

WORK ORDER NUMBER 1

INDIAN RIVER COUNTY BEACH PRESERVATION PLAN 2019 UPDATE

This Work Order Number 2018008-1 is entered into as of this 20th day of November, 2018 pursuant to that certain Continuing Consulting Engineering Services Agreement for Professional Services entered into as of this 17th day of April, 2018 (collectively referred to as the "Agreement"), by and between INDIAN RIVER COUNTY, a political subdivision of the State of Florida ("COUNTY") and Stantec Consulting Services, Inc., ("Consultant").

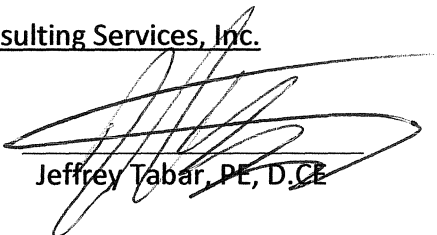
The COUNTY has selected the Consultant to perform the professional services set forth on Exhibit A (Scope of Work), attached to this Work Order and made part hereof by this reference. The professional services will be performed by the Consultant for the fee schedule set forth in Exhibit B (Fee Schedule), 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 C (Time Schedule), 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:

Stantec Consulting Services, Inc.

By:



Jeffrey Tabar, PE, D.CE

Title:

Principal/
Sr. Coastal Engineer

Date:

November 20, 2018

**BOARD OF COUNTY COMMISSIONERS
OF INDIAN RIVER COUNTY:**

By:

Bob Solari, Chairman

BCC Approved Date:

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

By:

Deputy Clerk

Approved:

Jason E. Brown, County Administrator

Approved as to form and legal sufficiency:

William K. DeBraal, Deputy County Attorney



Stantec Consulting Services Inc.
7370 Cabot Court, B-103, Suite A, Melbourne, FL 32940

November 15, 2018

Attention: James Gray, Jr., Coastal Engineer

Indian River County
1801 27th Street
Vero Beach, Florida 32960
772-226-1344

**Reference: Indian River County Beach Preservation Plan 2019 Update –
Scope/Fee Proposal**

Mr. Gray,

Stantec Consulting Services Inc. is pleased to provide professional consulting and coastal engineering services to support Indian River County by performing an update to the County's Beach Preservation Plan (BPP) for 2019, which was originally produced in 1988, with subsequent updates in 1998, 2002, 2008, and 2015. The BPP is the principal document utilized to evaluate and maintain the resources along the coastline under the County's Coastal Restoration Program (Program). This proposal outlines the scope of work for Stantec to complete the 2019 update on behalf of Indian River County.

BPP Update Report Intent and Layout

The purpose of the 2019 update to the BPP is to support the County in managing its beaches, analyze recent storm events, assess risk along the coast, and document the overall program performance. The report will discuss resiliency elements that include discussions regarding beach management strategies, coastal vulnerability, seasonality of the beach sediments and provide new ideas on beach profile designs to promote natural recovery.

This update to the BPP will be developed to provide a more comprehensive summary than the previous update. The report will be written in a manner intended for multiple audiences and the general public consumption. The main body of the report will be prepared with this consideration. Any items that are more technical in nature, analyses completed, or background data will be referenced in an appendix.

Scope of Work

Task 1: Beach Conditions Update

Stantec will analyze shoreline and volumetric change conditions based on the latest available survey data from the County. The 2015 BPP analyzed shoreline and volumetric changes for time periods (1972 to 1986, 1986 to 2005, and 2002 to 2013). This analysis will be extended through to 2019 to include the winter 2019 and summer 2019 survey data, if available. The depth of closure will be evaluated on a line by line (FDEP R-monument beach profile) basis before developing an average depth of closure. The impact of



November 15, 2018

Page 2 of 7

hardbottom on the depth of closure will be discussed. The erosion analysis shall include all survey data from 2005 to the most recent data available, and report shoreline change (at 0 ft, 5 ft, and 10 ft elevation) and volumetric change (to an agreed upon depth). The report will include a tabular and graphic (bar graphs similar to previous BPP updates) presentation of the data for each R-monument in the County. Background erosion rates will be reported for each sector in shoreline and volume change rates per year.

Stantec will also evaluate the impact of the recent hurricane events (from 2013 to 2018). We will examine recovery of the beach with respect to the shoreline and various dune elevations to determine whether natural recovery can be expected under future storm events and to what extent. Stantec will document any recent beach restoration projects from 2013 through 2019, if completed with available data. Stantec will also analyze seasonality through recent survey data collected by the County during the summer/winter time periods.

Task 2: Meetings/BCC Updates

Following completion of the draft BPP update, Stantec will present to the IRC advisory committee to explain the goals and objectives of update and to gain input from stakeholders, as deemed necessary. Stantec will prepare for and travel to two (2) advisory meetings, at the request of the County, to provide updates at the draft report and final report milestones. Stantec will be actively engaged with County staff during the project duration by providing periodic updates to discuss the analysis as the BPP update progresses. Should additional presentations to the BCC or advisory committee be requested by the County, Stantec can accommodate these requests in writing with the authorization of an additional approved scope/fee.

