

City of Folly Beach 2024 Dune Management Plan



PREPARED FOR
The City of Folly Beach

PREPARED BY
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Executive Summary

The 2024 update to the City of Folly Beach Dune Management Plan (DMP) builds upon the foundation established in the previous (2018) plan, aiming to restore and preserve the dune system along the City's beachfront through a proactive, collaborative, and adaptive approach. This plan is aligned with recommendations from numerous city planning documents and will be integrated into the state-required Local Comprehensive Beach Management Plan (LCBMP) during its next update. The plan's recommendations will help the City meet the local requirements for the operation and maintenance of the federal beach nourishment project.

Five overarching goals drive the objectives and recommendations of the 2024 DMP:

1. **Engagement:** Foster active community involvement and education through stakeholder engagement, partnerships, and initiatives like educational signage and volunteer opportunities.
2. **Monitoring:** Measure dune height, width, and vegetative cover, assess walkover and access conditions, and inventory other structures in the dune areas.
3. **Protection:** Enhance dune protection by aligning walkover structures with dune lines, updating regulations, and implementing new measures like a seawall setback.
4. **Restoration:** Rehabilitate the dune ecosystem through native plantings, sand fencing, and groin rehabilitation.
5. **Adaptation:** Implementing adaptive measures to prepare the dunes to withstand and recover from erosion and other climate-related impacts.

The updated Dune Management Plan (DMP) reaffirms the city's dedication to a comprehensive, forward-thinking approach to managing the dunes. It acknowledges balancing the protection of public and private beachfront areas, restoring the natural dune ecosystem, and accommodating recreational use. This plan prioritizes adaptive dune management in response to challenges posed by rising sea levels, increased storm frequency, and Folly's position downdrift of the Charleston Harbor jetties.

Introduction

The City of Folly Beach aims to protect its dunes so that the dunes will, in turn, protect the City. The storm protection benefits of a healthy beach and dune system are highlighted in long-term planning documents, including the Comprehensive Plan, Local Comprehensive Beach Management Plan, Strategic Plan, and the 2018 Dune Management Plan (DMP). The 2024 DMP update builds on the accomplishments of the 2018 plan and addresses the evolving challenges posed by climate change and sea-level rise. This updated plan aims to refine existing strategies, prioritize the ongoing protection and maintenance of the established dunes, and introduce new initiatives that reflect the latest environmental data and community input. By updating the DMP, the City continues its commitment to a resilient and sustainable coastline.

The goal of this plan is to update recommendations for the restoration and preservation of the dune system along the City's beachfront through a proactive and strategic approach. The DMP is essential for creating a cohesive connection between the ongoing federal beach nourishment project—an important investment by the City—and the adjacent beachfront properties and public infrastructure landward of the beach. The federal project with the U.S. Army Corps of Engineers (USACE) is in the process of renewal for an additional 50 years. The city has also planned for beach management alternatives in addition to the federal project in its State-Approved Folly Beach Local Comprehensive Beachfront Management Plan (LCBMP). The Dune Management Plan was adopted as an addendum to the LCBMP in 2018.

The dune system along the developed beachfront varies significantly, ranging from a robust series of established sand dunes along the west and central beachfront to areas with seawalls and revetments in the northeast. A comparison of photographs from the 1980's to today remind us that seawalls and riprap are buried beneath dunes along central Folly Beach (Figure 1). Thanks to adequate sediment supply from the federal beach nourishment project, dune restoration efforts have succeeded despite rising sea levels over the past three decades.



Figure 1. Comparison photos of Folly's dunes in the mid-1980's (Courtesy Richard Beck) and today. Left: 4th St. E. looking west. Right: 2nd St. E. looking east.

Dune Management Plan Approach

The 2018 DMP was developed over several years in direct response to the persistent challenges of chronic erosion and the severe storm impacts following Hurricanes Matthew and Irma in 2016 and 2017. These events underscored the vulnerability of private lands situated landward of the federal renourishment project. The plan emerged from a series of collaborative efforts involving City staff, the Planning Commission, and City Council and included the following goals:

1. Establish a Dune Management Area (DMA)
2. Enhance storm protection
3. Re-establish a natural dune ecosystem where possible
4. Implement strategic dune walkover/access path management
5. Manage dunes to maximize recreational benefits

The goals of the 2024 DMP update have been revised to reflect the evolving needs of our coastline and community. In addition to restoration and management, new goals focusing on engagement and protection have been added. The 2024 DMP is the product of a collaborative co-development process involving expert scientists, city officials and staff, and key stakeholders. Community concerns guided the development of prioritized goals and objectives. The recommendations reflect the collective expertise and input gathered throughout this process.

This effort was also coordinated with a concurrent update of the Charleston County Park & Recreation Commission (CCPRC) Dune Management Plan (Elko 2013). The update, also managed by Elko Coastal Consulting in 2024, expands the scope of the first CCPRC DMP to include all three Folly Beach properties (Folly Beach County Park, Folly Beach Fishing Pier, and the Lighthouse Inlet Heritage Preserve). This coordination helped to align information and planning actions between the organizations.

Federal Beach Nourishment Project

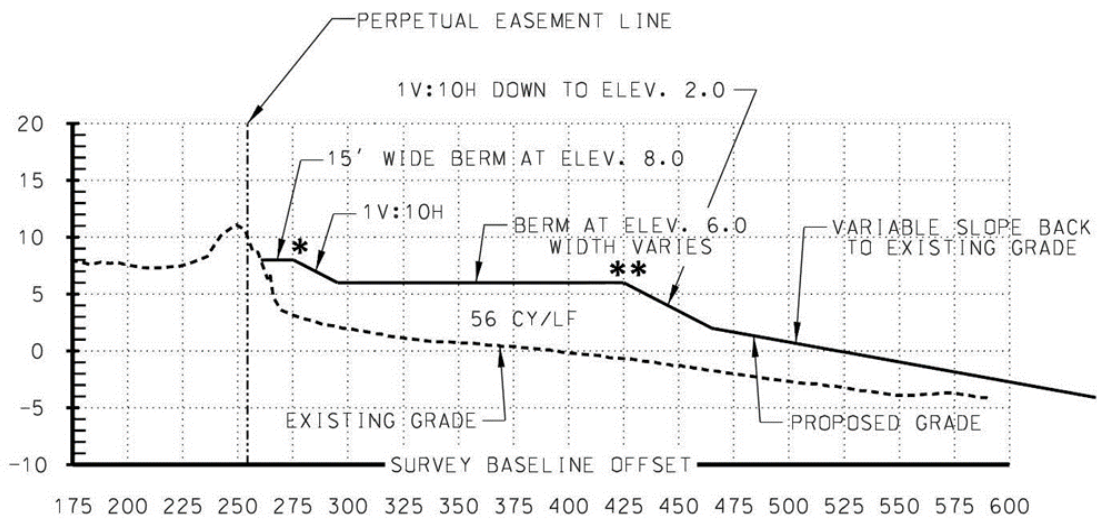
The federal Folly Beach Shore Protection project was authorized by Section 501 of Public Law 99-662 (Water Resources Development Act of 1986). A 50-year Local Cooperation Agreement (LCA) between the U.S. Army Corps of Engineers (USACE) and the city to maintain a 15-ft wide, 8-ft high storm berm (Figure 2) via beach nourishment remains in effect from 1992 until 2042. This project is referred to as the “federal project.” The LCA states that the city will handle Operations & Maintenance (O&M) of the beach project between federal renourishments. The O&M requirements are detailed in an updated Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual, herein referred to as the “O&M Manual” (USACE 2018). Protection of dunes is a primary operations responsibility cited in the manual.

