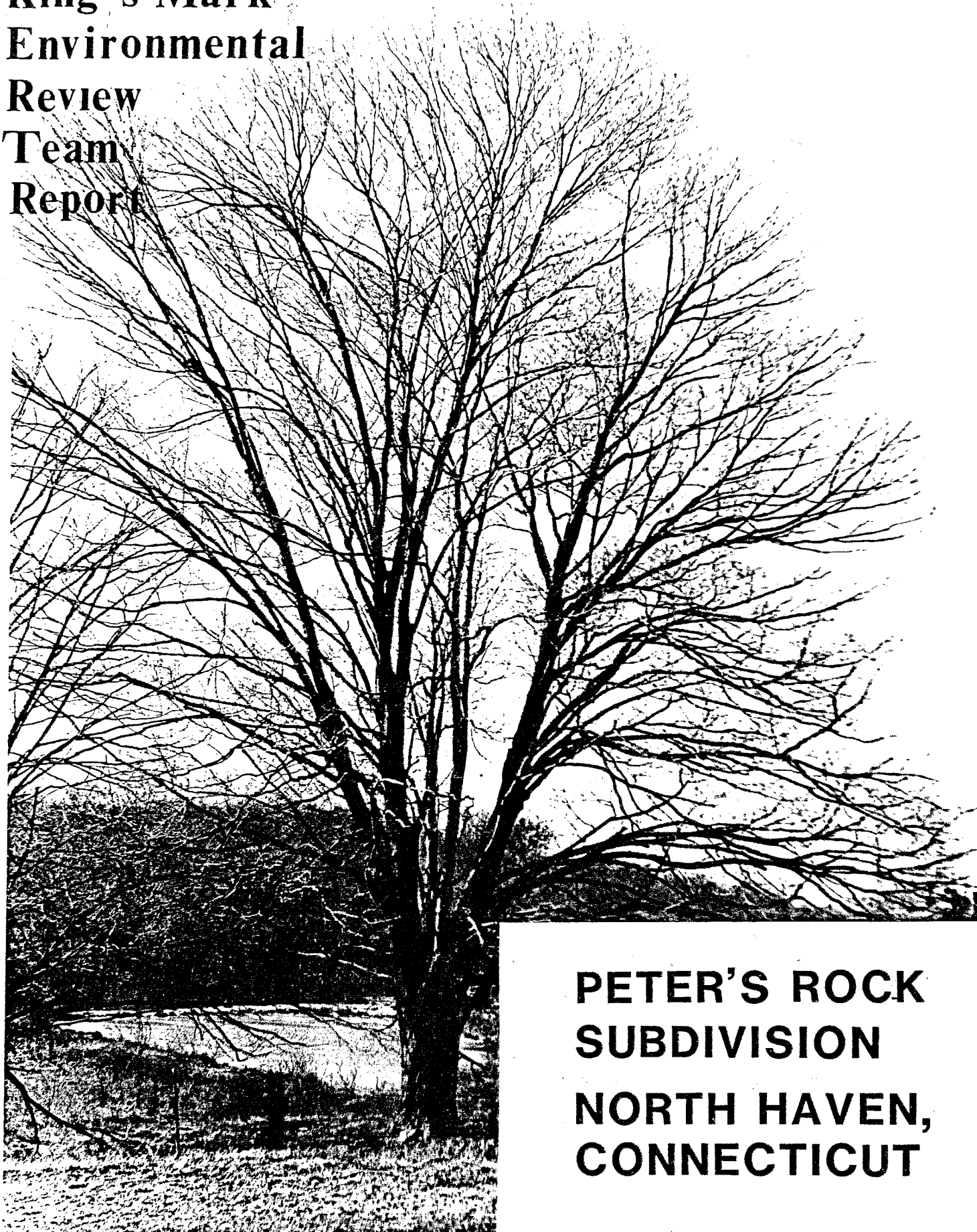


**King's Mark
Environmental
Review
Team
Report**



**PETER'S ROCK
SUBDIVISION
NORTH HAVEN,
CONNECTICUT**

PETER'S ROCK SUBDIVISION

NORTH HAVEN, CONNECTICUT

Environmental Review Team Report

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

North Haven Inland Wetlands Commission

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 Inland Wetlands Commission and the Town. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

MAY 1988

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team Coordinator, Nancy Ferlow, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this study:

- * William Warzecha, Hydrogeologist
Department of Environmental Protection - Natural Resource Center
- * Patricia Leavenworth, District Conservationist
USDA - Soil Conservation Service
- * Daniel Mayer, Inland Wetland Specialist
Department of Environmental Protection - Water Resources Unit
- * Judy Wilson, Wildlife Biologist
Department of Environmental Protection - Western District
- * Edmond Zaglio, Forester
Department of Environmental Protection - Forestry Bureau
- * Marie Silver, Planner
South Central Connecticut Council of Governments
- * Joseph Hickey, Recreational Planner
Department of Environmental Protection - Parks and Recreation

I would also like to thank Susan Anderson, Secretary for the King's Mark Environmental Review Team for assisting in the completion of this report.

Finally, special thanks to Frank Jablonski, Chair, North Haven Inland Wetlands Commission, John Papa, owner/developer, and Sergio DeCarli, developer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The North Haven Inland Wetlands Commission has requested that an environmental review be conducted on Peter's Rock, a site proposed for a subdivision development. The site is located in the southcentral portion of town, bordering the town of East Haven. The 182-acre site is characterized by second growth, mixed hardwood forests, wetlands, and rock outcrops. Steep slopes occur in the central and southern sections of the site. There are scattered wetland communities as well as numerous streamcourses. Several woods roads cross the site and it is currently used by hikers, campers, hunters and trail bikes. Peter's Rock, a town-owned open space and historic site, is almost surrounded by the property.

The proposed subdivision would encompass 122 house lots. Five roads are proposed to serve the subdivision. The subdivision would rely on municipal sewer and water.

The town was primarily concerned with the potential impact that the proposed development would have on: (1) existing natural resources; (2) effects of erosion and sedimentation; (3) traffic and access; and (4) site design compatibility. Therefore the Town asked the ERT to inventory on-site resources and determine their suitability for the proposed development.

The review process consisted of four phases: (1) inventory of the site's natural resources; (2) assessment of these resources; (3) identification of resource problem areas; (4) presentation of planning and land use guidelines. Based on the review process, specific resources, areas of concern and development limitations and opportunities were identified. The major findings of the ERT are presented below:

Setting, Land Use and Topography

The site is presently wooded but the western portions have an agricultural past. Slopes on the site range from gentle to very steep. Areas of steep to very steep slopes flank the stream eroded ravine and are concentrated around Peter's Rock. The bedrock controls the slopes in the areas dominated by steep slopes.

Geology

Two bedrock units underlie the site: New Haven Arkose and Butress Dolerite/West Rock Dolerite. New Haven Arkose consists of sedimentary rocks while the Dolerites consist of igneous rocks. The sedimentary rocks are relatively soft and should yield to heavy machinery. The igneous rocks are more compact and may need blasting during construction. The presence of shallow bedrock in the areas underlain by dolerite suggests that blasting may be required to place roads, foundations and utility lines. Any blasting which takes place should be done under the supervision of personnel familiar with the latest technology in blasting. A pre-blast survey of the area would also be wise so as to minimize the chance for damage claims.

Surficial geological materials which underlie the site are identified as glacial till and stratified drift. Till covers most of the site. The texture of the till ranges from sandy and loose in the areas of shallow bedrock to a more silty and compact variety which covers the remainder of the area. The more compact variety is commonly referred to as hardpan. Because the hardpan layer is compact, it has a low vertical permeability rate which creates a seasonally high water table. The high water table can be a hinderance in terms of construction. The availability of municipal sewers helps to allay some of the hydrogeologic concerns associated with building in hardpan soils. In order to reduce the chances for wet basements, building footing drains are suggested for homes with seasonally wet soils.

The stratified drift covers the till and bedrock paralleling Route 17. The major components are sand and gravel. A concern for the installation of utility lines is the potential for "cutback cave-ins" in sandy, gravelly soils. Proper shorings will be needed in deep trenches. Also sandy soil is typically droughty which makes it difficult to establish a vegetative cover.

There are five inland wetland areas on the site. The soils are poorly to very poorly drained in these areas. They hold very low potential for development purposes. The soil scientist's report noted that the flood control attributes and the sediment retention capabilities of the wetlands are good. The Inland Wetlands Commission needs to determine the impact of the project on the wetlands and decide if the activity deserves a permit.

Plans indicate a road crossing in the wetlands and building berms to create stormwater detention basins in the wetlands. It is suggested that fill lines be shown on the plans and the volume of fill quantified. This will aid decision makers in reviewing the project. The U.S. Army Corps of Engineers should be contacted if more than one acre of wetland is impacted as they may require a permit.

Hydrology

Most of the site drains to the Little River via the unnamed watercourse traversing the central parts of the site. The northeast part of the site drains to Fivemile Brook and the southeast part drains to Maloney Brook. Ground water at the site is classified as GB/GA which means that the groundwater is contaminated and the state has established a goal for cleaning it up. Surface waters off the site (i.e. Little River, Fivemile Brook, Farm River) are classified B or BA.

Conversion of the land from woods to subdivision development is expected to increase the amount of runoff from the site. Because the plans are preliminary, it is not known how storm drainage will be handled from individual lots. Three detention basins are planned in the southern limits of the site. These are not in a hydrologic position to capture runoff from the entire site. An ideal hydrologic position would be at the northwest limits of the site. If this is not feasible, the capacity of the proposed basins should be designed so that it compensates for runoff from the developed land in the drainage area which cannot be detained by the basin. Close examination of all downstream culverts is warranted.

All three detention basins are located in regulated inland wetlands. Since the wetland areas have some natural detention ability, it would be desirable to place the basins on upland soils. The detention basins may also be designed to function as sedimentation basins. This should be given consideration so sedimentation problems do not arise in streamcourses on and off site. Maintenance plans for the basins should be included in the plans.

In addition to creating or aggravating flooding problems, increased runoff can lead to streambank erosion and gulying. There is a high potential for erosion related problems, especially if a comprehensive soil erosion and sediment control plan is not developed. Once the plans and computations have been completed, the Town's engineer should carefully review the calculations.

Soil Resources

The soils occurring on the site are generally mapped in the "Soil Survey of New Haven County, Connecticut." Inland wetland and watercourse locations have been mapped by a soil consultant. Soil limitations on the site include: regulated inland wetland soils, steep slopes, high erosion potential and shallow soils.

Erosion and Sediment Control Considerations

The proposed development will require a detailed sediment and erosion control plan. Steeply sloping land and highly erodible soils dictate careful planning for control of erosion and sedimentation. Details should be provided for the proposed wetland crossing and the dikes for the detention basins. Lots along the steep ravine are also of concern. If these lots are graded improperly, concentrated runoff could cause rill and gully erosion along the steep stream embankments. Lots near or containing wetlands should be carefully developed with proper erosion and sediment controls.

Wetland Considerations

The area of wetlands on the site can be divided into four major systems. The first wetland (A) is located along Route 17. The second wetland (B) is located in the central portion of the site and consists of the stream in the ravine. The third wetland (C) is the large forested wetland in the southwest. The fourth wetland (D) is located in the southeast section. Two smaller wetlands exist (E1 and E2) in the northeast and southeast corners, respectively. All of the wetlands on the site are classified by the U.S. Fish and Wildlife Service as Palustrine, forested, broad-leaved deciduous, seasonally saturated. All of the systems possess the same functional values. They are excellent wildlife habitat and possess nutrient retention, pollution abatement and sediment retention functions. Flood water storage and aesthetic attributes are also excellent. These wetlands perform very high quality functions and are of high environmental quality.

The impacts of this development on the wetlands will be significant. The construction of detention basins will eventually change the overall character and quality of the wetlands by sedimentation and pollution infiltration. Recommendations include: (1) the use of box culverts for the road crossing to

limit the wildlife habitat disturbance; (2) consideration of the removal of lots 2 and 5 from construction due to the large percentage of wetlands; (3) creation of new wetland areas to mitigate the loss due to filling; (4) proper monitoring and maintenance of erosion and sediment control devices; (5) exploring alternatives to constructing detention basins in wetlands; (6) consideration of a cluster option; and (7) submitting detention berm plans to the DEP Dam Safety Unit. The North Haven Inland Wetlands Commission needs to decide if this proposal is within acceptable limits of wetland impacts with respect to the State Inland Wetland and Watercourses Act.

