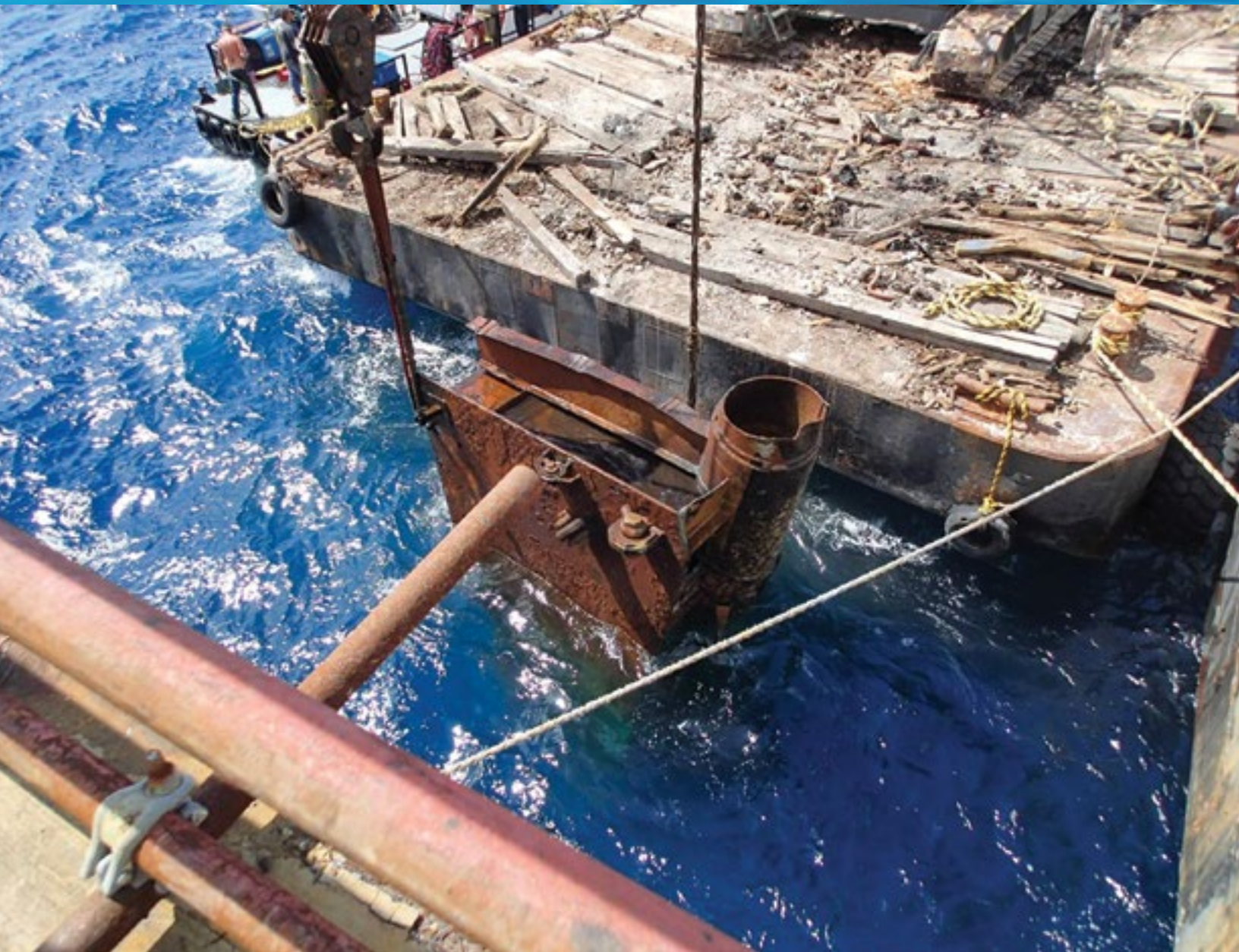


Break in the Bahamas

Cutters Head to the Caribbean to Wire Saw Sunken Pier



A 25-foot by 25-foot steel pier section had sunk into the water.



Divers were used to inspect the damaged structure and set up the cuts.

On May 25, 2012, a large pier at a busy oil terminal in the Caribbean was struck by a tanker, causing severe damage to the structure. Part of the pier's dolphin platform was left protruding approximately 5 feet from the water while the rest had sank below the surface. Three months later, the situation worsened when Hurricane Isaac blew through and caused the entire pier to sink around 6 feet below water level. Millions of dollars were being lost while the pier was not in use, so it was important the owner quickly removed and replaced it. In addition, the structure had become much harder to spot by passing ships, making it more susceptible to collisions.

Two CSDA contractors joined forces to provide a solution that would not only remove the damaged structure from the water quickly, but in a way that was safer than other demolition methods and preserved the natural environment around the sunken pier.

Bahamas Oil Refining Company International Limited (BORCO) is the largest storage terminal facility in the Caribbean, with the ability to store, blend, transship and bunker fuel oil, crude oil and various petroleum products. Located off the southern tip of Grand Bahama Island in Freeport, the facility has a storage capacity of 21.6 million barrels.



A wire saw was positioned on a work platform 25 feet above the water.

BORCO provides services for shipping trade from all over the world, so when the *Cape Bari*—an 810-foot-long tanker—hit the pier, the company began losing millions of dollars while the damaged pier was out of commission. A solution was needed—and fast.

