

PROCEEDINGS

WORKSHOP on INNOVATIVE SHORE PROTECTION TECHNOLOGIES

Tallahassee, Florida
February 22-23, 2006

Organized and Hosted by:
Florida Department of Environmental Protection,
Bureau of Beaches and Coastal Systems

TABLE OF CONTENTS

- I. Introduction
- II. Workshop Agenda
- III. Workshop Summary

APPENDICES

- A. Laws and Regulations Pertaining to Innovative Shore Protection Technologies
- B. Workshop Presenter/Vendor Contact Information
- C. Workshop Presentations and Handouts
 - Overview of FDEP Requirements and Procedures
 - FDEP - History of Innovative Technology in Florida
 - Flow and Erosion Control System
 - Moveable Wall
 - Seament®'s System Engineering Approach with Boxes (Seabox™) for Cost-Effective Shoreline Erosion Control
 - Subsurface Dune Protection and Restoration Systems
 - FDEP Erosion Control Program – Project Funding
 - Shoreline Erosion Control Study and Measures, Willapa Bay, WA
 - Sand Saver
 - Analysis of Submerged Groin Field at Stump Pass State Park
 - Submerged Artificial Reef Ball Breakwaters
 - Multi-Purpose Artificial Surfing Reefs
 - FDEP - Joint Coastal Permitting
 - FDEP - Experimental Test Plans
 - FDEP - Coastal Engineering Considerations
 - Pressure Equalizing Modules (PEM) System
 - Seadozer
 - JetSpray Thin Layer Placement of Dredge Spoil for Shore Protection
 - Catch Basin
 - FFWCC - Wildlife Considerations
 - Total Beach Management
 - Fort Livingston Wave Protection Project
 - Reef Mitigation 'Gardens'
 - The Quick Levee Builder & Probagger

I. Introduction

The Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems (BBCS), is often faced with requests to permit, implement or fund new and innovative erosion control projects¹.

Section 27 of Chapter 89-175 of the Laws of Florida (see Appendix A) was enacted by the Florida Legislature in 1989 to address requests such as these. The Law was incorporated into Section 161.082, F.S., and allows the Department to:

1. encourage the development of new and innovative methods for dealing with the coastal erosion problems along the state's shorelines,
2. authorize the construction of pilot projects utilizing alternative erosion control methods (upon receipt of an application from a riparian property owner or governmental entity, and upon consideration of the facts and circumstances surrounding the application).

Additional guidance for the regulatory approval of new/innovative shore protection technologies is provided in Chapter 62B-41, F.A.C. (see Appendix A).

The Department organized and hosted a workshop on innovative shore protection technologies in Tallahassee, on February 22-23, 2006. The workshop was held with the following goals in mind:

1. to offer designers and vendors of new and innovative shore protection technologies an opportunity to showcase their ideas and products,
2. to provide information on Florida Law, and Department rules and procedures for permitting pilot projects in the State,
3. to provide information on Florida Law, and Department rules and procedures for funding pilot projects in the State,
4. to allow an informal exchange of ideas and feedback to designers and vendors from workshop participants.

The Department advertised the workshop on the BBCS web site, through the University of Delaware's Coastal Listserv, and via email and telephone contact to over 100 potential workshop participants. Approximately 60 people attended the workshop. Seventeen presentations were given by designers and vendors; six presentations were given by the Department, and one presentation was given by the Florida Fish and Wildlife Conservation Commission (see Section II, Workshop Agenda).

¹ The Department considers new and innovative shore protection technologies as applied science, intended to solve an erosion problem, and about which the Department staff and professional engineering community have insufficient information to predict project performance and reliability, and potential impacts to the beach dune system. See 62B-41.002(30) in Appendix A for the precise definition.

II. Workshop Agenda

Wednesday, February 22, 2006

Time	Topic	Presenter	Affiliation
8:40	Introduction to Workshop	Christopher P. Jones	Consultant to FDEP
8:50	Overview of DEP Requirements and Procedures	Michael Barnett	FDEP, Beaches and Coastal Systems
9:00	History of Innovative Technology in Florida	Paden Woodruff	FDEP, Beaches and Coastal Systems
9:30	Flow and Erosion Control System	Lewis Rubin	Sandi Technologies
10:00	break		
10:25	Moveable Wall	Herb Ackerman	Herb Ackerman
10:55	Seament®'s System Engineering Approach with Boxes (Seabox™) for Cost-Effective Shoreline Erosion Control	Ed Veasey	Seament Shoreline Systems, Inc.
11:30	lunch		
12:45	Subsurface Dune Protection and Restoration Systems	Rande Kessler	Advanced Coastal Technology, LLC
1:30	FDEP Erosion Control Project Funding	Phil Flood	FDEP, Beaches and Coastal Systems
2:05	Shoreline Erosion Control Study and Measures, Willapa Bay, WA	Vladimir Shepsis	Coast & Harbor Engineering
2:35	Sand Saver	Jim Cravens	Granger Plastics Company, Inc.
2:50	break		
3:05	Analysis of Submerged Groin Field at Stump Pass State Park	Tim Engle and Kelly Rankin	Beach Restoration, Inc.
3:45	Submerged Artificial Reef Ball Breakwater	Lee Harris	Lee Harris
4:10	Multi-Purpose Artificial Surfing Reefs	Lee Harris	Lee Harris
4:30	Discussion and Wrap-Up	Christopher Jones	Consultant to FDEP
4:40	Adjourn		

