Agenda Item: **3L-6**

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS

AGENDA ITEM SUMMARY

Meeting Date:	July 8, 2025	(X) Consent ( ) Workshop	( ) Regular ( ) Public Hearing
Department:	Environmental Resources Management		

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to approve: Consultant Services Authorization No. 0090-16 (CSA) to Contract (R2023-0090) (Contract) approved on January 24, 2023 with Foth Infrastructure & Environment, LLC (Foth) in the amount of $492,213.51 for engineering services in support of a feasibility study of shore protection alternatives along Singer Island.

Summary: The Board of County Commissioners (BCC) approved the Contract with Foth, a Jacksonville company, on January 24, 2023. The CSA authorizes Foth to conduct a feasibility study for stabilization of an area of the Atlantic Ocean shoreline along Singer Island. The proposed feasibility study includes literature and coastal processes review, data collection, development of project alternatives, public meetings, project performance analysis, and a comprehensive feasibility study report. Costs will be paid from the Beach Improvement Fund. This project was presented to the Goal Setting Committee on April 6, 2022, and the Committee established an Affirmative Procurement Initiative of 20% mandatory Small Business Enterprise (SBE) subcontracting goal and an SBE evaluation preference for Prime Bidders. Foth committed to an overall 48% SBE participation in the Contract. The SBE proposed participation for this CSA is 4.1%. To date, the overall participation achieved on this Contract is 44.7%. The City of Riviera Beach will provide 25% cost-share via an Interlocal Agreement (R2024-1428) executed on October 22, 2024. **The cost to the County is $369,160.13. District 1 (YBH)**

Background and Justification: The current method of shoreline protection at Singer Island consists of dune restoration at regular intervals following severe storm-induced erosion. However, due to the system's highly dynamic nature, increased coastal armoring via seawall installation, and repetitive storm impacts in recent years, dune restoration efforts have exhibited diminishing returns in stabilizing ongoing erosion. Singer Island also hosts high-density critical nesting habitat for endangered marine turtles and extensive nearshore hardbottom resources that limit the application of other typical coastal management strategies. Therefore, the County is seeking to identify the best course of action for long-term protection of Singer Island's sensitive beach and dune system. The CSA consists of analyzing current and historical coastal landform changes due to erosion and sedimentation, evaluating various potential management strategies and long-term costs, and recommending the most cost-effective and permittable project methodology.

Attachment:
1. CSA No. 0090-16 with Exhibits A - C

Recommended by: mcm ybh _____ 6/4/25
Department Director **Date**

Approved by: _____ 6/17/25
Deputy County Administrator **Date**

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2025	2026	2027	2028	2029
Capital Expenditures	$492,214				
Operating Costs					
External Revenues	$123,054				
Program Income (County)					
In-Kind Match (County)					
NET FISCAL IMPACT	$369,160				
No. ADDITIONAL FTE POSITIONS (Cumulative)					

Is Item Included in Current Budget? Yes X No
Does this item include the use of federal funds? Yes No X
Does this item include the use of state funds? Yes No X

Budget Account No.:
Fund 3652 **Department** 381 **Unit** M037 **Object** 3120 **Program** E037
Task S049 **Sub Task** CSII **Task Order** 008

B. Recommended Sources of Funds/Summary of Fiscal Impact:
Beach Improvement Fund: $369,160.13
City of Riviera Beach ILA: $123,053.38

C. Department Fiscal Review:

III. REVIEW COMMENTS

A. OFMB Fiscal and /or Contract Dev. and Control Comments:

OFMB 6/6/25 Contract Development and Control 6/9/25 26 6/16/25
Reviewed Again 6/16/25

B. Legal Sufficiency:

Assistant County Attorney 6/17/25

C. Other Department Review:

Department Director

CONSULTANT SERVICES AUTHORIZATION

CSA #: 0090-16 CONSULTANT: Foth Infrastructure & Environment, LLC

ACCOUNT: 3652-381-M037-3120-S049-CSII-008 CONTRACT: R2023-0090; R2025-0036

[Fiscal approval of Budget Availability: Shirley King 6/13/25]
Shirley King

PROJECT MANAGER: Dani Tabilo PHONE: 561-681-3813

CONTRACT MANAGER: Juan Cueto PHONE: 561-233-2431

PROJECT NAME: Singer Island Feasibility Study

LOCATION/DISTRICT #: Singer Island / District 1

TASK DESCRIPTION (use additional pages if necessary): The Consultant shall provide professional services to conduct a feasibility study for stabilization of the shoreline along Singer Island, as described in the attached Foth proposal dated May 12, 2025 (Exhibit B). OEBO Schedules 1 and 2 (Exhibit A) and the Contract History (Exhibit C) are attached hereto and made part of this CSA. Execution of Task 7 will require separate written Notice to Proceed from the County.

DELIVERABLES: See Foth's proposal dated 5/12/2025 (Exhibit B).

CSA TYPE: FIXED PRICE DUE DATE: 7/31/2027

TOTAL AMOUNT: $492,213.51

TOTAL SBE PARTICIPATION: $20,128.00

This Contract, including all Schedules, Forms, and attachments, is subject to the County Emergency Ordinance 2025-014, approved by the BCC on June 3, 2025. As a result, the M/WBE participation will not be enforced.

(REMAINDER OF PAGE LEFT INTENTIONALLY BLANK)

CONSULTANT REP: _____ DATE: 5-13-25
Christopher G. Creed, Senior Client Manager

APPROVED AS TO TERMS AND CONDITIONS:

ERM DIRECTOR: Deborah Drum DATE: 5-30-2025
Deborah Drum

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

ASSISTANT COUNTY ATTORNEY: _____ DATE: 6/19/25
Yelizaveta B. Herman

ATTEST: JOSEPH ABRUZZO
CLERK & COMPTROLLER: _____ DATE: _____
Deputy Clerk

BOARD OF COUNTY COMMISSIONERS: _____ DATE: _____
Maria G. Marino, Mayor

OEBO SCHEDULE 1

SOLICITATION/PROJECT/BID NAME: Singer Island Feasibility Study **SOLICITATION/PROJECT/BID NO.:** CSA No. 0090-16

SOLICITATION OPENING/SUBMITTAL DATE: n/a **COUNTY DEPARTMENT:** Environmental Resources Management

Section A

PLEASE LIST THE DOLLAR AMOUNT OR PERCENTAGE OF WORK TO BE COMPLETED BY THE PRIME CONTRACTOR/CONSULTANT* ON THE PROJECT:

NAME OF PRIME RESPONDENT/BIDDER: Foth Infrastructure & Environment, LLC **ADDRESS:** 2618 Herschel Street, Jacksonville, FL 32204

CONTACT PERSON: Steven C. Howard, P.E. **PHONE NO.:** 904-387-6114 **E-MAIL:** Steve.Howard@foth.com

PRIME'S DOLLAR AMOUNT OR PERCENTAGE OF WORK: $403,405.51

*SMWBE Prime's must include their percentage or dollar amount in the Total Participation line under section B.

