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Proposal for Marine Engineering Services

Menemsha Commercial Fishing Dock Replacement Project – Phase 1 Certified Engineer Assessment and Report

Submitted to:

Town of Chilmark, Massachusetts

January 27, 2022



GZA GeoEnvironmental, Inc.

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January 27, 2022
File No. 18.P000134.22

Mr. Tim Carroll, Town Administrator
Town of Chilmark
P.O. Box 119
Chilmark, Massachusetts 02535

Re: Request for Proposals
Menemsha Commercial Fishing Dock Replacement Project
Menemsha Harbor
Chilmark, Massachusetts

Dear Mr. Carroll:

GZA GeoEnvironmental, Inc. (GZA) is pleased to present this proposal to the Town of Chilmark for the proposed Phase 1 – Certified Engineer Assessment and Report, for the Menemsha Commercial Fishing Dock Replacement Project in Menemsha Harbor. This proposal presents our qualifications and past experience with similar types of structures as well as a proposed scope and budget for the requested work.

For this assignment, the selected GZA team offers superior expertise and capabilities in all aspects of the work including:

- Experience on Waterfront Projects – we have nearly 50 years of experience providing inspection and evaluations, engineering design, permitting, and bid and construction phase services on similar waterfront projects in communities along the Massachusetts coast.
- A History of Working on Cape and Islands Projects - GZA has provided engineering and permitting services on numerous projects on Cape Cod, Martha's Vineyard and Nantucket, since 1987. Our extensive knowledge of working with various municipalities, coupled with our experience enables us to be well suited to meet the requirements for this project.

We appreciate the opportunity to submit this proposal. If you have any questions, please do not hesitate to contact us. We can be reached at david.smith@gza.com or anders.bjarngard@gza.com or via phone at 781-278-4806 for Dave and 781-278-4802 for Anders.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

David A. Smith
Senior Project Manager

Anders Bjarngard, P.E.
Principal-in-Charge
Attachment: Request for Proposal Package



SECTION 1 | BACKGROUND

SECTION 1 | INTRODUCTION AND BACKGROUND

INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide the Town of Chilmark (the Town) with this Statement of Qualifications and Fee Proposal for Phase 1 – Certified Engineer Assessment and Report, that includes inspection and assessment services for the Menemsha Commercial Fishing Dock Replacement Project in Menemsha Harbor. We have organized our proposal to provide the Town with an introduction to GZA and our highly qualified project team, demonstrate our understanding of the project requirements, succinctly describe our approach to meet these requirements, and present our scope of work and bid price.

Our proposal is organized as follows.

- Section 1 – Introduction and Background
- Section 2 – Company Qualifications and Project Specific Experience
- Section 3 – Project Team Key Personnel
- Section 4 – Scope of Services and Fee Schedule Summary
- Section 5 – Project Schedule
- Section 6 – Attachments
 - Attachment A – Resumes
 - Attachment B – Similar Project Descriptions
 - Attachment C – Breakdown of Fee Schedule
 - Attachment D – Ratings Assessment Tables
 - Attachment E – Overall Condition Summary (Example)

BACKGROUND

The Town of Chilmark is seeking the services of a qualified engineering firm to provide inspection, evaluation and assessments of the existing Town dock infrastructure, including the steel sheetpile bulkhead and related support structures to assess the need to repair or replace components of the docks, and if replacement is determined to be necessary, provide recommendations for the replacement. The Town is seeking to have this initial Phase 1 inspection and assessment of the Town docks to be performed by April 1, 2022.

The Menemsha Harbor Commercial Fishing Dock and Steel Bulkhead Replacement Project is a multi-phased project to enable the Town to prepare and plan for the future replacement and elevation of the Commercial Fishing Dock. The overall goal of Phase I is to complete a certified engineering inspection including surveys of the steel bulkhead to which the docks currently attach. The engineering inspection will identify structural issues related to the steel bulkhead that may be compromised and therefore pose a threat to public safety and a Town liability, particularly since the commercial fishing docks are heavily used to support the fishing industry and are a popular tourist spot. It is anticipated that the expected remaining lifetime of the bulkhead, if any, will be identified in this assessment, and whether the bulkhead can support the replacement docks including raising elevations to mitigate flooding.



The Town of Chilmark owns and maintains the approximate 600-foot length of Town docks located along the southwestern side of the end of Basin Road. The shoreline is composed of a steel sheetpile bulkhead that provides protection to various buildings, including several seafood retail and wholesale businesses, a marine and land fueling business, and the Harbormaster's dockside offices located between Basin Road and Menemsha Basin. Adjacent to the steel sheetpile bulkhead is a fixed height, timber pile-supported, timber-framed dock, running parallel to the steel sheetpile bulkhead. Access to the approximate 8 foot wide timber dock is provided by timber steps from the top of the steel sheetpile bulkhead at various locations. There are timber fender piles along the seaward side of the timber docks that provide berthing for the commercial fishing vessels.

It is believed that the docks and bulkhead were constructed in 1987. Due to the unknown longevity of the dock and bulkhead structures, along with the increasing frequency of coastal flooding events, and future sea level rise projections, the Town wishes to repair, reconstruct or replace the existing structures to continue the use of the facility to support the commercial fisherman into the future.

The Town has made recent repairs to the docks including;

- Fender Pile Replacement – 2016
- Electrical Conduit Upgrades – 2017
- Accident Damage Repairs – 2019
- Hardware Fasteners Replacement - 2020

The Town is seeking a consultant to provide the following scope of services:

- Become familiar with the existing dock and associated infrastructure, the utility of the docks, general landscape of Menemsha Harbor and the relevant activities along the docks. This may include a preliminary on-site visit, discussions with the Harbormaster, review of existing materials (designs, repair history, etc.) related to the existing infrastructure, and review of any relevant regulations related to repair or reconstruction options of the dock and infrastructure.
- A preliminary above-water and near under-water engineering inspection of the dock, bulkhead, and other easily accessible related infrastructure.
- A determination of the expected remaining life of that infrastructure based on the preliminary inspection, including its ability to support one or more dock rebuild options for at least 25 years.
- A preliminary report to the Town of the results and conclusions reached from the preliminary inspection including a recommendation whether further inspections are needed including underwater inspections potentially using dive teams or other appropriate means.
- If the results of the preliminary inspection are inconclusive as to the inability of the infrastructure to support a rebuilt dock for the desired period, and with written approval from the Town, conduct further inspections to determine the condition of the infrastructure more conclusively.
- A final determination of the expected remaining life of the infrastructure.
- Assessment of options to replace or repair the infrastructure as appropriate. The findings should focus on the remaining lifetime and need to replace the steel bulkhead, but the report should also include other findings and recommendations that are evident during the inspections related to the overall goal of replacing the docks including plumbing, electrical, and other elements of the docks.
- A final written report to the Town summarizing the activities, findings, and recommendations.
- A meeting with the Town to discuss the report and answer questions to clarify the findings and recommendations.

GZA has the proven experience and is capable of providing the scope of services required for this project. GZA will take a focused and pragmatic approach for proposed assignments for the Town. This method has proven to be successful and efficient on our past civil engineering and waterfront projects. Prior to commencing work, GZA will attend a kick-off meeting with representatives from the Town, and stakeholders, to review the schedule and overall goals and expectations.



SECTION 2 | COMPANY QUALIFICATIONS AND PROJECT SPECIFIC EXPERIENCE

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COMPANY QUALIFICATIONS

GZA GeoEnvironmental, Inc. (GZA), a specialized waterfront/geotechnical/environmental engineering firm, was founded in 1964 as a geotechnical engineering firm. GZA has grown into a multidisciplinary company providing waterfront, geotechnical, environmental, planning, permitting, civil, structural, and remedial services. We now have a staff of nearly 680 people located in 31 offices throughout the Northeast, Mid-Atlantic and Great Lakes regions. The Coastal/Waterfront Group consists of approximately three dozen engineers and scientists located through the Northeast in several offices.

GZA also has extensive experience in the design of new and replacement structures for all types of waterfront structures, including bulkheads, piers, and mooring facilities. Below are selected strengths of our staff that illustrate our ability to provide the requisite engineering services in a highly professional and timely manner.

- **Specialized Firm** – GZA is a specialized waterfront/geotechnical/environmental engineering firm. Proposed project personnel work almost exclusively on waterfront projects. Our project experience includes bulkheads, piers, and all types of waterfront structures in the Northeast and Mid-Atlantic regions. GZA has provided repair/replacement/maintenance projects for municipalities, state and federal agencies, port authorities and marine terminals. Our experience with waterfront, geotechnical and permitting requirements makes GZA a logical choice for this undertaking.
- **Specialized Personnel** – The individuals to be assigned to this project team possess the required experience and expertise, including above and underwater inspections and evaluations, geotechnical engineering, structural design and permitting for marine and waterfront facilities. Anders B. Bjarngard, P.E. will be GZA’s Principal-in-Charge to assure company standards are met and client satisfaction is achieved. David A. Smith will serve as Project Manager and bring his extensive experience on working with shoreline structures to the project. Dino Fiscaletti, P.E. will serve as Consultant Reviewer and brings more than 38 years of experience working in the waterfront environment. Resumes of our key project staff are provided in Section 6, Attachment A, of this submittal.
- **A history of working on waterfront projects** – GZA has been providing engineering services for numerous waterfront projects throughout the Northeast and Mid-Atlantic areas since 1982. We have inspected and evaluated all types of waterfront structures and provided designs for new as well as repairs/rehabilitation or replacement of existing facilities. We have developed bidding documents for repairs and new construction. GZA has experience with bulkheads, piers, and their associated waterfront structures. Our extensive knowledge of working on similar waterfront projects makes us well suited for this project.
- **Constructability of Projects** – Waterfront construction is a specialized and expensive undertaking. Proper design and construction management are essential to minimize potential costly problems and unforeseen issues that might otherwise arise during project implementation. GZA will provide high levels of quality control and cost management within the early design phase and beyond to avoid unwanted changes and costly change orders during construction.
- **Responsiveness and Flexibility** – GZA has earned a reputation of being responsive and flexible to our clients’ needs. A lot of our work has been with contractors that need fast responses with alternate designs or value engineering proposals while maintaining project schedules. We are accustomed to working in situations where flexibility is

needed to quickly adapt and respond to changing design requirements and site conditions. GZA is big enough to get the job done, but not too big to prevent us from being able to respond quickly and effectively. GZA is a licensed corporation in Massachusetts.

COMPANY INFORMATION

As stated above, GZA was founded in 1964 as Goldberg-Zoino & Associates, Inc., a soils and foundations specialty consultant, **GZA GeoEnvironmental, Inc. (GZA)** and has grown into a multidisciplinary consulting firm offering services in the fields of marine and waterfront, structural, geotechnical, civil and environmental engineering, hazardous waste assessment and remediation, water and wastewater engineering, and construction related services.

Through integration of our waterfront/marine, structural, geotechnical, environmental, and civil engineering expertise, GZA has historically been able to offer both a broad range of technical expertise and cost-effective and technically appropriate solutions to problems. We have taken the additional step to tailor our integrated services around the client-specific needs of various client groups such as those within the public sector (government agencies), private industry, contractors, etc. This approach allows us to provide the technical expertise, innovation, sensitivity to client needs, and responsiveness to the unique engineering, permitting and construction issues associated with each client group.

Since 1982, GZA has been involved in inspections, evaluations, design for repairs and new facilities, permitting, and construction of over 1,800 marine/waterfront projects throughout the United States. Our projects have ranged from small redevelopment projects to very large marine and waterfront facilities such as the Woods Hole Ferry Terminal.

Proactive communication is our company commitment. GZA is *Proactive by Design*[®]. We plan and perform our work better through taking complete responsibility for understanding your goals, needs, and project constraints. We develop a project-specific communications plan to meet your need for face-to-face, phone, email, and written communications about your project's progress. You are kept up to date on work status, often before you think to ask. You are advised and consulted on your most important project and risk options before work begins. We take a forward thinking "ownership" perspective on your project's critical success factors in partnering with you as a trusted advisor on your team.

With a staff of interrelated professionals dedicated to providing high-level expertise on complex projects above, below and at ground-level, GZA's experts provide seamless integration across practice areas, client type, and location. As an employee-owned, private company, GZA's staff is motivated to propel the firm forward, seeking integrated, complex, and interesting projects that underscore a commitment to client satisfaction, environmental stewardship and best practices in science, engineering, and construction. Because GZA experts are trained across disciplines, clients benefit from the knowledge and experience of our staff, and resources are in-house and available for every project at any time. With the ability to manage unpredictability, remain nimble, and mobilize quickly, GZA responds to client inquiries with urgency, sensitivity, knowledge, and value, while remaining mindful of project costs and schedule.

Excelling as a multi-disciplinary, multi-office firm of proactive, bright, and dedicated people, we provide value to our clients and our profession.

PROJECT SPECIFIC EXPERIENCE

Below are several overviews of projects that GZA has completed which encompassed a similar scope to the Menemsha Commercial Fishing Dock Replacement project. Detailed project description sheets of these projects, and others, are provided in Section 6, Attachment B, of this submittal.

In addition, client references from these projects are included below. In addition to the projects listed below, we are currently providing engineering and construction oversight services for reconstruction of Pier 2 at Quonset Development Corporation’s Davisville facility in North Kingstown, RI, and rehabilitation of a steel cofferdam-supported pier at Bath Iron Works (BIW) shipyard in Bath, Maine.