Prior to construction of the initial phase of the federal beach nourishment project in 1993, a Perpetual Easement Line (PEL) was established along the landward edge of the beach project area (Figure 2). The line was established along seawalls or the eroded dune/edge of vegetation demarking the line between the publicly funded renourished beach and the upland private property. Concurrently, a very similar line was established as the state baseline. This line is herein referred to as the PEL/baseline.

8-ft berm

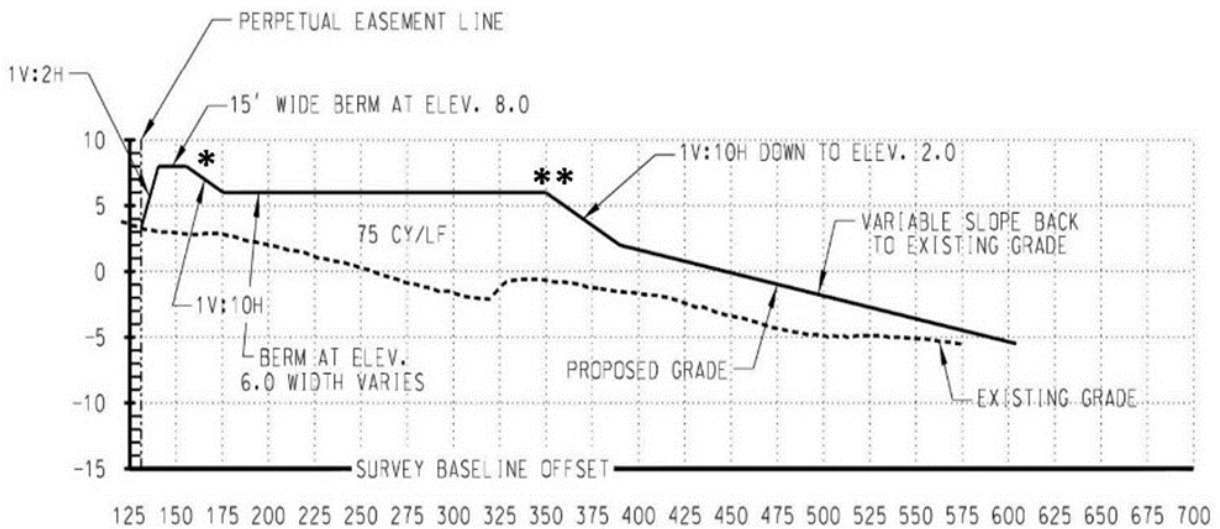
The federal project is designed with a 6-ft beach elevation and a protective 15-ft wide, 8-ft high storm berm, hereafter referred to as the “8-ft berm.” All elevations cited in the plan are relative to NAVD88. In some cases, a dune exists landward of the 8-ft berm and the beach fill “ties into” the dune (Figure 2a). This is typical along west and central Folly Beach. Here, the PEL is in the dune field. In other cases, the beach is severely eroded and no dune exists landward of the 8-ft berm. In most instances, a seawall has been constructed on the beachfront property to limit private land loss, but in a few cases, no seawall exists and private land loss occurs between periodic renourishments (Figure 2b).

This private land loss compromises the integrity of the federal project and causes the beach to erode more quickly than it would otherwise. To ensure the project provides its intended storm protection benefits, the private property landward of the 8-ft berm must be maintained at a similar elevation. The City of Folly Beach Ordinance 151.60, an **accomplishment** of the 2018 DMP, requires beachfront property owners to maintain this area.



TYPICAL SECTION WHERE FILL STARTS TO THE EAST OF THE PERPETUAL EASEMENT LINE
 (EXISTING GRADE AT 245+00 SHOWN HERE)
 1" = 50' H
 1" = 10' V

Note: Elevations are in feet and refer to NAVD 88.



TYPICAL SECTION WHERE FILL STARTS AT THE PERPETUAL EASEMENT LINE
 (EXISTING GRADE AT 30+00 SHOWN HERE)
 1" = 50' H
 1" = 10' V

Figure 2. Example profile cross-sections of the federal project, illustrating the 8-ft berm, the PEL, and the existing grade landward of the PEL (top, from the 1991 USACE O&M manual). In most cases, a seawall exists at the PEL but some areas without a dune or seawall at the PEL (bottom), private land loss occurs between periodic renourishments.

Since the 2018 DMP, a new federal project has been developed by USACE in collaboration with the city (USACE 2021). The Folly Beach Integrated Feasibility Study and Environmental Assessment was approved by the Secretary of the Army in October 2021 and authorized by Congress in the Water Resources Development Act of 2022. The city and USACE signed a design agreement in September 2024 to begin the permitting, engineering, and design phase of the project. As of the publication of this DMP, it has not yet been constructed and the federal project described above remains in place.

The “new project” offers several improvements over the previous federal project to increase coastal resilience. They include an 8-ft high design berm and a 15-ft high dune along the developed shoreline (Figure 3). The project does not include a dune along the CCPRC properties on either end of the island. The inclusion of a dune feature in the new federal project was a high priority for the city and is another **accomplishment** of the DMP.

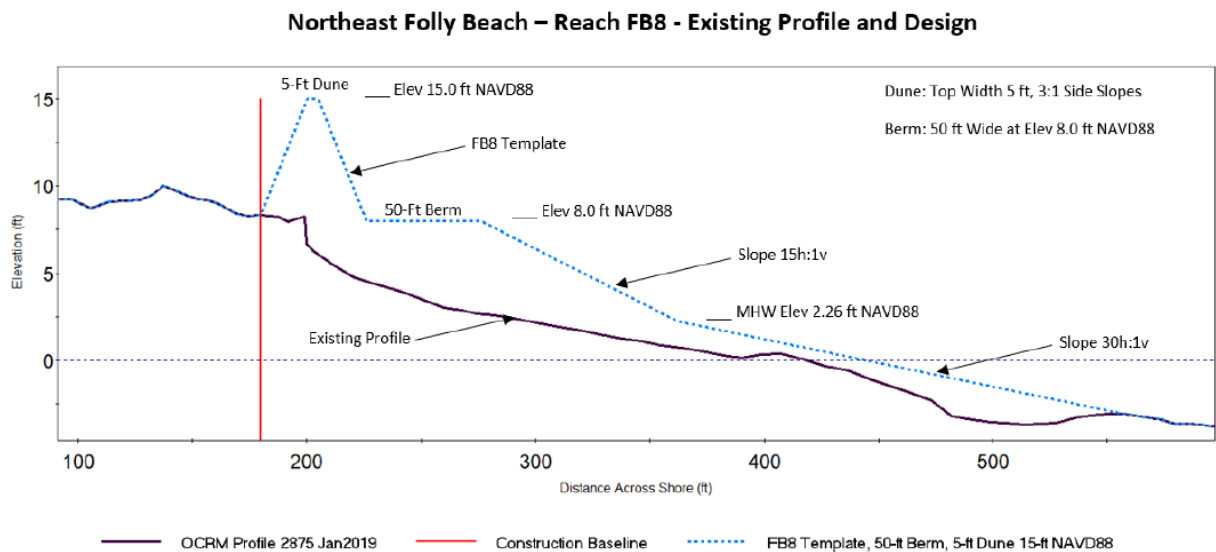
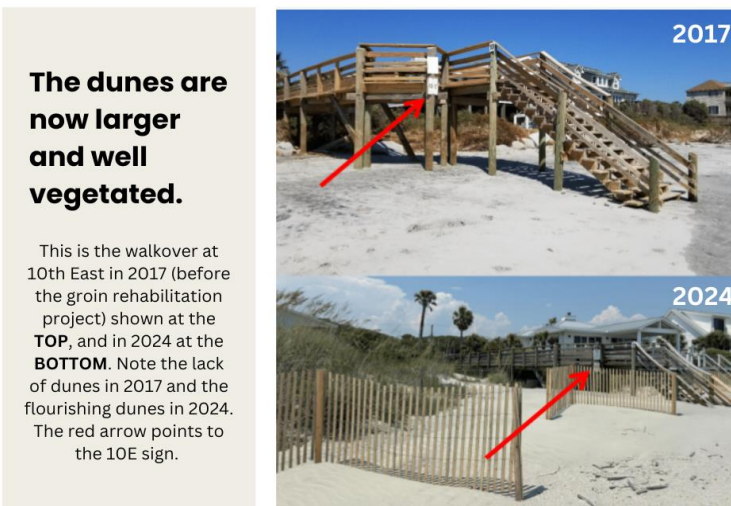


