



CHESTER MAIN ESTATES

EAST and WEST

North Stonington, Connecticut

EASTERN CONNECTICUT ENVIRONMENTAL REVIEW TEAM REPORT

Eastern Connecticut Resource Conservation & Development Area, Inc.

**Chester Main Estates
East and West
North Stonington, Connecticut**

January 1995



Eastern Connecticut Environmental Review Team Report

Prepared for

The North Stonington Planning and Zoning Commission

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ACKNOWLEDGMENTS

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

The ERT met and field checked the site on Friday, December 16, 1994. Team members participating on this review included:

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Prior to the review day, each Team member received a summary of the proposed project, a list of the town's concerns, a location map, a topographic map, soils map and additional information. During the field review the Team members were given full sets of plans. The Team met with, and were accompanied by members of the Planning and Zoning Commission, the Inland Wetlands Agency, the developer and his engineer and surveyor. Following the review, reports from each Team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project — all final decisions rest with the Town and landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in making your decisions on these subdivisions.

If you require additional information, please contact:

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INTRODUCTION

The North Stonington Planning and Zoning Commission requested assistance from the Eastern Connecticut Environmental Review Team in reviewing two proposed subdivisions.

Two single family subdivisions are proposed for the southern end of Chester Main Road at the site of the former Crosswoods Vineyard. Chester Main Estates East consists of 17 lots on 68.48 acres along the east side of the road. Lot 3 contains the former winery building in a reconstructed barn. Chester Main Estates West along the western side of the road contains 12 lots on 48.68 acres. The lots range in size from 2 to 17 acres. Lot 2 contains the renovated farmhouse and outbuildings and Lot 2.06 contains the Williams Burying Ground. Both subdivisions contain vineyard wires left from the production of grapes. All lots will be served by on-site wells and sewage disposal systems. Approximately 5 acres of open space is proposed which will be controlled by a homeowner's association.

The town has requested this review for the purpose of providing guidance to the Board of Selectmen, the Planning and Zoning Commission, the town sanitarian, the town building official, and Inland Wetlands Agency on the following areas of concern: overall project design, septic system design and feasibility, wetlands protection, stormwater runoff and drainage, open space, curb cut locations, effects of prior vineyard use on the proposed development, and archaeological significance and preservation.

The following sections of this report offer basic natural information, discussion of potential problem areas and areas of town concern, and recommendations for mitigation of adverse effects and information on good land use planning.

Figure 1

LOCATION MAP



Chester Main Estates East

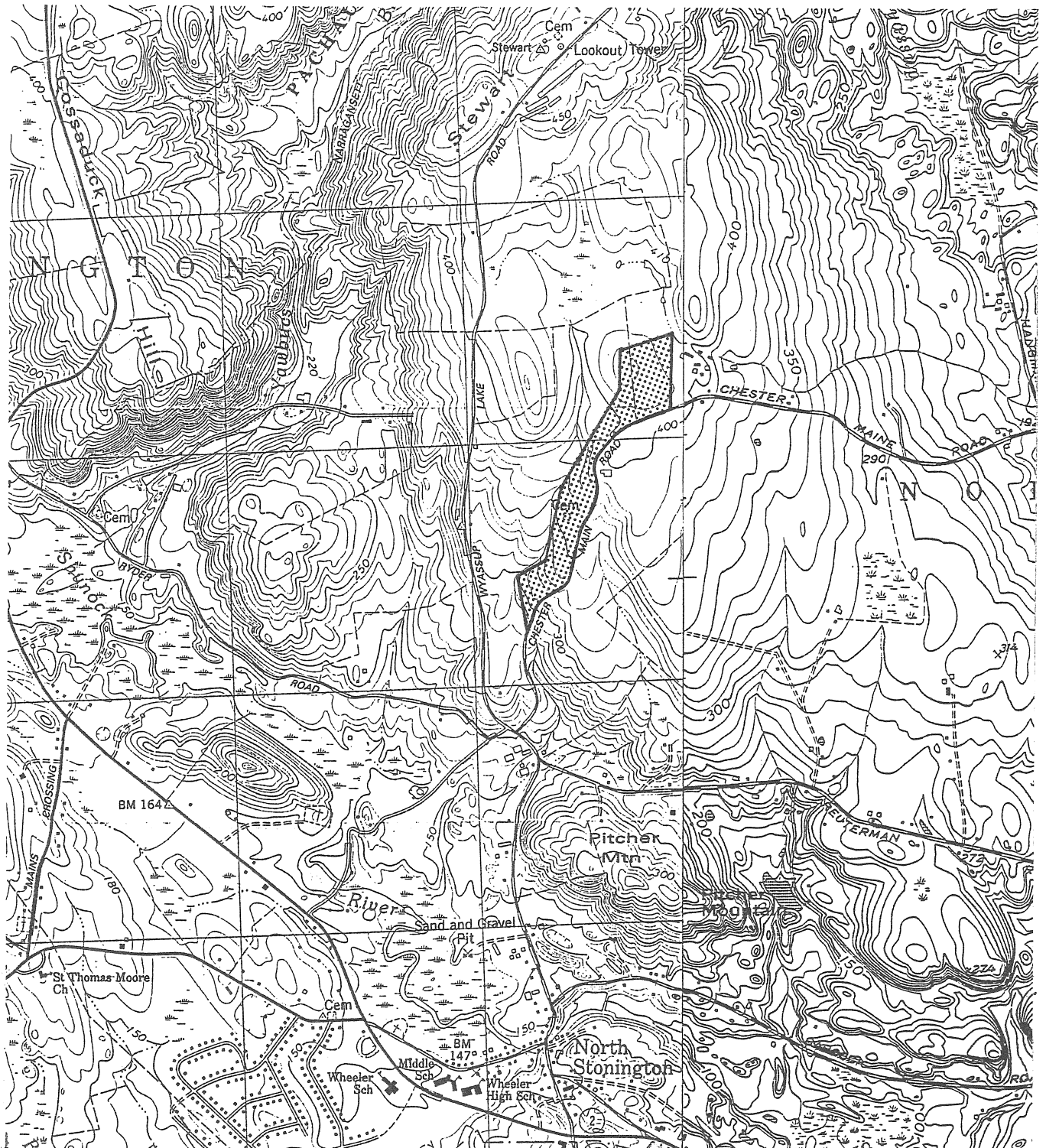


Figure 2

LOCATION MAP



Chester Main Estates West



GEOLOGY, TOPOGRAPHY AND HYDROLOGY

Geology and Topography

The bedrock in the study area is predominantly Potter Hill Gneiss, more than 600 million years old. The study area, according to the Bedrock Geologic Map of Connecticut (Rogers, 1985), is approximately at the center of a fold which closes to the west and opens to the east. The southernmost part of the study area is a porphyritic phase of the Potter Hill Granite Gneiss, with some coarser-grained minerals present. The entire area is part of the Avalonian Terrane, which became attached to North America during the collision that formed the Appalachian mountains.

The surficial deposits in the area are mapped as till, greater than 10-15 feet thick in the northern portion of the study area, and less than 10 feet thick in some southern portions of the study area (Stone, et. al., 1992). Test pit 16D showed white sandy material buried beneath the surface, so it is probable that the surficial geology is more complicated than shown on the surficial materials map, and that the material mapped as till is in some areas stratified in some way beneath the surface.

