

EXECUTIVE SUMMARY

Recommendation to recommend approval of Contract 17-7097 to provide engineering services for Collier Creek Modeling Study for time and material not to exceed \$298,959.30 to CB&I Environmental & Infrastructure, Inc. and make a finding that this expenditure promotes tourism.

OBJECTIVE: To obtain professional engineering services and authorization to move forward with the Collier Creek Modeling Study and project permitting.

CONSIDERATIONS: Collier Creek meets the Marco River on the north side of Marco Island in Collier County, Florida, and is flanked to the east by the Ville de Marco West condominium (VDMW) and to the west by a terminal jetty on Marco Point, the eastern end of Hideaway Beach. This creek is used by local boaters and visitors to access Collier Bay, residences and the Esplanade Shoppes on Smokehouse Bay.

Residents of Marco Island have raised concerns to Collier County about the safety of boaters navigating through Collier Creek's entrance and the amount of scouring that is occurring at the VDMW seawall and docks. As sand migrates east from Hideaway Beach, it is overtopping the terminal jetty and infilling the already narrowing entrance to Collier Creek. Collier Creek meets the Marco River at a right angle and strong currents from the river are creating turbulence along the eastern side of the creek entrance at VDMW.

A feasibility study to identify the current issues and potential solutions at the Collier Creek entrance was completed by Coastal Planning and Engineering/CBI in February of 2015. As a result of this feasibility study, the Board of County Commissioners (Board) authorized the development of a master plan for Collier Creek with the first step to stabilize the inlet. This interim dredging was completed in 2016 and addressed these safety concerns for a sufficient period of time to allow the proper investigation and modeling to occur to design a comprehensive long term solution.

On April 24, 2017 the Board approved and authorized staff to negotiate a contract with the top ranked firm CB&I Environmental & Infrastructure, Inc. for subsequent Board approval. CB&I Environmental & Infrastructure, Inc. is a very experienced consultant with extensive experience throughout Collier County. Additionally, CB&I has completed the successful modeling and straightening of Wiggins Pass in 2013.

The scope of work for this project includes the following activities:

- Agency and Stakeholder Consideration
- Field work and analysis to support modeling and permitting for jetty modifications
- Sediment budget
- Modeling alternatives
- Modeling study report

- Management plan
- Permitting and permitting contingency

The effort required permitting jetty modifications; increased offshore disposal capacity and modifications to the dredge template and alignment are dependent upon the permitting agencies. Due to uncertainties associated with potential agency requests related to these activities, permitting contingency is required. This contingency is for professional services outside of the expected base permitting efforts described in the proposal and will be authorized as a Change Order, if required.

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

FISCAL IMPACT: Funding for this work is available in project 90072 - Collier Creek Modeling, Jetty Rework and Channel Training. Funding for this contract will not be requested for reimbursement from any grantor agency.

RECOMMENDATION: To recommend approval of Contract 17-7097 to provide engineering services for Collier Creek Modeling Study for time and material not to exceed \$298,959.30 to CB&I Environmental & Infrastructure, Inc. and make 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

Attachments:

- 1) Contract 17-7097



June 26, 2017
Consent Agenda - A
CB&I Environmental & Infrastructure, Inc.
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Boca Raton, FL 33431
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June 6, 2017

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

Re: Collier Creek Modeling Study – Proposal

Dear Gary:

This letter is in response to Collier County's request for a proposal for CB&I Environmental & Infrastructure, Inc. (CB&I) to perform tasks to support the County in conducting a modeling study of Collier Creek, develop a management plan and related permitting. CB&I will conduct fieldwork to obtain waves, currents, tides, and updated bathymetric data of the study area, setup, calibrate and execute model runs to compare the identified scenarios, and coordinate with the County, stakeholders, and agencies to develop an implementable management plan and apply for permits for this area. A detailed scope of work is attached in Exhibit A.

A fee proposal is included as Exhibit B, and a rate schedule is provided as Exhibit C. We propose to perform these services on a time and material basis not to exceed \$298,959.30 upon award of a Contract in response to CB&I's proposal to Collier County's RFP No. 17-7097 (Collier Creek Modeling). Subject to mutually agreeable Contract terms and conditions, and barring any unforeseen circumstances, all work will be completed and submitted to the County within 730 days of our receiving the County's Notice to Proceed.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Tom P.', with a stylized flourish at the end.