Task 3: Sector Boundaries

Based on the results, Stantec will review the boundaries of the various Sectors (1 through 8) within the County. The delineation of these sectors will be evaluated with respect to dominant coastal processes, beach nourishment events, historical shoreline/volume changes, upland development, and environmental resources. The boundaries will be left as is for consistency purposes, unless there is a significant need to change them, such as an overlap for beach nourishment events (i.e. the southern 2,000 ft. of Sector 4 within Sector 5).

Task 4: Sand Resources

Stantec will analyze recently available data to discuss the viability and status of the offshore borrow areas and upland sources for future sand by-passing, beach restoration, and dune maintenance events. Stantec will provide an update assessment of sand locations and quantities. This will include a map of each location, distances to project locations, estimate of the quality/quantity and a cost estimate of the sand resource. This



November 15, 2018

Page 3 of 7

information can be used for planning of future renourishment and maintenance events. Information used for the task will be based solely on data collected and analyzed by others such as the current data being collected in the southern borrow area with vibracores and the investigation into the feasibility of upland sand sources in the area.

Task 5: Storm Vulnerability

Stantec will provide a vulnerability assessment that will include performing a storm damage vulnerability analysis by utilizing the Storm Induced Beach Change Model (SBEACH) which simulates changes in the beach profile that could result from coastal storms of varying intensity in terms of storm tide levels, wave heights, wave periods, and storm duration. This assessment will follow a similar approach to those used in previous BPP updates. Information required as input to run the SBEACH model includes the beach cross-section, the median sediment grain size, and the time histories of the wave height, wave period, and water elevation. This information will be gathered from existing data sources. No new collection of data is proposed. If it is determined that the available data is insufficient to develop an accurate model, then collection of additional data will be discussed with the County.

Sea level rise will be discussed as it relates to the management strategies and how the County can include sea level rise in their planning efforts. This discussion will be restricted to the impacts of sea level rise on the proposed beach management strategies but will also include a narrative on the Florida Statute requirements for local governments to prepare comprehensive plans to include sea level rise considerations in their future planning documents. Impacts of sea level rise to infrastructure close to the beach will not be included.

Task 6: Storm Damage Reduction Analysis

The analysis of potential storm damages will be followed by an evaluation of the size of a beach fill that would be required to eliminate the potential damage identified with a particular storm return interval. SBEACH will be re-run to determine the size of a beach fill that would be needed to eliminate that potential threat. This process will be repeated for each storm and each reach for which potential damages are indicated. The outcome of this analysis will be a list of beach fill dimensions needed in each reach to eliminate storm damage threats to structures for storm return interval deemed to pose a potential threat. It is anticipated that no more than three storm intervals will be used for this analysis.

The results of this analysis can be used to formulate a beach nourishment strategy that would seek to equalize the magnitude of the storm damage risk for the entire County or at least reduce the risk to an acceptable level. The determination of what constitutes an acceptable level of risk depends on priorities established by the County. Stantec will work with the County to identify and confirm these priorities.



November 15, 2018

Page 4 of 7

Task 7: Alternatives and Resiliency Assessment

Stantec will examine alternatives to enhance existing strategies and provide recommendations for future consideration. Stantec will review the strategies previously implemented and evaluate the performance of shore protection projects in terms of whether the previous projects are meeting the Program's objectives and purpose. An important factor in this assessment is the ability of a given alternative to be resilient. With the dynamic nature of the coastline, implementing resilient projects is key to the long-term success of the Program. Stantec will discuss possible alternatives (if warranted) and provide recommendations for County consideration (i.e. more/less frequent renourishment events, strategic placement of sand, dune restoration, coastal structures, ecosystem enhancements, etc.). Regulatory and environmental constraints associated with the various alternatives will be considered.

Task 8: Environmental Resources

Stantec will review and discuss the County's influence of beach restoration on environmental resources. This will include an assessment of the sea turtle monitoring data and nearshore hardbottom data (and other data as deemed appropriate) to evaluate the importance of coastal restoration. This section will also present a holistic view to how the County's environmental program is supported by the proactive beach management program within the County. This work will rely heavily on work performed by others and bring together previous monitoring results in a manner to determine the effect of the Program on local wildlife.

Task 9: Management Strategy Recommendations

Various beach management strategies will be evaluated for each sector. While all sectors will be evaluated, it is anticipated that focus will be on Sectors 3, 5 and 7 with respect to management strategies, based on the previous BPP updates and a review of ongoing efforts. Stantec will develop preliminary strategies to how best to restore and maintain the County's coastal resources targeting a 15-year horizon. This will also include an evaluation of data collection efforts that the County maintains to assess the Program's performance and recommendations of any proposed improvements to enhance the monitoring of the coastline. This section will also discuss the effectiveness of the County's beaches program over the last 20 years. A generalized strategy will be recommended for each sector.

Task 10: Forecasting BPP Costs

Stantec will work with County staff to develop a clear and concise prediction of future costs for the next 15 years (2020 through 2035) to administer and plan for the County's beach program. This will include a focused cost estimate for the first 5 years and a projection for years 5 through 15. This analysis will include predicted costs for data collection, engineering, permitting, surveying, construction, mitigation and monitoring to



assist County staff with capital expenditure planning. Costs will be provided with sufficient detail to follow how calculations were performed.

