

## **EXECUTIVE SUMMARY**

**Recommend approval of Work Order CPE-FT-3902-07-05 under Contract 06-3902 with Coastal Planning & Engineering (CP&E) for scope of services for annual physical (survey) monitoring and reports for time and material not to exceed \$147,214 (Project No. 900331).**

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**OBJECTIVE:** To recommend approval of Work Order CPE-FT-3902-07-05 under Contract 06-3902 with CP&E for scope of services for annual physical (survey) monitoring and reports for time and material not to exceed \$148,214.

**CONSIDERATIONS:** This Work Order is for the annual physical monitoring. The monitoring includes side scan survey of the hardbottom edge, survey of the beach, and preparation of monitoring reports required by FDEP as part of the permit.

The scope of services will provide the engineering, survey and remote sensing services for the 1-year monitoring surveys and reports required by the State permit (FDEP) Permit No. 0222355-001-JC), Physical Monitoring Plan and Biological Monitoring Plan for the 2006 renourishment project.

**COMMITTEE RECOMMENDATION:** At the May 10, 2007 CAC meeting this item was recommended for approval.

**FISCAL IMPACT:** The Source of funds is from Category "A" Tourist Development Tax.

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

**RECOMMENDATION:** To recommend approval of Work Order CPE-FT-3902-07-05 under Contract 06-3902 with CP&E for scope of services for annual physical (survey) monitoring and reports for time and material not to exceed \$147,214.

**PREPARED BY:** Gail Hambright, Tourist Tax Coordinator



## COASTAL PLANNING & ENGINEERING, INC.

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April 23, 2007

Gary McAlpin, Director  
Collier County Government  
Coastal Zone Management  
3300 Santa Barbara Blvd.  
Naples, FL 34116

**Subject: Collier County Beach Renourishment Project  
Physical Monitoring Scopes of Work and Fee Proposals**

Dear Gary:

The scopes of work and fee proposals for annual physical (survey) monitoring and reports are enclosed for your review and approval. The monitoring includes side scan survey of the hardbottom edge, survey of the beach, and preparation of monitoring reports required by FDEP as part of the permit.

Controlled aerial photographs flown according to FDEP's environmental rules are also included. This would include daily observations of the Gulf to assist the aerial photographic contractor in selecting a suitable day for flying. I have assumed that one of your staff could help us in this requirement. The contract rates for 2006 are used with the proposal. The services are hourly (time and materials) for a fee of:

1-Year Monitoring Survey, Aerials and Reports	\$ 99,667
Side Scan Survey of Hardbottom	\$ 47,547
Total	\$147,214

Please call me if you have any questions.

Sincerely,

COASTAL PLANNING & ENGINEERING, INC.

Stephen Keehn, P.E.  
Senior Coastal Engineer

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cc: Susan Beumel, CPE  
Jeffrey Andrews, PSM, CPE

**SCOPE OF SERVICES**  
**COLLIER COUNTY BEACH RENOURISHMENT PROJECT**  
**1-YEAR MONITORING SURVEYS, REPORTS AND SIDE SCAN SURVEY**  
**April 23, 2007**

**Introduction:**

This scope of services will provide the engineering, survey and remote sensing services for the 1-year monitoring surveys and reports required by the State permit (FDEP Permit No. 0222355-001-JC), Physical Monitoring Plan and Biological Monitoring Plan for the 2006 renourishment project.

The services are hourly (time and material) for a fee of \$147,214.

The following are the services provided in this scope of services:

**I. Beach and Nearshore Hydrographic Survey**

All work will be conducted in accordance to Section 01000 (Beach Profile Topographic Surveying) and 01100 (Offshore Profile Surveying) of the March 2004 Bureau of Beaches and Coastal Systems Monitoring Standards for Beach Erosion Control Projects including field methodology and final deliverables.

Prior to the start of the survey a reconnaissance of FDEP second order monuments will be conducted to confirm that survey control is in place and undisturbed using Real Time Kinematic Global Positioning System (RTK GPS). In order to achieve required accuracy, the survey will be controlled using FDEP 2<sup>nd</sup> order monuments. All assessable 2<sup>nd</sup> and 3<sup>rd</sup> order FDEP control monuments in the project area will be located using RTK GPS.