Non-SBE	MBE	WBE	SBE
☑	☐	☐	☐

Section B

PLEASE LIST THE DOLLAR AMOUNT OR PERCENTAGE OF WORK TO BE COMPLETED BY ALL SUBCONTRACTORS/SUBCONSULTANTS ON THE PROJECT BELOW:

Subcontractor/Sub consultant Name	(Check all Applicable Categories) Non-SBE	MBE Minority Business	WBE Women Business	SBE Small Business	DOLLAR AMOUNT OR PERCENTAGE OF WORK Black	Hispanic	Women	Caucasian	Asian	Other
1. Surfbreak Engineering Sciences, Inc.	☑	☐	☐	☐				$68,680.00		
2. Coastal Eco-Group, Inc.	☐	☐	☑	☑			$20,128.00			
3.	☐	☐	☐	☐						
4.	☐	☐	☐	☐						
5.	☐	☐	☐	☐						
				Total			$20,128.00	$68,680.00		

(Please use additional sheets if necessary)

Total Bid/Offer Price $ 492,213.51

Total Certified S/M/WBE Participation $ $20,128.00

I hereby certify that the above information is accurate to the best of my knowledge: Albert E. Browder III E.R. — Senior Client Manager

Name & Authorized Signature — Title

Note:

1. **The amount listed on this form for a Subcontractor/sub consultant must be supported by price or percentage listed on the properly executed Schedule 2 or attached signed proposal.**
2. Only those firms certified by Palm Beach County at the time of solicitation due date are eligible to meet the established OEBO Affirmative Procurement Initiative (API). Please check the applicable box and list the dollar amount or percentage under the appropriate demographic category.
3. **Modification of this form is not permitted and will be rejected upon submittal.**

This Contract, including all Schedules, Forms, and attachments, is subject to the County Emergency Ordinance 2025-014, approved by the BCC on June 3, 2025. As a result, the M/WBE participation will not be enforced.

REVISED 09/22/2022

Exhibit A (p. 1 of 3)

OEBO LETTER OF INTENT – SCHEDULE 2

A completed Schedule 2 is a binding document between the Prime Contractor and the Subcontractor listed on it and should be treated as such. The Schedule 2 that contain bolded language indicating that by signing the Schedule both parties recognize this Schedule as a binding document. * All Subcontractors/subconsultants, including any tiered Subcontractors/subconsultants, must properly execute this document. Each properly executed Schedule 2 must be submitted with the bid/proposal.

SOLICITATION/PROJECT NUMBER: CSA No. 0090-16

SOLICITATION/PROJECT NAME: Singer Island Feasibility Study

Prime Contractor: Foth Infrastructure & Environment, LLC Subcontractor: Surfbreak Engineering Sciences, Inc.

(Check box(s) that apply)

☐SBE ☐WBE ☐MBE ☐M/WBE ☑Non-S/M/WBE Date of Palm Beach County Certification (if applicable): n/a

The undersigned affirms they are the following (select one from each column **if applicable**):

Column 1	**Column 2**	**Column 3**
☑Male ☐Female	☐African-American/Black ☐Asian American ☑Caucasian American ☐Hispanic American ☐Native American	☐Supplier

S/M/WBE PARTICIPATION – S/M/WBE Primes must document all work to be performed by their own work force on this form. Failure to submit a properly executed Schedule 2 for any **S/M/WBE** participation may result in that participation not being counted. Specify in detail, the scope of work to be performed or items supplied with the dollar amount and/or percentage for each work item. S/M/WBE credit will only be given for the areas in which the S/M/WBE is certified. A detailed proposal may be attached to a properly executed Schedule 2.

Line Item	Item Description	Unit Price	Quantity/ Units	Contingencies/ Allowances	Total Price/Percentage
1	Wave Data Collection			$0.00	$68,680.00

The undersigned Subcontractor/subconsultant is prepared to self-perform the above-described work in conjunction with the aforementioned project at the following total price or percentage: $68,680.00

If the undersigned intends to subcontract any portion of this work to another Subcontractor/subconsultant, please list the business name and the amount below accompanied by a separate properly executed Schedule 2.

N/A
Name of 2nd/3rd tier Subcontractor/subconsultant

Price or Percentage: N/A

Foth Infrastructure & Environment, LLC
Print Name of Prime

By: [signature]
Authorized Signature

CHRISTOPHER B. CREED
Print Name

Sr. Client Team Leader
Title

Date: 13 May 25

Surfbreak Engineering Sciences, Inc.
Print Name of Subcontractor/subconsultant

By: [signature]
Authorized Signature

William R. Daily
Print Name

President
Title

Date: May 13, 2025

This Contract, including all Schedules, Forms, and attachments, is subject to the County Emergency Ordinance 2025-014, approved by the BCC on June 3, 2025. As a result, the M/WBE participation will not be enforced.

OEBO LETTER OF INTENT – SCHEDULE 2

A completed Schedule 2 is a binding document between the Prime Contractor/consultant and a Subcontractor/subconsultant (for any tier) and should be treated as such. The Schedule 2 shall contain bolded language indicating that by signing the Schedule 2, both parties recognize this Schedule as a binding document. **All Subcontractors/subconsultants, including any tiered Subcontractors/subconsultants, must properly execute this document. Each properly executed Schedule 2 must be submitted with the bid/proposal.**

SOLICITATION/PROJECT NUMBER: CSA No. 0090-16

SOLICITATION/PROJECT NAME: Singer Island Feasibility Study

Prime Contractor: Foth Infrastructure & Environment, LLC Subcontractor: Coastal Eco-Group, Inc.

(Check box(s) that apply)

☑SBE ☑WBE ☐MBE ☐M/WBE ☐Non-S/M/WBE Date of Palm Beach County Certification (if applicable): 5/9/24-5/8/27.

The undersigned affirms they are the following (select one from each column **if applicable**):

Column 1	Column 2	Column 3
☐Male ☑Female	☐African-American/Black ☐Asian American ☑Caucasian American ☐Hispanic American ☐Native American	☐Supplier

S/M/WBE PARTICIPATION – S/M/WBE Primes must document all work to be performed by their own work force on this form. Failure to submit a properly executed Schedule 2 for any **S/M/WBE** participation may result in that participation not being counted. Specify in detail, the scope of work to be performed or items supplied with the dollar amount and/or percentage for each work item. S/M/WBE credit will only be given for the areas in which the S/M/WBE is certified. A detailed proposal may be attached to a properly executed Schedule 2.

Line Item	Item Description	Unit Price	Quantity/ Units	Contingencies/ Allowances	Total Price/Percentage
	Biological Monitoring Services				$20,128.00

The undersigned Subcontractor/subconsultant is prepared to self-perform the above-described work in conjunction with the aforementioned project at the following total price or percentage: $20,128.00

If the undersigned intends to subcontract any portion of this work to another Subcontractor/subconsultant, please list the business name and the amount below accompanied by a separate properly executed Schedule 2.

