

The Town Attorney recommended the Board of Commissioners seek V-COMM's analysis of the proposed buyout(s) and have a report submitted on their findings. Commissioner Woodard agreed and indicated that since this is a new path input could be valuable, and added that he would like to get an opinion from V-COMM on exactly where the wireless communications industry is going. Commissioner Peele stated that the lump-sum buyout could be a great thing if budget concerns get too tight, although Kill Devil Hills may not be there, yet. The Board members agreed to have V-COMM explore Option #1, above, with a report to be scheduled for a future meeting.

5. **Appointment**

A. **Planning Board (Attached NB-5A)**

A regular term on the Planning Board becomes vacant in September 2011. Mr. Howard Kimble has expressed a desire to continue serving in this position. His dates of service are:

J. Howard Kimble	04/14/2003 – present	Planning Board
	12/16/2003 – present	SISPC
	07/10/2000 – 01/2008	Personnel Board
	06/28/2006 – 01/24/2008	ODRC

Commissioner Woodard made a motion to reappoint Mr. Kimble to a regular term on the Planning Board to expire September 2014. Mayor Sturza seconded that motion and approval was unanimous, 4-0.

Mayor Sturza commented that continuity of pedestrian improvements in Kill Devil Hills is a priority of Mr. Kimble's and he hoped work to have an elevated crosswalk across US 158 at Colington intersection could be a reality in the near future.

6. **Review Team Recommendation – Consultant for Shore Protection Plan (Attached NB-6)**

Planning Director Greg Loy's packet memorandum outlined the recommendation to the Board of Commissioners to authorize Staff to enter negotiations with Coastal Planning and Engineering (CPE) to create Kill Devil Hills' Shore Protection Plan and Beach Nourishment Project. CPE was one of five firms that submitted qualifications in response to the attached RFQ; two of the firms were selected to continue the interview process. Of the final two, CPE was selected based on their familiarity with Kill Devil Hills, their experience with Section 206 of the Water Resource Development Act of 1992, and their coastal engineering experience in North Carolina.

Preliminarily, the Review Team also recommended the Board of Commissioners authorize expenditure of \$9,850 from the Capital Reserve Fund for Beach Nourishment for the purpose of having CPE perform tasks associated with inter-agency coordination meetings, the goal of which is to narrow the scope of permitting and review requirements by resource agencies

such as the Army Corps of Engineers and the North Carolina Division of Coastal Management. Following these meetings, CPE will provide the Town with a detailed scope of work that will include the necessary tasks associated with permitting a shore protection project under Section 206 authorization.

Staff recommended a motion from the Board of Commissioners to authorize:

- Negotiations with Coastal Planning and Engineering to create Kill Devil Hills' Shore Protection Plan and Beach Nourishment Project; and,
- Expenditure of \$9,850 from the Capital Reserve Fund for Beach Nourishment for the purpose of having CPE perform tasks associated with inter-agency coordination meetings, the goal of which is to narrow the scope of permitting and review requirements by resource agencies such as the Army Corps of Engineers and the North Carolina Division of Coastal Management.

Mayor Sturza recapped the Board's previous discussions and action to bring them to this point. He explained that the first step, as proposed by CPE, will allow them to find out exactly what will be necessary to achieve beach nourishment permit status before a contract amount is submitted.

Mayor Sturz made a motion for the Board of Commissioners to take the action recommended and Commissioner Peele seconded that motion. Approval was unanimous, 4-0.

Mayor's Agenda

1. Resolution Urging Increased Awareness of Lyme Disease and Its Symptoms and Diagnosis (Attached MA-1)

In 2010 we were asked by retired Marine Corps Lt. Col. Dave Tierny to adopt a resolution in support of increased awareness of Lyme disease and its symptoms, and he has made the same request this year. Lyme disease is spreading in the United States and left untreated it can cause serious, permanent and sometimes life-threatening damage to those with the disease.

Mayor Sturza made a motion for the Board of Commissioners to adopt the Resolution Urging Increased Awareness of Lyme Disease and Its Symptoms and Diagnosis, which upon execution will be returned to Lt. Col. Tierny and sent to the other Dare County local governments and placed on the Town's webpage. Commissioner Finch seconded that motion and approval was unanimous, 4-0.

□ **Congratulations to Police Officer Joe Knight and Sgt. Sarah McDowell.**
Mayor Sturza expressed congratulations to Police Department staff members, Officer Joe Knight and Sgt. Sarah McDowell for their educational achievements to enhance their professional achievements. He asked the Town Manager to let Officer Knight and Sgt. McDowell know of the Board's congratulations.



TOWN OF KILL DEVIL HILLS

Land Where Flight Began

MEMORANDUM

August 8, 2011

TO: Mayor and Board of Commissioners

FROM: Debora P. Diaz, Town Manager

REF: New Business

**6. Review Team Recommendation – Consultant for Shore Protection Plan
(Attached NB-6)**

The attached memorandum from Planning Director Greg Loy outlines the recommendation to the Board of Commissioners to authorize Staff to enter negotiations with Coastal Planning and Engineering (CPE) to create Kill Devil Hills' Shore Protection Plan and Beach Nourishment Project. CPE was one of five firms that submitted qualifications in response to the attached RFQ; two of the firms were selected to continue the interview process. Of the final two, CPE was selected based on their familiarity with Kill Devil Hills, their experience with Section 206 of the Water Resource Development Act of 1992, and their coastal engineering experience in North Carolina.

Preliminarily, the Review Team also recommends the Board of Commissioners authorize expenditure of \$9,850 from the Capital Reserve Fund for Beach Nourishment for the purpose of having CPE perform tasks associated with inter-agency coordination meetings, the goal of which is to narrow the scope of permitting and review requirements by resource agencies such as the Army Corps of Engineers and the North Carolina Division of Coastal Management. Following these meetings, CPE will provide the Town with a detailed scope of work that will include the necessary tasks associated with permitting a shore protection project under Section 206 authorization.

Staff recommends a motion from the Board of Commissioners to authorize:

- negotiations with Coastal Planning and Engineering to create Kill Devil Hills' Shore Protection Plan and Beach Nourishment Project; and,
- expenditure of \$9,850 from the Capital Reserve Fund for Beach Nourishment for the purpose of having CPE perform tasks associated with inter-agency coordination meetings, the goal of which is to narrow the scope of permitting and review requirements by resource agencies such as the Army Corps of Engineers and the North Carolina Division of Coastal Management.

Director of
Planning and Inspection
GREG LOY

Planner
SHANDA DAVENPORT

Code Enforcement Officer
LEE PARTRIDGE

Secretary
NANCY MILLER



Assistant
Planning Director
MEREDITH GUNS

Zoning Administrator
DONNA ELLIOTT

Building Inspectors
MATT LOWCHER
STAN BELVIN

**THE TOWN OF KILL DEVIL HILLS
NORTH CAROLINA**

PLANNING DEPARTMENT

August 8, 2011

Memorandum

To: Debora Diaz, Town Manager

From: Beach Protection Plan Review Team

Subject: Review Team Recommendation – Consultant for Shore Protection Plan

As a result of the Town's Request for Qualifications to create a Shore Protection Plan and Beach Nourishment Project, five firms submitted qualifications. The Beach Protection Plan review team reviewed these submissions, created a short list of the two most qualified firms and conducted interviews with these firms. References were checked for both firms interviewed.

Based on this information, the review team recommends that the Board authorize staff to enter negotiations with Coastal Planning and Engineering (CPE) to create a Shore Protection Plan and Beach Nourishment Project for Kill Devil Hills under the authorization provided for in Section 206 of the Water Resource Development Act of 1992.

Rationale for this recommendation includes:

- Familiarity with Kill Devil Hills
- Experience with Section 206 reimbursable projects (Board direction on option #3)
- Coastal engineering experience in NC

In addition, the team recommends that the Board appropriate \$9,850 from the Capital Reserve Fund for Beach Nourishment to authorize CPE to perform tasks associated with inter-agency coordination meetings. The goal of these meetings is to narrow the scope of permitting and review requirements by resource agencies. I have attached an explanation of the preliminary meetings from CPE for your review.

ATTACHMENT NB-6

Preliminary Scoping and Inter-Agency Coordination Meeting

At this time it is not possible to accurately map out the exact scope of work necessary to conduct work associated with the environmental documentation/permitting and the development of the Limited Re-evaluation Report (LRR). This uncertainty is a result of the many variables that play into the U.S. Army Corps of Engineers (USACE) ultimately deciding on the appropriate procedures for obtaining permits and updating the engineering documents. In order to more accurately develop a scope of work to develop environmental documentation, submit the necessary permit applications, and update the USACE engineering documents, CPE has proposed a series of scoping meetings, which will facilitate discussions with the USACE and other resource agencies which will allow the USACE to determine the most appropriate approach for this project.

This task includes efforts by CPE to develop a presentation that describes the proposed project and the proposed methods for developing environmental documentation, submitting the necessary permit applications, and updating the USACE engineering documents. CPE will present this information at two separate meetings. The first meeting will be with the USACE, the North Carolina Division of Coastal Management (NCDCM), and representatives from other relevant Federal and State resource agencies. This interagency meeting is intended to clearly define the procedure necessary for permitting the project. The second meeting will be held with staff of the Wilmington District USACE, civil works section. This meeting is meant to define the process for updating the engineering documents for this project. Originally it was assumed that an LRR using the Beach \mathcal{F} economic analysis model would be necessary. Based on recent discussions between CPE and USACE staff, it has been suggested that a full Beach \mathcal{F} analysis may not be necessary. This may result in significant cost savings to Kill Devil Hills.

Following these two meetings, CPE will provide the Town a detailed scope of work that will include necessary tasks associated with permitting a shore protection project under Section 206 authorization.

Cost: \$9,850. This task will be completed as a not to exceed contract to be billed as time and expenses. In the case that there is a balance remaining upon completion of the work, it will be incorporated into the larger contract amount.

**Request for Qualifications (RFQ)
Kill Devil Hills Shore Protection Plan
Dare County, North Carolina**

Overview

The Town of Kill Devil Hills is seeking services from a qualified engineering/environmental firm or team to develop and design a Shore Protection Plan and beach nourishment project to be constructed and maintained under authorization provided for in Section 206 of the Water Resource Development Act (WRDA) of 1992. This project proposes to use a locally preferred alternative based on the Dare County Hurricane Protection and Beach Erosion Control Project, which has already been federally authorized. The local project will be constructed on an approximate one mile portion of beach at the near-mid-point of the Town's approximate total four and one half mile-long oceanfront. This will include assistance with the Section 206 process, assistance in securing a Project Partnership Agreement, services required to obtain state and federal permits, geotechnical analysis, environmental documentation, coastal engineering services, project cost analysis, preparation and processing oversight of the Limited Re-evaluation Report (LRR), development of plans and specifications, bidding and contractor selection and construction administration and oversight. This RFQ summarizes this and other background information in addition to the general long-term approach the Town wishes to take regarding shore protection in an effort to provide sufficient information with which to develop a qualified submittal.

All interested firms must respond by making their submittal by 5:00 p.m. on Friday, April 15, 2011. Late submittals will be considered non-responsive and therefore not included in the review process.

Background

The Town of Kill Devil Hills is located on North Carolina's Outer Banks, specifically on a relatively thin stretch of barrier island/sand banks peninsula known as "Bodie Island," which extends from southern Virginia to Oregon Inlet, North Carolina. Primarily, the shoreline orientation for this area is east/northeast and the Town's orientation is in an approximate north to south direction between the towns of Nags Head (south) and Kitty Hawk (north). Kill Devil Hills is bound on the west by Kitty Hawk and Roanoke Sound, a relatively shallow water body and to the east by the Atlantic Ocean. The Town's oceanfront length is approximately four and one half miles and its overall land area covers approximately five and six-tenths square miles or 3,580 acres. Year-round population is (+/-) 6,000 and seasonally, during the summer months, the estimated population is 35,000 – 40,000.

The width of the upland portions of Kill Devil Hills varies from a minimum of approximately one mile to one and one-half miles with maritime forest found in its southwestern quadrant, which is the only portion of the Town included in the Coastal Barrier Resources System. General elevations across the interior of Kill Devil Hills range from five to 25 feet above mean sea level (MSL), while dune elevations along the oceanfront of the island are substantially somewhat lower. Federal Emergency Management Agency's (FEMA) flood hazard maps place much of Kill Devil Hills below the 100-year flood level with few portions above the 500-year flood level.

Nourishment and Shorelines Protection Activities (Historical)

The Civilian Conservation Corps (CCC) constructed oceanfront dunes throughout Kill Devil Hills in the 1930s. Since that time the dunes have been protected and enhanced by both private and public efforts. Most recently, after Hurricane Isabel in 2003 Kill Devil Hills participated with FEMA to provide an emergency protective berm for approximately one mile of oceanfront in areas where the storm's impacts were strongest. In April of 2005 the Dare County Board of Commissioners voted to implement a 1% sales tax for shoreline protection which was collected for several months and then repealed by referendum. Proceeds from interest on this fund have been utilized to build sand fence and sprig oceanfront dunes; in the spring of 2011 the Town of Kill Devil Hills expects to erect more sand fence utilizing a part of this program.

Proposed Scope of Work (Engineering Report and NEPA/SEPA Document)

Kill Devil Hills is part of the Dare County Hurricane and Beach Erosion Control Project and that shall be the guiding document and project for Kill Devil Hills' local preferred alternative. The authorized plan of improvement for the Town's portion of the project consists of a 50-foot-wide berm to be constructed at elevation seven feet National Geodetic Vertical Datum (NGVD.) Federal funds for the Dare County Hurricane and Beach Erosion Control Project have been minimal and the Town of Kill Devil Hills proposes to move forward with establishing a strategy that would build the locally preferred project using a Section 206 approach using funds collected from Dare County's 1% Room Occupancy and Tourism Development Tax for Beach Nourishment. It is hope that federal fund, for maintaining the Town's beach nourishment project, will be available.

Engineering Report

The first focus of the proposed scope of work is to develop the Town's Shore Protection Plan which would be part of the proposed new local nourishment strategy. This will entail a complete assessment of Kill Devil Hills, the establishment and evaluation of beach health indicators, a review concerning the strength and weaknesses and development of a master nourishment and beach preservation program. Additionally, the engineering report should also incorporate

contingencies such as emergency, post-storm beach fill projects into the analysis and compulsory environmental documentation.

National Environmental Policy Act (NEPA)/State Environmental Policy Act (SEPA)
Document

The NEPA/SEPA Document coupled with the Engineering Report should be programmatic in nature. This would be the master document identifying all the impacts (short and long-term, cumulative) and offsetting measures of as many beach activities as possible. As briefly mentioned above, these activities could include dredging with concurrent beach disposal, beneficial use projects, FEMA replacement projects, etc. The programmatic Environmental Impact Statement (EIS) or Environmental Assessment (EA) should provide a mechanism to capture potential beach nourishment activities that could occur over the lifespan of the nourishment program.

The summary of the proposed scope of work presented in this RFQ should not be construed as absolute, and can be modified subsequent to consultation with the selected firm.

The Permit, Permit Process and Environmental Studies

It is envisioned that a 30-year (or longer) permit would ultimately be secured. This authorization would include a list of special conditions to address the separate events that could occur during the 30-year period that might require renourishment. The special conditions contained in the permit authorization could require the Town to undergo a notification review process and receive consequent written approval prior to conducting each discrete nourishment event. The proposed programmatic EIS (or EA) will be independent of the environmental document associated with the ongoing USACE (United States Army Corps of Engineers) Dare County Hurricane Protection and Beach Erosion Control Project.

Utilizing available information, the consultant may be required to provide an evaluation of the beach nourishment design for Kill Devil Hills contained in the Dare County Hurricane and Beach Erosion Control Plan. The consultant shall be familiar with and experienced in conducting shoreline and wave modeling procedures and analyzing accretion and erosion trends for the project's design and acquisition of project permits. The consultant should have knowledge and experience in designing and processing federally authorized beach nourishment projects. The consultant should have the knowledge and experience to create a new project design, or to modify the existing design, and provide construction administration services as required. Further, the consultant should have experience with and be prepared to assist the Town in addressing emergency situations.

Work may include:

- Scheduling and attending meetings with the North Carolina Division of Coastal Management personnel and other state and federal representatives and/or agencies to review the proposed project and to determine issues to be addressed in the permitting application documents.
- Providing technical criteria, written descriptions and design data, drawings and completed application forms for filing applications to secure the necessary permits from federal and state agencies that have jurisdiction to approve the design of the project, and assisting the Town in consultations with appropriate authorities to obtain the required permits and approvals.
- Preparing permit drawings, vicinity map, project plan, beach fill sections, and geotechnical data.
- Preparation of a project synopsis, computation of anticipated dredge and fill volumes, excavation and reclamation areas, and a description of the construction methodology.
- Selection and editing of supporting data and reports (attachments to the permit) covering the topics of engineering, geotechnical surveys, environmental surveys, etc.
- Meetings with the Town.
- Preparation of miscellaneous supporting materials (public advertisements, ownership affidavits, etc.) as required.
- Liaison and correspondence with regulatory agencies and preparation of responses to comments.
- Liaison with the principal regulatory agencies (United States Army Corps of Engineers [USACE], North Carolina Division of Coastal Management [NCDCM]) and commenting agencies (United States Environmental Protection Agency [USEPA], the United States Fish and Wildlife Service [USFWS], the National Marine Fisheries Service [NMF], the North Carolina Division of Marine Fisheries [NCDMF], etc.)

Dredge Contract Acquisition

Borrow sites have already been identified by the Dare County Hurricane and Beach Erosion Control Project. Further, the Town of Nags Head, in a separate and independent beach nourishment project, will also utilize one or more of the identified borrow sites. (Ref. S-1 being the preferred site, and also S-2, S-3, N-1 and N-2 on Figure 2). It is conceivable that Kill Devil Hills' nourishment project could overlap with Nags Head's project and dredging services coincide. However, the consultant must be prepared, as required, to provide bidding services to construct the beach nourishment project in Kill Devil Hills.

Additional Assistance

If required, the consultant shall provide additional assistance to the Town in coordinating with governmental or other agencies or the public. Such services may include attendance at meetings,

review of materials, preparation of studies or any other issues related to the beach and beach nourishment. Services may also include funding assistance for beach renourishment, dune restoration, mitigation, monitoring studies, and other services related to the project and the operation and maintenance of the constructed beach.