Topographic and Hydrographic profile surveys will be collected from R17 though R84 including R58A, a total of 69 lines. Four offshore profiles will be surveyed for the City of Naples as part of a separate contract. All data seaward of the dune will be collected using RTK GPS technology. Upland areas inaccessible to RTK GPS will be collected using standard differential leveling techniques. Upland topography will extend approximately 150 feet landward of the vegetation line or until an obstacle is encountered.

Hydrographic portions of the profile line will be collected from CPE's 24-foot survey vessel equipped with RTK GPS technology and a dynamic motion sensor to provide instantaneous tide and motion corrections. Standard hydrographic procedures will be followed including all necessary quality control checks. In order to maintain the vessel navigation along the profile lines HYPACK navigation software will be used. This software provides horizontal position to the sounding data allowing real-time review of the profile data in plan view or cross section format. HYPACK also provides navigation to the helm to control

the deviation from the online azimuth. The landward limits of the hydrographic survey will be based on a minimum of fifty feet beyond the seaward extent of the beach profile. Profiles will extend seaward beyond the depth of closure, approximately 2,500 feet offshore.

A Professional Surveyor and Mapper (PSM) signed and sealed survey report will be prepared including survey notes, profile plots, GIS plan view maps, and all other required deliverables included in Section 0100 and 01100 of the FDEP Monitoring Standards for Beach Erosion Control Projects.

## **II. Controlled Aerial Photography Using FDEP Environmental Standards**

Color aerial photography will be obtained for the Collier County Beach Project from R16 (Wiggins Pass) through R90 (Gordons Pass). Surveyors from CPE will coordinate ground control and GPS logging from HARN and/or CORS with the designated sub-contractor. A representative from Collier County will conduct the pre-flight sea condition monitoring and coordinate with CPE and the sub-contractor about the flight timing. Flight must occur during a 24 hour period of calm sea conditions, low tide levels, and low sun/water surface angle to ensure good water clarity. The flight window will be established by the sub-contractor. The sub-contractor will provide 9"x9" photographs and CD-ROM controlled raster imagery files. The photography will be collected following FDEP's standards for Environmental Aerial Photography Acquisition for Beach Erosion Control Projects (section 02100: March 2004).

## **III. 1-Year Coastal Engineering Monitoring Report Preparation**

An engineering monitoring report will be prepared containing survey monitoring results compared to the pre- and post-construction conditions. The changes in shoreline width, beach sand volume placed and remaining; and other pertinent beach characteristics will be described and illustrated in tables and figures. The report will summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. In addition, the report will include a comparative review of project performance to expectations and identification of impacts attributable to the project and recent storms. Appendices will include plots of survey profiles and graphical representations of volumetric and shoreline position changes for the monitoring area. Results will be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction. The ENGINEER will attend a CAC or other meeting, if requested, to present the results from the annual monitoring report. Two copies of the report along with a CD version will be provided to both the County and FDEP.

#### IV. Sidescan Sonar Nearshore Survey

**A. Field Operations.** The sidescan data will be used to verify the unconsolidated sediment surface and to map ocean bottom features such as hardbottom habitat and manmade features that may provide information needed to support the biological monitoring survey of this region. The survey will extend from Wiggins Pass (R-17) to FDEP monument R80 in Naples. The survey will extend offshore 300 m (1,000 ft). Hardbottom features will be classified as high or low relief, isolated rock outcrops or by equivalent descriptor for use in mapping the hardbottom edges. Manmade materials and debris will be noted. The sidescan sonar survey will be conducted using a suitable survey vessel with an enclosed or semi-enclosed cabin, generator and suitable deck space for equipment handling. The sidescan sonar system will be an EdgeTech 4200-FS sidescan sonar system. The system will be interfaced to a Real Time Kinematic Global Positioning System (RTK GPS) along with navigational input provided by the "HYPACK®MAX" system.

The 4200-FS instrumentation uses full-spectrum chirp technology to deliver wide band, high energy pulses coupled with high resolution and superb signal to noise ratio echo data. The sonar package includes a portable configuration with laptop computer running the DISCOVER acquisition software and a 120/410 kHz dual frequency towfish running in high definition mode.

