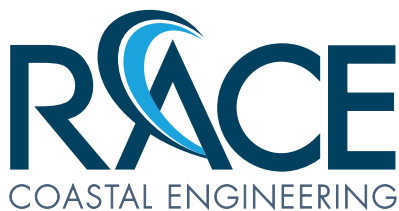




PROPOSAL - PROJECT # 2022-01

DUE: JANUARY 28, 2022, 10AM

**TOWN OF CHILMARK
MENEMSHA HARBOR
DOCK REPLACEMENT PROJECT
PHASE 1 OF 4**



PROPOSAL RESPONSE PREPARED BY:

RACE Coastal Engineering, Inc.
611 Access Road
Stratford, CT 06615
P. (203) 377-0663
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www.racecoastal.com

CONTACT:

Devin Santa, PE, SECB
RACE Coastal Engineering
(203) 377-0663

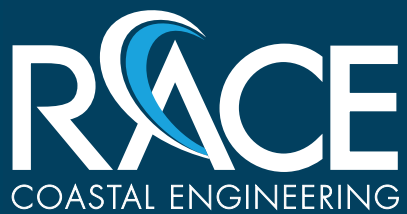
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MENEMSHA HARBOR
DOCK REPLACEMENT PROJECT PHASE 1 OF 4

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**TOWN OF CHILMARK
MENEMSHA HARBOR - DOCK REPLACEMENT PROJECT PHASE 1 OF 4**
SECTION 1: LETTER OF INTEREST





January 25, 2022

Mr. Tim Carroll
Town Administrator
Town of Chilmark
P.O. Box 119
401 Middle Road
Chilmark, MA 02535

**RE: Project # 2022-01
Menemsha Harbor – Dock Replacement Project PHASE 1 of 4**

Dear Mr. Carroll:

RACE Coastal Engineering, Inc (“**RACE**”) is pleased to provide the following proposal for professional engineering services in response to the Town of Chilmark’s solicitation for **Phase 1, Certified Engineer Assessment and Report, of the Menemsha Harbor – Dock Replacement Project**. **RACE** is eager to work with the community to perform a thorough investigation of the commercial fishing docks, prepare an engineering assessment, and recommend alternative solutions.

In consideration of our proposal, please note that the **RACE** Team are not civil engineers who occasionally get our feet wet or design the occasional structure near the water. We are committed waterfront and coastal engineers passionate about where we work, play and live. All of our projects are in the coastal environment and demand the expertise and knowledge that is necessary for the rehabilitation of your waterfront structures. Additional information on our experience and capabilities is included in our proposal.

As a licensed Captain, I have called on Menemsha Harbor both recreationally and commercially over the past two decades. I have come to appreciate the uniqueness of this harbor which supports a multitude of uses, including commercial fishing, recreational cruising, charter boats, and Coast Guard activities, in a relatively limited space. I am very familiar with the Harbor’s docks, businesses and shoreline.

The success of this project will hinge on the ability to develop an alternative that meets the challenges of sea level rise, can support the active commercial usage, is environmentally sound, and is affordable. By combining our extensive waterfront engineering portfolio with our understanding of facility use and operational considerations that can only come from an experience mariner, we are confident that we can work together to develop a successful approach for the restoration and improvement of this waterfront.

Our designs have been recognized for multiple awards by the American Council of Engineering Companies, the American Shore & Beach Preservation Association, and the Connecticut Society of Civil Engineers. This recognition by professional organizations for our project successes is indicative of the level of service that you can expect from **RACE**.

Our sole focus on waterfront projects, combined with our knowledge of your working waterfront, allows us to bring our extensive experience in the unique aspects of design and construction in the waterfront area to this project. We are committed to working closely with the Town of Chilmark and other stakeholders to complete a successful project. Thank you for the opportunity to provide this proposal and we look forward to meeting with you to discuss this project further.

Sincerely yours,

RACE Coastal Engineering, LLC

A handwritten signature in blue ink, appearing to read "Devin J. Santa".

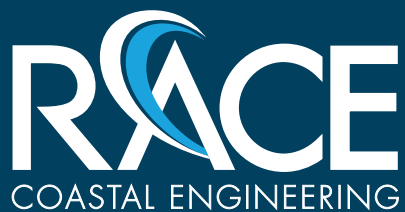
Devin J. Santa, PE, SECB
Principal





**TOWN OF CHILMARK
MENEMSHA HARBOR - DOCK REPLACEMENT PROJECT PHASE 1 OF 4**

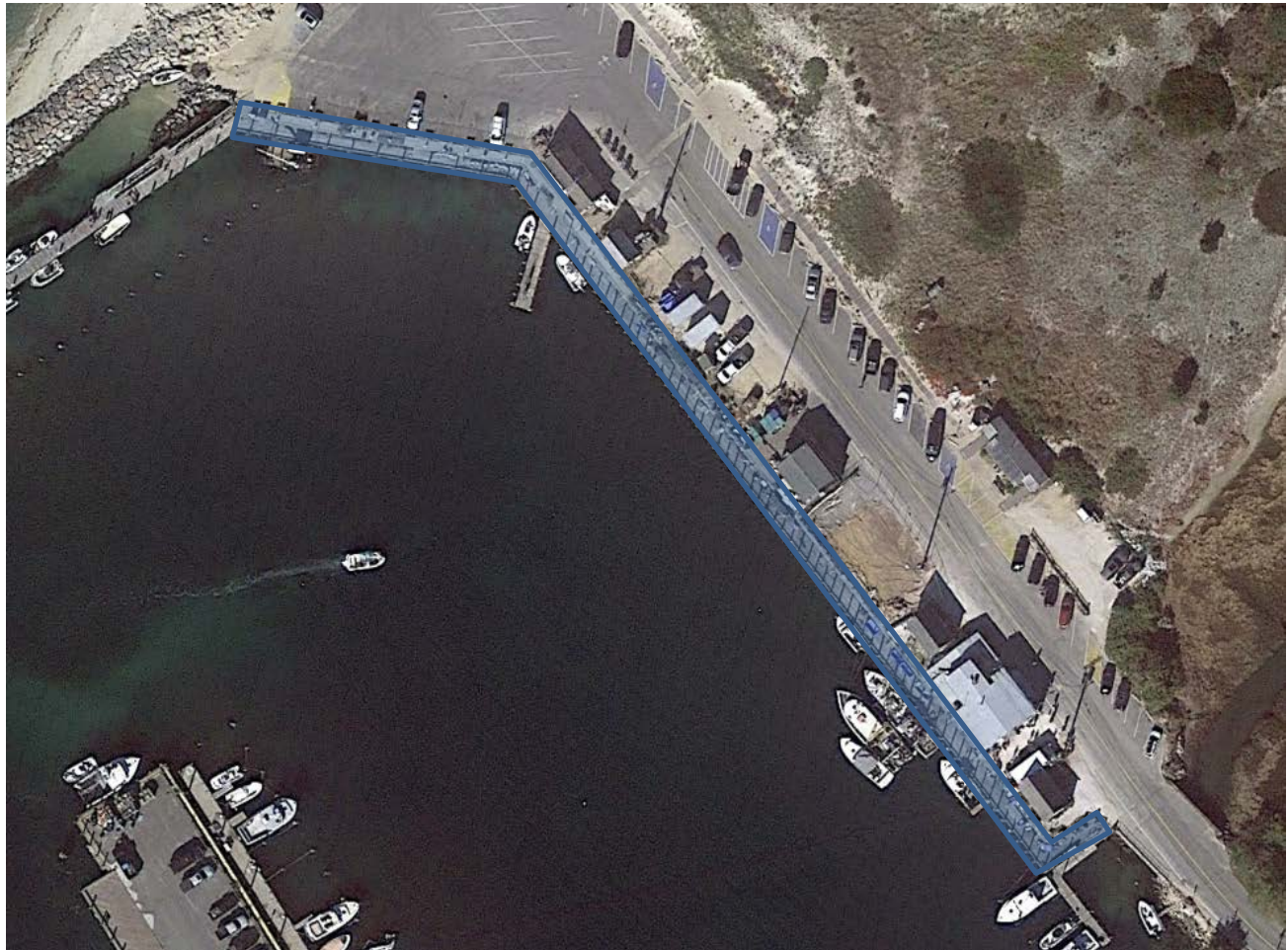
SECTION 2: PROJECT SCOPE, SCHEDULE AND FEES



RACE COASTAL ENGINEERING (“RACE”) herein submits to you this proposed scope of services, estimated schedule, and fee structure in response to the Request for Proposal (RFP) issued by the Town of Chilmark (“Client”) for the assessment of existing marine infrastructure at the Menemsha Commercial Fishing Dock.

Project elements to include review of steel sheet pile bulkhead and timber fixed dock structure for an approximate 620’ length and as depicted below:

Photograph #1: Project Area (blue highlight)



1. SCOPE OF SERVICES:

The following paragraphs identify the specific Scope of Services to be provided. **RACE’s** Scope of Services will include the following Phases:

- Phase 1: Project Initiation & Document Review
- Phase 2: Above Water Investigations & Preliminary Report
- Phase 3: Final Report & Presentation

Add Alternate 1: Underwater Investigations & Preliminary Report



Phase 1: Project Initiation & Document Review

- *Historic Document Review*

RACE will review documentation provided by the Client prior to initiation of subsequent Phases. This review will assist **RACE** in background knowledge of past work performed at the project site to supplement our existing knowledge of the site.

