55-90	35-80	20-60	---	NP
72---------- Whitman	0-5	Sandy loam-------	ML, SM, CL-ML	A-2, A-4	0-5	80-100	75-95	45-90	25-85	16-35	NP-10
	5-11	Sandy loam, gravelly fine sandy loam, gravelly silt loam.	ML, SM, CL-ML	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-35	NP-10
	11-25	Sandy loam, gravelly fine sandy loam.	ML, SM, CL-ML	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-32	NP-8
	25-65	Loamy sand, gravelly loamy sand, gravelly sandy loam.	ML, SM, CL-ML	A-1, A-2	0-10	65-95	60-90	30-65	15-35	---	NP

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
73----------	0-5	Extremely stony	ML, SM,	A-1, A-2,	10-40	65-80	60-75	35-70	20-65	16-35	NP-10
Whitman		sandy loam.	CL-ML	A-4							
	5-11	Sandy loam,	ML, SM,	A-1, A-2,	0-10	65-95	60-90	35-85	20-60	16-35	NP-10
		gravelly fine	CL-ML	A-4							
		sandy loam,									
		gravelly silt									
		loam.									
	11-25	Sandy loam,	ML, SM,	A-1, A-2,	0-10	65-95	60-90	35-85	20-60	16-32	NP-8
		gravelly fine	CL-ML	A-4							
		sandy loam.									
	25-65	Loamy sand,	SM	A-1, A-2	0-10	65-95	60-90	30-65	15-35	---	NP
		gravelly loamy									
		sand, gravelly									
		sandy loam.									
100C*:											
Brookfield------	0-2	Very stony fine	SM, ML, GM	A-2, A-4	5-15	65-100	60-95	40-80	25-65	<25	NP-5
		sandy loam.									
	2-31	Gravelly fine	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	25-60	<25	NP-5
		sandy loam,									
		loam, sandy									
		loam.									
	31-65	Gravelly sandy	SM, GM	A-2, A-4	0-15	65-100	60-95	40-70	25-45	---	NP
		loam, gravelly									
		fine sandy loam,									
		fine sandy loam.									
Brimfield-------	0-1	Very stony fine	SM, ML, GM	A-2, A-4	5-15	65-100	60-95	40-85	20-65	<25	NP-5
		sandy loam.									
	1-18	Gravelly fine	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	20-65	<25	NP-5
		sandy loam,									
		sandy loam,									
		loam.									
	18-22	Unweathered	---	---	---	---	---	---	---	---	---
		bedrock.									
Rock outcrop.											
101D*:											
Brimfield-------	0-1	Extremely stony	SM, ML, GM	A-2, A-4	15-30	65-100	60-95	40-85	20-65	<25	NP-5
		fine sandy loam.									
	1-18	Gravelly fine	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	20-65	<25	NP-5
		sandy loam,									
		sandy loam,									
		loam.									
	18-22	Unweathered	---	---	---	---	---	---	---	---	---
		bedrock.									
Brookfield------	0-2	Extremely stony	SM, ML, GM	A-2, A-4	15-30	65-100	60-95	40-80	25-65	<25	NP-5
		fine sandy loam.									
	2-31	Gravelly fine	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	25-60	<25	NP-5
		sandy loam,									
		loam, sandy									
		loam.									
	31-65	Gravelly sandy	SM, GM	A-2, A-4	0-15	65-100	60-95	40-70	25-45	---	NP
		loam, gravelly									
		fine sandy loam,									
		fine sandy loam.									

