

EXECUTIVE SUMMARY

Recommendation to approve the attached engineering proposal dated 6/7/2010 from Coastal Engineering Consultants to renourish the Marco South Beaches and investigate if additional or modified erosion control structures would lengthen the renourishment cycle for this beach.

OBJECTIVE: Approve the engineering proposal dated 6/7/2010 from Coastal Engineering Consultants to renourish the Marco South Beaches and investigate if additional or modified erosion control structures would lengthen the renourishment cycle for this beach. Anticipated construction will be FY 12/13 or FY 13/14.

CONSIDERATIONS: It will take several years to secure the permits to modify or install additional erosion control structures at the Marco South Beach. This study needs to be undertaken to determine if:

1. If additional erosion control structures would lengthen the renourishment cycle and if so what would the most likely cost, savings and cycle be. Preliminary modeling and historical analysis.
2. Can any of the existing structures be modified to achieve the same result? Preliminary modeling and historical analysis.
3. At a minimum obtain a permit to repair the existing structures.
4. Investigate the Sand sources of Capri Pass, Caxambas Pass and Cape Romano Shoals for beach renourishment sand.
5. Model the Beach renourishment to determine the optimum renourishment scope.
6. Can this project be combined with the major mainland renourishment project for savings?
7. Prepare report and present.

ADVISORY COMMITTEE RECOMMENDATIONS: Staff is recommending approval of this proposal.

FISCAL IMPACT: The Source of funds is from Category "A" Tourist Development Tax fund 195.

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

LEGAL CONSIDERATIONS: This item has been reviewed and approved by the County Attorney's Office and is legally sufficient for Board action. - CMG

RECOMMENDATION: Approve the engineering proposal dated 6/7/2010 from Coastal Engineering Consultants to renourish the Marco South Beaches and investigate if additional or modified erosion control structures would lengthen the renourishment cycle for this beach.

PREPARED BY: Gary McAlpin, CZM Director

SCHEDULE "A"
WORK ORDER NO. 1

TASK 1: PLAN FORMULATION & PROJECT UPDATE

Phase A: Beach Fill Volume Update

Utilizing COUNTY provided controlled digital photography and 2009 annual monitoring surveys (beach profiles, inlet, shoals, etc.); CEC shall apply the permitted beach fill template and update the volume requirements for the 2012-13 Beach Renourishment Project following the description in the FEMA Project Worksheet, Declaration No. 1785DRFL.

Phase B: Borrow Area Screening

Utilizing COUNTY provided borrow area surveys and data, CEC shall conduct an alternatives analysis of the existing permitted borrow areas including Caxambas Pass (South Marco prior source), Capri Pass (Hideaway Beach prior source), Tom's Hill (Collier County prior source) and Cape Romano Shoal (new source). Parameters to be evaluated include quality, quantity (compared to the fill volume needs defined in Phase 1), location, environmental impacts, navigation interests, cost, and synergy with Collier County's other beach nourishment project needs. A compatibility analysis shall be performed using existing sediment data for both the native beach and the permitted borrow areas. Based on the analysis, CEC shall rank the borrow areas and recommend the optimal source(s) for inclusion in the Project.

Phase C: Project Description Update

Based upon the results of Phases 1 and 2, CEC shall update the Project Description and Preliminary Opinion of Probable Construction Cost for the 2012-13 Beach Renourishment Project.

Phase D: Structural Alternatives Screening

Building upon the project performance to date, and relying upon our historical perspective of the South Marco project goals, objectives, permit issues, and design standards, as well as the COUNTY's other consultants' reporting and analyses, CEC shall conduct an evaluation of fiscal, environmental, and institutional parameters to screen the following structural alternatives, or combination of alternatives, for inclusion in the Project.

- Repair existing breakwaters: restore existing structures to their original design templates,
- Repair existing terminal groins: restore existing structures to their original design templates,
- Modify existing breakwaters: relocate, resize, and / or realign existing structures,
- Modify existing terminal groins: relocate, resize, and / or realign existing structures, and
- Enhance existing breakwaters: add new structure(s) to enhance existing structures.

Based upon the analysis, CEC shall rank the structural alternatives and recommend the two most favorable alternatives for the Modeling Task. The recommendation shall include the justification for carrying the selected alternatives forward along with the rationale for eliminating the other alternatives. The purpose of the structural assessment is to complement the beach fill for enhancing Project performance, extending Project life, and increasing the interval between renourishment events.

