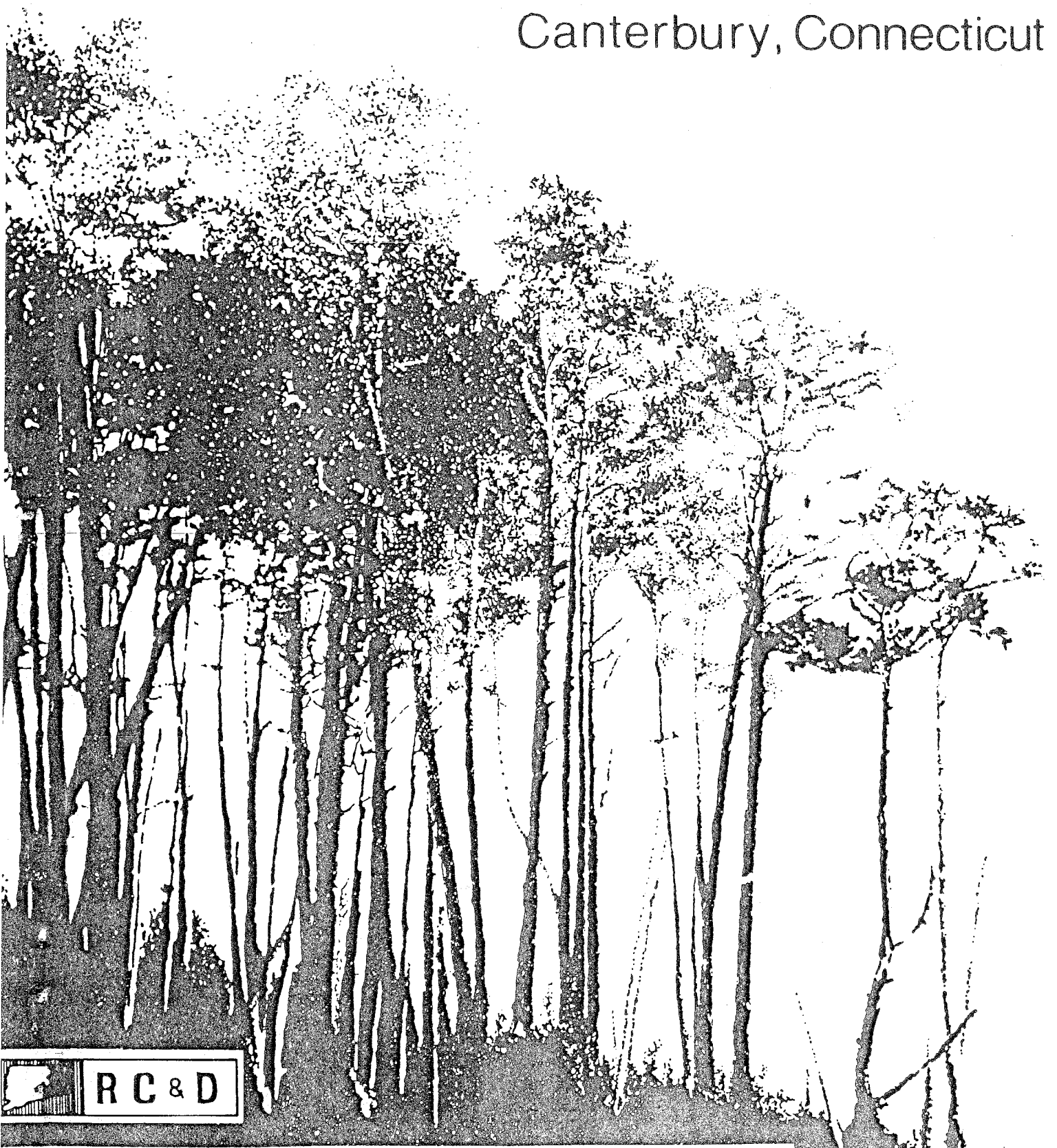


Environmental Review Team Report

Cadoret Subdivision

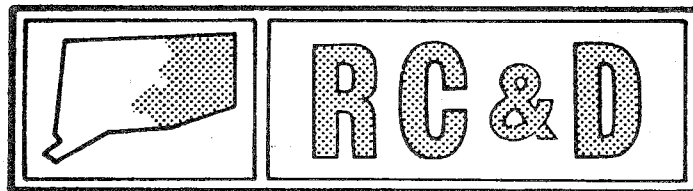
Canterbury, Connecticut



Environmental Review Team
Report

Cadoret Subdivision
Canterbury, Connecticut

April 1984

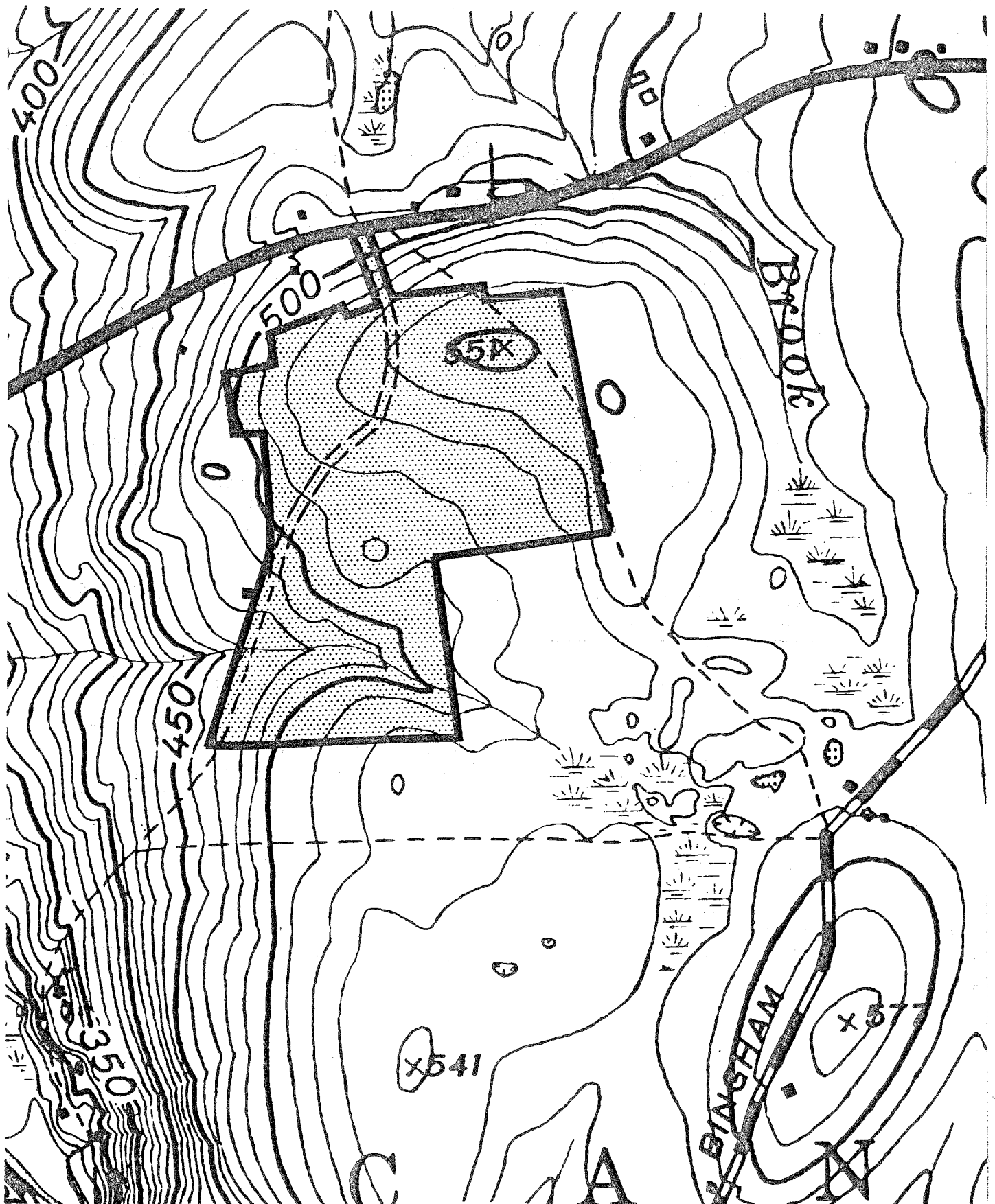


Eastern Connecticut Resource Conservation & Development Area
Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Topography

— Site Boundary

0 660'
scale



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment of a proposed subdivision in the Town of Canterbury. The site is approximately 60 acres in size and is located off of Route 14. Goodwin Road #2, an unimproved town road, runs south through the site. Preliminary development plans have been prepared by Fransen Associates.