The sidescan sonar will be towed at an optimum position and depth to ensure isolation from interference and optimum record quality. The digital sidescan data will be merged with positioning data (RTK GPS via HYPACK®MAX), video displayed and logged to disk for post processing and/or replay. The position of the sensor relative to the RTK GPS antenna will be thoroughly documented to ensure proper positioning of the data. The survey will be conducted in such a manner to achieve total bottom coverage within the survey area, which will be 5 passes each 200 ft wide, along the defined area. Dual frequency provides a differential aid to interpretation.

**B. Data Reduction.** The Chesapeake Technology, Inc SonarWiz.MAP® software will be used to post-process the sidescan sonar data in a geographical framework for target interpretation and delineation. The geo-encoded sonar imagery data will be collected in a *.jsf* file. The *.jsf* file will be converted to an *.xtf* file for post processing using the EdgeTech Discover® software. The *.xtf* file will then be imported into the SonarWiz.MAP® software to be processed, merged, and exported in the form of geo-referenced sidescan mosaics (geo-tiff files). Morphological features and potential artifacts observed in the sonar displays and records will be digitized in SonarWiz.MAP®, edited in ESRI® ArcMap™ 9.1, and saved as *.shp* files. The results will be used to map the hardbottom edges for use in a GIS.

**C. Nearshore Ground Truthing Dives.** The sidescan data will be ground truthed by divers to observe features mapped by the Side Scan Sonar investigation. These dives will take place after the initial data reduction of the sidescan result, and before the biological monitoring is conducted. The sidescan data reduction will be finalized based on this field investigation. These dives will facilitate the reduction of the Side Scan Sonar data. Dives will also serve as a precursor to the environmental dives investigation.

The nearshore hardbottom edge locations as documented in the 2003 Marine Resource Investigation Report, the pre-construction (Summer 2005) and immediate post-construction (Summer 2006) will be compared to the 1-Year post-construction results. A comparative analysis will be conducted to determine if project equilibration has resulted in a change in the hardbottom edge location. Remote sensing techniques will include beach profiles and aerial photography in addition to scan sonar imagery, and will be utilized by CPE to map the edge of hardbottom within the potential impact zone. After the remote sensing data are analyzed, diver groundtruthing will be conducted at select sites where comparative analysis indicates significant change in the location of the hardbottom edge has occurred or there is uncertainty in the results. The groundtruthing team will consist of a marine biologist, geologist and coastal engineer.

CPE anticipates that the remote sensing survey can be conducted in two (2) days, followed by a period of data reduction and comparative analysis; with two (2) days required to groundtruth the findings of the remote sensing survey.

A letter report of the results of the sidescan sonar investigation and the hardbottom edge determined from this investigation will be prepared and included with the survey report described above. The results will be used to support the marine resource 1-year monitoring survey of the nearshore habitat.

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**FEE PROPOSAL FOR COASTAL ENGINEERING SERVICES**  
**2006 COLLIER COUNTY BEACH RESTORATION PROJECT**  
**1-YEAR ANNUAL MONITORING SURVEYS & REPORTS**

**23-Apr-07**

**COASTAL PLANNING & ENGINEERING, INC.**

**COLLIER COUNTY, FLORIDA**  
**2006 COLLIER COUNTY BEACH RESTORATION PROJECT**  
**1-YEAR ANNUAL MONITORING SURVEYS & REPORTS**

**LABOR, EQUIPMENT & DIRECT COST RATES**

**COASTAL PLANNING & ENGINEERING, INC.**

<b>LABOR RATES (HOURLY)</b>	<b>2006 Rates</b>
Principal	<b>\$160</b>
Project Manager/Senior Engineer	<b>\$125</b>
QC / QA Technical Reviewer	<b>\$125</b>
Senior Coastal Engineer	<b>\$125</b>
Senior Marine Biologist/Coastal Zone	<b>\$120</b>
Certified Inshore Hydrographer	<b>\$120</b>
Professional Surveyor & Mapper	<b>\$120</b>
Senior Geologist	<b>\$120</b>
Coastal Engineer/Engineer III	<b>\$100</b>
Geologist	<b>\$90</b>
Marine Biologist	<b>\$90</b>
Junior Coastal Engineer/Engineer II	<b>\$85</b>
Junior Geologist	<b>\$78</b>
Junior Marine Biologist	<b>\$78</b>
Boat Operator	<b>\$75</b>
Project Surveyor	<b>\$90</b>
Sr CAD Operator/AutoCad Tech II Sr.	<b>\$85</b>
GIS Operator	<b>\$80</b>
CADD Operator I	<b>\$75</b>
Engineer I	<b>\$70</b>
Senior Technician/Survey Tech	<b>\$65</b>
Technician	<b>\$50</b>
Admin. Assistant/Secretary	<b>\$50</b>
Clerical	<b>\$40</b>