N/A

Name of 2nd/3rd tier Subcontractor/subconsultant

Price or Percentage: _____

Foth Infrastructure & Environment, LLC
Print Name of Prime

By: _____
Authorized Signature

CHRISTOPHER G. CREED, P.E.
Print Name

Sr. Client Team Leader
Title

Date: 13 May 25

Coastal Eco-Group, Inc.
Print Name of Subcontractor/subconsultant

By: Cheryl L Miller
Authorized Signature

Cheryl L Miller
Print Name

President
Title

Date: 5/13/2025

This Contract, including all Schedules, Forms, and attachments, is subject to the County Emergency Ordinance 2025-014, approved by the BCC on June 3, 2025. As a result, the M/WBE participation will not be enforced.

Foth | olsen

Foth Infrastructure and Environment, LLC (Foth | Olsen)
2618 Herschel Street
Jacksonville, FL 32204
(904) 387-6114
foth.com

May 12, 2025

Dani Tabilo
Palm Beach County Department of Environmental Resources Management
2300 North Jog Road, 4th Floor
West Palm Beach, FL 33411-2743
(561) 681-3813

Re: Annual Coastal Engineering Contract
Consultant Services Agreement (CSA) 0090-16
Singer Island Feasibility Study

Dear Ms. Tabilo;

At the request of Palm Beach County, Foth Infrastructure & Environment, LLC (Foth | Olsen) is pleased to present the following proposal for Consultant Services Authorization (CSA) 0090-16 to be completed under our existing annual services contract. This proposal provides for engineering services in support of a feasibility study of shore protection alternatives along Singer Island.

Foth | Olsen (Consultant) shall conduct a feasibility study for stabilization of an area of the Atlantic Ocean shoreline along Singer Island in Palm Beach County. The immediate area of interest spans approximately 1.7 miles of critically eroded shoreline from FDEP R-monument R60.5 to R69[1]. The current state-approved management strategy for Singer Island is to continue maintenance/monitoring of the existing dune project and re-evaluate the use of coastal erosion structures[2]. The latter is the focus of this investigation. The study will focus on evaluating various shore stabilization alternatives and will seek to describe the predicted physical performance of each alternative relative to a no action scenario. Specific focus will be placed on evaluating the ability of each alternative to provide more consistent dry beach conditions compared to the existing situation and a no action scenario. The possible effects of each alternative to adjacent nearshore hardbottom and the physical coastal system will also be considered.

The study will evaluate existing beach and upland conditions; develop the scope and scale of project alternatives; evaluate the anticipated physical benefit and performance of each alternative; discuss potential regulatory requirements which can be anticipated prior to entering a design and permitting phase; discuss potential physical and environmental effects associated with each alternative; and prepare an opinion of probable cost for each alternative. The goal of the study is to provide sufficient information to the County for selection of a preferred project plan. The specifics of each task required to support this work are described below.

[1] The corresponding study area is likely to include analysis beyond the limits of the area of immediate interest and will be determined by the engineer.

[2] Per FDEP's Strategic Beach Management Plan, May 2023 update.

1.0 **Literature and Coastal Processes Review** (Lump Sum). The Consultant will review existing reports, permit applications, etc. related to past efforts at developing a shoreline restoration and stabilization solution along the Singer Island shoreline. It is assumed that Palm Beach County will supply the requisite historical documentation for this review.

The Consultant will analyze existing beach profile survey data to describe shoreline change and volume trends along the study shoreline. The resulting trends will be considered during calibration of numerical model(s). It should be noted that because the proliferation of seawall construction along Singer Island inherently limits shoreline morphology, the accuracy of survey observations relative to the actual littoral transport potential may be low. This could negatively affect the quality of the model calibration. The range of dates and number of surveys used for this exercise will be determined by the Consultant. It is assumed that all data required for this analysis is existing and will be available from FDEP and/or Palm Beach County.

Deliverables: The Consultant will prepare and submit to Palm Beach County an electronic copy (.PDF) of a memorandum of findings that summarize the sediment transport patterns and shoreline trends along the study shoreline. County comments requiring report revision will be incorporated into the summary report discussed under Task 6.0.

Deliverables: The Consultant will prepare and submit to Palm Beach County a summary of the literature review, which will be incorporated into the summary report discussed under Task 6.0.

2.0 **Data collection** (Lump Sum). Numerical modeling of project alternatives is recommended under this proposal and will be required by regulatory agencies should the County desire to pursue permitting of a given alternative. Model input includes bathymetry, wave, and water level data.

Task 2.0 includes allowance for sourcing and aggregating applicable bathymetric data for the region to be modeled in Task 5.0. No new topographic/bathymetric data collection is proposed under this task. It is assumed that existing data sources can sufficiently describe the Singer Island shoreline, including but not limited to: the CUDEM database, NOAA's digital coastline, existing LIDAR data, existing LADS data, and beach profile data collected by Palm Beach County.

There are no sources of measured offshore wave data near the study area. Further, the seabed at the study site is characterized by rock outcroppings which can have a pronounced effect of wave transformation from deep water to the shoreline. Considering the complexity of the offshore and nearshore seabed, collection of wave data is essential for model calibration and to accurately represent the effect of nearshore rock. Under Task 2.0, the Consultant through a qualified subconsultant shall collect wave and water level data offshore of Singer Island. Data collection will consist of a 6-month deployment of two oceanographic instruments capable of measuring and recording directional wave and water level data. The ultimate locations of the gauges will be a function of substrate type, water depth, and proximity to the study area and will be determined via coordination between the Consultant and the Subconsultant. As possible, data will be recovered at a mid-point through the deployment to verify the operational status of each gauge. Foth |

Olsen will be responsible for coordination of field data collection and quality control of deliverables.

Task 2.0 additionally includes allowance for procurement of a long-term wave hindcast record developed by Oceanweather, Inc. The hindcast will consist of output from Oceanweather's GROW-FINE model at a single nodal point near the subject shoreline. The hindcast is expected to describe hourly oceanographic conditions from January 1979 to December 2023. These data will be used to describe the long-term and/or average annual wave climate off the study area and as input to the numerical model discussed in Task 5.0.

Deliverable: The Consultant shall provide all measured data and relevant reports produced by the Subconsultant. All products procured from Oceanweather, Inc. shall be provided to the County.

3.0 **Development of Project Alternatives** (Lump Sum). The Consultant, in coordination with Palm Beach County staff, shall develop up to six project alternatives. A no-action alternative shall be included.

Deliverables: The Consultant shall prepare and submit to the County a memorandum containing project alternatives for PBC-ERM review and subsequent study under Task 5.0.

4.0 **Public meetings** (Lump Sum). The Consultant shall prepare for, attend in Palm Beach County, and contribute to up to two meetings hosted by Palm Beach County. The task includes allowance for participation from both Consultant's engineering staff and environmental experts from Coastal Eco-Group.

5.0 **Project Performance Analysis** (Lump Sum). The Consultant shall conduct a project performance analysis of up to six alternatives. It is anticipated that performance evaluation will require numerical and/or analytical modeling. Best practices shall be employed with respect to the calibration and verification of the numerical model used, within the inherent limits of available measured data. Analytical models will be applied as applicable to structural alternatives (breakwaters, groins, etc.) to offer differing predictions of shoreline position, potential tombolo formation, etc. It is anticipated that a process-based, morphological model will be utilized for this effort.