- *Project Kick-off Meeting with Client*

Prior to accessing the project site in Phase 2, **RACE** shall schedule and attend a video-conference with the Client to review project approach, schedule, and other project related matters. **RACE** will document meeting with minutes and circulate to appropriate parties as determined by the Client.

- *Project Management Plan*

As part of the Project Initiation Phase, **RACE** will prepare a Project Management Plan (PMP) that will become the basis for performing the project work, as well as, associated quality control measures. The PMP will be reviewed with the Project Team in order to ensure a uniform understanding of the project objectives, schedule, and constraints.

Phase 2: Above Water Investigation & Preliminary Report

- *Above Water Investigations*

RACE will perform an above water investigation of the bulkhead and timber fixed dock system. This investigation will be performed by a two-person field crew led by a Professional Engineer experienced with investigations for bulkhead and dock structures in the marine environment. The field crew will utilize a small work skiff to access areas under the fixed dock during periods of low water. The above water investigations will occur over a two-day period.

Investigative efforts will include documentation and photographs of deficient elements, measurements of key visible structural components, and determination of steel thickness in representative areas. Steel thickness measurements will be a key component in the determination of the remaining functional life of the bulkhead structure. **RACE** will utilize a Cygnus Underwater Ultrasonic Thickness Measurement device (UTM) for determination of steel sheet pile thickness.



Photograph #1: UTM Reading on steel pile



Timber elements will be reviewed visually and probed in isolated areas to determine evidence of rot and/or decay.

Observations will be documented in a tabular format for incorporation into the preliminary report.

- **Preliminary Report**

Per the RFP, it is understood that the report will be issued in multiple steps. An initial, preliminary report of findings shall be prepared as part of this Phase. If findings indicate that additional underwater investigations are appropriate based on scope, then this will be discussed with the Client. Fees and scope associated with a proposed underwater investigation are included in Add Alternate Section below.

Proper planning for repair or replacement of this critical structure will require consideration of numerous factors including; remaining structure lifespan, future coastal resiliency planning; repair alternatives analysis; project cost; and related factors. The preliminary report will include following components.

- ***Structural and Predictive Analysis of Existing Bulkhead***

The Client is seeking guidance as to whether the bulkhead structure would be suitable to support a replacement fixed dock for an estimated 25 years. **RACE** will utilize information gathered as part of prior Phases to estimate rate of steel section loss and “forecast” time to critical section loss based on the estimated rate. This analysis can be useful for estimating the remaining structure life and determining repair versus replacement options.

RACE will develop a geo-structural model of the existing bulkhead in Shoring Suite software by CivilTech Corporation. This model will be used to determine critical bending forces at select elevations.

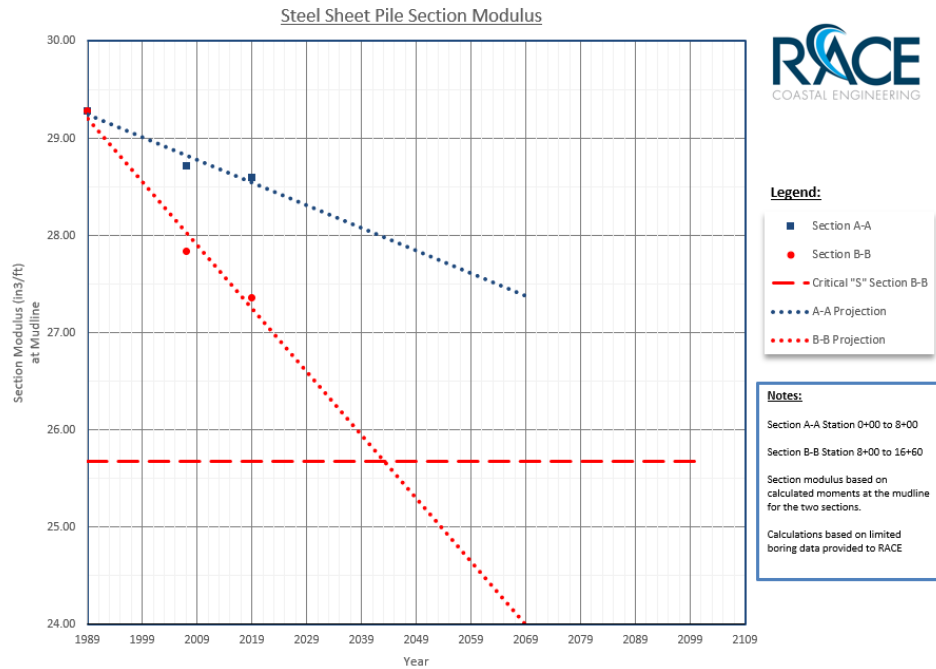
Geotechnical information will be necessary for the development of these models. If the Client has existing geotechnical information available, then **RACE** can utilize this for the analyses. If this information is not available, then geotechnical properties will need to be assumed. No geotechnical investigation effort is proposed as part of this effort.

RACE will review structural adequacy of the exist bulkhead structure and identify any specific areas for concern.



The following graph depicts this type of analysis used for a similar steel bulkhead system.

Table 1: Example of Predictive Analysis on similar project



The above example is based on steel section loss projections from UTM readings and compared to initial section properties. The lower horizontal dashed line indicates the point that the sheet pile would be overstressed according to design calculations.

RACE will prepare a summary of the structural and predictive analysis results for incorporation into the preliminary report.

o **Coastal Resiliency Assessment**

RACE will review relative sea level rise (RSLR) predictions from both the U.S. Army Corps of Engineers, NOAA, and Resilient MA. Graphs depicting predictions of RSLR from these organizations follow:

Table 2: Relative Sea Level Rise Predictions (USACE and NOAA)

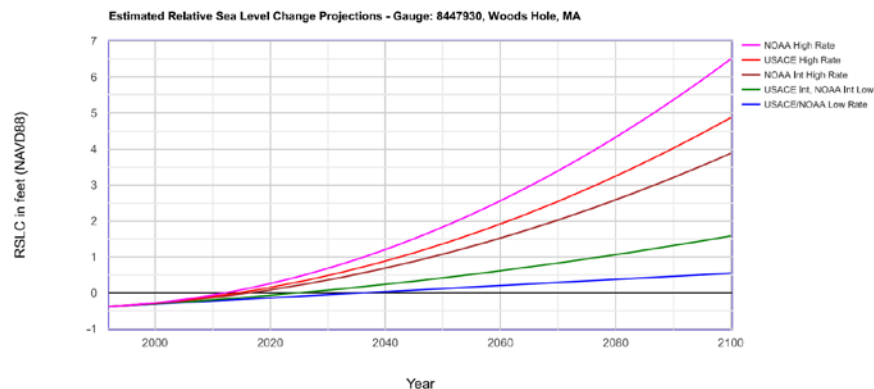
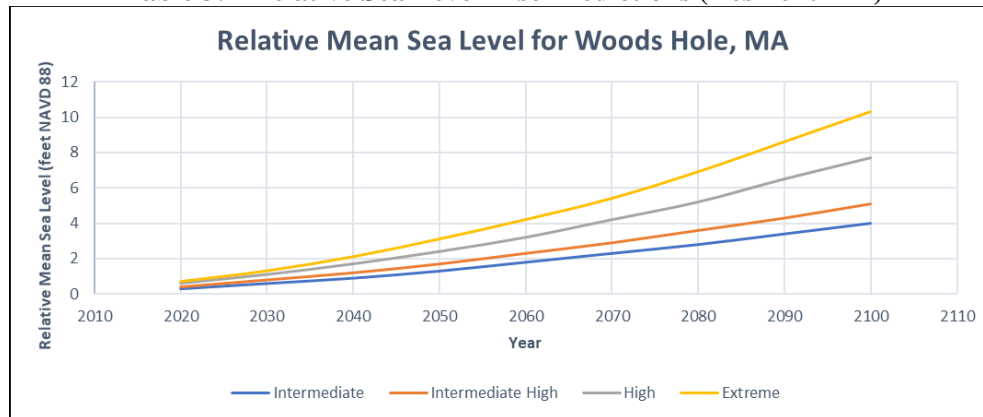


Table 3: Relative Sea Level Rise Predictions (Resilient MA)



As can be observed from these charts, the range of predicted RSLR can vary significantly. If we assume the bulkhead and fixed dock are repaired / replaced in 2025 with an estimated 50-year design life the expected RSLR in 2075 would range from approximately 0.25' (USACE/NOAA Low Estimate) to 6.3' (Resilient MA Extreme Estimate). In order to advance preliminary designs, a suitable design RSLR will need to be determined. Determination of the appropriate design RSLR needs to take into account several factors, including but not limited to;

- structure design life;
- susceptibility to damage from flooding;
- operational constraints associated with increased elevations;
- costs associated with increased elevations;
- integration with current infrastructure;
- coastal land use regulations and planning documents;
- and related factors

RACE will coordinate with the Client to develop a recommended design RSLR for this project. The final recommended RSLR will be incorporated into proposed repairs.

○ **Structure Repair Alternatives**

Based on the results of the prior Phases and our extensive experience with coastal structures, **RACE** will propose up to 3 alternatives for structural repair / replacement. It is anticipated that these alternatives may include structural retrofits to existing structures and/or replacement of structures. Additional alternatives or combinations may be considered as more information becomes available through the investigation and analysis Phases. Repair alternatives will address estimated useful life of existing structures, coastal resiliency considerations, and operational functionality.