Phase E: Plan Formulation Report

CEC shall prepare and submit to the COUNTY a draft Report to present the results of Plan Formulation including beach fill volume update, borrow area recommendations, updated Project Description and Preliminary Opinion of Cost, and structural alternative recommendations. CEC shall meet with the County to review the results and obtain comments. CEC shall revise and submit the final Plan Formulation Report to the County.

TASK 2: MODELING

Phase A: Data Collection and Analysis

CEC shall review COUNTY provided data, as well as, request and obtain existing data that may be available from other governmental agency sources, for example, Rookery Bay, FDEP, USACE, City of and Marco Island. It is assumed that additional hydrodynamic information will need to be obtained in order to calibrate the numerical models proposed for use in subsequent analysis. At this time, the following field data collection program is proposed:

- CEC shall install tide gages and current meters (or combination units) to measure water levels and velocities at two prescribed locations (offshore and within Caxambas Pass) for a total period of 30 days. The instrumentation will be recovered mid-month and again at the end of the month.
- Water level and current velocity data will be downloaded, reviewed and processed to provide a record of conditions during the 30 day deployment. CEC will then integrate the new information with similar data obtained from historical sources, noting any trends apparent in comparison to the historical information.

After completing Plan Formulation and reviewing the existing literature, CEC will recommend any changes to the COUNTY prior to initiating the field work.

Phase B: Regional Wave and Storm Statistics

Using the existing literature and data related to the general wind, wave and sediment transport processes affecting the project area, CEC shall develop a general understanding of the wave energy shaping the area's shorelines and characterize the geomorphic and littoral processes in the project area. CEC shall prepare tables summarizing the matrix of wave height, period, and direction conditions to be used in the modeling.

Using the historical storm data available in the literature, CEC shall compile report storm statistics with respect to wave height, period, direction and return interval and recommend the design storm parameters for use in the modeling.

Phase C: Model Calibration and Validation

CEC shall perform a detailed modeling analyses of selected alternatives. CEC shall calibrate and validate the models using historical records such as bathymetric surveys, dredge and fill records, aerial photography, and collected field data. In concert with model formulation and application, CEC shall:

- perform a desktop analyses of available wave, tide, sediment, morphology and dredging data to formulate the appropriate model domain and boundary forcing information;

- conduct an analytic assessment of sediment transport and morphological behavior of the inlet-beach system to formulate appropriate parameters for model application and to identify a range of reasonable model results;
- apply an integrated 2D numerical model, (such as MIKE 21 or equivalent) including dynamic coupling of wave, hydrodynamic and morphological modules; and
- validate the model via qualitative comparisons with measured changes and dredge records and via sensitivity analysis.

The modeling program shall be performed following the guidelines established by FDEP. Deviations from the guidelines shall be reported to the COUNTY as appropriate.

Phase D: Sediment Budget

Using historical data, CEC shall compute shoreline and volumetric changes. Combined with the results of the modeling, CEC shall develop the sediment budget for the project area. The sediment budget shall including estimates of the potential longshore transport rates along Marco Island central and south beach reaches as well as Kice Island, shoaling rate at Caxambas Pass, and order of magnitude of gross and net alongshore sediment transport into and out of the Project area.

Phase E: Alternatives Analysis

Once the model has been calibrated and validated, CEC shall model the beach fill only alternative and beach fill with the two structural alternatives determined in Plan Formulation. For each alternative, CEC shall predict sediment transport magnitude and directions, bathymetric changes, beach fill diffusion, shoal development and channel sedimentation rates. Based upon the model results, for each alternative, CEC shall:

- depict predicted changes in coastal processes;
- prepare a table and plan-view depiction of the expected sediment budget;
- qualitatively assess the expected performance, advantages and disadvantages;
- assess the likely issues or concerns of permitting agencies, permit requirements, and feasibility of obtaining permits;
- prepare a conceptual opinion of probable costs including initial costs, maintenance costs, and annualized costs for a 30 year project life; and
- summarize the evaluation parameters in matrix format.

Phase F: Modeling Report

CEC shall prepare and submit to the County a draft Report describing the data collection and analysis, calibration and validation of the model, alternative analysis and results, and recommendation for the preferred structural alternative to advance to Preliminary Design. CEC shall meet with the County to review the results and obtain comments. CEC shall revise and submit the final Modeling Report to the County.

