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

Boston Harbor - North

Nahant
Winthrop
Chelsea
Everett
Harbor Islands

July 6, 2009

Prepared for:
Massachusetts Department of Conservation and Recreation
Hingham, Massachusetts

Presented by:
Bourne Consulting Engineering
Franklin, Massachusetts

In Association With:
Childs Engineering Corporation

Bourne Consulting Engineering
Waterfront Engineers
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- MA DEP – CH 91 DOCUMENT LIST
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  - Copies of License Documents

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

- USACE – PERMIT DOCUMENT LIST
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Section I

Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION

PURPOSE

DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES

DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS
Section I – Coastal Hazards Infrastructure and Assessment Program

INTRODUCTION

The Project and Client

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

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

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

Consultant Team

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

PURPOSE

Study Purpose

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

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

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

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

Limit of Study

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

- All property ownership was taken as presumed. No legal investigation of ownership was performed during the project. Property ownership is based on town assessor maps. Where structures were located outshore of assessor map defined property lines, it was assumed to be Town land unless other information indicated otherwise. Where structures were located outshore of Mean Low Water, property is assumed to be State owned.

- The structure ownership was based on assessor maps and research at the local, state and federal levels. Where there was indication of public work on a structure on Town land or on private property, the structure was presumed to be Town owned. Where the structure was on state property, the structure was presumed to be state owned. Where ownership of the structure was not clear but was located on private property, the structure ownership was defined as unknown.

- The study included town and state owned structures as it was assumed that most town owned structures received state funding at some level for construction and/or maintenance.
  - Structures that were determined to be private were not included.
  - Undocumented structures considered to be on private land, but having the potential to have been publicly built and/or maintained, were identified as having an "unknown ownership".

- The prioritizing of structures was based primarily on risk to general infrastructure and density of housing. Infrastructure included was buildings. The study did not consider all infrastructure issues including:
  - No consideration on utility impacts – water, electrical, sewer, gas
  - No consideration of roadway and bridge protection
  - Evacuation routes were not considered within the investigation
  - Location of Emergency Shelters were not included in priority assessments

- Research was performed at the local, state and federal levels. The local research was limited to location and documenting available coastal structure contract drawings. Research at DCR was restricted to available historic construction plans for coastal structures at the MA-DCR Waterways office in Hingham, MA, and MA-DCR Division of Urban Parks and Recreation in
Boston, MA. No investigation of state archives was performed. Research at MA DEP Chapter 91 and USACE was limited to recorded permits and licenses found in their files. No investigation was performed at the Registry of Deeds.

DEVELOPMENT OF MassGIS DATABASE ATTRIBUTES

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

Database Attributes
- Attribute Descriptions/Definitions

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

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

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

CCC-MMM-BBB-PPP-SSS

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

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

Structure Ownership: The ownership of all structures is presumed as no verification of ownership was performed. Ownership of the structure was determined by research into historic state and federal
permits and the entity indicated on the permits as the applicant. Where no other information was found, the following was utilized:

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

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

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

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

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

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

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

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

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

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

Structure Condition: A preliminary assessment of the condition for each structure was performed by the field teams. This was by visual observation only and no detailed investigation was performed. The condition assessments were based on a predefined five level rating system that ranged from Rating A for Excellent Condition to Rating F for Critical Condition. A detailed listing of the conditions and their definitions can be seen in Exhibit A.
Priority Rating: In order to account for the need for protection at any one site, a five level priority rating system was established. This allowed for consideration of public infrastructure protection, density of residential housing for development of structure overall importance for coastal protection. The ratings range from Level 1 for no infrastructure or residence protection to Level 5 for critical inshore infrastructure protection and/or high density residential. The detailed listing and definitions for the priority categories can be seen in Exhibit B.

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

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

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

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

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

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

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

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

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

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

DEVELOPMENT OF REPAIR / RECONSTRUCTION COSTS

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

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

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

The cost implications for each rating condition are as follows:

- **A Rating** Structures not requiring any maintenance, repair or rehabilitation cost and would not be expected to experience damage if subject to a major coastal storm event

- **B Rating** Structures requiring limited or no repair and would be expected to experience only minor damage if subject to a major coastal storm event. The value of these maintenance costs is assumed to be 10 percent of the construction cost.

- **C Rating** Structures requiring moderate to significant level of repair or reconstruction and would be expected to experience significant damage if subject to a major coastal storm event. The structure is presumed to be effective under a major storm event. The value of the repair costs is assumed to be 50 percent of the construction cost.

- **D Rating** Structures requiring significant level of rehabilitation or total reconstruction and would be expected to experience significant damage or possibly fail if subject to a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost.
• **F Rating**  Structures requiring complete reconstruction and would expect to provide little or no protection from a major coastal storm event. The value of the repair costs is assumed to be 100 percent of the construction cost plus a cost for removal/disposal of the original structure.

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

<table>
<thead>
<tr>
<th>Height</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5'</td>
<td>Structures that were less than five feet in height</td>
</tr>
<tr>
<td>5'-10'</td>
<td>Structures five to 10 feet in height</td>
</tr>
<tr>
<td>10'-15'</td>
<td>Structures over 10 feet to 15 feet in height</td>
</tr>
<tr>
<td>&gt; 15'</td>
<td>Structures greater than 15 feet in height – assumed 20 feet typical</td>
</tr>
</tbody>
</table>

**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</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>
<tr>
<td>STRUCTURE TYPE</td>
<td>STRUCTURE MATERIALS</td>
<td>STRUCTURE HEIGHT</td>
</tr>
<tr>
<td>----------------</td>
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<tr>
<td>BULKHEAD/ SEAWALL</td>
<td>CONCRETE</td>
<td>Under 5 Feet</td>
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<td>5 To 10 Feet</td>
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<td>10 To 15 Feet</td>
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<td>Over 15 Feet</td>
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<td>STEEL</td>
<td>Under 5 Feet</td>
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<td>STONE</td>
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<td>Over 15 Feet</td>
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<td></td>
<td>WOOD</td>
<td>Under 5 Feet</td>
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<td>Over 15 Feet</td>
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<td>COASTAL BEACH</td>
<td>SAND</td>
<td>Under 5 Feet</td>
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<td>5 To 10 Feet</td>
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<td>Over 15 Feet</td>
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<td>COASTAL DUNE</td>
<td>SAND</td>
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<td>REVETMENT</td>
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<td>GROIN</td>
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<tr>
<td></td>
<td></td>
<td>10 To 15 Feet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 15 Feet</td>
</tr>
</tbody>
</table>

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

Nahant
Section II – Community Findings – Town of Nahant

COMMUNITY DESCRIPTION

The Town of Nahant consists of a land area of 1.24 square miles out of a total area of 15.48 square miles and had a population of 3,632 in the 2000 census. The Town is located in Boston Harbor of Massachusetts and its location can be seen on this report’s cover. The estimated length of shoreline is 11.2 miles that are directly exposed to open ocean. The town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Nahant, there were 25 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>STRUCTURE TYPE AND QUANTITY - Town of Nahant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bulkhead / Seawall</td>
</tr>
<tr>
<td>Revetment</td>
</tr>
<tr>
<td>Breakwater</td>
</tr>
<tr>
<td>Groin / Jetty</td>
</tr>
<tr>
<td>Coastal Dune</td>
</tr>
<tr>
<td>Coastal Beach</td>
</tr>
<tr>
<td></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 Nahant’s case there are a total of 24 structures which would require approximately $17.8 million to bring all the coastal structures to “A” Rating. Most critical will be the structures in the “D” and “F” classifications as those are assumed to undergo some level of damage or failure during the next major coastal storm event. To reconstruct these structures, identified in the preliminary survey as being in poor condition, an estimated $5.2 million would be required to upgrade the Town’s coastal protection.
STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Nahant

<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>10</td>
<td>$713,565</td>
<td>$4,429,418</td>
<td></td>
<td></td>
<td></td>
<td>$5,142,983</td>
</tr>
<tr>
<td>Revetment</td>
<td>15</td>
<td>$7,422,749</td>
<td>$4,953,036</td>
<td></td>
<td></td>
<td>$266,435</td>
<td>$12,642,220</td>
</tr>
<tr>
<td>Breakwater</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td>$</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>25</td>
<td>$713,565</td>
<td>$11,852,167</td>
<td>$4,653,036</td>
<td>$266,435</td>
<td>$17,785,203</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 Town of Nahant, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Nahant

<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>13</td>
<td>$103,725</td>
<td>$5,383,105</td>
<td>$859,716</td>
<td></td>
<td></td>
<td>$6,346,546</td>
</tr>
<tr>
<td>Commonwealth of Massachusetts</td>
<td>12</td>
<td>$609,840</td>
<td>$6,469,062</td>
<td>$4,093,320</td>
<td>$266,435</td>
<td>$11,438,657</td>
<td></td>
</tr>
<tr>
<td>Federal Government Owned</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Unknown Ownership</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>$713,565</td>
<td>$11,852,167</td>
<td>$4,653,036</td>
<td>$266,435</td>
<td>$17,785,203</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 Town of Nahant’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 - Nahant

Part B

Structure Assessment Reports
COASTAL STRUCTURE LOCATION PLAN

TOWN OF NAHANT
COASTAL INFRASTRUCTURE INVENTORY AND ASSESSMENT PROJECT
NOVEMBER 2007

SCALE: 1" = 150'-0"

Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Nahant

Location: Willow Road and Cliff Street
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $481,338.00

Date: 5/31/2007

Length: 195 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 17 Feet NGVD

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

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Dumped riprap slope comprised of stones that weigh up to 500 pounds. Stones at the base only are 1 to 2 ton. The slope is 1 to 1. Erosion present with loose stone. Private driveway and local road inshore of slope.

Condition Rating
D Poor

Level of Action Description
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:
[047-002B-000-010-100-PHG1A.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: Willow Road and Summer Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Based On Comment:</td>
</tr>
<tr>
<td>Presumed Structure Owner: Local</td>
<td>Earliest Structure Record: Unknown</td>
</tr>
<tr>
<td>Owner Name: Nahant</td>
<td>Estimated Reconstruction/Repair Cost: $162,162.00</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>135 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>13 Feet NGVD</td>
</tr>
</tbody>
</table>

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

### Structure Summary:
A mound of 4 inch crushed stone has a 1 ton granite blocks standing at top of slope. Local road directly inshore with houses across road.

### 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
- **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:
- [047-003C-000-064-100-PHO1A.JPG]

### Structure Documents:

---

Prepared By: Bourne Consulting Engineering
## Structure Assessment Form

**Property Owner:** Local

**Location:** Willow Road and Wharf Street

**Date:** 5/31/2007

**Presumed Structure Owner:** Local

**Owner Name:** Nahant

**Earliest Structure Record:** Unknown

**FIRM Map Zone:** V2

**FIRM Map Elevation:** 14 Feet NGVD

**Length:** 355 Feet

**Top Elevation:** Feet NAVD 88

**Primary Type:** Bulkhead/Seawall

**Primary Material:** Stone

**Primary Height:** Under 5 Feet

**Secondary Type:** Secondary Material:

**Secondary Height:**

**Structure Summary:**

<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>I None</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:**
- [047-003C-000-095-100-PHO1A.JPG](#)
- [047-003C-000-095-100-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: Nahant
Location: Willow Road and Wharf Street
Date: 5/31/2007
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $113,309.00

Length: 145 Feet
Top Elevation: 14 Feet NGVD
FIRM Map Zone: V2
FIRM Map Elevation: 14 Feet NGVD

Primary Type: Revetment
Primary Material: Concrete
Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
Revetment slope with concrete topping and concrete cap. Slope is 1 on 1. Moderate undermining at toe of slope. 5 feet wide cap with paved parking lot inshore.

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 additional material for full protection and extended life.

Priority Rating Action Description
1 None

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

Structure Images:
047-003C-000-095-200-PHO2A.JPG
047-003C-000-095-200-PHO2B.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: Nahant
Location: Summer Street
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $110,055.00
Date: 5/31/2007

Length: 145 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 14 Feet NGVD
Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: 5 to 10 Feet
Secondary Type:
Secondary Material:
Secondary Height:

Structure Summary:
Stone block seawall (dry set) with concrete cap. Paved parking lot is located inshore. Gaps between stones with slight movement of stones.

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:
047-003C-000-095-300-PH03A.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>Summer Street</td>
<td>5/31/2007</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>Nahant</td>
<td>Unknown</td>
<td>$653,400.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length: 330 Feet Feet NAVD 88</th>
<th>Top Elevation:</th>
<th>FIRM Map Zone: V2</th>
<th>FIRM Map Elevation: I4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet Feet NGVD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

**Structure Summary:**
Stone block (mortared) wharf has a paved parking area on top. Moderate loss of mortar with slight movement of stones is visible. Pier extends offshore with building on it.

**Condition Rating**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Fair</td>
</tr>
</tbody>
</table>

**Priority Rating**

<table>
<thead>
<tr>
<th>Priority</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>None</td>
</tr>
</tbody>
</table>

**Level of Action**

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

**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.

**Structure Images:**
- [047-003C-000-095-400-PHO4A.JPG](image)
- [047-003C-000-095-400-PHO4B.JPG](image)
- [047-003C-000-095-400-PHO4C.JPG](image)

**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: Nahant

Location: Cliff Street and Nahant Road
Based On Comment:
Earliest Structure Record: 1960
Estimated Reconstruction/Repair Cost: $73,735.00

Date: 5/31/2007

Length: 490 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 26 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Concrete
Primary Height: Under 5 Feet

Secondary Type: Revetment
Secondary Material: Stone
Secondary Height: Under 5 Feet

Structure Summary:
Precast concrete seawall with wave break face. 3 feet wide by 6 feet long concrete sections. Concrete seawall. Minor undermining of wall at eastern end (vertical 20 feet approximately). Of 50 foot high earth slope with local road directly inshore.

Revetment sloped beneath and outshore of Stones are 200 to 800 pounds. Wall protects toe of 50 feet high earth slope with local road directly inshore.

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
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:
[047-004B-000-017-100-PHO1A.JPG
047-004B-000-017-100-PHO1B.JPG

Structure Documents:
USAGE [May 12, 198]
MA-DCR [November 1]
Emergency Slope
Proposed Concrete

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Nahant

Location: Marginal Road
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $372,794.00

Date: 5/31/2007

Length: 135 Feet
Top Elevation: 15 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 21 Feet NGVD

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

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

Structure Summary:
Stone block seawall with concrete wall and cap. Wall top is 2 feet - 6 inches wide. Moderate cracking, spacing and weathering of wall. Residential area inshore. Dumped riprap along wall base. 100 to 1500 pound stones at a 1 to 2 slope. Western 500 feet has 500 to 1000 pound stone dumped on ledge.

Condition Rating: C
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: Moderate Priority
Action Description: 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:
[047-006-000-001-100-PH01A.jpg]

Structure Documents:

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

**Structure Assessment Form**

**Property Owner:**
- Local

**Location:**
- Marginal Road

**Date:**
- 5/31/2007

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Nahant

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $1,339,107.00

**Length:**
- 1085 Feet

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

**FIRM Map Zone:**
- V2

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

**Primary Type:**
- Revetment

**Primary Material:**
- Stone

**Primary Height:**
- Over 15 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
Dumped riprap slope comprised of 100 to 500 pound stone sloped at 1 to 1 slope. Loose stones at base. Wall base at mean high water. Local road directly inshore of slope with houses across road.

**Condition Rating**
- **Priority Rating**
- Moderate Priority

**Level of Action Description**
- Moderate

**Action Description**
- Consider for Active Project Improvement Listing

**Structure Images:**
- 047-006-000-008-100-PHO1A.JPG
- 047-006-000-008-100-PHO1B.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>Willow Road</td>
<td>5/31/2007</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>Nahant</td>
<td>Unknown</td>
<td>$1,498,530.00</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>1195</td>
<td>11</td>
<td>V2</td>
<td>12</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>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:**
Mortared stone block seawall with coastal sand beach outshore. Wall base steps out 1 foot with concrete repair on eastern 250 feet. Wall top is 2 feet wide with 4 feet wide paved walkway inshore. The middle third of the wall has moderate mortar loss. No noticeable wall movement. Minor scour at base for one 30 feet section near center. Minor erosion behind seawall (most likely through wall joints).

<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>

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

**Structure Images:**
- [047-009-000-032-100-PHO1A.JPG]
- [047-009-000-032-100-PHO1B.JPG]
- [047-009-000-032-100-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: Nahant

Location: Willow Road
Based On Comment: Unknown

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $678,810.00

Date: 5/31/2007

Length: 550 Feet
Top Elevation: 13 Feet NGVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 13 Feet NGVD

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

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary: Placed riprap mound comprised of 1 to 3 ton stones. Outshore slope 1 vertical on 2 horizontal slope toed into bottom. Inshore slope 1 vertical on 3 horizontal toed into shore. Outshore slope has some dislodged stones and some overhanging stones. 10 feet wide top apron. Golf course inshore.

Condition Rating
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
I
Long Term Planning Considerations
None
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
047-012-000-034-100-PH01A.JPG
047-012-000-034-100-PH01B.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: Nahant

Location: Bass Point Road

Based On Comment:

Earliest Structure Record: Unknown

Estimated Reconstruction/Repair Cost: $617,100.00

Date: 5/31/2007

Length: 500 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: Feet NGVD 22

Primary Type: Revetment

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary:
Dumped riprap slope comprised of stones that weigh up to 500 pounds. Approximately 1 on 4 slope. Park located inshore. Slope extends almost to mean low water.

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
None Long Term Planning Considerations No Inshore Structures or Residential Dwelling Units Present

Structure Images:
- 047-012F-000-00BH-100-PH01A.JPG
- 047-012F-000-00BH-100-PH01B.JPG

Structure Documents:

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

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Nahant

**Location:**
- Castle Road

**Based On Comment:**

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $216,216.00

**Date:**
- 5/31/2007

**Length:**
- 180 Feet NAVD 88

**Top Elevation:**
- 12 Feet NGVD

**FIRM Map Zone:**
- V4

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

**Primary Type:**
- Revetment

**Primary Material:**
- Stone

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

**Secondary Type:**
-

**Secondary Material:**
-

**Secondary Height:**
-

**Structure Summary:**
Stone slope comprised of 4 inch stones with granite blocks (18 inch by 18 inch) along inshore edge (edge of road). No defined toe. Coastal beach outshore. Stone starts at mean high water and extends inshore approximately 15 feet to edge of sidewalk/road.

**Condition 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 Rating**
- Low Priority

**Action Description**
Inshore Structures Present with Limited potential for Significant Infrastructure Damage

**Structure Images:**
- 047-023-000-066-100-PH01A.JPG

**Structure Documents:**

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

**Property Owner:**
- State

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- Nahant Road

**Based On Comment:**

**Earliest Structure Record:**
- 1933

**Estimated Reconstruction/Repair Cost:**
- $883,027.00

**Length:**
- 1130 Feet

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

**FIRM Map Zone:**
- V2

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

**Primary Type:**
- Revetment

**Primary Material:**
- Stone

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

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
- Dumped riprap slope comprised of 1 to 3 ton stones. Moderate erosion above top of revetment. No visible toe of structure. Local road located about 20 feet inshore.