Task 5.0 includes allowance for refinement of the collected bathymetric data; creation of the model domain(s); calibration of the numerical model using representative existing conditions; and simulation of up to six project alternatives. The duration of each model simulation will be determined by the engineer.

6.0 **Feasibility Study Report** (Lump Sum). The Consultant shall prepare a report which includes, at a minimum, the following topics:

- The report shall include a final version of the memorandum included in Task 1.0, Literature Review.
- The report shall include discussion of the data sources and data collected for this investigation.

- The report shall include a final version of the memorandum included in Task 1.0, Coastal Processes Review.

- The report shall include, at a minimum, a discussion of the numerical model setup, calibration, assumptions made, model limitations, input schematization techniques, physical performance of each modeled alternative, and discussion of predicted project-related changes to adjacent shorelines.

- Regulatory Discussion. In addition to the prominent nearshore reef system, Singer Island is an important high-density nesting beach for marine turtles, including loggerhead, green, and leatherback turtles. Protection of these resources and their essential habitat, to the maximum extent possible, should be included in the design process. The Consultant will discuss the potential path forward for permitting each project alternative. This will include discussion of potential hurdles in the permitting process associated with any given alternative. This includes, but is not limited to, discussion of the ecological needs of marine turtles, nearshore reef habitat, shorebirds, and other species of concern. A qualified environmental subconsultant will assist with this effort.

- Economic Discussion. The Consultant shall develop a probable cost to construct each alternative. This will include consideration of costs associated with alternatives requiring recurrent, planned maintenance, i.e., dune fill, etc.

- The report shall contain specific recommendations regarding shore protection alternatives.

Deliverables: The Consultant will prepare and submit to Palm Beach County the following deliverables: Electronic copies (MS Word & PDF format), of the draft engineering report. The final report will be delivered to the County within 21 days of receipt of all County comments.

7.0 **Contingency** (T&M). Task 7.0 allows for consideration of additional task items which are not explicitly defined herein but may arise during this investigation. It is assumed that a written notice to proceed from Palm Beach County is required prior to initiation of work on Task 7.0.

Fee: The total fee to complete the scope of work described herein is $492,213.51. Of that amount, $98,808 is allocated to subconsultants and $65,943.28 is reserved for contingencies (and requires a County NTP prior to initiation of this portion of the work).

Sincerely,

Steve Howard, P.E.
Lead Coastal Engineer

Authorizing Signatures:

Christopher Creed, PE
Senior Coastal Engineer and Client Team Leader

Kevin Bodge, PE, PhD
Senior Coastal Engineer and Team Leader

cc: File

Enclosure(s)
Cost Details
Subconsultant Proposals

Palm Beach County, Florida

ANNUAL COASTAL ENGINEERING CONTRACT
CSA 0090-16

DIRECT LABOR									OUTSIDE SVS/SUB-CONTRACTORS				TOTAL
LABOR CATEGORY	Fee	Engineer / Scientist VI	Engineer / Scientist V	Engineer / Scientist IV	Engineer / Scientist III	Technician IV	Assistant II	COST	SERVICE	COST	Administrative and Supervisory Fee (5%)	COST	
Rate ($/hr)		$ 242.35	$ 178.58	$ 122.76	$ 107.85	$ 93.47	$ 98.66						
Task 1 - Literature and Coastal Processes Review	Lump Sum	6	32		80		8	$ 16,585.94					$ 16,585.94
Task 2 - Data Collection	Lump Sum	4	24	24	32		8	$ 12,442.04	Surfbreak Engineering (wave data collection)	$ 68,680.00	$ 3,434.00	$ 72,114.00	$ 95,056.04
									Oceanweather, Inc. (wave hindcast)	$ 10,000.00	$ 500.00	$ 10,500.00	
Task 3 - Development of Project Alternatives	Lump Sum	32	40			40	8	$ 19,426.48					$ 19,426.48
Task 4 - Public Meetings	Lump Sum	42	42			40	8	$ 22,207.14	Coastal Eco-Group	$ 5,076.00		$ 5,076.00	$ 27,283.14
Task 5 - Project Performance analysis	Lump Sum	160	350	675	75		8	$ 193,020.03					$ 193,020.03
Task 6 - Feasibility Study Report	Lump Sum	24	160	160		20	40	$ 59,846.60	Coastal Eco-Group	$ 15,052.00		$ 15,052.00	$ 74,898.60
Task 7 - Contingency	Time & Materials	100	100	100	100		8	$ 65,943.28					$ 65,943.28
TOTAL								**$ 389,471.51**		**$ 98,808.00**	**$ 3,934.00**	**$ 102,742.00**	**$ 492,213.51**

William R. Dally, Ph.D., P.E.

Surfbreak Engineering Sciences, Inc.
19 Sailfish Drive
Ponte Vedra Beach, FL 32082 U.S.A.

(407) 227-6790
wdally@surfbreakengineering.com

April 28, 2025

REVISED PROPOSAL

Wave Data Collection off Singer Island, Palm Beach County, Florida

Submitted to:

Foth Infrastructure and Environment, LLC

2618 Herschel Street
Jacksonville, Florida 32204

Purpose and Methods

The purpose of this project is to collect directional wave data in the nearshore off Singer Island, Florida, in the region between FDEP monuments R060.5 and R069. The data collected are to be suitable for use in calibrating and verifying numerical wave transformation models, especially in regard to quantifying wave energy losses due to "friction" induced by the variety of roughness of the sea floor found in the area, including 1) sand, 2) exposed but low-relief hard-bottom and 3) natural high-relief reef systems. Referring to Figure 1, it appears that high roughness is evident in the region bordered by the 20-ft and 30-ft isobaths between R060 and R067. Note also the marked deepwater borrow area offshore of R054 to R065 that potentially adds difficulty to both wave modeling and attempting to optimize the deployment of the wave gauges. Recent beach profiles surveyed at each R-monument from the dry beach out into deep water are presented in Appendix A and are valuable in characterizing the types of seabed expected to be encountered.

The basic method to be used is to install "paired" wave gauges, one near the 70-ft isobath offshore of the broad expanse of exposed hard-bottom, and the second slightly inshore of the hard-bottom near the 20-ft isobath. Nominal locations of the two instruments will be established after Surfbreak Engineering Sciences (SES) conducts an underwater reconnaissance mission at the site and then confers with Foth staff.

When deployed appropriately, bottom-mounted Acoustic Doppler Instruments (ADI) are the best wave-measuring technology available in the water depths being considered. It is most likely that the instrument used in deepwater will be an RD Instruments 600 kHz Acoustic Doppler Current Profiler (ADCP). If the local bottom is composed of a sufficient sand layer, its mount will be a 10 ft long water-jetted stainless-steel pipe, 3" in diameter. If similar sand bed conditions exist at the site of the inner gauge at a nominal depth of 20 ft, a jetted pipe will also be used for mounting an RD Instruments 1200 kHz ADCP. Both instruments will be deployed in self-operating mode (powered by batteries, with raw data saved in onboard memory.

