Cape Ann

Gloucester
Rockport

July 6, 2009

Prepared for:

Massachusetts Department of Conservation and Recreation
Hingham, Massachusetts

Presented by:

Bourne Consulting Engineering
Franklin, Massachusetts
TABLE OF CONTENTS

Section I – Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION
PURPOSE
DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES
DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS

Section II - Gloucester

Part A - Community Findings

• COMMUNITY DESCRIPTION

• STRUCTURE INVENTORY

• SUMMARY OF FINDINGS

Part B - Structure Assessment Reports

Part C - Structure Photographs

Part D - Structure Documents

• CITY DOCUMENT LIST
  o Document Table

• MA DCR – DOCUMENT LIST
  o Document Table

• MA DEP – CH 91 DOCUMENT LIST
  o Document Table
  o Copies of License Documents

• USACE – PERMIT DOCUMENT LIST
  o Document Table
  o Copies of Permit Documents
Section III - Rockport

Part A - Community Findings

- COMMUNITY DESCRIPTION
- STRUCTURE INVENTORY
- SUMMARY OF FINDINGS

Part B - Structure Assessment Reports

Part C - Structure Photographs

Part D - Structure Documents

- TOWN DOCUMENT LIST
  o Document Table
- MA DCR – DOCUMENT LIST
  o Document Table
- MA DEP – CH 91 DOCUMENT LIST
  o Document Table
  o Copies of License Documents
- USACE – PERMIT DOCUMENT LIST
  o Document Table
  o Copies of Permit Documents
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.

Cape Ann
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 were 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

<table>
<thead>
<tr>
<th>Preliminary Condition Assessment</th>
<th>Definition Based Upon Perceived Immediacy of Action and Potential to Cause Damage if Not Corrected</th>
<th>Level of Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Excellent</td>
<td>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</td>
<td>None</td>
</tr>
<tr>
<td>B Good</td>
<td>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</td>
<td>Minor</td>
</tr>
<tr>
<td>C Fair</td>
<td>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</td>
<td>Moderate</td>
</tr>
<tr>
<td>D Poor</td>
<td>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.</td>
<td>Major</td>
</tr>
<tr>
<td>F Critical</td>
<td>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.</td>
<td>Immediate</td>
</tr>
</tbody>
</table>
### EXHIBIT B

**Priority Rating System** - 5 Level Rating System

<table>
<thead>
<tr>
<th>Preliminary Priority Level Assessment</th>
<th>Level Based Upon Perceived Immediacy of Action and Presence of Potential Risk to Inshore Structures if Not Corrected</th>
<th>Level of Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>None, No Inshore Structures or Residential Dwelling Units Present</td>
<td>Long Term Planning Considerations</td>
</tr>
<tr>
<td>II</td>
<td>Low Priority, Inshore Structures Present with Limited potential for Significant Infrastructure Damage</td>
<td>Future Project Consideration</td>
</tr>
<tr>
<td>III</td>
<td>Moderate Priority, Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (&lt;1 dwelling impacted / 100 feet of shoreline)</td>
<td>Consider for Active Project Improvement Listing</td>
</tr>
<tr>
<td>IV</td>
<td>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)</td>
<td>Consider for Next Project Construction Listing</td>
</tr>
<tr>
<td>V</td>
<td>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. (&gt;10 dwellings impacted / 100 feet of shoreline)</td>
<td>Consider For Immediate Action Due to Public Safety and Welfare Issues</td>
</tr>
</tbody>
</table>

---

I-10

Cape Ann
## REPAIR / REHABILITATION COSTING DATA

Cost per linear foot of structure

<table>
<thead>
<tr>
<th>STRUCTURE TYPE</th>
<th>STRUCTURE MATERIALS</th>
<th>LENGTH</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>BULKHEAD/SEAWALL</td>
<td>CONCRETE</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$84</td>
<td>$425</td>
<td>$850</td>
<td>$983</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$152</td>
<td>$759</td>
<td>$1,518</td>
<td>$1,782</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$251</td>
<td>$1,254</td>
<td>$2,508</td>
<td>$2,970</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$396</td>
<td>$1,980</td>
<td>$3,960</td>
<td>$4,752</td>
</tr>
<tr>
<td></td>
<td>STEEL</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$54</td>
<td>$273</td>
<td>$548</td>
<td>$680</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$165</td>
<td>$825</td>
<td>$1,650</td>
<td>$1,848</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$251</td>
<td>$1,254</td>
<td>$2,508</td>
<td>$2,772</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$343</td>
<td>$1,715</td>
<td>$3,432</td>
<td>$3,785</td>
</tr>
<tr>
<td></td>
<td>STONE</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$84</td>
<td>$426</td>
<td>$860</td>
<td>$983</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$152</td>
<td>$759</td>
<td>$1,518</td>
<td>$1,782</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$251</td>
<td>$1,254</td>
<td>$2,508</td>
<td>$2,970</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$396</td>
<td>$1,980</td>
<td>$3,960</td>
<td>$4,752</td>
</tr>
<tr>
<td></td>
<td>WOOD</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$96</td>
<td>$431</td>
<td>$862</td>
<td>$994</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$127</td>
<td>$632</td>
<td>$1,265</td>
<td>$1,493</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$161</td>
<td>$804</td>
<td>$1,608</td>
<td>$1,872</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$202</td>
<td>$1,008</td>
<td>$2,017</td>
<td>$2,380</td>
</tr>
<tr>
<td>COASTAL BEACH</td>
<td>SAND</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$26</td>
<td>$132</td>
<td>$264</td>
<td>$264</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$127</td>
<td>$634</td>
<td>$1,267</td>
<td>$1,267</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$224</td>
<td>$1,122</td>
<td>$2,244</td>
<td>$2,244</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$396</td>
<td>$1,980</td>
<td>$3,960</td>
<td>$3,960</td>
</tr>
<tr>
<td>COASTAL DUNE</td>
<td>SAND</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$18</td>
<td>$93</td>
<td>$198</td>
<td>$198</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$48</td>
<td>$236</td>
<td>$476</td>
<td>$476</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$79</td>
<td>$395</td>
<td>$790</td>
<td>$790</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$132</td>
<td>$690</td>
<td>$1,320</td>
<td>$1,320</td>
</tr>
<tr>
<td>REVETMENT</td>
<td>STONE</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$66</td>
<td>$333</td>
<td>$664</td>
<td>$730</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$120</td>
<td>$601</td>
<td>$1,201</td>
<td>$1,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$157</td>
<td>$781</td>
<td>$1,586</td>
<td>$1,696</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$247</td>
<td>$1,234</td>
<td>$2,468</td>
<td>$2,686</td>
</tr>
<tr>
<td>GROIN</td>
<td>STONE</td>
<td>Under 5 Feet</td>
<td>$0</td>
<td>$132</td>
<td>$684</td>
<td>$1,328</td>
<td>$1,460</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 To 10 Feet</td>
<td>$0</td>
<td>$240</td>
<td>$1,201</td>
<td>$2,402</td>
<td>$2,600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
<td>$0</td>
<td>$314</td>
<td>$1,584</td>
<td>$3,128</td>
<td>$3,392</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
<td>$0</td>
<td>$494</td>
<td>$2,468</td>
<td>$4,937</td>
<td>$5,333</td>
</tr>
</tbody>
</table>

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

Gloucester
Section II – Community Findings – City of Gloucester

COMMUNITY DESCRIPTION

The City of Gloucester consists of a land area of 25.97 square miles out of a total area of 41.5 square miles and had a population of 30,273 in the 2000 census. The City is located on the North Shore of Massachusetts and its location can be seen on this report’s cover. The estimated length of shoreline that is directly exposed to open ocean waves is 20 miles with the remaining shoreline semi-protected by offshore structures or landforms. The City 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 City 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 City of Gloucester, there were 33 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 8 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:

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead / Seawall</td>
<td>22</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td>3</td>
<td></td>
<td>9335</td>
</tr>
<tr>
<td>Revetment</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>4070</td>
</tr>
<tr>
<td>Breakwater</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>3615</td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Dune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Beach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>2</td>
<td>15</td>
<td>13</td>
<td>3</td>
<td></td>
<td>17020</td>
</tr>
</tbody>
</table>

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 City of Gloucester’s case there are a total of 31 structures which would require approximately $18 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 $6.4 million would be required to upgrade the City’s coastal protection.
STRUCTURE REPAIR / RECONSTRUCTION COST - City of Gloucester

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead / Seawall</td>
<td>22</td>
<td>$ 1,158,254</td>
<td>$ 4,026,891</td>
<td>$ 6,393,420</td>
<td></td>
<td>$ 11,578,565</td>
<td></td>
</tr>
<tr>
<td>Revetment</td>
<td>8</td>
<td>$ 482,235</td>
<td>$ 1,982,554</td>
<td></td>
<td></td>
<td></td>
<td>$ 2,464,790</td>
</tr>
<tr>
<td>Breakwater</td>
<td>3</td>
<td>$ 1,111,500</td>
<td>$ 3,369,366</td>
<td></td>
<td>$ 6,393,420</td>
<td></td>
<td>$ 4,480,866</td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 4,378,811</td>
<td>$ 6,393,420</td>
<td>-</td>
</tr>
<tr>
<td>Coastal Dune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Coastal Beach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>$ 2,751,889</td>
<td>$ 9,378,811</td>
<td>$ 6,393,420</td>
<td>-</td>
<td>$ 18,524,220</td>
<td></td>
</tr>
</tbody>
</table>

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 City of Gloucester, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - City of Gloucester

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town Owned</td>
<td>26</td>
<td>$ 1,137,450</td>
<td>$ 7,142,598</td>
<td>$ 6,393,420</td>
<td></td>
<td>$ 14,673,568</td>
<td></td>
</tr>
<tr>
<td>Commonwealth of Massachusetts</td>
<td>5</td>
<td>$ 434,729</td>
<td>$ 2,236,113</td>
<td></td>
<td></td>
<td></td>
<td>$ 2,670,842</td>
</tr>
<tr>
<td>Federal Government Owned</td>
<td>1</td>
<td>$ 1,111,500</td>
<td></td>
<td></td>
<td>$ 68,310</td>
<td>$ 1,111,500</td>
<td></td>
</tr>
<tr>
<td>Unknown Ownership</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 68,310</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>$ 2,683,679</td>
<td>$ 9,447,121</td>
<td>$ 6,393,420</td>
<td>-</td>
<td>$ 18,524,220</td>
<td></td>
</tr>
</tbody>
</table>

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 City of Gloucester’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 - Gloucester

Part B

Structure Assessment Reports
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Fort Point</td>
<td>6/5/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>1954</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

**Length:** 510 Feet  
**Top Elevation:** NAVD 88 Feet  
**FIRM Map Zone:** V2  
**FIRM Map Elevation:** 13 Feet NGVD

**Primary Type:** Bulkhead/Seawall  
**Primary Material:** Concrete  
**Primary Height:** Over 15 Feet

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

**Structure Summary:**
Seawall is cast in place. Construction appears new. Behind the wall there is a playground and park. Riprap in front of the wall is approximately 25 feet wide. Stones are 6 feet by 2 feet by 3 feet, varying to 100 pound stone dumped riprap. No signs of scour or undermine. The top of the wall has drainage scuppers. The wall is 2 feet higher than grade at the back of the wall.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Excellent</td>
<td>I None</td>
<td>None Long Term Planning Considerations</td>
</tr>
</tbody>
</table>

**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.

**Structure Images:**
- 028-001-000-001-100-PHO1A.jpg  
- 028-001-000-001-100-PHO2B.jpg

**Structure Documents:**
- USACE  
  - July 2001  
  - City of Gloucester - 028-001-000-001-100-COE1A
- MA-DCR  
  - April 1954  
  - Proposed Seawall at - 028-001-000-001-100-DCR1A
- MA-DCR  
  - August 2000  
  - Inspection of Stone - 028-001-000-001-100-DCR1B

Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

**Property Owner:** Local

**Presumed Structure Owner:** Local

**Owner Name:** Gloucester

**Location:**
- **Stacey Boulevard - West**

**Based On Comment:**

**Earliest Structure Record:** 1952

**Estimated Reconstruction/Repair Cost:** $5,078,700.00

**Length:** 2025 Feet

**Top Elevation:** Feet NAVD 88

**FIRM Map Zone:** V2

**FIRM Map Elevation:** 15 Feet NGVD

**Primary Type:** Bulkhead/Seawall

**Primary Material:** Stone

**Primary Height:** 10 to 15 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:** Stone mortared seawall with boardwalk, monuments, houses and road behind. There are areas with stone loss about every 100 feet with 5 feet width holes behind the top of the wall that are exposing the wall to the bottom. Small (100 to 200 pound) riprap has been placed in front of these areas.

**Condition Rating**
- **D Poor**

**Level of Action 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 Rating Action Description**
- **IV High Priority**
  - Consider for Next Project Construction Listing
  - 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:**
- [028-003-000-072-100-PHO1A.jpg](028-003-000-072-100-PHO1A.jpg)
- [028-003-000-072-100-PHO1B.jpg](028-003-000-072-100-PHO1B.jpg)

**Structure Documents:**
- **USACE**
  - September 2
  - Reconstruction of 028-003-000-072-100-COE1A
- **MA-DCR**
  - July 1952
  - Proposed Seawall 028-003-000-072-100-DCR1A
- **Gloucester**
  - June 1955
  - Hurricane Damage 028-003-000-072-100-TWN1A

Prepared By: Bourne Consulting Engineering
## CZM Coastal Infrastructure Inventory and Assessment

### Structure Assessment Form

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Gloucester

**Location:**
- Stacey Boulevard - West

**Based On Comment:**
- 

**Earliest Structure Record:**
- 1952

**Estimated Reconstruction/Repair Cost:**
- $0.00

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>280 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>15 Feet NGVD</td>
</tr>
</tbody>
</table>

**Primary Type:**
- Bulkhead/Seawall

**Primary Material:**
- Stone

**Primary Height:**
- 10 to 15 Feet

**Secondary Type:**
- 

**Secondary Material:**
- 

**Secondary Height:**
- 

### Structure Summary:

The newly constructed seawall is stone mortarted. The seawall is adjacent to a bridge over the channel to the Annisquam River. There is a roadway behind the structure.

