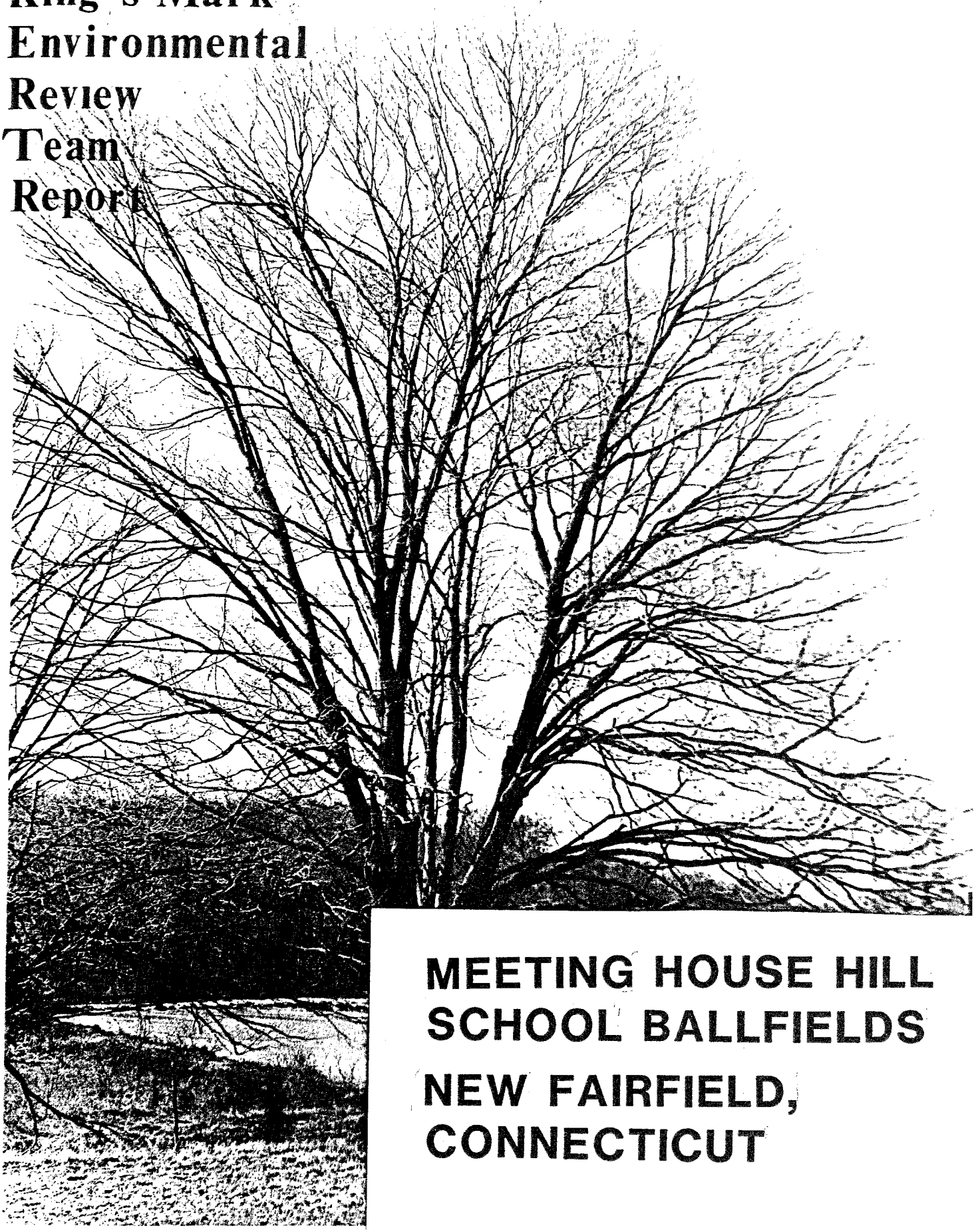
King's Mark Environmental Review Team Report



MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, CONNECTICUT

MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, 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

New Fairfield Parks and Recreation Department

and the

First Selectman

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 Parks and Recreation Department 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.

MARCH 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

* David Thompson, District Conservationist
  USDA - Soil Conservation Service

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 Kevin Walsh, Director, New Fairfield Parks and Recreation Department, Russell Gerow, New Fairfield First Selectman and Frank Misiorski, project designer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The New Fairfield Parks and Recreation Department, with support from the First Selectman, has requested that an environmental review be conducted on the Meeting House Hill School Ballfields, a site proposed for recreational development. The site is located in the south central part of New Fairfield off of Gillotti Road. The town-owned parcel is approximately 7 acres in size and located behind the current school.

The site is primarily forested with moderately steep slopes in the northeast corner. There is an intermittent streamcourse and wetlands just off the site which may be impacted by the project. The septic leaching field for the school is near the site. Plans to expand these leaching fields are being considered.

Plans for the property include the construction of two recreational playing fields. Because of the slopes there will be extensive grading. Underdrains will be used to keep water off of the fields.

The Town was primarily concerned with the potential impact that the proposed development would have on: (1) existing natural resources; (2) effects of stormwater runoff and erosion; and (3) 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, Topography and Geology

Land use surrounding the site consists of residential development, Meeting House Hill School and associated grounds, and wooded land. Stonewalls indicate an agricultural past. The property is located on the northeastern flank of a drumlin. No major watercourses were observed on the site. Drainage from the site ultimately flows into Ball Pond Brook.

Hydrogeology/Geologic Development Concerns

Bedrock geologic mapping indicates a bedrock outcrop on the school property, but recent septic test holes did not encounter bedrock near the ballfield site. It would be wise to conduct a few borings in the ballfield area to determine if bedrock will be encountered. If bedrock is encountered in the ballfield construction, blasting may be required. This would be a difficult and costly process.

