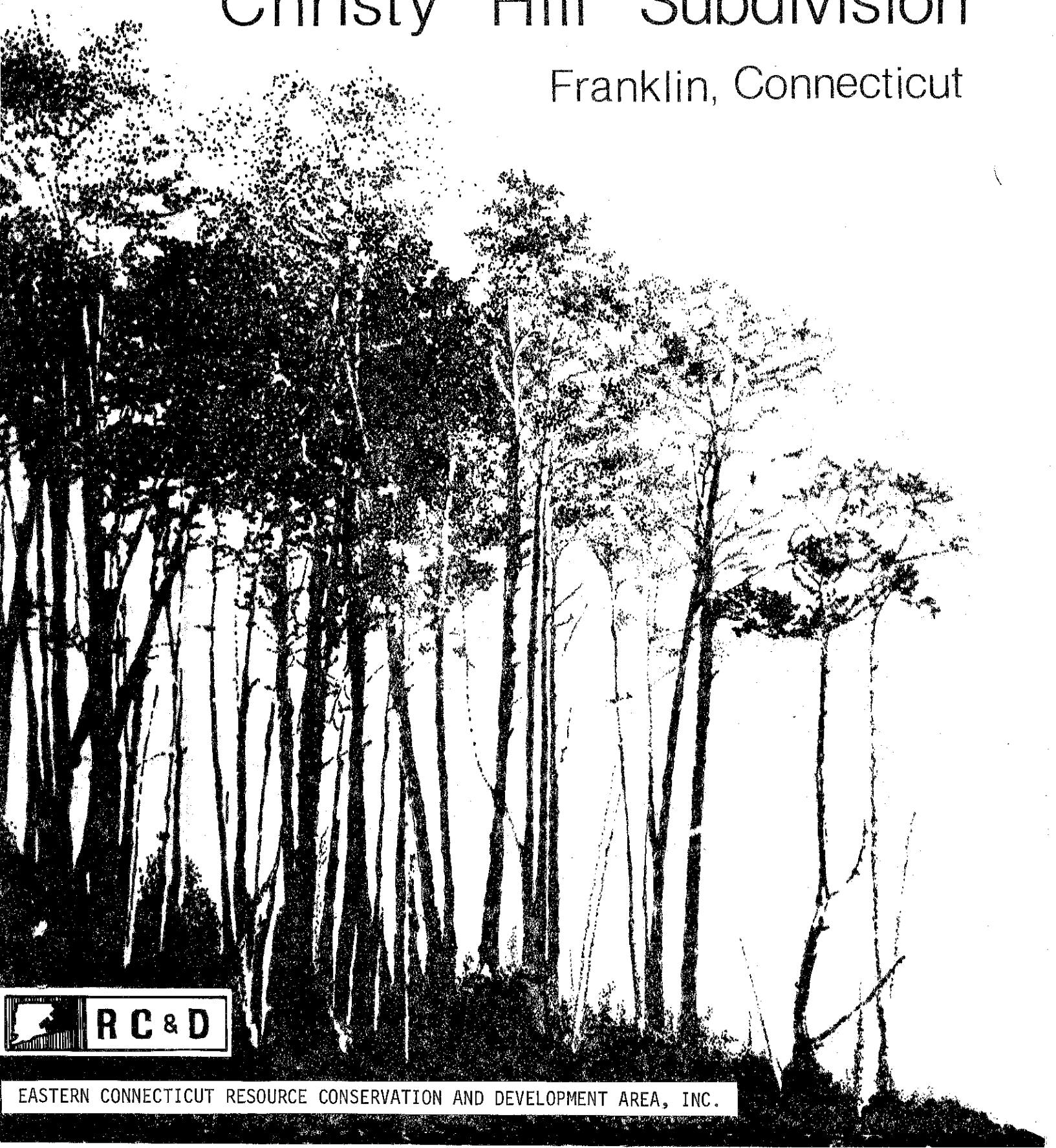


Environmental Review Team Report

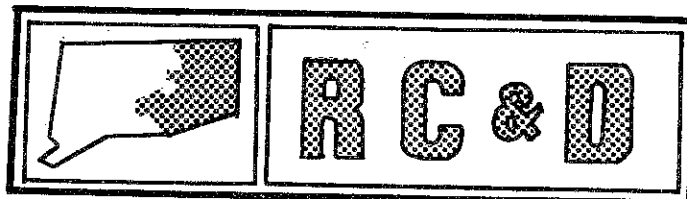
Christy Hill Subdivision

Franklin, Connecticut



EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

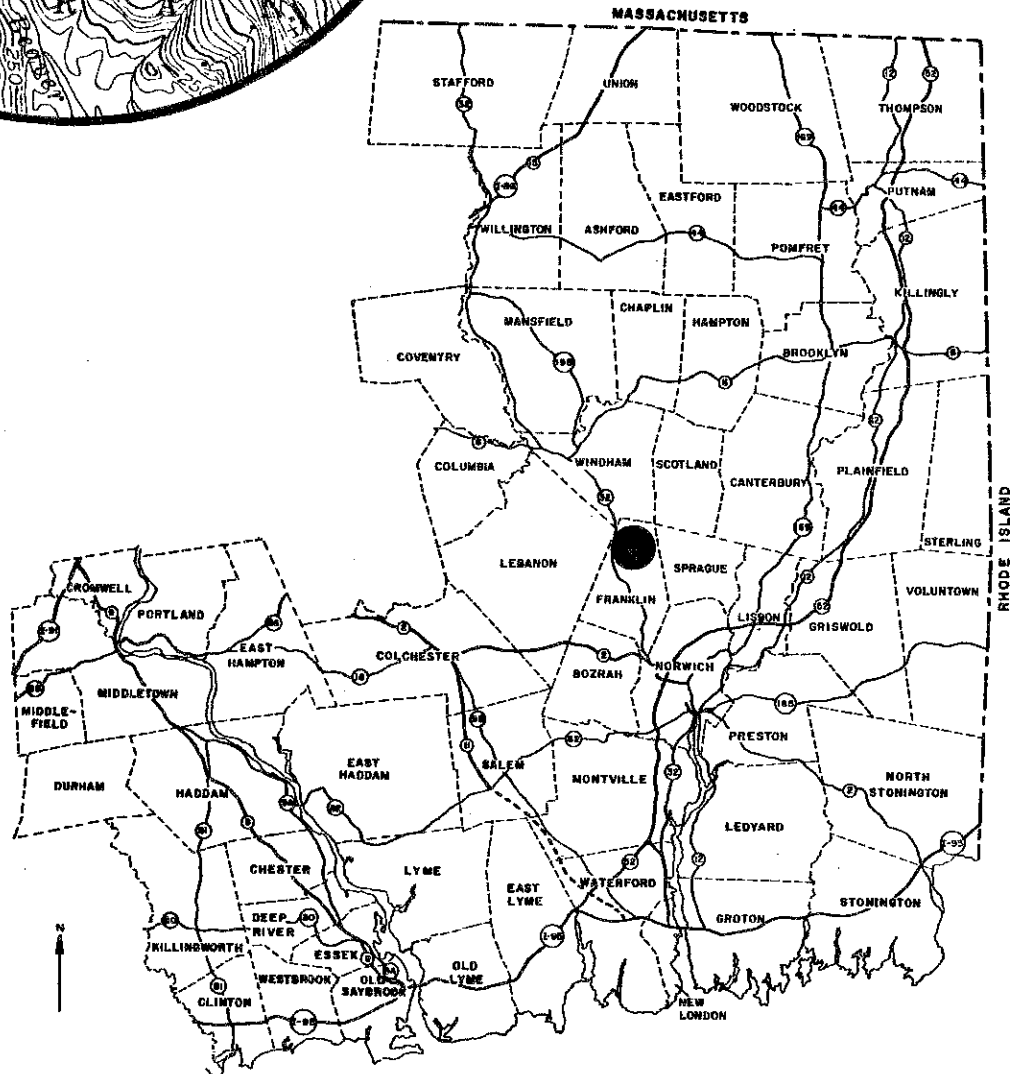
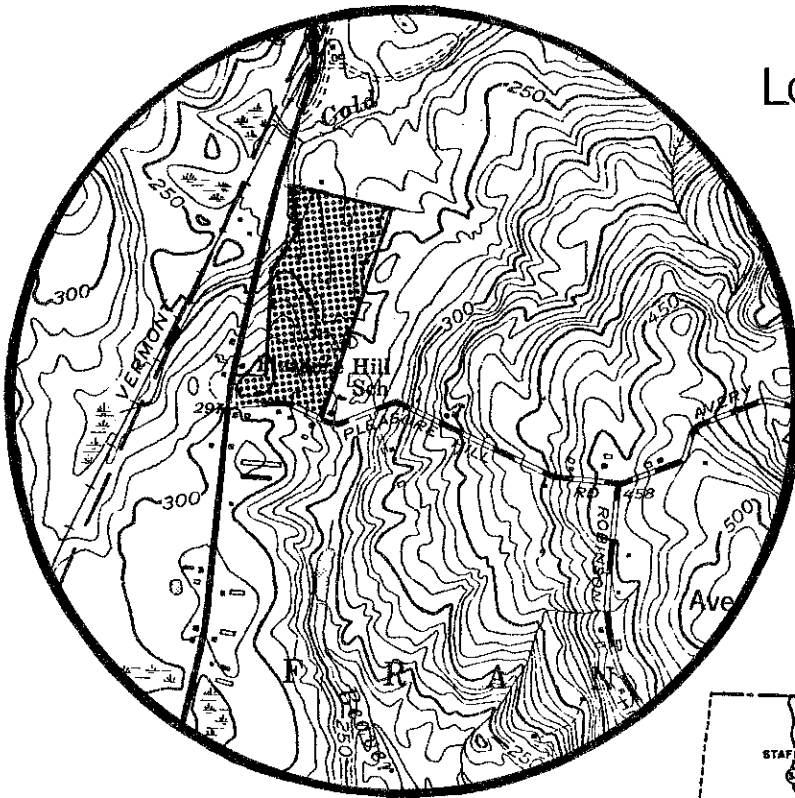
Environmental Review Team
Report
on
Christy Hill Subdivision
Franklin, Connecticut
April 1978



eastern connecticut resource conservation & development area
environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

CHRISTY HILL SUBDIVISION FRANKLIN, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

0 1 2 3 4 5 6 7 8 9 10

ENVIRONMENTAL REVIEW TEAM REPORT
ON
CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT

This report is an outgrowth of a request from the Franklin Planning and Zoning Commission to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field checked the site consisted of the following personnel: Gary Parker, District Conservationist, Soil Conservation Service (SCS), Mike Zizka, Geologist, Department of Environmental Protection (DEP), Donald Smith, Forester (DEP), Mark Traceski, Soil Conservationist (SCS), Dwight Southwick, Civil Engineer (SCS), Manny Cardozza, State Department of Health, Tom Seidel, Regional Planner, Southeastern Connecticut Regional Planning Agency and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field-checked the site on Thursday, March 16, 1978. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Franklin. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review a 39 acre parcel, owned by Christy Hill Builders, for proposed subdivision and development. The site is located immediately to the north and east of the intersection of Route 32 and Pleasure Hill Road in North Franklin.

The site was once used as farmland and has a gently rolling terrain, generally it is dominated by grasses, shrub growth and red cedar. The site is bisected by a large wetland and contains two small ponds which appear to be eutrophic. The eastern section of the site is forested.