### Condition Rating

- **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 Rating Action Description

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

- **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:

- [028-003-000-072-200-PHO2A.jpg](028-003-000-072-200-PHO2A.jpg)

### Structure Documents:

<table>
<thead>
<tr>
<th>Structure</th>
<th>Date</th>
<th>Description</th>
<th>File ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE</td>
<td>September 2</td>
<td>Reconstruction of City of Gloucester</td>
<td>028-003-000-072-200-COE2A</td>
</tr>
<tr>
<td>USACE</td>
<td>June 2002</td>
<td>City of Gloucester - Proposed Seawall</td>
<td>028-003-000-072-200-COE2B</td>
</tr>
<tr>
<td>MA-DCR</td>
<td>July 1952</td>
<td>Proposed Seawall</td>
<td>028-003-000-072-200-DCR2A</td>
</tr>
<tr>
<td>MA-DCR</td>
<td>May 1958</td>
<td>Proposed Wall</td>
<td>028-003-000-072-200-DCR2B</td>
</tr>
<tr>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage</td>
<td>028-003-000-072-200-TWN2A</td>
</tr>
</tbody>
</table>

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Stacey Boulevard - East
Earliest Structure Record: 1952
Date: 6/6/2007
Estimated Reconstruction/Repair Cost: $712,800.00

<table>
<thead>
<tr>
<th>Length: 180 Feet</th>
<th>Top Elevation: 15 Feet NGVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Type:</td>
<td>Primary Material: Concrete</td>
</tr>
<tr>
<td>Secondary Type:</td>
<td>Secondary Material:</td>
</tr>
</tbody>
</table>

Structure Summary:
The seawall is comprised of two parts. The bottom of the wall is five to six stones high with a cast in place wall on top of it. The stones are approximately 5 feet by 2 feet. There is settling of the boardwalk behind the wall and undermining holes visible.

Condition Rating: D
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 Rating: High Priority
Action Description: Consider for Next Project Construction Listing
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:
- 028-003-000-072-300-PHO03A.jpg
- 028-003-000-072-300-PHO03B.jpg
- 028-003-000-072-300-PHO03C.jpg

Structure Documents:
- MA-DCR July 1952 Proposed Seawall 028-003-000-072-300-DCR3A
- MA-DCR May 1958 Proposed Wall 028-003-000-072-300-DCR3B
- MA-DCR June 1958 Proposed Bank 028-003-000-072-300-DCR3C
- Gloucester June 1955 Hurricane Damage 028-003-000-072-300-TWN3A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester
Location: Stacey Boulevard - East
Based On Comment:
Earliest Structure Record: 1955
Estimated Reconstruction/Repair Cost: $752,123.00

Date: 6/6/2007

Length: 1170 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 15 Feet NGVD

Primary Type: Bulkhead/ Seawall
Primary Material: Concrete
Primary Height: Over 15 Feet

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

Structure Summary:
Monuments, boardwalk, houses and road are behind the stone block seawall. Five to six stones high (5 feet by 2 feet) for about half the wall then cast in place at the top of the wall. No scour visible. Riprap is approximately 5 feet by 5 feet by 5 feet dumped and stops about 2 feet below the cast in place wall.

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 Densify Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:
- 028-003-000-072-400-PHO4A.jpg
- 028-003-000-072-400-PHO4B.jpg

Structure Documents:
- MA-DCR June 1955 Hurricane Damage 028-003-000-072-400-DCR4A
- Gloucester June 1955 Hurricane Damage 028-003-000-072-400-TWN4A

Prepared By: Bourne Consulting Engineering
Contributed by: Bourne Consulting Engineering, Inc.

CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Date: 6/6/2007

Location: Lobster Pier

Based On Comment: 

Earliest Structure Record: 1968

Estimated Reconstruction/Repair Cost: $559,746.00

---

Length: 275 Feet (252 feet NAVD 88)
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Steel
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material: Concrete
Secondary Height: 10 to 15 Feet

---

Structure Summary:
Steel sheetpiling wall fronted by dumped riprap. The top are half ton stones. Sheetpiling has heavy corrosion at tidal zone. Erosion behind the concrete cap on the sheetpiling (3 feet by 2 feet). No sign of cracking. Above is timber pier.

---

Condition Rating
Level of Action Description
C Fair
Moderate
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 Rating Action Description
I None
Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present

---

Structure Images:
[028-007-000-005-100-PHO1A.jpg]
[028-007-000-005-100-PHO1B.jpg]
[028-007-000-005-100-PHO1C.jpg]

Structure Documents:
USACE: January 198
Proposed Site: 028-007-000-005-100-COE1A

DEP: August 21, 1
Plan Accompanying: 028-007-000-005-100-LIC1A

DEP: June 22, 1998
Plan Accompanying: 028-007-000-005-100-LIC1B

Prepared By: Bourne Consulting Engineering, Inc.
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner:
Local

Location:
St. Peter's Marina

Presumed Structure Owner:
Local

Date:
6/6/2007

Owner Name:
Gloucester

Earliest Structure Record:
1980

Estimated Reconstruction/Repair Cost:
$38,260.00

Length: 155 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

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

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Riprap is below timber pier. Concrete cap above the riprap. The stones are approximately 2 feet by 2 feet by 5 feet. No signs of movement or shifting.

Condition Rating
B Good

Priority Rating
II Low Priority

Level of Action
Minor

Action Description
Future Project Consideration

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.

Structure Images:
028-007-000-016-100-PH01A.jpg

Structure Documents:
DEP July 10, 1998 Plan Accompanying 028-007-000-016-100-LIC1A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local

Presumed Structure Owner: Local

Owner Name: Gloucester

Location: Town Landing

Based On Comment:

Earliest Structure Record: 1954

Estimated Reconstruction/Repair Cost: $200,640.00

Length: 160 Feet

Top Elevation: 88 Feet NAVD 88

FIRM Map Zone: A2

FIRM Map Elevation: 10 Feet NGVD

Primary Type: Bulkhead/Seawall

Primary Material: Stone

Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Stone block seawall is comprised of 2 feet by 2 feet stones. Toe of the wall is exposed at low tide. Stones are shifted and settled. Half of the wall is cast in place wall with wave return face, and half has a concrete cap. Gangway to the town landing floats is connected.

Condition Rating

Level of Action 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 additional material for full protection and extended life.

Priority Rating Action Description

None

Long Term Planning Considerations

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

028-007-000-016-200-PHC2A.jpg
028-007-000-016-200-PHC2B.jpg
028-007-000-016-200-PHC2C.jpg

Structure Documents:

USACE: July 1954 Proposed Seawall 028-007-000-016-200-COE2A

DEP: July 23, 1995 Construct Riprap and 028-007-000-016-200-LIC2A

Gloucester: 1/9/2007 Illustrative Plan - 028-007-000-016-200-TWN2A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Solomon Jacobs Park
Based On Comment:
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $263,340.00

Date: 6/6/2007

Length: 210 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Top is concrete walkway and park. The dry set stone seawall is comprised of stones that are on average 2 feet by 2 feet by 6 feet. There is stone movement, shifting, and bowing out.

Condition Rating
C Fair

Level of Action Description
Moderate 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 Rating
I None

Action Description
Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
028-009-000-014-100-PHO1A.jpg
028-009-000-014-100-PHO1B.jpg

Structure Documents:
USACE May 26, 1977 Proposed Shore and 028-009-000-014-100-COE1A

Prepared By: Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Head of the Harbor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6/6/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>1979</td>
<td>$29,621.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 Feet</td>
<td>Feet NAVD 88</td>
<td>A2</td>
<td>10 Feet NGVD</td>
</tr>
</tbody>
</table>

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

**Secondary Type:**  
**Secondary Material:**  
**Secondary Height:**

**Structure Summary:**
Placed riprap with stones that are on average between 0.5 to 1 ton. 1 on 1 slope. There are no signs of movement or shifting. The stones are placed and locked in well. Park behind revetment.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Good</td>
<td>I None</td>
<td>Minor</td>
<td>No inshore Structures or Residential Dwelling Units Present</td>
</tr>
</tbody>
</table>

**Structure Images:**
- [028-053-000-016-100-PHO1A.jpg](attachment:028-053-000-016-100-PHO1A.jpg)

**Structure Documents:**
- USACE: March 1979, Plan Accompanying 028-053-000-016-100-COE1A
- DEP: February 19, Plans Accompanying 028-053-000-016-100-LIC1A
- DEP: May 24, 197, Plan Accompanying 028-053-000-016-100-LIC1B

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: MA-DCR
Presumed Structure Owner: State
Owner Name: MA-DCR
Location: State Fish Pier
Based On Comment:
Earliest Structure Record: 1976
Estimated Reconstruction/Repair Cost: $338,171.00

| Length: 1370 Feet | Top Elevation: 10 Feet NGVD | FIRM Map Zone: A2 | FIRM Map Elevation: 10 Feet NGVD |

Primary Type: Revetment
Primary Material: Stone
Primary Height: Over 15 Feet
Secondary Type: None
Secondary Material: None
Secondary Height: None

Structure Summary:
Dumped riprap revetment circling the state pier. Unable to see materials under or behind wall. The slope is 1 on 2 to 1 on 1. Stones are 50 to 100 pounds. Riprap comes to grade level. Parking lot, building, and storage area behind. The timber pier off of it.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Good</td>
<td>III Moderate Priority</td>
<td>Minor 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.</td>
</tr>
</tbody>
</table>

Structure Images:
- 028-054-000-108-100-PHO1A.jpg
- 028-054-000-108-100-PHO1B.jpg
- 028-054-000-108-100-PHO1C.jpg

Structure Documents:
- USAGE June 9, 1976 Proposed Expansion 028-054-000-108-100-COE1A
- MA-DCR September 2 Gloucester State Fish 028-054-000-108-100-DCR1A
- MA-DCR State Fish Pier 028-054-000-108-100-DCR1B
- DEP May 1990 Plans Accompanying 028-054-000-108-100-LIC1A

Prepared By: Bourne Consulting Engineering
# CZM Coastal Infrastructure Inventory and Assessment

## Structure Assessment Form

**Town:** Gloucester  
**Structure ID:** 028-054-000-108-200  
**Key:** community-map-block-parcel-structure  
**Date:** 6/6/2007

### Property Owner:
- Local

### Presumed Structure Owner:
- Local

### Owner Name:
- Gloucester

### Location:
- State Fish Pier

### Based On Comment:

### Earliest Structure Record:
- 1976

### Estimated Reconstruction/Repair Cost:
- $69,300.00

<table>
<thead>
<tr>
<th>Length</th>
<th>Top Elevation</th>
<th>FIRM Map Zone</th>
<th>FIRM Map Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>175 Feet</td>
<td>Feet NAVD 88</td>
<td>10</td>
<td>A2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type</th>
<th>Primary Material</th>
<th>Primary Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type</th>
<th>Secondary Material</th>
<th>Secondary Height</th>
</tr>
</thead>
</table>

### Structure Summary:
Stone bulkhead with 2 feet by 2 feet stones with a concrete cap. Behind the wall is a parking lot and the Environmental Policy Organization Building. Some movement of stones. Chinking is still in place.

### Condition Rating
- **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 Rating
- **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:
- 028-054-000-108-200-PHO2A.jpg

### Structure Documents:
- **USACE**  
  - June 9, 1976  
  - Proposed Expansion  
- **MA-DCR**  
  - September 2  
  - Gloucester State Fish  
- **MA-DCR**  
  - N/A  
  - State Fish Pier  
- **DEP**  
  - May 1987  
  - Plans Accompanying

Prepared By: Bourne Consulting Engineering
### Structure Assessment Form

**Property Owner:** Local

**Presumed Structure Owner:** Local

**Owner Name:** Gloucester

**Location:** Cripple Cove Public Landing

**Based On Comment:**

**Earliest Structure Record:** 2000

**Estimated Reconstruction/Repair Cost:** $10,210.00

<table>
<thead>
<tr>
<th>Length</th>
<th>Top Elevation</th>
<th>FIRM Map Zone</th>
<th>FIRM Map Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 Feet</td>
<td>Feet NAVD 88</td>
<td>A2</td>
<td>10 Feet NGVD</td>
</tr>
</tbody>
</table>

**Primary Type:** Revetment

**Primary Material:** Stone

**Primary Height:** 5 to 10 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:** Placed riprap with stones approximately 4 feet by 2 feet by 2 feet. The toe is exposed at low tide. On the top of the revetment is a walkway and park. No scour or movement visible.

**Condition Rating Level of Action Description**

<table>
<thead>
<tr>
<th>Condition Rating Level of Action Description</th>
<th>Priority Rating Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Minor 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.</td>
<td>None Long Term Planning Considerations No Inshore Structures or Residential Dwelling Units Present</td>
</tr>
</tbody>
</table>

**Structure Images:**

- [028-058-000-040-100-PHO1A.jpg](028-058-000-040-100-PHO1A.jpg)

**Structure Documents:**

- USACE [028-058-000-040-100-COE1A](028-058-000-040-100-COE1A)
- MA-DCR [028-058-000-040-100-DCR1A](028-058-000-040-100-DCR1A)

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Cripple Cove Public
Based On Comment:
Earliest Structure Record: 2001
Estimated Reconstruction/Repair Cost: $50,160.00

Date: 6/6/2007

Length: 200 Feet
Top Elevation: 10 Feet NGVD
FIRM Map Zone: A2
FIRM Map Elevation:

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Stone bulkhead with stone approximately 6 feet by 3 feet by 2 feet. The top of the wall is mortared. Some mortar is lost. Behind the wall is a playground, and in front is the gangway for a public landing. Some riprap at the toe. No scour visible.

