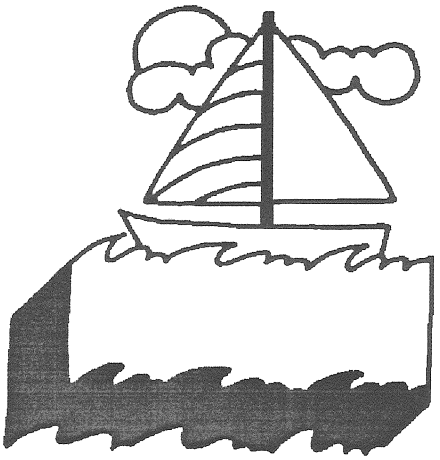
Lattin's Cove State Boat Launch Improvements

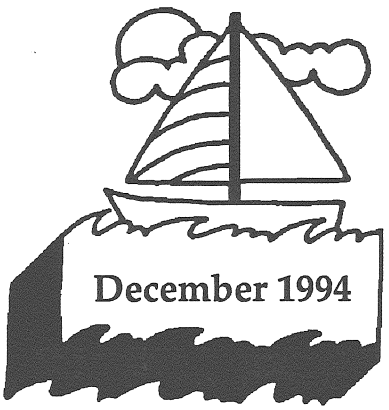
Danbury, Connecticut



KING'S MARK ENVIRONMENTAL REVIEW TEAM REPORT

King's Mark Resource Conservation and Development Area, Inc.

Lattins Cove State Boat Launch Improvements



Danbury, 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.

Haddam and Wallingford, Connecticut

for the Danbury Mayor's Office

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 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.

ACKNOWLEDGEMENTS

The King's Mark Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

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I would also like to thank the Danbury Mayor Gene Eriquez, Jack Kozuchowski of the Danbury Health Department, Jack Schweitzer of the Danbury Public Works Department, Dennis Elpern, the Danbury Planning Director, Senator James Maloney, Bruce Lockhart of the Candlewood Lake Authority, and Pam Adams and Charles Makarewich of the CT Department of Environmental Protection for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

An environmental review was requested by the Mayor of Danbury for the proposed improvements to the state owned boat launch at Lattin's Cove.

The Mayor and other city staff would like a detailed evaluation of the site and preliminary improvement plans since they feel that the proposal by the State is a major redesign/improvement to the existing facility. They requested an independent review of the plans so that they could have an objective base of information in order to engage in a constructive dialogue with the State regarding impacts and mitigative measures. Major concerns involved are water quality, public water supply, storm water drainage, wetland resources, fisheries habitat, traffic and access and land use.

The review process consisted of an inventory of the site's natural resources, assessment of these resources, identification of resource problem areas and presentation of planning, management and land use guidelines.

Topography, Hydrology and Geology

The bedrock in the area consists of metamorphic rocks which are overlain by varying amounts of glacial till. The shoreline in the area of the cove is quite steep in some places and about 6% in the area of the boat launch. The total drainage area for the boat launch is under 100 acres.

Soil Resources

Undisturbed soils within the study area are likely to be either well drained or moderately well drained soils.

In order to minimize potential adverse water quality impacts, considerable attention should be given to the control of soil erosion both during and subsequent to installation of the proposed improvements. Many of the features shown on the preliminary plans will help to reduce off-site impacts of the planned construction. Those features include: the parking area of gravel or stone, runoff from paved travel aisles being directed to oil and grease separator equipped catch basins, and construction of a sediment basin with a regular maintenance schedule.

An erosion and sediment control plan and a schedule of construction activities should be prepared prior to project initiation.

Water Quality

The watershed to lake surface area of approximately 5:1 is relatively small suggesting that water quality is extremely vulnerable to changes in the watershed land use patterns. The water quality has been studied regularly since the late 1970's. The lake is cur-

rently classified as mid to late mesotrophic. Paleolimnological analyses indicated that the eutrophication process in Candlewood Lake accelerated substantially after 1975 and continued up through the mid-1980's. Since 1988 there seems to a modest improvement in water quality.

The Candlewood lake watershed has undergone considerable development within the past 30 to 40 years. An analysis of land use patterns show a 24% decrease in wooded area and a 59% increase in urban/residential land in the past 20 years. The populations of the towns bordering on the lake increased by 66% in the last 30 years. This seems to suggest that ecological changes in the lake are related to land use changes in the watershed.

It is difficult to accurately predict the effects that the Lattin's Cove Boat Launch improvements will have on the lake. Three issues may have an impact:
1) the design used to modify runoff and reduce pollutants from entering the lake, including the sediment basin which may be of questionable effectiveness, 2) the design of the ramp which would temporarily and locally effect the water quality, and 3) the potential for modifying and regulating the number of boats that move through Lattin's Cove and out into the lake can have environmental, as well as boating safety, implications.

The Natural Diversity Data Base

According to the information on file at the Natural Diversity Data Base there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species occurring at Lattin's Cove.

Inland Wetlands Review

Wetlands on the site include ±650 of intermittent streams and associated wetlands. The streams function to carry stormwater runoff from paved and natural surfaces in the watershed. During wet periods these streams probably carry a sustained flow. There are two areas of wetlands soils which were identified and mapped by a soil scientist. The dominant vegetation of the wetlands is common reed plant.

A small length of intermittent stream with a small area of associated wetlands on the northeast side of the parking area was not shown on the plan, other wetlands appear to be accurately shown.

The primary function of the wetlands on site are to retain and attenuate excessive nutrients and sediments from the stormwater runoff being collected from upgradient areas. There value as wildlife habitat and their overall ecological integrity is considered low due to the invasive common reed plant, *Phragmites australis.*

The overall ecological of the lakeshore area has been significantly impacted due to its current use as a boat launch, regularly fluctuating water levels, and the disposition of excessive sediments from the watercourses that drain to the cove.

Direct, negative impact to the wetlands on site is inevitable as a result of the filling of wetlands for construction of a sediment basin and enlargement of the boat launch area. However, given the functional values of the wetlands and the improvement of the nutrient retention/sediment trapping function that will occur once the sediment basin is properly constructed, the overall negative impact is judged to be negligible.

The proposed plan should employ best management practices that conform to *CT's Guidelines for Sedimentation and Erosion Control* - Revised 1988, the plans that were reviewed did not.

The use of a low retaining wall at the edge of the parking lot could be used to avoid most of the impact to the flagged wetlands area.

It is not clear how the sediment basin will handle the constant, low-flow input of the watercourse it is intercepting and capture and detain the high volume flows for removal of sediments during large storm events. Design modifications to the sediment basin should be considered to allow low-flow passage and high-flow detention/storage and provide some mitigation of direct wetland impacts.

Several large willow trees at the bottom of the parking lot should be retained because they provide shade and wildlife habitat.

Fisheries Habitat

The cove in the immediate vicinity of the boat launch is relatively shallow with depths of 6 feet or less at normal lake elevation. The lake bed within the cove is composed of scattered boulders and coarse sand and sand/silt fines.

The fisheries resources in Candlewood lake is composed of both cold and warm water species. Fish species associated with Lattin's Cove include largemouth bass, bluegill sunfish, pumpkinseed sunfish, redbreast sunfish, yellow perch, white perch, brown bullhead, and white catfish.

Fish species abundance within the cove is anticipated to be low due to the scarcity of in-lake structure. Periodic water level draw-down of Candlewood lake causes a nearly complete dewatering of Lattin's Cove which eliminates aquatic habitat completely. Near shore areas should provide fair to good habitat for spawning of largemouth bass and sunfish.

The improvements to the parking area (regrading and paving) if done with proper erosion and sediment controls is not anticipated to impact the aquatic resources of Lattin's Cove.

An effective stormwater drainage system should be effective in preventing sediments from the immediate drainage area from being deposited in the cove area. The sediment basin design may allow nutrients in solution and possibly sediments to discharge directly to Lattin's Cove. Nutrients could promote excessive vegetative growth and sediments could degrade or eliminate shoreline habitat used by fish for spawning and juvenile rearing. Alternatives to the proposed stormwater detention basin should be investigated in an attempt to install one that could better handle the anticipated stormwater runoff. Such a design should not involve in-lake filling.

Fill required for the construction of the sediment basin will eliminate a small portion of near-shore habitat which is used for spawning and rearing of bass and sunfish.

The proposed dredging should prove to be advantageous because it will diversify habitat and may increase fish species abundance.

Fill required for the construction of the permanent dock and the stormwater detention basin will result in the loss of approximately 0.07 acres of near shore habitat. Consideration should be given to constructing a floating dock or a dock on piers and not one built

on fill.

The improvements to the boat launch should be done during periods of Candlewood Lake water level drawdown.

Water Supply Section Review

At the present time the water quality of Candlewood Lake is considered Class B. The City of Danbury has proposed to use Candlewood Lake as future source of drinking water supply. At the present time the use of Class B water for drinking water is prohibited under the Connecticut General Statutes, Section 22a-32d(b)(3), but a water supply plan can assess the use of alternative water supply sources which receive sewage discharge in their long range plans. Since Candlewood Lake has been identified as a proposed drinking water supply source, the lake and watershed should be protected as a potential drinking water supply.

The extent of the proposed filling of the wetland areas is not recommended. Filling the wetlands would only increase the amount of runoff, sediment, and the concentration of pollutants which will enter the sediment basin.

The adequacy of the proposed sediment basin shown on the plans was unable to be determined and analyzed. The need to detain the first flush of precipitation should be analyzed, since this contains approximately 90% of the non-point source contaminants. Effective stormwater management techniques involve the integration of artificial and natural controls. Regular maintenance of the sediment basin is very important and should include at least a biennial inspection and a yearly sediment buildup removal. The outflow from the sediment basin should be designed to dissipate the flow of energy in a way that will minimize the possibility of soil erosion.

Catch basins should be designed with at least 2 foot sumps and have a hooded outlet, and they should utilize multi-chamber oil separators. Biannual maintenance is important for them to work efficiently.

The Water Supply Section of the Department of Health and Addiction Services suggests that the existing ramp be upgraded to accommodate 2 ramps in the interest of protecting water quality. This would minimize dredging and filling.

The peak and average day use of the boat launch should be studied. This information would be beneficial in determining how many ramps are needed.

Port-potties should be located on impervious concrete slabs and be bolted down. They should be placed away from any catch basins, sedimentation basins, drainage systems and wetlands. They need to be cleaned and maintained regularly, and the responsible agency/company/person should be identified.

On-Site Sewage Disposal

Assuming that the planned improvements are not supposed to increase usage of the boat launch it could be assumed that domestic sewage disposal could be handled in the same manner as before the improvements if no public health or environmental pollution problems were being created.

The plans for improvement of the boat launch area does provide the opportunity to

improve upon the existing conditions (porta-potties). Provision could be made for the installation of a water supply well and consideration should be given to constructing a subsurface sewage disposal system. Portable toilets have the potential for accidental spillage and vandalism which could increase the likelihood of soils, ground and surface water pollution from the chemical disinfectants and deodorizers used.

The portable toilets should be located close to the boat launch area for ease of use, but this could create potential problems from spillage and vandalism.

Although no soil testing was performed it might be possible to locate a public toilet facility closer to the boat launch area and pump the sewage to a portion of the site closer to Forty Acre Mountain Road. This would make hand washing facilities available, which is a practice encouraged after each and every toilet use.

The use of on-site composting toilets could also be considered, and it would most likely be less expensive than building a conventional public toilet building. Large volume composting toilets are permitted in accordance with the CT Public Health Code. If water was available, a separate gray water disposal system could be constructed to dispose of handwashing wastes only.

It is unlikely that the three systems mentioned would create any objectionable odors to adjacent property owners. Since the site is to be manned daily during the peak season DEP personnel could report any problems. If the option of either a conventional or gray water system is to be considered than soil testing should be performed as required by code to determine if they could be realistically considered.

Planning Issues

Since removing the boat launch is not an option, the City of Danbury should strive to make efforts to solve the problems that this use of the property creates by enforcing controls off the property that will protect the City's interests.

One aspect that the City could control is the size of the boats using the roads that access the boat launch by addressing this problem with language in an ordinance. The City may want to limit the number of trailers accessing the site in a 24 hour period by placing limits on the use of the access roads for that purpose.

Site Design and Traffic Access

There are no official traffic counts for Forty Acre Mountain Road available, so it is difficult to assess the adequacy of the road itself.

The buffer between the parking lot and the neighboring properties appears adequate, and DEP has agreed to add additional plantings or fencing as requested by the town.

The proposed site plan efficiently displays on-site traffic circulation patterns without increasing the present lot size.

The relocation of the driveway eliminates an offset intersection and provides for a clearer view of the intersection upon exiting.

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INTRODUCTION

An environmental review was requested by the Mayor of Danbury for the proposed improvements to the state owned boat launch at Lattin's Cove.

The boat launch is located on Candlewood Lake and access is from Forty Acre Mountain Road. The boat launch currently has non-delineated parking in a dirt lot, which accommodates an estimated 200 cars on peak days. The improvements proposed include 140 designated car and trailer parking spaces which will be gravel with paved aisle lanes and entrance, drainage improvements to fix current problems, new boat launch ramps, a ticket booth, lighting and portable toilets.

The Mayor and other city staff would like a detailed evaluation of the site and preliminary improvement plans since they feel that this proposal by the State is major redesign/improvement to the boat launch. They requested an independent review of the plans so that they could have an objective base of information in order to engage in a constructive dialogue with the State regarding impacts and mitigation measures. Major concerns involve water quality, public water supply, storm water drainage, wetland resources, sewage disposal, fisheries habitat, traffic and access and land use.