Project	Location	Description	Reference
F Street Bulkhead Replacement Project	F Street Nantucket, MA	GZA provided above- and underwater inspection, geotechnical borings, limited topographic and bathymetric survey, design, permitting, contract document preparation, bid phase services, and construction support for the replacement and improvement of the F Street Bulkhead. The project is currently under construction.	Mr. Charles Gibson Deputy Chief of Police Nantucket Police Department 4 Fairgrounds Road Nantucket, Massachusetts 02554 508-228-1212 cgibson@police.nantucket-ma.gov
Woods Hole Ferry Terminal Reconstruction Project	Village of Woods Hole, Falmouth, MA	GZA is providing engineering and environmental services to the SSA for the design, permitting, and reconstruction of their Woods Hole terminal. The project involves the relocation of the SSA’s administrative offices into a new building and site development, phased reconstruction of three existing ferry slips, replacement of the existing passenger terminal and support/storage building, re-grading the terminal site to achieve enhanced resilience against extreme events (floods) while providing ADA compliant accessible services, and reconstruction and enhancements to the stormwater management system and other utilities.	Mr. Bill Cloutier Project Manager Woods Hole, Martha’s Vineyard and Nantucket Steamship Authority 1 Railroad Avenue Woods Hole, MA. 02543 508-548-5011 x429 bcloutier@steamshipauthority.com

Project	Location	Description	Reference
Shaw's Cove Steel Sheetpile Bulkhead Investigation	New London, CT	GZA provided inspection and evaluation assessment services for future design repairs or replacement of approximately 300 feet of existing bulkhead for the water's edge located along the Shaw's Cove waterfront situated on the western shore of the Thames River.	Mr. Brian Sear City of New London, CT. 860-447-5250 bsear@ci.new-london.ct.us
Gloucester Harbormaster Berthing Improvement Project	Gloucester Inner Harbor, Gloucester, MA	GZA provided initial survey and condition assessment of the existing facility. GZA provided preliminary concepts and budgets, planning with the City of Gloucester waterway board, grant funding applications, permitting with local, state, and federal regulatory agencies, and final design (plans and specifications) for the proposed Gloucester Harbormaster Berthing Facility located at Solomon Jacobs Park on Harbor Loop in Gloucester.	Mr. Michael Hale Director of Public Works City of Gloucester, MA 28 Poplar Street Gloucester, MA. 01930 978-281-9785 mhale@gloucester-ma. and Mr. Thomas Ciarametaro Gloucester Harbormaster 19 Harbor Loop Gloucester, MA. 01930 978-282-3013 tcarametaro@gloucester-ma.gov



SECTION 3 | PROJECT TEAM KEY PERSONNEL

SECTION 3 | PROJECT TEAM KEY PERSONNEL

PROJECT TEAM KEY PERSONNEL

GZA is proposing a project team with experienced personnel that has extensive background in the inspection, evaluation and design of repairs and new structures in the waterfront environment, and specifically with timber fixed docks and steel sheetpile bulkheads. Team management will remain consistent throughout the contract lifecycle and has been selected based on their area of expertise and experience. The majority of our project team is based in Amesbury, Massachusetts with select individuals from our Providence, RI office. All of these staff have worked together on similar projects in the past. If necessary, GZA has available additional resources than can be integrated into the project, both in our Amesbury and Providence office and from other GZA offices. Resumes with representative projects for each of the individuals identified below are included in Section 6, Attachment A.

GZA recognizes that strong project management is critical to the success of a project, including maintenance of schedule and cost. To maintain strong project control, GZA will utilize its proven project management system. Each project is assigned a Principal-in-Charge (PIC) and a Project Manager (PM) who are among our most experienced and qualified staff. The PIC is responsible for contract coordination with the Client and direct oversight and review of all aspects of the project as it is managed by the PM. The PM is responsible for daily management of the technical, logistical, and budgetary aspects of the project. Both the PM and PIC are responsible for maintaining client contact, and management of staff; both are wholly accountable for the success of the project. GZA’s matrix-style organization and computer networks offers Principals-in-Charge and Project Managers a large pool of qualified individuals with diverse backgrounds to appropriately staff each project, regardless of geographic location of the site, and to conduct work cost-effectively.

We have also assigned a Consultant/Reviewer for this project. This is a GZA representative who is qualified to provide an independent review of the work. The C/R is involved in an advisory and quality control capacity at key milestones of the work, but not in the day-to-day execution, thereby providing independent quality assurance of GZA’s work.

GZA has assembled a knowledgeable and experienced team of in-house waterfront, structural, civil, and environmental engineers to complete the scope of work outlined in the request for proposal. We are committing the resources necessary to successfully complete this project in an efficient, cost-effective, and timely manner.



PRINCIPAL-IN-CHARGE
ANDERS B. BJARNGARD, PE

Anders B. Bjarngard, P.E. will serve as the Principal-in-Charge and will provide the oversight and technical support necessary to successfully implement all work in a timely and organized manner. Mr. Bjarngard has 35 years of waterfront, geotechnical and civil engineering experience with GZA. He has provided inspection, engineering, permitting, and construction monitoring services for a variety of structures, including many state and municipal waterfront, dam, levee and building projects. He has been the principal-in-charge for several public projects funded through the EEA’s

Dam and Seawall Grant Program, FEMA and the Seaport Bond Bill including the Surf Avenue Seawall Reconstruction Project for the Town of Marshfield, FEMA-funded Pigeon Cove Breakwater Project for the Town of Rockport, Glover’s Wharf Waterfront Improvement Project for the City of Beverly, Long Beach Seawall Stabilization Project for the Town of Rockport and multiple seawall repair projects for the City of Gloucester. Mr. Bjarngard has also provided geotechnical

and civil engineering design services for several other publicly funded projects, including several dam safety repair projects.



PROJECT MANAGER
DAVID SMITH

David A. Smith will serve as the Project Manager for the project. Mr. Smith is a Senior Project Manager in the Waterfront/Marine Group at GZA with expertise in the survey, inspection, planning, permitting and design of marine and waterfront projects. Mr. Smith currently works extensively on municipal waterfront projects and also projects for the Massachusetts Department of Conservation and Recreation (DCR). He has worked throughout the Eastern United States, including bridges, urban ports and harbors, dredging projects, marinas, docks, parks, bulkheads, breakwaters and seawalls. Based on his 29 years of working on waterfront projects, he has an in depth understanding of all aspects of implementing waterfront work. His responsibilities have included field investigations, underwater inspection, structural evaluations, permitting, design and construction services on literally hundreds of waterfront improvement projects. Mr. Smith has led numerous river and harbor dredge projects including pre-and post-dredge hydrographic surveys, side scan surveys, sub-bottom profile surveys, beach nourishment surveys, eelgrass/shellfish delineations, soil exploration, calculation of pay quantities and permit preparations. His construction and dive inspection experience provide insight into the design and preparation of construction documents for waterfront structures. Based out of our Amesbury, MA office,



SENIOR WATERFRONT ENGINEER
MATTHEW TAVERNA, P.E.

Mr. Taverna has been involved with a variety of coastal engineering projects for municipal, industrial, commercial and residential marine facilities. Mr. Taverna has inspected and performed structural analysis assessments on steel, concrete and timber elements. He has designed and prepared construction documents for steel sheet pile bulkheads, concrete retaining walls and timber piers. He has obtained federal, state and local permits for shoreline stabilization, marina improvements, boat ramps and various municipal, commercial and residential projects. Mr. Taverna has performed above and below water inspections and prepared condition assessment reports that include estimated construction costs for repairs to marinas and berthing facilities for small craft vessels.



FIELD ENGINEER
JOSHUA J. ZALL, EIT

Mr. Zall has 16 years of experience and has been involved in topographic and hydrographic survey, inspection, planning, permitting, design and construction oversight for various marine waterfront civil/structural engineering applications throughout the eastern United States. These projects have included bridges, dredging projects, marinas, docks, boat ramps, bulkheads, seawalls and dams. His responsibilities have included field investigations and inspections, coordination and implementation of hydrographic and topographic surveys, underwater and above-water inspection, and project management as well as providing permitting, design and construction oversight service on waterfront projects.



CONSULTANT REVIEWER
DINO FISCALETTI, PE

Mr. Fiscoletti will also provide independent oversight and review of project deliverables as needed.

Mr. Fiscoletti serves as Technical Practice Lead of GZA's Marine and Waterfront Group and is based in GZA's Providence, RI office. He has over 38 years' experience and has been involved with a variety of engineering projects in a wide range of responsibilities. His design experience is multi-disciplinary and includes structural, coastal, geotechnical, and civil engineering for all types of waterfront structures as well as dredging and dredge disposal programs. Mr. Fiscoletti's marine experience includes the analysis, design, and production of contract documents for pile supported piers and wharfs, fender systems, steel sheet pile bulkheads, granite block and concrete seawalls, revetments, breakwaters, and other shore protection structures. Mr. Fiscoletti is currently managing GZA's construction phase services during the reconstruction of the Woods Hole Ferry Terminal as well as the design and construction effort for the reconstruction of Pier 2 at Quonset Development Corporation's Davisville facility in North Kingstown, RI. He also served as Project Manager for the Frenchboro, ME Ferry Terminal reconstruction project.



CORPORATE HEALTH AND SAFETY DIRECTOR
RICHARD ECORD, CSO, CHS, RCO

Rick Ecord is an accomplished and certified industrial hygienist and safety professional who consistently and quickly earns respect and trust from employees, executives, and regulators at all levels. He is a strategic leader and team-builder with proven ability to motivate colleagues around company goals and initiatives. He has worked with consulting and manufacturing sectors on four continents.

Mr. Ecord has catalyzed a step-change in environmental, health and safety (EHS) performance at GZA. He has done this through better integrating EHS program elements into the everyday workings of the firm, greatly enhancing communication with all levels of staff, and using electronic tools to modernize the program. He led the effort to revise the EHS program to conform to the OHSAS 18001 international health and safety management standard. Since Mr. Ecord joined GZA, OSHA recordable injuries and illnesses have decreased more than 50% to an all-time low. He continues to work towards improving EHS performance, while at the same time providing technical input into select GZA projects, such as this.

SUB-CONSULTANTS AND CONTRACTORS

In addition to the key GZA staff identified above, GZA will subcontract with additional team members to provide support services for our work at Menemsha Commercial Fishing Docks. GZA has engineer-divers on staff, including David Smith and Joshua Zall, and intends to self-perform the underwater inspection work. GZA may request to sub-contract the underwater portion of the work if warranted. The following sub-contractor would be engaged to provide the following services:

- Semper Diving & Marine Corporation – Underwater Inspection

Semper Diving & Marine Corporation, based in Charlestown, MA, is a veteran-owned company established in 2005 to provide a wide range of inspection and construction services for marine and heavy civil contractors and facility owners. Capabilities include full service commercial diving for all types of conditions for marine inspections and construction, pile driving in marine environments, and advanced underwater robotic services. Semper’s staff includes veteran divers, engineers, and marine construction personnel with knowledge of all forms of diving, marine construction, restoration, and engineering. Clients have included engineering firms, city and municipal authorities, port authorities, construction contractors, and the U.S. Coast Guard and U.S. Navy.

GZA has worked with **Semper Diving & Marine Corporation** on various projects, either as direct subcontractors to GZA or as partners on a team managed by others.



SECTION 4 | SCOPE OF SERVICES AND FEE SCHEDULE SUMMARY

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SCOPE OF SERVICES

The focus of the Scope of Services presented herein pertains to the inspection, evaluation, and assessments of the existing Town dock infrastructure, including the steel sheetpile bulkhead and related support structures to assess the need to repair or replace components of the docks, and if replacement is determined to be necessary, provide recommendations for the replacement.

PHASE 1 – CERTIFIED ENGINEER ASSESSMENT AND REPORT

Phase 1 of the project includes an assessment the existing docks and bulkhead conditions and preparation of a report summarizing GZA’s investigation tasks and recommended maintenance, repair, and improvement programs for the structures. To achieve these objectives, GZA proposes the following scope of work for Phase 1 of the project.

TASK 1: PROJECT REVIEW

The proposed existing conditions assessment tasks described below include a review of available existing information, an above-water conditions assessment, below-water (dive) conditions assessment if necessary, and a topographic survey of the project Site. These field-based tasks will be utilized to develop an existing conditions base plan and identify existing conditions of the docks and bulkhead structures.

SUB-TASK 1.1: PROJECT INITIATION, MANAGEMENT, AND REVIEW OF EXISTING INFORMATION

Upon receipt of notice of award, the GZA project team will have a kick-off meeting with the Town of Chilmark and other stakeholders to coordinate and review the proposed scope of services. Anticipated topics include overall project approach, planned scope of work, evaluation of project schedule, and review of existing relevant Site information and reports.

GZA will perform a review of available documentation pertaining to the Town docks and the surrounding area. Information that GZA will seek to obtain includes but is not limited to the following:

- As-Built Construction Drawings
- Geotechnical Information (Test Boring and Pile Driving Records)
- Utility Drawings
- Available Topographic Survey
- Available Hydrographic Survey
- Information related to Existing Structures, including prior repairs
- Local Climate Resiliency Reports, Sea Level Rise Projections, and other pertinent information related to future planning studies

Upon obtaining available documentation, a detailed review of the gathered information, previously obtained existing information, and utility research will be performed prior to performing the field inspection work.

TASK 2: ABOVE-WATER CONDITION ASSESSMENTS

SUB-TASK 2.1: TOPOGRAPHIC SURVEY

GZA proposes to self-perform a detailed topographic survey of the Town docks, including, but not limited to; timber docks, fender pilings, access steps, steel sheetpile bulkhead, buildings, pavement, roadway and parking areas, visible utility castings, and other pertinent features that may affect future shoreline structure improvements at the site. Utility information will be compiled from record plans and field survey. The survey will be referenced to Massachusetts State Plane Coordinate System (NAD 1983 and NAVD 1988) established via RTK GPS.

In addition, the topographic survey will include existing grade (mudline) elevations along the face of the timber docks and the steel sheetpile bulkhead. Existing grades will be compared to the grades on existing drawings, if available to note any changes in mudline conditions.

The survey procedures will include documentation of existing conditions of the wharf using field notes, tape measurements, sketches, and photography. Upon completion of the topographic survey, and collection of existing pertinent information, a base plan of the site will be generated for use in detailing and locating existing conditions at the site.

SUB-TASK 2.2: ABOVE-WATER STRUCTURE INSPECTIONS

An above-water visual and tactile structure inspection will be conducted to observe and document the existing conditions of the timber pile-supported, timber-framed docks and steel sheetpile bulkhead. Inspection will include, but not limited to; timber piles, timber framing, timber decking, associated hardware and connections, steel sheetpile bulkhead, cap, visual hardware and connections and adjacent landside conditions. This will include inspection of the structures visible above the water line, conducted on foot from the topside of the docks and bulkhead and by use from a small work boat.

GZA is proposing that Ultrasonic Thickness (UT) readings will be performed on the above-water accessible portions of the steel sheetpile bulkhead. We are proposing two readings at approximately 50-feet on center along the bulkhead length. UT readings will be performed using a Krautkramer Branson DMS 2 unit with a ½", 2.25 MHz dual element, transducer, or a Cygnus Dive Underwater Thickness Gauge. Before use, the unit selected will be calibrated on a step block of mild steel. UT readings will provide the thickness of the existing steel sheetpile bulkhead and provide information regarding corrosion rates at the site for calculations for remaining service life.

The inspection will be completed in accordance with ASCE Manual No. 130 Waterfront Facilities Inspection and Assessment Manual and appropriate regulatory and GZA safety compliance requirements for marine and general fieldwork activities as well as potential additional health and safety measures required by the Town of Chilmark. We anticipate this effort will require a three-person team from GZA (2 people in the work boat and one person on land) and three days to complete, including travel. It is anticipated the topographic survey and the condition assessment inspections will occur simultaneously.

