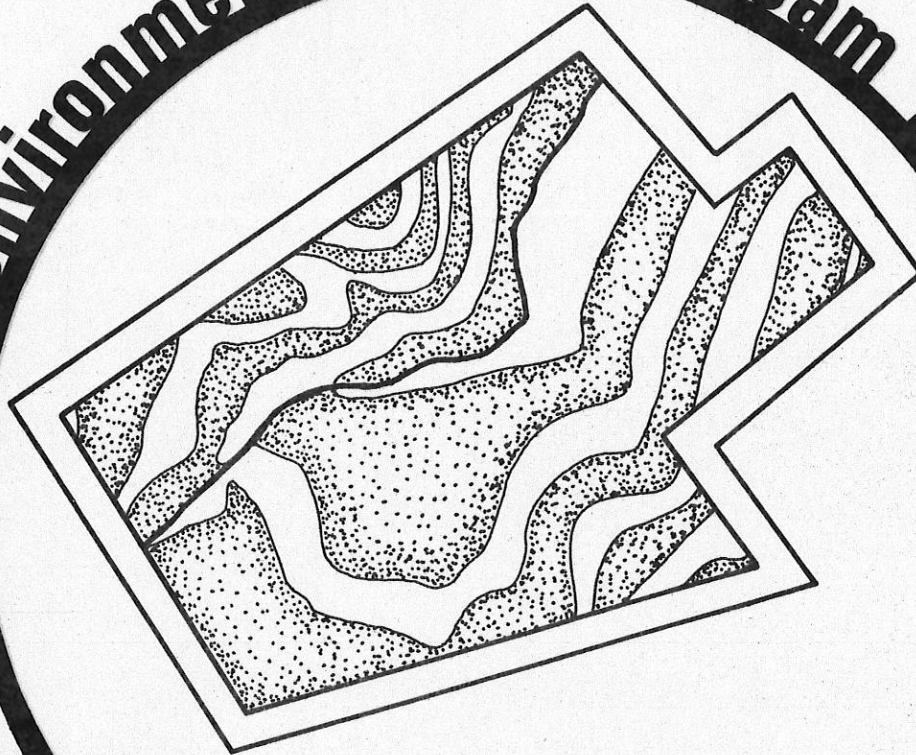


environmental review team report



PINE HILL ESTATES
SUBDIVISION
COLUMBIA, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

*ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES*

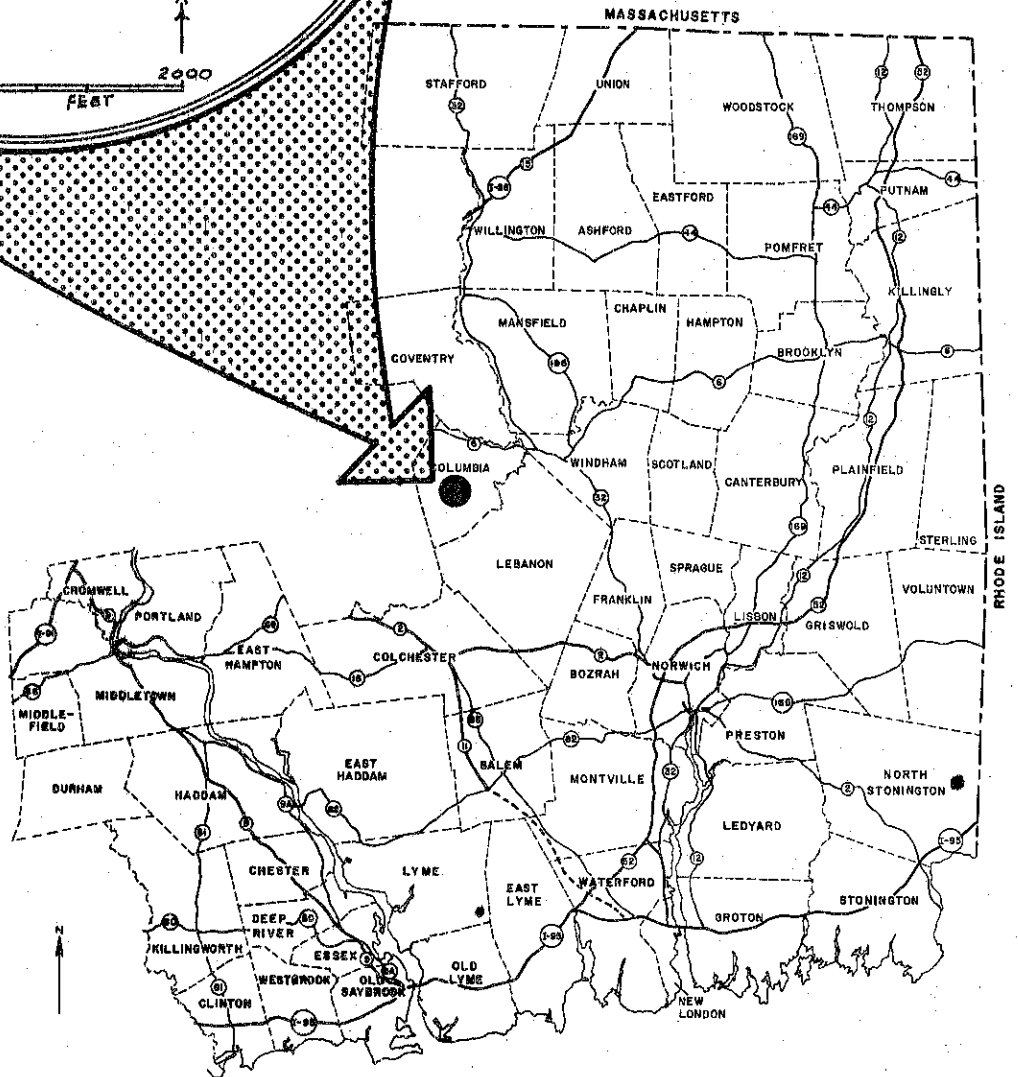
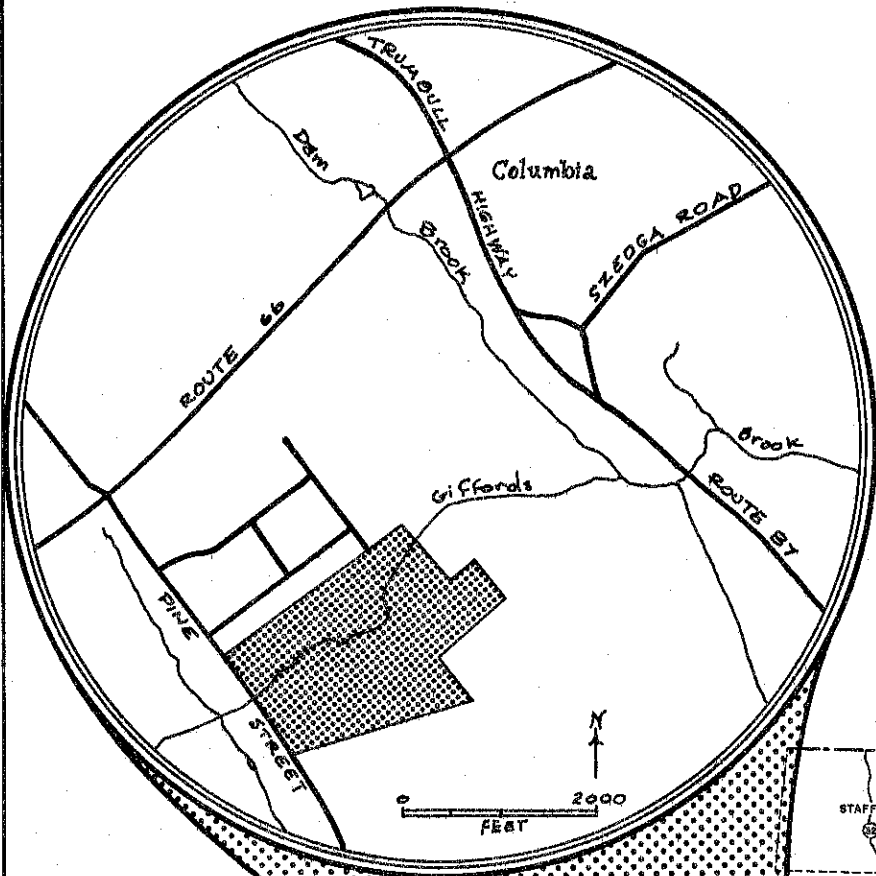
ENVIRONMENTAL REVIEW TEAM REPORT
ON
PINE HILL ESTATES
COLUMBIA, CONNECTICUT
MAY, 1976

*The preparation of this report was assisted
by a grant under Title 1, Section 107(a)4 of
the Housing and Community Development Act
of 1974, 24 CFR, Part 570, Section 570.406.*

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

PINE HILL ESTATES SUBDIVISION COLUMBIA, CONNECTICUT



**EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT**



ENVIRONMENTAL REVIEW TEAM REPORT
ON
PINE HILL ESTATES
COLUMBIA, CONNECTICUT

This report is an outgrowth of a request from the Columbia Conservation Commission, with the permission of the landowners, to the Tolland County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource, Conservation and Development (RC&D) Project 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, a table of soils limitations for certain land uses, and a topographic map of the site were forwarded to all ERT participants prior to their field review of the site.

The ERT that field-checked the property consisted of the following personnel: Lester Stillson, District Conservationist, SCS; Charles Reynolds, Soil Scientist, SCS; Dwight Southwick, Engineering Specialist, SCS; Tim Dodge, Wildlife Biologist, SCS; Robert Miller, Geologist, Connecticut Department of Environmental Protection (DEP); Charles Phillips, Fisheries Biologist, DEP; Tom Furgalack, Sanitarian, Connecticut Department of Health; Lester Barber, Regional Planner, Windham Regional Planning Agency; and Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Project.

The Team met and field-reviewed the site on Thursday, March 25, 1976. 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 Columbia. 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: Miss Linda M. Simkanin, Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 130 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review a 94 acre tract of land for which is proposed a single-family home subdivision. The tract of land, owned by the Land Development Corporation, is located on the east side of Pine Street, south of Connecticut Route 66 and the village of Columbia.

The site is presently undeveloped and is within close proximity to a recently developed residential area. The land is currently zoned for residential use on one acre lots. Water retrieval and sewage disposal would have to be developed on-site. Although the Team reviewed the entire tract relative to the developers' 63 lot preliminary subdivision plan, the site was reviewed with specific emphasis on the five lots fronting on Pine Street which the developers intend to develop first.

The present land uses include woodland, wetland, and old fields presently overgrown to brush. Giffords Brook is a natural perennial stream which divides the property in the northwest portion. Two intermittent tributaries to Giffords Brook also drain through the property which is subject to flooding in the vicinity of Giffords Brook.

