

## **EXECUTIVE SUMMARY**

**Recommendation to approve a proposal from CB&I Environmental & Infrastructure, Inc. for Feasibility Analysis of Building Collier County's Coastal Resiliency under Contract No. 15-6382, authorize the County Manager or his designee to execute the work order for a not to exceed amount of \$24,975.00 and makes a finding that this expenditure promotes tourism.**

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**OBJECTIVE:** To move forward with the Feasibility Analysis of Building Collier County's Coastal Resiliency.

**CONSIDERATIONS:** CBI will perform engineering calculations and analysis to determine potential for beach widening and the addition of dunes, prepare planning map tools, and coordinate with Florida Department of Environmental Protection (FDEP) to develop a potential beach widening methodology. Once CB&I has completed the analysis, they will provide a memo of the methodology and potential beach widths by project reach to Collier County and set up a webinar to consult with FDEP.

CB&I will seek conceptual approval and comments from FDEP and other regulatory agencies for assistance that the proposed plan will be supported for permit issuance and future state cost share.

**FISCAL IMPACT:** Funds have been budgeted and approved for this activity in FY 2016/17 fund 195 Tourist Development Tax.

FDEP cost share funding may be requested at a future date to reimburse Collier County for a portion of the completed work.

**GROWTH MANAGEMENT IMPACT:** There is no impact to the Growth Management Plan related to this action.

**ADVISORY COMMITTEE RECOMMENDATIONS:** At the June 8, 2017 Coastal Advisory Committee (CAC) meeting this item was recommended for approval by a unanimous vote of 5 to 0.

This item will be presented to the Tourist Development Council (TDC) for recommendation of approval at their June 26, 2017 meeting.

**LEGAL CONSIDERATIONS:** This item is approved as to form and legality and requires majority vote for approval. – CMG

**RECOMMENDATION:** To approve a proposal from CB&I Environmental & Infrastructure, Inc. for Feasibility Analysis of Building Collier County's Coastal Resiliency under Contract No. 15-6382, authorize the County Manager or his designee to execute the work order for a not to exceed amount of \$24,975.00 and makes a finding that this expenditure promotes tourism.

Prepared By: J. Gary McAlpin, P.E., Coastal Zone Management, Capital Project Planning,  
Impact Fees and Program Management Division, Growth Management Department

Attachments: 1) Proposal; 2) Work Order



June 26, 2017  
Consent Agenda 6-A (iv)  
CB&I Environmental & Infrastructure, Inc.  
2481 NW Boca Raton Blvd.  
Boca Raton, FL 33431  
Tel: +1 561 391 8102  
Fax: +1 561 391 9116  
www.CBI.com

June 7, 2017

Gary McAlpin, Director  
Collier County Coastal Zone Management  
2800 N. Horseshoe Drive  
Naples, FL 34104

**Re: Feasibility Analysis of Building Collier County's Coastal Resiliency (Contract No 15-6382)**

Dear Gary:

This letter is in response to Collier County's (County) request for a proposal for CB&I Environmental & Infrastructure, Inc. (CB&I) to perform engineering services for the County to investigate the method to build coastal resiliency into the beach renourishment program. CB&I will perform engineering calculations and analysis to determine potential for beach widening and the addition of dunes, prepare planning map tools, and coordinate with Florida Department of Environmental Protection (FDEP) to develop a potential beach widening methodology. Once we have completed the analysis, we will provide a memo of the methodology and potential beach widths by project reach to Collier County and set up a webinar to consult with FDEP.

Included as Exhibits are; the Scope of Work (Exhibit A), Fee Proposal (Exhibit B), and the Rates Schedule (Exhibit C). CB&I proposes to provide these services on a time and materials basis not-to-exceed \$24,975.00 under the terms and conditions of the existing *Contract No. 15-6382 for Grant Funded Professional Services for Coastal Zone*. Barring any unforeseen circumstances, all work will be completed within 180 days of receiving the Notice to Proceed.