There are areas of exposed outcrop in lots 3.15 and 3.16. In general, the exposed outcrop or ledge in these two lots is probably larger than appears on the subdivision plans. In particular, the outcrop in lot 3.15 is probably more extensive than appears on the plans. There are many large rocks in the area. Some of the rocks are definitely outcropping bedrock, and some are probably boulders that were loosened from bedrock near the surface. It is difficult to determine precisely the extent or depth of bedrock beneath the surface, because there may be topographic variations buried beneath the

glacially deposited till. It is probable that there is a line of ledge beneath the surface extending between the mapped outcrop locations in lots 3.15 and 3.16. The test pits for these lots were made near the edge of the property, inside the aquifer protection zone. Given the uncertain extent of the bedrock beneath the surface, there may not be any other appropriate location on these two lots for septic systems.

Hydrology

Hydrologic concerns listed by the Town include conditions for septic systems in some of the lots, particularly lots 3.01 and 3.02, and effects of the proposed development on a culvert at Wyassup Road. In order to investigate these problems, the site was revisited December 28, 1994 by the Team Geologists, five days after a major storm. There was water flowing over grass along the southern edge of the pond on lot 2.04. There was no well defined channel observed where the water was flowing, indicating that such periods of flow are not the norm at this location. Design of any septic system on lot 2.04 or lot 2.05 should take into consideration the fact that groundwater flow into the pond will probably increase as a result of input from the septic systems, and periods of overland flow such as was observed may become more common as a result.

On the northern corner of lot 3.02, near the border with lot 3.01, a large puddle about 15 feet wide by 30 feet long and 6 inches deep was observed. This puddle was not in the immediate vicinity of the percolation pits, but there was standing water near the percolation pits as well. The percolation tests shown on the plans for these lots were made in late August and early September, the dry time of year. Since the ground had been frozen at the time of the storm, it does not necessarily follow that the water table was actually at the surface of the ground near the puddle. This does, however, confirm

the poor drainage in this area, which should be taken into account in any septic design for that lot.

The culverts at Wyassup Road were examined. Development could increase the burden on these culverts, because surface cover such as forest, which allows rainwater to seep into the ground, is replaced by impermeable materials such as rooftops and driveways. The result could be increased flooding of the road. Increased erosion could also result from the increased flow. The engineer's drainage calculations for the twin culverts at Wyassup Road showed a projected increase in flow during a 50-year storm after the proposed development. His projected increase was from 335 cubic feet per second (cfs) to 350 cfs, a 4% increase. Since the culverts are inadequate at present, even a 4% increase in flow will increase flooding events. It is up to the town to determine whether this is acceptable or not. It may be desirable for the town to upgrade the stream crossing in any case. Possible alternatives to reduce potential flooding include designing small wetlands to slow down surface flow during storm events.

Related to hydrology are issues of possible soil contamination from pesticide use in the vineyards and leakage from the above ground storage tank. It would be worthwhile for the town to find out, if possible, which pesticides were used, in what quantities, and their expected persistence times in the soil. Four soil analyses were mentioned in the environmental review made by the previous owner of the vineyard. The town should find out, if possible, where those samples were taken. It may be desirable to have additional samples analyzed if the samples were not taken from areas of heaviest pesticide use. It may be desirable also to analyze a soil sample from the area of the above ground storage tank to determine if any leaks may have left harmful residues in the soil.

Conclusions

On some lots, the 100-foot wetland buffer and the required road setbacks overlap, leaving a very small or no area for the house, well and septic system. It is the Team Geologists understanding that the 100-foot setback from wetlands is advisory, and not required, so that it is not a fatal design flaw. In view of this, and the points mentioned above for lots 3.15 and 3.16, the town may wish to require a more detailed lot proposal for some of the lots, showing locations of prospective septic systems, wells, and buildings, and explaining potential impact on the aquifer protection zone, where applicable. More detailed contours may also be appropriate in some of the building lots. Soil analyses may be appropriate if there is no information available about quantities and kinds of pesticides used. If the locations of previous soil samples can be discovered, and the pesticides were not heavily used or not persistent, soil analyses may not be necessary.

The town may wish to upgrade the stream crossing at Wyassup Road, since it appears to be inadequate regardless of whether development occurs or not.

References

- Rogers, John, 1985. Bedrock Geological Map of Connecticut, Connecticut Natural Resources Atlas Series, Connecticut Geological and Natural History Survey.
- Stone, Janet, et. al., 1992. Surficial Materials of Connecticut, U.S. Geological Survey.

SOIL RESOURCES

The soils in the proposed developed area range from excessively well and well drained Charlton-Hollis soils to very poorly and poorly drained Ridgebury, Leicester, and Whitman soils. A soil map of the area is included in this section of the report. The soil interpretation table contains the current ratings for the soils in the study area. Moderate or severe ratings do not necessarily mean that the site cannot be used for the planned purpose. In these cases special conditions must be taken into consideration in planning and design, and usually results in higher site development costs. The last column of the soil interpretation table indicates which soils meet wetland and Prime Farmland criteria.

Drainage

The hydrology calculations do not use the standard procedure to calculate the time of concentration. A uniform velocity was assumed for the length of the watershed. Accounting for sheet flow, shallow concentrated flow and channel flow separately may change the time of concentration. If the velocity used is accurate, accounting for sheet flow should increase the time of concentration and reduce peak flows. The 2 acre lot size used for calculation of runoff curve number is conservative. Actual runoff should be less because most lots are larger than this, resulting in a lower percentage of the total area with impervious surfaces. There are ponds and swamps in the main flow path of the watershed which TR-55 does not account for. These also should help reduce the actual time of concentration.

No calculations are shown that address the impact of culverts under Chester Main Road on peak flows downstream.

Flood routing calculations of the stream through the culverts on Wyassup Road would better determine the impact of development on downstream areas. Because the culverts cannot handle a 50 year storm now, development may have little, if any, impact down stream if the road will not over-top more frequently. It may also be possible to utilize the proposed culvert crossings to detain some stormwater runoff and reduce peaks flows downstream. Impact on the stream and wetlands should be evaluated if this is considered.

The wetland crossings at the southern end of the property are at narrow, steep sided locations. A bridge, a pipe arch or concrete box culverts at the driveway crossings would have less impact on the stream and adjacent wetlands than pipe culverts. A bridge would have the least impact. A precast concrete or timber bridge could be placed on concrete, stone or timber abutments. The wider the span, the less impact there would be on the wetlands. A timber bridge could add aesthetic value to the crossing, and possibly to the lot in general. A pipe arch would also provide less impact to the wetland and stream. An arch could be placed on narrow concrete footings. Additional costs associated with these would be somewhat offset by the reduced amount of fill required and elimination of the rip rap required. In both cases the stream channel could remain undisturbed, reducing the potential for sedimentation during construction, maintaining existing velocities and providing a larger wildlife corridor.

Provisions should be made in driveways and lot grading to allow drainage from the small wetland in lot 2.05 to continue to the outlet.

Erosion and Sediment Control

Because the lots will be sold and developed individually no erosion and sediment control plans have been prepared. Some provisions should be made that will insure that buyers of the lots will know that an erosion and sediment control plan must be prepared and implemented.

