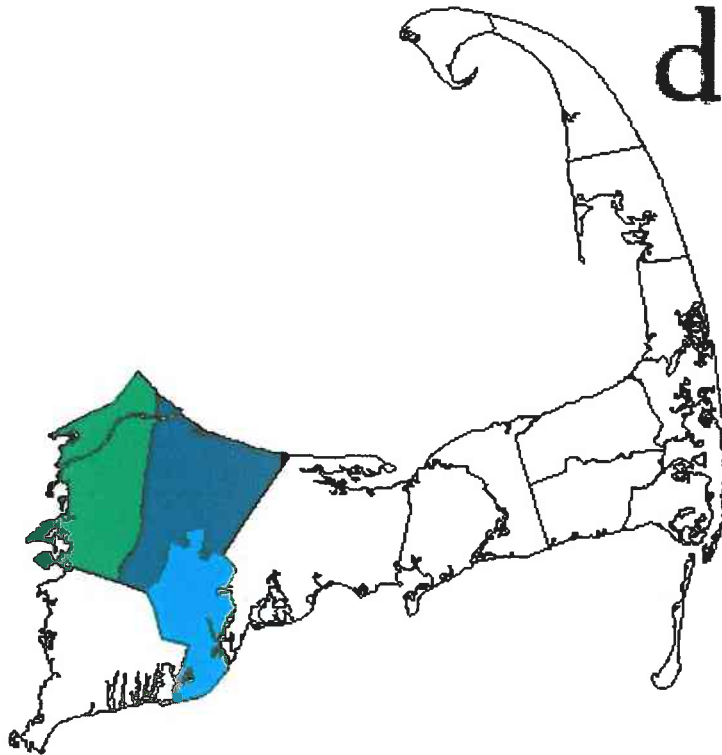


*Massachusetts Coastal Infrastructure
Inventory and Assessment Project
Massachusetts Department of Conservation and Recreation
Office of Waterways*

Upper Cape Cod



Bourne
Sandwich
Mashpee



July 6, 2009

Prepared for:

**Massachusetts Department of
Conservation and Recreation
Hingham, Massachusetts**

Presented by:

**Bourne Consulting Engineering
Franklin, Massachusetts**

In Association With:

Applied Coastal Research & Engineering



Upper Cape Cod

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Section I

Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION

PURPOSE

DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES

DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS

***Massachusetts Coastal Infrastructure
Inventory and Assessment Project
Coastal Hazards Commission***

Section I – Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION

The Project and Client

The Commonwealth of Massachusetts has initiated a Coastal Hazards Commission (CHC) to identify the vulnerability of the state to coastal hazards. As one of five working groups working under the CHC, the 20-Yr Infrastructure Plan was to establish a prioritization for the repair of coastal structures. The focus areas of the Working Group include:

- Publicly owned infrastructure
- Infrastructure for which State is responsible
- Inventory of public hazards infrastructure
- Evaluation on conditions
- Development for a prioritization of work
- Estimation of capital and maintenance costs

The 20-Yr Infrastructure Working Group is led by Representative Frank Hynes with CZM as the lead State Agency overseeing the management of the project. The Massachusetts coastline has been broken up into 4 major regions consisting of the North Shore, Boston, South Coast, and the Cape and Islands. The South Shore (the Towns of Hull, Cohasset, Seekonk, Hingham, Plymouth, Kingston, Scituate and Duxbury) was previously evaluated by Bourne Consulting Engineering as a demonstration project in 2006.

Consultant Team

The consultant team that performed the demonstration project was led by Bourne Consulting Engineering (**BCE**) of Franklin, MA who was responsible for overall project management, specified areas of field assessments, and research. Assisting **BCE** was Applied Coastal Research and Engineering Inc. of Mashpee, MA, Childs Engineering Corporation, of Medfield, MA., and Waterfront Engineer LLC of Stratham, NH.

PURPOSE

Study Purpose

CZM seeks to identify the capacity of Massachusetts coastal structures to resist major coastal storms and prevent storm damage. In working toward this goal, CZM has initiated a program to perform an assessment of Commonwealth owned and/or maintained coastal structures. The first phase of this program was the performance of a demonstration project for coastal structures located on the South Shore. The demonstration project identified existing structures, their general conditions, ability to provide coastal protection and the probable cost for repairs. The information collected and developed has been incorporated into the MassGIS system to allow use for developing a 20 Year Coastal Infrastructure Plan.

The demonstration project served as a basis for the current statewide inventory assessment of all Commonwealth coastal structures and the needs for their maintenance and/or repair.

Goals of Study

The goals of the Massachusetts Coastal Infrastructure Inventory and Assessment Project include:

- To identify all the coastal structures the state either owns or has responsibility to maintain for the 4 regions included within the study
- Of the structures identified, determine the structure location and characteristics, the structure condition relative to providing coastal protection and the structure importance in relation to what it is protecting.
- To the degree possible, identify the structure elevation and the FIRM mapping flood elevation and category.
- To the degree possible, identify structure owner and available documents from local, state and federal agencies.
- To establish an estimated cost to rehabilitate the coastal structures to provide the level of project established in the structure's original design.
- Provide the information in a format compatible for incorporation into the MassGIS system

Limit of Study

Due to the time constraints and the amount of effort necessary to collect, process and compile the information, the following are identified as limitations of the information presented:

- All property ownership was taken as presumed. No legal investigation of ownership was performed during the project. Property ownership is based on town assessor maps. Where structures were located outshore of assessor map defined property lines, it was assumed to be Town land unless other information indicated otherwise. Where structures were located outshore of Mean Low Water, property is assumed to be State owned.
- The structure ownership was based on assessor maps and research at the local, state and federal levels. Where there was indication of public work on a structure on Town land or on private property, the structure was presumed to be Town owned. Where the structure was on state property, the structure was presumed to be state owned. Where ownership of the structure was not clear but was located on private property, the structure ownership was defined as unknown.
- The study included town and state owned structures as it was assumed that most town owned structures received state funding at some level for construction and/or maintenance.
 - Structures that were determined to be private were not included.
 - Undocumented structures considered to be on private land, but having the potential to have been publicly built and/or maintained, were identified as having an "unknown ownership".
- The prioritizing of structures was based primarily on risk to general infrastructure and density of housing. Infrastructure included was buildings. The study did not consider all infrastructure issues including:
 - No consideration on utility impacts – water, electrical, sewer, gas
 - No consideration of roadway and bridge protection
 - Evacuation routes were not considered within the investigation
 - Location of Emergency Shelters were not included in priority assessments
- Research was performed at the local, state and federal levels. The local research was limited to location and documenting available coastal structure contract drawings. Research at DCR was restricted to available historic construction plans for coastal structures at the MA-DCR Waterways office in Hingham, MA, and MA-DCR Division of Urban Parks and Recreation in

Boston, MA. No investigation of state archives was performed. Research at MA DEP Chapter 91 and USACE was limited to recorded permits and licenses found in their files. No investigation was performed at the Registry of Deeds.

DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES

The specific attributes that would be incorporated into the MassGIS system were developed based on the scope of work and the goals to be achieved. The following was established to standardize the data collection and presentation and to allow total flexibility for sorting by attributes in the final GIS database. The attributes identified below were input into a MS Access database which was used to manage the data from all eight communities within a single file.

Database Attributes

- **Attribute Descriptions/Definitions**

Structure Number: A unique structure number was given to each coastal structure. The number was based on existing numbering systems that include the State Department of Environmental Protection community number followed by the local community assessor's parcel numbering system. The last three digits of the number represent the structure within the parcel. Where structures extend over several parcels, the structure is referenced to a parcel that is approximately in the center of the structure. Where Town assessor's references include letters, those are also included within the structure number. Some communities have block numbering within their numbering system and these are included. Communities without block numbering still have the block numbering included but these are illustrated as all zeros for that specific segment.

Structures that are on Town property, which would otherwise not have a parcel number, are referenced to a parcel that is in the immediate vicinity of the coastal structure.

On this basis, the following is the general numbering convention:

CCC-MMM-BBB-PPP-SSS

Where:	CCC	DEP Community Number
	MMM	Community Map Number
	BBB	Block Number (000 if no block numbering system)
	PPP	Community Parcel Number
	SSS	Structure Number

Property Ownership: All property ownership was on a "presumed" basis as no legal verification of ownership was performed. The ownership of the property was classified under four basic areas which were private ownership (Private), Town ownership (Local), Commonwealth of Massachusetts ownership (State), federal government ownership (Federal) or unknown. Property ownership was based on Town assessor's maps. Where the location was located above Mean Low Water, and not within a defined parcel, the property ownership was presumed to be the Town unless documentation was found to indicate otherwise. Where a structure was located offshore of Mean Low Water, the property ownership was presumed to be federal.

Structure Ownership: The ownership of all structures is presumed as no verification of ownership was performed. Ownership of the structure was determined by research into historic state and federal

permits and the entity indicated on the permits as the applicant. Where no other information was found, the following was utilized:

- Structures located on private land but appearing to be significant structures were identified as owned by the Town or as "Unknown". Unknown was used where there was a question of local or private ownership.
- Structures on Town property were assumed to be owned by the Town
- Structures that were located off-shore were presumed to be federally owned
- Structures that were identified as being privately owned were eliminated from the database

Basis of Ownership: The basis of structure ownership was provided to give rationale to the structure ownership and identified the research resource that identified the ownership or the methodology otherwise used. The responses utilized were limited to the following:

- DPW – DPW Employee Interview
- DCR - Contract Drawings
- DEP – Ch 91 License
- USACE – Permits
- Property Ownership
- Offshore Structure

Structure Owner's Name: Ownerships names reflect the presumed owner of publicly owned structures. As this was for public structures only, the ownership was restricted to the community name, the state agency or the federal agency.

Earliest Structure Record: The year of the oldest document located for the structure. The information is determined from the document research performed on the structure from local, state and federal agencies. If no documents could be found than this entry is denoted as 'Unknown'. Where documentation of the structure could be found, the date from the oldest document was utilized.

Primary Structure / Secondary Structure: Many of the coastal structures consisted of combined structures which were rated separately. It was typically found that one structure was significantly more predominant (Ex. Bulkhead/Seawall) and was therefore identified as the Primary Structure while a smaller structure might exist in front (ex. Revetment) of it. The type, height and material of each structure are identified separately. The condition of each structure was based on the Primary Structure. Where there was no secondary structure, the fields were left blank.

Structure Type: The structure type was categorized into five basic coastal structure categories which were Bulkhead/Seawall, Revetment, Coastal Beach, Coastal Dune, and Jetty/Groin.

Structure Material: The identification of the coastal structure's material of construction was performed and represents the primary material. Stone structures consisted of both mortared and non-mortared conditions.

Structure Height: Each type of structure was categorized by its visible height in feet which was broken into four specific ranges which are:

< 5 feet 5 to 10 feet 10 to 15 feet >15 feet

Structure Condition: A preliminary assessment of the condition for each structure was performed by the field teams. This was by visual observation only and no detailed investigation was performed. The condition assessments were based on a predefined five level rating system that ranged from Rating A for Excellent Condition to Rating F for Critical Condition. A detailed listing of the conditions and their definitions can be seen in Exhibit A.

Priority Rating: In order to account for the need for protection at any one site, a five level priority rating system was established. This allowed for consideration of public infrastructure protection, density of residential housing for development of structure overall importance for coastal protection. The ratings range from Level 1 for no infrastructure or residence protection to Level 5 for critical inshore infrastructure protection and/or high density residential. The detailed listing and definitions for the priority categories can be seen in Exhibit B.

Structure Repair / Reconstruction Cost: A preliminary estimation of construction costs to maintain or repair structures was made based on the preliminary field assessment of the structures. A Repair Cost Matrix was developed based on structure type, condition, height and material and can be seen in Exhibit C. Once each structure's type, height, and material classifications were determined, the cost per foot for the structure was determine from the Repair Cost Matrix and multiplied by the length of the structure to obtain the estimated repair/restoration cost. The cost matrix repair costs include a 20 percent construction cost contingency as well as 10 percent costs for engineering and permitting.

Structure Length: The length of each structure is provided and utilized in the development of the repair/reconstruction costs. The lengths are given to the nearest foot and taken as the linear distance along the structure, as determined by the GPS location, which takes into account structure angles and curvature.

Structure Elevation: The elevation of structures was determined in feet from existing information where available. The datum used is NAVD 88 and elevations are to the nearest foot. From a previous study much of the south shore coastal structures had elevations defined based on LIDAR mapping data. Where available structure documentation with elevations was found, in areas with no LIDAR data, the information was included within the structure information. Where there was no LIDAR information or existing documentation, the item has been left blank.

LIDAR (Light Detection and Ranging) is technology that is currently being used for high-resolution topographic mapping by mounting a LIDAR sensor, integrated with Global Positioning System (GPS) and inertial measurement unit (IMU) technology, to the bottom of aircraft and measuring the pulse return rate to determine surface elevations.

FEMA Zone and Elevation: For each structure the FEMA Flood Insurance Rate Maps (FIRM) were researched for their Flood Zone designation and their Base Flood Elevation from the most recent FIRM maps for the specific Town. The elevations are provided in feet on the same datum as the FIRM maps (NGVD) with no adjustments or conversions.

Structure Comments: The engineering team provided a brief description and comment on the structure at the time of the field assessments which is provided in support of the condition rating that was given for the structure.

Pictures: At the time of the field assessments, digital photographs were taken to provide a general overview of the structure. The number of pictures was limited to a maximum of six. The first photograph for each structure is shown on the Structure Assessment Form. The list of all photographs is provided on the form.

Town Documents: Town documents represent the structure information that could be found in the Town's DPW/Engineering Department records. Where particular records could be found, a table of document information was developed and included within the database with limited descriptions.

MA - DCR Documents: MA-DCR documents represent the structure information that could be found within DCR – Waterways office in Hingham. Where particular records could be found, a table of document information was developed and included within the database with limited descriptions.

MA - DEP Chp. 91 Licenses: MA-DEP Chapter 91 license documents represent the structure information that could be found within MA-DEP Chp 91 records in Boston. Where particular records could be found, they were scanned as pdf files and attached to the structure through the GIS database information. In addition, a table of license document information was developed and included within the database with limited descriptions.

USACE Permits: USACE Permits represent the structure information that could be found within the Army Corp of Engineers regulatory office in Concord, MA. Where particular records could be found, they were scanned as pdf files and attached to the structure through the GIS database information. In addition, a table of license document information was developed and included within the database with limited descriptions.

DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS

A matrix to be used within the database has been developed to assess likely rehabilitation/repair costs to restore the coastal structures to their original design condition. No attempt was made to assess the level of exposure and associated level of protection that might be required to meet current design standards for these structures. These costs are only an estimation to bring these structures back to their original design intent based on 2006 construction costs.

The development of the cost matrix is based on the following:

Structure Condition Ratings – The condition of the coastal structures was determined in the field by the survey crew which was led by an engineer with waterfront structure assessment and design experience. The definitions of the rating criteria utilized for the assessments are presented elsewhere.

The cost implications for each rating condition are as follows:

- **A Rating** Structures not requiring any maintenance, repair or rehabilitation cost and would not be expected to experience damage if subject to a major coastal storm event
- **B Rating** Structures requiring limited or no repair and would be expected to experience only minor damage if subject to a major coastal storm event. The value of these maintenance costs is assumed to be 10 percent of the construction cost.
- **C Rating** Structures requiring moderate to significant level of repair or reconstruction and would be expected to experience significant damage if subject to a major coastal storm event. The structure is presumed to be effective under a major storm event. The value of the repair costs is assumed to be 50 percent of the construction cost.
- **D Rating** Structures requiring significant level of rehabilitation or total reconstruction and would be expected to experience significant damage or possibly fail if subject to a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost.

- **F Rating** Structures requiring complete reconstruction and would expect to provide little or no protection from a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost plus a cost for removal/disposal of the original structure.

Height of Structure – Height of a structure is a major factor in the structure cost and therefore was identified as a significant factor in assessing rehabilitation/repair construction costs. The structures were broken down into four major categories which were:

< 5'	Structures that were less than five feet in height
5'-10'	Structures five to 10 feet in height
10'-15'	Structures over 10 feet to 15 feet in height
> 15'	Structures greater than 15 feet in height – assumed 20 feet typical

Length of Structure – Length is based on field GPS location with measurements rounded to the nearest foot.

Bulkhead / Seawall Structures – These structures are assumed to be constructed out of concrete, steel, stone or wood with each having its own criteria for establishing costs. For each structure type the following was assumed:

- **Concrete Seawalls** – These walls were assumed to be gravity structures with the volume of concrete used based on the bottom width being one-half of the structure height. Costs of construction were based on a per cubic yard estimate that varied from \$350 to \$630 per cubic yard depending on the structure height. Values for excavation and demolition of existing structure were also included.
- **Stone Seawalls** - These walls were treated the same as concrete seawalls and assumed to be gravity structures with the volume of the structure based on the bottom width being one-half of the structure height. Costs of construction were based on a per cubic yard estimate that varied from \$350 to \$630 per cubic yard depending on the structure height. Values for excavation and demolition of existing structure were also included.
- **Steel Bulkheads** – Steel bulkheads were presumed to be constructed with steel sheet piling. Tie back systems were presumed for structures 10 feet or greater in height. Shorter walls were assumed to have a cantilever design. The total depth of sheeting was presumed to be two times the exposed height. The cost for construction varied from \$40 per square foot to \$60 per square foot plus the cost of excavation and demolition.
- **Timber Bulkheads** – Timber bulkheads were presumed to be constructed with timber piles at eight foot on center, horizontal wales and vertical four inch sheathing. The unit costs for installed materials used were \$1,500 per pile and \$7.50 per bfm.

Revetment Structures – Revetment structures were presumed to be constructed of dry placed (no concrete) stone with a two on one slope and a horizontal toe and crown equal to the thickness layer established for each height condition. The total thickness of the revetment layers varied from six to ten feet with the cost of armor and under-layer stone assumed to be \$50 per ton and the crushed stone base to be \$15 per ton.

Groins and Jetties – Groins and jetties were assumed to be the same materials and construction as the revetment structures but would have two sides and therefore double the quantities.

Coastal Beaches – Costs for restoration of Coastal beaches presumed the placement of beach renourishment sands at a 1-on-20 slope over the existing beach conditions. The cost for deposition of sand assumed relatively close source of material and utilized \$20 per cubic yard for the material installed.

Coastal Dunes – Restoration of coastal dunes assumed a cross section of renourished sand with a one-on-four slope on one side of a 25 foot width at the defined dune height. The cost for deposition of sand assumed relatively close source of material and utilized \$20 per cubic yard for the material installed.

Contingency – A contingency of 20 percent was added to all costs to reflect the unknowns associated with this level of rehabilitation/repair estimating.

Engineering and Regulatory Approvals – A ten percent increase to the cost matrix prices was assessed to represent the engineering design and regulatory approval requirements for the restoration of these structures.

EXHIBIT A

Structure Condition Table – 5 Level Rating System

Preliminary Condition Assessment		Definition Based Upon Perceived Immediacy of Action and Potential to Cause Damage if Not Corrected	Level of Action Required
A	Excellent	Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm	None
B	Good	Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure	Minor
C	Fair	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide additional material for full protection and extended life	Moderate
D	Poor	Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.	Major
F	Critical	Conditions of structure/landform may warrant emergency stabilization as failure may result in potential loss of property and/or life. Landform eroded, loss of integrity Structure exhibits critical levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure provides little or no protection from a major coastal storm. Actions taken to totally reconstruct structure to regain full capacity. Landform stability is severely compromised, rate of erosion/material loss may be increasing, and landform does not provide adequate protection from a major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.	Immediate

EXHIBIT B

Priority Rating System - 5 Level Rating System

Preliminary Priority Level Assessment		Level Based Upon Perceived Immediacy of Action and Presence of Potential Risk to Inshore Structures if Not Corrected	Level of Action Required
I	None	No Inshore Structures or Residential Dwelling Units Present	Long Term Planning Considerations
II	Low Priority	Inshore Structures Present with Limited potential for Significant Infrastructure Damage	Future Project Consideration
III	Moderate Priority	Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)	Consider for Active Project Improvement Listing
IV	High Priority	High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)	Consider for Next Project Construction Listing
V	Immediate / Highest Priority	Critical Inshore Structures Present with Potential for Infrastructure Damage and/or High Density Residential Dwellings Conditions of structure may warrant emergency stabilization as failure may result in potential loss of property and/or life. (>10 dwellings impacted / 100 feet of shoreline)	Consider For Immediate Action Due to Public Safety and Welfare Issues

**MASSACHUSETTS COASTAL INFRASTRUCTURE
INVENTORY AND ASSESSMENT DEMONSTRATION PROJECT**

CZM SOUTH SHORE COASTAL INFRASTRUCTURE INVENTORY AND ASSESMENT PROJECT

EXHIBIT C

September 14, 2006

REPAIR / REHABILITATION COSTING DATA

Cost per linear foot of structure

STRUCTURE TYPE	STRUCTURE MATERIALS	STRUCTURE HEIGHT	STRUCTURE CONDITION RATING				
			A	B	C	D	F
BULKHEAD/ SEAWALL	CONCRETE	Under 5 Feet	\$0	\$84	\$425	\$850	\$983
		5 To 10 Feet	\$0	\$152	\$759	\$1,518	\$1,782
		10 To 15 Feet	\$0	\$251	\$1,254	\$2,508	\$2,970
		Over 15 Feet	\$0	\$396	\$1,980	\$3,960	\$4,752
	STEEL	Under 5 Feet	\$0	\$54	\$273	\$546	\$680
		5 To 10 Feet	\$0	\$165	\$825	\$1,650	\$1,848
		10 To 15 Feet	\$0	\$251	\$1,254	\$2,508	\$2,772
		Over 15 Feet	\$0	\$343	\$1,716	\$3,432	\$3,795
	STONE	Under 5 Feet	\$0	\$84	\$425	\$850	\$983
		5 To 10 Feet	\$0	\$152	\$759	\$1,518	\$1,782
		10 To 15 Feet	\$0	\$251	\$1,254	\$2,508	\$2,970
		Over 15 Feet	\$0	\$396	\$1,980	\$3,960	\$4,752
	WOOD	Under 5 Feet	\$0	\$86	\$431	\$862	\$994
		5 To 10 Feet	\$0	\$127	\$632	\$1,265	\$1,463
		10 To 15 Feet	\$0	\$161	\$804	\$1,608	\$1,872
		Over 15 Feet	\$0	\$202	\$1,008	\$2,017	\$2,380
COASTAL BEACH	SAND	Under 5 Feet	\$0	\$26	\$132	\$264	\$264
		5 To 10 Feet	\$0	\$127	\$634	\$1,267	\$1,267
		10 To 15 Feet	\$0	\$224	\$1,122	\$2,244	\$2,244
		Over 15 Feet	\$0	\$396	\$1,980	\$3,960	\$3,960
COASTAL DUNE	SAND	Under 5 Feet	\$0	\$18	\$93	\$186	\$186
		5 To 10 Feet	\$0	\$48	\$238	\$476	\$476
		10 To 15 Feet	\$0	\$79	\$395	\$790	\$790
		Over 15 Feet	\$0	\$132	\$660	\$1,320	\$1,320
REVETMENT	STONE	Under 5 Feet	\$0	\$66	\$333	\$664	\$730
		5 To 10 Feet	\$0	\$120	\$601	\$1,201	\$1,300
		10 To 15 Feet	\$0	\$157	\$781	\$1,564	\$1,696
		Over 15 Feet	\$0	\$247	\$1,234	\$2,468	\$2,666
GROIN	STONE	Under 5 Feet	\$0	\$132	\$664	\$1,328	\$1,460
		5 To 10 Feet	\$0	\$240	\$1,201	\$2,402	\$2,600
		10 To 15 Feet	\$0	\$314	\$1,564	\$3,128	\$3,392
		Over 15 Feet	\$0	\$494	\$2,468	\$4,937	\$5,333

NOTE: Repair / Rehabilitation Costs include 10% for engineering and regulatory approvals and 20 % construction contingency.

Section II

Bourne

Section II – Community Findings – Town of Bourne

COMMUNITY DESCRIPTION

The Town of Bourne consists of a land area of 40.9 square miles out of a total area of 52.82 square miles and had a population of 18,721 in the 2000 census. The Town is located on Cape Cod of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline is 28 miles. Of the 28 miles, 2 miles are exposed to open ocean, while the remaining 26 are for the most part protected by Falmouth and Gosnold. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Bourne, there were 34 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 12 in Section II-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Bourne

Primary Structure (1)	Total Structures	Structure Condition Rating				F	Total Length
		A	B	C	D		
Bulkhead / Seawall	7	1	4	2			2200
Revetment	11		4	3	4		2893
Breakwater							
Groin / Jetty	7	1	6				2525
Coastal Dune							7330
Coastal Beach	9	1	5	3			
	34	3	19	8	4		14948

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Bourne's case there are a total of 31 structures which would require approximately \$ 4.8 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated \$ 217,000 million would be required to upgrade the Town's coastal protection.

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Bourne

Primary Structure (1)	Total Structures	Structure Condition Rating				F	Total Cost
		A	B	C	D		
Bulkhead / Seawall	7		\$ 393,518	\$ 238,762			\$ 632,280
Revetment	11		\$ 181,463	\$ 1,637,163	\$ 216,724		\$ 2,035,350
Breakwater							\$ -
Groin / Jetty	7		\$ 584,400				\$ 584,400
Coastal Dune							\$ -
Coastal Beach	9		\$ 432,801	\$ 1,189,188			\$ 1,621,989
	34	\$ -	\$ 1,592,182	\$ 3,065,113	\$ 216,724	\$ -	\$ 4,874,019

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Bourne, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Bourne

Primary Structure (1)	Total Structures	Structure Condition Rating				F	Total Cost
		A	B	C	D		
Town Owned	27		\$ 1,134,971	\$ 3,065,113	\$ 216,724		\$ 4,416,808
Commonwealth of Massachusetts	4		\$ 457,211				\$ 457,211
Federal Government Owned							\$ -
Unknown Ownership	3						\$ -
	34	\$ -	\$ 1,592,182	\$ 3,065,113	\$ 216,724	\$ -	\$ 4,874,019

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section II-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

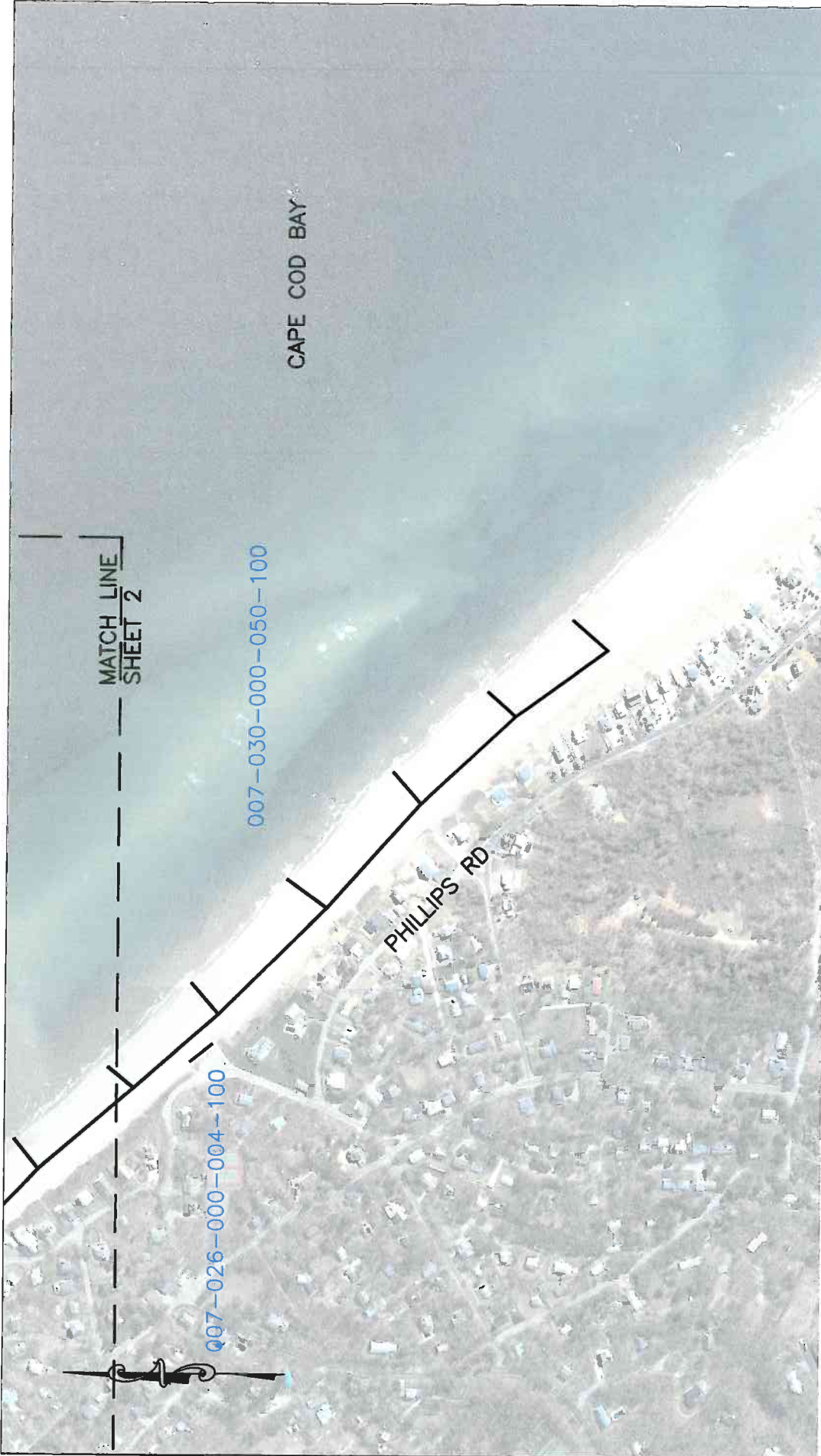
The enclosed reports and associated documents reflects the Town of Bourne's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section II - Bourne

Part B

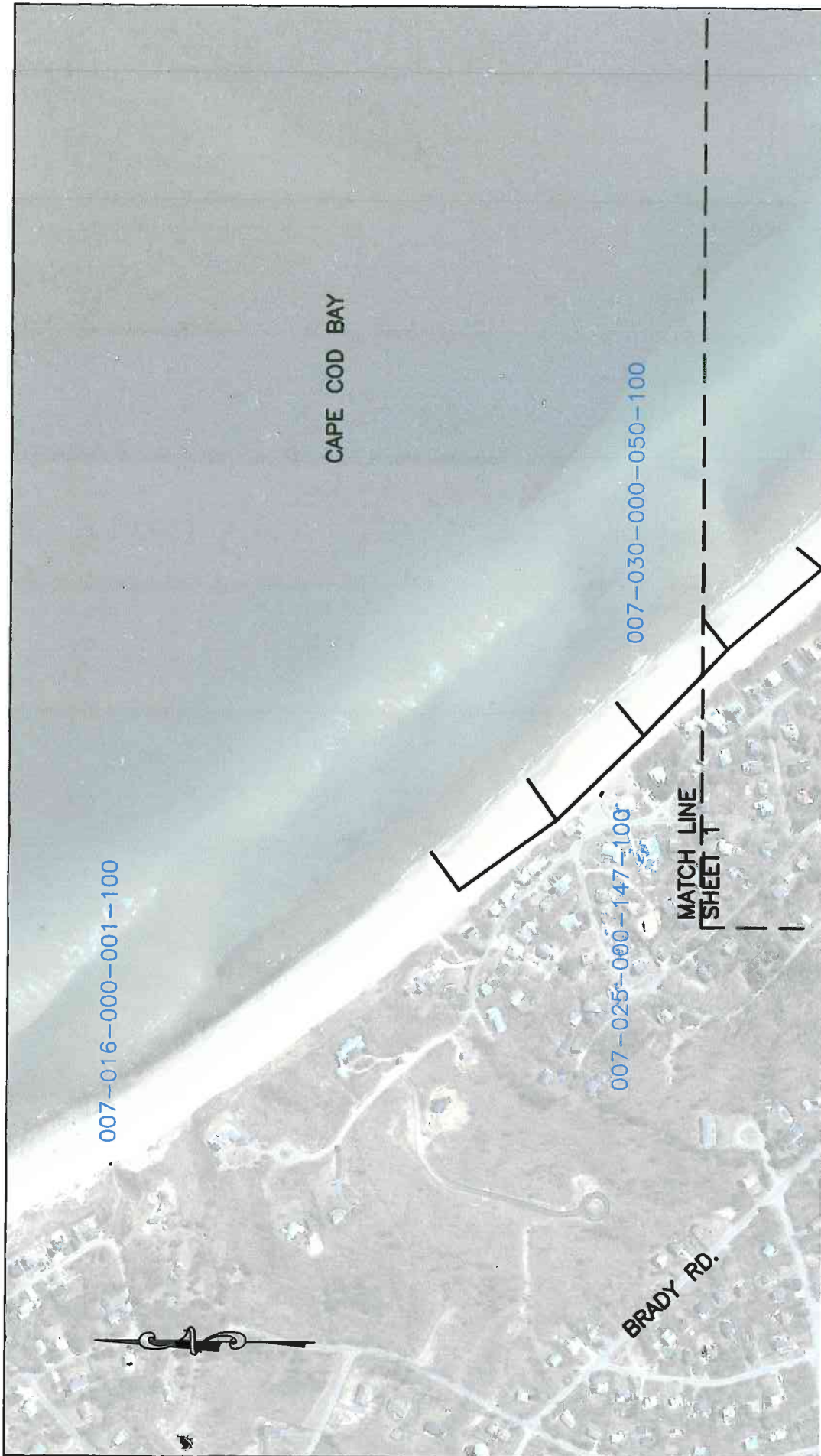
Structure Assessment Reports



COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

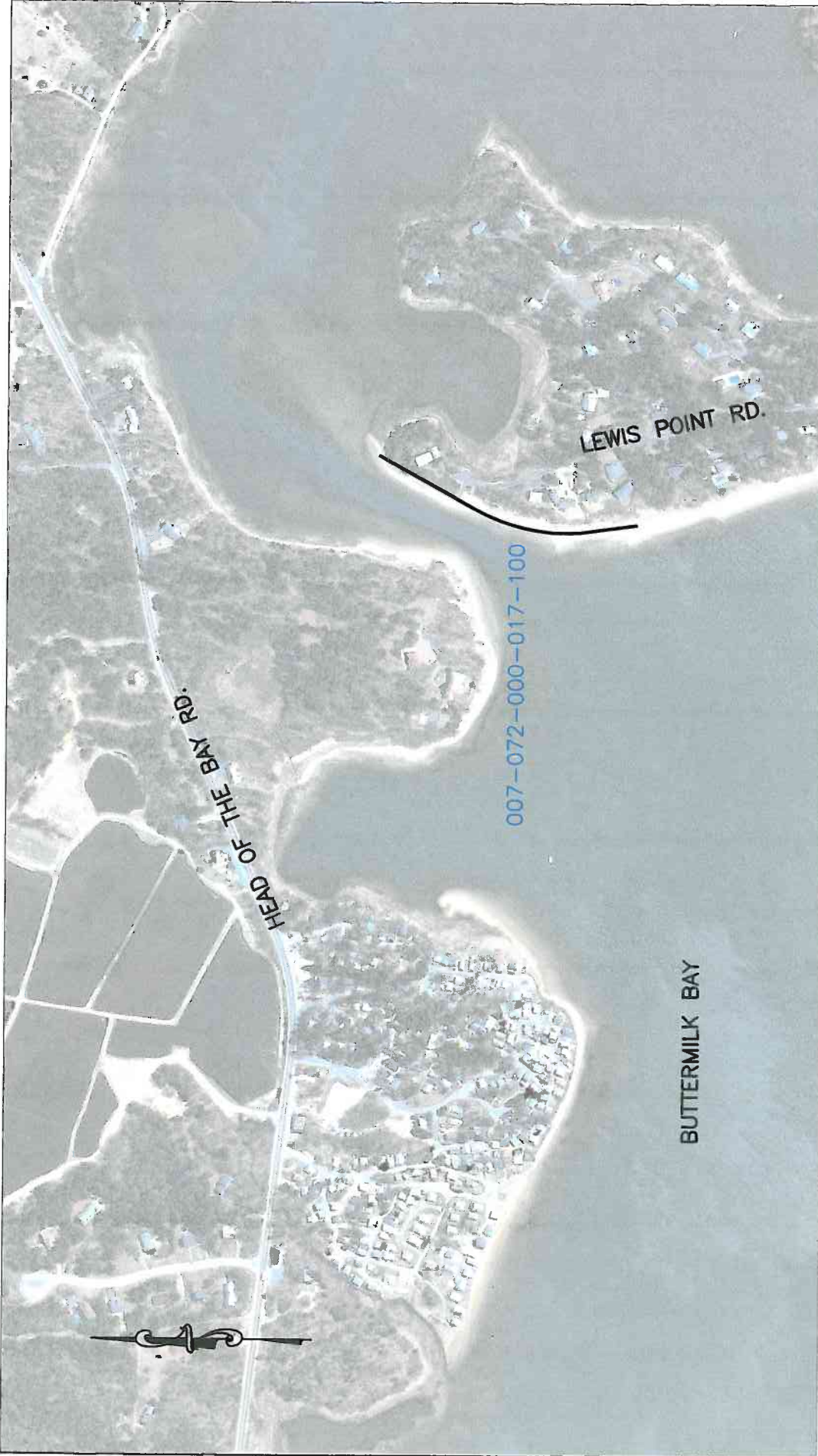


COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
 COASTAL INFRASTRUCTURE INVENTORY
 AND ASSESSMENT PROJECT
 DECEMBER 2007



BCE Bourne Consulting Engineering
 200 West
 Bourne, MA 01905
 TEL: (508) 552-0000 FAX: (508) 552-0000



COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007





COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'



COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'





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COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



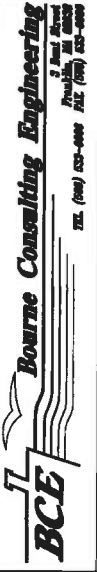
**BCE**
Bourne Consulting Engineering
2 Paul Street
Bourne, MA 01939
TEL: (508) 853-9999 FAX: (508) 853-9998

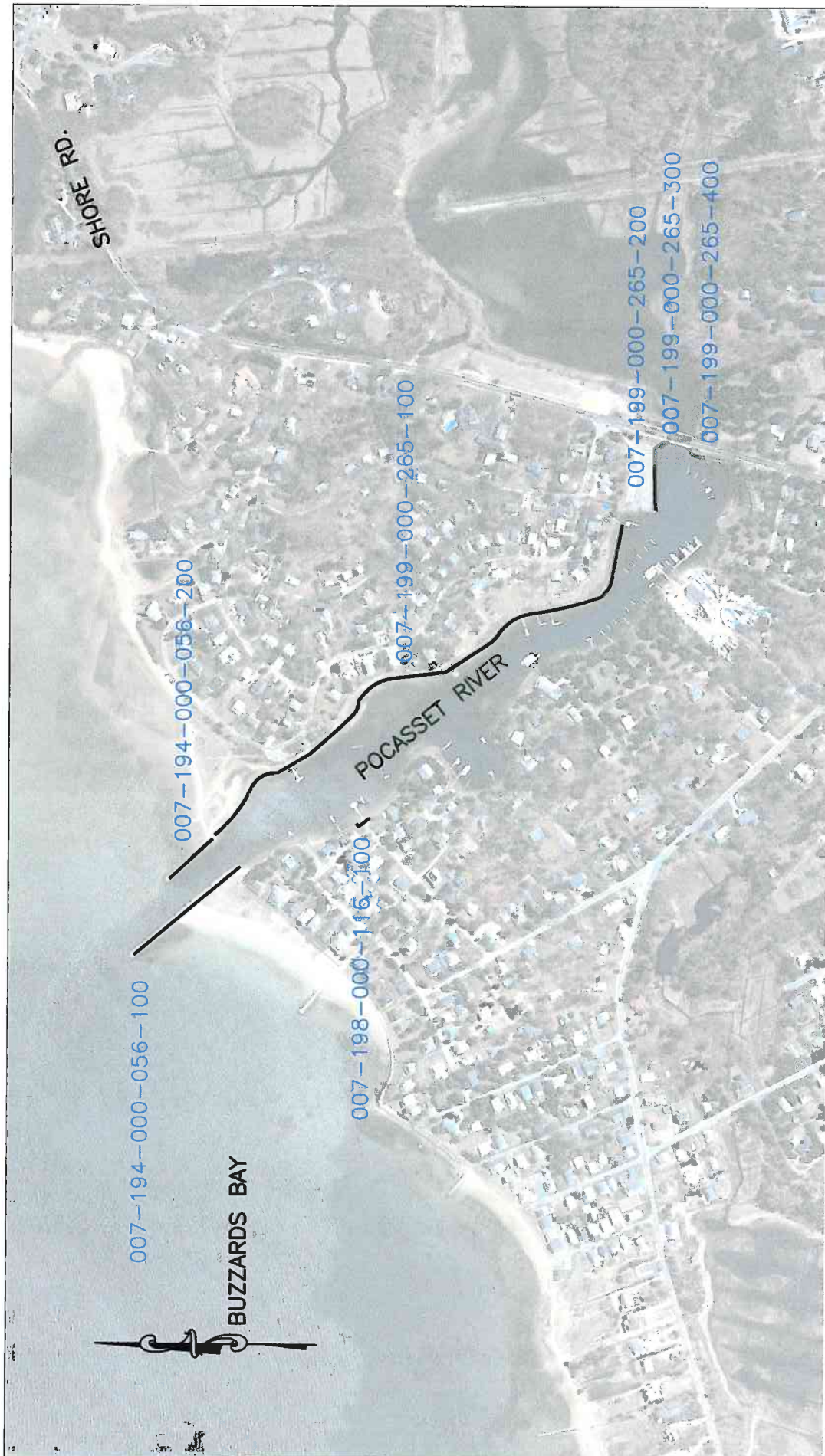


COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'





COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'

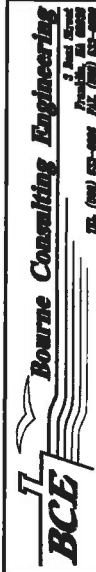




COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'





COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'





File: X:\27652-\27667\Cape Cod\CI-3\Bourne\dwg\Bourne.dwg

COASTAL STRUCTURE LOCATION PLAN

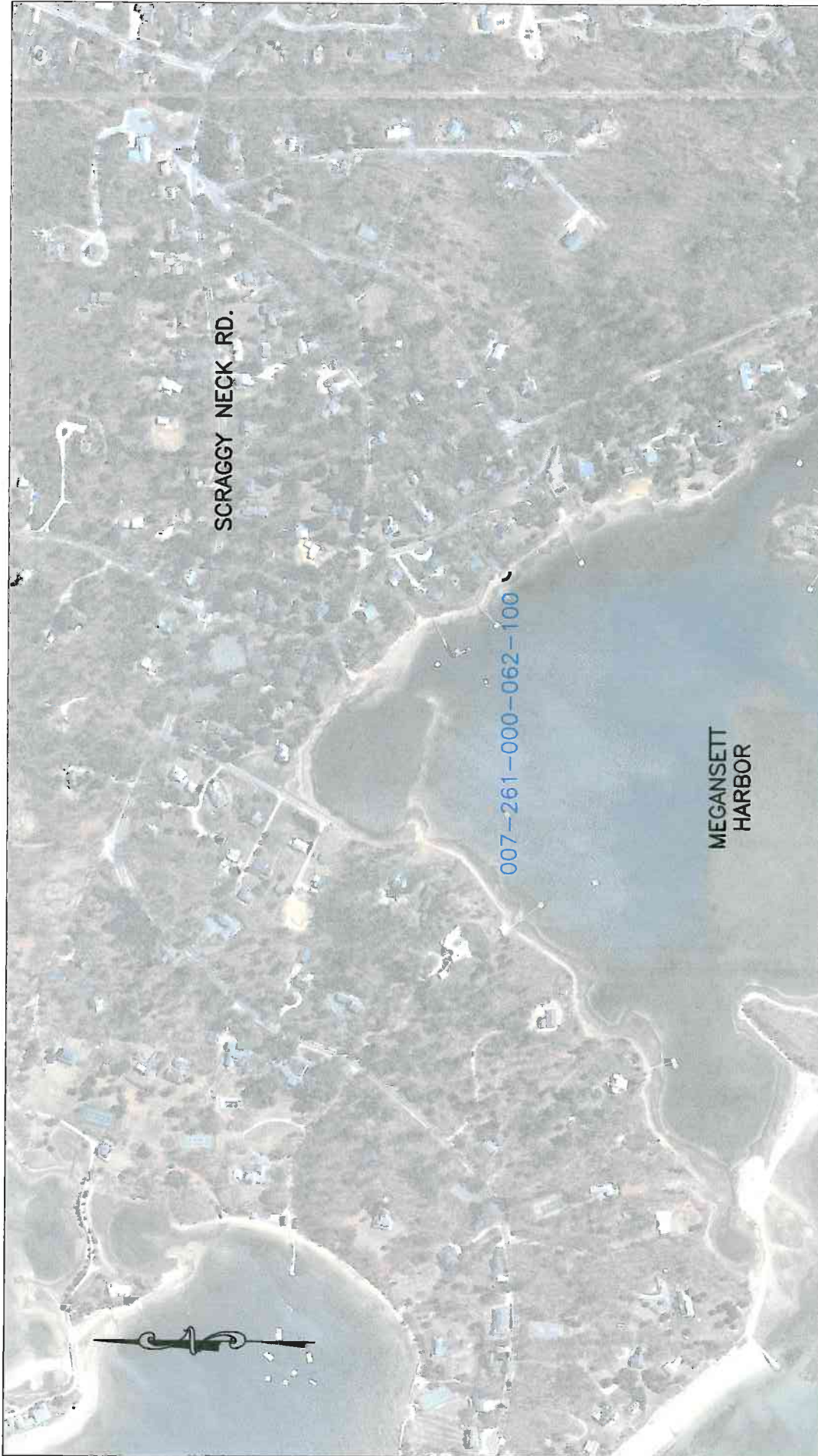
TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'

**BCE**

Bourne Consulting Engineering
2 Angel Street
Bourne, MA 01906
TEL: (508) 633-9999 FAX: (508) 633-4999



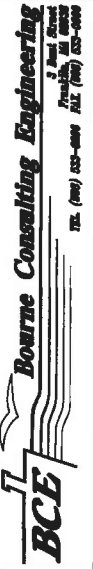
File: X:\27652-\27667\Cape Cod\CI-3\Bourne\dwg\Bourne.dwg

COASTAL STRUCTURE LOCATION PLAN

TOWN OF BOURNE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150

SCALE: 1" = 150'



Structure Assessment Form

Town: **Bourne**

Structure ID: 007-016-000-001-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Homestead Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$24,684.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
10		VE	13
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	Over 15 Feet
Secondary Type:	Secondary Material:	Secondary Height:



Structure Summary :

The riprap is dumped below the stair access to the beach. The stones are 6 inches in diameter and mixed with debris from the previous stairs. The stones are at a 1 on 10 slope.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-016-000-001-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-025-000-147-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Sagamore Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$12,012.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
20		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

15 feet of stones at a 1 on 3 slope are securing a dune adjacent to beach stair access. The stones are on average 3 feet by 1 foot by 2 feet. There is a house and parking lot behind the structure.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

007-025-000-147-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**Structure ID: **007-026-000-004-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Clark Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1947

Estimated Reconstruction/Repair Cost:

\$120,120.00

Length: **100** Top Elevation: **VE** FIRM Map Zone: **VE** FIRM Map Elevation: **13**
 Feet Feet NAVD 88 Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

Scattered stones make up a partially buried revetment. The stones are there to secure the slope from the parking lot above to the beach. The stones are on average 1 foot by 2 feet in size and at a 1 on 5 slope. There is a boat ramp adjacent and a road behind the parking lot being secured.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-026-000-004-100-PHO1A.JPG

Structure Documents:

USACE	August 1952	Proposed Groin	007-026-000-004-100-COE1A
USACE	November 1	Proposed Groin -	007-026-000-004-100-COE1B
MA-DCR	December 1	Proposed Jetty and	007-026-000-004-100-DCR1A
MA-DCR	April 1957	Proposed Shore	007-026-000-004-100-DCR1B

Structure Assessment Form

Town: Bourne

Structure ID: 007-030-000-050-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Cape Cod Bay

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$346,800.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1445	9	VE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The 10 groins are made up of stones that average 3 feet by 2 feet by 2 feet in size. The crest of the groin is one stone width. Concrete mortar is holding the stones in place. The groins extend out to mean low water.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-030-000-050-100-PHO1A.JPG

007-030-000-050-100-PHO1B.JPG

007-030-000-050-100-PHO1C.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-072-000-017-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Lewis Point Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

2001

Estimated Reconstruction/Repair Cost:

\$586,080.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
925		VE	23
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The Town renourished the private beach in order to gain public access. The beach is not well graded, on average at a 1 to 25 slope. It is made up of coarse sand and gravel. The beach is separated by private groins. There is section loss throughout.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-072-000-017-100-PHO1A.JPG

007-072-000-017-100-PHO1B.JPG

007-072-000-017-100-PHO1C.JPG

Structure Documents:

DEP

June 28, 200

Proposed New and

007-072-000-017-100-LIC1A

Structure Assessment Form

Town: Bourne

Structure ID: 007-087-000-075-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Gardenier Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
215		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The sand beach is well graded at a 1 on 30 slope. Inshore of the beach is a concrete seawall and small park.