<b>EQUIPMENT RATES (DAILY)</b>	
Truck (2WD road use)	\$0.445
Truck (4WD beach use)	\$110
Survey Boat (28 ft. Parker)	\$1,000
Survey Boat (24 ft. Privateer)	\$750
Survey Boat (17 ft. Boston Whaler)	\$250
Survey Boat (13 ft Boston Whaler)	\$135
Honda ATV (All Terrain Vehicle)	\$75
John Deere Gator (All Terrain Vehicle)	\$100
RTK GPS	\$485
Differential GPS	\$410
Leitz Total Station w/Data Collector	\$125
Hand Laser Range Finder	\$15
Range Azimuth System	\$300
Fathometer w/Digitizer	\$160
Heave, Pitch, Roll Compensator	\$210
Speed of Sound Velocity Meter	\$60
Hypack/Dredgepack Navigation System	\$250
X-STAR CHIRP 512i Seismic Profiling System	\$1,100
Seismic Profiler Thermal Printer	\$125
Sonar Web Seismic Data Processing Package	\$150
Sonar Wizard Sidescan Data Processing Package	\$150
Side Scan Sonar	\$650
Schonstedt GA-52B Magnetic Locator	\$30
TDR-3A Underwater Tide Gauge	\$165
Permanent Tide Gauge	\$50
Nikon Level/Tripod/Rod/Tide Stilling Well	\$60
Engineering Computer	\$15
Lietz Handheld Level	\$10
Optical Reading Compass	\$10
Portable AC Generator	\$55
Underwater Camera	\$30
Film (35mm)	\$6
Sieve Analysis	\$75
Monuments	\$25
Survey Disk	\$15
Dry Suit	\$15
Penetrometer	\$50
Carsonite Post	\$15
Aerial Targets	\$6

<b>SCUBA DIVING SERVICES</b>	
Equipment & Insurance -Per diver per day	\$75
Underwater Dives -Per diver per dive	\$25

<b>Direct Expenses</b>	
Meals	<b>\$36.00</b>
Lodging	\$100.00
Misc. Expenses *	1.00

**2006 COLLIER COUNTY BEACH RESTORATION PROJECT  
 1-YEAR ANNUAL MONITORING SURVEYS & REPORTS  
 COASTAL PLANNING & ENGINEERING, INC.**

**FEE PROPOSAL SUMMARY**

<b>TASK</b>	<b>DESCRIPTION</b>	<b>COST</b>
<b>I.</b>	<b>BEACH AND HYDROGRAPHIC SURVEY</b>	<b>\$63,004</b>
<b>II.</b>	<b>ENVIRONMENTAL AERIAL PHOTOGRAPHY ACQUISITION</b>	<b>\$21,953</b>
<b>III.</b>	<b>COASTAL ENGINEERING MONITORING REPORT</b>	<b>\$14,710</b>
<b>IV.</b>	<b>REMOTE SENSING DATA COLLECTION AND ANALYSIS</b> Includes Task A, B, C listed seperately below	<b>\$47,547</b>
A.	FIELD OPERATIONS	\$22,727
B.	DATA REDUCTION	\$6,295
C.	GROUNDTRUTHING & PRODUCT DEVELOPMENT	\$18,525
	<b>Total</b>	<b>\$147,214</b>

FEE PROPOSAL FOR COASTAL ENGINEERING SERVICES  
 2006 COLLIER COUNTY BEACH RESTORATION PROJECT  
 1-YEAR ANNUAL MONITORING SURVEYS & REPORTS

