# Town of Palm Beach Mid-Town Seawall Replacement Project 

Design, Permitting and Bid Phase Scope of Services

Submitted to:
Town of Palm Beach

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## 1. Introduction

### 1.1 Purpose

The Town of Palm Beach (Town) desires to replace an aging section of existing seawall fronting the Atlantic Ocean in order to provide storm protection for Ocean Boulevard, which serves as the hurricane evacuation route for this segment of the Island. This scope of services document provides a description of the GHD Team's approach, deliverables, anticipated fees, and schedule to complete the design and permitting of the replacement wall.

### 1.2 Location

The Mid-Town Seawall Replacement Project (Project) comprises approximately 2,700 linear feet and extends from just north of Royal Palm Way to just south of Gulfstream Road. The Project limits are shown in Figure 1.


Figure 1. Mid-Town Seawall Replacement Project Limits

## 2. Scope of Services

The GHD Team has identified four distinct tasks to complete the design and permitting of the replacement seawall. These are:

- Task 1: Kickoff Meeting \& Baseline Investigations
- Task 2: Seawall Engineering Design Services
- Task 3: Regulatory Authorizations for Seawall Replacement
- Task 4: Bid Phase Services


### 2.1 List of Assumptions and Basis of Estimate

The following assumptions apply to this scope of services and serve to assist in the formulation of the basis of estimate:

- This contract will be issued under a Time \& Materials - Not to Exceed cost basis.
- GHD assumes that most upland features and utilities have already been located as part of the Town's on-going utility undergrounding efforts.
- The Town shall be responsible for payment of the CCCL permit application/processing fee.
- Construction phase services will be provided at a later date as determined by the Town.
- Public access stairs and ADA ramp design modifications (anticipated to be required subsequent to construction of the replacement wall) will be accomplished under separate authorization.
- Both cantilevered and tie-back seawall alternatives will be carried through to final design.


### 2.2 Task 1 - Kickoff Meeting \& Baseline Investigations

### 2.2.1 Kickoff Meeting

The GHD Team will prepare for a Kick-Off Meeting with key Town Staff and members of the GHD Team to confirm communications protocols, develop a basis of design for the seawall, review the Seawall Project scope and schedule for major milestones (baseline investigations; $30 \%, 90 \%$, and final seawall design; permitting; bid phase services), and verify the Town's objectives and expectations for the work. The exact limits of the Seawall Project will be confirmed with Town Staff.

The Kick-Off Meeting will be conducted within 14 business days of NTP in order to ensure a timely initiation of Project activities. Within three business days of completion of the meeting, a Meeting Summary Memorandum will be prepared and distributed to all attendees for the record/file.

### 2.2.2 Baseline Investigations

### 2.2.2.1 Data Review

The GHD Team shall receive from Town Staff all existing relevant seawall design documents and reports within the Town's files to be used in connection with the evaluation of the existing seawall. Expedited reviews of these documents are expected to provide base information to ascertain materials of construction, approximate spacing and/or locations of anchor rods and tiebacks, sheet pile dimensions, and (if known) the age of the existing wall(s). It is possible that portions of a timber wall (known to be in place in the late 1940s) still reside landward of the existing wall. This understanding of the location of subsurface constraints will become important during the physical construction of the replacement seawall, particularly if an anchor-supported wall is deemed the most viable and cost-effective option. The GHD Team will acquire any GIS database information from the Town pertaining to the existing seawall fronting South Ocean Boulevard along the Seawall Project limits. Further, data from previous geotechnical investigations performed along the Project shoreline will be accessed and reviewed to assist in any refinements to the GHD Team's geotechnical investigation, described in additional detail below.

In summary, the following information is specifically requested to be provided to the GHD Team by the Town in order to assist in the design formulation:

- Record drawings of the existing seawall - orientation, materials of construction, confirmation of location and orientation of north return wall
- Utilities locates/as-builts to determine conflicts for replacement seawall design elements
- Historic aerials to confirm record drawings and assist in the determination of scour potential and exposure of the seawall to direct wave attack over the Project limits
- Geotechnical data
- Recent \& historic topographic surveys (for comparison following collection of Special Purpose Survey described below)
- Woods Hole Group Flood Modeling files to assist in the formulation of an appropriate top of wall elevation.


### 2.2.2.2 Topographic Survey

The Seawall Project will require regulatory authorization from the Florida Department of Environmental Protection (FDEP) in the form of a Coastal Construction Control Line (CCCL) Permit. The CCCL permit, "Application for a Permit for Construction Seaward of the CCCL or 50 Foot Setback" (DEP Form \#73100, September 2018) requires site-specific information to be submitted with the application. At this time - and based on preliminary discussions with FDEP CCCL staff - the Seawall Project should be pursued as 'major reconstruction' of existing coastal armoring.