TASK 3: INITIAL EVALUATION-TOWN REVIEW

GZA will compile the survey and inspection data and develop a preliminary evaluation of the inspection results. GZA will prepare a project update in letter format for Town review. In addition, GZA will arrange for, prepare, and attend a virtual review meeting with the Town and appropriate stakeholders to review the preliminary results. The goal of the initial review meeting will be to determine if a below-water condition assessment is warranted.

TASK 4: UNDERWATER CONDITION ASSESSMENTS

SUB-TASK 4.1: UNDERWATER STRUCTURE INSPECTIONS

Per the RFP documents, GZA has anticipated that a budget for conducting an underwater inspection will be required. The underwater structure inspections will include a “swim-by” inspection of the fender piles, dock support piles and the steel sheetpile bulkhead from the water line to the mud line. When combined with the above-water survey, nearly 100% of the exposed structure will be inspected. GZA has engineer-divers on staff and intends to self-perform the underwater inspection work. However, due to schedule requirements and prior project commitments of staff, GZA may request to sub-contract the underwater portion of the work. If schedule commitments require use of a sub-contractor, GZA will engage Semper Diving & Marine of Charlestown, Massachusetts for the underwater inspection. GZA has previously worked with Semper on several projects. GZA engineering staff will be on-site during the underwater inspections work.

This Level 1 inspection consists of a close visual examination of individual elements detailed enough to detect obvious major structural deficiencies, (such as deteriorated timber, deteriorated connections, and condition of the bulkhead. Level I inspection is generally referred to as a “swim-by” inspection however we propose to inspect each pile and the underwater portion of the steel sheetpile bulkhead to the level of detail to be able to detect obvious major damage or deterioration. In addition, we propose to perform limited Level II inspection efforts to include removal of marine growth or scaling if necessary, encompassing a 12-inch band around the pile at a selected critical area of the pile (ie. low water level) on selected piles. Level II inspection is directed towards detecting and identifying damaged/deteriorated areas that may be hidden by surface biofouling or deterioration. We anticipate approximately 10 percent of the piles will involve Level II inspection efforts and approximately 2 to 3 UT readings will be performed on the underwater sheetpile bulkhead per 50-foot length.

Damage and deterioration of the structural members will be identified, classified, and categorized based on the example rating assessment and terminology presented in Attachment D. The inspection procedures will include documentation of typical and abnormal conditions of the structure assets by field notes, sketches, and photography.

TASK 5: CONDITION ASSESSMENT REPORT

SUB-TASK 5.1: DRAFT CONDITION ASSESSMENT REPORT

Subsequent to completion of the above activities described under Task’s 1 through 4, GZA will prepare a Draft Condition Assessment Report documenting the findings of the above- and below-water inspections, surveys, and other information gathered during the Existing Conditions Assessment Study. Existing conditions plan and sections will be prepared as part of this report.

GZA will present a summary of structural deficiencies that were identified, classified, and categorized, overall condition assessment ratings for structural elements, and anticipated future improvement design and construction constraints. Overall condition assessment ratings will be presented similar to the example provided in Attachment E.

As part of this report, an assessment will be made as to the life expectancy of the structural elements under their current conditions without repairs and life expectancy of the structures with maintenance and repairs implemented at certain timeframes. Additionally, GZA will provide repair and/or improvement recommendations, anticipated construction costs, description of required permitting, construction conceptual schedule, timing, and sequencing, anticipated design/construction contingencies, operational constraints, constructability concerns, and preliminary budgetary cost estimates.

In addition, GZA will provide a summary review of available information regarding the Coastal Flood Elevations provided by the Federal Emergency Management Agency (FEMA), Flood Insurance Study (FIS), along with review of the U.S. Army Corps of Engineer’s North Atlantic Comprehensive Study (NACCS) on stillwater elevations, wave heights, total water elevations and FEMA’s 10-year (10-percent), 50-year (2-percent), and 100-year (1-percent) recurrence interval flood projections. In addition, GZA will review sea level rise estimates assuming a 50-year service life scenario (i.e., end of evaluation service life at year 2070). The relative sea level rise at the site will be estimated using the USACE sea level rise calculator and NOAA 2017 sea level rise projections.

SUB-TASK 5.2: REVIEW MEETING AND FINAL CONDITION ASSESSMENT REPORT

Subsequent to submission of the Draft Assessment Report, GZA will meet with the Town of Chilmark, and appropriate stakeholders, to discuss the findings of the Existing Conditions Assessment Study and recommended repairs and improvements. In preparation of the budget for this task, GZA has included time for response to the town reviewers’ questions and implementation of any revisions, or additional information requested, to progress the report for final submission.

FEE SCHEDULE SUMMARY

The cost estimate for the above-described Scope of Services will be based on actual accrued time and expenses for the Tasks outlined above that is summarized in the following table with detailed labor breakdown provided in the cost breakdown spreadsheet in Section 6, **Attachment C**:

TASK NO.	NAME	FEE
1	Project Review	3,145
2	Above-Water Condition Assessments	17,166
3	Initial Evaluation – Town Review	3,022
4	Underwater Condition Assessments (if required)	20,066
5	Condition Assessment Report	11,861
	Reimbursable Expenses (Travel, Ferry, etc..)	4,700
TOTAL FEE		\$59,960



SECTION 5 | PROJECT SCHEDULE

SECTION 5 | PROJECT SCHEDULE

GZA is prepared to commence work on this project immediately upon acceptance of this proposal and issuance of a purchase order. We have assumed that the Town of Chilmark plans to issue a notice to proceed in early-February 2022. For the purposes of the anticipated schedule below, GZA will initiate the Phase 1 – inspection and assessment work by the week of February 7, 2022.

ANTICIPATED SCHEDULE

Task	Anticipated Duration	Anticipated Schedule
Phase 1 – Certified Engineer Assessment and Report		
Task 1: Project Review		
Sub-Task 1.1: Project Review – Available Documentation	2 Days	By week of February 14, 2022
Sub-Task 1.2: Review Prior Coastal Resiliency Reports, Sea Level Rise Conditions, and Above-Water Conditions Assessment	2 Days	By week of February 14, 2022
Task 2: Above-Water Inspections, Evaluations and Topographic Survey		
Sub-Task 2.1: Topographic Survey	1 Day	Week of February 21, 2022
Sub-Task 2.2: Above-Water Investigations – Docks and Bulkhead	2-3 Days	Week of February 21, 2022 (Low Tide Week)
Sub-Task 2.3: Bulkhead UT Readings	1 Day	Week of February 21, 2022 (Low Tide Week)
Sub-Task 2.4: Reduce Survey Data – Create Existing Plan	1 Week	By Early March
Sub-Task 2.5: Reduce Field Inspection Data/Compile Photographs and Data Tables	1 Week	By Early March
Task 3: Initial Evaluation/Town Review	1 Day	Week of March 7, 2022
Task 4: Underwater Inspections	3 Days	By March 24, 2022
Task 5: Condition Assessment Report		
Sub-Task 5.1: Develop Draft Report	3-4 Weeks	By March 28, 2022
Sub-Task 5.2: Review Meeting - Virtual	1 Day	By March 30, 2022
Sub-Task 5.3: Final Report	2-3 Days	By April 4, 2022

We anticipate that several of the tasks above can be done simultaneously with other tasks. For example, topographic survey may be done in conjunction with the above-water inspections and UT reading work. Development of the Condition Assessment Report can be initiated once the above-water field data has been completed. Additional inspections results can be included to the report as they are completed.

GZA intends to meet the schedule requirements of the Town, however, unforeseen conditions that may alter the schedule would include environmental conditions (i.e., weather, ice, high flow conditions, tidal fluctuations), ferry cancellations, and COVID-19 restrictions. GZA is providing this schedule with the belief that we will be able to fulfill the scope and schedule requirements during this COVID-19 Pandemic. If delays are incurred beyond our control and/or performance of services are rendered impossible due to COVID-19, GZA will notify Client of that Force Majeure event.



SECTION 6 | ATTACHMENT A RESUMES



Anders Bjarngard, P.E.

Principal

Summary of Experience

Mr. Bjarngard's areas of experience include: geotechnical engineering, marine and coastal engineering, dam safety inspections and investigations, subsurface investigations; foundation, lateral earth support, dam rehabilitation; bulkheads, revetments, sea walls and living shorelines; dune and beach nourishment, dredging; construction monitoring and documentation; slope stability, seepage, and settlement analyses; and preparation of associated permits, plans, specifications, and contract documents. Relevant project experience includes:

Relevant Project Experience

Principal-in Charge, Reservation Terrace Plum Island Dune Nourishment, Newburyport, Massachusetts. Evaluated historic and accelerated erosion of dunes within the mouth of the Merrimack River using historical photographs, survey and numerical modeling. Developed remedial short-term alternatives to mitigate erosion which ranged from hard structures such as walls and revetments to softer solutions such as dune nourishment and management methods such as controlled access walkways and planting of dune grass and other native vegetation. Fast track permitting included consultation with Massachusetts Environmental Policy Act (MEPA), Massachusetts Natural Heritage and Endangered Species Act (MESA), and Newburyport Conservation Commission.

Principal-in Charge, Wynn Resorts Casino and Resort, Everett, Massachusetts.

Mr. Bjarngard was responsible for the waterfront and marine design development for the construction of the Wynn Casino at former chemical manufacturing facility in Everett, Massachusetts. The heavily contaminated property is located on the Mystic River, presenting numerous environmental, geotechnical, and permitting challenges. Marine construction includes dredging of contaminated sediment; a large float system to support ferry, water taxi and transient vessels; bulkheads; pile supported walkways; a living shoreline and other site and landscape elements. Mr. Bjarngard also helped obtain project permits on an accelerated schedule including: Order of Conditions, Water Quality Certifications, NPDES permits, Army Corps of Engineers Permits, Massachusetts Environmental Policy Act (MEPA) authorizations and permits through the Massachusetts Department of Environmental Protection.

Principal-in-Charge, Stacy Boulevard Seawall Reconstruction, Gloucester, Massachusetts.

Responsible for the permitting and reconstruction of a 1,800 lineal foot stone masonry seawall along the shoreline of Gloucester's Outer Harbor. The proposed project was funded by Seaport Advisory Council and provides for reconstruction of a majority of the bulkhead within the existing footprint as well as harborwalk reconstruction and landscaping improvements.

Principal-in-Charge, Salisbury Beach Sand Nourishment Project, Salisbury, Massachusetts.

GZA is assisting the Massachusetts Department of Conservation and Recreation with the engineering and permitting required to replace sand, which has eroded from the State beach during recent winter storms. The sand will be obtained from dredging the channel of the Merrimack River as well as importing from off-site services. Harvesting by mining from the tidal zone and/or offshore will also be evaluated. GZA's scope consists of topographic and bathymetric survey, stakeholder meetings, design, cost estimating and permitting. Bid and Construction Phase, as well as development of a storm response action plan and littoral drift study are also included.

Education

B.S., 1983, Civil Engineering,
University of Massachusetts
M.S., 1989, Civil Engineering (Geotechnical),
Tufts University

Registrations & Certificates

Professional Engineer
1997, Massachusetts, #39766

Affiliations

- American Society of Civil Engineers
- Boston Society of Civil Engineers
- American Shore and Beach Preservation Association
- U.S. Society on Dams
- Association of State Dam Safety Officials
- American Concrete Institute
- National Hydropower Association
- Northeast Sustainable Energy Association

Areas of Specialization

- Geotechnical Engineering
- Coastal/Marine Engineering
- Dam Engineering
- Dam Inspections



Anders Bjarngard, P.E.

Principal

Principal-in Charge, Pigeon Cove Breakwater Repairs, Town of Rockport, Massachusetts. Responsible for the inspection, design, permitting and construction support for repairs to two breakwaters: a 1,000-ft long land connected, granite stone, upper breakwater and an independent 320-ft long harbor entrance, granite block, breakwater. Worked with the Town and FEMA on developing mitigation rehabilitation that was approved for partial funding by FEMA. Construction was completed in the spring of 2016 on schedule and within budget.

Consultant/Reviewer, Long Beach Seawall Repairs, Rockport, Massachusetts. Provided Quality Assurance review for the permitting, inspection, evaluation, design, and identification of grant funding sources, for repair and replacement of a 3,350-linear foot seawall. The project also included fast-track permitting, design, and construction oversight for repairs to the abutting walkway to address public safety hazards. Preliminary design of the seawall repairs is currently completed, and funding/grant opportunities are being pursued.

Principal-in-Charge, Glover's Wharf and Recreational Marina Improvements, Beverly, Massachusetts. Served as GZA's internal Quality Assurance Consultant Reviewer for the first phase of this project, which involved GZA's design, and construction oversight of 5,000 square feet of steel pile supported concrete wharf, 275 linear feet steel sheet pile bulkhead, granite seawall repairs, and a 6,800-square foot bottom anchored concrete floating dock system. Mr. Bjarngard served as GZA's Principal-in-Charge on the second Phase of the project, which included a new commercial fishing facility constructed with concrete floats anchored by rock-socketed anchor piles.

Principal-in Charge, Surf Avenue Seawall, Town of Marshfield, Massachusetts. Responsible for the improvement of over 2,000 feet of existing concrete seawall originally constructed in 1932 includes complete replacement of 470 feet of wall that failed during a storm event. Replacement seawall incorporates a sheet pile cut-off wall.

Principal-in-Charge, Blynman Canal Seawall Repair Project, Gloucester, Massachusetts. The project scope includes inspection and survey, design and permitting associated with Seaport-funded repair of this granite block sea wall. Protection of critical structures including a MassDOT Bridge tender house immediately adjacent to the wall and a utility tunnel underneath the wall, are particularly challenging aspects of the work.

Principal-in-Charge, White Wharf Repairs, Rockport, Massachusetts. Responsible for engineering oversight of repairs to an approximate 50-foot-long failed section of the filled-wharf structure. The wharf was constructed in the mid 1700s and currently consists of granite block walls, gravel and concrete fill, and a granite block and concrete surface treatment with a granite seawall/breakwater extending approximately 10 feet above the finished grade along the north side of the wharf for protection from the ocean.

Principal-in-Charge, Massachusetts Department of Conservation and Recreation Heritage State Park Waterfront Improvements, Fall River, Massachusetts. Responsible for site investigations, including inspections and topographic survey as well as design development and permitting associated with repairs to seawalls and a harbor walk. The project also includes consideration of flood evaluation inclusive of climate change impacts such as increased storm magnitude/frequency and sea-level rise.

Consultant/Reviewer, Mechanic Street Seawall Replacement, Portsmouth, New Hampshire. Reviewed and provided consultation for the permitting, design, and construction oversight for replacement of 110 linear feet of granite block seawall. The project included historic research of the wall, geotechnical subsurface investigations, permitting, design, community outreach to the neighborhood group, and construction support services.