Maps

Figure 1. Town of Kill Devil Hills, North Carolina.

Figure 2. Kill Devil Hills Project Area Map. Dare County Beaches/Northern Project Limits.

Information Requested from Potential Firms

In order for your firm's submission to be considered responsive, it must include the following and be limited to not more than 10 pages, not including any appendices.

(A) A brief introduction of the team (internal or external to your firm) responsible to complete the range of services required – predominantly engineering design and environmental coordination/permitting. This introduction should include: company backgrounds; a list of key personnel that have appropriate coastal engineering, geological, biological, and environmental experience with similar projects, including personnel that would interface most with the Town of Kill Devil Hills and the resource agencies; and, a list with an abbreviated summary of relevant project experience that your firm (or team) has.

(B) The general engineering approach your firm would employ to:

- Evaluate and monitor beach conditions; and,
- Develop benchmarks and nourishment triggers understanding the heterogeneity that exist along the Outer Banks. Your firm should discuss the sand sources envisioned to be used for the nourishment program and provide a very loose chronology of beach nourishment events. This will be used to ascertain your firm's understanding of the sand resources and dredging methodologies/approaches that will be the most efficient for the nourishment program.

Selection Process and Local Governance Information

The Kill Devil Hills Board of Commissioners has the ultimate responsibility to enter into a contract for services agreement with the most qualified firm demonstrating the most effective and practical approach for the proposed beach nourishment project.

The RFQ/interview/selection process and final scope of work (once fully developed) will be completed under the general direction of the Kill Devil Hills Board of Commissioners. The Kill Devil Hills Planning Director will be the point-of-contact for all matters associated with the RFQ, including questions respondents may have, and the proposed beach nourishment project. The Planning Director will also work with the selected firm to finalize reports and presentations, and keep the Board of Commissioners apprised of any developments.

Once the consulting selection process is complete, negotiations on costs for services between the Town and the successful firm or consultant will be conducted.

Submittal Information and Questions/Answer Protocol

Questions regarding this RFQ should be provided in e-mail to greg@kdhnc.com. Questions and subsequent responses will be posted on Kill Devil Hills' website, www.kdhnc.com, where they will be available for review by all interested firms.

Qualifications are to be submitted by 5:00 p.m. on Friday, April 15, 2011 to:

Town of Kill Devil Hills Beach Nourishment Project
Att: Greg Loy, Planning Director
102 Town Hall Drive
P.O. Box 1719
Kill Devil Hills, North Carolina 27948

The Board of Commissioners of the Town of Kill Devil Hills reserve the right to reject any and all proposals, negotiate with the best qualified firm regarding fees and/or the scope of services, or postpone the decision for an indefinite period of time. It is anticipated that the Board of Commissioners will take action on selecting an engineering firm to perform the services contained in the RFQ during public meeting on Monday, May 9, 2011 at 7:00 p.m. in the Meeting Room of the Administration Building, 102 Town Hall Drive, off Colington Road, Kill Devil Hills, North Carolina 27948.

(Town Logo)

NOTICE OF REQUEST FOR QUALIFICATIONS
TOWN OF KILL DEVIL HILLS CONSULTING ENGINEER
For Beach Nourishment and Shore Protection Plan

The Town of Kill Devil Hills, North Carolina is seeking a qualified civil engineering firm or individual or team to develop and design a Shore Protection Plan and beach nourishment project to be constructed and maintained under authorization provided for in Section 206 of the Water Resource Development Act (WRDA) of 1992.

The Town expects the firm or individual hired to possess certain attributes, with the most important being experience in civil engineering practices directly related to planning, developing, constructing and maintaining beach nourishment project(s) in North Carolina and along similar coastlines.

Interested firms or individuals must submit their qualifications to perform these services for the Town of Kill Devil Hills to, Planning Director Greg Loy, P.O. Box 1719, 102 Town Hall Drive, Kill Devil Hills, North Carolina 27948 by 5:00 p.m. on Friday, April 15, 2011.

Posted this 25th day of March 2011.

Mary E. Quidley
Town Clerk

- Coastland Times: publish as a regular legal ad on 3.29.2011
- Post on North Carolina Department of Administration website for procurement of design services
- KDH website, Sunshine List, Electronic Distribution List
- News and Observer: publish as legal ad on 3.27.2011

NOTICE OF REQUEST FOR QUALIFICATIONS
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Posted this 25th day of March 2011.

Mary E. Quidley
Town Clerk

- News and Observer: publish as legal ad on 3.27.2011

**COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC.
A SHAW GROUP COMPANY**



4038 MASONBORO LOOP ROAD, WILMINGTON, NC 28409

910-791-9494 PHONE 910-791-4129 FAX
INTERNET: <http://www.coastalplanning.net>
E-mail: kwillson@coastalplanning.net

August 11, 2011

Greg Loy
Planning Director
Kill Devil Hills
P.O Box 1719
Kill Devil Hills , NC 27948

Re: Proposal for Preliminary Scoping and Inter-Agency Coordination Meetings

Dear Mr. Loy,

Coastal Planning & Engineering of North Carolina (CPENC) is pleased to offer the following proposal to conduct preliminary scoping and inter-agency coordination meetings associated with the Town's efforts to obtain permits and approvals for a shore protection project to be constructed under the authorization of Section 206 of the Water Resources Development Act of 1992 (WRDA-92):

Scope of Work

Preliminary Scoping and Inter-Agency Coordination Meeting

The Town of Kill Devil Hills has initiated efforts to obtain permits and approvals for a shore protection project to be constructed under the authorization of Section 206 of the Water Resources Development Act of 1992 (WRDA-92). At this time it is not possible to accurately map out the exact scope of work necessary to conduct necessary studies associated with the environmental documentation/permitting and the development of the Limited Re-evaluation Report (LRR). This uncertainty is a result of the many variables considered by the U.S. Army Corps of Engineers (USACE) in order to ultimately decide on the appropriate procedures for obtaining permits and updating the engineering documents. In order to more accurately develop a scope of work to develop environmental documentation, submit the necessary permit applications, and update the USACE engineering documents, CPENC has proposed a series of scoping meetings, which will facilitate discussions with the USACE and other resource agencies to allow the USACE to determine the most appropriate approach for this project.

This task includes efforts by CPENC to develop a presentation that describes the proposed project and the proposed methods for developing environmental documentation, submitting the necessary permit applications, and updating the USACE engineering documents. CPENC will present this information at two separate meetings. The first meeting will be with the USACE,

the North Carolina Division of Coastal Management (NCDCM), and representatives from other relevant Federal and State resource agencies. This interagency meeting is intended to clearly define the procedure necessary for permitting the project. The second meeting will be held with staff of the Wilmington District USACE, civil works section. This meeting is meant to define the process for updating the engineering documents for this project. Originally it was assumed that an LRR using the Beach *fx* economic analysis model would be necessary. Based on recent discussions between CPENC and USACE staff, it has been suggested that a full Beach *fx* analysis may not be necessary. This may result in significant cost savings to Kill Devil Hills.

Following these two meetings, CPENC will provide the Town with a brief synopsis of the meeting discussions and any final decisions made by the USACE and other permitting agencies. In addition a detailed scope of work that will include necessary tasks associated with permitting a shore protection project under Section 206 authorization will be provided.

Cost: \$9,850. This task will be completed as a not to exceed contract to be billed as time and expenses.

The proposed services will be governed by the terms and conditions of this proposal and the and the attached terms and conditions titled "CPE of NC_Service Agreement_TM 8 11 11". If these terms and conditions are agreeable to the Town, please print out two copies of the document, initial each page, fill in the applicable information on page 3 under (CLIENT), and sign. Please return both copies to CPENC so that we can execute the contract. Upon execution we will send the Town a fully executed copy of the contract.

Please do not hesitate to call us with any additional questions or concerns. We thank you in advance for your consideration of this proposal.

Sincere Regards,

COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC.

Ken Willson, M.S.
Project Manager

CC: Ann Range, Shaw E&I Contact Administrator
Tom Jarrett, P.E., CPENC
Thomas Campbell, P.E., CPENC

COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC.
SERVICES AGREEMENT
TIME & MATERIALS BASIS

All in accordance with the following terms and conditions.

1. **SCOPE OF SERVICES: COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC. ("CPENC")** agrees to perform for the undersigned **CLIENT**, engineering and consulting ("Services") described in attached Proposal dated August 11, 2011.
2. **FEES, INVOICES AND PAYMENTS:** The Services will be performed on a time and materials not-to-exceed basis for Nine Thousand Eight Hundred Fifty Dollars (\$9,850.00). Invoices will be submitted by CPENC no more frequently than every two weeks, with payment due upon CLIENT'S receipt of invoice. Payment shall be in U.S. Dollars. CLIENT shall be responsible for payments (without deduction or offset from the total invoice amount) of any and all sales, use, value added, gross receipts, franchise and like taxes, tariffs and duties levied against CPENC or its employees by any government or taxing authority. A service charge equal to on and one-half percent (1 1/2 %) per month, or the maximum rate permitted by law, whichever is less, will be added to all accounts which remain unpaid for more than thirty (30) calendar days beyond the date of the invoice. Should there be any dispute as payments to be made on a percent complete basis to any portion of an invoice, the undisputed portion shall be promptly paid.
3. **CLIENTS COOPERATION:** To assist CPENC in performing the Services, CLIENT shall (i) provide CPENC with relevant material, data, and information in its possession pertaining to the specific project or activity, (ii) consult with CPENC when requested, (iii) permit CPENC reasonable access to relevant project sites, (iv) ensure reasonable cooperation of CLIENT's employees in CPENC's activities, and (v) notify and report to all regulatory agencies as required by such agencies.
4. **CONFIDENTIALITY:** In the course of performing Services, to the extent that CLIENT discloses to CPENC, business or technical information that CLIENT clearly marks in writing as confidential or proprietary, CPENC will exercise reasonable efforts to avoid the disclosure of such information to others. Nonetheless, CLIENT shall treat as confidential all information and data furnished to it by CPENC in connection with this Agreement including, but not limited to, CPENC's technology, formulae, procedures, processes, methods, trade secrets, ideas, inventions, and/or computer programs; and CLIENT shall not disclose such information to any third party.
5. **DELAYS AND CHANGES IN CONDITIONS:** If CPENC is delayed or otherwise in any way hindered or impacted at any time in performing the Services by (i) an act, failure to act or neglect of CLIENT or CLIENT'S employees or any third parties; (ii) changes in the scope of the work; (iii) unforeseen, differing or changed circumstances or conditions including differing site conditions, acts of force majeure (such as fires, floods, riots, and strikes); (iv) changes in government acts or regulations; (v) delay authorized by CLIENT and agreed to by CPENC; or (vi) any other cause beyond the reasonable control of CPENC, then 1) the time for completion of the Services shall be extended based upon the impact of the delay, and 2) CPENC shall receive an equitable compensation adjustment. Any such equitable adjustment shall be based on CPENC's then current Time and Material Rates, as may be provided in a Rate sheet attached hereto.
6. **INSURANCE:** CPENC is presently protected by Worker's Compensation Insurance as required by applicable law and by General Liability and Automobile Liability Insurance (in the amount of \$1,000,000 combined single limit) for bodily injury and property damage. Insurance certificates will be furnished to CLIENT on request. If the CLIENT requires further insurance coverage, CPENC will endeavor to obtain said coverage, and CLIENT shall pay any extra costs therefor.
7. **INDEMNITIES:** CPENC shall defend, indemnify and hold harmless CLIENT from and against loss or damage to tangible property, or injury to persons, to the extent arising from the negligent acts or omissions or willful misconduct of CPENC, its subcontractors, and their

Nothing herein is meant to prevent nor shall be interpreted as preventing either party from disclosing and/or using any information or data (i) when the information or data are actually known to the receiving party before being obtained or derived from the transmitting party, (ii) when information or data are generally available to the public without the receiving party's fault at any time before or after it is acquired from the transmitting party; (iii) where the information or data are obtained or acquired in good faith at any time by the receiving party from a third party who has the same in good faith and who is not under any obligation to the transmitting party in respect thereto; (iv) where a written release is obtained by the receiving party from the transmitting party; (v) three (3) years from the date of receipt of such information; or (vi) when required by process of law; provided, however, upon service of such process, the recipient thereof shall use reasonable efforts to notify the other party and afford it an opportunity to resist such process.

respective employees and agents acting in the course and scope of their employment. CLIENT shall defend, indemnify and save harmless CPENC (including its parent, subsidiary, and affiliated companies and their officers, directors, employees, and agents) from and against, and any indemnity by CPENC shall not apply to, loss, damage, injury or liability arising from the acts or omissions of CLIENT, its contractors, and their respective subcontractors, employees and agents, or of third parties.

8. LIMITATIONS OF LIABILITY:

- a. GENERAL LIMITATION - CLIENT'S SOLE AND EXCLUSIVE REMEDY FOR ANY ALLEGED BREACH OF WARRANTY BY CPENC SHALL BE TO REQUIRE CPENC TO RE-PERFORM ANY DEFECTIVE SERVICES. CPENC'S LIABILITY AND CLIENT'S REMEDIES FOR ALL CAUSES OF ACTION ARISING HEREUNDER WHETHER BASED IN CONTRACT, WARRANTY, NEGLIGENCE, INDEMNITY, OR ANY OTHER CAUSE OF ACTION, SHALL NOT EXCEED IN THE CUMULATIVE AGGREGATE (INCLUDING ANY INSURANCE PROCEEDS) WITH RESPECT TO ALL CLAIMS ARISING OUT OF OR RELATED TO THIS AGREEMENT, WHATEVER MINIMUM AMOUNT MAY BE REQUIRED BY LAW OR, IF NONE, THE LESSER OF THE AMOUNT OF COMPENSATION FOR SUCH SERVICES, OR \$100,000 (WHICH AMOUNT INCLUDES ANY FEES AND COSTS INCURRED IN RE-PERFORMING SERVICES). THE REMEDIES IN THIS AGREEMENT ARE CLIENT'S SOLE AND EXCLUSIVE REMEDIES. ALL CLAIMS, INCLUDING THOSE FOR NEGLIGENCE OR ANY OTHER CAUSE WHATSOEVER SHALL BE DEEMED WAIVED UNLESS SUIT THEREON IS FILED WITHIN ONE (1) YEAR AFTER THE EARLIER OF (1) CPENC'S SUBSTANTIAL COMPLETION OF THE SERVICES OR (2) THE DATE OF CPENC'S FINAL INVOICE. FURTHER, CPENC SHALL HAVE NO LIABILITY FOR ANY ACTION INCLUDING DISCLOSURE OF INFORMATION WHERE IT BELIEVES IN GOOD FAITH THAT SUCH ACTION IS REQUIRED BY PROFESSIONAL STANDARDS OF CONDUCT FOR THE PRESERVATION OF PUBLIC HEALTH, SAFETY OR WELFARE, OR BY LAW.
- b. CONSEQUENTIAL DAMAGES: FURTHER AND REGARDLESS OF ANY OTHER PROVISION HEREIN, CPENC SHALL NOT BE LIABLE FOR ANY INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFITS, DECLINE IN PROPERTY VALUE, REGULATORY AGENCY FINES, LOST PRODUCTION OR LOSS OF USE) INCURRED BY CLIENT OR FOR WHICH CLIENT MAY BE LIABLE TO ANY THIRD PARTY OCCASIONED BY THE SERVICES OR BY APPLICATION OR USE OF REPORTS OR OTHER WORK PERFORMED HEREUNDER.

9. **GOVERNING LAWS:** This Agreement shall be governed and construed in accordance with the laws of the State of Florida.

10. **TERMINATION:** Either party may terminate this Agreement with or without cause upon twenty (20) days' written notice to the other party. Upon such termination, CLIENT shall pay CPENC for all Services performed hereunder up to the date of such termination. In addition, if CLIENT terminates, CLIENT shall pay CPENC all reasonable costs and expenses incurred by CPENC in effecting the termination, including, but not limited to non-cancelable commitments and demobilization costs.

11. **ASSIGNMENT:** Neither CPENC nor CLIENT shall assign any right or delegate any duty under this Agreement without the prior written consent of the other, which consent shall not be unreasonably withheld. Notwithstanding the foregoing, the Services may be performed by any subsidiary or affiliate of The Shaw Group Inc., or other person designated by CPENC, and, CPENC may, upon notice to CLIENT, assign, pledge or otherwise hypothecate the cash proceeds and accounts receivable resulting from the performance of any Services or sale of any goods pursuant to this Agreement.

12. MISCELLANEOUS:

a. **ENTIRE AGREEMENT, PRECEDENCE, ACCEPTANCE MODIFICATIONS:** The terms and conditions set forth herein constitute the entire understanding of the Parties relating to the provisions of the Services by CPENC to the CLIENT. All previous proposals, offers, and other communications relative to the provisions of these Services by CPENC, oral or written, are hereby superseded, except to the extent that they have been expressly incorporated by reference herein. In the event of conflict, the three pages of this Agreement shall govern. CLIENT may accept these terms and conditions by execution of this Agreement or by authorizing CPENC to begin work. Any modifications or revision of any provisions hereof or any additional provisions contained in any purchase order, acknowledgement or other document issued by the CLIENT is hereby expressly objected to by CPENC and shall not operate to modify the Agreement.

b. **DISPUTES, ATTORNEY FEES -** Any dispute regarding this Agreement or the Services shall be resolved first by exchange of documents by senior management of the parties, who may be assisted by counsel. Any thereafter unresolved disputes shall be litigated in the state whose law governs under Section 13 hereunder. In any litigation, the Prevailing Party shall be entitled to receive, as part of any award or judgment, eighty percent (80%) of its reasonable attorneys' fees and costs incurred in handling the dispute. For these purposes, the "Prevailing Party" shall be the party who obtains a litigation result more favorable to it than its last formal

written offer (made at least twenty calendar days prior to the formal trial) to settle such litigation.