RACE will prepare concept level (10% design level) design for the proposed alternative structural repairs. These designs will include primary member sizes as required for development of Opinion of Probable Costs to be prepared as part of the subsequent Phase.

○ **Opinion of Probable Costs and Estimated Schedule**

Using the alternatives developed above, **RACE** will develop Opinion of Probable Costs (OPCs) for each scenario. The OPCs will be developed utilizing our experience with recent and local bulkhead repair / replacement projects, as well as, industry costing guidance documentation (ie RS



Means). The OPC will include “hard” construction costs, as well as, “soft” engineering, design, and permitting costs.

In providing an OPC for any construction work, it shall be understood by the Client that **RACE** has no control over the cost or availability of labor, equipment, materials, market conditions, or the Contractors method of pricing. Any OPC provided by **RACE** is made on the basis of professional judgment and experience. **RACE** makes no warranty, express or implied, that any bids or negotiated cost of the Work will not vary from the OPC provided.

RACE will prepare an estimated schedule for each alternative. These schedules shall include estimated times for design and regulatory review, as well as, construction.

o **Review Preliminary Report**

RACE will schedule and attend a video conference to review preliminary report. It is anticipated that this will include review and discussion of the predictive analysis, structure alternatives, OPCs, and estimated schedule. **RACE** will document meeting with minutes and circulate to appropriate parties as determined by the Client.

Phase 3: Final Report of Findings & Presentation

RACE will prepare a summary report documenting the results of the previous Phases. The report shall include;

- Tabulated field observations
- Representative photographs
- Model summaries, charts, and projections for predictive analysis
- Relative Sea Level Rise projections and design recommendation
- Drawings and text summaries of alternatives considered
- OPC summary for each alternative
- Estimated schedule including regulatory review timeframe
- Summary of regulatory requirements
- Options and recommendations for future action
- *Summary of underwater investigations (if authorized by the Client)*

RACE will provide this report to the Client in both PDF and hard copy format.

RACE will schedule and attend a meeting to review the overall effort and report of findings. **RACE** will provide an overall project review and summary presentation for key Client stakeholders.

Phase Add Alternate 1: Underwater Investigations & Preliminary Report

Based on findings of Phase 2 and if specifically authorized by the Client, **RACE** can perform an underwater investigation to review the condition of the bulkhead and timber structures. **RACE** will coordinate and lead a three-person OSHA certified dive team consisting of a diver, diver tender, and supervisor. **RACE** will provide an engineer to document the efforts of the dive investigation. The underwater investigations will occur over a two day period.

The dive team will utilize surface supplied air and be equipped with real-time surface to diver communication. The Dive Station will be an independent operation (surface operations and power) and staged from the fixed dock. Any noted deficiencies will be documented.



The underwater investigation will be in accordance with the ASCE Underwater Investigations Standard Practice Manual as published by ASCE, latest edition.

Ultrasonic Thickness (UT) measurements will along the bulkhead and timber elements will be probed at discreet locations.

Observations will be documented in a tabular format and a preliminary report of findings will be prepared.

RACE will schedule and attend a video-conference with the Client to review the preliminary report.

2. ESTIMATED SCHEDULE:

It is understood that the Client would like to have this work complete by April 1, 2022. RACE has prepared a schedule to meet this required completion date. ***This schedule is based on receiving contract and authorization to proceed no later than February 14, 2022.*** Also, if specifically requested by the Client, RACE would need to be authorized for Add Alternate 1 (Underwater Investigation) work no later than March 1, 2022.

Project Schedule

Summary Phase Description	Estimated Start	Estimated Completion
Phase 1: Project Initiation & Document Review	2/15/22	2/21/22
Phase 2: Above Water Investigations & Preliminary Report	2/21/22	3/18/22
<i>Phase AA-1: Underwater Investigations & Preliminary Report (if authorized)</i>	3/7/22	3/25/22
Phase 3: Final Report of Findings & Presentation	3/28/22	4/1/22



3. EXCLUSIONS AND LIMITATIONS:

The Scope of Services described under Section 1 of this Agreement include specific services that **RACE** will perform, which are considered as *Basic Services*. Certain information may be required to be provided by others prior to or during the performance of such services which is not part of the *Basic Services*. Services to be performed by others or services not specifically listed as *Basic Services* within the Scope of Services consist of, but are not limited, to the exclusions listed below. The Client may authorize **RACE** to perform any of the services listed below or other services, and such services shall be considered as *Additional Services*.

1. Land surveying
2. Hydrographic Surveying
3. Dredge material sediment sampling and testing
4. Destructive testing of materials
5. Wetland delineation
6. Review for submerged aquatic vegetation (SAV), wildlife resources and habitat, benthic habitat, and indigenous aquatic life
7. Permitting services
8. Participation in presentations and public hearings
9. Regulatory application and other fees that may be required by federal, state, or local agencies
10. Attendance to meetings except as noted herein
11. Design of utilities such as electrical, water, and sanitary service
12. Design of storm-water management infrastructure
13. Preparation of drainage calculations, drainage reports, and associated forms required for storm-water management
14. Design of repairs to ancillary structures.
15. Preparation of Contract Documents or Construction Contracts
16. Preparation of Technical or Performance Specifications
17. Bid Solicitation
18. Engineering services during construction
19. Reproduction, mailing and courier costs

Basic Services to be provided in this Agreement are based on information provided by the Client. It shall be understood by the Client that conditions may be revealed during the course of the project that were unknown during preparation of this Agreement. Such conditions may require *Additional Services* to be performed.



4. ESTIMATED FEES:

Basic Services

The Scope of Services identified in Section 1 includes the *Basic Services* of this Agreement. The estimated fees for the *Basic Services* are broken down by Phase on the following Fee Schedule.

FEE SCHEDULE – BASIC SERVICES

Summary Phase Description	Total Basic Services Fees
Phase 1: Project Initiation & Document Review	\$ 845
Phase 2: Above Water Investigations & Preliminary Report	\$ 25,925
Phase 3: Final Report of Findings & Presentation	\$ 4,800
PROJECT TOTAL	\$ 31,570

FEE SCHEDULE – ADD ALTERNATE 1

Summary Phase Description	Total Basic Services Fees
Phase AA-1: Underwater Investigations & Preliminary Report	\$ 17,845



Additional Services

During the course of the Work, the Client may authorize services that are not specifically included in the Scope of Services. Such services are identified as *Additional Services*. The fees for *Additional Services* are NOT included in the fees for the *Basic Services*. All time and materials invoices and all *Additional Services* which may be required or requested by the Client during the performance of the *Basic Services* shall be invoiced per the following Rate Schedule for the professional services indicated. These rates are subject to change at the beginning of each calendar year.

RATE SCHEDULE

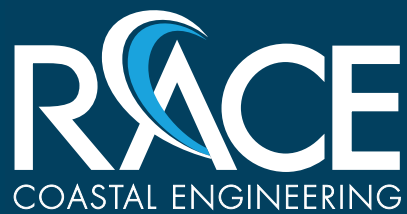
POSITION	HOURLY RATE	POSITION	HOURLY RATE
Principal	\$225	Project Engineer	\$150
Manager of Coastal Engineering	\$225	Engineer	\$130
Project Manager	\$195	Field Technician	\$130
Senior Engineer	\$195	CAD Operator	\$115
Coastal Engineer	\$150	Administrative	\$75

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**TOWN OF CHILMARK
MENEMSHA HARBOR - DOCK REPLACEMENT PROJECT PHASE 1 OF 4**
SECTION 3: COMPANY PROFILE





RACE SUMMARY

WHO IS RACE?

RACE Coastal Engineering, a licensed professional engineering firm, was founded in 1999 with the single purpose of providing specialty coastal engineering consultation and design to clients throughout the Northeast. These services have included more than 1,800 waterfront projects including 50+ dredging projects over the past 22 years. RACE brings a holistic approach to projects using our in-house coastal, geotechnical and structural expertise along with our extensive regulatory and construction phase experience to effectively address every facet of a project.

RACE STAFF

RACE's multi-disciplinary staff of 15 employees, including 10 Professional Engineers licensed in 13 states, maintain expertise in Coastal, Structural and Geotechnical engineering and are supported by USCG licensed captains, ACSM certified hydrographers, and professional office staff. The RACE professionals are intimately familiar with the requirements for proper structural restoration, the preparation of required regulatory permit applications, the preparation of construction drawings and specifications, as well as engineering services during the construction phase of the work. RACE also provides in-house hydrographic surveying services and mapping in support of many of our shoreline stabilization, structural rehabilitation and dredging projects. The range of our company experience and our size provides our clients with qualified staff for all phases of the project while also allowing for direct interaction with the RACE Leadership Team.