The FDEP requires, among ownership and property boundary information, the seawall location relative to the CCCL, the contour line at 0.0 North American Vertical Datum 1988, and representative crosssections depicting all structures and elevations from the Mean High Water Line (MHWL) to the CCCL. Owing to the extensive infrastructure development seaward of the CCCL along the Project shoreline,
the cross-section information will obtain data to the east edge of pavement of Ocean Boulevard. The inflection points along the seawall alignment, the cap/parapet wall elevation, the sand/wall interface elevations along the wall alignment, the seaward limits of the line of dune vegetation, the horizontal 'footprint' of the existing groins within the Seawall Project limits, where exposed will additionally be collected. The existing dune walkovers, public access ramps, the tunnel access for 100 Worth Avenue, the wastewater outfall vault, and other identified relevant design consideration features will also be located on the survey. On the landward side of the existing seawall, the sidewalks, benches, curbs, gutters, street lamps, stormwater drains, and landscaped areas will also be delineated. A Trimble S7 robotic-total station with "VISION" technology will be utilized to collect the field data.

In accordance with 62B-33.0081, Florida Administrative Code, the informational requirements will be collected in the field and compiled into a specific purpose survey. The survey will be signed and sealed by a Florida registered Professional Surveyor and Mapper.

### 2.2.2.3 Geotechnical Investigation

A geotechnical investigation will be conducted. The purpose of the investigation will be to evaluate generalized subsurface soil and groundwater conditions at the site on the landside and waterside of the seawall. We have assumed that the boring locations will be accessible to our truck-mounted and/or limited access drilling equipment, without the need for extensive clearing. The number, interval spacing, and depth of the soil borings that are recommended herein is based on our experience with similar projects. The geotechnical scope of services will include the following:

- identify the soil boring locations to minimize disruption to existing infrastructure as well as public use of the beach
- coordinate with the Town of Palm Beach Public Works Department to identify appropriate timing, maintenance of traffic requirements, and schedule
- obtain a Right of Way authorization/permit from the Town to perform the field work
- coordinate with Sunshine State One Call to identify possible buried underground utilities
- mobilize drilling equipment to the Project site
- conduct ten (10) Standard Penetration Test (SPT) borings per ASTM D 1586 (Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils). Maintenance of traffic will be provided. The first two borings, acquired at approximately one-third limits of the Project extent north to south, will be advanced to a nominal depth of 50 feet on the west side of the seawall and west side of the sidewalk (landside)
- the depth of drilling of the subsequent eight SPT borings will be field-adjusted based on the location of subsurface rock encountered in the first two borings (anticipated to be on the order of 30 foot borings)
- collect three (3) rock cores per ASTM Standard D2113 (Standard Practice for Rock Core Drilling and Sampling of Rock for Site Exploration) at varying depths below surface in order to obtain sufficient core samples for unconfined compression testing
- visually classify the soils encountered in accordance with the Unified Soil Classification System; conduct laboratory classification of recovered soil samples, as necessary
- perform unconfined compression testing of cored rock
- technical drafting of boring logs.

The boring logs and laboratory classifications will assist in the seawall design and possible geotechnical issues with seawall construction, such as subsurface shell or cemented shell/sand (coquina rock). The SPT borings will be spaced at intervals of approximately 270 feet to provide satisfactory coverage across the 2,700 linear feet of Seawall Project shoreline. The three rock cores will be collected at appropriate intervals along the Project frontage and within specifically encountered subsurface rock layers noted in the SPT borings, in order to obtain appropriate samples for compression testing.

### 2.2.2.4 Ground Penetrating Radar

Ground-Penetrating Radar (GPR) will be performed on the west side of the seawall (landside) to determine typical spacing of tie rods, typical deadmen locations, and to investigate the existence of remnant historical walls. Not all tie rods, deadmen, and remnant walls will be located; only a representative sampling of locations will be explored to compare with the information collected during the data review phase. This data is necessary to inform the demolition plan for the existing wall. The GPR equipment will be contained within a wheeled cart which allows the geophysical technician to easily traverse the study area. The GPR equipment will be calibrated with a global positioning system (GPS) for location and distance accuracy. Identified study targets will be marked in the field and provided on a scaled map.

The GPR survey will be performed by trained staff in general accordance with recognized methods and guidelines. It should be noted that subsurface soil conditions and groundwater conductivity/salinity will impact the depth of penetration of the GPR signal and might impact detection of the tie rods and dead men. As a secondary method a Schonstedt metal detector will be used to verify the locations of the tie rods.

## Deliverables

The following items will be provided in accordance with Baseline Investigations and Kickoff Meeting as described in Task 1 of this Scope of Services:

- Kick-Off Meeting Summary Memorandum
- Signed and Sealed Special Purpose (Site) Survey
- GPR Survey results
- Geotechnical Boring Logs and grain size distribution curves, and unconfined compression test results

The total cost for Task 1 services is $\$ 102,337.11$.