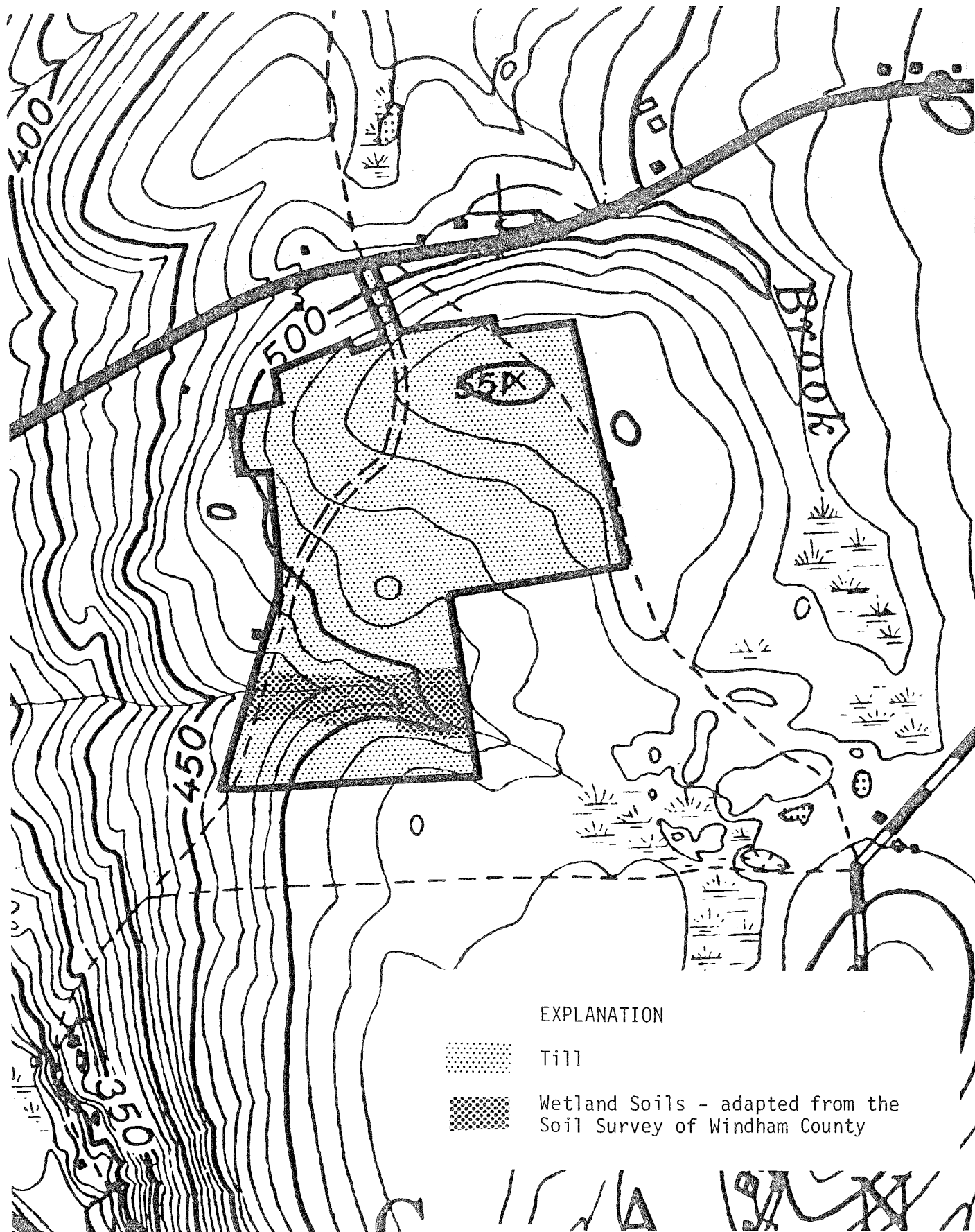
Preliminary plans show 30 lots of approximately 60,000 square feet each. A five to six acre open space area is shown in the southern section of the site, where wetland soils cross the property. All lots will be served by onsite septic systems and onsite wells. Goodwin Road #2 will be the primary access to interior lots. An additional road extending east from Goodwin Road #2 to the property boundary has also been proposed. Development of the site has been divided into phases, ten lots in Phase I, seven lots in Phase II, and 13 lots in Phase III.