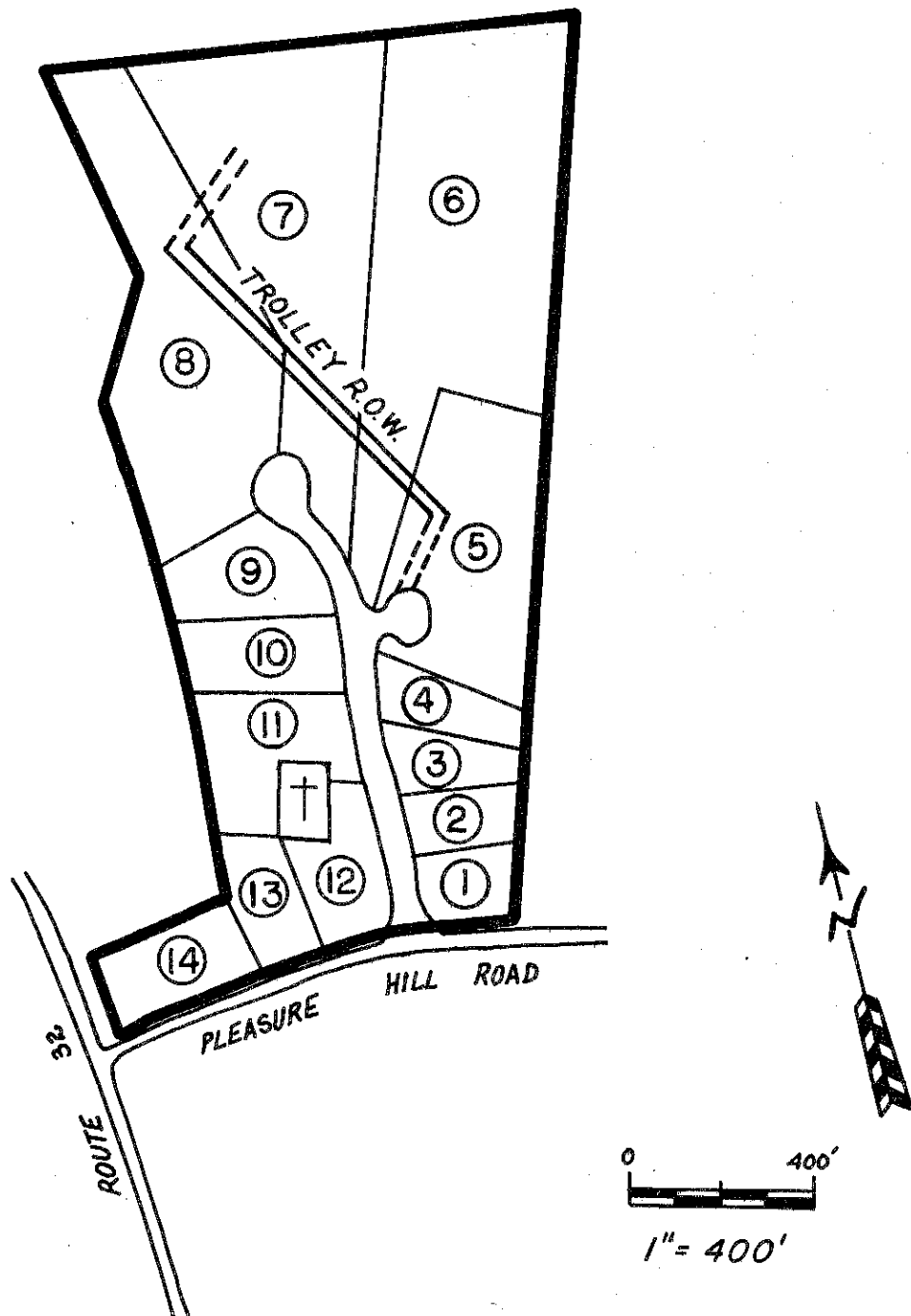
It is Christy Hill Builder's intention to provide 13 new home sites on this property which will be served by on-site sewerage disposal and on-site wells. Access to these lots will be supplied by a new paved road running north from Pleasure Hill Road and essentially parallel with Route 32. Several of these lots are located north of the wetland which bisects the property and access to homes in this area is proposed to be via two old farm cart paths and an abandoned trolley railbed. This access would remain unpaved and would be a private road to be maintained at the lot owner's expense. It is the developer's intention to sell the lots with houses on them in a scheduled manner, so as not to disturb the entire site at one time.

The Team's general concerns on this site are with the steep and erodable soils, the inevitable disturbance to the wetland, road and lot surface drainage and septic system design and placement. After review of the site and preliminary subdivision plan, it is evident that construction on lots 1 through 4 and lots 9 through 13 will not require wetland disturbance or any major earth movement. Construction on lots 5 through 8 will cause a major environmental disturbance and will eventually have a significant impact on the wetland area. We are concerned that drainage from any development on this site is liable to contribute to pollution and sedimentation of this wetland, but it is the Town's charge to weigh the possible environmental disturbance created by the development against the overall benefit that the Town could derive from this subdivision. Briefly, the Team feels that Christy Hill Builders should keep the following concerns in mind when developing the final subdivision plan for this site; erosion control measures should be installed prior to the start of construction, the sequence and maintenance of erosion control practices should be detailed in an erosion and sediment control plan; roads, drainage systems with protected outlets, and utility lines should be installed and roads surfaced prior to house construction, the amount and duration of soil disturbance should be minimized by disturbing only what is needed, when it is needed, followed by immediate revegetating of the disturbed area.

CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT

PRELIMINARY SUBDIVISION

PLAN



All lot lines and road locations shown are approximate.

ENVIRONMENTAL EVALUATION

GEOLOGY

Test pit reports provided by Bernard F. Stone indicate that the property is almost entirely underlain by glacial till. Till is an unconsolidated deposit produced by glacial erosion of rock and preexisting surficial geologic materials. Composed of varying percentages of clay, silt, sand, gravel, and boulders, till usually is compact and difficult to dig with hand tools. The depth of till on the property is unknown in most places, but the test hole information shows it to be only 32 to 34 inches thick in lots near Pleasure Hill Road. The till probably is nowhere thicker than 15 feet.

Bedrock underlying the property, as mapped in U.S. Geological Survey publication GQ-335, Bedrock Geology of the Willimantic Quadrangle, by George L. Snyder (1964), is identified as part of the Hebron Formation. This formation consists of interlayered fine-grained calc-silicate rock, and calcareous and non-calcareous biotite schists. The calc-silicate rock probably is what the consulting engineer, B.F. Stone, described as crumbly sandstone. The relatively high rate of percolation in test holes that encountered rock suggests that the formation, at least in this area, is highly weathered and disaggregated.

HYDROLOGY

The property is bisected by wetlands, which drain northward via a small stream into Cold Brook, which in turn empties into the Shetucket River. Wetlands serve several natural purposes: one of the most important is the reduction of flood damage along streams which pass through the wetland. During periods of heavy or prolonged rainfall, significant snow melt, or other times of increased stream flow, water may be stored temporarily in the wetlands. As a result, peak flow and erosive force of the stream is reduced. Destruction of wetland areas can therefore cause problems downstream by reversing these mitigating effects.

