

BUXTON GROIN REPAIR
COUNTY OF DARE, NORTH CAROLINA

NARRATIVE DESCRIPTION OF PROJECT

Attachment 1 – Proposed Repair Drawings
Attachment 2 – 2006 M&N assessment report
Attachment 3 – 2006 M&N drawings
Attachment 4 – Original USN and USACE drawings
Attachment 5 – 15A NCAC 07J .0210

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The applicant seeks to conduct repairs on a groin located near the Village of Buxton in Dare County. This groin is part of a three-groin structure near the Village of Buxton and is the southernmost of the three. The attached drawings depict the proposed repairs and the current assessed condition of the structure (Attachment 1).

The deteriorated condition of the structure limits sand-trapping capacity and has negatively impacted beach widths on the updrift (north) side, which has contributed to habitat loss and property damage along the Village of Buxton as well as the periodic closure of public beach accesses in the area. A brief history of the installation and maintenance of the structure is outlined below; a more detailed narrative is provided in a 2006 engineering report included as an attachment to this document (Attachment 2).

The structure was originally installed in 1969 and included a total length of 1,670 ft in three groins. The repairs proposed herein are only for the southernmost groin. This groin was initially constructed to a length of 610 ft as depicted in the attached drawings (Attachment 3 Figure 2.1). In 1975, damaged and/or destroyed sheet piles were repaired in place (Attachment 3 Figure 2.3). Figure A depicts the condition of all three groins in September 1978, before a storm in March 1980 damaged the original structures.

Following the 1980 storm, between 1980 and 1982 an additional ~300 feet of sheet piles were installed at the landward end of the southernmost groin and at an angle to the original piles (Attachment 3 Figure 2.5). This extended the total length of the southernmost groin to 910 ft, with 300 ft angled as an upland tie in and 610 ft oriented shore perpendicular. The total length of all three groins as of 1982 was 1,970 ft. By 1984, armor stone scour protection had been installed along the structure as shown in Figure B, along with a number of sandbags around the base of the Cape Hatteras Lighthouse.



Figure A. Much of the original 1,670 ft length of the three groins remained in place as of September 1978 as shown here. *Photo by T. Kana.*



Figure B. By 1984, following the landward extension of the southernmost groin by 300 ft, armor stone scour protection had been installed along the structure and sandbags had been installed at the lighthouse. *Photo by T. Kana.*

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Figure C. By 1999, most of the scour protection and sandbags had been buried or removed. *Photo by USAF.*

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The most recent repairs made to the structure (in 1994) consisted of new sheet piles driven adjacent to the original sheet piles, and additional scour protection at the base of the structure. According to engineered drawings (Attachment 3 Figure 2.7), ~180 ft of sheet piles were installed. By 1999, much of the scour protection was buried along with the sandbags as shown in Figure C.

As of October 2024, sheet piles remain in place along approximately 410 feet of the linear footprint of the southernmost groin (Fig D, E). An additional ~20 feet of buried sheet piles remain at the landward tie-in of repairs constructed following the 1980 storm. The proposed repairs consist of reconstruction of 640 ft of the original linear footprint of the southernmost groin (Fig E).

These repairs would involve placing sheet piles and armor stone along the same path as the existing structure. Existing sheeting will be removed and replaced by new sheets along the

landward end of the structure (between station 0+00 and 4+57). Note that conditions and buried pieces of material may prevent driving sheets along the seaward end of this section. Armor stone will be placed along the seaward end of the structure to aid in scour protection and restore sand and the sand trapping capacity in areas too deep to effectively install new sheet pile.

The maximum crest elevation of the proposed repairs is 8 ft NAVD, matching the original permitted design (Fig F; Attachments 1 and 4). The elevation will slope along the intertidal beach section to reduce the exposure of the structure. This will improve the aesthetics of the groin, reduce the likelihood of damage during storms, and allow for overpassing of sand to maintain sediment transport to the south. The groin elevation section will include (1) a horizontal berm section that should remain mostly buried on the northern side during typical weather conditions, (2) an upper beach section that slopes from +7.5 ft to +5.5 ft NAVD and will have varying levels of reveal depending on temporary changes in sand surface elevation, (3) an intertidal beach section sloping 1 on 19 between +5.5 ft and +2.0 ft NAVD (~still water mean high tide line), and a low-tide section sloping between +2.0 and 0.0 ft NAVD. At these elevations, the majority of the seaward third of the structure will sit at an elevation where only 1 to 2 ft of structure is exposed at a normal low tide. Armor stone will be placed adjacent to the seaward portion of the sheet piles and extend to station 6+40 to reduce scour and protect the sheets from storm waves. The stone section includes a core section of 1 to 3-ton stone, covered by the main protective stone ranging between 10 to 15 tons. Stone will slope at 1 on 1.5 on the northern and south side of the structure, while the seaward slope will be 1 on 2. Armor stone will be placed over marine gabion mattresses to prevent settlement of stone into the ocean bottom. Mattresses will extend beyond the limits of armor stone up to 20 ft to reduce the potential for scouring and settling/slumping of the stone.