**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 additional material for full protection and extended life.

**Priority Rating**
- II: Low Priority

**Action Description**
- Inshore Structures Present with Limited potential for Significant Infrastructure Damage

**Structure Images:**
- [047-025A-000-426-100-PHO1A.JPG](047-025A-000-426-100-PHO1A.JPG)
- [047-025A-000-426-100-PHO1B.JPG](047-025A-000-426-100-PHO1B.JPG)

**Structure Documents:**
- MA-DCR
- August 1933
- Proposed Shore
- 047-025A-000-426-100-DCR1A

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

**Structure Assessment Form**

**Town:** Nahant  
**Structure ID:** 047-025D-000-000-100  
**Key:** community-map-block-parcel-structure

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
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</thead>
<tbody>
<tr>
<td>State</td>
<td>Nahant Road</td>
<td>5/31/2007</td>
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<tr>
<td>Presumed Structure Owner:</td>
<td>Based On Comment:</td>
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<td>Owner Name:</td>
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<td>425 Feet</td>
<td>Feet NAVD 88</td>
<td>V4</td>
<td>13 Feet NGVD</td>
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<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
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<tbody>
<tr>
<td>Bulkhead/ Seawall</td>
<td>Concrete</td>
<td>10 to 15 Feet</td>
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</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:**
Concrete seawall with a mortared stone block face. A revetment slope outshore of the wall. The average stone size is 750 pounds. The revetment is covered with concrete topping. The structure protects the only land access to Nahant. Approximately 30 percent of the mortar has gaps, but the stones are still locked in place.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair</td>
<td>High Priority</td>
<td>Consider for Next Project Construction Listing</td>
</tr>
</tbody>
</table>

**Structure Images:**
- 047-025D-000-000-100-PHO1A.JPG
- 047-025D-000-000-100-PHO1B.JPG

**Structure Documents:**
- MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-100-DCR1A
- MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-100-DCR1B
- MA-DCR 12/18/1916 Nahant Beach 047-025D-000-000-100-DCR1C
- MA-DCR 6/7/1933 Nahant Beach 047-025D-000-000-100-DCR1D
- MA-DCR 11/22/1947 Nahant Beach 047-025D-000-000-100-DCR1E
- MA-DCR 6/9/1961 Nahant Beach 047-025D-000-000-100-DCR1F
- MA-DCR December 1 Cross-Section - Lynn 047-025D-000-000-100-DCR1G
- MA-DCR 11/24/1984 Nahant Beach 047-025D-000-000-100-DCR1H
- MA-DCR 4/30/1969 Nahant Beach 047-025D-000-000-100-DCR1I
- MA-DCR September 1 Nahant Beach 047-025D-000-000-100-DCR1J

**Prepared By:** Bourne Consulting Engineering
<table>
<thead>
<tr>
<th>Town: Nahant</th>
<th>Structure ID: 047-025D-000-000-100</th>
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<tr>
<td>Key: community-map-block-parcel-structure</td>
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<table>
<thead>
<tr>
<th>MA-DCR</th>
<th>5/22/1972</th>
<th>Nahant Beach</th>
<th>047-025D-000-000-100-DCR1K</th>
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<tbody>
<tr>
<td>MA-DCR</td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-100-DCR1L</td>
</tr>
</tbody>
</table>

Prepared By: Bourne Consulting Engineering
Property Owner: MA-DCR

Presumed Structure Owner: State

Owner Name: MA-DCR

Location: Nahant Road

Based On Comment:

Earliest Structure Record: 1913

Estimated Reconstruction/Repair Cost: $520,740.00

Length: 1315 Feet NAVD 88

Top Elevation: 13 Feet NGVD

FIRM Map Zone: V4

FIRM Map Elevation: 13

Primary Type: Bulkhead/Seawall

Primary Material: Concrete

Primary Height: Over 15 Feet

Secondary Type: 

Secondary Material: 

Secondary Height: 

Structure Summary: Concrete seawall with stone block face (mortared). Concrete wall also poured as repair outshore of original wall. Concrete foundation steps out twice beyond wall face. Repair has wave break on face. Transverse cracks about 4 feet on center. Wall joints about 8 feet on center. Minor surface spalling and weathering of repaired wall and foundation.

Condition Rating Level of Action Description
B Good Minor Structure observed to exhibit very minor problems, superficial in nature. Minor erosion to landfill present. Structure/landform is 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 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:
- 047-025D-000-000-200-PH02A.JPG
- 047-025D-000-000-200-PH02B.JPG
- 047-025D-000-000-200-PH02C.JPG

Structure Documents:
- MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-200-DCR2A
- MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-200-DCR2B
- MA-DCR 12/18/1916 Nahant Beach 047-025D-000-000-200-DCR2C
- MA-DCR 6/7/1933 Nahant Beach 047-025D-000-000-200-DCR2D
- MA-DCR 1/22/1947 Nahant Beach 047-025D-000-000-200-DCR2E
- MA-DCR 8/9/1961 Nahant Beach 047-025D-000-000-200-DCR2F
- MA-DCR December 1 Cross-Sections - 047-025D-000-000-200-DCR2G
- MA-DCR 11/24/1964 Nahant Beach 047-025D-000-000-200-DCR2H
- MA-DCR 4/30/1969 Nahant Beach 047-025D-000-000-200-DCR2I
- MA-DCR September 1 Nahant Beach 047-025D-000-000-200-DCR2J

Prepared By: Bourne Consulting Engineering
<table>
<thead>
<tr>
<th>Town</th>
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<tbody>
<tr>
<td>Structure ID</td>
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<td>Key</td>
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<th>MA-DCR</th>
<th>5/22/1972</th>
<th>Nahant Beach</th>
<th>047-025D-000-000-200-DCR2K</th>
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<td>MA-DCR</td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-200-DCR2L</td>
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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>
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<tbody>
<tr>
<td>State</td>
<td>Nahant Road</td>
<td>5/31/2007</td>
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<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
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<td>State</td>
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<td>$1,006,434.00</td>
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<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
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<tbody>
<tr>
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<tr>
<th>Length:</th>
<th>FIRM Map Zone:</th>
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<tbody>
<tr>
<td>390 Feet</td>
<td>V4</td>
<td>13 Feet NGVD</td>
</tr>
<tr>
<td>Feet NAVD 88</td>
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<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulwark/Seawall</td>
<td>Concrete</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>
<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
</tr>
</tbody>
</table>

**Structure Summary:**
Concrete seawall with stone block face (mortared). Stone revetment is outside of the seawall. Average stone size is 750 pounds. Revetment is covered with concrete topping. Structure protects the only land access to Nahant. Gaps in mortar (approximately 30%), but stones are still locked into place.

**Condition Rating**
C - Fair

**Level of Action Description**
Moderate

**Priority Rating**
IV - High Priority

**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)

<table>
<thead>
<tr>
<th>Structure Images:</th>
<th>Structure Documents:</th>
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<tr>
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<td>047-025D-000-000-300-PHO3B.JPG</td>
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Prepared By: Bourne Consulting Engineering
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<td>Nahant Beach</td>
<td>047-025D-000-000-300-DCR3L</td>
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</tbody>
</table>
## CZM Coastal Infrastructure Inventory and Assessment
### Structure Assessment Form

**Property Owner:**

**Location:** Nahant Road

**Date:** 5/31/2007

**Town:** Nahant

**Structure ID:** 047-025D-000-000-400

**Key:** community-map-block-parcel-structure

### Structure Details

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<tbody>
<tr>
<td>4260</td>
<td>10</td>
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<td>13</td>
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</table>

<table>
<thead>
<tr>
<th>Feet</th>
<th>Feet NAVD 88</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

### Structure Summary:
Stone revetment sloped with average stone size of 1000 pounds. Erosion at top of slope. Revetment is not teed into bottom. Toe of slope is above mean low water. (Sand migration covered slope toe.)

---

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

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:
- 047-025D-000-000-400-PHO4A.JPG
- 047-025D-000-000-400-PHO4B.JPG
- 047-025D-000-000-400-PHO4C.JPG

### Structure Documents:
- MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-400-DCR4A
- MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-400-DCR4B
- MA-DCR 11/24/1964 Nahant Beach 047-025D-000-000-400-DCR4H
- MA-DCR 4/30/1969 Nahant Beach 047-025D-000-000-400-DCR4I
- MA-DCR 9/30/1971 Nahant Beach 047-025D-000-000-400-DCR4J

Prepared By: Bourne Consulting Engineering
<table>
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<th>Location</th>
<th>Structure ID</th>
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<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-400-DCR4L</td>
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</tbody>
</table>

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

Structure Assessment Form

Property Owner: Unknown
Presumed Structure Owner: State
Owner Name: MA-DCR
Location: Nahant Road
Based On Comment:
Earliest Structure Record: 1913
Estimated Reconstruction/Repair Cost: $89,100.00

Date: 5/31/2007

Length: 500 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: V4
FIRM Map Elevation: 13 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Concrete
Primary Height: 5 to 10 Feet
Secondary Type: Coastal Beach
Secondary Material: Sand
Secondary Height: Under 5 Feet

Structure Summary:
Concrete barrier wall built at top of beach (about 5 feet above mean high water). Protects Department of Conservation and Recreation Building. Sand appears to be dumped and graded offshore of wall.

Condition Rating
B Good
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:
047-025D-000-000-500-PH05A.JPG
047-025D-000-000-500-PH05B.JPG

Structure Documents:
MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-500-DCR5A
MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-500-DCR5B
MA-DCR 12/18/1916 Nahant Beach 047-025D-000-000-500-DCR5C
MA-DCR 6/7/1933 Nahant Beach 047-025D-000-000-500-DCR5D
MA-DCR 1/22/1947 Nahant Beach 047-025D-000-000-500-DCR5E
MA-DCR 6/9/1961 Nahant Beach 047-025D-000-000-500-DCR5F
MA-DCR December 1 Cross-Sections 047-025D-000-000-500-DCR5G
MA-DCR 11/24/1964 Nahant Beach 047-025D-000-000-500-DCR5H
MA-DCR 4/30/1969 Nahant Beach 047-025D-000-000-500-DCR5I
MA-DCR September 1 Nahant Beach 047-025D-000-000-500-DCR5J

Prepared By: Bourne Consulting Engineering
<table>
<thead>
<tr>
<th>Agency</th>
<th>Date</th>
<th>Location</th>
<th>ID Number</th>
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<tbody>
<tr>
<td>MA-DCR</td>
<td>5/22/1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-500-DCR5K</td>
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<tr>
<td>MA-DCR</td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-500-DCR5L</td>
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CZM Coastal Infrastructure Inventory and Assessment
Structure Assessment Form

Town: Nahant
Structure ID: 047-325D-000-000-600
Key: community-map-block-parcel-structure

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
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<tr>
<td>State</td>
<td>Nahant Road</td>
</tr>
<tr>
<td>Presumed Structure Owner:</td>
<td>Based On Comment:</td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Owner Name:</td>
<td></td>
</tr>
<tr>
<td>MA-DCR</td>
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<th>Date:</th>
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<td>5/31/2007</td>
<td>1913</td>
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<table>
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<tr>
<th>Length:</th>
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<td>345 Feet</td>
<td>Feet NAVD 88</td>
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<tr>
<td>FIRM Map Zone: V4</td>
<td>FIRM Map Elevation: 13 Feet NGVD</td>
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<table>
<thead>
<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
</tr>
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<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
</tr>
</tbody>
</table>

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

Structure Summary:
Placed riprap slope along boat ramp parking area. The typical stone size is approximately 1000 pounds. Slope is toed into mud. Well constructed and in good condition.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
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<tbody>
<tr>
<td>Excellent</td>
<td>I</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>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.

<table>
<thead>
<tr>
<th>Structure Images:</th>
</tr>
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<tbody>
<tr>
<td>047-025D-000-000-600-PH06A.JPG</td>
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<tr>
<td>047-025D-000-000-600-PH06B.JPG</td>
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<th>Structure Documents:</th>
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<tr>
<td>MA-DCR</td>
</tr>
<tr>
<td>11/3/1913</td>
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<tr>
<td>Nahant Beach</td>
</tr>
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<td>047-025D-000-000-600-DCR6A</td>
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<td>MA-DCR</td>
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<td>3/23/1914</td>
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<td>047-025D-000-000-600-DCR6B</td>
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<tr>
<td>MA-DCR</td>
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<tr>
<td>12/18/1916</td>
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<tr>
<td>Nahant Beach</td>
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<td>6/7/1933</td>
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<td>047-025D-000-000-600-DCR6E</td>
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<td>MA-DCR</td>
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<td>6/9/1961</td>
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<td>Nahant Beach</td>
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<td>047-025D-000-000-600-DCR6F</td>
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<td>MA-DCR</td>
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<tr>
<td>December 1</td>
</tr>
<tr>
<td>Cross-Sections</td>
</tr>
<tr>
<td>047-025D-000-000-600-DCR6G</td>
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<tr>
<td>MA-DCR</td>
</tr>
<tr>
<td>11/24/1964</td>
</tr>
<tr>
<td>Nahant Beach</td>
</tr>
<tr>
<td>047-025D-000-000-600-DCR6H</td>
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<td>MA-DCR</td>
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<td>4/30/1969</td>
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<tr>
<td>Nahant Beach</td>
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<td>047-025D-000-000-600-DCR6I</td>
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<tr>
<td>MA-DCR</td>
</tr>
<tr>
<td>September 1</td>
</tr>
<tr>
<td>Nahant Beach</td>
</tr>
<tr>
<td>047-025D-000-000-600-DCR6J</td>
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Prepared By: Bourne Consulting Engineering
## CZM Coastal Infrastructure Inventory and Assessment

### Structure Assessment Form

<table>
<thead>
<tr>
<th>MA-DCR</th>
<th>Date</th>
<th>Location</th>
<th>Structure ID</th>
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<tbody>
<tr>
<td></td>
<td>5/22/1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-600-DCR6K</td>
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<tr>
<td>MA-DCR</td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-600-DCR8L</td>
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Town: **Nahant**

Structure ID: 047-025D-000-000-600

Key: community-map-block-parcel-structure

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

Structure Assessment Form

Town: Nahant
Structure ID: 047-025D-000-000-700
Key: community-map-block-parcel-structure

Property Owner: 
State: 
Presumed Structure Owner: 
State: 
Owner Name: MA-DCR
Earliest Structure Record: 1913
Estimated Reconstruction/Repair Cost: $78,210.00

Date: 5/31/2007

Location: Nahant Road
Based On Comment: 

Length: 50 Feet
Top Elevation: 13 Feet NGVD
FIRM Map Zone: V4
FIRM Map Elevation: 

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

Structure Summary:
Revetment slope consisting of dumped stone, concrete debris, and pavement debris. Ballfield and tennis courts inshore. Slope is steep and in poor condition.

Condition Rating: D
Priority Rating: I
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 Action Description: No Inshore Structures or Residential Dwelling Units Present

Long Term Planning Considerations:

Structure Images:
047-025D-000-000-700-PH07A.JPG

Structure Documents:
MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-700-DCR7A
MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-700-DCR7B
MA-DCR 12/18/1916 Nahant Beach 047-025D-000-000-700-DCR7C
MA-DCR 6/7/1933 Nahant Beach 047-025D-000-000-700-DCR7D
MA-DCR 1/22/1947 Nahant Beach 047-025D-000-000-700-DCR7E
MA-DCR 6/9/1961 Nahant Beach 047-025D-000-000-700-DCR7F
MA-DCR December 1 Cross-Sections - 047-025D-000-000-700-DCR7G
MA-DCR 11/24/1964 Nahant Beach 047-025D-000-000-700-DCR7H
MA-DCR 4/30/1999 Nahant Beach 047-025D-000-000-700-DCR7I
MA-DCR September 1 Nahant Beach 047-025D-000-000-700-DCR7J

Prepared By: Bourne Consulting Engineering
<table>
<thead>
<tr>
<th>Agency</th>
<th>Date</th>
<th>Location</th>
<th>Structure ID</th>
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<tbody>
<tr>
<td>MA-DCR</td>
<td>5/22/1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-700-DCR7K</td>
</tr>
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<td>MA-DCR</td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-700-DCR7L</td>
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</table>

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>State</td>
<td>Nahant Road</td>
<td>5/31/2007</td>
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<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
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<tbody>
<tr>
<td>State</td>
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</table>

<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
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<tbody>
<tr>
<td>MA-DCR</td>
<td>1913</td>
<td>$266,435.00</td>
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<tr>
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<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
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</thead>
<tbody>
<tr>
<td>365 Feet</td>
<td>11 Feet NAVD 88</td>
<td>V4</td>
<td>13 Feet NGVD</td>
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</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>Under 5 Feet</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Structure Summary:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The scattered line of dumped riprap is comprised of stones that on average are 500 to 1000 pounds.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>None</td>
<td>Long Term Planning Considerations</td>
</tr>
</tbody>
</table>

**Level of Action 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:**

- [047-025D-000-000-800-PHO8A.JPG](#)
- [047-025D-000-000-800-PHO8B.JPG](#)
- [047-025D-000-000-800-PHO8C.JPG](#)

**Structure Documents:**

- MA-DCR 11/3/1913 Nahant Beach 047-025D-000-000-800-DCR8A
- MA-DCR 3/23/1914 Nahant Beach 047-025D-000-000-800-DCR8B
- MA-DCR 12/18/1916 Nahant Beach 047-025D-000-000-800-DCR8C
- MA-DCR 8/7/1933 Nahant Beach 047-025D-000-000-800-DCR8D
- MA-DCR 11/22/1947 Nahant Beach 047-025D-000-000-800-DCR8E
- MA-DCR 6/9/1961 Nahant Beach 047-025D-000-000-800-DCR8F
- MA-DCR December 1 Cross-Sections - 047-025D-000-000-800-DCR8G
- MA-DCR 11/24/1964 Nahant Beach 047-025D-000-000-800-DCR8H
- MA-DCR 4/30/1969 Nahant Beach 047-025D-000-000-800-DCR8I
- MA-DCR September 1 Nahant Beach 047-025D-000-000-800-DCR8J

Prepared By: Bourne Consulting Engineering
## Structure Assessment Form

<table>
<thead>
<tr>
<th>MA-DCR</th>
<th>Date</th>
<th>Location</th>
<th>ID Number</th>
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<tr>
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<td>5/22/1972</td>
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<td>047-025D-000-000-800-DCR8K</td>
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<td></td>
<td>August 1972</td>
<td>Nahant Beach</td>
<td>047-025D-000-000-800-DCR8L</td>
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</table>

Town: **Nahant**
Structure ID: 047-025D-000-000-800

Key: community-map-block-parcel-structure

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: MA-DCR
Location: Nahant Road
Date: 5/31/2007

Presumed Structure Owner: MA-DCR
Based On Comment: 

Owner Name: MA-DCR
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $2,549,646.00

Length: 1630 Feet
Top Elevation: NAVD 88 Feet
FIRM Map Zone: V2
FIRM Map Elevation: 16 Feet

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

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
Dumped riprap slope comprised of 300 to 1000 pound stones. No defined toe or top of slope. Crushed stone mixed into slope. Coastal sand beach outshore. Park area and local road inshore. Eastern 500 feet has been rebuilt with 500 to 2000 pound stones dumped at a 1 to 3 slope.

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

Structure Images:
047-025E-000-001-100-PH01A.JPG
047-025E-000-001-100-PH01B.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: MA-DCR
Location: Nahant Road
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $462,462.00
Date: 5/31/2007

Length: 770
Top Elevation: 12
FIRM Map Zone: V4
FIRM Map Elevation: 12
Feet Feet NAVD 88 Feet NGVD

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

Secondary Type:
Secondary Material:
Secondary Height:

Structure Summary:
Dumped riprap slope comprised of 500 to 3000 pound stones. Coastal sand beach is located outshore. Local road about 15 feet inshore. Only land access to the rest of Nahant. Minor erosion above top of revetment slope. Slope toed into beach just above mean high water.

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
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:
047-025E-000-002-100-PH01A.JPG
047-025E-000-002-100-PH01B.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering
<table>
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<tr>
<th>Property Owner:</th>
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<tr>
<td>Owner Name:</td>
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<th>Presumed Structure Owner:</th>
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<tr>
<td>State</td>
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<td>1220 Feet</td>
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<tr>
<td>V2</td>
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<thead>
<tr>
<th>Primary Type:</th>
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<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
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<table>
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<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Structure Summary:</th>
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<tbody>
<tr>
<td>There is approximately 4 inches of dumped stone along the coastal dune. No evidence of structure visible other than the stones. Slope extends from mean high water to approximately 10 feet above mean high water. The slope is 1 on 3. No defined toe or top of slope.</td>
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<table>
<thead>
<tr>
<th>Condition Rating</th>
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<tbody>
<tr>
<td>D</td>
<td>Poor</td>
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<td>Major</td>
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<tr>
<td>047-025E-000-002-200-PHO2B.JPG</td>
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<tr>
<td>047-025E-000-002-200-PHO2C.JPG</td>
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<table>
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<th>Structure Documents:</th>
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Prepared By: Bourne Consulting Engineering
Section II - Nahant

Part C

Structure Photographs
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<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>
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<td>Structure Condition Photo at Time of Survey</td>
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Section II - Nahant

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 Nahant

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No MA - DEP Ch. 91 Documents for the Town of Nahant
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<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Contract/ Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
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Section III

Winthrop
Section III – Community Findings – Town of Winthrop

COMMUNITY DESCRIPTION

The Town of Winthrop consists of a land area of 1.99 square miles out of a total area of 8.3 square miles and had a population of 18303 in the 2000 census. The Town is located in Boston Harbor of Massachusetts and its location can be seen on this report’s cover. The estimated length of shoreline is 7 miles that are directly exposed to open ocean. The Town is protected from major coastal storms by both natural and man-made shoreline structures that require maintenance to insure the long term protection of its coastline. The man-made and publicly owned structures that protect the Town were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned, including coastal dunes and beaches, based on evidence of investment of public funds made to create/enhance/maintain these structures. The assessment did not include floating or pile supported structures as they are assumed not to provide any significant coastal protection from major storm events.