The Environmental Review Team Process

Through the efforts of the Town of Danbury and the King's Mark ERT, this environmental review and report was prepared for the Town. This report primarily provides a description of the on-site natural resources and presents planning, management and land use guidelines. The review process consisted of 4 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; and
4) Presentation of planning, management and land use guidelines.

The data collection phase involved both literature and field research. The ERT filed review took place on March 10, 1994. Mapped data or technical reports were also perused, and specific information concerning the property was collected. Being on-site allowed some Team members to

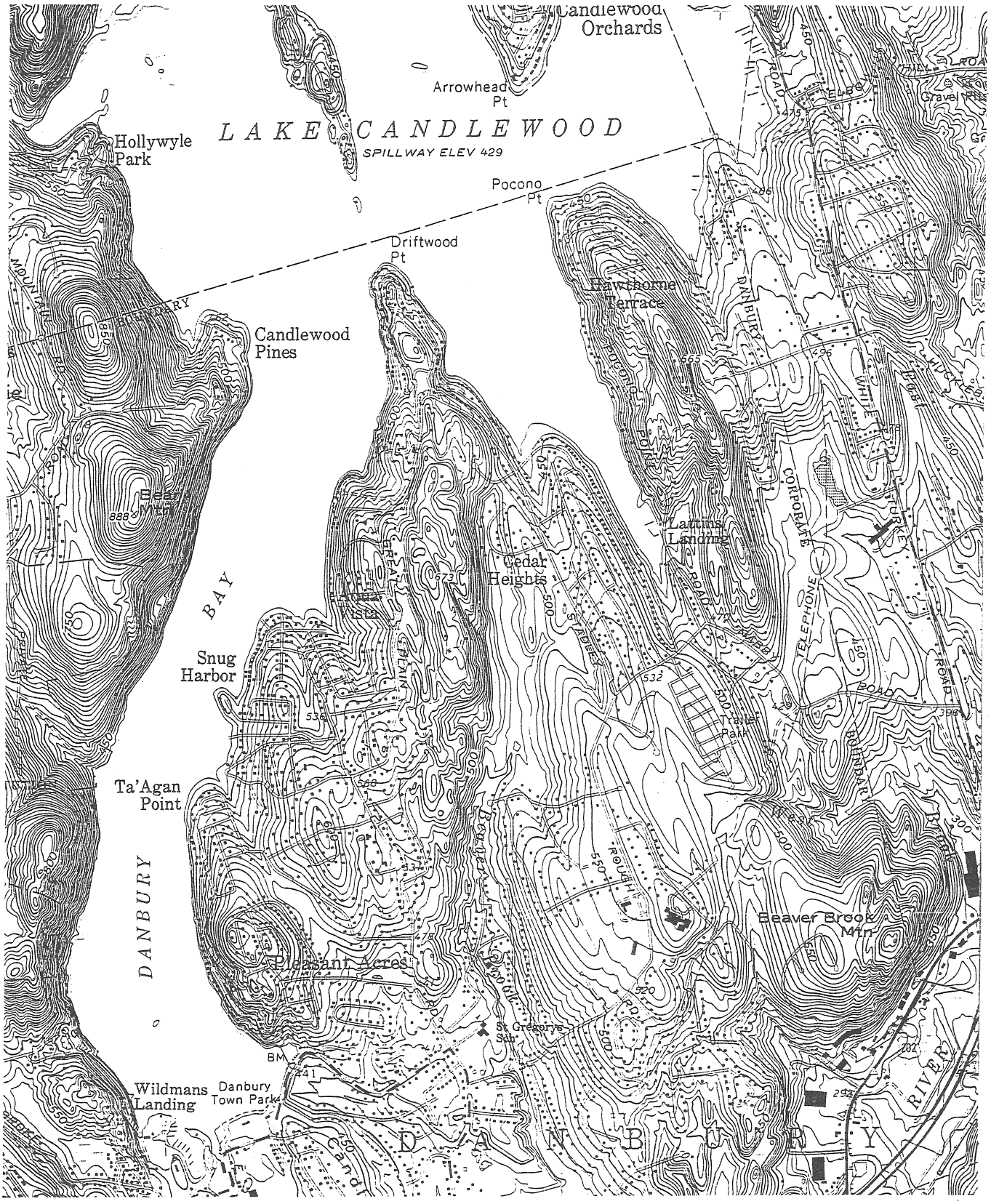
information and identify other resources.

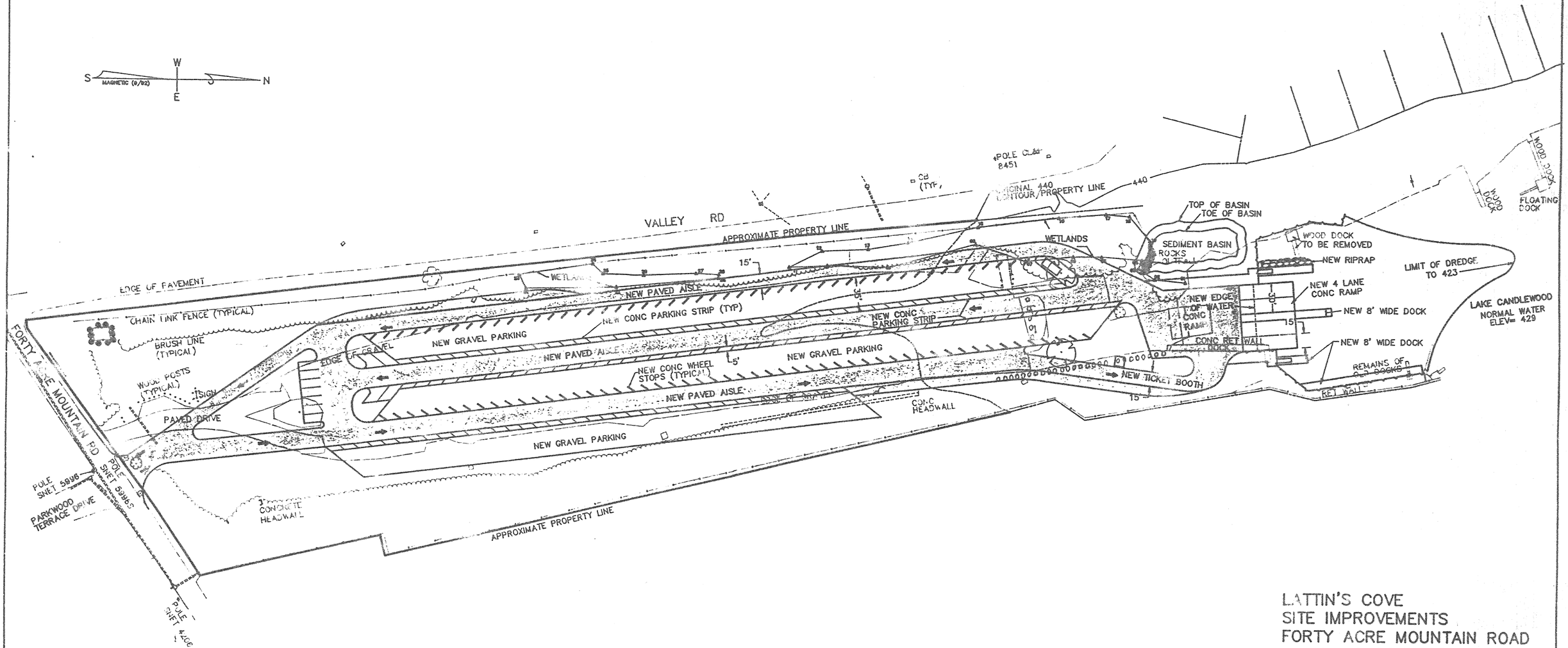
Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Results of this analysis enabled Team members to arrive at an informed assessment of the property's natural resource opportunities and limitations. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into the final ERT report.

LOCATION MAP

N

Scale 1" = 2000'





100 0 100 200

GRAPHIC SCALE IN FEET

LATTIN'S COVE
SITE IMPROVEMENTS
FORTY ACRE MOUNTAIN ROAD
DANBURY, CONNECTICUT
SCALE: 1" = 100' DATE: AUGUST 30, 1993

DICESARE BENTLEY
ENGINEERS, INC.
ENGINEERS • SURVEYORS

TOPOGRAPHY AND HYDROLOGY

Lattin's Cove is a narrow cove approximately 2000 feet long trending south-southeast from Lake Candlewood. The shoreline in some places is quite steep, with slopes of up to 20% to the southwest and approximately 6% in the boat launch area. The boat launch area drains the adjacent hills and approximately the area from Forty Acre Mountain Road to the lake, a total drainage area of well under 100 acres.

GEOLOGY

The bedrock of the area consists of older metamorphic rocks of two types. The eastern shore of Lattin's Cove is underlain by metamorphosed granite approximately one billion years old, called the "Younger Granite". The western shore is underlain by gneiss and schist approximately 500 million years old. The foliation, or planes of weakness, in the rock parallel the trend of Lattin's Cove. Both shores are overlain by variable amounts of glacial till.

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 Map of Connecticut*, U.S. Geological Survey.

SOIL RESOURCES

General Soil Conditions

Soils within the area surrounding the Lattins Cove boat launch area, as described in the National Cooperative Soil Survey of Fairfield County, have developed primarily from glacial till parent materials. North and east of the site Charlton soils are observed; these are generally friable soils that have formed in loamy-textured glacial till. It is likely that undisturbed soils within the area now improved for parking would have been classified within either the well drained Charlton or the moderately well drained Sutton fine sandy loam series. To the west and south of the boat launch are found soils of the Paxton and Woodbridge series, well and moderately well drained soils, respectively, that have developed in compact loamy glacial till. Brief, non-technical descriptions of soils noted above and soils commonly included within these mapping units are provided in Table 1.

Erosion and Sediment Control

In order to minimize potential adverse water quality impacts, considerable attention should be given to the control of soil erosion both during and subsequent to installation of the proposed improvements.

Several features of engineering drawings and plans available for review will, when implemented, combine to reduce off-site impacts of planned construction. Since much of the parking area will be surfaced with either gravel or stone, soil infiltration capacity will be maintained, and unnecessary increase in surface runoff avoided. Runoff from new paved travel aisles will be directed to catch basins equipped with oil and grease separators, thereby reducing the impact of such contaminants on adjacent waters. Construction of the proposed sediment basin, designed to accommodate the initial one-half inch of runoff, will provide

additional time for settling of waterborne sediments and associated pollutants. (Please refer to the Water Quality, Wetland Review and Fisheries Resources sections for further comment on the sediment basin design.) However, a regular maintenance schedule must be developed and adhered to in order to maintain the capacity of any constructed basin.

It would be helpful if both the sediment and erosion control plan and a schedule of construction activities were prepared prior to project initiation.

SOILS MAP

N

Scale 1" = 1320'

Table 1

Nontechnical Soils Descriptions

Map Symbol	Description
CnC	Charlton extremely stony fine sandy loam, 3 to 15 percent slopes. The Charlton series consists of very deep, well drained soils on uplands. They formed in glacial till derived mainly from schist and gneiss. Typically, these soils have a dark brown very stony or extremely stony fine sandy loam surface layer 6 inches thick. The subsoil from 6 to 26 inches is yellowish brown fine sandy loam and light olive brown gravelly fine sandy loam. The substratum from 26 to 60 inches is grayish-brown, friable gravelly fine sandy loam. This map unit consists of gently sloping to sloping, well drained soils. The Canton soil formed in sandy deposits over friable sandy gravelly till and the Charlton soil formed in friable loamy till. It is on the side slopes of upland hills and ridges. Stones cover 10 to 35 percent of the surface. Bedrock is commonly more than 60 inches below the surface. The water table is commonly below a depth of 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil, and rapid in the substratum. The permeability of the Charlton soils is moderate to moderately rapid throughout. Surface runoff is medium to rapid, and the available water capacity is moderate.
PbC	Paxton fine sandy loam, 8 to 15 percent slopes. The Paxton series consists of very deep, well drained soils on uplands. They formed in glacial till derived mainly from schist, gneiss and granite. In tilled areas, these soils have a dark brown fine sandy loam surface layer 8 inches thick. The subsoil from 8 to 26 inches is dark yellowish brown and olive brown fine sandy loam. The substratum from 26 to 60 inches is olive, very firm and brittle gravelly fine sandy loam. These sloping, well drained soils formed in compact glacial till. They are on the tops and side slopes of drumlins and hills of glacial till uplands. Depth to bedrock is commonly more than 60 inches below the surface. These soils have a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. Permeability in the Paxton soil is moderate in the surface layer and subsoil and slow to very slow in the substratum. Permeability in the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and moderately slow or slow in the substratum. Surface runoff is rapid and the available water capacity is moderate.

Rd

Ridgebury fine sandy loam. The Ridgebury series consists of very deep, poorly and somewhat poorly drained soils on uplands. They formed in glacial till. Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a very firm fragipan that is light olive brown and olive sandy loam. Slopes range from 0 to 15 percent.

This nearly level, poorly drained soil formed in compact glacial till. It is on concave slopes, in depressions, and in small drainageways of glacial till uplands. Depth to bedrock is commonly more than 60 inches below the surface. The soil has a seasonal high water table at a depth of about 10 inches from fall to spring. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Surface runoff is slow and the available water capacity is moderate.