Wildlife Considerations

The site contains mixed hardwood forest, old fields, a 30 foot right-of-way, rock outcrops, a brook and wetlands. The area is surrounded by development but it does offer an area of habitat to many species because of its size. The wetlands increase the habitat diversity and are important areas to preserve. Setting aside an "island of open space" whether wetlands or not, is least desirable for wildlife. Natural travelways are needed to pass from one area to the next.

As with any development, the impact on wildlife habitat will be negative. The area will be broken up and lost with the construction of roads, driveways, walkways, parking areas and homes. Other impacts include the creation of lawns and introduction of humans, traffic, dogs and cats. The proposed retention basins will have little value to wildlife.

There are many steps that can be taken in order to make the area more suitable for wildlife. These include buffer strips, natural landscaping techniques, maintaining forest wildlife requirements and providing nesting boxes for birds. Large lots would help to minimize the impacts on wildlife as would cluster development.

Forest Resources

The site can be divided into four forest types: mixed hardwoods, wetlands, old field and shrubby right-of-way. The health of the forest is good at the present time. The most serious insect pest problem will be gypsy moth defoliation. This will affect the oaks on the site. The black birch exhibited a fungal growth. This may weaken the trees until they break. The hemlocks on the site are subject to woolly adelgid.

The proposed development will affect approximately 14-15 acres of forest for road construction. Building houses will affect even more. In a number of areas there are large trees. If these can be saved, the aesthetics of the area may be enhanced. Among the least favorite food of gypsy moths are poplars, ashes and eastern redcedar. If these can be favored, the area might not be so susceptible to gypsy moths.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species or Connecticut "Species of Special Concern" that occur within the study area.

Natural Area Inventory Site

Peter's Rock is a point of great interest with its hexagonal basalt columns and dry site vegetation. It is one of 459 sites set aside as a Natural Area by the Connecticut Forest and Park Association in 1972. A site receives no legal protection by being included on the Natural Area Inventory list.

Planning Considerations

The Town Master Plan designated the area around Peter's Rock for "Natural Preservation Concept" protection. The plan shows low density residential and open space uses in the area. The site is located on an R-40 zone. The current plans comply with the zoning code standards. Surrounding land uses include residential subdivisions and commercial businesses.

The site has very steep slopes. Several lots are proposed on these slopes which will have an effect on the soil and vegetation. In addition, the buildings on the western slope will have a visual impact on the surrounding area. Care should be taken to address the possible aesthetic impacts. The use of visual barriers will be very important. Lots with building envelopes on steep slopes will require very careful planning. Perhaps the building envelopes could be shifted to a flatter portion and deed restricted. North Haven includes wetlands in their calculations of area for lots. Impacts on wetlands may be substantial in lots with large areas in wetlands. Deed restrictions on activities in wetlands should be considered. Another wetland impact will come from road and sewer line crossings. Crossings should keep road widths to a minimum and reduce fills. Sewer lines should avoid wetlands to reduce the amount of wetland disturbance and possibilities of contamination from leaks or line repair work. Other issues include the effects of blasting on Peter's Rock and access to the Park.

Traffic consultants should assess the impacts of the development. Access points onto Middletown Avenue have good sight lines, and the anticipated development traffic should be fairly low. Access via Glen Haven Road may prove more difficult with limited sight lines. Contact with East Haven planning and engineering staff is suggested. A traffic study should consider the impact of all access via Middletown Avenue and Traffic from Glen Haven Road Moving north through the subdivision.

Recreation Considerations

The property has some serious limitations. A cluster approach might be preferable with property of this type. Such a plan could avoid areas with severe limitations and focus on areas that are better suited for development. Costs of construction and maintenance could be cut with the decreased roads and utilities. This type of proposal may also decrease the need for detention basins. The cluster approach would be preferable from an open space and recreational standpoint. While the open space would have little value for intensive recreation, preservation of natural features and passive recreational opportunities would be of great value.

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INTRODUCTION



The review process consisted of four phases:

- (1) Inventory of the site's natural resources (collection of data).
- (2) Assessment of these resources (analysis of data).
- (3) Identification of resource problem areas.
- (4) Presentation of planning and land use guidelines.

The data collection phase involved both literature and field research. The ERT field review took place on April 13, 1988. Field review and inspection of the proposed development site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused and specific information concerning the site was collected. Being on site also allowed Team members to check and confirm mapped information and identify other resources.

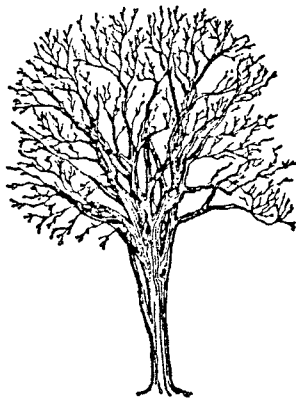
Once the Team members had assimilated an adequate data base, it was then necessary to analyze and interpret their findings. The results of this analysis enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Individual Team members then prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

The primary goal of this ERT is to inventory and assess existing natural resources occurring on the site as well as providing planning and traffic/access information. Specific objectives include:

- (1) assessment of the geological characteristics of the site, including geological development limitations and opportunities for roads and houses;
- (2) assessment of the hydrological characteristics of the site, including wetland hydrology and stormwater drainage;
- (3) determination of the suitability of existing soils to support the proposed development;

- (4) discussion of soil erosion and sedimentation concerns;
- (5) assessment of the impact of the development on the wetlands and rivers;
- (6) assessment of the impact of the development on the wildlife/habitat;
- (7) evaluation of traffic and access concerns, and;
- (8) assessment of planning and land use issues, including open space and recreational planning.

PHYSICAL CHARACTERISTICS



SETTING, LAND-USE AND TOPOGRAPHY

The subdivision site, approximately 182 acres in size, is located at the southern limits of North Haven. The East Haven town line forms the southern boundary of the parcel. Route 17 (Middletown Avenue) borders the northwest parts of the site and will provide two access points to the subdivision. Glen Haven Road in East Haven will be the other access point to the subdivision. Except for some commercial development along Route 17 (northwest side), the site is bordered by residential properties. It should be noted that Peter's Rock (a.k.a. Rabbit Rock), a local prominent land form and town owned open space area, lies just north of the site (see Natural Area Inventory Site section).

The site is located in an R-40 zone. Permitted uses of the land include single family residential properties with minimum lot sizes of 40,000 square feet (about 1 acre) and minimum frontage of 150 linear feet.

Although the site is entirely wooded at the present time, the western portions have an agricultural past. A 1934 air photo of the area depicts open farmland and orchards. In general, changes in the area land use since 1934 include a decrease in active farmlands, an increase in forested acreage, an increase in residential density and an increase in area covered by paved roadways.

Present plans indicate the construction of 122 house lots and approximately 12,000 linear feet of interior roads. The houses will be served by public water from the South Central Connecticut Regional Water Authority and by public sewers tied into the North Haven municipal system.

Slopes on the site range from gentle to very steep. The gentlest slope occurs along Route 17 in the northwestern parts and the wetlands in the southern parts. The majority of slopes on the site are moderately steep and

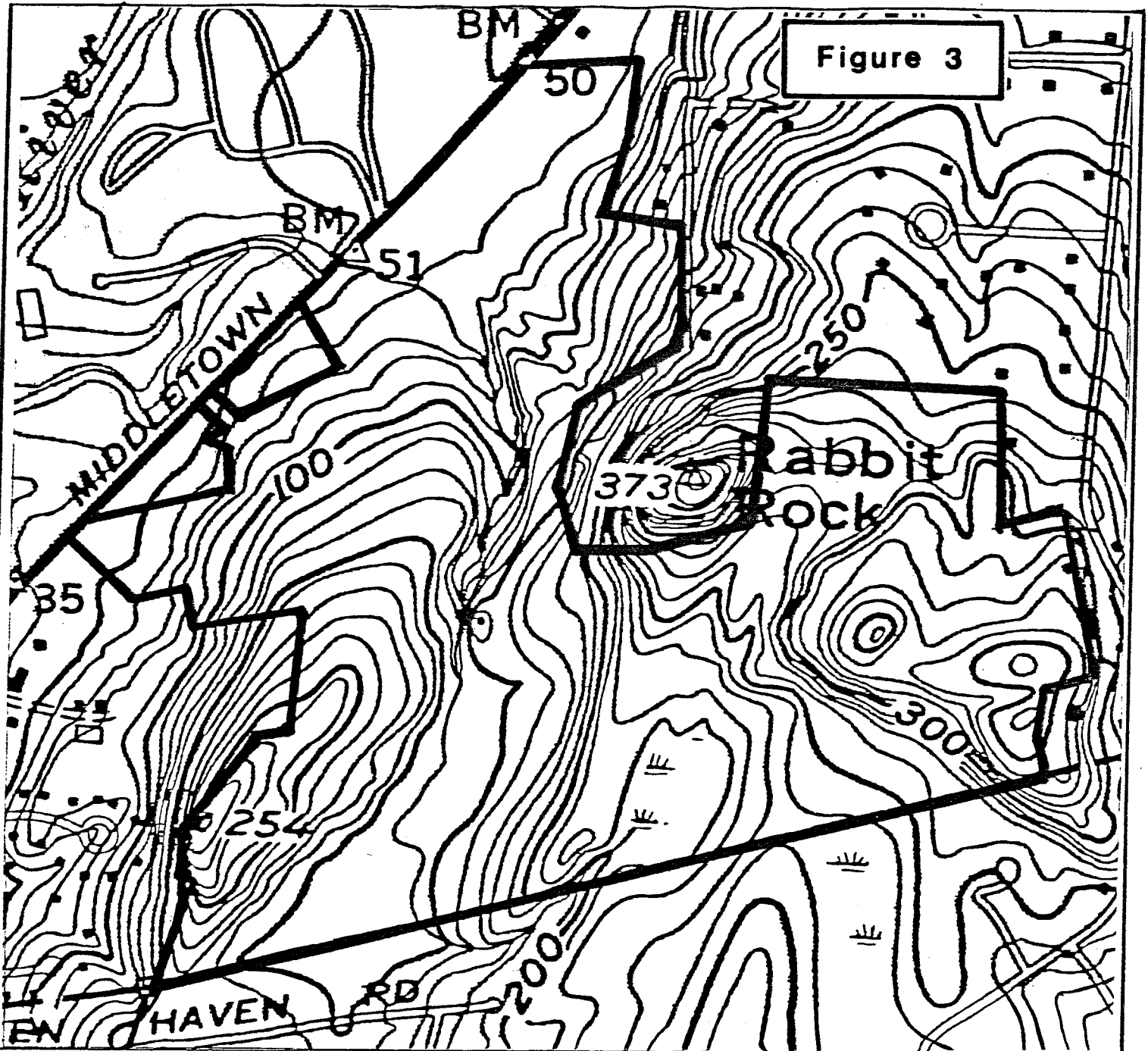
occur in the interior sections. Areas of steep to very steep slopes flank the stream eroded ravine in the central parts and are concentrated around Peter's Rock as well as the western parts of the site. The bedrock surface controls the slopes in the area dominated by steep slopes. It is at or near ground surface in these areas. Site elevations range from about 300 feet above mean sea level near Peter's Rock to about 50 feet above mean sea level along Route 17 (see Figure 3).

GEOLOGY

Bedrock in the vicinity of the site consists of New Haven Arkose* and Butress Dolerite/West Rock Dolerite* (see Figure 4). New Haven Arkose, which underlies most of the site, consists of sedimentary rocks. Sedimentary rocks are composed of bits and pieces of earlier rocks that were eroded from one area, transported to and redeposited in another area and cemented together over long periods of time. New Haven Arkose, a unit of middle to late Triassic age (about 200 million years old), consists of reddish-brown feldspathic and micaceous sandstone and siltstone.