STRUCTURE INVENTORY

Within the Town of Winthrop, 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 9 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:

<table>
<thead>
<tr>
<th>Primary Structure (t)</th>
<th>Total Structures</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Length</th>
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<tr>
<td>Bulwark / Seawall</td>
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<td>8</td>
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<td>14376</td>
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<td>2180</td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>485</td>
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<tr>
<td>Coastal Dune</td>
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</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 Winthrop’s case there are a total of 33 structures which would require approximately $17 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 $509,300 would be required to upgrade the Town’s coastal protection.
STRUCTURE REPAIR / RECONSTRUCTION COST - Town of Winthrop

<table>
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<th>Primary Structure (1)</th>
<th>Total Structures</th>
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<th>C</th>
<th>D</th>
<th>F</th>
<th>Total Cost</th>
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<td>$11,978,004</td>
<td>$494,868</td>
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<td>$418,724</td>
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<tr>
<td>Groin / Jetty</td>
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<td>$</td>
<td>$</td>
<td></td>
<td>$418,724</td>
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<tr>
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<td></td>
<td>33</td>
<td>$2,010,229</td>
<td>$14,496,908</td>
<td>$509,282</td>
<td>$17,016,419</td>
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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 Winthrop, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - Town of Winthrop

<table>
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<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>
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<td>Federal Government Owd.</td>
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<td>$14,496,908</td>
<td>$609,282</td>
<td>$17,016,419</td>
<td></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 III-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Town of Winthrop’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 - Winthrop

Part B

Structure Assessment Reports
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Town: Winthrop
Structure ID: 082-001-000-007-100
Key: community-map-block-parcel-structure

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop

Location:
Tafts Avenue
Based On Comment:
Earliest Structure Record: Unknown

Date: 6/13/2007
Estimated Reconstruction/Repair Cost: $159,073.00

Length: 585 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 12 Feet NGVD

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

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

Structure Summary:
The precast concrete wall with a wave return face is 2 feet wide by 3 feet high inshore and 2 feet by 7 feet high outshore. There are flood relief drains located in the wall. The dumped riprap is comprised of stones that are approximately 5 feet by 2 feet by 2 feet in size. There is no scour visible. The structures protect the road to Deer Island.

Condition Rating: B
Priority Rating: V
Level of Action 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.

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

#### Structure Assessment Form

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presumed Structure Owner:</td>
<td>Local</td>
</tr>
<tr>
<td>Owner Name:</td>
<td>Winthrop</td>
</tr>
<tr>
<td>Location:</td>
<td>Bay View Avenue</td>
</tr>
<tr>
<td>Date:</td>
<td>6/13/2007</td>
</tr>
<tr>
<td>Earliest Structure Record:</td>
<td>1958</td>
</tr>
<tr>
<td>Estimated Reconstruction/Repair Cost:</td>
<td>$124,093.00</td>
</tr>
</tbody>
</table>

| Length: | 790 Feet NAVD 88 |
| Top Elevation: | 11 Feet NGVD |
| FIRM Map Zone: | A2 |
| FIRM Map Elevation: | II |

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

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

**Structure Summary:**

The dumped riprap is comprised of stones that are approximately 3 feet by 2 feet by 2 feet in size. The slope is 1 on 1. There is no visible scour. At the toe there are some areas of stone settling. There is a road and houses behind the 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 Minor</td>
<td>IV High Priority</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>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:**

- 082-008-000-026-100-PHO1A.jpg
- 082-008-000-026-100-PHO1B.jpg

**Structure Documents:**

- MA-DCR September 1 Proposed Stone 082-008-000-026-100-DCR1A
- MA-DCR June 1961 Proposed Shore 082-008-000-026-100-DCR1B
- MA-DCR April 1965 Proposed Shore 082-008-000-026-100-DCR1C

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

Property Owner: MA-DCR
Presumed Structure Owner: State
Owner Name: State
Location: Grand View Avenue
Based On Comment:
Earliest Structure Record: 1958
Date: 6/13/2007
Estimated Reconstruction/Repair Cost: $182,186.00

Length: 670 Feet
Top Elevation: 60 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 12 Feet NGVD
Primary Type: Bulkhead / Seawall
Primary Material: Concrete
Primary Height: 5 to 10 Feet
Secondary Type: Secondary Material: Stone
Secondary Height: 5 to 10 Feet

Structure Summary:
The bulkhead is 2 feet wide by 3 feet high. There is new construction or repair. There appears to have been construction on top of the old wall. The placed riprap is comprised of stones that are approximately 4 feet by 5 feet by 2 feet in size and placed at a 1 on 1 slope. The toe appears in contact with no visible scour. There are roads and houses behind the structures.

Condition Rating: B
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: IV
Action Description: 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:
- 082-008-000-026-200-PHO2A.jpg
- 082-008-000-026-200-PHO2B.jpg

Structure Documents:
- MA-DCR September 1 Proposed Stone 082-008-000-026-200-DCR2A
- MA-DCR April 1985 Proposed Shore 082-008-000-026-200-DCR2B
- DEP December 2 Plan to Accompany 082-008-000-026-200-LIC2A

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

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop
Location: Town Landing
Based On Comment: 
Earliest Structure Record: 1970
Estimated Reconstruction/Repair Cost: $1,090,109.00

Date: 6/12/2007

Length: 1395 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

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

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
The dumped riprap is comprised of stones that are approximately 3 feet by 2 feet by 2 feet in size. There are areas with erosion at the top with some exposed filter fabric. The toe is intact. There are some areas where the stones are unraveled. There is a boat ramp in the middle of the structure.

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:
082-013-000-002-100-PHO1A.jpg
082-013-000-002-100-PHO1B.jpg
082-013-000-002-100-PHO1C.jpg

Structure Documents:
USACE July 24, 1977 Proposed Access 082-013-000-002-100-COE1A

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

**Property Owner:** Local

**Presumed Structure Owner:** Local

**Owner Name:** Winthrop

**Location:** Shirley Street

**Based On Comment:**

**Earliest Structure Record:** 1960

**Estimated Reconstruction/Repair Cost:** $717,255.00

**Date:** 6/12/2007

**Length:** 945 Feet

**Top Elevation:** 15 Feet NGVD

**FIRM Map Zone:** V2

**FIRM Map Elevation:** 15 Feet NGVD

**Primary Type:** Bulkhead/ Seawall

**Primary Material:** Concrete

**Primary Height:** 5 to 10 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
The cast in place wall has a wave return face. The beach is located in front of the wall and a small park, roads and houses are located behind it. The wall has minor cracking. There is one 10 feet localized section of scour. There is no other visible scour.

**Condition Rating**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Fair</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Priority</th>
<th>Rating</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>Moderate Priority</td>
<td>Consider for Active Project Improvement Listing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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:**

- 082-014-000-042-100-PHO1A.jpg

**Structure Documents:**

- MA-DCR
- July 1960
- Proposed Seawall
- 082-014-000-042-100-DCR1A

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

Structure Assessment Form

Property Owner: Local

Presumed Structure Owner: Local

Owner Name: Winthrop

Location: Shirley Street

Based On Comment:

Earliest Structure Record: Unknown

Estimated Reconstruction/Repair Cost: $392,990.00

Date: 6/12/2007

Length: 360 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: A2

FIRM Map Elevation: 10 Feet NGVD

Primary Type: Bulkhead/Seawall

Primary Material: Concrete

Primary Height: 5 to 10 Feet

Secondary Type: Revetment

Secondary Material: Stone

Secondary Height: Under 5 Feet

Structure Summary:
The dumped riprap is comprised of stones that are approximately 3 feet by 2 feet by 2 feet in size. There are some areas of erosion at the top with some exposed filter fabric. The toe is intact. There are some areas where the stones have come unraveled. There is a 3 feet high cast in place return face wall.

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 minor 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:

Structure Documents:

082-014-000-044-100-PHO1A.jpg

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

Structure Assessment Form

Property Owner:
Local

Presumed Structure Owner:
Local

Owner Name:
Winnthrop

Location:
Cottage Park Road

Based On Comment:

Earliest Structure Record:
Unknown

Date:
6/12/2007

Estimated Reconstruction/Repair Cost:
$6,072.00

Length: 40 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: 11 Feet NGVD

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

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
The public access stairs located on the cast in place wall are in poor condition. Behind the structure is the road and in front is the beach. An outflow is located on each side. There is no visible scour. There is minor cracking.

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
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:
082-015-000-007-100-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: Winthrop

Location: Woods Drive
Based On Comment:

Date: 6/12/2007
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $286,902.00

Length: 1890 Feet
Top Elevation: 11 Feet NGVD
FIRM Map Zone: A2
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 seawall has some cracks with no visible scour. The beach is located in front and the road is behind the structure. There are public access stairs to the beach.

Condition Rating
Good

Priority Rating
Moderate Priority

Level of Action Description
Consider for Active Project Improvement Listing

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

Structure Images:
[082-016-000-005-100-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>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presumed Structure Owner:</td>
<td>Local</td>
</tr>
<tr>
<td>Owner Name:</td>
<td>Winthrop</td>
</tr>
<tr>
<td>Location:</td>
<td>Woodside Avenue and Bartlett Street</td>
</tr>
<tr>
<td>Date:</td>
<td>6/12/2007</td>
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<tr>
<td>Based On Comment:</td>
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<tr>
<td>Earliest Structure Record:</td>
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<td>Estimated Reconstruction/Repair Cost:</td>
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<table>
<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Feet</td>
<td>11 Feet NAVD 88</td>
</tr>
<tr>
<td></td>
<td>Feet NGVD</td>
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<table>
<thead>
<tr>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>11</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>5 to 10 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></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Structure Summary:
The stone block seawall is mortared in place. There are signs of scour and undermining at the toe. There are areas of stone loss and cracked concrete. The public access stairs are broken. There is a road behind the structure. There is a outflow pipe located in the structure.

<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 addition 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>II</td>
<td>Low Priority</td>
<td>Inshore Structures Present with Limited potential for Significant Infrastructure Damage</td>
<td></td>
</tr>
</tbody>
</table>

### Structure Images:
- [082-016-000-031-100-PH01A.jpg](082-016-000-031-100-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: 

Location: Plumber Avenue

Based On Comment: 

Earliest Structure Record: Unknown

Estimated Reconstruction/Repair Cost: $24,288.00

Length: 16 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: 

Primary Type: Bulkhead/Seawall

Primary Material: Concrete

Primary Height: 5 to 10 Feet

FIRM Map Elevation: Feet NGVD

Structure Summary:
The wall has no visible scour or undermine. It is cracked, deteriorating, and has sections of loss. There is a road behind the wall and no public access.

Condition Rating

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

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:
082-016-000-055-100-PH01A.jpg

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

### Structure Assessment Form

<table>
<thead>
<tr>
<th>Town:</th>
<th>Winthrop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure ID</td>
<td>082-017-000-007-100</td>
</tr>
<tr>
<td>Key:</td>
<td>community-map-block-parcel-structure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Frances Avenue</td>
<td>6/12/2007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td></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>Winthrop</td>
<td>1979</td>
<td>$53,196.00</td>
</tr>
</tbody>
</table>

### Length: 260 Feet NAVD 88, Top Elevation: 11 Feet NGVD

<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:
The precast concrete seawall has a wave return face that is 3 feet high on top of a 4 feet by 4 feet cast in place footing. The stone revetment slopes outshore from the toe of the seawall. The stones are on average 2 feet by 1 foot by 1 foot in size. The beach is in front and the road and parking lot are behind the structure. This structure was built by the Army Corps of Engineers.

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

| 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:
082-017-000-007-100-PHO1A.jpg

### Structure Documents:

<table>
<thead>
<tr>
<th>Structure Documents</th>
<th>USACE</th>
<th>MA-DCR</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>August 1979</td>
<td>November 1</td>
</tr>
<tr>
<td>Proposed Shore</td>
<td>Proposed Shore</td>
<td>Proposed Shore</td>
</tr>
<tr>
<td>082-017-000-007-100-COE1A</td>
<td>082-017-000-007-100-DCR1A</td>
<td></td>
</tr>
</tbody>
</table>

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop

Location: Frances Avenue
Based On Comment:

Earliest Structure Record: 1961
Estimated Reconstruction/Repair Cost: $36,520.00

Length: 55 Feet NAVD 88
Top Elevation: 11 Feet NGVD
FIRM Map Zone: A2
FIRM Map Elevation: 11

Primary Type: Groin/ Jetty
Primary Material: Stone
Primary Height: Under 5 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
The stone groin is coming unraveled at the toe. The sand inshore has begun to fill in and bury the groin. The stones are on average 2 feet by 1 foot by 1 foot with a 1 stone width crest. This structure was built by the Army Corps of Engineers.

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 addition material for full protection and extended life.

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

Structure Images:
082-017-000-007-200-PHO2A.jpg

Structure Documents:
USACE April 1961 Proposed Jetty in
DEP July 1961 Plan Accompanying
082-017-000-007-200-COE2A
082-017-000-007-200-LIC2A

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: Local

Presumed Structure Owner: Local

Owner Name: Winthrop

Location: Frances Avenue

Based On Comment: 

Earliest Structure Record: Unknown

Date: 6/12/2007

Estimated Reconstruction/Repair Cost: $25,225.00

Length: 210 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: A2

FIRM Map Elevation: Feet NGVD 11

Primary Type: Revetment

Primary Material: Stone

Primary Height: 5 to 10 Feet

Secondary Type: 

Secondary Material: 

Secondary Height: 

Structure Summary:
The placed stone revetment is at a 1 on 2 slope. The stones are on average 1 foot by 1 foot. The stones have concrete mortar. There is some mortar loss; however, the stones are staying in place well. A timber fence is across the top of the wall.

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
II Low Priority

Future Project Consideration

Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images: 082-017-000-007-300-PHO3A.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: Winthrop
Location: Shirley Street
Based On Comment: 

Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $381,381.00

Date: 6/12/2007

Length: 635 Feet
Top Elevation: 11 Feet NGVD
FIRM Map Zone: A2
FIRM Map Elevation: 11

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

Structure Summary:
The 1 on 1 sloped stone revetment is comprised of stones that are on average 3 feet by 2 feet by 2 feet. There are roads and houses behind the structure. The toe is intact with no visible scour. The top of the wall has undermining and has places where stones have settled from underslope being washed out. There are many storm drains coming out of the slope.

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
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:
082-018-000-003-100-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:** Winthrop

**Location:** Beacon Street  
**Based On Comment:**

**Earliest Structure Record:** 1951  
**Estimated Reconstruction/Repair Cost:** $216,180.00

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<tr>
<td>180 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>22 Feet NGVD</td>
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</table>

**Primary Type:** Groin/Jetty  
**Primary Material:** Stone  
**Primary Height:** 5 to 10 Feet

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

**Structure Summary:**
There is a set of two stone mound groins with stones that are approximately 3 feet by 2 feet by 2 feet in size. The middle of the structure has some stones that have come unraveled. These groins were built by the Army Corps of Engineers.

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

**Priority Rating**
- **Priority** III  
- **Moderate Priority**

**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 atom. Actions taken to provide additional material for full protection and extended life.

**Structure Documents:**
- **USACE** [February 20, 2016]  
- **Proposed Groins at Winthrop Shore** [082-019-000-117-100-COE1A]
- **USACE** [August 23, 1981]  
- **Proposed Groin and Seawall at Winthrop Shore** [082-019-000-117-100-COE1B]
- **MA-DCR** [N/A]  
- **New Granite Coping Section at Winthrop Shore** [082-019-000-117-100-DCR1A]
- **MA-DCR** [9/14/1955]  
- **Preliminary Sections at Winthrop Shore** [082-019-000-117-100-DCR1B]
- **MA-DCR** [5/25/1956]  
- **Winthrop Shore** [082-019-000-117-100-DCR1C]
- **MA-DCR** [2/28/1955]  
- **Winthrop Shore** [082-019-000-117-100-DCR1D]
- **MA-DCR** [12/21/1954]  
- **Winthrop Shore** [082-019-000-117-100-DCR1E]
- **MA-DCR** [2/10/1953]  
- **Winthrop Beach, MA** [082-019-000-117-100-DCR1F]
- **MA-DCR** [1/19/1944]  
- **Winthrop Shore** [082-019-000-117-100-DCR1G]

**Prepared By:** Bourne Consulting Engineering
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<td>June 21, 1933</td>
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<td>March 31, 1993</td>
<td>Proposed Groin and</td>
<td>082-019-000-117-100-LIC1B</td>
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Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Winthrop

**Location:**
- Sargent Street

**Based On Comment:**

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $98,670.00

**Date:**
- 6/12/2007

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**Primary Type:**
- Bulkhead/ Seawall

**Primary Material:**
- Concrete

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

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

**Structure Summary:**
The mortared stone wall has an outflow and street behind it. The toe is undermined. Cracking and spalling are visible on the wall. The public access stairs are broken.

**Condition Rating**
- D

**Priority Rating**
- Moderate Priority

**Level of Action Description**
- Major

**Priority Action**
- Consider for Active Project Improvement Listing

**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.

**Structure Images:**
- [082-020-000-024-100-PHO1A.jpg](082-020-000-024-100-PHO1A.jpg)

**Structure Documents:**

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

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<th>Primary Height:</th>
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<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
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<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
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</thead>
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<td></td>
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**Structure Summary:**
The seawall is mortared stone with a beach in front and private property behind it. The stones are approximately 1 foot in diameter.

**Condition**

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

### Structure Images:

- ![Structure Image](082-020-000-038-100-PHOTOA.jpg)

### Structure Documents:

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

**Property Owner:** Local

**Presumed Structure Owner:** Local

**Owner Name:** Winthrop

**Location:** Somerset Avenue

**Based On Comment:**

**Earliest Structure Record:** Unknown

**Estimated Reconstruction/Repair Cost:** $9,517.00

**Length:** 35 Feet NAVD 88

**Top Elevation:** 10 Feet NGVD

**FIRM Map Zone:** A2

**FIRM Map Elevation:**

**Primary Type:** Bulkhead/Seawall

**Primary Material:** Concrete

**Primary Height:** 5 to 10 Feet

**Secondary Type:** Revetment

**Secondary Material:** Stone

**Secondary Height:** 5 to 10 Feet

**Structure Summary:**
The cast in place wall has a wave return face. The riprap has stones that are approximately 2 feet by 2 feet by 2 feet in size. There is no visible scour. Behind the structures is the road and in front is the beach. There is an enclosed outflow in the structure.

**Condition Rating**

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

**Structure Images:**

082-321-000-106-100-PHO1A.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: MA-DCR

Location: Charles Street

Based On Comment: Early Structure Record: 1899

Date: 6/13/2007

Estimated Reconstruction/Repair Cost: $445,104.00

Length: 240 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: 19 Feet NGVD

Primary Type: Bulkhead/ Seawall

Primary Material: Concrete

Primary Height: 10 to 15 Feet

Secondary Type: Secondary Material: Stone

Secondary Height: 5 to 10 Feet

Structure Summary:
The cast in place bulkhead is 8 feet wide by 3 feet high with wave return face. There is spalling, cracking, and some areas of undermine. The riprap is comprised of stones that are approximately 3 feet by 2 feet by 2 feet in size.