Condition

A

Rating

Excellent

Level of Action

None

Description

Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-087-000-075-100-PHO1A.JPG

007-087-000-075-100-PHO1B.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-087-000-075-200

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Gardenier Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$9,715.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
115		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Concrete

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

Precast concrete seawall is made up of 2 feet by 1 foot by 3 feet blocks stacked on top of each other. The visible height of the structure is only 2.5 feet. The concrete is slightly deteriorating throughout. There is a park behind the wall and a beach in front.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-087-000-075-200-PHO2A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**Structure ID: **007-117-000-042-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Harbor Place

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1980

Estimated Reconstruction/Repair Cost:

\$1,592,118.00

Length:

1290

Feet

Top Elevation:

Feet NAVD 88

FIRM Map Zone:

VE

FIRM Map Elevation:

17

Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

Over 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The revetment is made up of stones that are approximately 2 feet by 1 foot in size. The slope of the revetment is 1 on 2. There is major section loss, especially at the corner of the harbor and Buzzards Bay. There is exposed understone and filter fabric lining. Above is a marina. Adjacent is a boat ramp and railroad.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

IV

Rating

High Priority

Action

Consider for Next Project Construction Listing

Description

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-117-000-042-100-PHO1A.JPG

007-117-000-042-100-PHO1B.JPG

Structure Documents:

USACE

July 1980

Proposed Bourne

007-117-000-042-100-COE1A

Structure Assessment Form

Town: Bourne

Structure ID: 007-117-000-155-100

Key: community-map-block-parcel-structure

Property Owner:

State

Location:

Main Street Bridge

Date:

10/24/2007

Presumed Structure Owner:

State

Based On Comment:

Owner Name:

Mass Highway Department

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$25,225.00

Length:

210

Top Elevation:

Feet

Feet NAVD 88

FIRM Map Zone:

AE

FIRM Map Elevation:

15

Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The bridge abutment is surrounded by placed stones. The stones are on average 1 foot by 1 foot. There is slight stone movement visible. Unraveling is visible at the toe.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-117-000-155-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Structure ID: 007-120-000-099-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Tower Lane

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$172,260.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1305		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The beach, mainly made up of marsh, is in poor condition in most areas. It is at a 1 on 100 slope. Where the beach meets Massachusetts Maritime Academy, there is a fine sand that is more evenly graded.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-120-000-099-100-PHO1A.JPG

007-120-000-099-100-PHO1B.JPG

Structure Documents:

Structure Assessment Form

Structure ID: 007-121-000-051-100

Key: community-map-block-parcel-structure

Property Owner:

State

Location:

Academy Drive

Date:

10/24/2007

Presumed Structure Owner:

State

Based On Comment:

Owner Name:

Massachusetts Maritime Academy

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$16,179.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
103		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

10 to 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The dumped stone revetment is made up of stones that average 1 foot by 1 foot by 6 inches. The stones are at a 1 on 5 slope. There is no visible stone movement. The beach in front is visible at low tide. There is a parking lot and school directly behind the structure.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

IV

Rating

High Priority

Action

Consider for Next Project Construction Listing

Description

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-121-000-051-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-121-000-051-200

Key: community-map-block-parcel-structure

Property Owner:

State

Location:

Academy Drive

Date:

10/24/2007

Presumed Structure Owner:

State

Based On Comment:

Owner Name:

Massachusetts Maritime Academy

Earliest Structure Record:

1954

Estimated Reconstruction/Repair Cost:

\$124,879.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
795		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	10 to 15 Feet
Secondary Type:	Secondary Material:	Secondary Height:



Structure Summary :

The dumped stone revetment is at a 1 on 5 slope. The stone are on average 2 feet by 1 foot in size. The toe is visible at low tide and is coming unravelled. Behind the structure is a parking lot and school buildings.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

IV

Rating

High Priority

Action

Consider for Next Project Construction Listing

Description

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-121-000-051-200-PHO2A.JPG

Structure Documents:

USACE

June 1954

Proposed Fill and

007-121-000-051-200-COE2A

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-121-000-051-300

Key: community-map-block-parcel-structure

Property Owner:

State

Location:

Academy Drive

Date:

10/24/2007

Presumed Structure Owner:

State

Based On Comment:

Owner Name:

Massachusetts Maritime Academy

Earliest Structure Record:

1958

Estimated Reconstruction/Repair Cost:

\$290,928.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1160		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Concrete

Primary Height:

10 to 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The concrete seawall surrounds that Massachusetts Maritime Academy. There is a building above the seawall. Large vessels dock along the seawall. There is no visible spalling.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

IV

Rating

High Priority

Action

Consider for Next Project Construction Listing

Description

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-121-000-051-300-PHO3A.JPG

Structure Documents:

DEP	May 1995	Plan Accompanying	007-121-000-051-300-LIC3A
DEP	October 1, 1	Plan Accompanying	007-121-000-051-300-LIC3B
DEP	June 1, 2001	Plan Accompanying	007-121-000-051-300-LIC3C
DEP	January 27,	Proposed Bulkhead	007-121-000-051-300-LIC3D

Structure Assessment Form

Town: **Bourne**Structure ID: **007-139-000-185-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Gilder Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$430,848.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
680		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The coarse sand beach is not well graded. The slope drops from 1 on 50 to 1 on 10 at the high tide line. There are houses directly behind the beach

*Condition***C***Rating***Fair***Level of Action***Moderate***Description*

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

*Priority***IV***Rating***High Priority***Action***Consider for Next Project Construction Listing***Description*

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-139-000-185-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-160-000-009-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Monument Beach - Shore Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$233,376.00

Length:

1040

Top Elevation:

Feet

Feet NAVD 88

FIRM Map Zone:

VE

FIRM Map Elevation:

18

Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

10 to 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The coarse sand beach is evenly graded. There is a parking lot and railroad behind it. In the middle of the beach is a pier built over a jetty with a marina outshore.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-160-000-009-100-PHO1A.JPG

007-160-000-009-100-PHO1B.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-160-000-009-200

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Monument Beach - Shore Road

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1948

Estimated Reconstruction/Repair Cost:

\$24,000.00

Length:

100

Feet

Top Elevation:

Feet NAVD 88

FIRM Map Zone:

VE

FIRM Map Elevation:

18

Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The stone groin is made up of stones that are approximately 3 feet by 2 feet by 1 foot in size. There is no visible stone movement or scour. A timber pier is built on top of the jetty and has floats attached outshore of the jetty.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-160-000-009-200-PHO2A.JPG

Structure Documents:

USACE

October 194

Proposed Wharf and

007-160-000-009-200-COE2A

MA-DCR

April 1955

Proposed Beach

007-160-000-009-200-DCR2A

DEP

September 1

Proposed Wharf and

007-160-000-009-200-LIC2A

Structure Assessment FormStructure ID: **007-160-000-029-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Arthur Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$4,356.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
165		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The beach is made up of sand and gravel. It is well graded. There is a seawall, small park and tennis courts inshore of the beach.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description***No Inshore Structures or Residential Dwelling Units Present**

Structure Images:

007-160-000-029-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**Structure ID: **007-160-000-029-200**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Arthur Avenue

Date:

10/24/2007

Presumed Structure Owner:

Unknown

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
155		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Concrete

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The precast concrete blocks are 3 feet by 1 foot by 1 foot stacked on top of each other. The wall appears to be newly constructed. There is a small park above it, tennis court behind it, and a beach outshore.

Condition

A

Rating

Excellent

Level of Action

None

Description

Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-160-000-029-200-PHO2A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**Structure ID: **007-194-000-056-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Pocasset Inlet

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$110,400.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
460		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The stone groin is located at the southside of the inlet to the Pocasset River. The stones vary in size, but are on average 2 feet by 1 foot by 1 foot in size. The crest is 5 feet wide. There is minor undermining at the toe.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-194-000-056-100-PHO1A.JPG

007-194-000-056-100-PHO1B.JPG

Structure Documents:

Structure Assessment Form

Structure ID: 007-194-000-056-200

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Pocasset Inlet

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$48,000.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
200		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The stone groin is located at the north side of the inlet to the Pocasset River. It is made up of stones that average 2 feet by 1 foot by 1 foot in size. There is undermining at the toe. The crest is 5 feet wide.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-194-000-056-200-PHO2A.JPG

Structure Documents:

Structure Assessment Form

Structure ID: 007-198-000-116-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Tide Way

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$7,603.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
60		AE	16
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Wood

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The timber bulkhead is supported by timber piles. There is minor erosion at the top and buckling. There is no visible scour. There is a gangway, floats and stairway that extend off the bulkhead. The roadway comes to an end 10 feet before the bulkhead.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-198-000-116-100-PHO1A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-199-000-265-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Tahanto Road - Pocasset River

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$48,708.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1845		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The sand beach is visibly layered with gravel. The slope is 1 on 30. There are seawalls and houses directly behind the beach.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

V

Rating

Immediate / Highest Priority

Action

Consider For Immediate Action Due to Public Safety and Welfare Issues

Description

Critical Inshore Structures Present with Potential for Infrastructure Damage and/or High Density Residential Dwellings Condition of structure may warrant emergency stabilization as failure may result in potential loss of property and/or life. (>10 dwellings impacted / 100 feet of shoreline)

Structure Images:

007-199-000-265-100-PHO1A.JPG

007-199-000-265-100-PHO1B.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**Structure ID: **007-199-000-265-200**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Pocasset River

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1961

Estimated Reconstruction/Repair Cost:

\$185,632.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
245		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Concrete

Primary Height:

Under 5 Feet

Secondary Type:

Revetment

Secondary Material:

Stone

Secondary Height:

Under 5 Feet

Structure Summary :

The precast concrete seawall with wave return face is 3.5 feet tall and 2 feet wide. There is scour at the toe of the wall. The wall sits on top of a cast in place concrete wall that has major deterioration. The riprap is dumped in front of the wall. There is a parking lot behind and 3 gangways coming off the wall to floats on the river.

*Condition***C***Rating***Fair***Level of Action***Moderate***Description*

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description***No Inshore Structures or Residential Dwelling Units Present**

Structure Images:

007-199-000-265-200-PHO2A.JPG

Structure Documents:

USACE**March 1961****Proposed Seawall,****007-199-000-265-200-COE2A**

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-199-000-265-300

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Pocasset River Bridge

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$42,042.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
35		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet
Secondary Type:	Secondary Material:	Secondary Height:



Structure Summary :

The stone revetment is surrounding a bridge abutment. The stones are 1 foot by 1 foot by 2 feet on average. The slope is 1 on 3. There is stone movement. Excessive growth at the tidal zone.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-199-000-265-300-PHO3A.JPG

Structure Documents:

Structure Assessment Form

Structure ID: 007-199-000-265-400

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Pocasset River Bridge

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unkown

Estimated Reconstruction/Repair Cost:

\$33,033.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
55		AE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:	Primary Material:	Primary Height:
Revetment	Stone	5 to 10 Feet
Secondary Type:	Secondary Material:	Secondary Height:

**Structure Summary :**

The dumped stones surround the bridge abutment. The stones are approximately 1 foot by 1 foot by 2 feet. The slope is 1 on 3. There is stone movement throughout. Excessive growth in the tidal zone.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

007-199-000-265-400-PHO4A.JPG

Structure Documents:

Structure Assessment FormStructure ID: **007-216-000-053-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Barlow's Landing

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1965

Estimated Reconstruction/Repair Cost:

\$0.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
90		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The groin is made up of stones that are on average 3 feet by 2 feet. The crest is one stone width. There is slight unraveling at the end of the groin.

*Condition***A***Rating***Excellent***Level of Action***None***Description*

Like new condition. Structure expected to withstand major coastal storm without damage. Stable landform (beach, dune or bank). Adequate system exists to provide protection from major coastal storm.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description***No Inshore Structures or Residential Dwelling Units Present**

Structure Images:

007-216-000-053-100-PHO1A.JPG

Structure Documents:

MA-DCR**September 1****Proposed Beach****007-216-000-053-100-DCR1A**

Structure Assessment FormStructure ID: **007-216-000-053-200**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Barlow's Landing

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1965

Estimated Reconstruction/Repair Cost:

\$29,779.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
235		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The beach is made up of coarse sand and gravel. It is evenly graded. The slope is 1 on 20. There is a parking lot located behind the beach.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***III***Rating***Moderate Priority***Action*

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

007-216-000-053-200-PHO2A.JPG

Structure Documents:

MA-DCR**April 1965****Proposed Beach****007-216-000-053-200-DCR2A**

Structure Assessment FormStructure ID: **007-216-000-053-300**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Barlow's Landing

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$85,272.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
340		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Stone

Primary Height:

10 to 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The stones are mortared together with concrete. The stones average 2 feet by 1 foot in size. There is erosion behind the top of the wall. There is normal growth along the tidal zone. A gangway attached to floats extends from the middle of the bulkhead. The bulkhead forms the perimeter of a parking lot.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***II***Rating***Low Priority***Action***Future Project Consideration***Description*

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:**007-216-000-053-300-PHO3A.JPG****007-216-000-053-300-PHO3B.JPG****Structure Documents:**

Structure Assessment FormStructure ID: **007-216-000-053-400**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Barlow's Landing

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1965

Estimated Reconstruction/Repair Cost:

\$19,200.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
80		VE	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

A boat ramp has two groins extending along each side. The stones are 3 feet by 4 feet on average with smaller stones used for filling. There is no sign of stone movement.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description*

No Inshore Structures or Residential Dwelling Units Present

Structure Images:**007-216-000-053-400-PHO4A.JPG****007-216-000-053-400-PHO4B.JPG****007-216-000-053-400-PHO4C.JPG****Structure Documents:****MA-DCR****April 1965****Proposed Beach****007-216-000-053-400-DCR4A**

Structure Assessment FormStructure ID: **007-221-000-265-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Circuit Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1960

Estimated Reconstruction/Repair Cost:

\$116,582.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
920		AE	16
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Coastal Beach

Primary Material:

Sand

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The sandy beach is well graded. The slope is 1 on 30. There are houses and a road located behind the beach. Adjacent to the beach is a boat ramp.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description*

No Inshore Structures or Residential Dwelling Units Present

Structure Images:**007-221-000-265-100-PHO1A.JPG****007-221-000-265-100-PHO1B.JPG****007-221-000-265-100-PHO1C.JPG****007-221-000-265-100-PHO1D.JPG****Structure Documents:****MA-DCR****May 1960****Proposed harbor****007-221-000-265-100-DCR1A**

Structure Assessment Form

Structure ID: 007-221-000-267-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Circuit Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

1955

Estimated Reconstruction/Repair Cost:

\$36,000.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
150		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The stones are on average 3 feet by 2 feet by 1 foot. The crest of the groin is approximately 5 feet wide. The groin extends past mean low water. A cement walkway has been built on top of the crest, with a pier extending off the end. There is a boat ramp adjacent to the structure.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

007-221-000-267-100-PHO1A.JPG

Structure Documents:

USACE

June 1955

Proposed Groin -

007-221-000-267-100-COE1A

Structure Assessment FormStructure ID: **007-221-000-267-200**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Circuit Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$15,180.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
230		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The boat ramp is surrounded by placed stones. Concrete mortar is used as fill. There is minor stone movement and mortar loss. There is no visible scour.

*Condition***B***Rating***Good***Level of Action***Minor***Description*

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

*Priority***I***Rating***None***Action***Long Term Planning Considerations***Description***No Inshore Structures or Residential Dwelling Units Present**

Structure Images:

007-221-000-267-200-PHO2A.JPG

Structure Documents:

Structure Assessment Form

Town: **Bourne**

Structure ID: 007-246-000-013-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Red Brook Landing

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$53,130.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
125		VE	18
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Bulkhead/ Seawall

Primary Material:

Concrete

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

The concrete seawall surrounds the town boat ramp. There is cracking, spalling, scour at the toe, and exposed rebar. The concrete has begun to deteriorate at the ends of the wall. The wall is heaving outward. A boat yard and store are located behind the wall.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

007-246-000-013-100-PHO1A.JPG

Structure Documents:

Structure Assessment FormStructure ID: **007-261-000-062-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Ocean Avenue

Date:

10/24/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Bourne

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$29,878.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
45			
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:

**Structure Summary :**

The dumped stones are located at the end of Ocean Avenue. The stones are approximately 3 feet by 3 feet by 2 feet on average. The structure is one stone in width and height, and six stones in length. There are smaller stones scattered around the larger stones.

*Condition***D***Rating***Poor***Level of Action***Major***Description*

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

*Priority***II***Rating***Low Priority***Action***Future Project Consideration***Description*

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:**007-261-000-062-100-PHO1A.JPG****Structure Documents:**

Section II - Bourne

Part C

Structure Photographs

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
007-016-000-001-100	007-016-000-001-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-025-000-147-100	007-025-000-147-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-026-000-004-100	007-026-000-004-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-030-000-050-100	007-030-000-050-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-030-000-050-100	007-030-000-050-100-PHO1B.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-030-000-050-100	007-030-000-050-100-PHO1C.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-072-000-017-100	007-072-000-017-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-072-000-017-100	007-072-000-017-100-PHO1B.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-072-000-017-100	007-072-000-017-100-PHO1C.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-087-000-075-100	007-087-000-075-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-087-000-075-100	007-087-000-075-100-PHO1B.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-087-000-075-200	007-087-000-075-200-PHO2A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-117-000-042-100	007-117-000-042-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-117-000-155-100	007-117-000-155-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-121-000-051-200	007-121-000-051-200-PHO2A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-121-000-051-300	007-121-000-051-300-PHO3A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-139-000-185-100	007-139-000-185-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-160-000-009-100	007-160-000-009-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
007-160-000-009-100	007-160-000-009-100-PHO1B.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-160-000-009-100	007-160-000-009-100-PHO1B.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-194-000-056-100	007-194-000-056-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-199-000-265-100	007-199-000-265-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-199-000-265-300	007-199-000-265-300-PHO3A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-199-000-265-400	007-199-000-265-400-PHO4A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
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007-216-000-053-400	007-216-000-053-400-PHO4C.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
007-221-000-265-100	007-221-000-265-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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Massachusetts Coastal Infrastructure and Assessment



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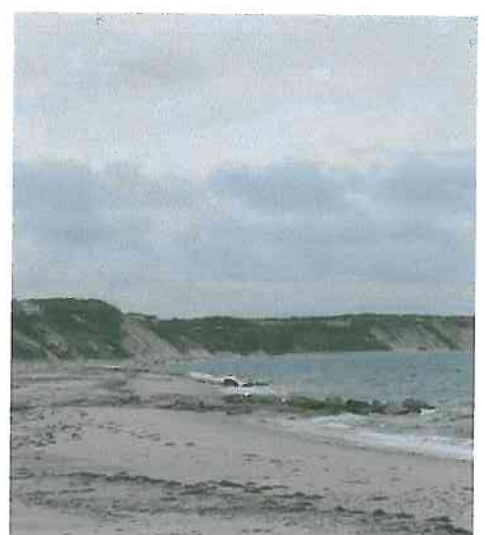
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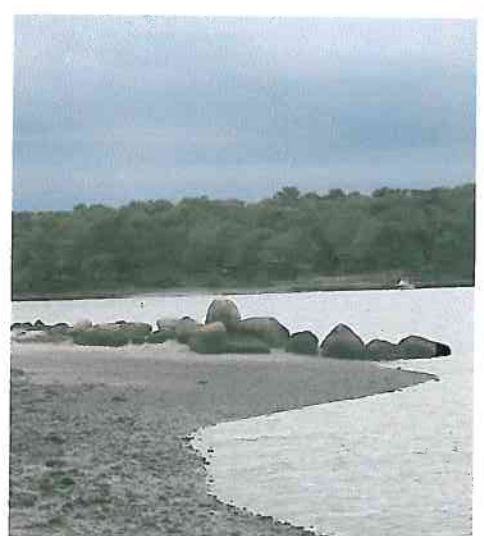
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Massachusetts Coastal Infrastructure and Assessment



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007-087-000-075-100-PHO1B



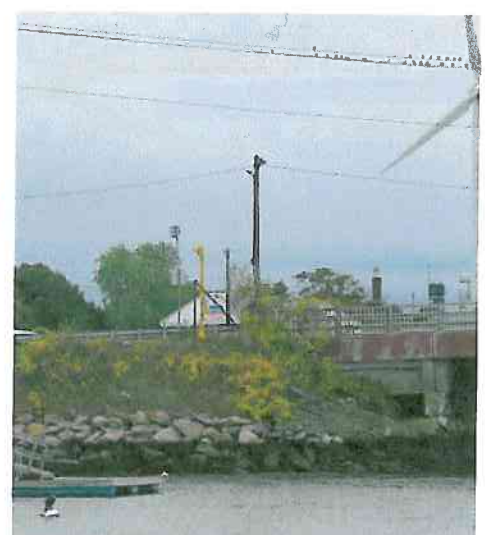
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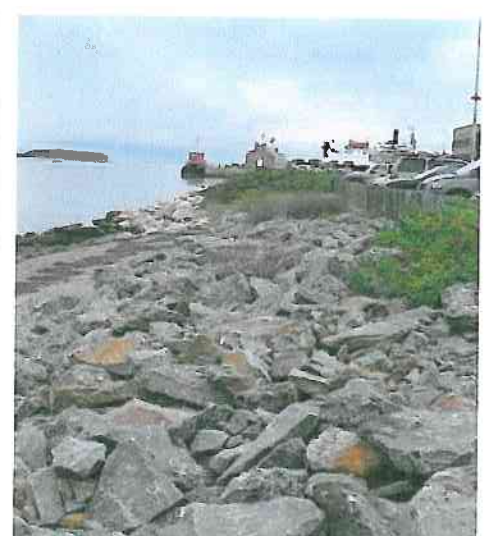
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Massachusetts Coastal Infrastructure and Assessment



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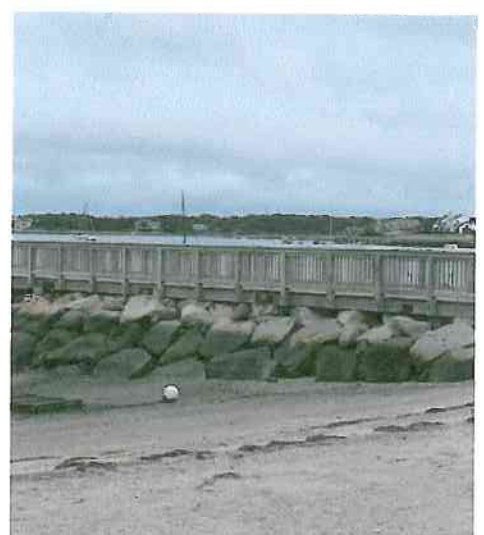
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007-160-000-009-100-PHO1B



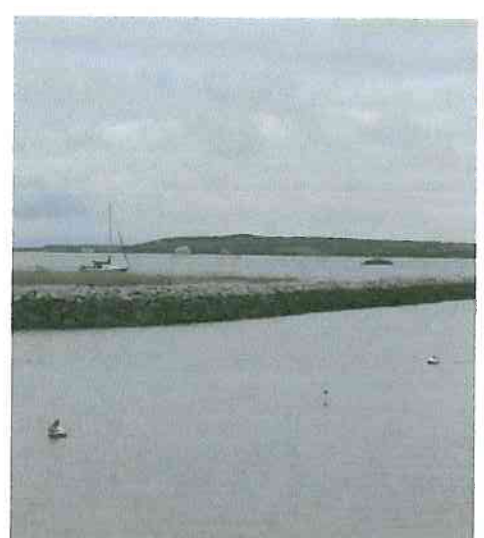
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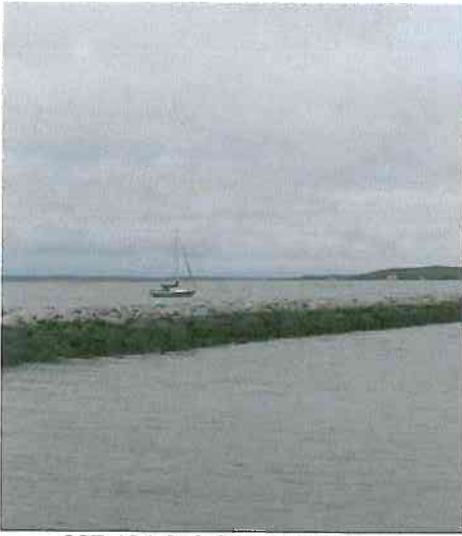


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Massachusetts Coastal Infrastructure and Assessment



007-194-000-056-100-PHO1B



007-194-000-056-200-PHO2A



007-198-000-116-100-PHO1A



007-199-000-265-100-PHO1A



007-199-000-265-100-PHO1B



007-199-000-265-200-PHO2A



007-199-000-265-300-PHO3A



007-199-000-265-400-PHO4A



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Massachusetts Coastal Infrastructure and Assessment



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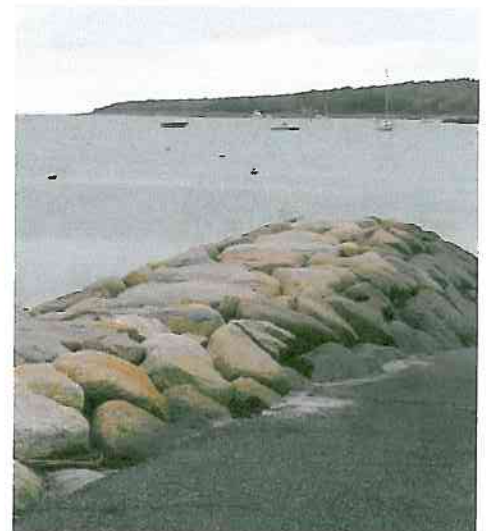
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007-216-000-053-400-PHO4B



007-216-000-053-400-PHO4C



007-221-000-265-100-PHO1A



007-221-000-265-100-PHO1B



007-221-000-265-100-PHO1C

Massachusetts Coastal Infrastructure and Assessment



007-221-000-265-100-PHO1D



007-221-000-267-100-PHO1A



007-221-000-267-200-PHO2A



007-246-000-013-100-PHO1A



007-261-000-062-100-PHO1A

Section II - Bourne

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

No Town Documents for the Town of Bourne

TOWN: BOURNE
SOURCE: Town of Bourne
LOCATION: TOWN
DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
007-026-000-004-100	007-026-000-004-100-DCR1A	1019	MA-DCR	Bourne	December 1947	Proposed Jetty and Jetty Reconstruction - Sagamore Beach - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	1	Sagamore Beach	Groins
007-026-000-004-100	007-026-000-004-100-DCR1B	1751	MA-DCR	Bourne	April 1957	Proposed Shore Protection - Groin Construction and Reconstruction - Sagamore Beach - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	2	Sagamore Beach	Groins
007-160-000-009-200	007-160-000-009-200-DCR2A	1487	MA-DCR	Bourne	April 1955	Proposed Beach Improvements - Dredging, Drainage, and Stone Jetty - Monument Beach - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	3	Monument Beach	Jetty
007-216-000-053-100	007-216-000-053-100-DCR1A	2457	MA-DCR	Bourne	September 1965	Proposed Beach Improvements - Stone Groin and Sand Fill - Barlow's Landing - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	1	Barlow's Landing	Groin and Sand Fill
007-216-000-053-200	007-216-000-053-200-DCR2A	2457	MA-DCR	Bourne	April 1965	Proposed Beach Improvements - Stone Groins and Sand Fill - Barlow's Landing - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	1	Barlow's Landing	Sand Fill and Groin
007-216-000-053-400	007-216-000-053-400-DCR4A	2457	MA-DCR	Bourne	April 1965	Proposed Beach Improvements - Stone Groin and Sand Fill - Barlow's Landing - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	1	Barlow's Landing	Stone Groin and Sand Fill
007-221-000-265-100	007-221-000-265-100-DCR1A	2121	MA-DCR	Bourne	May 1960	Proposed harbor Improvements and Beach Developments - Hen Cove - Bourne - Prepared for the DPW of Massachusetts - Division of Waterways	1	Circuit Avenue	Fill

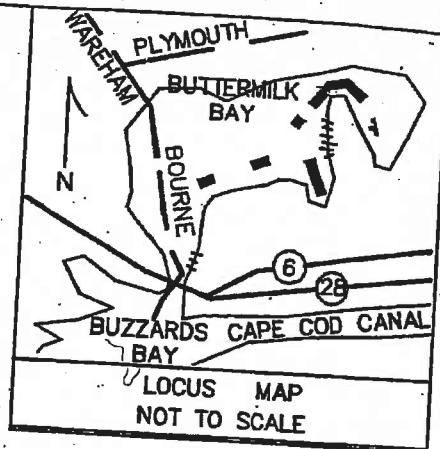
TOWN: BOURNE
 SOURCE: DEP
 LOCATION: BOSTON, MA
 DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
007-072-000-017-100	007-072-000-017-100-LIC1A	8881	DEP	Bourne	June 28, 2001	Proposed New and Improvement Dredging and Beach Nourishment At Buttermilk Bay in Bourne Ma, County of Barnstable	20	Lewis Point Road	Beach Nourishment
007-121-000-051-300	007-121-000-051-300-LIC3A	4613	DEP	Bourne	May 1995	Plan Accompanying the Petition of the Commonwealth of Massachusetts, Division of Capital Planning and Operations on Behalf of the Massachusetts Maritime Academy to Replace a Steel Bulkhead on the Cape Cod Canal In Bourne, MA	7	Massachusetts Maritime	Bulkhead
007-121-000-051-300	007-121-000-051-300-LIC3B	7597	DEP	Bourne	October 1, 1998	Plan Accompanying the Petition of the Commonwealth of Massachusetts Division of Capital Planning and Operations on Behalf of the Massachusetts Maritime Academy To Amend Waterways License # 4613	5	Academy Drive	Bulkhead Maintenance and Riprap Replacement
007-121-000-051-300	007-121-000-051-300-LIC3C	8851	DEP	Bourne	June 1, 2001	Plan Accompanying Petition of the Commonwealth of Massachusetts, Division of Capital Asset Management	8	Cape Cod Canal/Buzzards Bay	Bulkhead Mainlance
007-121-000-051-300	007-121-000-051-300-LIC3D	4043	DEP	Bourne	January 27, 1958	Proposed Bulkhead and Wharf, Buzzards Bay at Bourne	3	Massachusetts Maritime	Stone Fill and Timber Bulkhead
007-160-000-009-200	007-160-000-009-200-LIC2A	3080	DEP	Bourne	September 14, 194	Proposed Wharf and Fill at Monument Beach by Town of Bourne	1	Monument Beach	Beach Renourishment

007-072-000-017-100



5-22-01



HEAD OF THE BAY ROAD

GIBBS NARROWS

HIDEAWAY VILLAGE

LITTLE BUTTERMILK BAY

BUTTERMILK BAY

EBB FLOOD

BEACH NOURISHMENT AREA 2
SEE SHEETS 6 - 11

QUEEN SEWELL COVE

UPLAND DISPOSAL AREA 1
SEE SHEETS 17 & 18

PERMIT NO. 9881

Approved by Department of Environmental Protection
Date: JUN 28 2001

LEGEND



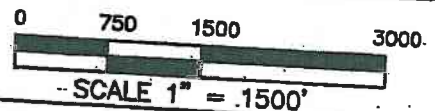
BEACH NOURISHMENT



CHANNEL DREDGING



DREDGE SECTION LOCATION



REV MAY 18, 2001

REV JAN. 16, 2001

NEW & IMPROVEMENT DREDGING & BEACH NOURISHMENT

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532

DATE: AUGUST 2, 2001

DB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'

MHW = 4.0'

HTL = 4.5'

IE BSC GROUP, INC.
WASHINGTON STREET
DORWELL, MA 02061

N 2736534.18
E 894812.11

N 2736276.65
E 894802.52

N 2735605.17
E 894859.70

FLOOD
EBB

SEE SHEET 3

N 2736508.41
E 894861.19

N 2736277.84
E 894852.60

N 2735622.54
E 894908.40

PREVIOUSLY DREDGED
MOORING BASIN

N 2735202.49
E 895196.01

BEACH
NOURISHMENT
AREA 1

N 2734840.32
E 895927.21

N 2735163.48
E 895162.13

N 2734802.91
E 895890.09

N 2734477.80
E 896054.32

N 2734194.39
E 896050.77

FLOOD
EBB

NA-1
NA-7
NA-2

N 2734489.42
E 896104.47

N 2734181.40
E 896100.62

N 2733812.69
E 895843.71

N 2733791.14
E 895888.90

BUZZARDS
BAY

FEDERAL CHANNEL

END OF EXISTING 6 FOOT
DEEP FEDERAL CHANNEL

ROUTE 28



SEE SHEET 3

MASS MAINLAND COORDINATES

PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: JUN 28 2001

JOB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

REV MAY 18 2001

REV JAN. 16, 2001

0 200 400 800
SCALE 1" = 400'

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
IN BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

NEW &
IMPROVEMENT
DREDGING &
BEACH
NOURISHMENT

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532

DATE: AUGUST 8, 2000 SHEET 2 OF 20

007-072-000-017-100



EBB
FLOW

N 2737946.32
E 896706.01

BUTTERMILK BAY

DREDGE MATERIAL TO BE
PLACED AT NOURISHMENT
AREA 1 SHOWN ON SHEET 2

BU-5
BU-4
BU-3
N 2737900.70
E 896728.48

TOWN OF BOURNE
TOWN OF WAREHAM

N 2736534.18
E 894812.11

N 2736276.65
E 894802.52

BU-1 BU-2

N 2736508.41
E 894861.19

PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

N 2736277.84
E 894852.60

SEE SHEET 2

REV MAY 18, 2001

REV JAN. 16, 2001

0 200 400 800

SCALE 1" = 400'

JOB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

NEW &
IMPROVEMENT
DREDGING &
BEACH
NOURISHMENT

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532

DATE: AUGUST 8, 2000 SHEET 3 OF 20

EBB
FLOOD

SEE SHEET 5

007-072-000-017-100

N 2739286.20
E 897849.37

N 2739278.13
E 897900.32

MASS MAINLAND COORDINATES

BUTTERMILK BAY

NA-5

BEACH NOURISHMENT
AREA 2
SEE SHEETS 6 THRU 16

NA-4

NA-3

SEE SHEETS 8 & 9 & 10

N 2738474.97
E 897923.70

N 2738462.30
E 897975.07

N 2738248.26
E 897776.73

N 2738232.44
E 897826.06

SEE SHEET 3

BUTTERMILK BAY

CHANNEL

N 2738196.05
E 897775.80

N 2738043.37
E 898415.36

EBB
FLOOD

N 2737995.41
E 898401.20

EBB
FLOOD

SE-12

SE-13

SE-14

SE-15

SE-16

UPLAND
DISPOSAL
AREA 1: SEE
SHEETS 17
AND 18.

QUEEN SEWELL
COVE

N 2737362.77
E 898872.09

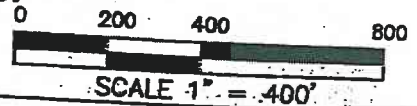
N 2737386.66
E 898904.18

DREDGE MATERIAL TO BE PLACED AT
UPLAND DISPOSAL AREA 1. SEE SHEETS 17
AND 18.

PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: JUN 28 2001

REV	MAY 18, 2001
REV	JAN. 16, 2001



JOB NO. 4-8075.00.DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
N BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

NEW &
IMPROVEMENT
DREDGING &
BEACH
NOURISHMENT

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532
DATE: AUGUST 8, 2000 SHEET 4 OF 20

007-072-000-017-100



522-01

BUTTERMILK BAY

LITTLE BUTTERMILK BAY

GIBBS NARROWS

N 2741034.68
E 898907.85

N 2740995.26
E 898730.35

N 2740975.30
E 899080.64

N 2740697.13
E 899365.25

N 2740982.82
E 898904.93

N 2740661.37
E 899330.31

N 2740951.03
E 898761.80

N 2740191.56
E 898292.53

N 2740931.67
E 899053.75

N 2740214.69
E 898248.04

N 2739286.20
E 897849.37

N 2739278.13
E 897900.32

BUTTERMILK BAY

BEACH NOURISHMENT
AREA 2
SEE SHEETS 6 THRU 16

N 2738474.97
E 897923.70

N 2738462.30
E 897975.07

N 2738248.26
E 897776.73

N 2738232.44
E 897826.06

SEE SHEET 4

PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: JUN 28 2001

REV MAY 18, 2001

REV JAN. 16, 2001

0 200 400 800

SCALE 1" = 400'

JOB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

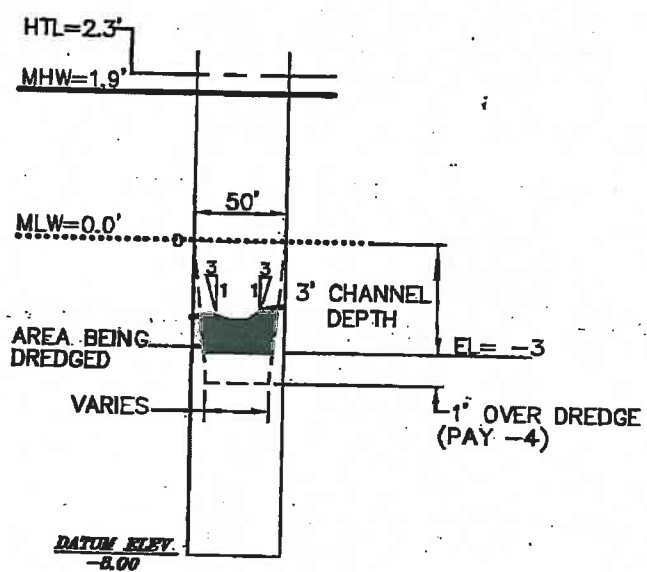
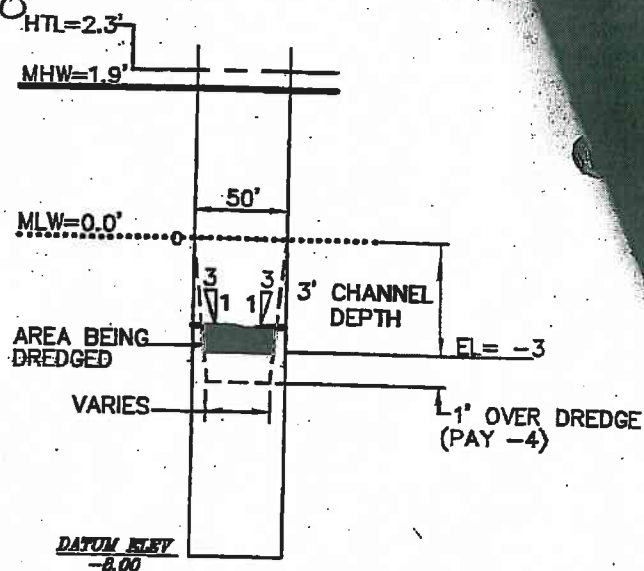
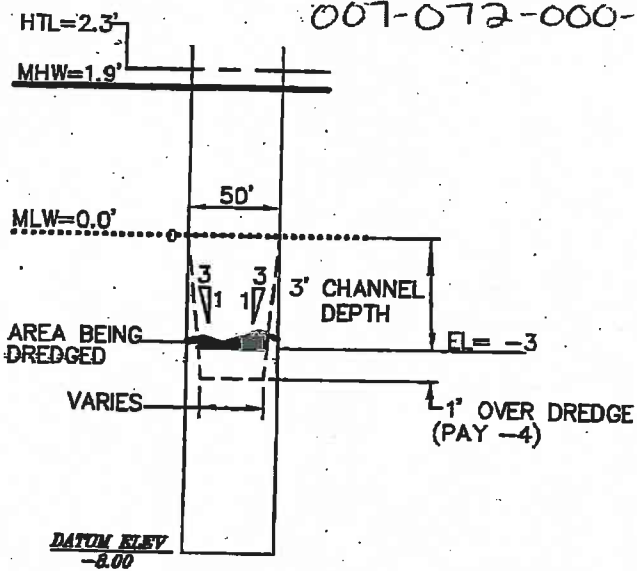
NEW &
IMPROVEMENT
DREDGING &
BEACH
NOURISHMENT

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532

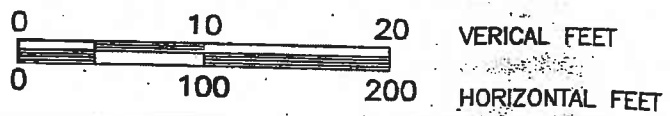
DATE: AUGUST 8, 2000 SHEET 5 OF 20

007-072-000-017-100



Handwritten signature and date: 5-22-01

SCALE: 1" = 100' HORIZONTAL
1" = 10' VERTICAL



PERMIT NO. **8881**
Approved by Department of Environmental Protection
Date: **JUN 28 2001**
JOB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
IN BUTTERMILK BAY, BOURNE, MA

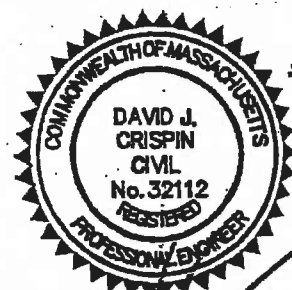
MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

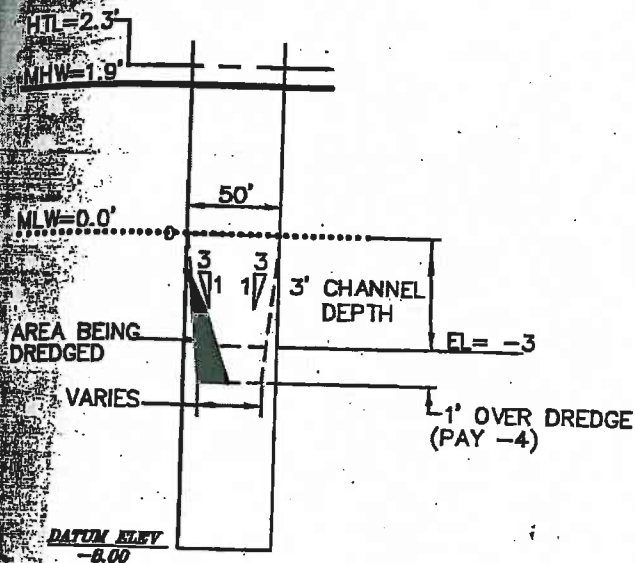
TYPICAL
DREDGING
SECTIONS

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532
DATE: MAY 18, 2001 SHEET 6 OF 20

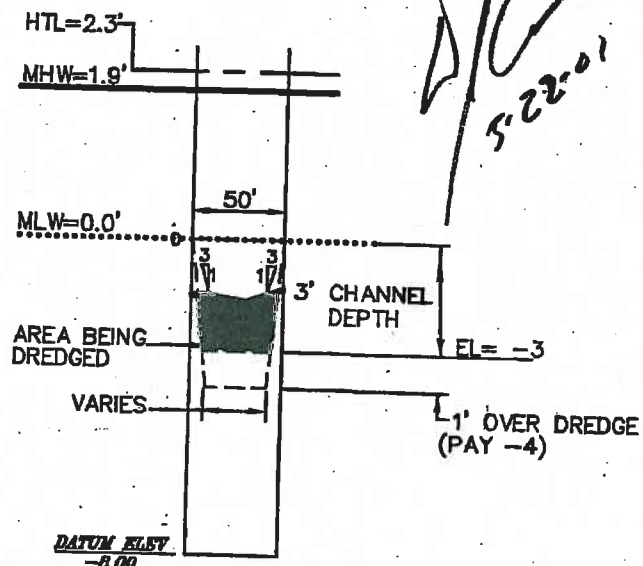
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5-22-01



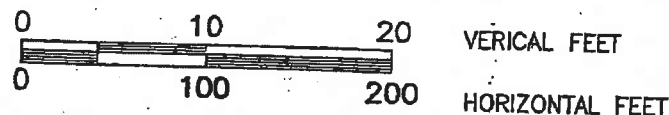
SECTION D-D
(SEE SHT. 5)



SECTION E-E
(SEE SHT. 5)

PERMIT NO. 8881
Approved by Department of Environmental Protection
Date: JUN 28 2001

SCALE: 1" = 100' HORIZONTAL
1" = 10' VERTICAL



OB NO. 4-8075.00 DWG. NO. 5157-03 FILE 8075CH91.DWG

PURPOSE:
PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT BUTTERMILK BAY, BOURNE, MA

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

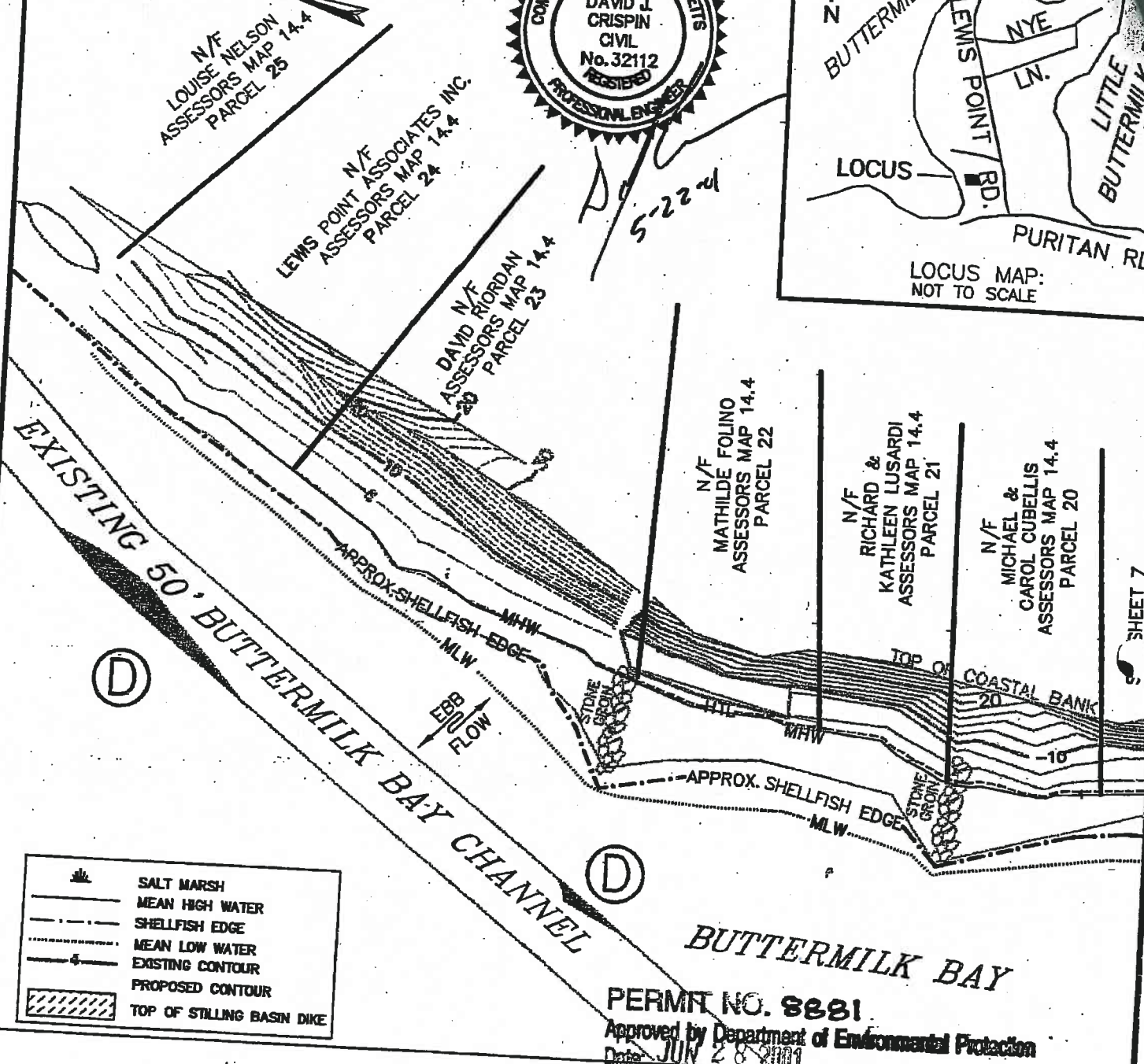
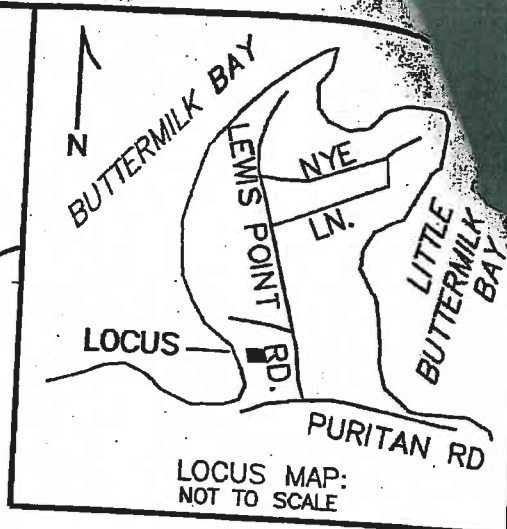
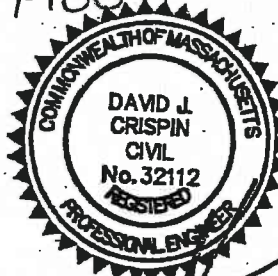
TYPICAL
DREDGING
SECTIONS

PROPOSED NEW & IMPROVEMENT
DREDGING & BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
24 PERRY AVENUE
BOURNE, MA 02532

DATE: MAY 18, 2001 SHEET 7 OF 20

007-072-000-017-100



- SALT MARSH
- MEAN HIGH WATER
- SHELLFISH EDGE
- MEAN LOW WATER
- EXISTING CONTOUR
- PROPOSED CONTOUR
- TOP OF STILLING BASIN DIKE

PERMIT NO. 8881
 Approved by Department of Environmental Protection
 Date JUN 28 2001

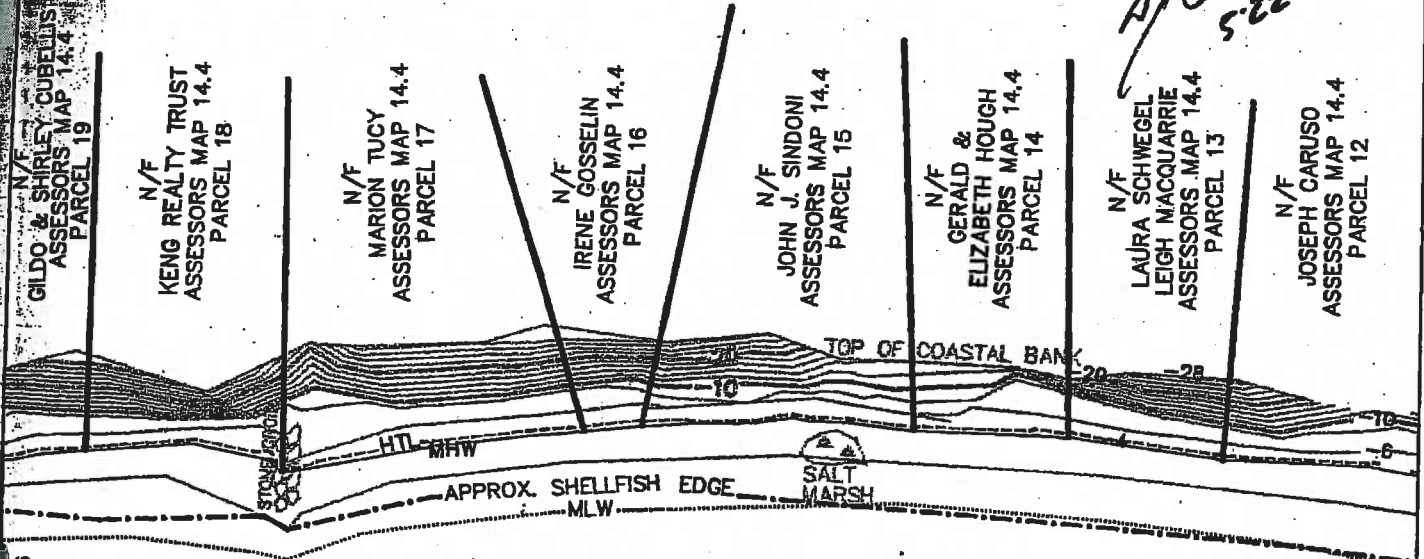
JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN\8075-ACOE		REV MAY 18, 2001 REV JAN 16, 2001	SCALE: 1" = 100'
PURPOSE: PROPOSED BUTTERMILK BAY CHANNEL DREDGING/ BEACH NOURISHMENT MLW = 0.0' MHW = 4.0' HTL = 4.5'		PROPOSED CHANNEL DREDGING/ BEACH NOURISHMENT AT: BUTTERMILK BAY IN: BOURNE, MA COUNTY OF: BARNSTABLE APPLICANT: TOWN OF BOURNE SHORE & HARBOUR COMMITTEE 24 PERRY AVE. BOURNE, MA 02532 DATE: DEC. 29, 2000 SHEET 8 OF 20	
THE BSC GROUP, INC. 384 WASHINGTON STREET NORWELL, MA 02061		EXISTING CONDITIONS PLAN	

007-072-000-017-100



5-22-01

LEWIS POINT RD.



BUTTERMILK BAY

PERMIT NO. 8881

Approved by Department of Environmental Protection

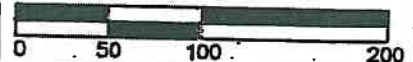
Date: JUN 28 2001

SCALE: 1" = 100'

JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 18, 2001



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

EXISTING
CONDITIONS
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA 02532

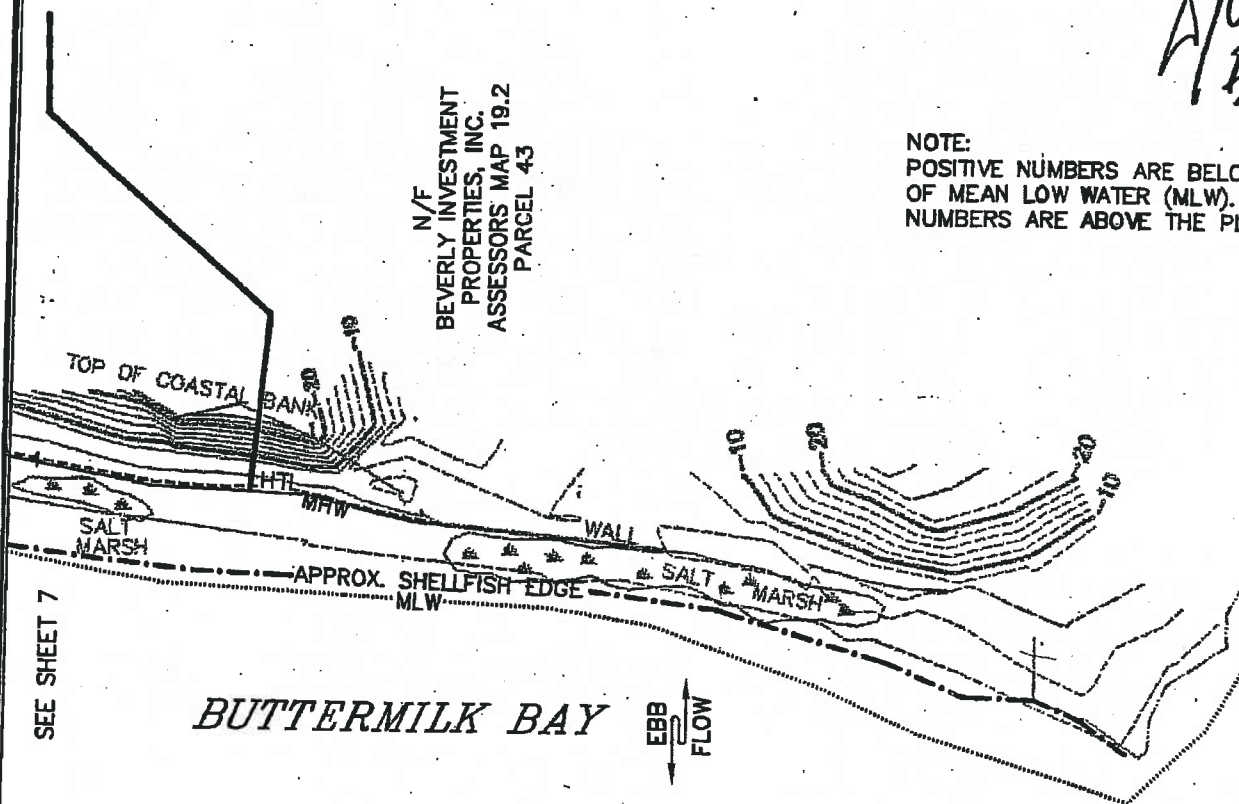
DATE: DEC. 29, 2000 SHEET 9 OF 20

007-072-000-017-100



N/F
BEVERLY INVESTMENT
PROPERTIES, INC.
ASSESSORS MAP 19.2
PARCEL 43

NOTE:
POSITIVE NUMBERS ARE BELOW THE PLANE
OF MEAN LOW WATER (MLW). NEGATIVE
NUMBERS ARE ABOVE THE PLANE OF MLW.



BUTTERMILK BAY

PERMIT NO. 8881

Approved by Department of Environmental Protection

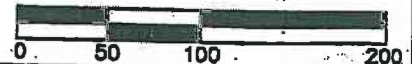
Date: JUN 28, 2001

SCALE: 1" = 100'

JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\8075-AC0E

REV MAY 18, 2001
REV JAN 16, 2001



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET

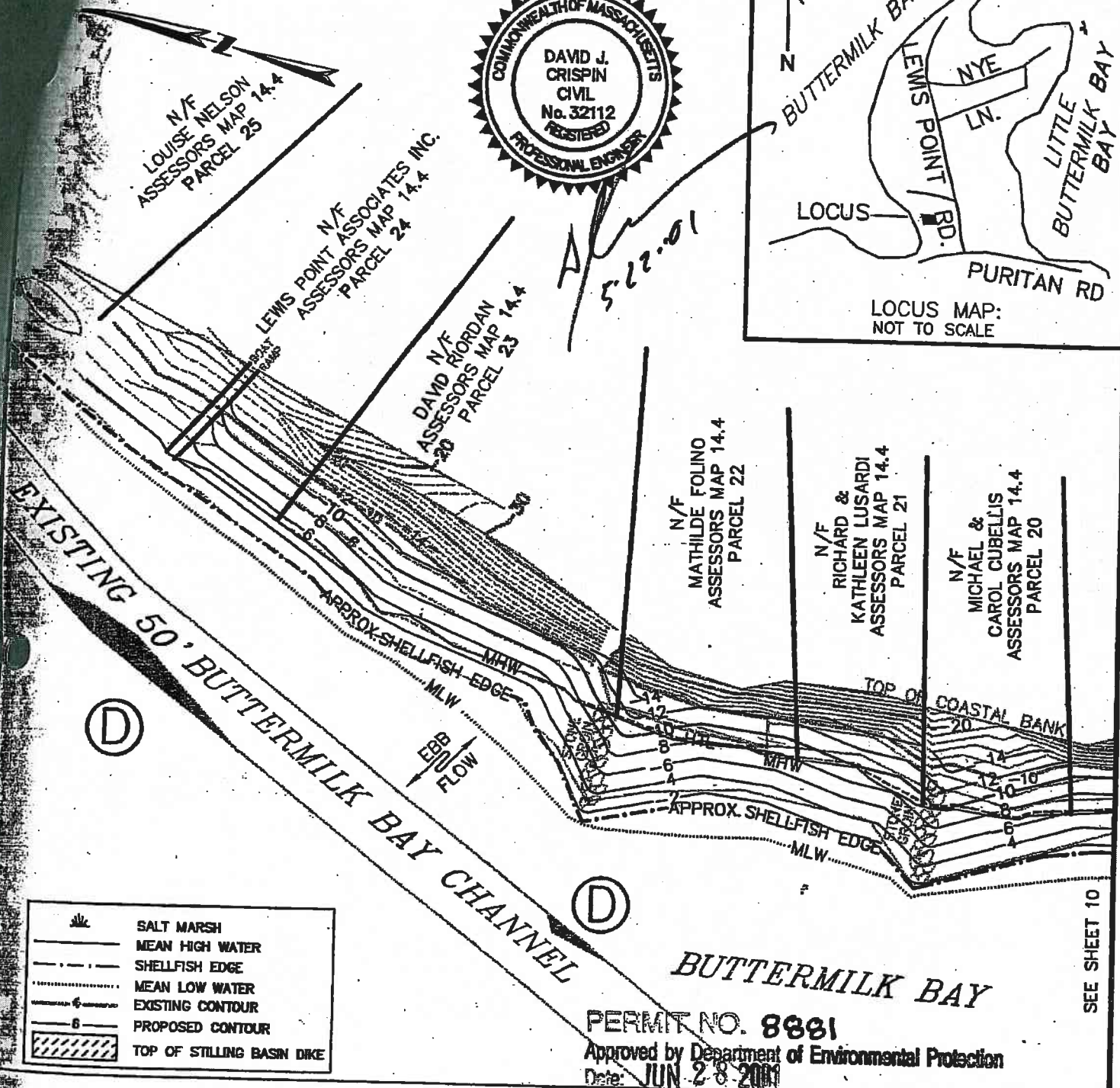
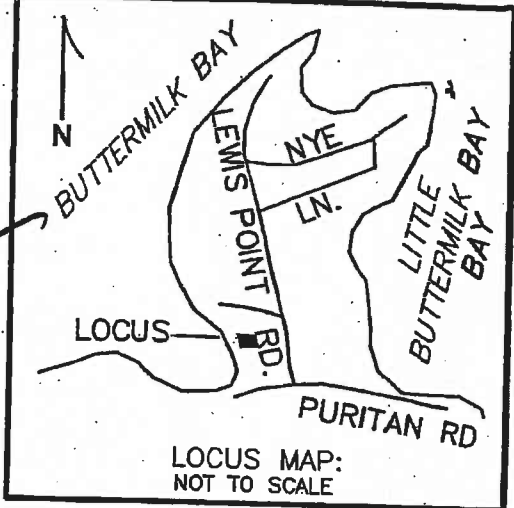
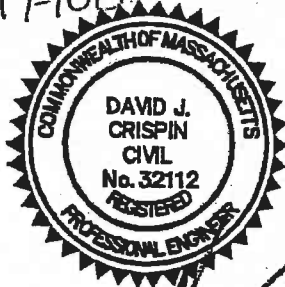
EXISTING
CONDITIONS
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA

007-072-000-017-100



	SALT MARSH
	MEAN HIGH WATER
	SHELLFISH EDGE
	MEAN LOW WATER
	EXISTING CONTOUR
	PROPOSED CONTOUR
	TOP OF STILLING BASIN DIKE

PERMIT NO. 8881
 Approved by Department of Environmental Protection
 Date: JUN 28 2001

JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN\8075-ACOE

REV MAY 18, 2001
 REV JAN 16, 2001



PURPOSE:
 PROPOSED BUTTERMILK BAY
 CHANNEL DREDGING/
 BEACH NOURISHMENT

MLW = 0.0'
 MHW = 4.0'
 HTL = 4.5'

THE BSC GROUP, INC.
 384 WASHINGTON STREET
 NORWELL, MA 02061

GRADING PLAN

PROPOSED CHANNEL DREDGING/
 BEACH NOURISHMENT

AT: BUTTERMILK BAY
 IN: BOURNE, MA
 COUNTY OF: BARNSTABLE

APPLICANT:
 TOWN OF BOURNE
 SHORE & HARBOUR COMMITTEE
 24 PERRY AVE.
 BOURNE, MA 02532

DATE: DEC. 29, 2000 SHEET 11 OF 20

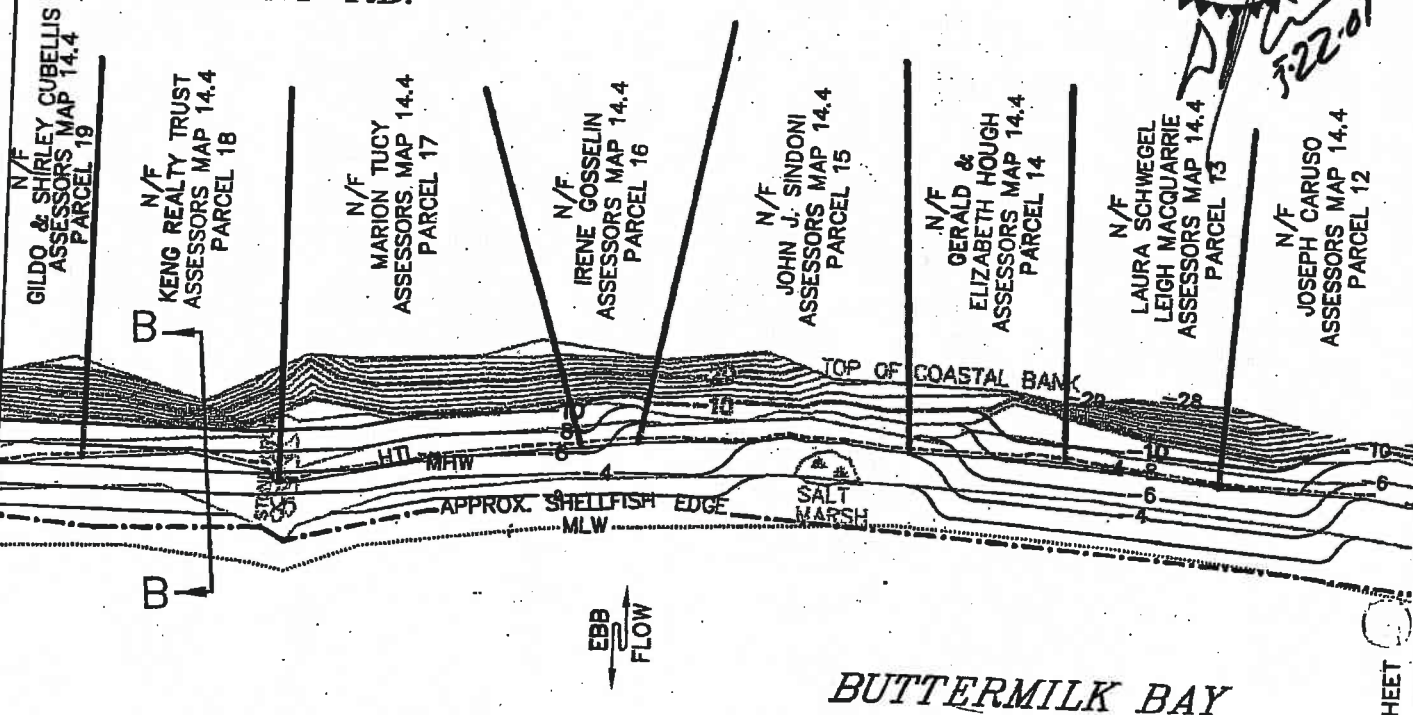
SEE SHEET 10

007-072-000-017-100



5-22-01

LEWIS POINT RD.



SEE SHEET 9

SEE SHEET

PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001

SCALE: 1" = 100'



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

GRADING
PLAN

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY
IN: BOURNE, MA

COUNTY OF: BARNSTABLE

APPLICANT:

TOWN OF BOURNE

SHORE & HARBOUR COMMITTEE

24 PERRY AVE.

BOURNE, MA 02532

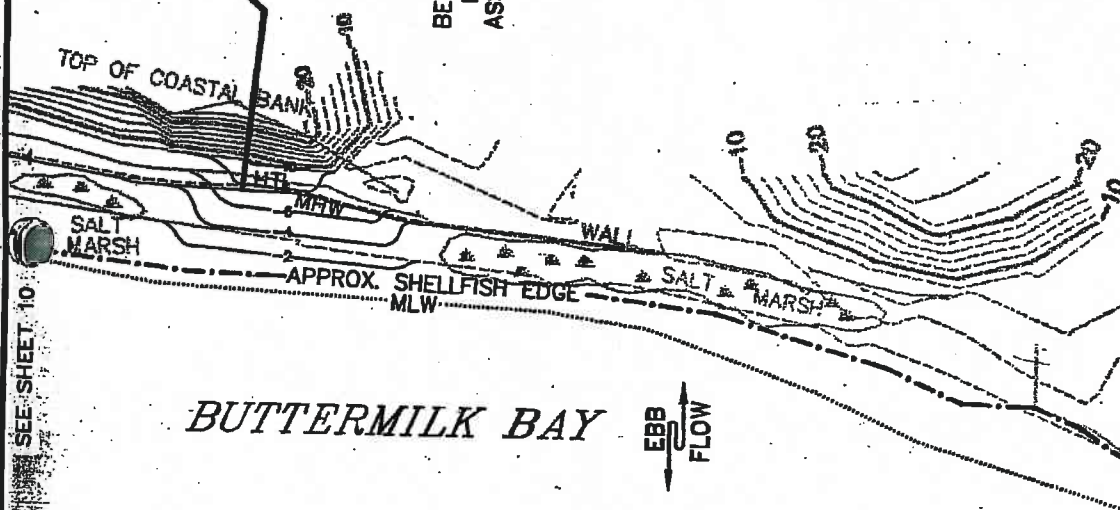
DATE: DEC. 29, 2000 SHEET 12 OF 20

007-072-600-017-100



N/F
BEVERLY INVESTMENT
PROPERTIES, INC.
ASSESSORS MAP 19.2
PARCEL 43

NOTE:
POSITIVE NUMBERS ARE BELOW THE PLANE
OF MEAN LOW WATER (MLW). NEGATIVE
NUMBERS ARE ABOVE THE PLANE OF MLW.



BUTTERMILK BAY

EBB
FLOW

PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

SCALE: 1" = 100'

DB-NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\B075-ACOE

REV MAY 18, 2001

REV JAN 16, 2001

PURPOSE:
PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'

MHW = 4.0'

HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

GRADING
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY

IN: BOURNE, MA

COUNTY OF: BARNSTABLE

APPLICANT:

TOWN OF BOURNE

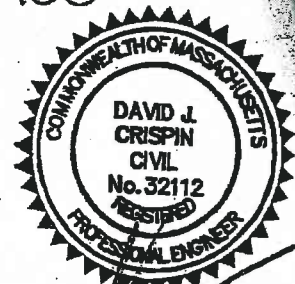
SHORE & HARBOUR COMMITTEE

24 PERRY AVE.

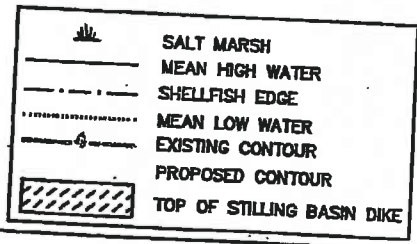
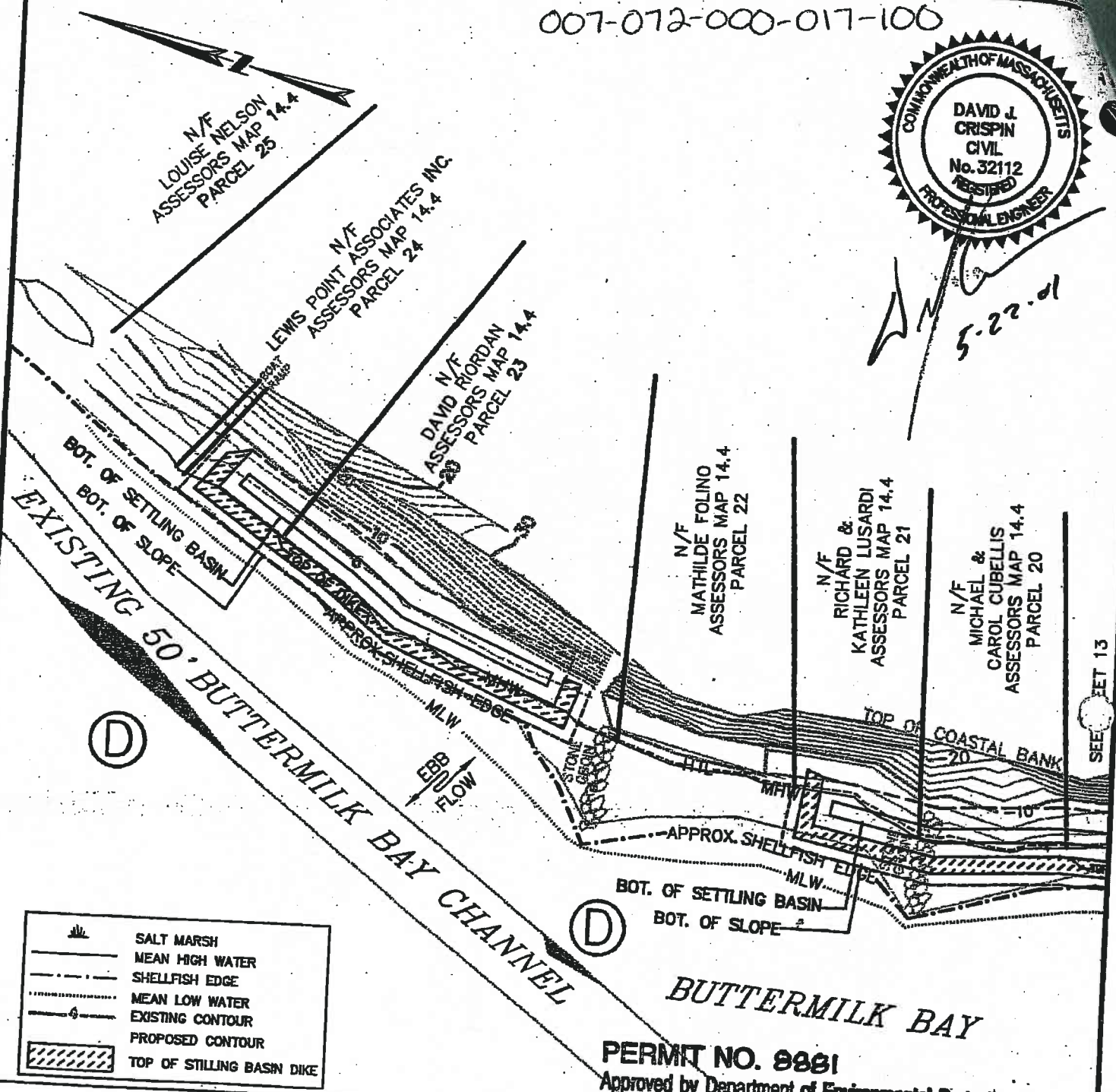
BOURNE, MA

DATE: DEC. 29, 2000 SHEET 13 OF 20

007-072-000-017-100



5-22-01



PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

SCALE: 1" = 100'



JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN \8075-ACOE

REV MAY 18, 2001

REV JAN 16, 2001

PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

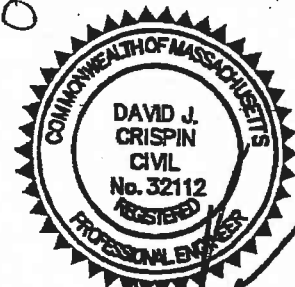
STILLING BASIN
LAYOUT
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA

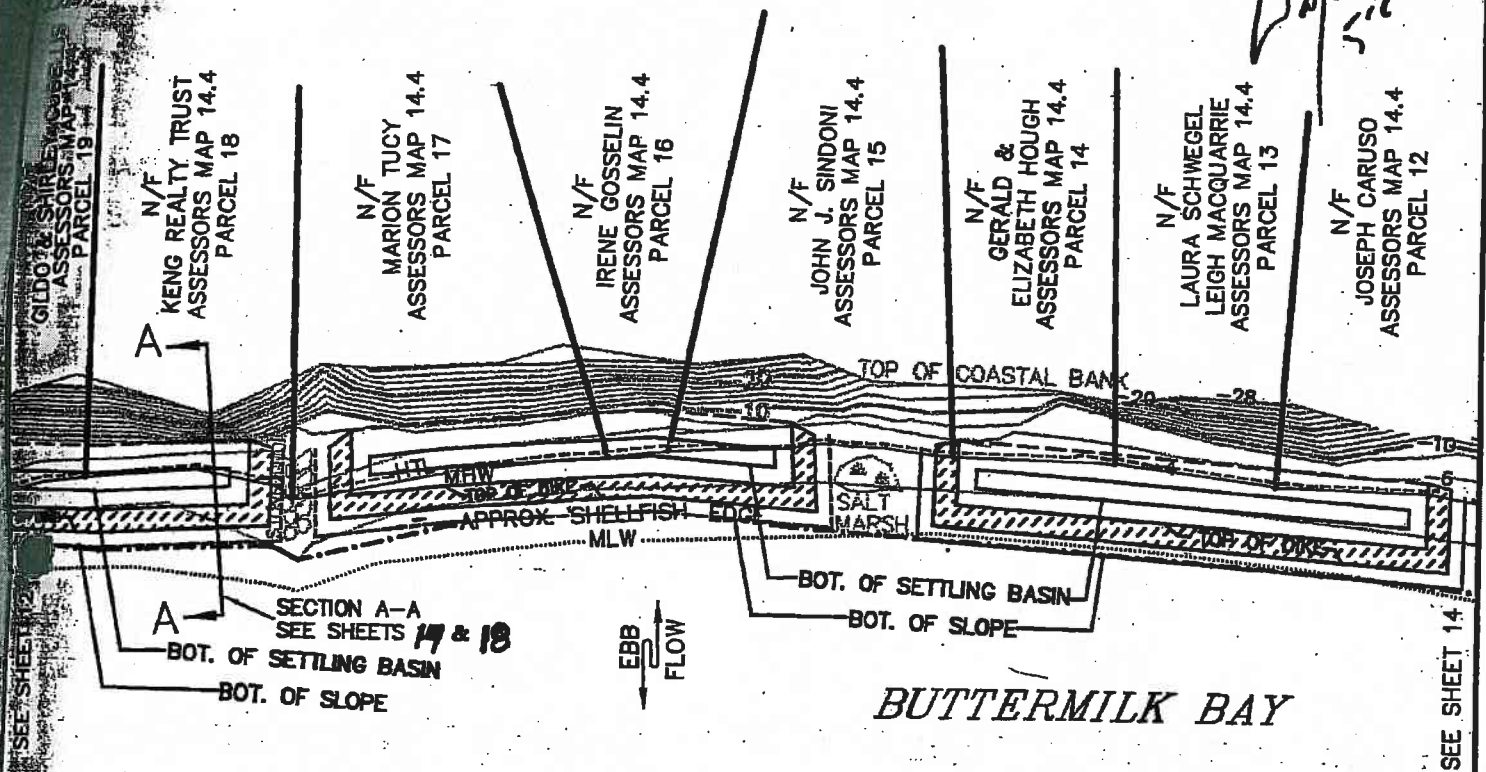
DATE: DEC. 29, 2000 SHEET 14 OF 20

SEE SHEET 13

007-072-000-017-100



LEWIS POINT RD.



PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: JUN 28 2001

SCALE: 1" = 100'

JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001



PURPOSE:
PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

STILLING BASIN
LAYOUT
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE

APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA 02532

DATE: DEC. 29, 2000 SHEET 15 OF 20

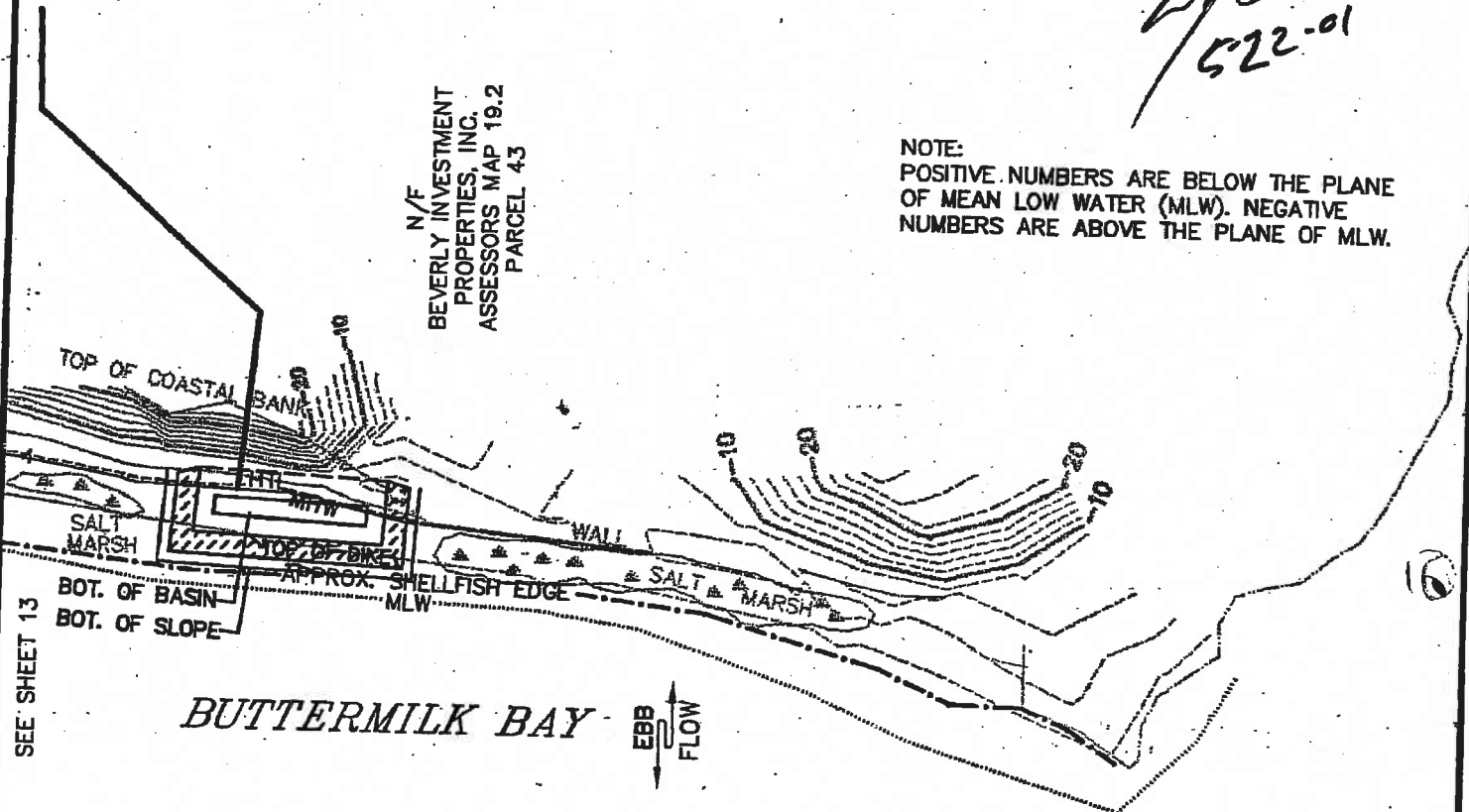
007-012-000-017-100



522-01

N/F
BEVERLY INVESTMENT
PROPERTIES, INC.
ASSESSORS MAP 19.2
PARCEL 43

NOTE:
POSITIVE NUMBERS ARE BELOW THE PLANE
OF MEAN LOW WATER (MLW). NEGATIVE
NUMBERS ARE ABOVE THE PLANE OF MLW.