	LABOR COST															
	Principal Engineer (Hours)	Senior Coastal/OA Engineer (Hours)	Junior Coastal Engineer II (Hours)	Professional Surveyor (PSM) (Hours)	Certified Inshore Hydrographer (Hours)	Project Surveyor (Hours)	Survey Technician (Hours)	Survey Technician (Hours)	Geologist (Hours)	Senior Marine Biologist (Hours)	Marine Biologist (Hours)	Boat Operator (Hours)	Senior CAD Operator (Hours)	CAD Designer/GIS (Hours)	Admin. Assistant (Hours)	Clerical (Hours)
<b>I. BEACH AND HYDROGRAPHIC SURVEY</b>																
A. ADMINISTRATION-PLANNING	1	2		2		2								6	4	
\$1,480.00																
B. BEACH MONUMENT RECONNAISSANCE																
1. MOBILIZATION / DEMOBILIZATION / TRAVEL				2		16	8	8				8		4		
2. SURVEY CONTROL RECONNAISSANCE						8	8	8				8				
C. ON-SHORE BEACH PROFILES (69 LINES)																
1. CONDUCT ONSHORE SURVEY				4		44	44	88								
2. DATA REDUCTION				8		24	20						20			
\$29,146.90																
D. OFF-SHORE BEACH PROFILES (69 FDEP) & DATA REDUCTION																
1. CONDUCT ON / OFFSHORE SURVEY (Sounder)					4	40	40					40				
2. DATA REDUCTION & PROFILE PLOTS				8	4	24	30	8					28		4	
\$25,876.80																
E. CHARTING & SURVEY REPORT PREPARATION																
1. CHARTING / MAPPING						4								20		
2. QA/QC TECHNICAL REVIEW		3		4		1	1						1			4
3. SURVEY REPORT & CERTIFICATION		1		4	4	8	4						1	6		4
\$6,500.00																
<b>II. AERIAL PHOTOGRAPHY ACQUISITION</b>																
A. ADMINISTRATION-PLANNING				1		4	4									
B. SUB-CONSULTANT DIRECT COST																
C. CONTROL SETUP AND LOGGING (MOBILIZATION, TRAVEL, FIELD WORK)																
1. MOBILIZATION and TRAVEL						6	6									
2. FIELD WORK						12	12									
D. CONTROL REDUCTION AND SUBMITTAL TO SUB-CONSULTANT				2		8										
\$21,953.25																
<b>III. COASTAL ENGINEERING MONITORING REPORT</b>																
1. ENGINEERING CALCULATIONS, ANALYSIS & FIGURES		12	56		4	4							6	20		4
2. REPORT PREPARATION	1	16	20	1	2									12		8
\$14,710.00																
<b>IV. REMOTE SENSING DATA COLLECTION AND ANALYSIS</b>																
A. FIELD OPERATIONS																
1. ADMINISTRATION-PLANNING	1	2							1							
2. SETUP & SURVEY PLANNING		2							8			4	4			
3. MOBILIZE / DEMOBILIZE / TRAVEL									8			8				
4. FIELD OPERATIONS (2 DAYS)									24			24				
\$22,727.05																
B. DATA REDUCTION																
1. DATA REDUCTION & EVALUATION					8				16							
2. CHARTING / MAPPING					4				12				1	6		
3. PREPARE REPORT					4				8							
\$6,295.00																
C. GROUNDTRUTHING & PRODUCT DEVELOPMENT																
1. MOBILIZE / DEMOBILIZE / TRAVEL			4						4		4	4				
2. FIELD OPERATIONS (2 DAYS)			24						24		24	24				
3. PRODUCT QC / QA TECHNICAL REVIEW	1	4														
4. INVESTIGATION REPORT DEVELOPMENT & SUBMITTAL		4	4		4	4			4		4		1	8		8
\$18,524.70																
<b>TOTAL LABOR HOURS</b>	4	51	108	36	38	209	177	112	109	0	32	120	42	102	8	28
<b>HOURLY LABOR RATE</b>	\$160	\$125	\$85	\$120	\$120	\$90	\$65	\$85	\$90	\$120	\$90	\$75	\$85	\$75	\$50	\$40
<b>LABOR COST</b>	\$640	\$6,375	\$9,180	\$4,320	\$4,560	\$18,810	\$11,505	\$7,280	\$9,810	\$0	\$2,880	\$9,000	\$3,570	\$7,650	\$400	\$1,120
<b>TOTAL LABOR COST</b>	\$97,100															
<b>TOTAL EQUIPMENT COST</b>	\$19,015															
<b>TOTAL EXPENSE COST</b>	\$31,099															
<b>TOTAL COST OF SURVEYS</b>	\$147,214															

\* NOTE: ALL SURVEYS ARE COMPLETED IN ACCORDANCE WITH CPE/FDEP SURVEY STANDARDS (INCLUDED IN PROPOSAL)