SERVICES

RACE has worked with private clients, commercial industries and municipalities throughout

the Northeast to perform studies, perform inspections, develop designs, obtain permits, prepare construction documents, produce Opinions of Probable Cost (OPC's) and provide engineering services during construction for engineering projects including:

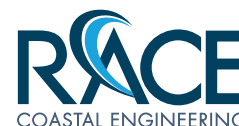
- Dredging and Dredged Material Management
- Waterfront/Coastal Structure Rehabilitation
- Marina Planning and Design
- Coastal Planning and Harbor Management
- Breakwaters and Wave Protection Structures
- FEMA Compliance, Flood Studies
- Sand By-passing/Back-passing at Tidal Inlets
- Environmental Permitting
- Municipal Wharf Facilities Infrastructure
- Beach Nourishment & Dune Restoration
- Coastal Resource Management
- Waterfront Recreational Structures
- Flood & Erosion Control Structures
- Resiliency and Green Infrastructure

HYDROGRAPHIC SURVEYS

RACE provides specialized hydrographic surveying and sampling services in-house. We have performed hundreds of hydrographic surveys in support of dredging, waterfront structure inventories and mapping, beach nourishment and shoreline monitoring, marina and mooring field planning, inlet and navigation channel shoaling, and our sediment transport studies. RACE provides a one-stop shop for data collection, processing and related engineering services, all of which are supervised and reviewed by our

Our mission is to enhance quality of life, experience, property & infrastructure by providing responsive solutions where water meets land.

RACE expertise embraces modern coastal engineering practices that are supported by a broad range of engineering disciplines including geotechnical and structural engineering as well as regulatory expertise. Our full-range of professional services include: coastal engineering, shoreline restoration and protection, inspections and rehabilitation of existing structures, design and planning of new marine structures, environmental permitting, hydrographic surveys, dredging planning and design, and marine construction administration.



very own ACSM certified hydrographer. To support our hydrographic surveys and dredging projects, RACE maintains multiple survey vessels with custom instrument enclosures, each of which carry the latest in depth recording and positioning technology.

DREDGING PLANNING & ENGINEERING

RACE provides a complete package of dredging engineering services designed to maintain safe navigation and operations in Federal Channels, ports, terminals, and marinas while complying with regulatory agency requirements. RACE considers coastal processes that may impact navigational and vessel berthing activities and designs programs to minimize overall impacts while maximizing productive outcomes. We provide management of dredged material disposal in conjunction with regulatory agencies and propose repurposing of material when applicable for beach nourishment, sand by-passing or back-passing.

COASTAL ENGINEERING / MODELING EXPERTISE

RACE has staff with advanced degrees or certifications specific to coastal engineering and maintains state-of-the-art computer and mathematical numerical tools to model coastal and offshore wave environments, storm water levels, sediment transport, and shoreline changes.

RACE staff are well versed in the use of numerical modeling tools for hydraulic, hydrodynamic, and coastal engineering assessments. RACE utilizes these models to determine the applicable design conditions and environmental response in order to develop practical design solutions.

STRUCTURAL DESIGN EXPERTISE

RACE has staff with expertise in structural and/or geotechnical engineering to perform inspection, analysis and design of waterfront structures as well as the rehabilitation of existing structures. Our design experience includes timber, steel, concrete, aluminum composite, and stone structures. Our engineers are well versed on the latest codes and standards and tools and software for structural analysis in support of the design of piers, docks, bulkheads, boat ramps and other earth retaining structures.

RACE was honored in 2017 by the American Council of Engineering Companies (ACEC) at

the state and national level for our innovative approach to the bulkhead design at the Steelpointe Harbor site in Bridgeport, CT.

GEOTECHNICAL ENGINEERING

RACE provides geotechnical engineering expertise to round out our structural and coastal engineering capabilities in order to provide a complete design package from the ground up. Our geotechnical engineering services include review of site geotechnical properties and conditions, soils and subsurface hydraulics analyses, retaining wall and bulkhead design, pile foundation design, earthworks, slope design and repair, and levee assessment. RACE maintains the latest geotechnical software applications required for design and analysis. Our staff are also experienced in the field during site data collection and construction phases including management of subsurface investigations and borings, subgrade preparation, controlled placement of fill, well installation, and shallow and deep foundations.

REGULATORY SUPPORT

RACE has extensive experience with marine permitting at Federal, State and local levels. RACE's regulatory specialists, utilizing the knowledge, experience, and professional relationships built through decades in the local industry, streamline the regulatory/permitting process by working closely with owners, our designers, and the regulatory agencies for positive project outcomes. From project initiation, our team of specialists will perform the tasks required to successfully obtain Federal, State, and local permits.

Our understanding of the environmental regulations and guidelines, as well as our relationships with state, US Army Corps of Engineers and other agencies provides a complete package for our clients. RACE has successfully combined expertise in coastal engineering, coastal processes and design of waterfront structures with our understanding of the regulations to design and permit hundreds of projects that are not only appropriate for the marine environment that they are located in, but with attention to minimizing impacts to natural resources consistent with the goals of the agencies.

CONSTRUCTION PHASE SERVICES

RACE's many years of experience in the design of marine structures and inspection

AWARDS

2020 AMERICAN SHORE & BEACH PRESERVATION ASSOCIATION (ASBPA)

America's 2020 Best Restored Beach Award

2020 AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS - NY (ASLA-NY)

Residential Design Award

2019 AMERICAN COUNCIL OF ENGINEERING COMPANIES (ACEC)

Connecticut Engineering Excellence Award
National Recognition Award

2017 AMERICAN COUNCIL OF ENGINEERING COMPANIES (ACEC)

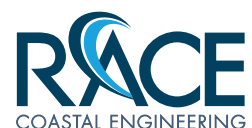
50th Anniversary Engineering Excellence Awards
National Recognition Award
Connecticut Engineering Excellence Award

2017 NEW YORK CITY HALL 34TH ANNUAL DESIGN AWARDS

Special Recognition Award

2015 CONNECTICUT SOCIETY OF CIVIL ENGINEERS (CSCE)

8th Annual Achievement in Civil Engineering (ACE) Awards
Structural ACE Award of Merit



of marine construction provides an excellent foundation to develop an understanding of construction techniques and constraints, and of the important role of quality assurance in the construction of marine structures. Our professional team of construction phase specialists can handle all components of a complete construction support system and understand the complex relationship between owner, construction manager, engineer, and contractor; we work closely with all parties to attempt to prevent problems from arising and to solve those issues that may occur.

MARINA PLANNING AND DESIGN

RACE lives, works and plays on the water. Our staff is comprised of boaters who not only understand marina planning and design from an academic standpoint, but from a practical, end-user perspective as well. RACE provides solutions to the complex planning, engineering, and regulatory challenges related to the improvement or maintenance of public and private marina facilities.

FEMA FLOOD HAZARD EVALUATION AND COMPLIANCE

RACE has extensive experience providing engineering design consultation and regulatory services related to FEMA flood hazard zone evaluation, mapping and compliance for both existing and proposed structures for private, commercial and public infrastructure. We provide site specific evaluation of coastal flood hazard zones in accordance with FEMA's current guidelines, policies and specifications. When projects must be sited in a flood zone, RACE can assess the design with respect to the requirements of the National Flood Insurance Program and local zoning authorities and provide evaluation of impacts and recommendations for compliance. RACE is able to determine flood loads and engineer the foundation and framing elements of buildings for flood zone compliance.

RESILIENCY AND GREEN INFRASTRUCTURE

Flooding, erosion and wind hazards caused by hurricanes, coastal storms, rising sea level, and other weather and climate-related events and phenomena are the primary coastal hazards that lead to economic losses and damage to property in developed coastal areas. RACE helps protect our clients from

these losses by developing extensive mitigation plans and strategies to minimize these types of impacts while building in resiliency. Our coastal, structural and geotechnical engineers are effective and creative in applying knowledge of mathematics and science to create holistic, practical and constructible solutions to hazard mitigation that reduce risk and accelerate recovery from storms, as well as prepare for future sea level rise and climate change. Our resiliency experience includes nature-based infrastructure such as beach enhancement, dune creation, hybrid living shorelines and marsh creation and restoration.

THE RACE DIFFERENCE

SOLE FOCUS ON WATERFRONT PROJECTS

RACE's sole dedication to waterfront projects means our clients are getting an unparalleled combination of coastal, structural, geotechnical, and dredging expertise required to successfully complete their projects.

SPECIALIZED COASTAL ENGINEERING EXPERIENCE

RACE prides itself on the credentials and capabilities of our in-house coastal engineers. Having provided coastal engineering services in nearly all of New England waters, RACE understands the dynamics of the region, the variability and vulnerability of the shoreline and associated facilities, and the steps to be taken to insure a successful project in this sensitive environment.

RECOGNIZED EXPERTS BY STATE AND FEDERAL AGENCIES

RACE staff have decades of experience working directly with the staff and within the statutes, policies and guidelines of the Federal, State, and local regulatory agencies. Several RACE staff members have been formally recognized as experts in our field by regulatory analysts in the context of public hearings and have been solicited for technical guidance in the development of new guidelines.

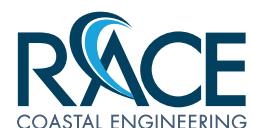
LOCAL AND RESPONSIVE

Our local knowledge afforded by years of experience living, working and playing in the area, our company size and location provides our clients with sufficient qualified staff and rapid response for all phases of their projects while also allowing for direct interaction between the Client and company Principals.

AWARDS (CONT.)