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
101D*:											
Rock outcrop.											
102C*, 102D*:											
Chatfield-------	0-4	Extremely stony fine sandy loam.	SM, GM, GM-GC, SC-SM	A-4, A-2, A-1	0-24	55-80	50-75	30-65	15-50	10-20	1-6
	4-30	Silt loam, gravelly loam, gravelly sandy loam.	SM, ML, GM, CL-ML	A-4, A-2, A-1	0-10	60-95	55-90	33-85	15-75	10-20	1-6
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hollis----------	0-6	Extremely stony fine sandy loam.	SM, ML, GM	A-2, A-4	15-30	65-100	60-95	40-85	20-65	<25	NP-5
	6-19	Gravelly fine sandy loam, sandy loam, loam.	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	20-65	<25	NP-5
	19-23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
253A, 253B, 253C, 253D----------	0-6	Sandy loam-------	SM	A-2, A-4	0-5	85-95	75-90	45-75	25-50	<20	NP
Hinckley	6-17	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GP-GM, SP-SM	A-1, A-2, A-3	0-20	50-95	30-85	15-70	2-30	<20	NP
	17-65	Stratified very gravelly loamy fine sand to cobbly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	5-25	50-65	30-50	10-40	0-20	<10	NP
254A, 254B, 254C, 254D----------	0-5	Fine sandy loam	SM, ML	A-2, A-4	0	85-95	70-90	40-85	20-55	<20	NP
Merrimac	5-17	Sandy loam-------	SM	A-2	0	75-95	70-90	40-60	20-35	<25	NP
	17-27	Gravelly loamy sand, sandy loam, gravelly sandy loam.	SP, SM, SP-SM	A-1, A-2, A-3	0	65-95	55-90	30-60	0-35	<25	NP
	27-65	Stratified sand to very gravelly coarse sand.	GP, SP, SP-SM, GP-GM	A-1	5-25	40-65	30-60	15-40	0-10	---	NP
255A, 255B, 255C, 255D----------	0-3	Loamy fine sand	SM	A-1, A-2	0	95-100	80-100	45-90	20-35	---	NP
Windsor	3-25	Loamy sand, loamy fine sand.	SM	A-1, A-2	0	95-100	80-100	45-90	15-30	---	NP
	25-65	Sand, fine sand, loamy sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	90-100	75-100	40-90	2-30	---	NP

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
260A, 260B------- Sudbury	0-2	Fine sandy loam	SM, ML	A-2, A-4, A-1	0-5	85-100	70-100	40-90	20-55	---	NP
	2-8	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4, A-1	0-5	85-100	60-100	40-80	20-50	---	NP
	8-20	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	---	NP
	20-65	Stratified sand and gravel.	SP, SP-SM, GP, GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	26-65	NP
300B, 300C, 300D- Montauk	0-5	Fine sandy loam	SM, SC-SM	A-2, A-4	0-5	80-100	75-100	45-95	20-85	<20	NP-4
	5-27	Fine sandy loam, gravelly sandy loam, silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4, A-1	0-15	60-100	55-95	35-90	15-80	<20	NP-4
	27-65	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2, A-1, A-4	0-15	60-100	55-95	20-80	10-50	<15	NP-2
302B, 302C, 302D- Montauk	0-5	Extremely stony fine sandy loam.	SM, ML, GM, CL-ML	A-2, A-4, A-1	2-15	65-80	55-75	30-75	15-70	<20	NP-4
	5-27	Fine sandy loam, silt loam, gravelly sandy loam.	SM, ML, SC-SM, CL-ML	A-1, A-2, A-4	0-5	60-100	55-95	35-90	15-80	<20	NP-4
	27-65	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-4	0-5	60-100	55-95	20-80	10-50	<15	NP-2
305B, 305C, 305D- Paxton	0-8	Fine sandy loam	SM, ML, GM	A-2, A-4	0-10	85-95	75-90	50-80	20-65	<40	NP-10
	8-24	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-90	45-80	25-65	<30	NP-7
	24-65	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	60-90	40-75	20-60	<30	NP-7
307B, 307C, 307D- Paxton	0-8	Extremely stony fine sandy loam.	SM, ML, GM	A-2, A-4	10-25	65-95	60-80	40-80	25-65	<40	NP-10
	8-24	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-90	45-80	25-65	<30	NP-7
	24-65	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	60-90	40-75	20-60	<30	NP-7
310A, 310B------- Woodbridge	0-11	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	50-80	25-65	<40	NP-10
	11-22	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-90	45-80	25-65	<30	NP-7
	22-65	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	60-90	40-75	20-60	<30	NP-7