Figure 3. New federal beach nourishment cross-section with a 15 ft dune (USACE 2021).

Summary of beach and dune restoration

Following the first federal project in 1993, subsequent federal renourishments occurred in 2005, 2007, 2014, 2018, and 2024. The 1993, 2005, 2014, and 2024 renourishment projects included a federal dune restoration element of sand fencing in a V-pattern and vegetation plantings. Sea oats (*Uniola paniculata*) and bitter panicgrass (*Panicum amarum*) were planted along most of the project area. Sand fencing was installed in individual V-shaped sections open to the shoreline, with 8 ft spacing between Vs. Northeast of about 10th St. E., efforts to restore the dune using fencing and grassing along had limited success. Dune restoration had been more successful in areas with rehabilitated groins, such as central Folly Beach. As detailed in the 2021 Folly Beach Local Comprehensive Beach Management Plan, 9 groins from roughly 9th St.

Since the groin rehabilitation project in 2018...



E. to the Washout were rehabilitated in conjunction with dune fencing and vegetation plantings in 2018.

Monitoring data revealed that dune growth was significant throughout the rehabilitated groin field which **did not have a dune** prior to the project. The beach previously eroded to the seawalls between renourishment events. Since groin rehabilitation, the dunes between 9th St. East and the Washout have grown larger and are now well-vegetated (Figure 4).

Figure 4. Dune changes at 10th St. E. following the 2018 groin rehabilitation project.



Figure 5 shows a 16 ft dune that has accumulated in front of a new seawall at 10th East! The seawall was built just before the 2018 project due to private property loss in this area. The groin rehabilitation project trapped sufficient sand in the project area leading to dune growth (Figure 5).

Figure 5. Photograph of a 16 ft high dune at 10th St. E. Taken on June 21, 2024.

As part of the 2024 DMP, dune elevations were compared in 2014 and 2023 along the beachfront (Table 1). The greatest increase in dune elevation during this time interval was 7.4 ft and occurred at 910 West Ashley Avenue. Dune elevation near the Tides Hotel (110 W) was relatively stable. Dunes decreased by 2.2 ft in elevation and retreated 100 ft landward at 6th St. E. Dune elevation at 10th St. E. within the rehabilitated groin field increased by 3.7 ft. Dunes did not exist during the time interval at Summer Place Lane on the far east end.

Table 1. Comparison of dune elevations in 2014 and 2023 along the beachfront. Note that the dunes at 6th St. E. retreated landward 100 ft during this time interval.

Profile	2014	2023 Elevation (ft) NAVD88	Difference	Location
2813	6.9	14.3	7.4	910 W
2828	13.1	14.6	1.4	110 W
2838	13.7	11.5	-2.2	6th E*
2850	9.5	13.2	3.7	10th E
2885	0.0	0.0	0.0	Summer Pl

In addition to the federal projects, several local projects have recently been constructed on Folly Beach. CCPRC funded a renourishment project of Folly Beach County Park in 2013. This project also included vegetation and sand fencing installation (Elko, 2013). To comply with the federal O&M Manual, the city: 1) maintains and supplements federal sand fencing between renourishment projects, 2) handles post-storm debris removal along the beach which often involves significant effort to remove destroyed sand fencing from erosion-prone regions, and 3) maintained public property behind the PEL and required private beachfront property owners to do the same (via Ordinance 151.60) to avoid compromising the integrity of the federal project.

Community Engagement

Community input served as the foundation of this project. Municipal leaders, residents, business owners, property owners, external technical experts, and other key stakeholders developed the plan's goals, objectives, and recommendations (Appendix A). Engagement efforts followed a structured process beginning with Stage 1: Stakeholder Identification and continued through a cycle of planning, communication, consultation, and feedback integration (Figure 6). Virtual planning charrettes, regular email updates, social media outreach, a joint meeting with the city and Charleston County Parks & Recreation Commission (CCPRC – pictured below), and two online surveys allowed key stakeholders first to shape the initial goals and then to further refine the objectives based on their priorities.



The 2024 update of the Dune Management Plan began with a comprehensive review of the 2018 adaptation actions to assess their implementation progress (see callout box below). This review was further enriched by insights gathered through interviews with key stakeholders. Conducted via Zoom and structured as "virtual planning charrettes," these interviews provided a focus group-style format. Before the charrettes, stakeholders completed the first of two surveys to gauge their concerns regarding the state of the dunes. With the survey as an icebreaker, the focus group discussion could dive right into understanding dune management concerns, assessing progress on the recommendations from the 2018 plan, and identifying remaining or emerging needs and gaps in management efforts.

Community Concerns and Implementation Progress

During the initial phases of stakeholder engagement, five key goals for dune management were identified: engagement, monitoring, protection, restoration, and adaptation. The majority of key stakeholders are quite- or extremely-concerned about the current state of the dunes. **Erosion and degradation** were identified as the most pressing challenge facing dune management. There was overwhelming consensus that establishing the Dune Management Area (DMA) through a protection ordinance was the most effective outcome of the 2018 DMP. The DMA established a 40-ft setback from the PEL/baseline for beachfront development except for dune walkovers, fencing, vegetation, and erosion control devices. The ordinance also requires property owners to elevate areas within 10 linear ft of the PEL/baseline that is below an 8 ft elevation to 10 ft.