Some aspects of the proposed development discussed by the Team involve waste disposal, the need for an erosion and sedimentation control plan to reduce the potential hazard of siltation and possible pollution into Giffords Brook, and the potential flood hazard to any dwellings built in the flood prone area surrounding Giffords Brook.

The report will also describe the natural characteristics of the site including topography, geology, soils, forest cover, wildlife habitat, and the Giffords Brook streambelt. Consideration will be given to the compatibility and suitability of the development relative to the natural resource base. Comments or recommendations made within the report are presented for consideration by the developer and the town in the preparation and review of the development plans, and should not be construed as mandatory or regulatory in nature.

EVALUATION

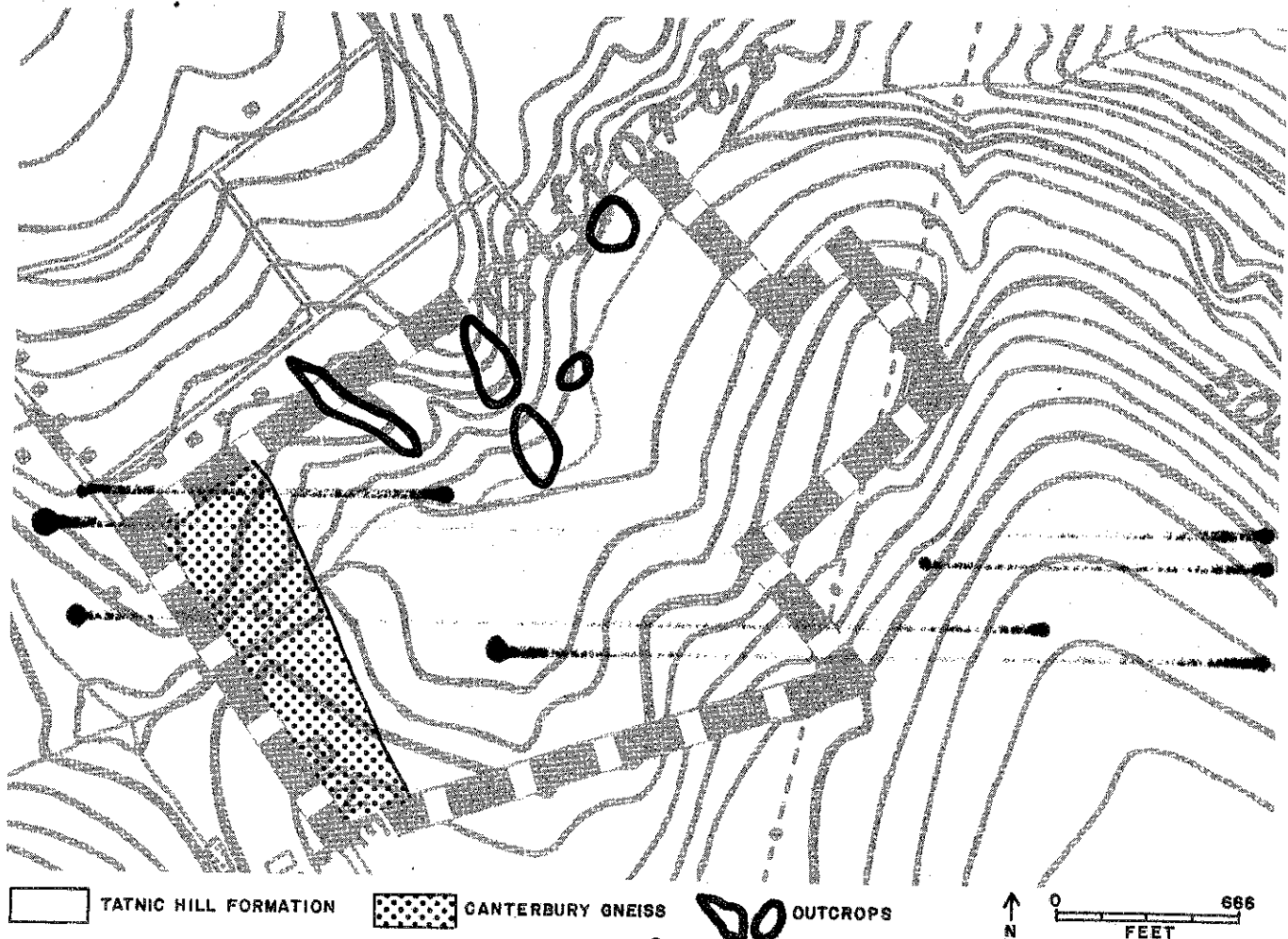
TOPOGRAPHY AND GEOLOGY

The site of the proposed subdivision development in Columbia, Connecticut is underlain by two distinct types of bedrock—Canterbury Gneiss and the Yantic Member of the Tatic Hill Formation.

The Canterbury Gneiss covers approximately one sixth of the site paralleling Pine Street. Its grains are medium with a gray to white color. The composition is oligoclase-orthoclase-quartz-biotite-granodiorite gneiss. It commonly makes long hillside ledges with broad hilltop exposures. Evidence of such exposures were observed on the northwest side of Gifford Brook (see topography and bedrock geology map).

The remaining area within the site is underlain by the Yantic Member of the Tatic Hill Formation. A member is simply one group of a certain rock type. Members are divided up by age. The Yantic Member is the youngest rock type in the Tatic Hill Formation. It is easily recognized by its silvery to rusty colored weathering and is composed of medium grained biotite-muscovite gneiss. The Yantic

TOPOGRAPHY AND BEDROCK GEOLOGY



Member may also contain local areas of garnet and sillimanite, although no examples were found on the site. Their outcrops are usually found as long ledges or rounded surface outcrops.