Principal-in Charge, Prides Crossing Granite Seawall Reconstruction Project, Beverly, Massachusetts. After failure of this existing seawall during a recent winter storm, GZA coordinated and performed inspection and survey of the subject property and adjacent properties. Alternative repair concepts were developed along with associated cost estimates. GZA developed final design on the selected alternative and performed permitting, contract document preparation. GZA also provided bid phase and construction oversight services.

Principal-in Charge, The Beach Club Seawall Evaluation and Repair Swampscott, Massachusetts. GZA performed a detailed field inspection and survey of the existing wall and adjacent structures. Repair recommendations along with engineering costs estimates were provided.



David A. Smith

Senior Project Manager

Summary of Experience

Mr. Smith has contributed to the survey, inspection, planning, permitting, and design of waterfront projects throughout the Eastern United States, including bridges, urban ports, and harbors, dredging projects, marinas, docks, parks, bulkheads, breakwaters and seawalls. Based on his 29 years of working on waterfront projects he has a keen understanding of all aspects of implementing waterfront work. His responsibilities have included field investigations, underwater inspection, structural evaluations, as well as providing lead permitting, design and construction oversight services on literally hundreds of waterfront improvement projects. He has undergone extensive training in the methods and use of various surveying and inspection equipment. His construction and dive inspection experience provides keen insight into the design and preparation of construction documents for waterfront structures. Some of the investigations, permitting, and design assignments have included:

Relevant Project Experience

Nantucket F Street Pier/Bulkhead, Nantucket, Massachusetts. Mr. Smith is serving as Project Manager for the inspection/evaluation of existing, development of conditions assessment letter report, design, permitting, bid phase and construction oversight services for replacement of the existing approximately 200-foot-long steel sheetpile bulkhead pier located on Hither Creek in Madaket, MA. The new steel sheetpile bulkhead will front the existing deteriorated bulkhead. The project is currently under construction.

Nantucket Town Pier Inspection and Storm Damage Repair Project, Nantucket, Massachusetts. Mr. Smith served as the Project Manager for the above-water and underwater inspection and assessment of the existing Town Pier facility. Services included inspection, condition report development, and contract document preparation work. Prior to implementation of the construction work, a major winter storm in January 2015 caused excessive damage to the facility. Mr. Smith provided immediate response and developed a condition assessment, permitting, bid phase and construction services to reconstruct the pier facility prior to the 2015 boating season. An additional post-storm inspection was performed in March 2018 after a several day Nor'easter caused extensive damage to the facility. Mr. Smith Provided an inspection and condition assessment report for the Town.

Shaw Cove Steel Sheetpile Bulkhead, City of New London, Connecticut. Mr. Smith served as Project Engineer/Diving Supervisor for the above-water and underwater inspection, ultra-sonic thickness readings, and condition evaluation assessment Mr. Smith developed a condition assessment report and provided recommendations and budgetary cost estimates for repairs.

Massachusetts Port Authority (Massport) – Various Locations, Boston, Massachusetts. Mr. Smith served as Project Engineer/Diving Supervisor for the above-water and underwater inspection, ultra-sonic thickness readings, and condition evaluation assessment of various Massport-owned facilities under multiple Waterfront Services Contracts including; Conley Terminal Berth's 11, 12, 14, 16 and 17; East Boston Shipyard Pier's 1, 2, 3 and 5; Mystic Pier One, East Boston Pier One, Moran Terminal, Medford Street Terminal, Army Base and Logan Airport Approach Piers. Mr. Smith was

Education

A.S., 1985, Civil Technology,
Northern Essex Community College
A.S., 1991, Engineering Science,
Northern Essex Community College
B.S., Civil Engineering, 1993,
University of Massachusetts- Lowell

Licenses & Registrations

Engineer-in-Training, 1995, Massachusetts,
#16030
Open Water Diver, 1989, PADI
N.H. Licensed Designer, Subsurface
Disposal Systems, New Hampshire, #1115
Hypack Certified Hydrographer, 2012

Affiliations

- Boston Society of Civil Engineers
- American Society of Civil Engineers
- Granite State Designers and Installers Association
- The Hydrographic Society of America
- Massachusetts Marine Trades Association

Areas of Specialization

- Waterfront Engineering
- Civil Engineering
- Hydrographic Surveys
- Side Scan Surveys
- Sub-Bottom Profile Surveys
- Eelgrass/Shellfish Delineations
- Soil Exploration

Presentations

- Dredging, 2011 United States Coast Guard, Ocean Engineering Working Group
- Stacy Boulevard/Blyman Canal Bulkhead Improvement Project, Gloucester, MA. GZA Technical Conference, March 2018



David A. Smith

Senior Project Manager

involved in the inspection of these facilities and provided the existing conditions report and developed budgetary costs estimates for repairs.

New Bedford Redevelopment Authority, New Bedford, Massachusetts. Mr. Smith coordinated and performed an underwater inspection and ultrasonic thickness readings of the approximate 1600 lineal foot steel sheetpile wall of the South Terminal in New Bedford Harbor in New Bedford, Massachusetts. Inspection was directed to determine the overall general condition, evidence of corrosion and any other visual structural deficiencies below the low water elevation including visual observation of the lower portion of the concrete wall cap.

Central Waterfront Piling Inspection Project, Newburyport, Massachusetts. – Mr. Smith served as Project Engineer for the above and underwater limited inspection services on the existing steel sheetpile bulkhead and concrete-filled, steel guide piles anchoring the City's public float system. Mr. Smith performed the inspections, including ultrasonic thickness readings and developed the conditions report and provided the City with recommendations and budgetary cost estimates.

Massachusetts Maritime Academy Facility Assessment – Buzzards Bay, Massachusetts. Mr. Smith served as Project Engineer/Diver for the underwater inspection and condition evaluation assessment of the support pilings, bulkhead and riprap slope at the main berthing facility at the Academy. Mr. Smith provided the existing conditions report and developed budgetary costs estimates for repairs.

Clarke Bulkhead Replacement Project, Salem, Massachusetts. Mr. Smith served as Project Manager for the inspection, condition assessment, design, permitting, bid phase and construction oversight services for an approximate 118 lineal foot steel sheetpile bulkhead replacement project fronting an existing timber lagging bulkhead along the South River in Salem, Massachusetts.

Cape Ann Marina Dredging Project, Gloucester, Massachusetts. Mr. Smith is serving Project Manager for survey, design, permitting, bid phases and construction oversight services for the reconstruction of an existing 330 lineal foot steel sheetpile bulkhead fronting the marina facility. Mr. Smith provided the necessary permitting services for this project and secured permits from the following agencies: Massachusetts Environmental Policy Act (MEPA), U.S. Army Corps of Engineers Permit, Massachusetts Department of Environmental Protection (MADEP), Chapter 91, and Gloucester Conservation Commission.

Stacy Boulevard Bulkhead Reconstruction Project, Gloucester, Massachusetts. Served as Project Manager for design and permitting services for the reconstruction of an 1,800 lineal foot stone masonry seawall along the shoreline of Gloucester's Outer Harbor. The proposed project provides for reconstruction of a majority of the bulkhead within the existing footprint, with the exception of a 332 lineal foot portion of bulkhead to be constructed seawall of the existing wall within the intertidal shoreline area. Mr. Smith provided the necessary permitting services for this project and secured permits from the following agencies: Massachusetts Environmental Policy Act (MEPA), U.S. Army Corps of Engineers Permit, Massachusetts Department of Environmental Protection (MADEP), Chapter 91, Gloucester Conservation Commission and Gloucester City Council.

Comprehensive Statewide Inventory and Assessment of Coastal Infrastructure Structures, Various Locations, Massachusetts. Performed visual inspections of various coastal structures identified on the Initial Massachusetts Department of Conservation and Recreation (DCR) Sites for Inspection list. Evaluated and prioritized each structure with a foreshore rating system to assist the DCR in prioritizing future improvement programs.

Gloucester Harbormaster Berthing Improvement Project, Gloucester, Massachusetts. Mr. Smith has served as Project Manager for the proposed improvement to the City's Harbormaster berthing facility. Mr. Smith has performed survey, inspection, design, permitting, and bid phase services for this ongoing project. The work is being performed in close coordination with National Grid who is proposing a large remediation project at, and adjacent to the site. The work includes new pile-supported anchored concrete floats with the main floats being design as breakwater floats for wave protection. Smaller finger floats will be connected to the main float and be orientated to the north, northeast of the main float system. Two gangways will provide access to the float system; one gangway will be ADA accessible and the second gangway for Harbormaster use. Electrical power and a vessel pump-out system will be proposed as part of berthing improvement facility.



Matthew T. Taverna, P.E.

Senior Project Manager

Summary of Experience

Mr. Taverna has over 16 years of experience in coastal, geotechnical and structural engineering applications for waterfront structures. Mr. Taverna maintains thorough knowledge in the design for municipal, industrial, commercial and residential marine facilities. His professional career includes performing structural analysis on various marine applications, regulatory permitting, cost estimating, surveying and site planning for various waterfront uses, preparation of construction contract documents, material specifications, and construction administration.

As an Engineer, Mr. Taverna has inspected and performed structural analysis assessments on timber, concrete and steel elements. He has designed and prepared construction documents for timber, concrete and steel bulkheads including tie-back systems. He has obtained federal, state and local permits for shoreline stabilization, marina improvements, dredge operation and various municipal, commercial and residential projects. Mr. Taverna has performed above and below water inspections and prepared condition assessment reports that included estimated construction costs for repairs.

Relevant Project Experience

Bulkhead Analysis, Gowanus Canal, New York. Reviewed design calculations and drawings for approx. 1,500-foot-long pipe pile bulkhead supporting approximately 40 feet of organic material. Design review included analyzing liquefaction of soil material during seismic event. Provided various options to reduce liquefaction of soil material, reviewed cost estimates for various methods of installation and provided options for reducing the depth of the sheet pile bulkhead material to reduce cost of the project.

Private Marina Assessment, Port Jefferson, New York. Prepared and managed design team for site assessment of an existing 900-foot-long timber pier, supported by 180 timber piles, a 900-foot-long timber wave screen, supported by 120 timber piles and 2,000-linear feet of floating docks supported by 100 timber piles. Review of structures included an ASCE Level II diving inspection. Prepared site condition assessment report which discussed existing site conditions, damage to structures, repairs to structures and estimated cost to repair structures.

Shoreline Protection, Queens, New York. Permitted, designed, prepared construction drawings, specifications, and construction cost estimate for a 2,000-foot-long stone revetment structure at Ralph Demarco Park in Queens, NY. The structure was damaged during Hurricane Sandy and the structure was required to stay within same footprint. The revetment structure design was modified to allow for the existing trees to remain undisturbed during construction.

Residential Dwelling, Westport, Connecticut. Provided wave analysis for concrete piers and grades beams supporting a residential dwelling. The results of the wave analysis were used to develop design environmental loads associated with extreme (current 100-year recurrence interval) water levels and waves.

Education

Coastal Engineering Certificate, 2019,
Old Dominion University
M.S., 2015, Structural Engineering
University of Connecticut
B.S., 2005, Structural/Civil Engineering,
Lafayette College

Licenses & Registrations

Professional Engineer – Connecticut,
#0028433
Professional Engineer – New York,
#102757

Areas of Specialization

- Coastal Engineering
- Structural Engineering
- Geotechnical Engineering
- Construction Management
- Above and Below Water Inspections
- Waterfront Permitting
- Marina Design

Certifications/Training

- SSI Scuba Certification
- Transportation Worker Identification Credential

Affiliations/Memberships

- American Council of Engineering
- American Institute of Steel Construction
- Structure Engineering Institute



Matthew T. Taverna, P.E.

Senior Project Manager

Public Harbor Walk, Salem, Massachusetts. Prepared site inspection team, prepared federal, state and local permit applications, presented at local hearing, prepared geotechnical and structural analysis calculations and monitored construction activities for a 1,000 f.t. long concrete walkway supported by a steel sheetpile bulkhead and timber piles.

Relevant Project Experience Prior to GZA

Commercial Pier, New Haven, Connecticut. Prepared and managed design team for initial site inspection and geotechnical soil observation, prepared construction cost estimate, prepared federal and state permit applications, performed structural analysis on proposed structure, prepared construction drawings, prepared construction administrative proposal and monitored the construction phase for the ACEC nationally awarded Nathan Hale Pier Reconstruction Project. The structure is a 7,000 s.f., ADA compliant, fishing pier, supported by 133 timber piles and designed to resist the FEMA 100-year storm. The project was completed on time and within client's budget.

Municipal Marina Improvements, Fairfield, Connecticut. Prepared and managed design team for initial site inspection of approx. 500,000 sf marina with approx. 3,500 linear feet of dock and 10 timber piers. Prepared condition assessment report with a multitude of various reconfigure options, that included drawings and estimated construction costs. Presented options and costs at multiple public meeting.

Municipal Boat Ramp, Greenwich, Connecticut. Prepared and managed design team for initial site inspection of the existing deteriorated asphalt boat ramp, prepared federal, state and local permit applications, prepared construction documents, which included construction drawings, specifications and bid documents, reviewed construction activities which included reviewing submittals, invoices, presented at weekly construction meetings and monitored construction for a 4,000 s.f. concrete boat ramp. The project was completed within the allocated time to allow for opening prior to boating season.

Residential Pier, Greenwich, Connecticut. Prepared design team for initial site inspection, managed, reviewed and submitted federal, state and local permit applications, liaison between owner, architect and design team, prepared construction contract, reviewed construction, made on-site modifications to design resulting from various soil conditions. Modifications kept project within budget and project finished within allocated time.

Stone Seawall and Patio, Yacht Club, Greenwich, Connecticut. Managed design team for initial site inspection, prepared and reviewed federal and state permit application, prepared and reviewed design calculation for FEMA compliant 400' long stone seawall protecting a new 2,500 s.f. concrete/paver patio. Liaison between yacht club representative, architect, design team and contractors. Mentored junior engineers in construction administrative services such as concrete testing, payment applications and submittal review.



Joshua J. Zall, EIT

Project Manager

Summary of Experience

Mr. Zall has over 16 years of experience and has been involved in topographic and hydrographic survey, inspection, planning, permitting, design and construction oversight for various marine waterfront civil/structural engineering applications throughout eastern United States including bridges, dredging projects, marinas, docks, bulkheads, seawalls and dams. His responsibilities have included field investigations and inspections, coordination and implementation of hydrographic and topographic surveys, underwater inspection, and project management as well as providing permitting, design and construction oversight service on waterfront projects. Some of Mr. Zall's projects include:

Relevant Project Experience

Massachusetts Port Authority Waterfront Structures Inspection, Boston Harbor, Massachusetts. Served as Project and Field Engineer for the inspection of waterfront structures at seven facilities for the Massachusetts Port Authority. Structures included timber piers, concrete wharfs and piers, gangways and floating dock systems, revetment slopes, sheetpile bulkheads, and mooring structures. Services included conditions inspection, concrete coring oversight, development of existing conditions report, conceptual design, cost estimating.

