

**WORK ORDER NUMBER 15**

**SECTOR 3 BEACH RESTORATION PROJECT**

**2017 PHYSICAL MONITORING SERVICES**

This Work Order Number 15 is entered into as of this \_\_\_\_ day of \_\_\_\_\_, 2017 pursuant to that certain Continuing Contract Agreement for Professional Services entered into as of March 19, 2013 ("Agreement"), and amended March 17, 2015, by and between Indian River County, a political subdivision of the State of Florida ("COUNTY") and CB&I Coastal Planning & Engineering Inc. f/k/a Coastal Planning & Engineering, Inc. ("CONSULTANT").

The COUNTY has selected the Consultant to perform the professional services set forth on Exhibit 1, attached to this Work Order and made part hereof by this reference. The professional services will be performed by the Consultant for the fee schedule set forth in Exhibit 2, attached to this Work Order and made a part hereof by this reference. The Consultant will perform the professional services within the timeframe more particularly set forth in Exhibit 2, attached to this Work Order and made a part hereof by this reference all in accordance with the terms and provisions set forth in the Agreement. Pursuant to paragraph 1.4 of the Agreement, nothing contained in any Work Order shall conflict with the terms of the Agreement and the terms of the Agreement shall be deemed to be incorporated in each individual Work Order as if fully set forth herein.

IN WITNESS WHEREOF, the parties hereto have executed this Work Order as of the date first written above.

CONSULTANT  
CB&I Coastal Planning & Engineering, Inc.

BOARD OF COUNTY COMMISSIONERS  
OF INDIAN RIVER COUNTY

By:   
Thomas P. Pierro, P.E., D.CE

By: \_\_\_\_\_  
Joseph E. Flescher, Chairman

Title: Director

Attest: Jeffrey R. Smith, Clerk of Court and  
Comptroller

Date: 3/1/2017

By: \_\_\_\_\_  
(Seal) Deputy Clerk

Approved:

By: \_\_\_\_\_  
Jason E. Brown, County Administrator

Approved as to form and legal sufficiency:

By: \_\_\_\_\_  
William K. DeBaal, Deputy County Attorney

# EXHIBIT 1



CB&I Coastal Planning & Engineering, Inc.  
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Boca Raton, FL 33431  
Tel: +1 561 391 8102  
Fax: +1 561 391 9116  
www.CBI.com

February 17, 2017

James Gray  
Indian River County  
Public Works - Coastal Engineering Division  
1801 27th St, Building A  
Vero Beach, FL 32960

**Subject: Work Order #15  
Indian River County Sector 3 Beach Restoration Project and Dune Repair Project  
Post Construction Physical Monitoring Services - 2017**

Dear James:

This proposal outlines a scope of work for CB&I Coastal Planning & Engineering, Inc. (CB&I), f/k/a Coastal Planning & Engineering, Inc. to provide services in support of one year of annual physical monitoring to fulfill FDEP and USACE permit requirements of the Sector 3 Beach and Dune Restoration Project constructed between 2010 and 2012 and the Sector 3 Dune Repair Project constructed 2014/2015.

The 2017 Physical Monitoring Services entails the following:

- "Year 5" annual post construction physical monitoring of the Phase 2b project area (R-20 – R-26+500),
- "Year 2" annual post-construction physical monitoring for the Sector 3 Dune Repair Project Area (R-24 – R-55).

## **Physical Monitoring Report**

The Indian River County Sector 3 Beach Restoration Project and Dune Repair Project were constructed under permitting authority of the Florida Department of Environmental Protection (FDEP) and United States Army Corps of Engineers (USACE). These permits (FDEP permit No. 0285993-001-JC, FDEP permit modification No. 0285993-008-JN, USACE permit SAJ-2007-01645, and USACE permit modification SAJ-2007-01645(MOD-AWP)) contain permit conditions pertaining to construction and post-construction periods. FDEP permit condition 56 (d) requires an engineering report be submitted to the FDEP within 90 days following completion of each post-construction survey.

