

Professional Services Agreement

FOR Marina Permit Performance & Ecological Monitoring

RFQ No. 2016-014



Prepared by:

The City of Fort Pierce Department of Engineering
John R. Andrews, P.E., City Engineer
P.O. Box 1480
Ft. Pierce, FL 34954
(772) 467-3773

SERVICES AGREEMENT

This Agreement between CITY and CONTRACTOR ("Agreement") is made and entered into by and between the CITY of Fort Pierce, Florida, a municipal corporation ("CITY"), and Tetra Tech, Inc., a Delaware Corporation with its principal place of business at 759 South Federal Hwy, Suite 314 Stuart, FL. 34994 ("CONTRACTOR").

CITY and CONTRACTOR hereby agree as follows:

1. CONTRACTOR Services.

CONTRACTOR will provide the services as set forth in **Exhibit A**, Statement of Work included in RFQ No. 2016-014, attached hereto and incorporated for all purposes ("the Services"), to the satisfaction of CITY.

2. Compensation.

Total compensation to CONTRACTOR will not exceed (\$576,939.00) for the initial term of the Agreement, which includes all travel and expenses. Payment for services performed will be processed within thirty (30) days of receipt and approval of invoice and in accordance with the Florida Prompt Payment Act, Florida Statutes Section 218.70-79.

Upon completion of the Services and acceptance by CITY, CONTRACTOR will submit an invoice setting forth amounts due to CONTRACTOR. Each invoice will be accompanied by documentation that CITY may reasonably request to support the invoice amount. CITY will, within thirty (30) days from the date it receives an invoice and supporting documentation, approve or disapprove the amount reflected in the invoice. If CITY approves the amount or any portion of the amount, CITY will promptly pay to CONTRACTOR the amount approved so long as CONTRACTOR is not in default under this Agreement. If CITY disapproves any invoice amount, CITY will give CONTRACTOR specific reasons for its disapproval in writing. CONTRACTOR will submit invoices to CITY as follows:

CITY of Fort Pierce
Engineering Dept.
Attn: Ed Seissiger
100 N. US Hwy 1
Fort Pierce, FL. 34950

3. Term.

This Agreement is effective as of the date last signed below ("Effective Date") and will terminate on September 30, 2019 unless earlier terminated in accordance with Section 9.

4. Licenses, Permits, Taxes, Fees, Laws and Regulations.

4.1 CONTRACTOR warrants that it will obtain, maintain in effect, and pay the cost for all licenses, permits, or certifications that may be necessary for

CONTRACTOR's performance of this Agreement.

- 4.2 CONTRACTOR will be responsible for the payment of all taxes, excises, fees, payroll deductions, employee benefits (if any), fines, penalties or other payments required by federal, state, or local law or regulation in connection with CONTRACTOR's performance of this Agreement.
- 4.3 CONTRACTOR will comply with, and will be responsible for requiring its officers and employees to comply with, all applicable federal, state, and local laws and regulations.

5. Ownership and Use of Work Material.

- 5.1 All drawings, specifications, plans, computations, sketches, data, records, photographs, tapes, renderings, models, publications, statements, accounts, reports, studies, and other materials prepared by CONTRACTOR or any CONTRACTOR's subcontractor in connection with the Services (collectively, "Work Material"), whether or not accepted or rejected by CITY, are the sole property of CITY and for its exclusive use and reuse at any time without further compensation and without any restrictions.
- 5.2 CONTRACTOR grants and assigns to CITY all rights and claims of whatever nature and whether now or hereafter arising in and to the Work Material.
- 5.3 CONTRACTOR will deliver all Work Material to CITY upon expiration or termination of this Agreement. CITY will have the right to use the Work Material for the completion of the Services or otherwise. CITY may, at all times, retain the originals of the Work Material.
- 5.4 The Work Material will not be used or published by CONTRACTOR or any other party unless expressly authorized by CITY in writing. CONTRACTOR will treat all Work Material as confidential.

6. Confidentiality and Safeguarding of CITY Records; Press Releases.

- 6.1 CONTRACTOR shall not disclose, publish, or authorize others to disclose or publish, Work Material or other information pertaining to the Services assigned to CONTRACTOR by CITY or other information to which CONTRACTOR has had access during the term of this Agreement without the prior written approval of the City Attorney.
- 6.2 **Advertising.** CONTRACTOR will not make any press releases, public statements, or advertisement referring to the services or the engagement of CONTRACTOR as an independent CONTRACTOR of CITY in connection with the Agreement, or release any information relative to the Agreement for publication, advertisement or any other purpose without the prior written approval of CITY.
- 6.3 **Duration.** The restrictions and obligations under this Section will survive expiration or termination of this Agreement for any reason.