Condition Rating
B Good
Level of Action Description
Minor 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 Rating Action Description
I None Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
[028-058-000-040-200-PHO2A.jpg]
[028-058-000-040-200-PHO2B.jpg]

Structure Documents:
[USACE] July 2001 City of Gloucester-
[028-058-000-040-200-COE2A]

Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Gloucester

**Location:**
- East Main Street

**Based On Comment:**

**Earliest Structure Record:**
- 2000

**Date:**
- 6/6/2007

**Estimated Reconstruction/Repair Cost:**
- $42,636.00

**Length:**
- 170 Feet

**Top Elevation:**
- 10 Feet NAVD 88

**FIRM Map Zone:**
- A2

**FIRM Map Elevation:**
- 10 Feet NGVD

**Primary Type:**
- Bulkhead/Seawall

**Primary Material:**
- Stone

**Primary Height:**
- 10 to 15 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
Stone block mortared seawall. The stones are approximately 1.5 feet in length by 1 foot in height. A sidewalk, road and houses are behind the wall. A sandy beach is in front of the wall. There is no sign of scour or undermine.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rating</th>
<th>Level of Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Good</td>
<td>Minor</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Priority**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Priority</td>
<td>Consider for Next Project Construction Listing</td>
<td>High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)</td>
</tr>
</tbody>
</table>

**Structure Images:**
- [028-064-000-081-100-PH01A.jpg](#)

**Structure Documents:**
- USACE
- April 2000
- City of Gloucester
- 028-064-000-061-100-COE1A

---

**Prepared By:** Bourne Consulting Engineering
Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Robinson Landing
Based On Comment: 
Earliest Structure Record: 1965
Estimated Reconstruction/Repair Cost: $601,920.00

<table>
<thead>
<tr>
<th>Length: 240 Feet</th>
<th>Top Elevation: 10 Feet NGVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRM Map Zone: A2</td>
<td></td>
</tr>
<tr>
<td>FIRM Map Elevation: 10 Feet NGVD</td>
<td></td>
</tr>
</tbody>
</table>

Primary Type: Bulkhead/ Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet
Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
Stone block seawall with 2 feet by 2 feet by 6 feet stones. The corner of the wall is unraveling. The back of the wall has erosion and undermining. There is a small park behind the seawall.

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: [028-079-000-001-100-PHO1A.jpg]

Structure Documents:
MA-DCR July 1965 Proposed Shore [028-079-000-001-100-DCR1A]
MA-DCR April 2000 Construction of Stone [028-079-000-001-100-DCR1B]

Prepared By: Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Rocky Neck Avenue</td>
<td>6/6/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>1958</td>
<td>$45,012.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>220 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>12 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead/ Seawall</td>
<td>Concrete</td>
<td>Under 5 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
</tr>
</tbody>
</table>

**Structure Summary:**
Precast concrete wall with riprap in front. Precast wall is 4 feet high by 4 feet wide. There is some cracking at the edges. Dumped riprap is 5 feet by 2 feet by 2 feet; in front is a sandy beach. Some undermining under and behind the wall. Behind is a walkway, small park, and road to Rocky Neck.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Priority Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>V</td>
<td>Immediate / Highest Priority</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of Action Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Structure Images:**
[028-130-000-011-100-PH01A.jpg]

**Structure Documents:**
[MA-DCR] May 1958
[Proposed Seawall] 028-130-000-011-100-DCR1A

Prepared By: Bourne Consulting Engineering
## CZM Coastal Infrastructure Inventory and Assessment

### Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Rocky Neck Avenue</td>
<td>6/6/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>Unknown</td>
<td>$57,334.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length: 365 Feet</th>
<th>Top Elevation: Feet NAVD 88</th>
<th>FIRM Map Zone: A2</th>
<th>FIRM Map Elevation: Feet NGVD 10</th>
</tr>
</thead>
</table>

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

**Secondary Type:**  
**Secondary Material:**  
**Secondary Height:**

### Structure Summary:
Placed stone riprap revetment. 5 feet by 2 feet by 2 feet at the top. 1 on 2 slope. Behind is parking lot and the only road to Rocky Neck. Toe is intact. No stone movement found. Mean high water is approximately half way up the slope.

**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:
- 028-130-000-011-200-PHO2A.jpg

### Structure Documents:
- DEP  
  - August 11, 1  
  - Plan Accompanying  
- 028-130-000-011-200-LIC2A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment
Structure Assessment Form

Town: Gloucester
Structure ID: 028-131-000-018-100
Key: community-map-block-parcel-structure

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester
Location: Wonson Cove
Based On Comment:
Date: 6/6/2007
Earliest Structure Record: 1958
Estimated Reconstruction/Repair Cost: $125,235.00

Length: 165 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: Feet NGVD
Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 5 to 10 Feet
Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Mortared stone seawall with sidewalk and road behind it. The concrete cap is approximately 2 feet wide. Some cracks and loose mortar visible, but no sour.

Condition Rating
Moderate
Level of Action 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 Rating Action Description
IV
High Priority
Consider for Next Project Construction Listing
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:
028-131-000-018-100-PHO1A.jpg

Structure Documents:
MA-DCR May 1958 Proposed Seawall 028-131-000-018-100-DCR1A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Unknown
Presumed Structure Owner: Unknown
Owner Name: 

Location: Niles Beach
Based On Comment: 
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $68,310.00

Length: 450 Feet
Top Elevation: 12 Feet NGVD
FIRM Map Zone: V2
FIRM Map Elevation: 

Primary Type: Bulkhead/Seawall
Primary Material: Concrete
Primary Height: 5 to 10 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
The stone seawall is mortared. There is parking lot above the wall and a road behind the wall. No scour found. 2 feet by 1 foot stones. Sandy 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 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:
028-133-000-017-100-PHO1A.jpg
028-133-000-017-100-PHO1B.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
The breakwater is at the mouth of the Gloucester Harbor. The stones are 9 feet by 3 feet by 3 feet and rectangular. The riprap on the ocean side is placed and is 9 feet by 4 feet by 5 feet with a 1 on 1 slope. Five of the riprap stones have been pushed out of place by storm action.

Structure Images:
[Images]

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner:
State

Presumed Structure Owner:
State

Owner Name:
University of Massachusetts

Location:
University of Massachusetts - Marine Station

Date:
6/6/2007

Based On Comment:

Earliest Structure Record:
Unknown

Estimated Reconstruction/Repair Cost:
$790,020.00

Length: 630 Feet NAVD 88
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 12 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Stone block seawall with stones that average 7 feet by 2 feet by 2 feet. Erosion behind the wall and stones have shifted and settled. Slope 1 on 1 to 1 on 0.5. The wall is in better condition inshore.

Condition Rating Level of Action Description
C Fair Moderate 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 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.

Priority Rating Action Description
III Moderate Priority Consider for Active Project Improvement Listing Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:
028-139-000-002-100-PHO1A.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
### CZM Coastal Infrastructure Inventory and Assessment

#### Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>University of Massachusetts - Marine Station</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Massachusetts</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Date:** 6/6/2007

**Estimated Reconstruction/Repair Cost:** $131,670.00

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>105 Feet</td>
<td>7 Feet NAVD 88</td>
<td>V2</td>
<td>15 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>10 to 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

**Structure Summary:**

Stone block bulkhead with stones averaging 7 feet by 2 feet by 2 feet. Erosion behind wall and stones have shifted and settled. Slope 1 on 1 to 1 on 0.5. The stones have unraveled on the inshore end of the wall.

<table>
<thead>
<tr>
<th>Condition Rating Level of Action Description</th>
<th>Priority Rating Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Fair Moderate 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 project shoreline during a major coastal storm. Actions taken to provide additional material for full protection and extended life.</td>
<td>III Moderate Priority Consider for Active Project Improvement Listing Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (&lt;1 dwelling impacted / 100 feet of shoreline)</td>
</tr>
</tbody>
</table>

**Structure Images:**

[028-139-000-002-200-PHO2A.jpg]

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: 
State

Presumed Structure Owner: 

Owner Name: 
University of Massachusetts

Location: 
University of Massachusetts - Marine Station

Based On Comment: 

Earliest Structure Record: 
Unknown

Estimated Reconstruction/Repair Cost: 
$96,558.00

Length: 
385 Feet

Top Elevation: 
9 Feet NAVD 88

FIRM Map Zone: 
V2

FIRM Map Elevation: 
12 Feet NGVD

Primary Type: 
Bulkhead/Seawall

Primary Material: 
Stone

Primary Height: 
10 to 15 Feet

Secondary Type: 

Secondary Material: 

Secondary Height: 

Structure Summary:
Stone block bulkhead with stones averaging 7 feet by 2 feet by 2 feet. Erosion behind wall and stones have shifted and settled. Slope is 1 on 1 to 1 on 0.5.

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

Rating

Action

Description

III

Moderate Priority

Consider for Active Project Improvement
Listing

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

Structure Images:
[028-139-000-002-300-PHO3A.jpg]

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner:
State

Presumed Structure Owner:
State

Owner Name:
University of Massachusetts

Location:
University of Massachusetts - Marine Station

Date: 5/6/2007

Based On Comment:

Earliest Structure Record: Unknown

Estimated Reconstruction/Repair Cost: $1,314,423.00

Length: 1065 Feet
Top Elevation: 7 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 15 Feet NGVD

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

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Dumped riprap with stones of varying size. The average stone size is 3 feet by 3 feet by 3 feet. The stones have unraveled, shifted and settled in many parts.

Condition Rating
C
Fair

Level of Action Description
Moderate
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 Rating Action Description
III Moderate Priority Consider for Active Project Improvement Listing Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:
028-139-000-002-400-PHQ04A.jpg
028-139-000-002-400-PHQ04B.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Washington Street</td>
<td>6/6/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>Unknown</td>
<td>$758,670.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>605 Feet</td>
<td>Feet NAVD 88</td>
<td>7</td>
<td>V2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>10 to 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

Structure Summary:
Stone block seawall with stones approximately 7 feet by 3 feet by 2 feet. The stones have shifted and moved. The wall breaks for the boat ramp behind it. A good amount of hardware is heavily corroded.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Fair Moderate</td>
<td>IV High Priority</td>
<td>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.</td>
<td>Consider for Next Project Construction Listing High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)</td>
</tr>
</tbody>
</table>

Structure Images:
- 028-139-000-010-100-PHO1A.jpg
- 028-139-000-010-100-PHO1B.jpg
- 028-139-000-010-100-PHO1C.jpg
- 028-139-000-010-100-PHO1D.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Lanes Cove
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $796,290.00

Date: 6/7/2007

Length: 635 Feet
Top Elevation: 4 Feet NAVD 88
FIRM Map Zone: V3
FIRM Map Elevation: 15 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet
Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Stone bulkhead 5 feet by 3 feet by 3 feet. There is undermining, shifting, and settling located behind the breakwater in the cove. The south side has come unraveled and is falling into the water. There is erosion and heaving of stones. There is a storage area for fishing equipment and a park behind the bulkhead.

Condition Rating Level of Action Description
C Fair Moderate 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.

Priority Rating Action Description
III Moderate Priority Consider for Active Project Improvement Listing Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:
028-142-000-038-100_PH01B.jpg
028-142-000-038-100_PH01A.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Gloucester

Location: Lanes Cove
Based On Comment: 
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $401,280.00

Date: 6/7/2007

Length: 320 Feet
Top Elevation: 4 Feet NAVD 88
FIRM Map Zone: V3
FIRM Map Elevation: 12 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
Stones are undermining, settling, shifting and rotating. They are approximately 4 feet by 2 feet by 2 feet. A storage area for fishing equipment and a parking lot are located above the middle structure in the cove.

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 1
Rating None
Action Long Term Planning Considerations
Description No Inshore Structures or Residential Dwelling Units Present

Structure Images:
028-142-000-038-200-PHO2A.jpg
028-142-000-038-200-PHO2B.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Lanes Cove</td>
<td>6/7/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>Unknown</td>
<td>$8,639.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 Feet</td>
<td>4 Feet NAVD 88</td>
<td>V3</td>
<td>12 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>10 to 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

Structure Summary:
Dumped riprap is approximately 200 pounds. Some erosion along the top. The toe is still intact.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action</th>
<th>Priority Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Good</td>
<td>Low Priority</td>
<td>Minor</td>
<td>Inshore Structures Present with Limited potential for Significant Infrastructure Damage</td>
</tr>
</tbody>
</table>

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.

Structure Images:
[028-142-000-038-300-PHO3A.jpg]

Structure Documents:

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

**Property Owner:** Local

**Presumed Structure Owner:**

**Owner Name:** Gloucester

**Location:** Lanes Cove

**Date:** 6/7/2007

**Based On Comment:**

**Earliest Structure Record:** Unknown

**Estimated Reconstruction/Repair Cost:** $1,135,464.00

**Length:** 460 Feet NAVD 88

**Top Elevation:** 9 Feet

**FIRM Map Zone:** V3

**FIRM Map Elevation:** 12 Feet NGVD

**Primary Type:** Breakwater

**Primary Material:** Stone

**Primary Height:** Over 15 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
Stone breakwater with stones approximately 4 feet by 3 feet by 2 feet. The corners appear to have been unraveled and repaired using staples. The breakwater protects the cove behind it and the channel adjacent to it. There is a 20 foot landing behind the breakwater, followed by a 15 foot bulkhead. Inshore the stones have signs of rotation and movement.

**Condition**

**Rating**

**Level of Action**

**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 additional material for full protection and extended life.

**Priority**

**Rating**

**Action**

**Description**

III

Moderate Priority

Consider for Active Project Improvement Listing

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

**Structure Images:**

028-142-000-038-400-PHO4A.jpg

028-142-000-038-400-PHO4B.jpg

028-142-000-038-400-PHO4C.jpg

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Lanes Cove</td>
<td>6/7/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>1988</td>
<td>$2,233,902.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>905 Feet</td>
<td>7 Feet NAVD 88</td>
<td>V3</td>
<td>15 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater</td>
<td>Stone</td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
</tr>
</thead>
</table>

Structure Summary:
The stone breakwater is approximately 4 feet by 3 feet by 1 feet. There is some visible stone heave and bowing out, along with some settling and unraveling. The breakwater protects the cove and channel. Adjacent to the breakwater is a 20 foot wall connected to a 20 foot landing which is connected to a 15 foot wall. There is erosion along the inshore base. There is approximately 100 feet of dumped riprap.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Level of Action Description</th>
<th>Priority Rating</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Moderate</td>
<td>IV</td>
<td>High Priority</td>
</tr>
</tbody>
</table>

Structure Images:
- 028-142-000-052-100-PHO1A.jpg
- 028-142-000-052-100-PHO1B.jpg
- 028-142-000-052-100-PHO1C.jpg
- 028-142-000-052-100-PHO1D.jpg

Structure Documents:
- Gloucester 5/3/1988 Proposed Ramp 028-142-000-052-100-TWN1A

Prepared By: Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Crescent Beach</td>
<td>6/6/2007</td>
</tr>
<tr>
<td>Presumed Structure Owner:</td>
<td>Based On Comment:</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owner Name:</td>
<td>Earliest Structure Record:</td>
<td>Estimated Reconstruction/Repair Cost:</td>
</tr>
<tr>
<td>Gloucester</td>
<td>Unknown</td>
<td>$34,155.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>225 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>16 Feet NGVD</td>
</tr>
<tr>
<td>Primary Type:</td>
<td>Primary Material:</td>
<td>Primary Height:</td>
<td></td>
</tr>
<tr>
<td>Bulkhead/ Seawall</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
<td></td>
</tr>
<tr>
<td>Secondary Type:</td>
<td>Secondary Material:</td>
<td>Secondary Height:</td>
<td></td>
</tr>
</tbody>
</table>

**Structure Summary:**
Mortared stone seawall. Some areas with loss of mortar. No scour found. The top is approximately 2 feet wide. Cobble and sand beach fronting. There are two stair beach accesses.