Nantucket Town Pier Inspection, Nantucket, Massachusetts. Served as Project and Field Engineer for the inspection and design of repairs to a Town-owned marina facility for the Town of Nantucket that incurred damage during winter storms. Structures included a timber pile-supported, timber framed pier system, steel and timber breakwater system and pile-held timber floating docks. Services included above-water and underwater inspection including ultrasonic thickness measurements of steel structural members, development of conditions report and programmatic repair schedule, cost estimating, preparation of permit documents, preparation of construction documents and construction submittal reviews.

Submarine Cable Location, Gloucester Drawbridge, Annisquam River, Gloucester, Massachusetts. Served as Project and Field Engineer to locate an underwater and underground power cable in the vicinity of the MBTA Gloucester Drawbridge over the Annisquam River in Gloucester, Massachusetts. Services included underwater tracking of submarine cable both at grade and below grade within an active river channel, development of a conditions plan to show the approximate location of the cable as tracked during the underwater investigation.

Magnolia Pier Inspection, Gloucester, Massachusetts. Served as Project and Field Engineer for the inspection and design of repairs to a City-owned pier structure in Gloucester, Massachusetts. A detailed underwater and above-water inspection was performed on the existing timber pile-supported and timber framed pier structure that incurred damage during winter storms. Services included inspection of the structure, development of an existing conditions report, design of structural repairs/reconstruction, development of permitting and construction documents, and bid phase services. The project is currently under construction.

National Grid Timber Pier Conditions Assessment, Gloucester, Massachusetts. Served as Field and Project Engineer for the conditions assessment of the four timber-framed piers at the National Grid site along Gloucester Harbor in Gloucester,

Education

B.S., 2007, Civil Engineering,
University of Vermont

Registrations & Certificates

Engineer-in-Training
2007, Vermont, #3478
Open Water Diver
2006, NAUI
40 hr. HAZWOPER Training, 2011
10 hr. OSHA Construction Safety, 2016
Hypack Certified Hydrographer, 2012

Affiliations

- American Institute of Steel Construction
- Boston Society of Civil Engineers
- American Society of Civil Engineers
- Order of the Engineer

Areas of Specialization

- Marine Waterfront Engineering
- Civil Engineering
- Hydrographic and Topographic Surveys
- CADD Technician
- Construction Inspection
- Subsurface Investigations



Joshua J. Zall, EIT

Project Manager

Massachusetts. Detailed conditions assessment and documentation was performed prior to demolition of existing piers and remediation dredging to accurately replace structures after completion of dredging. Project responsibilities included condition assessment, documentation, data reduction and assistance in the preparation of existing condition site plans.

1st Lt. Derek S. Hines Bridge over the Merrimac River – Bridge Fender System, Amesbury, Massachusetts. Served as Field Engineer for inspection and construction oversight for the timber fender system protecting the pivot pier of the swing bridge replacement. Project included working with the design-build team to assess unforeseen deterioration and damage of the existing fender system above and below water; evaluating repair options considering regulatory requirements, site constraints, and project timeline; and designing a unique repair alternative using mini piles.

Glover's Wharf, Ferry Landing & Commercial Marina Projects, Beverly, Massachusetts. Served as Project and Field/Resident Engineer for the multi-faceted and multi-phased projects at Beverly Harbor for the City of Beverly. The initial phase of the project involved topographic and hydrographic surveys of the site, development of permit plans and applications for local, state and federal authorities, and construction oversight. The initial phase of the project included the demolition of the existing floating dock structures, existing concrete wharf, existing timber and stone bulkhead. Structures were designed and replaced with concrete floating docks, concrete wharf, and steel sheet pile bulkhead. The second phase of the project included the dredging of the Ferry Landing portion of the site to accommodate the proposed concrete floating dock system. Services involved additional topographic and hydrographic survey, sediment sampling, development of dredging permit applications, dredging construction oversight, including submittal review, and payment requisition review, and testing of the dredge spoils during the dewatering process. The final phase of the project included the underwater and above water assessment of the existing Commercial Marina Site, and design and permitting of a proposed concrete floating dock system. Services included permitting, additional hydrographic and topographic survey, assisting in the bid reviews and reference reviews, construction oversight, submittal review, payment requisition review and overall project coordination.

Ipswich River Boat Ramp Reconstruction Project, Ipswich, Massachusetts. Serving as Project Engineer and Project Manager for the reconstruction of the boat ramp and public access facility for the Commonwealth of Massachusetts Department of Fish and Game, Office of Fishing and Boating Access. The project involved the inspection of the existing structure and the reconstruction of the concrete boat ramp and portion of the existing concrete seawall. Services included topographic survey and inspection, design, local, state and federal permitting, and preparation of bid documents. The project is currently in the submittal phase and is anticipated to be under construction during the winter/spring of 2020. Current services during the construction phase of the project include coordination with permitting agencies and review of contractor submittals.

F Street Bulkhead Replacement Project, Nantucket, Massachusetts. Serving as Project and Field Engineer providing topographic survey and above and underwater inspection of an existing steel sheetpile bulkhead owned by the Town of Nantucket. A detailed inspection and survey of the structure and site features was performed including observation of corrosion areas and underwater and above-water ultrasonic thickness measurements. Services included limited topographic survey, data reduction, under and above water inspection of the existing structure, and preparation of site plans and sections. The project is currently in the permitting phase.

PSEG Power Connecticut, Bridgeport Harbor Station, Bridgeport, Connecticut. Served as Field Engineer providing topographic and hydrographic surveys of the site, as well as inspection and conditions assessment of the PSEG Oil Dock facility. Services included land survey with RTK GPS of the shoreline and backland site features, hydrographic survey of the nearshore area, inspection of structures relating to damage from Superstorm Sandy, data reduction, preparation of site plans and sections, and assisting in the preparation of a conditions assessment report and cost estimating for proposed repairs.

Frenchboro Ferry Terminal, Frenchboro, Maine. Field Engineer providing topographic survey and condition assessment of the existing facility at the Frenchboro Ferry Terminal for the Maine Department of Transportation. Services included topographic survey, data reduction, preparation of site plans, sections and assisting in the preparation of condition reports.



Dino D. Fiscoletti, P.E.

Technical Practice Lead/Senior Consultant

Summary of Experience

Mr. Fiscoletti serves as Technical Practice Lead of GZA's Marine and Waterfront Group. He has been involved with a variety of engineering projects in a wide range of responsibilities. His design experience is multi-disciplinary and includes structural, coastal, geotechnical and civil engineering. He has also been involved in construction administration and project management. He has planned, performed or been in direct supervision of site and subsurface investigations, condition surveys, structural analysis and design, design of deep and shallow foundations, oceanographic and hydraulic analyses, preparation of construction documents, technical specifications, and cost estimates and preparation of coastal and waterways permits.

Mr. Fiscoletti's marine experience includes the analysis, design and production of contract documents for pile supported piers and wharfs, fender systems, steel sheet pile bulkheads, granite block and concrete seawalls, revetments, breakwaters and other shore protection structures, and dredging and dredge disposal programs. He has performed numerous condition surveys and developed rehabilitation programs for existing timber, steel, and reinforced concrete waterfront structures. He has also been involved in the design and development of marinas and berthing facilities for small craft as well as deep draft vessels.

Relevant Project Experience

Project Manager, Rehabilitation of Davisville Pier No. 2, North Kingstown, Rhode Island. Coordinating field data collection efforts, design and construction document production, and construction phase services for this multi-part effort. GZA initially assisted in the evaluation of the existing pier's bulkhead structure and its ability to accommodate deeper drafts and heavier deck loadings. Following the decision to upgrade and expand, GZA undertook a subsurface investigation program to inform the design of new bulkheading for the existing pier and piles for a pier extension. GZA was subsequently awarded the design for the east (Phase I) and south (Phase III) faces of the pier. GZA also provided design guidance for the pier extension along the east face (Phase II). Construction is phased to allow for continued operation of the facility during construction. Construction on the east face has been completed, and construction is continuing on the southern face of the pier.

Project Manager, Ferry Terminal Reconfiguration and Reconstruction, Woods Hole, Massachusetts. Overseeing coordination of field data collection, design efforts, permitting, construction document production, and construction phase services. The project includes the reconfiguration of the three slips, passenger loading areas and upland vehicle staging areas existing Woods Hole Ferry Terminal and construction of a new off-site administrative building in Falmouth, Massachusetts. The scope includes the preparation and submittal of environmental permit applications for the work, civil engineering services for both the terminal and administrative building sites, geotechnical engineering services for the design and construction of new waterfront structures in Woods Hole and upland structures at both sites, performing a pre-demolition evaluation of hazardous materials within the existing terminal building and preparing a Release Abatement Measures (RAM) and soils management plan. Construction is ongoing and phased over several seasons to allow full operation of the ferry terminal during the very busy summer season.

Education

B.S., 1982, Civil & Environmental Engineering, University of Rhode Island
M.S., 1987, Structural Engineering, University of Rhode Island

Registrations & Certificates

Professional Engineer, RI, #5234
Structural Engineer, MA, #35621

Areas of Specialization

- Port and Marine Engineering
- Structural Engineering
- Construction Administration
- Project Management



Dino D. Fiscaletti, P.E.

Technical Practice Lead/Senior Consultant

Project Manager, Bulkhead and Fender Replacement, Gulf Oil, LP, Chelsea, Massachusetts. Manager and served as lead structural engineer for the evaluation of geotechnical and structural conditions and the preparation of construction documents for the replacement of approximately 600 linear feet of existing sheet pile bulkhead and the installation of new fenders at an operating petroleum products terminal. Challenges included phasing the work and sequencing construction to allow for the installation of a new king-pile bulkhead and anchorage system without disrupting regular terminal operations. Responsibilities included bid administration, construction observation and construction management.

Project Manager, Improvements to Davisville Pier No. 1, Quonset Development Corporation, Davisville, Rhode Island. Manager and technical lead for the evaluation of structural conditions, completion of a berthing study and preparation of construction documents for the rehabilitation of this seven-acre concrete and timber pier. Tasks included performance of condition surveys, study and cost analysis of options for fender improvements, design of a pier rehabilitation schemes and design of a new fender system to accommodate RO/RO automobile transports. Construction documents were prepared for structural improvements and a new, pile supported fender system. Responsibilities included construction administration.

Senior Technical Consultant, Mooring Dolphin Design and Construction, Gulf Oil, LP, New Haven, Connecticut. Project included design and construction of pile supported mooring dolphins for this busy oil terminal. Limited overburden and a shallow bedrock surface required that tanker and barge mooring forces be resisted by rock anchors and steel pipe piles. Mooring line design forces were developed using proprietary software.

Senior Technical Consultant, Offshore Windfarm Staging, Deepwater Wind, Port of Providence, Rhode Island. Responsible for the design and construction of foundations required for support and staging of turbine towers during equipment fit-out at the Port, prior to delivery and installation off of Block Island, RI.

Project Manager, Ferry Slip and Pier Rehabilitation, Maine DOT, Frenchboro, Maine. Managed the inspection and evaluation of an existing facility, preparation of an alternatives analysis, design of improvements, development of construction documents and performance of construction phase services. The existing facility includes a stone masonry pier, vehicular transfer bridge, and timber pile dolphins. The alternatives analysis and basis of design were based on the inspection results and input from the project shareholders and public hearing input. Ferry slip improvements included replacement of timber pile dolphins with rock-socketed, steel pipe pile supported dolphins with energy absorbing fenders. Pier improvements consisted of repairs to voids in the stone masonry, removal, replacement and compaction of subgrade material and installation of new bituminous pavement.

Project Manager, Marginal Wharf Design, Tiltonville, Ohio. Project Manager and lead structural engineer for site investigations, design and permitting for a new marginal wharf for the loading and off-loading of sand at a sand processing facility along the Ohio River. Design was completed, including construction plans and specifications, and permits were submitted to local, state and federal agencies. The project was abandoned.

Technical Consultant, PSEG Bridgeport Harbor Station, Bridgeport, Connecticut. Responsible for assisting with the development of repair alternatives for a 1,000-foot-long oil dock damaged during Hurricane Sandy. Damaged structures included a timber pipe support trestle, timber pile supported walkways between fender dolphins and mooring dolphins, pipe pile supported concrete dolphins and fender systems.

Project Manager, Boat Haulout Construction and Seawall Improvements, Newport Shipyard, Newport, Rhode Island. Responsible for the design of new pile-supported reinforced-concrete piers and shoreside improvements required to support a 100-ton capacity boat haulout. A new sheet pile bulkhead was installed outboard of an existing granite block seawall at the foot of the piers. Due to questions regarding the stability of the existing seawall to support the haulout loading, the pile supported piers were extended over the seawall. Voids behind the seawall were filled with flowable concrete. Responsibilities included concept development, design of bulkhead and shoreside improvements, review of pier and pile foundation designs, production of construction documents, obtaining permits and providing construction administration services.

Pier and Bulkhead Rehabilitation, Hess Marine Terminals, Baltimore, Maryland and Perth Amboy, New Jersey. As Consultant/Reviewer providing oversight and direction during concept development, design and detailing of repair schemes for the rehabilitation of a pile supported pier and steel sheet pile bulkhead.



SECTION 6 | ATTACHMENT B SIMILAR PROJECT DESCRIPTIONS

Town of Nantucket F Street Bulkhead Replacement

Nantucket, Massachusetts



Project Highlights

- Above- and Underwater Inspection.
- Geotechnical Borings.
- Topographic and Bathymetric Survey.
- Continuation of Prior Condition Inspection/Assessment Work.
- Design, Permitting, Bid and Construction Support.
- Waterfront Rehabilitation.
- Reconstruction, Repair, and Improvement of Coastal Structures.

GZA was retained by the Town of Nantucket to provide above- and underwater inspection, geotechnical borings, limited topographic and bathymetric survey, design, permitting, contract document preparation, bid phase services, and construction support for the replacement and improvement of the F Street Bulkhead.

The F Street Bulkhead is a Town-owned, filled pier that extends from the northern end of F Street and into the tidal waters of Hither Creek in Madaket, Nantucket, Massachusetts. The existing bulkhead is constructed with internally braced, steel sheet piles and steel channel cap on three sides and the top surface is finished with asphalt pavement. Nine treated timber fender pilings are located around the perimeter of the steel sheet piles where existing grade is below mean low water level (MLW). Two timber-decked, floating docks are located along the east side and commonly secured to the bulkhead and timber fender piles with ropes. Two additional timber-decked, floating docks, supported by metal pipe guide piles, are located of the north side and accessible by an aluminum gangway attached to the top of the bulkhead. A pre-cast concrete plank boat ramp is located along the west side of the bulkhead. The F Street bulkhead facility is important to the local community and provides access for recreational and small-scale, local, commercial uses.