The bedrock that forms the core of the drumlin is described as pink granitic gneisses. The material covering the bedrock is a firm till which contains a "hardpan" layer. The hardpan restricts vertical movement of water and results in a seasonally high water table, which can be a hindrance in terms of constructing ballfields. Deep cuts are difficult to stabilize and often erode. Sediment and erosion control plans are required by the state. These should be properly enforced by the Town. Because of the seasonally high water table and the high silt content of the soil, the chance for environmental damage is great unless control methods are properly installed.

There is a need for drainage in order to keep the fields dry throughout the year. The designer has proposed the installation of underdrains along the cut area and throughout the field area. If properly installed, these drains should intercept surface and ground water before it reaches the ballfields. The drainage will be routed to a detention pond to be constructed near Route 39.

The installation of the underdrains in the fields and the proposed cut along the south edge of the fields raises two potential concerns. First, the septic system will need to be considered. Building ballfields will preclude the use of this area for further expansion. Town officials should discuss expansion plans with the Town Sanitarian before the ballfields are constructed. Second, the close proximity of the existing septic systems to the cut slopes could cause problems. It may be necessary to relocate the system if the ballfields are constructed. Although the public health code requires a minimum separating distance from a drain, a hydraulic analysis of the soil in the area might be needed to determine if greater distances should be required.

Soil Resources

The site consists entirely of Woodbridge soil (WzB), a moderately drained hardpan soil. Late fall and late winter to early spring high water tables characterize the soil. Excavations commenced before mid-May and after mid-November can be seriously hampered by mud, slope failure, subsurface drainage and excessive erosion. Controlling these hazards requires detailed planning. An artificial drainage system is essential when major regrading is planned. Recreation fields demand a total system of drains, generally installed at 40 foot intervals. Current plans do not show adequate drainage systems.

The cut slope envelope will protect the slopes from falling. It must be installed at the correct depth to intercept the subsurface flow. As depths may vary, accuracy in placement is crucial. Effluent from the septic leaching field may be intercepted by this drain. Should the additional leaching area be installed as planned, a serious incompatibility would result.

There is presently no erosion and sediment control plan to review. When the plan is prepared, it needs to address the phasing of land clearing and construction activities, stabilization of the access road, starting and completion dates for excavation and grading, erosion and siltation control, final stabilization of slopes, tree planting, and implementation.

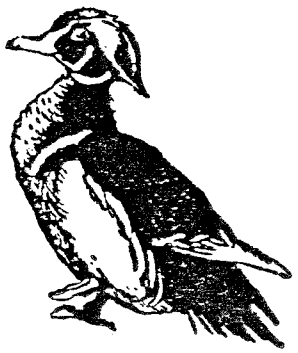
Assuming a faultless installation of these facilities, the final product will have a visual impact on several homes on Rita Drive. The impact will vary with each property but will be equivalent to the existing condition at the rear of the high school playing fields as viewed from homes in the Weldon Woods subdivision.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

INTRODUCTION



INTRODUCTION

The New Fairfield Parks and Recreation Department, with support from the First Selectman, has requested that an environmental review be conducted on the Meeting House Hill School Ballfields, a site proposed for recreational development. The site is located in the south central part of New Fairfield off of Gillotti Road. The town-owned parcel is approximately 7 acres in size and located behind the current school (see Figure 1).

The site is primarily forested with moderately steep slopes in the northeast corner. There is an intermittent streamcourse and wetlands just off the site which may be impacted by the project. The septic leaching field for the school is near the site. Plans to expand these leaching fields are being considered.

Plans for the property include the construction of two recreational playing fields (see Figure 2). Because of the slopes there will be extensive grading. Underdrains will be used to keep water off of the fields. The information generated by the ERT will then be used to assess the suitability of the project for the Town.

THE ERT PROCESS

Through the efforts of the New Fairfield Parks and Recreation Department, the project designer and the King's Mark ERT, this environmental review and report was prepared for the Town. This report primarily provides a description of on-site natural resources, and presents some development guidelines.

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 March 7, 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 analyses 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 information. Specific objectives include:

(1) assessment of the hydrogeologic characteristics of the site, including development limitations and stormwater hydrology;

(2) determination of the suitability of existing soils to support the proposed development;

(3) discussion of soil erosion and sedimentation concerns;

(4) discussion of the compatibility of the design with current plans and uses.