7. Public Records.

- 7.1 CITY strictly adheres to all statutes, court decisions and the opinions of the Florida Attorney General with respect to disclosure of public information under Chapter 119, Florida Statutes. In accordance with Chapter 119, Florida Statutes, CONTRACTOR shall comply with all public records laws, specifically to:
- 7.1.1 Keep and maintain public records required by CITY to perform the service.
 - 7.1.2 Upon request from CITY's custodian of public records, provide CITY with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.
 - 7.1.3 Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if CONTRACTOR does not transfer the records to CITY.
 - 7.1.4 Upon completion of the contract, transfer, at no cost, to CITY all public records in possession of CONTRACTOR or keep and maintain public records required by CITY to perform the service. If CONTRACTOR transfers all public records to CITY upon completion of the contract, CONTRACTOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If CONTRACTOR keeps and maintains public records upon completion of the contract, CONTRACTOR shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to CITY, upon request from CITY's custodian of public records, in a format that is compatible with the information technology systems of CITY.

7.6 IF CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS THROUGH THE CITY CLERK AT 772-467-3065, lcox@CITY-ftpierce.com, 100 North U.S. 1, Fort Pierce, FL 34950.

8. Independent CONTRACTOR.

For all purposes of this Agreement and notwithstanding any provision of this Agreement to the contrary, CONTRACTOR is an independent CONTRACTOR and is not a state employee, partner, joint venturer, or agent of CITY. CONTRACTOR will not bind nor attempt to bind CITY to any agreement or contract. As an independent CONTRACTOR,

CONTRACTOR is solely responsible for all taxes, withholdings, and other statutory or contractual obligations of any sort, including but not limited to workers' compensation insurance.

9. Termination.

- 9.1 If either party is in default of performance of any material obligation under this Agreement, the party that is not in default may give written notice of the default to the other party and if the party notified fails to correct the default within thirty (30) days or within such period fails to satisfy the party giving notice that the default does not exist, the party giving notice may terminate this Agreement upon expiration of the thirty (30) day period.
- 9.2 CITY may terminate this Agreement immediately in the event of the filing by or against CONTRACTOR of a petition for relief in bankruptcy or for receivership, or in the event that CONTRACTOR becomes insolvent.
- 9.3 The termination of this Agreement will not affect any right or remedy that has accrued to either party at the time of termination.
- 9.4 Upon termination of this Agreement, CONTRACTOR will deliver to the appropriate representative of CITY all Work Material related to the services performed by CONTRACTOR in the format requested by the CITY together with any keys, identification badges, or equipment owned by CITY.
- 9.5 Termination under Sections 9.1 or 9.6 will not relieve CONTRACTOR from liability for any default or breach under this Agreement or any other act or omission of CONTRACTOR.
- 9.6 CITY may terminate this Agreement, without cause, upon written notice to CONTRACTOR. At such time, CONTRACTOR will be compensated only for that work which has been satisfactorily completed to the date of termination. No compensation shall be paid for de-mobilization, take-down, disengagement wind-down or other costs incurred due to termination of this Agreement.

10. Indemnification.

CONTRACTOR will indemnify and hold harmless CITY, and its members, officials, officers, attorneys, employees, representatives and agents from all claims, demands, causes of action, and judgments for taxes, license fees, excises, fines, and penalties; for supplies, services, or merchandise purchased by CONTRACTOR; for wages and fringe benefits of CONTRACTOR's employees; and for injury or death of any person or damage to property that result directly or indirectly from the negligent or intentional acts or omissions of CONTRACTOR or its officers, agents, or employees in the performance of this Agreement.

11. Insurance.

- 11.1 CONTRACTOR shall, at its own expense, procure and maintain, with insurers acceptable to CITY, the types and amounts of insurance conforming to the

minimum requirements set forth herein. CONTRACTOR shall not commence work until the required insurance is in force and evidence of insurance acceptable to CITY has been provided to and approved by CITY.

- 11.2 As evidence of compliance with the insurance required herein, CONTRACTOR shall furnish CITY with (a) a fully completed satisfactory Certificate of Insurance (ACORD Form 25 or equivalent) evidencing all coverage required herein, with a copy of the actual notice of cancellation endorsement(s) as issued on the policy(ies) and a copy of the actual additional insured endorsement as issued on the Commercial General Liability policy, signed by an authorized representative of the insurer(s) verifying inclusion of CITY and its members, officials, officers and employees as Additional Insureds as Additional Insureds in the Commercial General Liability coverage; (b) the original of the policy(ies); or (c) other evidence satisfactory to CITY. Such evidence shall include thirty (30) days written notice of cancellation to CITY for all coverage.
- 11.3 To the extent CONTRACTOR is permitted to and elects to subcontract any of the work performed under this Agreement, CONTRACTOR will require all subcontractors to provide insurance coverage complying with the requirements set forth herein and will provide CITY with evidence of such coverage prior to the commencement of the subcontractor's work.
- 11.4 Until such insurance is no longer required by this Agreement, CONTRACTOR shall provide CITY with renewal or replacement evidence of insurance at least thirty (30) days prior to the expiration or termination of such insurance.
- 11.5 **Workers' Compensation/Employers' Liability.**

Such insurance shall be no more restrictive than that provided by the Standard Workers' Compensation Policy, as filed for use in Florida by the National Council on Compensation Insurance, without restrictive endorsements other than any endorsements required by NCCI or the State of Florida. In addition to coverage for the Florida Workers' Compensation Act, where appropriate, coverage is to be included for the Federal Employer's Liability Act and any other applicable Federal or State law. The policy shall also be endorsed to include NCCI endorsement WC 00 02 01A, "**Maritime Coverage Endorsement**" or its equivalent.