### 2.3 Task 2 - Seawall Engineering Design Services

### 2.3.1 Coastal Engineering Assessment

A thorough understanding of the environmental conditions and coastal processes along the Project shoreline are critical to the long-term success of the replacement seawall design. GHD will determine and document the site water levels and wave forces that could interact with the wall for input into the Team's structural design. These parameters will be used to inform the following:

- Top of Wall: GHD will analyze a range of top of wall elevations utilizing the inundation probability maps generated by the Woods Hole Group and collected during Task 1. The results will be presented as combinations of water elevation components relative to the top of wall. The results of the analysis may be utilized to provide adaptive capacity into the seawall design; thus, allowing to the top of wall elevation to be increased at a later date as deemed appropriate and/or necessary by the Town.
- Scour: All coastal structures built on an erodible substrate, such as sand, are susceptible to damage resulting from scour. For seawalls, unplanned scour can result in the seaward rotation and/or failure of the wall. Based on historic aerial imagery, there is a potential for the beach face to erode into the seawall on the downdrift side of the groins (Figure 2). This will increase in probability as sea levels rise. GHD will develop a scour estimate based on a review of the publically available historic aerials and elevation surveys collected in Task 1.


Figure 2. Google Earth Aerial Depicting Beach Erosion (Date: 12/31/2001)

### 2.3.2 Preliminary Design Phase (30\% drawings)

Utilizing the results of Task 1 and the coastal engineering assessment, our Team's structural engineers will recommend a seawall alignment option that provides a stable seawall design to withstand the anticipated forces acting along each segment of the seawall. It is anticipated that the proposed improvements will consist of at least partial demolition (cut-off) of the existing sheet pile seawall and the reconstruction of a new seawall located immediately seaward of the existing seawall alignment unless constraints exist along the seawall alignment that necessitate an alternate alignment location. We will evaluate two (2) steel sheet pile typical sections: (a) cantilevered and (b) with tie-backs. We will also evaluate the construction of a concrete cap and protective facing. Tie-backs, if required, are assumed to be screw-type to be installed from the beach to avoid significant impacts to North Ocean Boulevard.

This preliminary design phase will include a comparison of the impacts to the utilities, roadway, lighting, landscaping, existing groins, and rock toe scour apron/toe wall, limits of demolition, construction schedule restrictions, construction and stakeholder access and impacts, staging, phasing, traffic impacts, as well as permitting requirements associated with the proposed alignment. A conceptual opinion of probable construction cost (OPC) will be prepared as part of this phase.

The preliminary drawings will be included in the CCCL Permit application and are anticipated to include the following:

- Cover Sheet
- Specific Purpose Survey
- Site plan showing the location and limits of the new seawall
- A representative cross section that depicts the typical profile from the CCCL to the mean high water line
- Typical design section(s) for seawall to illustrate the design intent.

The drawings will be transmitted to Town Staff and will be followed by a meeting with key Team members (which will consist of GHD's Project Manager, Deputy Project Manager, Senior Structural Engineer and Senior Scientist I) at the Public Works facility. The Team will refine the concept design based on Town feedback and comments received during the regulatory review process before proceeding with (90\%) design development.

It is envisioned that the 30\% submittal will constitute the appropriate level of design detail to transmit as a component of a CCCL Permit application to the Florida Department of Environmental Protection. This regulatory authorization task is identified as Task 3 and is described further in this Scope of Services.

### 2.3.3 Ninety Percent (90\%) Design Documents

Project design drawings will be prepared for both the cantilevered and tie-back alternatives developed in Task 2.3.2 with site-specific geometries, seawall alignment, and layout based on our collected survey, geotechnical, and existing condition data. The drawing set will be fronted by a cover sheet with a drawing index, a plan sheet depicting the location of the Project and the limits of work, plan views rendered at an appropriate scale to show the seawall alignment and inflection points along the approximately 2,700
ft. limits, cross section drawings, grading plans and general notes to provide initial clarification of the construction requirements.

Additional attention will be given to those special design consideration areas/items identified along the Project limits to determine viable alternate cross-sections or structural solutions at these locations. Anticipated areas that will require special consideration and design include:

- North termination
- South termination
- Tunnel connection to 100 Worth Avenue residences
- Nine groin connections and integration
- Worth Avenue Clock Tower and balustrade
- Emergency Sanitary Outfall
- Beach vehicular gate access
- Lifeguard station and restroom facility
- ADA pedestrian ramp design and upland connection
- Two public pedestrian stair access connections
- Top of wall aesthetics (scalloped feature).

The $90 \%$ Design Documents to be transmitted to the Town for review and comment will include a constructability review and the following documents. Note that GHD assumes that a tie-back system is not feasible along some portions of the wall (e.g., the clock tower). Accordingly, both cantilevered and tie-back alternatives are included where appropriate in the list below:

- Cover Sheet
- Site-Specific Survey
- General Notes
- Site Plan/ Horizontal Control and General Wall Layout (cantilevered and tie-back alternatives)
- Construction Phasing Plan and Demolition Details (cantilevered and tie-back alternatives)
- Upland Restoration Details for Pavement, Lighting, Sidewalks and Landscaping (cantilevered and tie-back alternatives)
- Typical Wall Sections and Details (cantilevered and tie-back alternatives)
- Seawall Termination Details (cantilevered and tie-back alternatives)
- Existing Tunnel Façade Connection Details
- Groin Connection Details
- Specialty Sections at Clock Tower, Sanitary Outfall, Lifeguard Station and Restrooms
- Ramp, Stair and Vehicle Access Gate Plan, Section and Details
- Construction Details (cantilevered and tie-back alternatives)
- Technical and Environmental Specifications (cantilevered and tie-back alternatives).