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
312B---------- Woodbridge	0-11	Extremely stony fine sandy loam.	SM, ML, GM	A-2, A-4	10-25	65-95	60-90	40-80	25-65	<40	NP-10
	11-22	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-90	45-80	25-60	<30	NP-7
	22-65	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	60-90	40-75	20-60	<30	NP-7
315A, 315B------- Scituate	0-4	Fine sandy loam	SM, ML	A-2, A-4, A-1	0-5	80-95	70-90	40-85	20-65	<20	NP-4
	4-20	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4, A-1	0-25	70-95	60-90	35-85	20-65	<20	NP-4
	20-65	Loamy sand, gravelly loamy fine sand, gravelly loamy coarse sand.	SM	A-1, A-2	0-25	65-85	50-75	30-65	12-30	<15	NP-2
317B---------- Scituate	0-4	Extremely stony fine sandy loam.	SM, ML, GM	A-2, A-4, A-1	15-35	60-90	55-85	35-80	20-65	<20	NP-4
	4-20	Fine sandy loam, loam, sandy loam.	SM, ML	A-2, A-4, A-1	0-25	70-95	60-90	35-85	20-65	<20	NP-4
	20-65	Loamy sand, gravelly loamy fine sand, gravelly loamy coarse sand.	SM	A-1, A-2	0-25	65-85	50-75	30-65	12-30	<15	NP-2
400B---------- Brookfield	0-2	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-100	75-95	55-80	30-65	<25	NP-5
	2-31	Gravelly fine sandy loam, loam, sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	25-60	<25	NP-5
	31-65	Gravelly sandy loam, gravelly fine sandy loam, fine sandy loam.	SM, GM	A-2, A-4	0-15	65-100	60-95	40-70	25-45	---	NP
402B, 402C, 402D- Brookfield	0-2	Extremely stony fine sandy loam.	SM, ML, GM	A-2, A-4	15-30	65-100	60-95	40-80	25-65	<25	NP-5
	2-31	Gravelly fine sandy loam, loam, sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-100	60-95	40-80	25-60	<25	NP-5
	31-65	Gravelly sandy loam, gravelly fine sandy loam, fine sandy loam.	SM, GM	A-2, A-4	0-15	65-100	60-95	40-70	25-45	---	NP

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
405B, 405C------- Charlton	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-95	75-90	50-85	25-65	<25	NP-5
	8-34	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	65-90	60-90	40-80	20-65	<25	NP-3
	34-65	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM, GM	A-2, A-4	5-25	60-90	55-85	40-75	20-45	---	NP
407B, 407C, 407D- Charlton	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-25	75-95	70-90	60-85	30-70	<25	NP-5
	8-34	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	65-90	60-90	50-80	20-65	<25	NP-3
	34-65	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4	5-25	60-90	55-85	40-75	20-45	---	NP
420B, 420C, 420D- Canton	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	55-85	30-60	<18	NP-8
	3-20	Fine sandy loam, very fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-20	80-95	70-90	50-85	30-60	<12	NP-8
	20-65	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2	0-20	65-85	50-80	20-60	10-30	---	NP
422B, 422C, 422D- Canton	0-3	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	20-45	70-95	60-90	40-85	25-60	<18	NP-8
	3-20	Fine sandy loam, very fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-20	80-95	70-90	50-85	30-60	<18	NP-8
	20-65	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2	0-20	65-85	50-80	20-60	10-30	---	NP
600*------- Pits, gravel	0-6	Extremely gravelly coarse sand.	GP, GW	A-1	0-25	10-25	5-25	0-15	0-5	---	NP
	6-60	Extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand.	GP, GW, SP, SW	A-1	0-25	10-55	5-50	0-15	0-5	---	NP

See footnote at end of table.