BUTTERMILK BAY



PERMIT NO. 9881

Approved by Department of Environmental Protection
Date: JUN 28 2001

JOB NO. 4-8075.00 DWG. NO. 5157-04

FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001

SCALE: 1" = 100'



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

STILLING BASIN
LAYOUT
PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY

IN: BOURNE, MA

COUNTY OF: BARNSTABLE

APPLICANT:

TOWN OF BOURNE

SHORE & HARBOUR COMMITTEE

24 PERRY AVE.

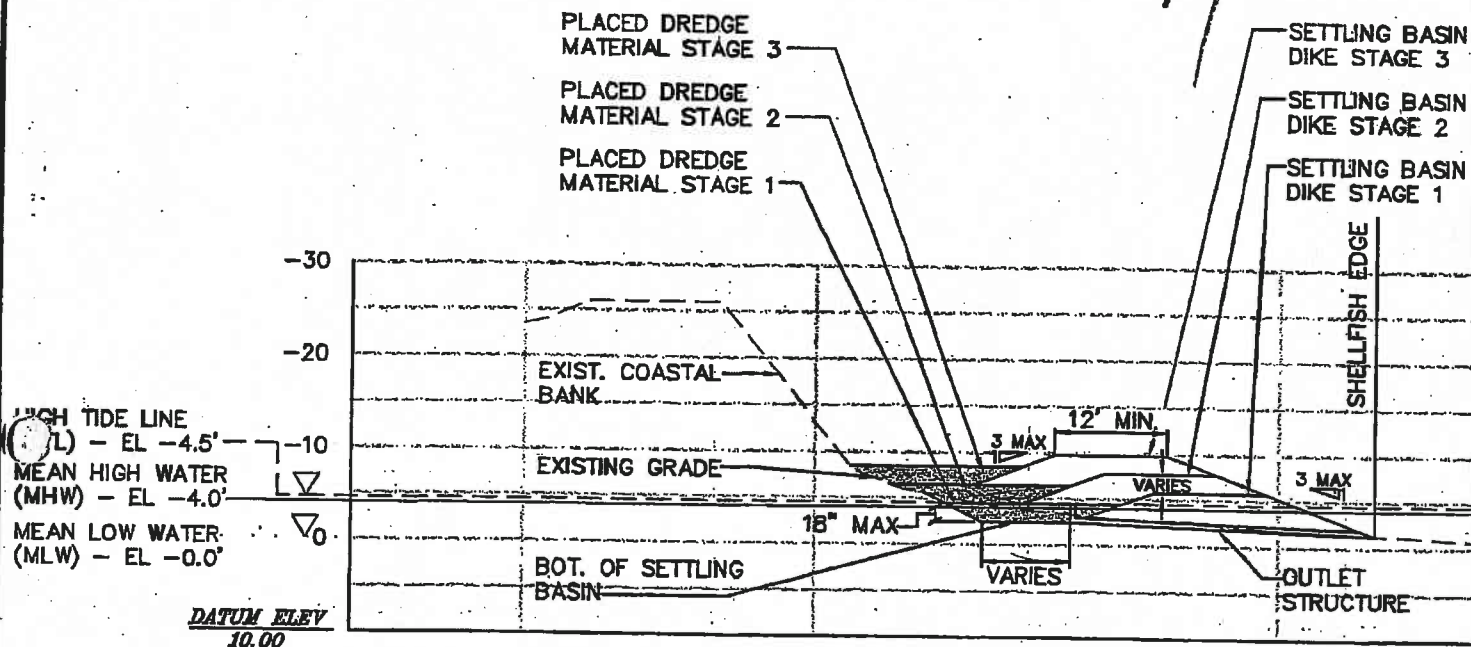
BOURNE, MA 02532

DATE: DEC. 29, 2000 SHEET 16 OF 20

001-012-000-017-100



Handwritten: 5-22-01



SECTION A-A
(SHOWING SETTLING BASIN)
(SEE SHEET 15)

PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: **JUN 28 2001**

SCALE: 1" = 20' HORZ. & VERT.

JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001



PURPOSE:
PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

**TYPICAL
SETTLING
BASIN
SECTION**

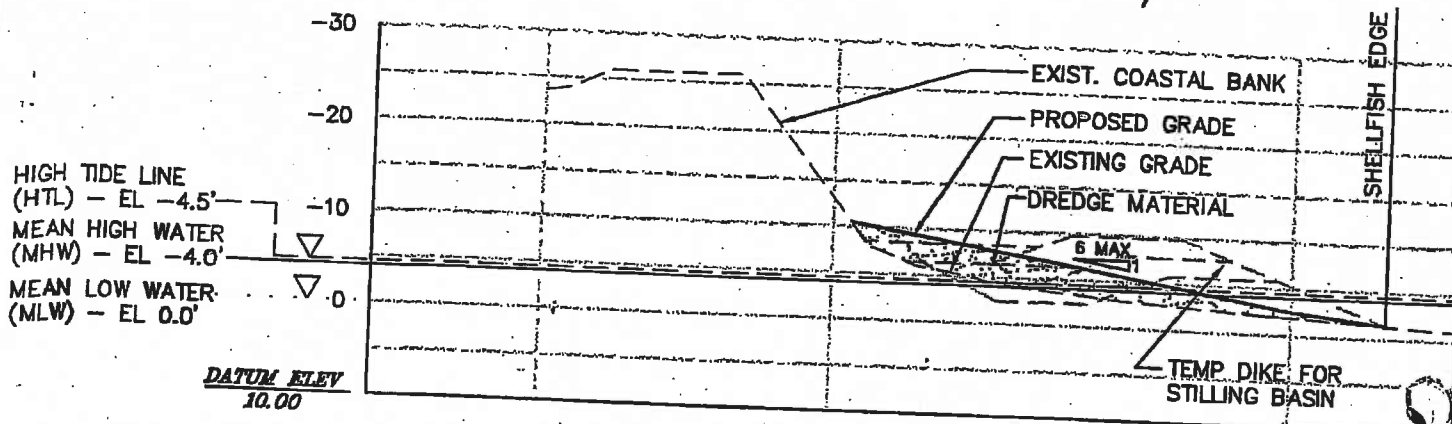
**PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT**

AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA 02532
DATE: DEC. 29, 2000 SHEET 17 OF 20

001-072-000-017-100



10-22-01



SECTION A-A
FINISHED PROFILE
(SEE SHEET 15)

PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

SCALE: 1" = 20' HORZ. & VERT.

JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN 8075-AC0E

REV MAY 18, 2001
REV JAN 16, 2001



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.5'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

**TYPICAL
BEACH
NOURISHMENT
SECTION**

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY
IN: BOURNE, MA

COUNTY OF: BARNSTABLE

APPLICANT:

TOWN OF BOURNE

SHORE & HARBOUR COMMITTEE

24 PERRY AVE.
BOURNE, MA 02532

DATE: DEC. 29, 2000 SHEET 18 OF 20

007-072-000-017-100

N/F
JOY REALTY TRUST
SUSAN LADD TRUSTEE
ASSESSORS MAP 19.2
PARCEL 50
21 LEWIS POINT ROAD

N/F
FRANK & MARY KOCHNOWICZ
ASSESSORS MAP 19.2
PARCEL 47
15 LEWIS POINT ROAD

LEWIS POINT ROAD

EXISTING DWELLING

N/F
KENNETH & DIANE TURPIN
ASSESSORS MAP 19.2
PARCEL 50
7 LEWIS POINT ROAD

PROPOSED DEWATERING PIPE
EXISTING 40' WIDE BEACH

2,200 C.Y. DISPOSAL AREA
PROPOSED WOODEN DRAINAGE WEIR
DURING DEWATERING

WRACK LINE

EDGE OF SALT MARSH

EBB FLOW

QUEEN SEWELL COVE



NOTE:
NEGATIVE NUMBERS ARE BELOW THE PLANE OF MEAN/LOW WATER (MLW). POSITIVE NUMBERS ARE ABOVE THE PLANE OF MLLW.

PERMIT NO. 8881

Approved by Department of Environmental Protection
Date: JUN 28 2001

SCALE: 1" = 60'



JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001

PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

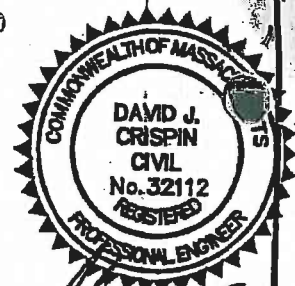
THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

UPLAND DISPOSAL
AREA AT #15
LEWIS POINT
ROAD
GRADING PLAN

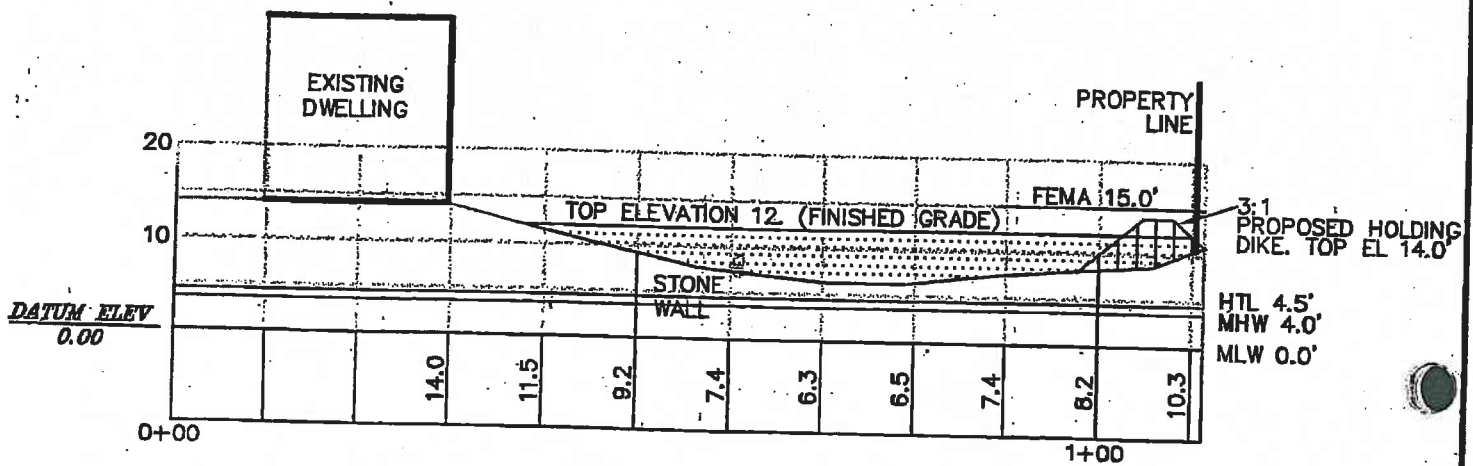
PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT
AT: BUTTERMILK BAY
IN: BOURNE, MA
COUNTY OF: BARNSTABLE
APPLICANT:
TOWN OF BOURNE
SHORE & HARBOUR COMMITTEE
24 PERRY AVE.
BOURNE, MA 02532
DATE: DEC. 29, 2000 SHEET, 19 OF 20

SEE SHEET 18

007-073-000-017-100



10-22-01



SECTION E-E
(SEE SH-19)

PERMIT NO. 8881

Approved by Department of Environmental Protection

Date: JUN 28 2001

SCALE: 1" = 20' HORIZ. & VERT.

JOB NO. 4-8075.00 DWG. NO. 5157-04 FILE DESIGN\8075-ACOE

REV MAY 18, 2001
REV JAN 16, 2001



PURPOSE:

PROPOSED BUTTERMILK BAY
CHANNEL DREDGING/
BEACH NOURISHMENT

MLW = 0.0'
MHW = 4.0'
HTL = 4.5'

THE BSC GROUP, INC.
384 WASHINGTON STREET
NORWELL, MA 02061

UPLAND DISPOSAL
AREA AT #15
LEWIS POINT
ROAD
SECTION PLAN

PROPOSED CHANNEL DREDGING/
BEACH NOURISHMENT

AT: BUTTERMILK BAY

IN: BOURNE, MA

COUNTY OF: BARNSTABLE

APPLICANT:

TOWN OF BOURNE

SHORE & HARBOUR COMMITTEE

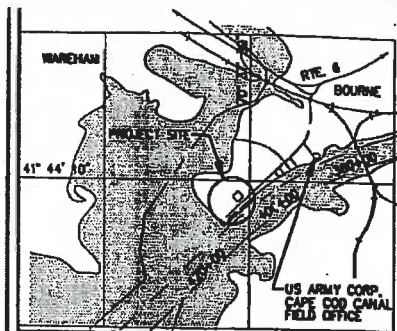
24 PERRY AVE.

BOURNE, MA 02532

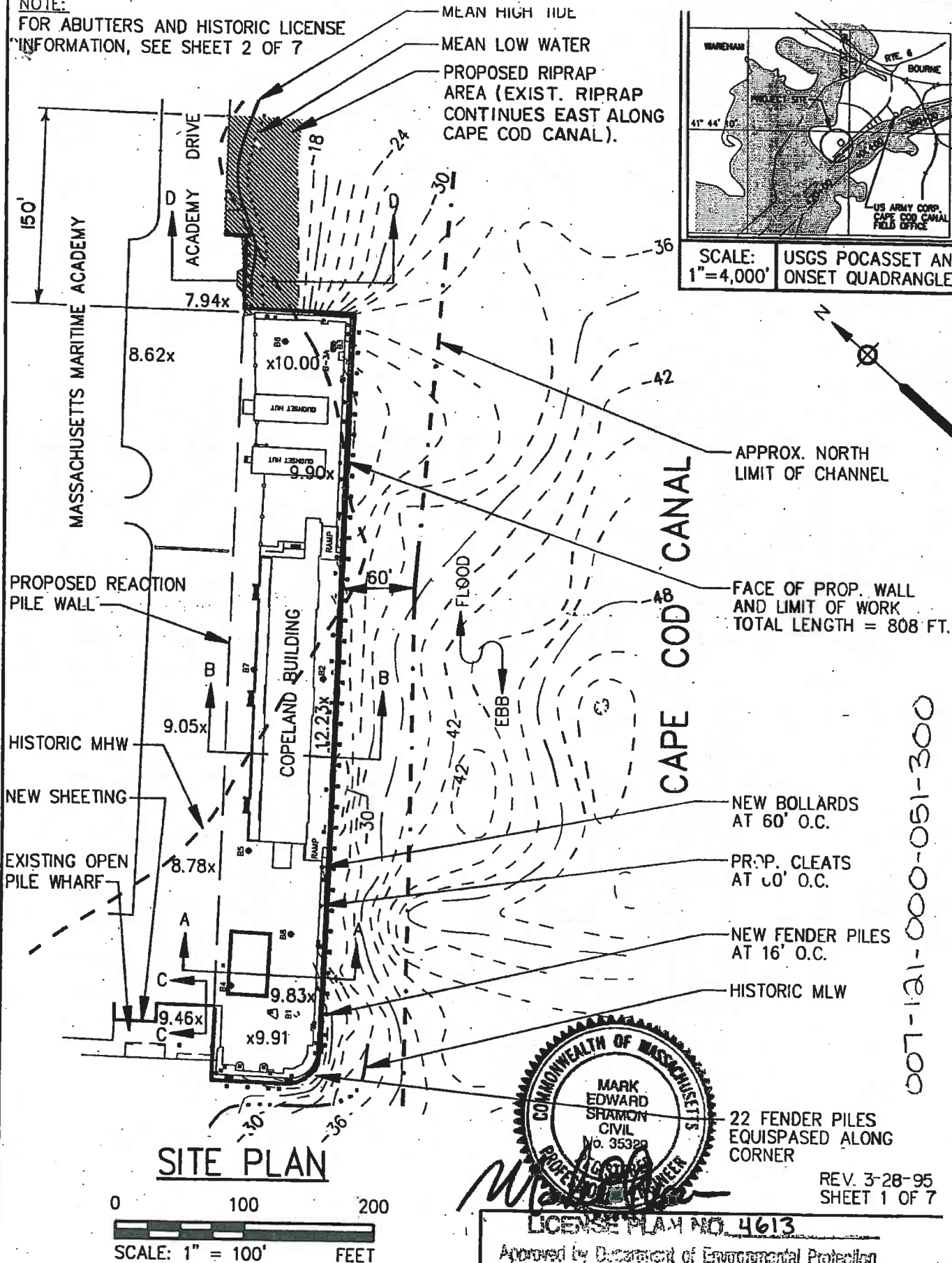
DATE: DEC. 29, 2000 SHEET 20 OF 20

NOTE:
FOR ABUTTERS AND HISTORIC LICENSE
INFORMATION, SEE SHEET 2 OF 7

MEAN HIGH TIDE
MEAN LOW WATER
PROPOSED RIPRAP
AREA (EXIST. RIPRAP
CONTINUES EAST ALONG
CAPE COD CANAL).



SCALE: 1"=4,000' USGS POCASSET AND
ONSET QUADRANGLE



LICENSE PLAN NO. 4613

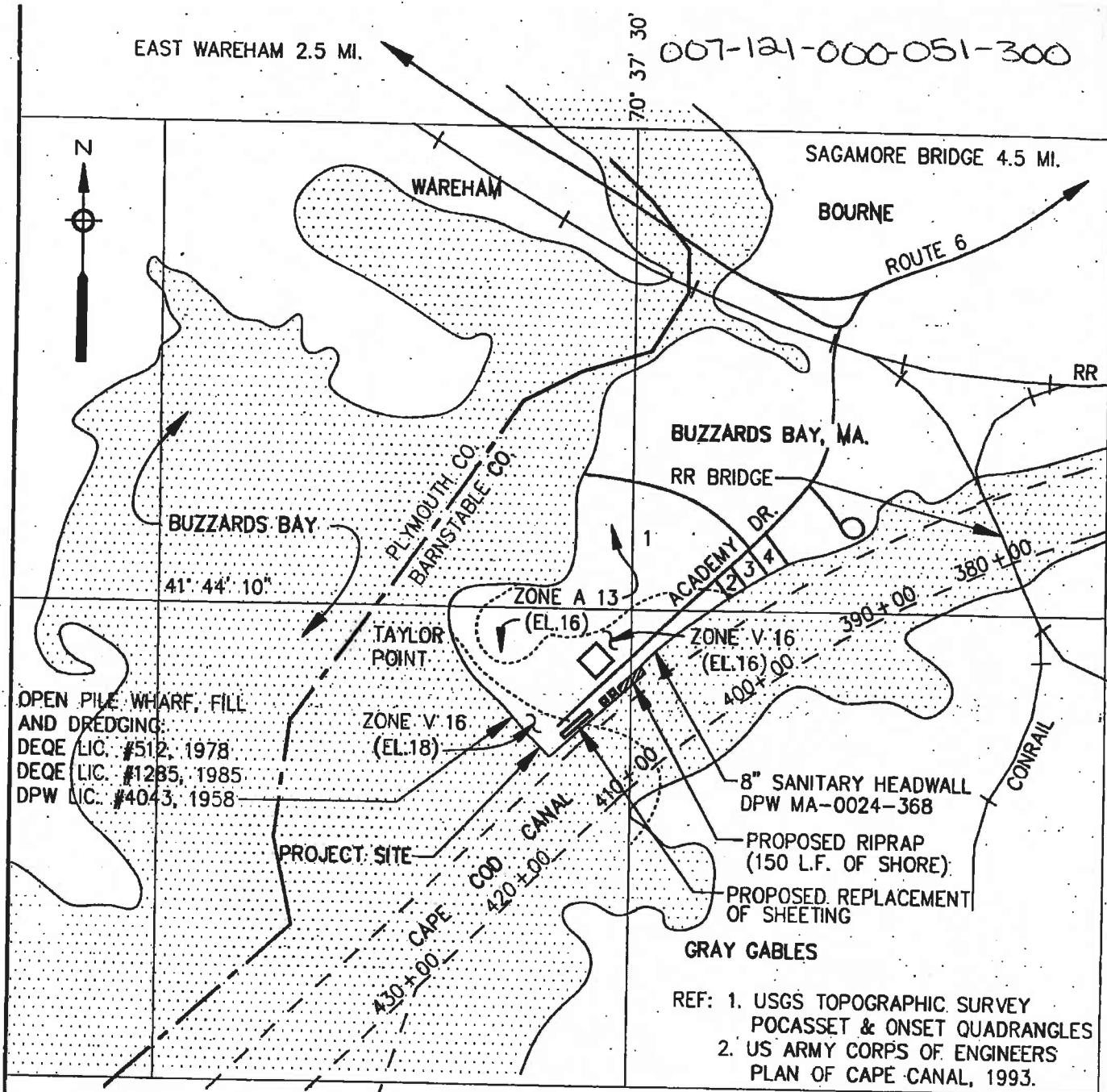
Approved by Department of Environmental Protection

Thomas B. Pappas
Calvin D. Smith
J. J. Sigafoos
MAY 3 1995

PLAN ACCOMPANYING THE PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL PLANNING AND OPERATIONS ON
BEHALF OF THE MASSACHUSETTS MARITIME ACADEMY
TO REPLACE A STEEL BULKHEAD ON THE CAPE
COD CANAL IN BOURNE, MA.

007-121-000-051-300

REV. 3-28-95
SHEET 1 OF 7



VICINITY PLAN LICENSE PLAN NO. 4613

PROPERTY IDENTIFICATION

SCALE: 1:12500

Approved by Department of Environmental Protection

Date: MAY 3 1995

1. COMMONWEALTH OF MASSACHUSETTS, TRUSTEES OF STATE COLLEGE (MASS. MARITIME ACADEMY)
2. N/F SUSAN RYAN, 70 ACADEMY DRIVE
3. N/F FRANK J. AND EILEEN M. FORD, 66 ACADEMY DRIVE
4. N/F MARY J. McLAUGHLIN, 64 ACADEMY DRIVE

NOTES:

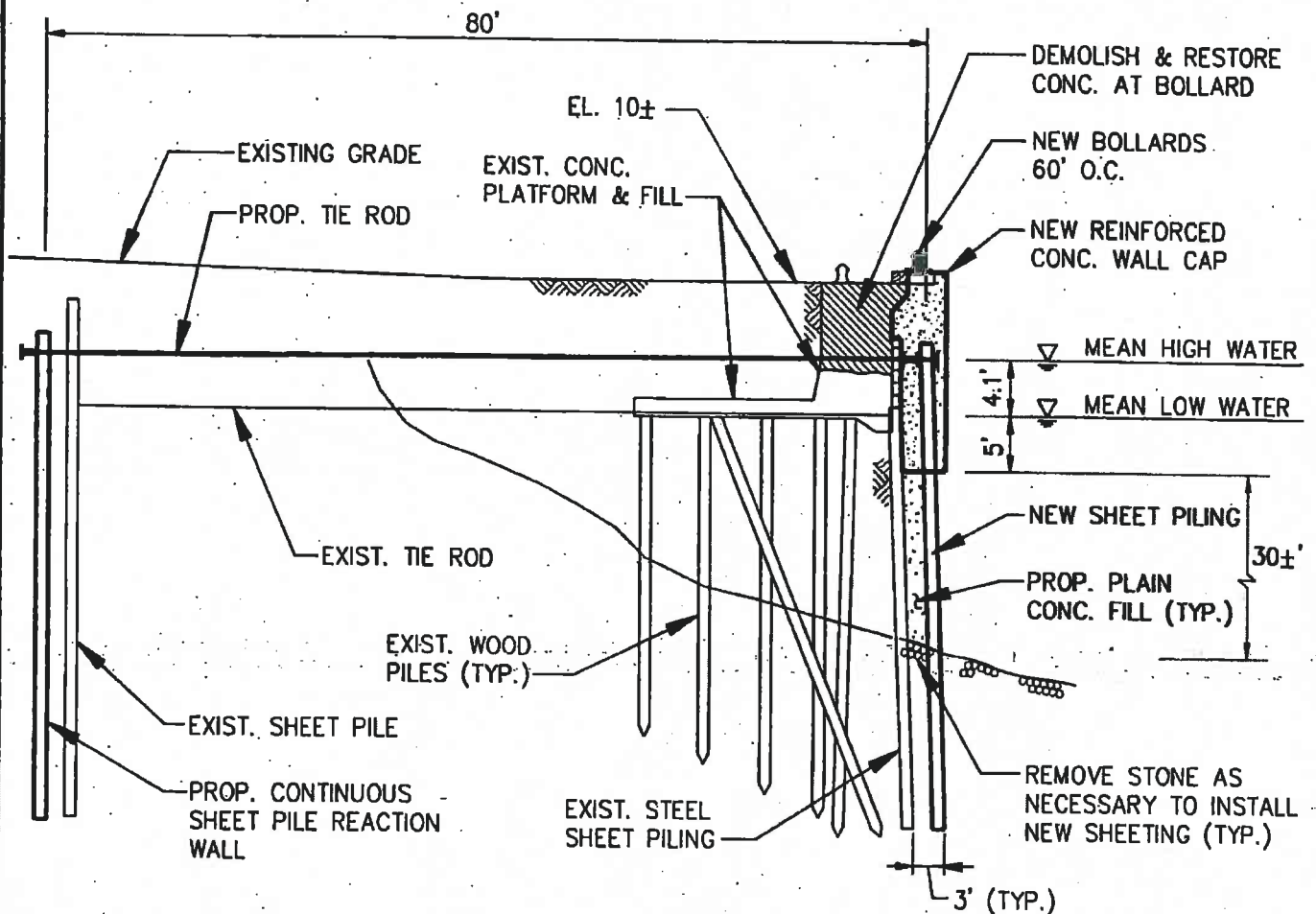
1. EXISTING BULKHEAD STRUCTURES WERE BUILT BY COMMONWEALTH OF MASS. DEPARTMENT OF PUBLIC WORKS, DIVISION OF WATERWAYS UNDER CONTRACT #312 (1932) AND CONTRACT #362 (1933). WATERWAYS LICENSES WERE NOT ISSUED.
2. CONTOURS SHOWN THUS ----- ARE AS DEFINED BY FEMA (1985).



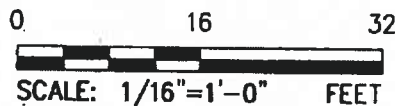
Mark Edward Shamon

REVISED 3-28-95
SHEET 2 OF 7

007-121-000-051-300



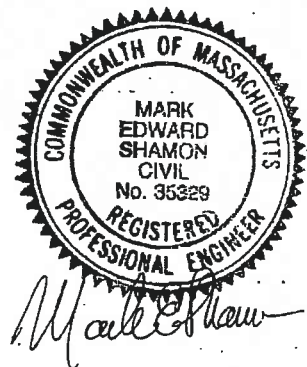
SECTION A-A

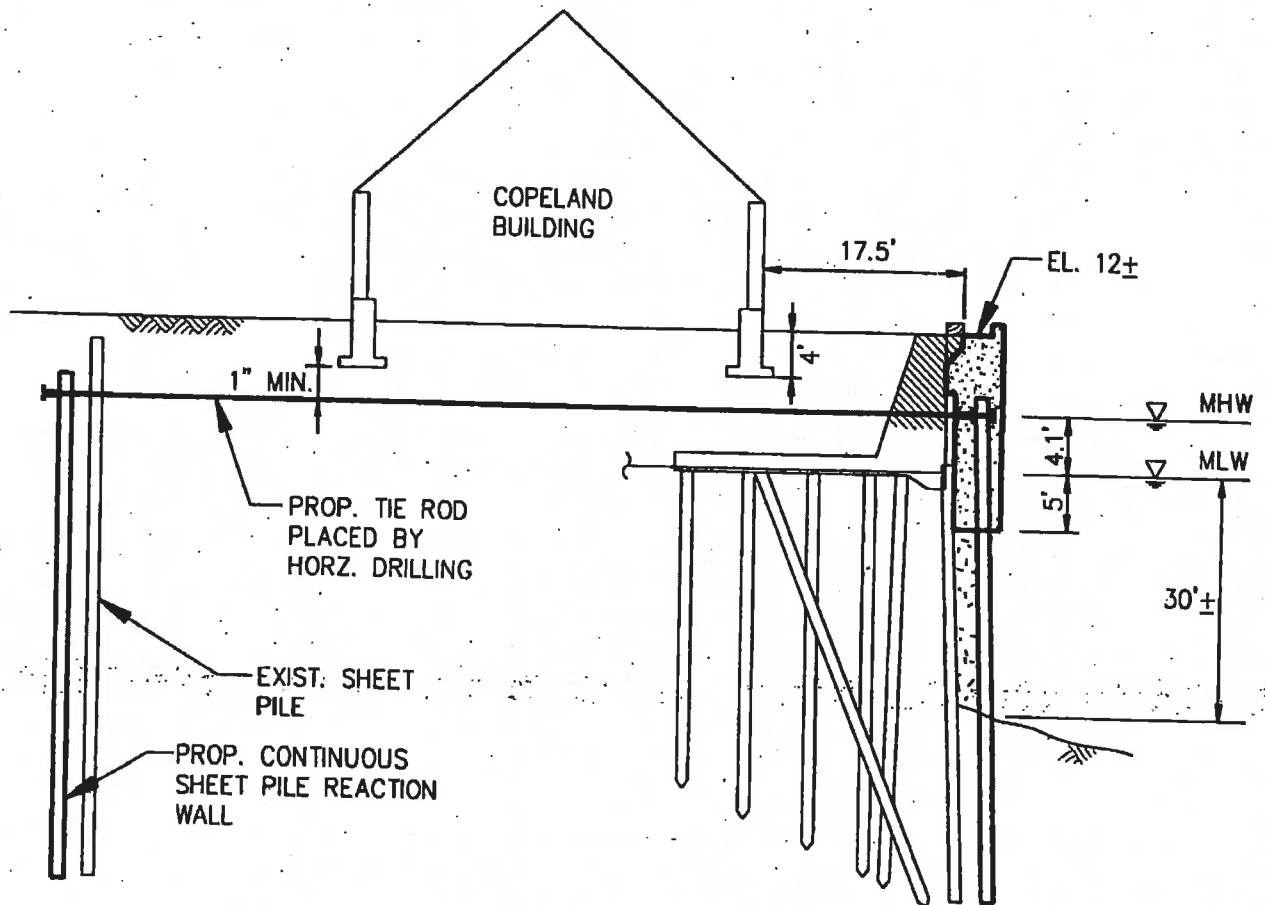


LICENSE PLAN NO. 4613
 Approved by Department of Environmental Protection
 Date: **MAY 3 1995**

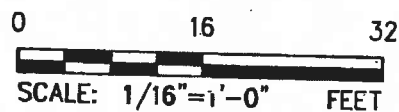
NOTES:

1. CONTRACTOR MAY NEED TO DISPLACE EXISTING ROCK TO INSTALL NEW SHEET PILES. PILES ARE 15" THICK. ROCK IS 3± FEET DEEP.
2. VOLUME OF PROPOSED STRUCTURE AND FILL, IS
 1450 CY TO MLW
 1647 CY TO MHW
3. VOLUME OF STONE DISPLACEMENT TO INSTALL NEW SHEETING IS 110 CY.





SECTION B-B



LICENSE PLAN NO. 4613

Approved by Department of Environmental Protection

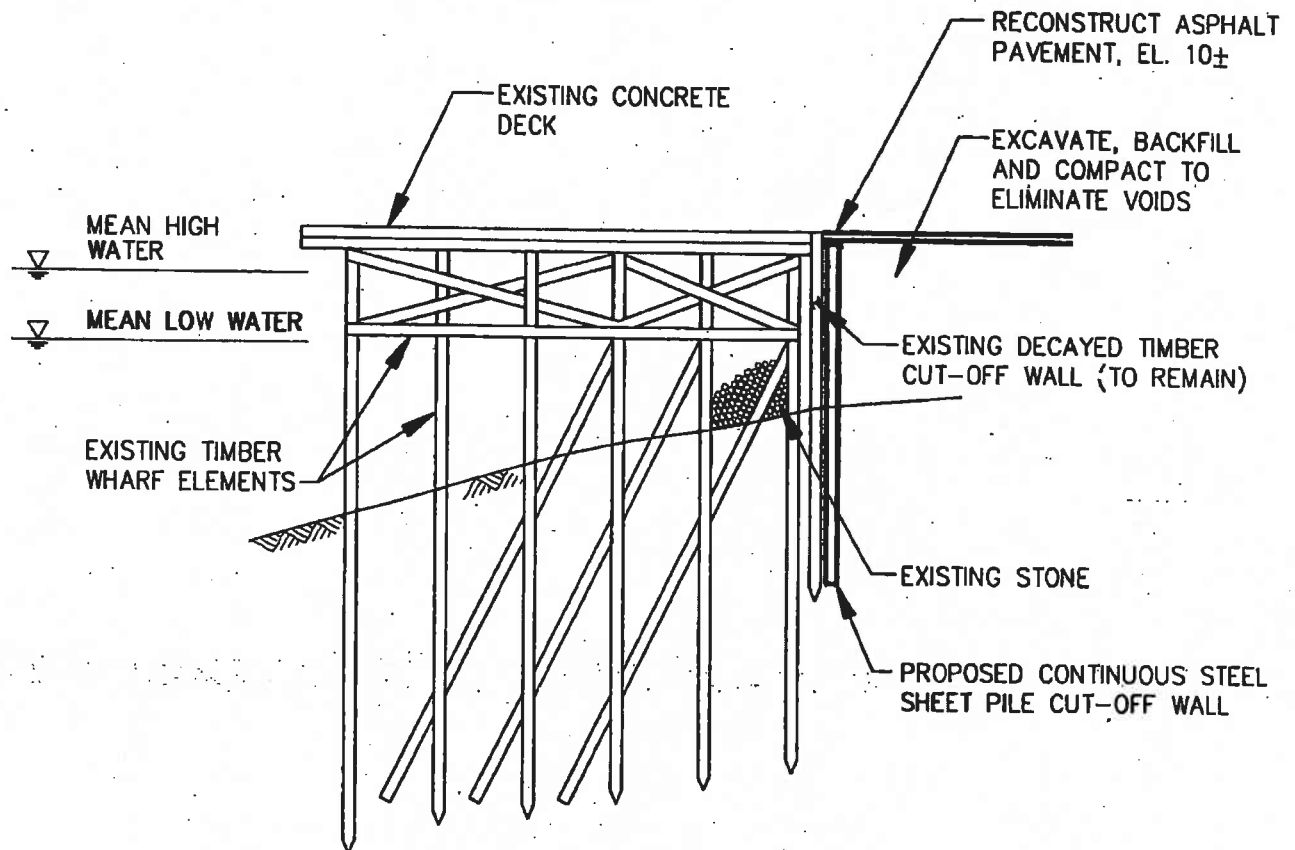
Date: MAY 3 1995

NOTES:

1. CONTRACTOR MAY NEED TO DISPLACE EXISTING ROCK TO INSTALL NEW SHEET PILES. PILES ARE 15" THICK. ROCK IS 3± FEET DEEP.
2. VOLUME OF PROPOSED STRUCTURE AND FILL, IS
1450 CY TO MLW
1647 CY TO MHW
3. VOLUME OF DISPLACEMENT TO INSTALL NEW SHEETING IS 110 CY.



007-121-000-051-300



SECTION C-C

0 16 32
SCALE: 1/16"=1'-0" FEET

LICENSE PLAN NO. 4613

Approved by Department of Environmental Protection

Date:

MAY 3 1995

NOTE:

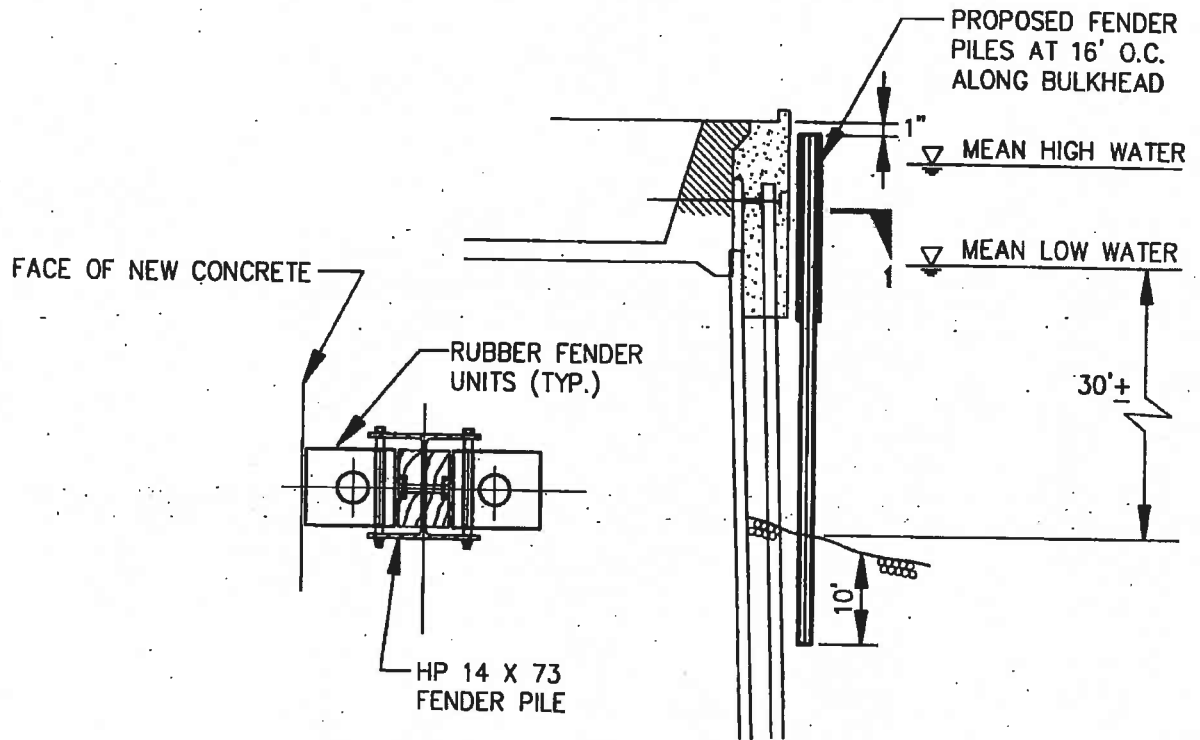
1. NEW SHEETING ALONG EXISTING OPEN PILE WHARF WILL BE 110 FEET LONG, AND WILL NOT REQUIRE ANY DREDGING OR FILLING OF THE WATERWAY.