The existing F Street Bulkhead structure was severely deteriorated, with indications of heavily corroded exposed steel elements, uneven asphalt pavement, and sinkholes developing in the surface. GZA's inspection work included documentation of frequent holes in the sheet piles, which appeared to contribute to the disturbance and loss of fill from within the sheet piles.

GZA's design for the bulkhead replacement includes the partial demolition and abandonment of the remaining, deteriorated bulkhead structure. New cantilevered, coated steel sheet piles will be installed around the existing structure and then backfilled. The project also includes replacement and improvement the pavement and drainage features associated with the bulkhead, float guide pile replacement, and general site restoration. Construction of the project began in the Fall of 2021 and is scheduled for completion in January 2022 for a total construction cost of approximately \$630,000.



Reconstruction of Woods Hole Ferry Terminal

Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
Village of Woods Hole, Falmouth, MA



Project Highlights

- \$52 million marine reconstruction project
- GZA introduced innovations, including using large diameter pipe piles as berthing and mooring dolphins in lieu of traditional pile supported cast-in-place concrete dolphins
- In-the-water delineation of eelgrass beds, which are recognized as a special habitat of Submerged Aquatic Vegetation

The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority (SSA) provides ferry services from Cape Cod to the islands of Martha's Vineyard (via Woods Hole) and Nantucket (via Hyannis).

Challenge: The Woods Hole Ferry Terminal had two functional slips with deteriorating waterfront structures that were susceptible to storm surges. The project objectives were to (1) increase the number of slips to three to better accommodate growing ridership, (2) upgrade the condition of the waterfront structures (3) upgrade and relocate offsite the administration offices, and (4) improve the resiliency of the waterfront facility to reduce downtime resulting from storm surge damage.

Solution: GZA, as part of the design team, is providing engineering and environmental services to the SSA for the design, permitting, and reconstruction of their Woods Hole terminal. The project involves the relocation of the SSA's administrative offices into a new building and site development, phased reconstruction of three existing ferry slips, replacement of the existing passenger terminal and support/storage building, re-grading the terminal site to achieve enhanced resiliency against extreme events (floods) while providing ADA compliant accessible services, and reconstruction and enhancements to the stormwater management system and other utilities.



GZA directed subsurface investigations to develop geotechnical recommendations for the ferry terminal and administrative offices projects and developed parameters to be used in the design of the new piers, bulkheads, and structure foundations. Innovations introduced by GZA included the use of large diameter pipe piles as berthing and mooring dolphins in lieu of traditional pile supported cast-in-place concrete dolphins. GZA performed quality assurance design reviews of all marine structures.

GZA led the permitting effort for all local, state, and federal permits. As part of this task, GZA performed an in-the-water delineation of eelgrass beds to the south of the facility, which is recognized as a special habitat of Submerged Aquatic Vegetation. GZA is also providing site civil engineering design services for both sites, including re-grading the terminal site to achieve required flood protection and maintain accessibility for the public. In support of the permitting effort, GZA prepared an updated stormwater management system design in accordance with Massachusetts Stormwater Management Standards. *(continued)*

As part of this project, GZA also provided stormwater management, dredging design, hazardous building materials management; LSP services; and public outreach services.

GZA is currently providing construction administration services and environmental monitoring for all infrastructure improvements and construction of waterfront structures.

Benefit: When completed, the reconstructed facility will provide increased passenger capacity, modernized facilities, and be more resilient to storms and high-water events.



Shaw's Cove Steel Sheetpile Bulkhead Investigation



The City of New London Public Works Department contracted with GZA to provide Waterfront Engineering Services to design repairs or replacement of approximately 300 feet of existing bulkhead for the water's edge located along the Shaw's Cove waterfront situated on the western shore of the Thames River. The project, known as the Shaw's Cove Retaining Wall Replacement Project is part of the United States Army Corps of Engineers (USACOE) levee system and is maintained by the City of New London. The USACOE has performed inspections of the retaining structure and has deemed it to be unsatisfactory in the latest report. The City wishes to restore the structure to a level which satisfies the requirements of the USACOE.

As part of the levy system, the current structure hardens and protects the upland shoreline from storms and storm surges. The hardening of Shaw's Cove consists of revetments and retaining structures that protect the mostly commercial properties along Bank Street. GZA's initial scope of work tasks focused on the underwater inspection, performed by GZA's engineer/divers, in accordance with OSHA Subpart T – Commercial Diving Directives and the American Society of Civil Engineers, Underwater Investigations, ASCE Waterfront Facilities Inspection and Assessment Manual No. 130. Additional scope of work included development of a letter-format condition assessment report with considerations for repair/improvements options to maximize the longevity for the steel bulkhead that supports a concrete retaining structure along a commercial property's southern border.

Project Highlights

- Field reconnaissance including above and below water investigation
- Ultra-sonic thickness (UT) readings performed
- Development of Condition Report
- Development of Plans and Specifications
- Permitting

Client

City of New London
 Contact: Brian Sear
 Phone: 860.447.5250
 Email: bsear@ci.new-london.ct.us



Gloucester Harbormaster Berthing Improvement Project

City of Gloucester
Gloucester, Massachusetts



GZA provided initial survey and condition assessment of the existing facility. GZA provided preliminary concepts and budgets, planning with the City of Gloucester waterway board, grant funding applications, permitting with local, state, and federal regulatory agencies, and final design (plans and specifications) for the proposed Gloucester Harbormaster Berthing Facility located at Solomon Jacobs Park on Harbor Loop in Gloucester. Upon receiving permitting approvals and grant funding, GZA developed bid documents for both the City-procured concrete floats in advance of the installation contract.

Previously, access by the Harbormaster and the public was provided by use of an old timber pier with gangways and floating docks tied to the northern and southern sides of the pier. The pier was in poor condition as part of the remediation project, the deteriorated timber pier was removed and some seawall and land-filled areas were rehabilitated and/or altered. Upon removal of the timber pier and completion of the remediation work, the City replaced the timber pier and older timber berthing floats with the improved berthing facility.

The proposed berthing facility consists of new steel pipe pile-supported anchored floats. The main floats are heavy-duty, deep draft concrete floats used for wave protection for berthed vessels. Shallower draft floats are connected to the main floats and are orientated to the north, northeast of the main float system. Two gangways provide access to the float system; one 80-foot gangway will be for public access and ADA compliant and the second gangway is for Harbormaster use. A bridge gangway allows for dingy access on the north side of the landward float. Electrical power and a vessel pump-out system are additional improvements to the new berthing facility.

Project Highlights

- Provided initial survey and conditions assessment of existing facility
- Provided conceptual planning and budgeting, grant funding, engineering design, permitting, bid and construction phase services for the proposed berthing facility.
- Coordinated work with adjacent multi-million-dollar remediation project.



Cape Cod and Islands Coastal Projects

Barnstable, Hyannis, Bourne, Chatham, Dennis, Falmouth, Martha's Vineyard, Nantucket, Mashpee, Provincetown, Sandwich, Wellfleet and Yarmouth, MA

Project Highlights

- Planning
- Permitting
- Hydrographic/ Topographic Surveys
- Engineering
- Sediment Testing
- Construction Oversight



BARNSTABLE

Bismore and Aselton Waterfront Park Improvements

The Town of Barnstable retained GZA to provide planning, permitting and design services for the development of their two waterfront parks on Inner Hyannis Harbor. The Bismore Park project included rehabilitation of bulkhead, utilities and berthing facilities for the tourist charter and fishing fleet vessels. The Aselton Park project included construction of a new bulkhead and timber walkway, utilities, and berthing accommodations for 24 recreational slips. Both projects included dredging to acquire necessary draft. Both sites are abutted by the Federal Channel, a cruise ship line, and private marinas.

Barnstable Harbor Dredging

Since the mid-1990s, GZA has been providing consulting services to the Town of Barnstable for the dredging of the Barnstable Harbor entrance channel. The Project is located in a highly active littoral environment, a State-designated Area of Critical Environmental Concern (ACEC), and Priority Habitat for State-Listed Rare Species. Frequent dredging of the channel is required to maintain safe navigation access into/from the harbor.

GZA provided hydrographic/topographic survey, engineering, permitting, sediment testing and construction oversight services to the Town for Phase 2 dredging of the entrance channel, which was completed in January 2009. The project consisted of the maintenance dredging of approximately 13,900 cubic yards (CY) of material. Approximately 5,000 CY of fine-grained sediments were dredged from the inner harbor channel and pumped into the existing Blish Point Sediment Containment Area. Approximately 8,900 CY of sandy sediments were dredged from the outer





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channel and pumped over 2 miles into an existing depression at the Sandy Neck Cottage area for dune restoration. Prior to commencing permitting, a dredge placement feasibility study was conducted to identify multiple reuse options for dredge sediments. Dredging operations were performed by the Barnstable County Dredge.

In 2005, GZA provided the required engineering, permitting and testing services to conduct the Phase 1 maintenance dredging of the entrance channel which included the hydraulic maintenance dredging of 5,000 cubic yards of sediments from the most shoaled areas along the channel, with beneficial re-use of the dredged sediments for beach nourishment at Millway Beach and erosion protection along the existing sediment containment area located at Blish Point and adjacent to the harbor. Dredging was performed by the Barnstable County Dredge. GZA work efforts included resource area delineations, site surveys, alternative analyses, preliminary design, permitting, final design, and construction plans and specifications.

Barnstable Inner Harbor Bulkhead Reconstruction

GZA is presently providing engineering and permitting services for the reconstruction of the existing timber and steel bulkhead structures which support approximately 800 linear feet (LF) of the inner harbor shoreline along Millway Road. Underwater and above water inspections were performed by GZA divers/engineers to determine the overall general condition of the timber and steel bulkheads and to assess and document any evidence of corrosion, decay or other visual structural deficiencies in the structures that were encountered above or below the low water elevation. In addition to visual inspections, Ultrasonic Thickness (UT) testing was performed along the length of the steel sheet pile bulkhead to measure the steel thickness to determine corrosion loss. A conceptual design analysis has been conducted to assess various structure alternatives, permitting requirements and associated construction costs. Alternatives being considered include construction of a new steel or timber bulkhead, concrete seawall or stone revetment. Construction commenced in Fall 2009.

Barnstable Inner Harbor Emergency Stabilization Project

In March 2008, an approximate 50-foot section of the existing timber bulkhead failed within the inner harbor. GZA was retained by the Town to inspect, engineer and permit

emergency stabilization measures for the failed bulkhead section along with two other yielding sections. In May 2008, the failed bulkhead section was temporarily stabilized with ½ to 3-ton stone and filter fabric and the two yielding sections were stabilized with a steel bracing system consisting of vertical and battered H-piles. The entire timber bulkhead is scheduled to be replaced as part of the inner harbor bulkhead reconstruction project.

Hyline Cruises, Hyannis Massachusetts

GZA provided design, permitting and construction phase services for the installation of a float and gangway system to upgrade the marine facility to accommodate full handicap access. The new system includes a ramp system, a float with platforms and gangways for the Gray Lady. Other projects for Hyline included permitting, design and construction services for upland disposal of dredged sediments.

Hyannis Inner Harbor Dredging

GZA provided engineering, design, sub-surface investigations and permitting services for maintenance dredging associated with the rehabilitation of bulkheads and new berthing systems at Bismore and Aselton Parks in Hyannis Inner Harbor. Several projects were developed for municipal and private upland disposal and confined aquatic disposal (CAD) methods. Work was performed in coordination with the U.S. Army Corps of Engineers and Massachusetts Department of Environmental Management (DEM) dredging, beach nourishment and CAD disposal project.

Stewart's Creek Restoration

GZA assisted the Town of Barnstable in securing a \$650,000 federal grant for the Stewart's Creek Estuary Restoration Project and is currently providing permitting services for the project. Located off Ocean Avenue in Hyannis, MA, Stewart's Creek is connected to Hyannis Harbor via an undersized culvert that restricts tidal flow which is responsible for the invasion of common reed (*Phragmites australis*) and the loss of saltmarsh cordgrass (*Spartina alterniflora*). Poor tidal flushing has also degraded intertidal and subtidal bottom habitats, which frequently experience lower salinity, extensive algal blooms, and hypoxia. The goal of the Stewart's Creek Estuary Restoration Project is to return approximately 14 acres of the lower Stewart's Creek ecosystem to its historic condition, which will include the restoration of salt marsh area and functioning and the



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restoration of other functions performed by healthy estuaries. The restoration will increase tidal flushing to the estuarine/marsh ecosystem. Ecosystem restoration will be accomplished by replacing an existing undersize culvert with a larger one, restoring historic channel depths, and restoring shoreline elevations using dredge material.

BOURNE

Gray Gables Salt Marsh Restoration

GZA provided volunteer engineering and wetland services to the Massachusetts Wetlands Restoration Program (WRP) through the Corporate Wetlands Restoration Partnership (CWRP) to determine the potential for restoring salt marsh within the Village of Gray Gables in Bourne, Massachusetts. GZA assessed the status and performance of several existing culverts, determined composition of vegetation at representative locations within the marsh and provided options for restoring tidal flow. The salt marsh in Gray Gables has been designated as a Priority Wetland by the MA WRP and is located within a State-designated Area of Critical Environmental Concern (ACEC) and Priority Habitat for State-Protected Rare Species.

Monument Beach Pier and Marina

GZA has provided engineering and permitting services to the Town of Bourne for the Monument Beach Pier and Marina. GZA's first responsibility was to implement an emergency construction contract to replace pilings and strengthen the existing pier from the ice damage sustained during a severe winter storm. GZA is currently providing a first phase program to further rehabilitate the existing town pier and floats. We are also implementing planning studies and helping the Town to secure grants for the expansion of the marina during a later work phase. The intent of this second phase improvement program is to expand the current fueling system capabilities to include diesel, and to double the size of the pier and float system of the facility.

Taylor's Point Marina

GZA was retained by the Town of Bourne Department of Natural Resources to provide a management plan for this town-owned 96-slip marina, which reverted back to town management in November 2003. Project included an inventory of conditions and the establishing of annual costs for maintaining the facility.

CHATHAM

Barnhill Boat Landing

GZA provided design, permitting and construction phase services for reconstruction of Town boat ramp.

Chatham Bridge Repairs

GZA provided field inspection, evaluations and development of a repair program for a 1920-vintage timber bridge, which was experiencing restricted opening by failure of members. Design of repair was developed to maintain aesthetics of existing structure and to allow full opening of bridge.