The policy must be endorsed to waive the insurer's right to subrogate against the CITY, and its members, officials, officers and employees in the manner which would result from the attachment of the NCCI Waiver Of Our Right To Recover From Others Endorsement (Advisory Form WC 00 03 13) with CITY, and its officials, officers and employees scheduled thereon or a blanket endorsement providing the waiver in the same manner as outlined in the Advisory Form WC 00 03 13.

The minimum amount of coverage (inclusive of any amount provided by an umbrella or excess policy) shall be:

Part One:	"Statutory"	
Part Two:	\$1,000,000	(Each Accident)
	\$1,000,000	(Disease-Policy Limit)

\$1,000,000 (Disease-Each Employee)

11.6 Commercial General Liability.

Such insurance shall be substantially equivalent to that provided by latest version of standard Commercial General Liability Form (ISO Form CG 00 01) as filed for use in the State of Florida by the "Insurance Services Office (ISO) without any restrictive endorsements and acceptable to the CITY.

The CITY and its members, officials, officers and employees shall be included as an "Additional Insured" on a form no more restrictive than ISO Form CG 2010 (Additional Insured - Owners, Lessees, or CONTRACTORS).

The Policy must be endorsed to provide CITY with 30 days prior written notice of cancellation.

The minimum limits (inclusive of amounts provided by an umbrella or excess policy) shall be:

General Aggregate	\$1,000,000
Products/Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Each Occurrence	\$1,000,000
Fire Damage (any one fire)	\$Nil
Medical Expense (any one person)	\$Nil

11.7 Automobile Liability.

Such insurance shall be no more restrictive than that provided by Section II (Liability Coverage) of the most recent version of standard Business Auto Policy (ISO Form CA 00 01) without any restrictive endorsements, including coverage for liability contractually assumed, and shall cover all owned, non-owned, and hired autos used in connection with the performance of the work.

Such insurance shall not be subject to any aggregate limit and the minimum limits (inclusive of any amounts provided by an umbrella or excess policy) shall be:

Each Occurrence Bodily Injury and Property Damage Liability Combined	\$1,000,000
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11.8 Watercraft Liability.

To the extent watercraft are utilized in the performance of the services required in the agreement, CONTRACTOR shall purchase and maintain, or cause its subCONTRACTORS to purchase and maintain, insurance which shall, at minimum, cover CONTRACTOR and subCONTRACTOR for injuries or damage arising out of use of all owned, non-owned and hired watercraft.

The insurance shall include CITY and its members, officials, officers and employees as additional insureds.

The Policy must be endorsed to provide CITY with 30 days prior written notice of cancellation.

The limits applicable to watercraft liability (inclusive of any amounts provided by an umbrella or excess policy) shall be:

Each Occurrence/Annual Aggregate	\$1,000,000
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11.9 Professional Liability Insurance.

Such insurance shall be on a form acceptable to CITY and shall CONTRACTOR for those sources of liability arising out of the rendering or failure to render professional services in the performance of the services required in the agreement, including any hold harmless and/or indemnification agreement. Coverage must either be on an occurrence basis; or, if on a claims made basis, the coverage must respond to all claims within (3) three years following the period for which coverage is required and which would have been covered had coverage been on an occurrence basis.

The policy must be endorsed to provide CITY with (30) thirty days written notice of cancellation.

The minimum limits (inclusive of any amounts provided by an umbrella or excess policy) shall be:

Each Claim/Occurrence	\$1,000,000
Annual Aggregate	\$1,000,000

General Conditions.

The insurance provided by CONTRACTOR shall apply on a primary basis to and shall not require contribution from, any other insurance or self-insurance maintained by CITY or CITY's members, officials, officers or employees. Any insurance, or self-insurance, maintained by CITY shall be in excess of, and shall not contribute with, the insurance provided by CONTRACTOR.

Except as otherwise specifically authorized in this Agreement, or for which prior written approval has been obtained hereunder, the insurance maintained by CONTRACTOR shall apply on a first dollar basis without application of a deductible or self-insured retention. Under limited circumstances, CITY may permit the application of a deductible or permit CONTRACTOR to self-insure, in whole or in part, one or more of the insurance coverage's required by this Agreement. CONTRACTOR shall pay on behalf of CITY or the CITY's officers or employees any deductible or self-insured retention applicable to a claim against the CITY or CITY's officers or employees. The required policies must be endorsed to provide CITY with thirty (30) days written notice of cancellation.

Compliance with these insurance requirements shall not limit the liability of CONTRACTOR. Any remedy provided to CITY by the insurance provided by CITY shall be in addition to and not in lieu of any other remedy (including, but not limited to, as an indemnitee of CONTRACTOR) available to CITY under this Agreement or otherwise.

Neither approval nor failure to disapprove insurance furnished by CONTRACTOR shall relieve CONTRACTOR from responsibility to provide insurance as required by this Agreement.