2014 CONNECTICUT SOCIETY OF CIVIL ENGINEERS (CSCE)

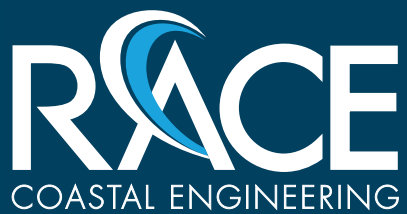
7th Annual Achievement in Civil Engineering (ACE) Awards
Sustainability ACE Award
Construction Award of Merit





**TOWN OF CHILMARK
MENEMSHA HARBOR - DOCK REPLACEMENT PROJECT PHASE 1 OF 4**

SECTION 4: SAMPLE PROJECT EXPERIENCE





Bulkhead at Tremley Terminal

PHILLIPS 66 TREMLEY TERMINAL TERMINAL RESTORATION IN LINDEN, NJ

PROJECT DESCRIPTION:

RACE prepared Contract Documents and performed Construction Administration Services for the \$3 million restoration project in Linden, NJ. The facility includes 500 feet of bulkhead, two loading platforms and ten breasting cells along the Arthur Kill Waterway. Services also included above and underwater investigations. Repair designs included a replacement bulkhead along a tidal wetland and overshooting of an existing bulkhead. Most notably, RACE developed a design that allowed the existing steel sheet pile to be cut and replaced with a new concrete extension. This repair allowed the bulkhead to be repaired in place and saved the owner from an expensive pipeline replacement project or the need to demolish a portion of the loading platform to gain access. This repair allowed the terminal to remain operational during construction.

CLIENT:

[Phillips 66](#)

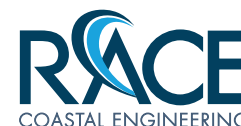
CONTACT:

[Available upon request.](#)

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2015

- Above and underwater investigations
- Geotechnical investigations
- Hydrographic Survey
- Engineered design of new steel sheet pile bulkhead, crane foundation and appurtenant structures
- Assistance with regulatory permits
- Preparation of Opinion of Probable Costs
- Preparation of Contract Documents that include structural design of replacement bulkhead, steel overshooting, concrete bulkhead, and platform repairs
- Construction Administration Services





Dredging and design changes to the marine facility's layout provides much improved access to vessels.

DREDGING & MARINE FACILITY IMPROVEMENT PLAN JAMESTOWN, RI

PROJECT DESCRIPTION:

RACE was contacted by Jamestown Boat Yard (JBY) to complete a study of their existing marine facility. RACE's tasks included a hydrographic survey, dredge study, and marina improvement concepts to accommodate vessels that JBY maintains.

Located in the high intensity boating waters of the lower Narragansett Bay, JBY has six slips to service its customers. The majority of yachts JBY services are sailboats with keels that touch bottom at low tide. Accordingly, the boats would need to be moved during low tides, thereby limiting access to both customers and service providers. In order to better serve their customers, JBY was looking at possible ways to improve their facility.

To determine current water depth, RACE performed a hydrographic survey. The data was then used to compute dredge volumes for various dredge depths. In addition, two marina concept plans were developed to better accommodate the larger vessels that JBY has been maintaining. RACE prepared Opinion of Probable Costs for each of the alternatives. Following the selection of an alternative, RACE assisted with the permitting process by collecting sediment samples, compiling data, preparing permit drawings, preparing applications, and submitting applications to local, State and Federal Agencies.

Upon approval, RACE prepared final dredge plans and specifications for contractor bid solicitation.

CLIENT:

Jamestown Boat Yard
60 Dumpling Drive
Jamestown, RI 02835

CONTACT:

Brandon Somers
General Manager
Safe Harbor
Jamestown Boatyard
Telephone:
(401) 423-0600

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2021

- Hydrographic surveying and dredge volume calculations
- Historic permit research
- Regulatory applications for Local, State and Federal Permits
- Soil Samples
- Submerged Aquatic Vegetation and Shellfish Survey
- Engineered design of dock/piling layout, including navigational access
- Development of Opinion of Probable Costs (OPC)
- Dredge construction drawings and assistance during construction/dredging



Repairs to bulkhead and pier at the City of Bridgeport's Bloom Shellfish facility.

BLOOM SHELLFISH FACILITY, BRIDGEPORT, CT BULKHEAD & PIER CONDITION ASSESSMENT, REPAIR DESIGN, PERMITTING & CONSTRUCTION ADMIN.

PROJECT DESCRIPTION:

RACE performed an investigation of both the steel sheet bulkhead and pile supported concrete pier. Findings were reported with recommendations to the City of Bridgeport along with an Opinion of Probable Cost (OPC). Recommendations included design of repairs of sufficient detail for the development of OPC's.

Additionally, RACE included recommendations for immediate and long-term maintenance requirements of the facility. The City of Bridgeport retained RACE to design and permit repairs to the bulkhead, its structural components, as well as repair specifications for the damaged protective coating of the wharf foundation piles and bulkhead.

Following the design, RACE assisted the City with acquiring Federal, State and Local Permits to complete the work. RACE also completed bid solicitation as well as Construction Administration Services including, but not limited to, shop drawing review, site observations, special inspections and meetings.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2020

- Historic Documentation Review
- Field investigations and Condition Assessment
- Geotechnical Investigations
- Bulkhead Analysis
- Summary Report with options for future action
- Designed Repairs
- Regulatory Permitting
- Bid Solicitation
- Construction Administration

CLIENT:

City of Bridgeport, CT
45 Lyon Terrace
Rm 216
Bridgeport, CT 06604

CONTACT:

John Urquidi, PE
City Engineer
Telephone:
(203) 576-7211



Repairs to bulkhead and pier at the City of Bridgeport's Bloom Shellfish facility.



BLOOM SHELLFISH FACILITY, BRIDGEPORT, CT BULKHEAD & PIER CONDITION ASSESSMENT, REPAIR DESIGN, PERMITTING & CONSTRUCTION ADMIN.

PROJECT DESCRIPTION:

RACE performed an investigation of both the steel sheet bulkhead and pile supported concrete pier. Findings were reported with recommendations to the City of Bridgeport along with an Opinion of Probable Cost (OPC). Recommendations included design of repairs of sufficient detail for the development of OPC's.

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PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2020

- Historic Documentation Review
- Field investigations and Condition Assessment
- Geotechnical Investigations
- Bulkhead Analysis
- Summary Report with options for future action
- Designed Repairs
- Regulatory Permitting
- Bid Solicitation
- Construction Administration

CLIENT:

City of Bridgeport, CT
45 Lyon Terrace
Rm 216
Bridgeport, CT 06604

CONTACT:

John Urquidi, PE
City Engineer
Telephone:
(203) 576-7211



Aerial Steelpointe

STEELPOINTE BULKHEAD STEELPOINTE DEVELOPMENT, BRIDGEPORT, CT

PROJECT DESCRIPTION:

RACE was retained by the Steelpointe Harbor Developer, Bridgeport Landing Development, LLC to restore the point. RACE provided design computations and the development of a 1,570 LF steel bulkhead system with additional fill to support a new public realm consisting of a network of shops, streets, promenades, condominiums, open spaces, and a hotel. The 2.8 million square foot mixed-use site is Bridgeport's largest development project and RACE provided a full complement of professional engineering services through the design, permitting and construction phases. The restored area has continuity and uniformity by eliminating dilapidated sections of timber bulkhead, boat ramps and concrete block walls and created new areas for access to the waterfront. The design took into account the various dredging depths, exposed wall heights, and sealing of the bulkhead to create a uniform structure to further facilitate the City's economic goals and enjoyment of the waterfront resources for the City and public.

RACE received the 2017 **Engineering Excellence Award** from the American Council of Engineering Companies of Connecticut for this project.

CLIENT:

Bridgeport Landing
Development
10 Middle Street
10th Floor
Bridgeport, CT 06604

CONTACT:

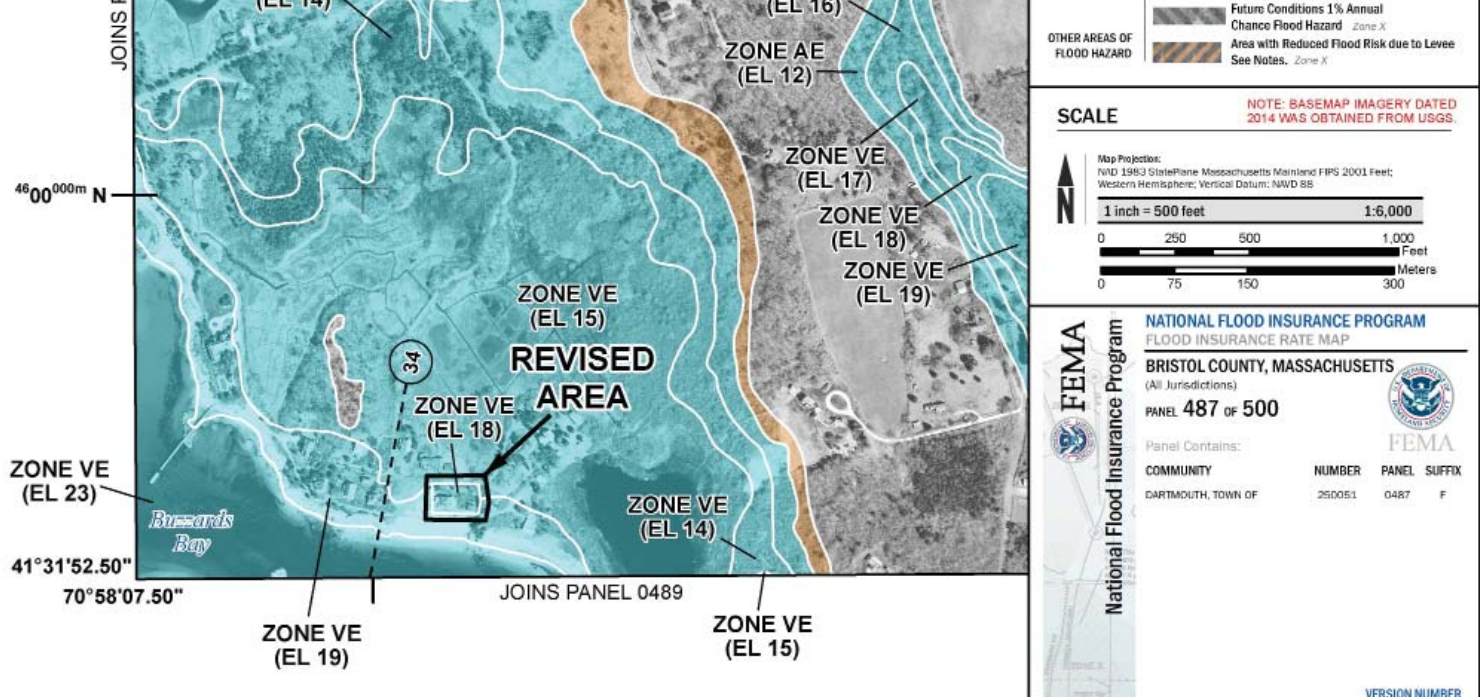
Mark Summers
Telephone:
(203) 330-8200

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2016

- Site investigation to review conditions and coastal resources
- Analysis of lateral forces on the structure due to soil and hydrostatic loads
- Design of concrete wale system accommodating the bulkhead's curvature
- Engineering Services During Construction were provided to ensure compliance with the design and regulatory conditions
- Coordination of specifications for geotechnical investigation program
- Opinion of Probable Costs and Bid Documents
- Resident Engineer during construction





FEMA LETTER OF MAP REVISION PRIVATE PROPERTIES, DARTMOUTH AND WESTPORT, MA

PROJECT DESCRIPTION:

RACE Coastal Engineering was contracted by private homeowners in the Towns of Dartmouth and Westport, MA to review the effective FEMA flood hazard zone designations and determine whether modifications of those designations might be warranted through FEMA’s Letter of Map Revision (LOMR) process. RACE performed coastal engineering analyses to determine the characteristic 100-year (1%-annual-chance) design wave which can impact the sites using empirical modeling techniques developed by the US Army Corps of Engineers and required by FEMA. Once the offshore wave climate was established, RACE utilized FEMA and Army Corps of Engineers methodology to determine the wave propagation upland, onto the property using WHAFIS (wave height) and RUNUP analyses as described in the FEMA publications “Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update – Final Draft,” dated February 2007 and Guidelines and Specifications for Flood Hazard Mapping Partners and current revisions. RACE’s analyses took into account site specific topography and site features including existing flood and erosion control structures along the shoreline.

RACE determined that modifications to the effective flood zones were warranted and successfully applied and received LOMRs for both properties which relocated the VE/AE Zone boundaries as well as lowered the base flood elevations consistent with the owner’s goals for property development and flood insurance purposes.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2017

- Performed wave transformation and flood modeling based upon “100-year” storm criteria
- Performed wave height, wave setup and wave runup computations using USACE and FEMA models
- Prepared flood zone boundary location plans
- Prepared FEMA Letter of Map Revision Applications and supporting documentation
- Coordinated with FEMA technical reviewers for successful outcomes

CLIENT:

Private Homeowners
Prospect Avenue,
Westport, MA
Smith Avenue,
Dartmouth, MA

CONTACT:

[Available Upon Request](#)



Hydrographic Surveying and Dredge Volume Computations at Hingham Shipyard

HINGHAM SHIPYARD **HINGHAM SHIPYARD MARINA DREDGING**

PROJECT DESCRIPTION:

RACE provided hydrographic survey services for the dredging contractor as part of a maintenance dredging project in Hingham, MA. The hydrographic survey work was required for the purposes of evaluating dredging performance and quality assurance. RACE furnished all equipment, materials, labor and supervision to complete a single-beam, echo sounder survey of the areas of the marina proposed for dredging. Following data collection, RACE processed the data, applied tidal corrections, and developed soundings and contours plans for the area. RACE additionally conducted surfacing rendering and computed dredge volumes.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2018

- Hydrographic Surveying and Dredge Volume Computations

CLIENT:

US Northeast Dredge and
Marine, LLC

P.O. Box 778

Hampstead, NH 03841

CONTACT:

Ed Valliere

(603) 489-3192



Veteran's Park Visitor Docks and Boat Ramp

VETERAN'S PARK BOAT RAMP IMPROVEMENT PROJECT

PROJECT DESCRIPTION:

RACE was retained by the City of Norwalk to secure permits from the CT DEEP and US Army Corps in addition to designing the replacement of the existing boat ramp, associated floating docks and improvements to the parking lot. RACE worked with the City on floating dock layout alternatives to provide the City with the maximum amount of berthing area based on the anticipated vessels that would use the facility. Upon acquiring the required permits, RACE designed and compiled construction documents for the improvement of the 58,200 square foot parking lot, replacement of the timber pile supported boat ramp with a pile supported concrete boat ramp, and replacement of the existing floating dock facility. RACE performed inspection and quality control Construction Administration services through the project's successful completion.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2018

- Floating Dock layout concepts
- Preparation of an Assessment Report for the existing facility
- Regulatory permit applications for State and Federal permits
- Grading improvements to the parking lot
- Design calculations for the concrete boat ramp
- Project specifications for the facility improvements
- Construction Administration Services

CLIENT:

City of Norwalk
2 South Smith Street
Norwalk, CT 06855

CONTACT:

Ken Hughes
Interim Director
Recreation & Parks
Telephone:
(203) 854-7725



Island Beach Pier

TOWN OF GREENWICH ISLAND BEACH REHABILITATION

PROJECT DESCRIPTION:

Immediately following Superstorm Sandy in October 2012, RACE provided critical coastal engineering services related to the timely restoration of all public beach and marina facilities in the Town of Greenwich. Within this scope of services, RACE provided the engineering support for the repair of the Island Beach facility. The ferry landing pier facilities at Island Beach were destroyed making access by Town residents impossible. A replacement pier was designed by RACE to withstand the hydrodynamic forces associated with a 1% annual (100-yr recurrence) storm event. The rapid response by RACE was critical in allowing the Island Beach facility to be reopened in time for the 2013 season.

RACE was honored to receive the 2014 CT Society of Civil Engineers Achievement in Engineering (ACE) Award for Sustainability, as well as, the ACE Award of Merit for Construction of the Island Beach project.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2013

- Post-Storm assessment and prioritization of repair activities
- Development of wave force impacts on pier structure for 100-yr recurrence interval event
- Engineered design of public access ferry landing structure and ancillary components
- Regulatory Permits
- Preparation of detailed engineering specifications for all elements of pier replacement project
- Shop drawing submittal, change order and invoice review
- Engineering Services During Construction to review and witness construction to ensure it conforms to the design and review of payment submittals

CLIENT:

Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

CONTACT:

Joseph Siciliano,
Director – Parks and
Recreation
Telephone:
(203) 622-6472



Sconset Bluff Protection Coastal Engineering and Modeling

TOWN OF NANTUCKET, MA SCONSET BLUFF PROTECTION PROJECT

PROJECT DESCRIPTION:

RACE Coastal Engineering, under subcontract agreement to Milone & MacBroom, Inc., provided coastal engineering peer review services for the Town of Nantucket for the Sconset Bluff Protection project. The proposed project included ~2,000 linear feet of bluff protection consisting of riprap revetment, sand-filled geotubes, and vegetated sand fill for the eroding bluff.

RACE performed a technical review of project materials, proposed plans and details and permit application documents submitted by the Applicant. RACE performed independent coastal engineering analyses to comment on the design. RACE evaluated alternatives and provided recommendations to the Town relative to permit requirements and special conditions. RACE participated in public hearings as a technical advisor for the Nantucket Conservation Commission.

PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2013

- Coastal Engineering Analysis and Modeling
- Existing Condition Review
- Slope Protection Alternatives Analysis
- Peer Review
- Technical Advisor to Conservation Commission

CLIENT:

Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

CONTACT:

John Milone, PE
203-271-1773





Pleasure Beach Pier

CITY OF BRIDGEPORT PLEASURE BEACH PIER REPLACEMENT

PROJECT DESCRIPTION:

RACE provided professional engineering services to the City of Bridgeport related to the assessment, repair alternatives analysis and design of a replacement structure for the Pleasure Beach Pier. The existing pier had exhibited substantial deterioration based on the above and below water inspections performed by RACE. The replacement of the structure was recommended for the intended future use as the sole means of public access to this unique site. RACE prepared detailed design drawings and specifications for the replacement structure and prepared applications to State and Federal Regulatory agencies.

RACE was honored to receive the 2015 **CT Society of Civil Engineers Achievement in Engineering (ACE) Award of Merit** for Structural Design of the Pleasure Beach Pier.