TASK III. PRELIMINARY DESIGN

Phase A: Pre-Application Conferences

CEC shall update the Project Description and prepare a Project Justification Document that identifies and describes the necessity and justification including consideration of the public

interest in shore protection and restoration and potential impacts of the Project, with particular attention to potential impacts to the Caxambas Pass shoals and historical shorebird nesting areas. The report shall address compliance with Section 404(b)(1) of the Guidelines of the Clean Water Act and the "Public Interest Assessment" criteria cited in Section 373.414, Florida Statutes. The Document will be (a) reviewed and approved by the COUNTY prior to distribution, (b) distributed to USACE and FDEP staff in advance of the pre-application conferences, and (c) serve as a foundation for the "Project Purpose and Need" section of the Joint Coastal Permit (JCP) Application.

CEC will arrange, attend, and chair two pre-application conferences including COUNTY staff with (1) FDEP regulatory and project management staff along with state commenting agency staff (FFWCC), and (2) USACE regulatory staff and federal commenting agencies (NMFS, USFWS, EPA). In general, the purpose of the pre-application conferences shall be to present the Project including the results of Plan Formulation and Modeling, solicit agency input on regulatory matters, identify if the current Project shall be processed as a new application or a major modification to the existing permit, define requirements for obtainment of permit approvals, and discuss requirements for mitigation. CEC shall prepare and submit to the COUNTY a written summary of each conference.

Phase B: Preliminary Design

Utilizing the annual monitoring surveys (beach profiles, inlet, shoals, etc.) to be performed by the COUNTY's other consultants, CEC shall prepare preliminary design drawings in the form of 8 1/2" x 11" permit drawings. Utilizing the existing borrow area data, marine surveys, and environmental surveys, CEC shall determine the design borrow area cuts to yield the fill volume requirements and identify potential pipeline corridors and marine vessel transport corridors from the selected borrow areas to the beach fill. CEC shall prepare the preliminary design of the preferred structural alternative.

The preliminary plans shall include location map; vicinity map; plan views depicting beach fill, borrow areas, coastal structures, construction access and staging areas, potential pipeline corridors and transport corridors; cross sections depicting dredge templates and beach fill templates; coastal structure sections and details; survey control; dune plantings; and environmental protection measures. The preliminary plans shall serve as the permit drawings for the JCP Application. Based on the preliminary design documents, CEC shall update the Preliminary Opinion of Probable Construction Cost. CEC will meet with the COUNTY to review the preliminary design. CEC shall finalize the preliminary design documents based on the COUNTY review and comments.

Phase C: Environmental Assessment

CEC shall calculate potential mitigation requirements based on FDEP UMAM procedures (or other approved functional assessment methods as may be prescribed by the USACE, FFWCC, NMFS or USFWS) and identify potential mitigation methods and mitigation areas. CEC shall prepare for COUNTY review and approval an Environmental Assessment (EA) documenting the location, quantity, and quality (including functions and values) of environmental resources in the Project area and borrow areas; summarize probable environmental and historic resource impacts; address potential pipeline and transport corridor impacts to resources within the corridors; and

incorporate the potential mitigation quantities, site locations, mitigation techniques, and associated mitigation costs.

TASK IV. JCP APPLICATION

Phase A: Supporting Documents: CEC shall prepare for COUNTY review and approval the following permit Supporting Documents:

- physical monitoring plan,
- sediment QA/QC plan,
- endangered species protection plans,
- biological monitoring plan,
- turbidity monitoring plan, and
- mitigation and monitoring plan.

Phase B: Permit Application

CEC shall prepare for COUNTY review and approval, a draft JCP application for the FDEP and USACE permits and easements required for the Project including an “*Application for Joint Coastal Permitting, Authorization to Use Sovereign Submerged Lands, and Federal Dredge and Fill Permit*” and a *Public Easement or Consent of Use* for each pipeline corridor. The application shall include the following:

- COUNTY provided documents (e.g. local consistency letter with comprehensive plan, existing borrow area permits and MMS leases for the two offshore areas, agent authorization letter)
- permit sketches (preliminary plans completed in Task III),
- sketch and legal description for each pipeline corridor,
- EA (prepared in Task III),
- alternatives analysis and modeling results (prepared in Task II), and
- existing geotechnical data formatted for inclusion in the ROSS database.

In the application, CEC will request:

- final design plans be a condition for issuance of a “*Notice to Proceed*” following agency review and acceptance and/or modification of the preliminary design,
- mixing zone within the fill area, and
- waiver of dredge fees for use of borrow material obtained from sovereign lands.

CEC shall incorporate COUNTY review comments and submit the JCP Application and Supporting Documents to FDEP and USACE.