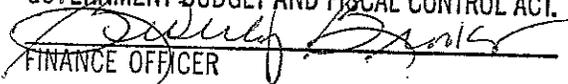
- c. **WAIVER OF TERMS AND CONDITIONS** - The failure of CPENC or CLIENT in any one or more instances to enforce one or more of the terms or conditions of this Agreement or to exercise any right or privilege in the Agreement or the waiver by CPENC or CLIENT of any breach of the terms or conditions of this Agreement shall not be construed as thereafter waiving any such terms, conditions, rights, or privileges, and the same shall continue and remain in force and effect as if no such failure to enforce had occurred.
- d. **NOTICES** - Any notices required hereunder may be sent by orally confirmed US Mail, courier service (e.g. FedEx), orally confirmed telecopy (fax) or orally confirmed email (further confirmed by US Mail) to the addresses set forth below.
- e. **SEVERABILITY AND SURVIVAL** - Each provision of this Agreement is severable from the others. Should any provision of this Agreement be found invalid or unenforceable, such provision shall be ineffective only to the extent required by law, without invalidating the remainder of such provision or the remainder of this Agreement.

Further, to the extent permitted by law, any provision found invalid or unenforceable shall be deemed automatically redrawn to the extent necessary to render it valid and enforceable consistent with the parties' intent. For example, if the gross negligence standard in Section 11 is unenforceable under an applicable "anti-indemnity" statute, but a sole negligence standard is enforceable, the sole negligence standard shall be automatically substituted therefor. The terms and conditions set forth herein shall survive the termination of this Agreement.

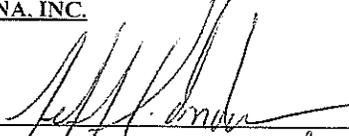
CLIENT and CPENC agree to the foregoing (INCLUDING THE LIMITATIONS ON LIABILITY IN SECTIONS herein) and have caused this Agreement to be executed by their duly authorized representatives as of the date set forth below.

Executed on _____, 2011

THIS INSTRUMENT HAS BEEN PREAUDITED
IN THE MANNER REQUIRED BY THE LOCAL
GOVERNMENT BUDGET AND FISCAL CONTROL ACT.


FINANCE OFFICER

COASTAL PLANNING & ENGINEERING OF NORTH CAROLINA, INC.

By (Sign): 

Print Name: JEFFREY L. ANDREWS

Title: VICE PRESIDENT

Address: 2481 Boca Raton Blvd
Boca Raton, FL 33431

Phone: 561-391-8102

Fax: 561-391-9116

E-mail: Jeffrey.Andrews@Shaw,RP.Co

(CLIENT)

Town of Kill Devil Hills

By (Sign): 

Print Name: Debora P. Diaz

Title: Town Manager

Address: P. O. Box 1719
102 Town Hall Drive
Kill Devil Hills, NC 27948

Phone: 252-449-5300

Fax: 252-441-7946

E-mail: debbie@kdhnc.com



A. COMPANY BACKGROUND

COASTAL PLANNING & ENGINEERING, INC. (CPE), a Shaw Company, is a multidisciplinary coastal services firm specializing in beach nourishment and inlet management. We are one of the most experienced beach nourishment consultants in the nation, having designed, secured permits, managed construction and conducted monitoring of over 70 major beach nourishment projects on the East and Gulf coasts of the U.S. Four of those projects used Section 206 of the Water Resources Development Act (WRDA) of 1992 to qualify our clients for federal reimbursement. As leaders in the field of beach nourishment, our unparalleled experience in coastal projects and the permitting process translates into tangible client benefits (*highlighted in our CPE Qualifications and Client Benefit Matrix on page 2*).

We have all of the disciplines in-house to help you develop an effective and cost efficient beach management program for Kill Devil Hills. Founded in 1984, we have 58 professionals including coastal engineers, biologists, geologists, modelers, oceanographers, surveyors and geographic information systems (GIS) specialists. Utilizing complementary disciplines, we provide integrated analyses of coastal processes and environmental considerations to develop projects that work with nature and meet our clients' objectives.

CPE can provide all of the required engineering, environmental, geotechnical, planning, and general coastal management services to the Town of Kill Devil Hills in support of a beach nourishment project to be constructed under authorization provided for in Section 206 of the Water Resource Development Act (WRDA) of 1992.

B. KEY EXPERIENCE WITH SIMILAR PROJECTS

CPE has considerable experience with federally reimbursable shore protection projects. An early example is the City of Delray Beach, Florida, where the coastal road was washing out after a concrete revetment failed in 1972. Thomas Campbell, President of CPE, guided the City of Delray Beach to construct its initial shore protection project in 1973 under special federal reimbursable authorization. CPE has engineered three reimbursable renourishment projects for Delray Beach since 1973, as well as others in Florida. Richard Spadoni, Senior Vice President of CPE was an author of the Section 206 language that was included in the Water Resources Development Act of 1992. The Section 206 legislation was modeled after the Delray Beach reimbursable authorization. Mr. Spadoni was able to have Section 206 placed into law with the support of a number of beachfront communities who wished to control their own beach nourishment programs.



SERVICES TO BE PROVIDED TO THE TOWN:

- ✓ Assistance with the Section 206 process preparation and processing oversight of the Limited Re-evaluation Report (LRR)
- ✓ Assistance in securing a Project Partnership Agreement (PPA) to secure Federal funding
- ✓ State and Federal permits
- ✓ Environmental documentation and monitoring
- ✓ Construction tasks including development of plans and specifications, bidding and contractor selection
- ✓ Cost analysis
- ✓ Geotechnical analysis and borrow area design
- ✓ Construction administration and construction oversight
- ✓ Coastal engineering analysis and numerical modeling of coastal processes

The 206 Authority has been used in Lee County, Manatee County, and Bay County Florida to build reimbursable projects. In Bay County, CPE was able to reduce the original Corps design project volume by approximately 18 million cubic yards. The reduction in required volume yielded an affordable and highly functional Locally Preferred Plan that received federal funding. Panama City Beach demonstrated that the beach could meet Federal requirements and perform well using a lower volume template. CPE can develop a similar plan for Kill Devil Hills through the LRR development process. CPE is the only North Carolina firm with staff that is experienced with the 206 process having built projects under this authorization with reimbursable federal funds provided to the local sponsors.

Our recent experience with the NEPA and SEPA processes on North Carolina coastal projects demonstrates the relevant familiarity required to help Kill Devil Hills develop the most cost-effective and timely strategy for obtaining the necessary permits to construct the preferred shore protection project. We are especially qualified to evaluate sand sources for your project as CPE is the nation's leading sand search team. This is one of the most important factors in formulating cost-effective and environmentally acceptable nourishment for the long term. Our location in Wilmington, minutes from the District office, allows us easy access to data and personnel that are of great assistance on projects of this type.

CPE QUALIFICATIONS & CLIENT BENEFIT MATRIX

AN OVERVIEW OF WHY CPE IS THE INDUSTRY LEADER IN BEACH NOURISHMENT AND WHAT IT MEANS FOR YOUR PROJECT

CPE Qualification	Client Benefit	Evidence
CPE provides in-house, multidisciplinary coastal science services for its coastal projects.	Engineering, geotechnical, survey, modeling, and other services are provided to the client in a comprehensive package.	Our client base attests to the quality of our services and comprehensive coastal programs. (See testimonial letters in Appendix C)
CPE has the experience of 70 coastal nourishment projects.	CPE can provide Kill Devil Hills with a wealth of previous experiences with shoreline management programs.	The projects included in this submittal are a sample of the type of work CPE has completed for satisfied client. (See testimonial letters in Appendix C)
CPE has experience navigating Federal funding avenues.	CPE's intimate knowledge of Federal funding allows for reimbursed projects, <i>lowering cost to the client</i> and <i>enhancing project performance</i> .	Delray Beach's renowned beach has benefited from three additional federally-reimbursed nourishment projects as a result.
CPE has more experience than any other firm with Section 206 Authorized and other Federally reimbursable shore protection projects.	CPE has an insight into Section 206 authority, giving us the ability to apply strategies in achieving 206 authority while meeting clients' objectives	CPE "wrote the book" on Section 206 implementation for storm protection projects. Lee County, Manatee County, and Bay County, FL have benefited from reimbursable projects and, in the case of Bay County, a Locally Preferred Plan was developed over the Corps plan.
CPE has recent experience with NEPA and SEPA processes on the North Carolina coast.	High quality, cost-effective, environmentally compatible design, which can avoid permit delays.	Our positive experience with successfully permitting three shore protection projects in North Carolina (Emerald Isle, Topsail Beach, North Topsail Beach). (See testimonial letters in Appendix C)

C. PERSONNEL

The following is a list of key personnel that would interface most with the Town and resource agencies. A brief description of project experience and roll that each person will play is also included. A more detailed resume for each person is included in Appendix A.

TOM JARRETT, P.E. (PROJECT MANAGER AND PROJECT ENGINEER) Mr. Jarrett is a Senior Coastal Engineer for CPE. Prior to joining CPE, Mr. Jarrett worked for the USACE – Wilmington District for 34 years in the field of Coastal Engineering. Tom Jarrett was Chief of the Coastal, Hydrology, & Hydraulics (CH&H) Section of the Wilmington District Corps of Engineers during the formulation of the Dare County Federal coastal storm damage reduction project. Tom attended several meetings with community leaders in Dare County in the 1980's and 1990's prior to the authorization of the federal feasibility study and continued to be involved in the formulation of the shore protection project until its authorization. Since joining CPE in 2002, Mr. Jarrett has managed the permitting of four (4) major beach projects in North Carolina. Mr. Jarrett is recognized as one of the foremost experts in coastal engineering in the State of North Carolina. He is a member of the North Carolina Coastal Resource Commission's Science Panel on Coastal Hazards, which provides the Coastal Resources Commission (CRC) with scientific data and recommendations pertaining to coastal topics. He is also a member of the Board of the North Carolina Beaches, Inlets, and Waterways Association (NCBIWA).

KEN WILLSON, M.S. (DEPUTY PROJECT MANAGER AND PROJECT GEOLOGIST) Mr. Willson has been an important member of CPE for the past 8 years. His primary responsibilities have included comprehensive project management, North Carolina office management, project geologist, and directing and assisting data collection including geophysical surveys, vibracoring operations, jet probe operations, hydrographic surveys, and beach profile surveys. Mr. Willson has worked with Kill Devil Hills over the past 2 years in developing the feasibility analysis, which has assisted the Town in making the decision to pursue a Section 206 beach nourishment project.

Mr. Willson has also managed projects in North Carolina for The Town of North Topsail Beach and New Hanover County. He also assists in data analysis and reduction, product preparation, report preparation and presentation of findings of marine sand searches along the Atlantic and Gulf Coast of the United States. Mr. Willson has also coordinated extensively with the North Carolina Coastal Resources Commission (CRC) with regards to the recently adopted technical standards for beach fill projects (15A NCAC 07H.0312), including publications and presentations describing real world application of the standards.

BRAD ROSOV, M.S. (PROJECT BIOLOGIST) Mr. Rosov joined CPE in 2007. Mr. Rosov has over 10 years of experience in coastal biology and environmental science. His area of focus has been primarily in the preparation of NEPA/SEPA compliant environment documents in order to obtain Federal and State permits for coastal projects. His experience includes the development of Environmental Impact Statements (EIS), Environmental Assessments (EA), Biological Assessments (BA), Essential Fish Habitat Assessments (EFH), and Cumulative Effects Assessments (CEA). Mr. Rosov has developed these documents in support of beach nourishment projects for Topsail Beach, North Topsail Beach, Emerald Isle, and Figure Eight Island in North Carolina as well as several municipalities in Florida. Along with documentation, he has experience with biological monitoring in support of these coastal projects.

RICHARD (RICK) SPADONI (SECTION 206 COORDINATOR) Mr. Spadoni is Senior Vice President of CPE. Mr. Spadoni has served as a Project Manager for 25 beach nourishment and renourishment projects since 1977, including geotechnical (sand search) investigations and Environmental Assessments. Mr. Spadoni was the author of Section 206 of the Water Resources Development Act of 1992, which provided for Federal reimbursement of beach nourishment projects that were managed by the local project sponsors. This provision of the WRDA allowed local governments to take control of their own shoreline protection projects controlling the schedule, design, sand

source, and construction administration while still receiving federal funding on a reimbursable basis. During his career, Mr. Spadoni has conducted final design modifications and assisted in the preparation of the final project plans and specifications for multiple projects including the Anna Maria Island Beach Renourishment Project in 2002 (Constructed under Section 206 Authorization) and the Lido Key Beach Nourishment Projects in 1997, 1999 and 2002 (Locally Constructed and Federally Reimbursed). In both administrative and federal court cases, Mr. Spadoni was designated as an expert in coastal engineering and hydrography, as well as marine biology.

THOMAS J. CAMPBELL, P.E. (QUALITY CONTROL/QUALITY ASSURANCE MANAGER) Mr. Campbell is Executive Vice President and a founding partner of CPE. Mr. Campbell has over 30 years of academic and professional engineering background specializing in coastal engineering projects. He has been Principal in Charge over an unprecedented seventy (70) beach nourishment projects, as well as inlet relocation and waterway dredging projects. As the Chief Engineer of CPE, he directs coastal engineering analyses and designs, state-of-the-art modeling including DELFT3D, construction supervision and inspections, recreational and storm damage analyses, beach and hydrographic/geotechnical surveys, permitting and funding applications, and environmental monitoring and assessments for coastal projects. He has extensive experience providing expert testimony in hearings and other litigation and is a nationally recognized expert in coastal engineering issues. He has served on a number of task forces, boards and committees on beach preservation at the local, state and national level. Mr. Campbell has 14 publications on beach design and channel relocation, mitigation strategy, and geology associated with locating beach-compatible sand.

STEPHEN KEEHN, P.E. (SUPPORT FOR COASTAL ENGINEERING AND SECTION 206 COORDINATION) Mr. Keehn is a Senior Coastal Engineer with CPE. Mr. Keehn is the project manager for several comprehensive beach nourishment programs including Panama City Beach, Florida (Constructed under Section 206 Authorization), Captiva and Sanibel Islands, Florida (Locally Constructed and Federally Reimbursed), and Collier County, Florida. Mr. Keehn brings a unique inside perspective to the USACE process having worked for the USACE Jacksonville District prior to joining CPE. At the USACE, Mr. Keehn worked as a coastal engineer preparing feasibility and detailed design reports for coastal protective works. He performed QA/QC of coastal engineering and economic analysis projects. Given this unique perspective, Mr. Keehn has been able to provide his clients a high level of service, which often includes strategic project formulation to take advantage of Federal authorizations to allow clients to customize their project to their individual needs while securing Federal funds to supplement project cost.

MELANY LARENAS, P.G. (BORROW AREA DESIGN) Ms. Larenas' team is responsible for detailed review, processing and analysis of all geological and geophysical data for CPE projects. She is in charge of all borrow area development and design for CPE. Ms. Larenas holds a professional geologist (PG) license in North Carolina, Florida, and Alabama and is responsible for sampling design and acquisition of geological and geotechnical data as well as managing the processing of geotechnical and remote sensing data. Ms. Larenas is able to isolate beach compatible material through the integration of geotechnical and remote sensing data within a GIS framework. To date, Ms. Larenas has processed the geotechnical data and designed and/or permitted borrow areas for over 20 coastal restoration projects including The Town Emerald Isle, NC; The Town of North Topsail Beach, NC; The Town of Topsail Beach, NC; Anna Maria Island, FL; Collier County, FL; Bay County, FL; Estero Island, FL; Captiva Island, FL; and Nantucket Island, MA.

D. RELEVANT PROJECT EXPERIENCE

The following is a list of our firm's relevant project experience with shore protection projects. Below the list of projects is a comprehensive table listing the projects and showing the relevant services provided by CPE for each project. A detailed description of each project listed below can be found in Appendix B.

1. *ANNA MARIA ISLAND BEACH NOURISHMENT AND RENOURISHMENT PROJECTS | MANATEE COUNTY, FLORIDA:* In 2002 CPE provided comprehensive coastal engineering support for Manatee County to construct a 5.2 mile beach nourishment project, which placed 1,900,000 cy of sand on Anna Maria Island under the authority of Section 206. CPE has been retained as the coastal engineer for Anna Maria since that time and is currently coordinating efforts to construct a second Section 206 beach re-nourishment project for the community.
2. *PANAMA CITY BEACHES PROJECT | BAY COUNTY, FLORIDA:* CPE provided comprehensive coastal engineering support for Bay County to construct a 17 mile beach nourishment project at Panama City Beach in 1998/1999 under the authority of Section 206. CPE has been retained as the coastal engineer for Bay County since that time and has coordinated several beach fill efforts including renourishment and emergency storm damage repair projects for the community.
3. *THE CITY OF DELRAY BEACH | PALM BEACH COUNTY, FLORIDA:* CPE's chief engineers have provided beach nourishment services to the City of Delray Beach since 1973. Since the initial 1973 nourishment, Delray has undergone four (4) periodic renourishments and one storm damage repair project. Since 1973, the beach of Delray Beach has made a major comeback. Once at risk to being overtaken by the ocean, highway A1A and its neighboring properties have been protected by the wide beach. The renourished beach of Delray Beach is an award winning beach project. It is also an important economic asset to both the City and State.
4. *BOGUE INLET CHANNEL EROSION RESPONSE PROJECT | EMERALD ISLE, NORTH CAROLINA:* CPE provided comprehensive coastal engineering support for the Town of Emerald Isle from 2002 to 2005 to construct an inlet channel realignment/beach nourishment project. Approximately 690,000 cubic yards of fill was distributed along 4.5 miles of the town's ocean shoreline and the inlet channel was moved 3,500 feet to the west to address channel related erosion issues on the western tip of the town.
5. *NORTH TOPSAIL BEACH NOURISHMENT AND CHANNEL RELOCATION PROJECT | NORTH TOPSAIL BEACH, NORTH CAROLINA:* CPE provided comprehensive coastal engineering support for the Town of North Topsail Beach through the process of obtaining State and Federal permits to construct a multi-phased inlet channel realignment/beach nourishment project for over 11 miles of shoreline.
6. *CAPTIVA AND SANIBEL ISLANDS BEACH NOURISHMENT AND RENOURISHMENT PROJECTS | CAPTIVA AND SANIBEL:* Since 1988, CPE has provided all required services for the construction of the original Federally authorized beach nourishment and two subsequent renourishments of the Federal Storm Damage Reduction Project for a 6-mile long beach constructed on both Captiva and Sanibel Islands on the Gulf Coast of Florida.