CLIENT:

City of Bridgeport
45 Lyon Terrace
Bridgeport, CT 06604

CONTACT:

Jon Urquidi
Engineering Supervisor
Telephone:
(203) 576-7211

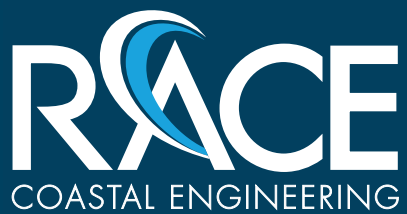
PROFESSIONAL SERVICES PROVIDED:

PROJECT COMPLETION: 2014

- Detailed above and below water inspections of existing pier condition
- Hydrographic survey to determine depths for structural design and vessel access
- Regulatory permit application preparation, submittal and follow-up services
- Preparation of Opinion of Probable Costs for pier repair and replacement alternatives
- Engineered design of public access structure and ancillary components
- Designed wave attenuator structure to provide for safe water taxi berthing
- Detailed engineering specifications for all elements of project and provided Construction Administration Services



**TOWN OF CHILMARK
MENEMSHA HARBOR - DOCK REPLACEMENT PROJECT PHASE 1 OF 4
SECTION 5: COMPANY RESUMES**



PROFESSIONAL PROFILE

DEVIN J. SANTA, P.E., SECB PRESIDENT



Mr. Santa has more than 25 years of coastal and structural engineering experience. His professional career includes the management of large design programs which have included: rehabilitation of waterfront structures, development and design of marina facilities, design of residential, commercial, and industrial marine facilities, beach nourishment, coastal structures and shoreline stabilization, dredging and dredged material

disposal, regulatory permitting, and marine construction. He is a certified Project Management Professional (PMP)[®] for his demonstrated experience, performance and education in achieving project objectives.

As a Professional Engineer, he has performed feasibility studies, coastal structure condition inspections, hydrographic surveying, design and preparation of construction documents for steel, concrete and timber bulkheads, stone revetment and breakwater structures, and design of marina and mooring facilities. He is proficient with numerical design applications typically used for coastal and structural engineering and hydrographic surveying and dredging design programs including but not limited to: HYPACK, Land Development Desktop, software normally employed for FEMA coastal flood analyses (CHAMP), and industry standard pile and bulkhead design software.

Mr. Santa maintains comprehensive knowledge and expertise in beach and shoreline surveying, hydrographic surveying and mapping, inspection and design of coastal structures, design and improvement of marina and yacht club facilities, and related marine construction expertise. His academic and professional experience has been focused in structural and coastal engineering. This experience has successfully been applied in the design of timber, steel, and concrete bulkhead structures, foundation structures exposed to tidal and wave induced load conditions, vessel mooring systems, jib crane and travel-lift facilities, pile foundation and anchor pile systems, and related waterfront structures. He has obtained numerous permits in L.I.S.

Mr. Santa employed his extensive on-the-water experience gained as a licensed Captain to assist clients in the optimization of marine facility layout, including vessel hauling & launching facilities. His wide-ranging expertise in hydrographic surveying & mapping contributes significantly to the numerous dredging, channel design, and navigation and mooring facility design projects by RACE. Mr. Santa has provided expert testimony regarding marina facility design and mooring facility planning and function and is recognized as an expert in the design of those facilities. Mr. Santa has served on the Town of Stratford Harbor Management Commission and as a Director of the Connecticut Harbor Management Association. He is currently a board member of the Connecticut Marine Trades Association.

QUALIFICATIONS

EDUCATION

M. Eng. Old Dominion University, Norfolk, VA
Civil (Coastal) Engineering

B.S. Northeastern University, Boston, MA
Civil (Structural) Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Professional Engineer: CT, NY, NJ, MA, RI, IL, PA,
FL, DE, VA, MD, ME

Certified Project Management Professional (PMP)[®]

Certified Hydrographer - American Congress of
Surveying & Mapping

Board Certified Structural Engineer (SECB)

USCG 100-Ton Near Coastal Master License

PIANC Corporate Member

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)

Current Board Member CT Marine Trades
Association (CMTA)

Former Member Stratford Harbor Management
Commission

Former Director CT Harbor Mgmt. Association
(CHMA)

CONFERENCE SPEAKING ENGAGEMENTS & PAPERS

"Re-thinking USACE Standards An Ecologically
Balanced Approach to Structured Shorelines"
Panel Member - Presented at Restore America's
Estuaries Conference 2017.

"Wading Through the Murky Waters of Risk and
Design for Marinas"
Panel Member - International Marina & Boatyard
Conference 2017.

"Planning a Successful Dredging Project"
Presented at the International Marina & Boatyard
Conference 2015 & 2017.

"Understanding FEMA Coastal Flood Hazard
Mapping & Modifications" Presented at the Con-
necticut Association of Land Surveyors
Annual Meeting 2013.



PROFESSIONAL PROFILE

AZURE DEE SLEICHER, PE

VICE PRESIDENT, COASTAL ENGINEERING



With nearly 20 years of experience in coastal engineering, Ms. Sleicher brings to RACE and our clients specialized knowledge in waterfront planning, regulatory processes and design. Her extensive experience includes: the analysis, design and permitting of coastal erosion protection structures such as revetments, seawalls, bulkheads, jetties, groins and breakwaters, design of beach and dune nourishment and dredging projects, as well as design of waterfront parks and marina infrastructure. Ms. Sleicher's duties have included surveying and site investigations, preparation of design plans and specifications, cost estimating, construction supervision, and regulatory compliance.

Ms. Sleicher has a strong theoretical background in coastal processes coupled with practical experience in wave dynamics, sediment transport, hydraulics, scour assessment, and dredging. She is well versed in coastal engineering software such as Mike21, STWAVE, CGWAVE, CMS-WAVE, CMS-FLOW, CEDAS, and the shore protection methods of the U.S. Army Corps of Engineers (USACE) to determine wave climates and design conditions. Dredging experience includes design and regulatory coordination for new and maintenance dredging including evaluation of material for beneficial reuse and demonstration projects.

Ms. Sleicher has extensive experience with the regulatory requirements of the USACE and multiple state and local authorities including Chapter 91 permits in MA. Combining expertise in coastal engineering, coastal processes, dredging and design of waterfront structures with her background in environmental engineering has allowed Ms. Sleicher to design projects that are not only appropriate for the marine environment that they are located in, but with attention to minimizing impacts to natural resources consistent with the goals of the agencies.

A sampling of Ms. Sleicher's project experience in MA includes evaluation of bluff and beach erosion at Fourth Cliff Air Force facility and nearby Humarock Beach; analysis and design of bluff protection structures in Nantucket; inspection and design of repairs to the West Bay breakwaters for the Town of Barnstable; coastal modeling and design of coastal protection projects at White Cliffs in Plymouth; design of docks at Constitution Marina in Boston; flood zone modeling, compliance and design of waterfront improvements at the "Pier 4" facilities in Boston; and site investigations and design of bulkhead repairs at Nantucket Yacht Club.

Ms. Sleicher is well-versed in determination of coastal flood hazard areas in accordance with FEMA's Guidelines and Specifications. She has successfully managed over 60 FEMA Letter of Map Revision (LOMR) applications in MA, ME, CT, NY and FL and was involved in county-wide coastal flood hazard mapping updates for over 800 miles of shoreline in FEMA Region I including Bristol, Barnstable, Plymouth, and Essex Counties.

QUALIFICATIONS

EDUCATION

M.S. Florida Institute of Technology, Melbourne, FL
Coastal Engineering

B.S. Syracuse University, Syracuse, NY
Environmental Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Professional Engineer: CT, NY, NJ
Envision™ Sustainability Professional

PROFESSIONAL AFFILIATIONS

American Council of Engineering Companies (ACEC)

American Shore & Beach Preservation Assoc. (ASBPA)

CT Association of Flood Managers

PIANC Corporate Member

CONFERENCE SPEAKING ENGAGEMENTS & PAPERS

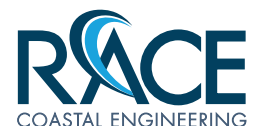
"Water: Conservation, Mitigation, Creation & Restoration", Presented at the Connecticut Chapter of the American Society of Landscape Architects 2019 Residential Design Expo.

"The Coastal Engineering Behind the Flood Maps", Presented at the Connecticut Association of Flood Managers Conference, 2018.

"Gandy's Beach Hybrid Breakwater Project – A Catalyst for Living Shoreline Protection and Ecological Uplift", Presented at the American Shore and Beach Preservation Association (ASBPA) Annual Conference, 2015.

"Implementation of Updated Guidelines for Coastal Redelineation in FEMA Region 1", Presented at the Association of State Floodplain Managers (ASFPM) Annual Conference, 2008.

"Modeling the Wave Impacts of Hurricane Floyd in Charleston Harbor, South Carolina", Presented at the American Society of Civil Engineers (ASCE) Solutions to Coastal Disasters Conference, 2005.



PROFESSIONAL PROFILE

MATTHEW RAKOWSKI, P.E. PROJECT MANAGER



Mr. Rakowski has more than 15 years of experience in structural engineering compiling designs and analyzing waterfront structures, foundations, and buildings. Mr. Rakowski maintains thorough knowledge in the design of marine structures such as infrastructure required at municipal marine facilities, residential, industrial, and commercial properties. His professional career includes structural analysis, regulatory permitting, cost estimating, surveying and planning for various waterfront uses under a broad range of load conditions, preparation of contract documents, material specifications, and construction administration services.

As a structural engineer, he has performed numerous structural assessments, coastal structure condition inspections, design and preparation of construction documents for steel and timber piers, design of concrete structures, design and structural roof assessments. He is proficient with numerical design applications typically used for such coastal and structural engineering design programs, including but not limited to Land Development Desktop, AutoCAD, RISA and industry standard pile and bulkhead design software.

His vast experience in design comprises the engineering of reinforced concrete, cold form steel, steel, timber, aluminum, and masonry structures. He has designed waterfront structures for municipalities on Long Island Sound, yacht clubs, marinas, and private residences.