Certificates of Insurance must be completed as follows:

Certificate Holder:
CITY of Fort Pierce
Attn: Edward Seissiger
P.O. Box 1480
Fort Pierce, FL 34954-1480

Additional Insured for General Liability:
CITY of Fort Pierce and its members, officials, officers and employees

12. Written Authorization Required.

CONTRACTOR shall not make changes in the job scope or perform any additional work or provide any additional material, under this Agreement without first obtaining written authorization from CITY for such additional work or materials. Additional labor or materials provided without written authorization shall be done at CONTRACTOR's risk and without payment.

13. Notice.

All notices, requests, consents, and other communications required or permitted under this Agreement shall be in writing and shall be (as elected by the person giving such notice) hand delivered by messenger or courier service, telecommunicated, or mailed by registered or certified mail (postage prepaid) return receipt requested, addressed to:

As to CITY:
**CITY of Fort Pierce
Purchasing Department
Attn: Gelencia Carter
100 N. US Hwy 1
Fort Pierce, FL. 34950**

With a Copy To:
**CITY of Fort Pierce
Engineering Department
Attn: Ed Seissiger
100 N. US Hwy 1
Fort Pierce, FL. 34950**

As to CONTRACTOR:
**Tetra Tech, Inc.
Attn: Brian Proctor
795 S. Federal Hwy, Suite 314
Stuart, FL. 34994-2936**

14. Miscellaneous.

14.1 Assignment. Neither party may assign this Agreement, in whole or in part, without the prior written consent of the other party.

14.2 Representations and Warranties by CONTRACTOR. If CONTRACTOR is a corporation or a limited liability company, CONTRACTOR warrants, represents, covenants, and agrees that it is duly organized, validly existing and in good standing under the laws of the state of its incorporation or organization and is duly authorized and in good standing to conduct business in the State of Florida, that it has all necessary power and has received all necessary approvals to

execute and deliver this Agreement, and the individual executing this Agreement on behalf of CONTRACTOR has been duly authorized to act for and bind CONTRACTOR.

- 14.3 Taxes. The CITY is exempt from Federal Excise and State Sales Taxes on direct purchases of tangible personal property. The CITY exemption number is on the face of the Purchase Order. CONTRACTOR shall not be exempt from paying sales tax to their suppliers for materials to fulfill contractual obligations with the CITY Tax Exemption Number in securing such materials. This exemption does not apply to purchases of tangible personal property in the performance of contracts for the CITY.
- 14.4 Entire Agreement; Modifications. This Agreement supersedes all prior agreements, written or oral, between CONTRACTOR and CITY and will constitute the entire Agreement and understanding between the parties with respect to the subject matter hereof. This Agreement and each of its provisions will be binding upon the parties and may not be waived, modified, amended or altered except by a writing signed by authorized representatives of CITY and CONTRACTOR.
- 14.5 Force Majeure. Neither party hereto will be liable or responsible to the other for any loss or damage or for any delays or failure to perform due to causes beyond its reasonable control including, but not limited to, acts of God, strikes, epidemics, war, riots, civil unrest, flood, fire, tsunami, volcano, sabotage, air space closure, ground stop(s), a U.S. Department of State Travel Warning or any other circumstances of like character ("force majeure occurrence").
- 14.6 Venue; Governing Law. St. Lucie County, Florida, will be the proper place of venue for suit on or in respect of this Agreement. This Agreement and all of the rights and obligations of the parties hereto and all of the terms and conditions hereof will be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Florida.
- 14.7 Dispute Resolution. Any disputes relating to interpretation of the terms of this Agreement or a question of fact or arising under this Agreement shall be resolved through good faith efforts upon the part of the CONTRACTOR and CITY. Unless otherwise directed by CITY, CONTRACTOR shall carry on the work and maintain its progress schedule in accordance with the requirements of the Agreement and the determination of CITY or its representatives, pending resolution of the dispute. Any dispute which is not resolved by mutual agreement shall be decided by the CITY Manager who shall reduce the decision to writing. The decision of the CITY shall be final and conclusive.
- 14.8 Waivers. No delay or omission in exercising any right accruing upon a default in performance of this Agreement will impair any right or be construed to be a waiver of any right. A waiver of any default under this Agreement will not be construed to be a waiver of any subsequent default under this Agreement.

- 14.9 Conflict of Interest. CONTRACTOR represents that it presently has no interest and shall acquire no interest, either direct or indirect which would conflict in any manner with the performance of services required hereunder, as provided for in Section 112.311, Florida Statutes. CONTRACTOR further represents that no person having any interest shall be employed for said performance.

- 14.10 Verification of Employment Status. CONTRACTOR agrees that it shall bear the responsibility for verifying the employment status, under the Immigration Reform and Control Act of 1986 if all persons it employs in the performance of this Agreement.

- 14.11 Non Discrimination. CONTRACTOR covenants and agrees that CONTRACTOR shall not discriminate against any employee or applicant for employment to be employed in the performance of the Agreement with respect to hiring, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment because of age, sex or physical handicaps (except where based on a bonafide occupational qualification); or because of marital status, race, color, religion, national origin or ancestry.