Chatham Town Pier

GZA provided facility inspection and analysis, design, and construction services to the Town of Chatham for the rehabilitation of the Chatham Town Pier and expansion of U.S. Coast Guard facilities. Work included steel sheeting, year round concrete floats, wave barrier, electrical, drainage and fendering.

Chatham Town Pier, South Jog

GZA provided design and permitting services for additional renovations to the South Jog of the Chatham Fish Pier. Additional renovations involved the replacement of an existing float system, including the installation of a new concrete float, steel piles, gangway and steel platform, in order to improve berthing of vessels.

Chatham Town Pier, North Jog

GZA is currently providing design and permitting services for additional renovations to the North Jog of the Chatham Fish Pier. Additional renovations include the installation of timber and concrete floats, timber and steel piles, gangways, a timber platform and stairs for improved public access to the adjacent Coastal Beach. The renovations will improve berthing of vessels and usage of dinghies at the existing facility.

Chatham Fish Processing Building

GZA provided design, permitting and construction phase services for the major rehabilitation program for the Town of Chatham Fish Processing Building located on the Town Pier at Lydia's Cove. The program includes renovations and improvements to the existing timber frame building. The cost of the program is approximately \$850,000 and includes



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improvements to the structural, electrical, and mechanical systems, installation of a mezzanine structure to improve processing operations, and renovation of drainage and fire systems to bring the structure to code conformance.

Stage Harbor Landing/Old Mill Boat Yard

GZA provided services for the Town including condition assessments, and repair programs for the rehabilitation of the bulkhead structure and the boat ramp. We are currently providing planning, design and permitting services for the expansion and realignment of floats within the mooring area.

DENNIS

Sesuit Harbor Marina and Dredging

The \$1.4 million Sesuit Harbor Marina included approximately 150-slip expansion and upgrading of the marina by dredging, new steel sheet pile bulkheads, reinforced concrete boat ramp, 4 timber piers, new gangways and float systems for the Town of Dennis. GZA provided full engineering services and permitting for the project. Services included laboratory-testing program for geotechnical design for on-site reuse and offsite disposal of dredged sediment. Project also included the upgrading of electrical facilities and drainage improvements for parking areas.

Sesuit Harbor Parking Lot Improvement

GZA provided development, permitting and design services for drainage improvements at an existing parking facility. Project design included site layout, grading and development of an innovative sand filtering system for the stormwater management system. The site design had to maintain grades to existing site facilities to accommodate historic resources within the site and mitigate any potential impacts to the sensitive salt marsh areas that surround the site.

FALMOUTH

Falmouth Boat Ramp

GZA provided services to the Massachusetts Public Access Board for the design of a new marine access facility for the Town of Falmouth. Work included topographic survey, foundation investigation, permitting, and final design of the new facility. The facility included improvement to road access and circulation pattern at the facility, a new parking lot with associated drainage systems, bulkheading, boat ramp, pier and floats, as well as street lighting, and improved signage.

Woods Hole Ferry Terminal

GZA provided design services to the Woods Hole and Martha's Vineyard Steamship Authority for rehabilitation of ferry terminal berthing structures at the Woods Hole Terminal. Work included geotechnical investigations, condition assessments, and preparation of construction documents for repairs to bulkhead, pavements, vehicular transfer bridges, and utilities. We have also provided engineering and expert witness services for the Authority for this facility and the facility in Hyannis.

Woods Hole Ferry Terminal

GZA provided engineering services at the Woods Hole Terminal including the rehabilitation design on two head fender dolphins for the terminal. The service experience for the fender dolphins had resulted in deterioration of the reinforced concrete dolphin cap, and remedial work was needed to maintain service. New dolphins were designed to provide continuing fender protection. Work was scheduled to maintain minimal disruption to the ferry operations at the site.

MARTHA'S VINEYARD

Lagoon Pond Bridge

GZA worked as a subconsultant on this Massachusetts Highway Department bridge improvement project, providing underwater inspection and geotechnical investigations.

Lagoon Pond Boat Ramp

GZA provided engineering services to the Massachusetts Office of Fishing and Boating Access for the reconstruction and improvement of the Lagoon Pond boat ramp. The project involved the reconstruction and improvement of parking facilities, boat ramp, and boarding floats. Work efforts included site surveys, utility investigations, alternative analyses, preliminary design, permitting, final design, and construction plans & specifications.

Oak Bluffs Ferry Terminal

GZA provided engineering services for the Oak Bluffs Terminal, which included underwater and above-water inspection of the marine structures at the terminal. The survey included the inspection of the structure to evaluate current conditions of the timber deck, and provide recommendations as to the continued service of the terminal



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Barnstable, Hyannis, Bourne, Chatham, Dennis, Falmouth, Martha's Vineyard, Nantucket, Mashpee, Provincetown, Sandwich, Wellfleet and Yarmouth, MA

structures. As part of the inspection, several members of the structure were partially dismantled, condition of the underlying structure exposed and inspected, and the structure repaired. Engineering evaluations included assessment of the traffic capability of the terminal wharf and recommendations for maintenance of the structures.

Emergency Access Alternatives Study

GZA prepared an emergency access alternatives report for a residential property located on Chappaquiddick Island. The goal of the study was to develop and investigate alternative means of access during severe storm conditions. GZA's services included topographic survey, site assessment, estimation of flood levels, field mapping of eelgrass and shellfish areas, development of alternatives and preparation of preliminary construction cost estimates.

Sengekontacket Pond

GZA provided services for the Department of Environmental Management, including permitting, design and construction phase services for a 42,000 cubic yard hydraulic dredging and beach nourishment program. The project was implemented in an expeditious manner due to its emergency nature.

Lake Tashmoo Boat Ramp

GZA provided engineering services to the Massachusetts Office of Fishing and Boating Access for the reconstruction and improvement of the Lake Tashmoo boat ramp. The project involved the reconstruction and improvement of boat ramp, and boarding floats. Work efforts included site surveys, utility investigations, preliminary design, permitting, final design, and construction plans & specifications.

Sylvia Beach Nourishment and Channel Dredging

GZA provided surveying, engineering and construction services to DEM for dredging and beach nourishment at Sylvia Beach State Park. This was a fast-track emergency dredging and beach nourishment project brought on by storms in late 1991 and 1992 which caused significant erosion on Sylvia Beach, threatening to cut through the road between Edgartown and Oak Bluffs. These storms also shoaled navigation channels leading into and across Sengekontacket Pond.

MASHPEE

Cape Wind Alternative Cable Routing Study Review

GZA provided a review and professional opinion on the proposed alternative distribution cable route that passed through Popponesset Bay on behalf of local citizens. GZA services included field investigations, review of filed testimony, review of alternative cable routing report filed by Cape Wind and presentation of testimony at the Massachusetts Department of Public Utilities hearing.

NANTUCKET

Consue Springs Pond Dredge Feasibility Study

GZA conducted a dredging feasibility assessment of Consue Springs Pond which included conducting a bathymetric survey, designing and implementing a sediment testing program, performing sediment volume calculations, comparing the feasibility of various dredging options, assessing various dredged material management options, and providing cost estimates for each management option.

Polpis Harbor Entrance Dredging

GZA provided permitting and design services to DEM for a 40,000 cubic yards dredge program, including beach nourishment at Polpis Harbor for the Town of Nantucket.

PROVINCETOWN

Town of Provincetown Harbor Plan Study

GZA provided waterfront engineering services for the State-approved Town Harbor Plan. Investigations included review and evaluation of all shoreline structures, investigations into expansion of mooring fields and Town Wharf, and cost estimates for improvement to town-wide waterfront infrastructure.

SANDWICH

Sandwich Marina Pier

GZA evaluated the Sandwich Marina for existing conditions and allowable loadings. Work involved field investigations, analyses and preparation of findings report with recommendations for improvement.



Cape Cod and Islands Coastal Projects

Barnstable, Hyannis, Bourne, Chatham, Dennis, Falmouth, Martha's Vineyard, Nantucket, Mashpee, Provincetown, Sandwich, Wellfleet and Yarmouth, MA

Sandwich Marina Harbormaster Building

GZA provided engineering services for the Town of Sandwich at the Sandwich Marina. This work includes a feasibility study for an expanded Harbormaster's building and the design and preparation of a bid package for the replacement of two docks within the Marina.

WELLFLEET

Wellfleet Dredge Survey

GZA provided topographic and bathymetric surveys of the Town Pier and anchorage areas for the dredging construction project undertaken by the Department of Environmental Management. Work included preparing volume calculations and providing engineering consultation on the limits of dredging achievable without upsetting the stability of existing bulkhead structures.

YARMOUTH

Bass River Dredging Project

As a key subconsultant, GZA provided surveying, engineering design and environmental assessment/documentation for the hydraulic dredging of approximately 180,000 cubic yards of material from a three mile channel of the Bass River and 40-acres of mooring basins within the River. The project's objective was to maintain 19 acres of the channel and mooring basin, with 21 additional acres dredged to accommodate mooring basin improvements. The project included the development of a phased 10-year dredging program for area Town.



Massport Waterfront Facilities Inspection and Repairs

Boston, MA

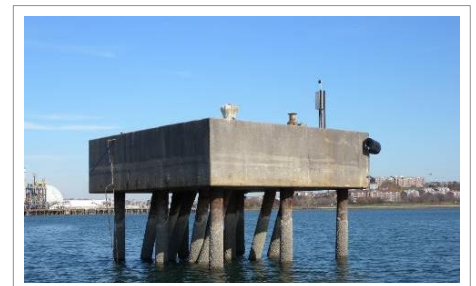
Project Highlights

- Inspection, evaluation and recommendations for 7 Massport waterfront structures
- Construction estimates for each structure were determined, as well as improvements, rehabilitation, and construction for the sites

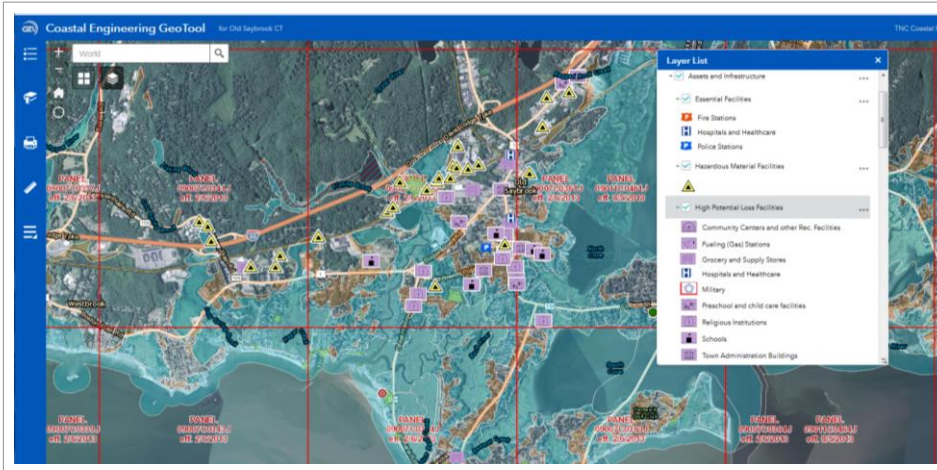


GZA provided inspections, evaluations, structural analysis and repair recommendations for various waterfront structures at 7 facilities in Charlestown, East Boston and South Boston. Structures included: concrete wharfs and mooring dolphins, timber piers, concrete floating docks, steel barge docks, granite block seawalls, steel sheet pile bulkheads, and rip rap slope protection.

Evaluations of the waterfront structures were based on GZA's above water and underwater inspections, including ultrasonic thickness measurements and concrete core samples for testing compressive strength and chloride-ion content. Based on the evaluations and structural analysis for HS-20 live loading, GZA provided operational restrictions and repair recommendations with associated budgetary construction cost estimates.



Town of Old Saybrook Community Coastal Resilience Study & Infrastructure Evaluation



Saybrook Breakwater Lighthouse located in Old Saybrook, Connecticut

GZA is in the process of conducting a Community Coastal Resilience Study and Infrastructure Evaluation for the Town of Old Saybrook, CT. GZA’s overall approach is to: 1) use “state-of-the-science” methodologies, including numerical models, for characterizing flood hazards and sea level rise; 2) calibrate our hazard analyses to those developed by the US Army Corps of Engineers (USACE) North Atlantic Coast Comprehensive Study (used for federal projects); 3) utilize HAZUS-MH for estimating losses; 4) present a blend of resiliency recommendations ranging from physical mitigation projects to change to Old Saybrook’s plans, policies and regulations; 5) take an integrated approach for physical mitigation projects including both structures and natural and nature-based features; and 6) use ARCGIS for all information management, including our web-based GIS GZA GeoTool©.

Community Coastal Resilience Study and Infrastructure Evaluation

The GZA team was selected to assist the Town with the following four tasks:

1. Community Coastal Resilience Study
2. Neighborhood Resiliency Concepts and Designs for Recovery and Adaption
3. Comprehensive Mitigation Items Feasibility Study
4. Coastal Structure Evaluation

Geospatial Modeling and Vulnerability Assessment

GZA recently completed the development of a baseline topographic model (Digital Elevation Model (DEM)) for the Town using the highest available resolution LIDAR elevation data. Additionally, GZA identified, inventoried and integrated existing critical facilities infrastructure, essential facilities into our web-based GIS GZA GeoTool©. Our team is in the process of using this unified geospatial platform to conduct the risk and vulnerability assessment throughout the Town of Old Saybrook for multiple flood risk scenarios.