Figure 1

LOCATION OF STUDY SITE

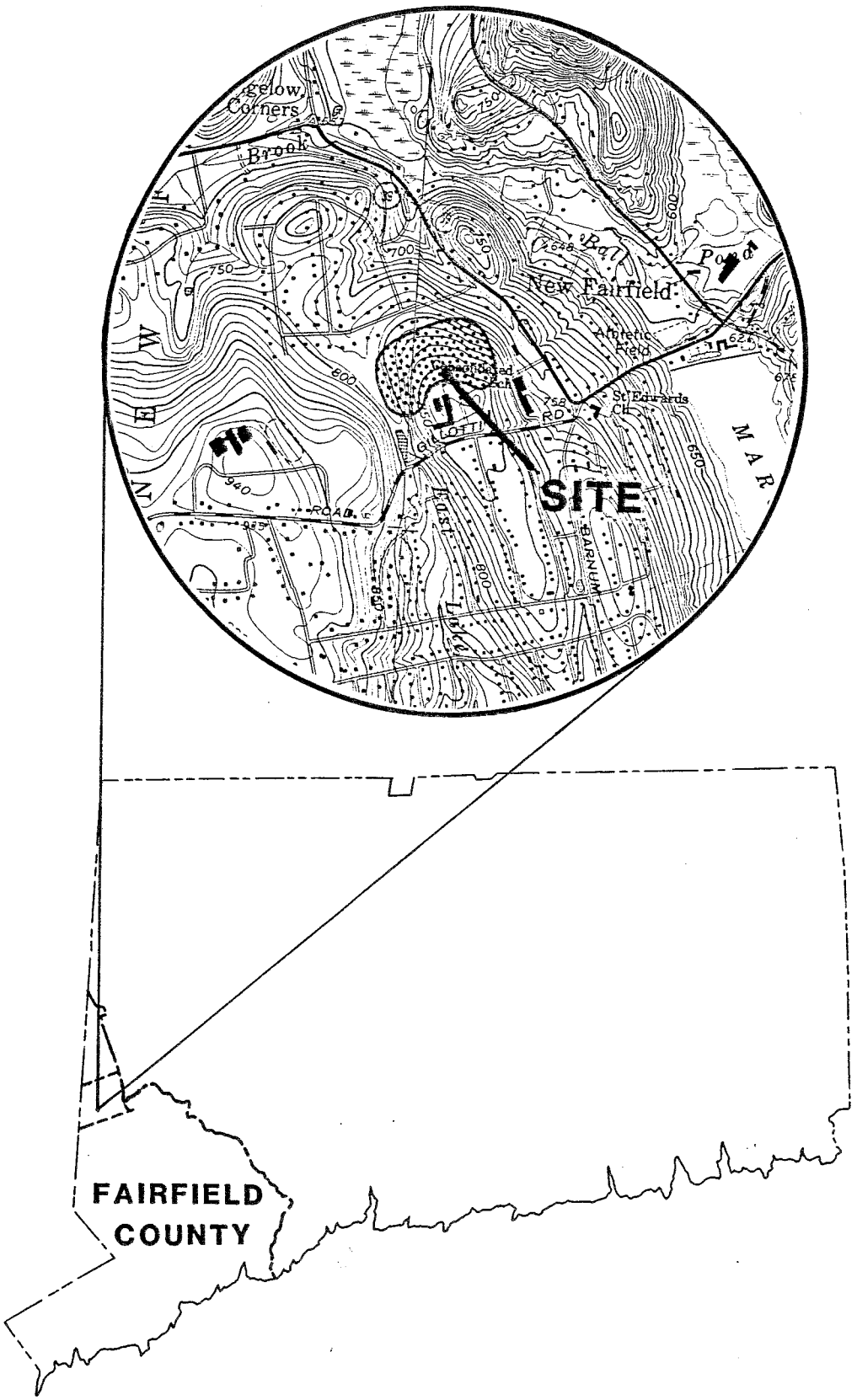
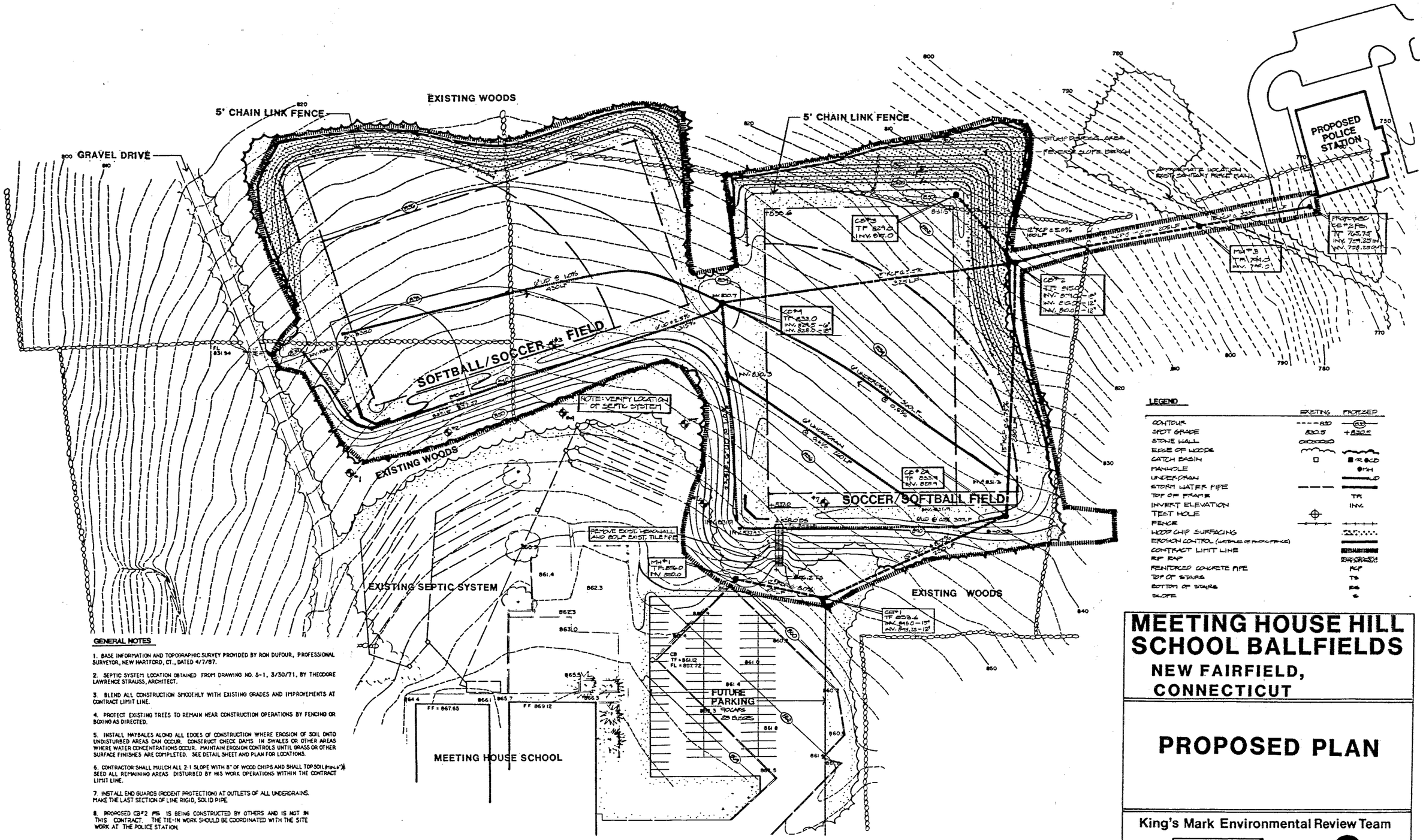


Figure 2



GENERAL NOTES

1. BASE INFORMATION AND TOPOGRAPHIC SURVEY PROVIDED BY RON DUFOUR, PROFESSIONAL SURVEYOR, NEW HARTFORD, CT., DATED 4/7/87.