TABLE 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
622*:											
Paxton----------	0-8	Fine sandy loam	SM, ML, GM	A-2, A-4	0-10	85-95	75-90	50-80	20-65	<40	NP-10
	8-24	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-90	45-80	25-65	<30	NP-7
	24-65	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-1, A-2, A-4	0-15	65-95	60-90	40-75	20-60	<30	NP-7
Urban land------	0-6	Variable---------	---	---	---	---	---	---	---	---	---
625*:											
Hinckley--------	0-6	Sandy loam-------	SM	A-2, A-4	0-5	85-95	75-90	45-75	25-50	<20	NP
	6-17	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GP-GM, SP-SM	A-1, A-2, A-3	0-20	50-95	30-85	15-70	2-30	<20	NP
	17-65	Stratified very gravelly loamy fine sand to cobbly coarse sand.	SP, SP-SM, GP, GP-GM	A-1	5-25	50-65	30-50	10-40	0-20	<10	NP
Urban land------	0-6	Variable---------	---	---	---	---	---	---	---	---	---
651----------	0-6	Variable---------	---	---	---	---	---	---	---	---	---
Udorthents	6-60	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" 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	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cc	In/hr	In/in	pH					Pct
2----------	0-10	2-6	1.10-1.35	0.6-6.0	0.11-0.21	4.5-6.5	Low----------	0.20	5	3	2-6
Pootatuck	10-25	1-6	1.20-1.45	0.6-6.0	0.09-0.18	4.5-6.5	Low----------	0.20			
	25-65	0-2	1.25-1.50	>6.0	0.01-0.10	4.5-6.5	Low----------	0.17			
3*:											
Scarboro---------	0-4	1-7	0.70-1.00	>6.0	0.10-0.23	4.5-6.0	Low----------	0.17	5	3	2-8
	4-10	1-5	1.15-1.35	>6.0	0.04-0.13	4.5-6.0	Low----------	0.17			
	10-16	0-2	1.35-1.55	>6.0	0.02-0.13	4.5-6.0	Low----------	0.10			
	16-65	0-2	1.35-1.55	>6.0	0.01-0.13	4.5-6.0	Low----------	0.10			
Walpole---------	0-1	2-6	1.00-1.25	2.0-6.0	0.10-0.18	4.5-6.0	Low----------	0.20	3	3	2-8
	1-18	2-6	1.30-1.55	2.0-6.0	0.07-0.15	4.5-6.0	Low----------	0.24			
	18-65	0-2	1.40-1.65	>6.0	0.01-0.10	4.5-6.0	Low----------	0.10			
4----------	0-17	2-6	1.10-1.35	0.6-6.0	0.11-0.21	4.5-6.5	Low----------	0.20	5	3	3-8
Rippowam	17-35	1-6	1.20-1.45	0.6-6.0	0.09-0.18	4.5-6.5	Low----------	0.20			
	35-65	0-2	1.25-1.50	>6.0	0.01-0.10	4.5-6.5	Low----------	0.17			
5----------	0-12	4-15	0.80-1.20	0.6-2.0	0.24-0.34	5.1-7.3	Low----------	0.49	5	3	10-20
Saco	12-20	2-15	1.20-1.50	0.6-2.0	0.16-0.26	5.1-7.3	Low----------	0.64			
	20-40	2-15	1.20-1.50	0.6-2.0	0.16-0.26	5.1-7.3	Low----------	0.64			
	40-65	1-8	1.30-1.60	>6.0	0.01-0.13	5.6-7.3	Low----------	0.10			
30----------	0-10	3-16	1.20-1.50	0.2-2.0	0.18-0.24	5.1-7.3	Low----------	0.49	3	5	3-10
Raynham	10-28	3-16	1.20-1.50	0.2-2.0	0.18-0.22	5.1-7.3	Low----------	0.64			
	28-65	3-16	1.20-1.60	0.06-0.2	0.17-0.21	5.1-7.3	Low----------	0.64			
51----------	0-3	---	0.10-0.30	0.6-6.0	0.35-0.45	3.6-4.4	Low----------	----	---	2	>50
Swansea	3-34	---	0.15-0.30	0.6-6.0	0.35-0.45	3.6-4.4	Low----------	----			
	34-65	1-5	1.15-1.40	>20	0.01-0.08	3.6-5.5	Low----------	0.10			
52----------	0-8	---	0.10-0.30	0.6-6.0	0.35-0.45	3.6-4.4	Low----------	----	---	2	>50
Freetown	8-65	---	0.15-0.30	0.6-6.0	0.35-0.45	3.6-4.4	Low----------	----			
53----------	0-65	---	0.10-0.30	0.6-6.0	0.35-0.45	3.6-4.4	Low----------	----	---	2	>50
Freetown											
70A, 70B---------	0-8	3-10	1.00-1.30	0.6-6.0	0.06-0.24	4.5-6.5	Low----------	0.24	3	3	4-7
Ridgebury	8-22	2-8	1.60-1.90	0.6-6.0	0.04-0.20	4.5-6.5	Low----------	0.32			
	22-65	2-8	1.80-2.00	<0.2	0.01-0.05	4.5-6.5	Low----------	0.24			
71A, 71B---------	0-8	3-10	1.00-1.30	0.6-6.0	0.06-0.21	4.5-6.5	Low----------	0.20	3	8	4-7
Ridgebury	8-22	2-8	1.60-1.90	0.6-6.0	0.04-0.20	4.5-6.5	Low----------	0.32			
	22-65	2-8	1.80-2.00	<0.2	0.01-0.05	4.5-6.5	Low----------	0.24			
72----------	0-5	5-8	1.10-1.30	0.6-6.0	0.13-0.23	4.5-6.5	Low----------	0.28	5	3	2-8
Whitman	5-11	2-4	1.60-1.80	0.6-6.0	0.10-0.17	4.5-6.5	Low----------	0.32			
	11-25	1-3	1.80-2.00	<0.2	0.03-0.04	4.5-6.5	Low----------	0.24			
	25-65	1-6	1.90-2.10	<0.2	0.02-0.03	4.5-6.5	Low----------	0.24			
73----------	0-5	5-8	1.10-1.30	0.6-6.0	0.12-0.24	4.5-6.5	Low----------	0.20	3	8	4-8
Whitman	5-11	2-4	1.60-1.85	0.6-6.0	0.10-0.17	4.5-6.5	Low----------	0.32			
	11-25	1-3	1.85-2.00	<0.2	0.03-0.04	4.5-6.5	Low----------	0.24			
	25-65	1-6	1.90-2.10	<0.2	0.02-0.03	4.5-6.5	Low----------	0.24			