Butress Dolerite/West Rock Dolerite which bisect the central parts in a northeast/southwest direction and which underlie the eastern parts, consist of igneous rock. Igneous rocks, in contrast to the sedimentary rocks, are formed by the solidification of liquid or "molten" material. The dolerites (traprock) are typically dark-colored (dark-grey to orange-brown weathering) and have a fine grained texture. They intruded the "layer cake" of sedimentary and igneous rocks that underlie North Haven as dikes and sills.

* Source: John Rodgers - Bedrock Geological Map of Connecticut, 1985.



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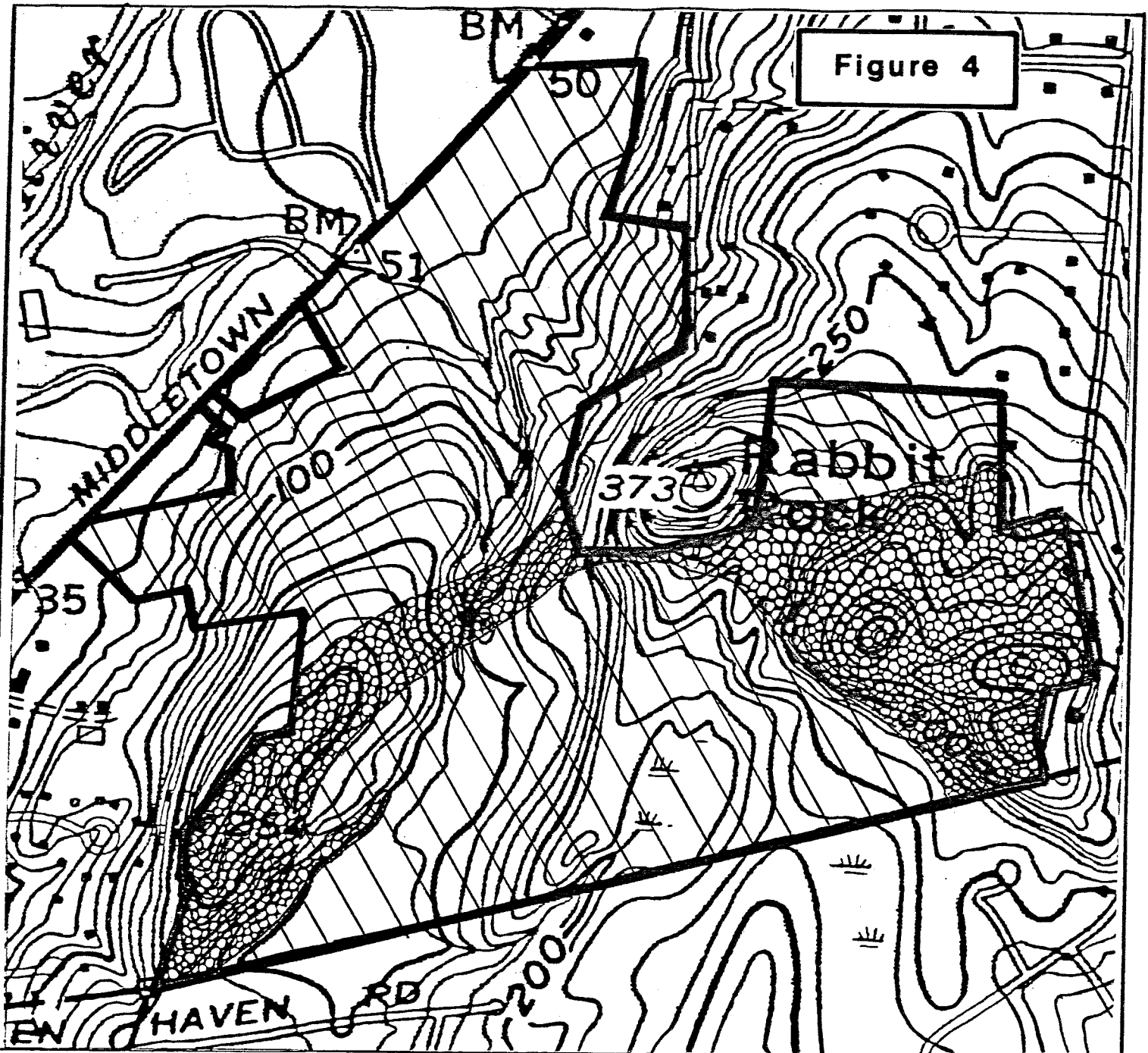
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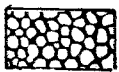
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Figure 4



NEW HAVEN ARKOSE



WEST ROCK DOLERITE AND
BUTRESS DOLERITE
(TRAPROCK)

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The sedimentary rocks (New Haven Arkose) underlying most of the site are relatively soft. The dolerites (traprock) are much more resistant to weathering and erosion.

The types of bedrock encountered on the site may have complications with respect to the need for blasting. The New Haven Arkose as noted above, is a much weaker rock than the dolerites that intruded into it. If the New Haven Arkose is encountered during construction, the upper few feet of it should yield easily to heavy equipment. As a result, little need for blasting is foreseen in these areas. On the other hand, dolerites are much more competent and, if encountered, will probably require blasting.

The presence of bedrock at shallow depths, which are primarily in the areas underlain by the dolerites (bisecting the central parts in a northeast/southwest direction and in the eastern parts) suggests that blasting will probably be required in order to place utilities such as electric, water and sewer lines, and possibly roads and house foundations. Any blasting that takes place on the site needs to be done very carefully and under the strict supervision of people experienced with newest technology in blasting techniques. This will hopefully help to diminish the chance for seismic shock and air blast problems. Of special concern with respect to the latter is the high density of residential homes in the area and Peter's Rock, a prominent basalt hill in North Haven. In this regard, it is suggested that the applicant's blaster be required to conduct a pre-blast survey in the area. Generally speaking, it is only when blasting is conducted without regard to seismic shock or air blast impacts that there are problems on surrounding properties.

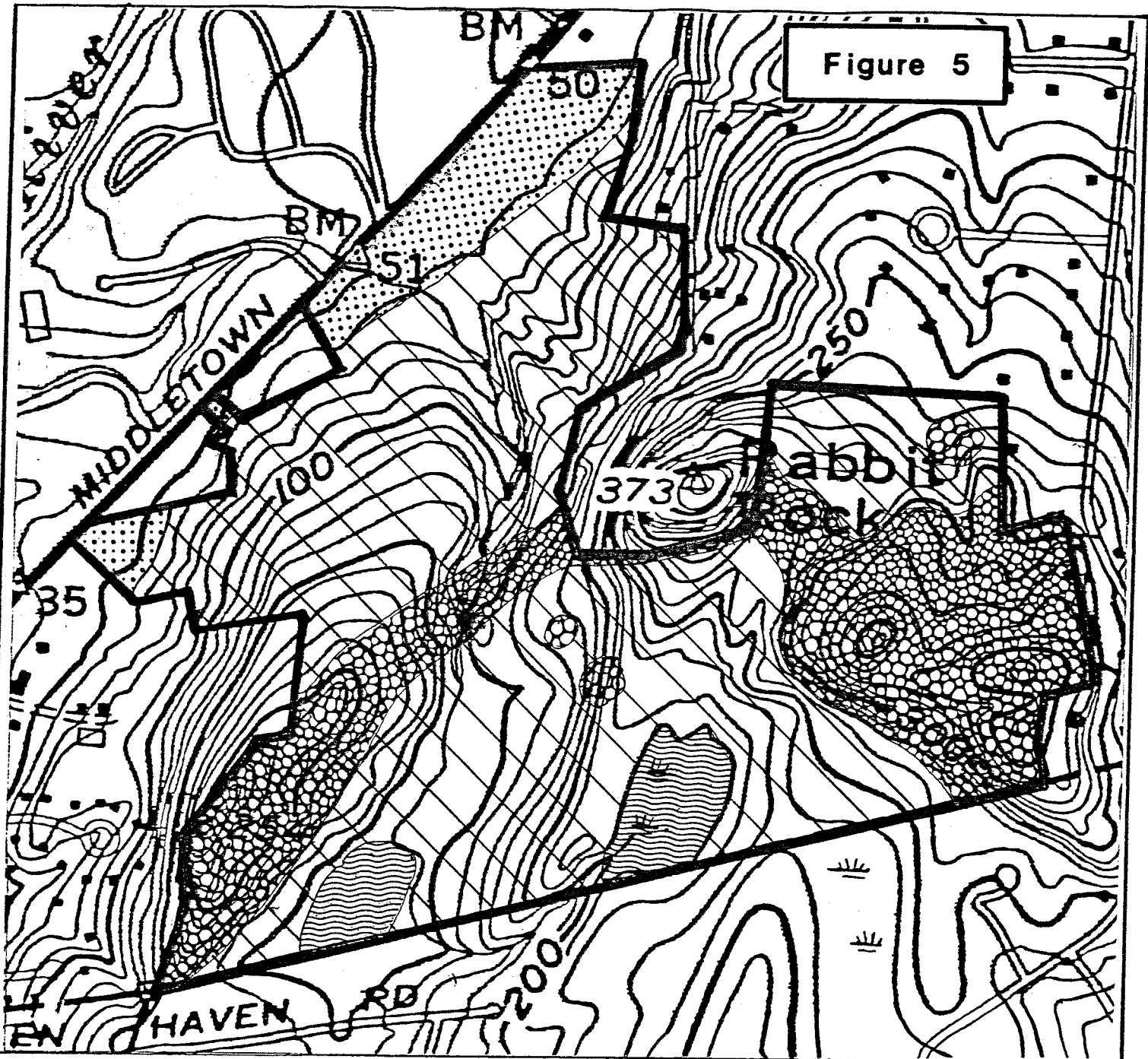
The proposed subdivision site is covered by two types of glacial sediments: till and stratified drift (see Figure 5). Till covers most of the site. It consists of glacial sediment that was deposited directly from glacier ice. The


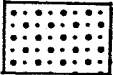


sediment is made up of varying proportions of sand, silt, gravel, clay and boulder. Particles of different sizes are generally mixed together in a complex fashion. The texture of till on the site ranges from sandy, stony and loose or moderately loose in the shallow to bedrock areas to a more silty, compact variety on the remainder of the site. The latter type of till is commonly referred to as "hardpan." Because the "hardpan" layer, which developed below the weathered and rooted surficial soil zone, is quite compact, it has a low vertical permeability. During the wetter times of the year, the more permeable soil zone above the "hardpan" layer often becomes saturated with groundwater resulting in a seasonally high water table. The seasonally high water table condition will be a hindrance in terms of constructing the proposed homes. The availability of municipal sewers to the site will help to allay the principal hydrogeologic concerns commonly associated with "hardpan" soils and the installation of on-site septic systems. Finally, in order to reduce the chance for wet basements on these soils, it is strongly suggested that homes constructed on the seasonally wet soils have building footing drains installed around them.

The major concern with construction of homes on the shallow till soils is mainly the potential for blasting.

The other glacial deposit found on the site is stratified drift. It covers till and bedrock and generally parallels Route 17 in the northwest parts. Stratified drift, whose major components are sand and gravel, was deposited by streams of glacial meltwater. Several tens of feet of sand and gravel may cover this area. A concern of the installation of sewers, waterlines and electric lines is the potential for "cutback" cave-ins in sandy gravelly soils. Proper shorings of sides will be needed in deep trenches (5 feet or greater). Also, because sandy soils are typically droughty, it is often difficult to stabilize slopes with vegetation.

Figure 5

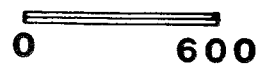


-  TILL
-  STRATIFIED DRIFT
-  SWAMP DEPOSITS
-  AREAS WHERE BEDROCK IS AT OR NEAR GROUND SURFACE

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wetland soils. There is also a chance that road fill material may extend into regulated soils. In this regard, it is suggested that fill lines be shown on the subdivision plans and the volume of fill to be placed over regulated soils be quantified. This will greatly help land-use decision makers in Town in reviewing the proposed project. The U.S. Army Corps of Engineers should be contacted if more than one acre of wetland is impacted, as they may require a permit.