The surficial geologic material is 99% till with some very, very small local deposits of alluvial sand and gravel along Gifford Brook. The depth of the bedrock ranges from 0 feet, along the north side of Gifford Brook to an estimated 25 feet in the southeastern corner of the property.

Hydrology

The proposed site is located near the outlet of the Gifford Brook drainage basin. The basin comprises approximately 2.61 square miles. Gifford's Brook and the watershed, the largest drainage area in Columbia, is located entirely within the Town (see Drainage Areas map).

The main channel of the drainage area flows through the center of the site. A flood prone area does exist along the brook (see flood prone area map). According to source material from the United States Geologic Survey (USGS), the area indicated as flood prone has a one in 100 years recurrence level, meaning that at least once in 100 years the flood water will reach the level indicated. Of course, it should also be noted that this is a statistical flood level and that the levels indicated can occur twice in one year or for two successive years or more. A study of soils types will give a good indication as to normal yearly flooding. For safety, the one in 100 years flood level should be used for all design plans.

The ground water flow for the site is generally similar to that of the surface water shown in the Drainage Area map. The site's unconsolidated materials are composed mainly of till, indicating slow movement of ground water. This slow movement is evidenced by the numerous intermittent streams found in the area, indicative of poor drainage.

Because of poor subsurface drainage and shallowness of bedrock, considerable care in placement of any on-site subsurface sewage disposal systems should be observed in the area.

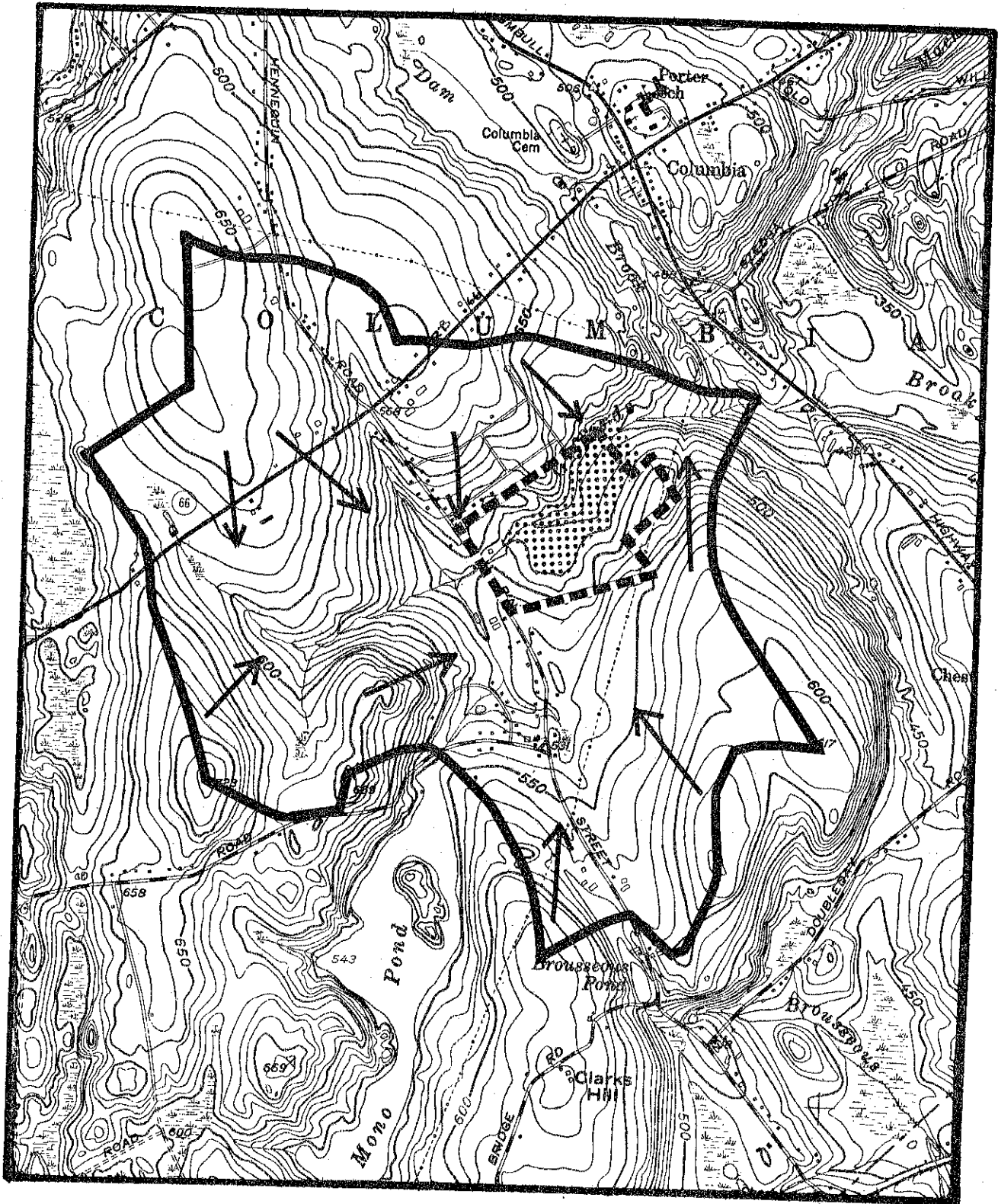
All wells drilled on the site for domestic purposes will intrude into bedrock. The quality of this water is excellent. Most recharge to the wells will be through the brook waters during the low flow or driest time of the year. Therefore, it is imperative that the quality of the brook water be maintained to insure the quality of the well water.