The site itself has a moderately sloping terrain and is lightly forested at present. Soils on the site are predominantly moderately well drained, however some wetland soils are found in the southeastern portion of the property.

The Team is concerned with the effect of this proposal on the natural resource base of the site. Although many severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. Team members have discussed site limitations and mitigating measures in detail in the following sections of this report.

Surficial Geology

0 660
scale



ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The proposed 30-lot subdivision is located on the south side of Route 14 approximately one mile west of Westminster in Canterbury. Goodwin Road #2 traverses the site in a southerly direction. From Route 14, the property rises moderately to the northcentral parts of the site. Land surface in the southern portion slopes gently to an unnamed tributary of Little River. Topographic conditions on the parcel should not pose any major problems with regard to the proposed development. High and low points on the site range from +460 feet to 551 feet above mean sea level.

GEOLOGY

The site is located entirely within the Scotland topographic quadrangle. The United States Geological Survey (USGS) has published a combined bedrock and surficial geologic map (Map GR-392) by H. Roberta Dixon and Charles E. Shaw, Jr. for the Scotland quadrangle.

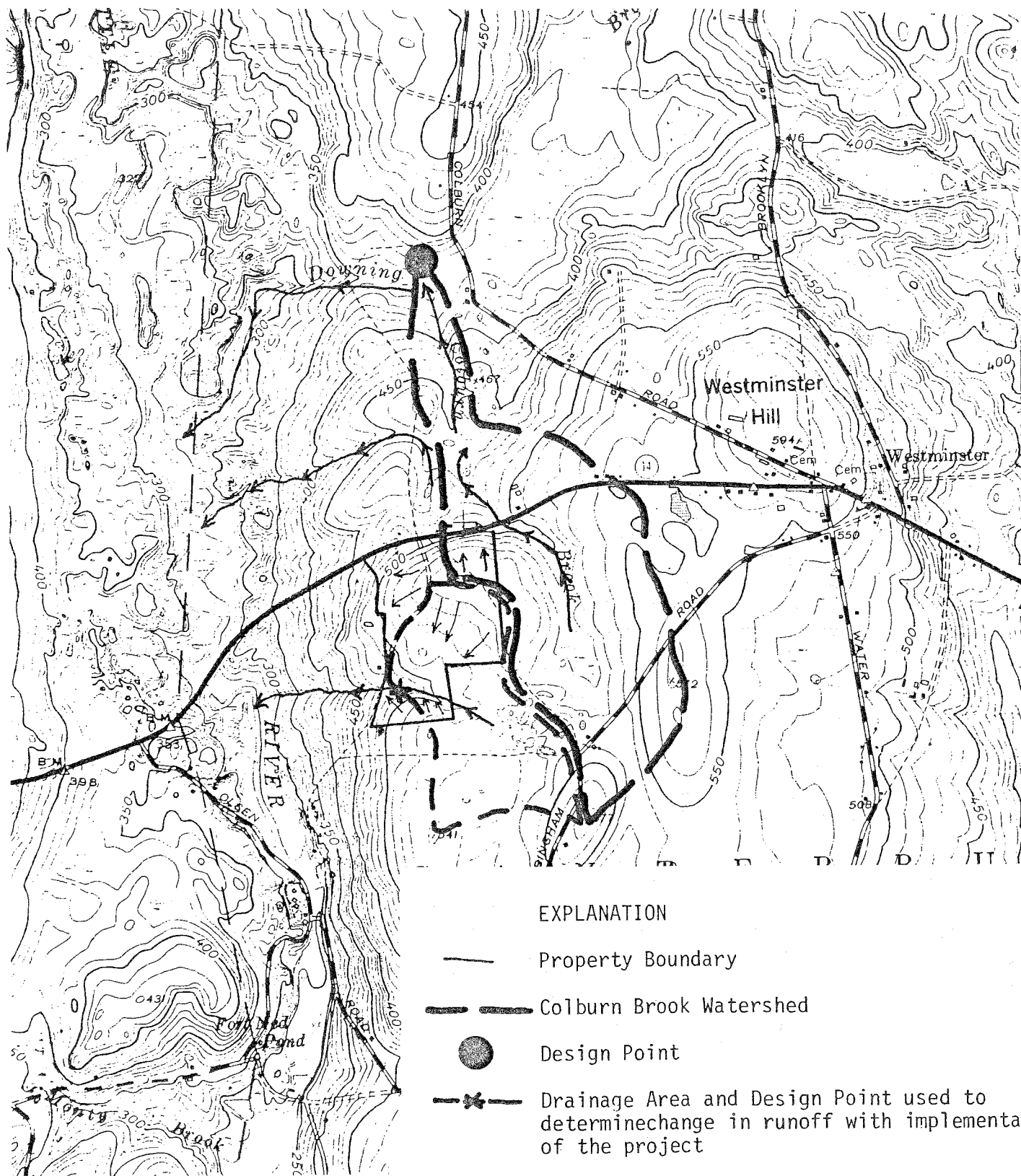
No bedrock outcrops were visible on the parcel during the site investigation. Numerous scattered surface boulders were observed in the central parts of the property. As shown by Map GQ-392, bedrock underlying the site has been classified as Canterbury Gneiss. This rock unit consists largely of a gray medium to coarse grained gneiss composed of the minerals potassium feldspar, albite, quartz, biotite and muscovite micas. The term "gneiss" refers to a crystalline, metamorphic rock (rocks altered by great heat and pressure deep within the earth's crust), in which very thin bands of elongate minerals (micas) alternate with bands of minerals (quartz and feldspar) having a rounder or blockier shape. The rock unit is exposed in outcrops on the east side of Brooklyn Road about one half mile to three quarters of a mile northeast of Westminster Hill and 2,000 feet west of the site. In terms of the proposed development, underlying bedrock should pose no major problem. However, since the underlying bedrock appears to be the only water supply source to serve homes in the proposed development, it will have an effect on the quality and quantity of water withdrawn from its fractures. This will be discussed further in the **Water Supply** section of this report.