**Condition** | **Priority**
---|---
B | Low Priority

**Rating** | **Action**
---|---
Good | Future Project Consideration

**Level of Action** | **Description**
---|---
Minor | Inshore Structures Present with Limited potential for Significant Infrastructure Damage

**Structure Images:**
- [028-216-000-140-100-PHO1A.jpg]
- [028-216-000-140-100-PHO1B.jpg]

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Crescent Beach</td>
<td>6/6/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
<td>1913</td>
<td>$668,131.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length: 855 Feet</th>
<th>Top Elevation: Feet NAVD 88</th>
<th>FIRM Map Zone: V2</th>
<th>FIRM Map Elevation: 16 Feet NGVD</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>10 to 15 feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
</tr>
</thead>
</table>

**Structure Summary:**
The stone riprap revetment has stones of approximately 5 feet by 3 feet by 2 feet size. The slope is 1 on 1.5. There is a good amount of erosion at the top. Some sections of understone have washed out leaving large gaps in the understone exposing geotextile. The toe is intact. There is a cobble beach in front of the revetment.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rating</th>
<th>Level of Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Fair</td>
<td>Moderate</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority</th>
<th>Rating</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Priority</td>
<td>Future Project Consideration</td>
<td>Inshore Structures Present with Limited potential for Significant Infrastructure Damage</td>
<td></td>
</tr>
</tbody>
</table>

**Structure Images:**
- 028-216-000-140-200-PHO2A.jpg
- 028-216-000-140-200-PHO2B.jpg
- 028-216-000-140-200-PHO2C.jpg

**Structure Documents:**
- Gloucester 3/21/1913 Proposed 028-216-000-140-200-TWN2A

Prepared By: Bourne Consulting Engineering
Section II - Gloucester

Part C

Structure Photographs
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1D.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1E.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1F.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1G.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1H.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1I.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1J.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1K.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1L.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1M.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1N.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1O.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1P.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1Q.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1R.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1S.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1T.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1U.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1V.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1W.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1X.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1Y.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>029-002-000-001-100</td>
<td>029-002-000-001-100-PHO1Z.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>Digital IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**City:** Gloucester  
**Source:** BCE - Field Photographs  
**Location:** Bourne Consulting Engineering  
**Date of Research:** July 2007
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>028-139-000-010-100</td>
<td>028-139-000-010-100-PHO1C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-139-000-010-100</td>
<td>028-139-000-010-100-PHO1D.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-100</td>
<td>028-142-000-038-100-PHO1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-100</td>
<td>028-142-000-038-100-PHO1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-200</td>
<td>028-142-000-038-200-PHO2A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-200</td>
<td>028-142-000-038-200-PHO2B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-300</td>
<td>028-142-000-038-300-PHO3A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-400</td>
<td>028-142-000-038-400-PHO4A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-400</td>
<td>028-142-000-038-400-PHO4B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-038-400</td>
<td>028-142-000-038-400-PHO4C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-052-100</td>
<td>028-142-000-052-100-PHO1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-052-100</td>
<td>028-142-000-052-100-PHO1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-142-000-052-100</td>
<td>028-142-000-052-100-PHO1C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-216-000-140-100</td>
<td>028-216-000-140-100-PHO1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-216-000-140-100</td>
<td>028-216-000-140-100-PHO1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-216-000-140-200</td>
<td>028-216-000-140-200-PHO2A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-216-000-140-200</td>
<td>028-216-000-140-200-PHO2B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-216-000-140-200</td>
<td>028-216-000-140-200-PHO2C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section II - Gloucester

Part D

Structure Documents

CITY DOCUMENT LIST

MA DCR - DOCUMENT LIST

MA DEP – Ch 91 DOCUMENT LIST

- Copies of License Documents

USACE – PERMIT DOCUMENT LIST

- Copies of Permit Documents
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>028-003-000-072-100</td>
<td>028-003-000-072-100-TVN1A</td>
<td>1528</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage Repair - Fisherman’s Municipal Park and Stage Fort Park</td>
<td>2</td>
<td></td>
<td>Repair</td>
</tr>
<tr>
<td>028-003-000-072-200</td>
<td>028-003-000-072-200-TVN2A</td>
<td>1528</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage Repair - Fisherman’s Municipal Park and Stage Fort Park</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-003-000-072-300</td>
<td>028-003-000-072-300-TVN3A</td>
<td>1528</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage Repair - Fisherman’s Municipal Park and Stage Fort Park</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-003-000-072-400</td>
<td>028-003-000-072-400-TVN4A</td>
<td>1528</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage Repair - Fisherman’s Municipal Park and Stage Fort Park</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-007-000-018-200</td>
<td>028-007-000-018-200-TVN2A</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>June 2007</td>
<td>Illustrative Plan - Saint Rober’s Square</td>
<td>1</td>
<td>Rogers Street</td>
<td>Plan View of Square</td>
<td></td>
</tr>
<tr>
<td>028-142-000-052-100</td>
<td>028-142-000-052-100-TVN1A</td>
<td>40632</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>5/3/1998</td>
<td>Proposed Ramp</td>
<td>3</td>
<td>Linn’s Cove Landing</td>
<td></td>
</tr>
<tr>
<td>028-218-000-140-200</td>
<td>028-218-000-140-200-TVN2A</td>
<td>135-A</td>
<td>Gloucester</td>
<td>Gloucester</td>
<td>3/21/2013</td>
<td>Proposed Improvements at Stage Fort Park</td>
<td>1</td>
<td></td>
<td>Wet Concrete</td>
</tr>
<tr>
<td>BCE Structure No</td>
<td>Document No</td>
<td>Contract/ Drawing Number</td>
<td>Entity</td>
<td>Municipality</td>
<td>Date</td>
<td>Title</td>
<td>Sheets</td>
<td>Location</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td>--------</td>
<td>--------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>028-001-000-001-100</td>
<td>028-001-000-001-100-DCR1A</td>
<td>1390</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>April 1954</td>
<td>Proposed Seawall at Harbor Cove - Gloucester, MA - Prepared for DPW of MA - Division of Waterways</td>
<td>2</td>
<td>Harbor Cove - Fort Point</td>
<td>Seawall</td>
</tr>
<tr>
<td>028-001-000-001-100</td>
<td>028-001-000-001-100-DCR1B</td>
<td>3429</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>August 2000</td>
<td>Inspection of Stone Bulkhead</td>
<td>5</td>
<td>Stacey Boulevard, Fort Square, Cripple Cove</td>
<td>Bulkhead</td>
</tr>
<tr>
<td>028-003-000-072-100</td>
<td>028-003-000-072-100-DCR1A</td>
<td>1261</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>July 1952</td>
<td>Proposed Seawall Repairs - Annisquam Canal - Gloucester - Prepared for DPW of MA - Division of Waterways</td>
<td>1</td>
<td>Annisquam Canal - East Side</td>
<td>Seawall</td>
</tr>
<tr>
<td>028-003-000-072-200</td>
<td>028-003-000-072-200-DCR2A</td>
<td>1261</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>July 1952</td>
<td>Proposed Seawall Repairs - Annisquam Canal - Gloucester, MA - Prepared for the DPW of Massachusetts - Division of Waterways</td>
<td>1</td>
<td>Annisquam Canal - East Side</td>
<td>Seawall</td>
</tr>
<tr>
<td>028-003-000-072-200</td>
<td>028-003-000-072-200-DCR2B</td>
<td>1500</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>May 1958</td>
<td>Proposed Wall Repairs - Annisquam Canal - Gloucester, MA - Prepared for the DPW of Massachusetts - Division of Waterways</td>
<td>4</td>
<td>Annisquam Canal - East Side</td>
<td>Seawall</td>
</tr>
<tr>
<td>028-003-000-072-300</td>
<td>028-003-000-072-300-DCR3A</td>
<td>1261</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>July 1952</td>
<td>Proposed Seawall Repairs - Annisquam Canal - Gloucester, MA - Prepared for the DPW of MA - Division of Waterways</td>
<td>1</td>
<td>Annisquam Canal - East Side</td>
<td>Wall Repairs</td>
</tr>
<tr>
<td>028-003-000-072-300</td>
<td>028-003-000-072-300-DCR3B</td>
<td>1900</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>May 1958</td>
<td>Proposed Seawall Repairs - Annisquam Canal - Gloucester, MA - Prepared for DPW of Massachusetts - Division of Waterways</td>
<td>4</td>
<td>Annisquam Canal - East Side</td>
<td>Wall Repairs</td>
</tr>
<tr>
<td>028-003-000-072-300</td>
<td>028-003-000-072-300-DCR3C</td>
<td>2047</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>June 1958</td>
<td>Proposed Seawall Repairs - Annisquam Canal - Gloucester, MA - Prepared for DPW of Massachusetts - Division of Waterways</td>
<td>2</td>
<td>Annisquam Canal - East Side</td>
<td>Concrete Wall</td>
</tr>
<tr>
<td>028-003-000-072-400</td>
<td>028-003-000-072-400-DCR4A</td>
<td>1528</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>June 1955</td>
<td>Hurricane Damage Repairs - Fishermen's Memorial Park and State Fort Park - Gloucester - Prepared for DPW of MA - Division of Waterways</td>
<td>1</td>
<td>Western Avenue</td>
<td>Seawall</td>
</tr>
<tr>
<td>028-054-000-108-100</td>
<td>028-054-000-108-100-DCR1A</td>
<td>3571</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>September 2005</td>
<td>Gloucester State Fish Pier Survey - Topo Survey</td>
<td>6</td>
<td>2 State Pier</td>
<td>Pier Existing Conditions</td>
</tr>
<tr>
<td>028-054-000-108-100</td>
<td>028-054-000-108-100-DCR1B</td>
<td>3410</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>August 2020</td>
<td>Inspection of Stone Bulkhead</td>
<td>6</td>
<td>Stacey Boulevard, Fort Square, Cripple Cove</td>
<td>Bulkhead</td>
</tr>
<tr>
<td>028-079-000-001-100</td>
<td>028-079-000-001-100-DCR1A</td>
<td>2472</td>
<td>MA-DCR</td>
<td>Gloucester</td>
<td>July 1985</td>
<td>Proposed Shore Protection - Seawall and Stone Revetment - Annisquam River - Gloucester - Prepared for DPW of MA - Division of Waterways</td>
<td>1</td>
<td>Annisquam River</td>
<td>Seawall and Stone Revetment</td>
</tr>
<tr>
<td>Document No</td>
<td>Municipality</td>
<td>Title</td>
<td>Date</td>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------</td>
<td>------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>028-001-000-005-100</td>
<td>Gloucester</td>
<td>Plan: Accompanying Action (Reserved)</td>
<td>August 21, 1966</td>
<td>Gloucester Inner Harbor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROPOSED STEEL BULKHEAD EXTENSION

EXIST WOODEN FOUNDATION

GLOUCESTER HARBOR
INNER HARBOR

TES:
ALL ELEVATIONS SHOWN
REFER TO NATIONAL
GEODETIC VERTICAL
DATUM (N.G.V.D.) 1929.

PLAN ACCOMPANYING PETITION OF
GLOUCESTER REDEVELOPMENT
AUTHORITY
TO CONSTRUCT AND MAINTAIN A WHARF,
AND RIPRAP FILL
IN GLOUCESTER INNER HARBOR
CITY OF GLOUCESTER, COUNTY OF ESSEX,
MASSACHUSETTS

SHEET NO. 1 OF 2
PLAN ACCOMPANYING PETITION OF THE CITY OF GLOUCESTER TO CONSTRUCT AND MAINTAIN A WOOD WHARF AND MAINTAIN EXISTING FLOATS, PILES, RAMPS, AND RIPRAPH IN GLOUCESTER HARBOR, CITY OF GLOUCESTER, ESSEX COUNTY, MASS.

SHEET 1 OF 2
EXISTING WOOD PILES: GUIDE FOR FLOATING WHARF.

CITY OF GLOUCESTER

SHEET 2 OF 2
PLANS ACCOMPANYING PETITION OF
THE GLOUCESTER REDEVELOPMENT AUTHORITY
TO CONSTRUCT & MAINTAIN RIP RAP DIKE, FILL, CONCRETE PIERS, TIMBER PILE FENDERS, EXTEND EXISTING DRAINAGE LINES AND DREDGE, AT INNER HARBOR, GLOUCESTER,
COUNTY OF ESSEX, MASSACHUSETTS.
LICENSE PLAN NO. 771

PLANS ACCOMPANYING PETITION OF
THE GLOUCESTER REDEVELOPMENT AUTHORITY
TO CONSTRUCT & MAINTAIN RIP RAP
DIKE, FILL, CONCRETE PIERS, TIMBER
PILE FENDERS, EXTEND EXISTING
DRAINAGE LINES AND DREDGE, AT
INNER HARBOR, GLOUCESTER,

FEBRUARY 5, 1982
GLOUCESTER HOUSING AUTHORITY
MAPLEWOOD PARK
GLOUCESTER, MASS.

PROP. ROADSIDE WIDENING

GLOUCESTER HOUSING AUTHORITY
MAPLEWOOD PARK
GLOUCESTER, MASS.

PROP. ROADWAY WIDENING

EAST MAIN ST.

ANST HAV. ST.

ADJ. FOOD CO.
R. 417 MAIN ST.
GLOUCESTER, MASS.