2. SEPTIC SYSTEM LOCATION OBTAINED FROM DRAWING NO. S-1, 3/30/71, BY THEODORE LAWRENCE STRAUSS, ARCHITECT.

3. BLEND ALL CONSTRUCTION SMOOTHLY WITH EXISTING GRADES AND IMPROVEMENTS AT CONTRACT LIMIT LINE.

4. PROTECT EXISTING TREES TO REMAIN NEAR CONSTRUCTION OPERATIONS BY FENCING OR BOXING AS DIRECTED.

5. INSTALL HAYBALES ALONG ALL EDGES OF CONSTRUCTION WHERE EROSION OF SOIL ONTO UNDISTURBED AREAS CAN OCCUR. CONSTRUCT CHECK DAMS IN SWALES OR OTHER AREAS WHERE WATER CONCENTRATIONS OCCUR. MAINTAIN EROSION CONTROLS UNTIL GRASS OR OTHER SURFACE FINISHES ARE COMPLETED. SEE DETAIL SHEET AND PLAN FOR LOCATIONS.

6. CONTRACTOR SHALL MULCH ALL 2:1 SLOPE WITH 8" OF WOOD CHIPS AND SHALL TOPSOIL, FERTILIZE, SEED ALL REMAINING AREAS DISTURBED BY HIS WORK OPERATIONS WITHIN THE CONTRACT LIMIT LINE.

7. INSTALL END GUARDS (RODENT PROTECTION) AT OUTLETS OF ALL UNDERDRAINS. MAKE THE LAST SECTION OF LINE RIGID, SOLID PIPE.

8. PROPOSED CB#2 FS IS BEING CONSTRUCTED BY OTHERS AND IS NOT IN THIS CONTRACT. THE TIE-IN WORK SHOULD BE COORDINATED WITH THE SITE WORK AT THE POLICE STATION.

MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, CONNECTICUT

PROPOSED PLAN

King's Mark Environmental Review Team

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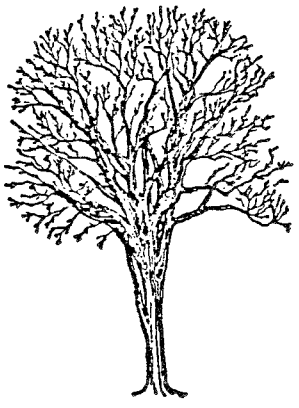
PHYSICAL CHARACTERISTICS



SETTING, TOPOGRAPHY AND GEOLOGY

The proposed ballfield sites are located in the southeast corner of New Fairfield. They would be located north of Meeting House Hill School. The site is bounded on the north by rear yards of residential homes on Rita Drive. The approximately 7 acre site as well as the land east and west of the site is wooded. The presence of stonewalls transecting the site indicates that the land has an agricultural past. Access to the proposed ballfields would be expected off Gillotti Road via the school parking lot.

The site is located on the northeastern flank of a streamlined hill (drumlin) whose shape derives from the smoothing action of overriding glacier ice. Based on geological mapping, the hill has a bedrock core.

The hill slopes gently then more moderately north/northeastward towards Rita Drive and Route 39 (see Figure 3). No major watercourses were observed in the area of the proposed ballfields. Surface water flows downslope to road drainage on Rita Drive or is intercepted by an intermittent stream that parallels Route 39. It ultimately flows into Ball Pond Brook (see Figure 4). In order to construct the ballfields on an acceptable grade, cutting and filling activity will be required on the site (see Hydrogeology/Geologic Development Concerns).

