ATTACHMENT NO. 5

PROJECT DESCRIPTION

ATTACHMENT NO. 5
PROJECT DESCRIPTION

Introduction

The proposed federally-authorized Lido Key Hurricane and Storm Damage Reduction (HSDR) project includes beach nourishment on Lido Key using sediment from the two adjacent passes and the construction of two groins to stabilize the southern shoreline. Big Sarasota Pass is designated as the primary and initial sand source under the requested 15-year permit. New Pass may be used as a supplemental sand source, subject to the sand sharing agreement between Lido Key and Longboat Key. New Pass is currently permitted under FDEP Permit No. 0039755-003-JC.

The federal authorization is described in the attached engineering reports (Attachment No. 38). Congress authorized the project in Section 364 of the Water Resources Development Act of 1999, Public Law 106-53, allowing for initial construction of a shore protection project and for periodic nourishment over 50 years of Federal participation. The non-Federal sponsor is the City of Sarasota. A Design Agreement for the Lido Key Project was signed 12 September 2007 between The Department of the Army and The City of Sarasota, Florida.

Beach Nourishment Description

The proposed Lido Key HSDR Project consists of the placement of approximately 950,000 cubic yards (cy) of sand along a 1.6 mile segment of the Lido Key coastline between FDEP monuments R-35 and R-44. The design is based on the Sarasota County, Florida, Hurricane and Storm Damage Reduction Project, Lido Key Segment, Feasibility Report with Environmental Assessment (October 2002 Report with April 2004 Addendum) and includes an 80-ft wide design beach (extension of the May 2000 MHW line) at +4-ft NAVD (+5-ft NGVD) with a 1V:10H slope and 5 years of advanced nourishment. This fill template was designed to minimize impacts to marine turtles. It features a constant elevation section at the back of the beach at +4.0 ft, NAVD, and a 200-ft sloped berm section from +4.0-ft to +2.0-ft NAVD at a 1V:100H slope. The template tolerance is +/- 0.5 feet.

In order to optimize the function of the beach fill in conjunction with the groin field while still maintaining the original design conditions set forth in the Feasibility Report, the beach fill was re-distributed to shift a portion of the placement volume from the southern end of Lido Key to the central region of the island, where it will act as a feeder beach for the groin field throughout the 5 year period between nourishments. The beach fill and groin field are shown on the permit sketches in Attachment No. 24. The detailed engineering analysis is described in the Sarasota County, Florida HSDR Project Analysis of Lido Key Groin Field report (USACE, 2014) provided in Attachment No. 38. At the time of construction, the entire length of the groins will be buried with sand. This will require a minimal amount of fill to be spread along the length of the groins. Over time, the structure is expected to become exposed as the beach fill equilibrates and is subject to natural coastal processes.

Sediment Source Description

The Big Sarasota Pass channel and ebb shoal are proposed as the main sediment source for the Lido Key HSDR project, with New Pass being used as a supplemental source. The Feasibility Report investigated multiple sand sources and determined that offshore sources are not a viable option due to limited quantities of beach compatible material. The Feasibility Report and the Comprehensive Inlet Management Plan, Big Sarasota Pass and New Pass for Sarasota County (Coastal Technology Corp., 2010) identified Big Sarasota Pass as a compatible sediment source. The U.S. Army Corps of Engineers (USACE) completed an extensive modeling study of dredging alternatives developed from the County's 2010 Inlet Management Program in support of this permit application, the Study of Big Sarasota Pass Mining Alternatives for Sarasota County, Lido Key Shore Protection Project (included in Attachment No. 38). The study compared multiple configurations of Big Sarasota Pass channel and ebb shoal dredging to evaluate the response and evolution of the inlet and ebb shoal morphology, the effect on the wave climate, the navigation channel response, and the effect on sediment transport pathways which exchange sediment between the ebb shoal and adjacent beaches. Based on the model results (USACE, 2015), the proposed Big Sarasota Pass borrow area has no significant adverse effects. It provides a renewable sediment resource in a region where sediment is scarce and relieves erosional pressure on the northern interior shoreline of Siesta Key. Additionally, use of the proposed Big Sarasota Pass borrow area does not impact the navigation channel and does not interrupt the current sediment pathways.