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 additional material for full protection and extended life.

Priority Rating
Immeicate / Highest Priority

Action Description
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:
082-026-000-052-100-PHO1A.jpg
082-026-000-052-100-PHO1B.jpg
082-026-000-052-100-PHO1C.jpg

Structure Documents:

USACE
December 1

MA-DCR
082-026-000-052-100-COE1A

MA-DCR
082-026-000-052-100-DCR1A

MA-DCR
August 1978

MA-DCR
Proposed Seawall

MA-DCR
Window Parkway

MA-DCR
082-026-000-052-100-DR1B

MA-DCR
June 1964

MA-DCR
Proposed Cap/Wall

MA-DCR
Winthrop Shore

MA-DCR
11/12/63

MA-DCR
Winthrop Shore

MA-DCR
6/15/60

MA-DCR
Winthrop Shore

MA-DCR
7/12/1956

MA-DCR
Winthrop Shore

MA-DCR
1/12/56

MA-DCR
Winthrop Shore

MA-DCR
9/14/1955

MA-DCR
Preliminary Sections

MA-DCR
5/25/1955

MA-DCR
Winthrop Shore

Prepared By: Bourne Consulting Engineering
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<td>11/30/1943</td>
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<td>Winthrop Shore</td>
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<td>6/15/1899</td>
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<td>082-026-000-052-100-DCR1T</td>
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</table>
## Structure Assessment Form

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Winthrop

**Location:**
- Court Road

**Based On Comment:**

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $14,414.00

**Date:**
- 6/12/2007

### Length:
- 12 Feet
- 10 Feet NGVD

### Top Elevation:
- 10 Feet NAVD 88

### FIRM Map Zone:
- A2

### FIRM Map Elevation:
- 10

**Primary Type:**
- Revetment

**Primary Material:**
- Concrete

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

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

### Structure Summary:
The concrete and stone revetment is to protect the outfall pipe. The toe is broken and undermined.

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

### Structure Images:
- [082-027-000-010-100-PH01A.jpg](#)

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

Structure Assessment Form

Property Owner: MA-DCR

Location: Winthrop Shore Drive

Date: 6/12/2007

Presumed Structure Owner:

Based On Comment:

Earliest Structure Record: 1899

Estimated Reconstruction/Repair Cost: $7,382,628.00

Length: 5430 Feet NAVD 88

Top Elevation: Feet NGVD

Primary Type: Bulkhead/Seawall

Primary Material: Concrete

Primary Height: 5 to 10 Feet

FIRM Map Zone: V2

FIRM Map Elevation: 19

Secondary Type: Secondary Material: Stone

Secondary Height: 5 to 10 Feet

Revetment

Structure Summary:
The embankment is 3 feet wide by 3 feet high. There is spalling, cracking and some areas of undermining (locally 30 feet). The beach is located in front of the structures and the road is behind them.

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
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:
- 082-040-000-005-100-PHO1A.jpg
- 082-040-000-005-100-PHO1B.jpg
- 082-040-000-005-100-PHO1C.jpg
- 082-040-000-005-100-PHO1D.jpg
- 082-040-000-005-100-PHO1E.jpg
- 082-040-000-005-100-PHO1F.jpg

Structure Documents:

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

### Structure Assessment Form

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<td>6/15/1899</td>
<td>Winthrop Shore</td>
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**Prepared By:** Bourne Consulting Engineering
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop

Location: Five Sisters

Date: 6/12/2007

Earliest Structure Record: 1933

Estimated Reconstruction/Repair Cost: $1,076,920.00

Length: 2180 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 19 Feet NGVD

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

Structure Summary:
A set of 5 detached breakwaters made up of stones that are approximately 3 feet by 2 feet by 2 feet in size. Some of the stones have become unraveled and there is some settling.

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 carriage. 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: 082-040-000-006-100-PHO1A.jpg

Structure Documents:
MA-DCR May 1933 Proposed Stone 082-040-000-006-100-DCR1A
MA-DCR July 1934 Proposed Extension 082-040-000-006-100-DCR1B
MA-DCR June 1935 Proposed Extension 082-040-000-006-100-DCR1C

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop

Location: Pleasant Street
Based On Comment: 
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $47,309.00

Date: 6/12/2007

Length: 280 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

Primary Type: Bulkhead/ Seawall
Primary Material: Concrete
Primary Height: Under 5 Feet

Secondary Type: Bulkhead/ Seawall
Secondary Material: Concrete
Secondary Height: Under 5 Feet

Structure Summary:
The primary cast in place wall is 1 foot wide by 3 feet high. There is a beach located in front. There is no visible scour. There is minor cracking along the wall. A road and walkway are located behind the wall. The secondary cast in place concrete wall is approximately 15 feet in front of the first wall. The wall is 1 foot wide by 3 feet high. There is no cracking or scouring. There appears to be recent construction or repairs.

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:
082-042-000-001-100-PHO1A.jpg

Structure Documents:
DEP September 2 In Accompanying 082-042-000-001-100-LIC1A

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

**Structure Assessment Form**

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Winthrop

**Location:**
- Wave Way

**Earliest Structure Record:**
- 1944

**Estimated Reconstruction/Repair Cost:**
- $166,000.00

**Date:**
- 6/12/2007

**Length:** 250 Feet
**Top Elevation:** 22 Feet NAVD 88
**FIRM Map Zone:** V2
**FIRM Map Elevation:** 22 Feet NGVD

**Primary Type:** Groin/ Jetty
**Primary Material:** Stone
**Primary Height:** Under 5 Feet

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

**Structure Summary:**
A set of 3 stone mound groins that are made up of stones that are approximately 3 feet by 2 feet by 2 feet in size. The stones were mortared using concrete. The middle and ends have unraveled and are undermined.

**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 additional material for full protection and extended life.

**Priority Rating**
- III
- Moderate Priority

**Action Description**
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:**
- 082-051-000-026-100-PHO1A.jpg
- 082-051-000-026-100-PHO1B.jpg
- 082-051-000-026-100-PHO1C.jpg

**Structure Documents:**

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<tr>
<th>USACE</th>
<th>Proposed Groins at Winthrop Shore</th>
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<tr>
<td>082-051-000-026-100-COE1A</td>
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<tr>
<th>MA-DCR</th>
<th>Proposed Seawall</th>
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<td>082-051-000-026-100-DCR1A</td>
<td>082-051-000-026-100-DCR1B</td>
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<th>Winthrop Shore</th>
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<td>082-051-000-026-100-DCR1D</td>
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<td>082-051-000-026-100-DCR1F</td>
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<td>082-051-000-026-100-DCR1H</td>
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**Prepared By:** Bourne Consulting Engineering
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<tr>
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<th>Winthrop Shore</th>
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<td>DEP</td>
<td>April 1951</td>
<td>Proposed Grains</td>
<td>082-051-000-028-100-LIC1A</td>
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**Town:** Winthrop  
**Structure ID:** 082-051-000-026-100  
**Key:** community-map-block-parcel-structure

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

Town: Winthrop
Structure ID: 082-052-000-001-100
Key: community-map-block-parcel-structure

Property Owner:
Local

Presumed Structure Owner:
Local

Owner Name:
Winthrop

Location:
Main Street

Based On Comment:

Earliest Structure Record:
Unknown

Estimated Reconstruction/Repair Cost:
$9,610.00

Length: 80 Feet
Top Elevation: 10 Feet NGVD
FIRM Map Zone: A2
FIRM Map Elevation: 10 Feet NGVD

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

Secondary Type: Secondary Material:
Secondary Height:

Structure Summary:
The placed riprap is comprised of stones that are approximately 6 feet by 2 feet by 2 feet in size. Mean high water comes approximately half way up the stones.

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
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:
[082-052-000-001-100-PH01A.jpg]
[082-052-000-001-100-PH01B.jpg]

Structure Documents:

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

**Town:** Winthrop  
**Structure ID:** 082-060-000-005-100  
**Key:** community-map-block-parcel-structure

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<th>Property Owner:</th>
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<tr>
<td>Local</td>
<td>Morton Street</td>
<td>6/12/2007</td>
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<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
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<tr>
<td>Local</td>
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<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
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<td>Winthrop</td>
<td>1980</td>
<td>$628,690.00</td>
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<thead>
<tr>
<th>Length:</th>
<th>Top Elevation:</th>
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<tbody>
<tr>
<td>1890</td>
<td>Feet NAVD 88</td>
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<table>
<thead>
<tr>
<th>FIRM Map Zone:</th>
<th>FIRM Map Elevation:</th>
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</thead>
<tbody>
<tr>
<td>A2</td>
<td>10 Feet NGVD</td>
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</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>Under 5 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:**
The stones in the dumped riprap were laid out with random spacing. The stones are not interlocking. The stones are inconsistent in size. Most are approximately 2 feet by 2 feet by 1 foot in size. In front of the riprap is a marsh and canal; while behind the structure there are roads and houses.

<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 addition material for full protection and extended life.</td>
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<table>
<thead>
<tr>
<th>Priority</th>
<th>Rating</th>
<th>Action</th>
<th>Description</th>
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<tbody>
<tr>
<td>III</td>
<td>Moderate Priority</td>
<td>Consider for Active Project Improvement Listing</td>
<td>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:**
[082-060-000-005-100-PHO1A.jpg]

**Structure Documents:**
<table>
<thead>
<tr>
<th>Structure Documents:</th>
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</thead>
<tbody>
<tr>
<td>MA-DCR</td>
</tr>
<tr>
<td>MA-DCR</td>
</tr>
</tbody>
</table>

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

**Structure Assessment Form**

<table>
<thead>
<tr>
<th>Property Owner:</th>
<th>Local</th>
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</thead>
<tbody>
<tr>
<td>Presumed Structure Owner:</td>
<td>Local</td>
</tr>
<tr>
<td>Owner Name:</td>
<td>Winthrop</td>
</tr>
<tr>
<td>Location:</td>
<td>Kennedy Road</td>
</tr>
<tr>
<td>Date:</td>
<td>6/12/2007</td>
</tr>
</tbody>
</table>

| Earliest Structure Record: | 1980 |
| Estimated Reconstruction/Repair Cost: | $132,132.00 |

| Length: | 1100 Feet |
| Top Elevation: | 10 Feet NAVD 88 |
| FIRM Map Zone: | A2 |
| FIRM Map Elevation: | 10 Feet NGVD |

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

**Structure Summary:**
The crushed stone riprap is on approximately a 1 on 1 slope. It is there to prevent erosion of the coastal bank. Behind the slope is a utility road, storage area for stone and dirt, and a cemetery.

**Condition Rating**
- **B**

**Level of Action 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**
- **I**

**Action Description**
- None

**Long Term Planning Considerations**
- No Inshore Structures or Residential Dwelling Units Present

**Structure Images:**
- [082-061-000-020-100-PHO1A.jpg]

**Structure Documents:**
- MA-DCR February 26, Belle Isle Marsh 082-061-000-020-100-DCR1A
- MA-DCR August 31, Belle Isle Marsh 082-061-000-020-100-DCR1B

Prepared By: Bourne Consulting Engineering
Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Winthrop
Location: Grover's Avenue
Based On Comment:
Earliest Structure Record: Unknown
Date: 6/13/2007
Estimated Reconstruction/Repair Cost: $491,469.00

Length: 1325 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: Feet NGVD 21

Primary Type: Bulkhead / Seawall
Primary Material: Concrete
Primary Height: 10 to 15 Feet
Secondary Type: Revetment
Secondary Material: Stone
Secondary Height: 5 to 10 Feet

Structure Summary:
The 3 feet wide concrete wall is cast in place with a wave return face. The dumped riprap is comprised of stones that are approximately 3 feet by 2 feet by 2 feet in size and is stacked half way up the wall. Minor spalling and cracks in the wall.

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. Action 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:
082-063-000-072-100-PHO1A.jpg
082-063-000-072-100-PHO1B.jpg
082-063-000-072-100-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: Winthrop

Location: Grover's Avenue
Based On Comment:
Earliest Structure Record: Unknown

Length: 340 Feet
Top Elevation: 21 Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 21 Feet NGVD

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

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

Structure Summary:
The 3 feet wide concrete wall is cast in place with a wave return face. The dumped riprap stones are approximately 3 feet by 2 feet by 2 feet in size and stacked one stone high.

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

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:
082-063-000-072-200-PHO2A.jpg
082-063-000-072-200-PHO2B.jpg
082-063-000-072-200-PHO2C.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>
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<tbody>
<tr>
<td>Local</td>
<td>Grover's Avenue</td>
<td>6/12/2007</td>
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<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
<th>Earliest Structure Record:</th>
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<tr>
<td>Local</td>
<td></td>
<td>1899</td>
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<th>Owner Name:</th>
<th>Estimated Reconstruction/Repair Cost:</th>
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<td>Winthrop</td>
<td>$1,574,021.00</td>
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<td>570 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>21 Feet NGVD</td>
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<th>Primary Type:</th>
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<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Concrete</td>
<td>Over 15 Feet</td>
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<th>Secondary Type:</th>
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<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>10 to 15 Feet</td>
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</tbody>
</table>

### Structure Summary:
The seawall is cast in place 3 feet wide by 2.5 feet high. The wave return face is cracking and rebar is exposed. The dumped riprap is comprised of stones that are approximately 2 feet by 2 feet by 2 feet in size.

### Condition Rating
**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. Lanform 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
**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:
- 082-068-000-080-100-PHO1A.jpg

### Structure Documents:
- **USAGE**
  - December 1
- **MA-DCR**
  - 11/26/1979
  - August 1972
  - April 1962
  - 9/14/1955
  - 5/25/1955
  - 4/30/1954
  - 9/18/1950
  - 11/15/1948
  - 8/1/1945
- **Proposed Seawall**
  - 082-068-000-080-100-COE1A
- **Proposed Seawall**
  - 082-068-000-080-100-DCR1A
- **Winthrop Shore**
  - 082-068-000-080-100-DCR1B
  - 082-068-000-080-100-DCR1C
  - 082-068-000-080-100-DCR1D
  - 082-068-000-080-100-DCR1E
  - 082-068-000-080-100-DCR1F
  - 082-068-000-080-100-DCR1G
  - 082-068-000-080-100-DCR1H
  - 082-068-000-080-100-DCR1I

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

**Structure Assessment Form**

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<th>Date</th>
<th>Structure</th>
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<td>082-068-000-080-100-DCR1J</td>
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<td>MA-DCR</td>
<td>10/15/1941</td>
<td>Winthrop Shore</td>
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<td>8/27/1931</td>
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<td>MA-DCR</td>
<td>6/15/1899</td>
<td>Winthrop Shore</td>
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Prepared By: Bourne Consulting Engineering
**Structure Assessment Form**

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<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
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<tr>
<td>State</td>
<td>Seawall Avenue</td>
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<th>Based On Comment:</th>
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<th>Earliest Structure Record:</th>
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<td>1920</td>
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<th>FIRM Map Elevation:</th>
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<td>1165 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>28 Feet NGVD</td>
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<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>

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

**Structure Summary:**
The concrete seawall is 2 feet high by 1 foot wide with a road behind it. The placed riprap is in front of the wall.

**Condition Rating**
- **Rating:** C
- **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**
- **Action:** Inshore Structures Present with Limited potential for Significant Infrastructure Damage
- **Rating:** Low Priority

**Structure Images:**
- [082-072-000-052-100-PH01A.jpg](#)

**Structure Documents:**
- **MA-DCR**
  - 1/10/1926 Winthrop Parkway 082-072-000-052-100-DCR1A
  - 4/5/1922 Winthrop Parkway 082-072-000-052-100-DCR1B
  - 10/21/1920 Winthrop Shore 082-072-000-052-100-DCR1C
  - June 1965 Proposed Shore 082-072-000-052-100-DCR1D

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

**Property Owner:**
- Local

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- Seawall Avenue

**Based On Comment:**

**Earliest Structure Record:**
- 1922

**Estimated Reconstruction/Repair Cost:**
- $14,923.00

**Length:**
- 95 Feet

**Top Elevation:**
- NAVD 88

**FIRM Map Zone:**
- V2

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

**Primary Type:**
- Revetment

**Primary Material:**
- Stone

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

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
The placed riprap has stones that average 3 feet by 2 feet by 2 feet in size. There is minor settling. The slope is 1 on 2. Behind the wall is a coastal bank, then approximately 100 feet back there are houses.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Level of Action Description</th>
<th>Priority Rating Action Description</th>
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<tbody>
<tr>
<td>B</td>
<td>Minor</td>
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<tr>
<td>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>Future Project Consideration</td>
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**Structure Images:**
- [082-073-000-048-100-PHO1A.jpg](#)
- [082-073-000-048-100-PHO1B.jpg](#)

**Structure Documents:**
- MA-DCR 1/10/1926 Winthrop Parkway [082-073-000-048-100-DCR1A](#)
- MA-DCR 4/5/1922 Winthrop Parkway [082-073-000-048-100-DCR1B](#)

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

Structure Assessment Form

Town: Winthrop
Structure ID: 082-075-000-011-100
Key: community-map-block-parcel-structure

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<th>Location: Short Beach</th>
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<th>Primary Type:</th>
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<tr>
<td>Bulkhead/ Seawall</td>
<td>Concrete</td>
<td>5 to 10 Feet</td>
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<th>Secondary Type:</th>
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<tr>
<td>Coastal Beach</td>
<td>Sand</td>
<td>5 to 10 Feet</td>
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Structure Summary:
The cast in place seawall is 2.5 feet wide by 3 feet high. There is no visible scour. There are cracks and spalling at the toe. The only road into Winthrop and houses are behind the wall. There is a beach in front of the wall.

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
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:
- 082-075-000-011-100-PHO1A.jpg
- 082-075-000-011-100-PHO1B.jpg
- 082-075-000-011-100-PHO1C.jpg

Structure Documents:
- MA-DCR 6/27/1960 Revere Beach and Winthrop Vistas
- MA-DCR 4/5/1958 Winthrop Parkway - Preliminary
- MA-DCR 9/14/1955 Preliminary
- MA-DCR 5/25/1955 Winthrop Shore

Prepared By: Bourne Consulting Engineering
Section III - Winthrop

Part C

Structure Photographs
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Massachusetts Coastal Infrastructure and Assessment

Town of Winthrop
Section III - Winthrop

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
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<td>082-019-000-117-100-LIC1A</td>
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<td>June 21, 1938</td>
<td>Plan Accompanying Petition of The Metropolitan district commission to Construct a Jetty in Broad Sound Winthrop</td>
<td>3</td>
<td>Broad Sound</td>
<td>Jetty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>082-019-000-117-100</td>
<td>082-019-000-117-100-LIC1B</td>
<td>4071 DEP Winthrop</td>
<td>March 31, 1958</td>
<td>Proposed Groin and Reconstruction of Existing Groin in Winthrop at Winthrop Beach</td>
<td>2</td>
<td>Winthrop Beach</td>
<td>Groin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>082-042-000-001-100</td>
<td>082-042-000-001-100-LIC1A</td>
<td>7415 DEP Winthrop</td>
<td>September 24, 1998</td>
<td>In Accompanying Petition of the Town of Winthrop for Beach Improvements and Retaining Wall Replacements in Boston Harbor</td>
<td>3</td>
<td>Court Road</td>
<td>Retaining Wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>083-051-000-026-100</td>
<td>082-051-000-026-100-LIC1A</td>
<td>3313 DEP Winthrop</td>
<td>April 1861</td>
<td>Proposed Groins - Winthrop Beach - Winthrop, Suffolk County, Massachusetts</td>
<td>1</td>
<td>Winthrop Beach - North of Breakwater</td>
<td>Groins</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PLAN ACCOMPANYING PETITION OF TOWN OF WINTHROP PARK DEPARTMENT TO BUILD A STONE GROIN IN BOSTON HARBOR AT PICO BEACH - WINTHROP

NOTE: Elevations are in feet and refer to Mean Low Water

PROFILE NEW JETTY
Scale - Ft.