A schedule of values will be prepared along with the Engineers' opinion of the probable cost of construction for each of these values. Additional design documentation will include the geotechnical investigation report. The $90 \%$ Design Documents will be transmitted to the Town for review and comment.

### 2.3.4 Final (100\%) Design Documentation (Plans and Specifications)

Upon receipt of final review and comments from the Town on the $90 \%$ Design Documents submittal package, the Team will incorporate/address those comments and assemble a final submittal package. The package elements will consist of the following:

- final construction plans and specifications as outlined in the $90 \%$ Design Documents task described above, prepared to a level of detail suitable for advertisement to qualified contractors
- a complete and final set of technical and environmental specifications, inclusive of both cantilevered and tie-back alternatives.
- a final opinion of probable cost of construction in the form of an annotated Schedule of Values.

Further, it is expected that the FDEP will issue the CCCL permit on or prior to our transmittal of the Final Design Documents. The permit will contain Specific Conditions that the selected contractor will need to comply with, so the permit will be a component of the design package.

All submittal documents will be provided in electronic PDF format for the Town to use for bidding and construction.

## Deliverables

The following deliverables for the seawall engineering design services will be provided in support of the above described Task 2 Scope of Services:

1. Preliminary (30\%) Drawings and Preliminary Opinion of Probable Cost
2. Ninety Percent ( $90 \%$ ) Design Documents and Schedule of Values
3. Final ( $100 \%$ ) Design Documents and Schedule of Values

The total cost for Task 2 services is $\$ 455,276.05$.

## Task 2 Allowance

Task 2 allowance includes three (3) progress meetings with the Town to review and discuss the $30 \%$, $90 \%$, and Final Design Documents. A meeting with key Team members will be scheduled with the Town following each of these submittals (after first allowing adequate time for Town review) to go over Town comments, concerns, and requests in detail. GHD will not proceed with the services associated with this allowance without first obtaining the Town's written consent to move forward.

The cost for the Task 2 allowance is $\$ 13,740.00$.

### 2.4 Task 3 - Regulatory Authorization for Seawall Replacement

The entirety of the Mid-Town seawall identified for replacement resides east (seaward) of the Coastal Construction Control Line (CCCL). This is a line of regulation, with the Florida Department of Environmental Protection (FDEP) the responsible agency to consider, process and issue a CCCL Permit for the replacement seawall and associated activities.

### 2.4.1 Agency Coordination

Once the GHD Team achieves approval from the Town of the $30 \%$ design documents, GHD will contact the CCCL Program Administrator, Environmental Administrator, and Permit Manager to discuss the anticipated Project components. The most appropriate regulatory authorization to obtain from FDEP for the Seawall Replacement Project appears to be to pursue major reconstruction as defined in 62B-33, Florida Administrative Code. The level of protection afforded to Ocean Boulevard, the hurricane evacuation route and the eligible structure that the seawall principally serves to protect, must be the same as the 'original' design to be considered for major reconstruction. This warrants further dialogue with FDEP Staff prior to submittal of a formal CCCL Application, as the processing for this Project should not be complicated. Plan and cross-section drawings sufficient to describe the replacement seawall (prepared as part of Task 2) will be included as exhibits to aid in the discussion.

It is recommended that a Pre-Application Meeting be conducted at the FDEP offices in Tallahassee. The Town's Coastal Program Manager will attend in person, with key GHD Team staff participating via telecom/webinar, to discuss the Project with the FDEP and the Florida Fish \& Wildlife Conservation Commission (FWC). GHD will organize, prepare for, and lead this Pre-Application Meeting. Discussion as to the level of repair/replacement FDEP Staff believes is warranted as well as a confirmation of the permit application fee will be accomplished. A meeting summary report will be prepared and transmitted to the Town within three business days of the meeting.

### 2.4.2 CCCL Permit Application Preparation and Submittal

Utilizing the site-specific survey and the $30 \%$ design development documents prepared by the Team, GHD will act as the authorized Agent for the Town of Palm Beach as Owner of Record of the Mid-Town Seawall. GHD will complete DEP Form \#73-100 Application for a Permit for Construction Seaward of the Coastal Construction Control Line and all applicable attachments/items of inclusion with the form. The Mid-Town seawall is located seaward of the Coastal Construction Control Line - as is Ocean Boulevard, which serves as the hurricane evacuation route and is the eligible structure the seawall serves to protect. By pursuing the regulatory authorization as major reconstruction, the vulnerability determination is exempt from the submittal and processing requirements.