See footnote at end of table.

TABLE 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH					Pct
100C*:											
Brookfield------	0-2	2-10	1.00-1.25	0.6-6.0	0.08-0.18	4.5-6.0	Low----------	0.20	3	8	2-6
	2-31	2-10	1.35-1.60	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.32			
	31-65	1-6	1.40-1.65	0.6-6.0	0.05-0.14	4.5-6.0	Low----------	0.24			
Brimfield-------	0-1	3-10	1.10-1.35	0.6-6.0	0.10-0.18	4.5-6.0	Low----------	0.17	1	8	2-6
	1-18	3-10	1.30-1.55	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.32			
	18-22	---	---	---	---	---	----------	----			
Rock outcrop.											
101D*:											
Brimfield-------	0-1	3-10	1.10-1.35	0.6-6.0	0.08-0.17	4.5-6.0	Low----------	0.17	1	8	2-6
	1-18	3-10	1.30-1.55	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.32			
	18-22	---	---	---	---	---	----------	----			
Brookfield------	0-2	2-10	1.00-1.25	0.6-6.0	0.08-0.18	4.5-6.0	Low----------	0.20	3	8	2-6
	2-31	2-10	1.35-1.60	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.32			
	31-65	1-6	1.40-1.65	0.6-6.0	0.05-0.14	4.5-6.0	Low----------	0.24			
Rock outcrop.											
102C*, 102D*:											
Chatfield-------	0-4	7-18	1.10-1.40	0.6-6.0	0.08-0.14	4.5-6.0	Low----------	0.20	3	8	2-10
	4-30	7-18	1.20-1.50	0.6-6.0	0.08-0.18	4.5-6.0	Low----------	0.20			
	30-34	---	---	---	---	---	----------	----			
Hollis----------	0-6	3-10	1.10-1.40	0.6-6.0	0.08-0.17	4.5-6.0	Low----------	0.20	1	8	2-6
	6-19	1-8	1.30-1.55	0.6-6.0	0.06-0.18	4.5-6.0	Low----------	0.32			
	19-23	---	---	---	---	---	----------	----			
Rock outcrop.											
253A, 253B, 253C,											
253D------------	0-6	4-8	0.90-1.10	6.0-20	0.11-0.18	3.6-6.0	Low----------	0.20	3	3	2-7
Hinckley	6-17	1-5	1.20-1.40	6.0-20	0.01-0.10	3.6-6.0	Low----------	0.17			
	17-65	0-3	1.30-1.50	>20	0.01-0.06	3.6-6.0	Low----------	0.10			
254A, 254B, 254C,											
254D------------	0-5	3-7	1.10-1.20	2.0-6.0	0.14-0.19	3.6-6.0	Low----------	0.24	3	3	1-5
Merrimac	5-17	1-4	1.20-1.40	2.0-6.0	0.14-0.17	3.6-6.0	Low----------	0.24			
	17-27	1-3	1.20-1.40	2.0-20.0	0.03-0.12	3.6-6.0	Low----------	0.17			
	27-65	0-3	1.30-1.50	6.0-20	0.01-0.06	3.6-6.0	Low----------	0.10			
255A, 255B, 255C,											
255D------------	0-3	1-3	1.00-1.20	>6.0	0.09-0.12	4.5-6.0	Low----------	0.17	5	2	2-4
Windsor	3-25	0-3	1.30-1.55	>6.0	0.07-0.10	4.5-6.0	Low----------	0.17			
	25-65	0-2	1.40-1.65	>6.0	0.04-0.10	4.5-6.5	Low----------	0.10			
260A, 260B-------	0-2	2-6	1.10-1.40	2.0-6.0	0.10-0.25	3.6-6.0	Low----------	0.24	3	3	2-6
Sudbury	2-8	2-7	1.15-1.45	2.0-6.0	0.07-0.18	3.6-6.0	Low----------	0.24			
	8-20	0-4	1.25-1.45	2.0-20	0.01-0.15	3.6-6.0	Low----------	0.17			
	20-65	0-3	1.30-1.45	6.0-20	0.01-0.06	3.6-6.0	Low----------	0.10			
300B, 300C, 300D-	0-5	6-18	1.30-1.60	0.6-6.0	0.10-0.16	3.6-6.0	Low----------	0.24	3	3	2-6
Montauk	5-27	1-18	1.70-1.90	0.06-0.6	0.02-0.08	3.6-6.0	Low----------	0.24			
	27-65	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cc	In/hr	In/in	pH					Pct