SEC. AA
9.7
13.0
9.5 MHW

SEC. BB
18.0
11.7
4.0
6.3

SCALE - FT

0.00 MLW

SCALE - FT

0.00 MLW

LICENSE PLAN NO. 4480
APPROVED DEPARTMENT OF PUBLIC WORKS JUNE 3, 1961

COMMISSIONER OF PUBLIC WORKS
ASSOCIATE COMMISSIONERS
DIRECTOR, DIVISION OF WATERWAYS
| BCE Structure No | Document No | Contract/ Drawing Number | Entity | Municipality | Date       | Title                                                                 | Sheets | Location                              | Description                      |
|------------------|-------------|--------------------------|--------|--------------|------------|                                                                      |        |                                      |                                 |
| 082-017-000-007-100 | 082-017-000-007-100-COE1A | 89-010 | USACE | Winthrop    | August 1979 | Proposed Shore Protection - Precast Concrete Seawall - Pico Beach, Winthrop | 2      | Pico Beach                            | Precast Concrete Seawall Above Stone Revetment |
| 082-017-000-007-200 | 082-017-000-007-200-COE2A | 61-179 | USACE | Winthrop    | April 1961  | Proposed Jetty in Boston Harbor at Pico Beach, Winthrop, County of Suffolk, State of Massachusetts | 2      | Pico Beach                            | Jetty                              |
| 082-019-000-117-100 | 082-019-000-117-100-COE1A | 51-74 | USACE | Winthrop    | February 20, 1957 | Proposed Groine at Winthrop Beach - Winthrop, Suffolk County, Massachusetts | 1      | Shore Drive from Beacon Street to Beach Road | Groine                            |
| 082-019-000-117-100 | 082-019-000-117-100-COE1B | 58-118 | USACE | Winthrop    | August 23, 1957 | Proposed Groin and Reconstructions of Existing Groin and Installation of Marker Piles in Broad Sound at Winthrop, Suffolk County, Massachusetts | 2      | Winthrop Shore Drive - Beach Street and Charles Street | Groine                            |
| 082-019-000-117-100 | 082-019-000-117-100-COE1C | 79-612 | USACE | Winthrop    | December 14, 1979 | Proposed Seawall Repairs - Winthrop Beach at Winthrop, Suffolk County, Massachusetts | 3      | Winthrop Beach - Seal Harbor Road to Beacon Street | Seawall and Riprap              |
| 082-026-000-052-100 | 082-026-000-052-100-COE1A | 79-612 | USACE | Winthrop    | December 14, 1979 | Proposed Seawall Repairs - Winthrop Beach at Winthrop, Suffolk County, Massachusetts | 3      | Winthrop Beach - Seal Harbor Road to Beacon Street | Seawall and Riprap              |
| 082-040-000-005-100 | 082-040-000-005-100-COE1A | 79-612 | USACE | Winthrop    | December 14, 1979 | Proposed Seawall Repairs - Winthrop Beach at Winthrop, Suffolk County, Massachusetts | 3      | Winthrop Beach - Seal Harbor Road to Beacon Street | Seawall and Riprap              |
| 082-051-000-026-100 | 082-051-000-026-100-COE1A | 61-74  | USACE | Winthrop    | February 20, 1957 | Proposed Groine at Winthrop Beach, Winthrop, Suffolk County, Massachusetts | 1      | Shore Drive from Beacon Street to Beach Road | Groine                            |
| 082-051-000-028-100 | 082-051-000-028-100-COE1B | 79-612 | USACE | Winthrop    | December 14, 1979 | Proposed Seawall Repairs - Winthrop Beach at Winthrop, Suffolk County, Massachusetts | 3      | Winthrop Beach - Seal Harbor Road to Beacon Street | Seawall and Riprap              |
| 082-068-000-060-100 | 082-068-000-060-100-COE1A | 79-612 | USACE | Winthrop    | December 14, 1979 | Proposed Seawall Repairs - Winthrop Beach at Winthrop, Suffolk County, Massachusetts | 3      | Winthrop Beach - Seal Harbor Road to Beacon Street | Seawall and Riprap              |
Plan

Scale: 1" = 100'

Parking Area
Town of Winthrop
Stone Revetment
Winthrop Harbor

Note:
Elevations are in feet and tenths above the plane of Mean Low Water. Minus figures show depths below that plane. Proposed elevations shown thus W.A.
Location of proposed work shown in red.

PROPOSED ACCESS RAMPS & DLLITIES
WINTHROP HARBOR
WINTHROP, MASS.
Application by DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

JULY 1970

Edward Chinn
Acting DEPUTY CHIEF ENGINEER WATERWAYS
TYPICAL RAMP PROFILE

TYPICAL RAMP SECTION

PROPOSED ACCESS RAMP & FACILITIES

WINthrop HARBOR

WINthrop, MASS

Application By

DEPARTMENT OF PUBLIC WORKS

OF MASSACHUSETTS

DIVISION OF WATERWAYS

JULY 1970

Edward Chase
PROPOSED ACCESS RAMP & FACILITIES
WINHROP HARBOR
WINHROP, MASS.
Application By
DEPARTMENT OF PUBLIC WORKS
OF MASSACHUSETTS
DIVISION OF WATERWAYS

JULY 1970

Edward Chase
Acting Deputy Chief
NOTES
1. PROPOSED PRECAST CONC. SEAWALL TO REPLACE DAMAGED TIMBER BULKHEAD.
2. ELEVATIONS ARE IN FEET AND TENTHS, AND REFER TO THE PLANE OF MEAN SEA LEVEL.
3. APPROX. 200 C.Y. EXCAVATED SAND WILL BE SPREAD IN AREA AS BEACH NOURISHMENT.
PROPOSED JETTY IN BOSTON HARBOR
AT PICO BEACH - WINTHROP
COUNTY OF SUFFOLK - STATE OF MASS.
APPLICATION BY WINTHROP PARK DEPT.
PROPOSED JETTY

GRADE TOP 16.83'

GRADE 16.83' is approximately 4.0' below top of bulkhead.

3" Plank Bulkhead in place

Wood Fence in place

Rip Rap in place

PICO BEACH

PICO AVENUE

FRANCES STREET

BOAT HARBOR

TOWN OF WINHROP

MASSACHUSETTS

MAJOR R. W. WINTER
STREET COMMISSIONER

PAUL G. CONNORS
CHIEF ENGINEER

OFFICE OF PARK COMMISSIONERS
PROPOSED GROINS
AT WINTHROP BEACH, WINTHROP
SUFFOLK COUNTY, MASS.
Application by METROPOLITAN DISTRICT COMM.
Proposed Groin and Reconstruction of Existing Groin and Installation of Marker Piles in Broad Sound at Winthrop, Suffolk County, Massachusetts.

Application by Metropolitan District Commission
August 23, 1937

Benjamin W. Fink, Director of Park Engineer
Profile Showing Reconstruction of Groin Near Beacon St.

Profile of Proposed Groin Near Charles St.

CROSS SECTION 150' FROM SEA WALL

Note: All elevations are in feet and refer to Boston City Base SL 0.0

Proposed Groin and Reconstruction of Existing Groin and Installation of Marker Piles in Broad Sound at Winthrop

Suffolk County, Massachusetts

Application by Metropolitan District Commission

DIRECTOR OF PARK ENGINEERING

AUGUST 20, 1907
082-024-000-052-100
082-040-000-005-100
082-019-000-117-106
082-051-000-024-100
082-068-000-080-100

Location Plan

Scale in Miles

Seawall Reconstruction

Scale in Feet

Elevation varies between 23.0 and 32.0

WASH FORC

PROPOSED RIP RAP

Front of original wall

Scale in feet

Seawall Face

M.W.W. varies

PROPOSED SEAWALL REPAIRS

Winthrop Beach

At Winthrop

Suffolk County State Mass.

Application by Met. District Comm.

Sheet 1 of 2
NOTE: EXTENT OF RIPRAP AT BASE OF SEAWALL FROM BEACON ST. TO FORT HEATH, WINTHROP
SEAWALL RECONSTRUCTION

PROPOSED SEAWALL REPAIRS
WINTHROP BEACH
AT WINTHROP
SUFFOLK COUNTY STATE MASS.
APPLICATION BY M&T. DISTRICT COMM.
SHEET 1 OF 2 DATE
NOTE: EXTENT OF RIP-RAP AT BASE OF SEAWALL FROM BEACON ST TO FORT HEATH, WINTHROP
082-024-000-052-100
082-040-000-005-100
082-019-000-117-100
082-051-000-024-100
082-068-000-080-100

SEAWALL RECONSTRUCTION

PROPOSED SEAWALL REPAIRS
WINTHROP BEACH
AT WINTHROP
SUFFOLK COUNTY STATE MASS.
APPLICATION BY MET. DISTRICT COMM.
SHEET 1 OF 2 DATE

LOCATION PLAN
SCALE IN MILES

PROPOSED RIP RAP
FRONT OF ORIGINAL WALL
SCALE IN FEET

ELEVATION VARIES BETWEEN 22.0 AND 25.0
NOTE:
SOUNDINGS ARE IN FEET AND REFER TO MEAN LOW WATER

TYPICAL SECTION THRU GROIN

PROPOSED GROINS
AT WINTHROP BEACH, WINTHROP
SUFFOLK COUNTY, MASS.
Application by METROPOLITAN DISTRICT COMM.
NOTE: EXTENT OF RIP-RAP AT BASE OF SEAWALL FROM BEACON ST TO FORT HEATH, WINTHROP
SEAWALL RECONSTRUCTION

PROPOSED SEAWALL REPAIRS
WINTHROP BEACH
AT WINTHROP
SUFFOLK COUNTY STATE MASS.
APPLICATION BY MET. DISTRICT COMM.
SHEET 1 OF 2 DATE
NOTE: EXTENT OF RIP-RAP AT BASE OF SEAWALL FROM BEACON ST. TO FORT HEATH, WINTHROP
NOTE: EXTENT OF RIPRAP AT BASE OF SEAWALL FROM BEACON ST TO FORT HEATH, WINTHROP
Section IV

Chelsea
Section IV – Community Findings – City of Chelsea

COMMUNITY DESCRIPTION

The City of Chelsea consists of a land area of 2.19 square miles out of a total area of 2.48 square miles and had a population of 35080 in the 2000 census. The City is located in the Boston Harbor of Massachusetts and its location can be seen on this report’s cover. None of the Chelsea shoreline is directly exposed to open ocean. 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 Chelsea, there were 4 structures which had public or unknown ownership which provide significant coastal protection. The location of the structures can be seen in Sheets 1 through Sheet 2 in Section IV-B of this report. The structures were categorized by their type and by their structural condition based on a preliminary field assessment. The distribution of structures by type and condition can be seen in the following table:

<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>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revetment</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakwater</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Dune</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Beach</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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 Chelsea’s case there are a total of 4 structures which would require approximately $ 540,000 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 which Chelsea has none.
STRUCTURE REPAIR / RECONSTRUCTION COST - City of Chelsea

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>Structure Condition Rating</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Bulkhead / Seawall</td>
<td>2</td>
<td>$436,088</td>
<td></td>
</tr>
<tr>
<td>Revetment</td>
<td>2</td>
<td>$12,210</td>
<td>$93,773</td>
</tr>
<tr>
<td>Breakwater</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Groin / Jetty</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Coastal Dune</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Coastal Beach</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>$448,268</td>
<td>$93,773</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 Chelsea, the breakdown of structures by assumed ownership is as follows:

STRUCTURE OWNERSHIP / REPAIR COST - City of Chelsea

<table>
<thead>
<tr>
<th>Primary Structure (1)</th>
<th>Total Structures</th>
<th>Structure Condition Rating</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Town Owned</td>
<td>1</td>
<td>$12,210</td>
<td></td>
</tr>
<tr>
<td>Commonwealth of Mass.</td>
<td>3</td>
<td>$436,088</td>
<td>$93,773</td>
</tr>
<tr>
<td>Federal Government</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Unknown Ownership</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>$448,268</td>
<td>$93,773</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 IV-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

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

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

Part B

Structure Assessment Reports
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: Eastern Avenue
Based On Comment: 
Earliest Structure Record: 1986
Estimated Reconstruction/Repair Cost: $22,433.00

Date: 7/24/2007

Length: 55 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: A3
FIRM Map Elevation: N/A Feet NGVD

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

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

Structure Summary:
A granite block wall that is capped with approximately 2 feet of concrete. The structure has a riprap slope comprised of mostly cobbles and small boulders with an average stone size of 1 foot diameter. The structure appears to generally be in good condition.

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

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

Structure Images:
011-015-000-004-100-PHO1A.JPG
011-015-000-004-100-PHO1B.JPG

Structure Documents:
MA-DCR January 1988 Design of Riprap 011-015-000-004-100-DCR1A

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

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: Eastern Avenue
Based On Comment: 
Earliest Structure Record: 1986
Estimated Reconstruction/Repair Cost: $93,773.00

Date: 7/24/2007

Length: 120 Feet
Top Elevation: 88 Feet NAVD 88
FIRM Map Zone: A3
FIRM Map Elevation: N/A
Primary Type: Revetment
Primary Material: Stone
Primary Height: 10 to 15 Feet
Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
A combination of concrete cribs mixed with approximately 1 foot diameter stones and granite blocks that have been loosely dumped on an existing slope. It is in fair condition with movement of stone and cement pieces evident.

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 additional material for full protection and extended life.

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

Structure Images: 011-015-000-004-200-PHO2A.JPG
Structure Documents: MA-DCR January 198 Design of Riprap 011-015-000-004-200-DCR2A

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

Structure Assessment Form

Property Owner: 
State

Presumed Structure Owner: 
State

Owner Name: 
MA-DCR

Location: 
O'Malley Park

Based On Comment: 

Earliest Structure Record: 

Estimated Reconstruction/Repair Cost: 
$413,655.00

Date: 
8/6/2007

Length: 
2725 Feet

Top Elevation: 
78 Feet NAVD 88

FIRM Map Zone: 
A2

FIRM Map Elevation: 
10 Feet NGVD

Primary Type: 
Bulkhead/Seawall

Primary Material: 
Stone

Primary Height: 
5 to 10 Feet

Secondary Type: 

Secondary Material: 

Secondary Height: 

Structure Summary:
A granite stone wall with an average stone size 2 feet by 3 feet by 8 feet. There is a rocky intertidal shore in front of the wall with some areas littered with large granite boulders. The wall is generally in good condition apart from the section that extends outshore, which is fenced off and needs to be repaired.

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

Structure Images:
011-017-000-004-100-PHO1A..jpg
011-017-000-004-100-PHO1B..jpg
011-017-000-004-100-PHO1C.jpg
011-017-000-004-100-PHO1D.jpg
011-017-000-004-100-PHO1E.jpg

Structure Documents:

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

Structure Assessment Form

Town: Chelsea
Structure ID: 011-035-000-012-100
Key: community-map-block-parcel-structure

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Chelsea

Location: Justin Drive
Date: 8/6/2007

Based On Comment: 
Earliest Structure Record: 
Estimated Reconstruction/Repair Cost: $12,210.00

Length: 185 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: A2
FIRM Map Elevation: Feet NGVD

Primary Type: Revetment
Primary Material: Stone
Primary Height: Under 5 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
A small revetment consisting of loosely laid granite blocks with an average stone size 2 feet by 1 foot by 3 feet. Spacing in between the stones typically ranges from 6 to 12 inches. There is marshland in front of the revetment. The blocks appear to be stable and in good condition.

Condition Rating
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
Low Priority Future Project Consideration Inshore Structures Present with Limited potential for Significant Infrastructure Damage

Structure Images: 011-035-000-012-100-PHO1A.JPG

Structure Documents:

Prepared By: Bourne Consulting Engineering
Section IV - Chelsea

Part C

Structure Photographs
Section IV - Chelsea

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
No City Documents for the City of Chelsea

<table>
<thead>
<tr>
<th>BCE Structure No</th>
<th>Document No</th>
<th>Control/Drawing Number</th>
<th>Entity</th>
<th>Municipality</th>
<th>Date</th>
<th>Title</th>
<th>Sheet</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>011-015-000-004-100</td>
<td>011-015-000-004-100-DCR1A</td>
<td>3134</td>
<td>DCR</td>
<td>Chelsea</td>
<td>Jan-'86</td>
<td>Design of Riprap Slope Protection - South Side of Mill Creek - Chelsea - DPW of MA - Division of Waterways</td>
<td>3</td>
<td>South Side of Mill Creek</td>
<td>Riprap</td>
</tr>
<tr>
<td>011-015-000-004-200</td>
<td>011-015-000-004-200-DCR2A</td>
<td>3134</td>
<td>DCR</td>
<td>Chelsea</td>
<td>Jan-'86</td>
<td>Design of Riprap Slope Protection - South Side of Mill Creek - Chelsea - DPW of MA - Division of Waterways</td>
<td>3</td>
<td>South Side of Mill Creek</td>
<td>Riprap</td>
</tr>
</tbody>
</table>
No US ACOE Documents for the City of Chelsea
Section V

Everett
Section V – Community Findings – City of Everett

COMMUNITY DESCRIPTION

The City of Everett consists of a land area of 3.38 square miles out of a total area of 3.66 square miles and had a population of 38037 in the 2000 census. The City is located in the Boston Harbor of Massachusetts and its location can be seen on this report’s cover. None of Everett’s shoreline is directly exposed to open ocean. 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. According to a representative from the Everett Mayor’s Office, none of the structures along the City’s coast are publicly owned and/or maintained. 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.

SUMMARY

Though there were no publicly owned structures at the time of investigation, the project database can be updated as needed for future construction. The City of Everett’s coastal structure information 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.
Section V - Everett

Part B

Structure Assessment Reports

No Publicly Owned/Maintained Structures in the City of Everett
Section V - Everett

Part C

Structure Photographs

No Publicly Owned/Maintained Structures in the City of Everett
Section V - Everett

Part D

Structure Documents

No Publicly Owned/Maintained Structures in the City of Everett
<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>

No MA - DEP Ch. 91 Documents for the City of Everett
<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>

No USACE - Permit Documents for the City of Everett
Section VI

Harbor Islands
Section VI – Findings – Boston Harbor Islands

COMMUNITY DESCRIPTION

The Islands are located in the Boston Harbor of Massachusetts and its location can be seen on this report’s cover. The estimated length of shoreline is 3.6 miles that are directly exposed to open ocean. The Islands are 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 Islands were investigated for their ability to provide adequate protection from major coastal storms. Structures have been identified as publicly owned 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. The Islands also are significant in the protection of Boston, Milton, Quincy and Weymouth from ocean propagated waves.

Boston Harbor has many Islands that were not included in this project based on the scope developed by the Coastal Hazards Commission. Thompson Island is not included in this project because it is privately owned. Green Island, Little Calf Island, Calf Island, Outer Brewster Island, Middle Brewster Island, Great Brewster Island and Little Brewster were also not included in this project because they are federally owned and maintained.

STRUCTURE INVENTORY

Within the Boston Harbor Islands, there were 35 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 10 in Section VI-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>Structure Condition Rating</th>
<th>Total Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulkhead / Seawall 20</td>
<td>A 1 B 5 C 8 D 2 F 4</td>
<td>12897</td>
<td></td>
</tr>
<tr>
<td>Revetment 11</td>
<td>1 2 7 1</td>
<td>9625</td>
<td></td>
</tr>
<tr>
<td>Breakwater 1</td>
<td>1</td>
<td>625</td>
<td></td>
</tr>
<tr>
<td>Groin / Jetty 3</td>
<td>2 1</td>
<td>1410</td>
<td></td>
</tr>
<tr>
<td>Coastal Dune</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Beach</td>
<td></td>
<td></td>
<td></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. revetments 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 Boston Harbor Islands’ case there are a total of 33 structures which would require approximately $33.5 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 $23 million would be required to upgrade the Islands’ 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 Boston Harbor Islands, 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 VI-B which contains Structure Assessment Reports for each individual structure found.