CITY and CONTRACTOR have executed and delivered this Agreement to be effective as of the Effective Date.

Tetra Tech, Inc.

City of Fort Pierce Florida

By: _____

By: _____

Brain Proctor

Linda D. Hudson, Mayor

Title: _____

Date: _____

Date: _____

Approved as to form and
Correctness as to the CITY

By: _____

James M. Messer, Esq.
City Attorney

Attached: Exhibit A – Statement of Work

EXHIBIT A

STATEMENT OF WORK

CONTRACTOR's performance of the Services shall (1) conform to the specifications and requirements of that certain Request for Qualifications, RFQ No. 2016-014, which is incorporated by reference for all purposes, and (2) to the extent consistent with the RFQ, shall conform with CONTRACTOR's Response, dated June 28, 2016 ("CONTRACTOR's Response") which was submitted by CONTRACTOR in response to the Request for Qualifications and is incorporated by reference herein for all purposes. To the extent that the Request for Qualifications or CONTRACTOR's response conflicts with the terms of this Agreement, the terms of this Agreement shall control. To the extent that the CONTRACTOR's response conflicts with the Request for Qualifications, the Request for Qualifications shall control.

I. Project: Marina Permit Performance and Ecological Monitoring RFQ No. 2016-014

II. Services and/or Deliverables. CONTRACTOR will provide the following services and/or deliverables in support of the Project:

Services/Deliverables:

In June 2014, the CITY of Ft Pierce completed the construction of a 14.66 acre Island Breakwater System and the reconstruction of its marina facilities destroyed after the Hurricanes in 2004. The island breakwaters consist of 10 free form limestone islands, one large island made of sand armored with stone groins, and a tombolo point made of sand and stones. The State and Federal Permits issued for construction of these structures requires a minimum 5 years of ecological and structural stability monitoring of the islands, the compensatory mitigation and its surrounding environment. The objective of the monitoring is to establish that the islands are performing as planned without long term ecological harm and that the compensatory mitigation and other ecological features are progressing satisfactorily. The Scope of work is broken down into three separate primary tasks: ecological monitoring (habitats of the natural features of the islands and its seagrass mitigation), and performance monitoring for structural stability of the breakwater and State and Federal environment resource permitting as needed. To date, CONTRACTORS have completed the Baseline, Time Zero, First Semi-Annual and First Annual monitoring events.

2. SCOPE OF SERVICES

TASK 1 - PERFORMANCE MONITORING

The Scope of Work is for inspection and preparation of a monitoring report of the structural performance of the series of constructed breakwater islands located directly to the east of the Fort Pierce CITY Marina and waterfront. The CONTRACTOR must supply all labor and materials necessary to complete the required tasks. The issued state and federal permits required that the performance of the Islands be monitored in accordance with the approved Performance Monitoring Plan. There shall be three levels of inspections for the breakwater island structures.

These levels are as follows:

- Level 1 – Baseline survey after construction – **Completed**
- Level 2 - Visual inspection:

All Breakwater Islands shall be visually inspected each year and after severe weather and special incidents. If Watch List items from previous visual inspections are determined to be degrading or if significant anomalies are identified during the inspection, follow-up level 3 surveys shall be required in the affected island(s).

· Level 3 - Topographic and hydrographic surveys:

A regularly scheduled comprehensive hydrographic survey shall be performed on all Island breakwaters at three-year intervals (at conclusion of year two of this contract). This survey shall involve all islands, including those surveyed in interim years. A regularly scheduled hydrographic survey shall be performed on the seafloor within 400 feet of the structures annually. An effort shall be made to conduct the comprehensive topographic survey and the hydrographic surveys simultaneously. This will help to give an overview of the entire site at an identifiable moment in time.

A special Level 3 survey will be conducted on affected islands if required by the results of a regularly scheduled or severe weather triggered Level 2 survey.

The inspections are in accordance with the Performance Plan which utilizes a tiered inspection approach that adjusts the required frequency and complexity of the inspection components depending on the recorded performance of the island structures. The performance plan also provides requirements for weather-triggered and special event inspections of the site.

The inspection components include above and below water visual inspections, digital photographs, topographic surveys and hydrographic surveys, and inspection reports including damage assessments and repair recommendations. The resulting reports are required to be submitted, upon review and approval, to the Florida Department of Environmental Protection, the U.S. Army Corps of Engineers, The Florida Fish and Wildlife Conservation Commission, and the Federal Emergency Management Agency.

The inspector shall visually inspect each breakwater island for general damage caused by current, tide, wave action and severe weather. The inspections will include both above water and below water visual observations of all breakwater island components. Inspectors should note and photograph, at a minimum, any of the following anomalies:

1. Overall structural instability of the island.
2. Formation of voids in armor stone layer (missing armor stones)
3. Displaced armor stones
4. Loss of fines from between armor stones
5. Exposure of the underlayer of stone
6. Change in shape of an island
7. Change in elevation of areas on an island
8. Areas of apparent vegetation damage or loss
9. Appearance or change of scouring patterns at the toe of rock structures
10. Buildup of transported island and/or natural material in open water areas
11. Exposure of filter fabric layers
12. Exposure of marine mattress layers
13. Damage to exposed sections of marine mattress layers
14. Exposed sections of Geotextile tube core
15. Damage to exposed sections of Geotextile tube core.