Overlying bedrock throughout the site are sediments called "glacial till." Till consists of a nonsorted, nonstratified mixture of clay, silt, sand, gravel and boulders. These sediments were deposited directly from glacier ice which formerly covered Connecticut some 10,000 to 13,000 years ago. The texture of till is commonly sandy very stoney and loose in areas where the till is less than five feet thick. However, where the till is thicker than five feet, the upper 2-3 feet is commonly sandy and friable (easily crumbled) as mentioned above, but becomes siltier, less stoney and more compact at depth. Based on the logs of soil information from 23 backhoe excavations supplied by the project engineer, compact layers in the till soils varied from 22 inches to 51 inches throughout the sites.







From a geologic perspective, it appears that the till soil found on this site may be a limitation to development in some areas (i.e., stoniness, compact layers); however, they should not pose any major problems. As mentioned earlier, compact layers may be encountered at depth in the till. Compact layers will restrict the

Drainage Areas

0 2000'
Scale



EXPLANATION

-  Property Boundary
-  Colburn Brook Watershed
-  Design Point
-  Drainage Area and Design Point used to determine change in runoff with implementation of the project
-  Watercourses showing direction of flow
-  Direction of surface runoff

downward movement of groundwater which results in an elevated groundwater table. This potential condition (high ground water table) will weigh heaviest on the ability to provide adequate subsurface sewage disposal. Properly engineered septic systems may therefore be required on some lots to overcome the problems associated with till based soils. Since sewage system failures are common in till soils, with compact layers, it is recommended that the soils on each lot be carefully evaluated with regard to onsite sewage disposal. Soil testing conducted by the local health department should include at least two deep test pits and a percolation test. The percolation tests should be made entirely within the compact layer.

Overlying till soils in the southern part of the site is a band of wetland soils which lie principally along the unnamed stream traversing the site. These soils which are commonly very stoney, are delineated by the symbol Rn (Ridgebury, Leicester and Whitman) soils on the accompanying soils map. Because of a high ground water table that prevails in these soils through most of the year, any development in these areas should be discouraged.

HYDROLOGY

The site is located within the Little River watershed, which is located about 2,000 feet west of the site. Approximately 40 acres in the central and southern portions of the site are drained by sheet flow to the unnamed perennial stream traversing the southern parts of the site. Surface runoff in the northern limits of the site flows generally northward by sheet flow towards Route 14. Once surface runoff reaches Route 14 along the northern property line, the road drainage channel (on the south side of Route 14) intercepts and directs the runoff either eastward to Colburn Brook or westward to the culvert which passes under Route 14 west of the entrance to Goodwin Road #2. From the outlet of the culvert, drainage flows northward overland into a wetland north of the site from which an unnamed tributary of Little River originates. Colburn Brook, which is east of the site, flows generally northward and merges with Downing Brook, a tributary of Little River.

Development of the site will cause at least some increases in the volume of runoff from the site. These increases would be caused mostly by the removal of vegetation, compaction of soil, and creation of impervious surfaces, such as roofs and parking areas.

The site plans distributed to Team members the day of the field review was not, by itself, sufficient to allow the determination of the effects from storm sewerage. Nevertheless, an estimate can be made of the runoff changes likely to occur as a result of this land use modification proposed for the site. A simplification of Technical Release No. 55 of the Soil Conservation Service provides a technique which may be used in formulating runoff estimates. This method involves the determination of runoff curve numbers, which relate the amount of precipitation to amounts of runoff. Because nearly 75 percent of the proposed homes (22) to be constructed lie within the watershed, which drains the central and southern portions of the property, the following runoff estimates shown in the following table refer only to this portion of the site. It was assumed that stormwater drainage in this area would be artificially collected in a stormwater system along the access roads and outletted at a point east of the temporary cul-de-sac. The construction of residential homes on Lots 1 and 24-30 should have little or no effect on runoff increase in their respective drainage areas. However, the applicant's project engineer should check the adequacy of the culvert passing under Route 14 (west of

TABLE 1: Estimated pre- and post-runoff changes likely to occur for the proposed development in the central and southern portions of the property which includes lots 2-23.

	10-year Storm	25-year Storm	50-year Storm	100-year storm
Pre-development runoff depths (in inches)	1.32"	1.74"	2.23"	2.72"
Post-development runoff depths (in inches)	1.38"	1.83"	2.32"	2.83"
Percent Increase	5%	5%	4%	4%

Goodwin Road #2) during storm events of various magnitudes (i.e., 25-year storm, 50-year storm, etc.) to ascertain the potential for handling future runoff increases.

The results of the runoff calculations performed by the Team's geohydrologist for the designated area are shown in the accompanying table. It should be noted that these runoff amounts are only estimates and should not be used as exact data for any engineering purposes.

As indicated by the accompanying table, it is estimated that the proposed development in the central and southern portion which includes Lots 2-23 would increase the curve number of the site by 1 (62 to 63). Under these conditions, runoff depth for a 25-year storm event would increase from 1.74 inches to 1.83 inches; an increase of about 5 percent. While the impact of the proposed development in the area mentioned above may be small, the cumulative impact of unregulated runoff from future development in the drainage area may be severe.

Because much of the runoff from the site takes the form of sheet flow and because slopes are moderate in some areas, the potential for erosion should be of concern. For this reason, it is recommended that a comprehensive erosion/sediment control plan be developed covering each phase of the proposed development.

Erosion and sediment control measures should be shown on the subdivision site plan. Considerations should be given for the installation of a temporary sediment pool during the construction phases. The pond could be located east of the temporary cul-de-sac on Goodwin Road #2. If the sediment pool is constructed, it should be located on upland type soils rather than wetland soils, i.e., Rn (Ridgebury, Leicester, Whitman soils). This will minimize wetland disturbance.

SOILS

The soils on the totally wooded site are shown on the Soils Map in the appendix to this report. Accompanying the map are soil map unit (CcB) definitions and descriptions, as well as a chart showing principal limitations and ratings of soils for residential development. The wetland soil Rn has severe limitations to development, but no building is proposed in this area. This area of wetland near the brook has been flagged in the field. The Woodbridge soil (WzC) may require that septic systems be specially designed if located on this hardpan soil. Curtain/footing drains around foundations are recommended on this soil and wherever a foundation excavation reveals hardpan and/or soil mottling (brown and gray colors). The other soils present CcB, CdC are well drained. There are numerous surface stones to be removed for lawn areas.