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

cc: Adam Northrup, Collier County Government
Tara Brenner, P.G., P.E., CB&I
Steve Keehn, P.E., CB&I



Exhibit A
Scope of Work

**EXHIBIT 1. - SCOPE OF WORK
COLLIER CREEK MODELING STUDY
COLLIER COUNTY, FL
June 2017**

Introduction

This is a scope of work for a modeling study, management plan, and permitting for Collier Creek. The modeling study will be based on the results of the Collier Creek Feasibility Study (CB&I, 2015). The area of concern is the entrance to Collier Creek, where it meets the Marco River on the north side of Marco Island. The creek entrance is flanked to the east by the Ville de Marco West condominium (VDMW) and to the west by a terminal jetty on Marco Point, the eastern end of Hideaway Beach. The modeling study will focus on the area from monument H-14 (near the easternmost T-groin) east to H-16, and channel cross sections C-1 to C-11. Currently, safe boating through Collier Creek is threatened by severe currents and turbulence during bi-monthly spring tides. The two primary modeling objectives of this project will be to improve navigability in the inlet and to manage coastal sediments so that periodic dredging events will have a project life of 4 years.

The 2015 feasibility study resulted in the following findings that will be investigated further through a modeling study:

1. The entrance to Collier Creek has narrowed since 2005, when the terminal jetty was installed.
2. Infilling is occurring in Collier Creek.
3. Collier Creek experiences turbulent flow and strong currents around peak tides.
4. Too much sand is being transported to the creek, shortening the time between dredging events and causing further constriction of the inlet's width.
5. The terminal jetty may need to be relocated, modified, or removed.

Based on the results of the modeling study, a Collier Creek Management Plan will be developed for County review and approval. The management plan will include an alternatives analysis considering pros, cons, and probable costs. In consultation with permitting agencies, CB&I will perform permitting tasks for the recommended plan from the Collier Creek Management Plan.

The following tasks are included in the scope of work:

Task 1. Agency and Stakeholder Coordination

For successful completion of this modeling study and development of an implementable coastal management plan, CB&I recognizes the importance of coordination with permitting agencies, stakeholders and the County throughout this project. As applicable, CB&I will coordinate with FDEP divisions of State Lands, and Beaches, Inlets & Ports (BIPS), and USACE about permitting and land use feasibility.

Meetings with the County or local stakeholders will be held at key milestones during the project:

1. Prior to the start of modeling production runs, CB&I will have a discussion with the County to review the data collected and the data proposed for use in modeling.
2. Once the bulk of the modeling work is completed, CB&I will regroup with the County and local stakeholders if needed, to discuss the initial results of the modeling.
3. CB&I will conduct another meeting with the County and local stakeholders to present the management plan.

Task 2. Field Work and Analysis to Support Modeling Study & Permitting for Jetty Modifications

All survey work will be conducted under the direct supervision of the registered Florida professional surveyor and mapper in compliance with Chapter 472 FS and 5J-12 FAC. A topographic and hydrographic survey map certified by a Florida registered professional surveyor and mapper will be provided.

- Conduct wave, current and tidal measurements for a 28 day period in the throat of Collier Creek and at the mouth of the Marco River using a pair of ADCPs.
- One tide gauge in Collier Bay will be deployed
- Conduct a survey of selected profiles from the project area containing cross sections C-1 to C-11 and beach profiles H-14 to H-16 (CB&I, 2015). One survey line across Marco River will be conducted east of Collier Creek. Include a survey of the VDMW seawall and toe protection (scour apron) for use in the model. Selected survey lines of the inlet entrance, ebb shoal and the 2016 Hideaway beach disposal area (see below) may be required to resolve specific bathymetric features.
- The approximate mean high water line will be located on the portions of Hideaway Beach along the Marco River and Collier Creek
- Using RTK GPS, our surveyors will locate the relevant features of the terminal jetty adjacent to Collier Creek as well as collect topographic data covering all of the potential jetty relocation sites, with enough detail to support the permit application for jetty modification.