The Streambelt Report for Columbia indicates that ~~approximately 1,000 feet upstream from the confluence of Gifford's Brook and the Tenmile River and northeast of Connecticut Route 87,~~ the topography and soils of the brook valley appear favorable for creating a moderately deep pond of up to 55 acres. Refer to Drainage Area map. ~~Extent of impounding would be limited by agricultural use of the brook valley land and the low elevation of Route 87.~~ The site has potential for a water supply, recreation, boating, fishing, and a wildlife pond.

SOILS

A detailed soil map of the site is given in the Appendix of this report. As

DRAINAGE AREA



--- PROPERTY BOUNDARY

--- BOUNDARY OF DRAINAGE AREA

→ SURFACE WATER FLOW DIRECTION

▨ PROPOSED WATER IMPOUNDMENT

0 2000
FEET

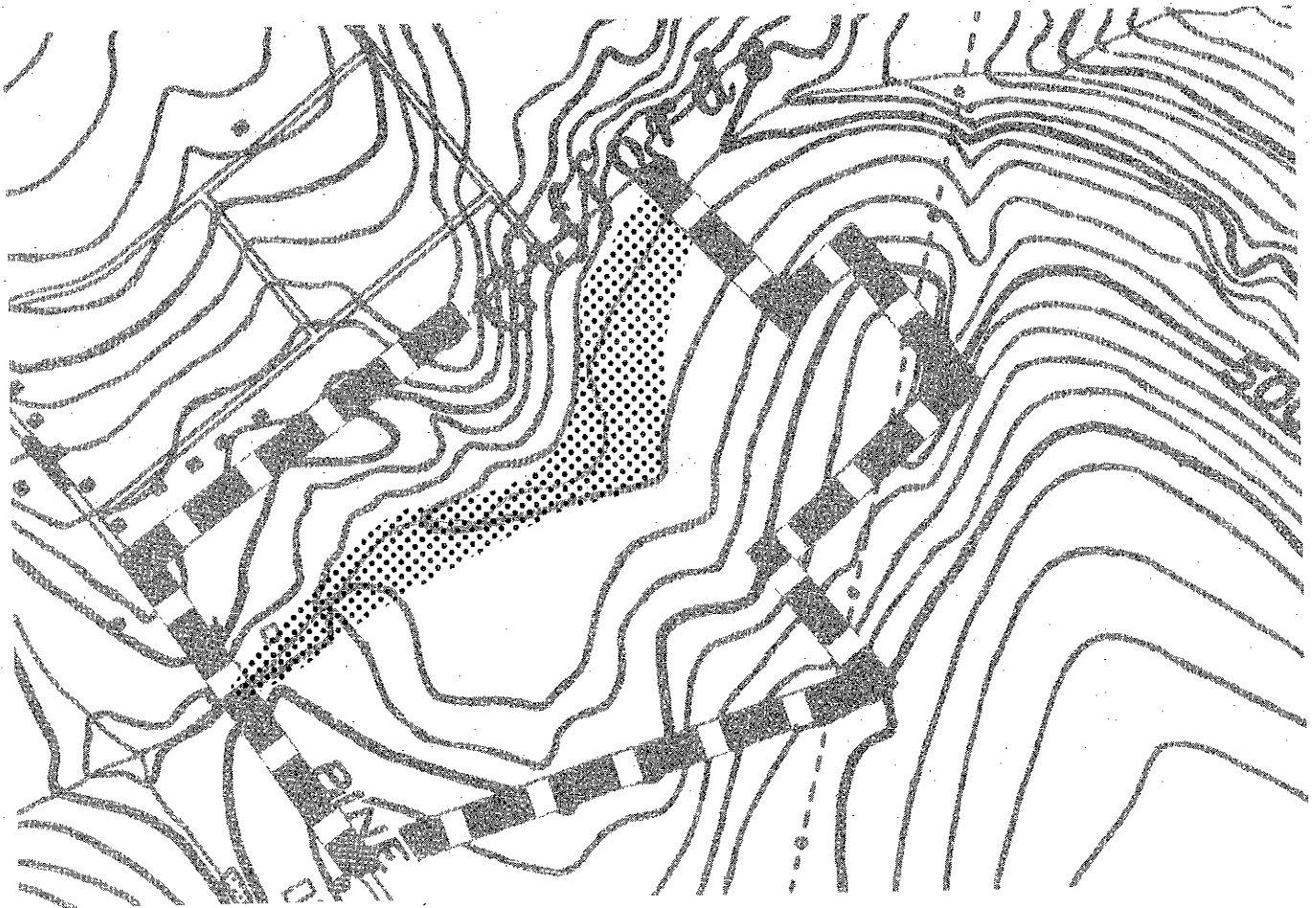
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the map is an enlargement from the original 1,320'/inch to 660'/inch scale, the soil boundary lines shown should not be viewed as absolute boundaries but rather as guidelines to the distribution of soil types on the property. The soils map, along with the Soil Survey report, Tolland County, (USDA, SCS, 1966), can serve as an educational tool regarding the identification and interpretation of soils.

The soils limitations chart for certain land uses which is found in the Appendix of this report, provides useful information concerning each soil type found on the Pine Hill Estates site. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix. Approximately 89% of the soils on the site exhibit severe limitations for the land uses proposed for this site. In general, the principal limiting factors are wetness and stoniness.