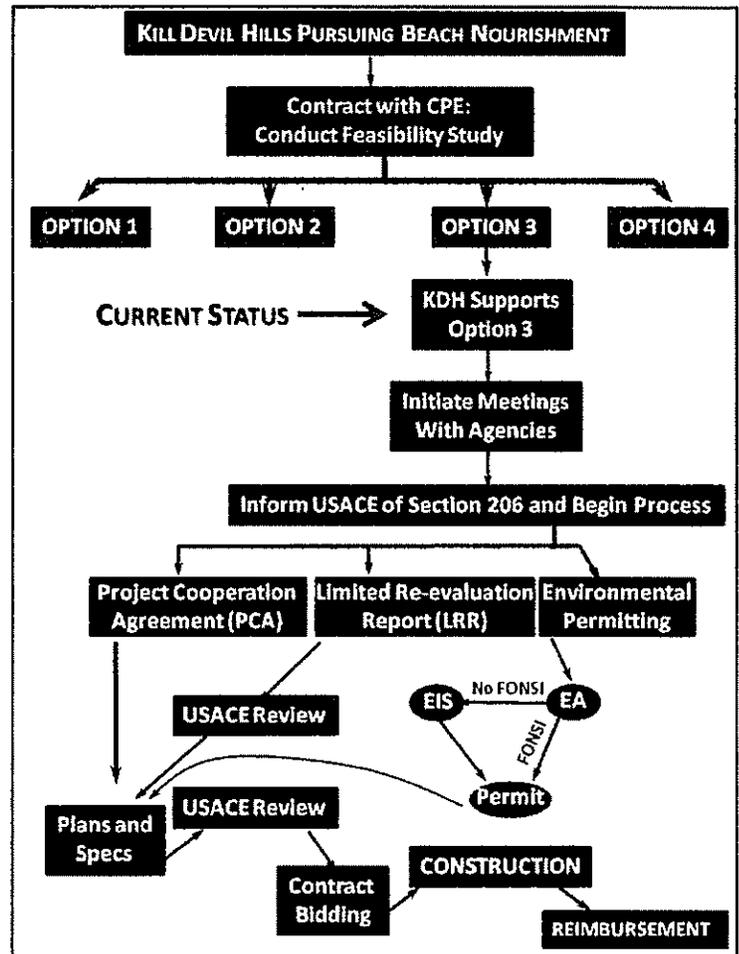
 RELEVANT PROJECT EXPERIENCE	Assistance with Section 206 Process or Other Federally Reimbursed Projects	Services Required to Obtain State and Federal Permits	Coastal Engineering Services	Working with Federal Resource Agencies	Working with NC Resource Agencies	Development of Plans and Specifications	Construction Administration and Oversight	Environmental Monitoring and Mitigation	Assistance in Securing a Project Partnership Agreement	Environmental Documentation	Geotechnical Analysis	Project Cost Analysts	Preparation/Processing Oversight of an LRR or Other Federal Civil Works Documents (i.e. GRR, GDM, or Feasibility Report).	Bidding and Contractor Selection	Funding Assistance for Beach Nourishment	NEPA Processing	North Carolina SEPA Processing	Post-storm Beach Renourishment	Dune Restoration
	1. ANNA MARIA ISLAND BEACH NOURISHMENT AND RENOURISHMENT PROJECTS	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
2. PANAMA CITY BEACHES PROJECT BAY COUNTY, FL	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	
3. THE CITY OF DELRAY BEACH, FLORIDA	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	
4. BOGUE INLET EMERALD ISLE, NORTH CAROLINA		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓		
5. NORTH TOPSAIL BEACH, NORTH CAROLINA		✓	✓	✓	✓			✓		✓	✓	✓				✓	✓		✓
6. CAPTIVA AND SANIBEL ISLANDS, FL	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓

GENERAL ENGINEERING APPROACH

CPE has an excellent understanding of the Town of Kill Devil Hills’ project due to CPE’s formulation of a Feasibility Evaluation for the Town in 2009. This study investigated the strengths and weaknesses of the currently proposed USACE option and evaluated three additional options. Option 3 was endorsed by the Town as the preferred option and represents a locally constructed Section 206 Locally Preferred Plan. This plan is a scaled back version of the National Economic Development (NED) Plan, which was authorized by the Federal Government in 2000. The NED Plan includes the construction of dunes and uses an alternate borrow source (N1). Based on the available information for average grain size of the native beach, the Locally Preferred Plan’s use of borrow area S1 would result in a reduction in the necessary fill volume of 1.4 million cy. Furthermore additional reduction in volume of 500,000 cy would be realized through the elimination of the dune portion of the project. These modifications may also increase the benefit to cost ratio of the project, which would help make the case for the prioritization of this project by Congress for funding.

The flow chart herein included illustrates the anticipated process the Town will need to undertake in order to implement the Section 206 project. The first step in moving forward with the Town's shore protection program will be to initiate a meeting with resource agencies and tentatively present the proposed plan. The feedback received during this meeting will dictate the scope of the remainder of the permitting process. Based on our past experience with Section 206 projects and a number of recent conversations with USACE Headquarters staff, the second step in the process is to submit a letter to the USACE informing them of the Town's intention to pursue the project under Section 206 Authorization.

At that point the process becomes a three pronged parallel process in which CPE will coordinate efforts for obtaining the Project Cooperation Agreement (PCA, a.k.a. Project Partnership Agreement PPA), preparing a Limited Re-evaluation Report (LRR), and obtaining environmental permits for the proposed project. CPE has extensive experience with each task. We have obtained PPA's for numerous reimbursable projects including Anna Maria Island, Bay County, Captiva and Sanibel Island, Delray Beach, and Boca Raton, Florida. CPE's experience completing LRRs and securing permits is in the following discussion.



A FLOW CHART DIAGRAMMING THE PROCESS THAT THE TOWN OF KILL DEVIL HILLS HAS INITIATED TO DATE AND THE ANTICIPATED REMAINDER OF THE PROCESS REQUIRED TO CONSTRUCT THE PROJECT UNDER SECTION 206 AUTHORIZATION.

ENGINEERING REPORT (LIMITED RE-EVALUATION REPORT – LRR)

CPE has extensive experience conducting Re-Evaluation Reports for the USACE. We have completed such reports for Anna Maria Island, Bay County, Captiva and Sanibel Island, and Delray Beach, Florida. This report will build on the existing USACE documentation to provide a complete and up to date assessment of Kill Devil Hills, including the establishment and evaluation of beach health indicators, and will serve as the new shoreline protection plan for the Town of Kill Devil Hills (i.e. the Master Nourishment and Beach Preservation Plan). The re-evaluation will allow for the Town to modify the current plan from the NED plan to the Locally Preferred Plan. This will involve a detailed engineering analysis of the current state of the beach which may require updated beach profile surveys. CPE has experienced in-house staff that can provide this service in a way that allows for seamless data flow from surveyors to coastal engineers who will design the project. This will also allow for the opportunity to re-examine nourishment interval, which can result in a decrease in cost of the project over its lifetime. We are well aware of the heterogeneity of the erosional characteristics along

the Dare County shoreline. The current NED plan specifies a 3 year nourishment cycle. This is a relatively high renourishment rate and was based on some of the higher erosion rates which are experienced along South Nags Head. The separation of the Kill Devil Hills portion of the Federal project will allow the Town to develop the most cost-effective re-nourishment interval for its particular section of the project, which again may result in a favorable increase in the benefit to cost ratio.

An update to the original cost-benefit analysis will also be required as part of the LRR. CPE's staff has the knowledge and experience working with the USACE mandated modeling software (BEACH-fx) employed in such a study. In addition to these modeling capabilities our professional engineering staff are proficient in using the most state of the art numerical modeling software packages, such as DELFT3D, to evaluate anticipated impacts of offshore borrow areas on the adjacent shorelines should such analysis be necessary.

PERMIT PROCESS

CPE is one of the most experienced firms in the State with regards to permitting beach nourishment projects. We have successfully permitted three nourishment projects in North Carolina (Bogue Inlet, North Topsail Beach, and Topsail Beach) and are currently involved in two other projects. We guide our clients through the permitting process based on a thorough understanding of current regulations and environmental concerns. Based on years of professional respect and knowledge, we have built strong relationships with the regulatory agencies that will play a role in the permitting process. These agencies include USACE, USEPA, USFWS, NMFS, NCDCM, and NCDMF amongst others. These strong professional relationships allow for positive interaction between the Town and the agencies, to quickly and concisely respond to comments providing the latest scientific information available.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

We anticipate that the Town could realize significant cost and time savings by conducting an Environmental Assessment (EA) rather than an EIS to support the issuance of a Federally issued Individual Permit. Most shore protection projects require the development of an Environmental Impact Statement as part of the NEPA process. However, an EA is feasible due to a wealth of project-specific data and environmental information available from the USACE Feasibility Study (Dare County Hurricane and Erosion Protection Project) and the local Beach Nourishment Project for the Town of Nags Head. This information is readily available and includes native beach characteristics and characteristics of the borrow area sediments. Furthermore, there is precedent which may allow for the issuance of a General Permit 291 in lieu of an Individual Permit which could streamline the NEPA process further. The information included within required environmental documents will serve to satisfy the needs of NEPA and will result in the issuance of necessary Federal permits and authorizations.

Should the Town wish to pursue a Programmatic EIS, CPE is capable of assisting in this process as we are currently assisting Fire Island, New York with a Programmatic EIS in support of their shore protection project. While the EIS and EA approach can result in the issuance of a 30 year permit for the project, the General Permit 291 approach may only result in the issuance of a 3 year permit. Given that State rules only allow for the issuance of three year permits, the GP 291 three year permit should not be seen as problematic as the renewal processes for both the State Major CAMA permit as well as the GP 291 Federal permit are fairly streamlined and will not require significant efforts. Depending on the permitting process, which ultimately will be dictated by the USACE regulatory staff, it may be necessary to provide additional documentation in the form of a biological assessment (BA), an essential fish habitat report (EFH), and/or a cumulative effects assessment (CEA). Our

environmental staff has prepared each of these documents for both Section 206 projects and for projects in North Carolina.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

Beach nourishment projects, including the proposed project for Kill Devil Hills require a State CAMA Major Permit. With regards to the State permit, the process is similar whether an EIS, EA, or General Permit is used to obtain the Federal Permit. For each of the five North Carolina projects that we have completed or are currently completing, we have worked through the SEPA process and completed Major CAMA Permit Applications. The major differences in the type of data required to obtain a State Permit is associated with the State Sediment Criteria Rules (15A NCAC 07H .0312). As a member of the CRC Coastal Hazards Science Panel, Tom Jarrett helped formulate the new sediment criteria and CPE was the first organization in the state to work with these rules. Since then CPE has completed all requirements for two (2) other projects.

It is not anticipated that any additional data will be needed for delineating borrow sites. However, if the process dictates that these services are necessary, CPE is the nation's leading Sand Search team and has identified more offshore sand for beach fill than any other firm in the Country.

While the Nags Head project has received a one-time approval for dredging during the summer months, we believe, given our expertise and relationships with the various state and federal resource agencies, we would be able to obtain a similar approval for Kill Devil Hills. The safety issues that were paramount in Nags Head's approval to construct its project during the summer would all be applicable to Kill Devil Hills. CPE has worked closely with all of the major dredging companies and could obtain the necessary information from the dredging industry to support the position for summer time work.

The process by which the Town constructs a Federally Authorized project under Section 206 authorization requires that the USACE provide review and oversight of the process. As such, there will be considerable coordination between the Town, CPE, and the USACE Wilmington District Staff. CPE is uniquely qualified to assist in these efforts for several reasons. CPE is the industry leader in supporting clients with reimbursable, federally authorized shore protection projects. Our staff has the knowledge and experience to assist USACE staff on what may be an unfamiliar process to some. Our team is led by Mr. Tom Jarrett, who worked for the Wilmington District for 34 years. His experience working with the Wilmington District will play an invaluable roll in the project due to his long standing professional relationships with the Wilmington District staff and his familiarity with the specifics of the Dare County Hurricane and Beach Erosion Control Project. In addition to Mr. Jarrett, Ken Willson and Brad Rosov have also formed close professional relationships with Wilmington District Staff. Our office is located within 10 minutes of the Wilmington District office, which will facilitate convenient and efficient coordination throughout the process.

Once the PCA, the LRR, and the environmental permitting are complete, the Town will be in a position to prepare Plans and Specifications in preparation of contract bidding with a construction contractor. CPE has extensive experience with preparing such documents for Federally reimbursable projects, and projects in North Carolina as shown in the **Relevant Project Experience** section above.

IN-HOUSE CAPABILITIES

COASTAL PLANNING & ENGINEERING'S TEAM OF PROFESSIONALS CAN PREPARE AND DEVELOP THE FOLLOWING:

- | | |
|--|------------------------------------|
| ✓ Project synopses | ✓ Excavation and reclamation areas |
| ✓ Computations of anticipated dredge and fill volumes | ✓ Permit drawings |
| ✓ Vicinity maps | ✓ Geotechnical data |
| ✓ Project plans | ✓ Beach fill cross sections |
| ✓ Descriptions of construction methodology necessary for the preparation of the plans and specifications | |

With the experience of constructing over 70 shore protection projects, we have proven capability to provide any additional ancillary services such as public advertisements, ownership affidavits, support with easements, public awareness and education campaigns, etc. that are necessary for the successful shoreline management program.

SUMMARY

CPE is the most qualified firm to help the Town of Kill Devil Hills develop and design a Shore Protection Plan and beach nourishment project constructed and maintained under Section 206 authorization. CPE has worked closely with the Town over the past two years to develop and analyze the most feasible options for shoreline management and feel that we have presented the Town with the best option. CPE has a thorough understanding of the Town's plan and the current authorized USACE project. Coupled with our vast experience with federally reimbursable shore protection projects and shore protection projects within the state of North Carolina, we will provide the Town with the most comprehensive service utilizing one seamless in-house team. Our staff of professionals has the specific expertise in Section 206 implementation, beach fill design, environmental permitting, geotechnical analysis, cost-benefit analysis, numerical modeling, and project management that will be vital to the successful construction of your project. All of this experience and capability will result in the highest quality design with optimal performance that will avoid permit delays and minimize construction costs. We have enjoyed working with the Town of Kill Devil Hills and look forward to seeing the program through to a successful implementation.

TOM JARRETT, P.E. | SENIOR COASTAL ENGINEER
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Project Manager / Project Engineer

EDUCATION

B.S. Civil Engineering, NC State University (1965)
M.S. Civil Engineering, NC State University (1967)

REGISTRATIONS

Professional Engineer: North Carolina

AFFILIATIONS

Tau Beta Pi Honorary Engineering Fraternity
Chi Epsilon Honorary Civil Engineering Fraternity
N.C. Shore and Beach Preservation Association
American Society of Civil Engineers
Association of Coastal Engineers

EXPERIENCE

Prior to joining Coastal Planning & Engineering, Inc. Tom Jarrett worked for the U.S. Army Corps of Engineers for 34 years in the field of Coastal Engineering. Mr. Jarrett served as project engineer in the Coastal Engineering Branch of the Wilmington District; Research Hydraulic Engineering for U.S. Army Waterways Experiment Station where he was appointed Chief of the Coastal Engineering Section in 1985. Mr. Jarrett was then appointed Chief of the Coastal, Hydrology, and Hydraulics Section where he served until his retirement in December 2000. From December 2000 to June 2002 he was sole proprietor of Tom Jarrett Coastal Engineering. Currently, Mr. Jarrett is principal in Coastal Planning & Engineering of NC, Inc. (CPE-NC).

A summary of project experience is listed below:

Bogue Inlet Channel Erosion Response Project, NC

Tom Jarrett served as project manager and project engineer for the Bogue Inlet Channel Erosion Response Project which involved the relocation of the main ebb channel of Bogue Inlet 3,550 feet west and nourishing 4.0 miles of shoreline along Emerald Isle to eliminate the erosive impact of tidal currents on the east shoulder of the inlet. State and Federal Permits were acquired by September 2004 with project construction in February 2005.

Topsail Beach Shore Protection Project, Pender and Onslow Counties, NC

Mr. Jarrett served as project manager and project engineer during the formulation of the 2009 beach fill project for the Town of Topsail Beach. Mr. Jarrett also managed the permitting process including plan design and formulation and prepared Plans and Specifications for the project.

North Topsail Beach Shore Protection Project, Onslow County, NC

Tom Jarrett served as the project manager and principal coastal engineer for the North Topsail Beach non-Federal Feasibility study to provide protection for the areas of North Topsail Beach located within the CBRA system. Project alternatives included the possible relocation of the navigation channel

TOM JARRETT, P.E. | SENIOR COASTAL ENGINEER
COASTAL PLANNING & ENGINEERING, INC.

through New River Inlet and the development of a sand management plan for that inlet as well as the location of suitable offshore sand sources.

Rich Inlet Management Plan, Figure Eight Island, New Hanover County, NC

Mr. Jarrett was the project manager and principal coastal engineer for the Figure Eight Beach Homeowners Association to develop an inlet management plan for Rich Inlet and provide long-term shoreline protection to the northern half of Figure Eight Island.

Dare County Hurricane and Beach Erosion Control Project, Dare County, NC

Mr. Jarrett was Chief of the Coastal, Hydrology, & Hydraulics (CH&H) Section of the Wilmington District Corps of Engineers during the formulation of the Dare County Federal coastal storm damage reduction project. He retired from the USACE in December 2000 shortly after the project was authorized by the Water Resources Development Act of 2000. Tom attended several meetings with community leaders in Dare County in the late 1980's and early 1990's prior to the authorization of the federal feasibility study and continued to be intimately involved in the formulation of the shore protection project until its authorization. As Chief of the CH&H Section, Tom guided and directed all engineering aspects of the plan formulation including the evaluation of shore processes, optimization of the project's storm damage reduction potential, and identification of compatible sand resources to construct and maintain the project. He participated in project coordination meetings with local officials keeping them informed of the study progress and results.

Carolina Beach Storm Damage Reduction Project, New Hanover County, NC

Mr. Jarrett served as the principle project engineer in the evaluation of the early performance of this beach fill project completed in 1965. Tom conducted special studies to determine the cause of inordinate erosion of the north end of the project area. One outcome of the investigation was the development of new beach fill design criteria to ensure that sufficient material is placed on the beach to nourish the entire active beach profile. This beach fill design criteria, termed the "profile of translation", has become a standard in the Coastal Engineering profession. Tom Jarrett continued to oversee the operation of the project, including the reevaluation of the project under Section 934 of the Water Resources Development Act of 1986 to determine if federal participation should continue through the year 2014 and annual assessments of the project's performance and periodic nourishment requirements.