A major concern in development of this property, is the proposed road and storm drainage, both for phase I presently, and later for phase II. In phase I approximately 700 feet of new road will storm-drain to the existing 18 inch diameter RCP under Route 14. Presently the flow through this culvert is slow over woodland. Runoff disperses easily on neighboring property north of Route 14. A new paved road and storm drains will increase runoff and direct it to the 18 inch culvert more quickly. It will be necessary to redirect the outflow north of Route 14 by means of piping or constructing a stable channel steering flow away from the neighbor. This would probably need to be done on state property--within road width limits. Constructing a small storm water retention basin--also to collect sediment during

road construction--is suggested as an alternative to piping directly to the existing 18 inch Route 14 culvert. It could be located before the inlet to the 18 inch culvert. It could serve as a sediment trap for soil erosion, some of which is inevitable as the new road is constructed, and to slow runoff.

As the new catch basins are installed, until the road is oiled and carbed, it is suggested that hay bales be staked immediately above catch basins to prevent earth from washing into the basins and potentially clogging them.

In phase I, the road will slope over the hill to a temporary cul-de-sac, for a 500 foot distance. It would be appropriate to disperse the storm drainage gently by means of a small rip rapped basin. Spreading the water out will help prevent a gully.

In phase II, Goodwin Road will be extended down to the wetlands. It would be best to locate the cul-de-sac where the slope first levels off--before entering the wetlands as is shown on the present plans. The topography is ideal to then outlet storm drainage into a rip rapped sediment retention basin. Sediment from construction of the road could be collected here. Storm drainage could then overflow out of the basin and filter through wetlands to the brook. This should prevent harm to the brook which is a tributary to the Little River. Again, as in phase I now being proposed, hay bales could be staked immediately above new catch basins installed.

Development of phase III is seen as no resource problem since the land slopes so slightly. Storm drainage here would tie into Goodwin Road drainage already installed.

It is anticipated that ground disturbance on each lot would be at a minimum. Lawns should be seeded down before September 15, and mulched with straw on slopes. A minimum of grading should be needed because of gentle slopes.

The preceeding comments stress erosion and sediment control. Plans, designs, and proper application of control measures are very important if problems with drainage and soil wash are to be prevented. The Windham County Soil and Water Conservation District will review future plans when requested.

VEGETATION

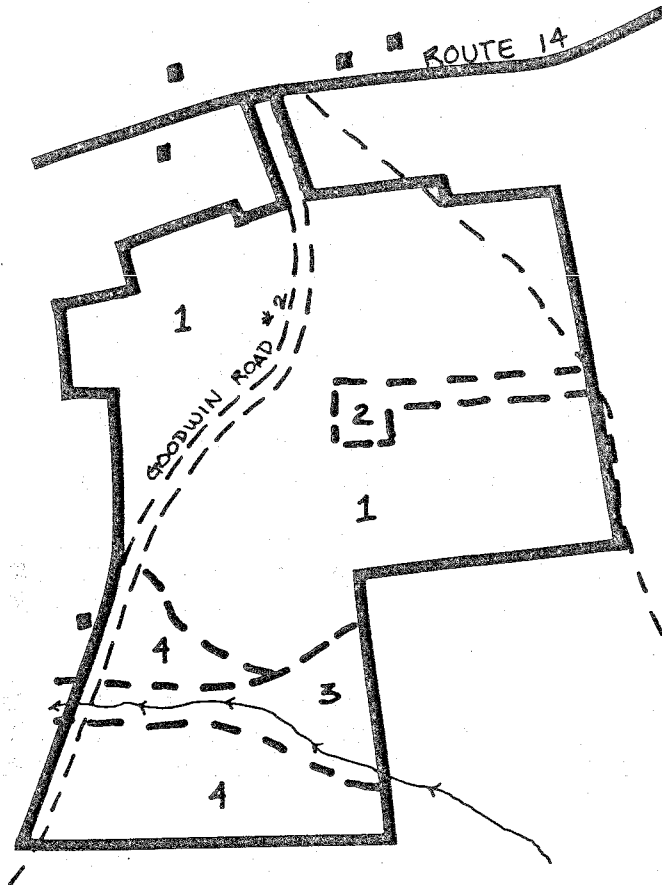
The tract proposed for subdivision may be divided into two major vegetation types. Included are mixed hardwoods which total 79± acres and a hardwood swamp/streambelt of 6± acres.

Vegetation Type Discriptions

Type 1 (Mixed Hardwoods). Poor quality pole-size black oak, scarlet oak, white oak, and red maple are present in the overstory of this fully stocked stand. Much of the 61± acre stand was heavily burned, as evidenced by fire scars on the boles of the trees. Hardwood tree seedlings, huckleberry and highbush blueberry form the understory. Ground cover consists of lowbush blueberry, mosses and various grasses.

Vegetation

0 660
scale



EXPLANATION

Property Boundary

— Woods Road

— Vegetation Type Boundary

~ Stream

VEGETATION TYPE DESCRIPTIONS*

TYPE 1: Mixed Hardwoods, 61 acres, fully stocked pole size.

TYPE 2: Mixed Hardwoods, 3 acres, fully stocked, pole size (underplanted with white pine and hemlock).

TYPE 3: Hardwood Swamp/Streambelt, 6 acres, overstocked, pole to sawtimber size.

TYPE 4: Mixed Hardwoods, 15 acres, fully stocked, pole to sawtimber size.

* Seedling Size: Trees less than 1" diameter at 4½ feet above the ground (DBH).
Sapling Size: Trees 1" to 5" DBH.
Pole Size: Trees 5" to 11" DBH.
Sawtimber Size: Trees 11" DBH and greater.

Type 2 (Mixed Hardwoods). This 3+ acre stand is essentially the same as Vegetation Type 1 except the understory is comprised of planted white pine and eastern hemlock saplings.

Type 3 (Hardwood swamp/streambelt). Pole to sawtimber-size sugar and red maple, white ash, yellow birch and American elm occur in the 6+ acre overstocked stand. An understory of hardwood tree seedlings and saplings, spicebush and swamp azalea is present. Ground cover consists of mosses, ferns and skunk cabbage.

Type 4 (Mixed Hardwoods). This 15+ acre well-stocked stand is composed of medium quality black, scarlet and white oak, and red maple poles to small sawtimber size. The understory contains hardwood tree seedlings, huckleberry and highbush blueberry. Various grasses form the ground cover.

