DR-4834-FL

Applicant: Brevard County, FL

South Beaches Engineered Dune Project

Project # 804068

Category G Engineered Beach

Location

The "South Beaches Engineered Dune Project" is located on the Gulf Coast of Florida in Brevard County (see Attachment 1. South Beach Engineered Dune Project Location Map) and Fig. 1 of Attachment 2. Brevard Post-Milton Assessment 2024_12-6-2024

Project Location

The South Beaches project segment comprises 13.1 miles of Atlantic Beach shoreline dune along Melbourne Beach, Brevard County, Florida, between FDEP Reference Monuments R-141 and R-213.

North Endpoint at R-141: 28.0476, -80.5479

South Endpoint at R-213: 27.8762, -80.4555

Project Length: 69,580 FT

There are no federally constructed shoreline management projects within Project template. The Project is not a specifically authorized and constructed Corps of Engineers (USACE) Coastal Storm Risk Management project. *Therefore, the beach is not a federally constructed shoreline under the specific authority of USACE* (PAPPG, p.180).

The South Beaches Engineered Dune Project (Project) is a non-federal, designed, constructed, and maintained for post-storm restoration project. The Project was constructed by Brevard County in 2004/05after severe storm impacts. The Project is wholly above the mean high-water line..

Therefore, the Project is the legal responsibility of the Applicant requesting assistance (PAPPG, p.52).

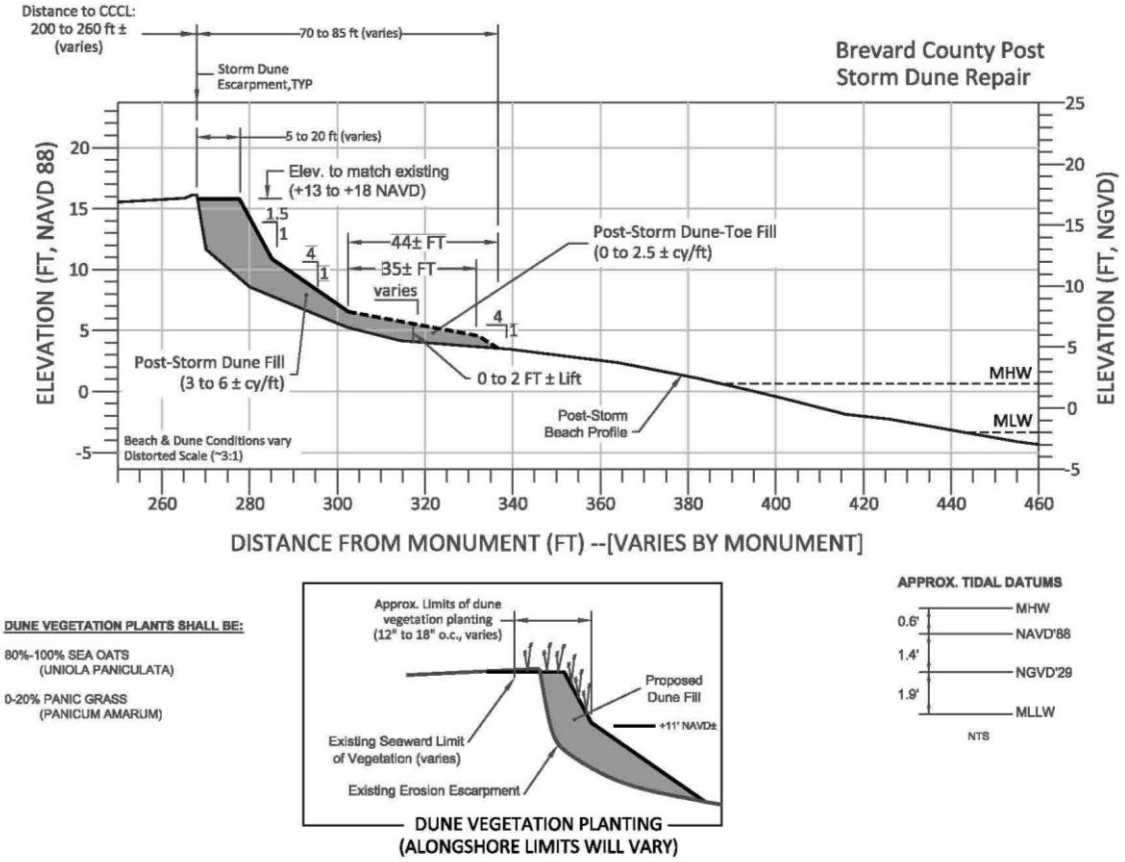
Damage Description and Dimensions

During the declared incident period from October 05, 2024 – November 02, 2024, Hurricane Milton generated storm surge and wave action that caused beach and dune erosion in Brevard County, Florida. A major disaster, DR-4834-FL, was declared on October 11, 2024. Photos of the beach taken after the storm are shown in Attachment 3. 4834 Brevard Co. Dune Photo Page

PROJECT HISTORY/MAINTENANCE:

Design

The original South Beaches Engineered Dune Project was constructed in 2004/2005. Typical design sections for the Project are shown below:



To date, all sand utilized for the initial construction and subsequent maintenance of the project has been derived from various beach-compatible upland sources and placed to the project area by truck haul. Future project renourishment (construction) is anticipated to utilize beach-quality sand from upland sources.