Project Highlights

- Risk Vulnerability and Risk Assessment
- Inundation Mapping Using Innovative Geospatial Management Tools
- Resiliency Adaptation Options Analysis
- Public Involvement Process Meetings and Charrettes
- Implementation Plan and Process
- Sandy-Impacted Neighborhoods Land Use and Development Analysis
- Neighborhood Conceptual Designs
- Living Shoreline Plan
- Physical and Infrastructure Feasibility Study



Marshlands in Old Saybrook



Old Saybrook Fire Department



SECTION 6 | ATTACHMENT C BREAKDOWN OF FEE SCHEDULE

ATTACHMENT C

**Menemsha Commerical Fishing Dock Replacement Project
Menemsha Harbor
Chilmark, MA**



FEE PROPOSAL

Table 1 - Labor										
TASK	Principal	Senior PM	Senior Engineer	Project Manager	Assistant P.M.	Engineer 1	E2/CAD Operator	Technical Support	Total Hours	TOTAL COSTS
Task 1 - Project Review										
HASP	1	1			2				4	\$707
Project Review		2					2	1	5	\$680
Review SLR-Flood Inundation by Others	4	2					4		10	\$1,758
									Subtotal	\$3,145
Task 2 - Above-Water Condition Assessments										
Field Work Coordination	1	2					1		4	\$717
Travel (round trip) - 4 trips		7			7	7	7		28	\$3,801
Topographic Survey (1 day)						8	8		16	\$1,744
Above-Water Investigations and Bulkhead UT (2 days)	1	16			16				33	\$5,442
Reduce Survey Data - Develop Existing Plan		2			4		24		30	\$3,450
Reduce Field Inspection Data (Photos-Notes-UT)	1	2			4		8		15	\$2,012
									Subtotal	\$17,166
Task 3 - Initial Evaluation/Town Review										
Preliminary Update to the Town-Presentation	1	2			8		3		14	\$2,047
Review Meeting - Virtual		3			3				6	\$975
									Subtotal	\$3,022
Task 4 - Underwater Condition Assessment										
Field Work Coordination		1				1			2	\$298
Travel (round trip)						7			7	\$791
Underwater Inspection Support (2.5 days)	1	1				18			20	\$2,461
Underwater Sub-Contractor (2.5 days)									0	\$15,000
Reduce Field Inspection Data (Photos-Notes-UT)	1	2				8			11	\$1,516
									Subtotal	\$20,066
Task 5 - Condition Assessment Report										
Develop Evaluation Report - Draft	2	8			4	8	8	2	32	\$4,468
Preliminary Design Options	2	2	8		4		8		24	\$3,734
Preliminary Cost Estimates	1	2			2				5	\$892
Review Meeting - Virtual		3			3				6	\$975
Final Report	1	2			4		4	2	13	\$1,792
									Subtotal	\$11,861
Hourly Rate	\$ 242	\$ 185	\$ 185	\$ 170	\$ 140	\$ 113	\$ 105	\$ 100	Total Labor	\$55,260

Table 2 - Expenses	
	Amount
Travel (Mileage)	\$750
Travel (Ferry, Parking - est)	\$900
Above-Water - Overnight/Meals Allowance (1 Night/4 people plus 1 night 2 people - est)	\$1,700
Underwater - Overnight/Meals Allowance (3 Night/1 person - est)	\$800
Jon Boat	\$300
Mailings/Reproductions	\$250
Total Expenses	\$4,700

Table 3 - Summary	
Total Labor	\$55,260
Total Expenses	\$4,700
TOTAL AMOUNT	\$59,960



SECTION 6 | ATTACHMENT D RATING ASSESSMENT TABLES



OVERALL CONDITION ASSESSMENT RATINGS

ASSESSMENT RATING		DESCRIPTION
6	Good	<ul style="list-style-type: none"> No problems or only minor defects noted Structural elements may show some very minor deterioration but no overstressing observed There is no apparent loss of capacity No action appears to be required at this time
5	Satisfactory	<ul style="list-style-type: none"> Minor to moderate defects and deterioration observed, but no overstressing observed The current condition does not indicate a loss of capacity No action appears to be required at this time
4	Fair	<ul style="list-style-type: none"> All primary structural elements are sound; but minor to moderate defects and deterioration observed Localized areas of moderate to advanced deterioration may be present but do not appear to significantly reduce the load bearing capacity of the structure No immediate action appears to be required however, Routine Repairs are recommended
3	Poor	<ul style="list-style-type: none"> Advanced deterioration or overstressing observed on widespread portions of the structure, but does not appear to significantly reduce the load carrying capacity of the structure Priority Repair designation is warranted Actions may include further investigation, analysis, and programming future repairs
2	Serious	<ul style="list-style-type: none"> Advanced deterioration, overstressing, or breakage may have significantly affected the load bearing capacity of primary structural elements Local failures are possible and loading restrictions may be necessary A detailed structural assessment of the affected areas is warranted Additional field investigations may be required Immediate Repair is warranted
1	Critical	<ul style="list-style-type: none"> Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural elements More widespread failures are possible or likely to occur Implement load restrictions as necessary A detailed structural assessment of affected areas is warranted Immediate Repair is warranted



TIMBER ELEMENT DAMAGE RATINGS

ASSESSMENT RATING		DESCRIPTION
NI	NOT INSPECTED	<ul style="list-style-type: none"> • Not Inspected • Inaccessible • Passed
ND	NO DEFECTS	<ul style="list-style-type: none"> • Sound surface material
MN	MINOR	<ul style="list-style-type: none"> • Checks, splits, and gouges less than 0.5-inches wide • Evidence of marine borers or fungal decay
MD	MODERATE	<ul style="list-style-type: none"> • Remaining diameter loss up to 15% • Checks and splits wider than 0.5-inches wide • Cross-section area loss up to 25% • Corroded hardware • Evidence of marine borers or fungal decay, with loss of section
MJ	MAJOR	<ul style="list-style-type: none"> • Remaining diameter loss 15 to 30% • Checks and splits through full depth of cross section • Cross-section area loss 25 to 50%; heavily corroded hardware • Displacement and misalignments at connections
SV	SEVERE	<ul style="list-style-type: none"> • Remaining diameter loss more than 30% • Cross section area loss more than 50% • Loss of connections and / or fully nonbearing connection • Partial or complete breakage

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-4 (Damage Ratings for Timber Elements)



TIMBER FENDER PILES DAMAGE RATINGS

ASSESSMENT RATING		DIAGRAMS	DESCRIPTION
NI	NOT INSPECTED		<ul style="list-style-type: none"> Not Inspected Inaccessible Passed
ND	NO DEFECTS		<ul style="list-style-type: none"> Good original surface, sound, no defects observed
MN	MINOR	<p style="font-size: small;">LIGHT (SURFACE) FUNGAL DECAY MINIMAL MARINE BORER ACTIVITY OBSERVED (LESS THAN 5 PERCENT SECTION LOSS)</p>	<ul style="list-style-type: none"> Light abrasion less than 1/2-in. deep Light (surface) fungal decay Minimal marine borer activity observed (less than 5% section loss) Weathered composite elements
MD	MODERATE	<p style="font-size: small;">FUNGAL DECAY (MAX 1" DEPTH) LOSS OF SECTION DUE TO MARINE BORERS LESS THAN 10 PERCENT LOSS OF SECTION DUE TO MARINE BORERS LESS THAN 10 PERCENT</p>	<ul style="list-style-type: none"> Timber cracked and checked up to 1/2-in. wide Fungal decay (max 1 in. depth) Abrasion up to 2-in. deep Loss of section due to marine borers less than 10%
MJ	MAJOR	<p style="font-size: small;">FUNGAL DECAY (MAX 3" DEPTH) LOSS OF SECTION DUE TO MARINE BORERS 10 TO 25 PERCENT LOSS OF SECTION DUE TO MARINE BORERS 10 TO 25 PERCENT</p>	<ul style="list-style-type: none"> Timber cracked and checked greater than 1/2-in. wide Fungal decay (max 3 in. depth) Abrasion damage greater than 2-in. deep Loss of section due to marine borers between 10 and 20% Composite elements cracked or split
SV	SEVERE	<p style="font-size: small;">FUNGAL DECAY (OVER 3" DEPTH) LOSS OF SECTION DUE TO MARINE BORERS (OVER 25 PERCENT OF THE SECTION) LOSS OF SECTION DUE TO MARINE BORERS (OVER 25 PERCENT OF THE SECTION)</p>	<ul style="list-style-type: none"> Fungal decay on timber members (greater than 3-in. depth) Loss of section due to marine borers (more than 25% of the section) Timber broken Composite elements broken

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-8 (Damage Ratings for Fender Piles)



STEEL ELEMENT DAMAGE RATINGS

ASSESSMENT RATING		DESCRIPTION
NI	NOT INSPECTED	<ul style="list-style-type: none"> • Not Inspected • Inaccessible • Passed
ND	NO DEFECTS	<ul style="list-style-type: none"> • Protective coating or wrap intact • Light surface rust • No apparent loss of material
MN	MINOR	<ul style="list-style-type: none"> • Protective coating or wrap damaged and loss of nominal thickness up to 15% at any location • Less than 50% of perimeter or circumference affected by corrosion at any elevation or cross section • Loss of thickness up to 15% of nominal at any location
MD	MODERATE	<ul style="list-style-type: none"> • Protective coating or wrap damaged and loss of nominal thickness 15 to 30% at any location • More than 50% of perimeter or circumference affected by corrosion at any elevation or cross section • Loss of nominal thickness 15 to 30% at any location
MJ	MAJOR	<ul style="list-style-type: none"> • Protective coating or wrap damaged and loss of nominal thickness 30 to 50% at any location • Partial loss of flange edges or visible reduction of wall thickness on pipe piles • Loss of nominal thickness 30 to 50% at any location
SV	SEVERE	<ul style="list-style-type: none"> • Protective coating or wrap damaged and loss of nominal thickness exceeding 50% at any location • Structural bends or buckling, breakage, and displacement at supports, loose or lost connections • Loss of wall thickness exceeding 50% of nominal at any location

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-5 (Damage Ratings for Steel Elements)



REINFORCED CONCRETE ELEMENT DAMAGE RATINGS

ASSESSMENT RATING		DESCRIPTION
NI	NOT INSPECTED	<ul style="list-style-type: none"> • Not Inspected • Inaccessible • Passed
ND	NO DEFECTS	<ul style="list-style-type: none"> • Good original hard surface, hard material, sound
MN	MINOR	<ul style="list-style-type: none"> • Mechanical abrasion or impact spalls up to 1-inch in depth • Occasional corrosion stains or small pop-out corrosion spalls • General cracks up to 1/16-inch in width
MD	MODERATE	<ul style="list-style-type: none"> • Structural cracks up to 1/16-inch in width • Corrosion cracks up to 1/4-inch in width • Chemical deterioration: Random cracks up to 1/16-inch in width; "soft" concrete and / or rounding of corners up to 1-inch deep • Mechanical abrasion or impact spalls greater than 1-inch in depth
MJ	MAJOR	<ul style="list-style-type: none"> • Structural cracks 1/16-inch to 1/4-inch in width and partial breakage • Corrosion cracks wider than 1/4-inch and open or closed corrosion spalls (excluding pop-outs) • Multiple cracks and disintegration of surface layer due to chemical deterioration • Mechanical abrasion or impact spalls exposing reinforcing
SV	SEVERE	<ul style="list-style-type: none"> • Structural cracks wider than 1/4-inch in width or complete breakage • Complete loss of concrete cover due to corrosion of reinforcing steel with more than 30% of diameter loss for any main reinforcing bar • Loss of bearing and displacement at connections • Loss of concrete cover (exposed steel) due to chemical deterioration • Loss of more than 30% of cross section due to any cause

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-6 (Damage Ratings for Reinforced Concrete Elements)



PRESTRESSED CONCRETE ELEMENT DAMAGE RATINGS

ASSESSMENT RATING		DESCRIPTION
NI	NOT INSPECTED	<ul style="list-style-type: none"> • Not Inspected • Inaccessible • Passed
ND	NO DEFECTS	<ul style="list-style-type: none"> • Good original hard surface, hard material, sound
MN	MINOR	<ul style="list-style-type: none"> • Minor mechanical or impact spalls up to 0.5-inches deep
MD	MODERATE	<ul style="list-style-type: none"> • Structural cracks up to 1/32-inch in width • Chemical deterioration: Random cracks up to 1/32-inch in width
MJ	MAJOR	<ul style="list-style-type: none"> • Structural cracks 1/32-inch to 1/16-inch in width • Any corrosion cracks generated by strands or cables • Chemical deterioration: cracks wider than 1/8-inch • "Softening" of concrete up to 1-inch deep
SV	SEVERE	<ul style="list-style-type: none"> • Structural cracks wider than 1/8-inch and at least partial breakage or loss of bearing • Corrosion spalls over any prestressing steel • Partial spalling and loss of cross section due to chemical deterioration

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-7 (Damage Ratings for Prestressed Concrete Elements)



MOORING HARDWARE DAMAGE RATINGS

ASSESSMENT RATING		DESCRIPTION
NI	NOT INSPECTED	<ul style="list-style-type: none"> • Not Inspected • Inaccessible • Passed
ND	NO DEFECTS	<ul style="list-style-type: none"> • Material sound, surfaces smooth without indications of corrosion, surface coating in good condition, connections sound • Bolt countersinks grouted or sealed
MN	MINOR	<ul style="list-style-type: none"> • Fitting has surface corrosion over 10 to 25% of its area • Minor wear marks or pitting on surface of fitting are less than 1/8-inch deep • Fasteners have minor corrosion with no significant loss of section
MD	MODERATE	<ul style="list-style-type: none"> • Fitting has moderate surface corrosion with loose scale over less than 50% of its area • Significant surface wear marks or pitting on fitting are up to 1/4-inch deep • Fasteners have corrosion with less than 25% loss of section
MJ	MAJOR	<ul style="list-style-type: none"> • Fitting has surface corrosion with loose scale over 50% or more of its surface area and / or less than 25% section loss • Significant surface wear marks or pitting on fitting are 1/4-inch deep or greater • Fasteners have corrosion with loose scale or loss of section greater than 25%
SV	SEVERE	<ul style="list-style-type: none"> • Fitting has heavy surface corrosion and loose scale with greater than 25% loss of section at critical areas of the fitting • Structural displacement, deformation, or rotation of the fitting are present; fitting components are broken, cracked, or delaminated • Loose, broken, or missing fasteners

Damage Ratings based on ASCE Manuals and Reports on Engineering Practice No. 130: Waterfront Facilities Inspection and Assessment (2015) Table 2-8 (Damage Ratings for Mooring Hardware)



SECTION 6 | ATTACHMENT E OVERALL CONDITION SUMMARY (EXAMPLE)



OVERALL CONDITION SUMMARY BATH IRON WORKS WATERBORNE INFRASTRUCTURE

INFRASTRUCTURE ASSET	ASSESSMENT RATING				OPERATIONAL RESTRICTIONS	
	STRUCTURE ¹	MOORING ²	UTILITIES ³	OVERALL ^o	DECK LOADING	VESSEL MOORING / FENDERING
NORTH WHARF						
CRANE PLATFORM						
SOUTH WHARF						
PIER #3						
LLTF						
DRY DOCK #3						

1 - The structure assessment rating will be based on structure related damage criteria from Attachment C and will range from *SEVERE (SV)* to *NO DEFECTS (ND)*
 2 - The mooring assessment rating will be based on mooring related damage criteria from Attachment C and will range from *SEVERE (SV)* to *NO DEFECTS (ND)*
 3 - The utilities assessment rating will be based on criteria from Attachment C: *CONDITION ASSESSMENT RATINGS* and range from *1-CRITICAL* to *6-GOOD*
 O - The overall asset assessment rating will be based on criteria from Attachment C: *CONDITION ASSESSMENT RATINGS* and range from *1-CRITICAL* to *6-GOOD* and account for the assessment ratings for the structure, mooring, and utilities

EXAMPLE