HARBOR COMMISSIONERS LINE

GLOUCESTER HARBOR

PLAN
0 50 100 200
SCALE IN FEET

SECTION A-A
0 5 10 15 20
SCALE IN FEET

PLAN ACCOMPANYING PETITION OF
THE GLOUCESTER HOUSING AUTHORITY
TO CONSTRUCT A 30° R.C. DRAIN
AND FILL A PORTION OF THE
GLOUCESTER INNER HARBOR
ESSEX COUNTY
GLOUCESTER, MASSACHUSETTS
MARCH, 1979

LICENSE PLAN NO. 569
Approved by Department of Environmental Quality of Massachusetts may 27, 1979
COMMISSIONER
CHIEF ENGINEER
GLoucester Inner Harbor (North Channel)

Plan

1. Approximately 4,000 CY. of granular fill and 7,000 CY. of stone riprap to be placed at pier extension.
2. Approximately 46,000 CY. of earth and 2,000 CY. of rock to be dredged from site.
3. Approximately 1,200 CY. of stone riprap to be placed in rehab of existing riprap.

Flood

State Harbor Line

CH124, Acts 1866

GLoucester Inner Harbor (North Channel)

140' ±

PIER EXTENSION

EXIST. PIER

MHW EL. 8.7

MLW EL. 0.0

MLWS EL. -1.0

LIMIT OF DREDGE AREA

FINGER PIER

STALLS BLDG.

FREEZER/COLD STORAGE

EXIST. WHARF

AREA OF UTILITY EXTENSION

REHABILITATION OF EXIST. TIMBER PIER

REHABILITATION OF EXIST. RIPRAP

SCALE IN FEET

0 100 200

GLoucester Inner Harbor (South Channel)

NOTES:

DEPT. OF ENVIRONMENTAL MANAGEMENT
DIVISION OF WATERWAYS TO CONSTRUCT FINGER PIER, DREDGE FILL AND PLACE RIPRAP IN GLouceSTER HARBOR, CITY OF GLouceSTER, COUNTY OF ESSEX, MA.

FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
PIER EXTENSION SECTION A-A

SCALE IN FEET

EDGE OF DECK

EDGE OF DECK

TYPICAL PIER SECTION B-B

SCALE IN FEET

LICENSE PLAN NO. 2511

Approved by Department of Environmental Protection

Date: NOV 30 1990

FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
LEXINGTON, MASS.
DREDGE DISPOSAL SITE

NOTES:
1. EARTH DREDGE SIDESLOPES 10 HORIZONTAL TO 1 VERTICAL
2. ROCK DREDGE SIDESLOPES 1 HORIZONTAL TO 1 VERTICAL
3. APPROXIMATE VOLUME OF EARTH DREDGING IS 46,000 C.Y.
4. APPROXIMATE VOLUME OF ROCK DREDGING IS 2,000 C.Y.

TYPICAL DREDGE SECTION C-C

LICENSE PLAN NO. 2511

Approved by Department of Environmental Protection
Date: NOV 30 1990

FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
LEXINGTON, MASS.
STATE HARBOR LINE
CH 124, ACTS 1866

GLOUCESTER INNER HARBOR (NORTH CHANNEL)

EXIST. WHARF

EXISTING GLOUCESTER STATE FISH PIER
CH 311, ACTS OF 1931
EXISTING TOP OF SLOPE

FLOOD

EBB

GLOUCESTER INNER HARBOR (SOUTH CHANNEL)

HISTORIC LICENSE PLAN
0 100 200
SCALE IN FEET

LICENSE PLAN NO. 2511
Approved by Department of Environmental Protection
Date: NOV 30 1990

FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS
License No. 2015

Existing Structure
- Deck, Dock, & Piles
- Unlicensed floats

112 ft to Harbor Line
88 ft to MHV

Planning accompanying petition of Head of the Harbor Nominee Trust to construct & maintain floats, ramp, & piles in Gloucester Harbor, city of Gloucester, Essex County.

EXISTING FLOATS:
- 20-6'x16', 4-3'x16', 9-4'x20'
- Remove: 5-4'x20', 4-6'x16'
- Relocate Existing: 3-3'x16'
- Construct: 9-8'x20'

See sheet 2 for proposed plan.

PILING COUNT:
- 20 New Piles
- 4 Existing Unlicensed,
  3 Removed, 1 Remaining

Note:

Richard A. Sabean
23651

Plan

Datum MLV NAD
Sheet 1 of 3

License Plan No. 1119
Approved by Department of Environmental Quality Engineering of Massachusetts.

Division Director
Section Chief
Date
Winburn Inc.
77 Margin St
Peabody
01960

Sanct Bats
Lobsters Inc.
PO Box 8
Magnolia 01930

Pier 7 Realty TR
C/O Manuel Perry TR
5 Rackliff St
Gloucester 01930

Abutter's
Floats

License No. 2815
Existing
Structure
Deck, Dock & Piles
Existing
Unlicensed
Floats

Proposed
Floats & Piles

License Plan No:
Approved by Department of Environmental Quality Engineering
Date: May 31, 1987

Comm of Mass'tts
State Fish Pier
Gloucester 01930

142' From
MHV

86' From
Harbor
Line

12' Dia Butt Min Piles
Driven to 25 ft Penetration
or Refusal
All Timber 4 CCA PT or Better
All Hardware HD Galvanized

Piling Count:
20 New Piles
3 Existing Removed

Plans Accompanying
Petition of
Head of the Harbor
Nominee Trust
To Construct & Maintain
Floats, Ramp, & Piles
In Gloucester Harbor
City of Gloucester, Essex County,

Plan

Datum MLV NOS

Scale 1" = 20 ft
4x12 Backers in Way of Cleats - 2 ft Long Min
2x12 Frame
1x8 Decking

20 lb Styrofoam Billet Flotation

Section 'X' - 'X'

1 0 2 4 6 8 10
Scale in Feet

3/8 Dia HD Galv Chain Bridle

'X'

PLAN - 8 ft X 20 ft Floats

Exisiting Structure, Deck, Dock, & Piles
Lic. No. 2815

Existing Unic. Floats

License Plan No. 1317
Approved by Department of Environmental Quality Engineering
Date: May 22, 1987

Proposed Floats

3 Pile Dolphin

Typical Bottom

Westerly Elevation

Plans Accompanying Petition of Head of the Harbor Nominee Trust
To Construct & Maintain Floats, Ramp, & Piles
In Gloucester Harbor
City of Gloucester, Essex County
Massachusetts

Deck
EL 13.0
MHW
EL 8.6
MLW
EL 0.0
ELW
EL -1.0

Datum: MLW NDS
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>029-001-000-001-100</td>
<td>029-001-000-001-100-COE1A</td>
<td>200020537</td>
<td>USACE</td>
<td>Gloucester</td>
<td>July 2001</td>
<td>City of Gloucester - Fort Square Seawall</td>
<td>8</td>
<td>Fort Square</td>
<td>New Bulkhead and Repairs to Existing Bulkhead</td>
</tr>
<tr>
<td>029-003-000-072-100</td>
<td>029-003-000-072-100-COE1A</td>
<td>200020535</td>
<td>USACE</td>
<td>Gloucester</td>
<td>September 2000</td>
<td>Reconstruction of Stone Bulkhead - Stacy Boulevard, Gloucester Harbor, Gloucester</td>
<td>12</td>
<td>Stacy Boulevard</td>
<td>Stone Bulkhead Reconstruction</td>
</tr>
<tr>
<td>029-003-000-072-100</td>
<td>029-003-000-072-100-COE1B</td>
<td>200020135</td>
<td>USACE</td>
<td>Gloucester</td>
<td>June 2002</td>
<td>City of Gloucester - Stacy Boulevard</td>
<td>10</td>
<td>Stacy Boulevard - Annisquam Canal</td>
<td>Seawall</td>
</tr>
<tr>
<td>029-003-000-072-200</td>
<td>029-003-000-072-200-COE2A</td>
<td>200020536</td>
<td>USACE</td>
<td>Gloucester</td>
<td>September 2000</td>
<td>Reconstruction of Stone Bulkhead - Stacy Boulevard, Gloucester Harbor, Gloucester, MA</td>
<td>12</td>
<td>Stacy Boulevard</td>
<td>Stone Bulkhead Reconstruction</td>
</tr>
<tr>
<td>029-007-000-005-100</td>
<td>029-007-000-005-100-COE1A</td>
<td>19940164</td>
<td>USACE</td>
<td>Gloucester</td>
<td>January 1984</td>
<td>Proposed Site Construction on Gloucester Harbor at Gloucester, MA</td>
<td>1</td>
<td>Rogers Street and Parsons Street</td>
<td>Steel Bulkhead</td>
</tr>
<tr>
<td>029-007-000-018-200</td>
<td>029-007-000-018-200-COE2A</td>
<td>3256</td>
<td>USACE</td>
<td>Gloucester</td>
<td>July 1964</td>
<td>Proposed Seawall Harbor Cove - Gloucester Harbor, Gloucester, Massachusetts</td>
<td>1</td>
<td>Harbor Cove</td>
<td>Seawall</td>
</tr>
<tr>
<td>029-009-000-014-100</td>
<td>029-009-000-014-100-COE1A</td>
<td>73-121</td>
<td>USACE</td>
<td>Gloucester</td>
<td>May 26, 1972</td>
<td>Plan Accompanying Application of the Gloucester Housing Authority to Construct a 30° R.C. Drain and Fill a Portion of the Gloucester Inner Harbor</td>
<td>10</td>
<td>Harbor Loop</td>
<td>Riprap and Granite Wall</td>
</tr>
<tr>
<td>029-053-000-016-100</td>
<td>029-053-000-016-100-COE1A</td>
<td>79-233</td>
<td>USACE</td>
<td>Gloucester</td>
<td>March 1976</td>
<td>Proposed Expansion of Docking Facilities in Gloucester Inner Harbor at Gloucester, County of Essex, State of Massachusetts</td>
<td>1</td>
<td>East Main Street and Eastern Avenue</td>
<td>Riprap and Fill</td>
</tr>
<tr>
<td>029-054-000-108-100</td>
<td>029-054-000-108-100-COE1A</td>
<td>78-475</td>
<td>USACE</td>
<td>Gloucester</td>
<td>June 9, 1976</td>
<td>Proposed Expansion of Docking Facilities in Gloucester Inner Harbor at Gloucester, County of Essex, Massachusetts</td>
<td>7</td>
<td>State Pier</td>
<td>Wharf Extension, Riprap</td>
</tr>
<tr>
<td>029-068-000-040-100</td>
<td>029-068-000-040-100-COE1A</td>
<td>200020538</td>
<td>USACE</td>
<td>Gloucester</td>
<td>July 2001</td>
<td>City of Gloucester - Cripps Cove Seawall</td>
<td>6</td>
<td>East Main Street</td>
<td>Revetment and Seawall Repairs</td>
</tr>
<tr>
<td>029-068-000-040-200</td>
<td>029-068-000-040-200-COE2A</td>
<td>200020538</td>
<td>USACE</td>
<td>Gloucester</td>
<td>July 2001</td>
<td>City of Gloucester - Cripps Cove Seawall</td>
<td>6</td>
<td>East Main Street</td>
<td>Revetment and Seawall Repairs</td>
</tr>
<tr>
<td>029-084-000-061-100</td>
<td>029-084-000-061-100-COE1A</td>
<td>200020088</td>
<td>USACE</td>
<td>Gloucester</td>
<td>April 2000</td>
<td>City of Gloucester - Robinson's Landing</td>
<td>3</td>
<td>Smith Cove</td>
<td>Bulkhead</td>
</tr>
</tbody>
</table>

1 of 1
NOTES:
1. MLW = 0.0, MHW = 8.7, HTL = 10.1
2. SURVEY PROVIDED BY NWA, IN FEBRUARY, 2000 AND JULY, 2000
3. PROPERTY LINES PER CITY OF GLOUCESTER ASSESSOR PLAN
4. PROPOSED WORK INCLUDES RECONSTRUCTING 230 LF OF STONE BULKHEAD WITHIN THE EXISTING FOOTPRINT, CONSTRUCTING 289 LF OF STONE OR CONCRETE BULKHEAD APPROXIMATELY 10'-14'-
   SEAMOW OF THE EXISTING BULKHEAD.
5. "PROPOSED AREA OF FILL IS 2,900 SF, ALL OF WHICH IS BELOW THE HTL. THE ESTIMATED TOTAL FILLING VOLUME IS 1,200 CY OF 
   3,500 CY - 1,200 CY OF DIRT BELOW THE HTL.

DATUM: MLW = 0.0
       MHW = 8.7
       HTL = 10.1

PROPOSED WORK PLAN

AT: GLOUCESTER HARBOR
   FORT SQUARE
   COUNTY: ESSEX
   APPLICATION BY:
   CITY OF GLOUCESTER
   GLOUCESTER, MASSACHUSETTS

DATE: JULY, 2001 SHEET 2 OF 8

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
PROPOSED BULKHEAD
STATION 3+34 TO 4+57

DATUM: MLW = 0.0
HTL = 10.1

SCALE IN FEET

5
0

SCALE IN FEET

5
0

RECONSTRUCT GRAINITE BULKHEAD
AND PROVIDE CONCRETE CAP

6' HIGH
CHAIN LINK FENCE

NEW FENCE

TOP OF BULKHEAD
EL. ±14.8

#8 DOWELS

RIPRAP TO BE REMOVED
FOR BULKHEAD RECONSTRUCTION
AND RESET

DUMPED STONE
REVETMENT

MLW = 0.0

AT: GLOUCESTER HARBOR
COUNTY: ESSEX
CITY OF GLOUCESTER, MASSACHUSETTS

APPLICATION BY:
GLOUCESTER HARBOR

DATE: APRIL 2001

SHEET 8 OF 8
DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

LOCUS PLAN

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 1 OF 12
NOTES:

1. DATUM: MLW=0.0; MHW=8.7; HTL=10.1

2. PROPOSED WORK INCLUDES RECONSTRUCTING 2,030 LF OF BULKHEAD OUTSIDE THE EXISTING FOOTPRINT AND REPAIRING OR RECONSTRUCTING 275 LF WITHIN THE EXISTING FOOTPRINT.

3. PROPOSED AREA OF FILL IS APPROXIMATELY 16,200 SF OF WHICH 6750 SF IS BELOW THE HTL. THE ESTIMATED TOTAL FILLING VOLUME IS APPROXIMATELY 5,800 CY, OF WHICH 760 CY IS BELOW THE HTL.

