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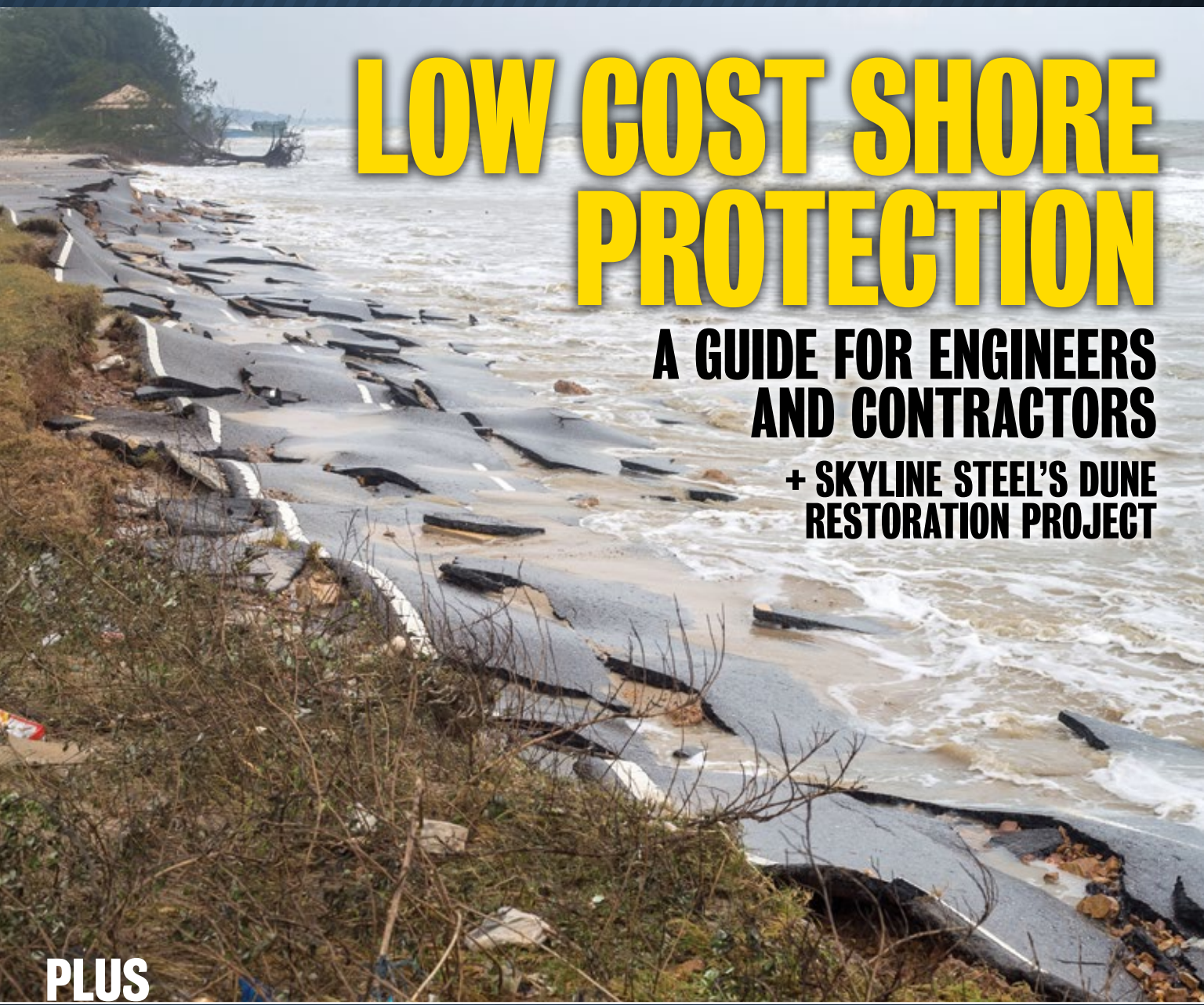

LOW COST SHORE PROTECTION

A GUIDE FOR ENGINEERS AND CONTRACTORS

+ SKYLINE STEEL'S DUNE RESTORATION PROJECT

PLUS

170 WEST BROADWAY PROJECT
Geotechnical Challenges and Helical Drilling

ADVANTAGES OF DDM
Drilled-In Displacement Micropiles

BIGFOOT CRANE COMPANY
Lifts Trams for Amtrak

JOB STORY

Fender pile replacement spread: dive boat, crane barge, and materials barge located inside debris boom adjacent to conveyor system used to load tunneling spoils onto barge for transport.

By Frank Immel

DRIVING SUCCESS WITH COOPERATION

Seattle, WA

Temporarily securing new fender pile in place prior to vibrating into bottom.

Just as BERTHA the tunnel-boring machine was getting underway after a long hiatus, progress was halted once again. BERTHA had been employed to bore a tunnel for the new State Route 99 roadway under the Seattle waterfront, and had been stuck just over two years for repair to a damaged bearing at the front of the machine. Then, just as the machine was getting ready to start moving again, another stoppage occurred at the other end of the scene — where spoils were being loaded onto a barge for transport away from the site.

During loading, due to yet-to-be-determined cause, the material on the barge shifted, causing the barge to list, or roll away from the dock. As the below water section of the hull pivoted toward the dock, it snapped twenty-three creosote-treated wood fender piles. Thankfully, the shore crew took quick action to cut the barge loose and prevent further damage to the piles that supported both the dock and the conveyor system.

Global Diving & Salvage, Inc. responded to the incident, performing an

underwater inspection to determine if the barge sustained any damage. Once they verified the seaworthiness of the barge, attention shifted to removal of the spoils. A derrick barge was used to move the materials to another barge for transport and disposal.

The wood fender piles had been snapped approximately ten feet below the dock level, so divers inspected the pilings down to mud line, and no further damage was noted. Inspection of the structural piling that supported the dock and conveyor system revealed no damage.

Global was awarded the contract to repair the dock on February 1st — working against a fish window closure of Feb. 14th, they would need to complete all in-water work in less than two weeks. "While not an overly complicated project, there was still a lot of moving pieces that needed to be pulled together in order to complete this work on time," said Mike Langen, V.P. of Marine Construction for Global. "It was only through great cooperation between the contractor, governing bodies, and the owner that we were able to be successful."

Work plans, SSSHP, safety orientations for all personnel, and necessary material procurement were all completed within the next three days, and Orion Marine Contractors was subcontracted to provide derrick barge services. Once the broken pile stubs above the water were removed from the fender rail, Global divers attached the vibratory hammer to the remaining pile stubs and vibrated the piles out of the bottom. All but three of the pilings were vibrated out — three were left because a section of the dock was blocked overhead by the barge-loading conveyor system. They would have to be cut off. Divers moved the bottom material from around them, uncovering just over two feet of each below the mud line. The stub was rigged to the crane, and divers, using a hydraulic chain saw, cut the piling off two feet below the natural bottom. The stubs were then removed from the water, and divers filled the holes back in. All of the piling remnants were removed from the water and disposed of properly.

Diver on surface after connecting vibrating hammer for extraction.

New pilings, 80-foot lengths of steel pipe pile were used for the new fender system. These pilings were driven with the vibratory hammer to -60 MLLW. Installation began on Feb. 4th and was completed by February 10th, four days ahead of the mandated fish closure window. The tops of the pilings were cut to the proper height, caps were welded on, and they were secured to the wooden fender railing by February 15th. Final inspection by the engineer of record, STP, Port of Seattle, and WSDOT was completed, and Global was off-site by February 16th.

Global worked cooperatively with all stakeholders to complete the project within a very tight window of time. ■