General comments are as follows (especially on steep lots):

- ◆ Steep driveway slopes should be paved as soon as possible, especially near the stream and wetlands.
- ◆ Keep disturbance of ground surface area to a minimum.
- ◆ Connect gutter downspouts to subsurface pipes and convey to stable outlet.
- ◆ Grade upslope runoff around yards and fill slopes.
- ◆ Cut slopes in glacial till soils may be difficult to stabilize due to seepage along the compacted layer.

Figure 4 - Soil Interpretation Report

Map Symbol	Soil Name	Septic Tank Absorption Fields	Dwellings with Basements	*
CcB	Canton	Moderate Large stones	Slight	
	Charlton	Slight	Slight	
CrC	Charlton	Moderate Slope	Moderate Slope	
	Hollis	Severe Depth to Bedrock	Severe Depth to Bedrock	
PdB	Paxton	Severe Percs Slowly	Moderate Wet	
	Montauk	Severe Percs Slowly Wet	Moderate Wet	
PeC	Paxton	Severe Percs Slowly	Moderate Wet Slope	
	Montauk	Severe Percs Slowly Wet	Moderate Wet Slope	
Rn	Ridgebury	Severe Percs Slowly Wet	Severe Wet	W
	Leicester	Severe Wet	Severe Wet	W
	Whitman	Severe Percs Slowly Ponding	Severe Ponding	W
SxB	Sutton	Severe Wet	Severe Wet	
WxA	Woodbridge	Severe Wet Percs Slowly	Severe Wet	P
WyB	Woodbridge	Severe Wet Percs Slowly	Severe Wet	
WzC	Woodbridge	Severe Wet Percs Slowly	Severe Wet	
	Rainbow	Severe Wet Percs Slowly	Severe Wet	

* P - Prime Farmland Soil

W - Wetlands Soil

Figure 5

SOILS MAP



Scale 1" = 1320'



THE NATURAL DIVERSITY DATA BASE

The Natural Diversity Data Base maps and files regarding the project site have been reviewed. According to the information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or sitespecific field investigations. Consultations with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact the Data Base if you have further questions at 424-3584. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

WETLAND RESOURCES

Included in this section are observations of the wetland resources and recommendations for future development of this parcel. Open space alternatives and erosion control will also be discussed.

Wetlands

The wetlands on this property are primarily associated with two separate perennial watercourses running generally north to south. These watercourses are unnamed on the U.S. Geological Survey topographical quadrangle. One flows through the eastern section of the subdivision and joins the other which flows along the rear portion of the western section of the subdivision. This watercourse then flows for approximately one half mile to its confluence with the Shunock River.

The 29 lots in these two subdivision range in size from 2 to 17 acres. Even though three driveway wetland crossings have already been approved by the North Stonington Inland Wetlands Agency and the project is now before the Planning & Zoning Commission for subdivision approval, the following are suggestions for modifications to these planned activities which could significantly decrease overall wetland impact. The project engineer may wish to study these alternatives to determine their feasibility.

Lot 3.11- The driveway access to Chester Main Road approximately 400 feet to the north (see Figure 6) could be relocated. The drive could follow the contour and cross the narrower wetland "arm" leading down to the main channel. With less flow in the

channel, the size of the downstream erosion protection rip-rap pad should decrease. The overall length of the drive should also decrease using this arrangement. However, constructing the drive along the contour may require more fill on the down-gradient side as it crosses the wetland. If the approved crossing is to remain, consider the use of a larger arch culvert, pre-cast box culvert or timber bridge here. These options reduce or eliminate the amount of fill necessary for the crossing, should eliminate the need for the downstream rip-rap pad and preserves stream-bottom characteristics as the watercourse flows under the drive.

Lot 3.13 (proposed as common drive with 3.12) - As above consider the use of a larger arch culvert, pre-cast box culvert, or timber bridge here. The steepness of the banks should accommodate one of these options.

Lot 2.03 - Re-arrange the side lot line so that access to Chester Main Road is 340 feet farther to the south onto what is now lot 2.04 (see Figure 7). Continue north to the upland area between the pond and other wetland area to the east (wetland flags 440 through 507). While inspecting this area in the field, it was evident that during high water periods, surface water flow from this wetland area traveled overland to the pond. If the drive is to be relocated to this position, a culvert would be necessary to accommodate this flow. See open space discussion on lot 2.04 below.

Other wetland considerations include:

◆ As part of this report, not all wetland boundary delineations were reviewed in the field, however aerial photographs covering this area were reviewed. According to this source information, the wetland boundary, as recorded on this site plan appears to be correct. There are two additional areas which may need further examination. A

well-defined drainage-way on lot 2.08 is clearly visible on aerial photographs. While this may not have all the usual characteristics of a watercourse, its presence should be noted on the site plan so that future septic and house locations can be sited accordingly (see Figure 8). Similarly, there are wet areas visible on aerial photographs (dated 4/9/90) in the area proposed for lots 3.01 and 3.02. They appear to be located southeast of test holes 1B and 2B (see Figure 9).

- ◆ The watercourses flowing through this parcel are not indicated on the site plan. The site plan should include the actual position of watercourses themselves as well as the associated wetlands.

- ◆ Lot 2.01 contains wetland boundaries based on the Soil Survey of New London County Connecticut. The site plan certifies that the wetland boundary marked on the property by the soil scientist is "shown correctly on the map". This apparently does not include most of the wetland boundary on lot 2.01. This boundary should be confirmed in the field by the project soil scientist.

- ◆ The wetland boundary, as it continues from sheet 6 to sheet 7 (East Subdivision) appears to be misaligned.

Erosion and Sedimentation Control

The topic of erosion and sedimentation control (E&S) is covered elsewhere in this report (please refer to Soil Resources), however, an additional comment should be made. Indirect impacts to wetlands on this property could occur as a result of inadequate or unmaintained erosion and sedimentation controls. Due to the absence of actual building "envelopes", the E&S control measures included on this plan are

very general and non-specific. There appears on this site plan a narrative section which could be used to certify this E&S plan. In essence, signing this section could "approve" the E&S plan for each lot as it exists on this site plan. It is clear that if a lot has wetlands or a wetland buffer, inland wetland agency review would be necessary. However, if no wetlands/buffer exists on the lot, would there be an opportunity for further review of the proposed building site for proper E&S control? It is recommended that final E&S approval take place for each lot as it comes under review for a building permit.

Open Space

There are many possibilities for the dedication of open space on this parcel. It is understood that the Town could require as much as 10% of the area (approximately 12 acres) as open space. Typically, this 10% should not include "unbuildable" land such as steep slopes or wetlands. Since it is expected that a homeowners association will own this open space privately, access to these areas would be restricted to member property owners.