4. SEE FIGURE 3 FOR PROPOSED WORK SECTIONS.
DATUM: MLW = 0.0  
MHW = 8.7  
HTL = 10.1  

PROPOSED WORK PLAN  
STA. 0+00 TO 13+50  

AT: GLOUCESTER HARBOR  
STACY BOULEVARD  
COUNTY: ESSEX  
APPLICATION BY:  
CITY OF GLOUCESTER  
GLOUCESTER, MASSACHUSETTS  
DATE: SEPT 2000 SHEET 3 OF 12
EXISTING SECTION A-A
STA 0+00 TO 20+30

DATUM:

MHW = 8.7
HTL = 10.1

SCALE IN FEET

CONCRETE SIDEWALK

PIPE RAILING

TOP OF BULKHEAD
EL. ±18.5 (VARIES)

MORTARED GRANITE STONE BULKHEAD

TEST BORING
(TBS-1)

BTM OF BORING
EL. ±7.8
REFUSAL

EXISTING GRADE
(VARIES)

HTL = 10.1
MHW = 8.7
PROPOSED SECTION A-A
STA 0+00 TO 20+30

DATUM: MLW = 0.0
MLW = 8.7
HTL = 10.1

AT: GLOUCESTER HARBOR
STACY BOULEVARD

COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS

DATE: SEPT 2000 SHEET 9 OF 12
PROPOSED
SECTION C-C
STA 21+55 TO 22+70

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 11 OF 12

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
DATUM:  MLW = 0.0  
MHW = 8.7  
HTL = 10.1

PROPOSED  
SECTION B-B  
STA 22+70 TO 23+05

AT: GLOUCESTER HARBOR  
STACY BOULEVARD

COUNTY: ESSEX  
APPLICATION BY:  
CITY OF GLOUCESTER  
GLOUCESTER, MASSACHUSETTS

DATE: SEPT 2000 SHEET 12 OF 12

NUCCI VINE ASSOCIATES, INC.  NEWBURYPORT, MASSACHUSETTS
DATUM: MLW = 0.0
       MHW = 8.7
       HTL = 10.1

EXISTING CONDITIONS PLAN

AT: ANNISQUAM RIVER
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MA.

DATE: JUNE 2002 SHEET 2 OF 10
SECTION A
STA 20+30 to 21+55

DATUM:
MLW = 0.0
MHW = 8.7
HTL = 10.1

AT:
ANNISQUAM RIVER
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MA.

DATE: JUNE 2002 SHEET 4 OF 10
DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

LOCUS PLAN

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 1 OF 12

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
PROPOSED WORK PLAN

STA. 13+50 TO 23+05

DATUM: MLW = 0.0
       MHW = 8.7
       HTL = 10.1

SCAE IN FEET

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 4 OF 12
EXISTING
SECTION B-B
STA 20+30 TO 21+55

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

SCALE IN FEET

5 10 15

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 6 OF 12
EXISTING
SECTION C-C
STA 21+55 TO 22+70

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 7 OF 12

NUCCI VNE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
PROPOSED
SECTION B-B
STA 22+70 TO 23+05

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

SCALE IN FEET

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

AT: GLOUCESTER HARBOR
STACY BOULEVARD
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: SEPT 2000 SHEET 12 OF 12
NOTE: ALL ELEVATIONS SHOWN REFER TO NATIONAL GEODETIC VERTICAL DATUM (N.G.V.D.) 1929.

APPROX. 630 CY OF GRAVEL BORROW AND 305 CY OF RIPRAP ARE TO BE PLACED BELOW THE HIGH TIDE LINE (H.T.L.)

ROGERS STREET

N/F GLOUCESTER REDEVELOPMENT AUTHORITY

H.T.L., MHW, & MLW ALL RUN ALONG THE EXIST. BULKHEAD.

PROP: STEEL BULKHEAD

EXIST. WOOD & STEEL BULKHEAD

EXIST. PIER

DREDGED

LIMIT CHANNEL

APPROX. 630 CY OF GRAVEL BORROW AND 305 CY OF RIPRAP ARE TO BE PLACED BELOW THE HIGH TIDE LINE (H.T.L.)

SECTION A-A

Proposed Site Construction

on Gloucester Harbor

at Gloucester

County of Essex  State Ma

Application by Gloucester Redevelop-

Sheet No. 1 of 1 Date January 1984
NOTE
ELEVATIONS ARE IN FEET AND TENTHS AND SHOW HEIGHTS ABOVE THE PLANE OF MEAN LOW WATER. MINUS FIGURES INDICATE DEPTHS BELOW THE SAME PLANE.
LOCATION OF PROPOSED WORK IS SHOWN IN RED, EXCEPT AREAS TEMPORARILY EXCAVATED. HATCH LINES INDICATE PROPOSED EXCAVATION (IN SECTION) TEMPORARY EXCAVATION WITH ADEQUATE SLOPE TO BE MADE FOR PLACEMENT OF INNER FOOT OF SLOPE ON STONE MOUND, BACK FILL THEN TO BE PLACED AS SHOWN ON SECTION.

PROPOSED SEAWALL
HARBOR COVE
GLOUCESTER HARBOR
GLOUCESTER - MASS.
APPLICATION BY DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS DIVISION OF WATERWAYS
JULY 1954
SCALES SHOWN

DISTRICT WATERWAY ENGINEER

APP 02 25C
Proposed SHORE & MARINE WORK
in GLOUCESTER HARBOR
at GLOUCESTER
County of ESSEX State of MASS
Application by U.S. COAST GUARD
FIRST DISTRICT
BOSTON MASS
Sheet 2 of 7 Date 4/72
Proposed SHORE & MARINE WORK in GLOUCESTER HARBOR at GLOUCESTER County of ESSEX State of MASS Application by US COAST GUARD FIRST DISTRICT BOSTON MASS Sheet 3 of 7 Date 4/72
Proposed SHORE & MARINE WORK in GLOUCESTER HARBOR at GLOUCESTER
County of ESSEX State of MASS
Application by US COAST GUARD FIRST DISTRICT BOSTON MASS
Sheet 4 of 7 Date 4/17/9
Proposed SHORE & MARINE WORK
in GLOUCESTER HARBOR
of GLOUCESTER
County of ESSEX  State of MASS
Application by US COAST GUARD
FIRST DISTRICT
BOSTON MASS

Sheet 5 of 7  Date 4/72
Proposed SHORE & MARINE WORK
in GLOUCESTER HARBOR
at GLOUCESTER
County of ESSEX, State of MASS
Application by U.S. COAST GUARD
PLAN ACCOMPANYING PETITION OF
U.S. COAST GUARD
TO CONSTRUCT DOCK, PIERS,
WALLS, RIP RAP SLOPE & FILL
IN
GLOUCESTER HARBOR
GLOUCESTER, MASS.
OCTOBER, 1972
Plan accompanying application of the Gloucester Housing Authority to construct a 30° R.C. drain and fill a portion of the Gloucester Inner Harbor.

Essex County
Gloucester, Massachusetts
March, 1979
SECTION A-A

PROPOSED BERTHING FACILITIES IN GLOUCESTER INNER HARBOR AT GLOUCESTER

PURPOSE: PUBLIC BERTHING FACILITIES
DATUM: MEAN LOW WATER

COUNTRY OF ESSEX STATE MASS APPLICANT: COMMONWEALTH OF MASSACHUSETTS DEGRE

SHEET 2 OF 3 DATE: 6/9/76
SECTION A-A

PROPOSED BERTHING FACILITIES
IN GLOUCESTER INNER HARBOR
AT GLOUCESTER
COUNTY OF ESSEX  STATE: MASS
APPLICANT: COMMONWEALTH OF MASSACHUSETTS
SAME

PURPOSE: PUBLIC BERTHING FACILITIES
DATUM: MEAN LOW WATER

AREA "C"

SCALE 100 FEET

SCALE 2000 FEET

SCALE IN FEET

0 10 20
SCALE 200 FEET

0 90 100
SCALE IN FEET

PLAN

EXIST. PIER

EXIST. BUILDING

PROT. BERTHING AREA

PROT. DREDGING

TO 10

PROT. TIMBER PILES 10" C-C

FLOATING WOODEN PIER (TYP)

-8.7 M.L.W.

0.0 M.L.W.

-10 DREDGE LINE

SHEET 3 OF 3 DATE: 6/9/76
NOTES:

1/ DREDGE TO EL. "10.0"

2/ EST. DREDGED MATERIAL 4,000 Cu. yds.

3/ TYPE OF MATERIAL TO BE DREDGED IS ORGANIC SILT, BED. SAMPLE NO.'S B420 & B421.

4/ METHOD OF HANDLING WILL BE MECHANICAL.

5/ THE DISPOSAL SITE IS LOCATED AT ST. JOSEPH'S CEM. IN AMERSBURY OR OTHER SATISFACTORY LAND DISPOSAL.

6/ SOUNDINGS ARE IN FEET AND TENTHS AND REFER TO DEPTHS BELOW THE PLANE OF MEAN LOW WATER.

PROPOSED EXPANSION OF DOCKING FACILITIES

IN GLOUCESTER INNER HARBOR
AT GLOUCESTER, MASS.
COUNTY OF ESSEX  STATE: MASS

APPLICATION BY
COMMONWEALTH OF MASSACHUSETTS
BBC/DEQE

SHEET: OF:  AUG. 10, 1979
SECTION A-A

PROPOSED BERTHING FACILITIES
IN GLOUCESTER INNER HARBOR
AT GLOUCESTER

PURPOSE: PUBLIC BERTHING FACILITIES
DATUM: MEAN LOW WATER

AREA "B"

COUNTY OF ESSEX  STATE MASS
APPLICANT: COMMONWEALTH OF MASSACHUSETTS

SHEET 2 OF 3  DATE: 6/9/76
NOTES:
1/ DREDGE TO EL. -10.0.
2/ EST. DREDGED MATERIAL 4,000 Cy.yds.
3/ TYPE OF MATERIAL TO BE DREDGED IS ORGANIC SILT, BED SAMPLE NO. 9 2420 8.88.
4/ METHOD OF HANDLING WILL BE MECHANICAL.
5/ THE DISPOSAL SITE IS LOCATED AT ST. JOSEPH'S CEML IN AMERSBURY OR OTHER SATISFACTORY LAND DISPOSAL.
6/ SCALES ARE IN FEET AND TENTHS AND REFER TO DEPTHS BELOW THE PLANE OF MEAN LOW WATER.

PROPOSED EXPANSION OF DOCKING FACILITIES
IN GLOUCESTER INNER HARBOR
AT GLOUCESTER, MASS.
COUNTY OF ESSEX   STATE: MASS
APPLICATION BY
COMMONWEALTH OF MASSACHUSETTS
BBC/DEQG

SHEET : OF :  

AUG. 0, 1978
NOTES:
1. MLW = 0.0; MHW = 8.7; HTL = 10.1
2. SURVEY PERFORMED BY MVA IN FEBRUARY, 2000.
3. PROPERTY LINES PER CITY OF GLOUCESTER ASSESSOR PLAN.
4. PROPOSED WORK INCLUDES REPAIRING 230 LF OF STONE BULKHEAD WITHIN THE EXISTING FOOTPRINT, CONSTRUCTION OF APPROXIMATELY 165 LF OF NEW STONE BULKHEAD APPROXIMATELY 10 FT BEHIND OF THE EXISTING BULKHEAD, AND REPAIR IN PLACE APPROXIMATELY 100 LF OF EXISTING REVETMENT.
5. PROPOSED FILLING ONLY ALONG 85 LF BULKHEAD ADJACENT TO MAIN ST. ESTIMATED FILL AREA IS 500 SF AND VOLUME IS 180 CY. ALL FILLING IS ABOVE HTL LEVEL.
6. NO FILLING OUTSIDE THE EXISTING FOOTPRINT IS PROPOSED FROM STATION 0+00 TO 2+73.

PROPOSED WORK PLAN

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

SCALE IN FEET

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS

AT: GLOUCESTER HARBOR
CHIRP PLE COVE
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: JULY 2001 SHEET 2 OF 6
PROPOSED BULKHEAD REPAIR
STA. 0+00 TO 1+47
SECTION B-B

DATUM:
MLW = 0.0
MHW = 8.7
HTL = 10.1

AT: GLOUCESTER HARBOR
CRIPPLE COVE

COUNTY: ESSEX

APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS

DATE: JULY 2001 SHEET 4 OF 6

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
PROPOSED BULKHEAD REPAIR
STA. 1+47 TO 2+35
SECTION C-C

DATUM: MLW = 0.0
       MHW = 8.7
       HTL = 10.1

AT: GLOUCESTER HARBOR
    CRIPPLE COVE

COUNTY: ESSEX

APPLICATION BY:
    CITY OF GLOUCESTER
    GLOUCESTER, MASSACHUSETTS

DATE: JULY 2001 SHEET 5 OF 6
PROPOSED
BULKHEAD REPAIR
STA. 2+35 TO 2+78
SECTION D-D

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

SCALE IN FEET

AT: GLOUCESTER HARBOR
CRIPPLE COVE

COUNTY: ESSEX

APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS

DATE: JULY 2001 SHEET 6 OF 6

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
NOTES:
1. MLW = 0.0; MHHW = 8.7; HHL = 10.1
2. SURVEY PERFORMED BY NWA IN FEBRUARY, 2000.
3. PROPERTY LINES PER CITY OF GLOUCESTER ASSESSOR PLAN.
4. PROPOSED WORK INCLUDES REPAIRING 235 LF OF STONE BULKHEAD WITHIN THE EXISTING FOOTPRINT, CONSTRUCTION OF APPROXIMATELY 65 LF OF NEW STONE BULKHEAD APPROXIMATELY 10 FT SEAMED OF THE EXISTING BULKHEAD, AND REPAIR IN PLACE APPROXIMATELY 100 LF OF EXISTING REVETMENT.
5. PROPOSED FILLING ONLY ALONG 65 LF BULKHEAD ADJACENT TO MAIN ST. ESTIMATED FILL AREA IS 500 SF AND VOLUME IS 190 CF. ALL FILLING IS ABOVE HHL LEVEL.
6. NO FILLING OUTSIDE THE EXISTING FOOTPRINT IS PROPOSED FROM STATION 0+00 TO 2+35.

