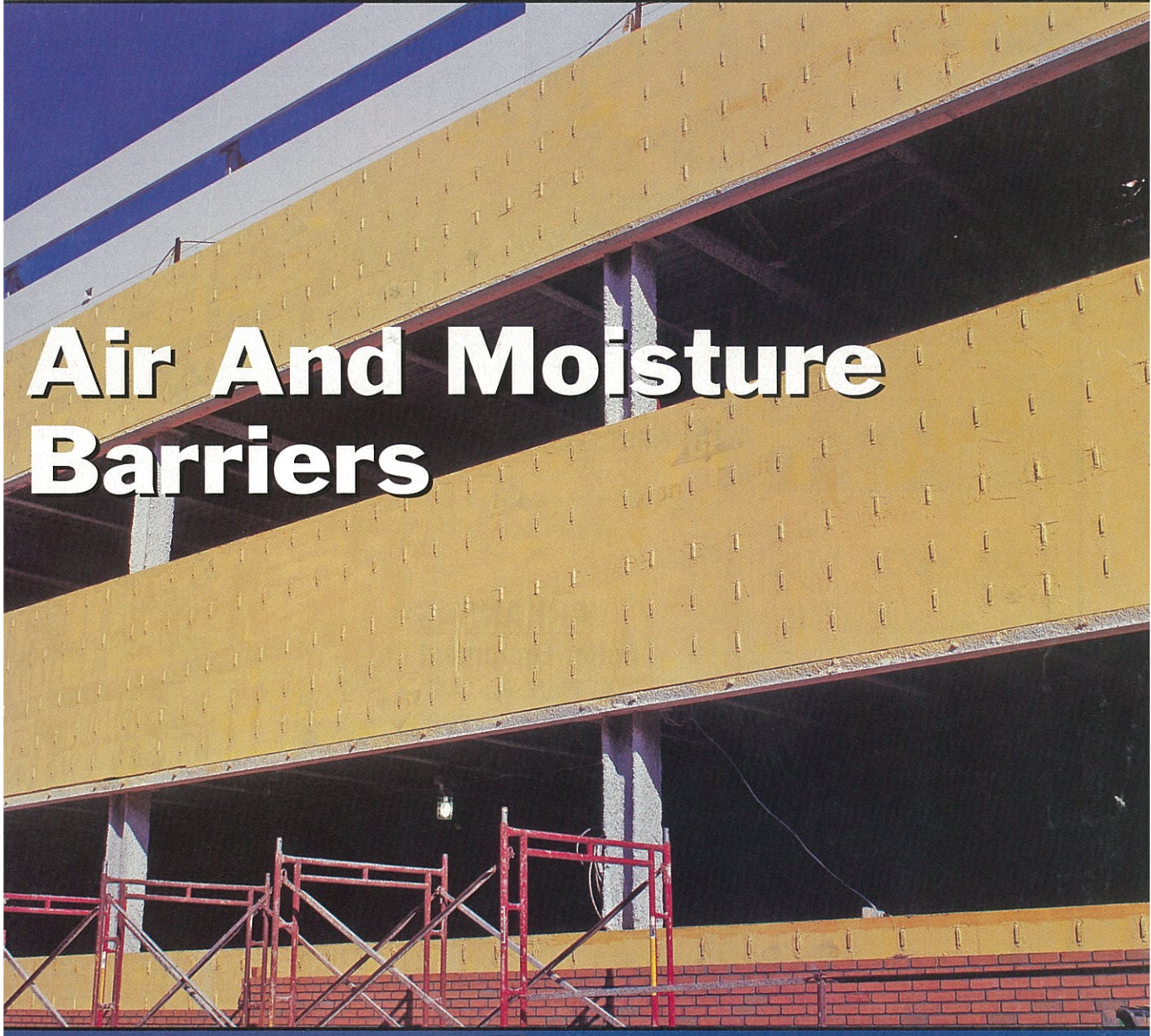


Construction News


July 5, 2004
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The Beaver Water District expansion project, planned to meet the demands of a growing population, will double the capacity of the existing treatment plant.

Beaver Water District Expansion

Major Project Meets The Growing Water Needs Of Northwest Arkansas

Northwest Arkansas, home of the Wal-Mart corporate offices, is one of the fastest growing residential and commercial areas of the central United States. The rapid growth of this area challenges civil engineers to meet the growing demand for water.