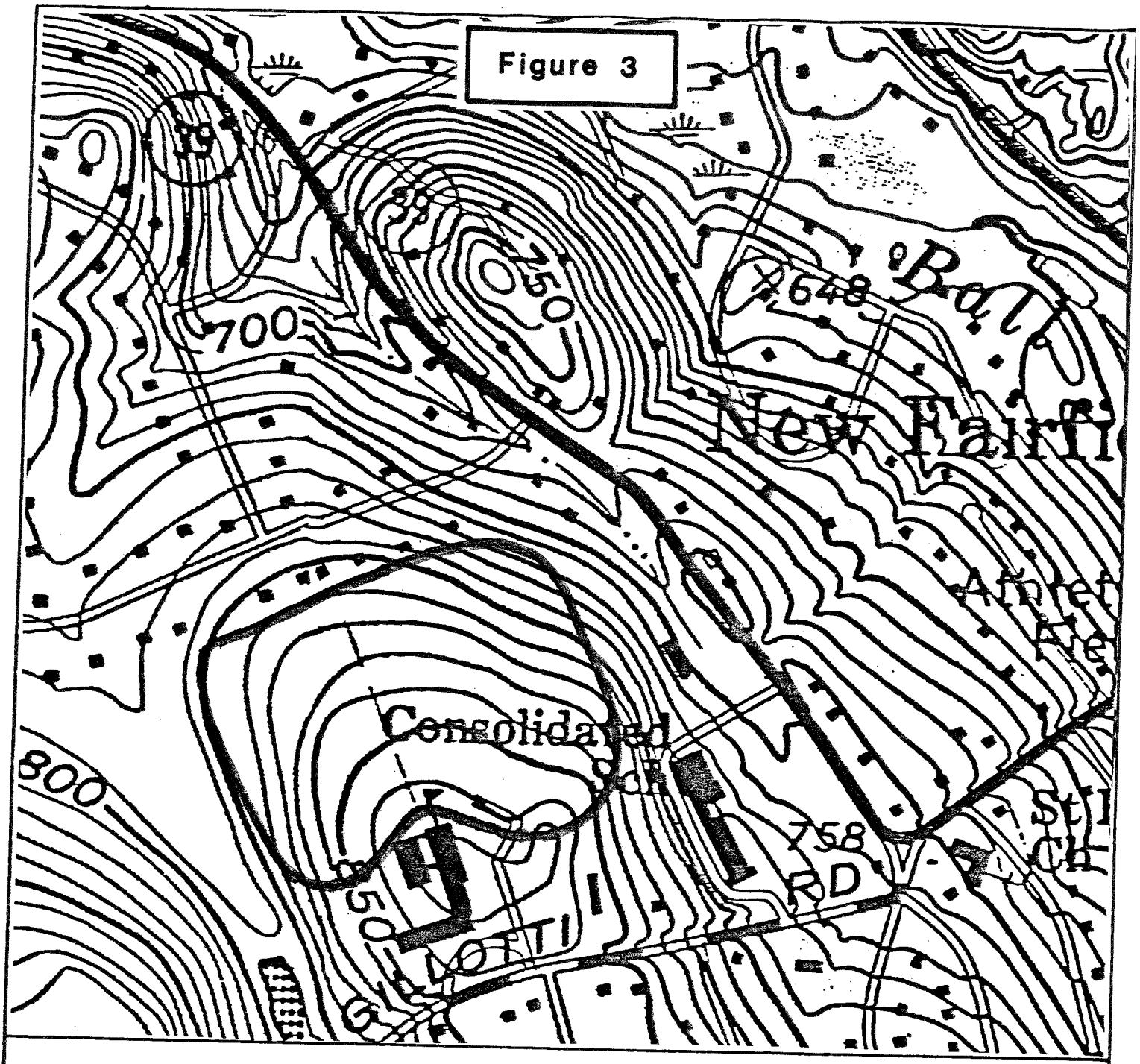
HYDROGEOLOGY/GEOLOGIC DEVELOPMENT CONCERNS

Bedrock geologic mapping information indicates a single bedrock outcrop (ledgerock) on the Meeting House Hill School property. However, it should be pointed out that recent subsurface exploration for expansion of Meeting House Hill School's septic system did not encounter the bedrock surface. Deep test holes located just south of the proposed ballfields ranged in depth from about

6 feet to 11.5 feet below ground surface (see Figure 2). It would be wise to conduct a few borings in the ballfield area to determine if the bedrock surface will be encountered during field construction. If the bedrock surface was encountered during the construction of ballfields, blasting would probably be required. Blasting activity can be difficult, especially in developed areas, and very costly.

The bedrock that forms the core of Meeting House Hill is described as pink granitic gneisses (see Figure 5). The major mineral components include feldspar and quartz. Geologists believe that the rock mass formed from molten material (magma), which was subsequently metamorphosed (geologically altered by great heat and pressure). These rocks are believed to be the oldest rocks in Connecticut, about 1.1 billion years old. The term "gneiss" used above refers to the rock's texture; these rocks characteristically include thin bands of elongate or flaky minerals that alternate with layers of granular minerals. This gives the rock a banded appearance.

The unconsolidated material (overburden) covering bedrock in the site is till, a non-sorted glacial deposit consisting of rock particles of widely varying sizes and shapes (see Figure 5). As a result of the mode of deposition by glacial ice, a relatively shallow "hardpan" developed below the weathered or rooted surficial soil zone. Geologists name this type of glacial deposit as lodgement till. Because the "hardpan" layer characterizing the soils in the proposed ballfield areas is quite compact, it has a low vertical permeability. As a result, groundwater movement generally parallels the topographic conditions on the site. 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



MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, CONNECTICUT

TOPOGRAPHY

King's Mark Environmental Review Team

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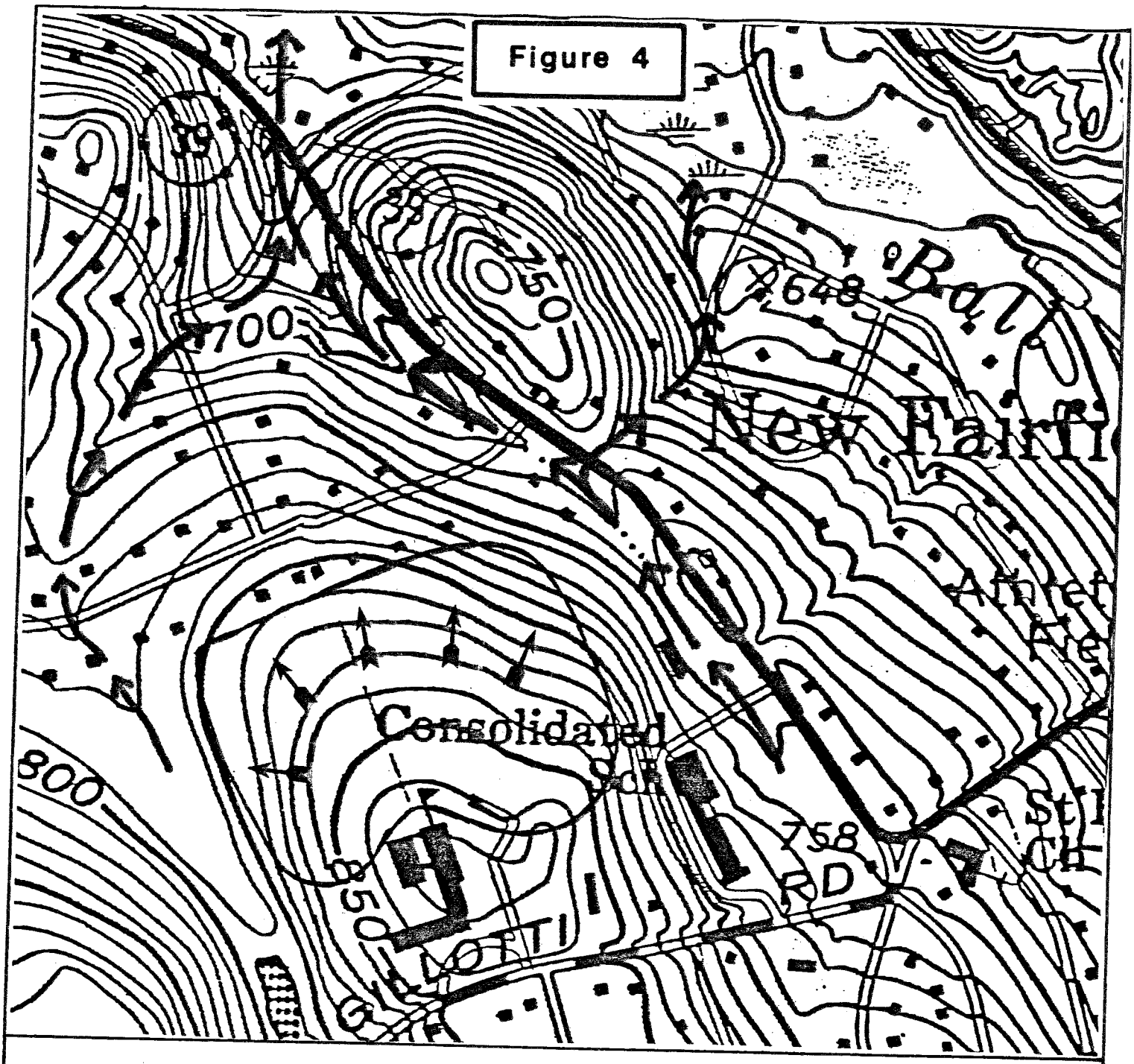