He has successfully completed a broad range of waterfront improvement projects, including: steel sheetpile bulkhead replacement, stone revetment shoreline protection structures, timber and steel piers, floating dock replacement, dredging projects, beach nourishment programs, and related waterfront improvement projects. He has completed project review for conformance with construction drawings and specifications, review of requests for payments, review of environmental controls as required by regulatory permits and construction practice, review and processing of change-order requests, and related construction administration services.

Mr. Rakowski also has management experience in all phases of a project including: field data acquisition, preparation of regulatory applications, design calculations, construction drawings, contractor bid package preparation, and construction.

One of Mr. Rakowski's larger projects has been managing the waterfront design, permitting and construction oversight of the Steelpointe Harbor Development (Bridgeport, CT) – a complex and critical part of Bridgeport Harbor's revitalization. For the innovative bulkhead design, RACE was presented a national *Engineering Excellence Award* from the American Council of Engineering Companies.

QUALIFICATIONS

EDUCATION

Old Dominion University, Norfolk, VA
Graduate Certificate in Coastal Engineering

B.S. University of Rhode Island, Kingston, RI
Civil (Structural) Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Professional Engineer: CT, MA

OSHA 10-Hr. 2013

PROFESSIONAL AFFILIATIONS

American Council of Engineering Companies
(ACEC)

American Institute of Steel Construction (AISC)

PIANC Corporate Member



PROFESSIONAL PROFILE

JILL PIETROPAOLO, P.E. SENIOR COASTAL ENGINEER



As a Coastal Engineer Ms. Pietropaolo has performed feasibility studies, Flood Insurance Rate Map (FIRM) revisions, regulatory permitting, design, drafting, and construction oversight of residential and municipal piers, marinas, revetments, seawalls, jetties, and other coastal structures under the supervision of a Project Manager or Principal. She has experience working with the models CHAMP,

WHAFIS and RUNUP2.0 normally employed for FEMA coastal flood analyses and with CEDAS ACES & SBEACH 4.03 applications used to model waves and shoreline change, respectively. Her capabilities also include analysis of beach and shoreline erosion and mitigation measures, numerical modeling, coastal flood mapping, and assessment and design of coastal structures. In addition, she has experience working with various coastal circulation and wave modeling programs within the Surface-water Modeling System such as CMS Wave and CMS Flow.

Ms. Pietropaolo is proficient in wave modeling used to assess wave load conditions applicable for design of the waterfront structures.

Ms. Pietropaolo is capable of developing wave loads by quantifying the offshore wave conditions associated with the 100-yr recurrence wind speeds that characterize the site & modeling the wave as it transforms in shallower water using advanced computer based applications.

Ms. Pietropaolo has obtained numerous regulatory permits on the Federal, State and local levels including LOMA, LOMR, LOMR-F, CLOMR and CLOMR-F administered by FEMA.

In July 2012, Ms. Pietropaolo attended the 33rd International Conference on Coastal Engineering in Santander, Spain where she presented, "Wave Runup on Dikes and Beaches." While completing her Master of Civil Engineering Degree in Coastal Engineering in May 2012 at the University of Delaware Center for Applied Coastal Research, she worked under Nobuhisa Kobayashi, Ph.D., in collaboration with the Army Corps of Engineers on research for prediction of wave transformation, breaking, runup, sediment transport, and the deformation of breakwaters with the numerical model CSHORE.

At RACE, Ms. Pietropaolo has developed hydrodynamic load conditions, assessed coastal flooding conditions at sites, evaluated impacts of flooding and potential erosion on the design and subsequent function of sites, and assists the Project Manager in the development of the project design.

In July 2015, she and a co-worker presented a poster on RACE's work on a breakwater reconstruction at the Young Coastal Scientists and Engineers Conference at the University of Delaware. The poster won "Best Poster Award" as voted by their peers.

QUALIFICATIONS

EDUCATION

M.C.E. University of Delaware, Newark, DE
Coastal Engineering

B.S. Villanova University, Villanova, PA
Civil Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Professional Engineer: CT

PROFESSIONAL AFFILIATIONS

American Council of Engineering Companies (ACEC)

American Society of Civil Engineers (ASCE)

Connecticut Society of Civil Engineers (CSCE)

American Institute of Steel Construction (AISC)

PADI Open Water Scuba Certification

PIANC Corporate Member

CONFERENCE SPEAKING ENGAGEMENTS & PAPERS

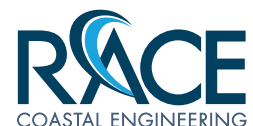
Pietropaolo, J., Kobayashi, N. and Melby, J.A. (2011). "Numerical Modeling of Wave Transformation, Breaking and Runup on Dikes and Gentle Slopes." Research Report No. CACR-11-05, Center for Applied Coastal Research, University of Delaware.

Pietropaolo, J., Kobayashi, N. and Melby, J.A. (2012). "Wave Runup on Dikes and Beaches." Proceeding of 33rd Intl. Coastal Engineering Conference, Current 19, 1-13. Santander, Spain, (presented).

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PROFESSIONAL PROFILE

MATTHEW WILLIAMS, P.E. PROJECT ENGINEER



Mr. Williams has over 15 years of experience in structural engineering for high-end residential, large commercial and municipal projects. Mr. Williams joined RACE at the beginning of the year.

Mr. Williams' experience includes structural design of small residential additions to complex renovations for a 5,000 sq. ft. estate with a new 15,000+ sq. ft. ground up residence. In addition, Mr. Williams has designed six story apartment structures, university housing structures, multi-use commercial structures and pedestrian bridges all utilizing various materials and lateral force resisting systems.

Mr. Williams' structural analysis and design expertise extends to the engineering and detailing of lateral force resisting systems including structural steel braced and moment frames, reinforced concrete and masonry as well as wood structural panel shear walls. In addition, Mr. Williams has experience designing with timber, cold formed steel and precast concrete. Mr. Williams is also proficient with design and analysis software including AutoCAD, RISA 3D, RAM Structural System, RAM Advanse and Quickwall,

Flood Hazard design experience includes design of new, concrete and masonry raised residential foundations in compliance with the Post Hurricane Sandy FEMA elevation regulations.

Mr. Williams is experienced in reviewing site conditions, coordinating with architects, verifying existing structural elements to confirm compliance with building code, producing detailed construction documents, studying the pros and cons of various alternative construction materials, and working with contractors through all phases of construction, including onsite structural observations.

Since joining RACE, Mr. Williams has been involved in the design and contractor bid package preparation for residential floating docks. In addition, he has performed site investigations for marinas in order to prepare reports and recommendations relating to existing steel sheet pile bulkheads, timber piles and floating docks.

QUALIFICATIONS

EDUCATION

B.S. University of Connecticut, Storrs, CT
Civil (Structural) Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Professional Engineer: CT

PROFESSIONAL AFFILIATIONS

PIANC Corporate Member



PROFESSIONAL PROFILE

CHRIS KANE, ENGINEER E.I.T. ENGINEER



Mr. Kane holds a degree in Civil Engineering and has spent his entire life in and around the water. Mr. Kane started in underwater construction with his family's business working on structures throughout the Northeast.

Mr. Kane is proficient in use of AutoCAD for development of drawing product of a variety of waterfront structures. His experience has

included investigation and documentation of existing conditions and collaborating on waterfront projects with the objective of developing designs such as seawalls, bulkheads, piers, docks, and marinas.

Mr. Kane possesses sound technical knowledge and judgment and employs careful observation. Mr. Kane has conducted concrete inspection programs including verification of the producer's mill test report and review of reinforcing steel and concrete placement, as well as witnessing and documenting pile driving and overall construction observation.

Mr. Kane has experience working with commercial divers while they perform below-water-inspections. He monitored their dive via top-side viewing screens while taking notes and made requests for further inspections of target areas. He inspected the diver's report and conducted his own top-side site investigation; with Mr. Kane's past involvements with underwater construction, he has inspected steel bulkheads, timber structures and various marina structures (including piling inspection and seawall inspections both above and below the water).

Mr. Kane's assignments include witnessing soil test boring operations, both on land and over the water, in order to document the findings in real-time and make adjustments to the program in the field should conditions warrant. He is proficient in the use of the RTK GPS equipment to take field measurement during construction in order to confirm that the work is being performed in compliance with the Contract Documents.

Mr Kane is part of the RACE Hydrographic Survey Crew which maps bottom contours and then processes the data as needed for tide and elevation corrections for use in development of drawings and volume computations. This includes the use of specialty software (Hypack & Carlson) in conjunction with AutoCAD.

Mr. Kane has prepared a number of regulatory permit applications including dredging, seawall/bulkheads, marinas, and residential piers; permit applications have included drawing product where his past experiences in marina layout have come as a major role. This part of his role includes identifying and describing sensitive coastal resources that are regulated by state, federal and local agencies.

QUALIFICATIONS

EDUCATION

University of Connecticut, Storrs, CT
B.S. Civil Engineering

PROFESSIONAL REGISTRATION AND LICENSURE

Transportation Workers Identification Credential
(TWIC)

OSHA 10-hr. June 2016

FAA Small Unmanned Aircraft System Remote Pilot
License

CT Safe Boating Certificate (SBC, SPWO)

Advanced PADI Open Water Diver

Engineer in Training CT

PROFESSIONAL AFFILIATIONS

American Council of Engineering Companies
(ACEC - CT)

American Water Works Association
(AWWA)