Mark Shamon

REV 3-28-95
SHEET 5 OF 7

007-121-000-051-360



DETAIL 1

SCALE: 1/2"=1'-0"

**BULKHEAD SECTION AT
PROPOSED FENDER PILE**

LICENSE PLAN NO. 4613

Approved by Department of Environmental Protection

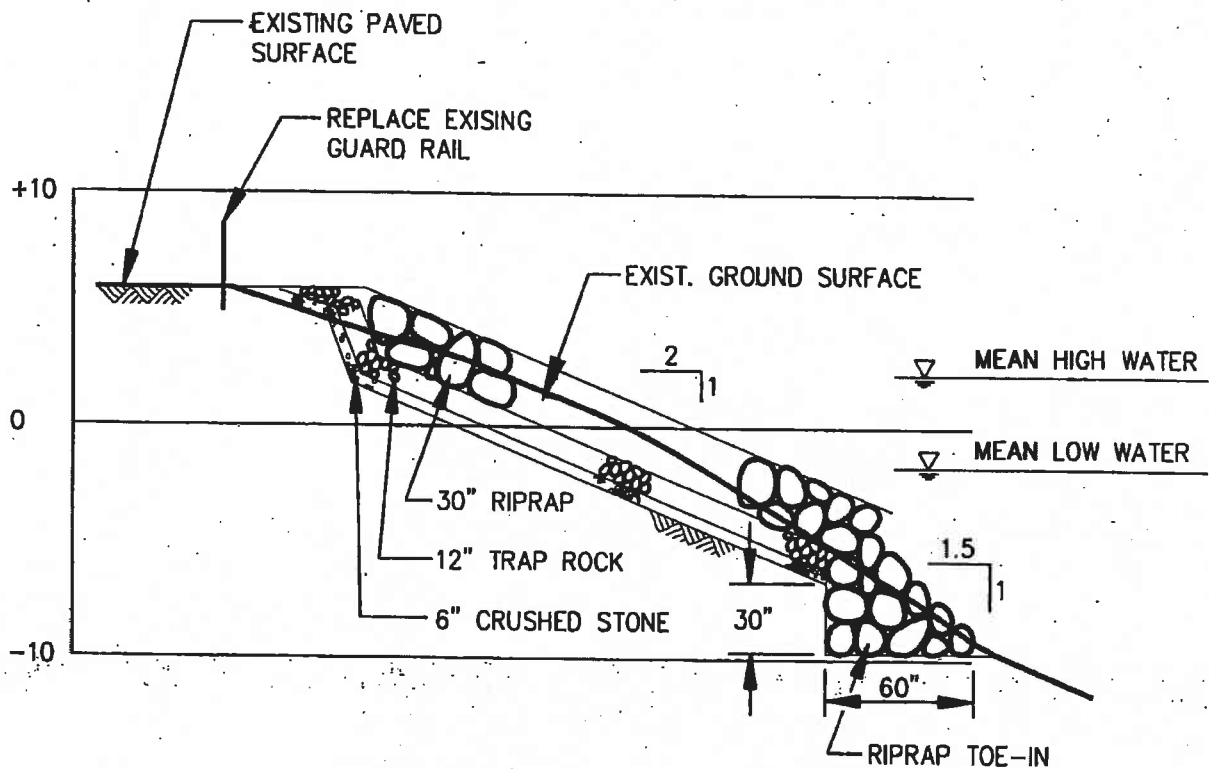
Date: **MAY 3 1995**

FENDER PILE DETAIL

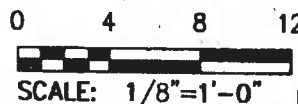


Mark Shamon

007-121-000-051-300



SECTION D-D RIPRAP DETAIL



LICENSE PLAN NO. 4613
 Approved by Department of Environmental Protection
 Date: **MAY 3 1995**

4. EXIST. RIPRAP EXTENDS FROM TOP OF BANK TO MLW.

NOTES:

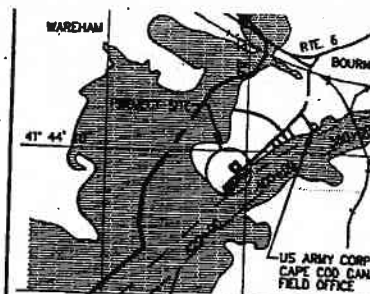
1. CONTRACTOR TO PREPARE EXISTING SLOPE BY REMOVAL OF EXISTING ROCK, CONCRETE AND DEBRIS. DREDGE A TRENCH TO TOE-IN THE PROPOSED RIPRAP. PROPOSED RIPRAP REPLACEMENT TO EXTEND 150 FEET FROM BULKHEAD ALONG THE CANAL.
2. VOLUME OF PROPOSED EXCAVATION (DREDGING) IS APPROXIMATELY 200 CY
3. VOLUME OF PROPOSED FILLING (RIPRAP) IS
 800 CY TO MLW
 1100 CY TO MHW



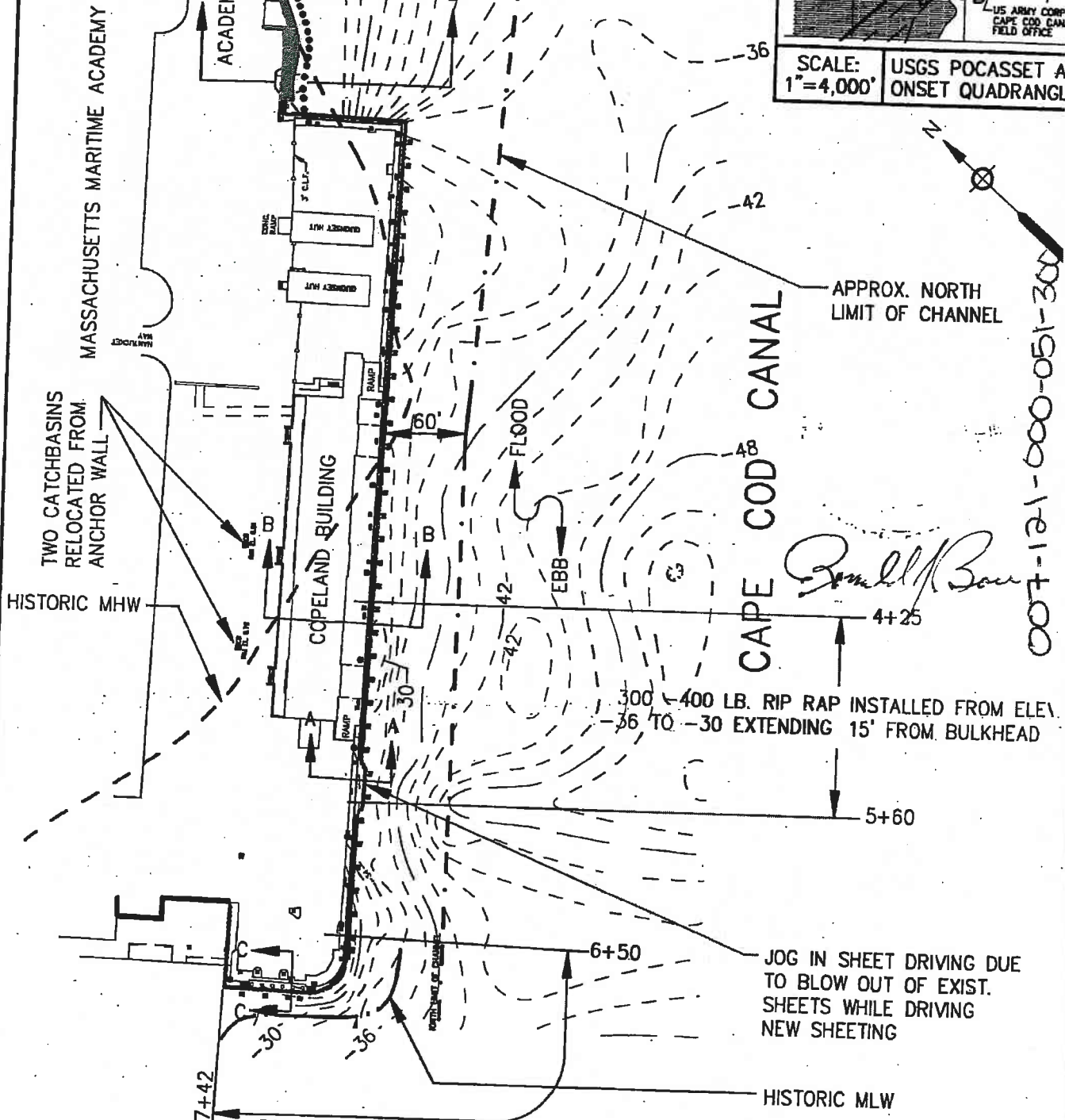
REV. 3-28-95
 SHEET 7 OF 7

FOR ADDITIONAL AND HISTORIC ELEVATION INFORMATION, SEE SHEET 2 OF 5

MEAN HIGH TIDE
MEAN LOW WATER



SCALE: 1"=4,000' USGS POCASSET A ONSET QUADRANGLE



SITE PLAN

SCALE: 1"=100'

PLAN ACCOMPANYING THE PETITION OF THE COMMONWEALTH OF MASSACHUSETTS, DIVISION OF CAPITAL PLANNING AND OPERATIONS ON BEHALF OF THE MASSACHUSETTS MARITIME ACADEMY TO AMEND WATERWAYS LICENSE # 4613

Bourne

LICENSE PLAN NO. 7597

Approved by Department of Environmental Protection of Massachusetts

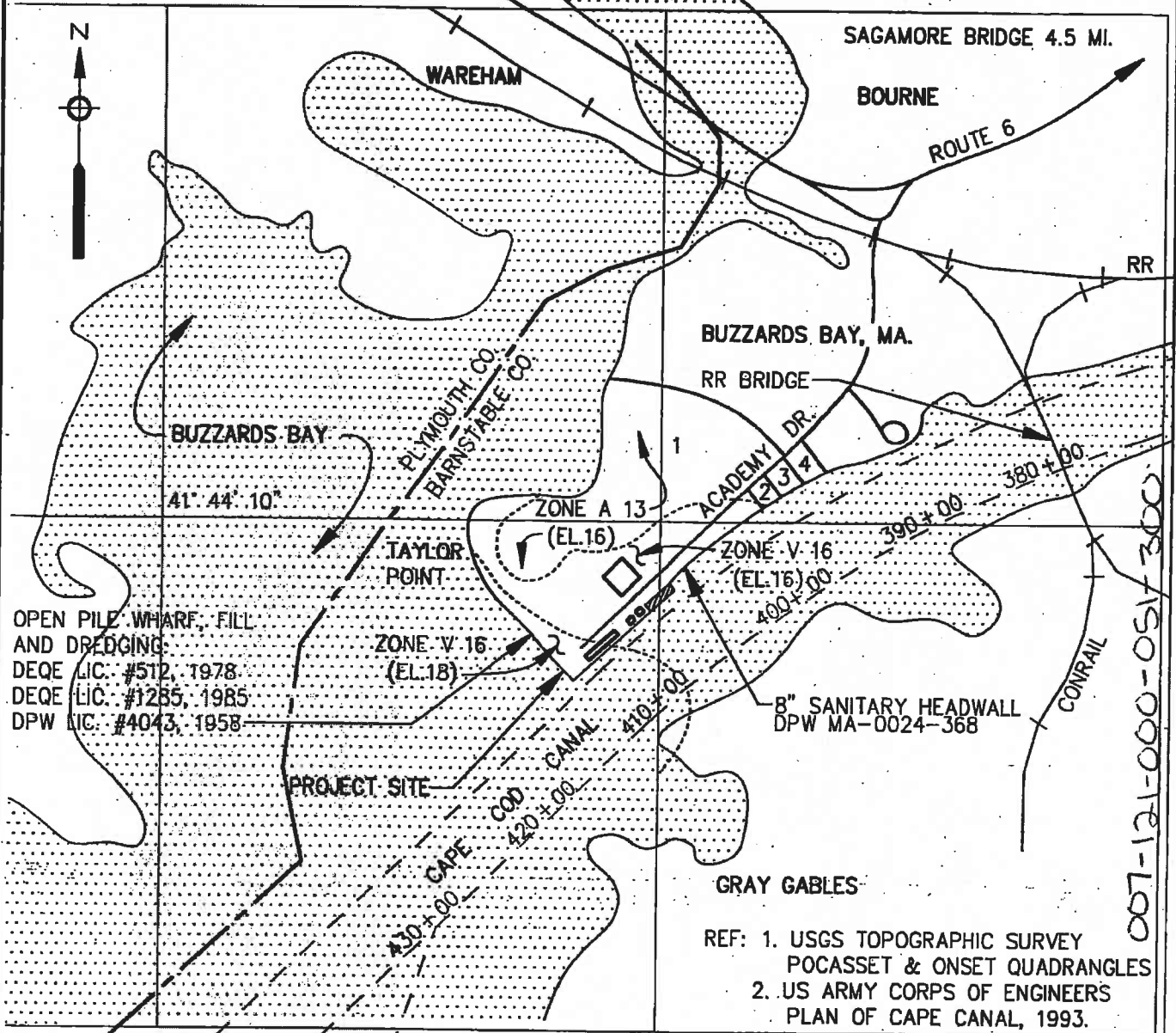
Eugene A. Kouloukera
R. W. J. J.
OCT 01 1998

SHEET 1 OF 5

007-121-000-051-300

EAST WAREHAM 2.5 MI.

Approved by Department of Environmental Protection
Date: OCT 01 1998



VICINITY PLAN

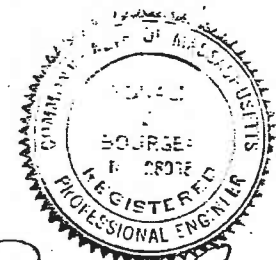
PROPERTY IDENTIFICATION

SCALE: 1:12500

1. COMMONWEALTH OF MASSACHUSETTS, TRUSTEES OF STATE COLLEGE (MASS. MARITIME ACADEMY)
2. N/F SUSAN RYAN, 70 ACADEMY DRIVE
3. N/F FRANK J. AND EILEEN M. FORD, 66 ACADEMY DRIVE
4. N/F MARY J. McLAUGHLIN, 64 ACADEMY DRIVE

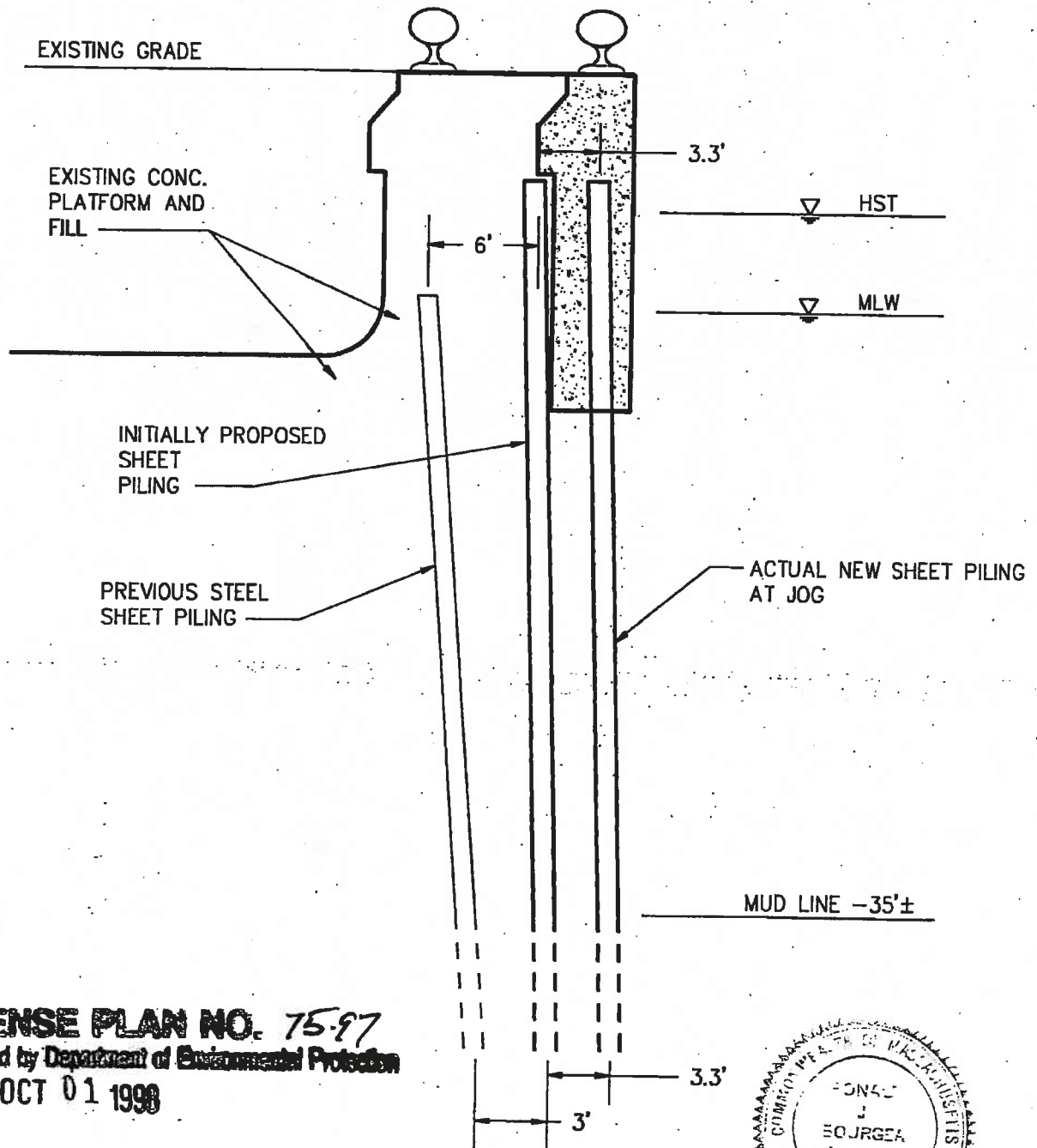
NOTES:

1. PREVIOUS BULKHEAD STRUCTURES WERE BUILT BY COMMONWEALTH OF MASS. DEPARTMENT OF PUBLIC WORKS, DIVISION OF WATERWAYS UNDER CONTRACT #312 (1932) AND CONTRACT #362 (1933). REPLACEMENT OF THE BULKHEAD WAS COMPLETED UNDER WATERWAYS LICENSE NO. 4613.
2. CONTOURS SHOWN THUS ----- ARE AS DEFINED BY FEMA (1985).



Ronald J. Bourque

TYPICAL CROSS-SECTION OF 36-FOOT LONG, 40-INCH
WIDE JOG IN BULKHEAD ALIGNMENT BETWEEN STATION
5+28 AND 5+64.
RESULTED IN INCREASE IN FILL OF 140 CY
BELOW MLW AND 165 CY BELOW MHW IMPACTED
AREA = 120 SF.

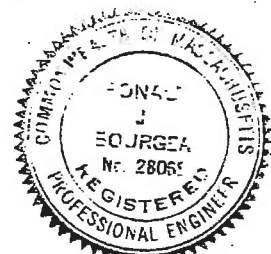


LICENSE PLAN NO. 75-87
Approved by Department of Environmental Protection
Date OCT 01 1990

CROSS SECTION A

SCALE: 1/8"=1'-0"

HST: +3.4
MHW: +2.4
MLW: -1.7



Ronald J. Bourgeois

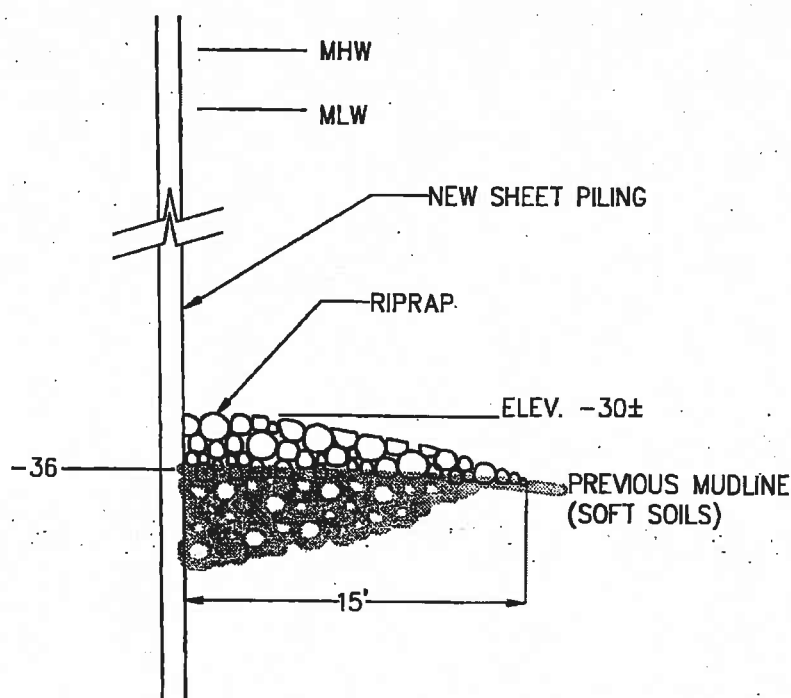
007-121-000-051-300

007-121-000-051-300

TYPICAL CROSS-SECTION OF RIPRAP PLACEMENT
OUTSIDE BULKHEAD BETWEEN STATION 4+25 AND
5+60

IMPACT AREA: 2,000 SF

APPROXIMATELY 225 CY OF FILL WERE PLACED
BETWEEN -30 AND -36. AN UNDETERMINED
QUANTITY OF RIPRAP SUNK BELOW THE EXISTING
MUDLINE.



HST: +3.4
MHW: +2.4
MLW: -1.7

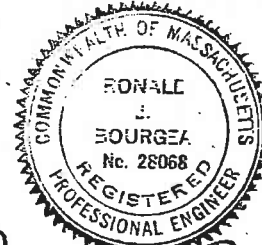
CROSS SECTION B

SCALE: 1/8"=1'-0"

LICENSE PLAN NO. 7597

Approved by Department of Environmental Protection

Date: OCT 01 1998



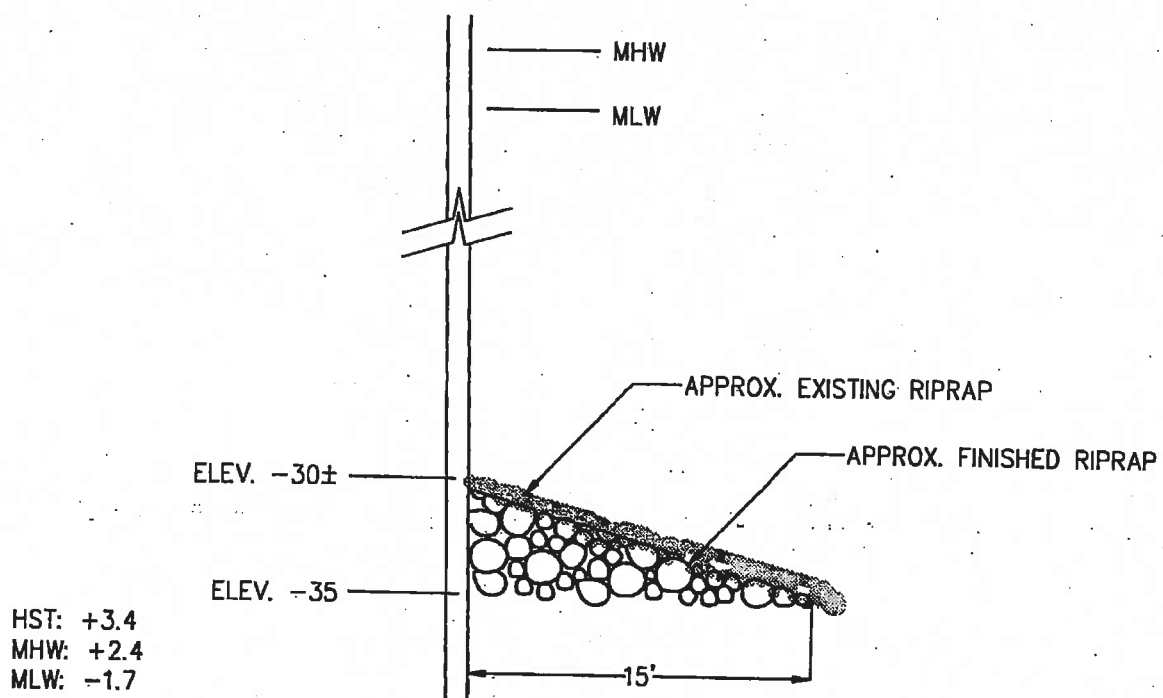
Ronald J. Bourgea

007-121-000-051-300

TYPICAL CROSS-SECTION OF RIPRAP REPLACEMENT
BETWEEN STATION 6+50 AND 7+42

IMPACT AREA: 1,380 SF

NO CHANGE IN THE VOLUME OF FILL, APPROXIMATELY
130 CY OF RIPRAP WERE REPLACED TO LOCATION
THAT WAS RIPRAPPED PRIOR TO CONSTRUCTING
THE NEW BULKHEAD.



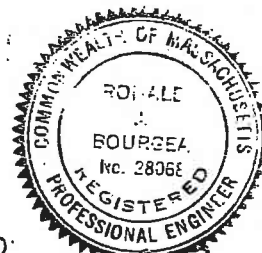
CROSS SECTION C

SCALE: 1/8"=1'-0"

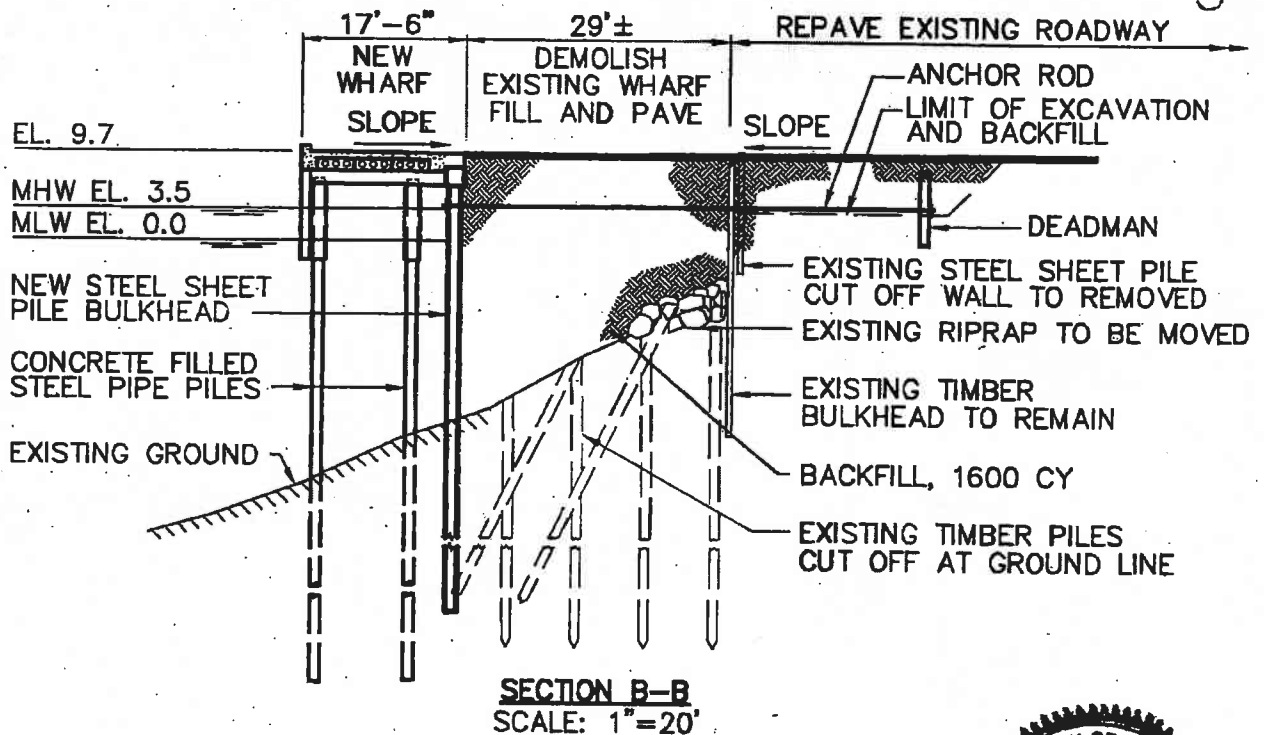
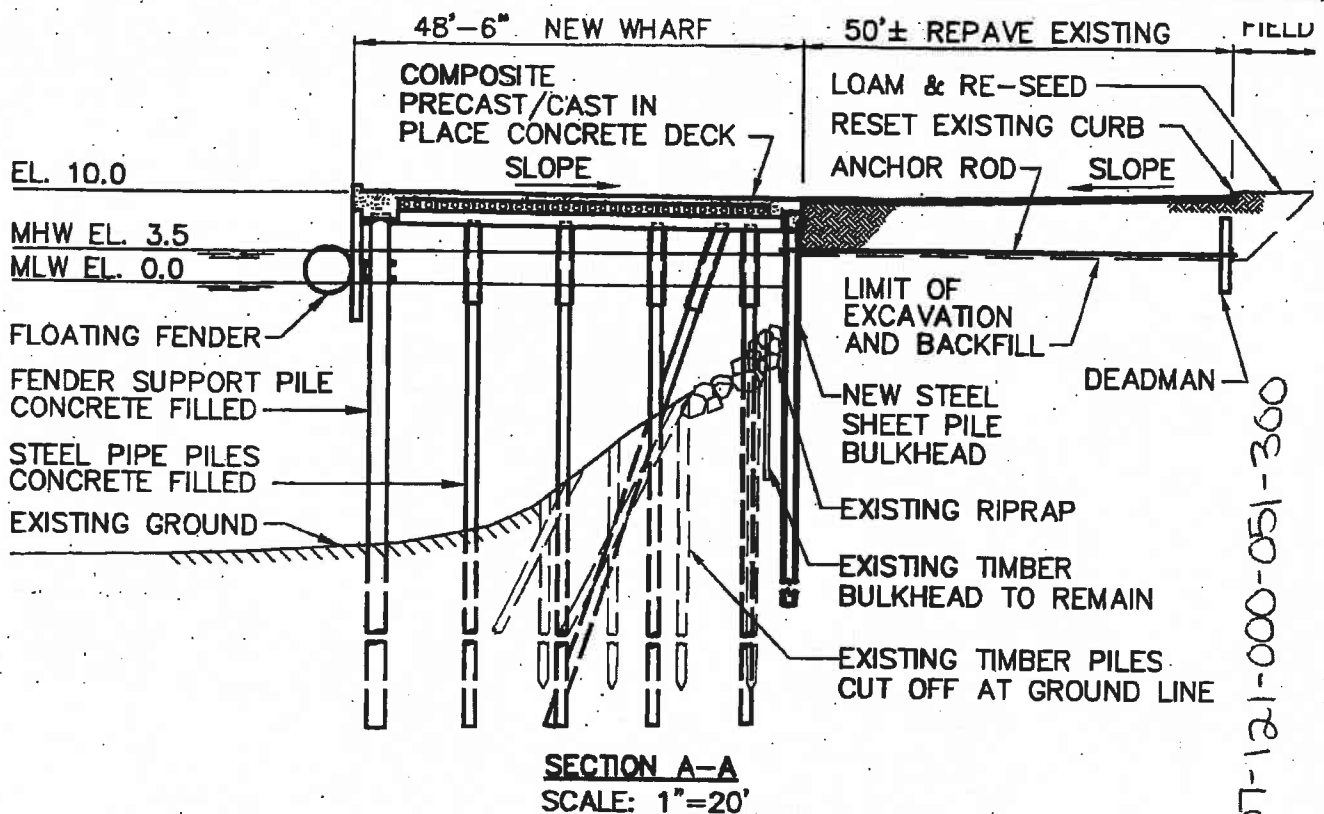
LICENSE PLAN NO. 7597

Approved by Department of Environmental Protection

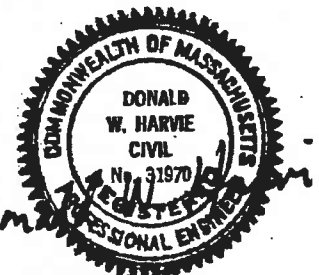
Date: OCT 01 1998



Ronald Bourgea



PLAN ACCOMPANYING PETITION OF THE COMMONWEALTH OF MASSACHUSETTS, DIVISION OF CAPITAL ASSET MANAGEMENT ON BEHALF OF THE MASSACHUSETTS MARITIME ACADEMY TO LICENSE, RECONSTRUCT, AND MAINTAIN A BULKHEAD AND WHARF AND LICENSE CONSTRUCT AND MAINTAIN FLOATING DOCKS IN BUZZARDS BAY, TOWN OF BOURNE, MA FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS BURLINGTON, MASS.



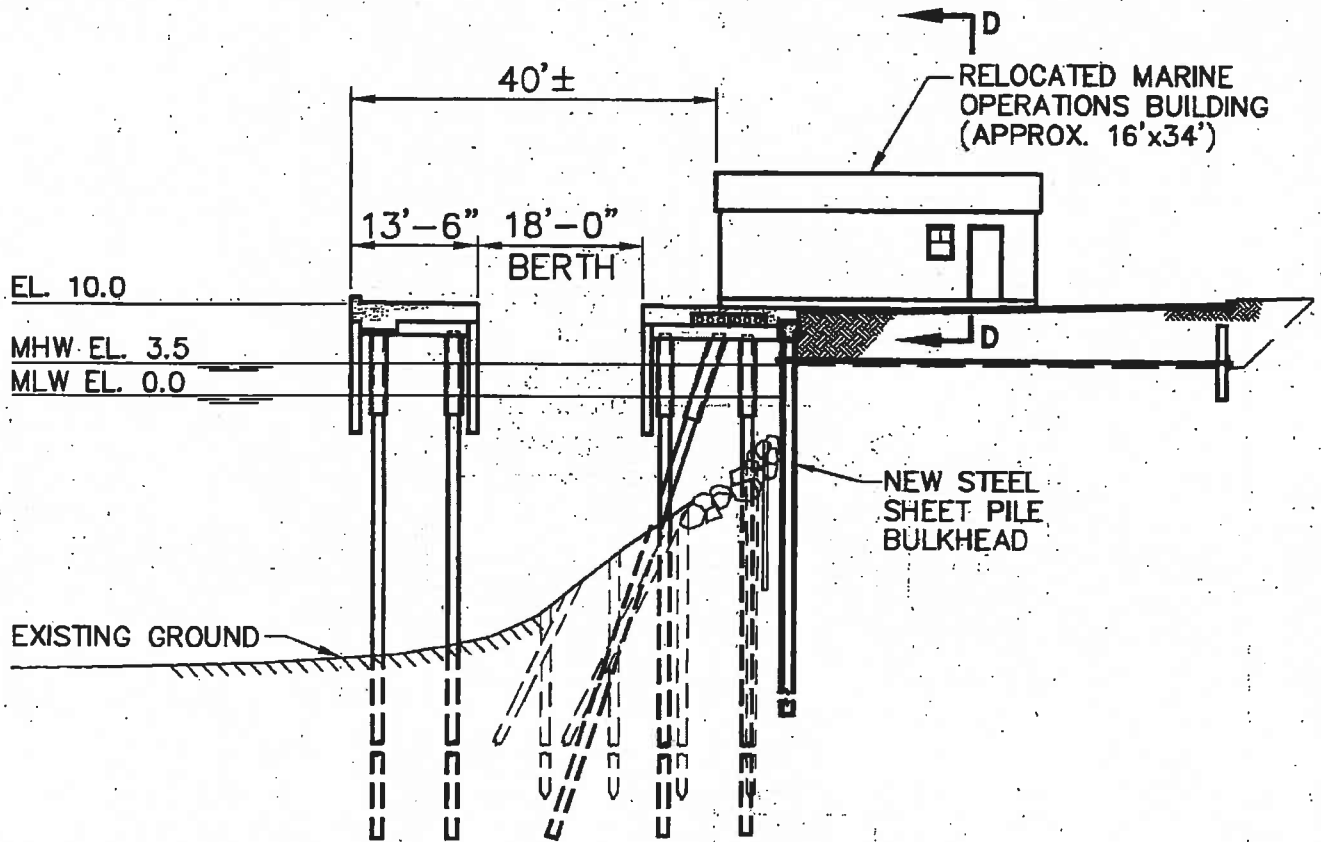
LICENSE PLAN NO. 8851

Approved by Department of Environmental Protection

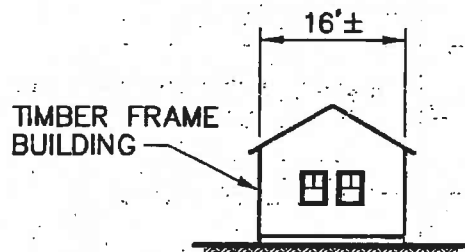
Date JUN 01 2001

DECEMBER 18, 2000 SHEET 3 OF 8

007-121-000-051-300



SECTION C-C
SCALE: 1"=20'



SECTION D-D
SCALE: 1"=20'

PLAN ACCOMPANYING PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL ASSET MANAGEMENT ON BEHALF
OF THE MASSACHUSETTS MARITIME ACADEMY
TO LICENSE, RECONSTRUCT, AND MAINTAIN A
BULKHEAD AND WHARF AND LICENSE
CONSTRUCT AND MAINTAIN FLOATING DOCKS
IN BUZZARDS BAY, TOWN OF BOURNE, MA
FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
BURLINGTON, MASS.

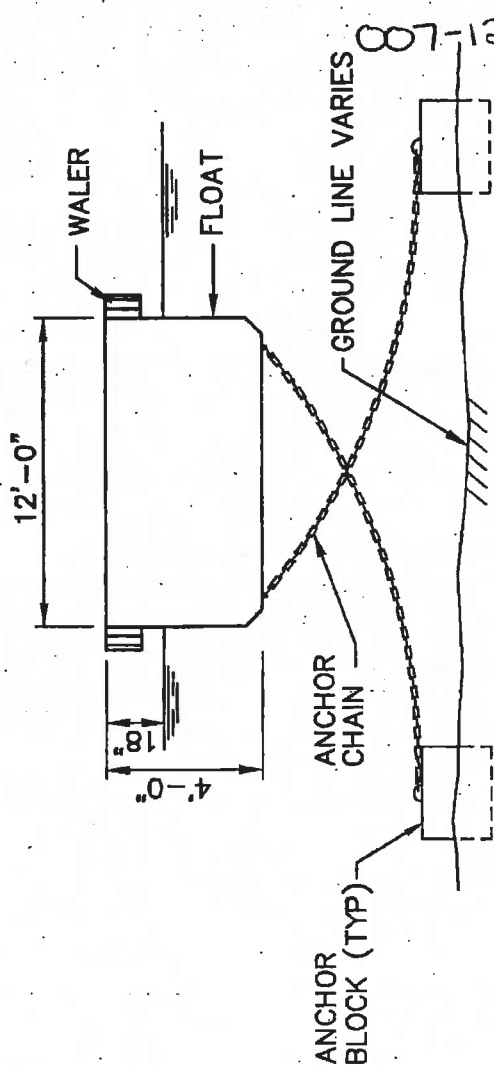


LICENSE PLAN NO. 8851

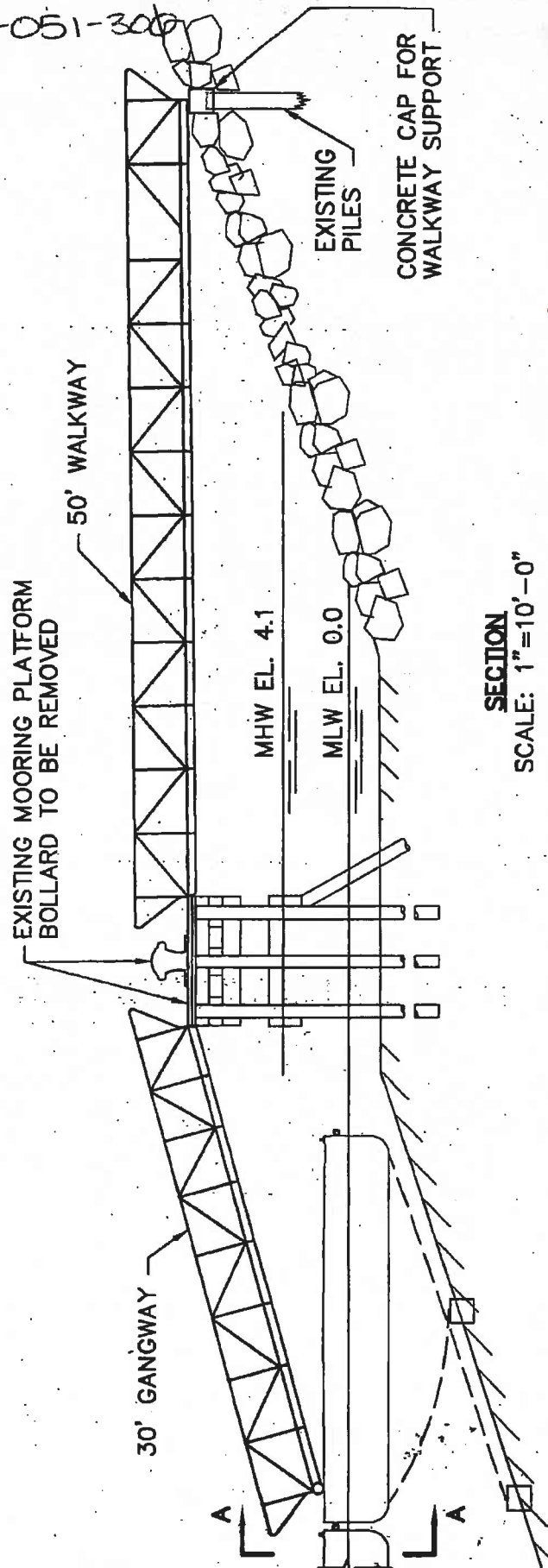
Approved by Department of Environmental Protection
Date JUN 01 2001



PLAN ACCOMPANYING PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL ASSET MANAGEMENT ON BEHALF
OF THE MASSACHUSETTS MARITIME ACADEMY
TO LICENSE, RECONSTRUCT, AND MAINTAIN A
BULKHEAD AND WHARF AND LICENSE
CONSTRUCT AND MAINTAIN FLOATING DOCKS
IN BUZZARDS BAY, TOWN OF BOURNE, MA
FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
BURLINGTON, MASS.



SECTION A-A
NOT TO SCALE

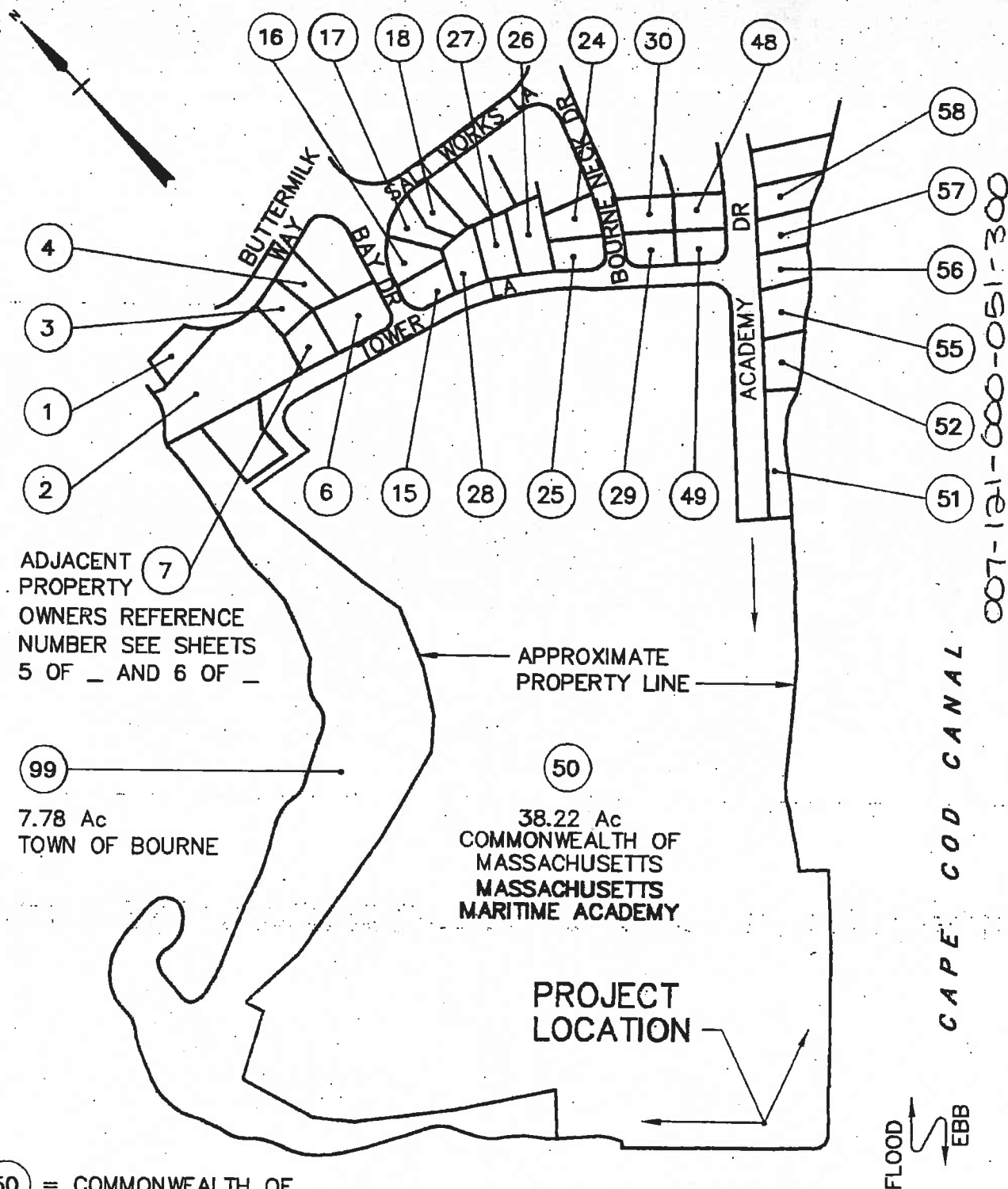


SECTION
SCALE: 1"=10'-0"

LICENSE PLAN NO. 8851

Approved by Department of Environmental Protection
Date JUN 01 2001

DECEMBER 18, 2000 SHEET 5 OF 8



ADJACENT
PROPERTY
OWNERS REFERENCE
NUMBER SEE SHEETS
5 OF _ AND 6 OF _

99
7.78 Ac
TOWN OF BOURNE

50
38.22 Ac
COMMONWEALTH OF
MASSACHUSETTS
MASSACHUSETTS
MARITIME ACADEMY

PROJECT
LOCATION

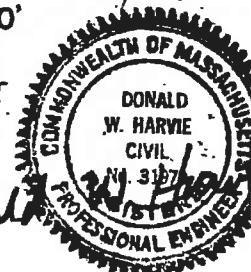
50 = COMMONWEALTH OF
MASSACHUSETTS OWNER

BUZZARD'S BAY
LICENSE PLAN NO. 8851

Approved by Department of Environmental Protection
Date JUN 01 2001

200
300
SCALE IN FEET

PLAN ACCOMPANYING PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL ASSET MANAGEMENT ON BEHALF
OF THE MASSACHUSETTS MARITIME ACADEMY
TO LICENSE, RECONSTRUCT, AND MAINTAIN A
BULKHEAD AND WHARF AND LICENSE
CONSTRUCT AND MAINTAIN FLOATING DOCKS
IN BUZZARDS BAY, TOWN OF BOURNE, MA
FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
BURLINGTON, MASS.