SvB

Sutton fine sandy loam, 3 to 8 percent slopes. The Sutton series consists of very deep, moderately well drained soils on uplands. They formed in glacial till derived mainly from schist and gneiss. Typically, these soils have a very dark grayish brown fine sandy loam surface layer 6 inches thick. The subsoil from 6 to 28 inches is dark brown and yellowish brown fine sandy loam with mottles below 12 inches. The substratum from 28 to 60 inches is brown firm gravelly fine sandy loam and light olive brown friable gravelly sandy loam.

This gently sloping, moderately well drained soil formed in loamy glacial till. It is near the base of hills and in depressions of glacial till uplands. Depth to bedrock is commonly more than 60 inches below the surface. The soil has a seasonal high water table at a depth of about 20 inches from fall to spring. Permeability is moderate in the surface layer and subsoil and moderately rapid in the substratum. Surface runoff is medium and the available water capacity is moderate.

WxB

Woodbridge fine sandy loam, 3 to 8 percent slopes. The Woodbridge series consists of very deep, moderately well drained soils on uplands. They formed in glacial till. In tilled areas, these soils typically have a very dark grayish brown fine sandy loam surface 7 inches thick. The subsoil from 7 to 30 inches is dark yellowish brown and light olive brown fine sandy loam, mottled below 18 inches. The substratum from 30 to 60 inches is light olive brown, very firm and brittle gravelly fine sandy loam.

This gently sloping, moderately well drained soil formed in compact glacial till. It is on the top and side slopes of large drumlins and hills on glacial till uplands. Depth to bedrock is commonly

more than 60 inches below the surface. The soil has a seasonal high water table at a depth of about 20 inches from fall to spring. Permeability is moderate in the surface layer and subsoil and slow to very slow in the substratum. Surface runoff is medium and the available water capacity is moderate.

WATER QUALITY

Note:

Candlewood Lake has a wealth of environmental data on water quality, much of which has been collected by a group at Connecticut College (formerly at Western Connecticut State University). Data was collected at Lattin's Cove from 1985 through 1987, as well as at seven other sites on the lake. Since 1988, four sites have been monitored annually and are located at: (1) off Birch Point in the New Milford arm of the lake; (2) just east of Green and Deer Islands in the Sherman arm; (3) centrally located between the tip of Vaughn's Neck and Chatterton's Point; and (4) half way down the Danbury Bay arm.

In this section of the report the Team water quality specialist refers to Hartranft et al. (1994), a comprehensive environmental investigation of Candlewood Lake. In that study the the group from Connecticut College statistically analyzed the differences in water quality characteristics among the current four sites and found no significant differences in most typical water quality characteristics. One notable exception was higher hypolimnetic total phosphorus (in 1985, 1988, 1989, and 1990) at the site in the Danbury Bay arm and at the centrally located site, off Chatterton's Point. This suggests that internal phosphorus loading is potentially more threatening at the two southern sites as opposed to the two norther sites on Candlewood Lake. Water quality in Lattin's Cove is likely to be similar that of the two southern sites based upon location. If environmental water quality is really a consideration, then reestablishing a monitoring site at Lattin's Cove may be of interest to both sides of the issue.

Candlewood Lake is a 66 year old, man-made waterbody located in the western uplands of Connecticut. Originally designed for pumped-storage hydroelectrical generation, the lake has become one of Connecticut's most popular recreational resources and has incurred substantial development throughout the watershed, especially along the shoreline.

Morphometric characteristics are presented in Table 2. The watershed to lake surface area of approximately 5:1 is relatively small suggesting that water quality is particularly vulnerable to changes in the watershed land-use patterns.

Water quality in Candlewood Lake has been investigated regularly since the late 1970's when the CT DEP (1983) conducted a Phase I: Diagnostic/Feasibility Study on the

lake. In 1983, a seasonal monitoring program was incorporated into the management strategy of the Candlewood Lake Authority (CLA). The program, under the direction of Dr. Peter Siver of Connecticut College, New London, CT, continues to run uninterrupted since that time.

Table 2

Morphological Characteristics of Candlewood Lake and Drainage Basin

Surface Area	10490 ha
Watershed Area	2194 ha
Watershed:Surface Area	4.7 : 1
Maximum Depth	25.9 m
Mean Depth	8.9 m
Volume	19^6 x 106 m^3
Mean Retention Time*	3.3 yr

**Varies depending upon pumping activity at the Rock River Hydroelectric Plant.*

Data obtained in yearly analyses were compiled and presented in annual reports on water quality in Candlewood Lake and Squantz Pond. Recently, Hartranft et al. (1994) utilized the monitoring data from 1983 to 1992 to assess changes in water quality over the ten year period. The resulting environmental history was then used to complement a paleolimnological assessment of in-lake changes for the duration of the waterbody.

Currently, Candlewood Lake is classified as mid to late mesotrophic. Since the early to mid-1980's, the lake was considered late mesotrophic to early eutrophic, and generally feared to be undergoing accelerated or cultural eutrophication.

Paleolimnological analyses indicated that the eutrophication process in Candlewood Lake accelerated substantially after 1975. Higher productivity continued up through the mid-1980's. Since 1988, lower chlorophyll levels and greater Secchi disk depths have indicated a modest improvement in water quality.

The most conspicuous trend observed, from both monitoring and fossil records, has been the gradual increase in specific conductivity. Specific conductivity is a measurement which reflects the ionic concentration of a water sample and has been significantly correlated to cation concentration and alkalinity in Connecticut lakes (Siver, 1993). In Candlewood Lake, conductivity has increased by over 40% since 1983, a trend which fossil records indicated began in the 1950's.

As mentioned, the Candlewood Lake watershed has sustained considerable development within the last 30 to 40 years. The analyses of land-use patterns within the Candlewood Lake watershed in 1970 (Norvell et al., 1979) and 1990 (Hartranft et al., 1994) revealed a 24% decrease in wooded area and a 59% increase in urban/residential land in the last 20 years. Similarly, the combined population of the five municipalities bordering the lake grew from approximately 40,000 in 1950 to 119,000 in 1990, an increase of 66%. These data strongly suggest that the ecological changes experienced in Candlewood Lake are related to land-use changes within the drainage basin.

It is difficult to accurately predict the environmental impacts on Candlewood Lake resulting from the improvements at Lattin's Cove boat launch, especially since the plans were not finalized at the time of the ERT review. At least three issues raised at the review meeting may potentially have an impact on water quality. The first is the design used to modify runoff and reduce pollutants from entering the lake, including the construction and use of a sedimentation basin. In theory, any reduction of the nutrient and other dissolved salt load into the lake represents a positive impact on water quality. However, during the on-site visit substantial runoff was observed moving through the general area of the proposed sedimentation basin. The

effectiveness of a sedimentation basin at the proposed site is questionable based on the relative size of the area for the sediment basin and its ability to handle periods of peak runoff.

The second issue is in regards to the design of the ramp. At the time of review meeting, it was unclear whether dredging would be necessary versus encroachment into the lake to build up the ramp area. In either case, impacts on water quality would likely be localized and temporary rather than widespread throughout the lake and sustained over a long period of time. Characteristics including turbidity and concentration of suspended solids may increase, while Secchi disk transparency decreases for a short period of time following construction.

Finally, the potential for modifying and regulating the number of boats moving through the Lattin's Cove and into main body of the lake can have environmental, as well as boating safety, implications. It must be noted that most of the marinas privately own launches on the lake which makes regulating nonresident boating traffic difficult. Weekend boating traffic on Candlewood Lake is heavy during the summer months. The debris and fragmented aquatic vascular plants observed along the edge of the lake following the weekend is quite noticeable. This suggests that colonization of *Myriophyllum spicatum* (Eurasian water milfoil) can be facilitated by over boating. Shoreline and beach erosion is also accelerated by waves action resulting from over boating.

References

Connecticut Department of Environmental Protection (Water Compliance Unit). 1983. *Phase I Diagnostic / Feasibility Study: Candlewood Lake, Brookfield, Danbury, New Fairfield, New Milford, Sherman, CT.* 1983.

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Norvell, W.A., C.R. Frink, D.E. Hill. 1979. *Phosphorus in Connecticut lakes predicted by land use.* Proc. Natl. Acad. Sci. USA. 76:5426-5429.

Siver, P.A. 1993. *Inferring the specific conductivity of lake water with scaled chrysophytes.* Limnol. Oceanogr. 38:1480-1492.

THE NATURAL DIVERSITY DATA BASE

The Natural Diversity Data Base maps and files have been reviewed regarding the Lattin's Cove site. According to the information, there is no known extant populations of Federal or State Endangered, Threatened or Special Concern Species occurring 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 site-specific 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 Ken Metzler (566-3540) if you have any questions regarding this information. Please 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 application submitted to DEP for the proposed site.

INLAND WETLANDS REVIEW

In this section are observations of the wetland resources, the impacts that the proposed activities will have on those resources and recommendations for reducing those impacts. Materials reviewed for this report include a set of preliminary plans entitled "New Boat Launch Ramp, Floating Docks and Dredging in Lake Candlewood at Lattin's Cove, Danbury, Fairfield County, Connecticut; by Dicesare Bently Engineers, Inc.; dated March, 1994.

Existing Wetland Resourses

Present on the site are 650± ft. of intermittent streams, primarily located on the western boundary, as well as the wetlands associated with these intermittent streams. These streams function to convey stormwater runoff from paved and natural surfaces of a relatively small watershed to Lake Candlewood. During wet periods, the watertable is probably high enough to create sustained flow in these watercourses for portions of the year. Associated with these watercourses are two areas of inland wetland soils mapped by the project soil scientist totaling 15,000± square feet. The dominant vegetation in these wetlands is *Phragmites australis* or common reed plant.

The boundaries as mapped on the above referenced plans appear to match inland wetland conditions in the field (not all wetland boundary marker flags were visible). However, there is a small 100′ length of intermittent stream with a small (approximately 400 square feet) area of associated wetlands on the northeast side of the parking lot that is not indicated on the plan. This watercourse emerges from a headwall and thereafter drains into a large catchbasin before it is piped across the

parking lot to an outfall on the western side of the existing boat launching ramp.Also present is a lakeshore/open water environment of Lake Candlewood in the vicinity of the existing boat launch.

Wetland Functional Values

The primary functional value of the intermittent streams and associated inland wetlands is their ability to retain and attenuate excessive nutrients and sediments from the stormwater runoff being collected from up-gradient areas. The functional value of these inland wetland areas as wildlife habitat as well as their overall ecological integrity is considered low due to the presence of the invasive, dominant *Phragmites australis.*

The overall ecological integrity of the lakeshore area has been significantly impacted due to its current use as a boat launching site, regularly fluctuating water levels, and deposition of excessive sediments via the aforementioned watercourses.

Proposed Activities

Proposed activities in or near inland wetland areas include, demolition and removal of the existing boat launching ramp, retaining walls and dock; dredging and filling in boat launching ramp area; and construction of a new ramp area. Also proposed is the deposition and grading of fill in the wetlands associated with the watercourse on the western portion of the site, as well as the construction of a sediment basin in the northwestern portion of the site.

Impact of Proposed Activities on Watercourses and Wetlands

Direct, negative impact to the inland wetlands of this site is inevitable as a result of the filling of inland wetlands associated with the western watercourse and the construction of a sedimentation basin (8,400± s.f.), and enlargement of the boat launching ramp (10,900 ± s.f.). However, given the existing functional values of these wetlands as listed above, and the improvement of the nutrient retention/sediment trapping function that will occur if a properly designed sedimentation basin is constructed, the overall negative impact is judged to be negligible. The following recommendations will act to further reduce or mitigate negative impacts associated with construction activities on this site.

Recommendations

The proposed plan does not employ Best Management Practices that conform with *CT's Guidelines for Sedimentation and Erosion Control* - Revised 1988. The following items should be added to the site plan in order to satisfy these requirements:

1) Construction schedule and sequence.
2) The name and certification of the soil scientist who delineated the inland wetland boundaries on this site.
3) The location of significantly sized trees (18" d.b.h. or greater) on the property.
4) Topsoil and subsoil stockpile areas with proper sedimentation barriers.
5) Areas to be vegetatively stabilized.
6) Planned vegetation with details of plants, seed, mulching, fertilizer, planting dates, etc.
7) Temporary erosion protection of disturbed areas (ie. silt fence).

8) Design calculations to ensure proper sizing of sediment basin and outlet protection areas for specific storm probability events.

9) Maintenance requirements for erosion controls and person responsible for that maintenance during construction of the project.

10) Maintenance requirements and parties responsible for the maintenance of permanent measures when project is complete (ie. sedimentation basin).

11) Existing and proposed grades.

A majority of the direct wetland impact in the area of the flagged wetland could be avoided with the use of a low retaining wall at the edge of the parking lot.

Without flow-line elevations and volume calculations to evaluate, it is not clear how the sedimentation basin will handle the constant, low-flow input of the watercourse it is intercepting and capture and detain high volume flows for removal of sediments during large storm events. Designs exist which allow low-flow passage and high flow storage/detention. Some mitigation of the direct wetland impacts listed above may be possible if the sedimentation basin is designed with a "fore-bay" area which is designed to capture a 2-year probability storm event (the "first flush" of polluted storm-water). This area would remove the majority of sediments and nutrients. The stormwater would then be sent through a created wetland area for further "polishing" of pollutants. Design modifications to the sedimentation basin to accomplish these objectives should be considered.

Several large willow trees are present just to the south of the existing portable outhouse at the bottom of the parking lot. These mature trees provide shade and wildlife habitat and should be preserved, if possible.