An integral component of the CCCL Permit Application is the delineation of significant habitats (i.e., beach, dunes, and vegetation - which will be captured in sufficient detail in the Task 1 topographic survey field work) and presence / absence of protected species within the area of anticipated effect from construction activities. As part of the permitting process, the GHD Team shall coordinate with sea turtle and shorebird monitoring professionals to ascertain the distribution and frequency of use of significant resources in the Project area. As part of the application package, the GHD Team shall prepare and submit a summary report of findings and shall include recommendations for mitigative activities and
protective measures that can be implemented to avoid or minimize impacts to sensitive natural resources.

The Town shall be responsible for payment of the CCCL permit application/processing fee (which, subject to verification by FDEP staff, is approximately $\$ 29,000$ ).

### 2.4.3 Processing and Approval of CCCL Application

By conducting a Pre-Application Meeting and establishing a mutual understanding as to the expectations and timelines for review and processing, coupled with the GHD Team's familiarity with the application process, as well as FDEP Staff who will be considering the application, it is anticipated that the FDEP will submit a single Request for Additional Information (RAI) prior to deeming the application complete. However, it is impossible to predict the level of review comments that may be generated by the FDEP (and whatever comments regarding marine turtles and shorebirds may be asked by the FWC). For this reason, we are proposing an allowance budget to assist the Town in responding to agency comments beyond the GHD-prepared (and Town approved) response to the initial RAI. The permitting task 'base' budget may or may not be sufficient to respond to the comments, depending on the nature of the comments generated. We will not exceed the allowance amount without receiving written authorization of a subsequent scope and fee from the Town.

Upon notification by the FDEP that the application has been deemed complete, GHD will track issuance of the permit and will immediately review Special Permit Conditions that will pertain to the Project. Although not anticipated, any conditions deemed onerous to the Town will be discussed with FDEP Staff within one week of receipt of the Final Order to determine if the FDEP will consider revision. GHD will adhere to the reporting and notification requirements of the permit as appropriate (e.g., Notice of Commencement of Construction; Progress Reports during construction; Final Certification).

## Deliverables

The following deliverables for the regulatory authorization for the seawall replacement will be provided as a result of the efforts described in Task 3 of this Scope of Services:

- FDEP Pre-Application Meeting Summary Report
- Summary Report of Significant Natural Resources and Mitigation / Protection Measures
- Coastal Construction Control Line (CCCL) Permit Application and supporting files
- Respond to one Request for Additional Information from FDEP
- CCCL Permit (issued by FDEP)

The total cost for Task 3 services is $\$ 47,801.06$.

## Task 3 Allowance

The Task 3 allowance includes a single response to a second agency RAI, if required. Although the level of effort and content of a second (potential) RAI is unknown at this time, we have included a labor hour allocation to provide responses as might be needed to enable FDEP to deem the application complete and thereby allow them to process the file. GHD will not proceed with a second RAI response without first obtaining the Town's written consent to move forward.

The cost for the Task 3 allowance is $\$ 12,253.78$.

### 2.5 Task 4 - Bid Phase Services

Upon Town acceptance of the final design documents, receipt of the issued Final Order from the FDEP for the CCCL permit, and upon notification that the Town wishes to advertise the Project for competitive bidding, the GHD Team will assist the Town with the bid advertisement. This support will include providing the construction drawing set (which will include both cantilevered and tie-back alternatives), the technical and environmental specifications (engineering design standards), the Schedule of Values, the geotechnical report, the issued CCCL permit, and other reports acquired or assembled by the Team that would be useful information for prospective bidders to evaluate and submit quotes on the Project. All of the anticipated submittal components to be provided to the Town by GHD have been identified in the tasks described previously. The Town will prepare the 'front-end' documents to the bid package.

Following formal advertisement by the Town, the GHD Team will prepare for and participate in a PreBid Conference (anticipated at this time to be mandatory), during which a summary presentation of the Project will be given. The GHD Team representatives (which will include the GHD Project Manager, Deputy Project Manager and Senior Structural Engineer) will respond to those questions posed by prospective bidders that can be definitively answered at the meeting and will note those questions and clarifications that are posed that cannot be directly addressed, but which will need to be accommodated into a Bid Addendum or through the issuance or responses to Requests for Information (RFI's).

Upon receipt of bids, the GHD Team will provide support to Town Staff to assist with evaluation of the submittals. Services include preparing a bid tabulation and a recommendation of award memorandum. Upon formal award of a contract to the lowest responsive, responsible bidder, the GHD Team will prepare and transmit sets of Conformed Drawings and Specifications to the Town and the selected Contractor to support the construction of the replacement seawall and all appurtenant elements.

## Deliverables

The following deliverables for the replacement seawall bid phase services will be provided as a result of the efforts described in Task 4 of this Scope of Services:

- Bid Documents (Plans, Specifications, Schedule of Values) - prepared under Task 2
- Pre-Bid Conference PowerPoint presentation
- Bid Tabulation
- Recommendation of Award Memorandum
- Conformed Drawings and Specifications

The total cost for Task 4 services is $\mathbf{\$ 2 8 , 1 1 3 . 1 0}$.