Thursday, February 23, 2006

Time	Topic	Presenter	Affiliation
8:35	Joint Coastal Permitting	Martin Seeling	FDEP, Beaches and Coastal Systems
8:55	Experimental Test Plans	Stacey Roberts	PBS&J, Consultant to FDEP
9:20	Coastal Engineering Considerations	Robert Brantly	FDEP, Beaches and Coastal Systems
9:35	Q/A regarding FDEP Presentations	Seeling, Roberts, Brantly	FDEP, Beaches and Coastal Systems
10:00	break		
10:20	Pressure Equalizing Modules (PEM) System	Kenneth Christensen	Ecoshore International, Inc.
11:00	Seadozer	Dennison Breese	Cape Fear International
11:30	JetSpray Thin Layer Placement of Dredge Spoil for Shore Protection	Troy Deal	Aztec Development Company
11:50	lunch		
12:45	Catch Basin	Calvin LeBuffe	Calvin LeBuffe
1:05	Wildlife Considerations	Robin Trindell	Florida Fish and Wildlife Conservation Commission
1:55	Total Beach Management	Jay Tiedeberg	Benedict Engineering Company
2:20	break		
2:35	Fort Livingston Wave Protection Project	Scott Hicks	Coast & Harbor Engineering
3:00	Reef Mitigation 'Gardens'	William Dally	Surfbreak Engineering Sciences, Inc.
3:30	Quick Levee Builder & Probagger	Wil Hagfors	Progressive Innovations, LLC
3:45	Discussion and Workshop Wrap-Up	Christopher Jones	Consultant to FDEP
4:35	Adjourn		

III. Workshop Summary

History

Although there was no formal mechanism to address the installation of innovative or experimental shore protection technologies prior to 1989, several such products were installed. Since that time, many other devices or beach alteration methods have been attempted along Florida's shorelines, including: beach scraping; beach dewatering; geotextile tubes filled with sand or concrete, and used as groins, sills or breakwaters; and proprietary reef structures, to name a few. In recent years, an average of one innovative or experimental project has been permitted annually.

The State's Interest

The impetus for the Department's role in this topic stems from the State's desire to protect and restore its sandy beaches. Thus, products, systems and procedures are sought that: reduce beach nourishment costs, extend beach nourishment project longevity, conserve beach/dune sediment resources, improve inlet sediment bypassing or otherwise facilitate management of the beach/dune system.

The Roles of Vendors and Project Sponsors

Designers and vendors with innovative or experimental technologies wishing to install or implement their device or system must follow the permitting and engineering steps outlined in the Department's (and FFWCC) presentations at the workshop (see Appendix C). These steps include:

- selection of candidate site(s) within areas designated as critically eroding by the Department, and outside of areas deemed environmentally sensitive by the Department,
- coordination with the government entity or riparian owner (who will be the project sponsor and permit applicant, and will be responsible for fulfilling the conditions of project permits),
- project planning, engineering and environmental studies,
- pre-application meeting with the Department,
- development of an experimental test plan,
- submission of permit applications (Joint Coastal Permit, USACE permit, local permits),
- project construction,
- project monitoring,
- mitigation of adverse impacts, including possible project removal if significant adverse impacts² are observed,

² See 62B-41.002 F.A.C (in Appendix A) for the precise definition, paraphrased here as: adverse impacts of such magnitude that they alter the coastal system, e.g., an increase in the rate of erosion; or a destabilizing of the coastal system such that it is more vulnerable

- project maintenance (these costs may not be trivial -- for example, some projects may be required to be covered by sand, but due to their location in a critically eroding area, this requirement could be expensive to fulfill).

Attendees at the workshop stressed the importance of coordination between innovative/experimental project vendors and local governments. Vendors are prone to underestimate the time, effort and expense required: to develop a workable project, to achieve local sponsor participation, to secure the necessary permits, and to monitor projects once constructed. Local governments are not in the research and development business, and will not typically fund the engineering and design associated with a particular project. Nor will they typically assume liabilities associated with installation, monitoring and performance of an innovative/experimental project – vendors must be prepared to do so.