HYDROLOGY

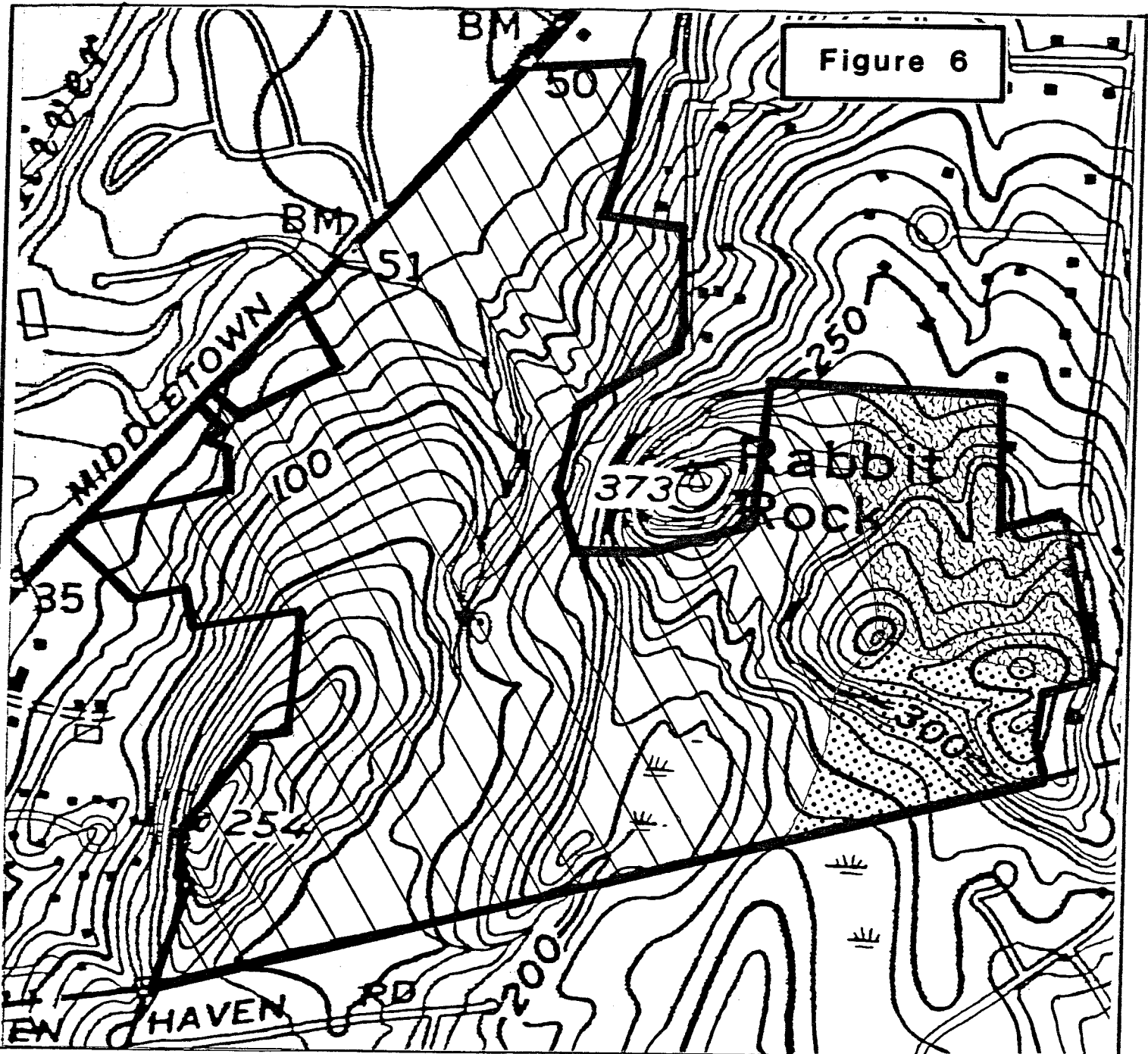
Most of the 182-acre site drains to Little River via the unnamed watercourse traversing the central parts of the site (see Figure 6). Little River arises in Harten's Pond northeast of the site and ultimately flows into the Quinnipiac River. Surface drainage in the far eastern limits of the site (roughly lots 75-80, 82 and 89-103) can be divided into two areas. The northern part of this area drains to Fivemile Brook via seasonal drainageways. Fivemile Brook is a Muddy River tributary. The southern part flows to a small wetland in East Haven (north of Batt Lane). The outlet for the wetland flows into Maloney Brook, a Farm River tributary.

Groundwater at the site is regulated by the Connecticut Department of Environmental Protection as GB/GA. This rating means that groundwaters are contaminated. The state has established a Class GA goal as these waters are being used as a private supply source or could be used for that purpose in the future. The proposed homes will not be served by on-site wells.

Mean annual precipitation in the North Haven area is about 49 inches per year.* The portion of annual precipitation that infiltrates into the

* The Climate of Connecticut by Joseph J. Brumbach, 1965, Bulletin #99, pg. 76.

Figure 6



Portion of site that drains to Little River



Portion of site that drains to Fivemile Brook



Portion of site that drains to Maloney Brook

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percent of the homes and respective road frontage proposed for the subdivision. An ideal hydrologic position would be at the northwest limits. If this is not feasible from an engineering standpoint, then the capacity of the proposed detention basins must be designed so that it compensates for runoff from the developed land in the drainage area, which cannot be detained by the basin. Close examination of all downstream culverts, especially the culverts passing under Route 17, is warranted.

All three detention basins are located on regulated inland wetland soils. Construction of the detention basins in wetlands will require a permit from the North Haven's Inland Wetlands Commission. Since the wetland areas already have some natural ability to detain stormwater flows, it would be desirable to keep detention basins on upland soils. The proposed detention basins may also be designed to function as a sediment basins. This should be given consideration so that sediment problems do not arise in streamcourses on and off the site. Maintenance measures should be included in the stormwater management plan in case a significant build up of sediments occurs during construction or from road sand accumulation from the roads following the construction period. There should be a determination made as to who will maintain the sediment basins. An access road for maintenance equipment to each basin should be shown on the final plan.

In addition to creating or aggravating flooding problems, increased runoff can lead to streambank erosion and gullyng. In view of the moderate to steep slopes, the presence of silty soils, seasonal seeps and "hardpan" soils in the interior sections, there is a high potential for erosion related problems, especially if a comprehensive erosion and sediment control plan is not developed for the subdivision. The Connecticut Soil Erosion and Sediment Control Act (Public Act Number 83-388), which became fully effective July 1,

1985, requires a detailed erosion sediment control plan for the project. The erosion and sediment control plan should be properly enforced by the Town. Disturbed areas should be kept to a minimum under such a plan. The erosion and sediment control measures called for under the plan should be shown on the final subdivision plan.

In summary, once the stormwater drainage plans and computations have been finalized, the Town's engineer should carefully review the plan and calculations. It is suggested that the design engineers reference the Connecticut Guidelines for Soil Erosion and Sediment Control for the design of detention basins, sediment basins and erosion and sediment control measures.

SOIL RESOURCES

The Peter's Rock subdivision consists predominantly of shallow (<20 inches) to deep (>40 inches), nearly level to very steep, glacial till soils on bedrock controlled uplands. Soil complexes with bedrock outcrops occur in the southeast and southwest sections of the parcel. A bank of glacial outwash soils occurs along Middletown Avenue. A stream corridor passes through the center of the parcel in a north-south direction. The corridor is narrow in one section forming a deep ravine linking major wetland areas.

The soil map included with this report (Figure 7) is a copy of the map sheet from the Soil Survey of New Haven County, Connecticut, 1979. All discussions about inland wetland locations and boundaries should use the wetlands as mapped by the soils consultant. Field review showed these wetland boundaries as generally accurate. Watercourses are also shown on the plans submitted. A chart of important soil features and interpretations has been prepared (Appendix A). Specific concerns include:

1. Lots with steep slopes include lots 56, 57, 58, 59, 60, 70, 71, 72, 73, 74, 79, 80, 81, 82, 93, 107, 109 and 111. Extensive grading on these lots will be necessary for house site development and driveway access. Erosion hazard will be high.
2. Lots with shallow to bedrock soils and bedrock outcrops include lots 112 and 113, lots along Road "C" and lots in the southeastern portion of the site. Many of these lots also have steep slopes.
3. Lots such as 1, 2, 5, 20 and 67 have large areas of wetland. Very often landowners will try to expand their useable yard space by filling wetlands or using these areas as dump sites for grass clippings and yard debris. This form of wetland encroachment is often subtle and difficult to prevent.

EROSION AND SEDIMENT CONTROL CONSIDERATIONS

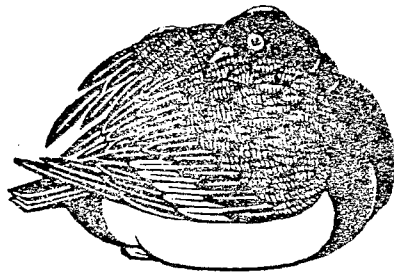
The proposed development will require a detailed sediment and erosion control plan. This plan should address items listed on the Sediment and Erosion Control Plan Worksheet (see Appendix B). The 1985 Connecticut Guidelines for Soil Erosion and Sediment Control should be used as a standard reference.

Steeply sloping land and highly erodible soils in several areas of the parcel dictate careful planning for control of soil erosion and sediment during development. Topsoil may have to be brought in to properly stabilize areas where shallow to bedrock soils exist.

Details should be provided for the proposed road crossing of inland wetlands and for construction of the dikes for detention basins 1, 2 and 3. A specific construction sequence including installation of sediment and erosion control measures should also be provided. Details are needed for the dikes and embankment to show properly designed foundation cutoffs and spillways, information on proper foundations for the embankments and provisions for maintenance. Maintenance access for dikes at basins 1 and 3 should be specified. Antiseep collars are needed with pipe spillways.

Along with those lots located on steep and shallow to bedrock soils, lots located along the watercourse ravine and other wetland areas and lots having pronounced surface drainageways are also areas of concern with respect to erosion and sediment control. If lots along the ravine are graded improperly, concentrated runoff could result causing rill and gully erosion along the steep stream embankments. Surface drainageways pass through lots 69, 70, 106, 107 and 108 and concentrated runoff flows could result in drainage and erosion problems. Lots near or containing wetlands should be carefully developed with proper erosion and sediment control principles and measures. The amount of vegetation removed should be kept to a minimum.

BIOLOGICAL RESOURCES



Glen Haven Road. The dominant vegetation in this wetland consists of Red Maple (Acer rubrum), Oaks (Quercus sp.), Birches (Betula sp.), Spicebush (Lindera benzoin), Roses (Rosa sp.), Highbush Blueberry (Vaccinium corymbosum), Skunk Cabbage (Symplocarpus foetidus) and Ferns.