Figure 1 – Recent bathymetry at Singer Island, showing the rough seabed in the nearshore between R060 and R067.

It is noted that ADCPs do not function well in aerated water due to bubbles interfering with the acoustic beams. Therefore, if wave breaking is expected to frequently occur at the inner ADCP, the type of instrument used in shallow water most likely will be switched to an Acoustic Doppler Velocimeter (ADV). These instruments make precise measurements even in aerated water but only at a single spot, *i.e.* they do not measure water motion throughout the water column. Consequently, the directional wave spectra measured by such "single point" instruments do not have the spectral resolution and accuracy of profiling instruments.

If the reconnaissance mission reveals that the preferred location of either instrument does not contain a sand layer of sufficient thickness to support a jetted pipe ($\geq$ 12 ft), as an alternative the instrument is to be mounted to a low-aspect, adjustable tripod, anchored by drilling 3 small holes

(~5/8" diam) into suitable exposed rock at the site, and 1/2" stainless-steel all-thread rods epoxied into the rock. Each foot of the tripod will then be securely anchored to the bed using threaded hardware.

Scope of Work

1. Meet with Foth staff to identify the locations that have the greatest potential to provide the type of data needed to support their numerical modeling efforts.
2. Travel from Jacksonville to Singer Island to perform a thorough reconnaissance of the proposed gauge locations, including water-jet probing and possibly underwater video.
3. Meet with Foth staff and, based upon the findings from the reconnaissance mission, select the most appropriate locations and type(s) of instrument to be deployed.
4. Design and fabricate appropriate mounts for the selected instruments and seabed conditions.
5. Obtain supplies and parts for all underwater tools and equipment needed to install the instrument mounts.
6. Travel from Jacksonville to Singer Island, install the instrument mounts, and deploy the two instruments.
7. Approximately two months after the initial deployment of the mounts and instruments, make a return trip to Singer Island to conduct an *in-situ* cleaning and assessment of each instrument and its mount. Make any repairs or replacements needed.
8. Approximately five to six months after the initial deployment, conduct a final trip to Singer Island to retrieve the waves gauges and their mounts.
9. Process the raw data from each instrument using the manufacturer's software.
10. Develop and provide all deliverables (listed below) to Foth, Inc.

Intended Work Schedule

It is intended to collect wave measurements for a minimum of five months in late 2025 and early 2026 during both the hurricane and nor'easter seasons, nominally between the beginning of September and the end of January. This time constraint means that preparations, particularly items 1-5, must be completed during July and August, and consequently it is necessary that contracting be completed by late June.

After the instruments and mounts are retrieved, approximately one month is required to process the wave data and provide the deliverables. It is noted that the intended schedule is subject to 1) the ability to obtain parts, instruments, and equipment in a timely manner, and 2) installation and retrieval of the instruments and mounts will be constrained by weather.

Deliverables

When collection of the raw wave data and its processing are completed, 1) digital files of directional wave spectra, 2) digital files of spectral wave parameters, and 3) a brief report that

includes both a log of activities as well as time-series plots of the parameter files and examples of fully directional spectra will be delivered to Folf, LLC.

Budget

Surfbreak Engineering Sciences, Inc.
Budget for Singer Island Wave Measurements

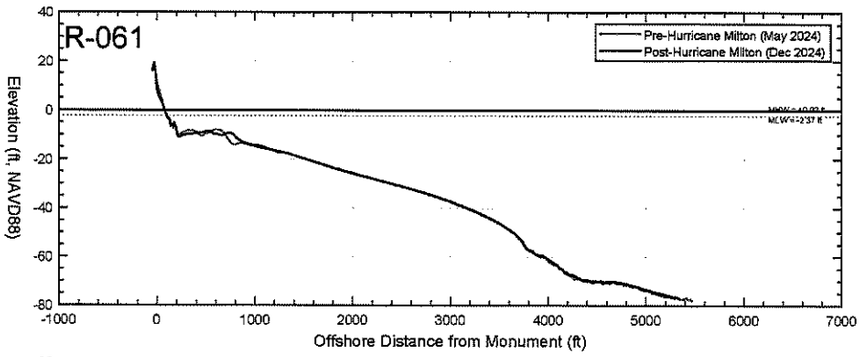
ADI instruments (2 instruments for 5.5 months; 1st mo.- $3k, 2nd mo.- $2k, each month thereafter-$1k per instrument)	$17,000.00
Lithium batteries	$3,000.00
Memory cards	$2,500.00
Instrument frame fabrication; shop labor	$3,500.00
U/W Installation equipment	$1,500.00
Boat rental (10 days total)	$4,500.00
Boat fuel[1]	$330.00
Truck rental (3/4 ton 4x4; 10 days total)	$1,450.00
Truck fuel[2]	$700.00
Field Labor (captain, 2 divers, deck hand); 10 days total)	$16,050.00
Project Engineer (40 hrs @ $175/hr)	$7,000.00
Meals $40/day (4 personnel, 10 days total)	$1,600.00
Lodging - Riviera Beach; 2 double rooms; 10 nights total	$3,000.00
Boat trailer parking, 10 days total	$350.00
Dockage - Riviera Beach Marina; 10 nights total	$1,200.00
Data processing and report (Technician: 20 hrs at $80/hr; Project Engineer: 20 hrs at $175/hr.)	$5,000.00
Total	$68,680.00

[1]$4.00/gallon x 1.1 gallon per mile x 15 miles/day x 5 days

[2] Round trip Jacksonville-Palm Beach + vicinity miles = 584 miles per trip x 4 trips / 12 miles/gallon x $3.60/gallon diesel)

APPENDIX A

RECENT BEACH PROFILES FROM R061-R066 ALONG SINGER ISLAND



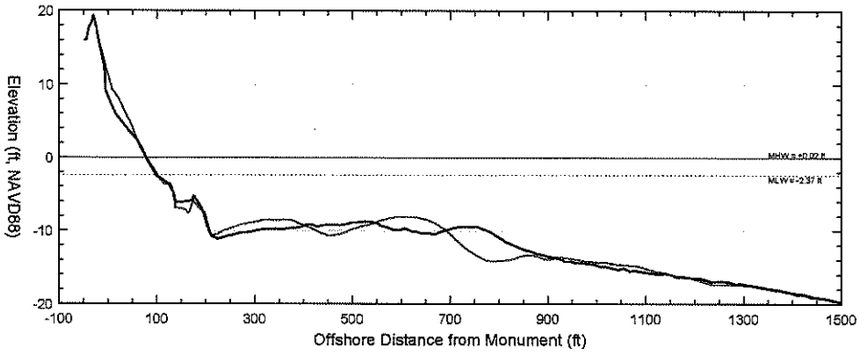
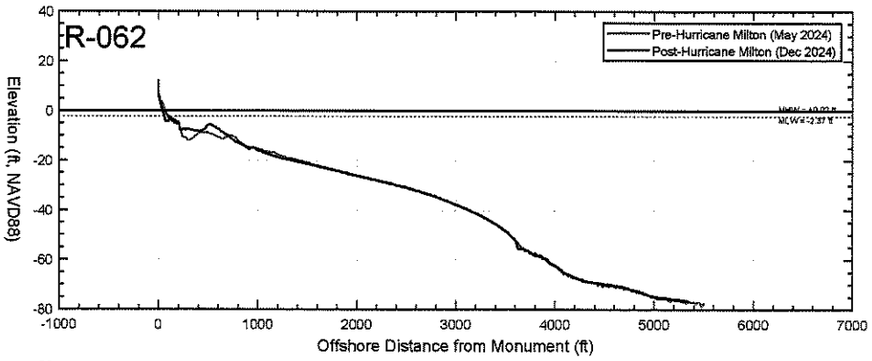


Figure A- 1: Measured beach profiles at monument R-0610 - Palm Beach County, Florida.