The Experimental Test Plan

One key element of the permit process for an innovative/experimental project is the development of an acceptable experimental test plan. The experimental test plan requirements are set forth in 62B-41.0075, F.A.C. (see Appendix A), and are summarized below:

- the experimental test plan must include a description of the objectives and nature of the experiment,
- a testable hypothesis must be articulated,
- project and control areas must be identified,
- project effectiveness measures must be stated,
- measures of project impacts (to the coastal system, marine turtles and other species and habitats) must be included,
- project monitoring data collection and procedures must be described in detail (e.g., type, location and frequency of data collection, equipment to be used, names and qualifications of persons collecting and analyzing data, etc.),
- schedule for submission of monitoring reports,
- installation schedules and contingency plans must be included (e.g., if the innovative/experimental project is intended to be installed immediately following a storm event, this should be spelled out in the test plan, with notification to the Department (and other entities, as appropriate) prior to installation.

While the test plan requirements listed above may appear daunting, the following “lessons learned” from prior test plan development and review were offered to designers and vendors:

to the effects of a coastal storm or its ability to recover from the effects of a coastal storm is hampered; or a “take” results.

- keep the plan simple
- keep the plan scientific
- the plan is not a sales pitch
- avoid giving opinions, just provide facts
- the data and methods proposed must be sufficient to prove the plan's hypothesis
- don't forget contingency plans

Wildlife Considerations

Federal and state agencies involved with threatened and endangered species protection will look at any proposed innovative/experimental project carefully, paying particular attention to the geographic location, the nature of the materials used, where the project is installed along the beach/dune profile, how the project is installed, and when the project is installed. The primary concerns of the agencies will be related to marine turtle nesting, shorebird nesting/foraging habitats, and other threatened/endangered species impacts. A pre-application meeting will help to identify potential concerns.

Duration of Projects

Innovative/experimental projects may be permitted with phases lasting up to three years, including preparation of the final report. The Department will review periodic monitoring reports to determine whether the project has caused a significant adverse impact. If such a determination is made, the Department may require project modification or removal. Following receipt and review of the project final report, the Department will determine the project effectiveness, will determine whether the project could be continued, and will determine whether the project should be modified or removed.

State Funding

The Department has requested funds for cost-sharing the design, permitting, construction and monitoring of innovative/experimental projects³. Applications for innovative/experimental project funding must be submitted to the Department by eligible local governments. The deadline for submission of applications will be determined by the Department following the 2006 legislative session.

Receipt of State funding will be based on a competitive evaluation of project proposals, which will be carried out by an independent committee of coastal engineers and scientists. Project evaluation and ranking criteria will be developed outside of the rulemaking process. Projects that are determined by the committee

³ Through the Department's Beach Management Funding Assistance Program, the "Fixed Capital Outlay, Local Government Funding Requests for Fiscal Year 2006-2007" contains a request for \$2 million as the State's share to be matched with a \$2 million local share for innovative/experimental projects.

to be technically sound and economically viable (i.e., those that optimize sediment management, when compared with conventional technology) will be selected for funding.

Hard structures (see 62B-33, F.A.C.) will not be eligible for State funding, unless those structures are intended to increase the longevity of a beach nourishment project.

Workshop Discussion

In addition to the issues and topics listed above, other issues and topics were discussed during the workshop. These are described briefly below:

- identification of critical erosion areas and environmentally sensitive areas – workshop participants asked where this information could be obtained, and if it could be placed on a single map. Creation of a single map with this information is not practical. However, critical erosion areas are identified on the Department's web site (http://www.dep.state.fl.us/beaches/publications/tech-rpt.htm#Critical_Erosion_Reports); environmentally sensitive areas are identified on the Department's web site (<http://www.dep.state.fl.us/coastal/>) and on the FFWCC web site (<http://www.floridaconservation.org/>). Designers and vendors should be aware that environmental constraints on projects may vary with geographic location, time of year, and the nature of the innovative/experimental device or method proposed.
- project liability – liability associated with an innovative/experimental project may fall on the project sponsor (by virtue of their being the project applicant), however, local governments will likely pass this through to the designer or vendor, including financial obligations associated with project monitoring, mitigation and removal. Liability for a project is not contingent on receipt of state funding.
- local government comments –
 - would like to see wave tank testing of the products (Department staff said that this falls under research and development and is generally the responsibility of the designer/vendor, but it may be possible for a portion of the State's funding to be set aside for this purpose)
 - would like vendors who approach them to have a specific site and project in mind, and would like vendors to have Florida experience
 - the short time frame between the announcement of State funding availability and the application deadline is a problem (note: the Department said that funds could be encumbered to allow local governments and the Department more time to prepare and evaluate applications)
 - would like to see a special permit process for these products
- additional information and guidance – designers and vendors requested flow charts to guide them through the permitting process and the funding process

- testing region? – would it be possible to identify a region where several innovative/experimental devices could be installed concurrently (separated by control areas)? This would allow monitoring costs to be shared, and would allow various devices to be tested under similar conditions.