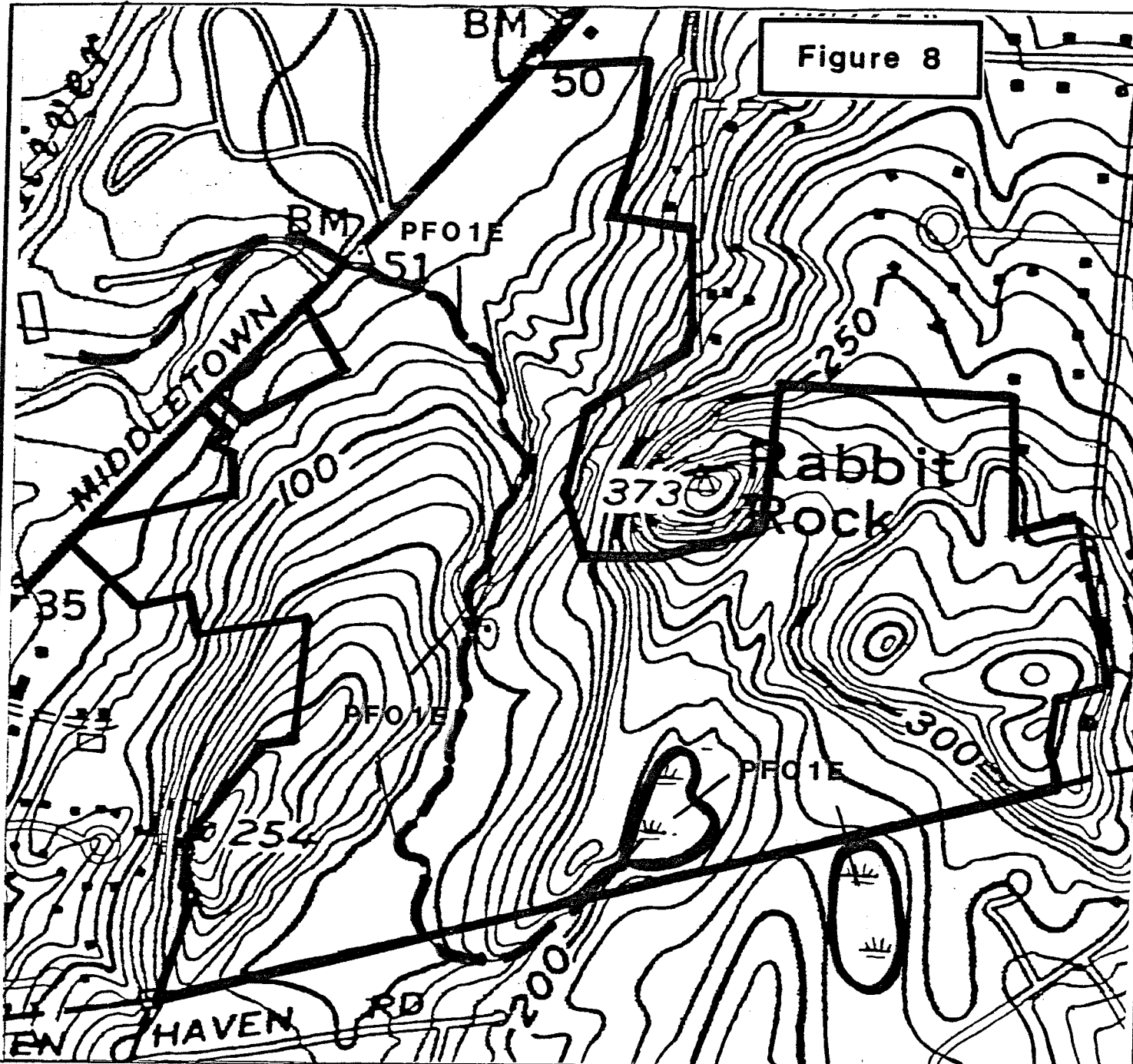
The last area of wetlands (D), is located on the southeastern portion of the site and is approximately 5.1± acres in size. This wetland drains into a stream channel at its southwest corner and ultimately flows into wetland area (C). This wetland possesses the following species of vegetation: Red Maple (Acer rubrum), Birches (Betula sp.), Oaks (Quercus sp.), Spicebush (Lindera benzoin), Roses (Rosa sp.), Highbush Blueberry (Vaccinium corymbosum), Sweet Pepperbush (Clethra alnifolia), Skunk Cabbage (Symplocarpus foetidus), Ferns and Grasses.

All of the wetland areas found on site are of good to excellent quality with the exception of area (A), due to its proximity to Middletown Avenue. As can be assumed by the vegetation identified, all of the wetland areas have much of the same vegetative character, though they still possess distinct and unique visual qualities. As defined by the U.S. Fish and Wildlife Service, all of the wetlands found on site are classified as follows: (see Figure 8)

PF01E-Palustrine; forested; broad-leaved deciduous; seasonally saturated.

In addition to the four major areas described above, two small wetlands exist on site which are 0.9 acres, in the northeast corner of the site (E1), and 1.3 acres in the southeast corner of the site (E2). Both of these wetlands possess similar vegetation as that noted in the other wetlands and have the same Fish and Wildlife Service classification. The 0.9 acres (E1) in the northeast corner comprise an intermittent stream which flows off of the

Figure 8

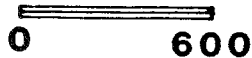


PFO1E Palustrine, forested, broad-leaved, deciduous, seasonally saturated

**PETER'S ROCK
SUBDIVISION
NORTH HAVEN
CONNECTICUT**

**NATIONAL WETLAND
INVENTORY**

King's Mark Environmental Review Team



Development Impacts

The impacts of this development on the wetlands would be significant despite the fact that the developer plans to deed all wetland areas to the Town of North Haven. The plans include the construction of two detention berms, a combined road crossing and detention berm, and three detention basins all within wetland boundaries. All of these activities will contribute to significant adverse impacts on the wetlands during and after construction.

The first berm will be constructed at the northern end of wetland area C. This berm will cross the opening of the ravine and be constructed to a height of approximately eight feet. This will result in an undetermined amount of wetlands filling and create potential for severe sedimentation problems within the ravine wetland and stream channel. This berm will also create the proposed detention basin #3 on the plans. Although developmentally practical, the creation of such basins within existing wetland areas is not a favorable activity for many reasons. The most obvious and detrimental impact will be an increase in the amount and type of pollutants which will enter the wetland. Increased runoff will also carry significantly larger loads of sediments, resulting in a need for continued monitoring of the basin, so that sediment accumulations can be removed whenever necessary. The combined effect of increased pollution and sediment loads into the wetland area will eventually produce a change in the overall character and quality of the wetland. This can be noticed by changes in plant species and diversity as well as reductions in wildlife populations and frequency of sightings.

The second berm will be constructed in the southwest corner of wetland area D. This berm will be approximately six feet in height and be constructed across the outlet of this wetland area. Again, the impacts of this berm will be much like those described above. In both cases culverts will be placed at the base of the berm to allow for the controlled outlet of water.

The combined road crossing and detention berm will be constructed in the middle of wetland area C, bisecting it into detention areas #3 and #2. The crossing will be approximately 6 feet high, 40 feet wide and 210 feet across. The construction of this crossing will have significant impacts beyond those mentioned with respect to the berm constructions. The placement of this crossing in a high quality wetland and its interruption of the existing natural corridors increase its impacts. Apart from the obvious increase in fill area, this crossing will create a physical barrier to wildlife. Culverts will be installed to control water flows, but these will not provide adequate corridors for wildlife movement through the area.

In addition to the activities proposed within the wetlands themselves, there exists the potential for severe sediment and erosion problems due to blasting which will be required to place public sewer and water and some building foundations. The shallow to bedrock soils which are present on much of the site, are susceptible to erosion. A portion of the sediments from these activities will unavoidably enter into the wetlands and intensify the immediate impacts from the project.

Recommendations and Conclusions

- (1) The use of box culverts for the crossing of wetland area C is highly preferred, so as to limit long-term disturbance to the habitat corridor. Box culverts with natural bottoms would provide a less intimidating barrier to the movement of small mammals and invertebrates. Crossings of this type would also maintain the natural water flow rates and allow the wetland to perform natural flushing of sediments and debris during storm events without any ponding of water. This recommendation is based on the question as to whether the proposed detention basin #2 is actually needed for adequate flood control on site. If ponding were to occur because of the use of smaller culverts this could alter the natural character of the corridor and would result in increased sediment and debris accumulation.
- (2) Due to the high percentage of wetlands which exist on lots 2 and 5 in combination with the town's set back requirements from roadways, it is recommended that the elimination of these lots as building sites be seriously considered.

- (3) The proposal shows no attempt on the part of the developer to create new wetland areas to compensate for wetlands lost due to fillings. Proposals of this magnitude often include such measures as mitigation for wetland area and functions lost to development.
- (4) Due to the slopes present on site, proper monitoring and maintenance of sediment and erosion control devices will be crucial in mitigating potential sediment and erosion hazards.
- (5) Alternatives to constructing the detention basin within existing wetlands should be thoroughly explored. Construction of such basins within wetlands create potential for adverse changes in wetland character (vegetative types, water regime, sediment filtration functions, wildlife diversity, etc.) and quality.
- (6) Overall, the development of this site as proposed does not appear to be the most prudent of the many options available to the developer. This site would appear to be best suited for cluster development to minimize wetland impacts and maintain the highest possible percentage of wetland functional area and open space. This form of development would be beneficial not only from a wetlands protection point of view, but also in light of the historical and functional values of the area. Such development techniques maintain the productivity and usefulness of the land to its owner while having the least amount of overall impact to the general public and environment.
- (7) Due to the size and function of the proposed detention berms, it is recommended that the applicant submit comprehensive plans to the Water Resources Unit, Dam Safety Section, of the DEP. Such plans should include complete construction specifications, hydrologic data and building materials in order to determine if a dam permit will be required for construction.

In conclusion, based upon the above evaluation it would appear that the North Haven Wetland Commission should consider if this proposal is within acceptable limits of wetland impacts with respect to the State's Inland Wetlands and Watercourses Act, Section 22a-36 to 22a-45 inclusive. Feasible and prudent development alternatives exist for this site and should be explored thoroughly.

WILDLIFE CONSIDERATIONS

Description of Area/Habitats

The 182-acre parcel contains mixed hardwood forest, overgrown old fields, an area of early successional stage vegetation within the 30 foot right-of-way, rock outcroppings, a brook and its associated wetlands and several other wetlands. Wetlands comprise about 26 acres of the area. The majority of the area is covered by mixed hardwood forest.

The existing wetland vegetative characteristics and wildlife habitat values appear to be fairly thoroughly described in the report by Soil Science and Environmental Services, Inc., thus comments will be directed to habitat use in general and to recommendations to help limit the negative impacts to wildlife habitat.

Wildlife Habitat

Wildlife habitat is said to be the complex of vegetative and physical characteristics that provide for all the requirements of wildlife, that is food, shelter, resting, nesting and escape cover, water and space. Because the area does offer some diversity of habitats and does contain wetlands which are a very important habitat type to a number of species, this area would probably provide desirable habitat for a variety of birds, mammals, amphibians and reptiles.

The area is surrounded by development, mainly single family dwellings, and has had a fair amount of abuse in the form of well used ATV trails, trash dumping and fires associated with camping. It does offer an area of habitat to the many species which can live in relatively close proximity to man because it is a relatively large piece of contiguous undeveloped property.

Because wetlands increase the habitat diversity of an area and offer a variety of food and cover to wildlife, they are important areas to preserve and set aside as open space if possible. Acre for acre, some types of wetlands and their associated riparian zones exceed all other land types in wildlife productivity. In addition to their value as wildlife habitat, wetlands serve other valuable functions including, water recharge, sediment filtering, flood storage, etc. Because of their value as habitat and other important functions they serve, the development of, filling in and/or crossing of wetlands should be avoided or limited whenever possible.

Whatever type or combination of types of areas are set aside, whether it be wetlands (as in this case) or upland, setting aside an "island of open space" surrounded by development is the least desirable for wildlife. The area should have natural travel pathways for wildlife (such as streams, valleys and ridgetops) to enter and exit to other open space areas outside the development. The open space area is more valuable to wildlife if not traversed by roads which may impede the movements of wildlife at times. Setting aside a combination of habitat types in conjunction with wetlands is desirable.

Wildlife Resources/Recommendations

As with any development the impact on wildlife habitat in general will be negative. A sizeable area will be broken up and lost with the construction of roads, driveways, walkways, parking areas and homes. Another impact is the loss of habitat where cover is cleared for lawns and landscaping. A third impact is the increased human presence, vehicular traffic and a number of free roaming dogs and cats. This could drive the less tolerant species from the site, even in areas where there has been no physical change.

Certain species which are adaptable to man's activities may increase due to his presence and associated nuisances may occur. Typical species which can become a nuisance include pigeons, starlings and racoons.

The design of this development which contains somewhat smaller lots (averaging about 1.5 to 2 acres) will probably augment the negative impacts to wildlife habitat.

Creation of the retention basins in the wetlands would probably do little to increase the value for wildlife. This is because they would probably only have water in them after a storm of some magnitude so they would not provide a reliable source of water. If they were not allowed to re-vegetate naturally or if they were not supplementally planted they would probably provide little food or cover for wildlife. If they were able to hold some supply of water and were allowed to re-vegetate naturally or were supplemented with naturally occurring vegetation, they could probably have some value as wildlife habitat.

Not only should the disturbance to wetlands be minimized before development, but afterwards as well. Post development homeowner activity in the wetlands should be avoided. If possible, through a conservation easement or deed restriction, activities such as pasturing animals in a wetland or filling in for extra lawn and/or garden should be restricted.

In a small but heavily developed and populated state like Connecticut where available habitat continues to decline on a daily basis, it is critical to maintain and enhance wherever possible existing wildlife habitat. In planning and constructing a development there are steps that should be considered in order to help minimize adverse impacts on wildlife.