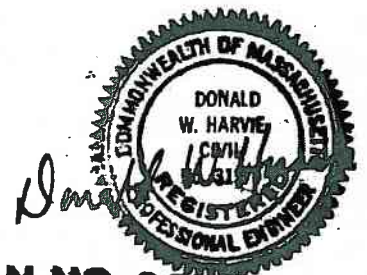


LIST OF ABUTTERS

- | | |
|--|--|
| <p>1 BEVERLY ADOMAITIS
CAPEWAY TOURS, INC.
31 MILK STREET, MEZZANINE LEVEL
BOSTON, MA 02109
(15 BUTTERMILK WAY)</p> <p>2 ROBERT & RITA PACHECO TRUSTEES
ATLANTIC TRUST
11 BUTTERMILK WAY
BUZZARDS BAY, MA 02532
(11 BUTTERMILK WAY)</p> <p>3 ROBERT & RITA PACHECO TRUSTEES
ATLANTIC TRUST
11 BUTTERMILK WAY
BUZZARDS BAY, MA 02532
(9 BUTTERMILK WAY)</p> <p>4 JOSEPH & SANDRA FEROLITO
7 BUTTERMILK WAY
BUZZARDS BAY, MA 02532</p> <p>6 W. H. CLARK & J. F. CLARK TRUSTEES
W. CLARK TRUST
33 N. MAIN STREET
FALMOUTH, MA 02540
(16 TOWER LANE)</p> <p>7 ROBERT & RITA PACHECO TRUSTEES
ATLANTIC TRUST
11 BUTTERMILK WAY
BUZZARDS BAY, MA 02532
(20 TOWER LANE)</p> <p>15 PATRICIA BARBER, TRUSTEE
22 BAY DRIVE REALTY TRUST
5215 S. BRIDGET POINT
FLORAL CITY, FL 34436
(22 BAY DRIVE)</p> | <p>16 RONALD & JANICE MCHUGH
5121 SW 210 TERRACE
FT. LAUDERDALE, FL 33332-1512
(20 BAY DRIVE)</p> <p>17 WILLIAM & DEBRA BERNARDINELLI
15 LAUREL STREET
WAKEFIELD, MA 01880
(11 SALT WORKS LANE)
(BUZZARDS BAY, MA 02532)</p> <p>18 JOHN SILVA
9 SALT WORKS LANE
BUZZARDS BAY, MA 02532</p> <p>24 WARREN & JOAN HUBNER
59 BOURNE NECK DRIVE
BUZZARDS BAY, MA 02532</p> <p>25 GEORGE & ROSE D'AMATO
436 CANTON STREET
WESTWOOD, MA 02090-2212
(6 TOWER LANE)</p> <p>26 FRANK & JULIA FLORIO
10 NAHANTON AVENUE
MILTON, MA 02186
(8 TOWER LANE)</p> <p>27 MARGARET BUTLER &
KATHLEEN DALZELL
10 TOWER LANE
BUZZARDS BAY, MA 02532</p> |
|--|--|

NOTE: THE PROPERTY ADDRESS
IS SHOWN IN PARENTHESIS WHEN
DIFFERENT FROM THE MAILING
ADDRESS

PLAN ACCOMPANYING PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL ASSET MANAGEMENT ON BEHALF
OF THE MASSACHUSETTS MARITIME ACADEMY
TO LICENSE, RECONSTRUCT, AND MAINTAIN A
BULKHEAD AND WHARF AND LICENSE
CONSTRUCT AND MAINTAIN FLOATING DOCKS
IN BUZZARDS BAY, TOWN OF BOURNE, MA
FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
BURLINGTON, MASS.



LICENSE PLAN NO. 8851

Approved by Department of Environmental Protection
Date JUN 01 2001

LIST OF ABUTTERS (CONTINUED)

- | | |
|--|---|
| <p>(28) GREGORY & EUGENIA CORAS,
CO TRUSTEES
THE EUGENIA FAMILY REALTY TRUST
PO BOX 510
FORESTDALE, MA 02644
(12 TOWER LANE)</p> <p>(29) EVELYN INMAN & PHYLLIS MYERS
TRUSTEES OF THE
TOWER LANE REALTY TRUST
4 TOWER LANE
BUZZARDS BAY, MA 02532</p> <p>(30) ROBERT & BETTY RUSSELL
23 LINCOLN AVENUE
WINCHENDON, MA 01475
(62 BOURNE NECK DRIVE)</p> <p>(48) MICHAEL & ELEANORE SHEA
65 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(49) LANE A. GAULIN, TRUSTEE
SPECIAL K'S REALTY TRUST
67 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(50) MASSACHUSETTS MARITIME
ACADEMY
(OWNER)</p> | <p>(51) COMM OF MA BOARD OF TRUSTEE
OF STATE COLLEGES
ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(52) SUSAN RYAN
109 WOOD DRIVE
E. HARTFORD, CT 06108-1210
(70 ACADEMY DRIVE)</p> <p>(55) FRANK J. & EILEEN FLOOD
66 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(56) MARY MCLAUGHLIN
64 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(57) CHARLOTTE OGILVY
62 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(58) JOSEPH F. CURLEY
60 ACADEMY DRIVE
BUZZARDS BAY, MA 02532</p> <p>(99) TOWN OF BOURNE
BEACH AREA TAYLORS POINT
24 PERRY AVENUE
BUZZARDS BAY, MA 02532</p> |
|--|---|

PLAN ACCOMPANYING PETITION OF THE
COMMONWEALTH OF MASSACHUSETTS, DIVISION
OF CAPITAL ASSET MANAGEMENT ON BEHALF
OF THE MASSACHUSETTS MARITIME ACADEMY
TO LICENSE, RECONSTRUCT, AND MAINTAIN A
BULKHEAD AND WHARF AND LICENSE
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IN BUZZARDS BAY, TOWN OF BOURNE, MA
FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
BURLINGTON, MASS.



LICENSE PLAN NO. 8851

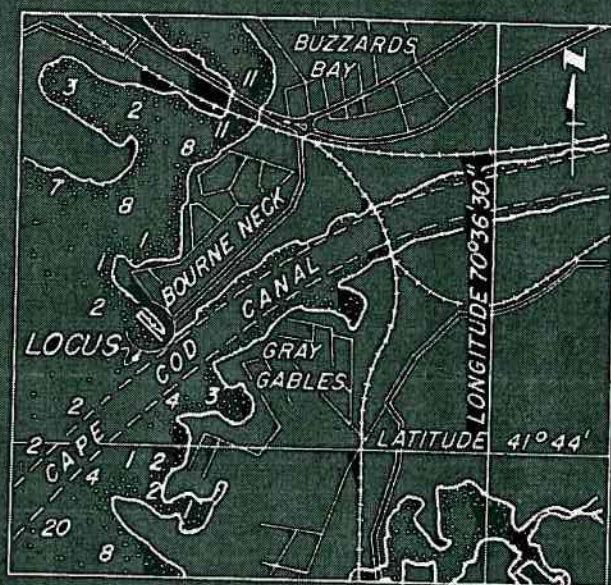
Approved by Department of Environmental Protection

Date JUN 01 2001

PROPOSED BULKHEAD & WHARF

BUZZARDS BAY AT BOURNE

BARNSTABLE COUNTY
MASSACHUSETTS



LOCATION MAP

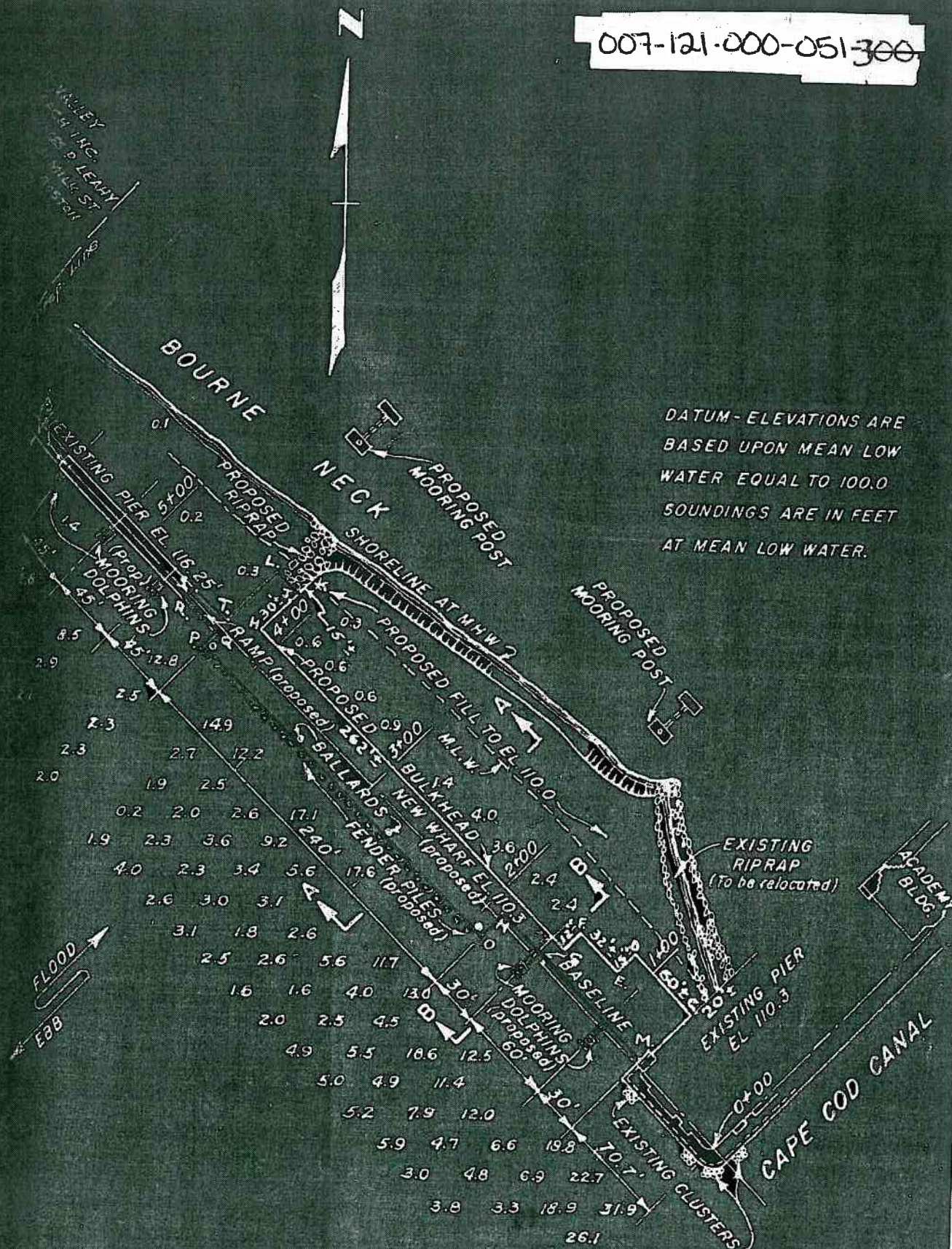
SCALE OF MILES



TRACED FROM MASS. D.P.W. ONSET
QUADRANGLE AND POCASSET QUADRANGLE

LICENSE PLAN NO. 4043
APPROVED BY DEPARTMENT OF PUBLIC WORKS
JANUARY 27, 1958
[Signature] } COMMISSIONER OF
PUBLIC WORKS
[Signature] } ASSOCIATE
COMMISSIONERS

007-121-000-051-300

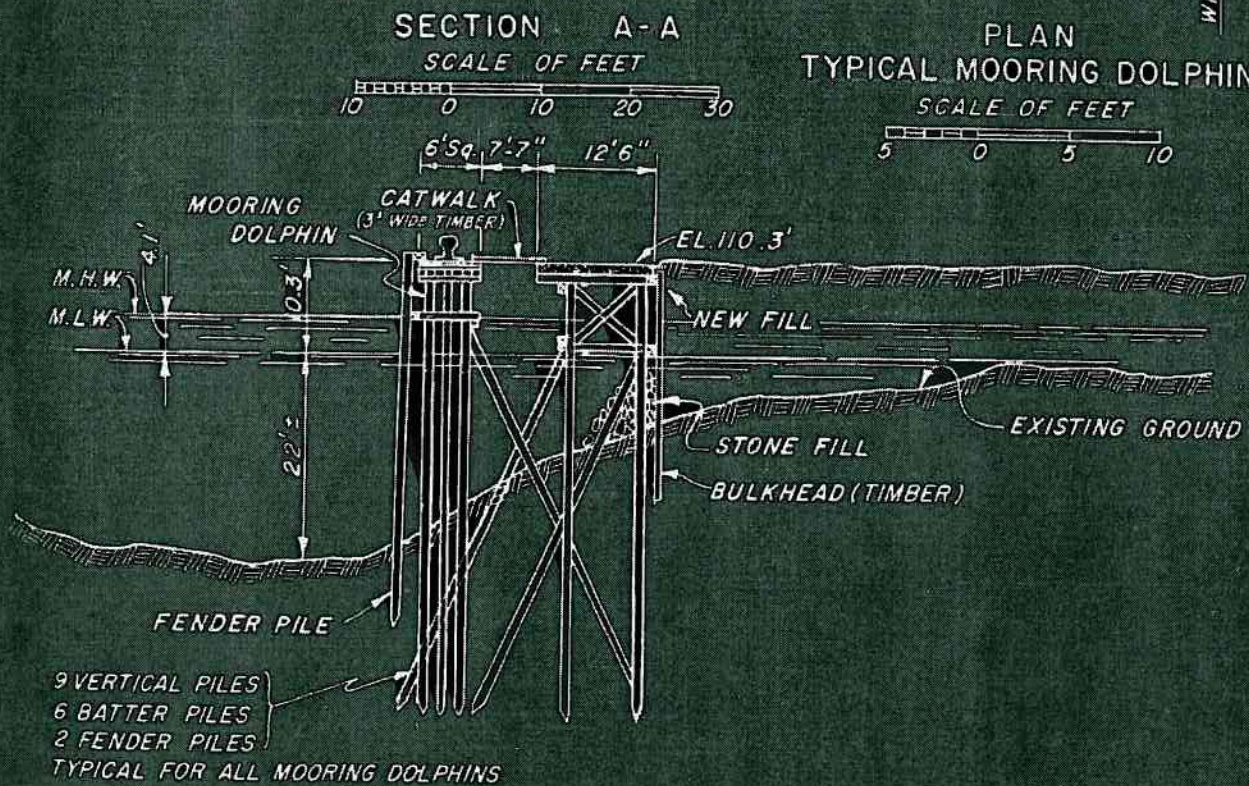
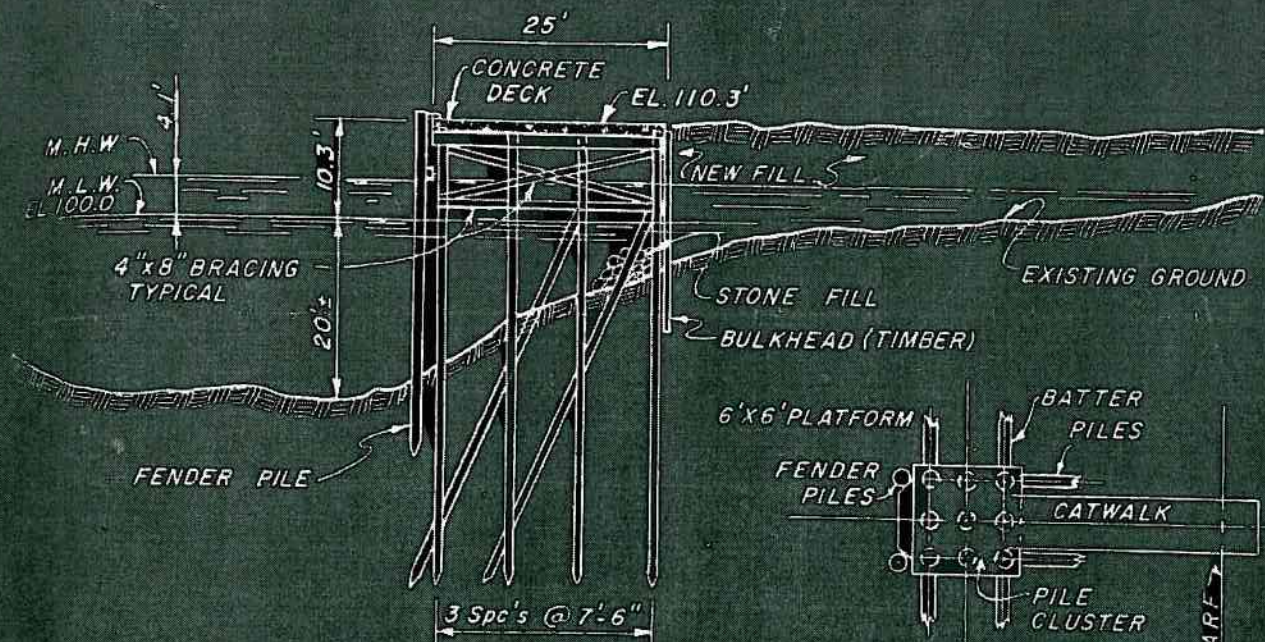


PLAN

SCALE OF FEET



LICENSE PLAN NO. 4043
APPROVED JANUARY 27, 1958

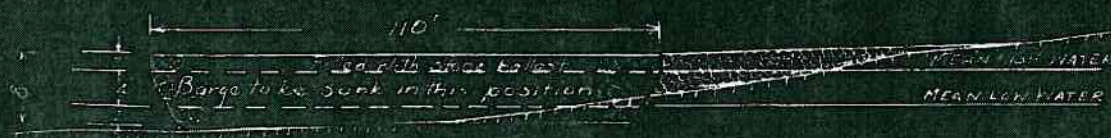


LICENSE PLAN NO 4043
APPROVED JANUARY 27, 1958

007-160-000-009-200



Elevations are in feet on the left and refer to 1918 M.T.W.



Barge to be filled with stone ballast and sunk as indicated

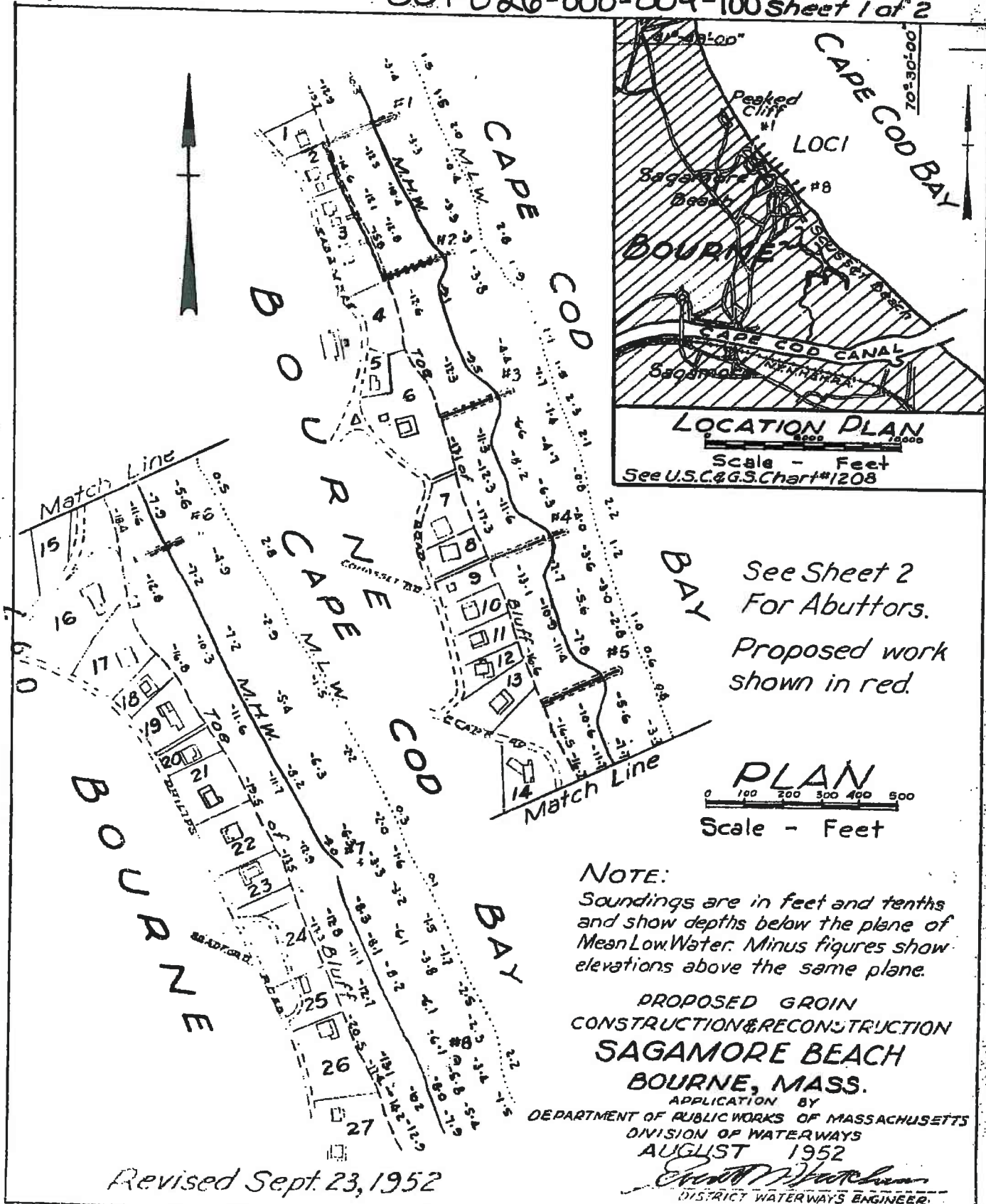
PROPOSED WHARF
AND FILL AT
MONUMENT BEACH
BY
TOWN OF BOURNE

NO. 3080
APPROVED BY DEPARTMENT OF PUBLIC WORKS
SEPTEMBER 14, 1948
COMMISSIONER OF PUBLIC WORKS
ASSOCIATE COMMISSIONERS

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
007-026-000-004-100	007-026-000-004-100-COE1A	52-212	USACE	Bourne	August 1952	Proposed Groin Construction and Reconstruction - Sagamore Beach - Bourne, Massachusetts - Application by the DPW of Massachusetts - Division of Waterways	2	Sagamore Beach - Phillips Road	Groins
007-026-000-004-100	007-026-000-004-100-COE1B	52-241	USACE	Bourne	November 1952	Proposed Groin - Sagamore Beach - Bourne, Massachusetts - Application by the DPW of Massachusetts - Division of Waterways	1	Sagamore Beach - Phillips Road	Groin
007-117-000-042-100	007-117-000-042-100-COE1A	81-384	USACE	Bourne	July 1960	Proposed Bourne Marina - At Taylors Point In Bourne, Massachusetts - County of Barnstable - Application by Massachusetts Dept. of Environmental Quality Engineering - Division of Land and Water Use	3	Wright Lane	Riprap Slope
007-121-000-051-200	007-121-000-051-200-COE2A	54-165	USACE	Bourne	June 1954	Proposed Fill and Riprap - Pier Road at State Pier - Cape Cod Canal - Bourne, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	1	Pier Road	Revetment
007-160-000-009-200	007-160-000-009-200-COE2A	48-204	USACE	Bourne	October 1948	Proposed Wharf and Fill at Monument Beach by Town of Bourne	1	Monument Beach	Filled Wharf
007-199-000-265-200	007-199-000-265-200-COE2A	61-146	USACE	Bourne	March 1961	Proposed Seawall, Docking Facilities, Mooring Piles and Excavation - Pocasset River - Bourne, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	2	Pocasset River	Seawall
007-221-000-287-100	007-221-000-287-100-COE1A	55-173	USACE	Bourne	June 1955	Proposed Groin - Pocasset Beach - Red Brook Harbor - Bourne, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	1	Circuit Avenue	Groin

0 9 1 7 7

007-D26-000-004-100 Sheet 1 of 2



See Sheet 2
For Abutments.
Proposed work
shown in red.

PLAN
Scale - Feet
0 100 200 300 400 500

NOTE:

Soundings are in feet and tenths
and show depths below the plane of
Mean Low Water. Minus figures show
elevations above the same plane.

**PROPOSED GROIN
CONSTRUCTION & RECONSTRUCTION
SAGAMORE BEACH
BOURNE, MASS.**

APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
AUGUST 1952

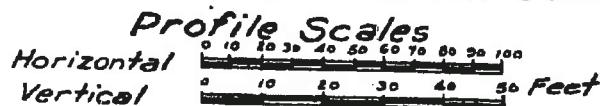
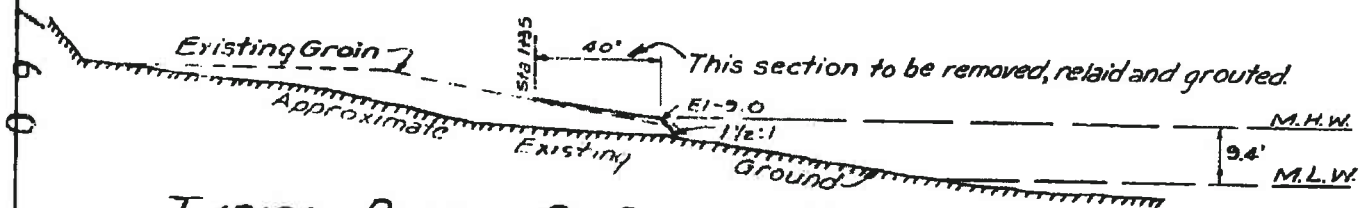
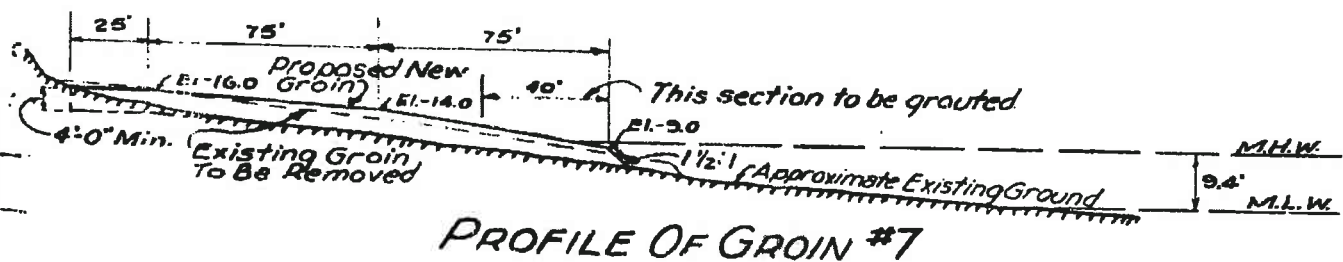
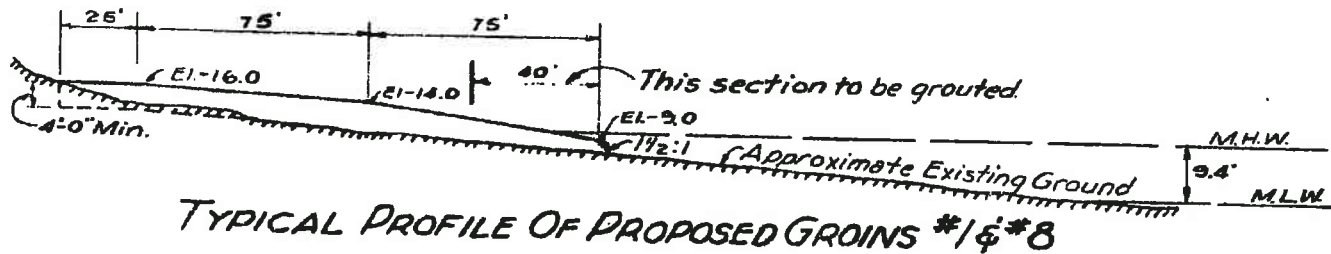
Ernest W. Warren
DISTRICT WATERWAYS ENGINEER

Revised Sept. 23, 1952

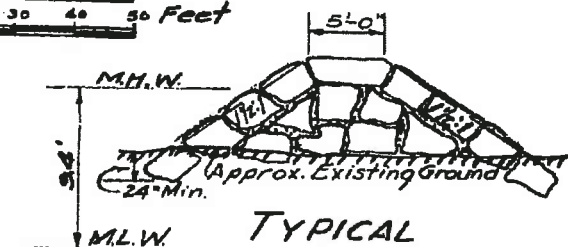
ACC. 03013-A

0 9 1 7 8

007-026-000-004-100 Sheet 2 of 2



PROPERTY OWNERS		
No.	NAME	ADDRESS
1	G. Forrest Peniman	3 Melrose St. Framingham
2	John C. & Marguerite A. Brown	Sagamore
3	Consolidated Trust - By Trustee Marguerite A. Brown - Sagamore	
4	Florence G. Claussen	156 Cliff Rd. Wellesley Hills
5	Carl M. Bowles	Buzzards Bay
6	Sydney A. Clark	Sagamore
7	Alden & Helen Grace Clark	Wilton, Conn.
8	Elizabeth S. Batchelder	33 Allen Rd. Wellesley
9	John D. & Minette E. Baer	218 County St. Attleboro
10	Alice M. Howard	North Easton
11	John D. & Minette E. Baer	218 County St. Attleboro
12	Malcolm & Georgia Green	38 Woodward St. Newton Highlands
13	Winifred F. Wood	42 W. Fitz St.
14	Joseph W. L. Jr.	32 Canterbury Rd. Newton Highlands
15	Theron Batchelder	164 T. Parker North Attleboro
16	Mabel C. Batchelder	33 Allen Rd. Wellesley
17	Edith E. Hall	58 Elm St. Worcester
18	Gordon S. & Barbara S. Butler	Sagamore
19	Maria A. M. Grover	57 Burwick St. Worcester
20	James A. Grover	5104 N. Arlington, Va.
21	Kent & Dorothy Whitman	416 Beacon St. Boston
22	Stanton T. Kett	42 May Terrace, Milton
23	Florence F. Farnon	15 Grant St. Waltham
24	R. Clark Newell	62 South Main St. Uxbridge
25	John O'Neill	250 Beacon St. Boston
26	Will A. McGuire	444 Mt. Vernon St. Boston
27	Arthur W. Holden, Jr. & Kane	434 Elm St. Boston
28	Robert F. Mahanor	101 Wendell Terrace, Syracuse
29		49 Corey St. Braintree



Hor. & Vert. scale

Revised Sept. 23, 1952.

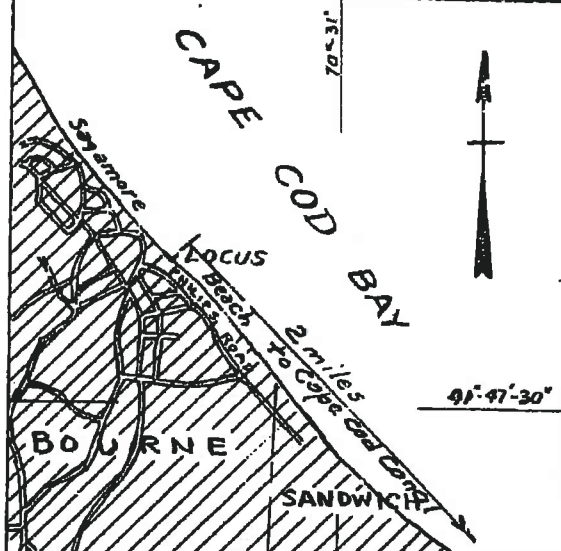
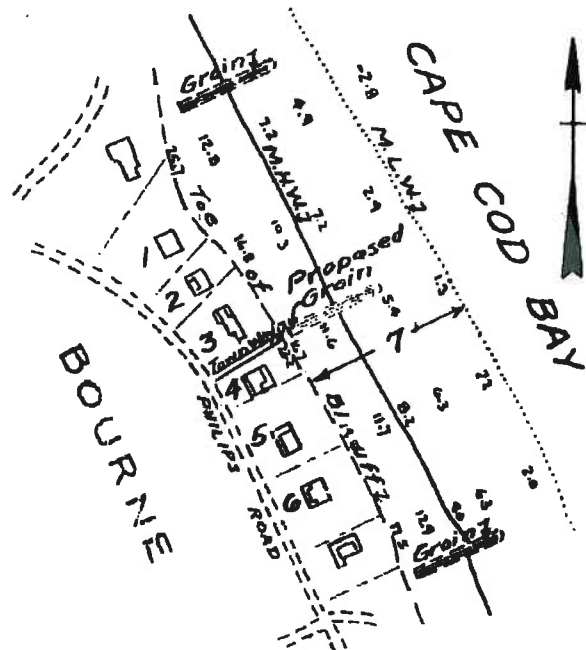
PROPOSED GROIN
CONSTRUCTION & RECONSTRUCTION
SAGAMORE BEACH
BOURNE, MASS.

APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
AUGUST 1952

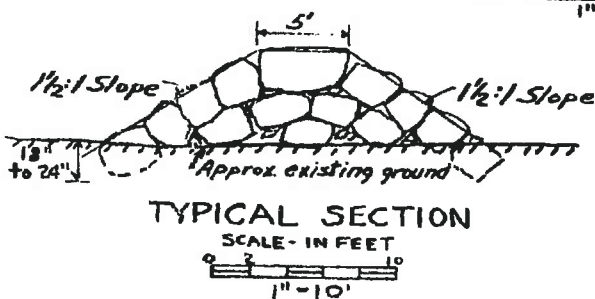
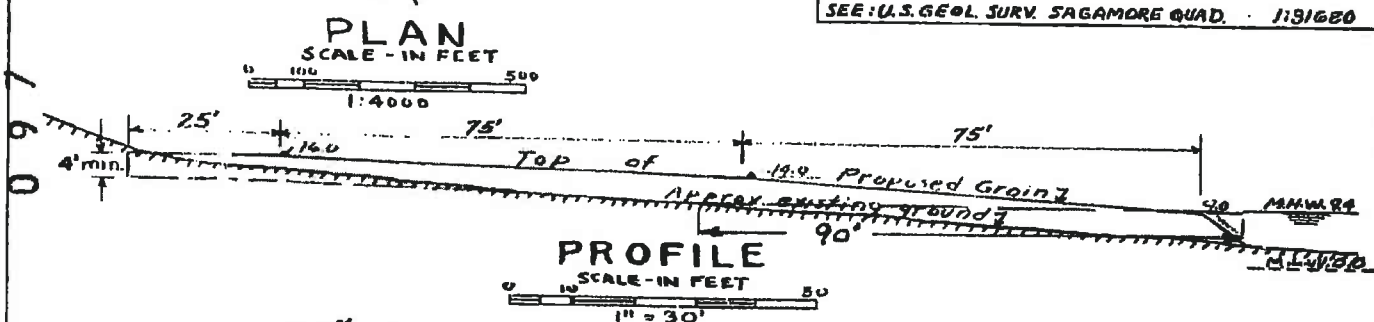
Edward J. [Signature]
DISTRICT WATERWAYS ENGINEER

09 1424

007-026-000-004-100



SEE: U.S. GEOL. SURV. SAGAMORE QUAD. 1131620



NOTE

Proposed work shown in red.
Elevations are in feet and tenths
above the plane of mean low water.
Minus figures show depths below
the same plane.

PROPERTY OWNERS

1. Edith E. Hall, Sagamore
2. Gordon S. Butler, 57 Burwick St. Worcester
3. Marion A. McGee, and Janet A. Traub, 5104 N 24 St. Arlington, Va.
4. Kent & Dorothy A. Whitman, 476 Beacon St, Boston
5. Stephen T. Kell, 42 Hoy Terrace, Milton
6. Florence E. Ferson, 15 Grant St, Waltham
7. Town of Bourne

PROPOSED GROIN SAGAMORE BEACH BOURNE, MASS.

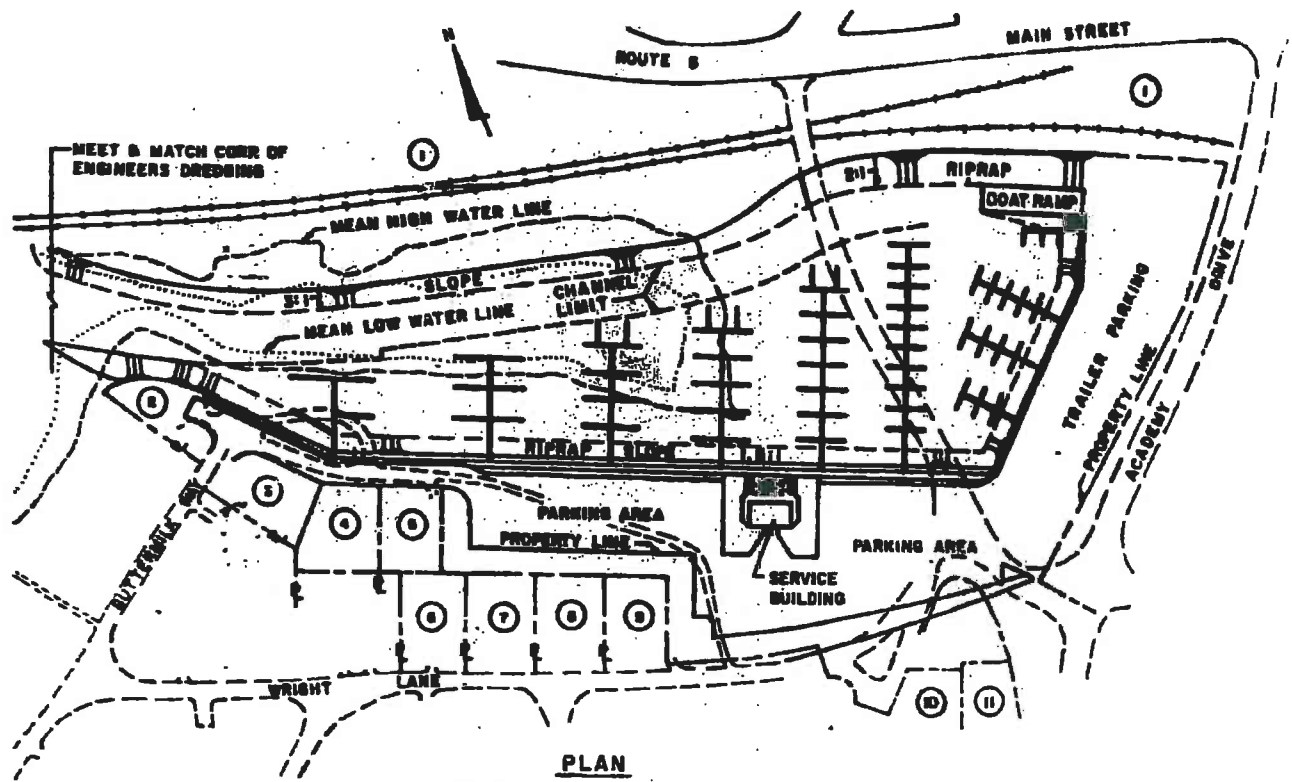
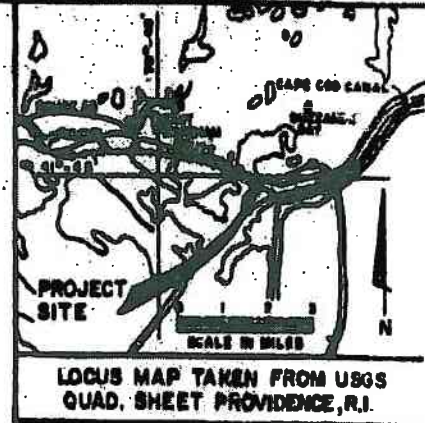
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
NOVEMBER 1952
Ernest J. Marchionis
DISTRICT WATERWAYS ENGINEER

ACC. 03041

007-117-000-042-100

PURPOSE: TO CONSTRUCT A 165 SLIP PUBLIC MUNICIPAL RECREATIONAL MARINA.
DATUM: N.S.V.D.

NOTE: APPROXIMATELY 120,000 C.Y. OF GRANULAR MATERIAL TO BE DREDGED TO ELEVATION -8.0 N.S.V.D. OF WHICH 110,000 C.Y. WILL BE TRUCKED AND DISPOSED AT THE BOURNE LAND FILL SITE, 10,000 C.Y. WILL BE USED ON SITE FOR FILL OF PARKING AREA AND SERVICE BUILDING AREA.