## 3. Summary of Project Costs

The following table presents the summary of costs associated with the Town of Palm Beach Mid-Town Seawall Replacement Project - Design, Permitting and Bid Phase Scope of Services as developed by GHD Inc.

Town of Palm Beach, FL RFQ No. 2020-05
Mid-Town Seawall Design \& Construction Management Services
Summary of Estimated Project Costs

| Description | Estimated Base Services Cost | Estimated <br> Allowances Cost |
| :---: | :---: | :---: |
| PHASE I - MID-TOWN SEAWALL REPLACEMENT DESIGN \& PERMITTING |  | N/A |
| Task 1 Summary - Baseline Investigations \& Kickoff Meeting | \$102,337.11 |  |
| Kick-Off Meeting | \$6,126.55 |  |
| Data Review | \$21,048.56 |  |
| Topographic Survey | \$26,590.00 |  |
| Geotechnical Investigation | \$48,572.00 |  |
| Task 2 Summary - Seawall Engineering Design Services (Excluding Supplemental Service Allowances) | \$455,276.05 | \$13,740.00 |
| Preliminary Seawall Design Phase (30\% Drawings) | \$82,714.00 |  |
| Cantilever and Tie-Back Seawall Design Plans \& Submittals ( $90 \%$ and 100\%) Through Final | \$372,562.05 |  |
| Task 3 Summary - Regulatory Authorizations (Excluding Supplemental Service Allowances) | \$47,801.06 | \$12,253.78 |
| Task 4 Summary - Seawall Bid Document Preparation \& Contractor Evaluation Support Services | \$28,113.10 | N/A |
| Phase I Total Estimated Costs | \$633,527.32 | \$25,993.78 |
| PHASE II - CONSTRUCTION PHASE SERVICES (To Be Provided to the Town Later) |  |  |
| Construction Inspection, Meetings / Coordination, Document Reviews, Reporting | TBD |  |
| Phase II Total Estimated Costs | TBD |  |

July 28, 2020


## about

 GHDGHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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## APPENDIX A

Town Approved GHD Team 2020 Rate Schedule

| GHD Inc. Labor Category | July 27, 2020 <br> Approved Hourly <br> Rate |
| :--- | :---: |
| Principal | $\$ 250.00$ |
| Senior Engineer (Geotechnical) | $\$ 250.00$ |
| Senior Engineer (Structural) | $\$ 250.00$ |
| Project Manager | $\$ 235.00$ |
| Senior Engineer | $\$ 200.00$ |
| Senior Scientist | $\$ 200.00$ |
| Mid Engineer | $\$ 145.19$ |
| Mid Scientist | $\$ 140.41$ |
| Contract Management | $\$ 136.55$ |
| Mid Geologist | $\$ 127.00$ |
| Junior Engineer | $\$ 99.00$ |
| Senior CADD | $\$ 123.50$ |
| Technical Editor | $\$ 95.00$ |
| Driller | $\$ 100.00$ |
| Junior Geologist | $\$ 100.00$ |
| GIS | $\$ 78.41$ |
| Junior Scientist | $\$ 78.41$ |
| Administration \& Accounting | $\$ 90.00$ |
| Junior CADD | $\$ 85.00$ |
| Technician | $\$ 85.00$ |

Terraquatic, Inc. Commercial rate schedule

| February 27, 2020 |  |
| :--- | :---: |
| Description |  |
|  | Rate |
| 2-Person Topo | Reg |
| 3-Person Topo | $\$ 118.00$ |
| 4-Person Topo | $\$ 153.00$ |
| 1-Person GPS | $\$ 170.00$ |
| 2-Person GPS | $\$ 117.00$ |
| 3-Person GPS | $\$ 163.00$ |
| 4-Person GPS | $\$ 216.00$ |
| 2-Person Hydro | $\$ 273.00$ |
| 3-Person Hydro | $\$ 218.00$ |
| Survey Tech | $\$ 255.00$ |
| Computer | $\$ 75.00$ |
| Cadd | $\$ 82.00$ |
| PSM | $\$ 95.00$ |
| PM | $\$ 150.00$ |
| Clerical | $\$ 130.00$ |
| Per Diem | $\$ 65.00$ |

Speciality Equipment Rates Multibeam System $\$ 950$ per day SSS System \$223 per day MAG System \$157 per day

## APPENDIX B

## Proposed Project Schedule

GHD Inc. understands that the Town of Palm Beach has indicated that a milestone based schedule shall be developed during the Kickoff Meeting. The following proposed schedule is included herein for planning purposes only and shall be revised based on input from the Town and GHD.