SUMMARY

The enclosed reports and associated documents reflects the Boston Harbor Islands’ 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 VI - Harbor Islands

Part B

Structure Assessment Reports
CZM Coastal Infrastructure Inventory and Assessment

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: Rainsford Island
Based On Comment:
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $4,752,000.00

Date: 7/25/2007

Length: 1600 Feet
Top Elevation: 25 Feet NGVD
FIRN Map Zone: V2
FIRM Map Elevation: Feet NAVD 88

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

Structure Summary:
The structure is a stone block seawall that is dry set with stones averaging 7 feet by 2 feet by 2 feet in size. The stones are stacked perpendicular to the shore in most areas. The wall is about 90 percent failed. There are many areas of erosion along the coastal bank behind the structure.

Condition Rating
F Critical
Level of Action Description
Immediate
Priority Rating
I None
Action Description
Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
006-010-706-4000-100-PHO1A.jpg
006-010-706-4000-100-PHO1B.jpg
006-010-706-4000-100-PHO1C.jpg
006-010-706-4000-100-PHO1D.jpg
006-010-706-4000-100-PHO1E.jpg

Structure Documents:
MA-DCR 1972
MA-DCR July 1979
MA-DCR September 1

Map C - 1972 Master
Boston Harbor Island
Boston Harbor Island

Prepared By: Bourne Consulting Engineering
The stone block seawall has stones that are approximately 4 feet by 2 feet by 2 feet in size. The stones are stacked 5 stones high. Approximately 80 percent of the wall has failed and is collapsed. The riprap in front has been placed with stones that average 3 feet by 3 feet by 2 feet in size. There are signs of stone movement and settlement.

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

Priority Rating: None
Action Description: Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present
### 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>State</td>
<td>Gallops Island</td>
<td>7/26/2007</td>
</tr>
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</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>Estimated Reconstruction/Repair Cost:</th>
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</thead>
<tbody>
<tr>
<td>MA-DCR</td>
<td>$618,618.00</td>
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<tr>
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<td>V4</td>
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<tr>
<td>12</td>
<td>Feet NGVD</td>
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<table>
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<tr>
<td>1030</td>
<td>Feet</td>
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<table>
<thead>
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<th>Primary Material:</th>
<th>Primary Height:</th>
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<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
</tr>
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</table>

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

#### Structure Summary:

The dumped stone revetment has stones that average 6 feet by 4 feet by 3 feet in size. The stones have been dumped approximately 30 feet wide. There are areas of stone settlement and section loss.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
</tr>
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<tbody>
<tr>
<td>C</td>
<td>I</td>
<td>None</td>
</tr>
<tr>
<td>Fair</td>
<td>None</td>
<td>Long Term Planning Considerations</td>
</tr>
<tr>
<td>Moderate</td>
<td>No Inshore Structures or Residential Dwellings Units Present</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>1972</th>
<th>Map C - 1972 Master</th>
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<td>MA-DCR</td>
<td></td>
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</tr>
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<td>MA-DCR</td>
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<th>Structure Images:</th>
<th>Structure Documents:</th>
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<td>006-010-706-5000-200-DCR2A</td>
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<td>006-010-706-5000-200-PHO1B.jpg</td>
<td>006-010-706-5000-200-DCR2B</td>
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<td>006-010-706-5000-200-DCR2C</td>
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<td>006-010-706-5000-200-DCR2E</td>
<td></td>
</tr>
<tr>
<td>006-010-706-5000-200-DCR2F</td>
<td></td>
</tr>
</tbody>
</table>

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

Structure Assessment Form

Property Owner:

State

Presumed Structure Owner:

State

Owner Name:

MA-DCR

Location:

Gallows Island

Based On Comment:

Earliest Structure Record:

1972

Estimated Reconstruction/Repair Cost:

$61,631.00

Date:

7/26/2007

Length: 145 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: Under 5 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary:
The stone block seawall has stones that are approximately 3 feet by 2 feet by 2 feet in size. There is moderate stone rotation and settlement visible. The top stones show signs of movement and overhang. There is no visible scour. There is a sandy beach and pier in front of the structure.

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

Action Description
None

No Inshore Structures or Residential Dwelling Units Present

Prepared By: Bourne Consulting Engineering

Structure Images:

Structure Documents:

USACE May 5, 1975

Proposed Pier and Map C - 1972 Master

006-010-706-5000-300-COE3A

006-010-706-5000-300-DCR3A

006-010-706-5000-300-DCR3B

006-010-706-5000-300-DCR3C

006-010-706-5000-300-DCR3D

006-010-706-5000-300-DCR3E

006-010-706-5000-300-DCR3F

006-010-706-5000-300-DCR3G

006-010-706-5000-300-DCR3H

006-010-706-5000-300-DCR3I

MA-DCR 1972

MA-DCR January 1977

MA-DCR July 1979

MA-DCR September 1

MA-DCR February 19

MA-DCR June 1989

MA-DCR 2/4/1997

MA-DCR March 1999

MA-DCR April 1999

MA-DCR

Boston Harbor Island

Boston Harbor Island

Fire Damage

Pier Improvements -

Boston Harbor

Boston harbor

Maintenance and
Structure Assessment Form

<table>
<thead>
<tr>
<th>DEP</th>
<th>October 1976</th>
<th>Plan Accompanying</th>
<th>006-010-706-5000-300-LIC3A</th>
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</table>

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

Structure Assessment Form

Property Owner:

State

Presumed Structure Owner:

State

Owner Name:

MA-DCR

Location:

Gallops Island

Based On Comment:

Date:

7/26/2007

Earliest Structure Record:

1972

Estimated Reconstruction/Repair Cost:

$308,750.00

Length: 625 Feet

Top Elevation: 10 Feet NAVD 88

FIRM Map Zone: A2

FIRM Map Elevation: 10 Feet NGVD

Primary Type: Breakwater

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
The stone mound breakwater consists of stones that are 4 feet by 3 feet by 2 feet on average. The crest is 1 to 2 stones wide. There are signs of minor stone movement and settlement. The breakwater protects the pier to the island.

Condition Rating

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

None

Long Term Planning Considerations

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

006-010-706-5000-400-PHO4A.jpg

006-010-706-5000-400-PHO4B.jpg

Structure Documents:

MA-DCR 1972 Msp C - 1972 Master

MA-DCR January 197

MA-DCR July 1979

MA-DCR September 1

MA-DCR February 19

MA-DCR June 1989

MA-DCR 2/4/1997

Toogeographical

Boston Harbor

Boston Harbor Island

Fire Damage

Pier Improvements -

Boston Harbor

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

**Property Owner:**
- State

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- Gallops Island

**Based On Comment:**

**Earliest Structure Record:**
- 1972

**Estimated Reconstruction/Repair Cost:**
- $274,903.00

**Length:** 890 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:** 5 to 10 Feet

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

**Structure Summary:**
The stone block seawall has stones that average 4 feet by 2 feet by 2 feet in size. The stones are stacked 5 stones high. The riprap is placed in front with stones that average 3 feet by 3 feet by 2 feet in size. There are some signs of stone settlement.

**Condition Rating**
- B

**Level of Action 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**
- I

**Action Description**
- None

**Structure Images:**
- [006-010-706-5000-500-PHO5A.jpg](#)

**Structure Documents:**
- MA-DCR 1972 Map C - 1972 Master
- MA-DCR January 1977 Topographical
- MA-DCR July 1979 Boston Harbor Island
- MA-DCR September 1 Fire Damage
- MA-DCR February 19

**Prepared By:** Bourne Consulting Engineering

**Town:** Boston
**Structure ID:** 006-010-706-5000-500
**Key:** community-map-block-parcel-structure

**Date:** 7/26/2007
Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Boston
Location: Long Island
Based On Comment:
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $1,032,240.00

Length: 2000 Feet Top Elevation: 29 Feet NGVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 29 Feet NGVD

Primary Type: Bulkhead/Seawall
Primary Material: Stone
Primary Height: Over 15 Feet
Secondary Type: Revetment
Secondary Material: Stone
Secondary Height: 5 to 10 Feet

Structure Summary:
The stone block seawall is made up of stones that average 7 feet by 2 feet in size. The revetment is made up of dumped riprap with approximately 0.5 to 1 ton stones. The wall is 7 stones high with mild erosion at the toe.

Condition Rating
Level of Action Description

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:
[006-010-706-7001-100-PHO1A.jpg]
[006-010-706-7001-100-PHO1C.jpg]

Structure Documents:
[MA-DCR 1972 Map C - 1972 Master 006-010-706-7001-100-DCR1A]
[MA-DCR July 1979 Boston Harbor Island 006-010-706-7001-100-DCR1B]
[MA-DCR September 1 Boston Harbor Island 006-010-706-7001-100-DCR1C]

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Boston

Location: Long Island
Based On Comment:
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $1,486,485.00

Date: 7/25/2007

Length: 2475 Feet
FIRM Map Zone: V4
FIRM Map Elevation: 14 Feet NGVD

Top Elevation: Feet NAVD 88
Primary Type: Revetment
Primary Material: Stone
Primary Height: 5 to 10 Feet
Secondary Type: Secondary Material: Secondary Height:

Structure Summary:
The dumped riprap consists of stones that are approximately 4 feet by 2 feet by 2 feet in size. The stones start at mean high water and are dumped to 20 feet inshore. Behind the stones is a heavily eroded coastal bank.

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:
- 006-010-706-7001-200-PHO2A.jpg
- 006-010-706-7001-200-PHO2B.jpg
- 006-010-706-7001-200-PHO2C.jpg
- 006-010-706-7001-200-PHO2D.jpg

Structure Documents:
- MA-DCR 1972 Map C - 1972 Master 006-010-706-7001-200-DCR2A
- MA-DCR July 1979 Boston Harbor Island 006-010-706-7001-200-DCR2B
- MA-DCR September 1 Boston Harbor Island 006-010-706-7001-200-DCR2C

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>
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<tbody>
<tr>
<td>Local</td>
<td>Long Island</td>
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<table>
<thead>
<tr>
<th>Presumed Structure Owner:</th>
<th>Based On Comment:</th>
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<td>Local</td>
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<table>
<thead>
<tr>
<th>Owner Name:</th>
<th>Earliest Structure Record:</th>
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<tr>
<td>Boston</td>
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<th>Length:</th>
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<tr>
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<td>Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
</tr>
<tr>
<td></td>
<td>Feet</td>
<td>Feet NGVD</td>
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<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
</tr>
</thead>
</table>

**Structure Summary:**
The dumped riprap is from mean high water to 20 feet inshore. The stones average 5 feet by 2 feet by 2 feet in size. Behind the stones is heavily eroded coastal bank.

**Condition Rating**

- **Priority Rating**
- **Level of Action Description**
- **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.

**Structure Images:**

- [006-010-706-7001-300-PHO3A.jpg](#)
- [006-010-706-7001-300-PHO3B.jpg](#)
- [006-010-706-7001-300-PHO3C.jpg](#)

**Structure Documents:**

- [MA-DCR 1972](#)
- [MA-DCR July 1979](#)
- [MA-DCR September 1](#)
- [Map C - 1972 Master](#)
- [Boston Harbor Island](#)
- [Boston Harbor Island](#)
- [006-010-706-7001-300-DCR3A](#)
- [006-010-706-7001-300-DCR3B](#)
- [006-010-706-7001-300-DCR3C](#)

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Boston

Location: Long Island
Based On Comment: 
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $96,268.00

Date: 7/25/2007

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<tr>
<td>390</td>
<td>Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
</tr>
<tr>
<td></td>
<td>Feet NGVD</td>
<td></td>
<td>29</td>
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</tbody>
</table>

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

Secondary Type:
Secondary Material:
Secondary Height:

Structure Summary:
The placed stones are approximately 4 feet by 3 feet in size and the dumped riprap stones are approximately 100 to 200 pounds. The revetment starts at mean high water and protects the coastal bank.

Condition Rating
Level of Action 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:
006-010-706-7001-400-PHO0A.jpg

Structure Documents:
<table>
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<th>Structure Documents</th>
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<tr>
<td>MA-DCR 1972</td>
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<tr>
<td>MA-DCR July 1979</td>
</tr>
<tr>
<td>MA-DCR September 1</td>
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<tr>
<td>DEP June 1994</td>
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<td>Map C - 1972 Master</td>
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<td>Boston Harbor Island</td>
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<td>Plan Accompanying</td>
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Prepared By: Bourne Consulting Engineering
**CZM Coastal Infrastructure Inventory and Assessment**

**Structure Assessment Form**

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<td>V4</td>
<td>14 Feet NGVD</td>
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<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
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<tbody>
<tr>
<td>Revetment</td>
<td>Stone</td>
<td>Over 15 Feet</td>
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<table>
<thead>
<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
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</table>

**Structure Summary:**
The placed stones are at a 1 on 1 slope. The stones average 3 feet by 2 feet in size. They are tightly placed together. The structure is in front of and behind a bridge abutment. There is minor scour at the toe.

<table>
<thead>
<tr>
<th>Condition Rating Level of Action Description</th>
<th>Priority Rating Action Description</th>
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<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>
<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>
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</tbody>
</table>

**Structure Images:**
-
-

**Structure Documents:**
- MA-DCR | 1972 | Map C - 1972 Master | 006-010-706-7001-500-DCR5A
- MA-DCR | July 1979 | Boston Harbor Island | 006-010-706-7001-500-DCR5B
- MA-DCR | September 1 | Boston Harbor Island | 006-010-706-7001-500-DCR5C
- DEP | August 28, 2 | Plan Accompanying | 006-010-706-7001-500-LICSA

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Boston

Location: Long Island
Based On Comment:

Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $613,800.00

Date: 7/25/2007

Length: 310 Feet NAVD 88
Top Elevation: A2
FIRM Map Zone: 10 Feet NGVD

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

Secondary Type:
Secondary Material:
Secondary Height:

Structure Summary:
The stone block bulkhead consists of stones that are approximately 5 feet by 2 feet in size. The stones are dry set with moderate areas of settlement and rotation of stones. Attached is connectors for a pier or gangway.

Condition Rating
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 additional material for full protection and extended life.

Priority Rating Action Description
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:
006-010-706-7001-600-PHOSA.jpg
006-010-706-7001-600-PHOSB.jpg
006-010-706-7001-600-PHOSC.jpg

Structure Documents:
MA-DCR 1972 Map C - 1972 Master
006-010-706-7001-600-DCR6A
MA-DCR July 1979 Boston Harbor Island
006-010-706-7001-600-DCR6B
MA-DCR September 1 Boston Harbor Island
006-010-706-7001-600-DCR6C

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

Structure Assessment Form

Property Owner: Local
Presumed Structure Owner: Local
Owner Name: Boston

Location: Long Island
Based On Comment: 
Earliest Structure Record: 1972
Estimated Reconstruction/Repair Cost: $795,366.00

Length: 585 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: A4
FIRM Map Elevation: Feet NGVD 15

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

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

Structure Summary:
The cast in place wall has dumped riprap in front of it. The wall has minor cracks and spalling throughout. There are signs of minor erosion and scour throughout. The riprap is approximately 3 feet by 2 feet by 2 feet in size. There is some section loss and stone movement.

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:
- 006-010-706-700-700-PHO7A.jpg
- 006-010-706-700-700-PHO7B.jpg

Structure Documents:
- MA-DCR 1972 Map C - 1972 Master 006-010-706-700-700-DCR7A
- MA-DCR July 1979 Boston Harbor Island 006-010-706-700-700-DCR7B
- MA-DCR September 1 Boston Harbor Island 006-010-706-700-700-DCR7C

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

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: Lovell's Island
Based On Comment:
Earliest Structure Record: Unknown
Estimated Reconstruction/Repair Cost: $1,487,178.00

Length: 2030 Feet
Top Elevation: 19 Feet NGVD
FIRM Map Zone: V2
FIRM Map Elevation: 19 Feet NGVD

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

Secondary Type: Coastal Beach
Secondary Material: Sand
Secondary Height: Under 5 Feet

Structure Summary:
The dumped stone riprap consists of stones that are approximately 6 feet by 4 feet by 2 feet in size. The stones are placed at the toe of a coastal bank. There are areas of section loss and stone movement. In front of the structure is a beach.

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
I None
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
006-010-708-8000-100-PHO1A.jpg
006-010-708-8000-100-PHO1B.jpg

Structure Documents:

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

**Property Owner:**
- State

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- Lovell's Island

**Date:**
- 7/25/2007

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $1,835,460.00

**Length:**
- 1030 Feet

**Top Elevation:**
- NAVD 88 Feet

**FIRM Map Zone:**
- V4

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

**Primary Type:**
- Bulkhead/ Seawall

**Primary Material:**
- Stone

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

**Secondary Type:**
- Secondary Material: 

**Secondary Height:**
- 

**Structure Summary:**
The stone block seawall has unraveled and failed except at the bottom. The stones are approximately 7 feet by 2 feet by 2 feet in size.

**Condition Rating**
- F

**Priority Rating**
- None

**Level of Action Description**
- Critical

**Action Description**
- Long Term Planning Considerations

**Condition**
- Immediate

**Priorities**
- No Inshore Structures or Residential Dwelling Units Present

**Structure Images:**
- [006-010-705-8000-200-PHO2A.jpg](#)
- [006-010-705-8000-200-PHO2B.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: MA-DCR

Location: Lovell's Island
Based On Comment:
Earliest Structure Record: Unknown

Length: 800 Feet
Top Elevation: 10 Feet NAVD 88
FIRM Map Zone: A4
FIRM Map Elevation: 10 Feet NGVD

Primary Type: Groin/ Jetty
Primary Material: Stone
Primary Height: 10 to 15 Feet

Secondary Type: 
Secondary Material: 
Secondary Height: 

Structure Summary:
Set of 3 dumped stone groin like structures with dumped stone in front of them on the outshore side. Possible old stone piers. The stones are approximately 3 feet by 2 feet by 2 feet in size and have heavy signs of stone movement and section loss.

Condition Rating
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
None Long Term Planning Considerations No Inshore Structures or Residential Dwelling Units Present

Structure Images:
[006-010-706-8000-300-PHO3A.jpg]
[006-010-706-8000-300-PHO3B.jpg]
[006-010-706-8000-300-PHO3C.jpg]
[006-010-706-8000-300-PHO3D.jpg]
[006-010-706-8000-300-PHO3E.jpg]

Structure Documents:

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

Structure Assessment Form

Town: Boston
Structure ID: 006-010-706-8000-400
Key: community-map-block-parcel-structure

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<td>300 Feet</td>
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<td>12 Feet NGVD</td>
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<th>Primary Height:</th>
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<td>Revetment</td>
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<td>Under 5 Feet</td>
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<tr>
<th>Secondary Type:</th>
<th>Secondary Material:</th>
<th>Secondary Height:</th>
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Structure Summary:
The dumped stone riprap is along the edge of the beach. The stones are approximately 3 feet by 2 feet in size.

<table>
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<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Priority Action Description</th>
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<tbody>
<tr>
<td>C</td>
<td>I</td>
<td>None</td>
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Condition Rating:
- C

Rating:
- Fair

Level of Action Description:
- Moderate

Structure Images:
- 006-010-706-8000-400-PHO4A.jpg

Structure Documents:

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

**Property Owner:**
- State

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- Lovell's Island

**Based On Comment:**

**Earliest Structure Record:**
- Unknown

**Estimated Reconstruction/Repair Cost:**
- $141,372.00

**Date:**
- 7/25/2007

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<td>12 Feet NGVD</td>
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**Primary Type:**
- Revetment

**Primary Material:**
- Stone

**Primary Height:**
- Under 5 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
The 200 to 300 pound stones are scattered along the edge of the beach, appears to be a dumped stone revetment to prevent erosion of the beach and adjacent coastal bank.

**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**
- I
- None
- Long Term Planning Considerations
- No Inshore Structures or Residential Dwelling Units Present

**Structure Images:**
- 006-010-706-8000-500-PHOSA.jpg

**Structure Documents:**

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

**Structure Assessment Form**

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<th>Primary Height:</th>
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<td>Stone</td>
<td>Over 15 Feet</td>
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<th>Secondary Height:</th>
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**Structure Summary:**
The wall is made up of stones that average 2 feet by 2 feet by 2 feet in size. There is heavy erosion and damage to the wall. The stones have rotated, moved, and there is section loss. Only approximately 20 percent of the wall still exists.