302B, 302C, 302D-	0-5	6-18	1.00-1.25	0.6-6.0	0.09-0.14	3.6-6.0	Low	0.24	3	8	3-6
Montauk	5-27	6-18	1.30-1.60	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.24			
	27-65	1-18	1.70-1.90	0.06-0.6	0.02-0.08	3.6-6.0	Low	0.24			
305B, 305C, 305D-	0-8	3-12	1.00-1.25	0.6-2.0	0.10-0.20	4.5-6.0	Low	0.24	3	3	2-5
Paxton	8-24	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.32			
	24-65	3-12	1.70-2.00	<0.2	0.05-0.10	4.5-6.0	Low	0.24			
307B, 307C, 307D-	0-8	3-12	1.00-1.25	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.20	3	8	2-8
Paxton	8-24	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.32			
	24-65	3-12	1.70-2.00	<0.2	0.05-0.10	4.5-6.0	Low	0.24			
310A, 310B-------	0-11	3-12	1.00-1.25	0.6-2.0	0.10-0.20	4.5-6.5	Low	0.24	3	3	2-6
Woodbridge	11-22	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.5	Low	0.32			
	22-65	3-12	1.70-2.00	<0.2	0.05-0.10	4.5-6.5	Low	0.24			
312B----------	0-11	3-12	1.00-1.25	0.6-2.0	0.08-0.18	4.5-6.5	Low	0.20	3	8	2-8
Woodbridge	11-22	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.5	Low	0.32			
	22-65	3-12	1.70-2.00	<0.2	0.05-0.10	4.5-6.5	Low	0.24			
315A, 315B-------	0-4	4-10	1.00-1.30	0.6-2.0	0.11-0.21	5.1-6.0	Low	0.24	3	3	2-6
Scituate	4-20	2-9	1.25-1.50	0.6-2.0	0.09-0.16	5.1-6.0	Low	0.24			
	20-65	2-9	1.75-2.00	0.06-0.2	0.01-0.07	5.1-6.0	Low	0.24			
317B----------	0-4	4-10	1.00-1.30	0.6-2.0	0.08-0.15	5.1-6.0	Low	0.17	3	8	2-8
Scituate	4-20	2-9	1.25-1.50	0.6-2.0	0.09-0.16	5.1-6.0	Low	0.24			
	20-65	2-5	1.75-2.00	0.06-0.2	0.01-0.07	5.1-6.0	Low	0.24			
400B----------	0-2	2-10	1.00-1.25	0.6-6.0	0.14-0.20	4.5-6.0	Low	0.24	3	3	2-5
Brookfield	2-31	2-10	1.35-1.60	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.32			
	31-65	1-6	1.40-1.65	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.24			
402B, 402C, 402D-	0-2	2-10	1.00-1.25	0.6-6.0	0.08-0.18	4.5-6.0	Low	0.20	3	8	2-8
Brookfield	2-31	2-10	1.35-1.60	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.32			
	31-65	1-6	1.40-1.65	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.24			
405B, 405C-------	0-8	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.24	3	3	2-5
Charlton	8-34	3-8	1.40-1.65	0.6-6.0	0.07-0.20	4.5-6.0	Low	0.24			
	34-65	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24			
407B, 407C, 407D-	0-8	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.20	3	8	2-8
Charlton	8-34	3-8	1.40-1.65	0.6-6.0	0.07-0.20	4.5-6.0	Low	0.24			
	34-65	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24			
420B, 420C, 420D-	0-3	1-8	0.90-1.20	2.0-6.0	0.11-0.19	3.6-6.0	Low	0.24	3	3	1-6
Canton	3-20	1-8	1.20-1.50	2.0-6.0	0.09-0.17	3.6-6.0	Low	0.28			
	20-65	0-5	1.30-1.50	6.0-20	0.04-0.08	3.6-6.0	Low	0.17			
422B, 422C, 422D-	0-3	1-8	0.90-1.20	2.0-6.0	0.13-0.17	3.6-6.0	Low	0.20	3	8	1-6
Canton	3-20	1-8	1.20-1.50	2.0-6.0	0.09-0.17	3.6-6.0	Low	0.28			
	20-65	0-5	1.30-1.60	6.0-20	0.04-0.08	3.6-6.0	Low	0.17			
600*----------	0-6	0-1	---	>6.0	0.01-0.02	---	Low	0.02	---	8	<.1
Pits, gravel	6-60	0-1	---	>6.0	0.01-0.02	---	Low	0.02			