PROPOSED WORK PLAN

DATUM: MLW = 0.0
HHL = 10.1

SCALE IN FEET

0 40 40

AT: GLOUCESTER HARBOR
CRIPPLE COVE
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: JULY 2001 SHEET 2 OF 6

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
PROPOSED
BULKHEAD REPAIR
STA. 2+35 TO 2+78
SECTION D-D

DATUM: MLW = 0.0
MHW = 8.7
HTL = 10.1

SCALE IN FEET

AT: GLOUCESTER HARBOR
CRIPPLE COVE
COUNTY: ESSEX
APPLICATION BY:
CITY OF GLOUCESTER
GLOUCESTER, MASSACHUSETTS
DATE: JULY 2001 SHEET 6 OF 6

NUCCI VINE ASSOCIATES, INC. NEWBURYPORT, MASSACHUSETTS
Section III

Rockport
Section III – Community Findings – Town of Rockport

COMMUNITY DESCRIPTION

The Town of Rockport consists of a land area of 7.07 square miles out of a total area of 17.59 square miles and had a population of 7,767 in the 2000 census. The Town is located on the North Shore of Massachusetts and its location can be seen on this report’s cover. The estimated length of shoreline that is directly exposed to open ocean waves is 14 miles with the remaining shoreline semi-protected by offshore structures or landforms. 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 Rockport, there were 22 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 Rockport**

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead / Seawall</td>
<td>13</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td></td>
<td></td>
<td>8188</td>
</tr>
<tr>
<td>Revetment</td>
<td>5</td>
<td></td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td>2055</td>
</tr>
<tr>
<td>Breakwater</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1995</td>
</tr>
<tr>
<td>Grin / Jetty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Dune</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Beach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>1238</td>
</tr>
</tbody>
</table>

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 Rockport’s case there are a total of 20 structures which would require approximately $ 21.9 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 $4.4 million would be required to upgrade the Town’s coastal protection.
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 Rockport, the breakdown of structures by assumed ownership is as follows:

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 Rockport’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 - Rockport

Part B

Structure Assessment Reports
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Pigeon Cove
Based On Comment: 

Earliest Structure Record: Unknown
Estimated Recreation/Repair Cost: $50,160.00

Length: 200 Feet
Top Elevation: 6 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 25 Feet NGVD

Primary Type: Bulkhead/ Seawall
Primary Material: Stone
Primary Height: 13 to 15 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
The stone block bulwark is approximately 5 feet by 2 feet by 2 feet. Some settling of stones. The top is used for storage of fishing equipment and parking. No sign of scour throughout.

Condition Rating Level of Action Description
B Good Minor 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 Rating Action Description
II Low Priority Future Project Consideration Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:
062-016-000-026-100-PHO1A.jpg
062-016-000-026-100-PHO1B.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Pigeon Cove
Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $314,000.00

Date: 6/7/2007

Length: 1000 Feet
Top Elevation: 31 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 15 Feet NGVD

Primary Type: Breakwater
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
Stone mound breakwater with a 1 on 1 slope on both sides. Stone size 5 feet by 3 feet by 2 feet. The crest is 5 feet across. The breakwater protects the cove and houses behind it. The outshore face has been unraveled at one area 5 feet long.

Condition Rating Level of Action Description
B Good Minor 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 Rating Action Description
V Immediate / Highest Priority Consider For Immediate Action Due to Public Safety and Welfare Issues 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:
[062-016-000-026-200-PHO2A.jpg]
[062-016-000-026-200-PHO2B.jpg]

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Rockport
Structure ID: 062-016-000-026-300
Key: community-map-block-parcel-structure

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Pigeon Cove
Date: 6/7/2007

Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $203,346.00

Length: Top Elevation: FIRM Map Zone: FIRM Map Elevation:
130 Feet Feet NAVD 88 V2 15 Feet NGVD

Primary Type: Retention
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Dumped riprap; approximately 200 pound stones. In between is a boat railway. The stones are unraveled and settled.

Condition Rating Level of Action Description
D Poor Major 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 Rating Action Description
III Moderate Priority Consider for Active Project Improvement Listing Inshore Structures with potential for Infrastructure Damage and/or Limited Residential Dwellings (<1 dwelling impacted / 100 feet of shoreline)

Structure Images:
[062-016-000-026-300-PH03A.jpg]
[062-016-000-026-300-PH03B.jpg]

Structure Documents:

Prepared By: Bourne Consulting Engineering
# CZM Coastal Infrastructure Inventory and Assessment

## Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Pigeon Cove Breakwater</td>
<td>6/7/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockport</td>
<td>$1,579,776.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>320 Feet</td>
<td>7 Feet NAVD 88</td>
<td>V2</td>
<td>15 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater</td>
<td>Stone</td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure Summary:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone breakwater has stones that are approximately 9 feet by 3 feet by 2 feet. The middle section has unraveled and failed about 40 feet. It is built on ledge to help protect the cove behind it and the channel adjacent to it.</td>
</tr>
</tbody>
</table>

| Condition Rating | Priority Rating Action Description |
|------------------|-----------------------------------|------------------------------------|
| D                | V Immediate / Highest Priority    |
| Poor             | Consider For Immediate Action Due to Public Safety and Welfare Issues |

<table>
<thead>
<tr>
<th>Level of Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### Structure Images:
- 062-016-000-026-400-PHOA4A.jpg
- 062-016-000-026-400-PHOA4B.jpg

### Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: [Local]

Location: [Old Granite Pier]

Date: 6/7/2007

Presumed Structure Owner: [Local]

Based On Comment: 

Estimated Reconstruction/Repair Cost: $1,727,880.00

Owner Name: [Rockport]

Earliest Structure Record: [Unknown]

Length: 1400 Feet

Top Elevation: 35 Feet NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: 15 Feet NGVD

Primary Type: Retention

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type: Retention

Secondary Material: 

Secondary Height: 

Structure Summary:
A stone riprap revetment with two sections approximately 30 feet long have unraveled due to storm damage. The understone is exposed. The top has areas of erosion. There is some movement and settling of the stones throughout. There is a crushed stone parking area on top.

Condition Rating Level of Action Description
C Fair Moderate 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 Rating Action Description
IV High Priority Consider for Next Project Construction Listing 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:
062-017-000-017-100-PHO1A.jpg
062-017-000-017-100-PHO1B.jpg
062-017-000-017-100-PHO1C.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Rockport

**Location:**
- Old Granite Pier

**Date:**
- 6/7/2007

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $269,280.00

**Length:**
- 680 Feet

**Top Elevation:**
- 23 Feet NAVD 88

**FIRM Map Zone:**
- V2

**FIRM Map Elevation:**
- 23 Feet NGVD

**Primary Type:**
- Bulkhead/Seawall

**Primary Material:**
- Stone

**Primary Height:**
- Over 15 Feet

**Secondary Type:**
- 

**Secondary Material:**
- 

**Secondary Height:**
- 

**Structure Summary:**
Stone bulkhead with stones approximately 8 feet by 3 feet by 3 feet. The top is concrete and crushed stones are used for boat storage. Some stones have been stapled together. A few stones are missing at the tidal zone.

**Condition Rating**
- B
- Good

**Level of Action Description**
- Minor

**Priority Rating Action Description**
- Low Priority
- Future Project Consideration
- Inshore Structures Present with Limited potential for Significant Infrastructure Damage

**Structure Images:**
- 062-017-000-019-100-PHO1A.jpg
- 062-017-000-019-100-PHO1B.jpg
- 062-017-000-019-100-PHO1C.jpg

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

**Property Owner:** Local  
**Location:** Back Beach  
**Date:** 6/7/2007  
**Town:** Rockport  
**Structure ID:** 062-017-000-054-100  
**Key:** community-map-block-parcel-structure

**Owner Name:** Rockport  
**Earliest Structure Record:** Unknown  
**Estimated Reconstruction/Repair Cost:** $2,320,296.00

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>940 Feet</td>
<td>15 Feet NAVD 88</td>
<td>V2</td>
<td>16 Feet NGVD</td>
</tr>
</tbody>
</table>

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

**Secondary Type:**  
**Secondary Material:**  
**Secondary Height:**

**Structure Summary:**
The stone riprap is approximately 5 feet by 3 feet by 3 feet. The toe is still in place and buried. Some sections of the stone have settled and caved in. Behind the riprap is a road and houses; in front of the riprap is a beach. The middle of the revetment has been washed out and replaced and filled in with cobble. The ends are still intact.

**Condition Rating**
- **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 Rating**
- **Description:** High Priority

**Level of Action Description**
- **Description:** Consider for Next Project Construction Listing

**Structure Images:**
- 062-017-000-054-100-PHO1A.jpg  
- 062-017-000-054-100-PHO1B.jpg

**Structure Documents:**

**Prepared By:** Bourne Consulting Engineering
# Structure Assessment Form

**Property Owner:** Local  
**Location:** Long Beach  
**Date:** 6/7/2007

**Presumed Structure Owner:** Local  
**Based On Comment:**

**Owner Name:** Rockport  
**Earliest Structure Record:** 1958  
**Estimated Reconstruction/Repair Cost:** $10,928,280.00

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3400 Feet</td>
<td>16 Feet NAVD 88</td>
<td>V2</td>
<td>17 Feet NGVD</td>
</tr>
</tbody>
</table>

**Primary Type:** Bulkhead/Seawall  
**Primary Material:** Concrete  
**Primary Height:** Over 15 Feet

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

**Structure Summary:** The concrete seawall has a wave return face. It is 3 feet wide at the top. Many homes are close behind the wall and a sandy beach in front. Minor cracks and spalling on the wall. There are many visible repairs. There are a few sink holes behind the wall and the walkway is heaving. The riprap is one stone high starting at the wall and continuing out 20 feet. The riprap is on average 6 feet by 3 feet by 3 feet.

**Condition Rating**  
**Level of Action Description**  
**Priority Rating Action Description**

**Structure Images:**  
[062-021-000-017-100-PHO1A.jpg](062-021-000-017-100-PHO1A.jpg)  
[062-021-000-017-100-PHO1B.jpg](062-021-000-017-100-PHO1B.jpg)

**Structure Documents:**  
[MA-DCR](MA-DCR)  
[September 1 Proposed Seawall](September 1 Proposed Seawall)

**Prepared By:** Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**  
**Structure Assessment Form**

**Property Owner:**  
Local  

**Presumed Structure Owner:**  
Local  

**Owner Name:**  
Rockport  

**Location:**  
Old Garden Beach  

**Date:**  
3/13/2009  

**Estimated Reconstruction/Repair Cost:**  
$10,454.00  

**FIRM Map Zone:**  
V2  

**FIRM Map Elevation:**  
28  

**Primary Type:**  
Bulkhead/Seawall  

**Secondary Type:**  
Revetment  

**Primary Material:**  
Stone  

**Secondary Material:**  
Stone  

**Primary Height:**  
10 to 15 Feet  

**Secondary Height:**  
Under 5 Feet  

**Length:**  
33 Feet  

**Top Elevation:**  
33 Feet NAVD 88  

**Earliest Structure Record:**  
Unknown  

**Structure Summary:**  
Stone blocks that are approximately 4 feet by 2 feet by 2 feet set six courses high. No shifting or rotating visible in stones. Mortar is intact. Minor erosion behind wall, which has been repaired. In front of wall is beach rocks used as riprap. Rocks are scattered and minor scour is visible.

**Condition Rating:**  
B Good  

**Priority Rating Action Description:**  
II Low Priority Future Project Consideration Inshore Structures Present with Limited potential for Significant Infrastructure Damage

**Structure Images:**  
[062-022-000-309-100-PHO1A.JPG]  

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Old Garden Beach</td>
<td>3/13/2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockport</td>
<td>Unknown</td>
<td>$65,010.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length: 50 Feet</th>
<th>Top Elevation: Feet NAVD 88</th>
<th>FIRM Map Zone: V2</th>
<th>FIRM Map Elevation: 28 Feet NGVD</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Structure Summary:**
Dumped stone approximately 4 feet in diameter in front of a pumping station. Stones are scattered creating many voids. There is heavy erosion in the coastal bank behind the revetment.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Priority Action</th>
<th>Priority Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>High Priority</td>
<td>Consider for Next Project Construction Listing</td>
<td>High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)</td>
</tr>
<tr>
<td>Level of Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Condition 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.

**Structure Images:**
[062-022-000-309-200-PHO2A.jpg]

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Granite Street
Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $524,700.00

Date: 6/7/2007

Length: 265 Feet
Top Elevation: 8 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 15 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: Over 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Stone bulkhead with parking lot and building behind. Stones are approximately 9 feet by 3 feet by 2 feet. Some movement of stones and sink holes behind walk and at the corners of the wall. No sign of scour. Some stone movement at jetty.

Condition Rating
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 landfill 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.

Priority Rating
Low Priority
Action Description
Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:
[062-026-000-026A-100-PHO1A.jpg]
[062-026-000-026A-100-PHO1B.jpg]

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: White Wharf
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $1,089,000.00

Date: 6/7/2007

Length: 550 Feet
Top Elevation: 16 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 18 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: Over 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Stone bulkhead with stones that are 5 feet by 2 feet by 2 feet. There is no visible scour. Some settling of stones and erosion and cracking at the top. The wall never had or has lost chinking stones. Some stones have been stapled together. The out shore face was built twice as high then steps down. Adjacent to it is a channel for a small cove. The higher section has been mortared. There looks to have been recent repairs.

Condition Rating
C 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 Rating
IV High Priority
Consider for Next Project Construction Listing

Action 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:
062-035-000-001A-100-PHO1A.jpg
062-035-000-001A-100-PHO1B.jpg
062-035-000-001A-100-PHO1C.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Middle Wharf
Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $82,764.00

Date: 6/7/2007

Length: 330 Feet
Top Elevation: 4 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 18 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 10 to 15 Feet
Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
The stone bulkhead has stones that are approximately 5 feet by 2 feet by 2 feet. There is no visible scour. Some settling of stones and erosion at the top. The wall never had or has lost chinking stones. Some stones have been stapled together. The top has concrete that is cracking.