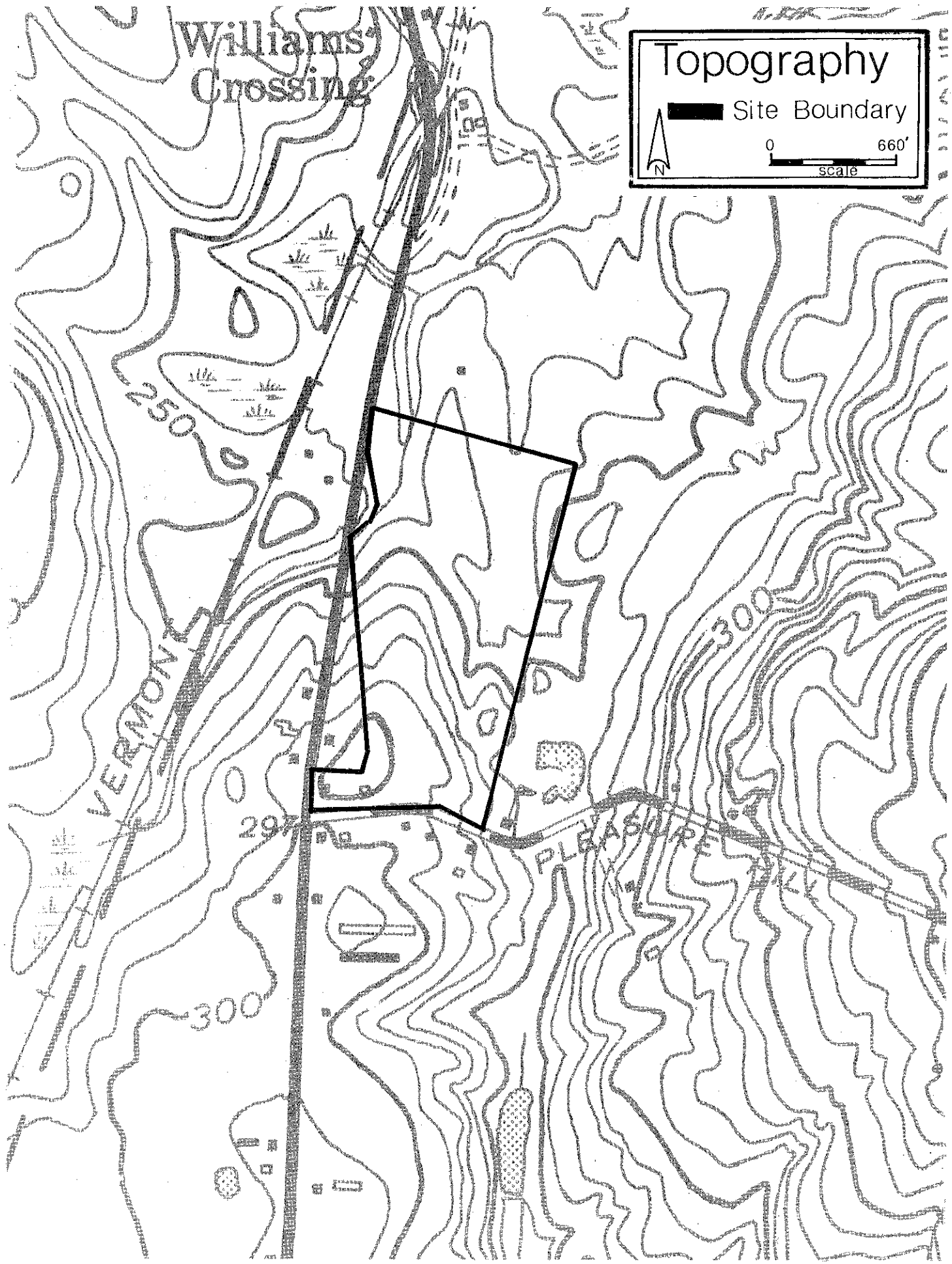
The change of land use from pasture to residential is certain to increase the percentage of runoff for a given rainfall amount. The exact figure for the increase depends upon the extent of the development. Flow in the brook that traverses the property, to the point where it passes under the cart path between lots 7 and 8, originates in a drainage area of approximately 76 acres (fig. 1). Assuming that the homeowners maintain either lawns or the current vegetative cover, and that approximately 1/5 acre of land per house will be covered by impermeable surfaces, such as roofs and driveways, an estimate of the increase can be made. The method used for the estimate is detailed in Technical Release No. 55 of the Soil Conservation Service. The runoff curve number (RCN), which relates rainfall to runoff amounts, is calculated to increase by 1 for the overall drainage area. Assuming a present runoff curve number of 60 for the watershed, a future RCN of 61 is predicted. This seemingly small change could increase peak flow in the brook by as much as 11% during a 24-hour, 10-year rainfall event, and by as much as 8% during a 24-hour, 100-year rainfall event. Hence, the chance for flooding, both of yards and of the trolley road, would be greater than it is now.

Williams Crossing

Topography



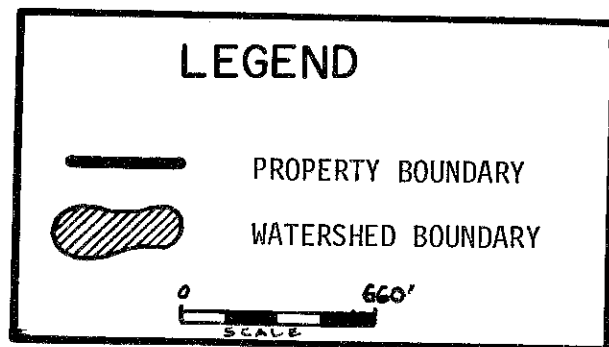
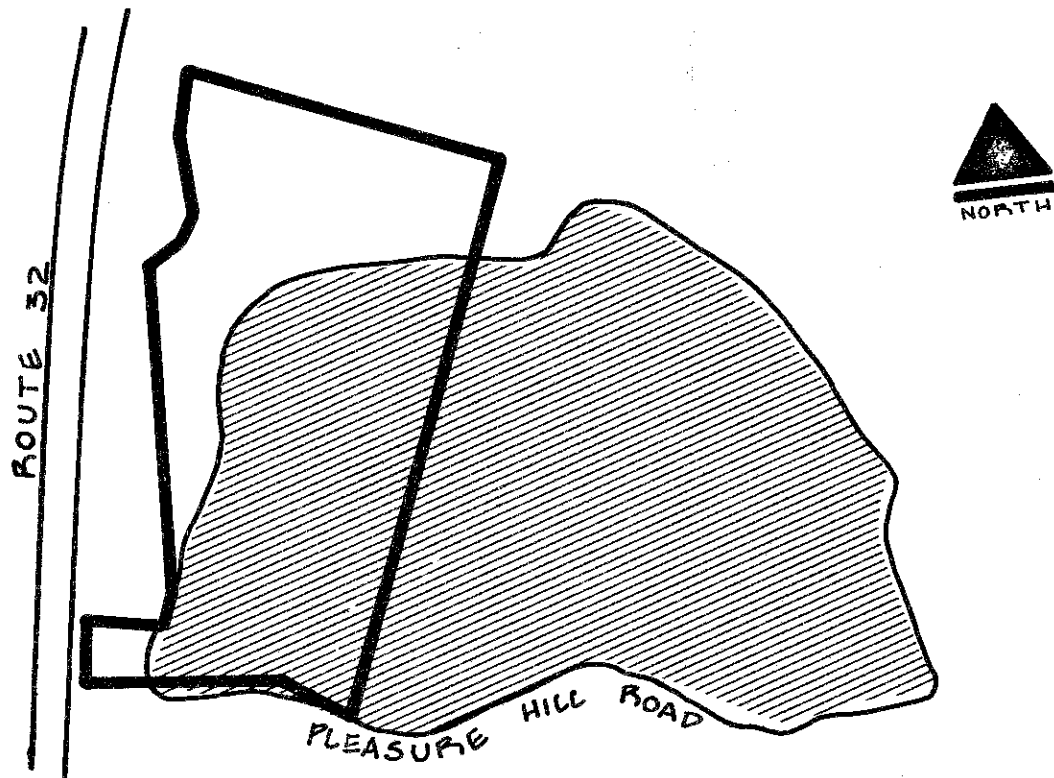
Site Boundary



CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT

WATERSHED

Watershed area of the brook
traversing Pleasure Hill Road
property to the point of its
underflow at the cart path
joining lots 7 and 8.



VEGETATION

Generally, the site is an old farm which has gradually been reverting from open field to forest land. The southernmost portion of this rolling terrain remains in native grasses. The mid to northernmost regions have become dominated by red cedar, barberry, bayberry, common juniper and sweet fern. Mosses are also abundant on this site, they are typically represented by sphagnum mosses in the wetlands and reindeer moss, British Soldier moss and hairy capped mosses on the slopes. Tussock sedge is the dominant vegetation in the wetland area.

WILDLIFE

Wildlife evident on the site at the time of the field review were seasonal songbirds, cottontail rabbits, rodents, and white-tailed deer. Their current usage of the site is light. The wetland and pond area, however, are significant to waterfowl and other wetland wildlife in the immediate area. Summer usage should be moderate. The pond crossing lots 7 and 8 had a dense algae bloom where ice was melted on the date of the site inspection. This indicates that the pond is eutrophic. This pond and adjacent wetlands will no doubt breed mosquitoes, flies and other insects during the summer months.

Development as proposed will cause sufficient disturbance of the actual wetland and surrounding habitat to essentially eliminate resident white-tailed deer and waterfowl. Urban wildlife forms such as robins, skunks and raccoons may increase. Existence or non-existence of roving cats and dogs also has a marked effect on wildlife. This side effect of urbanization frequently depresses most wildlife near urban areas. If left undisturbed, this area's wildlife value will increase over the next 10 to 15 years.

FOREST RESOURCES

Forest resources for the Christy Hill Subdivision Property on Pleasure Hill Road can be divided into four separate stands. These stands are shown in the accompanying illustration.

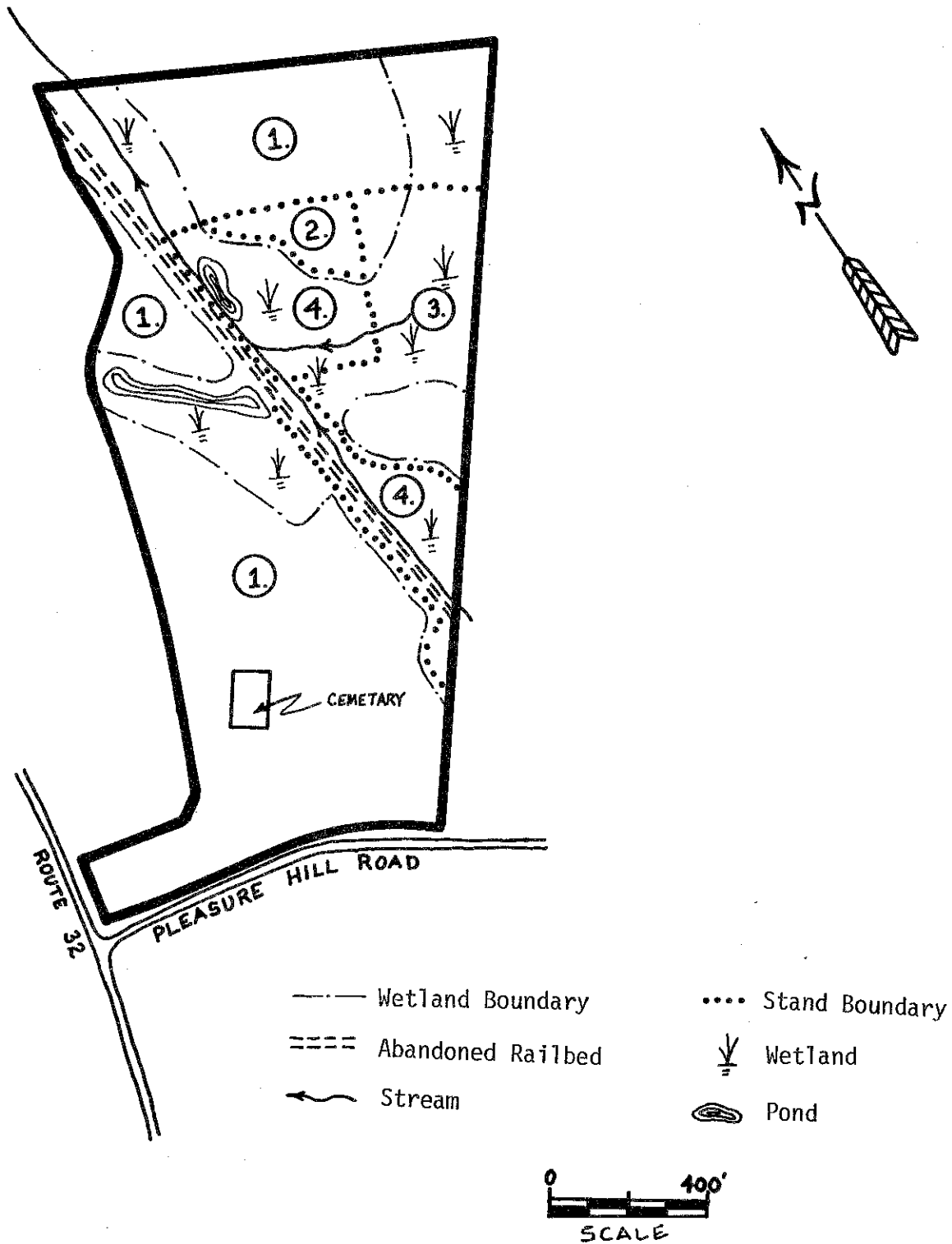
STAND ONE: This area consists of approximately 26 acres of open field. It is populated by occasional red cedar, shrubby growth and large trees near field margins. Development recommendations include planting lot lines and road borders with white pine, larch and hemlock. All large open grown trees should be retained, if at all feasible.