Task 3. Sediment Budget

Based on available historic data and field collected grab samples, CB&I will develop a sediment budget around the Collier Creek entrance. A sediment budget illustrating the flows and quantifying the sediment movement will assist in defining the coastal processes and provide a basis for design alternative selections. The developed sediment budget will be one of the tools used to calibrate the model. Once this project proceeds to the permitting phase, the sediment budget will likely be requested by the permitting agencies for consideration of any proposed projects.

Task 4. Modeling

A model that performs waves, hydrodynamic and morphological simulations in the vicinity of Collier Creek in 3D is essential in order to evaluate the impact of the channel dredging and sediment transport from the adjacent beaches. The Delft3D model is specifically designed to model complex interactions between offshore and inlet bathymetry, structures, waves, tides, wind-induced currents, sediment transport, erosion and deposition.

The model will be setup in three-dimensional (3D) mode and calibrated with existing bathymetry data, along with the locally measured water levels, currents and waves. This includes the development of a model computational grid, interpolation of the bathymetry, waves, hydrodynamic and morphological calibration, and production runs of the simulation alternatives. To the maximum extent practical, the modeling set up will use existing surveys including construction and monitoring surveys of Collier Creek and Hideaway Beach, 2007, 2010 and 2015 LiDAR survey datasets where available, and NOAA bathymetry. The hydrodynamic and morphology model calibration will be conducted to a level that is sufficient for comparing relative performance of the project alternatives.

Prior to simulating possible changes to the inlet, the 3D hydrodynamic model calibrated with ADCP data collection will be applied to study the 3D flow field and better understand the causes for the severe turbulence and currents.

Based on data availability and the input from the County, the period of the sediment budget and morphology model calibration will be defined. The analyzed time frame should extend at least two years and consider the December 2014 channel survey or a similar condition of Collier Creek to be approved by the County, which represents a time of severe turbulence and currents.

After calibration, the combined wave, 3D hydrodynamic, sediment transport and morphology model will be used to compare the results of a baseline condition and the alternatives listed below. The alternatives analysis will examine both the hydrodynamic performance within the inlet and sediment transport from the adjacent Hideaway Beach. Performance of each alternative will be optimized by varying size and position, except the first and last ones listed below.

1. December 2012 permitted plan with jetty relocation.
2. Enlarge entrance channel to an equilibrium cross section
3. Move terminal jetty to the west
4. Adjust terminal jetty: raise, lengthen, sand tighten and move west
5. Streamline the flow in Collier Creek
6. Remove the jetty on the west side of the inlet.
7. Groin Updrift of Inlet

Modeling results will be provided to the County for review prior to finalization. After consultation with the County and initial production runs, a combination alternative will likely be developed and modeled as the final plan.

Task 5. Modeling Study Report

Following completion for the Delft3D modeling effort and processing of the modeling results, CB&I will compile a Collier Creek Modeling Study Report. The detailed modeling report will document the data collection, model setup, calibration, model scenarios and results of the production runs. Lessons learned from the modeling study as well as ideas for future consideration will also be included in this report.

Appendices may include:

- 1) Certified Survey Map
- 2) Granularmetric Reports and Grain Size Distribution Curves
- 3) Sediment Budget
- 4) Modeling Graphics

Task 6. Management Plan

Based on the model results, coordination with permitting agencies and stakeholder input, CB&I will build upon the Modeling Study Report and prepare an alternatives analysis of the potential implementation options, including pros, cons and probable cost estimates. This analysis will result in a recommended alternative and be incorporated into a management plan with a detailed description suitable for discussion with stakeholders and permitting agencies. The plan will identify portions that can be implemented without a new permit and those pieces that would require additional permitting coordination.

A goal of the plan will be to develop a sediment management plan that promotes longevity for the navigation project and minimize sediment transport from Hideaway Beach into the inlet. Analyses will be conducted to estimate the amount of sand that can be placed on Hideaway Beach without negative impact to navigation in Collier Creek. The sediment management plan may include identification of a potential location other than Hideaway Beach, its borrow areas and the Marco-Capri Pass Disposal Area, for economical long-term

dredge disposal and sand stockpiling. Modeling results and environmental constraints will be considered. The plan will recommend responsibilities of participating stakeholders in the Collier Creek area.

CB&I will present the findings of the alternatives analysis along with the recommended alternative to the County for review and input. Based on County feedback, CB&I will finalize the management plan for County acceptance and accompany the County in presenting the plan to FDEP and USACE. The resulting Collier Creek Management Plan will be prepared as a final report and will include the Modeling Study Report as a supporting attachment.