FISHERIES RESOURCES

Site Description

Lattin's Cove State Boat Launch is located at the southern terminus of Lattin's Cove, a bay of Candlewood Lake. The cove in the immediate vicinity of the launch is relatively shallow with depths of 6 feet or less at normal lake elevation. The lake bed within the cove is composed primarily of scattered boulder, coarse sand and sand/silt fines. Land surrounding Lattin's Cove has been extensively developed as residential housing with manicured lawns predominating as riparian vegetation.

Fisheries Resources

The fisheries resources of Candlewood Lake as a whole are quite diverse, composed of both cold water and warm water species. Fish species associated specifically to habitats of Lattin's Cove are largemouth bass, bluegill sunfish, pumpkinseed sunfish, redbreast sunfish, yellow perch, white perch, brown bullhead, and white catfish.

Fish species abundance in Lattin's Cove is anticipated to be low given the scarcity of in-lake structure. Periodic water level draw-down of Candlewood Lake causes a nearly complete dewatering of Lattin's Cove which eliminates aquatic habitat entirely. Near shore areas (water depths of 2-5 feet) should provide fair to good habitat for spawning of largemouth bass and sunfish.

Impacts of Proposed Activities

The DEP Bureau of Outdoor Recreation is proposing several measures to upgrade the Lattin's Cove State Boat Launch. Those measures, and impacts anticipated to occur with each, are as follows:

1. The existing sand/gravel parking area will be re-graded with launch entrance and aisle lanes paved. The existing launch facility has a reported capacity for up to 200 vehicles; the upgraded facility is to have 140 spaces designated for vehicles with trailers and 10 spaces for car-top carriers.

With provisions for the installation and maintenance of all appropriate erosion and sediment control devices, re-grading and paving are not anticipated to impact the aquatic resources of Lattin's Cove.

2. A stormwater drainage system, comprised of catch basins with sumps and a detention basin, will be installed to collect and treat stormwater runoff from the launch area and roadways within the 41.5 acre watershed.

Historically, sediments from the immediate drainage area have been deposited in the cove and have promoted degradation of nearshore habitats. An effective stormwater drainage system should remedy that situation.

The site plan narrative indicates that the most appropriate detention basin need be of a size adequate to detain runoff from a 10 year frequency storm event for a 24 hour period. However, site constraints require a "down-sizing" of the basin to a dimension which will intercept the first 1/2" of stormwater runoff. The remainder of flow will

pass directly to the lake. Although the smaller basin is designed to process the initial 1/2" of stormwater flow, nutrients in solution and possibly sediments have an opportunity to discharge directly to Lattin's Cove. Nutrients may promote excessive aquatic plant growth to shallow water areas, while sediments can degrade or completely eliminate shoreline habitat utilized primarily by largemouth bass and sunfish for spawning and juvenile rearing.

A portion of the detention basin will extend into Lattin's Cove. The fill required will eliminate a small section of near-shore habitat which, as previously mentioned, is utilized for spawning and rearing of bass and sunfish.

3. Approximately 1/2 acre of lake bed will be dredged to elevation 423. This requires the removal, on average, of 1 foot of existing material with maximum dredge depths of 4 feet.

Proposed dredging should prove advantageous as it will serve as a means of diversifying habitat and may increase fish species abundance.

4. A permanent dock is slated for the westerly side of the launch with a substantial length created by rip-rap or similar fill.

The amount of fill required for both the permanent dock and stormwater detention basin will result in loss of approximately 0.07 acre of near-shore habitat.

Recommendations

The following are recommended as means of mitigating impacts to Lattin's Cove

aquatic resources:

1. "Down-sizing" of the proposed stormwater detention basin may result in an inadequate removal of dissolved nutrients and sediments. Alternatives to site design should be investigated in an attempt to install a basin, or basins, better able to handle stormwater runoff. Such design should not involve in-lake filling. A schedule of maintenance should be incorporated into plans for the stormwater management system.

2. Consider a floating dock or dock supported by piers in lieu of a structure founded on fill.

3. Schedule facility upgrade, especially near- or in-lake activities, during periods of Candlewood Lake water level drawdown.

WATER SUPPLY SECTION REVIEW

Project Description

The Department of Environmental Protection (DEP) is proposing improvements to the design of the Lattin's Cove Boat Launch area on Candlewood Lake in the town of Danbury. The project consists of these proposed activities:

1) removal of 1500 square feet (SF) of concrete launch ramp;
2) removal and modification of drainage pipe and structures including the installation of a new sediment basin with a new drainage outfall into the cove;
3) removal of 120 linear feet (LF) of concrete retaining wall and dock;
4) removal of 144 SF fixed dock with ramp and 80 SF floating dock;
5) construction of 55 LF of 68 LF wide concrete launch ramp with 1500 SF of slope paving;
6) installation of 262 LF, 8 feet wide floating wood dock with tree 15 LF, 4 foot wide gangway;
7) dredge of 2,500 cubic yards (CY) of material below elevation 429 over an area of 10,900 SF;
8) fill of 200 CY of wetland over an area of 8,400 SF for site parking, drainage, and sedimentation basin; and installation of 400 LF wood bulkhead.

The current launch area has non-delineated parking which is estimated to accommodate up to 200 cars on peak days. The capacity of the launch area after improvements will be 140 designated car and trailer spaces, and 10 vehicle spaces for car top carriers. The parking area will be gravel with paved aisle lanes and entrance. Drainage improvements include a ticket booth to collect fees and sanitary facilities (portable toilets,

standard and handicapped). The DEP states that these improvements will not increase site use or expansion of parking.

Public Water Supply

Currently, Candlewood Lake's water quality is considered Class B*. The City of Danbury's Water Department has proposed to utilize Candlewood Lake as a future source of drinking water supply. Within the City of Danbury's Draft Comprehensive Water Supply Plan dated February, 1991, figure IX-2 page IX-5 shows the diversion of 15 MGD from Lake Candlewood in the year 2014. The plan specifically discusses the use of this source on pages IX-13 through IX-15. This diversion of Lake Candlewood is also included within the Housantonic Water Utility Coordinating Committees' (WUCC) Integrated Report for the Housatonic Water Supply Management Area dated September 1, 1988 within Table 3.4.2 of the WUCC plan. It is also discussed on pages 3.4.3 through 3.4.5. Currently, under Connecticut General Statutes (CGS) Section 22a-417, the use of Class B water for drinking water purposes is prohibited. However, CGS Section 25-32d(b)(3) states that a water supply plan can assess the use of alternative water supply sources which receive sewage discharge in their long range plans. Therefore, since the diversion of Candlewood Lake is identified within the City of Danbury's Water Supply Plan as a proposed drinking water supply source, then this lake and watershed should be protected as a potential drinking water supply.

Comments and Recommendations

- **Wetlands**

The extent of the proposed filling of the wetland areas is not recommended. The filling of inland wetlands for any reason other than drainage or the sedimentation basin

should be prohibited. The existing wetland area on the western side of the parking lot provides a degree of natural water quality filtration which should not be disturbed. With the filling of these wetlands, a dependence is made totally upon the sedimentation basin to improve the water quality of the runoff before entering Candlewood Lake. By leaving the existing wetlands, sediment and pollutants will naturally filter out and improve the quality and quantity of water which will enter the sediment basin and eventually the lake. Filling the wetlands is only increasing the amount of runoff, sediment, and the concentration of pollutants which will enter the sedimentation basin.

- **Stormwater System**

The adequacy of the sedimentation basin, as shown on the plans provided to us, is unable to be determined and evaluated. The need to detain the first flush of precipitation (first half-inch of rain) should be analyzed. This first flush contains approximately 90% of the non-point source contaminants. Therefore, it is important to detain this initial flow to preserve the water quality of Candlewood Lake. Effective stormwater control techniques involve the integration of artificial and natural controls. Regular maintenance of sedimentation basins is needed to adequately perform their function of detaining sediments and the settling of pollutants. Regular maintenance would include at least a biennial inspection of the site and yearly sediment build up removal before increased spring runoff. The outflow to Lattin's Cove should be designed to dissipate the flow of energy in a way that will minimize the possibility of soil erosion. These provisions should be made to protect water quality.

- **Catch Basins**

The catch basins should be designed with at least two foot sumps and have a hooded outlet. Please refer to the enclosed diagram. Catch basins should utilize multi-chamber oil separators. Proper maintenance of the catch basins is required to operate

efficiently. They should be maintained on a biannual basis considering the high usage of this boat launch.

The persons, or company(s), responsible for maintenance should be identified.

- **Boat Launch Ramp**

The plans indicate that the boat launching capacity will be increased from one boat to four boats. To allow this four lane boat ramp the plan shows dredging of 2500 cubic yards of material and the fill of 1800 cubic yards of material. The area of fill extends into the existing lake to accommodate the four lane ramp. Dredging is being done because the build up of sediment needs to be removed to allow for boats to be launched. It is recommended that the area to be filled be minimized and not be done for the purpose of increasing the capacity of the boat launch. This agency suggests an alternative with the least environmental impact to water quality of the lake would be to upgrade the existing ramp to accommodate two ramps. Therefore, dredging and filling would be minimized due to the fact that the existing ramp area would be used.

- **Peak Use**

No studies were made concerning the peak or average day use of the existing parking lot. These studies would be beneficial in determining just how many boat launch ramps are needed. The peak use of 200 vehicles per day (as stated by DEP) was based upon a resident's best estimate of usage.

- **Porta-potties**

Porta-potties should be located on an impervious concrete slab and bolted down. They should be placed away from the catch basins, sedimentation basin, drainage system and wetlands. They need to be regularly cleaned out and maintained. Who will be

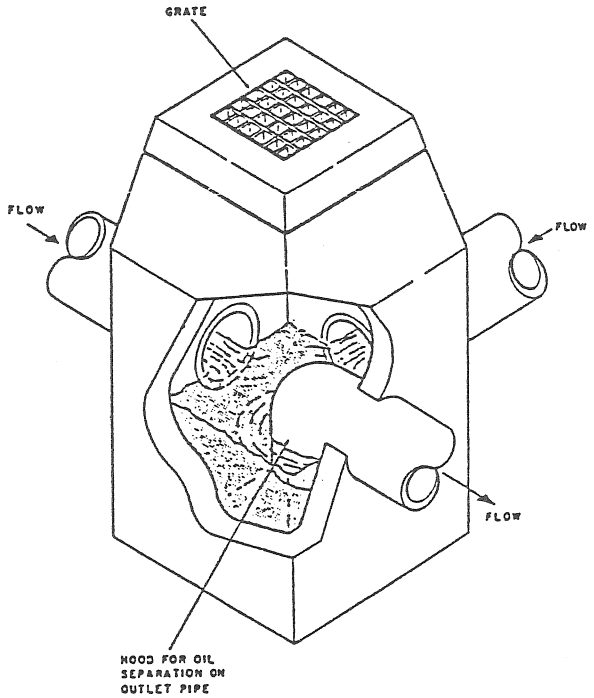
responsible for the maintenance?

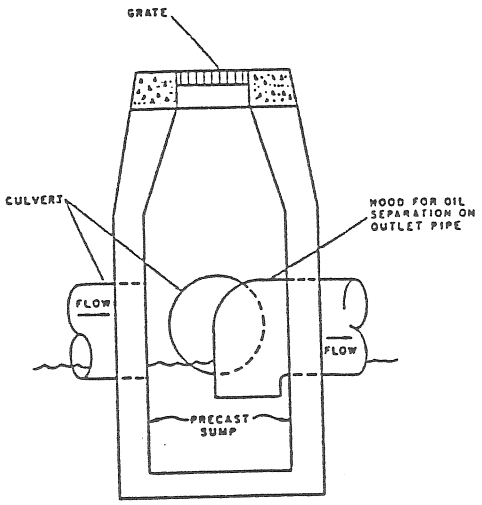
Conclusion

Candlewood Lake is being considered as a future source of supply for the City of Danbury. Therefore, it is felt that some aspects of this project need further evaluation to consider the ramifications upon the water quality of this potential drinking water supply source. Filling of wetlands and the partial paving of the parking lot will increase the amount pollutants entering the sedimentation basin. This sedimentation basin has not been described in detail to thoroughly determine the adequacy. The Water Supply Section of the State Department of Health and Addiction Services not approve of the filling of wetlands to accommodate parking area when these wetland areas serve the purpose of slowing runoff and settling sediment and contaminants. Further analysis should be made before filling wetlands and sizing the sediment basin. Further evaluation should also be made to determine the actual use of the existing boat launch ramp. With this data, the appropriate size of the parking area can be determined and the need for four new ramps determined.

CATCH BASIN WITH HOOD

A standard catch basin is illustrated here, modified with a hood on the outlet pipe. This provided oil separation. The catch basin sump serves to retain trash and sediments and must be cleaned periodically if it is to function as intended.





ON-SITE SEWAGE DISPOSAL

The Lattin's Cove boat launch property is located in an area of Danbury which is not serviced by either public water or sewers. There are no wells on this site and sewage disposal facilities for both DEP employee's and the public have been handled in the past by seasonal installation of portable toilets. A very simplistic analysis of the overall site improvement plan would lead one to conclude that improvements should not increase or decrease boating user activities because site improvements do not increase the number of car and trailer sites available. If that were indeed the case, domestic sewage could be handled in the same manner as before assuming no public health or environmental pollution problems were being created.

The plan for improvement of this boat launch area could provide the opportunity to improve on the "rustic" facilities currently being used at this site. Provisions could be made for installing a private well and consideration could be given to construction of a subsurface sewage disposal system rather than continue the use of portable toilets. Although portable toilets provide one favorable aspect of zero gallons discharge to the property, the potential for accidental spillage and acts of vandalism could significantly increase the liklihood of soils, ground and surface water pollution should the chemical disinfectants and deodorizers used in association with those units be leaked, spilled or dumped onto the ground.