STAND TWO: This area is an old wooded pasture of approximately one acre, dominated by 16 to 20" DBH (diameter of trunk at breast height) red oaks. Due to recent grazing, reproduction in this area is limited to an occasional locust or hawthorne. A cordwood harvest of the poorest quality trees in this area of the site, is recommended to help stimulate vegetative reproduction.

STAND THREE: This old pasture of approximately 5 acres, is dominated by a dense growth of native red cedar and occasional hardwoods. Much of this area has a seasonally high water table. Consideration should be given to retaining this area as a buffer to the wetland and as a wildlife food source.

CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT

FOREST STANDS



prepared by D.H. Smith, DEP

STAND FOUR: This area is a wetland of approximately five acres, dominated by red maple, black birch, yellow birch and some ash in drier locations. Reproduction could be increased by a cordwood harvest of all trees in poor condition, with a potential yield of 10 cords.

SOILS

A detailed soils map of this site is included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 330'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types of the site. The soil limitation chart indicates the probable limitations for each of the soils for on site sewage disposal, buildings with basements, streets and parking, and landscaping. However, limitations even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Special Soils Report: Southeastern Connecticut Region, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups For Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The soils on the site of the proposed Christy Hill Subdivision are generally derived of glacial till. The soil series most representative of this site are Canton-Charlton, Walpole and Agawam. Regulated wetlands, under Public Act 155, cover approximately 27% of the site.

The Canton soils are well drained soils developed in upland till normally deeper than five feet. These soils are rapidly permeable in the subsoil but slowly to very slowly permeable layers may be present below 60 inches. The water table is normally below 60 inches during most of the year. The Canton soils are naturally stony and contain few to many stones through the soil. Gravel size rock fragments generally make up 10 to 30% of the surface and subsoil. Canton Soils constitute approximately 60% of the Canton-Charlton mapping unit. Most development problems are related to slope and stoniness.

The Charlton soils are also well drained soils developed in upland till normally deeper than five feet. These soils are moderately permeable in the subsoil, but slowly to very slowly permeable layers may be present below 60 inches. The water table is normally below 60 inches during most of the year. Charlton soils are naturally stony and contain few to many stones throughout the soil. They make up 30% of the Canton-Charlton mapping series. Development problems are related to slopes and stoniness.

The Walpole soils are somewhat poorly to poorly drained soils developed in sandy glacial outwash, from 18 to 24 inches deep, over coarse textured stratified sands and gravels. These deposits, normally deeper than 10 feet, occupy low lying terraces, above the present overflow of large streams. These soils are moderately permeable in the subsoil. The water table normally is near the surface from late fall through early spring. Most use problems are related to the long seasonal high water table.

The Agawam soils are well to somewhat excessively drained soils developed in water deposits of sand. These deposits, normally deeper than 10 feet, are located on terraces above the present overflow of large streams. These soils have moderate to rapid permeability in the subsoil. The water table normally is below 60 inches during most of the year. Most use problems are related to the variability of the underlying substrata.

As the soils limitation chart indicates, approximately 59% of the site is in Canton-Charlton soils, 27% of the site is in Walpole soils, a regulated wetland soil under Public Act 155, 6% is in Agawam soils and 4% is in Sutton soils. Canton-Charlton soils and Agawam soils are generally favorable for on-site sewerage, buildings with basements, streets and parking and landscaping. Sudbury, Walpole and Sutton soils, however, are severely limited for establishment of on-site sewerage systems and buildings with basements, due to wetness and frost action. All slopes over 8% will be difficult to revegetate.

The proposed development may result in permanent damage to the wetland unless preventive measures are taken. The hay bales to be placed at the end of the proposed road will be helpful, but probably will not be adequate to contain all sediment from the sites of construction. The topography of the property presently is somewhat irregular, and significant cut-and-fill operations probably will be needed to make the area suitable for housing. Such activities will expose a large quantity of soil, making it available for transport by surface runoff. The slope of the land and the layout of the proposed road assure that much of the sediment will be carried toward the wetland. Filling of the wetland by sediment will force floodwaters to invade other land areas, possibly washing out the trolley road and parts of several lots.

Effective sediment and erosion control measures should be considered for this site. A permanent measure, such as a sediment basin, may prove more useful than temporary hay bales at the end of the new road. Sand and other debris from the road will be carried into the wetland via the drainage pipes even after the construction has long been completed. Hay bales, however, could prove very valuable during construction if located more extensively around the perimeter of the wetland. In all, the potential combination of increased runoff and wetland siltation make the issue of flooding a serious one for consideration.

Connecticut's Erosion and Sediment Control Handbook published by the Soil Conservation Service will aid both the developer and the Town in preparing and approving an adequate erosion and sediment control plan. Standards and specifications for both mechanical and vegetative practices listed within the Handbook are available at the New London County Soil Conservation Service office, Norwich, Connecticut.

FOUNDATION DEVELOPMENT/GRADED CONDITIONS

Storm water from Pleasure Hill Road drains through a road culvert directly east of the proposed access road and spreads across lot 1. This water could be easily controlled by installing a storm drainage system which would connect this culvert with the Pleasure Hill Road drains to the east.

The proposed access road crosses drainage draws at four points; the front of lots 9 and 10, the front of lots 3 and 4, the neck of the eastern cul-de-sac,

and the neck of the northern cul-de-sac. Surface drainage should be controlled at these points by either the storm drain system or culverts. Much of the access road also crosses steep slopes and erosion may become a problem on unprotected road edges. Some catch basins and storm drains are shown, but the Team recommends that curbing and a complete storm drainage system including the cul-de-sac areas be implemented on this site.

The section of the access road located from the easternmost cul-de-sac continuing to the northernmost cul-de-sac, is proposed for a very steep slope adjacent to the wetland. Construction on this slope will require extensive cutting and/or filling. The cuts on these slopes will be difficult to stabilize. Moving the road onto the gentler slope to the west is recommended. If steeper banks are not cut and the road is not moved, a certain amount of wetland will need to be filled to make a level road grade with a stable bank.