Task 7. Permitting

Based upon agency feedback on the management plan, the County may choose to pursue additional permit modifications and permits to achieve the selected alternative. CB&I has the multi-disciplined in-house professionals needed to bring permit modification requests and new state and federal permit applications to completion in support of the County's management plan for Collier Creek. Pending the results of the study, the County may wish to pursue one or all of the following options: Terminal Jetty Modifications, Increase Offshore Disposal Capacity, and Adjust Dredge Template/Alignment.

a) Pre-application Meeting

CB&I will prepare for and accompany the County to pre-application meetings with FDEP and USACE to communicate the permitting intent and determine the documentation needed for the permit and/or permit modification applications.

b) Permitting for Terminal Jetty Modifications

At this stage, it is assumed that modifications (improvements, relocation, or removal) to the terminal jetty will be part of the long term Collier Creek Management Plan. This scope includes professional services for CB&I to support the County in submitting a major permit modification/new permit application for jetty modifications to state and federal permitting agencies.

Following the pre-application meeting, and with a clear path forward, CB&I engineers will conduct preliminary structural design work for the terminal jetty modifications. Structural drawings suitable for inclusion in the permit application will be developed. A technical design narrative will be written and used to support the permit applications, which will include the Modeling Study Report and Collier Creek Management Plan prepared in Tasks 5 and 6.

CB&I will prepare the appropriate permit application/modification request for regulatory authorizations. We will research existing easements and support the County in obtaining additional easements as required. The County will provide all permit fees directly to the permit agencies and will be responsible for publication of any public notices. CB&I will prepare the permit application/modification request and reply to limited and reasonably expected Requests for Additional Information (RAI) from the permitting agencies to bring the permit application to completion.

c) Permitting to Increase Offshore Disposal Capacity or Adjust Dredge Template/Alignment

A potential result of the modeling study and management plan could be the need for an increased capacity for offshore disposal or an adjustment to the dredge template. Increasing offshore disposal capacity may be achieved by reducing the environmental restrictions on the currently permitted Big Marco/Capri Pass Disposal Area or by identification of a new offshore disposal area. CB&I will include

this for discussion in the pre-application meeting, if supported by the modeling study and deemed a viable, cost effective option by the County.

It is assumed that these activities may be achieved by permit modifications to FDEP Permit No. 0309260-001-JC and USACE Permit No. SAJ-1988-00290. After the pre-application meeting, CB&I will proceed with preparations of a minor modification request. CB&I will make a formal consultation early in the process with the USACE to consider expanding the permitted disposal area into sea turtle critical habitat. This scope assumes that a minor modification request is one that can be submitted utilizing existing data and analysis for support, and does not require additional coordination with environmental agencies beyond an initial request for consultation.

CB&I will prepare the appropriate permit modification request(s) for regulatory authorizations. We will research existing easements and support the County in obtaining additional easements as required. The County will provide all permit fees directly to the permit agencies and will be responsible for publication of any public notices. CB&I will prepare the permit modification request(s) and reply to limited Requests for Additional Information (RAI) from the permitting agencies to bring the permit modification request to completion.

d) Permitting Contingency

The effort required to permit jetty modifications, increased offshore disposal capacity, and/or modifications to the dredge template/alignment are dependent upon input from the permitting agencies. Due to the uncertainties associated with potential agency requests related to these permitting efforts, this task is included in the scope of work as contingency for professional services outside of the expected base permitting efforts described above.

These additional permitting efforts may include:

- responses to protracted agency RAIs
- additional engineering analysis and computation
- limited modeling efforts in support of the RAIs
- additional regulatory coordination
- coordination with consulting environmental agencies
- additional design effort, permit drawings revisions, or expanded permit modification requests

This scope of work does not include geophysical, geotechnical or environmental field investigations. CB&I will request feedback from the agencies early on to determine the additional field investigations and engineering work that may be required for the alternatives for the County to consider. CB&I could complete these tasks under a change order and separate notice to proceed from the County. However, a cost benefits analysis will be discussed with the County to determine if additional field investigations are worthwhile before proceeding.