TASK V: PERMIT PROCESSING

Phase A: FDEP and USACE Permit Processing: Subsequent to submittal of the permit application, CEC will serve as the COUNTY’s agent for the permit process. CEC will proactively contact FDEP and USACE staff to informally monitor the process, address staff questions, and facilitate agency consideration of the application. CEC will verify the JCP

Application processing fee amount and notify the COUNTY when payment is due to FDEP. As needed, CEC will compile, clarify, and provide existing information as may be requested by FDEP and USACE staff. CEC will seek to negotiate permit condition(s) for the project that are acceptable to the COUNTY.

Phase B: RAI Response: For the purposes of this Scope, it is expected that FDEP and USACE will make two (2) requests for additional information (RAI) each, and that one (1) meeting will be required with FDEP staff in Tallahassee to favorably conclude the permit application. It is assumed that existing information (including design details/analysis) will be sufficient to meet permit application requirements with minor adjustments, clarifications, or analysis. If FDEP mandates additional surveys, reports, modeling analysis or and studies beyond those identified herein, CEC will undertake these additional tasks under separate authorization as approved by the COUNTY.

TASK VI: FINAL DESIGN

Phase A: Construction Plans and Technical Specifications

Based on the permit processing results including comments received from the agencies, accepted preliminary design documents, and the 2011 annual monitoring surveys (beach profiles, inlet, shoals, etc.) to be performed by the COUNTY's other consultants, CEC will prepare for review and approval by the County, construction plans and technical specifications to show the general scope, character and extent of the work to be furnished and performed by the contractor. CEC shall design the final beach fill, borrow area, and coastal structure plans including horizontal and vertical control, survey baseline, construction access and staging areas, beach fill limits, design fill templates, dune construction limits, vegetation details, pipeline corridors, marine vessel transport corridors, borrow area dredge templates, coastal structure design sections and details, and construction quantities. CEC shall prepare a Final Opinion of Probable Construction Cost. CEC shall review the COUNTY's standard general conditions, instructions to bidders, etc... and prepare for review and approval by the COUNTY, supplemental conditions and bid forms for inclusion in the Bid Documents.

ASSUMPTIONS

Based on multiple discussions with Coastal Zone Management, CEC understands the following.

I. Annual Monitoring Surveys

The COUNTY shall provide the following surveys for 2009, 2010, and 2011 for use in the Project design, thus no beach, inlet and shoal, and borrow area bathymetric surveys are included in the scope:

- controlled (scale rectified) digital photography,
- beach profile, inlet, and shoal survey data as xyz files in Excel or similar file format, and
- monitoring reports.

II. Borrow Areas

The COUNTY shall provide the following data for the existing borrow areas (Caxambas Pass, Capri Pass, Tom’s Hill, and Cape Romano Shoal), thus no borrow area surveys are included in the scope:

- “post-dredging” surveys of the three borrow areas associated with prior nourishment events,
- geophysical survey data in appropriate digital format,
- geotechnical survey data such as jet probes, vibracore logs and photos, gradation curves, and related sediment tests in appropriate digital format,
- magnetometer survey reports and/or results in appropriate digital format,
- Cultural Resources survey reports and/or archeological reports,
- existing permits, and
- MMS Leases for the two offshore sources.

III. Miscellaneous

The COUNTY shall provide the following:

- Environmental Assessments, Permit Documents, and Related Reports,
- Funding related tasks (FEMA coordination, public access requirements, etc.),
- Permit Fees,
- Public Noticing,
- Local Consistency Letter with Comprehensive Plan, and
- Agent Authorization Letter.

Further, because this is the next maintenance cycle of the existing permitted Project, CEC bases this scope on the following:

- The Project has an established Erosion Control Line for the entire shoreline to be renourished,
- The COUNTY has its own property or has obtained construction easements from private upland property owners for construction access and staging and to allow for placement and maintenance of beach fill and coastal structures upland of the ECL, and
- Because the COUNTY has permitted the four (4) borrow areas (noted above), wave refraction analyses to verify that no adverse impacts to adjacent shorelines will occur from borrow area excavation will not be required.

BUDGET

TASK	DESCRIPTION	FEE
I	Plan Formulation Update	\$ 25,000
II	Modeling	\$ 80,000
III	Preliminary Design	\$ 95,000
IV	JCP Application	\$ 35,000
V	Permit Processing	\$ 85,000
VI	Final Design	\$ 30,000
	Contingencies (10%)	\$ 35,000