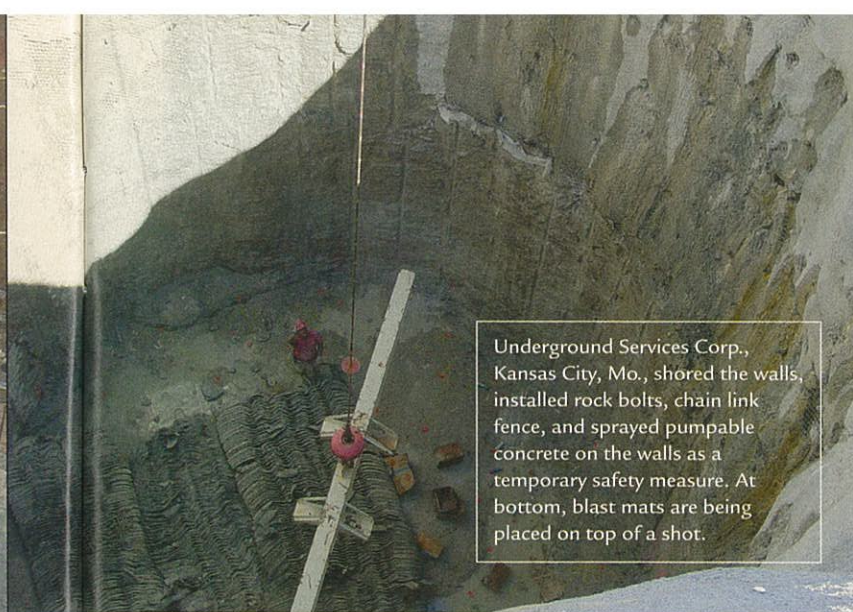
Beaver Water District treats and supplies a major portion of the drinking water for all of Northwest Arkansas. The current facility has a capacity of 70 million gallons of water per day, with a demand that is growing by leaps and bounds. In response to this increasing demand for water, Beaver Water District has contracted an expansion project, which will double the capacity of the

existing treatment plant, with a built-in capacity of an additional 60 million gallons per day if required in the future.

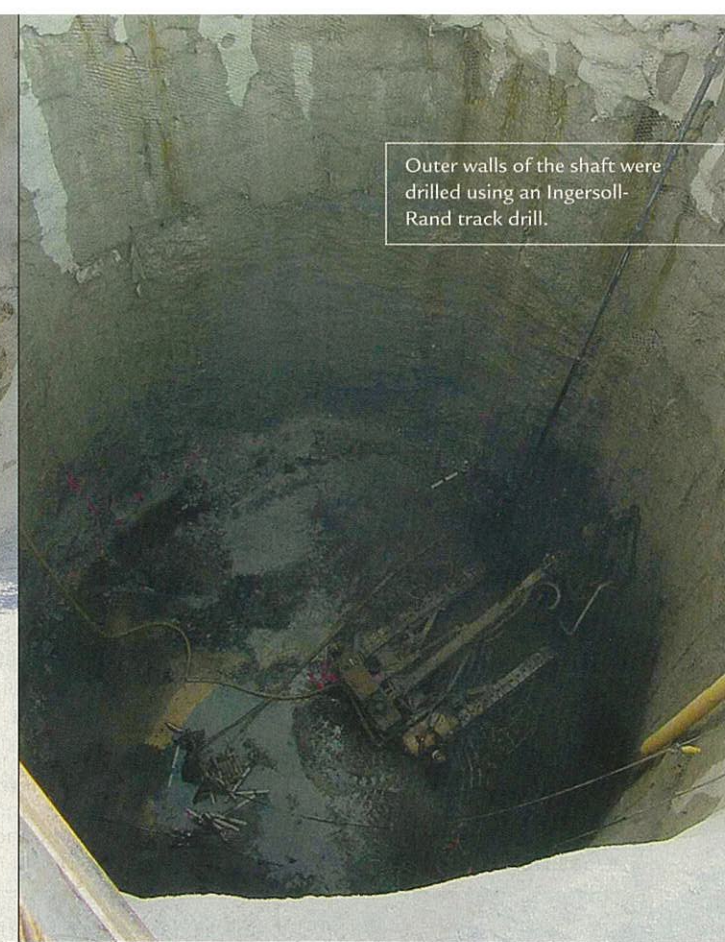
A team of engineers, geologists and general construction workers took on this substantial project. Their objective was to take a piece of lake front property and turn it into a raw water pump facility. This project is top priority in northwest Arkansas. The Beaver Water District's intake facilities expansion started in May 2003 and is due for completion in March 2005, coinciding with the completion of Beaver Water District's complete system upgrade. The intake facilities expansion is a \$13.4-million project consisting of two round shafts

approximately 95 feet deep, pump building and various other support structures.

Garney Companies, Inc. is the general contractor for the Beaver Water District, Intake Facilities Expansion. The specialty rock drilling and blasting was performed by Dykon Blasting Corp. of Tulsa, Okla. The project is designed and managed by MWH Americas, Inc., Lowell, Ark., in association with Bennett/Staheli Engineers, Sacramento, Calif., and McGoodwin, Williams & Yates, Inc., Fayetteville, Ark. Jim Holt, Garney's senior project manager, and Sandra Holt have temporarily relocated to Lowell, Ark., while this project is in progress. With Jim's ability to efficiently delegate



Underground Services Corp., Kansas City, Mo., shored the walls, installed rock bolts, chain link fence, and sprayed pumpable concrete on the walls as a temporary safety measure. At bottom, blast mats are being placed on top of a shot.



Outer walls of the shaft were drilled using an Ingersoll-Rand track drill.

work and his local labor, he has the project moving full steam ahead.