Inspectors shall set foot on each island in order to create a detailed written and photo documented description of existing physical conditions.

Reports documenting the results of the visual inspections shall be prepared and submitted within one month of the completion of the visual inspection. The report shall document in writing and with digital photography, any significant conditions including but not limited to:

- a. Overall structural instability of the island.
- b. Displaced armor stones
- c. Change in shape of island where the shoreline changes in horizontal position by 3 feet or more
- d. Change in elevation of areas of island by +/- 0.5 foot or more
- e. Appearance of scouring patterns at the toe of rock structures when the scour depression is

- greater than 0.5 ft deep and/or two or more armor stones are displaced from the toe of the structure
- f. Buildup of transported island and/or natural material in open water areas greater +/- 1 foot
- g. Exposure of filter fabric layers
- h. Exposure of marine mattress layers
- i. Damage to exposed sections of marine mattress layers
- j. Exposed sections of Geotextile Tube core
- k. Damage to exposed sections of Geotextile tube core.

Minor anomalies shall be identified in a Watch list section of the report for particular evaluation during the next visual inspection. Watch List items will continue to be listed until anomalies are deemed "stabilized", repairs are required and/or the conditions are eliminated.

If a previous visual inspection identified specific Watch List items, the inspector shall carefully compare the condition of the previously reported items with their current condition and determine if the condition is stable or degrading. Conditions triggering a follow-up topographic and /or bathymetric survey include:

1. Degraded condition of a previously identified Watch List item.
2. A significant anomaly noted in the current inspection

Dive operations associated with performance monitoring activities shall be conducted following commercial diving standards. A written Health and Safety Dive Plan compliant with all OSHA 29 CFR Part 1910, Subpart T – Commercial Diving Operations standards and Association of Diving CONTRACTORS International (ADCI) standards must be prepared and approved by the CITY prior to commencing any in water activities. Additionally, qualifications of the dive team members must be provided and approved prior to in water activities.

Topographic Survey Description:

The topographic survey consists of a collection of three dimensional coordinate data points obtained with measured survey grade instrumentation. Survey data for the breakwater islands needs to be collected along the centerline of each island and on parallel transects running east/west spaced at 25 feet along the centerline, with points collected every 10 feet or less along each line. The number of data points collected on each island will be sufficient so that a surface model and contour map for each island structure can be created. The surface and contour map need to portray the actual elevations and outlines of each island at the time the survey was obtained. Contour lines need to be prepared from the resulting data in one foot intervals. A plan view and three (3) cross sections of each island need to be consistent with previous efforts. The cross sections need to compare the design cross section, the 2014 "As Built" cross section, the 2015 survey data cross section and the current year cross sectional data.

The islands have been stationed off and a series of land based benchmarks were established on the islands in 2014 to ascertain elevations on the breakwater Islands. These benchmarks are maintained on the site by the Fort Pierce CITY Marina. The benchmarks are to be used to assess changes in the island's structure over time or after storm events.

All topographic surveys coordinates are in feet and relative to the following datum's:

- Horizontal: Florida State Plane Coordinate System East Zone (901) Transverse Mercator Projection, North American Datum, 1983 (NAD83)
- Vertical: National Geodetic Vertical Datum, 1929 (NGVD 29)

Hydrographic Survey:

The bathymetric/hydrographic survey of the project needs to be performed with hydrographic survey equipment controlled by a GPS unit with sub-meter accuracy. The number of data points collected should be sufficient so that a surface model and contour map of the seafloor can be created. This surface model and contour map accurately portray the seafloor contours at the time of the survey. The survey boundaries start at the south side of the south causeway bridge and extend from western shore of the IRL east to the eastern right of way line of the ICW and extends south 400 feet of Tern Island. Survey data for the seafloor will be collected on parallel transects running east/west spaced at 25 feet along the centerline, with points collected 10 feet or less along each line.

The hydrographic survey coordinates are in feet and relative to the following datums:

- Horizontal: Florida State Plane Coordinate System East Zone (901) Transverse Mercator Projection, North American Datum, 1983 (NAD83)
- Vertical: National Geodetic Vertical Datum, 1929 (NGVD 29)

A portion of the data obtained from the bathymetric survey will be analyzed under the parameters stated in the USACE Permit #SAJ 1993-41787 (transects every 400 feet over an extension of 3200 feet in the ICWW Federal Channel in the area adjacent to the project). A full comparison of the pre-construction and post-construction condition, at time-zero and one-year, is included in the Appendix of the reports. The cross sections and the "Isopach" (change of surface elevation/depth comparison) will show areas of deposition and/or scouring have occurred in the ICWW Federal Channel.