## Town of Palm Beach Mid-Town Seawall Design \& Construction Management Services GHD, Inc. Estimated Project Schedule

Schedule assumes that GHD Inc. Contract will be approved at an August, 2020 Town Council Meeting
Schedule assumes that Notice to Proceed and Purchase Order will be issued by the Town on (or before) September 01, 2020

| Description | Days | Start | Completion |
| :---: | :---: | :---: | :---: |
| PHASE I - MID-TOWN SEAWALL REPLACEMENT DESIGN \& PERMITTING | 433 | 09/01/20 | 11/08/21 |
| Task 1 - Baseline Investigations \& Kickoff Meeting | 94 | 09/01/20 | 12/04/20 |
| Project Plan Development \& Project Kick-Off Meeting | 14 | 09/01/20 | 09/15/20 |
| Site Information - Data Review / Due Diligence / Basis of Design | 30 | 09/15/20 | 10/15/20 |
| Specific Purpose Survey \& Reporting | 30 | 09/15/20 | 10/15/20 |
| Geotechnical Investigation - Sampling and Analyses | 80 | 09/15/20 | 12/04/20 |
| Dune Vegetation \& Cultural Resource Surveys \& Reporting (if required) | 21 | 09/15/20 | 10/06/20 |
| Task 2 - Seawall Engineering Design Services | 295 | 12/04/20 | 09/25/21 |
| Coastal Engineering Assessment | 45 | 12/04/20 | 01/18/21 |
| Thirty (30) Percent Design Development \& Submittal | 90 | 01/14/21 | 04/14/21 |
| Town Review of Thirty (30) Percent Design | 14 | 04/14/21 | 04/28/21 |
| Ninety (90) Percent Design Development \& Submittal | 90 | 04/29/21 | 07/28/21 |
| Town Review of Ninety (90) Percent Design | 14 | 07/28/21 | 08/11/21 |
| One Hundred Percent (100\%) Design Document Development \& Submittal | 45 | 08/11/21 | 09/25/21 |
| Task 3 - Regulatory Authorization (Agency Coordination From Baseline Survey Phase through Permit Issuance) | 330 | 10/21/20 | 09/16/21 |
| Task 4 - Seawall Bid Document Preparation \& Contractor Evaluation Support Services | 60 | 09/09/21 | 11/08/21 |
| PHASE II - CONSTRUCTION PHASE SERVICES (To be provided to the Town at a later date) | TBD | TBD | TBD |
| Review of Contractor Submittals | TBD | TBD | TBD |
| Construction Inspection, Meetings / Coordination, Document Reviews, Reporting | TBD | TBD | TBD |

July 28, 2020

## APPENDIX C

Detailed Cost Estimate



| Town of Palm Beach, FL RFQ No. 2020-05 Mid-Town Seawall Design \& Construction Management Services |  | PHASEI-MID-TOWN SEAWALL REPLACEMENT DESIGN \& PERMITTING |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| GHD Inc. Detailed Cost Estimate |  | Task 2 Detail - Seawall Engineering Design Services |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TERRAOLATIG <br> July 28, 2020 |  | Cantilever and Tie-Back Seawall Design Plans \& Submittals (90\% and 100\%) Through Final |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Construction Plans \& Drawings |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Final Structural DesignCalculations |  | Cover Sheet |  | General Notes (2 Sheets) |  | Site Plan / Wall Layout / Plan \& Elevations (6 Sheets each alternative |  | Demolition, Phasing andSequence of Construction(6Sheets each alternative) |  | Upland Restoration Details (2 Sheets each alternative) |  | Typical Wall Sectionand Details (2 Sheets) |  | Termination / Connection Details (2 Sheets each alternative) |  | Tunnel FaçadeConnection Details (1 |  | Groin Connection Details(2 Sheets) |  | Bathroom BuildingConnection Details (1 Sheet) |  |
| GH, |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| ${ }_{\text {atem }}^{\text {asis }}$ |  |  | S.000 | 20 | coictis | 120 | Stitione | 120. | Stision | 120.0 |  | 4.0 | Sts.aseo | 2.0 | S. | S\% | cisision | 180 | S.isiois | $\stackrel{3}{32}$ | cosisiou | 18.0 | S.9.8icoo |
|  | Sos |  | Soiol |  | S000 |  | so.00 |  | so.00 |  | 50,00 |  | 5000 | . | ${ }^{\text {s.0.00 }}$ |  | 5000 |  | 50.00 |  | so.0 |  | S.ion |
| TOTAL LABOR Cost |  | 158.0 | \$32.640,00 | 3.0 | 5489.50 | 38.0 | S6.852.00 | 2960 | \$48,660.00 | 2360 | \$356.644.00 | 120.0 | \$20,122.00 | 56. | 59,330.00 | 1400 | S22,428.00 | 40.0 | S6,74200 | 80.0 | S14,028.00 | 520 | S9,84600 |
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| TOTAL EXTERNAL SUBCONTRACTOR |  |  | s0.00 |  | s0.00 |  | so.00 |  | \$190.00 |  | s0.00 |  | s0.00 |  | s0,00 |  | s0.00 |  | s0,00 |  | s0.00 |  | s0.00 |
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| Coinemeral Remal | simomo |  | s.000 |  | somo |  | s.000 |  | s.000 |  | somo |  | s.0.0 |  | s.0.0 |  | 5000 |  | s.0.0 |  | so.0 |  |  |
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| Total Equipment |  |  | 50.00 |  | 50.00 |  | 50.00 |  | 50.00 |  | 50.00 |  | \$0.00 |  | s0.00 |  | \$0.00 |  | 50.00 |  | 50.00 |  | \$0,00 |
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| TOTAL LTHER DRECT COSTS |  |  | s0.00 |  | 50,00 |  | 50,00 |  | 50,00 |  | \$0,00 |  | 50,00 |  | s0,00 |  | 50,00 |  | s0.00 |  | s0.00 |  | so,00 |
| Grand total |  |  | S32,640.00 |  | S489.50 |  | S6,85200 |  | \$48, 850.00 |  | \$35,654,00 |  | \$20,122,00 |  | s9,330.00 |  | \$22,428.00 |  | S6,74200 |  | \$14,028.00 |  | ร9,846.00 |



