



Left: The crane lines up support work platform and saw.

Precision Underwater Cutting Required in Great Egg Harbor

In September 1999, Kiewit/Tidewater, AJV began constructing a new 3,450-foot-long bridge over Great Egg Harbor in Ocean City, NJ adjacent to an existing bascule bridge. The new structure had battered (angled) piles that required precision cutting underwater to complete the new bents. Kiewit contracted CSDA contractor member Cutting Edge Services Corporation of Cincinnati, OH to complete this unusual job.

The job required precision cutting of 82 pre-stressed concrete cylinder piles, which would support the new bridge structure. The hollow piles were 54 inches in diameter and driven deep into the tidal floor at an angle. In order to cut the piles correctly, Cutting Edge Services needed to find a way to make a precision cut below the surface of the water, severing pre-stressed reinforcing strands and spiral-wrapped rebar, while also preserving the structural integrity of the piles. The elevation of the cut also needed to be closely controlled. Because the piles were located in the harbor, this limited-access job also required a saw that would work consistently in salty underwater conditions.

Additional factors that complicated this project were the tidal changes, cold weather and “snapping” of the pre-stressed strands as they were cut. Kiewit and Cutting Edge Services put their heads together and came up with a unique solution to this complicated cutting task.

“This project demonstrated a successful mix of a creative client, a talented manufacturer and a professional concrete cutter,” said Tim Beckman, President and CEO of Cutting Edge Services. “It took persistence from all three parties to complete this unique wall saw application in a timely manner.”

Cutting Edge Services conceptualized a modified wall saw on a circular track that would perform in underwater conditions. They contracted with CSDA manufacturer member Diamond Products, Elyria, OH, to create a modified wall saw and track. To facilitate shop fabrication and testing, a 54-inch-diameter, hollow, pre-stressed concrete pile was shipped to Diamond Products’ shop in Ohio. Diamond Products modified a DZ Wall Saw and created an I-beam guide rail circular track customized to fit around the concrete pile. Special guide rollers were needed to hold the saw onto the cir-

cular track. They also added additional remote operation capabilities, blade indicators and hydraulic-actuated stabilizers at the request of Kiewit and Cutting Edge Services.

Diamond Products tested the modified saw using various blade diameters and segment configurations to ensure uniform depth of cut without penetrating the inside of the hollow pile. This was an extremely important factor because if the piles were overcut, they could fall and cause unsafe conditions; if they were undercut, they could not be removed without damaging the remaining pile.

While the saw was undergoing final assembly and testing, Kiewit designed and fabricated a custom support work platform to hold the operators while they were running the circular wall saw. This platform included a tapered steel pole that centered the cutting apparatus into the concrete piles and maintained stability during cutting operations. The DZ saw and support mechanism were powered by a large hydraulic unit located on a nearby barge. A control panel could monitor and perform all setting and saw operations by remote control. The blade depth could also be monitored by indicator lights. The modified circular I-beam track was attached to the support platform by chains to keep saw movement independent of the platform.

Once operators had lowered the saw to the desired level, a hydraulic piston locked the saw track in place around the pile and held it firm during cutting. When the saw was not in use, it was kept submerged in a special solution on the deck of the barge.

To begin the cut at each pile, a crane operator lifted the entire support platform and modified wall saw, lined it up with the pile to be cut and carefully lowered it into the hollow core of the pile. This was somewhat difficult, as the piles were set at an angle in the water. After lining up the saw and setting the actuator pistons for the track, operators began the cut by making a 1-inch-deep, 360-

degree pass around the pile. Operators then made a second 360-degree pass, cutting an additional depth of 2 inches. They completed the cut with a third pass, making the total cut 6 inches deep.

A total of 82 piles, in groups of four, six or eight per bent, were cut with this timesaving machine. Typical cuts were made in one hour versus several hours with hand tools and a dive team. Kiewit confirmed that significant time and money were saved with this unique diamond-cutting saw.

“The determination and drive of Cutting Edge, coupled with the manufacturing flexibility of Diamond Products, made this project a real success,” said Kent Werle of Kiewit.

Cutting Edge Services Corporation has been a CSDA member since 1998. They are a specialty diamond cutting contractor, offering engineered field services and equipment for the nuclear, forest products, hydro, industrial, decommissioning and bridge markets. The business began in 1997 and is based in Cincinnati, Ohio. CEO and President, Tim Beckman, has over 30 years experience and helped commercialize construction wire sawing in 1983. ●

Resources:

General Contractor: Kiewit/Tidewater, AJV, Longport, NJ

Method: Wall Sawing

Location: Ocean City, NJ

Sawing and Drilling Contractor:

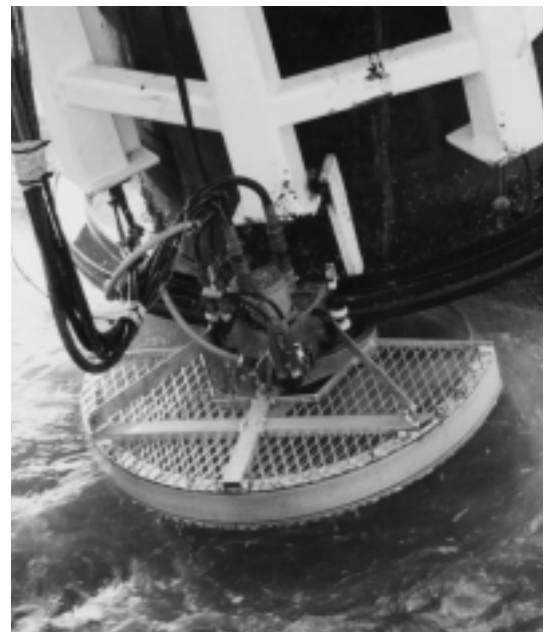
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Left: Kevin Cote (left) of Diamond Products and Herbie Reece (right) of Cutting Edge stand before the cut piles.
Right: The customized circular wall saw at work.