Wrightsville Beach, NC Storm Damage Reduction Project, New Hanover County, NC

Mr. Jarrett developed a detailed sediment budget analysis for the area including an evaluation of the impacts of jetties a Masonboro Inlet, located on the southern end of the beach. The outcome of the investigations was the development of a sand management plan for the Masonboro Inlet project that involves the transfer of littoral sediment from the inlet to Wrightsville Beach and Masonboro Island every 4 years. The sediment budget study resulted in additional federal cost sharing for the project due to the impacts of navigation project

Masonboro Inlet Navigation Project, New Hanover County, NC

Mr. Jarrett completed the Detailed Project Report and Design Memorandum for the south jetty and developed the sand management plan for the project.

TOM JARRETT, P.E. | SENIOR COASTAL ENGINEER

COASTAL PLANNING & ENGINEERING, INC.

Kure Beach Storm Damage Reduction Project, New Hanover County, NC

Mr. Jarrett supervised the preparation of the Supplemental Design Memorandum for the Kure Beach project and participated in the development of the detailed design and specifications. He also provided engineering guidance during construction.

Wilmington Harbor 96 Act Project, New Hanover and Brunswick Counties, NC

Mr. Jarrett was primarily responsible for developing the sand management plan for the harbor entrance which is a key element in the Section 933 project for the adjacent beaches. Mr. Jarrett also participated in the preparation of the plans and specification for using the inner harbor dredged material to nourish Kure Beach.

Special Study – Hurricane Impacts on Communities with and without Shore Protection

Mr. Jarrett was a member of a Corps of Engineers study team, assembled to evaluate the impacts of Hurricane Fran (September 1996) on communities with and without federal shore protection projects. The study compared the impacts of the storm on Carolina Beach and Wrightsville Beach, which had federal projects, to the impacts on Kure Beach and Topsail Island communities, which did not have projects.

Fort Fisher Erosion Control Project

Tom Jarrett participated in all aspects of the feasibility study for this project including an evaluation of project alternatives ranging from revetments, groins, beach fill, and a combination of all three. The beach fill design involved the first application of a beach fill material compatibility analysis using new techniques developed by the Coastal Engineering Research Center. The feasibility study showed beach nourishment to be and ineffective and costly alternative with the final plan involving the construction of a rock revetment extending from the northern boundary of the park south past Battle Acre. The Fort Fisher revetment project was designed and constructed under my direct charge.

Manteo (Shallowbag) Bay Project (Oregon Inlet), Dare County, NC

Mr. Jarrett was involved in all of the various phases of the project ranging from feasibility to general and feature design memorandums. He responsible for overseeing the conduct of numerous model studies by the Waterways Experiment Station including: physical model studies of the inlet hydrodynamics; physical model studies of the structural design of the jetties; model studies of a unique floating breakwater known as the sloping float breakwater; and numerical model studies of the impacts of hurricanes on flow through the existing and improved inlet. Mr. Jarrett also conducted detailed sediment budget studies for the project and, working in cooperation with other Federal agencies, developed a unique sand management plan for the inlet stabilization project.

Oregon Inlet Terminal Groin, Dare County, NC

Mr. Jarrett served on a Governor appointed tasks force to develop alternative plans to protect the Bonner Bridge, which spans Oregon Inlet. One of the alternatives was a terminal groin located on the north end of Pea Island. This plan was selected for implementation. Mr. Jarrett worked with the State of North Carolina to obtain the necessary special use permits from the Fish and Wildlife Service and participated in the development of the detailed design and specifications for this work as a member of the District's design team.

KENNETH T. WILLSON, M.S. | SENIOR COASTAL GEOLOGIST
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Deputy Project Manager / Project Geologist

EDUCATION

M.S. Geology (2009)
B.S Earth Science (2000)

REGISTRATIONS

2008/American Heart Association CPR
2004/PADI Advanced Open Water Certification (Dry Suit Diver)
1998/PADI enriched Air Nitrox Diver (IANTD/EANx)
1998/NAUI Advanced Open Water Certification (Research Diver)
1998/PADI Open Water Certification
1997/Red Cross Lifeguard Certified

AFFILIATIONS

American Shore and Beach Preservation Association
North Carolina Beaches, Inlets, and Waterways Association

EXPERIENCE

Mr. Willson has worked for Coastal Planning & Engineering for the past 8 years. His primary responsibilities have included comprehensive project management, North Carolina office management, project geologist, and directing and assisting data collection including geophysical surveys, vibracoring operations, jet probe operations, hydrographic surveys, and beach profile surveys. He also assists in data analysis and reduction, product preparation, report preparation and presentation of findings of marine sand searches along the Atlantic and Gulf Coast of the United States. Mr. Willson has also coordinated extensively with the North Carolina, Coastal Resources Commission (CRC) with regards to the recently adopted technical standards for beach fill projects (15A NCAC 07H.0312), including publications and presentations describing real world application of the standards.

A summary of project experience is listed below:

North Topsail Beach Shoreline Protection Project, North Carolina (2005 – Present).

Mr. Willson managed the development of engineering, geotechnical, and environmental documents in support of obtaining State and Federal permits for a shoreline protection project along 11.1 miles of the Town of North Topsail Beach. Project geologist for geotechnical and geophysical offshore and inlet sand search investigations.

New Hanover County Contingency Plan Formulation, North Carolina (2010-Present)

Mr. Willson is currently assisting with developing a contingency plan for New Hanover County to allow the County to supplement any Federal funding shortfalls anticipated for future funding cycles. This report involves developing a road map for obtaining the proper permits, coordination with the USACE Wilmington District and Headquarters, and preparing cost estimates and schedules for implementing the plan.

KENNETH T. WILLSON, M.S. | SENIOR COASTAL GEOLOGIST
COASTAL PLANNING & ENGINEERING, INC.

Figure Eight Island Shoreline Protection Project, North Carolina (2006 – Present).

Mr. Willson served as project geologist for geotechnical investigations associated with a sand investigation to quantify and qualify the material available within a proposed ebb channel realignment.

Bogue Banks Shoreline Protection Project, Hardbottom Resource Confirmation and Characterization, North Carolina (2008 – 2009).

Mr. Willson served as project geologist for the geophysical evaluation of sidescan sonar data to identify potential hardbottom habitat for further investigations using SCUBA diver investigations.

Louisiana Emergency Berm Project in Response to BP Oil Spill, Louisiana Coast, Louisiana (2010).

Mr. Willson served as party chief and lead field geologist for multiple geophysical investigations associated with quantifying and qualifying sand resources as well as conducting cultural resource surveys in support of emergency sand source permitting.

Point Au Fer and Caillou Lake Land Bridge Sand Search Investigation, Louisiana (2002-2004 and 2008).

Mr. Willson lead field investigations associated with quantifying and qualifying sand resources to be used for these projects. Investigations included bathymetric and geophysical surveys including sidescan sonar, subbottom profile, and magnetometer surveys.

Canal Norte Jetprobe Investigation, Florianopolis, SC, Brazil (2008)

Mr. Willson lead field investigations to determine sediment quality using jetprobe surveys for fill to be used in the construction of a new harbor side road system in Florianopolis, SC.

Anna Maria Island Geophysical and Geotechnical Investigation (2008)

Mr. Willson lead geophysical and geotechnical field investigations associated with a marine sand search survey to identify sand for use in a beach nourishment project on Anna Maria Island. Investigations included sub bottom profile, sidescan sonar, magnetometer, bathymetric, and vibracore surveys.

Marsh Island Geophysical Investigation, Louisiana (2007)

Mr. Willson assisted in geophysical surveys, which included subbottom, sidescan sonar, magnetometer, and bathymetric survey. Project was to identify sediment to be used for habitat restoration projects in Louisiana

Topsail Beach Sand Search Survey, North Carolina (2007)

Mr. Willson lead geophysical and geotechnical field investigation associated with a marine sand search survey to identify sand for use in a beach nourishment project at Topsail Beach. Investigations included sub bottom profile, sidescan sonar, magnetometer, bathymetric, and vibracore surveys.

North Topsail Beach Native Beach vs. Fill Compatibility Survey, North Carolina (2007)

Mr. Willson conducted sand compatibility analysis between native and proposed fill material which included beach sampling, fill sampling, and sieve analysis.

Annual Hardbottom Monitoring Sidescan Sonar Survey, Collier County, Florida (2007)

Mr. Willson lead a sidescan sonar survey to map nearshore hardbottom habitat as part of a monitoring program associated with beach nourishment projects in Collier County, Florida.

KENNETH T. WILLSON, M.S. | SENIOR COASTAL GEOLOGIST
COASTAL PLANNING & ENGINEERING, INC.

Nantucket Island Sand Search Investigation, Massachusetts (2006 – 2007)

Mr. Willson lead geophysical and geotechnical field investigations associated with a marine sand search survey to identify sand for use in a beach nourishment project on Nantucket Island. Investigations included sub bottom profile, sidescan sonar, magnetometer, bathymetric, and vibracore surveys.

BRAD A. ROSOV | MARINE SCIENTIST
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Project Biologist

EDUCATION

M.Sc. Marine Biology, University of North Carolina at Wilmington (2001)

B.Sc. Biology with a concentration in Neuroscience, University of Delaware (1997)

REGISTRATIONS

2008/American Heart Association CPR

2008/PADI enriched Air Nitrox Diver (IANTD/EANx)

2006/UNCW Certified Boat Operator

2006/Red Cross Lifeguard Certified

1998/PADI Advanced Open Water Certification

1992/PADI Open Water Certification

AFFILIATIONS

Ecological Society of America

International Society of Coral Reef Science

EXPERIENCE

Brad Rosov brings over 10 years of environmental permitting, documentation, and field work experience to CPE. Mr. Rosov is experienced with drafting NEPA/SEPA compliant documents, including Environmental Impact Statements, Environmental Assessments, Essential Fish Habitat Assessments, Biological Assessments, and Cumulative Effects Assessments in support of numerous beach nourishment projects within Florida and North Carolina.

Related Training and Experience

- Software Program Training in ESRI ArcMap 9.1
- USEPA Wetlands Evaluation Training
- YSI Water Quality Monitoring Equipment Training

A summary of project experience is listed below:

BIOLOGICAL AND ENVIRONMENTAL SURVEYS/ASSESSMENTS

Conducted water quality assessments of canal systems and natural streams, creeks, and rivers, collected biological, physical, and chemical parameters, sediment and benthic invertebrate composition, still photography, data management and statistical analysis, for the following projects:

- New Hanover County Water Quality Monitoring in Wilmington, NC (2005-2011).
- Wilmington Watersheds Project in Wilmington, NC (2005-2007).
- New River Water Quality Monitoring Project in Jacksonville, NC (2005-2007).
- Cape Fear River Water Quality Monitoring Program Southport, NC (2005-2007).
- Florida Keys Watch Canal Monitoring Project in the Florida Keys, Florida (2002-2004).

Interpreted aerial photography, mapped marine and terrestrial habitats and conducted habitat characterization for the following projects:

BRAD A. ROSOV | MARINE SCIENTIST

COASTAL PLANNING & ENGINEERING, INC.

- Draft Environmental Impact Statement for Figure Eight Island Shoreline Management Project, NC (2009).
- Draft Supplemental Environmental Impact Statement for Topsail Beach Interim (Emergency) Beach Fill Project, NC (2008).
- Bogue Inlet Channel Erosion Response Project Third-Year Post-Construction Monitoring, NC (2008).

Conducted infaunal macroinvertebrate monitoring assessments within intertidal and subtidal habitats for the following projects:

- Figure Eight Island Shoreline Management Project, NC (2009).
- Topsail Beach Interim (Emergency) Beach Fill Project. Topsail Beach, NC (2009).
- Bogue Inlet Channel Erosion Response Project. Emerald Isle, NC (2007, 2008).

Established monitoring stations and conducted biological assessments of natural hardbottom habitats including identification of flora and fauna, sessile biotic cover analysis, still photography, statistical analysis, for the following projects:

- Florida Reef Resilience Program. South Florida and the Florida Keys (2005).
- Diadema antillarum Research Project. Florida Keys, Florida (2003-2005).
- Sea Stewards Coral Reef Assessment. Florida Keys, Florida (2002-2003).
- Queen Conch Restoration Project. Key West, Florida (2002).
- University of North Carolina at Wilmington Coral Ecology Research. Key Largo, Florida (2001).

Conducted biological assessments of salt marsh communities including quantification of dominant species percent cover and density, soil composition, wildlife utilization, topographic changes, still photography, statistical analysis for the following projects:

- Figure Eight Island Shoreline Management Project. Figure Eight Island, NC (2009).
- Bogue Inlet Channel Erosion Response Project. Emerald Isle, NC (2007, 2008).

Conducted biological assessments of shellfish and submerged aquatic vegetation (SAV) communities and subsequent statistical analysis for the following projects:

- Figure Eight Island Shoreline Management Project, NC (2009).
- Topsail Beach Interim (Emergency) Beach Fill Project. Topsail Beach, NC (2009)

COASTAL PROJECT PERMITTING & NEPA COMPLIANCE

NORTH CAROLINA

- Draft Environmental Impact Statement for the Figure Eight Island Inlet Management and Beach Fill Project in Figure Eight Island, NC (2008-2011).
- Draft Essential Fish Habitat Assessment for the National Marine Fisheries Service in accordance with Magnuson-Stevens Fishery Conservation and Management Act for Figure Eight Island Inlet Management and Beach Fill Project in Figure Eight Island, NC (2009-2011).
- Cumulative Effects Analysis for the Figure Eight Island Inlet Management and Beach Fill Project in Figure Eight Island, NC (2009-2011).
- Biological Assessment for the Figure Eight Island Inlet Management and Beach Fill Project in Figure Eight Island, NC (2009-2011).
- Draft Supplemental Environmental Impact Statement for the Topsail Beach Interim Beach Fill Project, Topsail Beach, NC (2007)

BRAD A. ROSOV | MARINE SCIENTIST

COASTAL PLANNING & ENGINEERING, INC.

- Cumulative Effects Analysis for the Topsail Beach Interim Beach Fill Project, Topsail Beach, NC (2007)
- Biological Assessment for the Topsail Beach Interim Beach Fill Project, Topsail Beach, NC (2006-2007)
- Draft Essential Fish Habitat Assessment for the National Marine Fisheries Service in accordance with Magnuson-Stevens Fishery Conservation and Management Act for Topsail Beach, NC (2006-2007)
- Final Environmental Impact Statement for the North Topsail Beach Shoreline Protection Project, North Topsail Beach, NC (2010)

FLORIDA

- Environmental Assessment for the Longboat Key Beach Nourishment Project for Longboat Key, FL (2011)
- Biological Assessment for the City of Delray Beach Nourishment Project, Delray Beach County, FL (2011)
- Preparing an Essential Fish Habitat Assessment for the City of Delray Beach Nourishment Project, Delray Beach County, FL (2011)
- Biological Assessment for the Bay County Beach Nourishment Project, Bay County, FL (2011)

Project Management

- Project Manager for environmental documentation and permitting in support of the Figure Eight Island Inlet Management and Beach Fill Project in Figure Eight Island, NC (2009-2011).
- Project Manager for Pre-construction monitoring projects associated with the Topsail Beach Interim (Emergency) Beach Fill Project, NC (2009).
- Project Manager for the New Hanover County Water Quality Monitoring Program, New Hanover County, NC (2007-2008).
- Project Manager for the Wilmington Watersheds Water Quality Monitoring Program, Wilmington, NC (2005-2007).
- Project Manager for the New River Water Quality Monitoring Program, Jacksonville, NC (2005-2007).
- Project Manager for the Florida Reef Resilience Program, Summerland Key, FL (2004-2005).
- Project Manager for the Diadema antillarum Research Project, Summerland Key, FL (2002-2005).
- Project Manager for the Florida Keys Watch Canal Monitoring Project, Summerland Key, FL (2002-2004).
- Project Manager for the Sea Stewards Coral Reef Assessment Program. Summerland Key, FL (2002-2003).

BRAD A. ROSOV | MARINE SCIENTIST

COASTAL PLANNING & ENGINEERING, INC.

Environmental Research Experience

Research Technician- University of North Carolina at Wilmington Aquatic Ecology Laboratory (2005-2007). Coordinated and managed the Wilmington Watersheds Water Quality Project and the New River Water Quality Project. Ensured compliance of water quality standards within rivers, tidal streams and creeks in coastal North Carolina by performing physical, chemical, and biological analysis of water column samples. Communicated the results of water quality studies to the general public and agency partners through the preparation of accurate written and verbal reports. Analyzed and interpreted data utilizing statistical software, ArcGIS and desktop digitizing applications.

Marine Conservation Program Manager- The Nature Conservancy (2002-2005). Designed, implemented, and managed multiple research and stewardship projects including a water quality monitoring program, a coral reef restoration project, and a coral reef resilience project in conjunction with local, state and federal agencies. Assisted with developing and implementing local and regional marine management plans in conjunction with Nature Conservancy staff and partners. Wrote permit applications and grant proposals. Successfully obtained funding from private foundations as well as state and federal agencies to support marine conservation projects. Organized and moderated the numerous meetings and workshops including the *Diadema* Workshop in partnership with the University of Miami. Participants included over 50 coral reef biologists from 11 countries/islands from the wider Caribbean.

Research Assistant- University of North Carolina at Wilmington Coral Reef Ecology Laboratory (2000-2001). Quantified algal nutrient levels by utilizing a Bran + Luebbe autoanalyzer and elemental analyzer. Assisted with *in situ* coral reef algae collection in Key Largo, Florida. Created databases and conducted data analysis using Microsoft Excel. Trained and managed undergraduate research assistants.