See footnote at end of table.

TABLE 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH					Pct
622*:											
Paxton----------	0-8	3-12	1.00-1.25	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.24	3	3	2-5
	8-24	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.0	Low----------	0.32			
	24-65	3-12	1.70-2.00	<0.2	0.05-0.10	4.5-6.0	Low----------	0.24			
Urban land------	0-6	---	---	---	---	---	----------	----	---	---	---
625*:											
Hinckley--------	0-6	4-8	0.90-1.10	6.0-20	0.11-0.18	3.6-6.0	Low----------	0.20	3	3	2-7
	6-17	1-5	1.20-1.40	6.0-20	0.01-0.10	3.6-6.0	Low----------	0.17			
	17-65	0-3	1.30-1.50	>20	0.01-0.06	3.6-6.0	Low----------	0.10			
Urban land------	0-6	---	---	---	---	---	----------	----	---	---	---
651----------	0-6	---	---	0.06-20	---	---	----------	----	---	---	---
Udorthents	6-60	---	---	0.06-20	---	---	----------	----			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

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		Uncoated steel	Concrete
					Ft			In			
2---------- Pootatuck	B	Occasional	Brief-----	Nov-Apr	1.5-2.5	Apparent	Nov-Apr	>60	Moderate----	Moderate	Moderate.
3*:											
Scarboro---------	D	None--------	---	---	+1-1.0	Apparent	Jan-Dec	>60	High--------	High-----	High.
Walpole----------	C	None--------	---	---	0-1.0	Apparent	Nov-May	>60	High--------	Low------	Moderate.
4---------- Rippowam	C	Frequent----	Brief-----	Oct-May	0-1.5	Apparent	Sep-Jun	>60	High--------	High-----	High.
5---------- Saco	D	Frequent----	Brief-----	Oct-May	0-0.5	Apparent	Sep-Jun	>60	High--------	Low------	Moderate.
30---------- Raynham	C	None--------	---	---	0-2.0	Apparent	Nov-May	>60	High--------	High-----	Moderate.
51---------- Swansea	D	None--------	---	---	0-1.0	Apparent	Jan-Dec	>60	High--------	High-----	High.
52---------- Freetown	D	None--------	---	---	0-1.0	Apparent	Jan-Dec	>60	High--------	High-----	High.
53---------- Freetown	D	None--------	---	---	+3-0	Apparent	Jan-Dec	>60	High--------	High-----	High.
70A, 70B, 71A, 71B---------- Ridgebury	C	None--------	---	---	0-0.5	Perched	Nov-May	>60	High--------	High-----	High.
72, 73---------- Whitman	D	None--------	---	---	+1-0.5	Perched	Sep-Jun	>60	High--------	High-----	High.
100C*:											
Brookfield-------	B	None--------	---	---	>6.0	---	---	>60	Moderate----	Low------	High.
Brimfield--------	C/D	None--------	---	---	>6.0	---	---	10-20	Moderate----	Low------	High.
Rock outcrop.											
101D*:											
Brimfield--------	C/D	None--------	---	---	>6.0	---	---	10-20	Moderate----	Low------	High.
Brookfield-------	B	None--------	---	---	>6.0	---	---	>60	Moderate----	Low------	High.
Rock outcrop.											