PROPERTY OWNERS

- 1 CONRAIL REAL ESTATES DEPT., 744 BROAD STREET, SUITE 423, NEWARK, N.J.
- 2 LEO SALHANY, 392 BROADWAY, PAWTUCKET, R.I.
- 3 MANUEL J. ROSE, 46 BUTTERMILK WAY, BUZZARDS BAY, MA
- 4 MAURICE FORD, 31 WORLEY STREET, W. ROXBURY, MA
- 5 THOMAS FORD, 7 HARBOR PLACE, BUZZARDS BAY, MA
- 6 MARY VERRIER, 14 WRIGHT LANE, BUZZARDS BAY, MA
- 7 BRIAN SULLIVAN & JOSEPH SILVIA, 144 CROSS STREET, BELMONT, MA
- 8 ELEANOR R. BODERICK, BROLANDS, UPTON, MA
- 9 THERESE LOISEAU, R.O. BOX 650, 8 WRIGHT LANE, BUZZARDS BAY, MA
- 10 JOSEPH DIGIOVANNI, 52 NORMAN AVENUE, PAWTUCKET, R.I.
- 11 BRIAN SULLIVAN & JOSEPH SILVIA, 144 CROSS STREET, BELMONT, MA

PROPOSED BOURNE MARINA

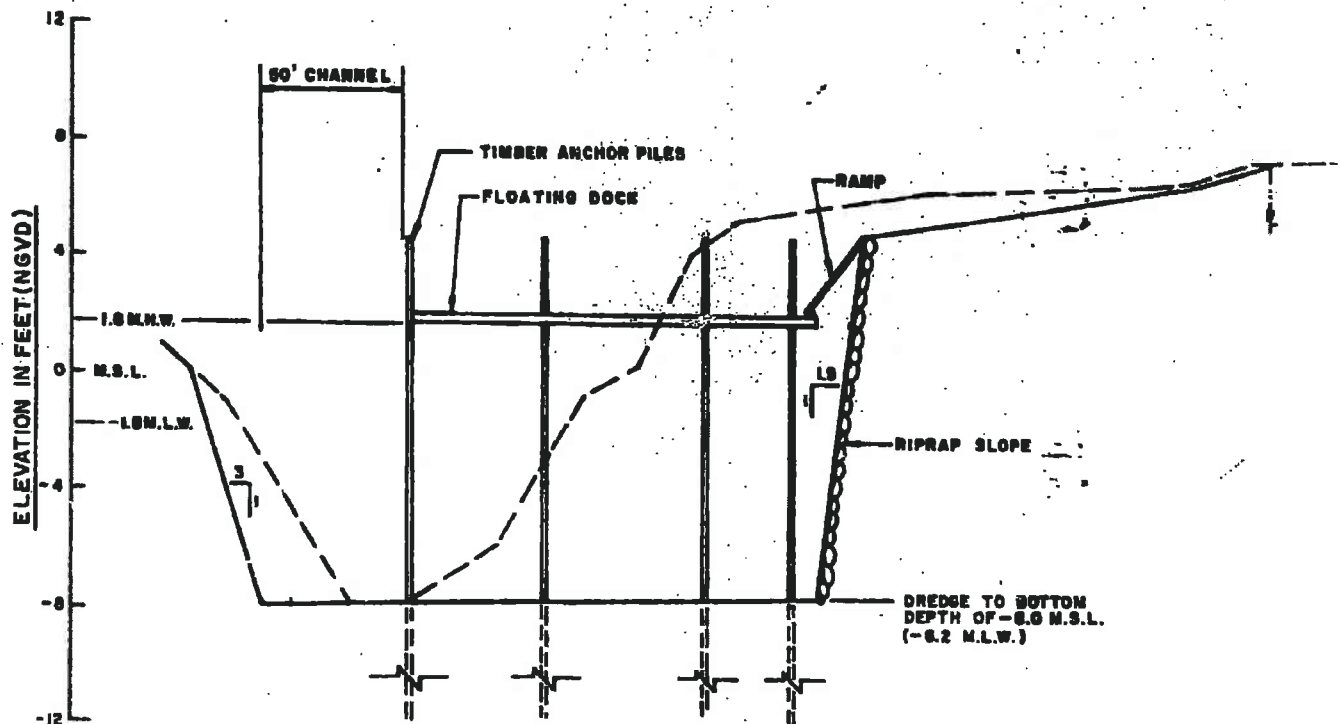
AT TALYORS POINT
IN BOURNE, MASSACHUSETTS

COUNTY OF BARNSTABLE STATE OF MASS.
APPLICATION BY MASSACHUSETTS DEPARTMENT
OF ENVIRONMENTAL QUALITY
ENGINEERING-DIVISION OF
LAND AND WATER USE

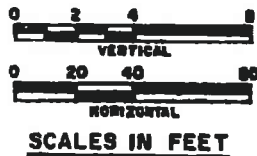
SHEET 1 OF 1

DATE: JULY, 1980

007-117-000-042-100

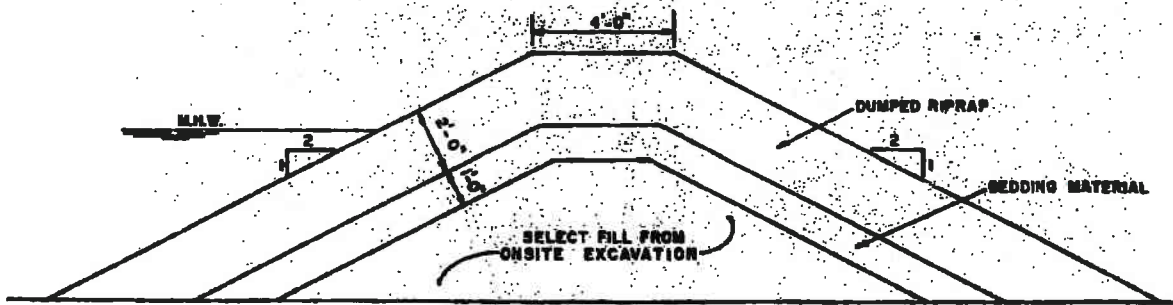


TYPICAL SECTION



007-117-000-042-100

ELEVATION IN FEET (NGVD)

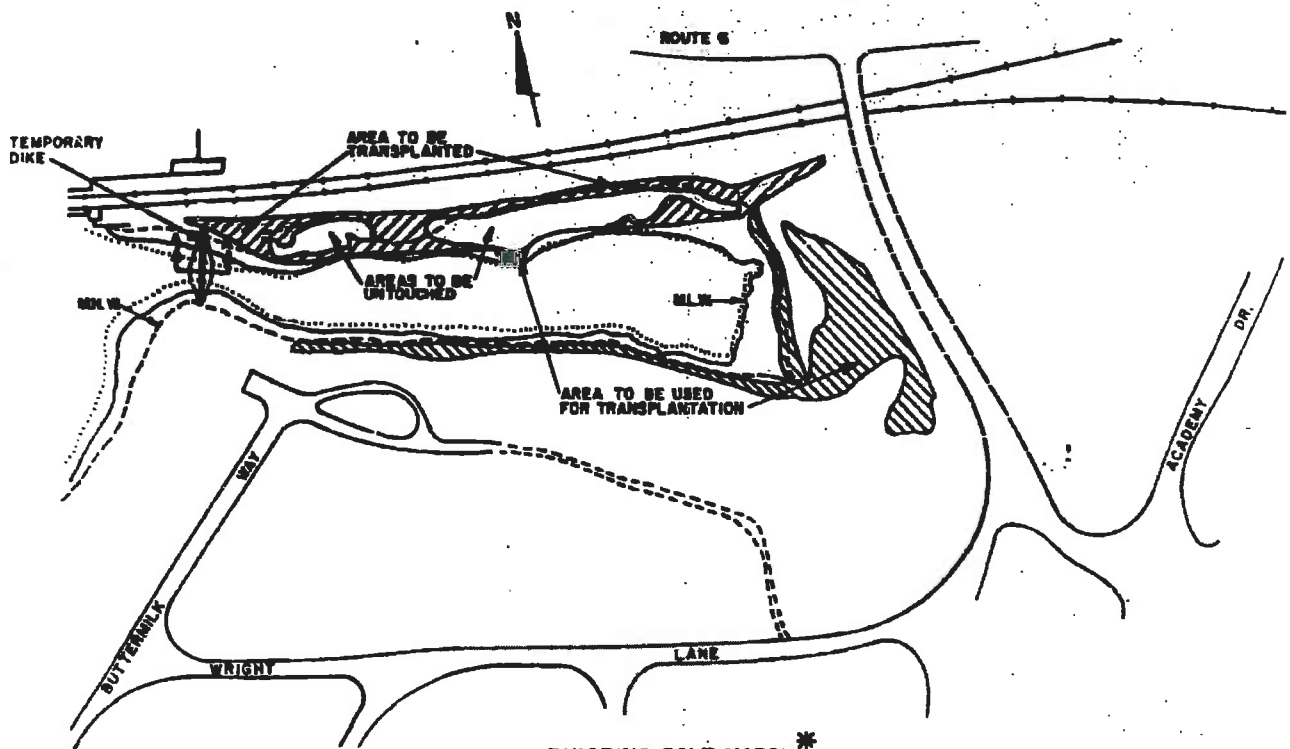


**PROPOSED TEMPORARY DIKE
SECTION A-A**



NOTES:

1. FILL BELOW M.H.W. FOR TEMPORARY DIKE - 200 CU. Y.
2. FILL BELOW M.H.W. FOR CONSTRUCTION OF MARINA - 4700 CU. YDS. (RIPRAP AND BEDDING MATERIAL).
3. FILL BELOW M.H.W. ON EXISTING WETLANDS - NONE, (DREDGING ONLY).



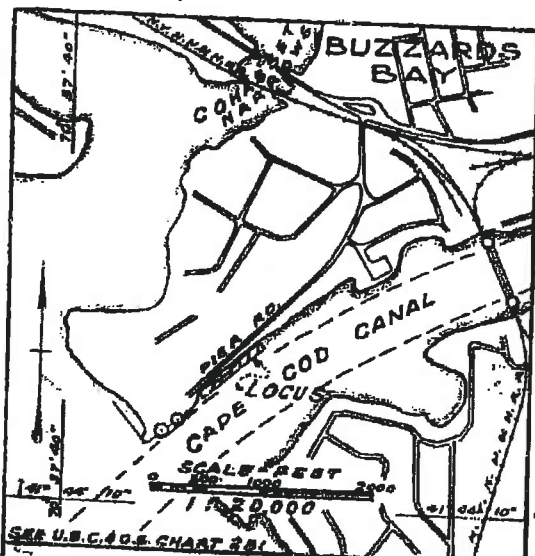
EXISTING SALT MARSH *



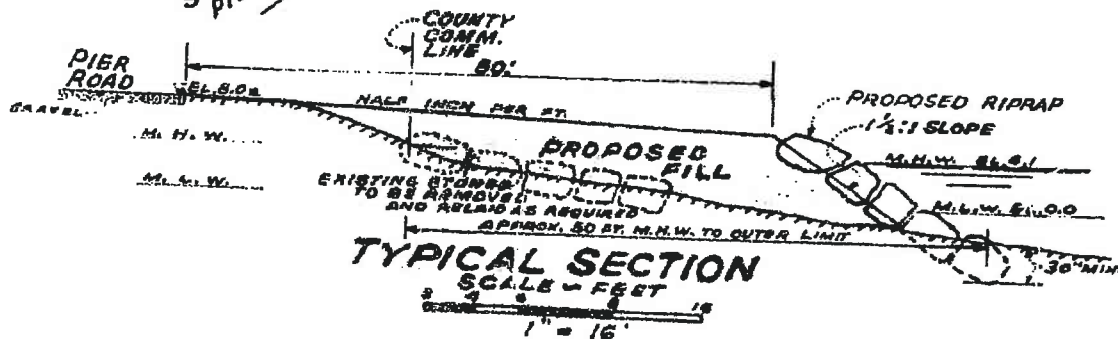
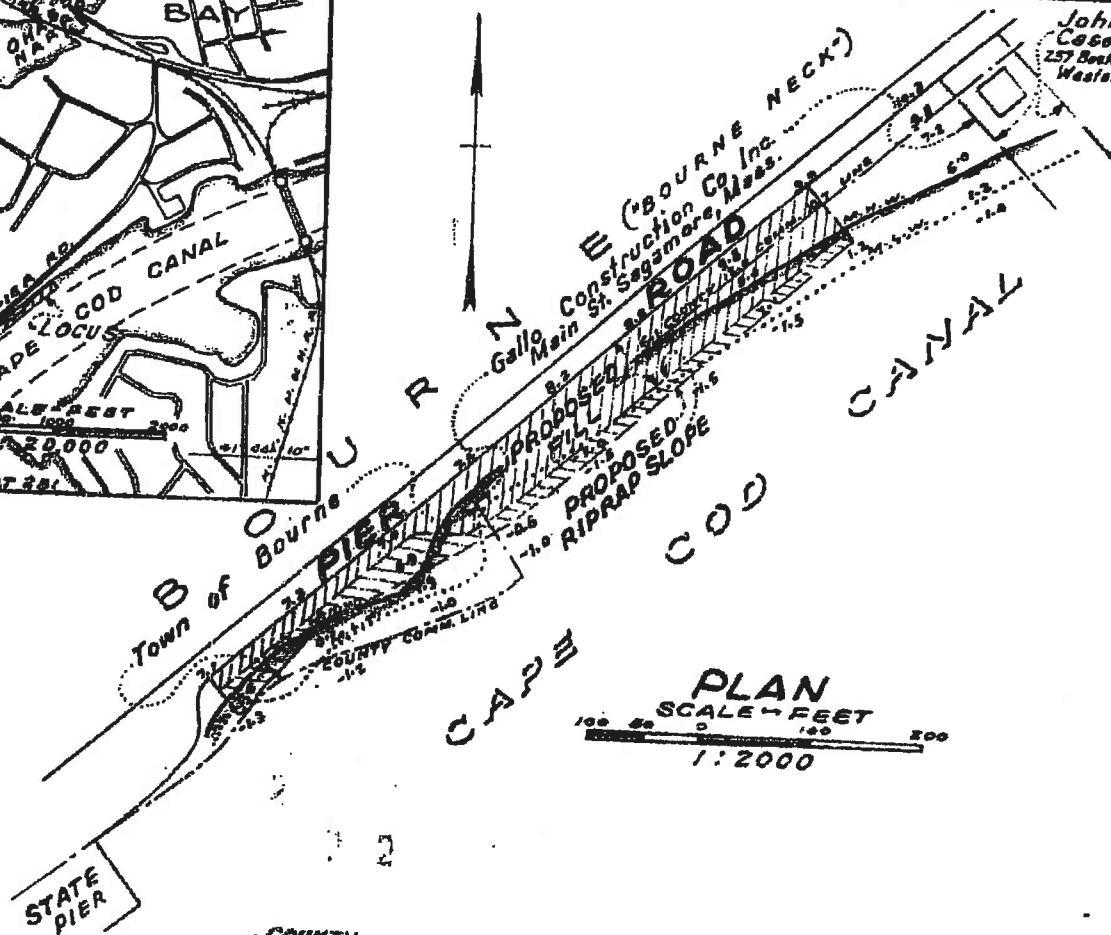
09102021

NEW ENGLAND DIV.

007-121-000-051-200



John P. Casady
257 Boston Post Rd.
Wenham, Mass.



NOTE

ELEVATIONS ARE IN FEET AND TENTHS
ABOVE THE PLANE OF MEAN LOW WATER
MINUS FIGURES SHOW DEPTHS BELOW
THE SAME PLANE.
LOCATION OF WORK TO BE DONE IS
SHOWN IN RED.

PROPOSED FILL AND RIPRAP
PIER ROAD & STATE PIER
CAPE COD CANAL

BOURNE - MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS - MASSACHUSETTS
DIVISION OF WATERWAYS
JUNE 1954
SCALES SHOWN

Robert B. MacKinnon
DISTRICT WATERWAYS ENGINEER

099 0882



True North

N.Y.N.H. & H. R.R. CO.

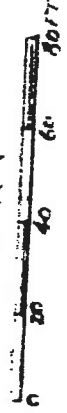
LIZZIE K. FIELD
45 GEMERSON AVE
ATCANTILL, MASS
L.C. 16.55 Cert 4607

Land Court 16.55
Cert 49.56

7.5' TOWN
OF
BOURNE



PLAN



Elevations are in feet and
tenths and refer to mean low water

CECIL H. BIGELOW
MONUMENT BEACH, MASS.

Town Way



PROFILE

Scale



Barge to be filled with stone
ballast and sunk as indicated

007-160-000-009-200

PROPOSED WHARF
AND FILL AT
MONUMENT BEACH
BY
TOWN OF BOURNE
OCT. 1948

094 1640

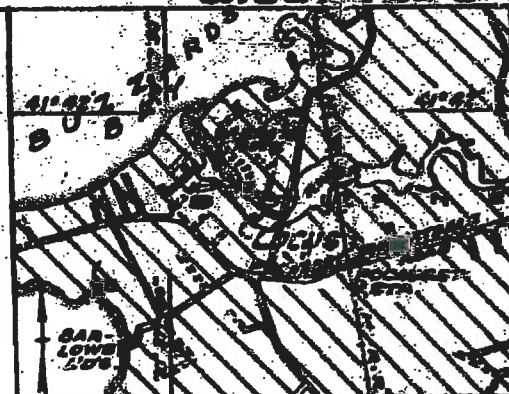
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SHEET 1 OF 2

B O U R N E

TAHANTO ROAD

WAY

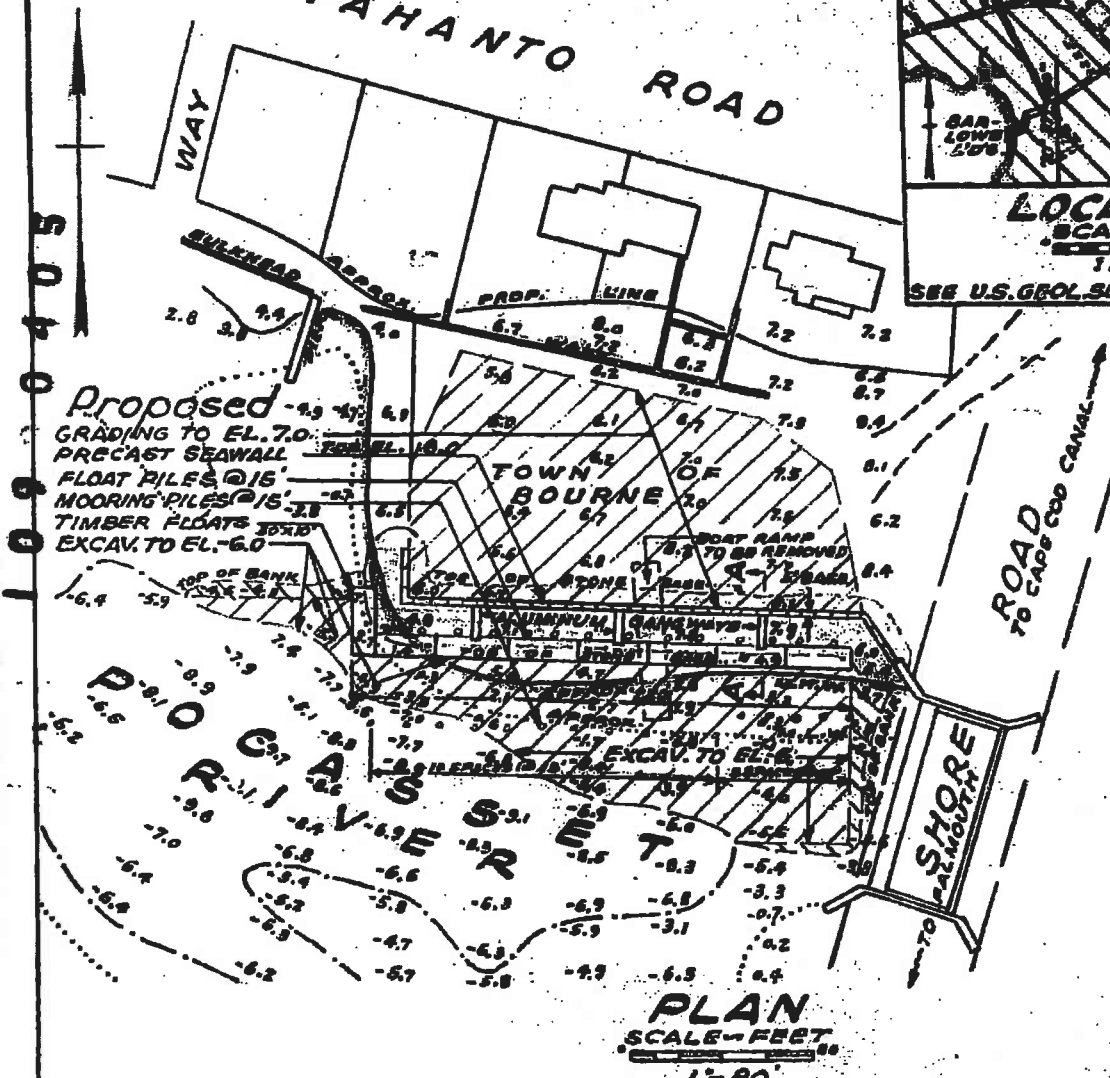


LOCATION MAP

SCALE - FEET

1" = 21,680'

SEE U.S. GEOL. SURV. POCASSET QUAD.



PLAN
SCALE - FEET
1" = 80'

NOTES

ELEVATIONS ARE IN FEET AND TENTHS AND REFER TO PLANE OF MEAN LOW WATER. MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE.
EXCAVATED MATERIAL, APPROX. 7000 CU. YDS., TO BE DEPOSITED AS BACK FILL OR GRADING WHERE AND IF SATISFACTORY FOR THE PURPOSE. ANY EXCESS TO BE PLACED IN APPROVED LOCATIONS.
ALL PILE AND SPUR PILE DRIVING, TIMBER FLOATS (STYROFOAM SUPPORTS) TRAVELER IRONS AND OTHER HARDWARE TO BE OF STANDARD USAGE
LOCATION OF WORK TO BE DONE SHOWN IN RED.

**PROPOSED
SEAWALL, DOCKING FACILITIES,
MOORING PILES AND EXCAVATION
POCASSET RIVER**

BOURNE - MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
MARCH - 1961

Robert R. MacKinnon
CHIEF WATERWAYS ENGINEER

ACC. 04223-A

SHEET 2 OF 2



NOTE

FLOATS, 10' x 30', TO BE TIMBER WITH "FEETATION MATERIAL SUPPORTING. ALL HARDWARE SUCH AS BOLT FASTENINGS, RING BOLTS, TRAVELER APPROVALS, MOORING EYES, CLEATS, ETC. TO BE STANDARD SALT WATER RESISTANT. THE THREE APPROVED STANDARD ALUMINUM GANGWAYS ARE SHOWN IN LOCATION ONLY ON SHEET 1.

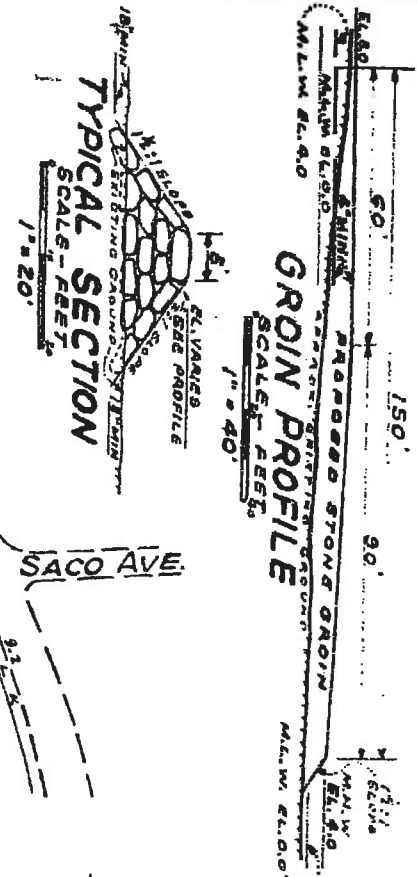
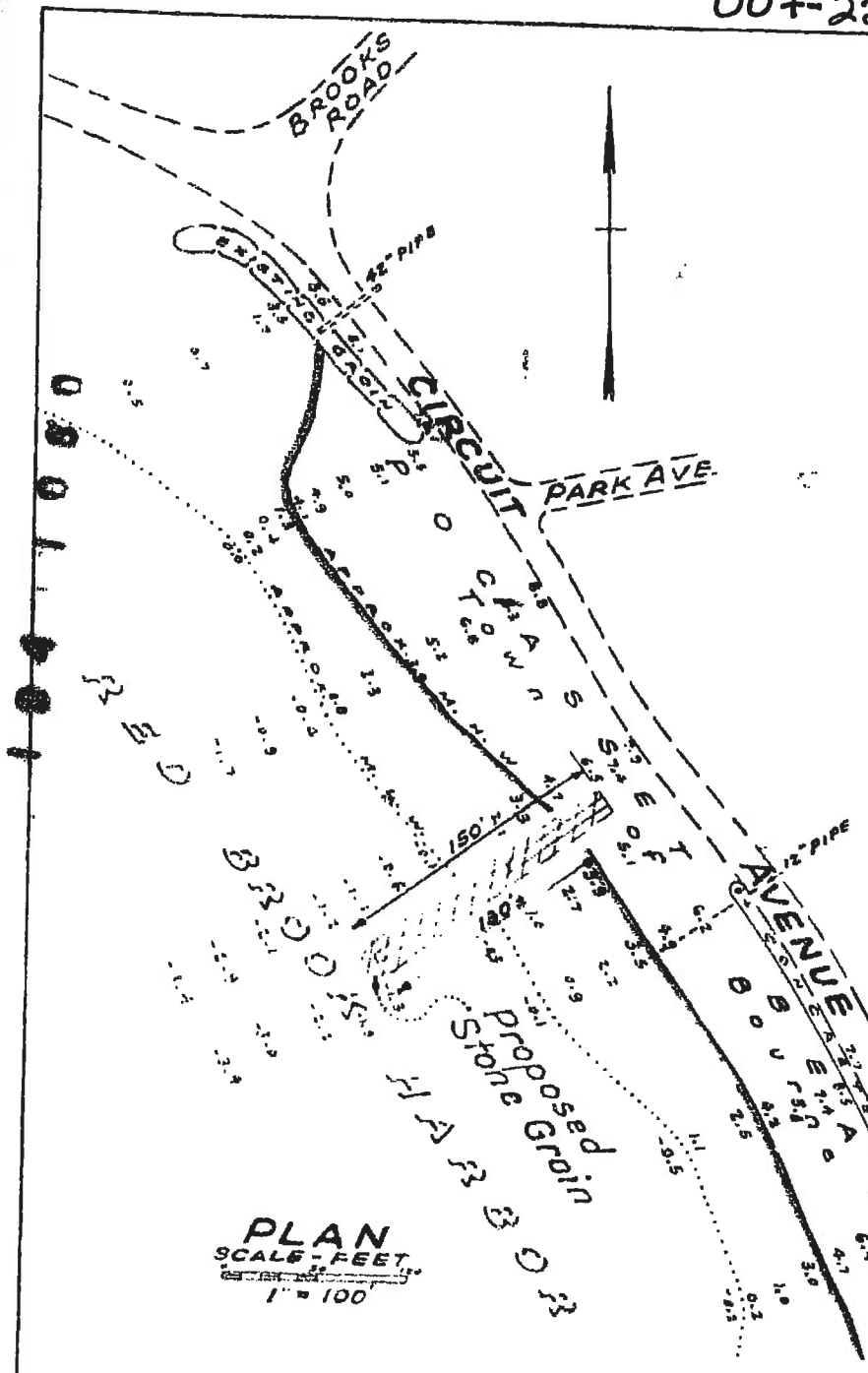
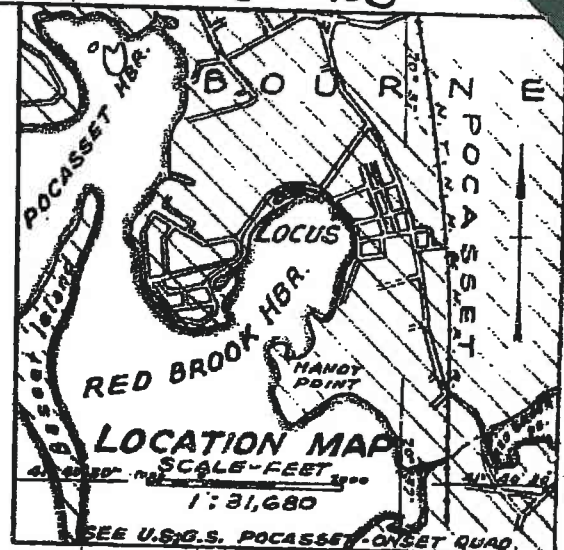
**PROPOSED
SEAWALL, DOCKING FACILITIES
MOORING PILES AND EXCAVATION
POCASSET RIVER**

BOURNE - MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
MARCH - 1961

Robert B. MacKinnon

0901700

007-221-000-267-100



NOTE
ELEVATIONS ARE IN FEET AND TENTHS ABOVE THE PLANE OF MEAN LOW WATER. MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE. LOCATION OF PROPOSED WORK IS SHOWN IN RED.

**PROPOSED GROIN
POCASSET BEACH
RED BROOK HARBOR
BOURNE - MASS.**
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS - MASSACHUSETTS
DIVISION OF WATERWAYS
JUNE 1955
Robert B. Mackinnon
DISTRICT WATERWAYS ENGINEER

Section III

Sandwich

Section III – Community Findings – Town of Sandwich

COMMUNITY DESCRIPTION

The Town of Sandwich consists of a land area of 43.04 square miles out of a total area of 44.36 square miles and had a population of 20,136 in the 2000 census. The Town is located on Cape Cod of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline is 10 miles that are directly exposed to open ocean. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Sandwich, there were 6 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 4 in Section III-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Sandwich

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Length
		A	B	C	D	F	
Bulkhead / Seawall							
Revetment	2		2				2460
Breakwater							
Groin / Jetty	4			1	2	1	2590
Coastal Dune							
Coastal Beach							
	6		2	1	2	1	5050

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Sandwich's case there are a total of 6 structures which would require approximately \$ 5.3 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated \$ 4.8 million would be required to upgrade the Town's coastal protection.

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Sandwich

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Cost
		A	B	C	D	F	
Bulkhead / Seawall							\$ -
Revetment	2		\$ 295,495				\$ 295,495
Breakwater							\$ -
Groin / Jetty	4			\$ 252,210	\$ 2,704,997	\$ 2,069,364	\$ 5,026,571
Coastal Dune							\$ -
Coastal Beach							\$ -
	6	\$ -	\$ 295,495	\$ 252,210	\$ 2,704,997	\$ 2,069,364	\$ 5,322,066

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Sandwich, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Sandwich

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Cost
		A	B	C	D	F	
Town Owned	6		\$ 295,495	\$ 252,210	\$ 2,704,997	\$ 2,069,364	\$ 5,322,066
Commonwealth of Massachusetts							\$ -
Federal Government Owned							\$ -
Unknown Ownership							\$ -
	6	\$ -	\$ 295,495	\$ 252,210	\$ 2,704,997	\$ 2,069,364	\$ 5,322,066

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section III-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Sandwich's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.

Section III - Sandwich

Part B

Structure Assessment Reports



COASTAL STRUCTURE LOCATION PLAN

TOWN OF SANDWICH
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



**BCE**

Bourne Consulting Engineering
3 Acad Street
Bourne, MA 01939
TEL: (508) 833-8888 FAX: (508) 833-8888



COASTAL STRUCTURE LOCATION PLAN

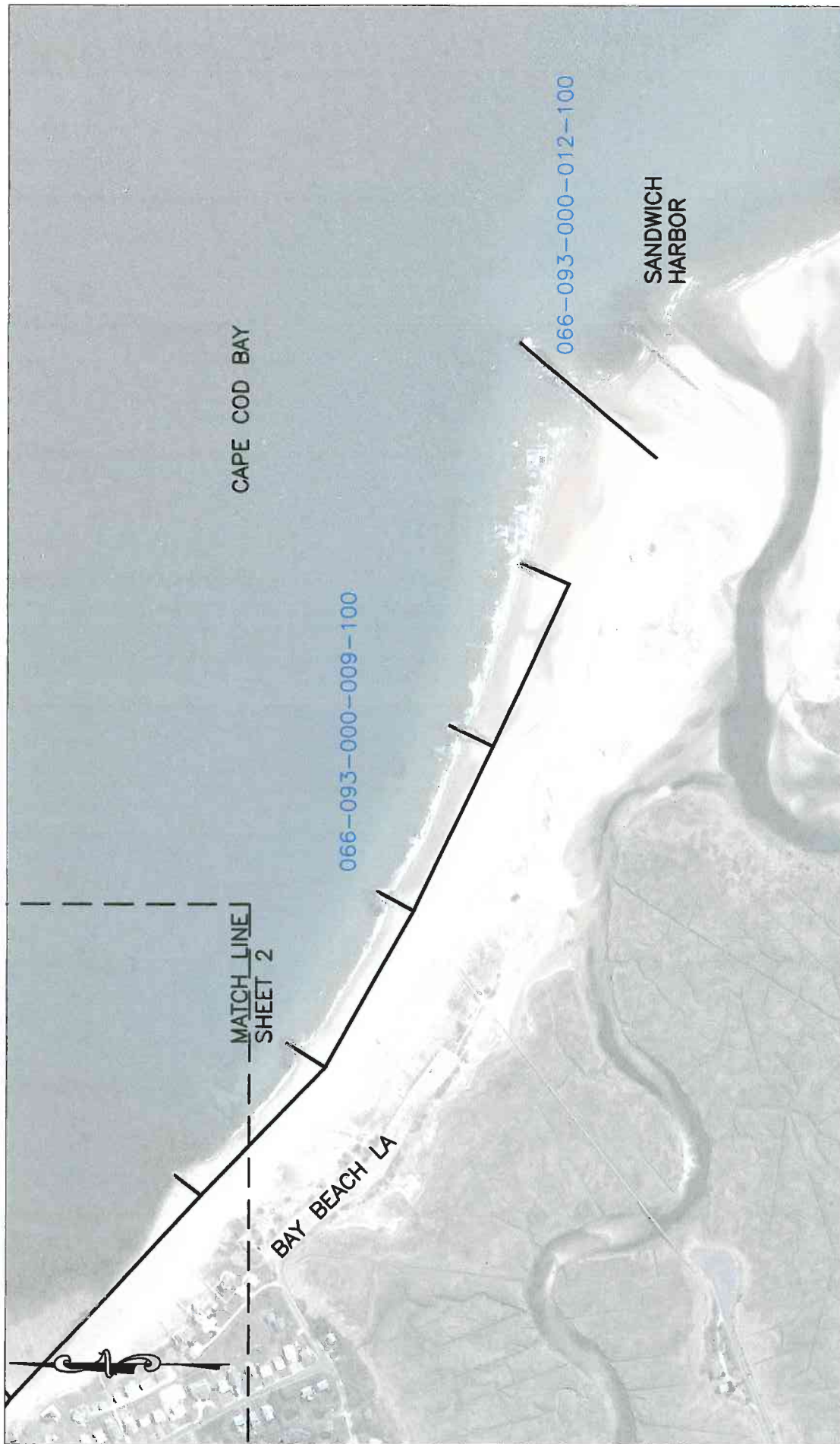
TOWN OF SANDWICH
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



SCALE: 1" = 150'



SHEET 2



COASTAL STRUCTURE LOCATION PLAN

TOWN OF SANDWICH
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



**BCE**

Bourne Consulting Engineering
2 Pond Street
Bourne, MA 01939
TEL: (508) 853-6666 FAX: (508) 853-6666



COASTAL STRUCTURE LOCATION PLAN

TOWN OF SANDWICH
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



SCALE: 1" = 150'

BCE *Bourne Consulting Engineering*
 7 West Street
 Bourne, MA 01905
 TEL (508) 533-4000 FAX (508) 533-4000

Structure Assessment Form

Town: **Sandwich**

Structure ID: 066-071-000-034-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Scorton Creek

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$252,210.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
210	5	VE	16
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the west jetty at Scorton Creek. The crest elevation is low and the armor is becoming unraveled at structure head. The beach has filled in the updrift side of the jetty.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

066-071-000-034-100-PHO1A.jpg

Structure Documents:

Structure Assessment Form

Town: Sandwich

Structure ID: 066-071-000-034-200

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Scorton Creek

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$792,792.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
330	3	VE	15
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the east jetty at Scorton Creek. The armor stone is completely unraveled and shows no interlocking. There is no distinct crest or side slopes.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

066-071-000-034-200-PHO2A.jpg

Structure Documents:

Structure Assessment Form

Town: **Sandwich**Structure ID: **066-092-000-003-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Sandwich Marina

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$100,901.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
840		AE	10
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the stone revetment around the west side of the Sandwich Marina basin. The armor stone is weathered but in good condition. The crest and side slopes show good lines and are in good condition.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

066-092-000-003-100-PHO1A.jpg

Structure Documents:

Structure Assessment Form

Town: **Sandwich**

Structure ID: 066-092-000-003-200

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Sandwich Marina

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$194,594.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1620		AE	10
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the stone revetment around east side of the Sandwich Marina basin. The armor stone is weathered but in good condition. The crest and side slopes show good lines and are in good condition.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

066-092-000-003-200-PHO2A.jpg

Structure Documents:

Structure Assessment Form

Town: **Sandwich**Structure ID: **066-093-000-009-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Town Beach

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

1953

Estimated Reconstruction/Repair Cost:

\$1,912,205.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
1440	6	VE	16
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the 9 groins from turn in Freeman Avenue, east to Old Harbor. All groins exhibit unraveled armor stone. Many are becoming flanked at high tide.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

I

Rating

None

Action

Long Term Planning Considerations

Description

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

066-093-000-009-100-PHO1A.jpg

Structure Documents:

USACE	January 195	Proposed Stone	066-093-000-009-100-COE1A
USACE	July 1956	Proposed Groin -	066-093-000-009-100-COE1B
USACE	October 195	Proposed Groins -	066-093-000-009-100-COE1C
USACE	March 1966	Proposed Shore	066-093-000-009-100-COE1D
MA-DCR	December 1	Proposed Shore	066-093-000-009-100-DCR1A
MA-DCR	June 1956	Proposed Shore	066-093-000-009-100-DCR1B
MA-DCR	September 1	Proposed Shore	066-093-000-009-100-DCR1C
MA-DCR	December 1	Proposed Shore	066-093-000-009-100-DCR1D
MA-DCR	March 1966	Proposed Shore	066-093-000-009-100-DCR1E

Structure Assessment Form

Town: **Sandwich**Structure ID: **066-093-000-012-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Old Sandwich Harbor

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Sandwich

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$2,069,364.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
610	0	VE	16
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

10 to 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the stone jetties at the entrance to Old Sandwich Harbor. The inlet is no longer contained within the jetties and so the structures are non-functional. The west jetty is exposed at low tide and in poor condition. The east jetty is submerged at all tides.

*Condition***F***Rating***Critical***Level of Action***Immediate***Description*

Conditions of structure/landform may warrant emergency stabilization as failure may result in potential loss of property and/or life. Landform eroded, loss of integrity. Structure exhibits critical levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure provides little or no protection from a major coastal storm. Actions taken to totally reconstruct structure to regain full capacity. Landform stability is severely compromised, rate of erosion/material loss may be increasing, and landform does not provide adequate protection from a major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

*Priority***III***Rating***Moderate Priority***Action*

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

066-093-000-012-100-PHO1A.jpg

Structure Documents:

Section III - Sandwich

Part C

Structure Photographs

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
066-071-000-034-100	066-071-000-034-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
066-071-000-034-200	066-071-000-034-200-PHO2A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
066-092-000-003-100	066-092-000-003-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
066-092-000-003-200	066-092-000-003-200-PHO2A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
066-093-000-009-100	066-093-000-009-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
066-093-000-012-100	066-093-000-012-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey

Massachusetts Coastal Infrastructure and Assessment



066-071-000-034-100-PHO1A



066-071-000-034-200-PHO2A



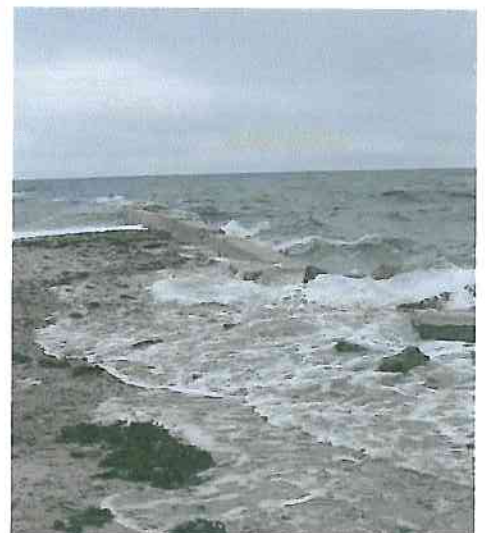
066-092-000-003-100-PHO1A



066-092-000-003-200-PHO2A



066-093-000-009-100-PHO1A



066-093-000-012-100-PHO1A

Section III - Sandwich

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

TOWN: SANDWICH
SOURCE: Town of Sandwich
LOCATION: TOWN
DATE OF RESEARCH: JULY 2007

No Town Documents for the Town of Sandwich

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
066-093-000-009-100	066-093-000-009-100-DCR1A	1353	MA-DCR	Sandwich	December 1953	Proposed Shore Protection - Groin Construction Town Neck Road - Sandwich - Prepared for the DPW of Massachusetts - Division of Waterways	1	Town Neck Road	
066-093-000-009-100	066-093-000-009-100-DCR1B	1627	MA-DCR	Sandwich	June 1956	Proposed Shore Protection - Groin Construction and Reconstruction - East Sandwich and Town Neck Beaches - Sandwich - Prepared for the DPW of Massachusetts - Division of Waterways	3	Town Neck Beach	Groins
066-093-000-009-100	066-093-000-009-100-DCR1C	1804	MA-DCR	Sandwich	September 1957	Proposed Shore Protection Groin Construction - Town Neck Beach - Prepared for the DPW of Massachusetts - Division of Waterways	1	Town Neck Beach	Groin
066-093-000-009-100	066-093-000-009-100-DCR1D	1980	MA-DCR	Sandwich	December 1958	Proposed Shore Protection - Groin Construction, Repairs and Reconstruction - Town Neck Beach and Springhill Beach - Sandwich - Prepared for the DPW of Massachusetts - Division of Waterways	2	Town Neck Beach	Groins
066-093-000-009-100	066-093-000-009-100-DCR1E	2530	MA-DCR	Sandwich	March 1968	Proposed Shore Protection - Groin Construction - Town Neck Beach - Sandwich - Prepared for the DPW of Massachusetts - Division of Waterways	1	Freeman Avenue	Groins

TOWN: SANDWICH
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

NO DEP CH. 91 LICENSES FOR THE TOWN OF SANDWICH

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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TOWN: SANDWICH
 SOURCE: US ACOE
 LOCATION: CONCORD, MA
 DATE OF RESEARCH: AUGUST 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
066-093-000-009-100	066-093-000-009-100-COE1A	54-20	USACE	Sandwich	January 1954	Proposed Stone Groin in Cape Cod Bay between Cape Cod Canal and Town Neck - Sandwich, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	1	Town Neck Road	Groin
066-093-000-009-100	066-093-000-009-100-COE1B	56-217	USACE	Sandwich	July 1958	Proposed Groin - Cape Cod Bay - Town Neck Beach - Sandwich, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	1	Town Neck Beach	Groin
066-093-000-009-100	066-093-000-009-100-COE1C	57-326	USACE	Sandwich	October 1957	Proposed Groins - Town Neck Beach - Cape Cod Bay - Sandwich, Massachusetts - Prepared for the DPW of Massachusetts - Division of Waterways	1	Town Neck Beach	Groin
066-093-000-009-100	066-093-000-009-100-COE1D	66-162	USACE	Sandwich	March 1966	Proposed Shore Protection - Groin Construction - Town Neck Beach - Cape Cod Bay - Sandwich - Prepared for the DPW of Massachusetts - Division of Waterways	2	Town Neck Beach	Groin

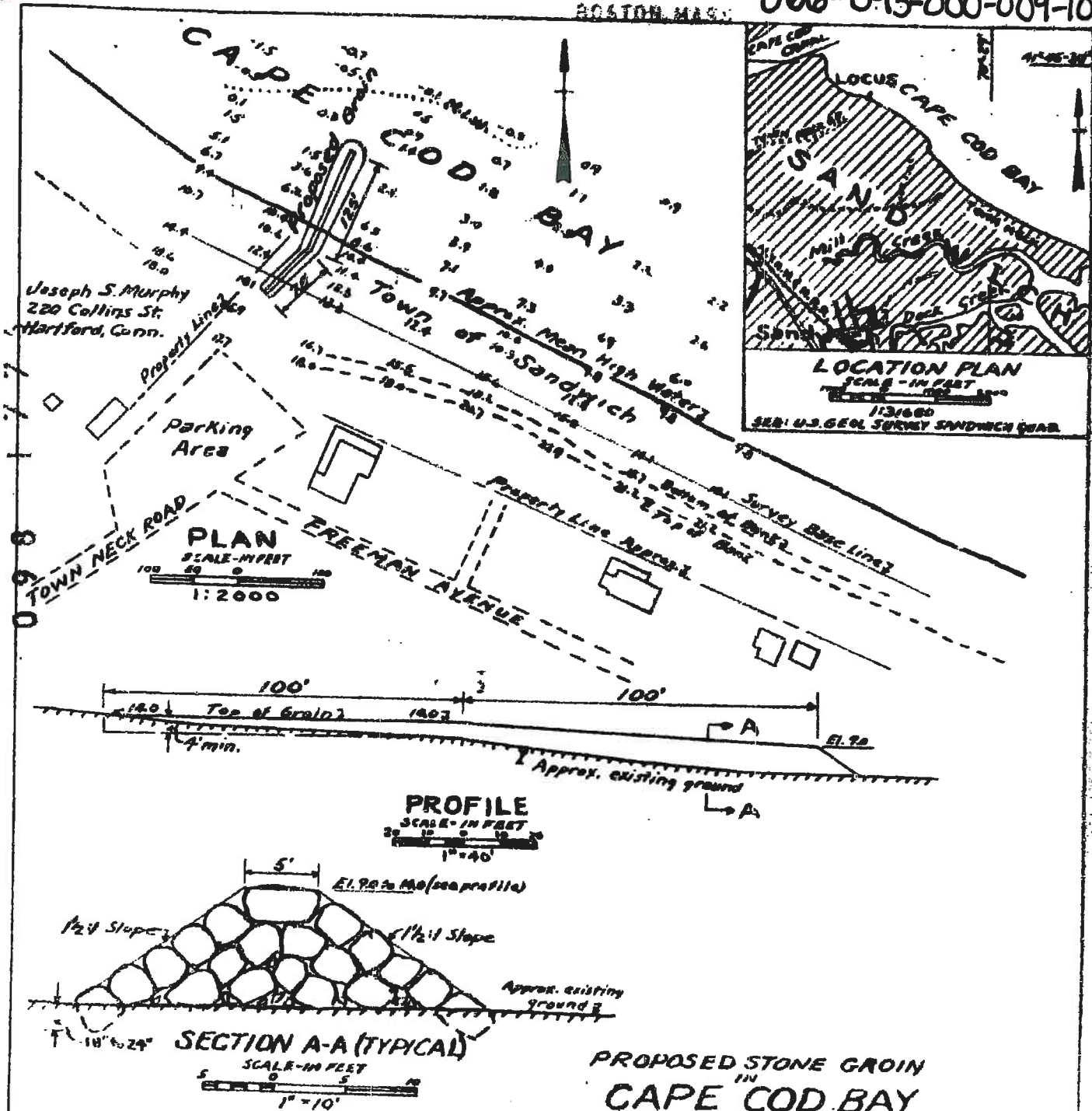
09100756

NEW ENGLAND DIV.