**Condition Rating**
- **F** Critical

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

**Priority Rating Action Description**
- **I** None

**Structure Images:**
- 006-010-706-9000-100-PHO1A.jpg
- 006-010-706-9000-100-PHO1B.jpg
- 006-010-706-9000-100-PHO1C.jpg

**Structure Documents:**
- MA-DCR May 1973 Seawall 006-010-706-9000-100-DCR1A
- MA-DCR August 27, 1 George's Island 006-010-706-9000-100-DCR1B
- MA-DCR May 5, 2000 George's Island 006-010-706-9000-100-DCR1C

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

Structure Assessment Form

Property Owner: State

Presumed Structure Owner: State

Owner Name: MA-DCR

Location: George's Island

Based On Comment:

Earliest Structure Record: 1973

Estimated Reconstruction/Repair Cost: $192,160.00

Date: 1/30/2007

Length: 160 Feet

Top Elevation: Feet NAVD 88

FIRM Map Zone: A2

FIRM Map Elevation: Feet NGVD 10

Primary Type: Groin/ Jetty

Primary Material: Stone

Primary Height: 5 to 10 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary:
The riprap groin is on the southwest corner of the island. The middle has areas of section loss near mid tide range. The stones go out to approximately mean low water. The stones are 3 to 4 tons in size.

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

I None

Long Term Planning Considerations

No Inshore Structures or Residential Dwelling Units Present

Structure Images:

Structure Documents:

[006-010-706-9000-110-PHO11A.jpg]

MA-DCR May 1973 Seawall 006-010-706-9000-110-DCR11A

MA-DCR August 27, 1 George's Island 006-010-706-9000-110-DCR11B

MA-DCR May 5, 2000 George's Island 006-010-706-9000-110-DCR11C

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

**Property Owner:**
- State

**Presumed Structure Owner:**
- State

**Owner Name:**
- MA-DCR

**Location:**
- George's Island

**Date:**
- 1/30/2007

**Based On Comment:**

**Earliest Structure Record:**
- 1973

**Estimated Reconstruction/Repair Cost:**
- $79,695.00

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<tbody>
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<td>525 Feet</td>
<td>Feet NAVD 88</td>
<td>A2</td>
<td>10 Feet NGVD</td>
</tr>
</tbody>
</table>

**Primary Type:**
- Bulkhead/Seawall

**Primary Material:**
- Concrete

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

**Secondary Type:**
- Secondary Material:
- Second Height:

**Structure Summary:**
The cast in place concrete wall is 2.5 feet wide with riprap in front of it. The stones are approximately 0.5 tons. There is minor cracking on the face and top. The riprap comes mid height of the wall. There is no visible scour. Some of the riprap is loose at the base of the wall. There is 1 ton riprap at the southern end of the wall.

**Condition Rating:**
- B Good

**Level of Action 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:**
- None
  - Long Term Planning Considerations
  - No Inshore Structures or Residential Dwelling Units Present

**Structure Images:**
- [006-010-706-9000-120-PHO12A.jpg](#)
- [006-010-706-9000-120-PHO12B.jpg](#)
- [006-010-706-9000-120-PHO12C.jpg](#)

**Structure Documents:**
- MA-DCR May 1973 Seawall 006-010-706-9000-120-DCR12A
- MA-DCR August 27, 1 George's Island 006-010-706-9000-120-DCR12B
- MA-DCR May 5, 2000 George's Island 006-010-706-9000-120-DCR12C

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

**Structure Assessment Form**

<table>
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<th>Property Owner:</th>
<th>Location:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>State</td>
<td>George's Island</td>
<td>1/30/2007</td>
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<tr>
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<tr>
<td>MA-DCR</td>
<td>1973</td>
<td>$545,490.00</td>
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<tr>
<td>435 Feet</td>
<td>Feet NAVD 88</td>
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<td>10 Feet NGVD</td>
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<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
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<tbody>
<tr>
<td>Bulkhead/Seawall</td>
<td>Stone</td>
<td>10 to 15 Feet</td>
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<table>
<thead>
<tr>
<th>Secondary Type:</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Structure Summary:**
The granite blocks that make up the wall are 2 feet by 3 feet by 5 feet. The bulkhead is approximately 12 feet wide with asphalt on top in some parts. There is one face stone that is cracked in half and missing half. Three piers connect to the bulkhead. There are some cracks on the stones and the concrete is broken up. There is some visible settling. No signs of rotation or shifting. The stones have been set tightly.

**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: 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:**
- 006-010-706-9000-130-PHO13A.jpg
- 006-010-706-9000-130-PHO13B.jpg
- 006-010-706-9000-130-PHO13C.jpg

**Structure Documents:**
- MA-DCR May 1973 Seawall 006-010-706-9000-130-DCR13A
- MA-DCR August 27, 1 George's Island 006-010-706-9000-130-DCR13B
- MA-DCR May 5, 2000 George's Island 006-010-706-9000-130-DCR13C

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: State

Presumed Structure Owner: State

Owner Name: MA-DCR

Location: George's Island

Based On Comment:

Earliest Structure Record: 1973

Estimated Reconstruction/Repair Cost: $265,650.00

Date: 1/30/2007

Length: 350 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: 5 to 10 Feet

Secondary Type: Secondary Material:

Secondary Height:

Structure Summary:
The granite bulkhead has mixed store sizes, but they average 2 feet by 2 feet by 3 feet. The stones are settling, leaning and rotating. There are 3 to 4 inch gaps between the stones. The wall is partly concrete set and partly dry set. There is a path behind the wall and a coastal beach in front.

Condition Rating
C
Fair
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
I None
Long Term Planning Considerations
No Inshore Structures or Residential Dwelling Units Present

Structure Images:
006-010-706-9000-140-PHO14A.jpg
006-010-706-9000-140-PHO14B.jpg
006-010-706-9000-140-PHO14C.jpg

Structure Documents:
MA-DCR May 1973 Seawall 006-010-706-9000-140-DCR14A
MA-DCR August 27, 1 George's Island 006-010-706-9000-140-DCR14B
MA-DCR May 5, 2000 George's Island 006-010-706-9000-140-LIC14A

Prepared By: Bourne Consulting Engineering
Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: George's Island
Based On Comment: 
Earliest Structure Record: 1973
Estimated Reconstruction/Repair Cost: $298,800.00

Length: 450 Feet NAVD 88
Top Elevation: 25 Feet NGVD
FIRM Map Zone: V2
FIRM Map Elevation: 

Primary Type: Groin/ Jetty
Primary Material: Stone
Primary Height: Under 5 Feet

Secondary Type: Secondary Material:  
Secondary Height: 

Structure Summary:
The three groins are located on the east side of the island. The stones are approximately 1 to 2 tons in size. First groin is fully submerged at mean high water; the second ends at mean high water; the third ends close to 15 feet past mean low water. The stones show signs of movement, shifting, and rotation.

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 landfill 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:
006-010-706-9000-200-PHO2A.jpg
006-010-706-9000-200-PHO2B.jpg

Structure Documents:
MA-DCR May 1973 Seawall 006-010-706-9000-200-DCR2A
MA-DCR August 27, 1 George's Island 006-010-706-9000-200-DCR2B
MA-DCR May 5, 2000 George's Island 006-010-706-9000-200-DCR2C

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

Structure Assessment Form

Property Owner:
State

Presumed Structure Owner:
State

Owner Name:
MA-DCR

Location:
George's Island

Based On Comment:

Date:
1/30/2007

Earliest Structure Record:
1973

Estimated Reconstruction/Repair Cost:
$111,672.00

Length: 282 Feet

Top Elevation: NAVD 88

FIRM Map Zone: V2

FIRM Map Elevation: 25 Feet NGVD

Primary Type: Bulkhead/Seawall

Primary Material: Stone

Primary Height: Over 15 Feet

Secondary Type:

Secondary Material:

Secondary Height:

Structure Summary:
The double high bulkhead has some visible rotation and settling of stones. The face stones are straight and aligned. There is erosion at the end of the wall. The riprap at the base goes out to mean low water. The stones are approximately 0.5 tons. There is erosion behind the wall. In front of the wall are stone groins.

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

Structure Images:
006-010-706-9000-300-PHO3A.jpg
006-010-706-9000-300-PHO3B.JPG

Structure Documents:
MA-DCR May 1973 Seawall Restoration - 006-010-706-9000-300-DCR3A
MA-DCR August 27, 1 George's Island 006-010-706-9000-300-DCR3B
MA-DCR May 5, 2000 George's Island 006-010-706-9000-300-DCR3C

Prepared By: Bourne Consulting Engineering
The 2 feet by 2 feet by 2 feet stones are stacked 7 stones high forming the seawall. The top of the wall is approximately 20 feet wide. There are many areas of erosion and voids. There is settling of stones. The top of the bulkhead has a minor slope. There is riprap at the base of the wall that goes out to mean low water. The riprap stones are approximately 0.5 tons.

Structure Images:
- [006-010-706-9000-400-PHO4A.jpg](#)
- [006-010-706-9000-400-PHO4B.jpg](#)
- [006-010-706-9000-400-PHO4C.jpg](#)

Structure Documents:
- MA-DCR May 1973 Seawall 006-010-706-9000-400-DCR4A
- MA-DCR August 27, 1 George's Island 006-010-706-9000-400-DCR4B
- MA-DCR May 5, 2000 George's Island 006-010-706-9000-400-DCR4C

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

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<th>Date:</th>
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<tbody>
<tr>
<td>State</td>
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<td>1/30/2007</td>
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<td>65 Feet</td>
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<td>V2</td>
<td>25 Feet NGVD</td>
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<tr>
<th>Primary Type:</th>
<th>Primary Material:</th>
<th>Primary Height:</th>
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<tbody>
<tr>
<td>Bulkhead/ Seawall</td>
<td>Stone</td>
<td>Over 15 Feet</td>
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<table>
<thead>
<tr>
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<th>Secondary Material:</th>
<th>Secondary Height:</th>
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### Structure Summary:
The top of the seawall is settling. The stones show sign of rotation and shifting. The face of the wall has 8 stones stepped then stacked stones. The stones are approximately 8 feet by 2 feet by 2 feet. The riprap at the base of the wall average 1 to 2 tons. There is a 10 feet by 5 feet void at the base of the wall leading to the wall unraveling.

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<th>Condition Rating</th>
<th>Priority Rating</th>
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<table>
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<tr>
<th>Description</th>
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<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:
- 006-010-706-9000-500-PHO5A.jpg
- 006-010-706-9000-500-PHO5B.jpg
- 006-010-706-9000-500-PHO5C.jpg

### Structure Documents:
- MA-DCR May 1973 Seawall 006-010-706-9000-500-DCR5A
- MA-DCR August 27, 1 George's Island 006-010-706-9000-500-DCR5B
- MA-DCR May 5, 2000 George's Island 006-010-706-9000-500-DCR5C

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

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: George's Island
Based On Comment: 
Earliest Structure Record: 1973

Length: 250 Feet
Top Elevation: Feet NAVD 88
FIRM Map Zone: V2
FIRM Map Elevation: 25 Feet NGVD

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

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

Structure Summary:
The bulkhead is approximately 8 stones high with stones that average 8 feet by 2 feet by 2 feet in size. The top of the wall is 15 feet wide. There are many points on the top that have undermined creating 20 feet voids to halfway down the wall. The face stones are okay. There is no visible rotation. The riprap in front is approximately 0.5 tons and goes out to mean high water.

Condition Rating
C Fair

Level of Action Description
Moderate Structure 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:
006-010-706-9000-600-PHO6A.jpg
006-010-706-9000-600-PHO6B.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:**
- MA-DCR

**Location:**
- George's Island

**Date:**
- 1/30/2007

**Earliest Structure Record:**
- 1973

**Estimated Reconstruction/Repair Cost:**
- $777,546.00

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<td>315 Feet</td>
<td>Feet NAVD 88</td>
<td>V2</td>
<td>15 Feet NGVD</td>
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**Primary Type:**
- Revetment

**Primary Material:**
- Stone

**Primary Height:**
- Over 15 Feet

**Secondary Type:**
- Secondary Material:

**Secondary Height:**
- Structure Summary:

The riprap revetment has failed in the middle and the ends are close to failure. At one time there were placed stones that were approximately 1 to 2 tons in size with a 20 feet apron at a 1 on 1 slope. It looks as if the stones were placed or moved around to protect the area.

<table>
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<tr>
<th>Condition</th>
<th>Rating</th>
<th>Priority</th>
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<td>Poor</td>
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<td>Major</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>
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### Structure Images:
- 006-010-706-9000-700-PHO7A.jpg
- 006-010-706-9000-700-PHO7B.jpg

### Structure Documents:
- MA-DCR
  - May 1973: Seawall
  - August 27, 1: George's Island
  - May 5, 2000: George's Island

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

Structure Assessment Form

Property Owner: State
Presumed Structure Owner: State
Owner Name: MA-DCR

Location: George’s Island
Based On Comment: 
Earliest Structure Record: 1973
Estimated Reconstruction/Repair Cost: $376,200.00
Date: 1/30/2007

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<td>190</td>
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<td>A2</td>
<td>10 Feet NGVD</td>
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<tr>
<td>Bulkhead/ Seawall</td>
<td>Concrete</td>
<td>Over 15 Feet</td>
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<table>
<thead>
<tr>
<th>Structure Summary:</th>
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</table>
The bulkhead is made up of stones that are approximately 2 feet by 3 feet by 8 feet in size. The wall is on average 8 stones high. There is well failure and riprap loss at the southern end. The rest of the wall is in good shape.

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<tr>
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<td>Fair</td>
<td>None</td>
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<thead>
<tr>
<th>Description</th>
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</table>
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.

Structure Images:
006-010-706-9000-800-PHO08A.jpg

Structure Documents:
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<tr>
<td>MA-DCR</td>
<td>May 1973</td>
<td>Boston</td>
<td>community-map-block-parcel-structure</td>
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<td>MA-DCR</td>
<td>August 27, 1</td>
<td>George’s Island</td>
<td>006-010-706-9000-800-DCR6B</td>
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<tr>
<td>MA-DCR</td>
<td>May 5, 2000</td>
<td>George’s Island</td>
<td>006-010-706-9000-800-DCR8C</td>
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</table>

Prepared By: Bourne Consulting Engineering
## Structure Assessment Form

**Property Owner:**

- State

**Presumed Structure Owner:**

- State

**Owner Name:**

- DCR

**Location:**

- George's Island

**Date:**

- 1/30/2007

**Earliest Structure Record:**

- 1973

**Estimated Reconstruction/Repair Cost:**

- $532,950.00

### Structure Summary:

The bulkhead has stones that are approximately 3 feet long by 2 feet in height by 2 feet wide. The cast in place wall has a path behind it. The riprap comes 1 foot below the height of the wall. The stones making up the riprap are approximately 0.5 to 1 ton stones. Parts of the knee wall have fallen down. The stones have been set well and there is no visible sign of settling or rotation.

**Condition**

- C

**Rating**

- Fair

**Level of Action**

- Moderate

**Description**

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

**Priority**

- I

**Rating**

- None

**Action**

- Long Term Planning Considerations

**Description**

- No Inshore Structures or Residential Dwelling Units Present

### Structure Images:

- [006-010-706-9000-900-PHO9A.jpg](#)
- [006-010-706-9000-900-PHO9B.jpg](#)

### Structure Documents:

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<th>MA-DCR</th>
<th>May 1973</th>
<th>Seawall</th>
<th>006-010-706-9000-900-DCR9A</th>
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<tr>
<td>MA-DCR</td>
<td>August 27, 1</td>
<td>George's Island</td>
<td>006-010-706-9000-900-DCR9B</td>
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<td>MA-DCR</td>
<td>May 5, 2000</td>
<td>George's Island</td>
<td>006-010-706-9000-900-DCR9C</td>
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</tbody>
</table>

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

## Structure Assessment Form

**Property Owner:**
- Local

**Presumed Structure Owner:**
- Local

**Owner Name:**
- Boston

**Location:**
- Spectacle Island

**Date:**
- 7/26/2007

**Based On Comment:**

**Earliest Structure Record:**
- 1972

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

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<th>Length:</th>
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<tbody>
<tr>
<td>Feet</td>
<td>Feet NAVD 88</td>
<td>A2</td>
<td>25 Feet NGVD</td>
</tr>
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</table>

**Primary Type:**
- Revetment

**Primary Material:**
- Stone

**Primary Height:**
- Over 15 Feet

**Secondary Type:**

**Secondary Material:**

**Secondary Height:**

**Structure Summary:**
The placed stone revetment consists of stones that are on average 3 feet by 2 feet in size. They are at a 1 to 2 slope.

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<th>Condition Rating</th>
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<td>Long Term Planning Considerations</td>
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**Structure Images:**
- 006-010-707-4000-100-PHO1A.jpg

**Structure Documents:**
- MA-DCR 1972 Map C - 1972 Master 006-010-707-4000-100-DCR1A
- MA-DCR July 1979 Boston Harbor Island 006-010-707-4000-100-DCR1B
- MA-DCR September 1 Boston Harbor Island 006-010-707-4000-100-DCR1C
- DEP March 1993 Plans Accompanying 006-010-707-4000-100-LIC1A

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

**Structure Assessment Form**

<table>
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<th>Property Owner:</th>
<th>Location:</th>
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<td>28 Feet NGVD</td>
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<td>Revetment</td>
<td>Stone</td>
<td>5 to 10 Feet</td>
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<tr>
<td>Coastal Beach</td>
<td>Stone</td>
<td>Under 5 Feet</td>
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**Structure Summary:**
The dumped riprap consists of stones that are approximately 100 to 200 pounds in size. There are a few 1 ton stones. The stones have been dumped at the toe of a coastal bank with a beach in front of it.

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<th>Condition Rating</th>
<th>Priority Rating</th>
<th>Level of Action Description</th>
<th>Action Description</th>
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**Structure Images:**
- [006-010-707-4000-200-PHO2A.jpg](006-010-707-4000-200-PHO2A.jpg)

**Structure Documents:**
- MA-DCR 1972: Map C - 1972 Master 006-010-707-4000-200-DCR2A
- MA-DCR July 1979: Boston Harbor Island 006-010-707-4000-200-DCR2B
- MA-DCR September 1: Boston Harbor Island 006-010-707-4000-200-DCR2C

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

Structure Assessment Form

Property Owner: Local

Presumed Structure Owner: Local

Owner Name: Boston

Location: Spectacle Island

Based On Comment: 

Earliest Structure Record: 1972

Estimated Reconstruction/Repair Cost: $0.00

Date: 7/25/2007

Length: 850 Feet NAVD 88

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: Stone

Secondary Height: 5 to 10 Feet

Structure Summary:
The stone block seawall has stones that average 7 feet by 2 feet by 2 feet in size. There is a sand beach in front and a building and park behind the structure. There is a walkway on top filled with gravel. There are 5 visible courses. At the end of the structure is a small area of dumped riprap stones that are on average 4 feet by 3 feet by 2 feet in size.

Condition Rating
A Excellent

Level of Action 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
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:
- 006-010-707-4000-300-PHO3A.jpg
- 006-010-707-4000-300-PHO3B.jpg
- 006-010-707-4000-300-PHO3C.jpg
- 006-010-707-4000-300-PHO3D.jpg

Structure Documents:
- MA-DCR 1972 Map C - 1972 Master
- MA-DCR July 1979 Boston Harbor Island
- MA-DCR September 1 Boston Harbor Island
- MA-DCR 1993 Massachusetts
- MA-DCR 2/18/2002 Massachusetts
- MA-DCR September 2 Spectacle Island
- DEP March 1993 Plans Accompanying
- 006-010-707-4000-300-DCR3A
- 006-010-707-4000-300-DCR3B
- 006-010-707-4000-300-DCR3C
- 006-010-707-4000-300-DCR3D
- 006-010-707-4000-300-DCR3E
- 006-010-707-4000-300-DCR3F
- 006-010-707-4000-300-LIC3A

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

Structure Assessment Form

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| Length: 130 Feet | Top Elevation: 10 Feet NAVD 88 | FIRM Map Zone: A2 | FIRM Map Elevation: 10 Feet NGVD |

| Primary Type: Bulkhead/ Seawall | Primary Material: Concrete | Primary Height: Under 5 Feet |
| Secondary Type: Revetment | Secondary Material: Stone | Secondary Height: 5 to 10 Feet |

Structure Summary:
The cast in place wall is 2 feet wide with dumped riprap in front of it. The stones are approximately 3 feet by 2 feet. There is a beach and pier in front of it.