Trees are very sensitive to the condition of the soil within the entire area under their crowns. Development practices near trees, such as excavating, filling and grading for construction of roadways and buildings may disturb the balance between soil aeration, soil moisture level and soil composition. These disturbances may cause a decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may cause the same results. Dead trees reduce the aesthetic quality of an area and may become hazardous and expensive to remove if near roadways, buildings or utility lines.

Care should be taken during the construction period not to disturb the trees that are to be retained. In general, healthy and vigorous trees should be retained as they are more resistant to the environmental stresses brought about by construction.

Where feasible, trees should be saved in small groups or "islands." This practice lowers the possibility of soil disturbance and mechanical injury. Individual trees and "islands" of trees should be temporarily, but clearly, marked so that they may be avoided during construction.

The poorly drained soils present within Vegetation Type 3 (Hardwood swamp/streambelt) limit the vegetative growth to species that are able to tolerate high moisture conditions. The sugar maple, white birch and yellow birch are able to tolerate the present site conditions, however, any adverse change in the drainage condition could change the species composition of the area.

The loss of trees due to windthrow is a potential hazard in Type 3. The soil is saturated with water for the greater part of the year causing soil aeration to be poor. These conditions result in unstable, shallow root systems which are unable to securely anchor the trees. The potential for windthrow is intensified by the crowded condition in the hardwood swamp. It should be noted that any clearings made in and around this area will increase the windthrow hazard by allowing the wind to pass through rather than over this area. If possible, any clearing of vegetation in this type should be kept to a minimum.

Management Considerations

The trees which are present in Vegetation Types 1 and 2 are declining in health and vigor as a result of past fires, gypsy moth infestations and droughty site conditions. Long term management of these Vegetation Types should be aimed at conversion to softwoods. Softwoods are preferred on dry sites because, unlike

hardwoods, their growth is completed before the occurrence of a late summer drought. In Type 1, 1/3 of the total fuelwood volume may be removed, prior to underplanting softwoods. Either white pine or hemlock will do well on these sites as evidenced by the growth of those present in Type 2. The softwoods should be planted on a 15'x15' spacing, however, if any openings are created, the softwoods may be planted 8'x8'.

Ten years after the first cut, another third of the fuelwood volume should be removed. Removal of the overstory should be completed 20 years after the first cutting.

One half of the total fuelwood volume in Type 2 should be removed to release the pines and hemlocks to allow increased growth. The remainder of the overstory should be removed ten years after the first cut.

Vegetation Type 3 could be lightly thinned by removing 1/4 of the total fuelwood volume. The sugar maple, white ash and yellow birch should be favored for the residual stand. Care should be taken not to create any large openings in the crown canopy.

To avoid irreversible soil damage, thinning operations in the hardwood swamp/streambelt should be implemented during the winter months when the ground is frozen or the summer months when the ground is dry.

Vegetation Type 4 should be left as is and reevaluated in ten years.

A public service forester or private consulting forester should be contacted to help select trees to be removed in the thinnings and to offer specific planting advice. Revenue from the thinnings will more than cover consultant costs.

WILDLIFE

Mixed hardwood forest, consisting of red oak, white oak, white ash, birch, beech, hickory, and maple make up the majority of this 60 acre tract. A brook runs through the southern portion of the property; there is additional wetlands beyond the southeast boundary. Thick understory in many areas will provide both food and cover to a variety of wildlife species. The entire tract provides good wildlife habitat.

Construction of a housing development will eliminate the majority of the wildlife habitat and displace many wildlife forms. The southern section of the tract should be left undeveloped to provide a buffer zone between the houses and the wetlands. Landscaping the developed sections may attract some tolerant wildlife species and will be aesthetically pleasing to residents. Trees of all age classes should be left wherever possible. It is important to leave mature trees, such as oak, as they produce mast (acorns, nuts), which are valuable wildlife foods. Planting evergreens, such as cedar and hemlock, will also benefit wildlife. Evergreens scattered around the development, grown in clumps, provide cover to many forms of wildlife. Shrubs, planted throughout the development, will also provide wildlife food and cover. Shrubs that are fruit producers such as dogwood, winterberry, elderberry, and autumn olive are most desirable. Snag and/or den trees should be left where possible. A snag tree is a standing dead or nearly dead tree.

A den tree is one that has its trunk and limbs hollowed out (this includes some snags). Snag and den trees are valuable to many wildlife species who use them for living quarters and temporary shelter.

WATER SUPPLY

Since there is no municipal water supply line available near the proposed development, each lot in the subdivision would need to be serviced by individual onsite wells. As previously mentioned, the underlying bedrock appears to be the only aquifer on the site that has practical water supply potential.

Water is supplied to bedrock-based wells chiefly through the fracture system in the rocks. Due to the uneven distribution of the fractures, which generally occur within the first 100 to 150 feet of the ground surface, it is very difficult to predict the potential yield from any new well. A yield of at least three gallons per minute is described and is adequate for most domestic needs. A survey of a residential well east of the site (on Route 14) showed a yield of 3 1/2 gallons per minute. In a survey of wells in the Shetucket River Basin, however, it was found that 90 percent of bedrock-based wells tapping a rock type similar to that underlying the proposed subdivision site, provided at least 3 gallons per minute (source: Connecticut Water Resources Bulletin No. 11). In addition, the Bulletin states that few wells yielded 50 gallons per minute and that only in a few instances did wells have insignificant yields or were dry holes.

As there is always a chance of potential supply problems, it may be advisable to drill the well prior to house construction. When several wells are drilled in an area, it is prudent to separate them by at least 300 feet to minimize the potential for mutual interference.

Bulletin No. 11 suggests that moderate concentration of iron and/or manganese may taint the local well water and therefore may require appropriate filtration measures. Once the new wells are drilled, water samples should be collected and analyzed for bacteriological, chemical, and/or physical quality.

