



**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

## ***National Erosion Control Development and Demonstration Program (Section 227)***

# **Cape May Point, N.J.**

### **Description**

Cape May Point, New Jersey, is a 1.7- km (1.1-mile) beachfront community vulnerable to beach erosion and storm damage. Existing shore protection structures include a series of nine groins and a rubble revetment armoring the shoreline in the easternmost groin cell constructed in the 1950's, and two concrete prefabricated breakwaters called Beachsaver Reefs™ that were installed in groin cells 2 and 3 in 1994 as part of an experimental State of New Jersey Pilot Reef Project. Beach-fill material was placed in groin cells 3 and 4 in 2000 to mitigate for dune erosion. The present demonstration project consists of the construction of an additional Beachsaver Reef™ in cell 5 with an improved geotextile cloth base to prevent settling and an innovative inverted prefabricated concrete parking garage floor called a Double-T sill in cell 6. Additional beach nourishment material was placed later. The project goal is to create a perched beach and maintain sand within the two groin cells using the prefabricated structures. These two low-cost structures will be evaluated to assess their ability to retain beach sand, maintain their structural integrity and save money by reducing the renourishment interval after the beach fill is placed.

### **Issue**

The shoreline of Cape May Point is vulnerable to storm damage through wave attack, erosion, and inundation. This unstable shoreline necessitated repeated local action in the form of construction and rehabilitation of nine groins, dune construction, seawall fortification, and some beach nourishment since the 1930's. These actions

have made much of the shoreline relatively stable, fluctuating between periods of erosion and accretion. The extensive man-made dune system that has been developed over the years along the western portion of Cape May Point has been particularly effective in providing shore protection for that area. However, while these efforts have for the most part "held-the-line" in most shoreline sections with regard to erosion, that "line" is at a critical position. There is virtually no beach in front of the dunes to act as a buffer to deal with forces due to storm events, which can severely damage the area and also contribute to the saltwater intrusion to Lower Cape May Meadows.



**Prefabricated concrete Beachsaver Reef™ is installed**

### **Technology**

The Beachsaver Reef is a reinforced prefabricated concrete breakwater. The breakwater is narrow-crested due to its triangular shape, with the smallest dimension at the crest width. Each unit is 1.8 m (6 ft) high, 3 m (10 ft) long and 4.5 m (15 ft) wide, with a crest width of 0.45 m (1.5 ft), and weight of around 186,825.3 N (21 tons). The units interlock with each

other and were placed in a line across the seaward end of the groin cell. A new innovation was to place a filter cloth with a concrete-filled tube on the landward end as a base under the structures to prevent scour and settlement (experienced with the 1994 placement in cells 2 and 3). A line of 72 units was constructed completely across cell 5 using a barge-mounted crane and rocks were placed to connect the Beachsaver Reef with the adjacent groins, making a closed compartment.

In cell 6, a unique innovative “Double-T” sill was constructed with the same barge-mounted crane. This sill was composed of a reinforced prefabricated concrete parking garage deck that was turned upside down so that the two legs of the structure faced toward the surface. One end of the unit had an extension of the legs that allowed placement of the units in a line to interlock. Dimensions of this Double-T sill were 9.1 m (30 ft) long, 3.6 m (12 ft) wide and 0.85 m (2.8 ft) high and weighted around 169,032.41 (19 tons). No filter cloth was used in this placement. A single line of 22 units was placed at -2.7 m (-9 ft) North American Vertical Datum (NAVD) across the seaward end of the groin compartment to create a closed sill structure.

### **Status**

The project was constructed between August and October 2002, with the placement of a Beachsaver Reef in groin compartment cell 5 and a Double-T sill in the adjacent groin compartment in cell 6. As-built surveys of the structures were collected in October 2003. A monitoring program is in place, which includes beach and nearshore profiles, structure settlement surveys, sediment samples, wave and current measurements, and aerial photography. Post-construction monitoring surveys for 2003 have been conducted in April (profiles and settlement surveys), July (profiles and settlement surveys, sediment samples, wave and current measurements), and October 2003 (profiles and settlement surveys). In 2004 a monitoring survey was collected in February (profiles and settlement surveys). A small beach fill was truck-hauled in cell 4 in March with a post-placement survey just in that cell. Surveys were taken in April/May (profiles and settlement surveys, wave and current measurements) and in July (profiles and settlement surveys, sediment samples). Surveys were taken in October 2003 as a pre-fill condition (profiles and settlement and additional current surveys). A beach fill was placed in cells 1-6 as part of the Lower Cape May Meadows to Cape May Point Environmental Restoration Project in 2003. An as-built survey was collected just after fill placement (profiles). In January 2005, a post-fill survey was completed (profiles and settlement) to document fill placement in relation to the shore-parallel Beachsaver Reefs and Double-T sill structures and control cells without structures in all eight cells. After an icy winter, an April survey was collected to document the beginnings of redistribution of the fill material and the effectiveness of the structures in holding the fill in place.

### **Time Line**

Construction complete, monitoring program ongoing.

### **Points of Contact**

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### **Program Authorization**

Water Resources and Development Act of 1996 (Public Law 104-303, 110 Stat. 3658) dated October 12, 1996.

Additional information can be found at <http://chl.erdc.usace.army.mil/section227>.