- 1) Maintain a 100 foot (minimum) wide buffer zone of natural vegetation around all wetland/riparian areas to filter and trap silt and sediments and to provide some habitat for wildlife.
- 2) Utilize natural landscaping techniques (avoiding lawns and chemical runoff) to lessen acreage of habitat lost and possible wetland contamination.
- 3) Stone walls, shrubs and trees should be maintained along field borders.

- 4) Early successional stage vegetation (i.e. field) is an important habitat type and should be maintained if possible.
- 5) During land clearing, care should be taken to maintain certain forest wildlife requirements:
 - a) Encourage mast producing trees (i.e. oak, hickory, beech). A minimum of five oaks/acre, 14 inches dbh or greater should remain.
 - b) Leave 5 to 7 snag/den trees per acre as they are birds and mammals for nesting, roosting and feeding.
 - c) Exceptionally tall trees, used by raptors as perching and nesting sites, should be encouraged.
 - d) Trees with vines (i.e. fruit producers) should be encouraged.
 - e) Brush debris from tree clearing should be piled to provide cover for small mammals, birds, amphibians and reptiles.
 - f) Shrubs and trees which produce fruit should be encouraged (or can be planted as part of the landscaping in conjunction with the development) especially those that produce fruit which persists through the winter (i.e. winterberry) (see Appendix C).
- 6) Nesting sites can be provided for a great variety of birds with placement of artificial nesting boxes.

Large house lots and implementation of the suggested guidelines may help to minimize the adverse impacts to local wildlife populations. Implementation of backyard wildlife habitat management practices should be encouraged. Such activities include providing food, water, cover and nesting areas. If large house lots cannot be provided for, cluster housing should be considered. By clustering the homes together, less land is disturbed and built on, and therefore more remains to be utilized for wildlife habitat.

FOREST RESOURCES

Vegetation

The Peter's Rock subdivision property (182 acres) is essentially 100% covered with mixed hardwoods. Originally, 16 areas were delineated on the aerial photos, and then these stands were inspected on the ground to determine species composition, size and quality.

After the field review, many of the different stands were combined because species composition was very similar from one to another. As a result of this, four general forest types are described below (see Figure 9).

Mixed hardwoods (approximately 150 acres): This general cover type reflects a forest in which a variety of deciduous species predominates. Areas #3, 5, 6, 7, 8, 10, 11, 14, 15 and 16 on the map exhibit a variety of hardwood species with their size, quality and spatial distribution dependent upon several factors - most noticeably past land use and soil type and depth. Typical species found in this cover type are white ash, bigtooth aspen, American beech, birches (primarily black), maples (primarily red), oaks (red, white, black) and yellow poplar.

Depending upon soil depth, an abundance of one species or species group over another may be evident. For example, in area #16 a greater variety of species (e.g. oaks, red maple, yellow poplar, black gum, birches) with better form are found near the wetlands area in the southern portion. As elevation increases to the northeast, oaks become more predominant and the trees become noticeably shorter as depth of soil decreases.

The only evergreens found consist of a small group of hemlocks located in area #15 northwest of the gas line.

Wetlands (approximately 26 acres): The areas identified on the map as #1, 4, 9, 12 and 13 may not correspond exactly to the inland wetlands as designated on the subdivision map. However, the trees in these areas are predominantly red maple, and the areas are closely associated with the designed inland wetland areas. The vegetation has already been described in a study done by Soil Science and Environmental Service Inc. Area #13 was not identified as a wetland but the vegetation (red maple and spicebush) is similar to other wetland areas.

Even within these wetlands, a small increase in elevation (even a foot or two) can make a difference in vegetation. For example, in area #12 large oaks and yellow poplar are found on a small piece of higher ground, whereas red maple and spicebush are found in the surrounding wetlands.

The remaining two cover "types" are small, both being less than 2 acres in size. Area #2 "old field" type in which gray birch, hickories, oaks and junipers have invaded an open area. Crown closure has not yet occurred so it is still somewhat open. The other type is an open, shrubby area which consists of the 30 foot right-of-way for the Southern Connecticut Gas Company. It is mentioned because it represents a distinct break in forest cover in the southwestern portion of the property.

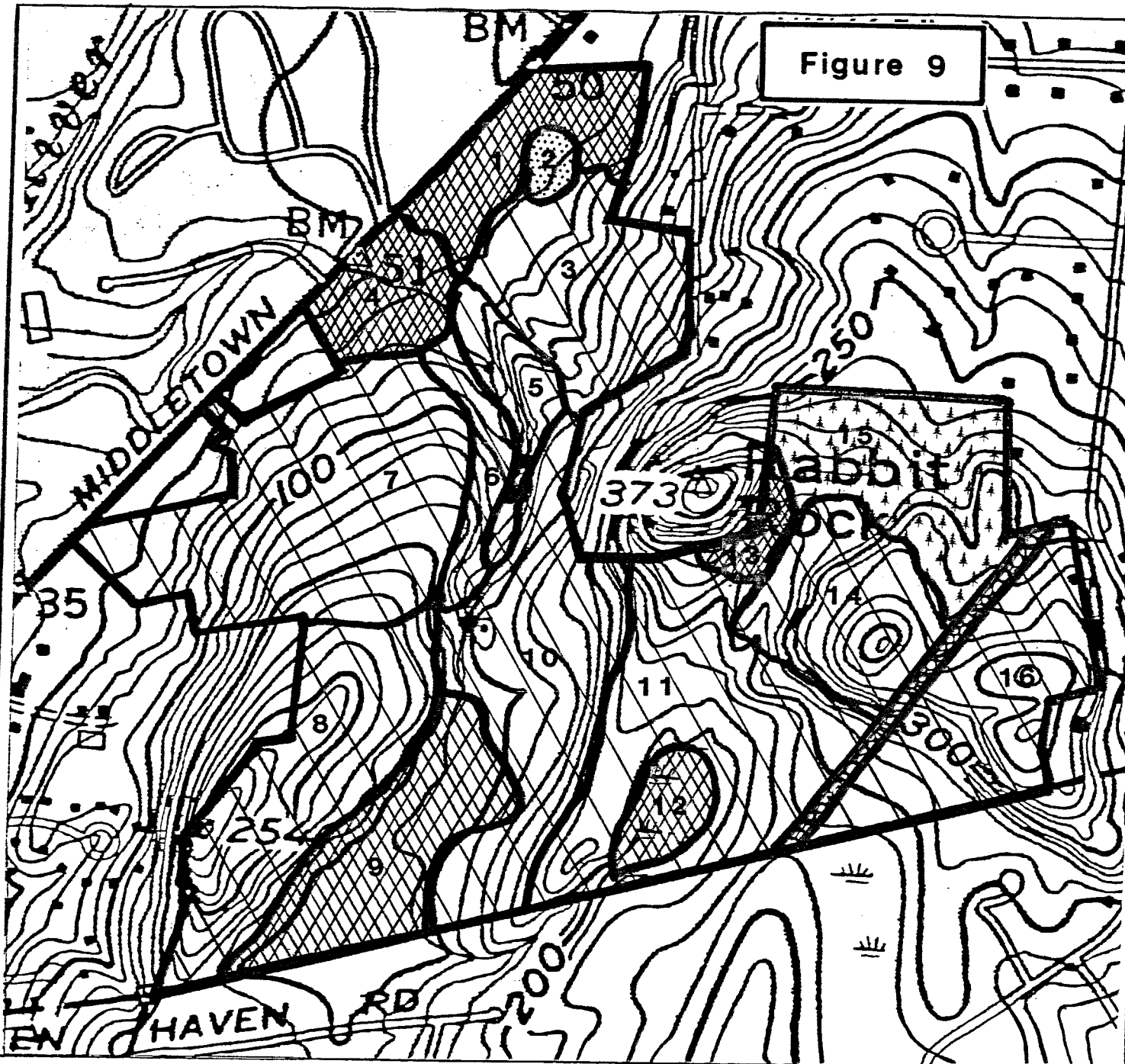
Health/Quality






The overall health of the forest at this point in time is good. Perhaps the most serious insect pest problem that will occur in the future is gypsy moth defoliation. Although no egg masses were readily apparent, the predominance of a variety of oaks serves as an excellent food source for the gypsy moth once the population starts to build again. Defoliation, coupled with additional stresses (e.g. moisture, other insects and diseases), may result in tree mortality.

One particular problem that was noticeable was the prevalence of Nectria canker on black birch. A large percentage of the black birch over the entire tract exhibited this fungal canker. If the canker enlarges on the stem to a great degree, the tree may be weakened to such a point that storms may cause the stems to break. Mortality of portion of the tree or entire trees can result if the canker completely encircles a stem.

The few hemlocks on the property are located in area #15 (vicinity of lots #100 and 101). North Haven is well within the range of the hemlock wooly

Figure 9



-  MIXED HARDWOODS
-  HARDWOODS WITH EVERGREENS
-  WETLANDS
-  OLD FIELD
-  GAS COMPANY R.O.W.

**PETER'S ROCK
SUBDIVISION**

**NORTH HAVEN
CONNECTICUT**

FOREST STANDS

King's Mark Environmental Review Team

0 600



Among the least preferred food sources for the gypsy moth are the ashes, eastern redcedar (not common on the property) and yellow poplar. If these species can be favored wherever possible during initial construction stages, these trees may provide some islands of green should gypsy moth defoliation occur in the future.

During any construction operations, practices employed may impact individual trees. Cuts and fill during road construction may impact individual trees as moisture regimes are changed or fill added to areas where roots are numerous. Changes may result in loss of vigor or mortality over a period of time. Decrease in vigor may then result in further stress as other environmental or biotic factors impact the tree. Wherever possible, construction practices employed should minimize impacts upon individual trees, especially mature or specimen trees within or near the road right-of-ways.

Species list (partial):

White ash	<u>Fraxinus americana</u>
Bigtooth aspen	<u>Populus grandidentata</u>
American beech	<u>Fagus grandifolia</u>
Black birch	<u>Betula lenta</u>
Yellow birch	<u>B. alleghaniensis</u>
Gray birch	<u>B. populifolia</u>
Red maple	<u>Acer rubrum</u>
Sugar maple	<u>A. saccharum</u>
Red oak	<u>Quercus rubra</u>
White oak	<u>Q. alba</u>
Black oak	<u>Q. velutina</u>
Yellow poplar	<u>Liriodendron tulipifera</u>
Blackgum	<u>Nyssa sylvatica</u>
Elms	<u>Ulmus spp.</u>
Hickories	<u>Carya spp.</u>
Eastern hemlock	<u>Tsuga canadensis</u>
Eastern redcedar	<u>Juniperus virginiana</u>