Accomplishments since 2018 DMP

- Protect: The Dune Management Area that established a 40-ft setback from the baseline/PEL and required private property owners maintain and protect those lands,
- Protect: Inclusion of a 15-ft dune in new USACE project,
- Restore: 2018 groin rehabilitation project from 9th St. E. to the Washout reversed the dune erosion trend in this area, which not only restored but also sustained robust dunes between the 2018-2024 renourishment interval,
- Engage: Addition of a new Dune Management Area layer in the public Charleston County GIS https://gisccweb.charlestoncounty.org/public_search/
- Adapt: As stated by one stakeholder, “*the city has been proactive in facilitating protections and looking at issues from a larger perspective.*”

Stakeholders identified areas for improvement including increased regulation on beachfront development such as a setback for erosion control structures. Stakeholders also offered solutions to unmet challenges such as existing septic systems in the DMA and hiring a beach/dune coordinator to enhance outreach efforts. The remainder of the plan includes goals, objectives, and recommendations that the second stakeholder survey prioritized.

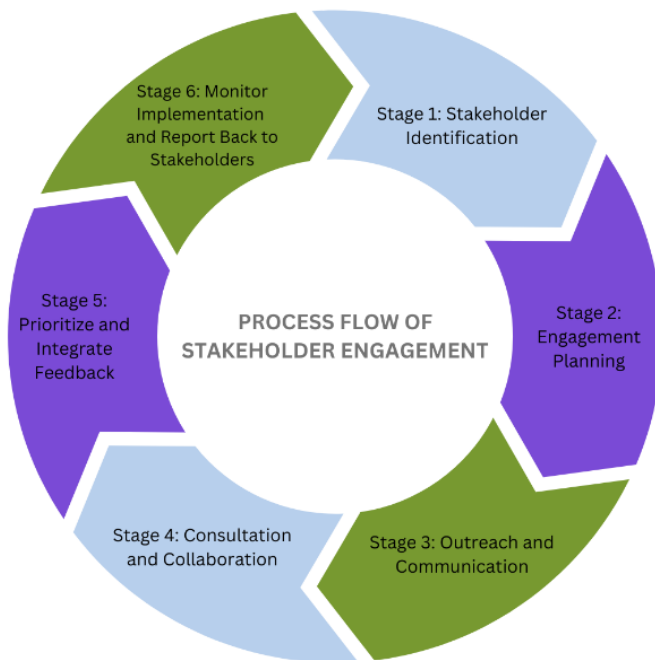


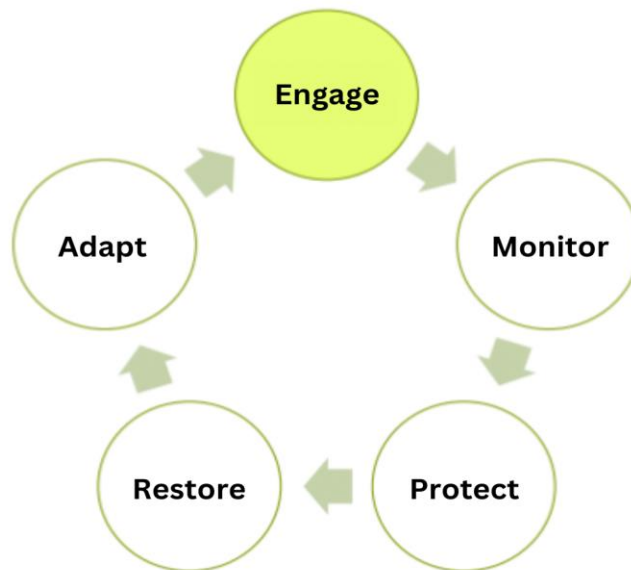
Figure 6. Process flow of stakeholder engagement utilized in DMMP development.

Goals, Objectives, and Recommendations

This list of goals and objectives was shaped by input from City staff, City Council, key stakeholders (beachfront primary residents, beachfront business owners, subject-matter experts, local organizations, and state agencies). Each goal includes prioritized objectives with specific recommendations to achieve them. The order of recommendations is based on stakeholder feedback from surveys. It does not necessarily reflect the ease of, or timing for, implementation.

Foundational definitions for framing each goal:

1. **Engagement:** Actively involving and educating the community and stakeholders in the planning, decision-making, and implementation processes of dune management to ensure their participation and support.
2. **Monitoring:** Continually observing and assessing dune health, environmental changes, and management efforts. This process involves data collection, analysis, and reporting to ensure that dunes are functioning as intended and that management strategies can be adjusted as needed.
3. **Protection:** Safeguarding the dunes and the coastal environment from natural and human-induced threats through policies and regulations.
4. **Restoration:** Repairing and revitalizing damaged or degraded dunes to their natural state by planting native vegetation and sand fencing, adding sand, and rehabilitating groins.
5. **Adaptation:** Developing and implementing strategies to adjust and prepare the dune management practices to cope with changing environmental conditions, such as sea-level rise and climate change, to ensure long-term sustainability.



Engagement

Engagement with the Folly Beach community is essential for the success of the Dune Management Plan (DMP). Signage to protect the dunes is also a requirement of the federal O&M manual (USACE 2018). The following objectives and actions are recommended:

Facilitate Stakeholder and Community Involvement:

- **Seek Input on Plan Updates** from stakeholders and the community.
- **Create and Promote Volunteer Opportunities:** Engage community members in activities like beach clean-ups, dune plantings, and educational events.
- **Collaborate with Local, State and National-Scale Programs and Organizations:** Share lessons learned with other beachfront communities. In particular, foster beachfront planning collaboration with CCPRC (e.g., this plan and groin rehabilitation). Develop an MOU with CCPRC their three properties for new federal O&M manual.
- **Hire a City Beach/Dune Coordinator** for engagement and implementation.

Enhance Public Education and Awareness:

- **Install Educational Signage:** Consistent, collaborative, island-wide signage, in partnership with CCPRC, utilizing both physical (e.g., kiosks, signs) and virtual formats (e.g., websites, social media, apps).
- **Develop Tourist Education Campaigns:** Update short-term rental (STR) flyers.
- **Disseminate Educational Resources:** Update materials like Appendix B to inform the community about dune management for property protection, groins influence on dune health, Dune Management Area (DMA) regulations, and incentives for compliance.
- **Establish a Nature Center:** An Educational/Cultural/Nature Center in partnership with CCPRC and the FB Nature Conservancy at the Lighthouse Inlet Heritage Preserve property (long-term goal).

Incentivize Compliance with Dune Management Area Ordinance:

Pilot City Beach Preservation Grants to beachfront property owners who apply for <\$2,000 eligible projects such as:

1. Vegetation plantings
2. Walkover repairs, extensions, consolidations, or retreats
3. Adding beach-quality sand for DMA compliance
4. Relocating or properly locating septic systems within the DMA
5. Fencing installations

Monitoring

Regular monitoring of dune conditions and infrastructure will identify areas of concern and guide necessary interventions and proactive planning, ensuring the dunes continue to serve as a natural defense against erosion and storm impacts. Additionally, monitoring of beach design section conditions and “*Superintendent Inspections*” are City operations responsibilities described in the O&M Manual (USACE 2018). To comply, ongoing monitoring operations and new inventories and post-storm assessments are recommended:

Hire an Engineering Firm to conduct 50% Post-Storm Damage Assessments

Following a devastating storm that erodes the beach/dune system and damages beachfront homes and seawalls, the City should use the state framework of hiring an engineering firm to help determine whether structural damage is >50%.

Catalog Permanent Structures in the DMA

An inventory of permanent structures within the Dune Management Area (DMA) such as seawalls, pools, and habitable and accessory structures should be conducted every five years to assess their condition and impact on dune stability, and to track non-compliance.