TASK 2- ECOLOGICAL MONITORING:

The Project's approved Environmental Resources Permits require the monitoring of the constructed habitats on the islands, the off-site seagrass mitigation, and the seagrass recruitment around the islands. The permits for both FDEP and the USACE differ relative to frequency of monitoring events for each agency. Below we have listed the specific monitoring requirement along with frequency.

Coastal Dune/Least Tern Habitat:

Monitoring of the dune habitat will occur annually at the end of the growing season. The monitoring protocol includes the use of line transects and two-meter quadrats to identify percent survival of planted species and species naturally recruiting to the area. It must also document coverage of any exotic or nuisance species. Coastal dune monitoring transect locations are identified in the Monitoring Plan (2009) and adjusted in the field as necessary in order to capture representative conditions on site and ensure adequate spacing between transects. Four permanent coastal dune transects were established across the width of the Island by recording the beginning and end of each transect using a Trimble® Differential Global Positioning System (DGPS) and marking with PVC stakes. This will enable scientists to easily locate transects during future monitoring events. The dune transects range from 35 to 50 m, depending on the width of the Island at a given transect. Figure 1 illustrates the coastal dune vegetation transect locations. Quadrat stations were determined in the field by selecting evenly-spaced meter intervals along one dune transect and applying the same intervals at successive dune transects. Seven quadrats were placed along each of the four dune transects for a total of 28 dune stations. The fourth quadrat (Q4) of every transect is located on top of the berm where no vegetation was planted. A 2-m² quadrat was used to monitor dune habitat, alternating sides of the transect with each interval (i.e., Quadrat 1N=north side of transect, Quadrat 2=south side of transect, Quadrat 3N=north side of transect, etc.).

Mangroves:

Mangrove monitoring will occur annually for FDEP and semi-annually for USACE in years 2 and 3. Mangrove monitoring transect locations were identified in the Plan (2009) and adjusted in the field as necessary in order to capture representative conditions on site and ensure adequate spacing between transects. Four permanent mangrove transects were established on the western perimeter of the Island and five on the eastern/southern perimeter by recording the beginning and end of each transect using a Trimble® Differential Global Positioning System (DGPS) and marking with PVC stakes. Each of the nine mangrove transects on the Island are 30 meters (m) in length. Figure 1 illustrates the mangrove transect locations. Quadrat stations were determined in the field by haphazardly selecting locations at various meter intervals along one mangrove transect and applying the same intervals at successive mangrove transects. Six quadrats were placed along each of the nine mangrove transects for a total of 54 mangrove stations (24 on the west side and 30 on the east side). A two square-meter (2-m²) quadrat centered on the transect will be used to sample mangrove habitat. All transects run from north to south/east to west.

Oysters:

Monitoring will be conducted semi-annually for the FDEP in year 2 and annually in year 3. For the USACE, the monitoring of oyster should be semi-annually for years 2 and 3. In order to account for oyster recruitment and survival on deployed oyster habitat, monitoring will occur bi-annually during the first two years post-deployment, and annually for the next three years (for a total of 5-years). For reasonable levels of success to be determined, recruitment, settlement, and survival of juvenile and adult oysters must be shown to increase over time. Although levels of spat recruitment or adult survivability may vary from year to year, an overall increase in community structure and area must be shown.

Haphazardly placed Vexar® mats (18 inches square in size with thirty-six (36) high shell fraction coquina fragments attached to each mat) were secured at the sampling locations throughout the selected constructed islands. This design is incorporated from a study conducted by Lisa Wall titled, "Recruitment and Restoration of the oyster, *Crassostrea virginica*, in Areas with Intense Boating Activity in Mosquito Lagoon, Florida in 2001." Thirteen (13) mats were sampled along both the protected and exposed sides of Tern Island and 1 or 2 two mats each for the freeform islands with created oyster habitat (Fishhook, Snook, Starfish, and Manatee) for a total of 19 monitoring stations. The mats will be removed in order to count the number of recruited oysters during monitoring. Once removed, the live oysters on each substrate shell will be counted and the mats subsequently returned to their original sampling locations. Photographic and written documentation of each mat will be used to track oyster recruitment and abundance over extended periods. All collected data will be utilized to find the number of spat or live oysters per recruitment mat and per meter square. An average will be taken for the number of species found per meter squared area.

Water quality parameters will be collected using a multi-parameter probe and data logger (e.g. YSI). Data to be collected included temperature, dissolved oxygen, pH, and conductivity. Finally, data will be collected on both floral and faunal diversity found within and around created oyster habitats, with particular attention paid to attached organisms and algae that may foul oyster habitat and affect spat settlement. A nearby background or control site was established for comparison to the project location. This natural oyster reef, located adjacent to the southeast portion of Jack Island, will be monitored using ¼-m² quadrats to count the number of live oysters.

The original proposed monitoring protocol has not been shown to be very effective due to limited substrate and optimal placement of mats in the intertidal zone. Additional haphazard transects were established to account for recruitment on the structure itself. See figure 2a for oyster transect locations.