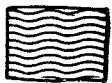
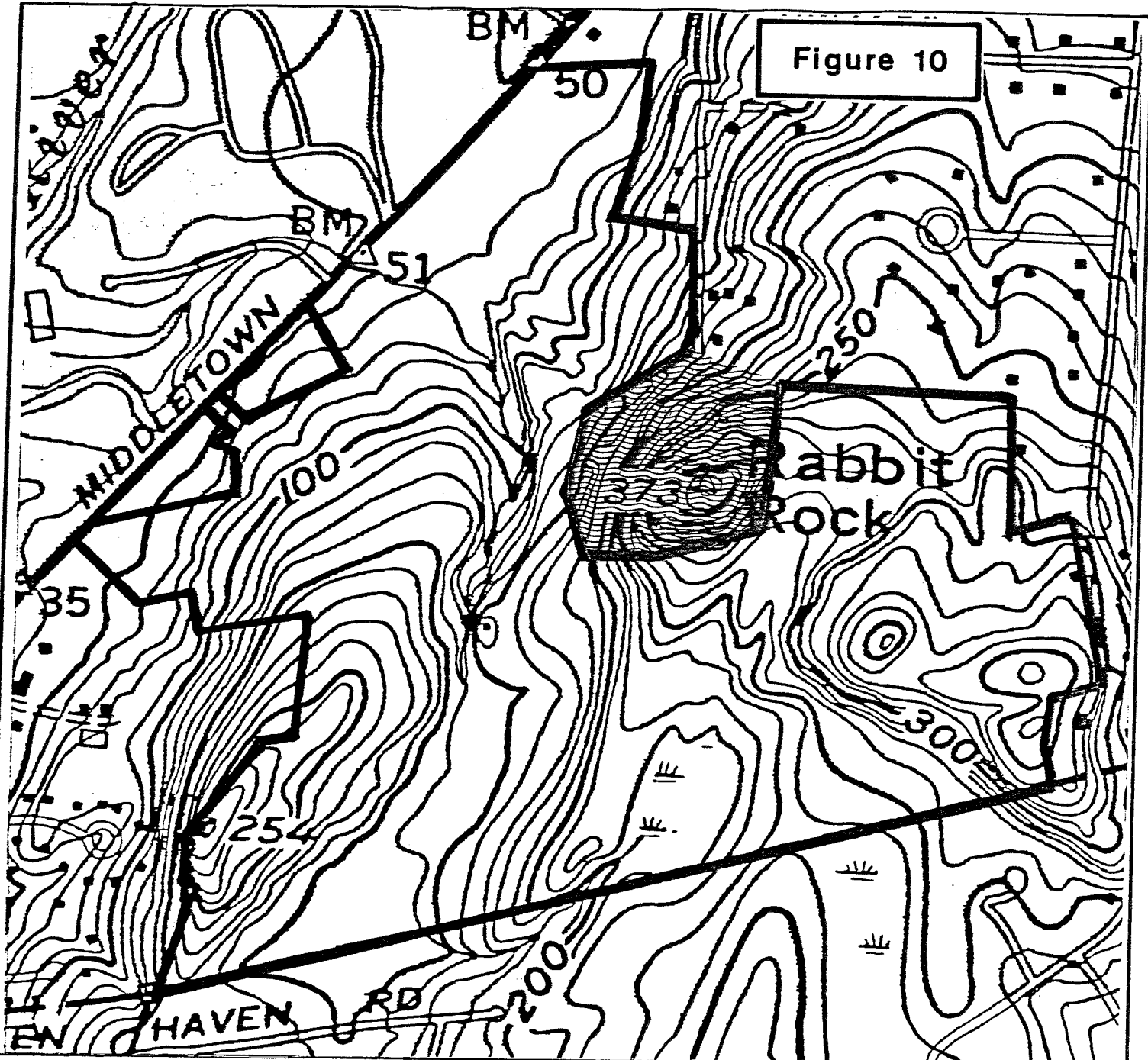
THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species or Connecticut "Species of Special Concern" that occur within the study area. The Natural Diversity Database contains the most current biological data concerning endangered or threatened plant or animal species. On-going research continues to locate additional populations of species or locations of habitats of concern as well as existing data.

NATURAL AREA INVENTORY SITE

Peter's Rock (a.k.a. Rabbit Rock) is a Natural Area Inventory site (see Figure 10). The point of greatest interest is a series of hexagonal columns of basalt that are visible over a considerable part of the hilltop. The hill also has very extensive dry site vegetation. The information on file indicates that a "stone hermit house" occupies a site near the top of the hill. In 1972 the Connecticut Forest and Park Association, Inc. prepared a Natural Area Inventory which included 459 sites. These were nominated as significant sites for one or more of the following attributes: (1) geologic; (2) hydrologic; (3) biologic; (4) archaeologic; (5) cultural; (6) aesthetic; and (7) research/educational. A site receives no legal protection by being included on the Natural Area Inventory list.

Figure 10

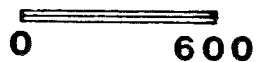


NATURAL AREA INVENTORY
SITE

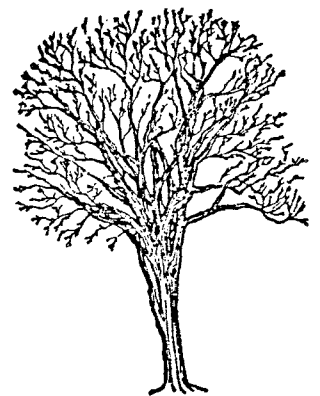
**PETER'S ROCK
SUBDIVISION**
NORTH HAVEN
CONNECTICUT

**NATURAL AREA
INVENTORY SITE**

King's Mark Environmental Review Team



**LAND USE AND PLANNING
CONSIDERATIONS**



PLANNING CONSIDERATIONS

General Planning

The 1982 North Haven Town Master Plan designed the area around Peter's Rock for "Natural Preservation Concept" protection. The plan describes this as an area where a variety of measures could be employed to provide open space around the Rock, such as donations from private or non-profit entities or by utilizing unique land planning techniques and setting aside stream corridors. The Regional Plan of 1968 showed open space and low density residential uses in this area. There is some history of this site being considered for acquisition by the town (with assistance from the state). However for a variety of reasons, this was not accomplished, and the owner has chosen to develop the property. The fact remains that there has been interest in preserving this land for public use on a town level.

In general, the site is located on an R-40 zone which North Haven reserves for non-sewered, large lot subdivisions in the northwest and eastern portions of town. The proposed subdivision will comply with zoning code standards in that one acre lots are shown and the lot frontages, etc. are adequate. On the north and east borders of the property in North Haven, zoning is R-40 and any existing homes are also on one acre lots. To the west of the site also in North Haven, there is a small pocket of R-20 zoned property (1/2 acre lots) and a strip of CB-20 (commercial business on 1/2 acre lots). This area is dominated by small businesses such as gas stations and small retail stores. To the south in East Haven, the land is zoned R-4, the second most restrictive category reserved for suburban areas. Lots are all a minimum of 25,000 square feet. Therefore, in terms of lot size and standards, the proposed subdivision is in keeping with surrounding land uses and adopted zoning regulations.

Physical Planning

The site is very steeply sloped in certain portions which has both a physical and aesthetic impact on the land. Some proposed lots, spread out as they are across the slopes, will require substantial cut and fill, impacting both the soils and the vegetation. In addition, many of the proposed buildings on the western slope will have a prominent visual impact on the surrounding area as this is the most dominant relief in North Haven. In particular, traffic on Quinnipiac Avenue will see the slope quite clearly if substantial vegetation is removed. Care should be taken to address the possible aesthetic impacts in an area that is valued by many North Haven residents as a natural landmark. The use of screening will be of special importance in this project. The physical impacts of building on slopes should also be reviewed carefully. In general, construction in steeply sloped areas is either done utilizing excessive cutting and filling or by allowing steep drives, and building homes with pier and beam construction. Excessive cut and fill requires very careful erosion control measures and may result in greater vegetation losses. Specifically, lots 71, 72, 73, 81 and 107 (and possibly others) show building envelopes on over 40% slopes. Building envelopes could be shifted to flatter areas and perhaps deed restricted as such.

Inland wetland impacts derive from two separate aspects of the proposal. North Haven does not have a zoning regulation that "nets out" inland wetland acreage. Therefore a one acre lot may include designated wetlands to meet minimum lot size requirements. The only exception is that private septic systems must be located outside of the wetland area as must the building itself. In this particular proposal, several of the one acre lots contain up to half of their land area as designated wetland. While this subdivision will receive public sewer service, residential impacts on the wetland may have a

substantial impact. Homeowners usually believe that land shown within their purchased lot may be fully utilized. It is suggested that some of the one acre lots containing more than 25% wetlands be enlarged or that deed restriction be enforced that require no activity within the wetland area. The developer has expressed that the only deed restriction contemplated at this time is to require a minimum 2,000 square foot home per lot.

The other inland wetland impact derives from roadway and sewer line crossings. Crossings should keep roadway widths to a minimum and reduce fills as much as possible. The engineer for the project suggested that all sewer lines would be located within roadway right-of-ways or "along back lot lines." It is strongly suggested that sewer lines along back lot lines be avoided whenever those lots border an inland wetland. Not only would it cause possibly unnecessary construction within the wetland, but any leakage or line repair work could also harm the integrity of the area. It is also noted that the project will utilize the various wetland areas for detention and sedimentation purposes. While the large size of the wetlands may mitigate some of the long term effect of sedimentation on the vegetation, it is vital that storm sewer outlets be sensitively placed and maintained and that energy dissipators be used in all cases.

Other physical issues include the potential effects of blasting on Peter's Rock. Special care should be taken to maintain the integrity of the park property with respect to short term construction impacts and long term community impacts. As a public park, access to the site will be important. It is noted that while roads will adjoin the park property, no consideration is given to parking. At a minimum, roadway width should reflect the public's proclivity to parallel park in the vicinity of the egress points.

Transportation Planning

It is understood that traffic consultants will shortly assess the impact of proposed development on the adjacent highway system. Limited exposure suggests that Middletown Avenue access proposals should not prove troublesome in view of anticipated site traffic, good sight lines and a decision to forego northerly access via Road D. Southerly access via Glen Haven Road may prove more difficult in view of limited sight lines to the east. East Haven might, justifiably, be sufficiently concerned to deny access, prompting a new subdivision plan for the site. Early and close contact with East Haven planning and engineering staff would be helpful. Similarly, a traffic and access study should alternately suggest: (1) the impact of all access via Middletown Avenue while (2) considering a limited version of east-west Glen Haven Road traffic moving north on Middletown Avenue via the proposed subdivision street.

With Road D moved to avoid crossing the wetland, one of the three intersections on Middletown Avenue is removed and will slightly increase the traffic at the intersection of Road A and Middletown Avenue.

RECREATION CONSIDERATIONS

The property has many serious physical limitations, limitations which must have encouraged the owners to propose the original cluster condominium plan. However, because neighbors opposed this approach, the owners are now proposing a typical single family home development.

Planning features of this second proposal include protection of the wetland areas as open space, development of stormwater retention basins for flood control and installation of municipal water supply and sewage service.

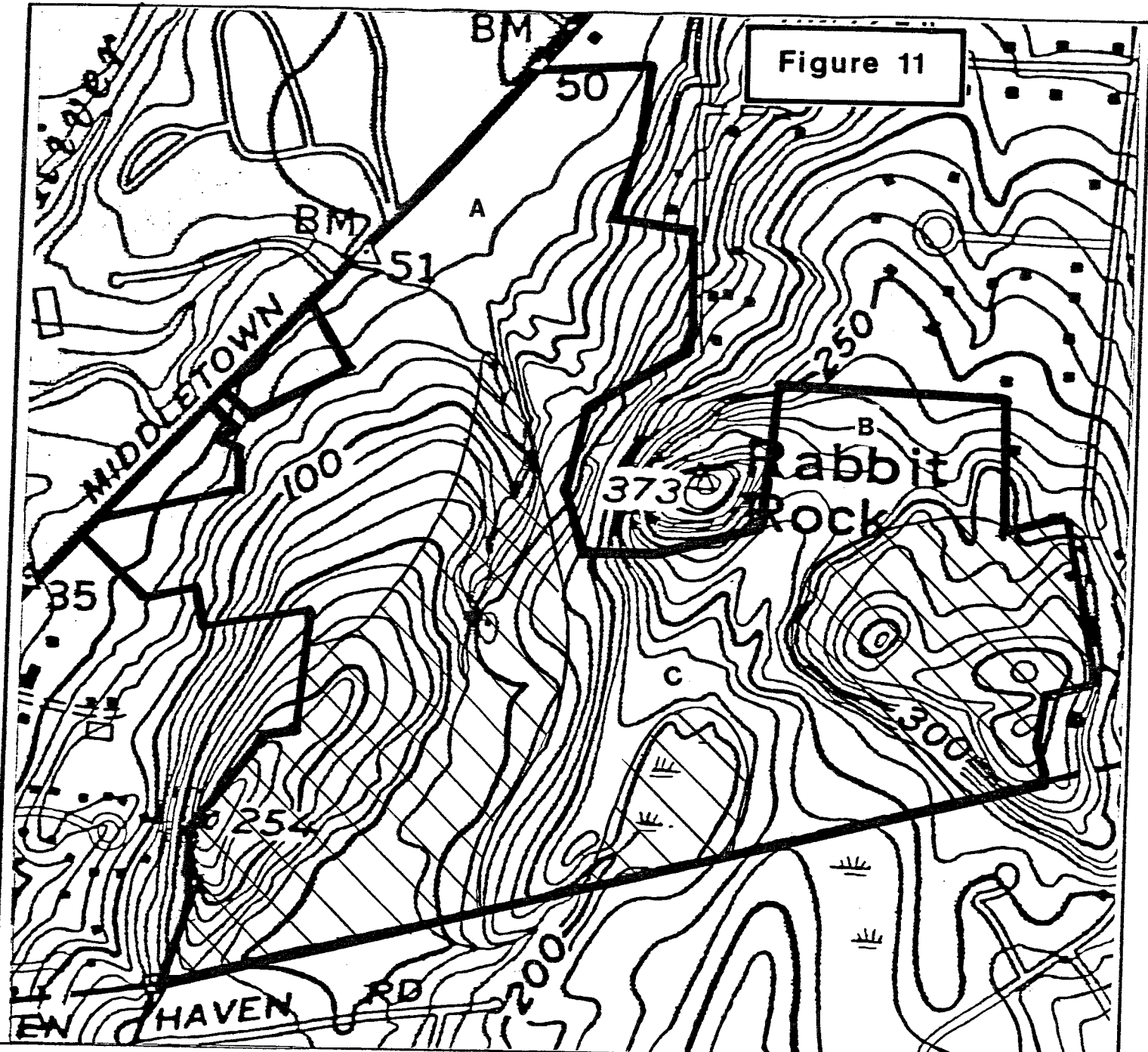
Nevertheless, imposition of such a plan on a property with extensive areas of steep slope (+15%), rock outcrop and wetland is not desirable both in terms of environmental impact and cost of development.