Streamcourses showing direction of flow

Direction of surface flow

NOTE: This does not account for rerouting by man-made structures, i.e. road drainage, culverts, etc.

MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, CONNECTICUT

WATERSHEDS

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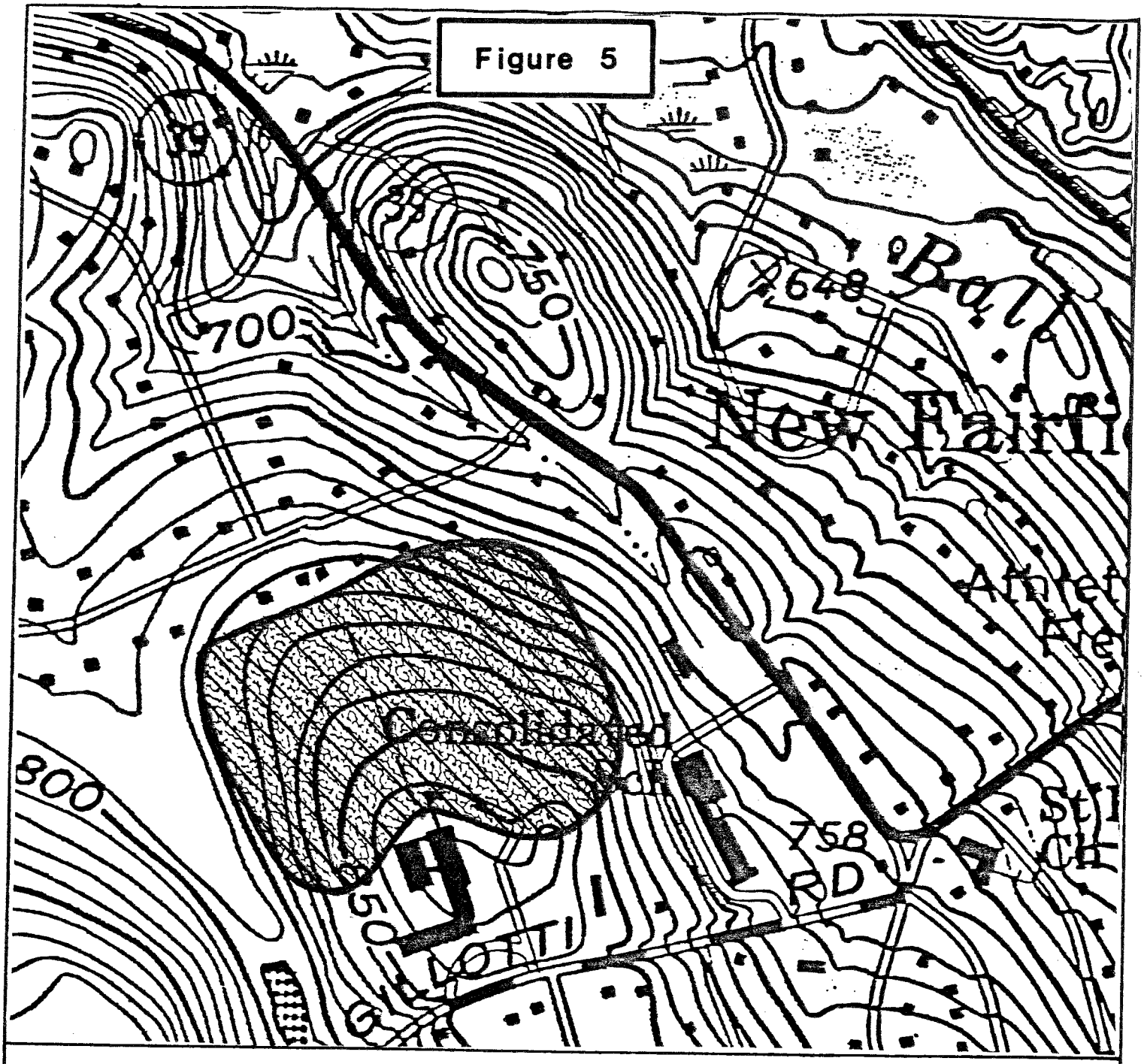

BEDROCK GEOLOGY

Pink Granitic Gneisses

SURFICIAL GEOLOGY

Firm Glacial Till

MEETING HOUSE HILL SCHOOL BALLFIELDS

NEW FAIRFIELD, CONNECTICUT

BEDROCK AND SURFICIAL GEOLOGY

King's Mark Environmental Review Team

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water table condition will be a hindrance in terms of constructing the proposed ballfields. The careful installation of curtain drains/underdrain is necessary in order to protect the usefulness of the playing fields from surface and subsurface waters during the wet months.