The site development plans do not specifically identify the proposed location of portable toilet units. It is assumed that they would be located sufficiently away from the high level of the lake and that fact in itself dissuades some individuals from making the long trek up to the toilet area in order to use the facility. It would be most beneficial for employees and the public if toilets were closer to the ramp area, but that could create potential problems with portable units for the aforementioned reasons.

Although no soil testing has been performed, it may be possible to locate a public toilet facility closer to the ramp area and pump sewage for final disposition to the higher portion of this site adjacent to Forty Acre Mountain Road. Installation of an on-site sewage disposal system would address the need for hand washing facilities, a practice encouraged after each and every toilet use.

The use of on-site composting toilet systems has been considered by DEP in the past for other state projects. These large volume composting toilets are permitted in accordance with the CT Public Health Code and could be considered on this site as an alternative to the portable toilets and the on-site disposal option. The composting chambers would be housed inside permanent structures and would require minimal use of electricity for positive venting. If water was available, a separate gray water disposal system could be constructed to dispose of handwashing wastes only. Installation of a composting toilet/gray water facility would most likely be less expensive than the conventional public toilet building.

It would be unlikely that odors from any of the three mentioned sewage disposal systems would create objectionable odors for the adjacent property owners. The facility is manned daily during the peak season and DEP employees can easily observe and report problems with any system so that proper maintenance can be taken. If continued use of portable toilets is the option selected for handling domestic sewage, consideration should be given to taking those steps necessary to prevent accidental spillages and vandalism to the units in order to prevent the deodorizing chemical from coming in contact with ground or surface waters. If options for installation of either conventional or gray water systems are to be considered, soil tests should be performed as required by code to determine whether on-site sewage disposal can realistically be considered.

PLANNING ISSUES

The zoning regulations for the City of Danbury do not appear to be at issue with this project, as it belongs to the State, therefore the zoning regulations have no control. If the regulations could exercise any control in this situation, certainly it would be beneficial, in this instance, if no more intense use of the property were allowed. It is obvious from casual observation that this is an actively sought boat launch. If it were a commercial venture, in this location, there would be great efforts to expand. Because of its popularity and activity, removing the use is not an option. Therefore, the City should strive to make efforts to solve the problems the use of this property causes by enforcing controls off the property that will best protect the City's interests.

The height of a boat transported to this launch appears to be controlled by the height of electric and telephone wires, alone. Perhaps , the City could control the size of boats using the roads that access the launch by addressing this problem with language in an ordinance.

If the capacity of the parking lot is reduced by whatever means that are proposed, this may not reduce the number of boats that use the roads accessing the site. Other boats may be brought in, launched and then the trailer and truck are taken off-site to another storage site. The City may want to limit the number of trailers accessing the site in a 24 hour period by placing limits on the use of the access roads for that purpose. The site plans offered by the State show four lanes of access to the water. It would be the Team Planner's assumption that this connotes a great deal of use and the City will want to be wary of overuse.

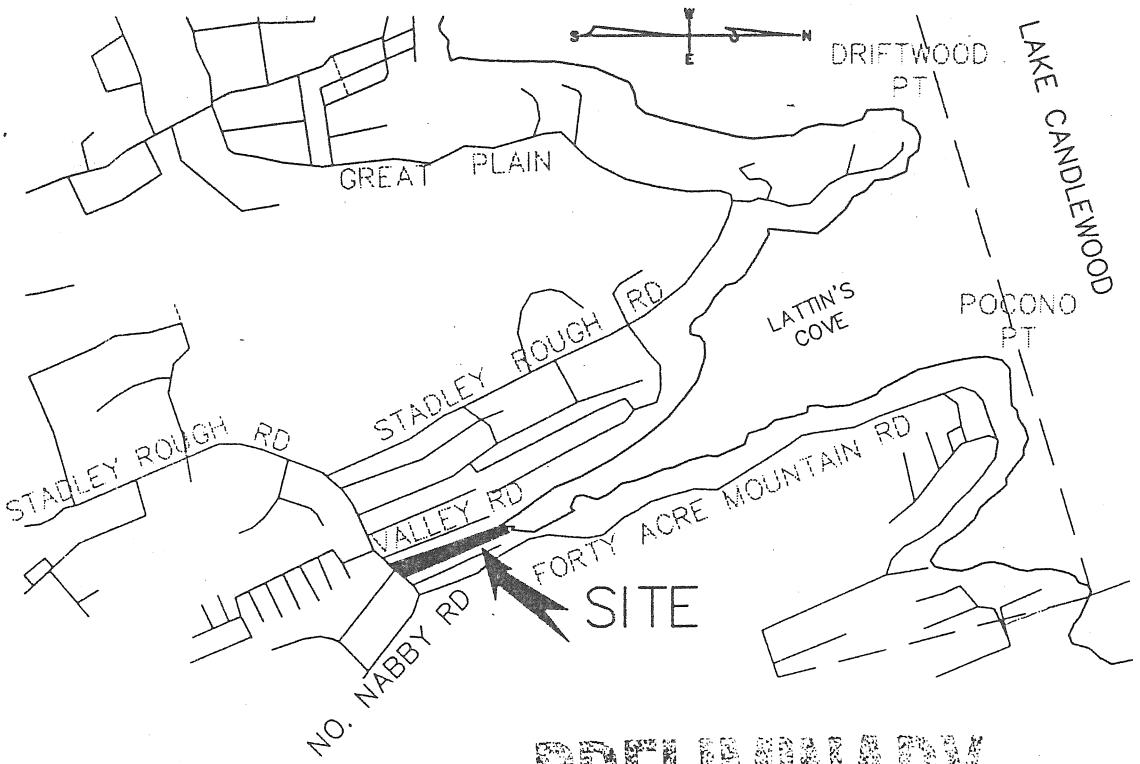
REVIEW OF SITE DESIGN AND TRAFFIC ACCESS

Based on coordination with Housatonic Valley Council of Elected Officials, Danbury's Traffic Engineer, and ConnDOT's Office of Inventory and Forecasting, there are no specific traffic counts available for Forty Acre Mountain Road. Since the existing road conditions are unknown, it is difficult to assess the adequacy of the road itself.

In discussion with Mr. Dean Kraska, Department of Environmental Protection [DEP), the buffer between the parking lot and adjacent properties is adequate. DEP has agreed to provide additional plantings or fencing, as requested by the Town. The plantings will require little or no maintenance.

The proposed design plan efficiently displays on-site traffic circulation patterns without increasing the lot size. The relocation of the driveway is necessary in order to eliminate the offset intersection. This new layout will also alleviate any concerns of traffic turning left onto Parkwood Terrace Drive and will allow for clearer view of the intersection upon exit from the cove.

APPENDIX



PRELIMINARY

VICINITY MAP

DANBURY QUADRANGLE

2000 0 2000 4000

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: AS SHOWN MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 1 OF

NOTES:

1. ELEVATIONS ARE BASED ON THE LOCAL CL&P CO. ROCKY RIVER DATUM.

2. THIS SITE IS LOCATED IN FLOOD HAZARD ZONE C (AREAS OF MINIMAL FLOODING) AND ZONE A (AREAS OF 100 – YEAR FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED).

3. PURPOSE: PUBLIC LAUNCH RAMP.

4. RIPARIAN ADJOINERS: EAST:

   WEST:

5. PROPOSED ACTIVITY:

   REMOVAL OF 1500(+/–) SF CONCRETE LAUNCH RAMP.

   REMOVAL AND MODIFICATION OF DRAINAGE PIPE AND STRUCTURES INCLUDING THE INSTALLATION OF A NEW SEDIMENT BASIN WITH A NEW DRAINAGE OUTFALL INTO THE COVE.

   REMOVAL OF 120(+/–) LF CONCRETE RETAINING WALL AND DOCK.

   REMOVAL OF 144(+/–) SF FIXED DOCK WITH RAMP AND 80(+/–) SF FLOATING DOCK.

   CONSTRUCTION OF 55(+/–) LF, 68 FT WIDE CONCRETE LAUNCH RAMP WITH 1,500(+/–) SF OF SLOPE PAVING.

   INSTALLATION OF 262(+/–) LF, 8 FT WIDE FLOATING WOOD DOCK WITH THREE 15 LF, 4 FT WIDE GANGWAY.

   DREDGE OF 2,500(+/–) CY OF MATERIAL OVER AN AREA OF 33,600(+/–) SF TO A DEPTH RANGING FROM ELEVATION 429 TO ELEVATION 423.

   FILL OF 1,800(+/–) CY OF MATERIAL BELOW ELEVATION 429 (ORDINARY HIGH WATER) OVER AN AREA OF 10,900(+/–) SF.

   FILL OF 200(+/–) CY OF WETLAND OVER AN AREA OF 8,400(+/–) SF FOR SITE PARKING, DRAINAGE AND SEDIMENTATION BASIN.

   INSTALLATION OF 400 LF WOOD BULKHEAD.

6. THESE PLANS HAVE BEEN PREPARED TO A CLASS "D" ACCURACY STANDARD.

7. THESE PLANS HAVE BEEN PREPARED FOR PERMIT PURPOSES ONLY AND ARE NOT CONTRACT DOCUMENTS.

   TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

WILLIAM H. BENTLEY LICENSE # 15774 _____ DATE _____

LEGEND

BCLC	BITUMINOUS CONCRETE LIP CURB
CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CY	CUBIC YARDS
ELEV	ELEVATION
FT	FEET
HW	HEADWALL
INV	INVERT
LF	LINEAR FEET
PVC	POLYVINYL CHLORIDE PIPE
SF	SQUARE FEET
TYP	TYPICAL

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

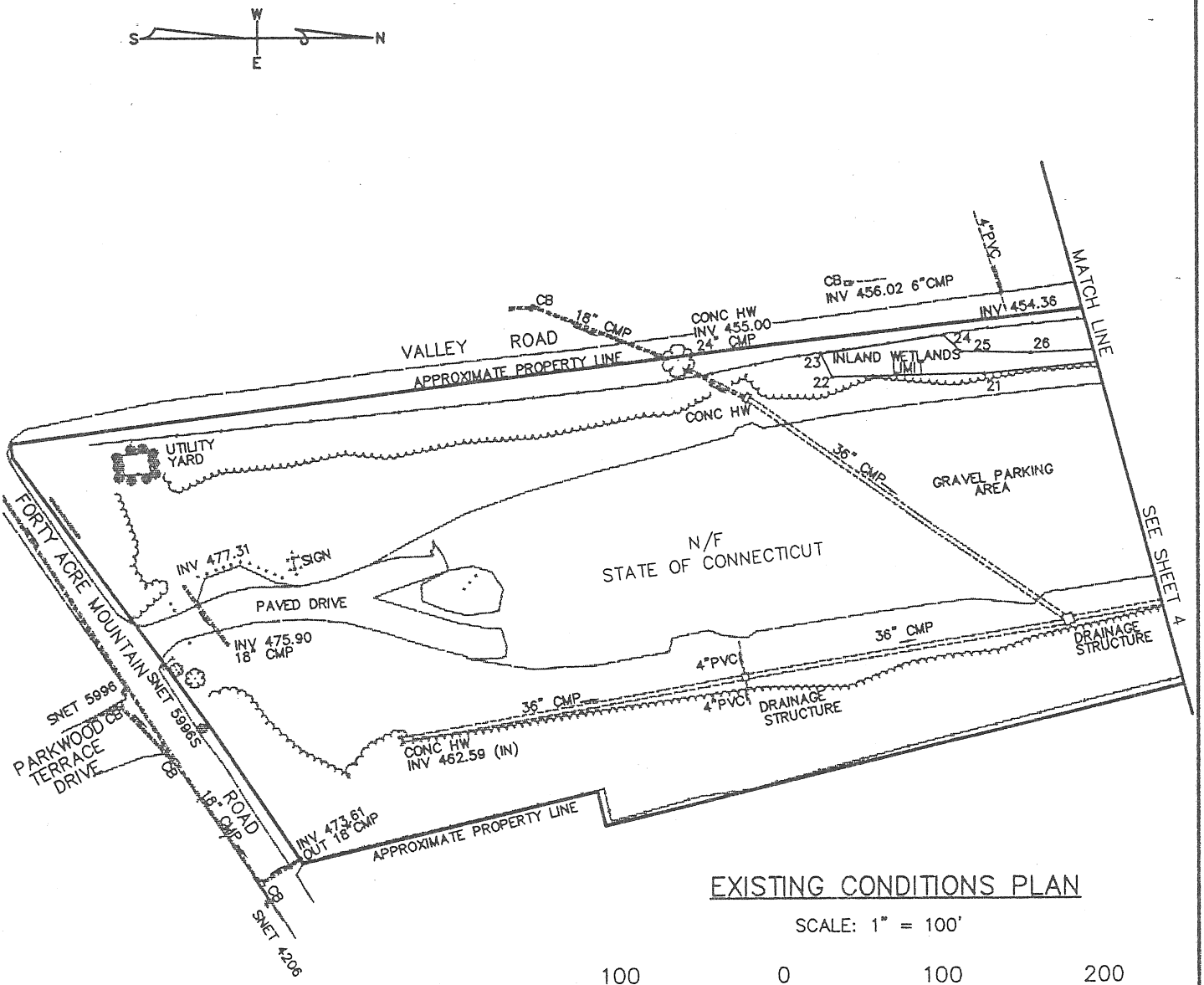
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: AS SHOWN MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 2 OF