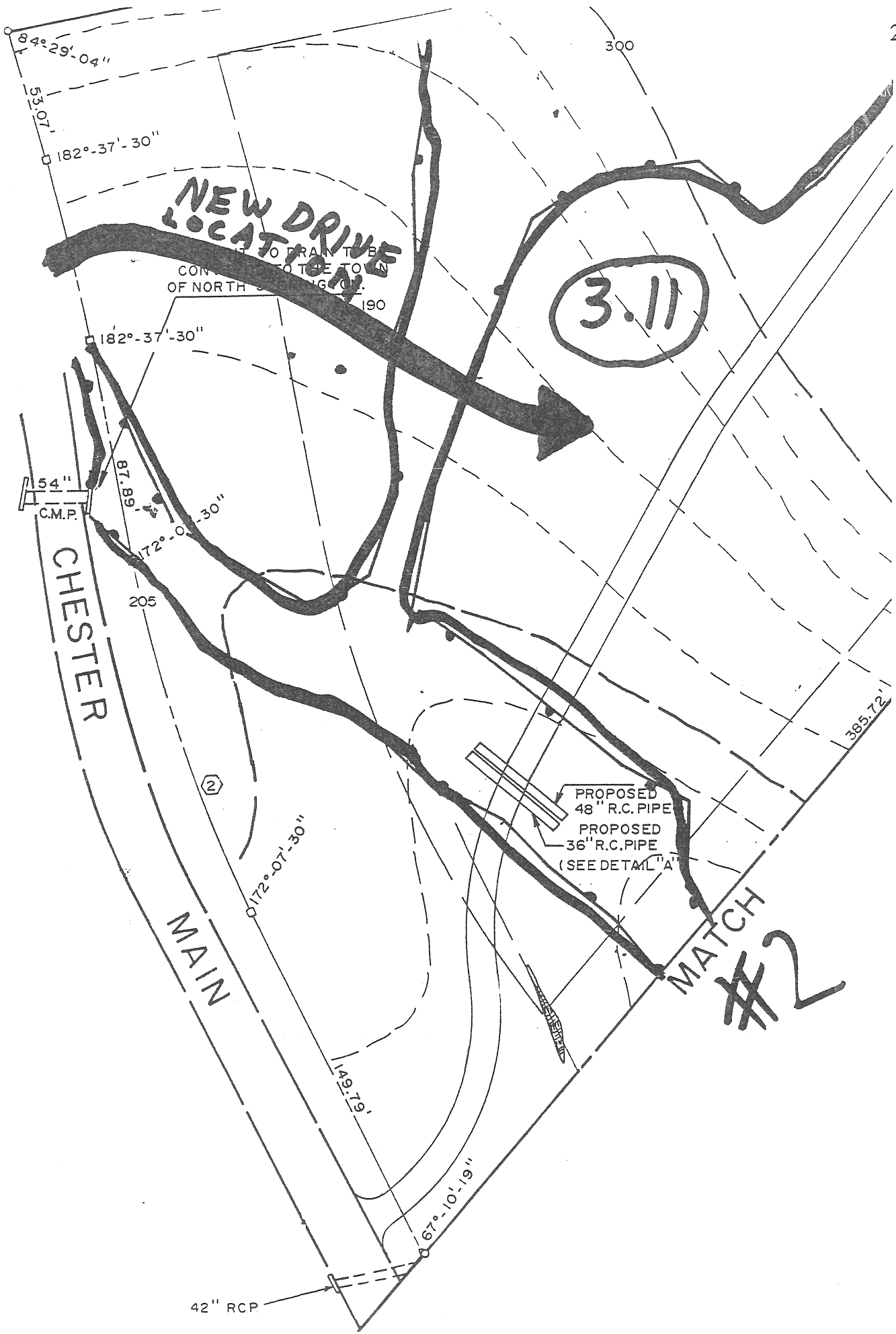
The plan currently sets aside about 5 acres of commonly owned open space in the form of a 30 foot wide horse trail circling about three quarters of the property. This area was created by simply offsetting a line 30 feet from the rear property lines. While this may provide adequate trails on the east side of the development, much of the rear properties on the west side contain wetlands, stone walls, tangled vegetation etc. If this open space is to be developed for horse travel it is recommended that it stay out of wetland areas or on existing wetland crossings. It may be easiest to move the trail onto nearby cleared lands where it currently passes through difficult terrain on the west side. This would require more precise field surveys to locate the trail accordingly.

It would be ultimately preferable to have the trail circle completely circle around the east and west sides of the subdivision. It appears that by including lot 2.04 (the pond lot) as open space, the trail could continue north past the pond and either cross the road at a point on to lot 3.01 or even continue up and around lot 2.01 if there is enough room.

Other open space opportunities include:

- ◆ The rear of lots 3.09 and 3.10. Here the trail could break out of the 30 foot restriction into a more expansive area of pasture land, to provide a break from the linear nature of the rest of the trail.

- ◆ Lots 3.15 and lots 3.16 contain areas of steep, uneven ground with rock outcroppings as well as a significant area of wetland. This area is also located immediately on the right as you turn off of Wyassup Road onto Chester Main Road. This area, as well as the area on the left side of the road, is currently undeveloped. By leaving this area undeveloped it creates a natural "gateway" effect as you begin to travel up Chester Main Road. It may be desirable to maintain it as such. If these two lots are to be developed it may be necessary to generate 2 foot contour intervals instead of the normal 5 foot interval due to the natural limitations of outcrop, slope and wetlands.



20

Figure 6

LOT 3.11



3.11

PROPOSED
48" R.C. PIPE
PROPOSED
36" R.C. PIPE
(SEE DETAIL "A")

MATCH
#2

NEW DRIVE
LOCATION

CHESTER

MAIN

42" RCP

84°-29'-04"

53.07'

182°-37'-30"

300

182°-37'-30"

54"

C.M.P.

87.89'

68.78'

172°-0'-30"

205

(2)

172°-07'-30"

149.79'

67°-10'-19"

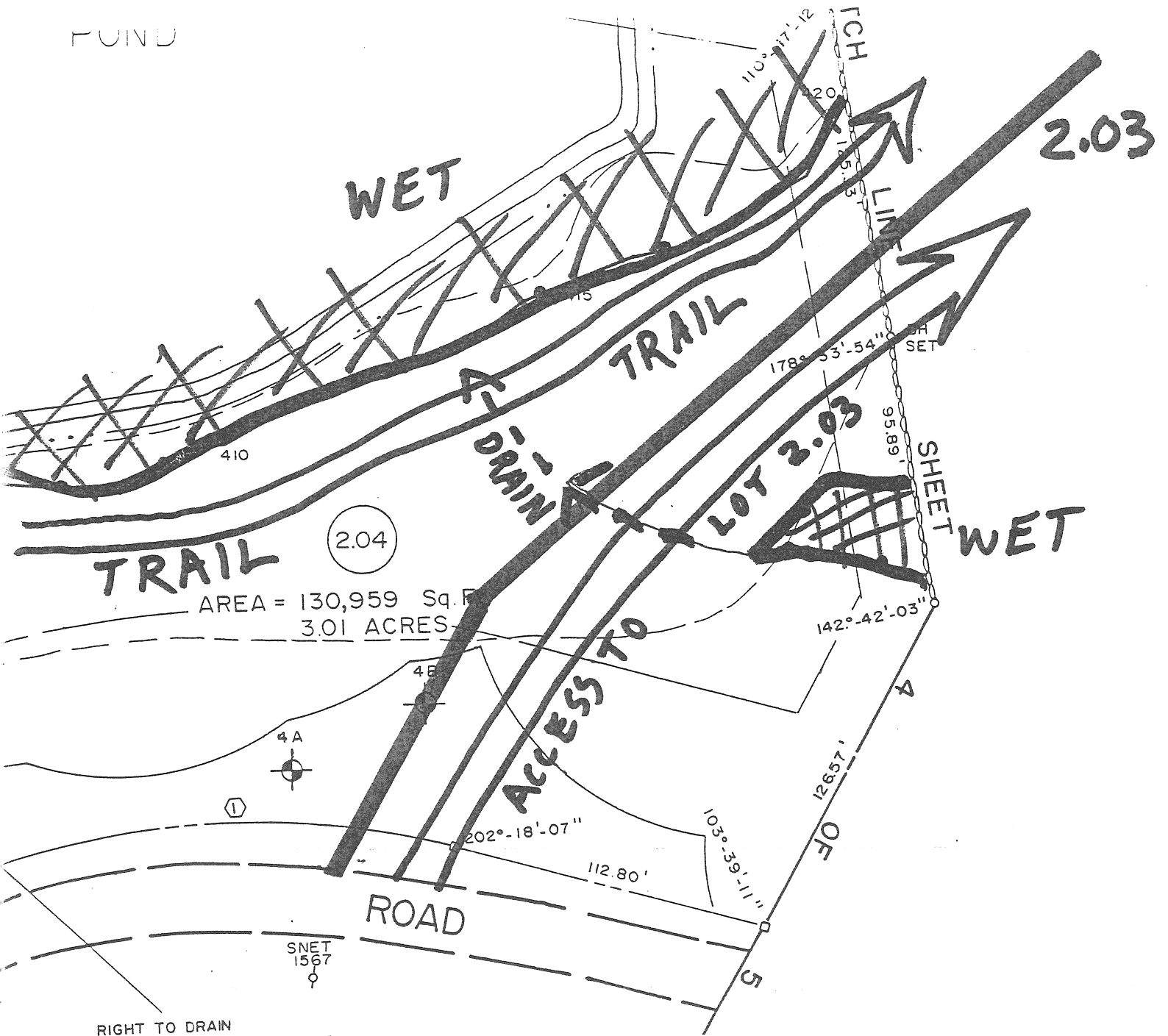
385.72'