Seagrass:

All seagrass monitoring will be performed annually with data collection to occur in May. For reasonable

levels of success to be determined, levels of recruitment, settlement, and survival of seagrasses in the project and mitigation areas must be shown to increase over time. Although the settlement of individual species of seagrass may vary, success is based on total area of seagrass coverage. In order to accurately assess and document the levels of recruitment, settlement, and survival of seagrasses in the project and mitigation areas, high resolution seagrass mapping will be conducted on an annual basis. Separate figures depicting and quantifying the areal cover by seagrasses species and percent cover class are required. Mapping results should be accurate and repeatable in order to assess changes over time. A pre-construction mapping output is provided as an example (see Figure 3a) of the surveys that have been completed to date. All staff responsible for collecting benthic data should be skilled in identification of benthic organisms of south Florida and have documented experience conducting high resolution benthic mapping and characterization.

Seagrass mapping will be conducted within five separate areas (marina survey, island breakwater survey area, seagrass area 1, spoil island SL-9A, dredge hole, and the propeller scar seagrass protection zone). The cumulative areal extent of the five survey areas is 114.1 acres. The marina survey (island breakwater survey) area includes a 400-foot (ft.) radius around the island breakwaters excluding the foot print of the Fort Pierce Marina lease boundary, and two of the three Corps permit-required survey areas (seagrass areas 2 and 3). The Corps-designated seagrass survey area 1 is described separately due its location. The three approved mitigation areas (spoil island SL-9A, dredge hole, and the propeller scar mapping [seagrass protection zone]) include a 100-ft. buffer surrounding the mitigation footprint. Figure 4 presents the extent and locations of each of the five surveys areas. Part of the mitigation for the USACE consisted of creation of 5 acres of seagrass in around the island breakwaters.

In addition to the mapping described above, eleven permanent transects were established within the marina survey area during the Time Zero monitoring event. Seagrass percent coverage will be recorded using 1 m² quadrats at ten evenly-spaced intervals along each of the eleven transects for a total of 110 replicates (10 quadrat samples per transect). A modified Braun-Blanquet (B-B) method (Braun-Blanquet, 1932; Fourqurean et al., 2001; Kirsch et al., 2005) will be used to determine seagrass cover. Each quadrat will be visually inspected for seagrass and assigned a cover-abundance scale value (B-B score). B-B scores will be assigned based on cover estimates of the total resource projection over the substrate when visually inspected from directly above.

Photographic documentation will be required for all survey activities. Representative images will be captured from known locations. GPS coordinates for each image or set of images will be required.

Limerock:

In order to account for hard-bottom species recruitment onto the installed lime-rock habitats, monitoring of all installed lime-rock islands. Recruitment, settlement, and survival of a variety of hard bottom species shall be documented over time. Hard-bottom communities are dominated by gorgonians, algae, sponges, and a few stony coral species. Success is based on an overall increase in biological community structure and the area must be shown to provide habitat for fish and invertebrate species. Additional roving diver observations will also be recorded for motile species. Visual inspections and photo-documentation shall be used to describe species found on and among the limerock (hard-bottom) habitat. Monitoring should be conducted semi-annually for FDEP. No limerock monitoring is required for USACE. A total of 15 transects and 45 quadrats (3 quadrats per transect) shall be monitored within the limerock habitat.

Table 1-1 Indicates event timelines for each associated task also which agency the reporting is required

Table 1-1. Summary of Project Permit Requirements

Monitoring Requirement	Parameter(s) Monitored	Schedule
Task 2 Ecological Monitoring	Seagrass mapping within 400 feet of Breakwaters, Areas, 1, 2, and 3 (USACE only)	July 2016 ⁺ , May 2017 ⁺ , May 2018 ⁺ , May 2019 ⁺
	Dredge Hole Monitoring and Seagrass Beds within 100 feet	July 2016, Oct 2016 ⁺ , May 2017, May 2018, May 2019
	Prop scar Monitoring and associated signage	July 2016, Oct 2016 ⁺ , May 2017, May 2018, May 2018
	Spoil Island SL 9 A scrape down monitoring (state only)	July 2016*, Oct 2016*, May 2017*, May 2018*, May 2019*
	1.54 acres of Mangrove Habitat	July 2016, Oct ⁺ 2016, May 2017, Oct 2017 ⁺ , May 2018, May 2019
	1.23 Acres of Oyster Habitat (19 monitoring stations) along with reference sites and additional transects established on Island Structures	July 2016, Oct 2016 ⁺ , May 2017, October 2017 ⁺ , May 2018, May 2019
	28 Dune Transects (In the monitoring plan but not part of Mitigation Plan)	May 2016
Task 1 Performance Monitoring	Lime Rock (In monitoring Plan but not part of Mitigation plan)	May 2016
	Level 2 Inspection (Annual Visual)	July 2016, May 2017, May 2018, May 2019
	Level 3 Inspection Topographic Survey	May 2017 or as needed based on Level 2 inspection
	Level 3 Bathymetric Survey	May 2017 or as needed based on Level 2 Annual Inspection
	ICW Bathymetric Survey and Cross-sections	July 2016, May 2017, May 2018, May 2019

+ USACE Only; * State only