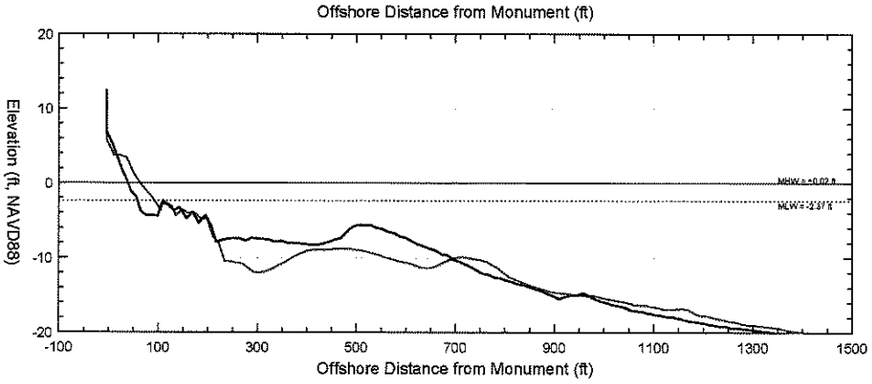


Figure A- 3: Measured beach profiles at monument R-0620 - Palm Beach County, Florida.

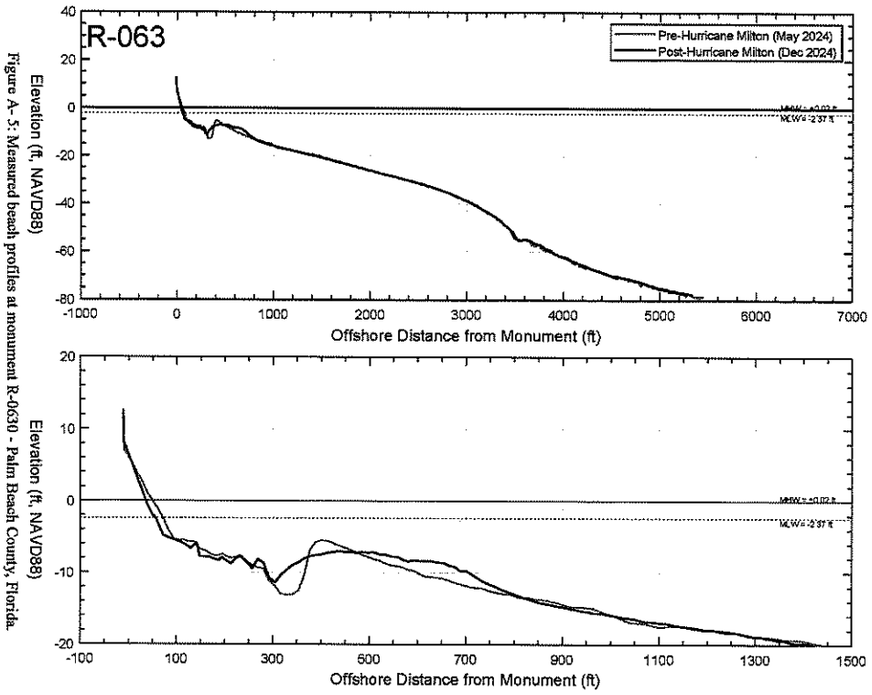


Figure A- 5: Measured beach profiles at monument R-0630 - Palm Beach County, Florida.

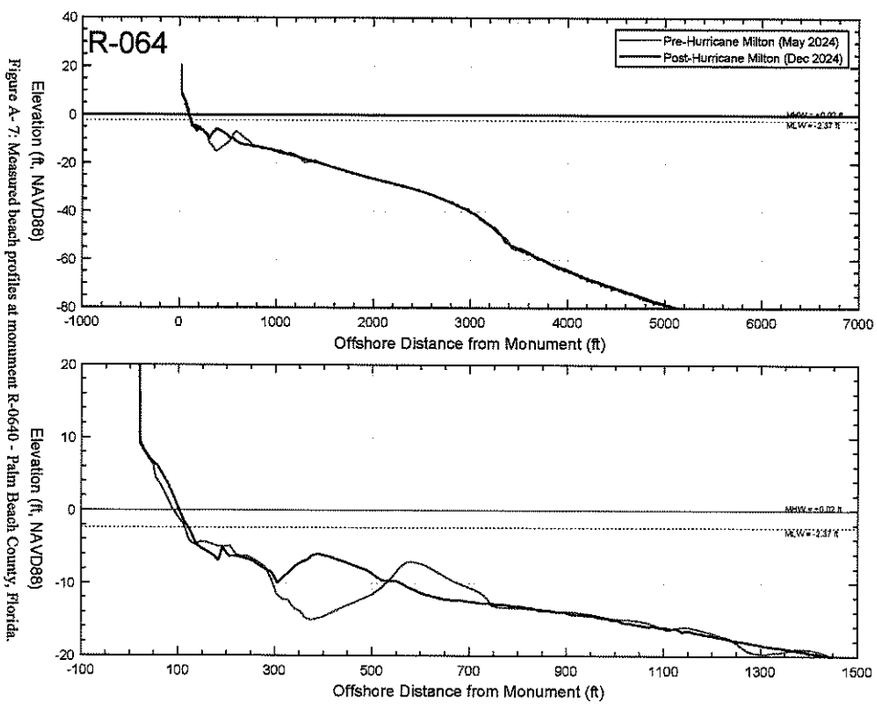
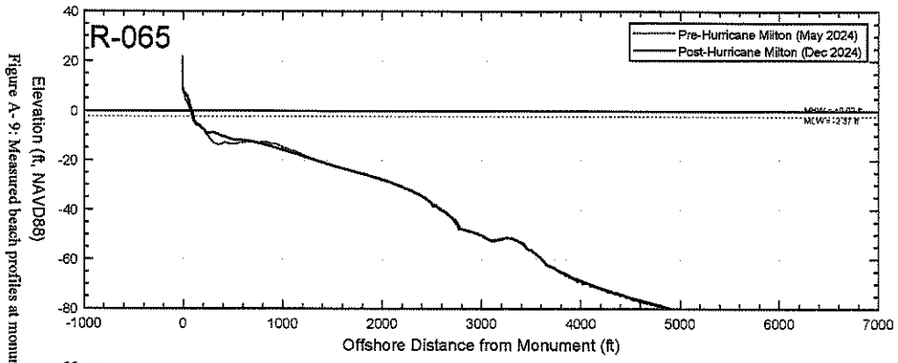


Figure A- 7: Measured beach profiles at monument R-0640 - Palm Beach County, Florida.