190

Figure 7

LOT 2.03

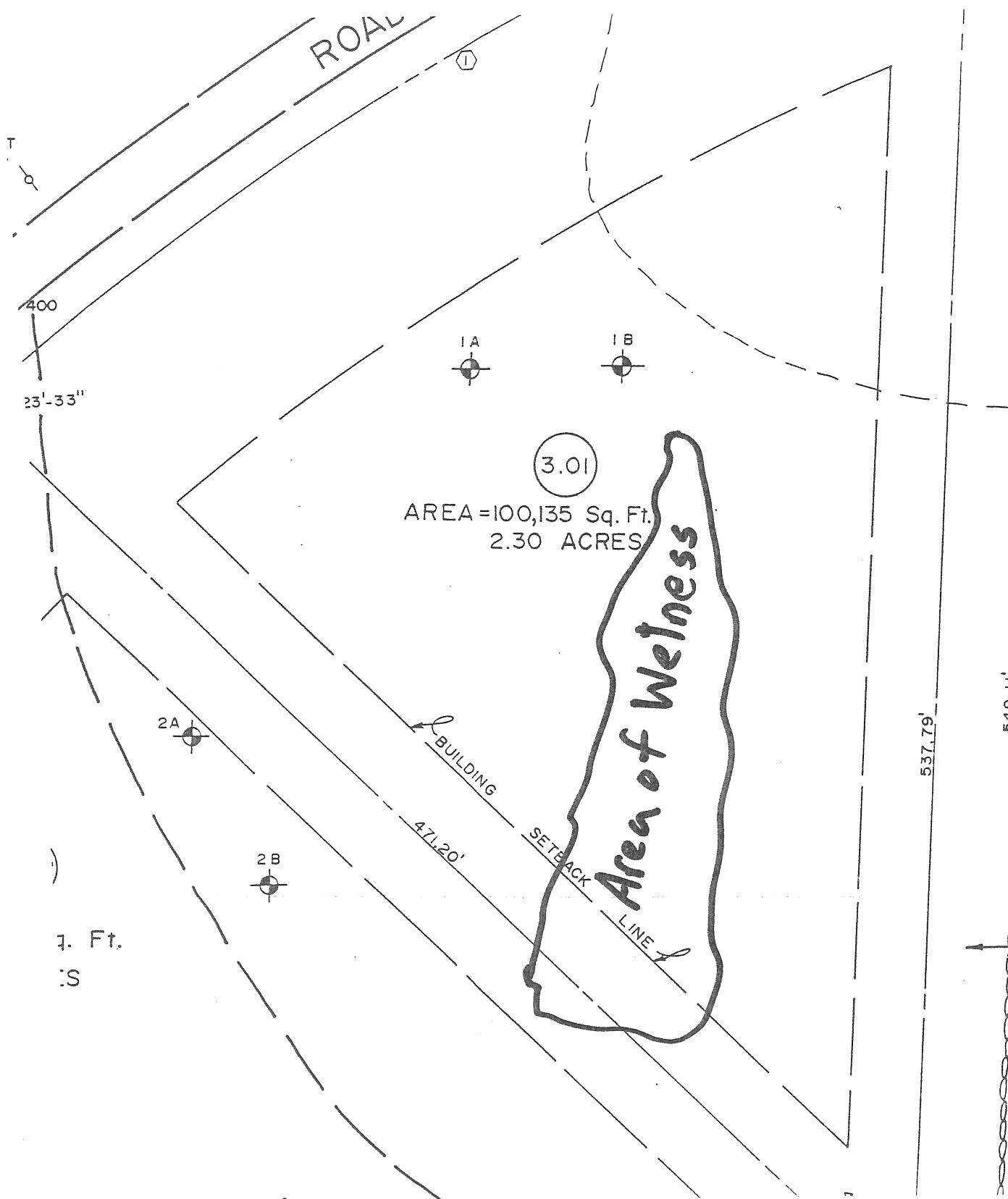
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RIGHT TO DRAIN TO BE CONVEYED TO THE TOWN OF

Figure 9

LOT 3.01



SEWAGE DISPOSAL

Chester Main Estates East consists of 17 lots on 68.48 acres on the east side of the Chester Main Road, while Chester Main Estates West consists of 12 lots on 48.68 acres on the west side of the road. All lots are proposed to be served by individual on-site wells and subsurface sewage disposal systems. Plans for the subdivisions were prepared by Dieter and Gardner and were stamped by Peter Gardner, L.S. and Gary Winalski, P.E..

This section contains comments on sewage disposal issues for the two proposed subdivisions.

Soil Test Witnessing/Testing

All the soil testing for the subsurface sewage disposal systems was done by the applicant's engineer, Gary Winalski, P.E.. It is the Team Sanitarian's understanding that the town sanitarian, Robert Shabunia has indicated he could not participate in the testing partly due to his limited sanitarian hours. The Team Sanitarian has been provided with a copy of a September 10, 1990 letter Mr. Shabunia wrote to the North Stonington Planning and Zoning Commission. Mr. Shabunia states he will not comment on proposed subdivisions due to budget constraints and an increase in paperwork required by the State Department of Public Health and Addiction Services Environmental Health Services Division - On-site Sewage Disposal Section. The On-site Sewage Disposal Section has found that the benefits of providing appropriate staffing during the normal work week far out weigh the monetary savings that are realized in limited, part time, off-hour sanitarian coverage. The On-site Sewage Disposal Section office supports any changes that are needed by the North Stonington Health Department to provide the proper coverage.