EXISTING CONDITIONS PLAN

SCALE: 1" = 100'

100 0 100 200

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

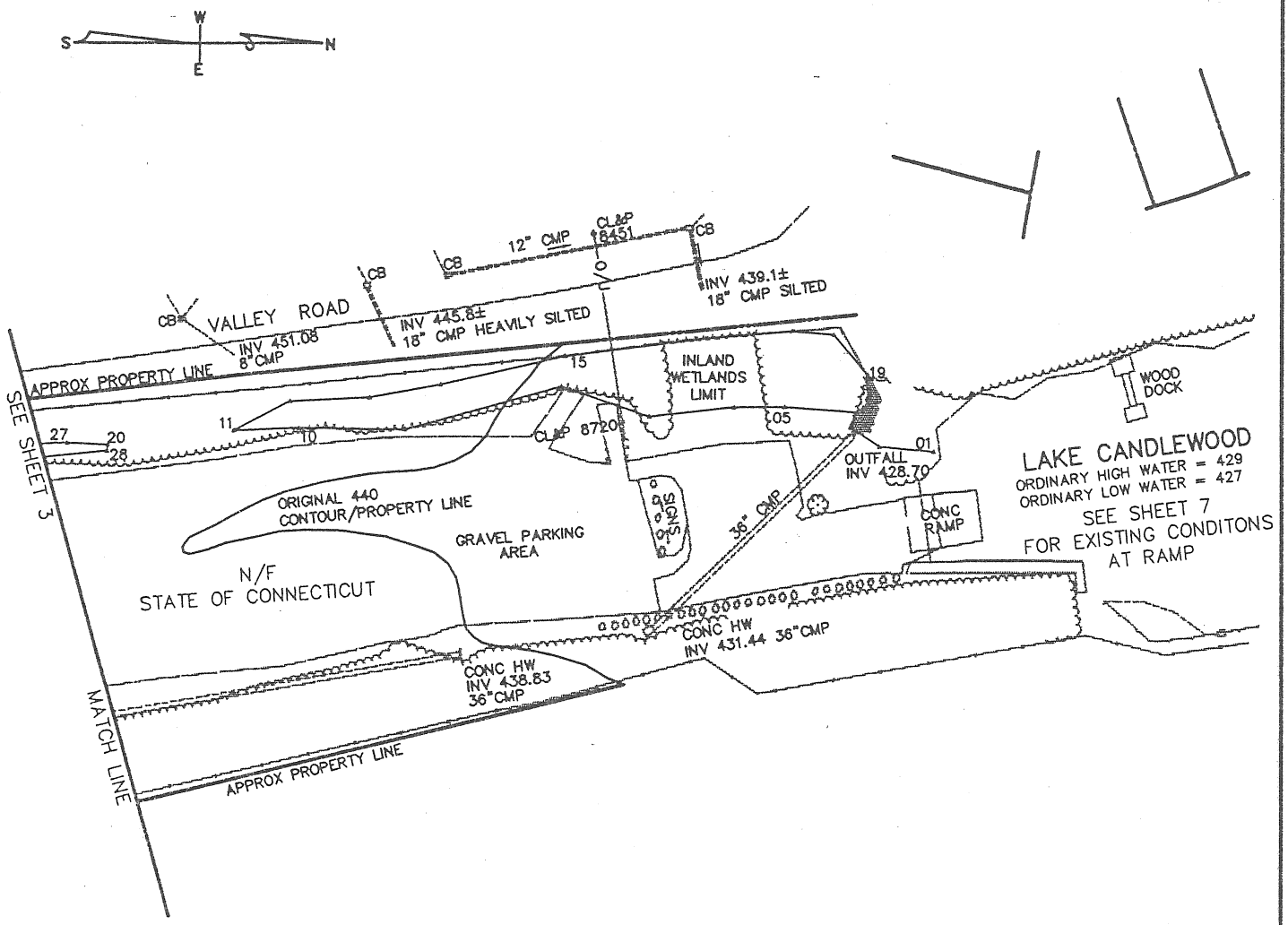
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1" = 100' MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 3 OF



EXISTING CONDITIONS PLAN

SCALE: 1" = 100'

100 0 100 200

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

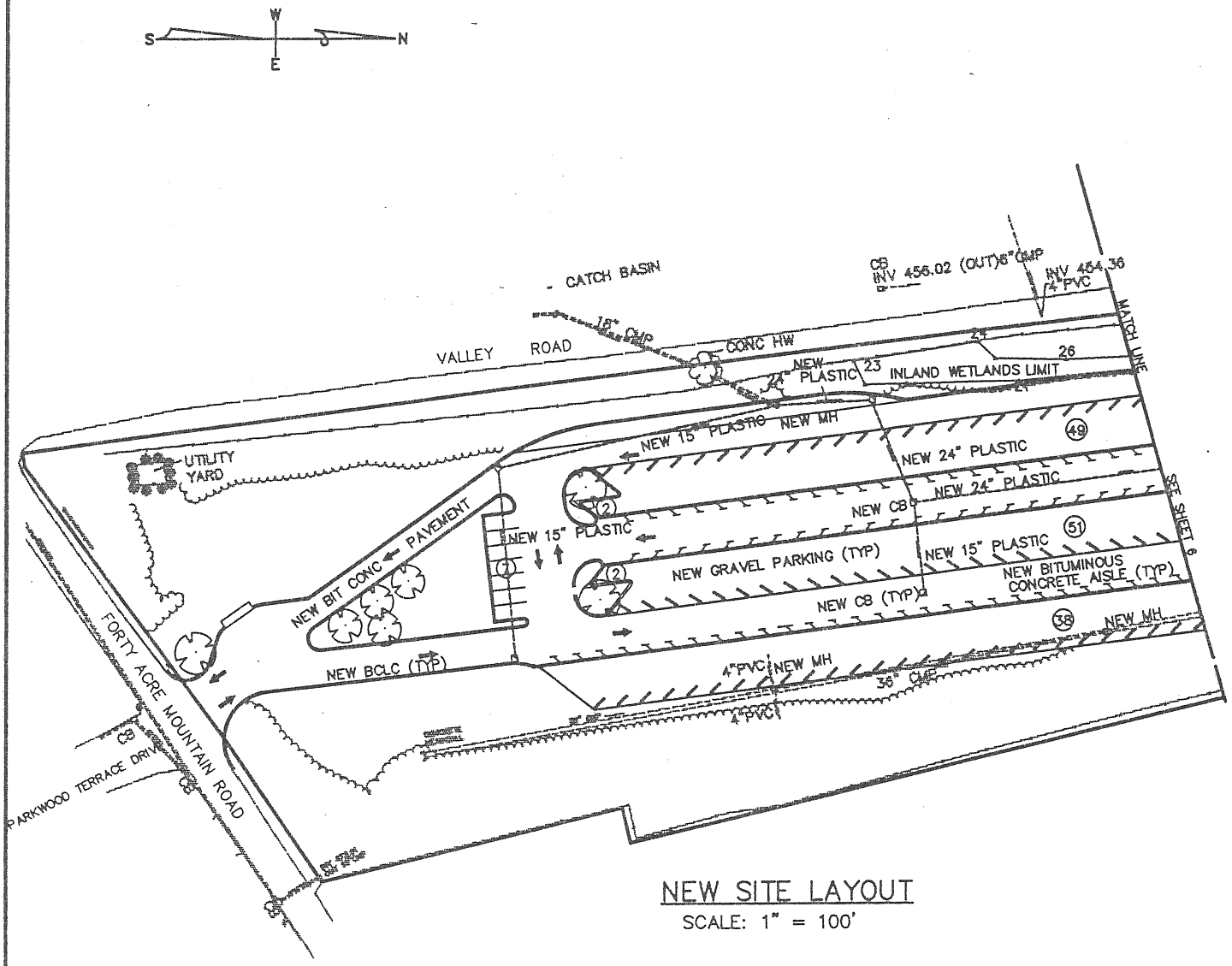
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1" = 100' MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 4 OF



NEW SITE LAYOUT

SCALE: 1" = 100'

100 0 100 200

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

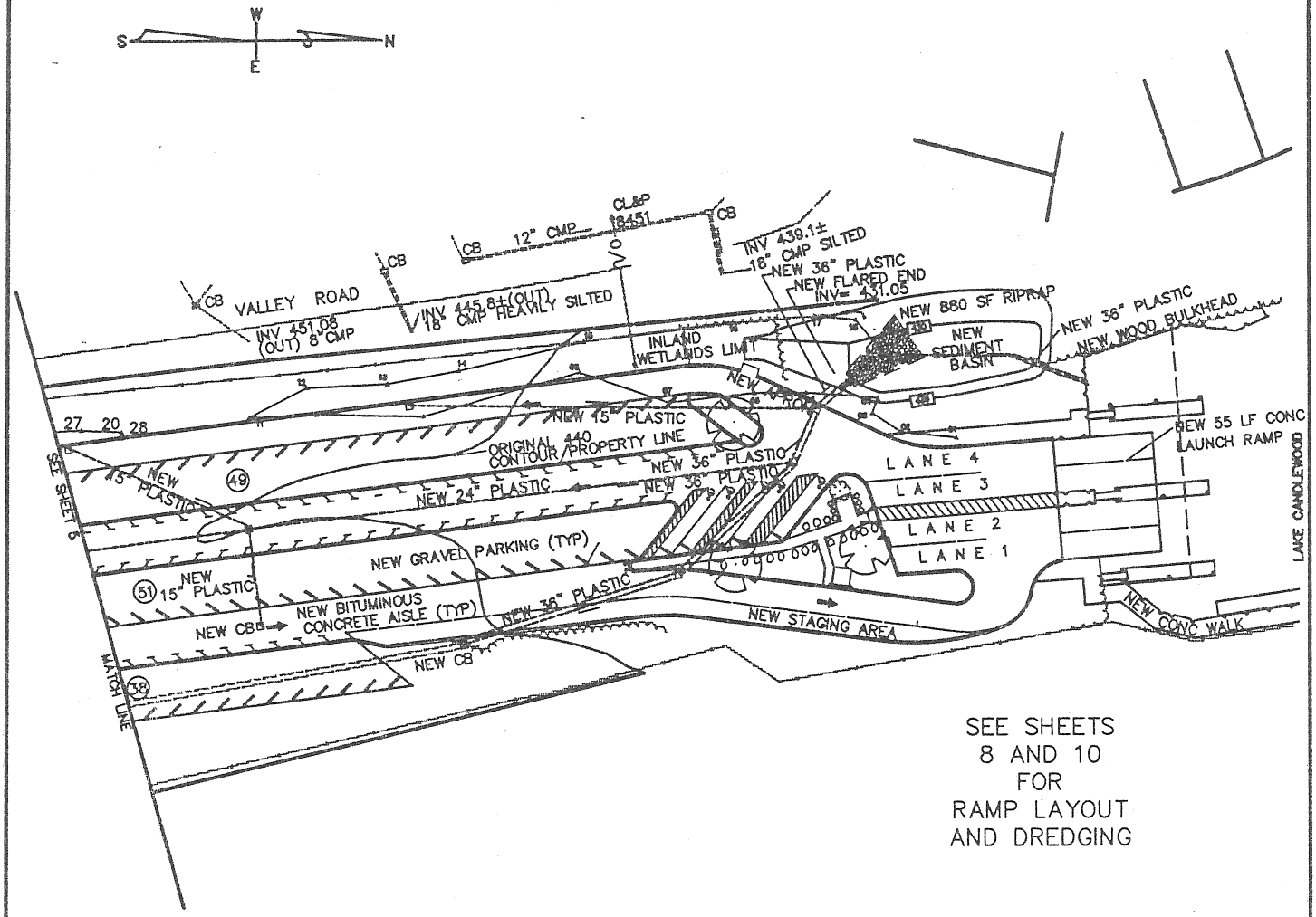
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=100' MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 5 OF



SEE SHEETS
8 AND 10
FOR
RAMP LAYOUT
AND DREDGING

NEW SITE LAYOUT

SCALE: 1" = 100'