The Big Sarasota Pass borrow area design includes three cuts labeled B, C and D (Attachment Number 24). Cuts B and C are proposed as the initial sediment sources. Borrow Area B is a southern extension of the existing channel located offshore of Siesta Key. Borrow Area B contains approximately 299,000 cubic yards of beach compatible material and has an excavation elevation of -13.5 ft NAVD. Borrow Area C is located within the ephemeral channel of Big Sarasota Pass and contains approximately 985,000 cubic yards of beach compatible material and has an excavation elevation of -13.5 ft NAVD. Contour dredging is proposed in borrow area D, located to the north of Cut C containing 458,000 cubic yards of beach compatible material and has an excavation elevation of -13.5 ft NAVD. Borrow areas C and D intentionally overlap at the seaward end of borrow area C as shown in the Attachment No. 24. The overlap section can be dredged when accessing borrow areas C or D and is necessary since these borrow areas may not be proposed for dredging during the same event. Attachment No. 27 provides the borrow area geotechnical information. Seagrasses were located in and nearby the proposed borrow areas during the 2014 benthic resource investigation of the project area. Potential impacts will be mitigated as described in Attachment No. 37 Seagrass Mitigation and Monitoring Plan.

The New Pass borrow area is being proposed for future use to supplement nourishment of Lido Key from Big Sarasota Pass. New Pass has been used in multiple previous nourishments, including the 2015 Lido Key Nourishment Project that is currently being construction on Lido Key. The City of Sarasota (City) and Town of Longboat Key (Town) hold an inter-local sand sharing agreement to alternate use of the New Pass sand source. As the existing permit to dredge New Pass is expiring, the City and Town are currently coordinating with the FDEP on obtaining a new permit to periodically dredge New Pass and place the material on both shorelines in alternating events, under FDEP Permit File Number 0039755-003-JC, Sarasota County. With the anticipated

New Pass dredging permit, the USACE and City are proposing to utilize New Pass under the New Pass dredging permit as a borrow source for the Lido Key HSDR project if the material is available and timing aligns for a Lido Key placement event in terms of the inter-local sand-sharing agreement.

The applicants propose to dredge all of Borrow Area B (299,000 cubic yards) and a portion of Borrow Area C for the initial nourishment event. Borrow Area C contains 985,000 cubic yards (cy), however the first event will remove approximately 900,000 cy. Therefore, the total amount estimated for removal is 1,199,000 cubic yards, which accounts for losses from borrow area to beach template due to the nature of dredging work. Subsequent nourishments are anticipated to occur on the nourishment interval of 5 years. Based on the advanced nourishment, the volume removed from the borrow source is estimated to be 325,000 cy for subsequent events. The future use of the borrow areas is dependent on the project performance, borrow area re-filling rates, and the condition of the beach at the time of construction. The actual quantities are subject to change and will be determined by the annual physical monitoring data and analyses.

Groin Field Description

The applicant is proposing two shore-perpendicular groin structures between R-42 and R-44 at the south end of the fill area to stabilize beach fill on the southern end of Lido Key and lengthen the time required between sand placement events. The two groins will maintain the minimum beach design width and allow sand to bypass downdrift due to optimized lengths and porosity determined through further engineering analyses (USACE, 2014) following the Feasibility Report. The first structure will extend 170 feet (crest length) from the existing seawall near R-42.5. The second structure will extend 345 feet (crest length) seaward from the existing seawall near R-43.2. The design crest width of the groins is 9 feet with a varied design depth and a side slope of 1V:1.5H. Adding the front slopes and 5-foot scour aprons at the end of each structure yields total lengths along the foundations of 187 feet and 362 feet, respectively. The template tolerances will be determined during final design and included in the plans and specifications. In order to install Groin 2, dune vegetation will be removed. The impacts will be localized around the proposed structure within the contractor's work area and will depend on the condition at the time of construction and the contractor's means and methods to perform the installation and access the immediate work area. Dune contours and impacted vegetation will be restored per the conditions of the requested FDEP permit.

The 2002/2004 Feasibility Report included a third, terminal groin at the south end of the island. Due to the optimization of the two groins between R-42 and R-44, the engineering analyses show that the third groin is not needed. The details of the design analysis are presented in Attachment No. 38 of the original application.

References

Coastal Technology Corp., 2010. Comprehensive Inlet Management Plan, Big Sarasota Pass and New Pass for Sarasota County (2010).

U.S. Army Corps of Engineers, 2004. Sarasota County, Florida, Hurricane and Storm Damage Reduction Project, Lido Key Segment, Feasibility Report with Environmental Assessment (October 2002 Report with April 2004 Addendum).

U.S. Army Corps of Engineers, 2014. Sarasota County, Florida, HSDR Project, Analysis of Lido Key Groin Field (2014).

U.S. Army Corps of Engineers, 2015. Study of Big Sarasota Pass Mining Alternatives for Sarasota County, Lido Key Federal Shore Protection Project (2015).