Mr. Shabunia makes reference in his letter to two forms from the State code (Public Health Code Section 19-13-B103/Technical Standards). It is assumed this is the "paperwork" he is referring to. Form #2 is a site investigation form which contains percolation test and deep test hole data, as well as information as to whether a site is suitable for subsurface sewage disposal and if an engineered design is required. Obviously, if a Planning & Zoning Commission was reviewing an application to create new lots which will utilize septic systems, the data contained in Form #2 is invaluable. The other form, Form #3 does not have to be completed until the septic system is being installed. The On-site Sewage Disposal Section office has previously informed Mr. Shabunia that there is no need to have applicants complete Form #3.

Although the State sewage disposal regulations do not specifically address subdivisions the On-site Sewage Disposal Section office has strongly recommended that the local health department staff witness at least some of the testing in order to verify the data being recorded is accurate. The code requires that the local director of health (or certified agent) assure the accuracy of the findings of soil tests and deep observation pits. The most reliable means to comply with this requirement is to witness the tests. Since Mr. Shabunia did not witness any of the testing he may request retesting on each lot at the time construction is proposed.

If the local health department witnessed at least some of the more than five dozen test holes on the proposed subdivisions then there would be some assurance that the profiles on the plans have been reasonably verified to be accurate. Assuring the accuracy of the soil test data at the time the subdivision is created not only saves time and effort in the long run but also goes a long way in preventing the unintentional creation of lots that may have sewage disposal limits that were not realized. The worst

case scenario would be to create a lot that is later found to be unsuitable for subsurface sewage disposal.

In the case of the proposed subdivisions the soil test data recorded by the engineer is for the most part consistent with the type of soils that might be found on the property based on the Soil Conservation Service New London County Soil Survey. The engineer typically describes the soils on lots 3.01 through 3.12 as having mottled sand and till beneath an orange subsoil. The Soil Survey indicates the soils on these lots are in the Woodbridge-Paxton-Montauk association which can be expected to have a compact, slowly permeable, substratum (hardpan) and a perched water table. The majority, if not all of these lots, will require engineered septic designs due to their "area of special concern" designation. Lot 3.06 and 3.07 were relatively flat which can result in substantial perched water above the hardpan. Lot 3.06 had mottling which is indicative of maximum ground water levels, at 20" - 22" in the two deep test holes. Maximum groundwater less than eighteen inches below the ground surface is defined by code to be unsuitable. Considering the wetness of these areas during the ERT site visit it is advisable for the engineer to monitor groundwater levels during the quickly approaching wet season in order to verify satisfactory conditions.

Based on the engineer's results, most of the remaining lots are not classified as areas of special concern per our code. It is recommended the engineer indicate which lots are classified as areas of special concern and require engineered septic system designs. Lots without this designation may still need engineered septic designs if the ultimate septic system location is found to be in an area of special concern.

The two deep test pits on lot 3.03 indicated the area tested was disturbed and filled with 4-5 feet of fill material. Additional testing should be conducted to verify

satisfactory natural soils are available for sewage disposal facilities. The only other lot where conditions may warrant additional testing is 3.16. This lot has a limited area where a septic system can be located due to the lot configuration, wetlands, and ledge outcropping. Depth to ledge can vary significantly and therefore it would be appropriate to verify sufficient soil in the leaching system area.

Soil Test Documentation

The engineer should provide complete percolation test data (depth of hole, readings, presoak time, etc...) so that it is part of the record. Data for deep test holes 7C and 7D should be on the plans. Locations for test holes 13A and 13B should be on the plans. Some of the lot designations listed with the test hole data on sheets 5 of 7 and 7 of 7 of the East Subdivision has been incorrectly listed.

System Layouts

The On-site Sewage Disposal Section office recommends subdivision plans show acceptable house and utility locations for each lot. This would include a feasible location of a house and driveway. Well and septic areas should also be delineated. Wells should be provided with the required source protection designation which is typically 75 feet. The sewage disposal area should include the primary and reserve leaching systems.

The State code stipulates the natural soils on a property must be sufficient to handle the expected sewage flow without overflow, breakout or detrimental effect on ground or surface water. In order to ensure that this is evaluated the On-site Sewage Disposal Section office has added a screening procedure into the State code. This

assessment referred to as Minimum Leaching System Spread (MLSS) applies to the primary leaching system and takes into account site specific parameters that can limit the hydraulic capacity of the soil within the sewage disposal system area. These parameters include design flow, depth to restrictive layer, slope, and leaching system spread.

It is recommended that subsurface sewage disposal system areas meeting the MLSS criteria be designated for all the proposed lots. Detailed designs need not be provided, however, the subdivision plans should stipulate the design criteria the subsurface sewage disposal systems were laid out for (e.g. 3 bedroom house, 5.1-10.0 minute per inch perc rate, 165 L.F. of 3' wide trenches). It appears all the lots have more than satisfactory spreads.

Separating Distances

General note #15 on the West Subdivision indicates lots 2.05, 2.06, 2.07 and 2.08 have subsurface drains on them. The approximate locations of the drains should be noted on the plans. Additional testing should be required prior to approval of the septic systems on these lots in order to verify appropriate separation distances are maintained. Removal/relocation of the drains may be needed.

Several lots have stone walls on them. Many older stone walls have foundations that extend well below the ground surface. In certain instances this has allowed partially treated effluent from the leaching system to short circuit along the base of the wall which can result in bleedouts. Stone walls should be assumed to be drains when laying out septic systems. Additional future investigation may be needed if a leaching system is to be located near a stone wall.

The plans indicate there is a 100 foot regulated area around designated wetlands. Several lots such as 3.06 and 3.07 will require substantial leaching system spreads because of high groundwater and limited slope. As a result the leaching systems may be within the regulated areas. This may also be the case of lots 2.02, 2.11, 3.12 and 3.13 depending on the house size and location. The sewage disposal systems probably will be within the wetland regulated areas on lots 2.03 and 2.04. There is no specific distance in the State code to wetlands. The minimum horizontal distance to a watercourse is 50 feet.

Existing Structures

Lot 2 contains an existing seven bedroom house. The location of the existing well and septic system should be shown on the plans. The existing sewage disposal system must be at least 10 feet from the proposed property line. A fully sized sewage disposal system meeting all code requirements for a seven bedroom house should be designated on the lot. It is recommended a reserve leaching area also be designated.

Lot 3 contains an existing barn which is served by a well and a septic system. The well location should be shown on the plans. The bounds of the septic area is shown on the plans. The required 10 foot separating distance has been maintained from the lots proposed southern property line. However, it appears the existing leaching system extends into the proposed town right-of-way. It is recommended the entire sewage disposal system be on the proposed lot with a minimum 10 foot separation distance from the property line being maintained. If lot 3 is intended to also support a house soil testing is needed on the lot. The layout of feasible utility and house locations should also be shown.

If the engineer can comply with the above noted recommendations it is the opinion of the CT Department of Health and Addiction Services Environmental Health Services Division - On-site Sewage Disposal Section that based on the information presented, the proposed lots in the two subdivisions have been shown to be capable of supporting on-site sewage disposal systems.

PLANNING CONCERNS

The present proposals generally display good planning design, especially within the context of the existing land use regulations. The proposals will deed land along Chester Main Road to the town to create a 50 foot right-of-way, and the proposals seem to conform to dimensional requirements, which include a minimum buildable area on each lot.

The site also contains development limitations due to natural resource areas of wetlands, watercourses, and steep slopes. This is exhibited by proposed lot sizes which exceed the 80,000 square foot minimum.