The rear portions of lots 3, 4, and 5 drain into a brook which runs along the old trolley bed. The present stability of this stream channel is questionable. Development plans should incorporate any needed channel improvements. An adequate and stable channel design for the post-development peak flows should be established prior to construction activities.

The higher, dry ground provided by Canton-Charlton soils toward the back of lot 5 is suitable for a house. Access to this section of land will require wetland filling and a stream crossing. If a house is built on the front section of lot 5, special consideration should be given to avoiding surface drainage problems and steep slopes. The proposed access road in lot 5 appears to create a drainage pocket. A small culvert may be needed under the drive to alleviate this problem.

As this is a preliminary plan, no houses have been sited on these lots and no final grading plan is available for Team evaluation. Caution should be taken, however, in designing the individual grading plans to avoid channeling excess surface water into the wetlands before it passes through a sediment trap.

WASTE DISPOSAL

Information currently available suggests that septic systems will not pose any major problems, particularly on the southern part of the property. The till appears to be a relatively coarse, loose variety that permits adequate drainage. Percolation rates, as shown in test results given to the Team by B.F. Stone, exceeded state standards. Test holes that encountered bedrock at shallow levels showed remarkably high percolation rates. It is likely that the rock was so decomposed that its texture was similar to a coarse gravelly sand, allowing ample transmission of water. Proximity to bedrock ordinarily hinders groundwater flow and leads to septic system failure.

Septic systems should be placed away from the wetlands to allow maximum filtration of effluent and avoid contamination of these sensitive areas, as groundwater on the property flows naturally toward the wetlands. Moreover, distance from the wet areas will reduce the potential for adverse seasonal high water table conditions. A high water table could flood the tanks and leaching fields, causing sewerage backup. Of all the test holes on the property, only hole 9 showed a high water table; a second visit to the site in late March showed the hole completely filled with water while adjacent holes were merely damp.

This hole is located in the area not presently recommended for development.

There appear to be some suitable soils for on-site septic systems on each lot. Most systems can be located on Canton-Charlton soils. As most of the land is steeply sloping, systems installed on slopes over 8% may require special design consideration. Lot 8 has excessively drained soils and therefore, special consideration should be given to avoiding groundwater contamination in that area.

WATER SUPPLY

Most wells on the property probably will have to tap bedrock to obtain an adequate water supply. In the Shetucket River basin, 90% of wells tapping bedrock yield at least 3 gallons per minute, enough for an average family. The crumbly nature of the rock increases the potential for sufficient yields.

The only significant problem with water supply that can presently be suspected is the possibility of excessive concentrations of iron and manganese in the water. Connecticut Water Resources Bulletin No. 11, a publication of the U.S. Geological Survey, indicates that the property lies within a zone wherein moderate to excess concentrations of these elements are frequently found. Such circumstances may be resolved by proper methods of filtration and/or water softening.

STREETS

The proposed subdivision has access from Pleasure Hill Road. This access will have two cul-de-sacs to provide turn-around and minimum frontage on some lots. The access to lots 5, 6, 7 and 8 is over abandoned farm cart paths and an old trolley bed.

The traffic coming onto Pleasure Hill Road from the development would not have adequate visibility to the west unless the slope is cut back to accommodate this. The visibility to the east is limited to about 200 feet due to a curve in Pleasure Hill Road.

The Town is expected to accept and maintain the paved access road in this development. The indicated catch basins on this road and the fact that the road will be constructed across sloping fields indicate that curbing will be needed. The proposed road has a storm drainage system that outlets into the wetlands at lot 6. This outlet should also provide outlet for the surface water from lots 9, 10, and 11. The pipe outlets should be protected from developing scour holes by riprap or other permanent protection as well as the baled hay erosion check.

Should roads be placed in the wetlands, the sub grade base courses will need to be adequately constructed with gravel and underdrained to overcome frost heaving limitations. Also, culvert sizing and placement should be hydrologically engineered.

The use of the existing cart paths and trolley lines for a common driveway to lots 5, 6, 7 and 8 will cause the least disturbance to the wetlands, but such a drive may not be convenient to homeowners. The trolley bed is not proposed as an impervious paved road surface. As it will be a gravel road, it will need to be well maintained to prevent potholes and ruts from developing. Development plans should also include adequate measures to keep surface water off this road to prevent

washouts. This system of cart paths and trolley bed is not proposed to be widened, currently it is adequate to handle traffic in one direction only, vehicles coming from the opposite direction would be forced to back up or pull to the side of the road to allow the other vehicle to pass.

As explained above, a host of problems seem to exist with the proposal to use the trolley road bed for access to lots 5 through 8. At the pre-field review meeting, a Town resident familiar with the trolley road noted that it had been flooded several times during its active use many years ago. The road is likely to be flooded more frequently under the proposed plan, making access to the houses difficult. Lots 5 through 8 are called "mini-estates" on the engineer's preliminary plan, but much of the acreage is regulated wetland. The Team recommends that these lots remain undeveloped until such time that access to them can be gained along a better route.

SERVICES TO SUPPORT DEVELOPMENT

The site is located on Route 32 in northern Franklin about three miles north of the Town Hall and Fire Department, and approximately three miles northwest of the school and Town garage which are located on Route 207. Route 32 is about 500 feet west of the proposed subdivision. From the intersection with Pleasure Hill Road, Route 32 proceeds north and descends into Cold Brook valley. Route 32 also has a small horizontal curve at the intersection with Pleasure Hill Road. With speeds on Route 32 in the vicinity of 50 mph it may be necessary to install a caution light to better warn Route 32 drivers of this intersection as development in northern Franklin increases.

Access to lots 6, 7, and 8 is by means of a common driveway, eight to ten feet in width consisting of the old trolley line and two cart paths which traverse the regulated wetland soils. Section 3.9 of the Franklin Zoning Regulations requires that "no building other than an agricultural building shall be permitted on a lot that does not have frontage on and direct access to a street." A street is defined as an "improved right-of-way accepted for public use by lawful procedure and suitable for vehicular traffic."

Lots 6, 7, and 8 do not have direct access to a street but will require over 1,000 feet of this common driveway. Even with deed restrictions specifying owner responsibility for driveway maintenance the possibility still exists for future citizen requests for the Town to make costly improvements if problems develop with access and movement of snow plows, oil trucks, fire trucks, and emergency vehicles. One of the reasons for the adoption of subdivision and zoning regulations in southeastern Connecticut communities was that unpaved roads with 3 or 4 homes along them were evolving into town roads at town expense. Although the FIA flood hazard map is not available for this area of Franklin, the former trolley bed in some locations is not much higher in elevation than the brook flowing through the site so the possibility of flooding exists.