Bahama Industrial Technologies (BIT) was approached by BORCO to act as general contractor for the job. BIT began searching for a company that had the equipment and expertise to cut underwater and remove the sunken damaged sections of the pier deck. The general contractor invited CSDA member ABC Concrete Cutting—South Florida, located in Pompano Beach, to visit the terminal and come up with a plan to remove the sections. After performing a review of the site, ABC concluded that it would need additional resources for the job. The contractor reached out to fellow CSDA member Cutting Edge Services Corporation of Batavia, Ohio, and the two companies combined expertise to complete the work.

“Skip Aston [owner of ABC Concrete Cutting—South Florida] and I go way back and hold each other in high regard,” said Tim Beckman, owner of Cutting Edge Services Corp. “He wanted our underwater wire saw expertise to supplement his team’s work above the water, so we were happy to enter into the joint venture.”

The submerged pier was unstable and the bottom sat approximately 30 feet below the surface of the water. The top of the section would break the surface during low tide and be around 6 feet below surface at high tide. The damaged section consisted of a 1.5-inch-thick steel plate measuring 25 feet by 25 feet. The plate needed to be cut into three sections for a barge-mounted crane to lift it from the water and place on a work platform for disposal. The plate was connected to six 3-foot-high I beams, so cuts had to be made through each one to free the sections.

The ABC/Cutting Edge joint venture planned to deploy a diamond wire saw system to cut the damaged pier sections. The remote-operated saw would allow divers to stay a safe distance from the unstable structure, while mobilization and setup times were much quicker than other methods. BIT had attempted to use underwater torches to cut the structure, but the process took too long and the financial losses for BORCO were mounting.

A diving vessel with six divers and two crew members from Orion Marine was employed to support the work of the joint venture. Each day consisted of a 20-minute boat ride to the pier, where a work platform and crane barge were anchored in place. A modified WS25 wire saw from



Each wire saw pull cut took around six hours to complete.

Diamond Products was positioned on the work platform, standing 25 feet above the water. Divers entered the water and captured video to allow ABC/Cutting Edge to assess the situation and create a game plan for the cutting work. Instructions were then given to the divers for the installation of the underwater pulleys, while the cutting team set up pulley stands on the work platform. Custom-fitted fenders were attached to some pulleys to prevent the wire from 'jumping' off while cutting underwater.

With the saw and pulley runs in place, divers began creating starting notches for the pulls using pneumatic power grinders. These notches were necessary, as the sunken plate was at a skewed angle underwater, making it difficult for the wire to get a "bite" on the steel. Diamond wire was run around the system, positioned in the notch and tensioned for the commencement of cutting. Crane rigging was also attached to the cut sections so that they could be lifted from the water once cut free. ABC/Cutting Edge used 140 feet of 10.3-millimeter-diameter (0.4 inches) wire from Tyrolit and ran the saw with 2,800 psi of pressure. Once the equipment and wire run was set up, each pull cut took approximately six hours to complete. Work commenced on September 10 and finished on October 1.



Ships continued to dock at nearby piers while cutting was performed.



Notches were made in the steel to help the diamond wire get a “bite” on the structure.



Cut sections were loaded on to work barges by crane for disposal.



The cut sections had spent months underwater in a damaged state.

Joe Bland was ABC's project manager for the BROCO job. "We selected Cutting Edge to take the lead on this project due to their vast underwater wire sawing experience, which worked out extremely well for everyone involved. More importantly, there was a mutual trust and respect between the two companies. This insured the project was completed in a timely fashion, to the best of our abilities and to the satisfaction of the customer."

Working in the middle of the Caribbean may sound like an idyllic job location, but it was not without its problems. The team from ABC/Cutting Edge experienced delays when rough, 6-foot seas interfered with the initial setup of the equipment and made the underwater environment very difficult for divers to operate. Working underwater generally makes for a challenging jobsite, whether it be due to the speed of setup or the movement of damaged structures as was the case with this job. Another challenge was the removal of one particular



One cut section required two cranes to stabilize it during removal.



section that was positioned directly underneath the existing structure. This section had to be rigged to two cranes to safely remove it from the water without colliding with work barges.

Divers had all necessary PPE and workers on the platform were supplied with floatation devices, lanyards and harnesses. All personnel on the jobsite were briefed on the equipment and safety rails were put in place to prevent falls into the water. Gas detecting equipment was also used to ensure safe levels while cutting.

"I was extremely satisfied with the outcome of the job," concluded Bland. "BIT was very pleased with our rapid response and our expedited mobilization. From the time that we looked at this job, we were able to mobilize and get all of our equipment through customs within a two week period."

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COMPANY PROFILE

ABC Concrete Cutting—South Florida is a division of Ohio Concrete Sawing and Drilling, Inc. and is based in Pompano Beach, Florida. The Florida division has been a CSDA member company since 2010, while the parent company has been a member for 31 years. ABC Concrete Cutting—South Florida has 23 operators and 30 trucks. The company offers the concrete cutting services of core drilling, slab sawing, hand sawing wall sawing, grooving and grinding, polishing and crushing.

Cutting Edge Services Corporation has been in business for over 15 years and is based in Batavia, Ohio. Support operations are located in Houston and Richland, Washington. The company offers primary services of engineered solutions, diamond wire sawing, underwater cutting and core drilling. Cutting Edge has been a member of CSDA since 1997, employs CSDA Certified Operators and is Level 1 Certified through the association's Company Certification Program.

RESOURCES

General Contractor:

Bahamas Industrial Technologies

Sawing and Drilling Contractors:

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Methods Used: Wire Sawing