A major potential development limitation which should be addressed to the Commission's satisfaction is the ability of each proposed lot area to adequately support a subsurface sewage disposal system. Lots which represent questionable land for such systems should be re-configured. Additional planning concerns that should be considered by the Commission deal with driveway access and open space.

As both of the proposed subdivisions utilize existing road frontage and the roadway is a narrow winding local road unlikely to be improved in the near future, driveway access location and the number of curb cuts is important. The lot layout, to a large extent, determines driveway numbers and locations. The town's present land use regulations limit the use of interior lots to one for each parcel being subdivided. As such, the ability to utilize interior land for lots while providing lengthy road frontage to front lots to maximize distance between curb cuts is unavailable. Based on the lot configurations of the proposed subdivisions consideration should be given to requiring

combined driveway aprons and determining their locations. Making this determination during plan review will help to insure that as building permits are issued driveways will be located so as to to be used by adjacent lots when they are developed. At present there is one combined driveway proposed for lots 3.12 and 3.13 due to a wetlands crossing. Under the present lot layout the following lots have the potential to share driveway aprons: 2.01 and 2.02; 2.05 and 2.06 utilizing the right-of-way proposed for the Williams Family Cemetery; 2.07 and 2.08; 2.10 and 2.11; 3.15. and 3.14; 3.08 and 3.09; utilize frontage for 3.04 for that lot and 3.03 and 3.05; and 3.01 and 3.02.

Another general planning concern is the open space aspect of the proposal. Presently a 30 foot strip of land extends along the east side of lot 3.01 south to lot 3.10. At this point it runs between lots 3.10 and 3.11 accessing Chester Main Road again. This area totals 2.68 acres and is proposed as a horse riding trail. Two other 30 foot strips are proposed as buffers. One extends from Wyassup Road along the eastern side of lots 3.16, 3.15, and 3.14, and totals .63 acres. The other extends along the western side of lots 2.11 through 2.03 with an intersection at the right-of-way for the Williams Burying Ground, and totals 1.87 acres. The total area of all three areas is 5.18 acres. While the provision of these areas as proposed is not detrimental to these subdivisions their asset is questionable. Of the three areas the proposed horse riding trail is the most accessible but it does include a wetland area at its intersection with lots 3.08 and 3.09 making this length inaccessible. It is uncertain what would happen at this point. While an existing trail is located east of this point which could possibly loop around the wetland, it is not on the property proposed for subdivision and there is no indication that any legal agreements have been executed to allow for access. This proposed trail extends from one area of Chester Main Road to another separated by approximately 3000 feet. It does not connect any dedicated open space areas. As such, the overall usefulness of the trail as a "horse trail" is questionable. As a hiking or walking trail it may have more

usefulness, especially for the owners of abutting lots. Even then the access across the wetlands at lots 3.08 and 3.09 must be addressed. The other two "buffer strips" are generally not accessible for much of their length due to steep grades and wetlands. The provision of a 30 foot buffer between residential uses in the same R-80 zoning district is of questionable significance.

When the above factors of accessibility for both function and usefulness, and total land area, are considered it is felt that other open space possibilities would be more beneficial for the town.

As a major limitation with regard to available options is the absence of a "fee in lieu of open space" provision in the regulations. Such a provision would allow the applicant to pay the town a fee which the town would place in a fund specifically for open space and recreation projects.

With regard to open space the town's Plan of Development stipulates that land acquisitions should serve a particular open space function. Such functions include the "preservation of natural and historic resources" or "the linking of existing open space areas by walking or riding trail systems or natural corridors for the movement of wildlife." With the wetlands, streambelt, waterbody, and steep slope areas on the properties the purpose of open space with regard to natural resource preservation can easily be met by delineating an area along one of these resources. While examples of such sites within these subdivisions are numerous, and include the pond on lot 2.04, the streambelt and steep slope areas on lots 2.11, 3.11, 3.12, 3.13, and the wetland and ledge on lot 3.16, any one of which would be appropriate to satisfy the objectives as stated above, such an area should be considered in conjunction with the overall buildability of the area(s) adjacent to that resource. The area with the lowest buildability

potential would be a top candidate for open space. A significant component of an areas buildability is its suitability to support a subsurface sewage disposal system. Conversely, if proposed building lots are released for open space other areas which do not include sensitive natural resources and have high buildability potential could be considered for additional building sites, within the dimensional requirements of the zoning regulations. An example of such an area could be lot 3.04. Although a major constraint with the present lot configuration is the lack of road frontage.

Summary

- ◆ Driveway aprons should be combined where feasible during the plan review process. Suggestions are listed in the above text.
- ◆ The open space areas, as proposed, while not detrimental, are not very useful in accomplishing open space objectives. Other more sensitive natural resource area(s) should be considered.
- ◆ Future considerations should be given to amending the zoning regulations to allow, with the Commission's approval, wider use of interior lots in order to allow for greater flexibility in lot layouts.
- ◆ Future consideration should be given to amending the subdivision regulations to allow the Commission to authorize an applicant to pay a fee in lieu of open space as outlined by the Connecticut General Statutes.

ARCHAEOLOGICAL REVIEW

The proposed project area contains archaeological resources of both prehistoric Native American and historical European American settlement of the land. Vineyard cultivation has turned over soils yielding prehistoric stone tool artifacts, one of which typologically dates to 7,000 years ago. The most significant historic resource is the Williams Burying Ground.

The Williams Burying Ground is situated west of Chester Main Road on lot 2.06, and is surrounded by an overwhelming and well constructed stone wall. Headstone's date from the late-18th century and reflect changing attitudes of mortuary beliefs in early New England. While some of the headstones are in disrepair, many represent fine examples of the fearful "angel of death" and the later more peaceful "willows and urns." James Slater, in his book on eastern Connecticut cemeteries, notes that the fallen stone for Eunice Williams (1770) is a fine example of its time and is "dedicated to William Williams, Jr. who died at sea a few months after the death of his young wife. It has a touching verse from the Bible." (p.225). The Mary Williams (1797) marble is a curious stone in that the lunette shows a hand-from-cloud motif. This historical family cemetery also has a few conventional flared-ear and fleur-de-lies sandstones.

A review of the protection mechanism proposed by the developer, including buffer and access paths appear to be adequate. The proposed twenty-five foot buffer surrounding the cemetery should provide protection for unmarked graves that may lie outside the stone enclosure. Recent archaeological evidence in southern New England indicates that although cemeteries are bounded by stone walls, socially marginal peoples, such as African slaves, Indians and poor English farmers, may have been

buried outside the enclosure in poorly or unmarked graves. Buffers are essential to assure that unmarked burials are not encountered during a land use activity. The Office of State Archaeology prefers a thirty foot buffer, however, twenty-five feet is acceptable.

The proposed access route from the trail system and Chester Main Road is very good. Maintaining the land as open and visible from the road will help protect this historical cemetery from vandals. There is currently an illegal market for the buying and selling of early New England tombstones as artforms. The removal of tombstones and any desecration of historical burying grounds is a felony in Connecticut. The open access route and visibility will deter vandals. In addition, it is recommended that the proposed homeowner's association develop a maintenance policy in their by-laws for the long-term preservation of the burying ground. The Office of State Archaeology is prepared to provide technical assistance to the association in preparing this policy.

A final note on the historic resources of the project area concerns the existing stone walls. While it is recognized that it is not feasible to maintain all stone walls, the proposed subdivision plan is creative in its use of the stone walls as property boundaries. Along with the preservation of the existing house and barn, this will help maintain the historic rural character of the property.