We understand that the County's surveyor (or in collaboration with Sebastian Inlet District' surveyor) will perform the beach profile physical monitoring from R-15 to R-60, and be responsible for certifying the survey data and submitting a survey report to the FDEP. CB&I will review the data to ensure that it conforms to the standards required by the FDEP physical monitoring plan. CB&I will notify the County of any issues with the survey data and will coordinate through the County or directly with the surveyor to resolve any issues.

CB&I will develop an engineering report that discusses the performance of the beach fill project. We will analyze shoreline and volumetric changes throughout the project area, identifying erosion and accretion patterns. The results will be analyzed for patterns, trends or changes between annual surveys and for cumulative changes over time. The project was constructed in three phases and the analysis will account for the phased construction. Furthermore, the report will compare the project performance to the stated design. Plots of the survey profiles, and graphical



representations of shoreline (contour) and volumetric changes for the monitoring area will be presented. Summary tables of the shoreline and volumetric changes will be presented.

CB&I will collect aerials of the project area as discussed more fully later in this scope of work. The aerials will be collected from R-15 through R-60. Plots of relevant hardbottom and shoreline positions will be overlaid on the aerials and included in the report appendix. Considering biological monitoring is no longer required for this project, delineation of the edge of hardbottom is not required for the aerial photography.

#### Deliverables

CB&I will submit a draft of the report of the County for review and comment. This will be submitted electronically (PDF and/or MS Word formats). CB&I will incorporate comments from the County and revise the report accordingly. CB&I will then submit an electronic copy to the FDEP. CB&I will submit one hard copy and an electronic copy (PDF) to the County.

#### Required Data

To perform the physical monitoring evaluation, CB&I will need the following data:

- Survey data in x,y,z format collected in summer of 2017.

#### Schedule

The draft monitoring report will be completed within 60 days of receipt of the survey data. We estimate that the County will review and provide comments on the document within 2 weeks. CB&I will revise the report, incorporate the County's comments, and submit a final report to the County and FDEP within 2 weeks of receipt of the County's comments. The goal is to submit the final report to the FDEP within 90 days of receipt of the required data. Assuming that data is provided by August 31, we estimate submittal of a final report by November 30, 2017.

#### Cost

The cost of the monitoring report, excluding the aerial collection is \$27,642.00. A breakdown of the hours and expenses to develop these costs is attached and follow the provisions of the Professional Coastal Engineering Services Agreement (dated March 19, 2013) and Contract Renewal (dated March 17, 2015), between Indian River County and CB&I Coastal Planning & Engineering, Inc.

#### **Rectified Aerial Photographs**

Aerial photographs are required per FDEP special permit condition 56(c). CB&I will have aerials collected that follow BBCS Monitoring Standards for Beach Erosion Control Projects, Section 02100 – Environmental Aerial Photography Acquisition.

Controlled, flight-dated, color vertical aerial photographs will be taken from Indian River County FDEP range monuments R-15 through R-60, inclusive. Collection of the aerial photography will be timed so as to collect the aerials concurrently with the surveys. CB&I will rely on Indian River County to notify us as to when these surveys are being performed.



The flight will be conducted on an incoming tide and when there is sufficient visibility in coastal waters to capture nearshore hardbottom. Film will be selected to provide the best possible images in the greatest possible water depths. Photography will be obtained during morning hours with cloud cover at less than 10%, and in order to minimize glint, the flight window shall occur when the sun angle is between 15 to 30 degrees to the horizon. If, during the flight, weather conditions deteriorate to the point that the purposes of the flight cannot be met, or the five flight conditions are not satisfied, the flight will be aborted and flown at a later date when conditions are satisfactory.

The photography will employ the use of an aerial camera approved by the US Geological Survey. The camera will be equipped with a data block, which will record the lens number, calibration, focal length of the lens, altitude, date, and time. The photographs will be color aerial photography and geo-referenced digital imagery with the following specifications:

1. A minimum 60% overlap with each adjacent photograph and a ratio of 50% land and 50% ocean (2000' and 2000') on the horizontal.
2. The image will be clear and sharp in detail, free from clouds, shadows or any other blemishes that would render the image as uncertain for mapping rock and reef features as far offshore as possible and no less than -15 feet, NAVD.
3. Each frame will contain:
  - i. time of day clock in standard time,
  - ii. altimeter reading,
  - iii. exposure counter,
  - iv. camera identification number,
  - v. lens focal length in mm, and
  - vi. the plate ID number.

