

Precision Cutting Cleanly Removes Wastewater Tank Cap

Operators Remove Domed Cap Piece by Piece

The City of Parsons, Kansas needed to rebuild its wastewater treatment plant to meet new state regulations for efficiency and water treatment technology. The \$5 million project would involve new construction as well as modifications to some of the existing structures. As part of renovation efforts, an enclosed sewage tank needed to have its domed concrete cap removed so it could become an open-air holding tank. The cap measured approximately 50 feet in diameter, had a 3-foot curved rise from bottom to top and varied in thickness from 6 inches at the top to 13 inches at the bottom.

Contractors needed to remove the cap in a way that would not damage the integrity of the structure. In addition, since the tank was going to be used as a holding tank, debris could not fall into it as it would

An operator uses a wall saw with a 20-inch blade to cut a section of the tank's domed concrete cap.





Clockwise from top left: Only one section remains to be cut during phase one of the project. The sections were rigged for removal before the last two cuts were made. The I-Beams that supported the center section can be seen as the final piece of the tank cap is removed. Fall protection was critical throughout the entire job.

have required additional time and labor to remove debris. In July 2005, general contractor LaForge & Budd Construction Co., Inc. of Parsons, Kansas selected CSDA member Kansas Concrete Cutting of Wichita to remove the concrete cap. Precision cutting was determined to be the fastest and safest way to remove the cap and would provide a clean, smooth line along the top edge of the tank.

Kansas Concrete Cutting decided to divide the concrete cap into 16 pieces

fanning out from the center. Each piece measured 20 feet long on the sides, 3 feet wide at the top and 10 feet wide at the bottom. The job would take place in two stages with eight pieces removed in each. In the first stage, every other piece would be cut and removed. In the second stage, the remaining eight pieces and the center piece would be cut and removed.

The tank was drained before Kansas Concrete Cutting arrived on the job site. Operators began by cutting every other 20-foot-long side cut using a Longyear

360 Wall Saw with 30-inch-diameter, 0.187-inch-thick blades supplied by Diamond Products. Next, they made the 3-foot-long top cuts for the first eight pieces to be removed. For this part of the cutting, 20-inch-diameter blades were used because the concrete was not as thick near the top center of the tank.

In the meantime, the general contractor drilled 4-inch diameter core holes for rigging and the first piece to be removed was rigged. The operators then made the remaining 20-foot-long side cut

and the bottom 10-foot-cut to free the section. The general contractor removed the piece using a link-belt crane. A second Grove crane was used to tie off the pieces for safety during the cutting process. This cutting and removal procedure was repeated for the remaining seven pieces, and within three days the first stage was complete.

While the first phase of cutting was being done, the general contractor was debating how the center of the cap could be supported during phase two of the removal process. The general contractor decided to shore up the center of the cap before the final pieces were cut and removed. LaForge & Budd ordered two 35-foot-long, 24-inch-high I-beams and welded them together. Then they inserted the beams through one opening and out the opposite side, passing directly under the center piece. Finally, two-ton hydraulic jacks were used to jack the I-beam down and shore it so that the beams did not give.

Kansas Concrete Cutting returned to finish the second stage of cutting and removal and only needed to make the top and bottom cuts on the remaining eight pieces to cut them free. The last section removed was the top center piece.

To complete this job, Kansas Concrete Cutting operators cut 530 linear feet of concrete that varied in thickness from 6 inches near the center cap to

13 inches and weighed approximately 60 tons. The cuts around the structure's top edge were clean and smooth, and no debris was left in the tank. With the job completed, it appeared as though the tank had been designed as an open air holding tank all along.

Safety was a major concern for operators on this job. They had to use fall protection at all times because the depth of the tank itself was 40 feet and the outside wall of the tank was 15 feet from the ground. The cap itself was curved and there was a 3-foot rise from the bottom to the top of the cap so the work floor was not level. In addition, once phase one of the job was completed, there was really no way to cover the "holes" created during phase one of the project, so operators had to work around the sections they had already cut and removed. And as each successive section was removed, there was less concrete on which to stand and work.

The hot summer temperature also reached over 100 degrees Fahrenheit in Parsons every day so the operators had to drink plenty of water to keep hydrated. They also started as early in the day as possible and tried to quit by 3:30 PM in the afternoon.

Ronnie Simmons, co-owner of the Wichita office of Kansas Concrete Cutting, said he was pleased with the finished product. "We were very satisfied because we had some unusual obstacles on

this job and overcame them without any problems," Simmons said. The general contractor was also satisfied because not only was concrete sawing safer, faster and cleaner than the other options considered, but it proved to be more cost-effective as well.

Thanks in part to the precision cutting performed by Kansas Concrete Cutting, renovations at the new wastewater treatment plant were successful and the updated facility began operating in August. The city says that the new plant is much more updated and requires less manipulation by employees. It is also much more energy efficient, using less electricity and water to run, than the former plant. ●

COMPANY PROFILE

Kansas Concrete Cutting, part of The Coring & Cutting Group, has been in business for 25 years. The company has seven trucks in the Wichita office and five trucks in the Salina office. Kansas Concrete Cutting performs a variety of sawing and drilling services including wall sawing, core drilling, slab sawing and grinding. The company has been a member of CSDA since 1979.

RESOURCES

General Contractor:
LaForge & Budd Construction Co., Inc.
Parsons, KS
Sawing & Drilling Contractor:
Kansas Concrete Cutting
Wichita, KS
Methods Used: Wall Sawing
Tel: 316-832-1580
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