Condition Rating Level of Action Description
B Good Minor 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 Rating Action Description
IV High Priority Consider for Next Project Construction Listing 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:  
[Image 0x0 to 792x612]

Structure Documents:

[062-035-000-018C-100-PHO1A.jpg]
[062-035-000-018C-100-PHO1B.jpg]
Property Owner: Rockport

Location: Lumber Wharf

Date: 6/7/2007

Presumed Structure Owner: Rockport

Based On Comment: Unknown

Estimated Reconstruction/Repair Cost: $251,460.00

Owner Name: Rockport

Earliest Structure Record: Unknown

Length: 635 Feet

FIRM Map Zone: V2

FIRM Map Elevation: 18 Feet NGVD

Top Elevation: 6 Feet

Primary Type: Bulkhead/Seawall

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type: Secondary Material:

Secondary Height:

Structure Summary:
Stone bulkhead with stones that are 5 feet by 2 feet by 2 feet. There is no visible scour. Some settling of stones and erosion and cracking at the top. The wall never had or has lost chinking stones. Some stones have been stapled together. The outshore face was built twice as high then steps down. Adjacent to it is a channel for a small cove. The higher section has been mortared.

Condition Rating: B Good

Priority Rating: High Priority

Level of Action Description: Consider for Next Project Construction Listing

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:
- 062-035-000-021E-100-PHO1A.jpg
- 062-035-000-021E-100-PHO1B.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Beach Street
Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $0.00

Length: 130 Feet
Top Elevation: 9 Feet NAVD 88
FIRM Map Zone: AO
FIRM Map Elevation: 2 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Concrete
Primary Height: 10 to 15 Feet
Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
The stone wall is mortared with stones approximately 7 feet by 2 feet by 2 feet in size. There is a ramp that goes to the beach. The wall is protecting the road behind and there is a sandy beach in front. No scour or erosion is visible.

Condition Rating
Level of Action Description
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.

Priority Rating Action Description
IV High Priority Consider for Next Project Construction Listing
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: 062-035-000-053-100-PHO1A.jpg
Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment
Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Beach Street

Earliest Structure Record: Unknown

Length: 120 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: AO
FIRM Map Elevation: 2 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 5 to 10 Feet

Secondary Type: Secondary Material:
Secondary Height:

Condition Rating Level of Action Description
A Excellent None 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 Rating Action Description
IV High Priority Consider for Next Project Construction Listing High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Summary:
Stone wall with concrete mortar. Stones are 4 feet by 2 feet by 2 feet. Appears to be recently repaired. Behind the wall there is a road and houses; in front, there is a sandy beach. There is a stair access to the beach.

Structure Images:
062-035-000-054-100-PHO1A.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Headlands Breakwater</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></td>
<td>6/7/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockport</td>
<td>Unknown</td>
<td>$56,810.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>11</td>
<td>V2</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feet NAVD 88</th>
<th>Feet NGVD</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater</td>
<td>Stone</td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

**Structure Summary:**
Small breakwater that protects the mouth of Rockport Harbor. Stones are approximately 5 feet by 5 feet by 5 feet. Some stone movement and voids are visible.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Good</td>
<td>V Highest Priority</td>
<td>Consider For Immediate Action Due to Public Safety and Welfare Issues</td>
</tr>
<tr>
<td>Minor</td>
<td>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. (&gt;10 dwellings impacted / 100 feet of shoreline)</td>
<td></td>
</tr>
</tbody>
</table>

**Structure Images:**
[062-036-000-002-100-PHO1A.jpg]

**Structure Documents:**

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local

Presumed Structure Owner: Local

Owner Name: Rockport

Location: T-Wharf

Date: 6/7/2007

Based On Comment:

Earliest Structure Record: 1998

Estimated Reconstruction/Repair Cost: $376,200.00

Length: 950 Feet

Top Elevation: 12 Feet NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: 16 Feet NGVD

Primary Type: Bulkhead/Seawall

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type: Secondary Material:

Secondary Height:

Structure Summary:
The stone bulkhead with a parking lot above it and floats attached to it with average stone size of 4 feet by 2 feet. Some stone movement and unraveling. There is no visible scour. The west side has concrete on top of the wall that is cracking at sections.

Condition Rating
B Good

Level of Action Description
Minor 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 Rating
II Low Priority

Future Project Consideration
Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images:
062-036-000-033-100-PHO1A.jpg
062-036-000-033-100-PHO1B.jpg
062-036-000-033-100-PHO1C.jpg

Structure Documents:
USACE November 1 Bradley Wharf and T-
DEP July 26, 1999 Town of Rockport

Town: Rockport
Structure ID: 062-036-000-033-100
Key: community-map-block-parcel-structure

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Rockport

Location: Rockport Harbor
Based On Comment:

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $211,167.00

Date: 6/7/2007

| Length: 135 Feet | Top Elevation: 18 Feet NAVD 88 | FIRM Map Zone: V2 | FIRM Map Elevation: 16 Feet NGVD |

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

Structure Summary:
Riprap against a cast in place concrete boat ramp. Stone size is approximately 100 to 200 pounds. Section loss and stones are unraveled in a few sections. The boat ramp is undermined and cracking halfway up.

<table>
<thead>
<tr>
<th>Condition Rating Level of Action Description</th>
<th>Priority Rating Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Poor Major 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 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.</td>
<td></td>
</tr>
<tr>
<td>I None No Inshore Structures or Residential Dwelling Units Present</td>
<td></td>
</tr>
</tbody>
</table>

Structure Images: 062-036-000-054-100-PHO1A.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner:
Local

Presumed Structure Owner:
Local

Owner Name:
Rockport

Location:
Bradley Wharf

Based On Comment:

Earliest Structure Record:
1998

Estimated Reconstruction/Repair Cost:
$267,300.00

Length:
675 Feet

Top Elevation:
10 Feet NAVD 88

FIRM Map Zone:
V2

FIRM Map Elevation:
16 Feet NGVD

Primary Type:
Bulkhead/ Seawall

Primary Material:
Stone

Primary Height:
Over 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary:
Stone bulkhead with stones that are approximately 6 feet by 3 feet by 2 feet. Some settling and movement of stones. Parking lot and fishing equipment storage above. No scour or undermine visible.

Condition Rating
B Good

Priority Rating
III Moderate Priority

Level of Action Description
Minor

Action Description
Consider for Active Project Improvement Listing

Structure Images:
062-036-000-067-100-PH01A.jpg
062-036-000-067-100-PH01B.jpg

Structure Documents:
USACE November 1 Bradley Wharf and T-
DEP July 26, 1999 Town of Rockport
062-036-000-067-100-COE1A
062-036-000-067-100-LIC1A

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Rockport
Structure ID: 062-036-000-077-100
Key: community-map-block-parcel-structure

Local

Based On Comment:

Inner Breakwater

Earliest Structure Record: Unknown

Estimated Reconstruction/Repair Cost: $1,382,304.00

Date: 6/7/2007

Local

Owner Name: Rockport

Length: 560 Feet

Top Elevation: 12 Feet NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: 18 Feet NGVD

Primary Type: Breakwater

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type: Secondary Material:

Secondary Height:

Structure Summary:
The breakwater is located at the mouth of Rockport Harbor. The stones are approximately 5 feet by 5 feet by 3 feet on average. Some movement has occurred among the stones, along with some section loss.

Condition Rating
C
Fair

Level of Action 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 Rating Action Description
V Immediate / Highest Priority
Consider For Immediate Action Due to Public Safety and Welfare issues
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:
062-036-000-077-100-PHO1A.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Rockport
Structure ID: 062-036-000-078-100
Key: community-map-block-parcel-structure

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Bearskin Neck</td>
<td>6/7/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockport</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Based On Comment:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Earliest Structure Record:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Reconstruction/Repair Cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$134,640.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 Feet</td>
<td>20 Feet NAVD 88</td>
<td>V2</td>
<td>18 Feet NGVD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

Structure Summary:
Stone bulkhead with stones that are approximately 5 feet by 2 feet by 2 feet. No sign of movement or settling. Above is a parking lot and small park. The bulkhead is attached to a breakwater. There is no visible scour. The bulkhead is built on a ledge.

<table>
<thead>
<tr>
<th>Condition Rating Level of Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Good Minor 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority Rating Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV High Priority Consider for Next Project Construction Listing High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)</td>
</tr>
</tbody>
</table>

Structure Images:
- 062-036-000-078-100-PHO1A.jpg
- 062-036-000-078-100-PHO1B.jpg
- 062-036-000-078-100-PHO1C.jpg
- 062-036-000-078-100-PHO1D.jpg

Structure Documents:

Prepared By: Bourne Consulting Engineering
Section III - Rockport

Part C

Structure Photographs
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contractor Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>062-035-000-001A-100</td>
<td>062-035-000-001A-100-PHD1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001A-100</td>
<td>062-035-000-001A-100-PHD1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001A-100</td>
<td>062-035-000-001A-100-PHD1C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001A-100</td>
<td>062-035-000-001A-100-PHD1D.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001B-100</td>
<td>062-035-000-001B-100-PHD1A.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001B-100</td>
<td>062-035-000-001B-100-PHD1B.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001B-100</td>
<td>062-035-000-001B-100-PHD1C.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062-035-000-001B-100</td>
<td>062-035-000-001B-100-PHD1D.jpg</td>
<td>Bourne Consulting Engineering</td>
<td>October 2007</td>
<td>DIGITAL IMAGE</td>
<td>1</td>
<td>Structure Location</td>
<td>Structure Condition Photo at Time of Survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table above lists various documents related to structure location images taken during a survey. Each document entry includes the BCE Structure Number, Document Number, Contractor Drawing Number, Entity, Municipality, Date, Title, Sheets, Location, and a brief description of the condition photo taken at the time of the survey.
Section III - Rockport

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 Rockport

<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>062-021-000-017-100</td>
<td>062-021-000-017-100-DCR1A</td>
<td>1959</td>
<td>MA-DCR</td>
<td>Rockport</td>
<td>September 1958</td>
<td>Proposed Seawall and Revetment - Long Beach - Rockport, Massachusetts - Prepared for the DIPW of Massachusetts - Division of Waterways</td>
<td>5</td>
<td>Long Beach</td>
<td>Seawall and Revetment</td>
</tr>
<tr>
<td>BOC Structure No</td>
<td>Document No</td>
<td>Contract/ Drawing Number</td>
<td>Entity</td>
<td>Municipality</td>
<td>Date</td>
<td>Title</td>
<td>Sheets</td>
<td>Location</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>----------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>062-036-000-033-100</td>
<td>062-036-000-033-100-LIC1A</td>
<td>7818</td>
<td>DEP</td>
<td>Rockport</td>
<td>July 26, 1999</td>
<td>Town of Rockport D.P.W. To License and Maintain Improvements to Bradley Wharf and T-Wharf in Rockport Harbor</td>
<td>5</td>
<td>Bradley T-Wharf</td>
<td>Bulkhead</td>
</tr>
<tr>
<td>062-036-000-067-100</td>
<td>062-036-000-067-100-LIC1A</td>
<td>7818</td>
<td>DEP</td>
<td>Rockport</td>
<td>July 26, 1999</td>
<td>Town of Rockport D.P.W. To License and Maintain Improvements to Bradley Wharf and T-Wharf in Rockport Harbor</td>
<td>5</td>
<td>Bradley T-Wharf</td>
<td>Bulkhead</td>
</tr>
</tbody>
</table>
SECTION C-C
GEOTECHNICAL PROFILE
SCALE 1/2" = 20'

TOP PILE ATTACHMENT DETAIL
DETAIL #2

PLAN
2" DRILL HOLE TO 4" DEEP
CRANDE Block
7/8 STEEL ROD, BEND TO FIT TIGHTLY AROUND PILE
CIRCUT SOLID WITH NON-SHINK CONCRETE

ELEV.

CUT SELL 45° SLOPE
ACCROSS TOP OF PILE

DETAIL #1

N.T.S.

ROUND 1/2" THICK PLATE
WELDED TO BOTTOM
ALL AROUND
STEEL DRIVE SHOE REQUIRED FOR NEW PILES AT BRADLEY WHARF ONLY.

CUT OFF AT 12" TO LENGTH

1-9/16" PIPE INSTALL 12" ABOVE MUDLINE
1-9/16" PIPE INSTALL 1-9/16" OFF PLAQUE'S 9"
SECTION C-C
GEOTECHNICAL PROFILE
SCALE: 1"=20'

TOP ELEV = 14.0

PROPOSED
CROSSWALL SHEETING

B-7

PROPOSED P2-27

RED TRENCH TO DENICE
SAND & GRAVEL
(REDUCTION TRENCH)

B-9

PROPOSED
CROSSWALL SHEETING

PROPOSED
30' STEEL CELL

ELEV = 37.7

3' ROCK CORE
BOT OR BORING
ELEV = 37.7

ELEV = -67.7

ELEV = -83.7

ELEV = -113.7

3' ROCK CORE
BOT OR BORING
ELEV = -67.7

TOP PILE ATTACHMENT DETAIL
DETAIL #2
N.T.S.

2" DRILL HOLE TO 4" DEEP

GRANITE BLOCK

1-1/2" STEEL RED. SEND
TO FIT TIGHTLY
AROUND PILE

CIRCUIT SODD
WITH HIGH-DRY MIX

ELEV.

12" TOP CUT 1/2" T.F. MIN.

FIBERGLASS CAP

WOOD SLIP PILE
CUT TO LENGTH

1-1/4" PIPES INSTALL 12" ABOVE
MAO LINE

WOOD E-2.9 PILE
CUT TO LENGTH

1-1/2" THICK PLATE
WELDED TO BOTTOM
ALL AROUND

STEEL DRIVE SHOE REQUIRED FOR:
NEW PILES AT BRADLEY WHARF
ONLY.

DETAIL #1
N.T.S.

TIBBETTS ENGINEERING CORP., NEW BEDFORD, MA.
<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheets</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>002-036-000-033-100</td>
<td>002-036-000-033-100-001</td>
<td>199903348</td>
<td>USACE</td>
<td>Rockport</td>
<td>November 10, 1998</td>
<td>Bradley Wharf and T:Wharf Repairs</td>
<td>6</td>
<td>Bradley Wharf</td>
<td>Sheet Pile and Rproc Repairs</td>
</tr>
<tr>
<td>002-036-000-067-100</td>
<td>002-036-000-067-100-001</td>
<td>199903348</td>
<td>USACE</td>
<td>Rockport</td>
<td>November 10, 1998</td>
<td>Bradley Wharf and T:Wharf Repairs</td>
<td>6</td>
<td>Bradley Wharf</td>
<td>Sheet Pile and Rproc Repairs</td>
</tr>
</tbody>
</table>