JAN 13 8 29 AM '54

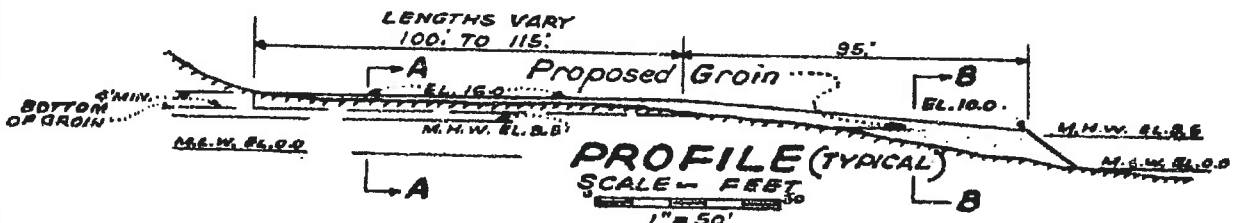
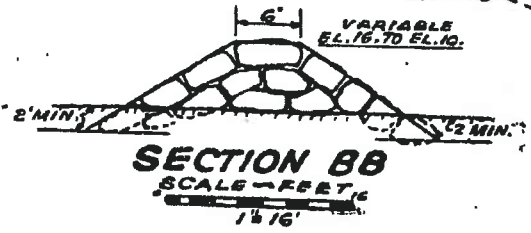
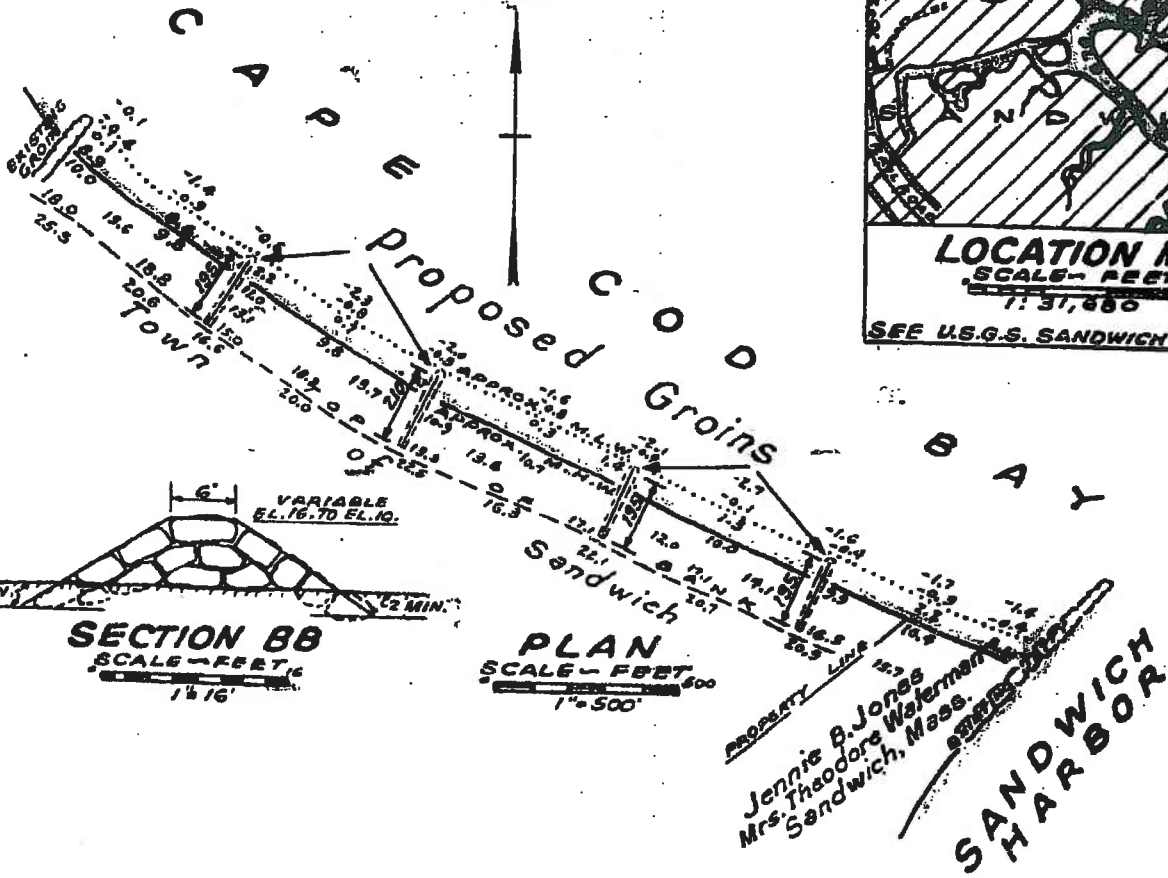
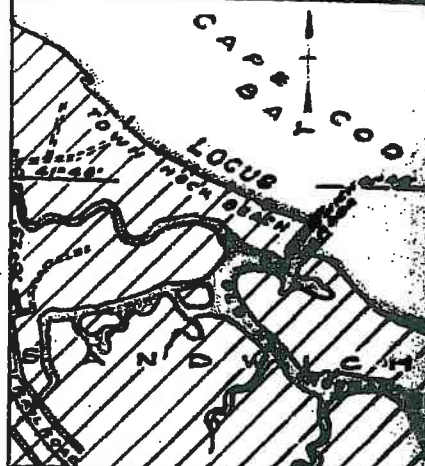
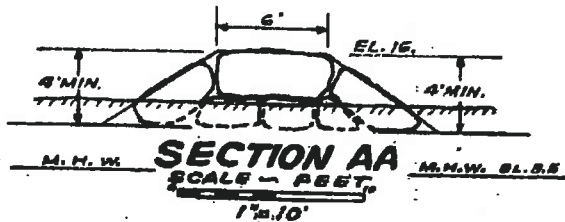
BOSTON, MASS.

066-093-000-009-100



088 506

066-093-000-009-100



NOTE

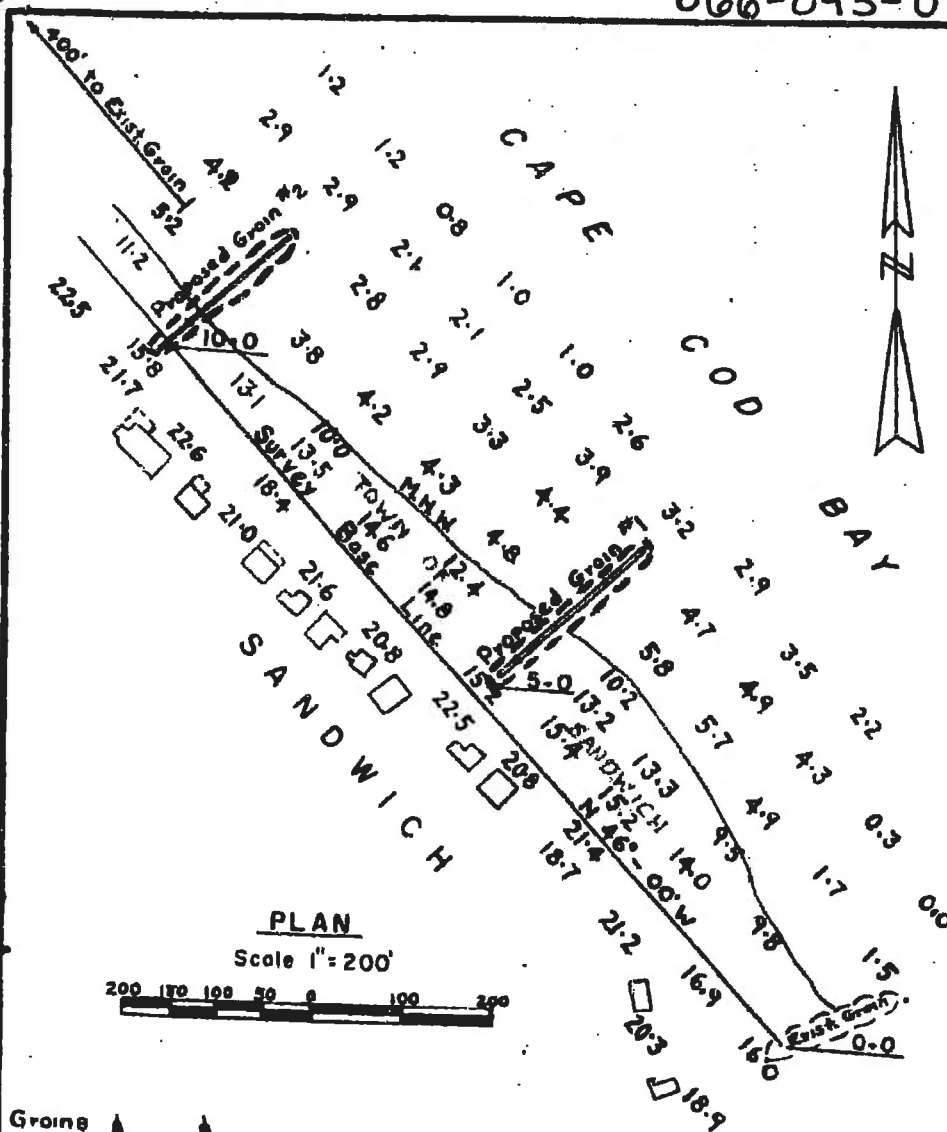
ELEVATIONS ARE IN FEET AND TENTHS AND REFER TO PLANE OF MEAN LOW WATER MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE.
APPROX. LOCATION OF GROUND SURFACE IS SHOWN THUS.
ALL SIDE AND END SLOPES FOR GROINS TO BE 1.5 TO 1.
LOCATION OF PROPOSED WORK IS SHOWN IN RED.

**PROPOSED GROINS
TOWN NECK BEACH
CAPE COD BAY**

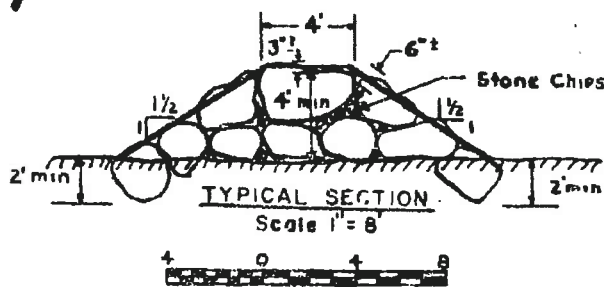
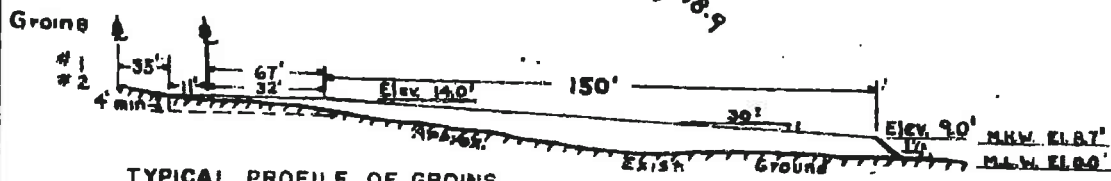
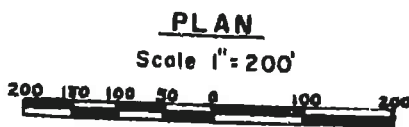
SANDWICH - MASS.
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS - MASSACHUSETTS
DIVISION OF WATERWAYS
OCTOBER 1957
Robert B. MacKinnon
CHIEF WATERWAYS ENGINEER

0 7 0 0 2 5 3

066-093-000-009-100



GENERAL NOTES:
 Elevations are in feet and
 Tenths and Refer to the
 Plane of Mean Low Water
 Refer to Transit Book No. 463
 Survey made Sept. 1964
 Location of Proposed Work
 Shown in Red

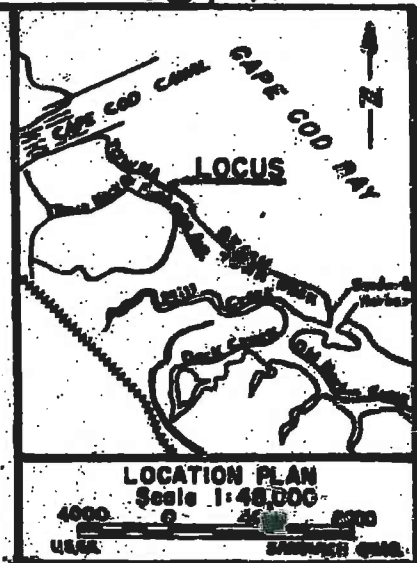
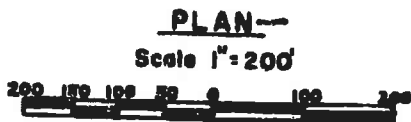
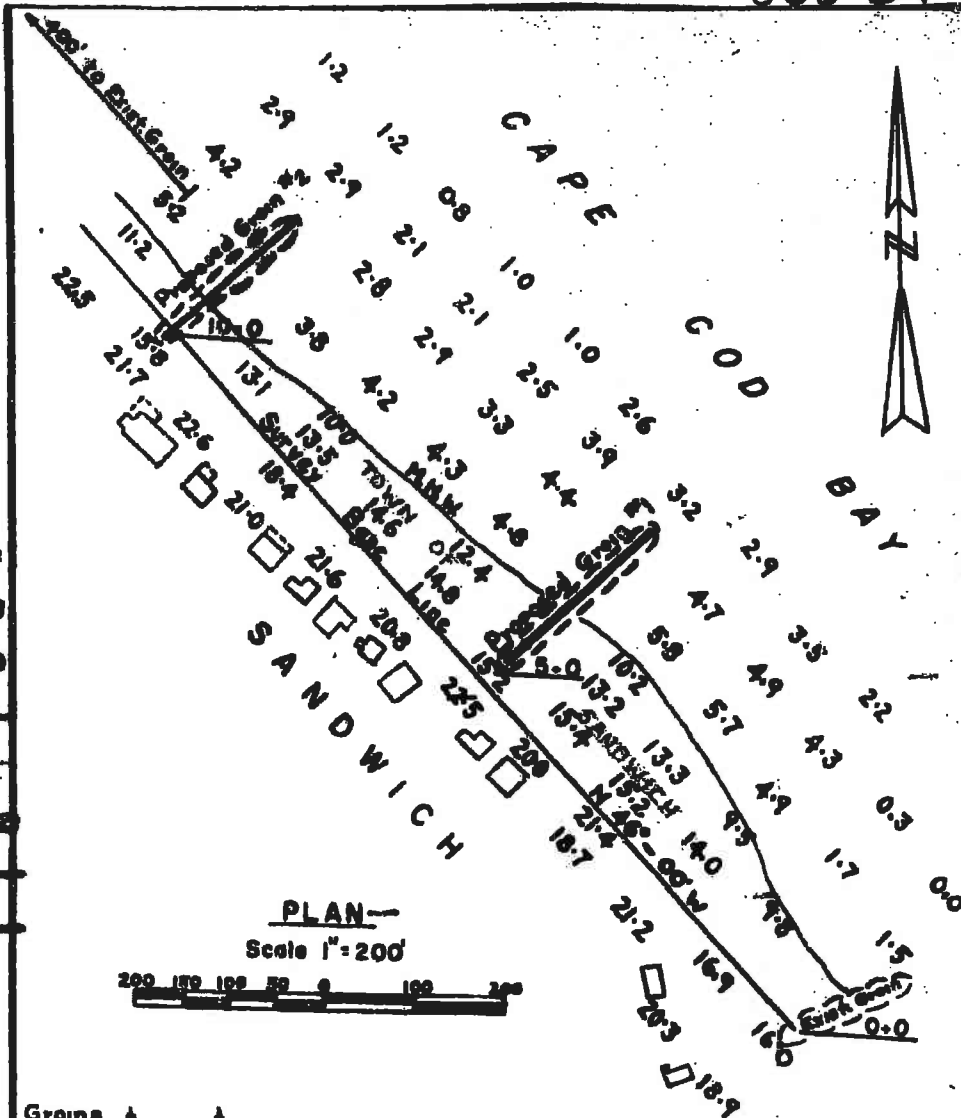


**PROPOSED SHORE PROTECTION
 GROIN CONSTRUCTION
 TOWN NECK BEACH
 CAPE COD BAY
 SANDWICH**
 APPLICATION BY
 DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
 DIVISION OF WATERWAYS
 MARCH 1966
John T. Hannons
 DEPUTY CHIEF ENGINEER FOR WATERWAYS
 ACC. 04820

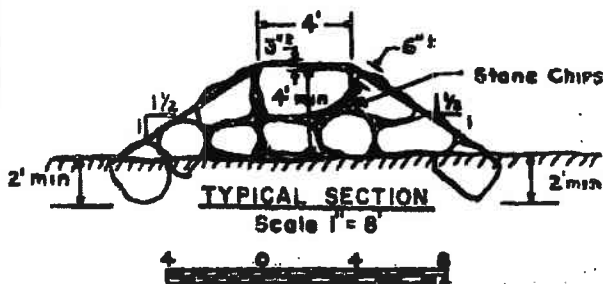
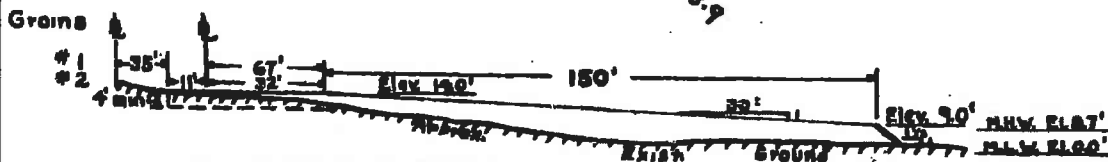
0 7 0 0 2 5 4

066-093-000-009-100

118 1336



GENERAL NOTES:
Elevations are in Feet and Tenths and Refer to the Plane of Mean Low Water Refer to Transit Book No. 963 Survey made Sept. 1964 Location of Proposed Work Shown in Red



**PROPOSED SHORE PROTECTION
GROIN CONSTRUCTION
TOWN NECK BEACH
CAPE COD BAY
SANDWICH**
APPLICATION BY
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
MARCH 1966
John T. Hannons
DEPUTY CHIEF ENGINEER FOR WATERWAYS
ACC. 04523

Section IV

Mashpee

Section IV – Community Findings – Town of Mashpee

COMMUNITY DESCRIPTION

The Town of Mashpee consists of a land area of 23.48 square miles out of a total area of 27.24 square miles and had a population of 12,946 in the 2000 census. The Town is located on Cape Cod of Massachusetts and its location can be seen on this report's cover. The estimated length of shoreline is 7 miles that are directly exposed to open ocean. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Mashpee, there were 4 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 4 in Section IV-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

STRUCTURE TYPE AND QUANTITY - Town of Mashpee

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Length
		A	B	C	D	F	
Bulkhead / Seawall							
Revetment	1			1			295
Breakwater							
Groin / Jetty	2		1		1		1265
Coastal Dune							
Coastal Beach	1		1				8650
	4		2	1	1		10210

Within the above table, the total length of each type of structure is also provided. The structures are listed by the type which is providing the primary coastal protection. Many sites have multiple structure types at the same location (i.e. revetment in front of seawall). These secondary structures, although not identified within these tables, are included in the development of repair/rehabilitation costs.

The development of repair costs has been included by structure type and by condition. In the Town of Mashpee's case there are a total of 4 structures which would require approximately \$ 3.2 million to bring all the coastal structures to "A" Rating. Most critical will be the structures in the "D" and "F" classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated \$ 1.9 million would be required to upgrade the Town's coastal protection.

**MASSACHUSETTS COASTAL INFRASTRUCTURE
INVENTORY AND ASSESSMENT PROJECT**

STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Mashpee

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Cost
		A	B	C	D	F	
Bulkhead / Seawall							\$ -
Revetment	1			\$ 177,177			\$ 177,177
Breakwater							\$ -
Groin / Jetty	2		\$ 76,184		\$ 1,873,872		\$ 1,950,056
Coastal Dune							\$ -
Coastal Beach	1		\$ 1,096,128				\$ 1,096,128
	4	\$ -	\$ 1,172,312	\$ 177,177	\$ 1,873,872	\$ -	\$ 3,223,361

Based on the limited research within the scope of this project research, the presumed ownership of the structures was established on an initial basis and would be subject to more intense review in future tasks. Structures identified as being owned privately were excluded from further consideration. Although ownership of the land on which the structure was located was a factor, the structure ownership was treated as a separate issue from land ownership. For the Town of Mashpee, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Mashpee

Primary Structure (1)	Total Structures	Structure Condition Rating					Total Cost
		A	B	C	D	F	
Town Owned	4		\$ 76,184	\$ 177,177	\$ 1,873,872		\$ 2,127,233
Commonwealth of Massachusetts			\$ 1,096,128				\$ 1,096,128
Federal Government Owned							\$ -
Unknown Ownership							\$ -
	4	\$ -	\$ 1,172,312	\$ 177,177	\$ 1,873,872	\$ -	\$ 3,223,361

The identification of presumed ownership was not based on the investigation of legal documents but relied on property ownership and from construction and regulatory documents that were found. A more detailed investigation of legal documents and agreements would be required where structure ownership is disputed. A more detailed identification of structure type, length, condition and location can be found in Section IV-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Mashpee's coastal structure information that will eventually be input into a state-wide GIS database and will be accessible through MassGIS. This data, when compiled state-wide, will be critical in the development of both short term and long term planning for maintaining and improving Massachusetts coastal protection.

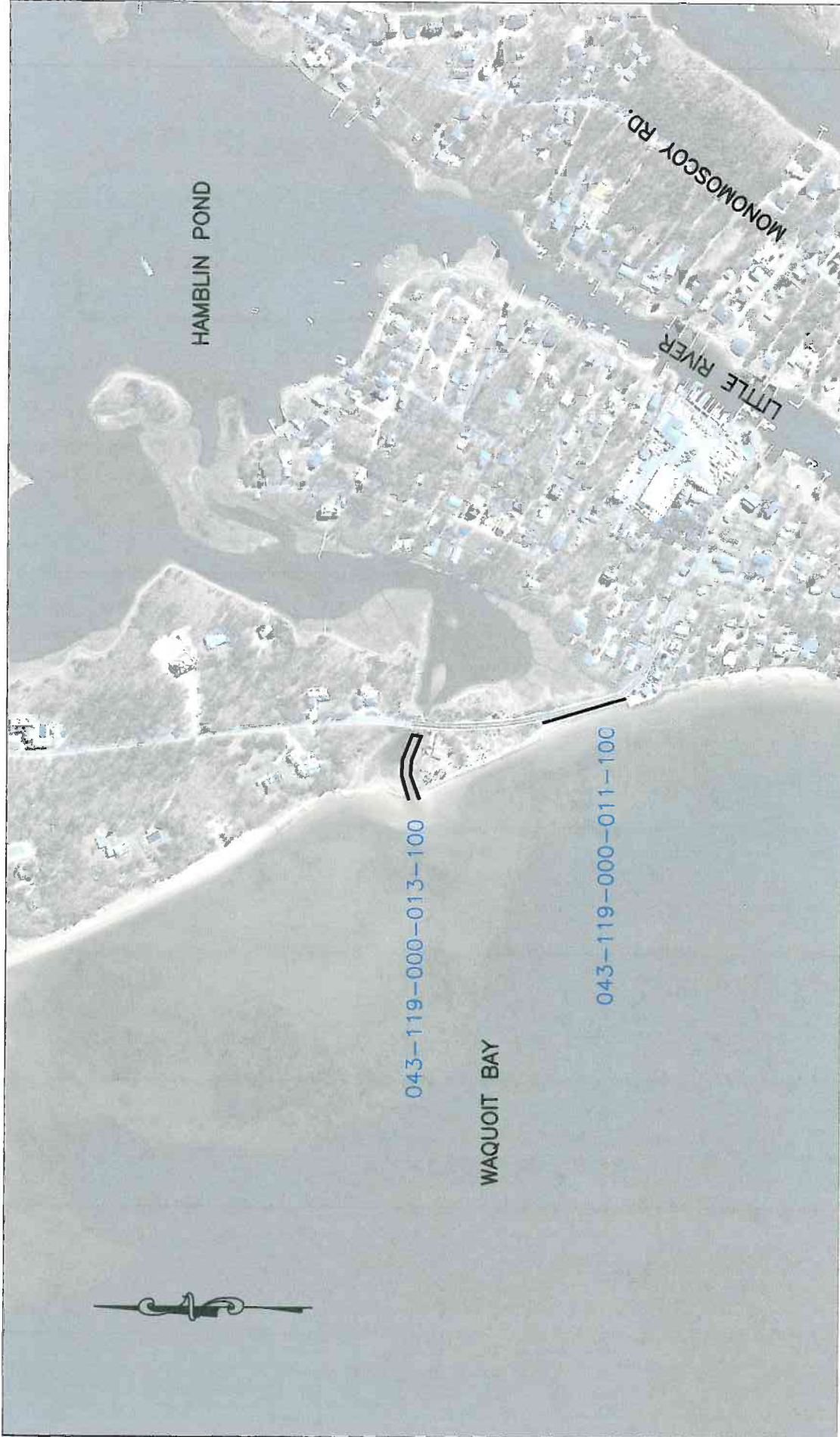
This database will also provide relatively quick access to identify available documentation for these structures as well as the ability to be updated as coastal structure improvements are made.



Section IV - Mashpee

Part B

Structure Assessment Reports

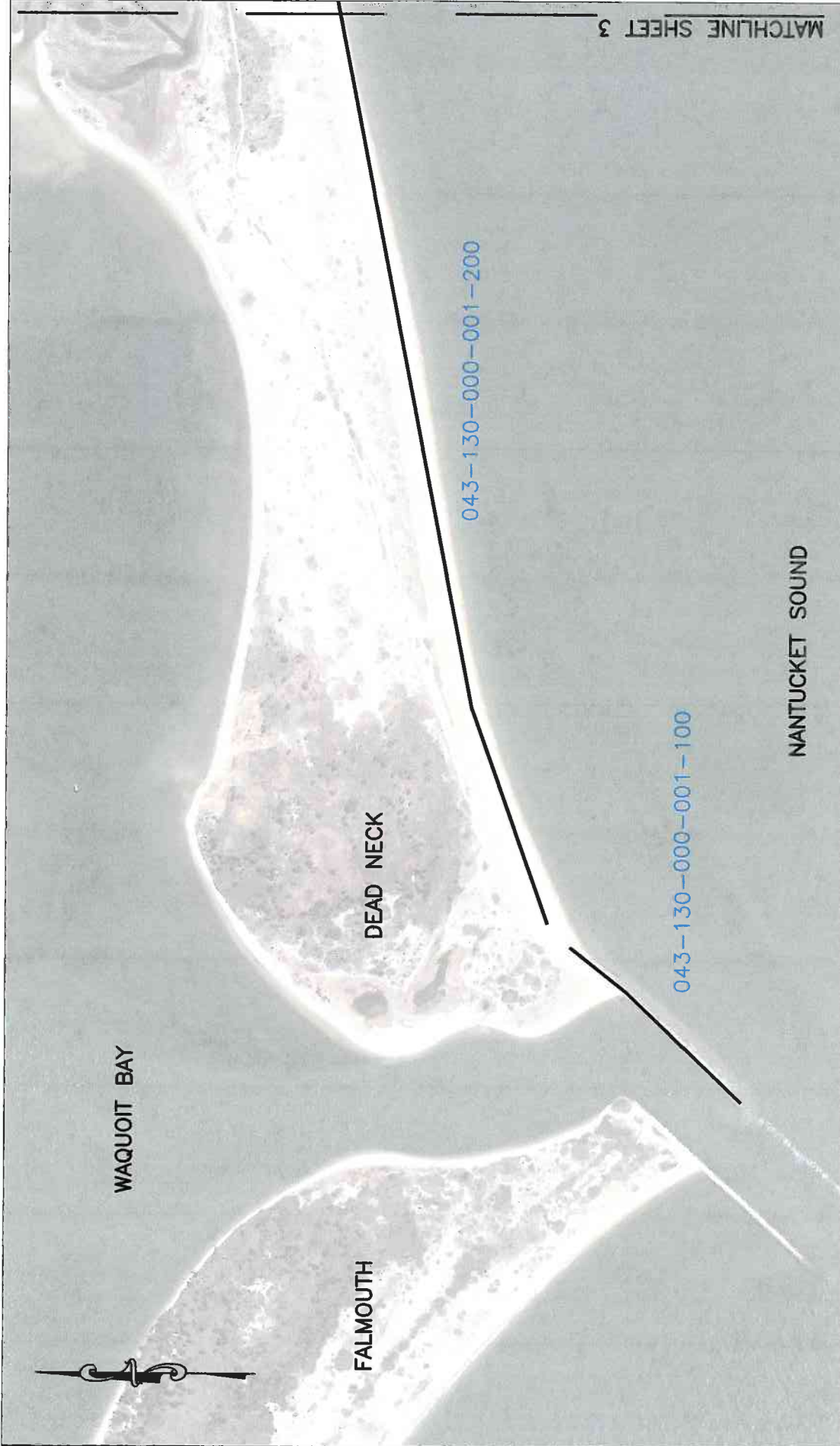


COASTAL STRUCTURE LOCATION PLAN

TOWN OF MASHPEE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



SCALE: 1" = 150'



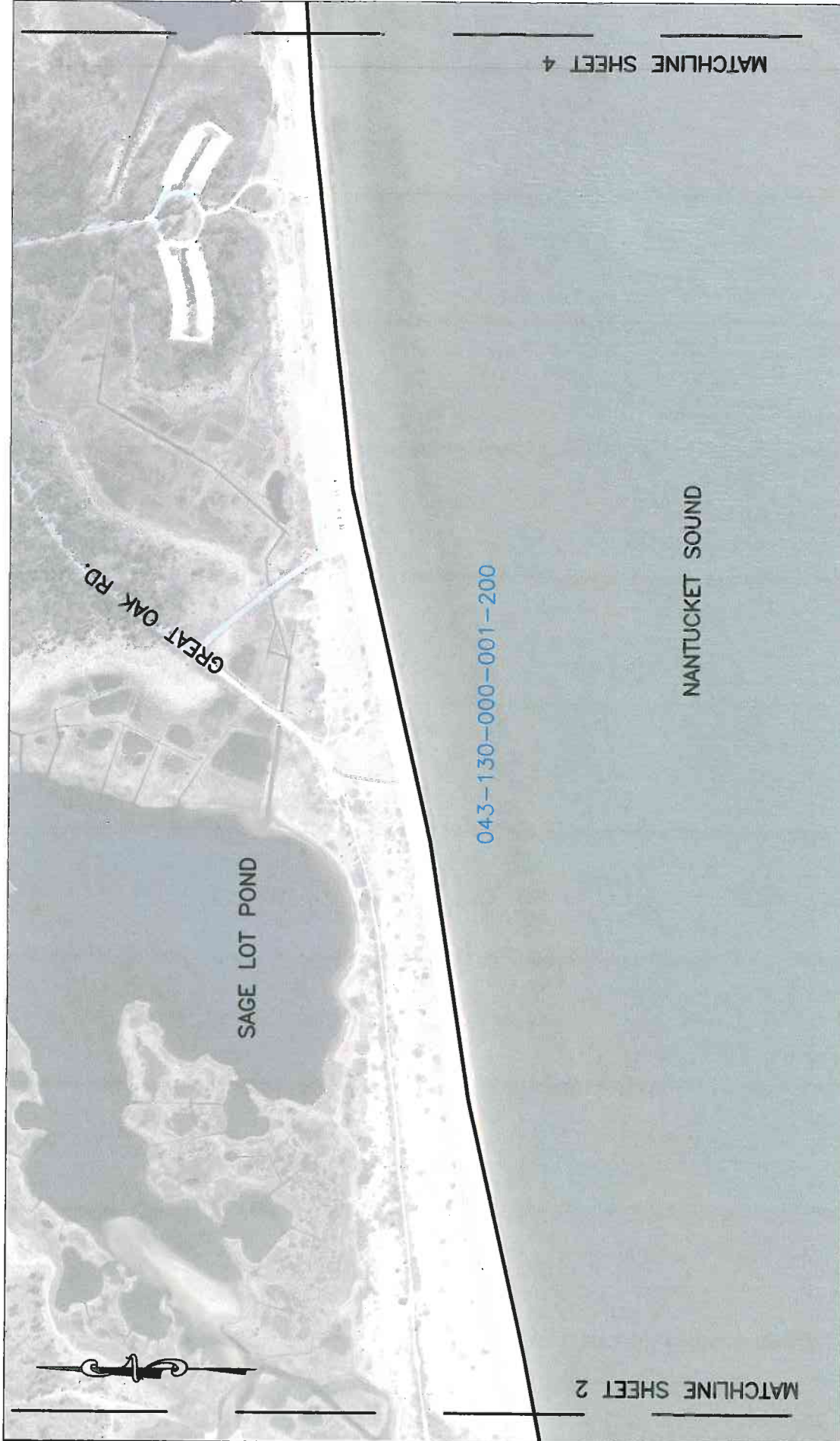
MATCHLINE SHEET 3

COASTAL STRUCTURE LOCATION PLAN

TOWN OF MASHPEE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



BCE *Bourne Consulting Engineering*
1000 Main Street
Bourne, MA 02532
TEL: (508) 552-0000 FAX: (508) 552-0000

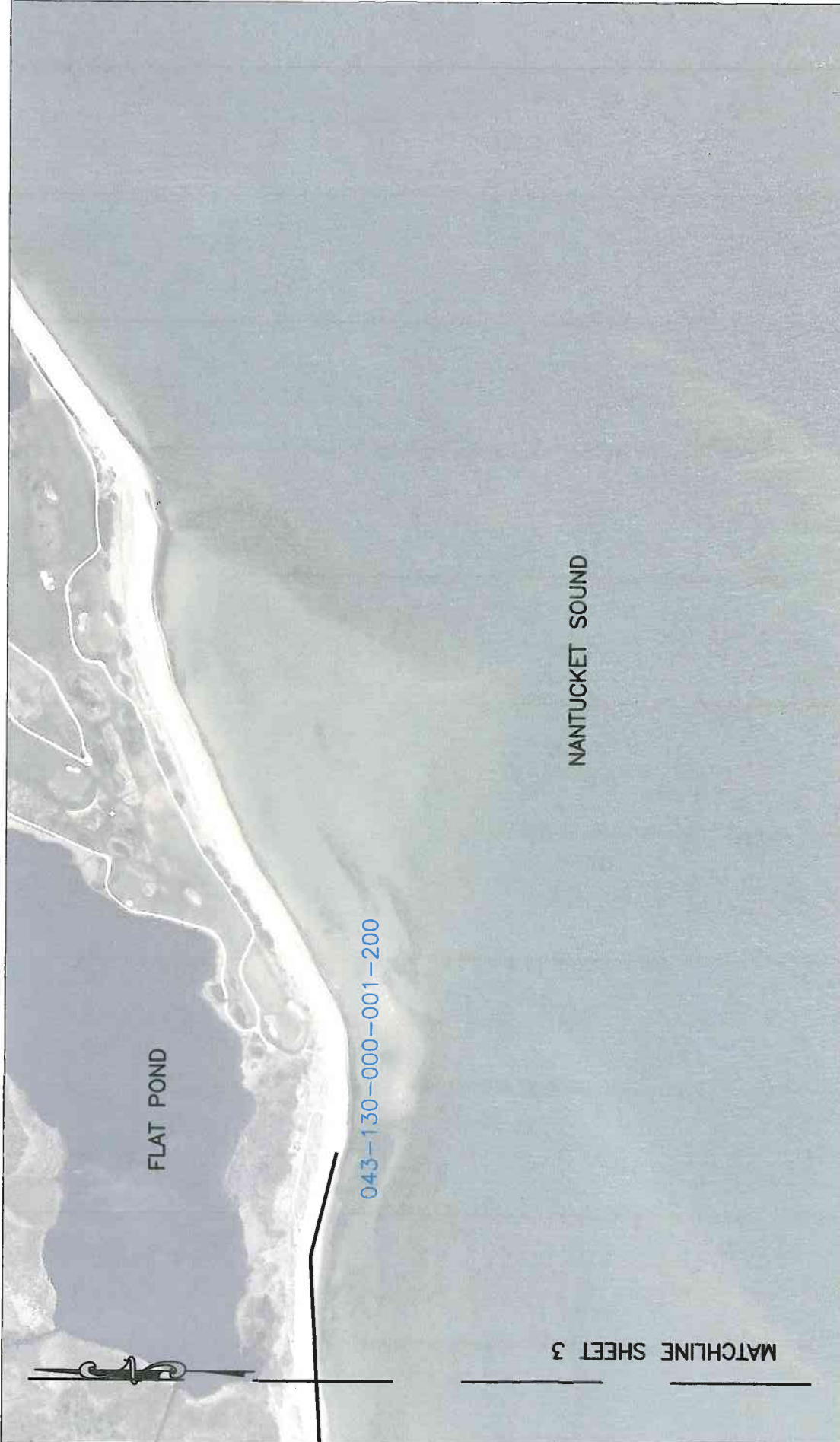


COASTAL STRUCTURE LOCATION PLAN

TOWN OF MASHPEE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007

0 150
SCALE: 1" = 150'





COASTAL STRUCTURE LOCATION PLAN

TOWN OF MASHPEE
COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT PROJECT
DECEMBER 2007



Structure Assessment Form

Town: **Mashpee**Structure ID: **043-119-000-011-100**

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Seconsett Island Road

Date:

8/8/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Mashpee

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$177,177.00

Length:

295

Feet

Top Elevation:

Feet NAVD 88

FIRM Map Zone:

V18

FIRM Map Elevation:

14

Feet NGVD

Primary Type:

Revetment

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is a revetment along Seconsett Island Road. There is some slumping in the central section of structure resulting in a minor loss of crest elevation.

Condition

C

Rating

Fair

Level of Action

Moderate

Description

Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.

Priority

IV

Rating

High Priority

Action

Consider for Next Project Construction Listing

Description

High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

043-119-000-011-100-PHO1A.jpg

Structure Documents:

Structure Assessment Form

Town: **Mashpee**

Structure ID: 043-119-000-013-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Seconsett Island Road at Hamblin Pond

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Mashpee

Earliest Structure Record:

Unknown

Estimated Reconstruction/Repair Cost:

\$64,020.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
485		V18	14
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the jetties at the culvert into Hamblin Pond along Seconsett Island Road. The armor stone is weathered but solid. The side slopes and crest in good condition.

Condition

B

Rating

Good

Level of Action

Minor

Description

Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landform is present. Structure / landform adequate to provide protection from a major coastal storm with no damage. Actions taken to prevent / limit future deterioration and extend life of structure.

Priority

II

Rating

Low Priority

Action

Future Project Consideration

Description

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:

043-119-000-013-100-PHO1A.jpg

Structure Documents:

Structure Assessment Form

Town: Mashpee

Structure ID: 043-130-000-001-100

Key: community-map-block-parcel-structure

Property Owner:

Local

Location:

Wauquoit Bay entrance

Date:

10/11/2007

Presumed Structure Owner:

Local

Based On Comment:

Owner Name:

Mashpee

Earliest Structure Record:

1945

Estimated Reconstruction/Repair Cost:

\$1,873,872.00

Length:	Top Elevation:	FIRM Map Zone:	FIRM Map Elevation:
780		V17	17
Feet	Feet NAVD 88		Feet NGVD

Primary Type:

Groin/ Jetty

Primary Material:

Stone

Primary Height:

5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:



Structure Summary :

This structure is the East Jetty at Wauquoit Bay. There are multiple sections with damaged armor. These damaged areas show slumped sideslopes and loss of crest elevation. There is minimal interlocking between armor stones in the damaged sections.

Condition

D

Rating

Poor

Level of Action

Major

Description

Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.

Priority

III

Rating

Moderate Priority

Action

Consider for Active Project Improvement Listing

Description

Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:

043-130-000-001-100-PHO1A.jpg

Structure Documents:

MA-DCR	Janaury 194	Proposed Jetty	043-130-000-001-100-DCR1A
MA-DCR	September 1	Proposed Shore	043-130-000-001-100-DCR1B
MA-DCR	December 1	Reconstruction of	043-130-000-001-100-DCR1C
MA-DCR	February 19	Plan of Land - South	043-130-000-001-100-DCR1D

Section IV - Mashpee

Part C

Structure Photographs

TOWN: MASHPEE
 SOURCE: ACE - FIELD PHOTOGRAPHS
 LOCATION: Bourne Consulting Engineering
 DATE OF RESEARCH: JULY 2007

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
043-119-000-011-100	043-119-000-011-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
043-119-000-013-100	043-119-000-013-100-PHO1A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
043-130-000-001-100	043-130-000-001-100-PHO2A.jpg		Bourne Consulting Engineering		October 2007	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
043-130-000-001-200	043-130-000-001-200-PHO2A.jpg		Bourne Consulting Engineering		April 2009	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
043-130-000-001-200	043-130-000-001-200-PHO2B.jpg		Bourne Consulting Engineering		April 2009	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey
043-130-000-001-200	043-130-000-001-200-PHO2C.jpg		Bourne Consulting Engineering		April 2009	DIGITAL IMAGE	1	Structure Location	Structure Condition Photo at Time of Survey

Massachusetts Coastal Infrastructure and Assessment



043-119-000-011-100-PHO1A



043-119-000-013-100-PHO1A



043-130-000-001-100-PHO1A



043-130-000-001-200-PHO21



043-130-000-001-200-PHO2B



043-130-000-001-200-PHO2C

Section IV - Mashpee

Part D

Structure Documents

TOWN DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents

TOWN: MASHPEE
SOURCE: Town of Mashpee
LOCATION: TOWN
DATE OF RESEARCH: JULY 2007

No Town Documents for the Town of Mashpee

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
043-130-000-001-100	043-130-000-001-100-DCR1A	823	MA-DCR	Mashpee	January 1945	Proposed Jetty Repairs - Waquoit Bay Entrance - Mashpee - Prepared for the DPW of Massachusetts - Division of Waterways	2	Waquoit Bay Entrance	Jetty Repairs
043-130-000-001-100	043-130-000-001-100-DCR1B	1267	MA-DCR	Mashpee	September 1952	Proposed Shore Protection and Drainage - Popponesset Beach and Waquoit Bay - Mashpee - Prepared for the DPW of Massachusetts - Division of Waterways	1	Waquoit Bay Entrance	Jetty
043-130-000-001-100	043-130-000-001-100-DCR1C	1292	MA-DCR	Mashpee	December 1952	Reconstruction of Jetty - Waquoit Bay - Mashpee and Falmouth - Prepared for the DPW of Massachusetts - Division of Waterways	1	Waquoit Bay Entrance	Jetty
043-130-000-001-100	043-130-000-001-100-DCR1D	N/A	MA-DCR	Mashpee	February 1976	Plan of Land - South Cape Beach, Mashpee, Massachusetts - Survey of Existing Conditions	2	Waquoit Bay	Breakwater

TOWN: MASHPEE
SOURCE: DEP
LOCATION: BOSTON, MA
DATE OF RESEARCH: JULY 2007

NO DEP CH. 91 LICENSES FOR THE TOWN OF MASHPEE

BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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BCE Structure No	Document No	Contract/ Drawing Number	Entity	Municipality	Date	Title	Sheets	Location	Description
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