Along Pine Street where the first five lots are proposed there are three soil types present. There are approximately 30 acres of a Woodbridge soil type, mapping unit WZB. Lot one is proposed in this soil type. The Woodbridge series consists of moderately well drained soils that have formed over glacial till deposits derived mainly from schist and gneiss. The soils have a hard, compact layer at a depth of 20 to 30 inches. This layer is difficult to dig with a spade, but it crumbles readily in the hand when disturbed. This compact layer is sandy loam or fine sandy loam. Water passes through it slowly.

FLOOD PRONE AREA



SOURCE: USGS FLOOD PRONE AREAS FOR 1 IN 100 YEARS STORM EVENT

Lot one is proposed in Woodbridge soil mapping unit WZB. This is a very stony, fine sandy loam soil, with a gently sloping (3-8% grade) topography.

Lot 2 also includes a portion of the Leicester, Ridgebury, Whitman (very stony complex) soil type, mapping unit Lg. This soil type is made up of poorly drained Leicester and Ridgebury and poorly drained Whitman soils. The three soils occur in such an intricate pattern that it is not feasible to map them separately. All these soils are wet and very stony. They are nearly level or very gently sloping. Because of wetness and stoniness, they are used mainly for forestry, wildlife habitat, and unimproved pasture. Soil type Lg makes up approximately 25 acres of the site, surrounding Giffords Brook and its tributaries.

Lots 3, 4, and 5 are proposed in Woodbridge soil mapping unit WZA. It is largely a forest soil type. Scattered areas have been cleared and are used as unimproved pasture but is generally too stony for cultivated crops.

The other soil types found on the site are illustrated on the soil map, and their limitations summarized in the limitations chart found in the Appendix of this report.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The major concern for foundations would be the need for foundation drains and planning for proper depth and outlets. Any excavated slope for grading around the houses or driveways will seep if the depth of excavation is below the hardpan layer. The driveways will need subsurface drainage or the frost action will break up the surfacing material. Those areas where the seeps are present along with the natural slope of the land will indicate that sediment and erosion control practices could be used to good advantage to keep silt from entering the streams.

Plans prepared before construction should show how erosion and sedimentation will be kept at a minimum. Two SCS publications, Urban Hydrology for Small Watersheds, and Erosion and Sediment Control Handbook are available, as are SCS personnel, to assist with the planning of the land surface and natural cover.

FOREST COVER

Approximately 75 acres of the site are presently in woodland. Dominant tree species include red maple, white ash, shagbark hickory and northern red oak. Individual white pine are occasionally present. Understory growth is sparse, dominated by spice bush in the wetter areas where it becomes quite dense. Ground cover includes partridge-berry, rattlesnake plantain, princess pine, striped pipsisewa, and ground cedar. Wetlands are primarily wooded with the exception of a natural peat bog about two acres in size located in the approximate center of the site, adjacent to Giffords Brook.

Hardwood growth is variable with trees ranging in size from sapling through mature, some 16" diameter breast height (DBH) or greater sized trees are present. The old field areas account for approximately 16 acres and are vegetated with weeds and brushy growth including dense multiflora rose, hardhack, goldenrod, ragweed, jewel weed, and pussywillow. In addition, stonewall borders along field edges contain wild cherry and red maple trees.

WILDLIFE HABITAT

Areas of greatest value to wildlife include the overgrown fields and their adjacent borders. Food and cover is available in these areas primarily for cottontail rabbit and songbirds. Additional wildlife habitat is available on the 76 acres of woodland to animals such as gray squirrel, woodpeckers, songbirds, white-tail deer, ruffed grouse, raccoon, skunk, and opossum.

A dense tree canopy reduces understory growth of desirable browse plants in most wooded areas, due to reduced sunlight penetration. Overstocked pole size red maple further reduce the quality of habitat in wooded areas east of the old fields. Wetland areas including the peat bog provide wetland wildlife habitat. Wood duck and woodcock habitat is available along Giffords Brook. The peat bog may offer habitat to furbearers, waterfowl, and other birdlife. In addition, the assemblage of plants in peat bogs is often unique, being found only on bogs. These wet areas have additional values for sediment retention, water storage, streamflow regulation, and water quality protection.

Development of the front five lots would result in habitat losses to wildlife, however, grasses and shrubs utilized in landscaping lots following construction would help offset these losses. Giffords Brook, the peat bog and adjacent wetlands should not be developed or encroached upon. There should be provisions to maintain a minimum of 100 feet on either side of the brook and contiguous wetlands set aside in undeveloped land for wildlife and open space. Therefore, development of this site should be limited to lots adjacent to Pine Street, and along the southerly and easterly portions of the site.

FISH HABITAT

Giffords Brook is one of the few annual state-stocked trout streams in the Columbia area. It is a fine example of a small stream capable of supporting small numbers of native trout. It is nearly silt-free and is very well shaded throughout the area proposed for development. Preservation of the streambelt is desirable to maintain this valuable fish resource habitat. From a fisheries standpoint, creation of a pond as is mentioned on page 4 of this report would be detrimental to the existing fish resource. Pond excavation could contribute to higher water temperatures and reduced water quality to Giffords Brook, and could also jeopardize the flow volume in the Brook.

With the exception of a well-planned stream crossing perhaps to connect with the existing road network indicated to the northwest of this site on the topographic map, any development should be restricted from within 100' of the brook. This restriction should also be applied to the stream tributaries feeding Giffords Brook. Every effort should be made in the planning stages to minimize the actual number of stream crossings. Runoff from roadways and bridges will represent a potential source of contamination to Giffords Brook.