One possible way to deal with these problems is to turn those lots with difficult access into an open space area since none has been provided for in the sketch plan. Section 8.1 of the Franklin Subdivision Regulations state that the Commission may require the dedication of open space in subdivisions. The trolley line could serve as a walking path and bike trail to connect the open space back to the subdivision and could be tied into a future town bike trail if the old

trolley line south of Pleasure Hill Road is ever developed for this purpose.

The portion of lot 5 closest to lot 4 appears to have enough area to meet the zoning requirements while the portion of lot 8 closest to lot 9 appears to almost meet the zoning requirements. If these two lots could be developed at these locations then only two lots would be lost by providing open space.

ALTERNATIVE LAND USES

Alternative land uses for this site appear to be recreation, open space or agriculture. The site is a former farm and most of the soils would classify as prime agricultural lands. This serves as an excellent example of Connecticut farmland undergoing the development process. The adopted Regional Plan recommends this area for low density uses such as scattered residential uses at greater than one acre per unit, agriculture, conservation and recreational uses. The adopted Town Plan recommends this area for low density residential and agricultural uses with lot sizes of at least one and one half acres.

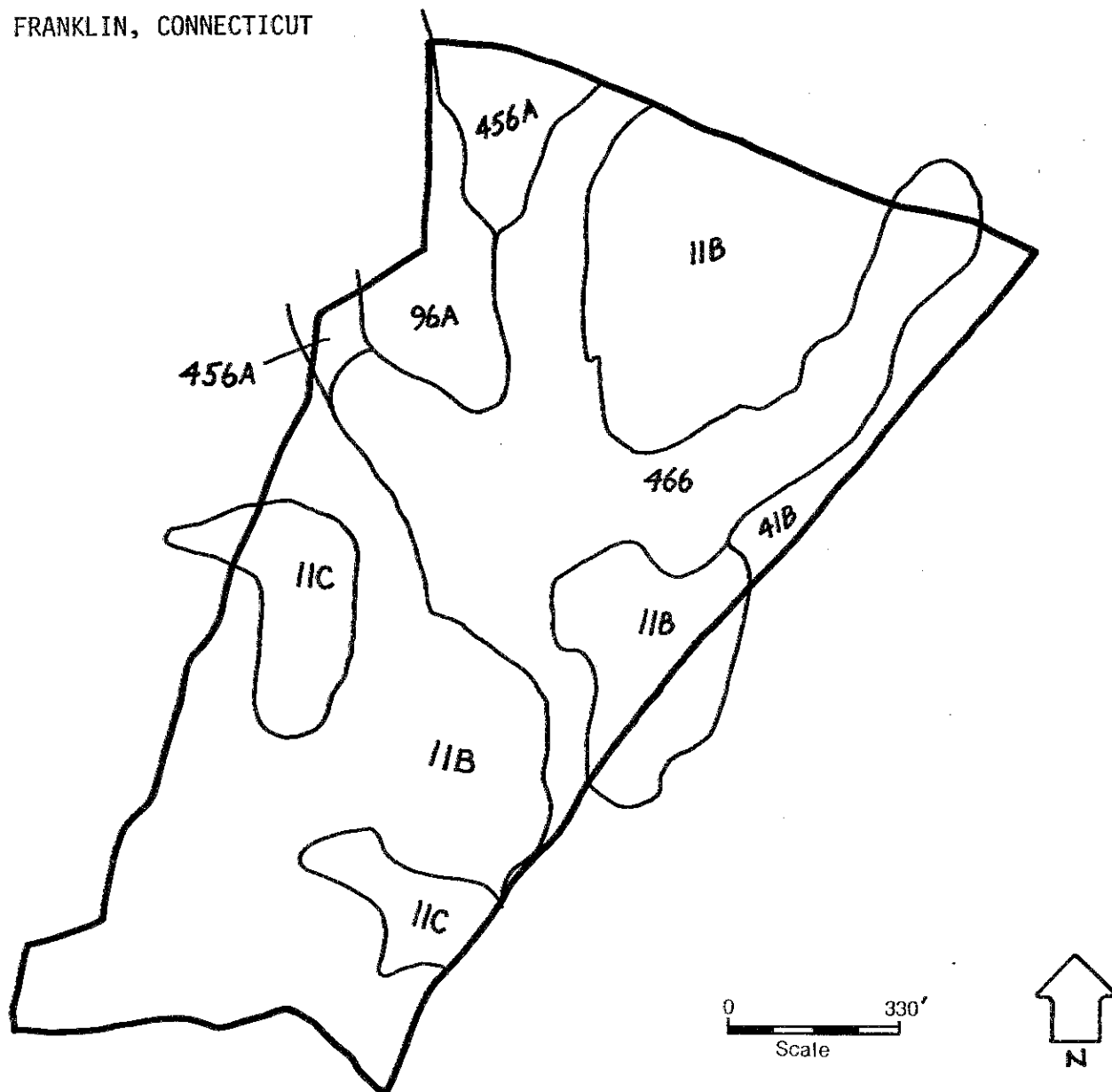
SURROUNDING LAND USES

Surrounding land uses are low density residential, agriculture and undeveloped open space. The Ralston-Purina Mushroom plant is located about 1500' north of the proposed subdivision. On a land use basis, low density residential uses should be compatible with the surrounding uses.

Appendix

Soils

CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT



The map is an enlargement from the original 1,320'/inch scale to 330'/inch.

Prepared by: United States Department of Agriculture, Soil Conservation Service.
Advance copy, subject to change.

CHRISTY HILL SUBDIVISION
FRANKLIN, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Natural Soil Group	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
						On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Canton-Charlton		11B	20.6	52		1	1	1	1
Canton-Charlton		11C	2.9	7	Slope	2	2	2	2
Agawam		96A	2.2	6		1*	1	1	1
Sudbury		456A	1.7	4	Wetness, Frost Action	3	3	2	1
Walpole**		466	10.6	27	Wetness Frost Action	3	3	3	3
Sutton		41B	1.4	4	Wetness, Frost Action	3	3	2	1

* Excessive permeability may cause ground water pollution.

** Protected wetland under P.A. 155.

Limitations: 1 = slight; 2 = moderate, 3 = severe.

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.