In summary, the Project was constructed by the placement of imported sand—of proper grain size—to a designed elevation, width, and slope (PAPPG, p. 180).

Maintenance

The first maintenance nourishment of the South Beach Engineered Dune Project was completed in 2006. FEMA participated in cost share for the 2004/05, 2006, 2009, 2017, 2017/18, 2019/20, and 2023/24 project activities. Additional maintenance and storm related repairs are detailed in Table 1 and on pg. 6 of Attachment 2 and are as follows:

Table 1 – Summary of South Beaches Engineered Dune projects.

Dates	Cause of Erosion	Sand Placed (cy)	Vegetation Planted (units)
Dec 2004 to Apr 2005	Hurr. Charley, Frances and Jeanne	252,200	
Feb to Apr 2006	Hurr Wilma	47,770	
Feb to Apr 2007	Hurr. Charley, Frances, Jeanne, and Wilma		495,000
Feb to Apr 2008	TS/Hurr Noel	30,948	41,062
Jan to Apr 2009	TS Fay	69,132	135,000
Dec 2013 to Apr 2014	Hurr Sandy	47,262	13,200
Oct 2016 to Apr 2017	Hurr Matthew	99,382	375,500
Dec 2017 to May 2018	Hurr Irma	78,828	451,592
Dec 2019 to Apr 2020	Hurr Dorian	99,898	
Dec 2020 to Feb 2021	Storm waves (nor'easters)	47,167	430,000
Jan 2023 to Apr 2023	Hurr Ian & Nicole	244,450	
Nov 2023 to Mar 2024	Hurr Ian & Nicole	140,830	Pending (2025)

In summary, the Applicant has established and adhered to a maintenance program involving periodic renourishment with imported sand to preserve the original design (PAPPG, p. 180).

INCIDENT-RELATED DAMAGE:

The principal erosion was observed along the South Beaches shoreline. Volumetric losses attributed to **Hurricane Milton** were computed by Foth-Olsen above approximate elevation of +6.4 ft NAVD from pre- and post-storm beach profile surveys. The pre- and post-storm beach profile surveys were conducted by Morgan & Eklund, Inc. at average 2,000-ft spacing alongshore from landward of the dune crest to below the MHWL at 40 R Monuments withing the project template: R-143, R-145, R-147, 149, 151, 153, 155, 157, 159, 161, 162, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 184, 185, 186, 187, 188, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, and 213. Pre and post storm profiles are available in Attachment A.

Surveys were conducted as follows:

Pre-Storm: 11-12 March 2024

Post-Storm: 24-28 October 2024

The topographic surveys (Attachment B) show incident related sand loss for the South Beaches Engineered Dune Project equates to 50,710 CY as measured by the pre-storm (3-6 11-12 March 2024) and post-storm (24-28 October 2024). Volumetric changes specific to each R monument in the project template are presented in Table 3 of Attachment 2.

Background Accretion

Background accretion (volume changes) are accounted by previous assessment of February 2021 to June 2022 surveys, during which no fill was placed and no unusual storm activity occurred. These changes were documented in the post-Ian and post-Nicole damage assessment (Olsen, 2022). Comparison of the February 2021 and June 2022 surveys indicated that a total of +11,190 CY was gained above +6.4 ft NAVD during this period (481 days), or +23.3 CY/day.

Using this historical background change value, the March 11-12, 2024 survey to the October 24-28, 2024 survey (~226 days) yields a background volume gain of approximately 226 days x +23.3 CY/day = +5,266 CY.

Dune Access

Repair of storm-erosion damage will practically require an additional 888 cy of sand placement to build sand ramp to beach and restore upland staging areas, based upon historical project construction precedent. At each of eight staging sites, 111 cy of sand will be used to construct ramp for heavy equipment access.

Total Incident Related Sand Loss = Survey Losses + Background Accretion + Dune Access

= 50,710 CY + 5,266 CY + 888 CY

= 56,864 CY of Hurricane Milton related sand loss within the project template from R-141 to R-213

Scope of Work

WORK TO BE COMPLETED

The Applicant will place the **Hurricane Milton** repair of **56,864 CY** of beach quality sand within the existing Project template at the engineer's discretion based on field conditions at time of construction.