AESTHETICS AND PRESERVATION

The site possesses a number of special features which should play a role in the design of any subdivision which might occur on the plot. The most notable is Giffords Brook. As Pine Street becomes solidly built up with housing, a process which will be considerably advanced by the construction of homes on the proposed five front lots, the corridor of open streambelt land along Giffords Brook will become increasingly important as a natural break in a continuous wall of housing.

Maintenance of at least a 100' wide natural streambelt along the Brook would be desirable.

The Brook and its attendant wetland is a central feature throughout the site and is ideally located to serve as a natural park and greenbelt for adjacent lot owners in the proposed subdivision and in adjacent subdivisions. The streambelt contains the very fine remains of an old dam which could well serve as a focal point for a small community park or picnic area.

While the Town's subdivision regulations do not require the dedication of open space in new subdivisions, the long term value of the subdivision itself would benefit from dedication of the streambelt area to permanent natural open space functions. The land could be dedicated to the town or if the town were not interested it could be dedicated to a local or regional conservation trust, such as Joshua's Tract Conservation and Historic Trust. In the conveyance of title to land to the town or a trust, restrictions could be placed on the uses permitted on the site, for instance, mandating that the site be kept in its natural state with only hiking and fishing permitted.

An equally effective means to preserve the streambelt would be to grant a conservation easement to the town or a local land trust restricting disturbance of the natural character of that portion of the land covered by the easement. Such an easement need not permit general public trespass on the property but it would ensure that the natural integrity of the land would be preserved. Where the easement technique is used the actual ownership of the land could be retained by the developer or by the extension of adjacent lots into the wetland area.

The site has a number of stone walls in a variety of states of repair. Road locations and lot lines should be laid out to minimize destruction of these features in the construction of public roads or the construction of private homes.

The double row of walls between lots 4 and 5 are particularly noteworthy. The layout of the right-of-way to the interior of the subject parcel should be so located as not to necessitate the destruction of these walls when the proposed road is constructed at some point in the future. Location of walls along the periphery of lots is always to be preferred.

HAZARDS

The hazards of siltation and possible pollution (from individual septic systems) to trout-stocked Giffords Brook on the site would be a critical concern. This potential hazard could be reduced by use of practices outlined in the Erosion and Sediment Control Handbook.

ROADS AND UTILITIES

The proposed development when completely constructed will contribute incrementally to the need for improvements to Pine Street. The development in and of itself would not place undue stress on the collector road system in the area. The presence of subsurface water and small drainage ways would indicate the roads into this subdivision would have to include road drainage with numerous culverts.

WATER SUPPLY

Since the site is not anticipated to be served by public water in any current adopted plan on the local or regional level, individual on-site drilled wells are planned for each house. There should be no serious problems if sanitary health codes are met and proper sealing of well casing into solid bedrock is accomplished. Consideration for proper location of these wells to insure their protection must be provided for in the planning and construction stages. Adequate separation between subsurface sewage disposal systems, surface water, groundwater control drains and other sources of contamination and water supply wells must be maintained. Consideration should also be given to provide a community water supply for this development.

WASTE DISPOSAL

The site is not anticipated to be serviced with public sewers in any current adopted plan on the local or regional level. The State Plan of Conservation and Development includes the general area in the Limited Development category in which on-site disposal methods are to be considered permanent.

On-site disposal systems on the five lots along Pine Street will require additional design and site testing to overcome problems associated with wetness due to high water table. Because of the severe limitations of the soils along Pine Streets, curtain drains are planned for lots 1, 2, 3, 4, and 5. The effectiveness of the curtain drains should be verified by percolation tests after the drains (or trenches) have been installed. These curtain drains will probably lower the water table caused by natural means but the soil has a compact layer which allows water to pass very slowly. Introduction of septic effluent and wash water may still cause effluent to break out on the ground surface in the late fall and spring months.

Specific plans for the sewage disposal system serving each lot must be prepared by a professional engineer registered with the State of Connecticut and must be reviewed by the State Department of Health. If groundwater control drains are planned for purposes of lowering the water table in the area of the subsurface sewage disposal system their effectiveness must be demonstrated (they would be required to lower the groundwater at least two feet below the bottom of the proposed leaching system). Extensive plans and site preparation would be required to control the groundwater problems. The Land Development Corporation presented preliminary plans for groundwater control and subsurface sewage disposal which were prepared by the engineering firm of Griswold and Fuss. These plans indicate that the foundation and curtain drains serving lots 2-5 would discharge to Gifford Brook. The DEP and the agency administering the Inland Wetlands and Watercourses Act in the Town of Columbia should be consulted concerning the discharge of foundation and curtain drains to the Gifford Brook. Precautionary measures should be planned for and implemented to prevent siltation of Gifford Brook during any construction operations.

Test borings made during the site investigation by members of the Soil Conservation Service revealed the following:

- Lot #1 - Groundwater was observed to enter at 22 inches when the boring was made and had risen to 10 inches approximately one and a half hours later; a hardpan at 24 inches.

Lot #4 - Groundwater at 16 inches and a hardpan layer at 36 inches.

Lot #6 - Groundwater at 18 inches.

Proposed road (Timber Trail) adjacent to Lots #61 and 46 -- Mottling at 25 inches.

Lot #58 - Groundwater at 36 inches.

Mr. Pescetello, sanitary inspector for the Town of Columbia, conducted an investigation of soils on Lots #1-5, on October 26, 1975. At this time deep observation test pits were observed, and the findings follow here:

Lot #1 - 0-8 inches Topsoil
8-20 inches Subsoil
20-56 inches Compact sand

Mottles were observed at 22 inches with groundwater entering at 30 inches.