RICHARD H. SPADONI | SENIOR VICE PRESIDENT

COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Section 206 Coordinator

EDUCATION

B.S., Ocean-Coastal Engineering (1977)

B.S., Marine Biology and Geology (1972)

AFFILIATIONS

2010 FSBPA PER BRUUN Distinguished Service Award

2002 / NOAA Scientific Diver

1996 / The Coastal Society

1992 / NITROX Certification

1991 / PADI Advanced Open Water SCUBA Diver

1991 / PADI Rescue Diver Certification

1989 / American Shore and Beach Preservation Association

1977 / Florida Shore and Beach Preservation Association

1968 / YMCA Open Water SCUBA Diver

EXPERIENCE

Richard Spadoni is a Senior Vice President with Coastal Planning & Engineering. Mr. Spadoni has served as a Project Manager and/or Chief Biologist for numerous beach nourishment and renourishment projects since 1977, including geotechnical (sand search) investigations and Environmental Assessments. During his career, Mr. Spadoni has conducted final design modifications and assisted in the preparation of the final project plans and specifications for multiple projects including the Section 206 Anna Maria Island Beach Renourishment Project in 2002 and the Federally reimbursable Lido Key Beach Nourishment Projects in 1997, 1999 and 2002. For the 1988 Boca Raton beach nourishment project, Rick proposed construction of an artificial reef and terminal groin to replace surf zone reef formation which would be buried by the project. This was the first time the State of Florida accepted mitigation (artificial reef) to issue permits for a beach nourishment project. In 1984, he developed and permitted a 3 mile long mixing zone for the Delray Beach First Periodic Beach Renourishment Project in conjunction with the Department of Environmental Regulation (DER). This was the first water quality variance for a beach restoration issued in the State of Florida. Mr. Spadoni holds a double B.S. in Ocean Engineering and Marine Biology.

Mr. Spadoni was the author of Section 206 of the Water Resources Development Act of 1992, which provided for construction of shoreline protection projects (beach nourishment projects) by the local (City or County) project sponsors. Rick has been the project manager for 25 major beach nourishment projects including numerous federally-authorized but local sponsor constructed (cost reimbursable) projects. He has also successfully managed a Section 206 authorized construction of a beach project in Anna Maria Island and is currently in the planning stages of a second Section 206 project for this community.

A summary of project experience is listed below:

- Project Manager / Engineer for Manatee County Shore Protection Program. - For the upcoming beach nourishment projects for Coquina Beach and the City of Anna Maria (Section 206 Project). Mr. Spadoni is the Project Manager and Project Engineer for Manatee County. In addition Mr.

RICHARD H. SPADONI | SENIOR VICE PRESIDENT

COASTAL PLANNING & ENGINEERING, INC.

Spadoni is working with Manatee County on the reconstruction of the Manatee County Public Pier, the placement of the geotextile groin adjacent to the existing southern jetty, and beach nourishment of the northernmost section of shoreline with sediment from the Port Dolphin pipeline project.

- Project Manager for the 2009 Lido Key Beach Nourishment Project.
- Project Manager / Engineer for the 2006 Town of Palm Beach Mid-Town Beach Renourishment Project.
- Project Manager / Engineer for the 2006 Town of Palm Beach Reach 7 Beach Nourishment Project.
- Project Manager for the Town of Palm Beach Reach 8 Beach Nourishment Project.
- Engineer for the Delray Beach, Beach Renourishment Projects of 1978, 1984, 1992, and Project Manager / Engineer for the Renourishment Project of 2002 and Hurricane Repair Project of 2006.
- Project Manager / Engineer for the initial 1988 Boca Raton North Beach Restoration Project and 1998 First Renourishment Project and 2009 Second Renourishment Project.
- Project Manager / Engineer for the 2004 Boca Raton Central Beach Nourishment Project and Post-Hurricane Beach Repair of 2006.
- Project Manager / Engineer for the 1986, 1992, 2002 and 2008-2009 Boca Raton South Beach Nourishment and Renourishment Projects.
- Project Manager / Engineer for the Anna Maria Island Beach Nourishment Projects of 1992 and 2002; and the Cortez Beach, Beach Nourishment Project of 2008.
- Project Manager / Engineer for three Lido Key (City of Sarasota) Beach Renourishment Projects constructed in 1998, 2001 and 2003, and a pending Renourishment Project scheduled for 2009.
- Project Manager for the Galveston, Texas Beach Nourishment Project of 1995.
- Project Manager for the Nantucket, Massachusetts Sconset Beach Nourishment Project presently in the permitting phase.
- Project Manager for the Town of Palm Beach Reach 7 Mitigative Artificial Reef.
- Engineer for the "One Mile" mitigative artificial reef and South Anna Maria Island mitigative artificial reef (1993 and 2002) for Manatee County.

RICHARD H. SPADONI | SENIOR VICE PRESIDENT

COASTAL PLANNING & ENGINEERING, INC.

- Engineer for the nearshore artificial reef and shore-detached groin as mitigation for the Boca Raton North Beach Restoration Project (1988).
- Project Manager / Engineer for the Emergency Coral Reef Restoration Project at Mona Island, Puerto Rico (1998) for the National Oceanic and Atmospheric Administration.
- Project Manager / Engineer for the 2000 coral reef repair at Looe Key National Marine Sanctuary, Florida Keys.
- Project Manager / Engineer for the 2002 Wellwood (Molasses) Reef Repair at the Florida Keys National Marine Sanctuary.

KEY REGULATORY MILESTONES

- Project Manager / Engineer for the construction of an artificial reef to replace surf zone reef formation which would be buried by the Boca Raton Beach Nourishment Project (1988). This was the first time the State of Florida accepted mitigation (artificial reef) to issue a permit for a beach nourishment project.
- Developed and permitted a 3 mile long mixing zone for the Delray Beach First Periodic Beach Renourishment Project (1984) in conjunction with the Department of Environmental Regulation (DER). This was the first ever water quality mixing zone variance issued for a beach nourishment project in the State of Florida.
- Author of Section 206 of the Water Resources Development Act of 1992 which provided for construction of shoreline protection projects (beach nourishment projects) by the local (City or County) project sponsors. This provision of the WRDA allowed local governments to take control of their own Shoreline Protection projects controlling the schedule, design, sand source, construction administration while still receiving federal funding on a reimbursable basis.

COASTAL/BEACH MANAGEMENT AND COMPREHENSIVE PLANS

- Managed Erosion Control Line establishment:
 - Town of Palm Beach (2006 and 2008).
 - City of Delray Beach (1989)
 - City of Boca Raton (1988, 1995, 2001).
 - Manatee County (Central Anna Maria Island-1990).
 - City of Sarasota (Lido Key-1989).
 - Manatee County (Southern Anna Maria Island-2008).
- Co-authored four ordinances and amended three existing City of Boca Raton Codes designed to implement the City's Coastal Management and Conservation Elements of the Comprehensive Plan (1990).
- Co-authored State of Florida mandated Inlet Management Plans for:
 - Boca Raton Inlet, City of Boca Raton, Florida (1991-1992).
 - New Pass, City of Sarasota, Florida (1991).
 - Big Sarasota Pass, City of Sarasota (1991).

RICHARD H. SPADONI | SENIOR VICE PRESIDENT

COASTAL PLANNING & ENGINEERING, INC.

- Co-authored Comprehensive Plan, Coastal Management Elements for three (3) Florida municipalities:
 - City of Boca Raton (1989).
 - City of Delray Beach (1989).
 - Town of South Palm Beach (1989).

ENVIRONMENTAL SURVEYS/ASSESSMENTS/MONITORING

- Served as Project Manager / Chief Biologist for the following beach nourishment programs and projects which included detailed environmental and biological assessments; and mapping characterization and monitoring of hardbottom habitats:
 - Town of Palm Beach, Biological Assessment, Studies and Monitoring (2004 to present).
 - Boca Raton North Biological Assessment, Studies and Monitoring and Coral Growth Studies (on-going 1984 through 2001).
 - Boca Raton Central Environmental Assessment, Studies and Monitoring (2000-2001).
 - South Boca Raton Environmental Assessment, Studies and Monitoring (1984-2002).
 - Anna Maria Island Biological Assessment, Studies and Monitoring (1990-1995 and 2002-2005).
 - Fort Pierce Inlet Management Plan Biological Assessment (1990).
 - Vero Beach Biological Assessment (1990).
 - Delray Beach Biological Assessment and Coral Growth Studies (1987).
 - Delray Beach Environmental Assessment, Studies and Monitoring (1977, 1983, 1991 and 1997).
 - Jupiter Island Environmental Assessment (1980).
 - Jupiter / Tequesta Environmental Assessment (1979).
- Conducted Environmental inventories / assessments of marine and estuarine habitats for State mandated Inlet Management Plans adjacent to:
 - New Pass (1992).
 - Big Sarasota Pass (1992).
 - Venice Inlet (1992).
 - Boca Raton Inlet and Adjacent Beaches Management Program (1989-1995).
 - Hillsboro Inlet (1991).
 - Fort Pierce Inlet (1990).
- Developed the preliminary Environmental Assessment for the Staten Island, New York Erosion Control and Flood Protection Project Reconnaissance Study (1995).
- Coastal project permitting & NEPA Compliance.
- Coordinated acquisition of beach renourishment joint coastal construction permits and approvals required by State and Federal permitting agencies for:
 - Town of Palm Beach (2004, 2006, 2008).
 - Boca Raton North (1988 – 1998).
 - Boca Raton Central (2002, 2006).
 - Boca Raton South (1986, 1992, 2002).
 - Anna Maria Island (Manatee County) (1992, 2002, 2005).

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- Lido Key (City of Sarasota) (1998, 2001, 2003).
- Delray Beach, (1998, 1989, 1992, 2002, 2006).
- Smathers Beach (Key West) Beach Renourishment Project (1999).
- Galveston, TX Beach Nourishment Project (1996).

EXPERT WITNESS

- City of Boca Raton, Florida Statues 120 Administrative Hearing for Beach Nourishment (1987-1988).
- City of Boca Raton, represented City against an injunction to stop the Boca Raton North Beach Nourishment Project (1988).
- City of Boca Raton, Federal Court lawsuit brought by the City to prevent the U.S. Army Corps of Engineers from taking Spanish River Park for an Intercoastal Waterway Dredge spoil site (1990); designated expert in coastal engineering and hydrographic survey.
- Manatee County (Anna Maria Island) eminent domain process for the 1992 Anna Maria Island Beach Nourishment Project.

THOMAS J. CAMPBELL, P.E. | EXECUTIVE VICE PRESIDENT
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Quality Control / Quality Assurance Manager

EDUCATION

ME 1973 Ocean-Coastal Engineering - Florida Atlantic University
BE 1971 Civil and Structural Engineering - Cooper Union

PROFESSIONAL MEMBERSHIPS

American Shore and Beach Preservation Association (ASBPA) – Director and Vice President	National Society of Professional Engineers (NSPE)
Florida Shore and Beach Preservation Association (FSBPA) – Ex-Officio Director	Association of Coastal Engineers (ACE)
Florida Engineering Society (FES)	Coastal Engineering Technical Advisory Committee (CETAC)

EXPERIENCE

Thomas J. Campbell, P.E. is the Executive Vice President and one of the founders of Coastal Planning & Engineering, Inc. (CPE). Mr. Campbell has directed environmental and physical monitoring, coastal engineering analysis, design, geotechnical surveys and numerical modeling for beach restoration projects for 36 years and has unmatched practical experience in beach design on the East and Gulf coasts of the U.S. Under his direction, CPE has constructed more than 60 beach restoration projects nationwide.

Mr. Campbell is a registered P.E. in 5 states, heads the Scientific Advisory Committee for the American Shore and Beach Preservation Association, is a Director of the Florida Shore and Beach Preservation Association and is on the editorial board of the *Journal of Coastal Research*, and the FSBPA publication, *Shore and Beach*.

Mr. Campbell is also a contributing author to the book Beach Nourishment and Protection. In 1985, Mr. Campbell was the Chairman of the Engineering Committee of the Florida Governor's "Restore our Coast" Task Force. In 1995, Mr. Campbell served on the National Research Council's Marine Board Committee on Beach nourishment. In 2003, Mr. Campbell was the Chairman of the Design Panel of a State and Federal (LCA) program that resulted in the program: "Implementing a Louisiana Barrier Island and Barrier Shoreline Restoration Program."

Mr. Campbell is currently a Ph.D. candidate at Delft Institute of Technology under Dr. Marcel Stive and is preparing a thesis on a Morphodynamic Model of Barrier Island Erosion. Mr. Campbell is a master of regional planning and funding acquisition and has extensive knowledge of both current issues and the lessons learned from coastal management projects nationwide. He received the Jim Purpura Award from the FSBPA in 1982 for outstanding contribution to coastal engineering in the State of Florida.

Comprehensive Long-Range Coastal Management

For the past 27 years Mr. Campbell has served as Principal in Charge and Chief Engineer for all CPE projects including supervision of the preparation and/or review of more than 20 coastal and inlet management plans as well as sand bypass feasibility studies. He has supervised engineering analysis and developed program designs based on analysis of historical data, coastal processes, geotechnical and hydrographic information, environmental concerns, and permitting limitations, as well as cost/benefits analysis, funding options, and the potential for regional cost savings.

THOMAS J. CAMPBELL, P.E. | EXECUTIVE VICE PRESIDENT
COASTAL PLANNING & ENGINEERING, INC.

Regional Sand Search and Hydrographic Investigations

Mr. Campbell has directed sand search investigations in a total of 23 geographic locations including 17 locations in Florida and others in New Jersey, New York, Louisiana, Texas, Georgia and Virginia. Under the direction of Mr. Campbell, CPE has identified billions of cubic yards of sand resources on the Continental Shelf in State and Federal waters, including finding sand in areas where no sand was believed to exist. Of that volume, hundreds of millions of cubic yards of beach quality sand have been either placed on beaches or reserved for use in future beach nourishment projects.

Beach Nourishment and Coastal Structures Design and Permitting

As Principal in Charge and Chief Engineer, Mr. Campbell has directed the design and construction of more than 60 beach nourishment projects and 30 projects involving coastal structures. These projects include numerical modeling and statistical analysis of coastal processes, engineering design, modeling of projected levels of protection provided by various beach designs, beach and hydrographic surveys, storm damage assessments, economic evaluations, permitting, funding and cost estimating.

Environmental Monitoring and Assessments Related to Beach Nourishment Projects

Mr. Campbell has been Principal in Charge for beach nourishment projects which included detailed qualitative and quantitative environmental and coastal assessment; monitoring of the project area before and after construction; biological inventories and mapping of hardbottom habitats; water quality sampling; sedimentation rate analysis and infauna analysis. Representative projects that include environmental monitoring are: the Collier County Beach Renourishment, the Anna Maria Island Beach Nourishment project, the Boca Raton Beach Restoration project, and the Delray Beach beach renourishment project.

Funding Strategies

Mr. Campbell is exceptionally well versed in funding options and the requirements for eligibility and opportunities for combining Federal, State, local and private financial support. In 1985, Mr. Campbell assisted the Florida Department of Natural Resources, currently the Department of Environmental Protection, through the "Restore Our Coast" Task Force to develop funding mechanisms for coastal erosion projects throughout Florida. Since that time, Mr. Campbell has obtained Florida State funding for 8 beach nourishment projects and received the 1997 "Distinguished Service Award" from the FSBPA for leadership of the legislative committee which promoted Florida's dedicated funding source for beaches.

STEPHEN KEEHN, P.E. | SENIOR COASTAL ENGINEER
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Support for Coastal Engineering and Section 206 Coordination

EDUCATION

M.Eng., Coastal & Hydraulic Eng., UC, Berkeley (1982)
B.S., Engineering, USMA (1972)
Certificate Hazardous Material Mgmt., UC Santa Cruz (1991)

REGISTRATIONS

Professional Engineer: Florida (1984), California (1991), New Jersey (1994)
1991/PADI Certified Advanced Open Water Scuba DIVER

AFFILIATIONS

American Society of Civil Engineers
Association of Coastal Engineers
American Shore and Beach Association
Society of American Military Engineers
Awarded the Per Brunn Distinguished Service Award by the Florida Shore and Beach Preservation Association in 1999.
Project Manager and Senior Engineer for three recipients of the ASBPA Top Restored beach Award

EXPERIENCE

Stephen Keehn, P.E. is a Senior Coastal Engineer with CPE and received his Masters in Coastal Engineering from UC Berkeley in 1982. He then served with the U.S. Army Corps of Engineers, Jacksonville District in planning, engineering, and construction assignments on beach and navigation projects. His major projects included feasibility and design reports for Sarasota (Venice), Duval and Dade (Miami Beach) Counties, and the construction of a joint navigation and beach renourishment project for St. Johns River and Jacksonville Beach, FL.

He has served as a senior coastal engineering with CPE since 1992, on numerous beach and inlet projects. Mr. Keehn has experience with two separate section 206 projects as well as extensive experience with other federal reimbursable projects authorized under Section 215 of the Flood Control Act (FCA) of 1968. Mr. Keehn brings an inside perspective to Federal storm protection projects through his experiences working for the USACE Jacksonville District as a coastal engineer. Mr. Keehn was the project manager for Panama City Beach and Estero Beach, Florida, which are discussed above. Mr. Keehn has also been the project manager for multiple beach nourishment projects at Captiva and Sanibel Islands, which have seen the benefits of Federal reimbursements for both project formulation and construction. Some of Mr. Keehn's additional Major beach projects include Naples in Florida, and Fire Island, New York. He has worked on over a dozen inlet management plans in Florida, in addition to planning, design and permit of numerous inlet structures and dredging projects, including 7 inlets on the southwest Florida Coast. He planned and coordinated a beneficial use of dredged sand project for Panama City Beach using sand from the Panama City Harbor dredging project. He was awarded the Per Brunn Distinguished Service Award by the Florida Shore and Beach Preservation Association in 1999.

STEPHEN KEEHN, P.E. | SENIOR COASTAL ENGINEER
COASTAL PLANNING & ENGINEERING, INC.

A summary of project experience is listed below:

PROJECT MANAGEMENT/PROJECT ENGINEERING

Since 1992, served as Project Manager and Senior Coastal Engineer on ten beach nourishment projects for CPE including three ASBPA Top Restored Beaches. Senior engineer in the preparation of a dozen inlet management plans. Knowledgeable in all aspects of coastal projects to include coastal engineering, geology, hydrographic and Lidar survey, Federal & state permitting and funding, marine habitats, lands and easements needed to implement a successful project. Project engineer with the Jacksonville District Corps of Engineers.

1998-9 Panama City Beach, FL Beach Nourishment – Design Engineer and Project Manager for the 17.5 mile beach restoration project. Updated the design for the impacts of Hurricane Opal, developed cost engineering strategies to compensate for the hurricane effects while reducing total project cost. Improved sand quality by developing 3 new borrow areas. Implemented the Federal project under Section 206 local construction authority and qualified the updated project for Federal funding. Provided total project management for the Bay County TDC and construction management services for beach and outfall modification construction.