100 0 100 200

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

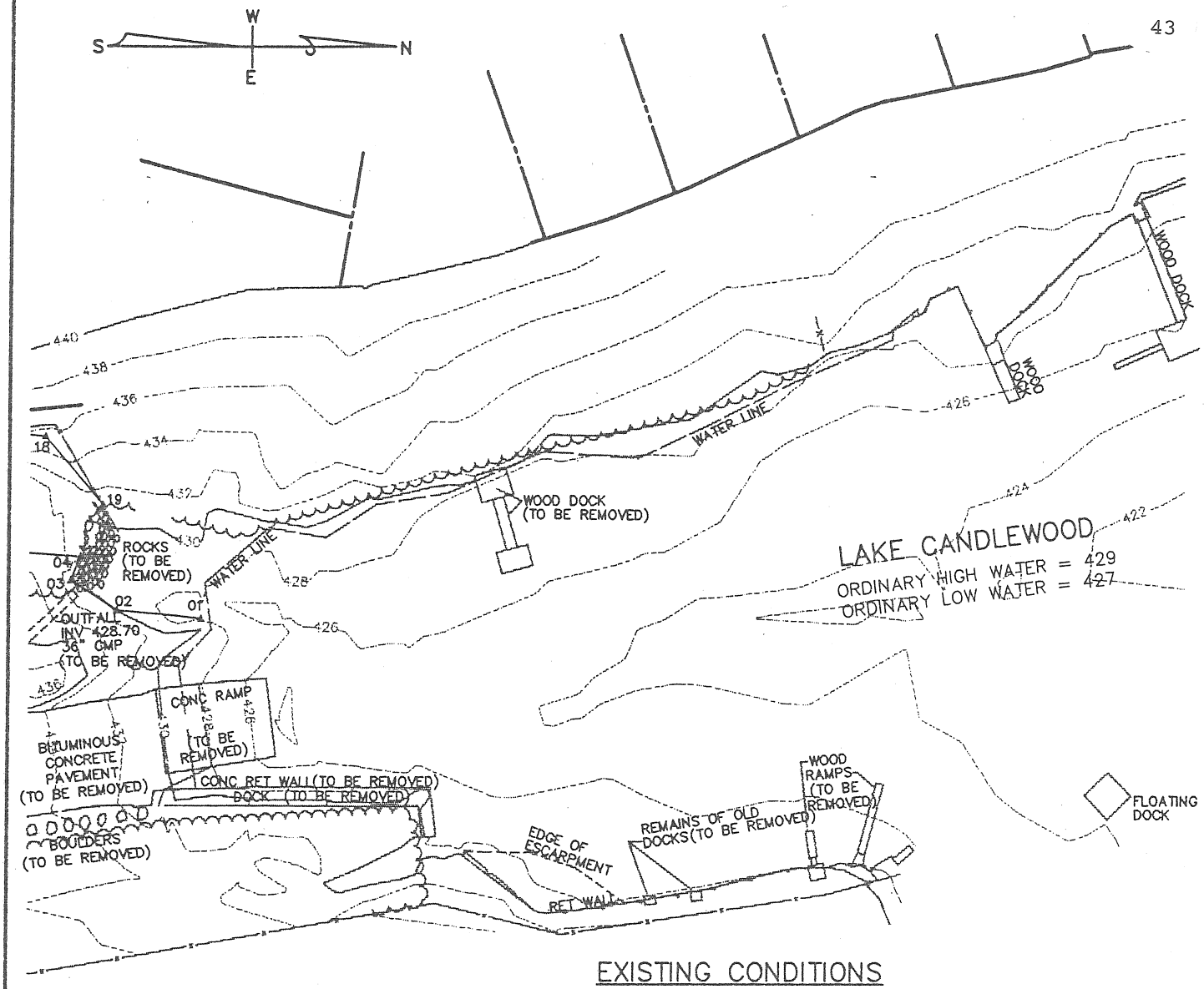
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: AS SHOWN MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 6 OF



EXISTING CONDITIONS AT RAMP

SCALE: 1" = 60'

60 0 60 120

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

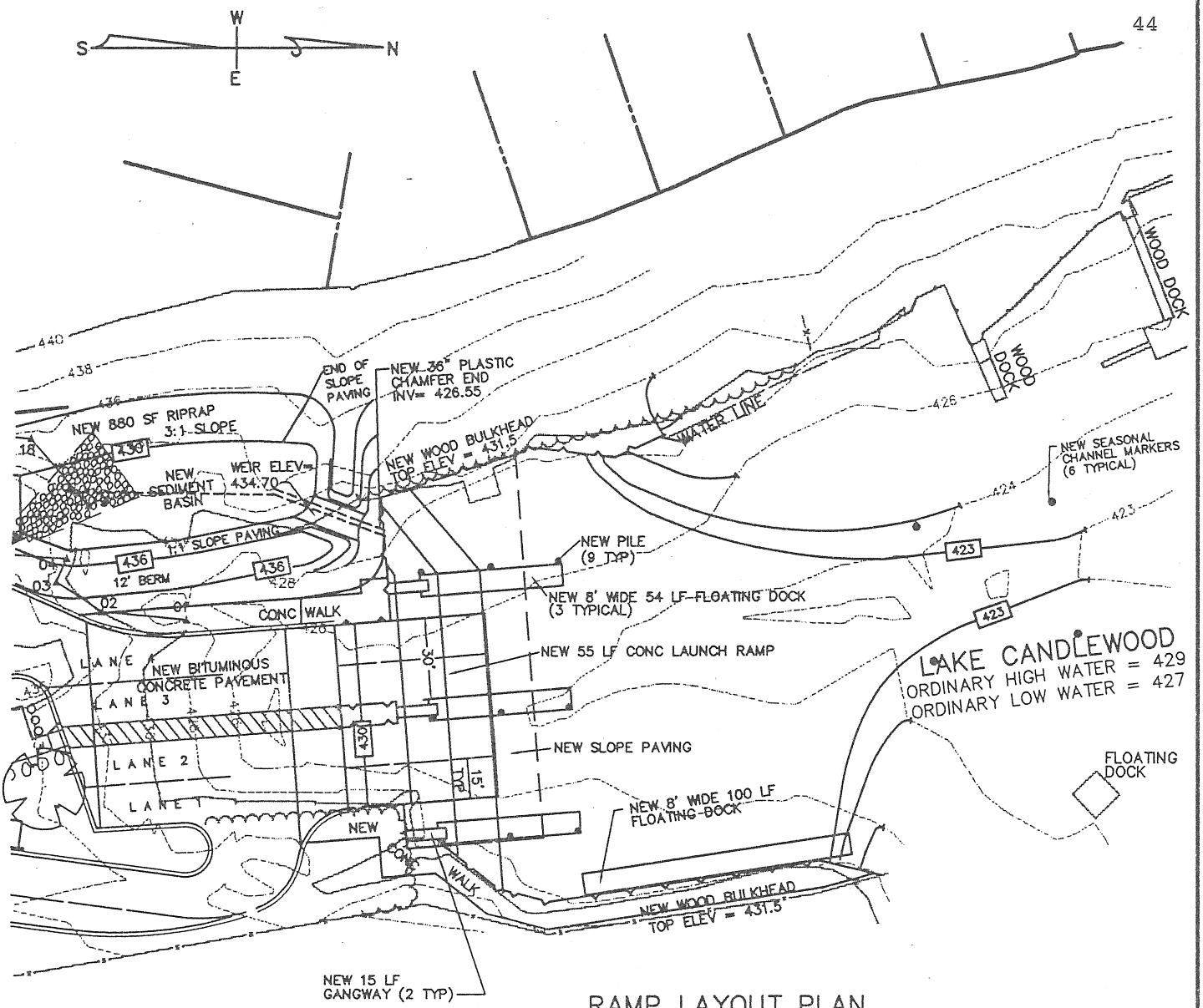
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=60' MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 7 OF



RAMP LAYOUT PLAN

SCALE: 1" = 60'

60 0 60 120

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

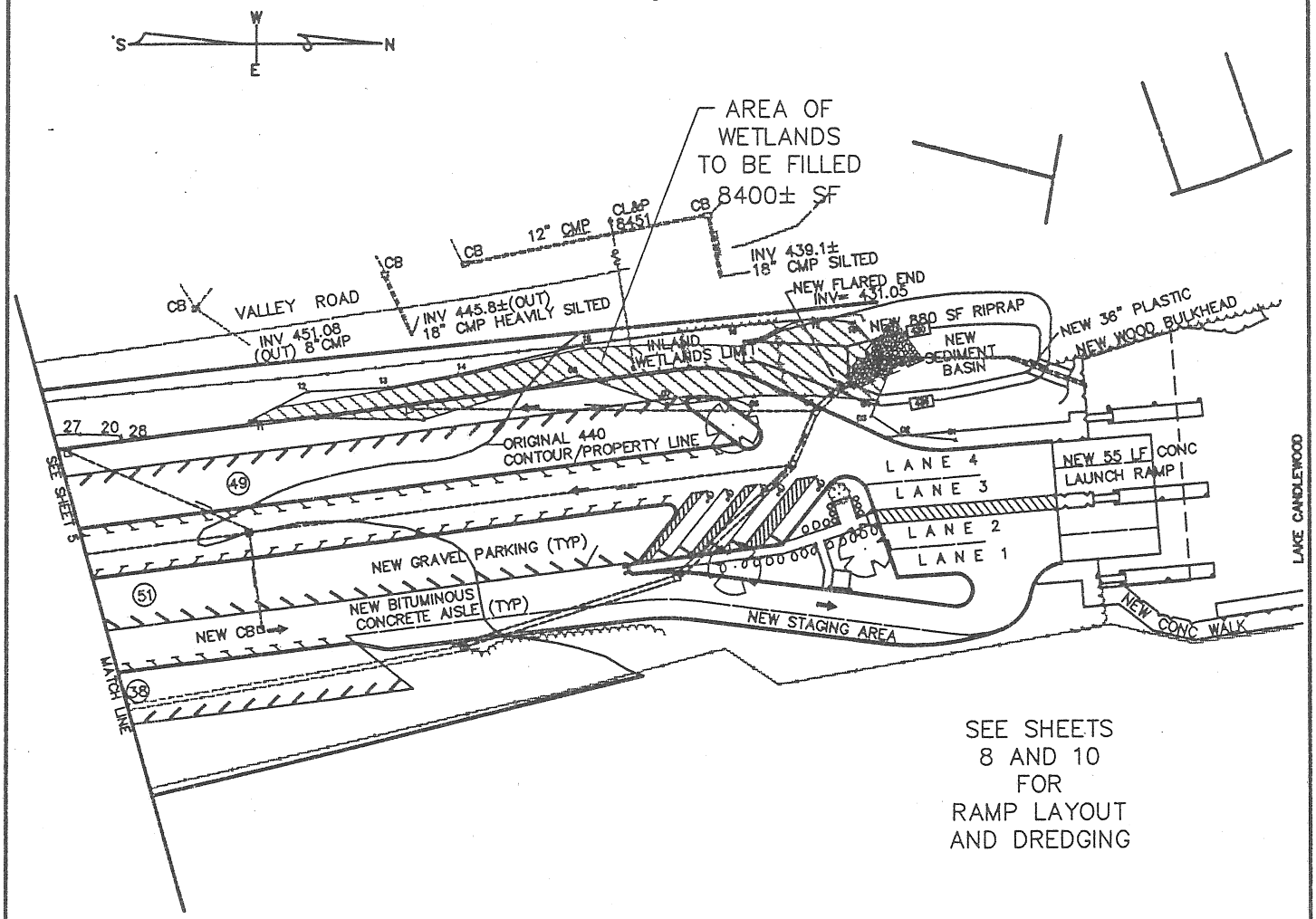
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=60' MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 8 OF



WETLANDS TO BE FILLED

SCALE: 1" = 100'

100 0 100 200

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

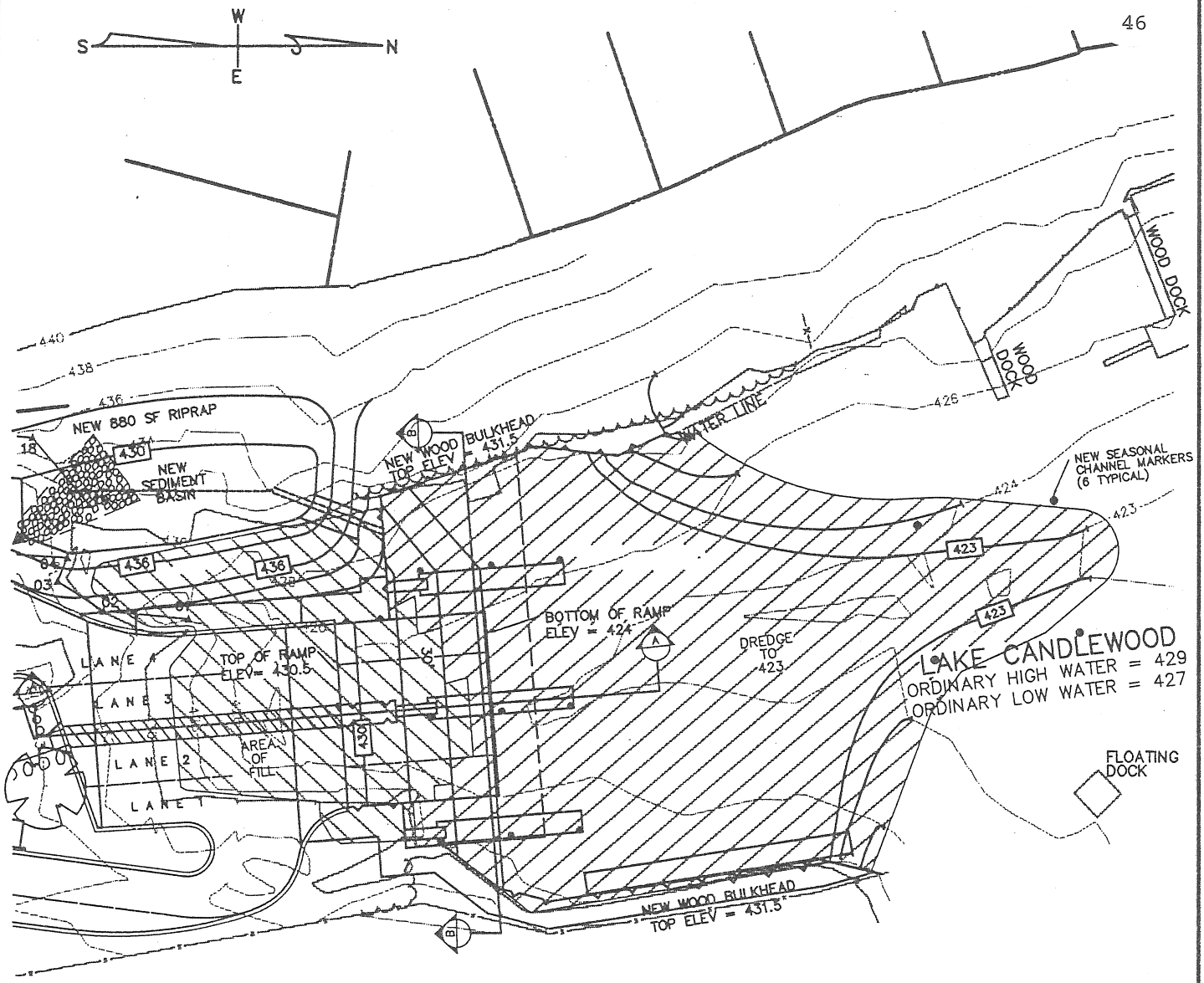
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1" = 100' MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 9 OF