Lot #4 - 0-15 inches Topsoil
15-33 inches Subsoil
33-96 inches Compact sand.

Mottles were observed at 33 inches with groundwater entering at 29 inches and the walls were breaking away at 48 inches.

Lot #5 - 0-10 inches Topsoil
10-22 inches Subsoil
22-96 inches Compact sand

Mottling was observed at 24 inches with groundwater entering at 60 inches and the walls breaking away at 24 inches.

COMPATIBILITY OF SURROUNDING LAND USES

The Columbia Plan of Development indicates the area of this site as recommended for one acre residential development. A portion of the Giffords Brook is recommended for open space in the mountain-reserve category.

ALTERNATIVE LAND USES

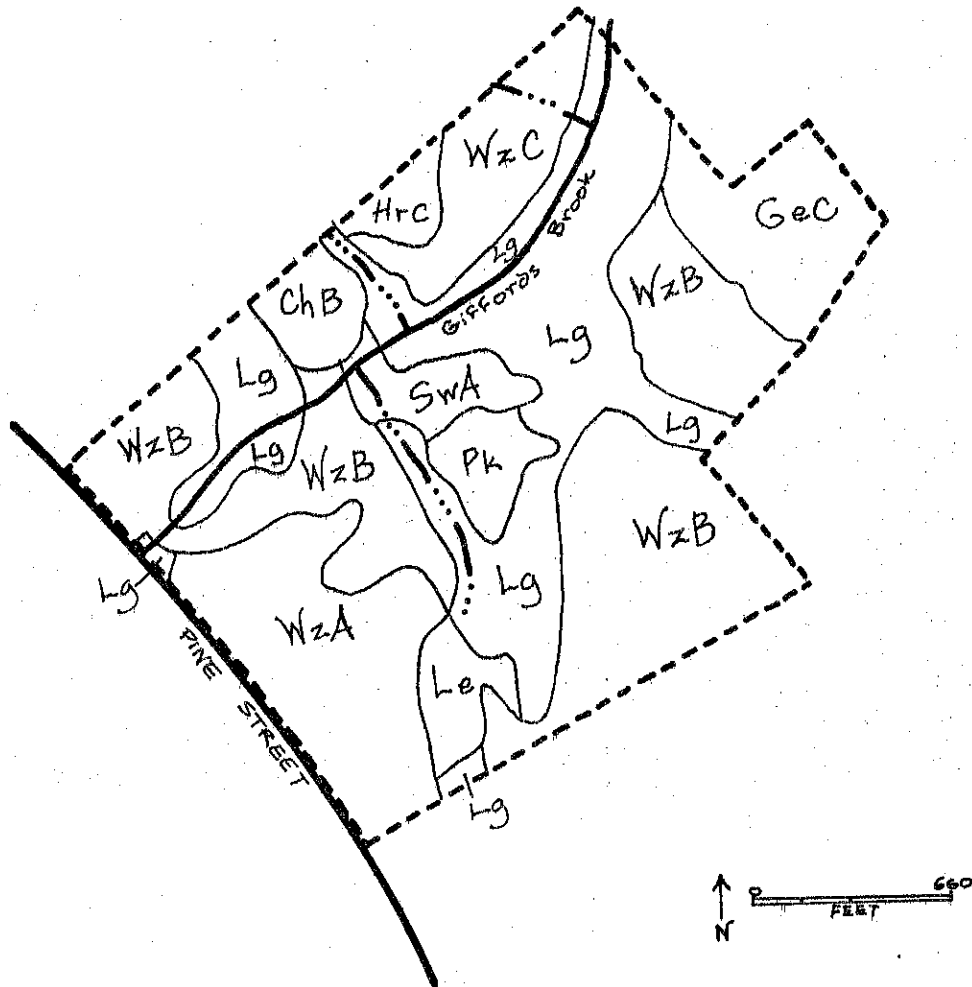
This site was selected for a deep water impoundment in the Columbia Stream-belt Report. Consideration should also be given to this land use as a potential recreation, fish, and wildlife habitat resource.



APPENDIX

SOIL MAP

PINE HILL ESTATES SUBDIVISION
COLUMBIA, CONNECTICUT



The map is an enlargement from the original 1,320'/inch scale to 660'/inch.

Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Conservation Service.

Advance Copy, Subject To Change.

May, 1976

PINE HILL ESTATES, COLUMBIA, 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
Charlton 3-8%	B-1a	ChB	3	3.2	Stoniness	2	2	1	2
Gloucester & Charlton 3-15%	B-1c	GeC	7	7.4	Slope	2	2	2	2
Hollis 3-15%	D-1	HrC	2	2.1	Depth to Bedrock	3	3	3	3
Leicester	B-3a	Le	3	3.2	Wet	3	3	3	3
Leicester, Ridgebury, Whitman	B-3b	Lg	25	26.7	Wet	3	3	3	3
Peat & Muck	F-1	Pk	2	2.1	Wet	3	3	3	3
Woodbridge 0-3%	C-2b	WzA	12	12.8	Wetness	3	3	3	2
Woodbridge 3-8%	C-2a	WzB	30	31.9	Wetness Lg. stones	3	3	3	2
Woodbridge 3-15%	C-2b	WzC	7	7.4	Wetness Lg. stones	3	3	3	2
Sutton 0-3%	B-2a	SwA	3	3.2	Wetness	3	3	2	2
TOTAL			94	100%					

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe (see back of this page for a further explanation of limitation classifications).

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.