A cluster approach might be preferable with a property of this type. Such a plan would avoid areas with site development problems as sketched in Figure 11, with such areas to be dedicated as permanent open space. Development, perhaps of semidetached condo variety, could be concentrated largely on the more readily developable land in the northwest portion of the property (A on map). Perhaps a higher density townhouse condo approach could be used in proximity to Route 17 to help offset the loss of other acres as open space. Feeder roads could also lead to clusters of condos on other pockets of good land south and east of Peter's Rock/Rabbit Rock (B and C on map).

A plan of this general type could result in a very handsome neighborhood which combined good design with retention of the area's natural features. Costs of construction and continuing maintenance could be cut substantially by the decreased need for blasting and for decreased mileage of roads and water and sewer utilities. Such a development approach could perhaps obviate, or at least decrease the need for retention basins.

Clearly the cluster approach would also be preferable from a recreational or open space standpoint. Although the proposed open space would have little value for intensive recreational usage, the simple preservation of natural features and dedication as public land would provide areas of amenity for naturewalking, etc., as well as a pleasant backdrop for homes. In addition, Peter's Rock itself would be enhanced by protection of much of the natural character of its surroundings.

Figure 11



ABC AREAS FOR POTENTIAL DEVELOPMENT.



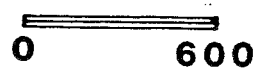
AREAS FOR POTENTIAL OPEN SPACE

PETER'S ROCK SUBDIVISION

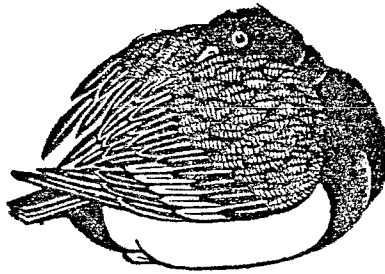
NORTH HAVEN CONNECTICUT

POSSIBLE ALTERNATIVE LAYOUT

King's Mark Environmental Review Team



APPENDICES



Appendix A: Soils Limitation Chart

DRAINAGE CLASS AND DEPTH
TO SEASONAL HIGH WATER
TABLE

GENERAL SOIL PROPERTIES

MAJOR LIMITATIONS TO THE DEVELOPMENT OF:
ROADS AND STREETS
HOMES WITH BASEMENTS

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: HOMES WITH BASEMENTS	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: ROADS AND STREETS
CsB - Cheshire fine sandy loam, 3-8% slopes	Very deep soils formed in glacial till derived mainly from red sandstone, shale and conglomerate	Well drained >6 ft.	None	None
CsC - Cheshire fine sandy loam, 8-15% slopes	Very deep soils formed in glacial till derived mainly from red sandstone, shale and conglomerate	Well drained >6 ft.	Slope	Slope
CsD - Cheshire fine sandy loam, 15-25% slopes	Very deep soils formed in glacial till derived mainly from red sandstone, shale and conglomerate	Well drained >6 ft.	Slope	Slope
CyC - Cheshire-Holyoke Complex, 3-15% slopes	Complex of shallow to very deep glacial till soils and exposed bedrock	Well drained to somewhat excessively drained >6 ft.	Depth to bedrock, slope	Depth to bedrock, slope
Eh - Ellington silt loam	Very deep soils formed in loamy over sandy and gravelly glacial outwash	Moderately well drained 1.5-2.5 ft.	Wetness	Wetness, subject to frost action
Hyc - Holyoke-Rock Outcrop Complex, 3-15% slopes	Complex of shallow glacial till soils and exposed bedrock	Well drained to excessively drained >6 ft.	Depth to bedrock	Depth to bedrock
HZE - Holyoke-Rock Outcrop Complex, 15-35% slopes	Complex of shallow glacial till soils and exposed bedrock	Well drained to excessively drained >6 ft.	Depth to bedrock, slope	Depth to bedrock, slope

DRAINAGE CLASS AND DEPTH
TO SEASONAL HIGH WATER
TABLE

MAJOR LIMITATIONS TO THE DEVELOPMENT OF:
ROADS AND STREETS
HOMES WITH BASEMENTS

MAP UNIT NAME GENERAL SOIL PROPERTIES

MAP UNIT NAME	GENERAL SOIL PROPERTIES	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: ROADS AND STREETS HOMES WITH BASEMENTS	DEVELOPMENT OF: ROADS AND STREETS
LpB - Ludlow silt loam, 3-8% slopes	Very deep soils formed in glacial till	Moderately well drained 1.5-2.5 ft.	Wetness Wetness, subject to frost action
MgC - Manchester gravelly sandy loam, 8-15% slopes	Deep soils formed in glacial outwash deposits	Excessively drained >6 ft.	Slope
PnB - Penwood loamy sand, 3-8% slopes	Very deep soils formed in glacial outwash deposits of sands and loamy sands	Excessively drained 76 ft.	None
Rb - Raypol silt loam	Very deep soils formed in loamy over sandy and gravelly glacial outwash	Poorly drained 0-1.0 ft.	Wetness Wetness, subject to frost action
WcB - Watchaug fine sandy loam, 3-8% slopes	Very deep soils formed in glacial till	Moderately well drained 1.5-2.5 ft.	Wetness, subject to frost action
WkB - Wethersfield loam, 3-8% slopes	Very deep soils formed in glacial till	Well drained 1.5-2.5 ft.	Wetness, subject to frost action
WkC - Wethersfield loam, 8-15% slopes	Very deep soils formed in glacial till	Well drained 1.5-2.5 ft.	Wetness, slope, subject to frost action
WkD - Wethersfield loam, 15-25% slopes	Very deep soils formed in glacial till	Well drained 1.5-2.5 ft.	Wetness, slope, subject to frost action
Ws - Wilbraham very stony silt loam	Very deep soils formed in glacial till	Poorly drained 0-1.5 ft.	Wetness Wetness, subject to frost action

Appendix B: Erosion and Sediment Control Plan Worksheet

NEW HAVEN COUNTY SOIL AND WATER CONSERVATION DISTRICT
EROSION AND SEDIMENT CONTROL PLAN WORKSHEET

This is a guide for the development and review of erosion and sediment control plans. Local commissions should be consulted for regulatory requirements concerning erosion and sediment planning.

Checked () items are those that have been provided on the current erosion and sediment control plan. Items identified with a star (*) should be incorporated into final plans.

Name of development _____
Materials received _____

Total Area _____ Location _____
Engineer _____
Date Received _____ Site Visit _____ Reviewed by _____
Submitted by _____

NARRATIVE SECTION DESCRIBING:

- _____ The development
- _____ Major land uses of adjoining areas
- _____ The number of total acres and acres to be disturbed in the project
- _____ The schedule of grading and construction activities including:
 - Start and completion dates.
- _____ Application sequence of all E & S control measures
- _____ The design criteria for all proposed E&S control measures
- _____ Construction details and installation procedures for all proposed E&S control measures
- _____ The operations and maintenance program for all proposed E&S control measures
- _____ The name of the person or organization that will be responsible for the installation and maintenance of the E&S control measures
- _____ Organization or person responsible for maintenance of permanent measures when project is completed. Measures include: _____

=====

A SITE PLAN AT A SUFFICIENT SCALE SHOWING:

Natural Features

- _____ Existing topography
- _____ Existing vegetation
- _____ Soils information, including test pit data if available
- _____ Identification of wetlands, watercourses, major drainageways and water bodies on the site
- _____ Name of soil scientist who performed wetlands delineations and flag numbers
- _____ Rock outcrop areas
- _____ Seeps, springs
- _____ Major aquifers
- _____ Floodplains (100 yr.) and floodways
- _____ Channel encroachment line (DEP permit required)
- _____ Coastal zone boundary
- _____ Public water supply watershed boundaries
- _____ Possible Army Corps Sec. 404 or Sec. 10 Permit Areas (Contact Corps @ 1-800-343-4789).

Project Features

- _____ The location of the proposed development
- _____ A plan legend
- _____ Adjacent properties
- _____ Property lines
- _____ Lot lines and setback lines
- _____ Lot and/or building numbers
- _____ Planned and existing roads
- _____ Proposed structures
- _____ Location of existing and planned utilities
- _____ Location of wells and septic systems
- _____ Proposed topography
- _____ North arrow

Clearing, Grading, Vegetative Stabilization

- _____ The sequence of grading, construction, and sediment and erosion control activities
- _____ The location of and construction details for all proposed E&S control measures

Recommended measures include _____

-
- _____ Limits of disturbed areas
 - _____ Extent of areas to be graded
 - _____ Disposal procedure for cleared material
 - _____ Location of stockpiled topsoil and subsoil
 - _____ Temporary erosion protection for stockpiles
 - _____ Areas to be vegetatively stabilized
 - _____ Temporary erosion control in disturbed areas
 - _____ Method for protection of disturbed areas when time of year or weather prohibit establishment of permanent vegetative cover
 - _____ Seedbed preparation (including topsoiling specifications)
 - _____ Seeding mixture, rates, and seeding dates
 - _____ Fertilizer and lime application rates
 - _____ Mulch application rate
 - _____ Mulch anchoring measures

Drainage System

- _____ Existing and planned drainage pattern
- _____ Drainage areas used in design of stormwater management system
- _____ Size and location of culverts and storm sewers
- _____ Drainage calculations for review by town engineer
- _____ Stormwater management measures and construction details
- _____ Groundwater control measures (footing drains, curtain drains)
- _____ Planned water diversions and dams (DEP permit may be required)

House Site Development

- _____ Sediment and erosion control measures for individual lot development

Additional Comments

Appendix C: Suitable Planting Materials for Wildlife
Food and Cover

SUITABLE PLANTING MATERIALS FOR WILDLIFE FOOD AND COVER

Herbaceous/Vines

Panicgrass
Timothy
Trumpet creeper
Grape
Birdsfoot trefoil
Virginia creeper
Switchgrass
Lespedeza
Bittersweet
Boston ivy

Shrubs

Sumac
Dogwood
Elderberry
Winterberry
Autumn olive
Blackberry
Raspberry
Honeysuckle
Cranberrybush

Small Trees

Hawthorn
Cherry
Serviceberry
Cedar
Crabapple

NOTES

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists, landscape architects, recreational specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC & D) Area - a 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns and/or developers within the King's Mark RC & D Area - free of charge.

PURPOSE OF THE ENVIRONMENTAL REVIEW TEAM

The Environmental Review Team is available to assist towns and/or developers in the review of sites proposed for major land use activities. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments, and recreational/open space projects.

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 site, and highlighting opportunities and limitations for the proposed land use.

REQUESTING AN ENVIRONMENTAL REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality, or the chairman of an administrative agency such as planning and zoning, conservation, or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District, and the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC & D Executive Committee, the Team will undertake the review. At present, the ERT can undertake two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Nancy Ferlow, ERT Coordinator, King's Mark Environmental Review Team, King's Mark Resource Conservation and Development Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.