Maintain a database of unarmored, developed beachfront lots

A database to help the City proactively identify areas of potential erosion behind the PEL/baseline, educate private property owners, and stabilize public lands.

Survey Beach and Dune Profiles

Annual surveys detect physical changes in dune height and width to assess the outcome of restoration efforts, storms, sea-level rise, and human activity on the dune system.

Conduct Public Access Condition Assessment

An inventory of public access points, including sand fencing, paths, and dune walkovers, will be annually conducted to identify areas where maintenance or improvements needs (Appendix C).

Assess Groin Conditions

Regular assessments of the structural integrity will proactively identify maintenance needs.

Manage Walkovers and Access Paths

Maintain existing structures, strategically install new walkovers where needed, and ensure access paths support dune stability and adaptability.

Protection

Stakeholders emphasized the importance of clear regulations and proactive measures to improve the dune system's health and stability. This section is in keeping with the intent of the 2018 DMP which described the DMA as a natural buffer. It also meets the City's requirements in the federal O&M Manual (USACE 2018) to prevent encroachments stating, "*prevent unwise future development through enforcement of an adequate setback of development from the PEL and the protection of the adjacent upland or dune areas to which the project ties-in.*" To achieve these goals and requirements, the following protective objectives and actions are recommended:

Strengthen the Dune Management Area (DMA)

- Require property owners to **remove debris from the DMA** with a penalty if left for >60 days.
- Implement a 25-ft **seawall setback** for new construction and 50% damaged rebuilds. A local precedent exists at Summer Place Lane (right) and in the Town of Seabrook Islandⁱⁱ.



Figure 7. Google Earth image showing that the seawall at Summer Place Lane is set back 25 ft from the yellow PEL/baseline.

- **Assess a special tax district for beachfront lots** to fund protection efforts using lessons learned from communities that have implemented similar taxes (e.g., Figure 8).
- **Modify the DMA-required elevation and add beach-compatible sand standards:** Increase the minimum elevation of 12.5 ft of sand landward of the PEL and enforce state-mandated sand quality regulationsⁱⁱⁱ on private properties.
- **Collaborate with DES BCM** on targeted [jurisdictional line updates](#) to the state baseline (e.g., move landward on Nature Conservancy Lots) and on continued enforcement in areas where the state Beaches Critical Area exists landward of the baseline.

Enable Dune Protection Measures

- **Enforce Private Walkover requirements:** Regulate walkover structures to terminate at the toe of dune, adhere to the DMA, and be consistent with state regulations (Appendix D).
- **Funnel Pedestrians to Access Points to Reduce Trampling:** Enforce sand dune preservation ordinances and the federal O&M requirement to restrict foot traffic on the dunes (USACE 2018).

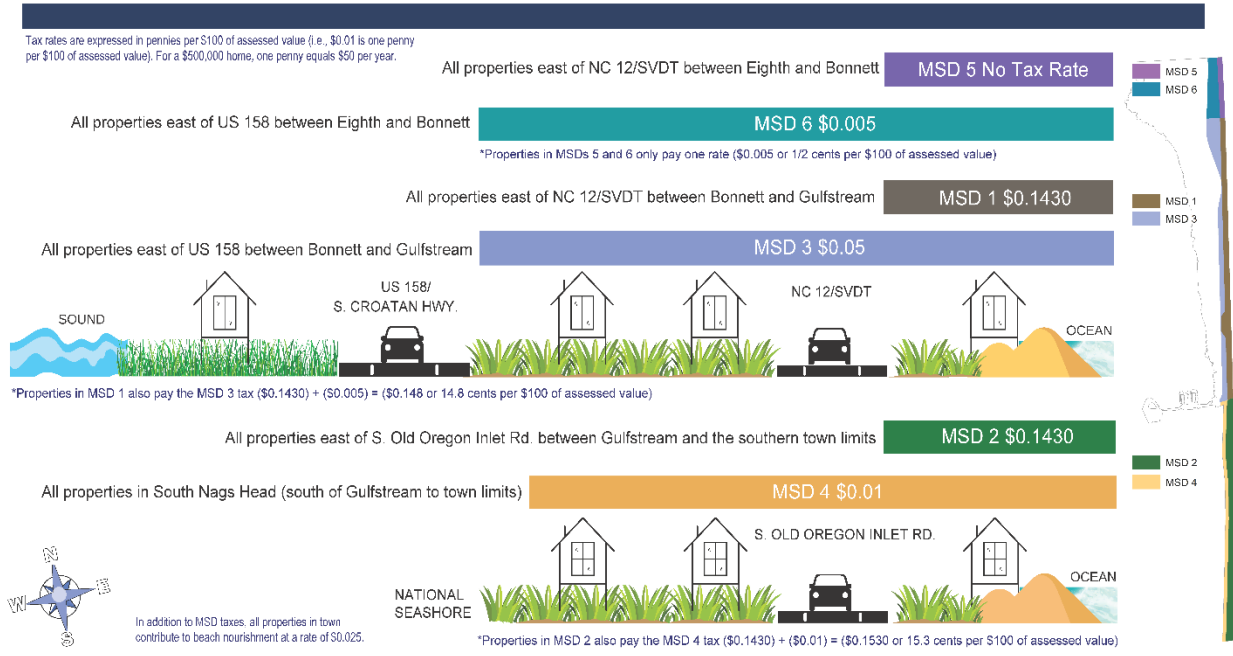


Figure 8. Example of a special beachfront tax district (Nags Head 2024).

- **Clearly define dunes in city regulations:** The City’s definition of dunes should be consistent with the state’s definition of primary oceanfront sand dunes as follows: *Sand dunes are elevated ridges adjacent to the Atlantic Ocean that typically exhibit the presence of stable, native vegetation. Dunes may extend landward to the most seaward road in the absence of beachfront development.*
- **Enforce local, state, and federal laws and agreements** that prohibit permanent structures seaward of the baseline or PEL (including tents and commercial storage containers) unless permitted: City ordinance on abandoned items^{iv}, State permit for structure in the beach/dune system critical area, the O&M Manual (USACE 2018), and federal regulations^v.
- **Increase beachfront owners’ legal and financial liability** by requiring insurance or a bond to cover costs of the removal of a condemned home or clean-up of a compromised septic system.

Include Septic Standards in DMA

- Work with the state to require new **septic tanks, relocated out of the DMA** if houses are torn down/redeveloped or damaged/condemned.
- Replace the language “as landward as possible” with measurable and enforceable distances.

Restoration

Dune systems provide storm protection while promoting ecological health and resilience. The restoration goal also meets the City's requirements in the federal O&M Manual (USACE 2018) which states that "*the non-federal sponsor will preserve the integrity of the sand fences and replace them when lost or damaged. Vegetation will be preserved, sustained, and replanted where necessary.*" To achieve these goals and requirements, the following restoration actions are recommended:

Rehabilitate and Enhance the Dune System:

- Plant native vegetation listed in Appendix E. Beach vitex (*Vitex rotundifolia*) is an exotic invasive and should be prohibited.
- Maintain sand fencing between periodic renourishments (Appendix F) and ensure that USACE fencing is installed no more than 15 ft seaward of the toe of existing dunes.
- Apply for state and federal permits for additional groin rehabilitation
- Acquire Undevelopable and Vulnerable Beachfront Property

Balance Recreational and Ecosystem Integrity

- Focus on increasing the elevation of dunes rather than adding additional rows (i.e., Goal 5 of the 2018 DMP)
- Install walkovers at appropriate beach accesses to provide public access while elevating the primary dune^{vi}.