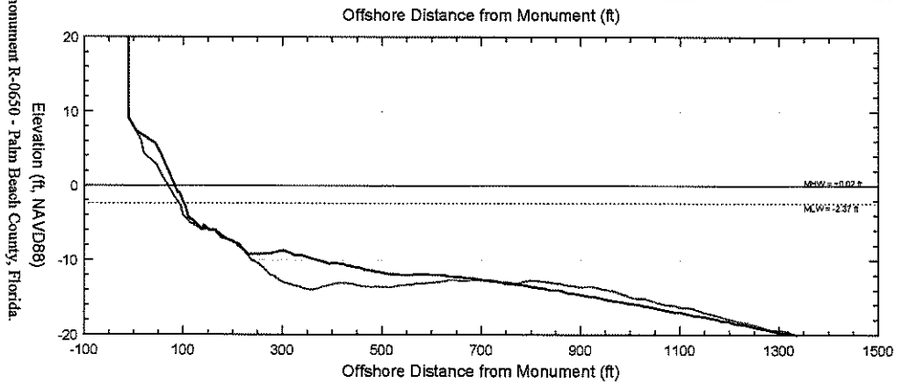
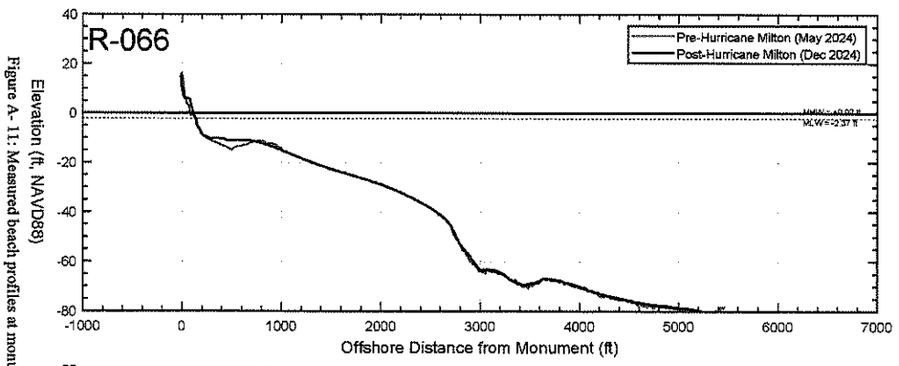


Figure A- 9: Measured beach profiles at monument R-0650 - Palm Beach County, Florida.



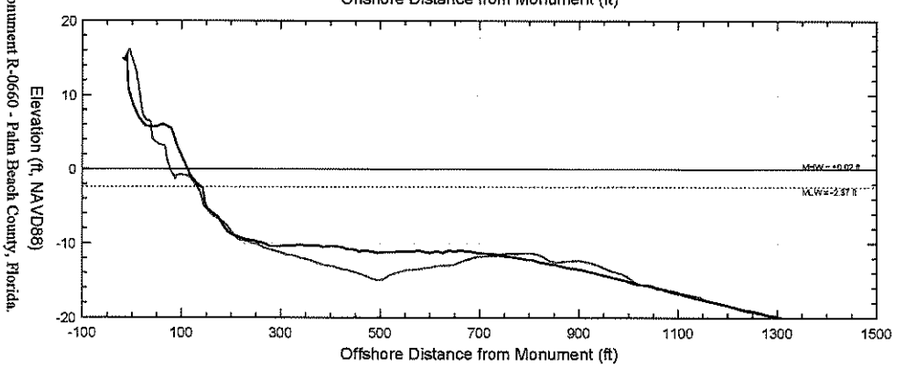


Figure A- 11: Measured beach profiles at monument R-0660 - Palm Beach County, Florida.

Coastal Eco-Group, Inc.
665 SE 10th St. Suite 104
Deerfield Beach, FL 33441
(954)591.1219 Phone • (954)653-2981 Fax
www.coastaleco-group.com

April 21, 2025

Mr. Steve Howard, P.E.
Foth | Olsen Associates, Inc.
2618 Herschel St.
Jacksonville, FL 32204

RE: Proposal for Environmental Consulting Services- Singer Island Shoreline Stabilization Project - Feasibility Study

Dear Steve:

Pursuant to your request, Coastal Eco-Group, Inc. (CEG) is pleased to provide this cost proposal for environmental permitting support services for the Singer Island Shoreline Stabilization Project feasibility study. Our tasks are numbered to correspond with your overall scope of services to Palm Beach County. Detailed task descriptions and associated deliverables are provided below. A breakdown of the costs for each task is provided in the attached spreadsheet.

Task 4 – Public Meetings
In support of this task, CEG scientists shall prepare for, attend, and contribute to up to two meetings hosted by Palm Beach County. Where applicable, CEG shall provide limited preparation for progress meetings including preparation of meeting agendas and presentation materials.

Deliverables. Deliverables include meeting notes in PDF format and digital copies of any presentation materials developed for the project.

Lump Sum Task 4 Total Cost: $5,076

Task 6 - Feasibility Study Report
CEG shall contribute to the alternatives analysis which identifies major regulatory obstacles in permitting project alternatives and assists with development of a preferred alternative which avoids and minimizes potential environmental effects to the greatest extent practicable. Project alternatives must consider competing ecological needs of resident and migratory species. The project area beach provides high-density sea turtle nesting habitat, and the nearshore hardbottom is valuable foraging habitat for juvenile green sea turtles, as well as Essential Fish Habitat (EFH) for numerous fish and macroinvertebrate species.

Under Task 6, CEG shall conduct a single day field effort to document the current condition of nearshore hardbottom resources and beach habitats in the project area. These data will be used to develop detailed benthic habitat maps required for evaluation of project alternatives.

Deliverables. Deliverables for this task include a field observation summary report (PDF format); benthic habitat maps developed in ArcGIS with associated shapefiles and georeferenced digital still photos and video clips; and relevant sections of the Draft feasibility study document.

Lump Sum Task 6 Total Cost: **$15,052**

The total lump sum cost to conduct the work described in this scope of services is **$20,128.** Thank you for the opportunity to provide this cost estimate. Please let me know if you have any questions. We look forward to working with you on this project.

Sincerely,

Cheryl L. Miller

Cheryl L. Miller
President, Coastal Eco-Group Inc.