Very truly yours,

Thomas P. Pierro, P.E., D.CE  
Director  
CB&I Environmental & Infrastructure, Inc.

cc: Tara Brenner, P.G., P.E., CB&I  
Steve Keehn, P.E., CB&I



**Exhibit A**  
**Scope of Work**

**Feasibility Analysis of Building Collier County's Coastal Resiliency  
Collier County, Florida  
Scope of Work  
Contract Number 15-6382**

## **Introduction**

The purpose of this study is to investigate the feasibility of constructing a higher and wider beach and dune system in support of Collier County's Coastal Resiliency Program. This analysis will investigate if adding additional beach fill within dunes and/or an extended beach template is feasible and permissible with consideration of the County's nearshore hardbottom habitat. A higher and wider beach and dune system may improve Collier County's ability to resist storm surge, erosion and wave impacts, and allow the community to rebound in a more resilient manner in the wake of a storm.

The resulting memo will make recommendations to update goals and objectives, and further explore options for improving resiliency by building upon the established beach management program. Through this work, we will seek conceptual approval and comments from the Florida Department of Environmental Protection (FDEP) and other regulatory agencies for assurance that the proposed plan will be supported for permit issuance and future state cost sharing.

The project will be limited to the Collier County beach renourishment project areas:

Vanderbilt	R-22 to R-30
Park Shore	R-42 to R-54
Naples	R-58A to R-79

This study is meant to be of sufficient detail to obtain constructive agency feedback and to scope out the next phase of Collier County's Coastal Resiliency Program.

### **1. Planning Database**

A planning database will be developed within a GIS framework to illustrate the geospatial relationship between pertinent project features. The GIS database will utilize information developed or obtained from previous projects. Bathymetry and topography developed from the 2010 USACE LiDAR data and other sources will be included. The topography will identify the seaward and landward limits of the dune and its crest. Various alongshore lines will be included such as: Erosion Control Lines (ECL), Coastal Construction Control Line (CCCL), Mean High Water (MHW), permitted Equilibrium Toe of Fill (ETOF), and latest mapped hardbottom edges. The project will include R-monuments, street names, and the permitted plan view fill limits. The database will be of sufficient detail to support the analysis describe below and used to create graphics and maps for planning purposes and discussion with FDEP.

### **2. Feasibility Analysis for Dunes and Beach Widening**

#### Beach Widening

The currently permitted beach widths are constrained by proximity to nearshore hardbottom and engineering assumptions that were acceptable to FDEP during past permitting efforts. The 2006

beach renourishment project's goal was to establish a beach design and biological monitoring plan that avoided hardbottom coverage. During that permitting effort, compromises were made with the permit agencies when determining the location of the ETOF. The result was an estimated ETOF permitted approximately 50 feet further offshore than the actual performance of the 2006 beach project. The permitted ETOF and hardbottom edge have a similar alignment and location. The sand used for the 2006 and 2013 projects had an average mean grain size of 0.32 mm, which was considerably coarser than the beach sand that existed on the beach in 2003. The continued use of this coarser sand has developed a steeper beach profile. We hypothesize that by keeping the permitted ETOF (from 2006) unchanged and continuing to use coarser sand, that a wider beach could be constructed without any additional impacts to the nearshore hardbottom. Given typical alongshore and cross-shore variability, this added width may not be uniformly realized in all areas, but it can be refined through engineering analysis to create a project with increased durability and beach width to resist storm impacts.

To determine the size of the added beach width available, the results of recent profile surveys that best represent the equilibrium condition (2015 or 2016) at each selected R-monument will be compared to the permitted ETOF and adjacent hardbottom edge. This will establish the existing gap between the hardbottom edge and the actual toe of fill. Based on this comparison, the potential additional volume will be estimated. This method will use Deans' equilibrium theory and average profile methods to develop equilibrium profiles suitable for design. These profiles will be translated until they are tangent to the permitted ETOF and/or hardbottom edge. This will be the maximum extension feasible, before any safety factor is considered. This proposed method is based on review of monitoring surveys conducted since 2006 that show an average gap of more than 50 feet between the permitted ETOF and the actual toe of fill.