Demonstrate and Leverage Public Projects

- Educate and encourage private property owners to use successful public dune restoration efforts by showcasing methods such as sand fencing, native vegetation plants, etc. at public beach access points.
- Demonstrate the innovative Dune Infiltration Project that leverages drainage relief for native vegetation irrigation at public accesses.

Adaptation

Facing climate change and the unique challenges posed by the Charleston Harbor jetties to the north, this goal emphasizes the importance of implementing adaptive measures to protect dunes from erosion and other climate-related impacts. This goal ensures that management strategies remain resilient, forward-thinking, and responsive to changing conditions.

Prepare to withstand and recover from climate change, chronic erosion, and hazardous events by addressing the challenges of rising sea levels and increased storm frequency, as well as the reality of Folly's location downdrift of the Charleston Harbor jetties, in dune management (i.e., implement adaptive measures to protect dunes from erosion and other climate-related impacts).

Sustain long-term planning and adaptation efforts to address evolving environmental and recreational needs by conducting the recommended assessments annually (see Monitor section) and updating this plan every five years.

Ensure consistency between this plan and other environmental and resilience plans such as the City's Comprehensive Plan, LCBMP, and SLR Adaptation Plans.

References

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Endnotes

ⁱ DES BCM's Keep off the Dunes Program: <https://des.sc.gov/programs/bureau-coastal-management/keep-dunes-program>

ⁱⁱ Town of Seabrook Island code Section 10.5 - Requirements for CRITICAL AREAS and WATERBODIES.

https://library.municode.com/sc/seabrook_island/codes/development_standards?nodeId=DEST_ART10ENPEST_S10.5RECRARWA

ⁱⁱⁱ S.C. Code Ann. Regs. 30-13.L(3)(a) states that "Sand shall be compatible in size and grain color, shall be from an upland source, and its use approved in writing by the Department staff." R.30-13.L is related to minor beach nourishment and dune restoration projects.

S.C. Code Ann. Regs. 30-13.N(2)(a) states that "Careful study shall be given to the type (grain size and quality) of material most suitable for nourishment of a particular beach area." R.30-13.N(2) is related to major beach nourishment/dredging projects.

^{iv} § 151.13 LITTERING AND ABANDONMENT OF PERSONAL PROPERTY PROHIBITED ON THE BEACH

^v Alterations to the federal project require prior written approval from the District Engineer, Charleston District, in compliance with paragraph 8.a.4 of the ER and current requirements for 33 USC 408 (USACE 2018).

^{vi} Although a stakeholder recommended installing walkovers at every beach access, the plan recommends that additional expenditure, surge funneling potential, and future storm debris from a new walkover is not justified when pedestrian use (trampling) is less than wind-blown sand input (i.e., the pedestrian path does not compromise dune integrity).

Appendix A

Key Stakeholders

Name	Affiliation	Title
Aaron Pope	City of Folly Beach (COFB)	Administrator
Eric Lutz	COFB	Public Works Director
Jenna Stevens	COFB	Zoning Administrator
Billy Grooms	COFB	City Council rep
Paula Stubblefield	COFB	Planning Commission reps
Toni Catoe	COFB	BZA rep
Allen Kinter	COFB	Design Review Board rep
Emily Cedzo	Coastal Conservation League	Director of Conservation Programs & Policy
Patty Newshutz	Charleston County Parks & Recreation Commission	Director of Planning & Development
Matt Slagel	SC DHEC OCRM/DES BCM	Manager, Beachfront Management
Adam Bode	SC DHEC OCRM/DES BCM	Coastal Planner
Bradley Craig	SC Office of Resilience	Hydrologist
Vanessa Oltmann	COFB Resident	Toby the Turtle
Caleb Rodgers	Onsite Septic Engineering	President
Patrick Barrineau	Coastal Science & Engineering	Senior Scientist
Rob Young	Western Carolina University	Professor of Geology
Mike Ezelle	Folly Beach Chair Co.	Owner

Appendix B

Private Beachfront Property Best Management Information



- City's Role

- To maintain the public beach and dune to the extent possible. The beach/dune system is a public resource and important infrastructure for the City providing recreational, economic, storm protection, and environmental benefits.
- The City is restoring nine (9) deteriorated timber groins located between 8th St. E. and the Washout in an effort to retain nourished sand longer and restore the beach and dune system. Maintaining a dune northeast of the Washout has proven difficult due to high erosion rates.



- The City is also maintaining City-owned property behind the Perpetual Easement Line (PEL) to meet the requirements of Ordinance 151-23.
- If the public beach and dune system requires maintenance, please contact the City (see below).

- Property Owner's Role

- Improve your beachfront property to create a seamless connection between the public beach and private property.
- Provide additional storm protection benefits to your property by:
 - Building or repairing the existing seawall or revetment: Most beachfront properties on Folly Beach have a seawall or revetment in place, but some are in disrepair. Seawall construction requires a City permit and must meet the requirements of Code of Ordinance 151-23.
 - Haul in sand to elevate the private property to the level of the public restored beach, or to build a protective dune.
 - Restore the dune system by installing sand fencing (in a V-pattern with V's opening to the ocean) and/or native dune vegetation such as bitter panicum (panic grass) and sea oats. Sand fencing helps trap wind-blown sand. Dune vegetation does too; it offers the additional benefit of a complex root system that helps to naturally stabilize the dune.
- An ideal level of protection could include all three: a seawall buried under a restored beach/dune system with native vegetation. This type of "redundant" protection has proven to be effective during recent hurricanes, for example during Hurricane Sandy in the northeast.

Public/Private Property Line

- The following photo illustrates the difference between the public beach and private land:



In this photo taken after the last renourishment, the public beach was renourished by the federal contractor but no sand was placed on private land. The static boundary between public and private land is the red line. It is known as the Perpetual Easement Line (PEL). The above scenario compromises the integrity of the federal beach project; thus, the U.S. Army Corps of Engineers (USACE) requires that land behind the line is maintained. City Ordinance 31-17 was adopted in response to this USACE mandate. Private property owners are encouraged to follow the guidelines outlined herein to avoid this scenario.

Creating Redundant Storm Protection on Private Beachfront Property

- Building or repairing a Seawall
 - City building permits are required
 - For more info: <http://www.cityoffollybeach.com/city-departments-services/building-planning-and-business-licenses/building-permits-and-inspections/>
- Purchasing beach-compatible sand
 - In conjunction with the 2018 beach renourishment project, property owners may purchase sand to address erosion on the seaward side of beachfront lots.
 - Property owners of beachfront lots that require sand to be placed will be notified 60 days prior to beach nourishment construction. A volume requirement and estimated cost will be provided.
 - For more information, please contact the City.
- Dune Restoration
 - Following the 2018 beach renourishment project, the City will be rehabilitating the dunes on the public beach between 8th and 14th St. E. There is not sufficient space on the public beach northeast of 14th St. E. to warrant public dune rehabilitation at this time.
 - If private beachfront property owners wish to participate in this effort, please contact the City.
 - If property owners wish to restore their dune system, sand, sand fencing, and native dune vegetation may be installed by the owners. Sea oats or bitter panicum may be purchased from local growers.
 - Plant native dune vegetation in spring and early summer.
 - Additional information on dune building from SCDHEC-OCRM is available here: http://www.scdhec.gov/HomeAndEnvironment/Docs/dunes_howto.pdf
 - Please note that American Beachgrass is not recommended for Folly Beach.
 - For more information, please contact the City.