The total length of the groin system at Buxton including original construction and permitted extensions is 1,970 ft. The proposed repairs would restore functionality to 640 ft of the southernmost groin. Therefore, repairs do not require a Major Permit application according to Code 15A NCAC 07J .0210 'REPLACEMENT OF EXISTING STRUCTURES' (Attachment 5).

Construction is expected to take 2 to 3 months to complete. If practicable, work will be completed prior to the peak of sea turtle nesting season to minimize potential impacts to endangered species. Due to the energetic nature of the ocean during winter months, and the need to construct a portion of the work in and around the intertidal beach and nearshore zone, it is advantageous to construct the project in the late spring and summer period. Dare County presently is scheduled to construct a nourishment project at Buxton in summer 2026. If this project is built on schedule, work for the groin may be scheduled to coincide with the dredging work to reduce the overall temporal impacts to the Buxton beach area. Work on the groin will be completed by land-based equipment during daylight hours. A temporary trestle may be required for completing the seaward end of the groin.



Figure D. As of late 2024, approximately 410 ft of the sheet piles remain in place along the original linear footprint of the southernmost groin. *Photo by D Giles.*

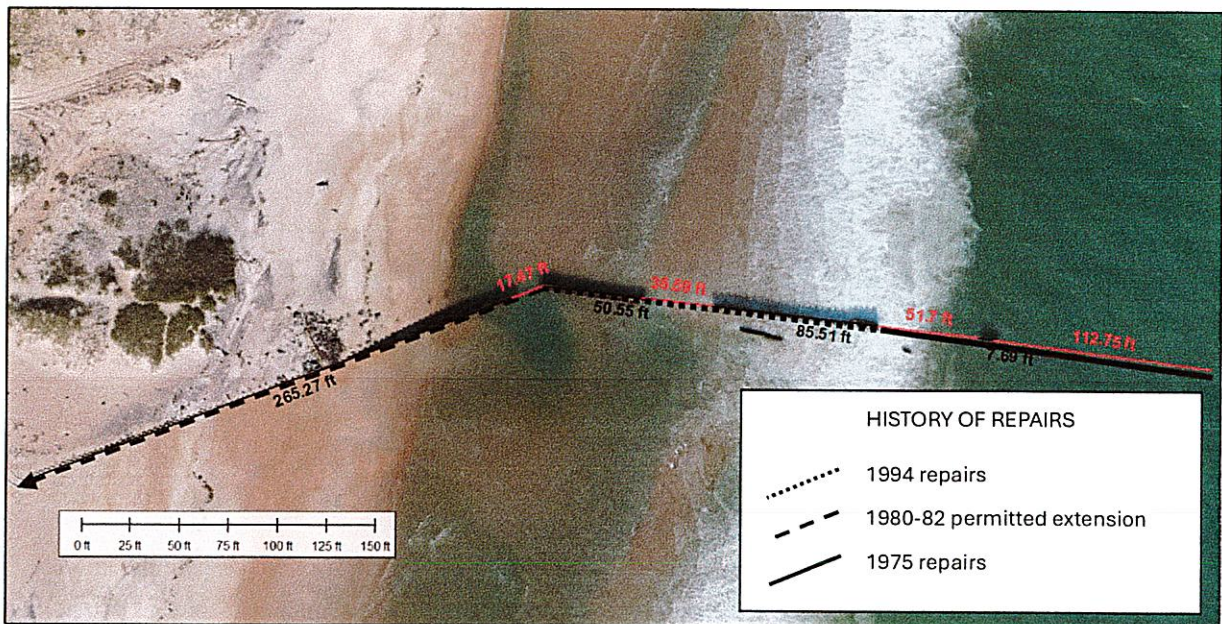


Figure E. Proposed repairs consist of placing sister sheet piles along 640 ft of the original footprint of the structure. Black segments indicate portions of sheet piles remaining in place, while red sections indicate portions of sheet pile lying below MSL (e.g. heavily damaged).

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