To access the new water treatment plant site, it was necessary to clear and remove trees for the construction of two roads off of the existing water treatment road. The site then required a substantial amount of earthwork to remove all dirt and material down to the bedrock. The objective was to clear an area large enough to work and keep the slopes from sliding into the shafts, while minimizing the amount of disturbed land. The shafts are to be the future raw water intakes.

Dykon Blasting Corp., Tulsa, Okla., drilled and blasted these shafts through solid limestone and shale. The 33-foot-diameter shafts were blasted alternating from one to the other, achieving 10-foot-deep cuts each time for a total depth of 87 feet in the rock. The outer walls of the shafts were drilled and pre-split 2 feet below each production blast. This method of controlled blasting protected the walls of the shaft from over break and produced picture-perfect, smooth walls in the limestone.

Garney's helpful crew utilized a crane for continuous movement of men, equipment and materials in and out of the shafts. In order to work in such a confined area a small airtrack drill, backhoe, skip bucket, man basket, and high-flow water pumps were raised and lowered as needed. The shafts were sunk alternating from one to the other to maximize production and minimize the potential for damage to the other shaft.

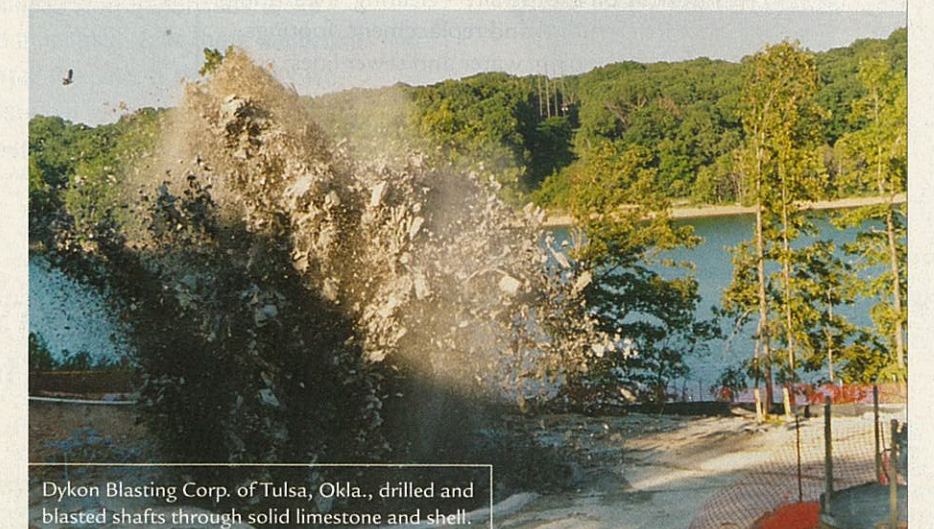
In order to excavate the blasted material, Garney, with the use of the crane,

lowered the mini excavator and then the skip bucket into the shaft. The mini excavator loaded the shot rock into one bucket while another was lifted out of the shaft. Due to the confined work area and small excavation equipment, Dykon Blasting had to pulverize the 30,000-psi rock formation in order to facilitate loading with the small equipment.

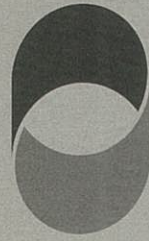
Following the excavation, Underground Services Corp., Kansas City, Mo., shored the walls, installed rock bolts, chain link fence, and sprayed pumpable concrete on the walls. Their work, although only a temporary fix, was a vital safety feature. Shoring the walls kept rocks from falling off the walls as men worked in the bottom,

sinking the shafts. Working in these extremely confined and wet conditions required two shifts, seven days a week to achieve the desired production rate.

The concrete-lined shafts are 30 feet in diameter, 95 feet deep and will contain eight 60-inch-diameter lake-tap micro-tunnels. The micro-tunnels will supply raw water to the shafts and range in length from 80 feet to 180 feet depending upon the depth. The different intake levels will result in selecting the best water quality at any given time.



Dykon Blasting Corp. of Tulsa, Okla., drilled and blasted shafts through solid limestone and shell.



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Top: A mini excavator, lowered into the shaft with the use of a crane, loads shot rock into a bucket.



Above: Square, stepped benches were prepared in the rocky lakeshore to give the micro-tunnels uninterrupted access to the lake water.

There is also one 60-inch-diameter, 60-foot-long micro-tunnel used to connect the two shafts.

The lake-tap micro-tunnels reach out into the lake at various elevations. Square, stepped benches were prepared in the rocky lakeshore to give the micro-tunnels uninterrupted access to the lake water. Dykon Blasting Corp.'s expertise with underwater blasting was crucial for preparation of the stepped benches. The hard limestone and varying geological layers of the lakeshore added degrees of difficulty to the underwater drilling and blasting. The drilling was performed from a barge floating just off the lakeshore. The holes had to be loaded through PVC pipes acting as casings for the holes. The step benches were precisely cut into the side of Beaver Lake and excavated with a clam bucket and long-reach excavator.

Garney Companies, Inc. along with Dykon Blasting Corp., and Underground Services have paved the way for the construction of the new water treatment plant. With the shafts completely excavated and the substructure under way, Beaver Water District will have a new raw water treatment plant in its near future. ■

Construction News

Coming in the August 16th issue

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