Necessary ground control will be extracted from existing imagery sources and used in combination with collected ABGPS to rectify this imagery. It is assumed that previous control points can be used and have been previously surveyed. No additional field work is included in this proposal.

#### Deliverables

CB&I will provide the following deliverables to the County and FDEP:

1. Camera Calibration Report.
2. Flight Report – includes Flight Log, Weather Log, and Tide Log.
3. Individual geo-referenced image frames in uncompressed TIFF format and associated world files stored on DVD.
4. Mosaicked geo-referenced files in JPEG format on DVD.
5. MetaData - Complete federally compliant metadata file in ASCII or HTML format for the flight and image processing.



Required Data

CB&I may require additional survey points to rectify the images. We are proposing to sub-contract Aerial Cartographics of America (ACA), who previously performed the work, and they should have sufficient historic survey points to rectify the images. However, additional survey points may be required. Typically, the Public Works Department will have surveys that can be used to rectify aerial images avoiding additional field work.

Schedule

We will attempt to schedule collection of the aerials to coincide with collection of the survey data. Final deliverables related to the aerials will be submitted within 60 days of collection of the aerials.

Cost

The cost to collect the aerials and rectify the images is \$16,335.80. A breakdown of the hours and expenses to develop these costs is attached and follow the provisions of the Professional Coastal Engineering Services Agreement (dated March 19, 2013) and Contract Renewal (dated March 17, 2015), between Indian River County and CB&I Coastal Planning & Engineering, Inc.

**Summary**

The total lump sum cost of this proposal for Work Order #15 is \$43,977.80.

We appreciate the opportunity to work with Indian River County on this effort. Please call me if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Michelle Pfeiffer".

Michelle R. Pfeiffer, P.E.  
Senior Project Engineer  
CB&I Coastal Planning & Engineering, Inc.

A handwritten signature in blue ink that reads "Thomas Pierro".

Authorized Corporate Signature

Thomas Pierro

Printed Name

Director of Operations

Title

Please Reply To: Michelle Pfeiffer  
Phone: 561.361.3177  
E-Mail Address: [Michelle.Pfeiffer@cbi.com](mailto:Michelle.Pfeiffer@cbi.com)

cc: Thomas Pierro, P.E. D.CE, CB&I  
William Reilly, P.E., CB&I



SPM REVISION: 2017 - REV 17 2  
Release Date: 2/7/17

PROJECT NUMBER: 000000  
PROPOSAL NUMBER: 630224026  
Date Pricing Model was Prepared: 2/10/17

**Project Estimate  
Summary By Task**  
IRC WO 15 2017 Physical Monitoring  
02/17/17

Task Number	Task Name	Labor	Sub-contractors	Equipment	Materials	Other ODC's	Travel	Total	Adjustments	Total Project
Tsk-001	Survey Data Review and Handling	\$ 2,290.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,290.00	-	\$ 2,290.00
Tsk-002	Shoreline Change Analysis	\$ 2,495.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,495.00	-	\$ 2,495.00
Tsk-003	Volume Change Analysis	\$ 3,670.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,670.00	-	\$ 3,670.00
Tsk-004	Report Development	\$ 19,167.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 19,167.00	-	\$ 19,167.00
Tsk-005	Geo-referenced Aerials	\$ 1,202.00	\$ 15,133.80	\$ -	\$ -	\$ -	\$ -	\$ 16,335.80	-	\$ 16,335.80
Tsk-006	Task Name 6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
Tsk-007	Task Name 7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
Tsk-008	Task Name 8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
Tsk-009	Task Name 9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
Tsk-010	Task Name 10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
<b>Totals =</b>		<b>\$ 29,044.00</b>	<b>\$ 16,133.80</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 45,977.80</b>	<b>\$ -</b>	<b>\$ 45,977.80</b>

Submitted By: Michelle Pfeiffer  
Submitted To: IRC WO 15 2017 Physical Monitoring  
Submission Date: 02/17/17