Appendix C

Table A-1. Public Access Inventory updated August 15, 2024, including the status, condition, recommended actions, and the timeframe for implementing those actions.

Location	Status	Condition	Recommended Action	Timeframe
10 W	Closed: Nourishment	Good	none	<u>n/a</u>
910 W	Open	Sand path	none	<u>n/a</u>
9 W	Open	Mediocre	<u>Cut off access to bottom part of oceanfront ADA ramp. Build alternate access like 1561 E</u>	<u>Immediate</u>
810 W	Open	Good	none	<u>n/a</u>
8 W	Open	Good	none	<u>n/a</u>
7 W	Open	Good, Walkover too short	Extend walkover to toe of vegetation	Short- to Long-term
610 W	Open	Mediocre-Poor; Short walkover	Add fencing to funnel pedestrians; not recommending replacement at ½ blocks	<u>Immediate</u>
6 W	Open	Good	Walkover extended as pilot. Success!	<u>n/a</u>
510 W	Open	Mediocre-Poor; Short walkover	none	<u>n/a</u>
5 W	Open	Mediocre-Poor; Walkover too short	Extend walkover improvement project here (like 6W)	Short-term
4 W	Open	Mediocre-Poor; Walkover too short	Extend walkover improvement project here (like 6W)	Short-term
310 W	Open	Mediocre-Poor; Short walkover	none	<u>n/a</u>
3 W	Open	Good	Add fencing to funnel pedestrians	<u>Immediate</u>
3 W Bathhouse	Open	Good	n/a	<u>n/a</u>
210 W	Open	Good	Add fencing to funnel pedestrians	<u>Immediate</u>
110 W	Open	Pavers	None	<u>n/a</u>
110 E	Open	Sand path	Do not reinstall Mobi-Mat; Add sand to create mound at dune line like 9E	Short-term
2 E	Open	Sand vehicle access path	Add sand to create mound at dune line like 9E	Short-term
210 E	Open	Good; Sand path (Removed old walkover)	None	<u>n/a</u>
3 E	Open	Good; Extended prior to dune erosion, now	Retreat once dune growth begins to ID toe	Medium-term

		too long	of dune	
4 E	Open	Mediocre walkover	None	n/a
410 E	Open	Mediocre walkover	None	n/a
5 E	Open	Old ramp covered w sand used	Maintain as is, used as bike access	n/a
510 E	Closed	City rehab	Retreat and repair	<u>Complete</u>
6 E	Open	walkover	None	n/a
610 E	Closed: Nourishment	Sand path	None; not recommending walkovers at 1/2 blocks	n/a
7 E	Closed: Nourishment	Mediocre walkover	None	n/a
710 E	Closed: Nourishment	Mediocre walkover	None; not recommending replacement at 1/2 blocks	n/a
8 E	Closed: Nourishment	Mediocre walkover	None	n/a
810 E	Closed: Nourishment	Sand path thru dunes; No walkover.	n/a	n/a
9 E	Open	Vehicle access; sand ramp	Good model to replicate for vehicle access points	n/a
910 E	Open	Sand path	n/a	n/a
10 E	Open	Good, repaired, parking lot expanded	Dune Infiltration Project upcoming	n/a
1010 E	Open	Excellent dune growth	n/a	n/a
11 E	Open	Good; City built new seawall to plug opening that allowed surge in	Consider future expansion of parking lot	Long-term
1110 E	Open	Sand path allowed surge to reach the road	Installed seawall with property owner to NE	n/a
12 E	Open	Good; Walkover retreated to seawall	Candidate for parking lot expansion	<u>Short-term</u>
1210 E	Open	Good	None	n/a
13 E	Open	Good	None	n/a
14 E	Open	Sand path and walkover;	<u>n/a</u>	n/a
15 E	Open	Good, retreated	n/a	n/a
1510 E	Closed	Good, retreated	n/a	n/a
1522 E	Open	Good, retreated	n/a	n/a
1550 E	Open	Repaired, good	n/a	n/a
1560 E	Open	Good	n/a	n/a
1561/1563 E	Open	City rehab	Retreat and repair	<u>Immediate</u>

1587 E	Closed: contractor access	Demolished walkover; Sand vehicle access path	Add sand to create mound at dune line like 9E	Short-term after nourishment
1640 E	Open	Retreated, good	n/a	n/a
1670 E	Closed: contractor access	ADA ramp repaired	Add sand to create mound at dune line like 9E	Short-term after nourishment
1690 E	Closed	Retreated; good	n/a	n/a
Summer Place	Open	Good	None	n/a

Note: Two private walkovers require action

1. 1639, should be retreated to transition straight to beach
2. 207 E should be retreated

Appendix D

Dune Walkover Guidance From

R.30-13(O)(1):

O. Sand Dune Management.

(1) Walkways over dunes, as provided in Section 48-39-130(D), shall meet the following requirements:

- (a) All components must be constructed of wood or Department-approved wood-like material;
- (b) Have a maximum width of six feet;
- (c) Conform with the contour of the dunes with a 2 foot vertical clearance between the surface of the dune and top of the walkway;
- (d) Displace no sand in a critical area;
- (e) Be constructed with as little environmental damage as possible;
- (f) Not be located within fifty feet of another walkway on the same parcel of property;
- (g) Be limited to no more than one of these structures per lot unless a limit of one would cause an unnecessary hardship as determined by the Department;
- (h) Be shore perpendicular, except as necessary for handicapped access.

Additionally, the structure must terminate as far landward as possible and not extend far across the dry sand beach. After an erosional event, you may be required to shorten the length of a dune walkover structure. A wider deck cannot be incorporated into the structure without a General Permit from this office. This guidance does not alleviate your responsibility of obtaining any local permits or approvals that may be needed.