Task 11: Funding Alternatives

Stantec will assist the County in evaluating potential funding options. A discussion of potential funding options will be included in the BPP, such as local, State and Federal funding sources. A brief discussion of potential local funding options such as a Municipal Services Benefit Unit (MSBU), Municipal Services Taxing Unit (MSTU), Erosion Prevention District (EPD), Independent or Dependent Special Taxing Districts or parking fees will be included. A 5-year funding strategy recommendation will be included in this section.

Task 12: BPP Update Report

Stantec will prepare a report that includes results from the BPP update. A draft report will be provided to the County for review and comment. The report will be developed to provide a general summary that will be easy to understand and comprehend by multiple audiences. The main body of the report will be prepared with this consideration and any items that are more technical in nature, analyses completed, or background data will be referenced in an appendix.

Costs

Exhibit B

The cost for development of the BPP update is a lump sum cost of \$198,608. All work will be performed follow the provisions of the Professional Coastal Engineering Services Agreement (RFQ2018008), dated April 17, 2018, between Indian River County and Stantec. Note: Funds may be moved between tasks during the project lifecycle.

Task	Estimated Fee (LS)
Task 1: Beach Conditions Update	\$48,820
Task 2: Meetings/BCC Updates	\$18,300
Task 3: Sector Boundaries	\$3,952
Task 4: Sand Resources	\$4,780
Task 5: Storm Vulnerability	\$27,668
Task 6: Storm Damage Reduction Analysis	\$20,374
Task 7: Alternatives and Resiliency Assessment	\$8,216
Task 8: Environmental Resources	\$7,360
Task 9: Management Strategy Recommendations	\$14,632
Task 10: Program Cost Estimates	\$9,168
Task 11: Funding Alternatives	\$6,942
Task 12: BPP Update Report	\$28,396
Total Fee	\$198,608



November 15, 2018

Page 6 of 7

Exhibit C

Schedule

Stantec will coordinate closely with Indian River County to develop a final deliverable schedule as the project proceeds, but the proposed overall schedule is shown below:

- Notice to Proceed Jan 2019
- Conditions Analysis Jan 2019 to Sept 2019
- Draft BPP Report Sept 2019
- Comment Period Sept 2019 to Oct 2019
- Final BPP Report Nov 2019

ASSUMPTIONS:

Our estimated costs for this Project include the following assumptions:

- This effort does not include design or engineering plan development for the proposed management strategies. The purpose of this effort is to provide recommendations based on the evaluation described in the scope of work.
- Existing data will be provided by the County to Stantec in a timely manner. The following is a list of the data needs that are anticipated within the timeframes of this scope but may not be all-inclusive. Stantec will work with the County to transfer data and identify data needs whether through the County's database or through existing consultants.
 - **Survey Data** – reports, historic beach profiles, topography, bathymetry, GIS data
 - **Environmental Data** – monitoring reports, hardbottom locations, sea turtle nesting and shorebird data
 - **Geotechnical Data** – design documents, beach fill characteristics, dune replenishment events, beach restoration activities, placement locations and quantities
 - **Cost Data** – reports, previous project costs (i.e. beach restoration activities, design services, construction, construction administration, monitoring, etc.), emergency costs for post-storm recovery, data collection, cost estimates from others for project implementation
- The County is performing an updated offshore sand resources multibeam survey of the south borrow area and an upland sand resources inventory in 2019. This information will be made available to Stantec upon completion.



November 15, 2018

Page 7 of 7

- It is assumed that all base information, design documents, engineering calculations and previous as-builts for beach projects will be provided to Stantec by the County.
- Relevant information/data/documentation will be provided to Stantec by the County in a timely manner.
- Any delays in delivery of the data collected by others will result in adjustments to the overall schedule without penalty to Stantec.
- This scope does not include any field data collection. All data used will be from existing information/sources.
- No permitting is included in this scope of work.
- No economic assessment/study or cost/benefit analysis calculations are included. Only a planning level cost estimate will be provided.
- This scope of work does not include costs to prepare additional documentation, respond to or modify the work product based on legal challenges or third-party peer review requests. It is assumed any costs associated with this type of request will be paid for under a separate scope of work.
- Only items listed in the scope are included in the associated fee schedule.
- Additional services will be provided under a separate scope and fee schedule.

We thank you for the opportunity to provide professional services for this project and look forward to working with Indian River County. We are prepared to begin work on this assignment as soon as you direct us to proceed.

Regards,

A handwritten signature in black ink, appearing to read 'Jeff Tabar', with a long horizontal stroke extending to the right.

Jeffrey R. Tabar, PE, D.CE
Principal
US Coastal Lead/Senior Coastal Engineer
Phone: (410) 443-2061
Jeff.Tabar@stantec.com

A handwritten signature in black ink, appearing to read 'Matt Starr', with a stylized, cursive script.

Matthew S. Starr, PG
Associate
SE Coastal Team Leader
Phone: (239) 315-6208
Matthew.Starr@stantec.com