The results of this preliminary analysis will be used to estimate the maximum sand volume for the project area compared to the renourishment volumes within the existing permit and design intent. A recommended safety factor will be provided, which will be the buffer between the toe of fill and the hardbottom edge to account for uncertainty and be dependent upon permit agency guidance.

### Dunes

A wider beach will provide additional dry beach area that may provide space to build up the natural dune system, which would increase the storm surge protection qualities of the beach. The dunes can be integrated with existing structures and the natural dune line to create a continuous and comprehensive level of protection for coastal infrastructure.

In areas where dune construction is not feasible, an alternate method would be to create an elevated sand berm seaward of the Erosion Control Line on State Lands. The GIS database created in Task 1 will be useful in identifying gaps in the existing beach and dune system and will be a decision making tool helpful in considering the tradeoffs between enhancing the existing dunes versus building a newer enhanced seaward berm.

### Memo Report

A memo report will be prepared discussing the methodology of the higher and wider beach and dune system analyses conducted and results by reach. A preliminary cost estimate will be prepared using the calculated beach and dune volume estimates. The memo will include lessons

learned, suggestions for future analysis, and a recommendation for next steps in building Collier County's Coastal Resiliency Program.

### **3. Agency Coordination**

An interactive webinar with FDEP will be scheduled to consult on building a higher and wider beach and dune system for Collier County. CB&I will prepare a project description and supporting graphics suitable for consultation with the permit agencies using their terminology and perspective. The proposed methodology, project size, and impacts will be discussed.

#### **Summary**

This work will be performed on a time and materials (T&M) basis with a cost not to exceed \$24,975.00 as outlined in the attached fee spreadsheet. The work will be completed within 180 days of receipt of the Notice to Proceed.



**Exhibit B  
Fee Proposal**

**EXHIBIT A**  
**FEE PROPOSAL FOR**  
**FEASIBILITY ANALYSIS OF BUILDING COLLIER COUNTY'S COASTAL RESILIENCY**  
**COLLIER COUNTY, Contract No. 15-6382**

June 7, 2017

Task Item	Cost	Principal	Senior Project Manager	Project Manager	Planner/ Coastal Engineer	GIS Specialist
		(Hours)	(Hours)	(Hours)	(Hours)	(Hours)
1 Planning Database	\$2,413.00		1	4		16
2 Feasibility Analysis for Dunes and Beach Widening	\$20,172.00	4	16	52	80	
3 Agency Coordination	\$2,390.00	2	8	4		
Total Hours =		6	25	60	80	16
Rate =		\$207	\$173	\$148	\$111	\$103
Cost =		\$1,242	\$4,325	\$8,880	\$8,880	\$1,648
<b>TIME &amp; MATERIAL TOTAL</b>	<b>\$24,975.00</b>					



**Exhibit C  
Rate Schedule**

**SCHEDULE B**

**RATE SCHEDULE**

<b>Title</b>	<b>Rate</b>
Principal	\$207.00
Senior Project Manager	\$173.00
Project Manager	\$148.00
Senior Engineer	\$158.00
Engineer	\$124.00
Senior Inspector	\$97.00
Inspector	\$77.00
Senior Planner	\$140.00
Planner	\$111.00
Senior Designer	\$115.00
Designer	\$95.00
Environmental Specialist	\$110.00
Senior Environmental Specialist	\$135.00
Scientist/Geologist	\$94.00
Senior Scientist/Geologist	\$119.00
Marine Biologist/Hydrogeologist	\$111.00
Senior Marine Biologist/Hydrogeologist	\$139.00
Senior GIS Specialist	\$146.00
GIS Specialist	\$103.00
Clerical/Administrative	\$63.00
Senior Technician	\$86.00
Technician	\$73.00
Surveyor and Mapper	\$121.00
CAD Technician	\$82.00
Survey Crew - 2 man	\$136.00
Survey Crew - 3 man	\$172.00
Survey Crew - 4 man	\$205.00
Senior Architect	\$155.00
Architect	\$122.00

This list is not intended to be all inclusive. Hourly rates for other categories of professional, support and other services shall be mutually negotiated by Collier County and firm on a project by project basis as needed.