It should be noted that deep cuts in hardpan soils are extremely difficult to stabilize. This is due mainly to seepage of water over the hardpan layer, which creates an unstable condition below the seepage line. The weight of the unstable soil causes the soil to flow down the slope. Once this begins, the slope is very difficult to stabilize. The establishment of good vegetative cover is practically impossible on these eroding slopes. Beside the unsightly conditions, the eroded soils must be removed from the base of the slope.

The Connecticut Soil Erosion and Sediment Control Act (Public Act 385-388), 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. Because of the seasonally high water tables that characterize these soils and because of the high silt content in the soil, the chance for environmental damage from silt and erosion to neighboring properties and downstream watercourses and wetlands would be expected to be high unless erosion and sediment control measures are properly installed. It is suggested that temporary sediment pools be constructed prior to any land disturbance on the site. Also, it is strongly suggested that any construction be done during the dry time of year when groundwater tables have receded. This will hopefully reduce the chance for erosion/siltation problems.

As mentioned earlier, there is a need for drainage in order to keep the proposed fields dry. The project designer has proposed the installation of underdrains along the cut area (south side of field) and throughout the field area. If properly installed these drains should effectively intercept surface

water and ground water before it reaches the ballfields. Hopefully, this will protect the ballfield from the seasonally high water table that characterizes the area. The installation of the drains will also probably lower the water table north of the proposed playing fields. Surface and groundwater collected by the underdrain and stormwater drains will be routed eastward towards the police station. It will be outletted to a detention pond, which will be constructed in the intermittent streamcourse that parallels the west side of Route 39.

The installation of the proposed underdrain and drainage pipes in the ballfields and the proposed cut along the south side raises two potential concerns that the Town needs to consider. First, the installation of surface and groundwater drains for the ballfields will preclude the future use of the approximately 7 acre area for expansion of the septic system for Meeting House Hill School. It is understood that the existing septic system is presently failing and efforts are being made to renovate and expand the system. Public sewers are not available to this area. The area of proposed expansion appears to be between test holes 4 and 5 on the site plans distributed to Team members on the review day. If the need for septic system renovation arose, suitable areas for such expansion would be severely restricted by the drainage systems in the proposed fields, parking lot area and the on-site well serving the school. The only potential expansion area appears to be the land west of the gravel road behind the school. In this regard, school officials should probably discuss possible areas for future expansion with the Town Sanitarian before the ballfields are constructed. It might also be wise to conduct soil testing to determine subsurface conditions in the area. Without public sewers in the areas and extremely limited area for septic system expansion, the Town could be left in a very difficult position.

Second, the location and close proximity of the existing septic system serving the school to the proposed cut area and underdrains system warrants close attention. Every effort should be made to ensure that untreated waste does not break out along the north facing slope (cut area) down gradient from the existing septic system, and that it is not intercepted by the proposed drainage system. Both scenarios could result in a public health hazard condition as well as contaminate surface waters in the area. It seems likely that the existing septic system closest to holes 4 and 5 would need to be relocated, if the ballfields are constructed. Also, the area currently proposed for new leaching field expansion should be abandoned and relocated elsewhere, since it would be located at or near the proposed cut area. Finally, although the public health code requires a minimum separating distance of 50 feet when the drain is located down gradient from the septic system, it might be wise to conduct hydraulic analysis of the soil in the area to determine if greater distances should be required.