During the course of tilling the land for vineyard cultivation, prehistoric stone tool artifacts have been brought to the surface and reported from five areas on the property (See Figure 10). These areas lie north and south of the Williams Burying Ground, along the open land between the existing pond and Chester Main Road, and in the fields immediately north and south of the barn structure. Areas of artifact collection, probably represent at least three prehistoric archaeological sites: Area 1 has yielded an early spearpoint dating to around 7,000 years ago; Areas 2, 3, and 4 are

represented by a series of flake and groundstone tools including a stone axe and spearpoints, dates to 1,000 years ago (Please refer to Figures 11 and 12). Site ages are estimated from similar artifact types associated with radiocarbon dating. Artifact assemblage in relatively distinct areas and representing different temporal periods indicates continued use of this land and the natural resources associated with the brook system by prehistoric hunters-gatherers. Aboriginal use of the upland drainages such as Shunock River has been demonstrated from other archaeological sites in southeastern Connecticut.

The Office of State Archaeology recommends an archaeological survey for these areas of prehistoric occupation. Survey techniques may include the excavation of small shovelled test pits systematically placed in the areas of concern. The survey will provide more detailed information on the distribution of the prehistoric Indian campsites. Distribution patterns can be reviewed for proposed house, septic and driveway construction. Site locations not affected by these landuse activities can be better preserved by avoidance, however, sites in designated construction areas should be mitigated by data recovery, that is, archaeological excavation subsequent to ground disturbance.

In summary, the project area contains both prehistoric campsites and a historical family cemetery. Proposed methods to protect the cemetery are adequate and the establishment of a buffer and access trails should help preserve this ancient burying ground in the future. Designated areas of prehistoric stone tool concentration should be surveyed to determine the distribution of site boundaries; those locations affected by construction activities should be excavated prior to landuse, those areas not affected should be preserved in place and managed for future generations.

The Office of State Archaeology is prepared to offer to Chester Main Estates and the Town of North Stonington any technical assistance in conducting the above-mentioned survey. The project area has along history of human settlement as demonstrated by the archaeological resources located there both above and below-ground. The Office of State Archaeology looks forward to working with all concerned parties in preserving these resources as human settlement continues on this property in the future.

Figure 11

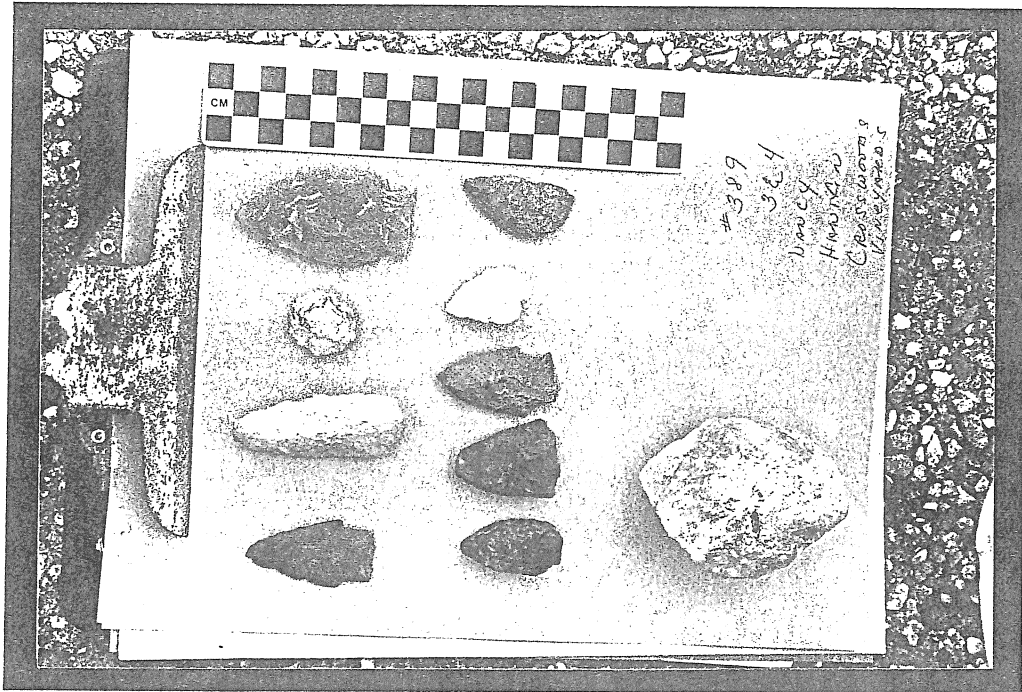
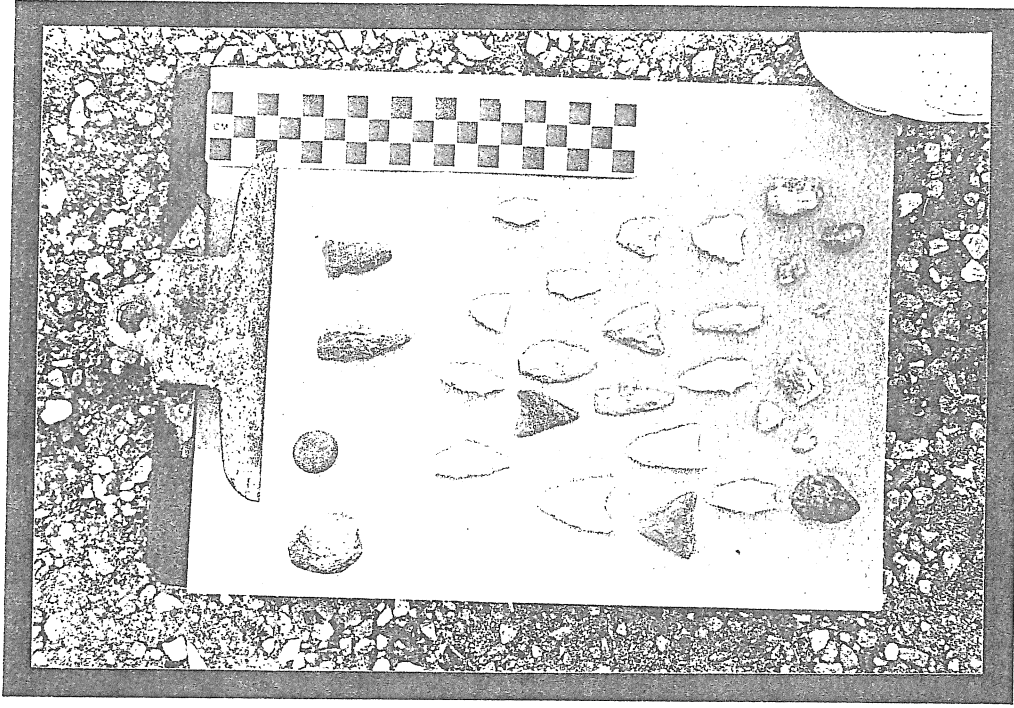


Figure 12



Prehistoric stone tools recovered from plowed fields north of the Williams Family Cemetery dating to around 4,000 years ago.

Prehistoric stone tools recovered from plowed fields behind the standing barn structure dating to around 1,000 years ago.

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

**The services of the Team are available as a public service
at no cost to Connecticut towns.**

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 203-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.