| Town of Palm Beach, FL RFQ No. 2020-05 Mid-Town Seawall Design \& Construction Management Services |  | PHASEI-MID-TOWN SEAWALL REPLACEMENT DESIIG \& PERMITTING |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| GHD Inc. Detailed Cost Estimate |  | Task 3 Summary -$\frac{\text { Aegulatory }}{\text { Authorizations }}$(ExcludingSupplementil ServiceAllowances) |  | Task 3 Detail - Regulatory Authorizations |  |  |  |  |  |  |  | Task 4 Summary-$\frac{\text { Seawall Bid Document }}{\text { Preparation } \&}$Contractor EvaluationSupport Services |  |  |  | Task 4 Detail - Seawall Bid Document Preparation \& Contractor Evaluation Support Services |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TERDARLATIC |  |  |  | CCCCL Preimimary |  | Pre-Application Meeting /Conference |  | CCCL Permit ApplicationDevelopment andSubmittal |  |  |  |  |  |  |  | Bid |  | Mandatory Pre-BidConference |  | $\begin{gathered} \text { Assist the Town in } \\ \text { Responding to } \\ \text { Prospective Bidder } \\ \text { Questions Addedena } \\ \text { Preparation } \end{gathered}$ |  | Review of Submitted Bids/Summary of Findings |  | ${ }_{\substack{\text { Recommenatation of } \\ \text { Award }}}^{\substack{\text { a }}}$ |  | Total Estimated Project Cost |  |  |  |
| July 28,2020 |  |  |  |  |  | $\begin{aligned} & \text { to Additional Request(s) } \\ & \text { for Information (Each } \\ & \text { RAI) } \end{aligned}$ |  |  |  |  | Total Estimated Allowances |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  | 2510 | S4532305 | 220 | S460000 | 320 | sroor 00 | 29 | ${ }^{21205028}$ | 78. | S1251128 | 720 | ${ }_{\text {St2 }}$ | 1540 | S28,13,10 | 320 | cat5000 | 40 | 5781200 | 540 | S959717 | 170 | 8879000 | 110 | S24000 | 36940 | ss56 20. 32 | 1140 | 20,96628 |
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| CADD Operator <br> Clerical <br> Baseline Design \& Permitting Location Survey (Lump Sum) - Person GPS Survey Crew (Hourly) | Stisision |  | s.iom |  | (sion |  | somo |  | som |  | cois |  | som |  | s.om |  | s.iom |  | Som |  | som |  | som |  | como | 践 | Steme |  |  |
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| (total ExTERNAL SUBCONTRACTOR |  |  | \$1,940,00 |  | s000 |  | s0.00 |  | S1138000 |  | S560.00 |  | 50.00 |  | s0.00 |  | s0.00 |  | s0,00 |  | s0,00 |  | s0,00 |  | S000 |  | \$34,62000 |  | S0.00 |
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| EQUIPMENT \& TESTING |  |  |  |  |  |  |  |  |  |  |  |  | Somom |  | som |  | somm |  | som |  | som |  | som |  | somo |  | sirsome |  | 500 |
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| $\begin{array}{\|l\|} \hline \text { GPR Equipment } \\ \hline \text { Schonstedt Metal Detector } \\ \hline \text { MOT } \\ \hline \text { Grout } \\ \hline \end{array}$ | Sismoc |  | somo |  | somo |  | $\xrightarrow{\text { siom }}$ |  | som |  | somo |  | somo |  | somo |  | somo som |  | som |  | Somo |  | som |  | somo | soor | Sismow |  | Som |
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| OTHER DIRECT COSTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  | S537.50 |  | \$112.50 |  | S200.00 |  | S16750 |  | S57.50 |  | S57.50 |  | s000 |  | s0.00 |  | s000 |  | 50.00 |  | s000 |  | S0.00 |  | S3,487,00 |  | s57.50 |
| Total Other direct costs |  |  | S47, 801.06 |  | S4,71250 |  | 57,20700 |  | S227,5278 |  | s13,128.78 |  | \$12,253,78 |  | S28,13,10 |  | S4,504,00 |  | 57,812,00 |  | s9,517,70 |  | 83,79000 |  | \$249000 |  | S833,57732 |  | \$25,993.78 |