Palm Beach County, FL
Singer Island Shoreline Stabilization Feasibility Study
Task 4 Public Meetings April 21, 2025

DESCRIPTION	2025	Preparation, Participation & Presentation- Two Public Meetings in Palm Beach County		TOTAL	
		Hours	$	Units	$
Coastal Eco-Group					
Labor Classification					
Principal Scientist	$132.00	28	$3,696.00	28	$3,696.00
Senior Scientist	$115.00	12	$1,380.00	12	$1,380.00
TOTAL		**40**	**$5,076.00**	**40**	**$5,076.00**

Palm Beach County, FL
Singer Island Shoreline Stabilization Feasibility Study April 21, 2025
Task 6- Feasibility Study Report

DESCRIPTION	2025	Diver Mapping Survey of Nearshore Hardbottom Edge, Benthic Characterization, & Beach Habitat Site Inspection		Alternative Analysis, Critical Habitat Effects Assessment, and GIS Benthic Habitat Maps		TOTAL	
Coastal Eco-Group							
Labor Classification							
Principal Scientist	$132.00	-	$0.00	40	5,280.00	40	$5,280.00
Senior Scientist	$115.00	20	$2,300.00	16	1,840.00	36	$4,140.00
Staff Scientist	$100.00	40	$4,000.00		-	40	$4,000.00
Boat Captain	$68.00	11	$748.00	-	-	11	$748.00
Equipment							
Survey Vessel	$650.00	1	$650.00	-	-	1	$650.00
Trimble Mapping System	$50.00	1	$50.00	-	-	1	$50.00
Still Camera	$30.00	2	$60.00	-	-	2	$60.00
Field Expendables	$25.00	1	$25.00	-	-	1	$25.00
Dive Equipment (includes dive gear and tanks)	$33.00	3	$99.00	-	-	3	$99.00
CEG Labor Subtotal		**71**	**$7,048.00**	**56**	**$7,120.00**	**127**	**$14,168.00**
TOTAL			**$7,932.00**		**$7,120.00**		**$15,052.00**

GROW-FINE East Coast Pricing

GROW-FINE East Coast is an Oceanweather product sold on a per-grid-point basis. Multiple grid point requests per order are provided at a discount. Delivery for wind/wave fields and standard statistics is 1 business week. Wave spectra, if available, are delivered in 2 business weeks. Standard hindcast for the continuous is Jan 1979 - Dec 2023. The storm hindcasts consist of tropical storms of various dates from 1924-2023 and extra-tropical storms of various dates from 1957-2023. The tropical and extra-tropical storm hindcasts contain hydrodynamic variables for storm-driven surge height and vertically integrated current speed and direction. The data product is provided subject to an end-user license agreement applicable to a single-project or application. Please see paragraph 2 of the license agreement for details including third-party usage.

	First Point	*Second Point*	*Third Point*	*Additional Points*
Continuous and Storm Fields	$15,000 US	$13,500 US	$12,750 US	$11,250 US
Continuous and Storm Spectra (if available)	Additional $1,000 US	Additional $900 US	Additional $850 US	Additional $750 US
Continuous or Storm Fields	$10,000 US	$9,000 US	$8,500 US	$7,500 US
Continuous or Storm Spectra (if available)	Additional $1,000 US	Additional $900 US	Additional $850 US	Additional $750 US
Continuous and Storm Fields and Statistical Analysis	$17,500 US	$15,750 US	$14,875 US	$13,125 US
Continuous or Storm Fields and Statistical Analysis	$12,500 US	$11,250 US	$10,625 US	$9,375 US
Statistical Analysis Only	$10,000 US	$9,000 US	$8,500 US	$7,500 US
Update Additional Year for Licensee	$1,000 US	$900 US	$850 US	$750 US

oceanweather inc.

350 Bedford Street, Suite 404
Stamford, CT, USA
Tel: 203-661-3091
Email: oceanwx@oceanweather.com
Web: www.oceanweather.com

Exhibit C

CONTRACT HISTORY
Foth Infrastructure & Environment, LLC
(f.k.a. Olsen Associates, Inc.)
Continuing Contract for Coastal and Marine Engineering Services

Contract R2023-0090 dated January 24, 2023 for a period of two years, expires on January 23, 2025.
Amendment No. 1 (R2025-0036) dated January 7, 2025 extends the contract through January 23, 2026.
SBE Goal: 48.0%

Consultant Services Authorization summary:

CSA #	TOTAL/ SBE AMOUNT	CSA DUE DATE	PROJECT DESCRIPTION	APPROVED BY/DATE
0090-01	47,130.28 44,853.00	12/31/2023	2023 Lake Worth Lagoon Seagrass Fixed Transect Monitoring	ERM 3/16/2023
0090-02	227,979.42 167,485.00	1/31/2024	2023 Regional Monitoring Surveys and Post-Storm Damage Assessment	BCC 5/16/2023
0090-03	43,889.84 42,089.00	12/31/2023	2023 Lake Worth Lagoon Seagrass Mapping	ERM 4/19/2023
0090-04	33,321.55 0.00	11/30/2023	NCCSPP Segment I - 1 Year Post-Construction Physical Monitoring Report	ERM 5/1/2023
0090-03A	124,767.98 122,082.00	12/31/2023	2023 Lake Worth Lagoon Seagrass Mapping	BCC 7/11/2023
0090-05	34,495.46 0.00	5/1/2024	NCCSPP Sand Search - Phase 1	ERM 8/18/2023
0090-06	5,845.67 5,072.00	12/31/2023	NCCSPP Segment 2 Legal Descriptions	ERM 11/9/2023
0090-07	195,326.24 131,675.00	1/31/2025	2024 Regional Monitoring Surveys and Post-Storm Damage Assessment	BCC 5/7/2024
0090-08	52,267.28 49,990.00	12/31/2024	2024 Lake Worth Lagoon Seagrass Fixed Transect Monitoring	CRC 4/24/2024
0090-09	37,541.17 0.00	12/31/2024	NCCSPP - Segment III Year-Three Post Construction Physical Monitoring Report	ERM 5/10/2024
0090-10	68,773.72 65,400.00	3/31/2025	2024 Coastal Aerial Hardbottom Delineation	CRC 8/14/2024
0090-11	27,108.06 0.00	3/1/2025	NCCSPP Borrow Area Cable Investigation	ERM 12/23/2025
0090-12	52,864.04 50,340.00	12/31/2025	2025 Lake Worth Lagoon Seagrass Fixed Transect Monitoring	ERM 3/21/2025
0090-13	217,999.64 152,272.00	1/31/2026	2025 Regional Monitoring Surveys and Post-Storm Damage Assessment	BCC
0090-14	34,166.48 0.00	6/15/2025	NCCSPP Segment I - 3 Year Post-Construction Physical Monitoring Report	ERM 4/30/2025
0090-15	450,501.30 109,129.00	9/30/2026	NCCSPP Sand Search - Phase 2	BCC
0090-16	492,213.51 20,128.00	7/31/2027	Singer Island Feasibility Study	BCC

Total: 2,146,191.64
SBE: 960,515.00
SBE Participation: 44.7%
Report Date & Filename: 06/13/25

Subject to Emergency Ordinance 2025-014, approved by the BCC on June 3, 2025. As a result, the M/WBE participation will not be enforced.

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