WASTE DISPOSAL

The development is to be served by onsite sewage disposal systems. Based on visual observations, soil mapping data and review of the engineer's soil test results (phase I), it is generally concluded the parcel is favorably suited for subsurface sewage disposal. Most of the soils are indicated to be of the Canton and Charlton type which are stony but well drained sandy loam. It is noted, however, in the test pit data for the first phase of development the underlying soil has a firm sandy layer with mottling indicated at a depth of between 2 and 3 feet (most holes). In two of the holes (3C and 4A) water was at 39 inches. Assuming these holes were made and recorded during the wet season of the year (around the time of review), mottling without the actual presence of water may not be too significant. Percolation test results within this underlying firmer soil material was not available. The soils in the more southerly area of the property have more severe limitations due to a seasonal perched water condition and poorly or slowly drained underlying soil layer (hardpan). This type of soil would require special engineered design systems. Because of the slope, wetlands and stream along the lower side of one of the future lots (#23), it would seem more feasible to provide better

protection of the wetlands and watercourse by relocating the temporary cul-de-sac more northerly (area of the abandoned house) and incorporating this lot into the indicated open space area. Test pits in this general area should indicate the major constraints for onsite sewage disposal and development purposes.

PLANNING CONCERNS

The proposed subdivision as submitted, appears to be in conformity with applicable planning and zoning requirements. Canterbury's soil-based zoning requires lot sizes of 60,000 square feet within well drained and moderately well drained soil types (as defined in Canterbury's zoning regulations). All of the proposed lots, as indicated on the subdivision plans, contain at least 60,000 square feet and are within well drained or moderately well drained soil categories and, therefore, are compatible with the 60,000 square feet zoning requirement.

The Town's requirement that at least 5 percent of the total acreage of a planned subdivision be committed as open space also is more than adequately satisfied if the subdivision is developed as planned.

The subdivision also generally conforms to the land use section of the Town Plan of Development. The area is designated in the Plan as an open space areas. However, the Plan notes that residences at a density of one per 60,000 square feet are acceptable on lands designated as open space.

The adequacy of water supply for the planned homes appears somewhat questionable. The general area contains several wells that either have gone dry, have not produced water at all, or have produced very low flows. It might be in the best interests of future property owners for adequacy of water supplies to be well established before homes are built.

TRAFFIC CONCERNS

State Route 14, which will bear the additional traffic from the new subdivision, is well able to support the volume of vehicles from the planned subdivision. The section of Route 14 between the junctions of Route 97 and Barstow Road has a design capacity of 17,500 vehicles per day and is currently carrying only 2100 vehicles per day. However, the Connecticut Department of Transportation has rated certain characteristics of Route 14 in that vicinity as relatively poor, including road width and sight distances. The width of the road is less than the evaluation standard of 40 feet for rural roads. The section of road also has restricted sight distances, and one such restricted sight distance is located immediately to the west of Goodwin Road #2. This restricted sight distance may result in somewhat hazardous conditions for vehicles entering or exiting the subdivision.

ENGINEERING CONCERNS

The following points regarding the upgrading of Goodwin Road #2 should be considered:

The vertical curve with PVI at sta. 7+00 has a grade difference of 7% (5%-(-2%)). From the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Rural Highways the minimum length of vertical curve for a 7% grade difference and a design speed of 30 MPH is 200 feet. The plan of the proposed road shows a vertical curve of 150 feet.

Catch basin No. 1 on the easterly side of Goodwin Road #2 and adjacent to State Route 14 is shown with a rim elevation approximately equal to the centerline grade of Route 14. This rim should be lowered to an elevation slightly below the edge of pavement of Route 14 in order to collect the maximum amount of water shed from the state road and prevent flow across the end of Goodwin Road #2.

The existing cross culvert in Route 14 to which the street drainage from the northerly portion of the project is to be directed is severely plugged with sediment and does not have a well defined drainage channel leading away from its outlet. Arrangements must be made with the state to clean this culvert and channel water to an appropriate discharge point before any additional flow is added.

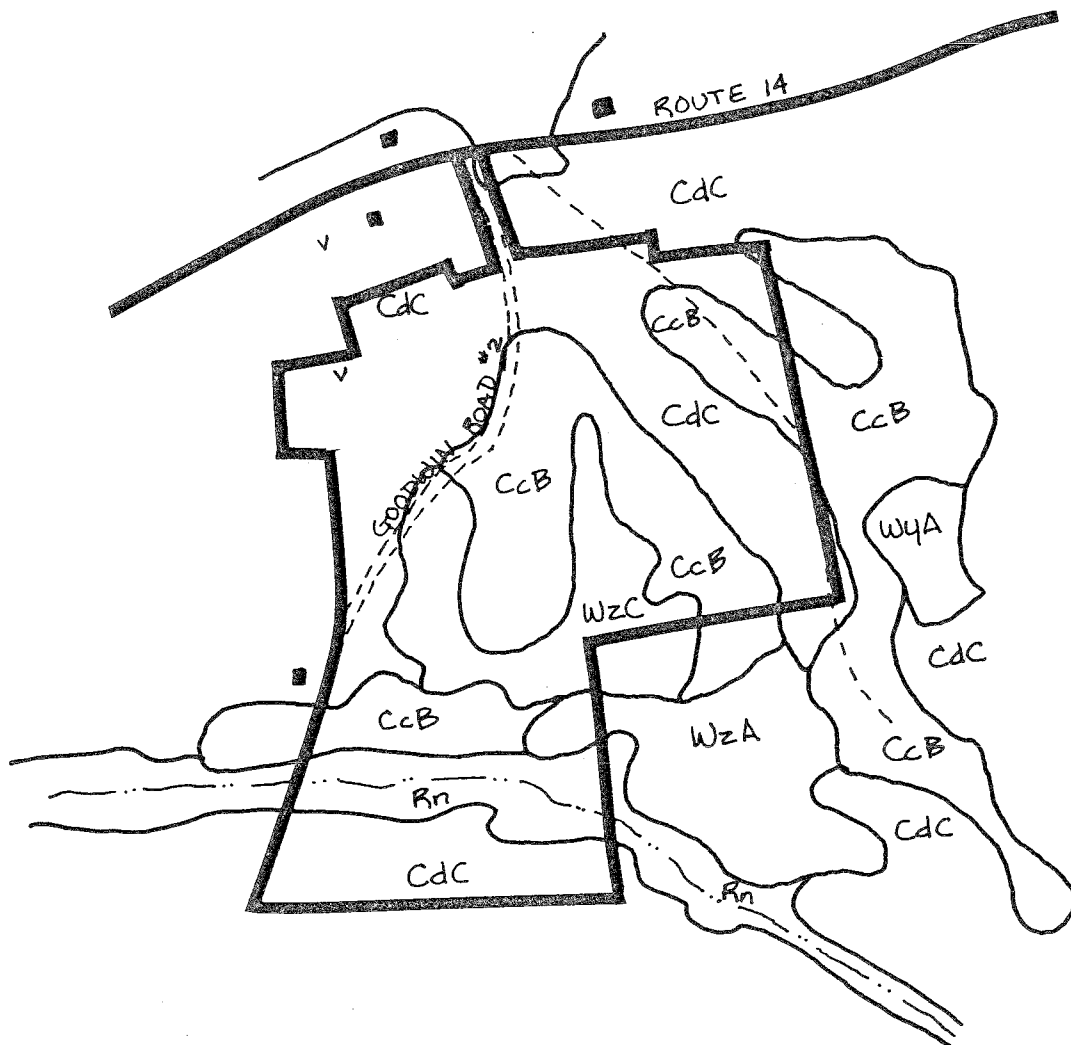
Consideration should be given to make catch basin No. 9 at sta. 12+30 a type C-L and locate it in such a way as to make it possible to change the top to a type C and have it become part of the continuation of the Goodwin Road #2 improvement when the next phase is undertaken.