Captiva and Sanibel Islands Renourishment Project, Lee County, FL

Project Manager for the 2005-06 Captiva and Sanibel Islands Renourishment Project. Designed the project, managed onsite engineer and assisted the Corps of Engineers in implementing the emergency project. Managed design and construction of the terminal groin rehabilitation at Redfish Pass. Researched and reviewed monitoring performance of the Captiva and Sanibel Islands beaches in support of the Joint Coastal Permit from the Florida Department of Environmental Protection.

1996 Captiva Island, Florida Renourishment Project - Project Engineer for development of Renourishment Design Memorandum required to qualify the project for Federal funding. Utilized monitoring study surveys to develop a detailed littoral budget to refine maintenance fill requirements. Prepared monitoring, engineering and permitting documents in support of 2nd renourishment.

2005-6 Panama City Beaches Renourishment Project – Analyzed Hurricane Ivan Storm losses and prepared a FEMA Storm Loss Report, which was the basis for FEMA and Corps of Engineers funding approved for the project. Developed a design to replace storm losses and renourished the beach to its initial construction width. Managed modeling and a sand search in support of an emergency renourishment project. Assisted Corps of Engineering and the County in permitting and implementing the project.

Panama City Beach, Beach, FL Beneficial Sand Project – Project Manager who developed and managed project to use Corps channel dredged sand for Bay County Tourist Development Council. Provided expertise in negotiations with State and Corps representatives evaluated sand quality for placement within project area and provided quality assurance oversight to clients sand quality standard during Corps construction of project.

Collier County, FL (Naples) Beach Renourishment Project - Project Manager for Collier County's renourishment project completed in 2006. Work began with preparation of a comprehensive engineering report to identify alternatives, natural resources and scope for the project. Tasks included field inspections, survey data analysis, volumetric and shoreline change calculations, sand search, as well

STEPHEN KEEHN, P.E. | SENIOR COASTAL ENGINEER
COASTAL PLANNING & ENGINEERING, INC.

as preparation and presentation of annual monitoring reports. Analysis also included inspection and evaluation of the existing outfall and groin structures along the project area as well as trends related to the sediment budget and inlet effects. The design incorporated techniques to avoid nearshore habitat impacts. As a component of the major beach renourishment project, designed and developed plans and specifications for the construction of a 1.09 acre artificial reef in Naples, FL. Integrated FEMA storm losses into project. Senior project manager for post-construction and first annual physical and biological monitoring projects.

2003/4 Fire Island - NY Renourishment Project – Project manager for design, permitting, sand search and construction management of a multi-community renourishment project on the North Atlantic Ocean Coast of Long Island, NY. Project needed new sand sources and require permits from two Federal agencies.

Dade County, FL Alternate Sand Source Investigation – Senior project engineer responsible for research and report preparation. Inventoried, located, and evaluated upland and overseas sand sources for future Miami Beach renourishments. Developed a sand specification for bidding a renourishment project from sources with diverse sand characteristics and recognition for the beach fill advantage of coarser materials.

1997 Fire Island Pines, New York Renourishment Project - Designed, prepared plans and specifications and managed construction of a renourishment project.

Port Monmouth, NJ Feasibility Study – Project Engineer responsible for littoral budget development, inlet impact analysis (Pews and Comptons Creek) design template development and development of potential sand sources in the Lower Bay. Prepared the coastal engineering appendix for the report.

Fire Island Interim Project - Project Engineer in charge of sediment budget development for existing and improved conditions for 30 miles of coastline from Fire Island to Moriches Inlet, and development of the coastal engineering appendix for the Corps of Engineers report.

South Shore of Staten, NY Island Reconnaissance Study - Project Engineer who developed historical, existing and improved conditions, sediment budgets for 11 miles of shoreline.

Lovers Key and Fort Myers Beach Restoration Project – Project Manager in charge of design, sand search, engineering, surveys, and permitting of a locally constructed Federal project. Prepared plans and specifications for the project, including the terminal groin for Ft. Myers Beach. Senior Engineer for construction of Lovers Key segment.

Longboat Key Comprehensive Plan, Florida Beach Renourishment Project – Project Engineer who analyzed sediment budgets from adjacent inlets, borrow area, beach sand sizes, and beach monitoring results to develop a comprehensive sediment budget and beach sand standard for a comprehensive beach renourishment design. Established the importance of grain size in the future renourishment of the island and proposed a design strategy to use available sand sizes for future projects.

STEPHEN KEEHN, P.E. | SENIOR COASTAL ENGINEER

COASTAL PLANNING & ENGINEERING, INC.

INLET DESIGN AND SAND BY-PASSING STUDIES

Project Engineer/major contributor on a dozen inlet studies and management plans. Inlet management plans identify the cause of inlet induced erosion and analyze the shoaling patterns at the inlet in order to improve navigation and develop erosion control or mitigation measures to solve the problem. Plans included:

Venice Inlet Management Plan – Project Engineer to determine the impact of jetties and the intracoastal waterway on sand by-passing at the inlet. Developed a phased long-range plan which used economical sand sources in the short run and the future construction of a by-passing plant when sand costs rise.

Fort Pierce Inlet, Florida Management Plan - Project Manager to evaluate the impact of a Federal navigation channel and jetties on the adjacent beaches and the development of a long-term sand management plan. Measured tides and currents, conducted dye study, calculated tidal prism and inlet stability.

Wiggins Pass, Florida Inlet Management Plan – Inlet Navigation and Maintenance Modification Study. - Project Manager for the development of a sand bypassing plan and navigation channel design to minimize shoaling and to increase the maintenance dredging interval, within the County and Parks planning objectives.

Bakers Haulover Inlet Management Plan – Project Engineer to evaluate the inlets impact on the Miami Beach Restoration Project and identified cost effective solutions to address the sediment deficit caused by the inlet. Conducted a field measurement program (tides and currents) and identified an ebb shoal sand source.

Redfish Pass and Blind Pass Inlet Management Plans – Determined the impact of these two inlets on Captiva and Sanibel Islands, and developed mitigation measures acceptable to State and local governments. Integrated the plans into the renourishment program for the Islands.

COASTAL STRUCTURES

Developed feasibility level designs for:

- Bakers Haulover Inlet North Jetty Replacement, Miami, FL
- Redfish Pass Terminal Groin and Seawall Design, Captiva Island, FL
- North Sanibel Island Road Seawall
- Longboat Key, FL Road Seawall
- Various jetty sand tightening projects
- Pinellas County, FL Breakwater

Developed Final Design and/or Managed Construction for:

- Redfish Pass Terminal Groin Rehabilitation, Captiva, FL
- Naples, FL Artificial Reef
- Ft. Myers Beach, FL Terminal Groin
- Smathers Beach Groins, Key West, FL

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COASTAL PLANNING & ENGINEERING, INC.

COASTAL ENGINEERING WITH CORPS OF ENGINEERS

Served as a Coastal Engineer with the U.S. Army Corps of Engineers, Jacksonville District. Completed numerous feasibility and detailed design reports of coastal protective works. Performed QA/QC of coastal engineering and economic analysis and coordinated multi-disciplinary efforts of others.

- Supervised report preparation and coordination, and performed coastal engineering analysis and design for three major beach restoration studies in Florida.
- Feasibility Report for the Sarasota County Beach Restoration Project (Venice) (1984)
- First Renourishment Design Report, Duval County (Jacksonville), FL (1984)
- First Renourishment Design Report for the Dade County (Miami Beach), FL (1984)
- Revised cost-benefit analysis, Smathers Beach (Key West) Nourishment Project
- Designed coastal structures (Jetty Extension and Sand Tightening) at Bakers Haulover Inlet, FL (1984)
- Construction manager on the combined St Johns River Maintenance Dredging & Jacksonville Beach Renourishment Project (1985) and the Mayport Naval Station Maintenance Dredging (1985)

MELANY LARENAS, P.G. | SENIOR COASTAL GEOLOGIST
COASTAL PLANNING & ENGINEERING, INC.

PROJECT ASSIGNMENT

Borrow Area Design

EDUCATION

2002 M.Sc. (Geology)/Florida Atlantic University

1998 B.Sc. (Geology)/Florida Atlantic University

REGISTRATIONS

Professional Geoscientist:
Texas (10402)

Professional Geologist:
Florida (PG2397)
North Carolina (2108)
Alabama

CERTIFICATIONS

Open Water SCUBA Diver/1987/PADI
Advanced SCUBA Diver/2002/PADI
Nitrox SCUBA Diver/2002/TDI
Certified Protected Species Observer/2007/MMS

EXPERIENCE

Ms. Larenas and her Department are responsible for detailed review, processing and analysis of all geological and geophysical data for Coastal Planning & Engineering, Inc. projects. She is in charge of all borrow area development and design for CPE. Ms. Larenas is responsible for sampling design and acquisition of geological and geotechnical data as well as managing the processing of geotechnical and remote sensing data. Ms. Larenas is able to isolate beach compatible material through the integration of geotechnical and remote sensing data within a GIS framework.

To date, Ms. Larenas has processed the geotechnical data and designed and/or permitted borrow areas for over 20 coastal restoration projects including Galveston and Jefferson Counties in Texas, The Town of Palm Beach, Longboat Key, Collier County, Bay County, Siesta Key, Estero Island, Alligator Point, Lido Key, Captiva Island, and Boca Raton in Florida as well as; Nantucket Island in Massachusetts and Fire Island in New York, , Holly Beach, East and West Grand Terre, Baratavia/Plaquemines Barrier Island and New Cut in Louisiana.

LASARD Database West Belle Pass Pilot Project

Ms. Larenas worked with the Louisiana Office of Coastal Protection and Restoration (OCPR) to refine and standardize the Louisiana Sand Resource Database (LASARD). LASARD was developed to help facilitate the identification and management of offshore sediment resources, which will be used to develop a regional sediment management strategy.

During this study, existing geophysical and geotechnical data compiled by CPE for the West Belle Pass sand and marsh fill investigation was used to test and refine existing LASARD guidelines. Refined

MELANY LARENAS, P.G. | SENIOR COASTAL GEOLOGIST

COASTAL PLANNING & ENGINEERING, INC.

attribute tables were developed that incorporate key information that can be utilized by the OCPR to identify sediment resources using archived data. Twenty-eight (28) geoscientific datasets compiled for the West Belle project were formatted using the new attribute table structure. Six (6) datasets that were previously formatted using the original guidelines were mapped to the new standard. The datasets included geophysical tracklines; seismic, sidescan sonar; magnetometer; bathymetry and isopach points and contours; vibracores; grab samples; borrow areas and deposits; pipelines and platforms.

Reconnaissance Offshore Sand Search Project

Ms. Larenas is a primary architect for the Reconnaissance Offshore Sand Search (ROSS) database structure for the Florida Department of Environmental Protections Bureau of Beaches and Coastal Systems. ROSS stores offshore geotechnical and geophysical data for the entire State of Florida. This database contains legacy and recent geophysical and geotechnical data, as well as various environmental data sets related to sand search investigations.

During the development of the ROSS database, Ms. Larenas worked directly with the State of Florida to create standards for geological and geophysical data collection, processing and reporting. This work resulted in a ROSS database format which all geotechnical data submitted to the Bureau of Beaches is required to be in.

Borrow Area Design and Permitting

Professional geoscientist responsible for oversight of geological and geotechnical data processing and analysis; final borrow area design; and permit preparation. Projects include:

- Longboat Key, Florida, Offshore Geotechnical Investigation (2009/2010)
- Grand Liard, Louisiana, Offshore Geotechnical Investigation (2010)
- Barataria, Louisiana, Offshore Geotechnical Investigation (2010)
- Dauphin Island, Alabama, Reconnaissance Offshore Geotechnical Investigation (2010)
- Caillou Lake, LA, Land Bridge Project (2008-2009)
- West Belle Pass, LA, Barrier Headland Restoration Project TE-52 (2008-2009)
- Sand Key Sand Search Investigation (2008)
- Longboat Key Coarse White Sand Search (2008)
- Anna Maria Island Sand Search Investigation (2008)
- New River Inlet Borrow Area Investigation (2007-2008)
- Collier County Emergency Sand Source Evaluation (2007)
- Sand Key Constructability Analysis (2007)
- Topsail Beach, NC Sand Search Investigation (2006-2008)
- Town of Palm Beach Sand Search Investigation (2006-2007)
- Reach 8 Beach Nourishment Project (2006-2007)
- Nantucket Island, Massachusetts Shore Protection Project (2006)
- Bay County Beach Nourishment Project (2006-2007)
- Longboat Pass Sand Search Investigation (2006-2007)
- North Topsail Beach/New River Inlet, NC Shore Protection Project and Channel Stabilization (2006-2007)
- Lido Key Sand Search Investigation (2006)

MELANY LARENAS, P.G. | SENIOR COASTAL GEOLOGIST

COASTAL PLANNING & ENGINEERING, INC.

- Galveston and Jefferson Counties, Reconnaissance Sand Search Investigation (2006)
- Bay County Emergency Sand Search Investigation (2005)
- Point Sand Search Investigation (2005)
- New Cut, Louisiana Sand Search Investigation (2005)
- South Siesta Key Beach Nourishment Project (2004-2006)
- Galveston and Jefferson Counties, Preliminary Offshore Evaluation (2004)
- North Boca Raton Beach Renourishment Project (2003-2007)
- East and West Grand Terre, LA, Geotechnical Investigation (2003-2004)
- North Collier County Renourishment Project (2003)
- Port Everglades Entrance Channel Shoal Dredging and Beach Disposal Project – Permit preparation/review (2003)
- Longboat Key Beach Nourishment Project (2002)
- Alligator Holly Beach Shore Protection Project (2000)

Geotechnical Investigations

Responsible for collection and processing of various geological and remote sensing data. Projects include:

- Investigations Conducted for the East Marsh Island Marsh Creation Project, LA (2008)
- Longboat Key Sea Turtle Physical Monitoring (2007 and 2008)
- North Boca Raton Vibracore Investigation (2004)
- Siesta Key Jet Probe Investigation (2004)
- Sandy Point Shoreline Restoration Project, Vibracore Analysis (2003)
- Marco Pass Sand Search Vibracore Analysis (2003)
- Collier County Jet Probe and Vibracore Investigations (2002- 2003).
- Longboat Key White Sand Search Jet Probe, Side Scan Sonar, magnetometer and Seismic Investigations (2002).
- Barataria/Plaquemines, LA, Barrier Shoreline Restoration Project Side Scan Sonar Magnetometer and Seismic Investigation (2002).
- Central Boca Raton Beach Restoration, Jet Probe, Side Scan Sonar, Seismic and Vibracore Investigations (2001).
- Fire Island, New York Vibracore Investigation (2001).
- Holly Beach, Louisiana Jet Probe, Side Scan Sonar, Seismic and Vibracore Investigations (2000-2001).
- Captiva Island Side Scan Sonar and Seismic Investigations (2000).
- Estero Island Beach Restoration, Side Scan Sonar, Seismic and Vibracore Investigation (2000).
- Lido Key Feasibility Study Vibracore Investigation (2000).

MELANY LARENAS, P.G. | SENIOR COASTAL GEOLOGIST

COASTAL PLANNING & ENGINEERING, INC.

SELECTED PUBLICATIONS

LARENAS, M. AND FORREST, B.M., 2009. *The Predictability of Beach Nourishment Sediment Characteristics.* Presentation to the National Conference on Beach Preservation Technology.

LARENAS, M.; FORREST, B. AND THOMPSON, G. *Beach Sediment Characterization: The Keystone of Beach Engineering and Design.* Presented by Melany Larenas and Beth Forrest. Texas Coastal Conference, Caring for the Coast. June 4-5, 2009. Galveston, Texas.

CAMPBELL, T.; FINKL, C. AND LARENAS, M. 2009. *Dwindling Offshore Sand Resources in Florida – How Might Oil and Gas Exploration and Supply Lines Further Limit Remaining Sand Sources – What can we do about it?* Presentation to the Florida Shore and Beach Association.

FINKL, C.W.; FORREST, B.; LARENAS, M. AND ANDREWS, J.L., 2009. *Collier County Emergency Sand Source Investigation: Phase III Geophysical and Geotechnical Investigations.* Boca Raton, Florida: Coastal Planning & Engineering, Inc. 36p. (Prepared for Collier County, Florida).

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MELANY LARENAS, P.G. | SENIOR COASTAL GEOLOGIST

COASTAL PLANNING & ENGINEERING, INC.

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COASTAL PLANNING & ENGINEERING, INC.

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PANAMA CITY BEACHES PROJECT | BAY COUNTY, FLORIDA

Since 1995, CPE has provided broad coastal engineering and management services for the Panama City Beaches Project. The original project proposed by the U.S. Army Corps of Engineers (USACE) was too expensive for Bay County to construct even though the County's share was less than the federal share. The project CPE developed cost \$100 million less and had a higher Federal cost sharing rate than that initially proposed by the USACE. During the period when the Mobile District Corps of Engineers was completing the initial feasibility report for Panama City Beaches, CPE provided expertise to the USACE to modify the project into a locally preferred alternative and increase the cost sharing based on documented inlet impacts from the Federal navigation project at Panama City Harbor. This led to a 17-mile project costing \$30 million for the placement of 9 million cy of sand. When the USACE was unable to complete the engineering work, CPE stepped in to complete the permitting and design, leading to construction in 1998-1999 with full Federal funding. The reformulation plan was developed to include effects of Hurricane Opal. CPE provided a full spectrum of services including coordination for Federal and State funding to implementing a cost effective project, eliminating the need for local bonding.

Between 1999 and 2004, CPE worked with Bay County and the Mobile District Corps of Engineers to lay out the basis for future project. A beneficial beach nourishment occurred, using Federal dredging of Panama City Harbor to address a hot spot with in the Panama City Beach project area.

Hurricane Ivan struck the project area in 2004, and this was followed by additional storms in early 2005. In the two year period, about 2 million cy of sand were lost, and when combined with another 1.3 million cy of renourishment, led to a 3.3 million cy project in 2005. Based on prior planning and analysis conducted by CPE, a fast track emergency design and permitting effort by CPE led to a year-long construction starting in April 2005 to restore the beach. Due to the nature of the project, it was advantageous for Panama City Beaches to have the USACE construct the project, with CPE providing basic design and sand source information. The emergency design and permitting included a rapid sand search to bring the total available sand supply to over 4 million cy. The USACE emergency authority provided a major portion of the construction cost, since all sand lost to the storm was at a 100% Federal cost as it qualified for Federal emergency project under PL 84-99 Authority.