**Exhibit B
Fee Proposal**

EXHIBIT B
FEE PROPOSAL FOR
COLLIER CREEK MODELING STUDY
COLLIER COUNTY BEACH RENOURISHMENT PROJECT, Contract No. 17-7097

Page 1 of 2

Task Item	Task Cost	Reimbursable Expenses	Labor & Equipment	LABOR COSTS												
				Principal (Hours)	Senior Project Manager (Hours)	Project Manager (Hours)	Senior Planner/Modeler (Hours)	Senior Marine Biologist (Hours)	Planner/Coastal Engineer (Hours)	Surveyor and Mapper (Hours)	Senior Scientist (Hours)	Senior Technician (Hours)	Survey Crew 2 man (Hours)	Scientist/Geologist (Hours)	GIS Specialist (Hours)	Clerical (Hours)
1 Coordination	\$15,118.40	\$399.40	\$14,719.00	6	9	20	20	32	8						8	
2 Field Work & Analysis	\$47,583.40	\$3,270.40	\$44,313.00			2				28	16	128	76		12	
3 Historic Data Analysis & Sediment Budget	\$5,777.00	\$0.00	\$5,777.00	1	2	4	4		16					16	4	
4 Modeling Alternatives	\$70,428.00	\$0.00	\$70,428.00	8	12	24	432		24							
5 Modeling Report	\$17,378.00	\$0.00	\$17,378.00	2	6	16	80			2				4	12	8
6 Management Plan	\$35,642.10	\$3,086.10	\$32,556.00	8	36	72		48	40					8	16	8
7 Permitting	\$107,032.40	(see below)	(see below)													
a. Pre-Application Meeting		\$2,850.40	\$13,750.00	2	24	32		32								
b. Permitting Terminal Jetty Modifications		\$0.00	\$46,654.00	2	12	96	8	72	100	12	16				40	4
c. Permitting to Increase In-Water Disposal or Adjust Dredge Template/Alignment		\$0.00	\$22,840.00	2	8	42	4	40	32	4	8			4	30	4
d. Permitting Contingency		\$0.00	\$20,938.00	2	16	30	12	32	20	12	8				20	8
TIME & MATERIALS TOTAL	\$298,959.30			33 \$207 \$6,831	125 \$173 \$21,625	338 \$148 \$50,024	560 \$140 \$78,400	256 \$139 \$35,584	240 \$111 \$26,640	58 \$121 \$7,018	48 \$119 \$5,712	128 \$86 \$11,008	76 \$136 \$10,336	32 \$94 \$3,008	142 \$103 \$14,626	32 \$63 \$2,016

EXHIBIT B
FEE PROPOSAL FOR
COLLIER CREEK MODELING STUDY
COLLIER COUNTY BEACH RENOURISHMENT PROJECT, Contract No. 17-7097
 Page 2 of 2

Task Item	REIMBURSEABLE EXPENSES						EQUIPMENT							
	Meals	Lodging	Airfare	Mileage	Rental Car	Tolls	Sieve Analysis	ADCP (Units/Month)	Underwater Tide Guage (Unit/Month)	Survey Boat (Days)	RTK GPS (Days)	Hypack (Days)	Heave, Pitch, Roll Compensator (Days)	Sounder (Days)
1 Coordination	4			520		2								
2 Field Work & Analysis	15	15		520		2		2	1	3	4	2	1	1
3 Historic Data Analysis & Sediment Budget							4							
4 Modeling Alternatives														
5 Modeling Report														
6 Management Plan	9		3	580	1	2								
7 Permitting														
a. Pre-Application Meeting	6		3	320	1	1								
b. Permitting Terminal Jetty Modifications														
c. Permitting to Increase In-Water Disposal or Adjust Dredge Template/Alignment														
d. Permitting Contingency														
	34 \$36.00 \$1,224.00	15 \$165.00 \$2,475.00	6 \$800.00 \$4,800.00	1,940 \$0.445 \$863.30	2 \$80.00 \$160.00	7 \$12.00 \$84.00	4 \$95.00 \$380.00	2 \$5,000.00 \$10,000.00	1 \$900.00 \$900.00	3 \$790.00 \$2,370.00	4 \$495.00 \$1,980.00	2 \$260.00 \$520.00	1 \$215.00 \$215.00	1 \$160.00 \$160.00



Exhibit C
Rate Schedule

SCHEDULE B

RATE SCHEDULE

Title	Rate
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.