Repair of erosion caused by Hurricane Milton will occur in one sand placement project activity over one construction season through one contract.

Road trucks shall transport sand from upland sources to then deliver and dump the sand to the construction staging areas, located immediately upland of the dune crest. The sand will be then transferred by excavator to off-road beach trucks which shall then traverse the beach and place the sand to the dune (within approximately 1 mile in either direction from the staging areas), after which a bulldozer will shape the sand into the construction template against the eroded dune face. The beach transit & work areas shall be filled, and the staging areas restored, within several weeks after construction. Post-construction dune/beach profile survey data will be collected.

Beach Access Locations:

Eight previously established staging areas may be utilized, located at approximately R-140.2, R-151.2, R-157, R-165.4, R-179, R-187.5, R-192.6, and R-205.8, as identified in the project's permit drawings (see Attachment C).

Sand Source

Beach compatible sand will be obtained from a properly licensed, permitted, and qualified supplier of the material (upland mine). The exact source of the material will be determined through the bid selection process. The sediment from the supplier will be similar in Munsell color and grain size distribution to the material in the existing coastal system at the beach placement site.

Engineer's Estimate of Probable Cost:

Table 4 – Estimated cost to repair South Beaches Engineered Dune Project damages from Hurricane Milton.

Items	Unit	Unit Price	Quantity	Price
Beach fill	Cubic Yard	$65	56,864	$3,696,160
Engineering/Design/Monitoring (2026)	LS	$95,000	LS	$95,000
Construction Review Contract (2026)	LS	$350,000	LS	$350,000
Beach Tilling & Phys Monitoring (Post- and 3-years post-const, 2026-29)	LS	$300,000	LS	$300,000
Marine Turtle Monitoring (3 years)	LS	$450,000	LS	$450,000
Public Assistance 406 Mitigation	LS	Allowance: 15% of beach fill cost	LS	$554,420
Total				**$5,365,580**

Explanation of Items

"Engineering/Design/Monitoring" includes: Post-Storm & Post-Construction physical surveys to document dune physical conditions, compute storm erosion losses, design repair plan and prepare construction drawings, evaluate upland sand sources for sand compatibility, acquire permit modifications for new sand sources and new construction staging areas, conduct pre-construction conference, prepare as-built sediment QA/QC evaluation per permit requirements, photo document pre/post repair conditions, update the Project summary report.

"Construction Review Contract" is for construction supervision of Contractor.

The “Beach Tilling & Phys Monitoring (3-yrs post-construction, 2026-29)” task includes:

Permit-required beach tilling and escarpment removal for 3 years following construction (spring 2027, 2028, 2029).

Permit-required physical dune surveys, analysis and physical monitoring summary report for 3 years following construction (spring 2027, 2028, 2029).

The “Marine Turtle Monitoring (3 Years)” task includes:

Permit-required daily field surveys & annual reporting of marine turtle nesting activity along the project area during nesting seasons following construction activities (2026) plus two seasons thereafter (2027, 2028).

Cost per CY = All Inclusive Cost / Total CY in place

= $4,811,160 / 56,864 CY

=$84.6082 / CY

Hurricane Milton Related Sand Replacement Estimate

= Hurricane Sand Loss x Cost per CY

= 56,864 CY x $84.6082 / CY

= $4,811,160

Schedule

The County proposes the following schedule:

- Category G Engineering Report Submittal: January 2025
- FEMA Requests for Information and Responses: January 2025 – March 2025
- Environmental and Historic Preservation Review: March – June 2025
- Revised Project Worksheet and FEMA Approval: June – July 2025
- Final Design: August 2025
- Bid Process: September – November 2025
- Construction: January 2026 – March 2026

ENVIRONMENTAL COMPLIANCE

Sand Source

Beach compatible sand will be obtained from properly licensed, permitted, and qualified suppliers of the material (upland mine). The exact source of the material will be determined through the bid selection process.

Construction Method

The construction method that will be used is described in the Scope of Work, above.

All work will be conducted within the existing project template, from R-141 to R-213.

Environmental Permits

FDEP permit 0388538-001-JC (Attachment D) issued 6 October 2020 and expiring 6 October 2035

Dept of the Army permit SAJ-2008-04456 (Attachment G) issued 15 March 2018, re-verified 28 June 2022, and valid through 14 March 2026 with further renewal pending.

- Biological Opinion (from permit SAJ-2008-04456) is included as Attachment E

Coastal Barrier Resources Act

CBRS System Unit FL-13, "Spessard Holland Park" an Otherwise Protected Area is within the Northern End of the Project template near R-141.

CBRS System Unit P09A, "Coconut Point" is within the Project template from R-155 to approx. R-166 – 240.

CBRS System Unit P10P, "Vero Beach" an Otherwise Protected Area is adjacent to the south end of the Project near R-213.