SOIL RESOURCES

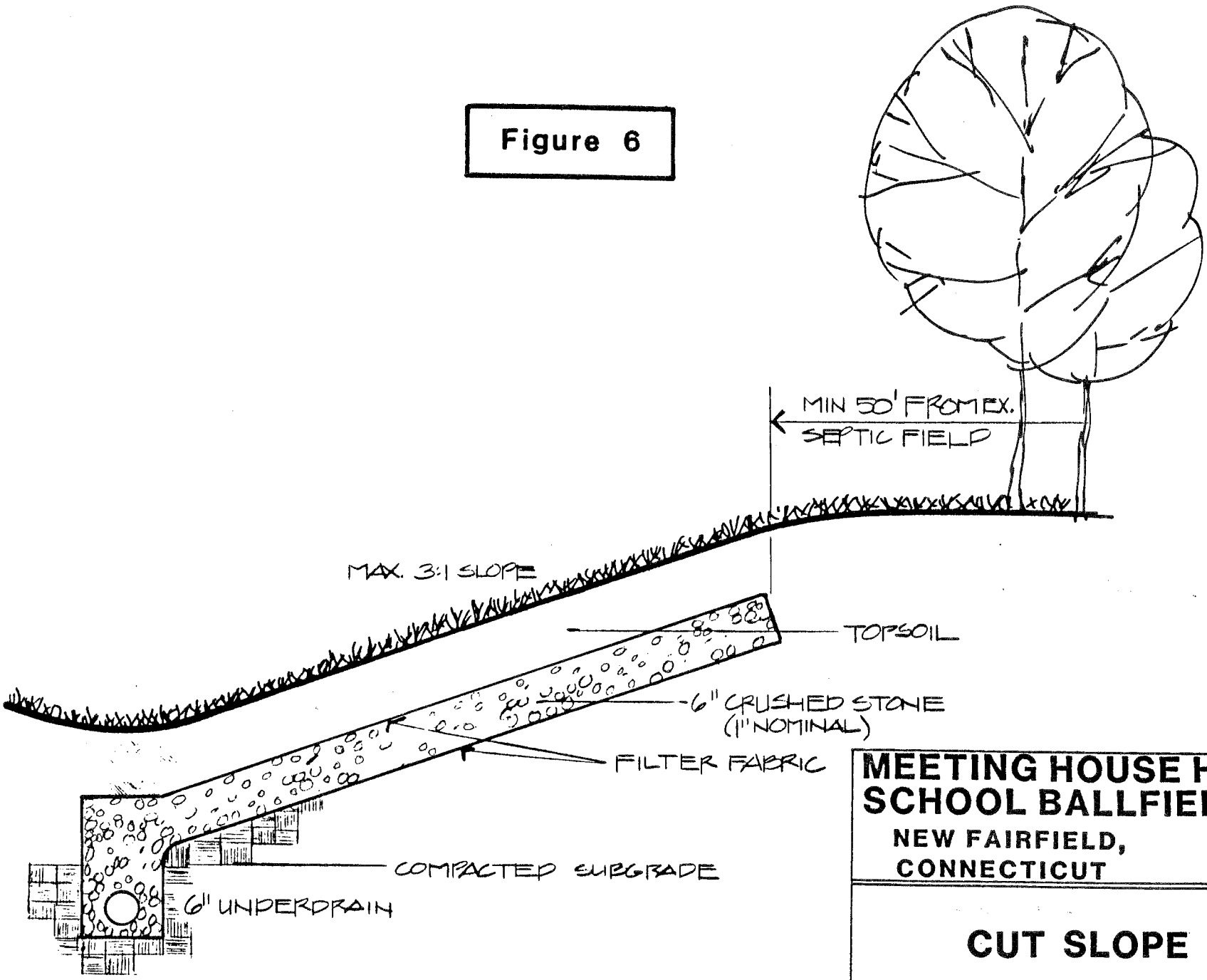
The construction site consists entirely of Woodbridge soil (WzB), a moderately well-drained hardpan soil. The drainage characteristic of a Woodbridge soil is attributable to a fluctuating water table that rises to within eighteen to twenty inches of the soil surface during the late winter and early spring and again in the late fall. During these periods the soil above the hardpan is saturated; the horizontal flow of water is slow, allowing water to accumulate on the surface of the hardpan layer. Excavation activities commenced before mid-May and after mid-November can be seriously hampered by mud, slope failure, subsurface drainage and excessive erosion.

Controlling these hazards requires detailed planning prior to a construction start to prepare the site for a trouble-free activity. More intensive planning is needed for the artificial drainage system to insure the utility of the completed project. The artificial drainage system is absolutely essential when major regrading is planned with a resulting composite area consisting of raw hardpan and compacted hardpan fill. Recreation fields in particular demand a total system of subsurface drains, generally installed at forty foot intervals throughout the entire playing surface, to assure full season use. The grading plan for this proposal does not show an adequate drainage system in the completed fields.

The stone-filled envelope slope drainage proposal for cut slopes will protect these slopes from falling (see Figure 6). It must, however, be installed at the correct depth to intercept the subsurface flow line. This depth may vary across the slope; accuracy in placement is crucial. It is unavoidable that effluent from the existing leaching field will be picked up in a portion of the slope drain. Should the additional leaching field be installed as planned, a serious incompatibility would exist.

There is presently no erosion and sediment control plan to review. Second to the artificial drainage plan, this is the most critical planning element for this project. When the plan is prepared, it must address phasing of both the land clearing and construction activities. Most important, it must prescribe the stabilization of the access road, starting and completion dates for excavation and grading, erosion and siltation control for the construction site and the fill slopes, final stabilization schedule and techniques and tree planting specifications and post project care. The text should also state how the plan will be implemented and who will monitor the implementation.

Figure 6



9/L-3 UNDERDRAIN ADJACENT TO SLOPE

NOT TO SCALE

MEETING HOUSE HILL SCHOOL BALLFIELDS

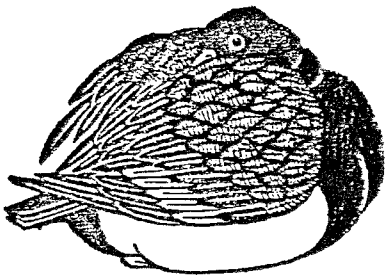
NEW FAIRFIELD, CONNECTICUT

CUT SLOPE ENVELOPE DETAIL

King's Mark Environmental Review Team

Assuming a faultless installation of these facilities, the final product will have a visual impact on several homes on Rita Drive. The impact will vary with each property but will be equivalent to the existing condition at the rear of the high school playing fields as viewed from homes in the Weldon Woods subdivision.

APPENDICES



Appendix A: Soils Limitation Chart

WzB—Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, moderately well drained soil is on drumlins and hills. Stones and boulders cover 5 to 35 percent of the surface. The areas are irregular in shape and mostly range from 4 to 80 acres.

Typically, this soil has a surface layer of very dark grayish brown fine sandy loam 6 inches thick. The subsoil is yellowish brown fine sandy loam 24 inches thick that is mottled in the lower part. The substratum is firm and brittle, grayish brown, mottled fine sandy loam to a depth of 60 inches or more.

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

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

Most areas of this soil are wooded. A few areas are used for community development, and a few are used for pasture.

The slow or very slow permeability of the substratum, the seasonal high water table, and stones and boulders on the surface limit the soil for community development. Onsite septic systems require special design and installation because of the high water table and slow permeability. Slopes of excavations are unstable when wet, and lawns are soggy from autumn to spring. The stones and boulders need to be removed for landscaping. Foundation drains help prevent wet basements. Quickly establishing plant cover, mulching, and using siltation basins and diversions help to control erosion and sedimentation during construction.

The stones and boulders on the surface make the use of farming equipment impractical and, along with slope and wetness, make the soil generally unsuitable for cultivated crops. The soil is suitable for trees, but the stones and boulders make machine planting impractical.

The capability subclass is VIIs.

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.