If the portion of Goodwin Road #2 which is not to be improved under this phase is to remain passable, then suitable provision should be made at the cul-de-sac to allow traffic to continue onto the unimproved section.

Appendix

Soils

0 660'
scale



Soil boundary lines are approximate, adapted from Soil Survey of Windham County, Connecticut; December 1981, USDA, SCS.

WESTMINISTER HILLS ESTATES #2
SUBDIVISION
ROUTE 14, GOODWIN ROAD
CANTERBURY, CT.

Principal Limitations and Ratings of Soils for: Residential Development

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITH BASEMENTS	LOCAL ROADS AND STREETS	LAWNS AND LANDSCAPING	SEPTIC TANK ABSORPTION FIELDS	DRAINAGE
CcB - Canton	Slight	Slight	Moderate, large stones	Severe	Deep to water
Charlton	Slight	Slight	Moderate, large stones	Slight	Deep to water
CdC - Canton	Moderate, slope	Moderate, slope	Moderate, large stones, slope	Severe	Deep to water
Charlton	Moderate, slope	Moderate, slope	Moderate, large stones, slope	Moderate, slope	Deep to water
*Rn - Ridgebury	Severe, wetness	Severe, wetness, frost action	Severe, wetness	Severe, percs slowly, wetness	Percs slowly, frost action
Leicester	Severe, wetness	Severe, wetness, frost action	Severe, wetness	Severe, wetness	Frost action
Whitman	Severe, ponding	Severe, frost action, ponding	Severe, large stones, ponding	Severe, percs slowly, ponding	Percs slowly, Frost action
WZA - Woodbridge	Severe, wetness	Severe, frost action	Moderate, large stones, wetness	Severe, wetness, percs slowly	Percs slowly, frost action
WZC - Woodbridge	Severe, wetness	Severe, frost action	Moderate, large stones, wetness, slope	severe, wetness, percs slowly	Percs slowly, frost action, slope

* Designated wetland soil by Public Act 155

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

SOIL DESCRIPTIONS

CcB--Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes. This unit consists of gently sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. Slopes are mainly smooth and convex. Stones cover 1 to 8 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium runoff, and both are very strongly acid to medium acid.

The soils of this unit generally are too stony for cultivation. Stone removal makes the soils well suited to cultivated crops but is difficult. The soils are well suited to use as woodland, but the Charlton soils have higher productivity than the Canton soils.

Some excavations in the Canton soils are unstable. The stones on the surface limit landscaping.

CdC--Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. Slopes are mostly smooth and convex. Stones cover 8 to 25 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam,

gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff, and both are very strongly acid to medium acid.

The soils of this unit generally are too stony for cultivation. Stone removal makes the soils suited in cultivation but is difficult. The soils are well suited to woodland, but the Charlton soils have higher productivity than the Canton soils. The stones on the surface hinder the use of some woodland harvesting equipment.

Slope is the main limitation of the soils for community development, especially for onsite septic systems. Slopes of excavations in these soils are unstable. The stones on the surface hinder landscaping.

Rn--Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. This unit consists of nearly level, poorly drained and very poorly drained soils in depressions and drainages of glacial till uplands. Slopes range from 0 to 3 percent. Stones cover 8 to 25 percent of the surface. About 40 percent of the total acreage of this unit is Ridgebury soils, 35 percent is Leicester soils, 15 percent is Whitman soils, and 10 percent is other soils. Some areas of this unit consist of one of these soils, and some others consist of two or three. The soils of this unit were mapped together because they have no significant differences in use and management.

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

Typically, the Leicester soils have a surface layer of very dark brown fine sandy loam 7 inches thick. The subsoil is mottled, grayish brown and light olive brown fine sandy loam to a depth of 60 inches or more.

Typically, the Whitman soils have a surface layer of very dark gray fine sandy loam 9 inches thick. The subsoil is gray, mottled fine sandy loam 5 inches thick. The substratum is mottled, light olive gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of moderately well drained Sutton and Woodbridge soils and very poorly drained Adrian and Palms soils. Also included are a few areas where stones cover less than 8 percent of the surface.

The Ridgebury soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate to moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Ridgebury soils have moderate available water capacity and are very strongly acid to medium acid.

The Leicester soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate or moderately rapid. Runoff is slow. The Leicester soils have moderate available water capacity and are very strongly acid to medium acid.

The Whitman soils have a seasonal high water table at or near the surface from fall through spring. The permeability of the soils is moderate or moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Whitman soils have moderate available water capacity and are very strongly acid to slightly acid.

The soils of this unit are too stony for cultivation. The unit is suited to woodland. However, the stones on the surface and the high water table hinder the use of harvesting equipment. The water table causes a high rate of seedling mortality and restricts rooting, causing a hazard of uprooting during windy periods.

The high water table and slow to very slow permeability are major limitations of the soils of this unit for community development. Steep slopes of excavations in these soils slump when saturated. The stones on the surface restrict landscaping, and lawns are soggy most of the year.

WzA--Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Also included are a few small areas where stones cover less than 8 percent of the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil generally is too stony for cultivation but is well suited to Woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

WzC--Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This soil is generally sloping to sloping and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area.

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should address. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.