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Structure Images:
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- 006-010-707-4000-400-PHO4B.jpg

Structure Documents:
- MA-DCR 1972 Map C - 1972 Master
- MA-DCR 1972 Boston Harbor Island
- MA-DCR 1972 Boston Harbor Island
- MA-DCR 1993 Spectacle Island
- MA-DCR 1993 Massachusetts
- MA-DCR 1993 Massachusetts
- MA-DCR 1993 Massachusetts
- MA-DCR 1993 Massachusetts

Prepared By: Bourne Consulting Engineering
Section VI - Harbor Islands

Part C

Structure Photographs
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Harbor Islands
Section VI - Harbor Islands

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
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PLAN ACCOMPANYING PETITION OF
DEPT. OF ENVIRONMENTAL MANAGEMENT
TO CONSTRUCT AND MAINTAIN A TIMBER PIER, PILES, FLOATS, GANGWAYS, TIMBER BULKHEAD AND FILL
ON GALLOPS ISLAND
BOSTON HARBOR
1975

NOTE:
Elevations are in feet and tenths and refer to the plane of Mean Low Water. Bars below denote elevations below that same plane.

LICENSE PLAN NO. 58
APPROVED BY DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING
OF MASSACHUSETTS October 30, 1975

[Signature]
PROPOSED WORK

LICENSE PLAN NO. 3838
Approved by Department of Environmental Health
Date: JUN 22 1994

NOTES:
1. VOLUME OF EXISTING GRADE = 4500 C.Y.
2. VOLUME OF SUBSOIL BELOW MHW = 1000 C.Y. (AREA = 800 S.F.)
3. ALL PROPERTY OWNED BY THE CITY OF BOSTON.

JANUARY 15 1994
SECTION A-A

SCALE: 1" = 20'
SCALE IN FEET
0 10' 20'

LICENSE PLAN NO. 3638
Approved by Department of Environmental Protection
Date: JUN 22 1994

JANUARY 18, 1994

SHEET 3 OF
PLAN ACCOMPANYING PETITION OF:
THE CITY OF BOSTON TO CONSTRUCT
AND LICENSE STONE SLOPE PROTECTION
AT THE LONG ISLAND BRIDGE ABUTMENT
BOSTON HARBOR
BOSTON, MASSACHUSETTS
DATE: 06-14-02
PLAN: ACCOMPANYING PETITION OF:
THE CITY OF BOSTON TO CONSTRUCT
AND LICENSE STONE SLOPE PROTECTION
AT THE LONG ISLAND BRIDGE ABUTMENT
BOSTON, HARBOR
BOSTON, MASSACHUSETTS
DATE: 06-14-02

LICENSE PLAN NO. 9396
Approved by Department of Environmental Protection
Date: AUG 28 2002

PROPOSED SITE PLAN
NOTE: SEE SHEETS 3 AND 4 FOR TYPICAL SECTIONS
TYPICAL SECTION
STA 1+45 TO 1+65

TYPICAL SECTION
STA 1+65 TO 2+70

TYPICAL SECTIONS

PLAN ACCOMPANYING PETITION OF:
THE CITY OF BOSTON TO CONSTRUCT
AND LICENSE STONE SLOPE PROTECTION
AT THE LONG ISLAND BRIDGE ABUTMENT
BOSTON HARBOR
BOSTON, MASSACHUSETTS
DATE: 06-14-02
PLAN ACCOMpanying PETITION OF:
THE CITY OF BOSTON TO CONSTRUCT
AND LICENSE STONE SLOPE PROTECTION
AT THE LONG ISLAND BRIDGE ABUTMENT,
BOSTON HARBOR
BOSTON, MASSACHUSETTS
DATE: 06-14-02

TYPICAL SECTION
STA 2+70 TO 4+80

LICENSE PLAN NO. 9396

Approved by Department of Environmental Protection
Date: AUG 28 2002

SHEET 5 OF
PLANS ACCOMPANYING PETITION OF THE MASSACHUSETTS HIGHWAY DEPARTMENT TO CLOSE LANDFILL, CONSTRUCT CONTAINMENT DIKE, SEAWALL AND OUTFALLS, DREDGE, FILL, PROVIDE BEACH NOURISHMENT AT SPECTACLE ISLAND, BOSTON, HARBOR, BOSTON, MA.
LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

NOTES:
1. EL. 100 = MSL
2. ALL GRADES ARE FINISHED GRADES
3. ALL STRUCTURES SHOWN ARE PROPOSED

SPECTACLE ISLAND GENERAL SITE PLAN PROPOSED CONDITIONS

Sheet 3 of 19
LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

NOTES:
1. EL. 100 = MSL
2. VOLUME OF DREDGE EAST SIDE OF ISLAND = 173,000 C.Y.
3. VOLUME OF FILL BELOW MHW = 204,000 C.Y.
4. AREA OF FILL BELOW MHW = 7.9 ACRES

SPECTACLE ISLAND
CONTAINMENT DIKE /
COFFERDAM
SHEET 4 OF 19
LONGITUDINAL SECTION THROUGH STONE DRAINAGE CONDUIT

NOTES:

1. ROCK USED IN CREST, COVER LAYER AND UNDER LAYER SHALL BE ROUGH, ANGULAR, QUARRY STONE. MIN. UNIT WEIGHT SHALL BE 165 LBS./CF.

2. THE TOP OF THE BERM IS EVEN WITH THE TOP OF FOUNDATION SUBGRADE.

3. EL. 100 = MSL

18" TOPSOIL OR LOAM

GEONET

GLACIAL TILL

DIKE

CREST ROCK WEIGHT 10500 LBS

ROCK WEIGHT 10500 LBS

EL. 128.5

EL. 100 MSL

TOE OF DIKE

TOE OF DIKE

8'-0"

20'-0"

4'-0"

MHW EL. 105

MLW EL. 95

EL. VARIES

2ND BEDDING LAYER 6" STONE 12" THICK

ANCHOR TRENCH

CLAY

UNDER LAYER ROCK WEIGHT 1050 LBS.

1ST BEDDING LAYER 1 1/2" STONE 10" THICK

TILL

GEOTEXTILE

CONTINUOUS DIKE CREST ANCHOR TRENCH

DETAIL 1 (SHEET 4)

STONE COLUMN ZONE

DREDGE AREA
SECTION A-A
(SHEET 7)
STATION 4+70

NOTES:
1. EL. 100 = MSL
2. CUT-OFF WALL LOCATION DENOTES LIMIT OF BEACH DEVELOPMENT MATERIAL.

SPECTACLE ISLAND
WEST SIDE DREDGING-
SECTION
SHEET 9 OF 10

February 5, 1993
LICENSE PLAN NO. 3181

Date: MAR 10 1993

SEAWALL, TOP EL. Varies between 105.0 and 134.5

COVER LAYER
Rock weight 10500 LBS

SEAWALL BASELINE

EXISTING GRADE: 2% CRUSHED STONE PATH PATH

Sediments to be removed

EL. 105

MHW

EL. 100

MLW

MLW

EL. 100

MSL

Sediments

GLACIAL TILL

SECTION VIEW
(SHEET 3)

1ST BEDDING LAYER
2" STONE, 10" THICK

2ND BEDDING LAYER
6" STONE, 12" THICK

MINIMUM UNIT WEIGHT OF ALL ROCK FOR SEAWALL CONSTRUCTION SHALL BE 165 LBS/CF.

ROCK USED IN COVER LAYER AND UNDER LAYER SHALL BE ROUGH, ANGULAR, QUARRIED STONE.

EL. 100 = MSL

VOLUME OF FILL BELOW MHW FOR NORTH AND EAST SEAWALLS = 80,000 CY.

February 5, 1993

SPECTACLE ISLAND
NORTH & EAST SEAWALL SECTION
SHEET 10 OF 19
N.T.S.
(SHEET 3)

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF $f'_c = 4000$ PSI IN 28 DAYS. CONCRETE SHALL CONTAIN 4 TO 6 PERCENT ENTRAINED AIR.

2. ALL REINFORCING BARS SHALL BE EPOXY COATED AND CONFORM TO ASTM A 615 GRADE 60.

3. CONCRETE COVER FOR REINFORCING SHALL BE AS SHOWN. REINFORCING BAR LAPS, DOWEL PROJECTIONS AND EMBEDMENT SHALL BE IN ACCORDANCE WITH ACI-318-89 FOR EPOXY COATED REINFORCEMENT UNLESS NOTED OTHERWISE ON THE DRAWINGS.
SECTION C–C (SHEET 3)

SECTION D–D (SHEET 3)

LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
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SPECTACLE ISLAND
BEACH NOURISHMENT SECTIONS
SHEET 12 OF 19

February 5, 1993
NOTE:
EL. 100 = MSL

LICENSE PLAN NO. 3181
DATE: MAR 10 1983
APPROVED BY DEPARTMENT OF ENVIRONMENTAL PROTECTION

SPECTACLE ISLAND
FILL PLACEMENT
SHEET 14 OF 19

1"=300' HORIZONTAL
1"=30' VERTICAL

FINISHED GRADE 200
GEOCOMPOSITE DRAINAGE/GAS VENT LAYER (TYP) 15 FT. SPACING SLOPE @ 1% MIN.

CA/T MATERIALS
VEGETATIVE SUPPORT/DRAINAGE LAYER

NATURAL IMPERVIOUS CAP MATERIAL

EXISTING GRADE
12" LAYER OF CRUSHED STONE DRAIN

DREDGE AREA
FILLED TIDELANDS
APPROXIMATE BOTTOM OF REFUSE

STONE DRAINAGE CONDUIT

REFUSE TO BE REMOVED AND REPLACED WITH CLEAN FILL

REFUSE TO BE REMOVED

CUT-OFF WALL

SECTION B-B (SHEET 3)
LICENSE PLAN NO. 3181

NOTES:
1. EL. 100 = MSL
2. SUITABLE MATERIAL TO BE USED FOR BEACH NOURISHMENT. UNSUITABLE DREDGED MATERIAL TO BE DISPOSED ON SPECTACLE ISLAND ABOVE EL.105.0.
3. VOLUME OF DREDGING FOR PIER AREA=63,000 C.Y.
1. EL. 100 = MSL
2. ALL PILES DRIVEN TO GLACIAL TILL.
PLANS ACCOMPANYING PETITION OF THE MASSACHUSETTS HIGHWAY DEPARTMENT TO CLOSE LANDFILL, CONSTRUCT CONTAINMENT DIKE, SEAWALL AND OUTFALLS, DREDGE, FILL, PROVIDE BEACH NOURISHMENT AT SPECTACLE ISLAND, BOSTON HARBOR, BOSTON, MA.

NOTE: CA/T PROJECT DATUM EL 100 = MSL EL 95 = MLW ALL ELEVATIONS ARE EXPRESSED IN FEET AND TENTHS OF FEET

LEGEND

STRUCTURES TO BE REMOVED

SCALE IN FEET

SPECTACLE ISLAND GENERAL SITE PLAN
EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET 1 OF 19

LICENS PLAN NO. 3181

Approved by Department of Environmental Protection of Massachusetts

COMMISSIONER

DIVISION DIRECTOR

SECTION CHIEF

MAR 10 1993
NOTES:
1. EL. 100 = MSL
2. ALL GRADES ARE FINISHED GRADES
3. ALL STRUCTURES SHOWN ARE PROPOSED

LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

February 5, 1993
SPECTACLE ISLAND GENERAL SITE PLAN PROPOSED CONDITIONS

SCALE IN FEET
LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

NOTES:
1. EL. 100 = MSL
2. VOLUME OF DREDGE EAST SIDE OF ISLAND = 173,000 C.Y.
3. VOLUME OF FILL BELOW MHW = 204,000 C.Y.
4. AREA OF FILL BELOW MHW = 7.9 ACRES

SCALE IN FEET

SPECTACLE ISLAND
CONTAINMENT DIKE /
COFFERDAM
SHEET 4 OF 19
NOTES:
1. ROCK USED IN CREST, COVER LAYER AND UNDER LAYER SHALL BE ROUGH, ANGULAR, QUARRY STONE. MIN. UNIT WEIGHT SHALL BE 165 LBS./CF.
2. THE TOP OF THE BERM IS EVEN WITH THE TOP OF FOUNDATION SUBGRADE.
3. EL. 100 = MSL
SECTION A-A
(SHEET 7)
STATION 4+70

NOTES:

1. EL. 100 = MSL

2. CUT-OFF WALL LOCATION DENOTES LIMIT OF BEACH DEVELOPMENT MATERIAL.

February 5, 1993
NOTES:

1. MINIMUM UNIT WEIGHT OF ALL ROCK FOR SEAWALL CONSTRUCTION SHALL BE 165 LBS/CF.

2. ALL ROCK WEIGHTS SHOWN IN THIS SHEET ARE AVERAGE WEIGHT FOR EACH LAYER.

3. ROCK USED IN COVER LAYER AND UNDER LAYER SHALL BE ROUGH, ANGULAR, QUARRY STONE.

4. EL. 100 = MSL

5. VOLUME OF FILL BELOW MHW FOR NORTH AND EAST SEAWALLS = 80,000 CY
LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

STONE PATHWAY
FINISHED GRADE 114.00
TOP OF WALL EL. 113.00
1'-0" THICK GRANITE VENEER
STONE ANCHORS
FINISHED GRADE
EL. 108.00
EL. 106.50
GRANULAR DRAINAGE
MATERIAL TO WEEP HOLE
6" ø WEEP HOLES @ 6'-0"

L. 105 MHW ▼ #5 DOWELS X 2'-0" 1'-0"
24" O.C. SEE NOTE A
3/4" CL. 12" TYP.
3" CL. 12" TYP.

L. 100 MSL ▼ #7@12" TYP.
#5@18" TYP.
#6@9" TYP.
#5@18" TYP.

L. 95 MLW ▼ #7 DOWELS @ .12"
t=2'-8 1/2"-3'-2"

WALL
6'-0" - 9'-4"
3'-2"-4'-2"

BASELINE OF WEST SEAWALL
1'-10" - 2'-4"

NOTE
BRING BACKFILL UP
LEVEL WITH COURSING
OF GRANITE FACING
BOTTOM OF FOOTING EL. VARIES.

TYPICAL SECTION WEST SEAWALL

NOTE A
DRILL GRANITE
FACING, PLACE
USING NONSHRINK
GROUT

WEST SEAWALL SECTION
SPECTACLE ISLAND SHEET 11 OF 19

N.T.S.
(SHEET 3)

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF FC'=4000 PSI IN 28
   DAYS. CONCRETE SHALL CONTAIN 4 TO 6 PERCENT ENTRAINED AIR.

2. ALL REINFORCING BARS SHALL BE EPOXY COATED AND CONFORM TO ASTM A 615 GRADE 60.

3. CONCRETE COVER FOR REINFORCING SHALL BE AS SHOWN. REINFORCING BAR LAPS, DOWEL
   PROJECTIONS AND EMBEDMENT SHALL BE IN ACCORDANCE WITH ACI-318-89 FOR EPOXY
   COATED REINFORCEMENT UNLESS NOTED OTHERWISE ON THE DRAWINGS.

NOTE
BACKFILL BOTH SIDES
OF WALL SIMULTANEOUSLY TO
EQUALIZE PRESSURES.
SECTION C-C (SHEET 3)

SECTION D-D (SHEET 3)

LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

SPECTACLE ISLAND
BEACH NOURISHMENT SECTIONS
SHEET 12 OF 19
February 5, 1993
NOTE:
EL. 100 = MSL

 LICENSE PLAN NO. 3181

200
190
180
170
160
150
140
130
120
110
100
90

FINISHED GRADE 200

CA/T MATERIAL PLACEMENT

GEOMEMBRANE DRAINAGE/GAS VENT LAYER (TYP)
15 FT. SPACING SLOPE @ 1% MIN.

CA/T MATERIALS

VEGETATIVE SUPPORT/DRAINAGE LAYER

(SHEET 6)

DOUBLE LAYER GEOCOMPOSITE

CONTAINMENT DIKE

DREDGE AREA

12" LAYER OF CRUSHED STONE DRAIN

FILLED TIDELANDS

APPROXIMATE BOTTOM OF REFUSE

STONE DRAINAGE CONDUIT

REFUSE TO BE REMOVED AND REPLACED WITH CLEAN FILL

REFUSE TO BE REMOVED

EXISTING GRADE

NATURAL IMPERVIOUS CAP MATERIAL

FILLED TIDELANDS

CUT-OFF WALL

1" = 300' HORIZONTAL

300  0  300

30  0  30

1" = 30' VERTICAL

SECTION B-B (SHEET 3)
TRESTLE LIGHT POLES (TYP.)

SLOPE

EXISTING MUDLINE

CLAY

TILL

DREDGE TO EL. 85.0

1:2 1/2 BATTER PILES (TYP.)

STEEL VEHICLE BARRIER

TRANSFER BRIDGE

STEEL VEHICLE BARRIER

TRANSFER BRIDGE STEEL LIFTING FRAME

TOP OF BARGE DECK EL. 166.4 @ MHWS (EMPTY)

TOP OF BARGE DECK EL. 97.0 @ MHWS (LOADED)

MHW EL. 105

MLW EL. 95

EXISTING MUDLINE

SEDIMENTS

1:2 BATTER PILES (TYP.)

1:3 BATTER PILES (TYP.)

DREDGE TO EL. 83.0

5+00

6+00

TILL

MLW 95

70

95

120

MHW 105

70

95

120

MATCH

SHEET 16 OF 19

LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993
NOTES:
1. EL. 100 = MSL
2. ALL PILES DRIVEN TO GLACIAL TILL.
LICENSE PLAN NO. 3181
Approved by Department of Environmental Protection
Date: MAR 10 1993

NOTE:
EL. 100 = MSL

FOR DIMENSIONS SEE SECTION B

STEEL VEHICLE BARRIER (TYP.)

EL. 112.0 (TYP.)

MHW EL. 105
MLW EL. 95

EXISTING GROUND (VARIES)

14"Ø TIMBER PILES (TYP.)

4" x 8" BRACING (TYP.)

DREDGE LINE EL. 85.0

MLW (EL. 95)

45" x 10" BRACING (TYP.)

12" x 12" PILE CAP

STANDARD VEHICLE BARRIER (TYP.)

12" x 24" PILE (TYP.)

6" x 12" STRINGER

3" x 12" TREADS

WALKWAY

HANDRAIL

26'-6" VEHICLE LANE

7 SPACES @
5'-3 3/8" ± O/C = 37'-0"
PILE SPACING

40'-0"

1'-6"

1'-0"

SECTION B-B (SHEET 15)

SECTION A-A (SHEET 15)

SPECTACLE ISLAND SUPPLY FACILITY
TRESTLE - TYPICAL SECTION

February 5, 1993

STA. 2+00 TO 4+00

STA. 10+00 TO 12+00
<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>005-010-706-5000-300</td>
<td>006-010-706-5000-300-CDE3A</td>
<td>36-15</td>
<td>USACE</td>
<td>Boston</td>
<td>May 5, 1975</td>
<td>Proposed Pier and Floats in Boston Harbor on Gallops Island, Suffolk County, Massachusetts</td>
<td>1</td>
<td>Gallops Island Pier</td>
<td>Timber Bulkhead and Stone Wall</td>
</tr>
</tbody>
</table>
SIDE ELEVATION

PURPOSE: PUBLIC DOCKING FACILITY

DATUM: MEAN LOW WATER
PROPERTY OWNER:
MASS DEPT. OF NATURAL RESOURCES

NOTE:
ALL ELEVATIONS REFER TO MEAN LOW WATER

PROPOSED PIER AND FLOATS

IN: BOSTON HARBOR
NEAR: GEORGES ISLAND
COUNTY OF: SUFFOLK  STATE: MASSACHUSETTS
APPLICATION BY: MASS DEPT. OF NATURAL RESOURCES

SHEET 1 OF 1  DATE MAY 5, 1975