Due to various State and Federal grants, the Panama City Beaches share of the 1998-1999 and 2005-06 projects was about 10% of the total cost. This included services provided by CPE to modify the project to optimize the design and qualify the project for the maximum support for Federal and State funding sources.



Western Reach Post-Construction 2006

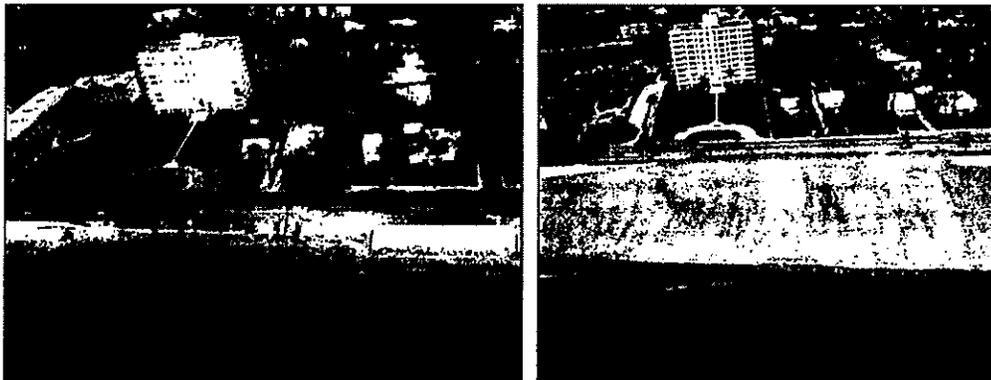
Since another round of hurricane and tropical storms hit the projects in 2005, the USACE was unable to address all the historic erosion during the 2005-2006 construction. CPE conducted an analysis of post-2005 storm impacts and found that additional volume should qualify for Federal funding. CPE is working with Bay County TDC and the Mobile District to formulate a beach nourishment project scheduled for construction this year. An ongoing sand search effort has led to identification of almost 10 million cy yards of white beach compatible sand, some of which will be used to renourish Panama City Beach in 2010 and address the remaining storm loss, along with the addition of a new beach section to the project. Since 1995, CPE has helped Panama City Beach qualify for over \$30 million in outside grants to support their projects, allowing Bay County TDC to build up a reserve for future emergency response projects. All of these efforts required a high degree of coordination between Bay County TDC, the USACE and CPE.

THE CITY OF DELRAY BEACH | PALM BEACH COUNTY, FLORIDA

The City of Delray Beach beach nourishment project was originally constructed in July 1973 and consisted of the placement of approximately 1.6 million cubic yards of sand along a 2.7 mile segment of Delray Beach on the east coast of Florida. Since the initial nourishment in 1973, the beach has had four periodic renourishments and one storm damage repair project in 2005.

The 2002 beach renourishment project was constructed from February through March 2002. The project extended from 500 feet north of Atlantic Avenue (R-179A) to 500 feet south of Atlantic Dunes Park (R-188A). Approximately 1,200,000 cubic yards of sand were placed over the 1.9 mile project area. The beach compatible sand used for the project was obtained from an offshore borrow area. The project construction cross-section provided for an average berm width extension of 100 feet at a berm elevation of +7.5 feet (NAVD).

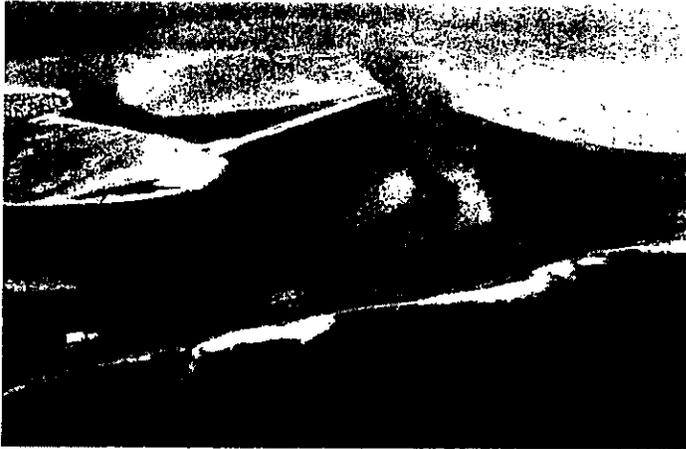
CPE provided all of the engineering services required for each of the projects including project design, geotechnical investigations, environmental studies, State and Federal permitting, FEMA funding assistance, surveying services and construction oversight required to build the project. The Delray Beach nourishment project was awarded the 2005 Project Award winner, American Shore and Beach Protection Association (ASBPA) and the 2002 Best Restored Beach Award winner American Coastal Coalition (ACC).



Pre- and Post-Construction 1973

Since 1973, the beach of Delray Beach has made a major comeback. Once at risk to being overtaken by the ocean, highway A1A and its neighboring properties have been protected by the wide beach. The renourished beach of Delray Beach is an award winning beach project. It is also an important economic asset to both the City and State. The 2005, FEMA supported, storm damage repair project effectively restored the beaches to the condition prior to the devastating hurricanes of 2004. Delray Beach continues to provide storm protection for the upland roads and buildings, recreational beach areas for both residents and tourists, and environmental habitat for nesting sea turtles and shorebirds.

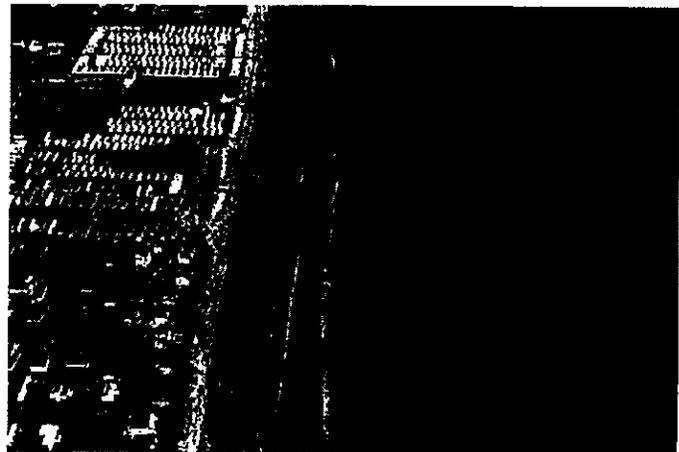
BOGUE INLET CHANNEL EROSION RESPONSE PROJECT | EMERALD ISLE, NORTH CAROLINA



The main ocean bar channel through Bogue Inlet, located on the border of Carteret and Onslow Counties in southeastern North Carolina, began to migrate toward the western boundary of the Town of Emerald Isle in the mid 1980's and threatened development in the subdivision known as The Point and Town infrastructure located immediately adjacent to the inlet shoreline. The Town of Emerald Isle contracted with CPE in 2002 to develop plans, prepare

the necessary environmental documents, obtain permits, and supervise the construction to relocate the channel to a more central location. A portion of the dredged material removed to create the new channel was used to construct a dike to close off the existing channel. The remaining material was used to nourish four (4) miles of the Town's ocean shoreline located east of the inlet. Construction of the new channel began on the sound side and proceeded towards the ocean with the first 691,000 cy used to nourish the ocean shoreline and the last 325,000 cy pumped into the existing channel to form the sand dike.

CPE performed a detailed geomorphic analysis of the inlet's history in order to develop relationships between the inlet channel and impacts on the adjacent shorelines and to define a stable channel corridor that would provide the optimum level of protection to the inlet shoreline. Once the channel location was determined, detailed geotechnical investigations were conducted to characterize the material contained in the ebb tide delta of the inlet and compare

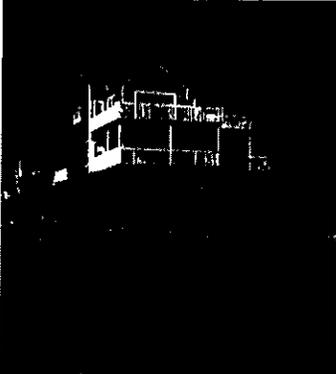


the inlet material with that on the native beach. A numerical model of the inlet was constructed (ADCIRC) to evaluate several aspects of the system including: changes in flow and circulation patterns associated with the modified inlet channel, predict changes in sediment transport, evaluate the stability of the proposed channel, and refine the design of the project. The model indicated that the existing channel, located immediately adjacent to the west end of the town, should be closed to ensure tidal currents are deflected away from the threatened structures. By closing the existing channel, recovery of the inlet shoreline would be accelerated, contributing to the development of a recurved sand spit off the west end of Emerald Isle, as well as provide additional assurance that the relocated channel would assume the flow through the inlet. The accelerated rate of spit development was also favored by State

and Federal resource agencies as a means to mitigate for subtidal and shallow water habitat lost from the channel relocation efforts. CPE developed plans to construct the dike using the direct disposal of dredged material obtained from a portion of the new channel.

This shoreline protection/inlet management project was the first of its kind in North Carolina to require a full Federal Environmental Impact Statement. As such, CPE worked closely with a project delivery team (PDT) consisting of State and Federal resources agencies, private environmental organizations, and local interest groups during the plan formulation and development to assure that all concerns were identified and properly addressed in the EIS. In order to address concerns identified by the PDT, CPE performed extensive hydrographic, bathymetric and habitat mapping of the various resources in the project area including photo-interpretations and ground-truth investigations for submerged aquatic vegetation, salt marsh communities, shellfish beds, etc. In addition, CPE completed the comprehensive pre- and post-project monitoring of the salt marsh habitats, macroinvertebrates, and shorebirds.

NORTH TOPSAIL BEACH NOURISHMENT AND CHANNEL RELOCATION PROJECT | NORTH TOPSAIL BEACH, NORTH CAROLINA



The Town of North Topsail Beach has an approximate 11.1-mile ocean shoreline that extends south from New River Inlet to the northern town limits of Surf City. Most of the northern 7.25 miles of the town lies within the Coastal Barrier Resource System (CBRS). The Coastal Barrier Resource Act (CBRA-82) of 1982 and the Coastal Barrier Improvement Act (CBIA-90) of 1990 established CBRA areas to restrict Federal expenditures and financial assistance on undeveloped coastal barrier islands that might encourage development on these islands.



Faced with the prospect of only 35% of its ocean shoreline being included in a federal coastal storm damage reduction project, the Town of North Topsail Beach contracted with CPE in 2003 to initiate a non-Federal study to determine the feasibility of providing shore protection for the 7.25 miles of ocean shoreline excluded from Federal consideration. The major shoreline management issues facing the Town of North Topsail Beach include preventing or reducing damages due to: (1) coastal storms, (2) long-term shoreline erosion, and (3) changes in New River Inlet. The prevention or reduction in damages due to coastal storms and long-term shoreline erosion along the majority of the Town's shoreline are being addressed through a program of beach nourishment,

while solutions to problems associated with New River Inlet offer greater challenges that involve inlet management strategies.

CPE was contracted by the Town in October, 2004 to conduct all aspects of the work associated with the design and permitting of this project including: beach and inlet management design, marine sand search investigations, numerical modeling, hardbottom habitat investigations, baseline environmental investigations, hydrographic survey of the inlet, beach profile surveys, and preparation of the EIS and associated permitting documents. Two areas were investigated to locate sand for the project, one offshore of North Topsail Beach and a second within New River Inlet. CPE conducted all work associated with these sand searches, including collection and analysis of geophysical data, collection and analysis of vibracores, native vs. fill compatibility analysis, and borrow area design. CPE conducted investigations to locate and characterize hardbottom habitats. The project was designed to avoid impacts to hardbottom habitats mapped in the nearshore environment off the project area.

A Final Environmental Impact Statement (EIS) under both the National Environmental Policy Act (NEPA) and the North Carolina State Environmental Policy Act (SEPA) was completed in December 2009. The environmental document will be used to support permit requests from the USACE and the State of North Carolina (Major CAMA permit).

CAPTIVA AND SANIBEL ISLANDS BEACH NOURISHMENT AND RENOURISHMENT PROJECTS | CAPTIVA AND SANIBEL

Since 1988, CPE has provided all required services for the construction of the original beach nourishment and two subsequent renourishment projects of a 6-mile long beach constructed on both Captiva and Sanibel Islands on the Gulf Coast of Florida. CPE developed the initial feasibility study, designed, permitted, and supervised the construction, and developed a beach and inlet management plan for two adjacent inlets. Other tasks included: coastal process analysis and sediment budget development; management alternative evaluations; coastal structure design and permitting; beach nourishment design and permitting; surveys, as well as hydrographic and offshore geotechnical investigations. CPE prepared the General Design Memorandum (GDM), which qualified the project for Federal reimbursement. Additionally, they amended and updated the project GDM for continued Federal funding. CPE has also provided benefit calculations for the Captiva Erosion Prevention District's (CEPD) taxing district apportionments.

The 2005-2006 Captiva and Sanibel Islands Project was a combination renourishment and storm repair, placing 1.3 million cy of sand along 6.4 miles of beach between Redfish Pass at the north end of Captiva Island and Bowman's Beach on Sanibel Island. This project was constructed by the USACE utilizing the design, sand sources and permits developed by CPE for the CEPD. The project was an exceptional example of partnering relationships developed through CPE in order to maximize Federal funding. The Captiva Island fill project included 156,000 cy of emergency sand under the USACE emergency program, 23,000 cy for emergency repair under FEMA Category G program, and the remainder was authorized USACE renourishment volume. The Redfish Pass terminal groin was rehabilitated to improve sand retention on the island, also partially funded by FEMA. On Sanibel Island, 46,500 cy qualified for support by FEMA's Category G program, 200,000 cy for renourishment under an interlocal agreement, and 80,000 cy for new construction on Bowmans Beach. Sand quality exceeded residents' expectations and matched historic beach characteristics which are critically important for environmental compatibility.



CAPTIVA BEFORE BEACH RENOURISHMENT



CAPTIVA AFTER BEACH RENOURISHMENT

Town of Emerald Isle

Mayor
Arthur B. Schools, Jr.

Mayor Pro Tem
Floyd Messer, Jr.

Board of Commissioners
Nita Hedreen
Tom Hoover, Jr.
John Wootten
Maripat Wright



Town Manager
Frank A. Rush, Jr.
frush@emeraldisle-nc.org

Mailing Address
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Visit our web site at www.emeraldisle-nc.org!

March 17, 2008

Subject: Coastal Planning & Engineering, Inc.

To whom it may concern:

By 2002, the main channel in Bogue Inlet had migrated east causing undermining of a number of homes along the western tip of Emerald Isle in an area known as The Point. We selected Coastal Planning & Engineering to help us develop a solution to this problem, secure necessary permits, and oversee construction of the identified solution.

The CPE team designed a channel relocation / beach nourishment project to reduce erosion stress caused by the migrating inlet channel and to provide sand to nourish the oceanfront beach in area of Emerald Isle approximately 1 – 6 miles east. Major challenges included technical development of the concept and coordination of an EIS through state and Federal agencies. CPE's team led a successful effort to secure permits, and construction of the project was completed in April 2005. Despite some ongoing issues associated primarily with subsequent hurricane impacts, the Town remains very pleased with the project results and CPE's performance on the project. The Town continues its relationship with CPE for post-project monitoring and assessment of current conditions and issues in the Bogue Inlet complex.

The Town is pleased to recommend CPE to governments in need of coastal engineering and environmental services for dredging projects, beach nourishment projects, and inlet channel projects.

Sincerely,

A handwritten signature in black ink that reads "Frank A. Rush, Jr." with a stylized flourish at the end.

Frank A. Rush, Jr.,
Town Manager



MANATEE COUNTY FLORIDA

December 7, 2007

To whom it may concern:

Manatee County has had a successful and productive relationship with Coastal Planning and Engineering, Inc., spanning a continuous period of 18 years.

During this 18-year period, Manatee County has conducted four competitive consultant selection proposals.

Each time, a selection panel of staff from the Purchasing Department and other County departments has ranked Coastal Planning and Engineering, Inc., as the most qualified proposal, a ranking subsequently affirmed by the Manatee County Board of County Commissioners upon their selection of Coastal Planning and Engineering as the County's beaches and coastal systems consultant following all four competitive selection procurement processes.

With CPE as our coastal consulting engineers, the County has a highly successful coastal management program for Anna Maria Island. They have assisted the County in implementing two major beach nourishment projects on Anna Maria Island. In 1992, and again in 2002, CPE was the County's engineer for nourishment and renourishment of the central 5 mile section of Anna Maria Island. In each case, the project involved the placement of about 2 million cubic yards of fill from offshore borrow areas. CPE conducted the geotechnical investigations which identified a major volume high quality sand source located off the north end of Anna Maria Island which was used for the 2002 project, and to conduct hurricane damage repairs of the beach in 2005. Recently, CPE completed a Feasibility Study for the northern and southern Anna Maria Island shoreline which included a funding eligibility evaluation, a sand source evaluation and an alternatives analysis which culminated in engineering design recommendations.

Presently, CPE is working on behalf of Manatee County with the state and federal agencies for the permitting of a beach repair of damage caused by the hurricanes of 2004. This project will utilize Federal Emergency Management Agency (FEMA) funding to repair the northern section of the island shoreline. They are also engineering a second beach nourishment project to include the southern one mile of Anna Maria Island. CPE is also presently working to refurbish the County's fishing pier at Manatee Beach Park on Anna Maria Island.

In addition to their high level of experience and expertise, CPE has in-house capabilities for all of the major disciplines required to implement a comprehensive beach management program, including marine surveyors, marine geologists, biologists and coastal engineers. We anticipate our professional relationship to continue well into the future resulting in continued successful management of the beaches of Anna Maria Island.

If you should have any questions, please call me at 941-748-4501, ext. 4601.

Sincerely,

Charlie Hunsicker, Director
Conservation Lands Management Department

CONSERVATION LANDS MANAGEMENT DEPARTMENT

P. O. Box 1000 • 415 10th Street West, Bradenton, Florida 34205 • Phone: 941 745 5725 • Fax: 941 741 3227 • www.myanatee.org

AMY STEIN • GWEN BROWN • JANE VON HAHMANN • RON GETMAN • DONNA HAYES • CAROL WHITMORE • JOE MCCLASH
District 1 District 2 District 3 District 4 District 5 District 6 District 7