Appendix E

Native dune plants recommended for the DMA

Common (Scientific) Name

Sea oats (*Uniola paniculata*)



Bitter panicum (*Panicum amarum*)



Railroad vine (*Ipomoea pescaprae*)



Marsh hay cordgrass (*Spartina patens*)



Searocket (*Cakile edentula*)

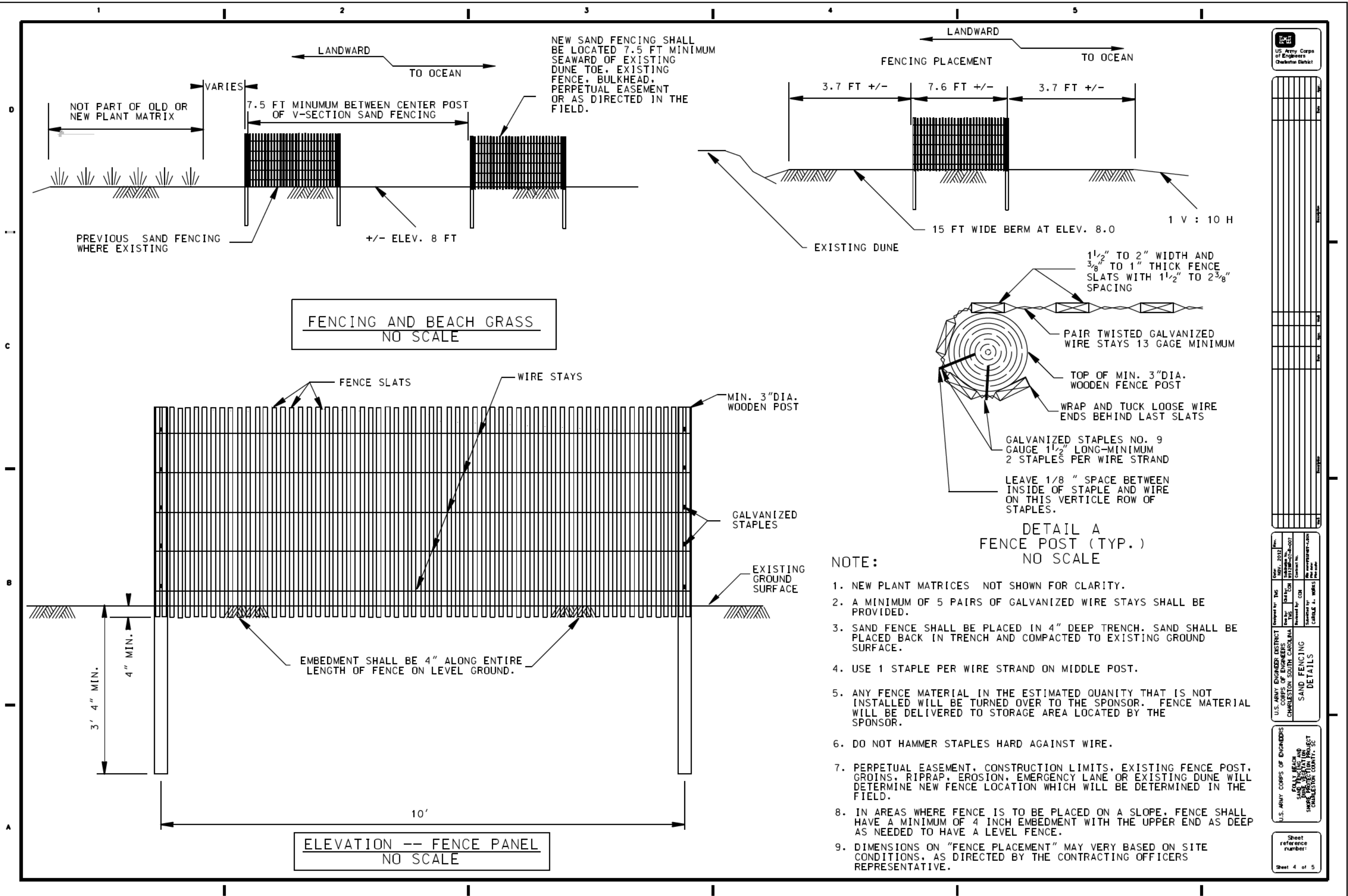


Sea purslane (*Sesuvium portulacastrum*)



Morning glory (*Ipomoea purpurea*)

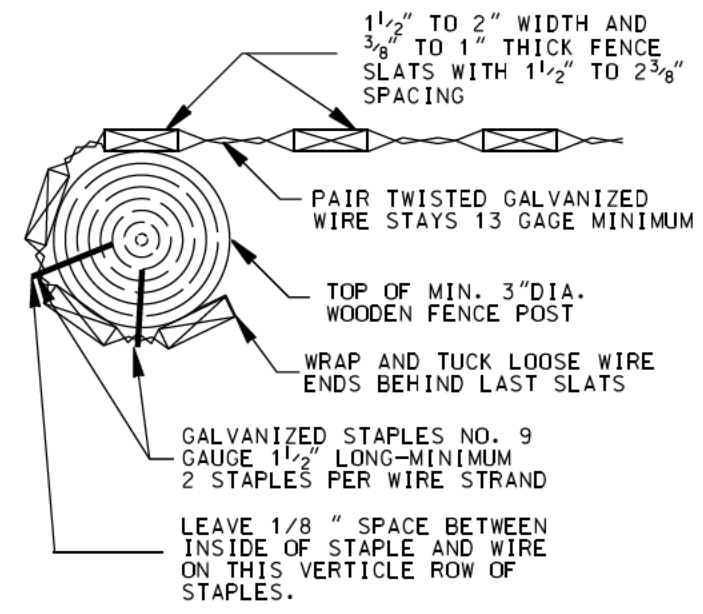




NEW SAND FENCING SHALL BE LOCATED 7.5 FT MINIMUM SEAWARD OF EXISTING DUNE TOE, EXISTING FENCE, BULKHEAD, PERPETUAL EASEMENT OR AS DIRECTED IN THE FIELD.

FENCING AND BEACH GRASS
NO SCALE

ELEVATION -- FENCE PANEL
NO SCALE



DETAIL A
FENCE POST (TYP.)
NO SCALE

NOTE:

1. NEW PLANT MATRICES NOT SHOWN FOR CLARITY.
2. A MINIMUM OF 5 PAIRS OF GALVANIZED WIRE STAYS SHALL BE PROVIDED.
3. SAND FENCE SHALL BE PLACED IN 4" DEEP TRENCH. SAND SHALL BE PLACED BACK IN TRENCH AND COMPACTED TO EXISTING GROUND SURFACE.
4. USE 1 STAPLE PER WIRE STRAND ON MIDDLE POST.
5. ANY FENCE MATERIAL IN THE ESTIMATED QUANTITY THAT IS NOT INSTALLED WILL BE TURNED OVER TO THE SPONSOR. FENCE MATERIAL WILL BE DELIVERED TO STORAGE AREA LOCATED BY THE SPONSOR.
6. DO NOT HAMMER STAPLES HARD AGAINST WIRE.
7. PERPETUAL EASEMENT, CONSTRUCTION LIMITS, EXISTING FENCE POST, GROINS, RIPRAP, EROSION, EMERGENCY LANE OR EXISTING DUNE WILL DETERMINE NEW FENCE LOCATION WHICH WILL BE DETERMINED IN THE FIELD.
8. IN AREAS WHERE FENCE IS TO BE PLACED ON A SLOPE, FENCE SHALL HAVE A MINIMUM OF 4 INCH EMBEDMENT WITH THE UPPER END AS DEEP AS NEEDED TO HAVE A LEVEL FENCE.
9. DIMENSIONS ON "FENCE PLACEMENT" MAY VARY BASED ON SITE CONDITIONS, AS DIRECTED BY THE CONTRACTING OFFICERS REPRESENTATIVE.

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS CHARLESTON SOUTH CAROLINA	Date: 08/14/2022 Drawn by: [Name] Checked by: [Name] Contract No.
U.S. ARMY CORPS OF ENGINEERS SAND FENCING AND BEACH VEGETATION SUBJECT CHARLESTON COUNTY, SC	SAND FENCING DETAILS
Sheet reference number: Sheet 4 of 5	