DREDGING PLAN

SCALE: 1" = 60'

60 0 60 120

GRAPHIC SCALE IN FEET

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

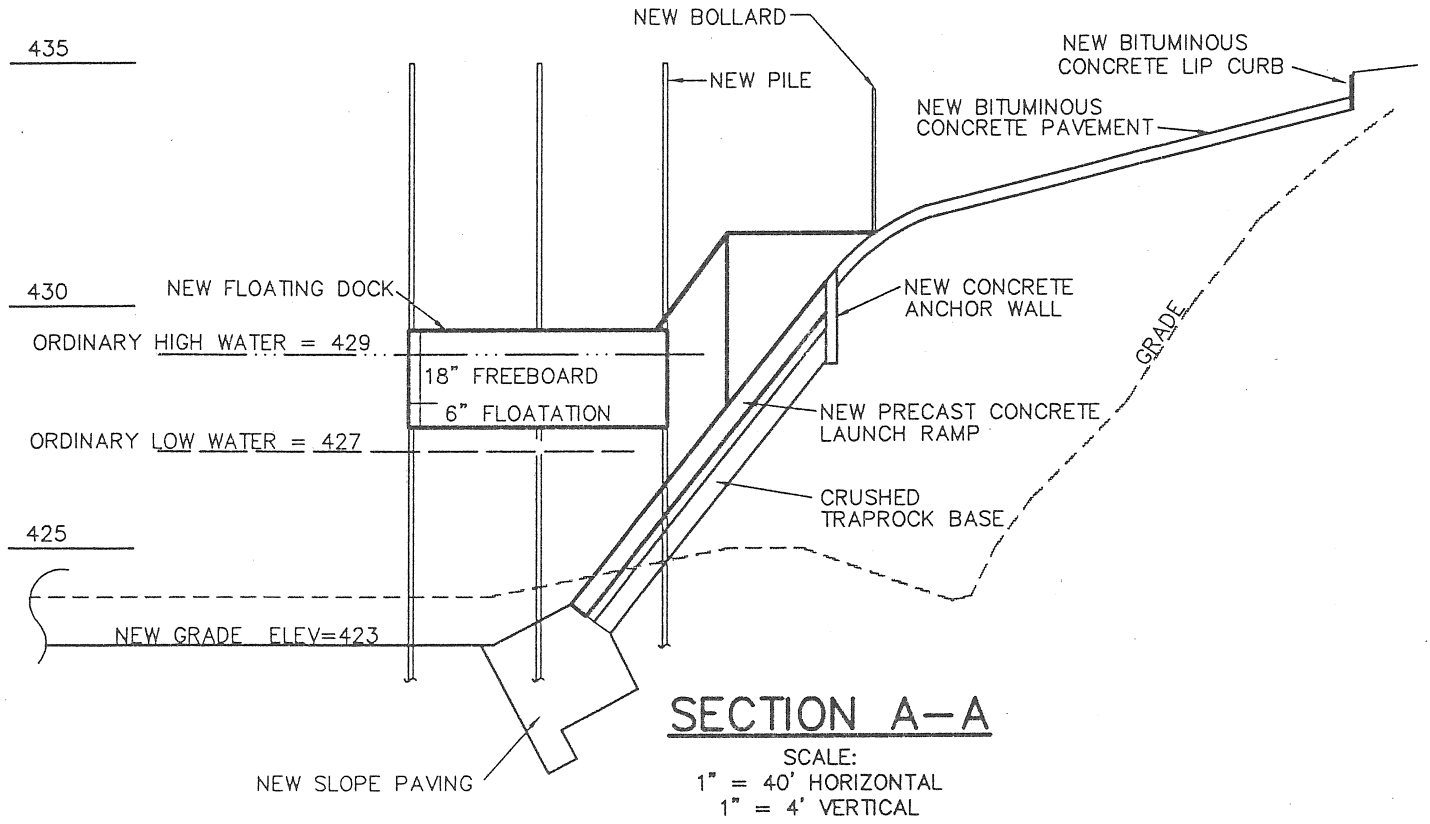
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=60' MARCH ??, 1994

DiCESARE-BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 10 OF



SECTION A–A

SCALE:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

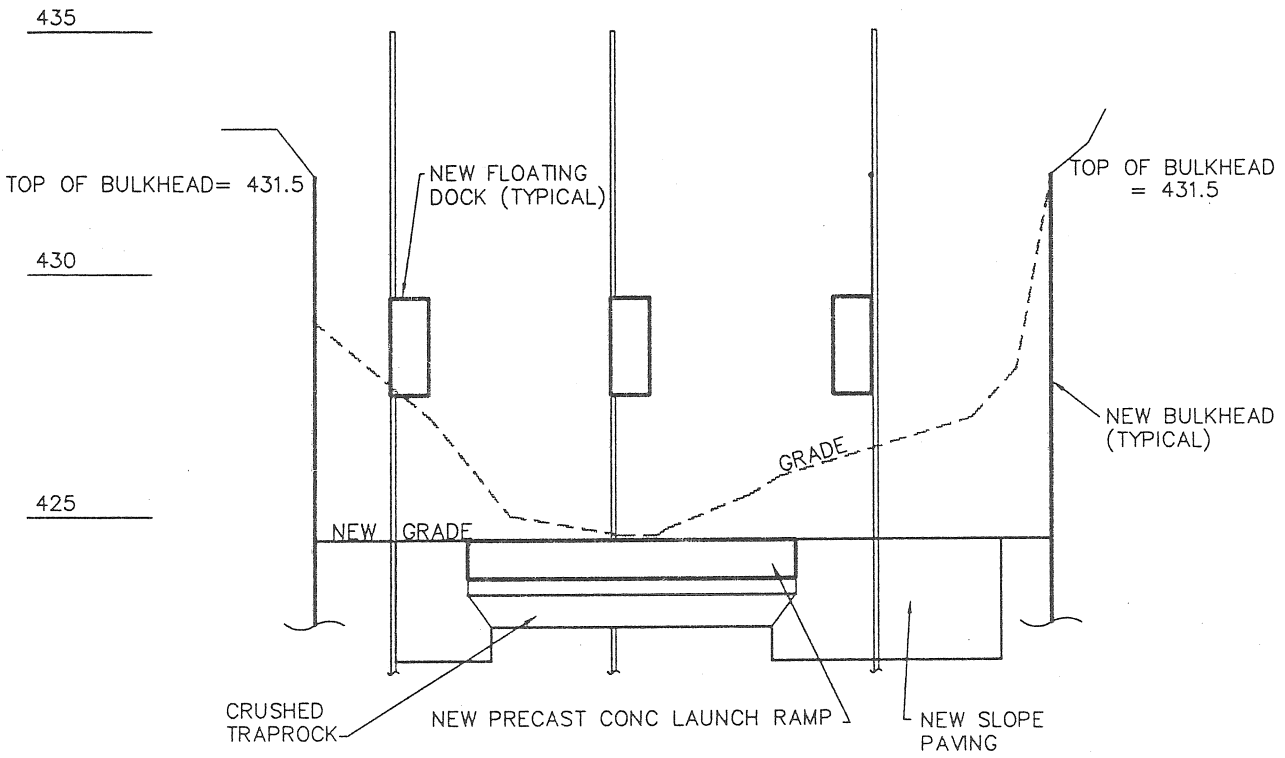
IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=60' MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 11 OF



SECTION B–B

SCALE:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

REVISIONS:

NEW BOAT LAUNCH RAMP, FLOATING DOCKS AND DREDGING

IN: LAKE CANDLEWOOD
AT: LATTIN'S COVE, DANBURY
FAIRFIELD COUNTY, CONNECTICUT

APPLICATION BY: STATE OF CONNECTICUT

SCALE: 1"=60' MARCH ??, 1994

DiCESARE–BENTLEY ENGINEERS, INC.
GROTON, CONNECTICUT

JOB # 92002 SHEET 12 OF

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WATER MANAGEMENT TECHNICAL GUIDANCE

MUNICIPAL MANAGEMENT PRACTICES FOR THE REUSE OF ROAD SAND SWEEPINGS MARCH 1994

Purpose: These guidelines have been developed to assist municipalities manage the disposition of road sand sweepings. The goal is to use common sense techniques to minimize risks to water resources. The guidelines should prevent the inadvertent filling of wetlands and the sedimentation of any surface water resources from erosion at an unstable fill site and minimize the potential affect on potable water supply wells.

Nature of Material: Road sand collected in the spring may contain residual salt and other materials associated with stormwater runoff from streets. It is not as clean as virgin earth materials and should be handled with a certain degree of care.

Planning Considerations: Perhaps the most critical aspect of management is the careful and thoughtful selection of the location of sites for storage and disposal. Municipalities should carefully consider certain factors in determining storage areas and disposal (utilization as fill) locations including:

- Proximity to wetlands and watercourses.
- Proximity to wells.
- Ability to have reasonable all-weather access to the site (storage locations only).

It may be that the most efficient way for a municipality to plan for management of this material is to create a comprehensive municipal plan for the management of all municipally generated construction, maintenance and demolition debris, including road sweepings. Municipal officials are further advised to develop a plan for the disposition of road sand sweepings in the fall or winter to optimize ability to reuse the material as aggregate, and to have enough time to provide for the coordination of decisions to place fill at suitable locations.

Temporary Storage Site: A temporary storage site needs to be located to facilitate the management and subsequent disposal of the material. Appropriate locations for temporary storage are:

a. in an empty salt storage shed.
b. at a municipal site where sand and salt are normally handled.
c. elsewhere at a site that meets the fill location guidelines below.
d. at an inactive landfill, preferably on an unfilled area.
e. an open field where drainage will flow in an overload pattern which allows runoff to flow through grass or natural vegetation to encourage soil and debris removal.

Reuse as construction aggregate: The Department promotes reuse of road sand sweepings by blending with crushed stone or reclaimed aggregate in the production of processed gravel for use as fill material below an impervious surface at a construction site (e.g. beneath roads, and parking lots). The Department recommends this use over others to the extent practicable.

Use as fill: Use of sweepings as fill material, although generally less desirable, may be necessary to reuse all the sand sweepings collected by a municipality, and should be coordinated with both the municipal inland wetlands enforcement officer and the town sanitarian to minimize risks to surface water resources and with appropriate officials (local health department, water department or water company) to determine approximate locations of potable water supply wells. Fill should be placed only with the consent and permits required under applicable regulatory programs but in general, be located as follows:

a. not within 100 feet of any wetland or watercourse
b. not within 100 feet of any private potable water supply well
c. not within 250 feet of any public potable water supply well
d. not placed below the seasonal high ground water table

Quantity guidelines: Because the material may contain residual salt and other materials, it is desirable to limit disposal to less than 100 cubic yards at any location unless the municipality maintains permanent records of any larger fill location. This guideline does not apply when the material is incorporated in a pavement base or sub-base.

Erosion controls: Road sand sweeping fills should be covered with a minimum of 3" of top soil, and stabilized using appropriate erosion and sediment control techniques as described in "Guidelines for Soil Erosion and Sediment Control, Connecticut", by the Department of Environmental Protection and the Connecticut Council on Soil and Water Conservation.

Department Contacts:

Water Management Bureau: Liz Napier 566-7049
Waste Management Bureau: Earl Beebe 566-8722

Note: The following are firms that are listed as Construction and Demolition Aggregate Recycling Facilities. The Department has received information from these firms but this listing is not an endorsement of any firm or process. This is only a partial list. As additional information is received the Waste Bureau will update the list and provide additional information for callers. For additional aggregate recycling facilities and construction aggregate producers in your area you may wish to examine the Yellow Pages under "Sand and Gravel."

Firms that engage in aggregate recycling:

Recycling Concrete Products
Apothecaries Road
East Windsor, CT
Phone: 800-742-6701

O&G
240 Bostwick Avenue
Bridgeport, CT
Phone: 366-4586

O&G
South Main Street
Torrington, CT
Phone: 489-9261

Tilcon Connecticut
Colt Highway Rte 6
New Britain, CT
Phone: 677-1643

Stapleton Resource
Recycling, Inc.
221 Old Gate Lane
Milford, CT
Phone: 882-5353

Soneco Services
185 South Road
Groton, CT 06340
Phone: 445-2457

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 and 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 - an 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns 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 in the review of sites proposed for major land use activities or natural resource inventories for critical areas. 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 recreation/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 through 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 the purposes of a review and a statement identifying the specific areas of concern the Team members should investigate. When this request is reviewed by the local Soil and Water Conservation District and approved by the King's Mark RC&D Executive Council, the Team will undertake the review. At present, the ERT can undertake approximately two reviews per month depending on scheduling and Team member availability.

For additional information regarding the Environmental Review Team, please contact the King's Mark ERT Coordinator, Connecticut Environmental Review Team, P.O. Box 70, Haddam, CT 06438. The telephone number is 203-345-3977.