See footnote at end of table.

TABLE 17.--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		Uncoated steel	Concrete
					Ft			In			
102C*, 102D*:											
Chatfield	B	None	---	---	>6.0	---	---	20-40	Moderate	Low	Moderate.
Hollis	C/D	None	---	---	>6.0	---	---	10-20	Moderate	Low	High.
Rock outcrop.											
253A, 253B, 253C, 253D---- Hinckley	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
254A, 254B, 254C, 254D---- Merrimac	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
255A, 255B, 255C, 255D---- Windsor	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
260A, 260B---- Sudbury	B	None	---	---	1.5-3.0	Apparent	Dec-Apr	>60	Moderate	Low	High.
300B, 300C, 300D, 302B, 302C, 302D- Montauk	C	None	---	---	2.0-2.5	Perched	Feb-May	>60	Moderate	Low	High.
305B, 305C, 305D, 307B, 307C, 307D- Paxton	C	None	---	---	1.5-2.5	Perched	Feb-Apr	>60	Moderate	Low	Moderate.
310A, 310B, 312B-- Woodbridge	C	None	---	---	1.5-2.5	Perched	Nov-May	>60	High	Low	Moderate.
315A, 315B, 317B-- Scituate	C	None	---	---	1.5-3.0	Perched	Nov-May	>60	Moderate	Low	High.
400B, 402B, 402C, 402D---- Brookfield	B	None	---	---	>6.0	---	---	>60	Moderate	Low	High.
405B, 405C, 407B, 407C, 407D------- Charlton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
420B, 420C, 420D, 422B, 422C, 422D- Canton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
600*---------- Pits, gravel	A	None	---	---	>6.0	---	---	>60	---	---	---

See footnote at end of table.

TABLE 17.--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		Uncoated steel	Concrete
					Ft			In			
622*:											
Paxton	C	None	---	---	1.5-2.5	Perched	Feb-Apr	>60	Moderate	Low	Moderate.
Urban land	-	None	---	---	>2.0	---	---	>10	---	---	---
625*:											
Hinckley	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
Urban land	-	None	---	---	>2.0	---	---	>10	---	---	---
651 Udorthents	B	None	---	---	>6.0	---	---	>60	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--Classification of the Soils

Soil name	Family or higher taxonomic class
Brimfield	Loamy, mixed, mesic Lithic Dystrochrepts
Brookfield	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Canton	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Chatfield	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Freetown	Dysic, mesic Typic Medisaprists
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hollis	Loamy, mixed, mesic Lithic Dystrochrepts
Merrimac	Sandy, mixed, mesic Typic Dystrochrepts
Montauk	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Paxton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Pootatuck	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Ridgebury	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Rippowam	Coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Saco	Coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts
Scarboro	Sandy, mixed, mesic Histic Humaquepts
Scituate	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Sudbury	Sandy, mixed, mesic Aquic Dystrochrepts
Swansea	Sandy or sandy-skeletal, mixed, dysic, mesic Terric Medisaprists
Udorthents	Udorthents
Walpole	Sandy, mixed, mesic Aeric Haplaquepts
Whitman	Coarse-loamy, mixed, nonacid, mesic Typic Humaquepts
Windsor	Mixed, mesic Typic Udipsamments
Woodbridge	Coarse-loamy, mixed, mesic Aquic Dystrochrepts

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