by Jeff Griffin, Senior Editor

Town's Fast-Growth Prompts Use Of Restrained Joint PVC For Water Line

Located 28 miles east of Memphis on Tennessee Highway 64, Oakland, TN, is one of the region's fastest growing towns. Yet, as urban-weary Memphians move east to live in quieter small-town surroundings, the sudden swell in population has caused significant strain on a transmission line running from the Oakland Water Treatment Plant to the western portion of Fayette County, TN.

By 2004, the 8-inch pipeline the town installed in 1980 was no longer sufficient to serve all of its residents. The last straw occurred that summer when an elevated water storage tank ran dry because of the increased demand on the county water supply from the many new utility customers.

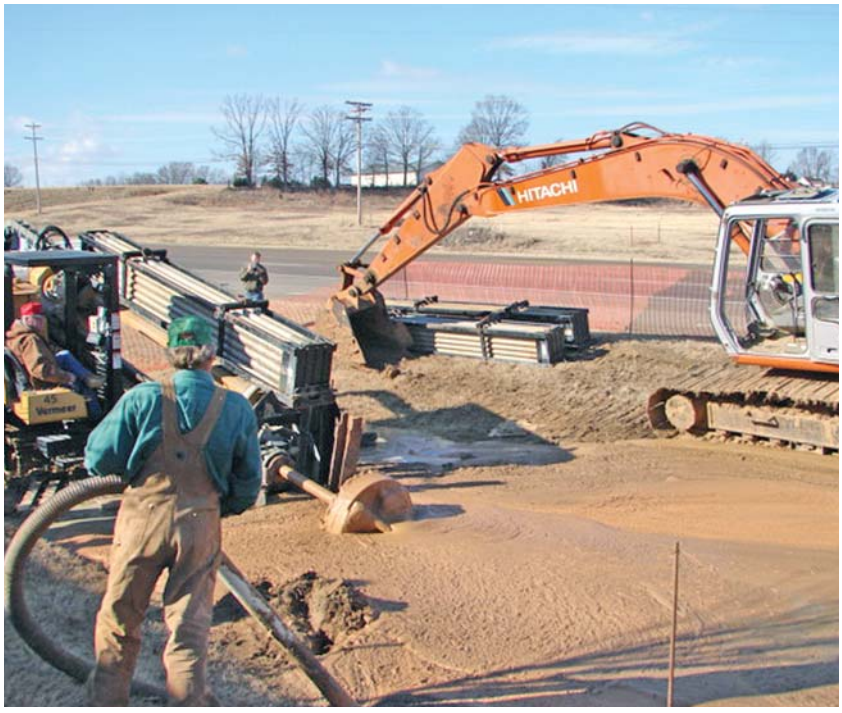
"That is not a good thing to have happen to your water system," says Ken King, president of King Engineering, Memphis, Oakland's engineering firm. "If your tank's drained and you have a fire, you're in trouble. With more people moving into the area, we knew we needed a larger transmission line."

King Engineering drew up plans for a new 14,500-foot transmission line with pipe that would be at least twice the diameter of the existing pipe. They narrowed down the pipe options to high-density polyethylene (HDPE) and restrained joint polyvinyl chloride (PVC), but decided to leave the choice between the two up to the contractor chosen for the project. Revell Construction, of Union City, TN, bid against four other contractors in August 2005 to win the job.

Pipe material strength and the bore size needed for each pipe type would be two of the prominent factors in the final pipe selection. Revell Construction chose CertainTeed 16-inch Certa-Lok C905/RJ PVC pipe for the project for various reasons. First, PVC pipe requires a wall thickness of 40 percent less than HDPE for an equivalent pressure rating; the resultant larger inside diameter significantly improves flow performance. To get the same hydraulic carrying capacity provided by a 16-inch PVC pipe, they would have needed 20-inch HDPE pipe. Working with a smaller diameter pipe, thereby using less pipe material, is more cost effective and eases installation.

Work begins

Work on the new transmission line began in late October 2005, with a crew of five. The majority of the pipe, nearly 13,000 feet, was installed using the open trench method without much trouble. The biggest challenge of the project, however, was figuring out the best way to run the pipeline underneath Highway 64 and a 15-foot deep creek on the other side of the road. To minimize traffic disturbance and debris, the Revell crew em-



Top: *Memphis Boring and Tunneling's and Revell Construction's drilling crew prepare to ream a bore for a new water transmission line in Oakland, TN.*
Bottom: *C905/RJ pipe installed for a 16-inch water transmission line.*

Revell Construction crew connects two lengths of CertainTeed C905/RJ pipe with CertainTeed's new fiber wound coupling. The coupling and pipe form a joint that achieves full strength immediately in all weather conditions.

ployed the directional drilling method to install 1,520 feet of the pipe.

"There wasn't much of a choice because the pipe needed to go underneath a state highway and a creek," King says. "So, open cut was out of the question. We would have torn the whole world up – gas lines, water lines, roads – if we would have gone open cut," adds Tim Revell, co-owner of Revell Construction. "Trying to dig through all of that would have been a nightmare."

The Revell crew made one 250-foot bore and a 100-foot bore using a Vermeer D33x44 directional drill with 33,000 pounds of pullback to run the pipe under the highway, drilling mostly through red clay. The long bore it would take to get under the creek, however, required extra help. Revell Construction subcontracted the longer bore out to Memphis Boring & Tunneling, of Olive Branch, MS, a contractor with more long boring experience and a larger Vermeer D80x100 directional drill with 80,000 pounds of pullback. The two contractors have worked together on several projects over the past 30 years.

"I don't believe my machine would have pulled the pipe in," Revell says. "I would have been struggling."

Trash

After having some difficulty with their locator system, the crew from Memphis Boring & Tunneling made a 720-foot bore underneath the creek, through hard, red sand, and then backreamed it three times because of all the debris encountered along the way. Apparently, the creek was formerly a favorite dump site used by area residents. The crew found such things as old tires, concrete, rebar and even an old car body in the creek bed, says Jimmy Dodson, vice president of Memphis Boring & Tunneling.

"People dumped a lot of trash there over the years before it was filled in, and the town just forgot all of that debris was there," he says. "We got through it, though. We put enough mud to it to suspend our hole open, and that worked pretty well. As for pulling the pipe, we had no problems."

Dodson was impressed with the integrity of the restrained joint PVC pipe, connected by fiberwound Certa-Lok couplings. The pipe held up very well during pullback, he says.

"It really pulled back a lot quicker than I thought it would," he said. "It's a good product. In the right application, you can't find anything to beat it."

Memphis Boring & Tunneling finished its portion of the project in 10 days. Revell Construction made all the remaining pipe installations and connections, completing the project in January 2006. Now operational, the new transmission line has allowed the town of Oakland to serve 950 customers more than it was able to with the 8-inch pipeline, King says.

"The new pipeline is going to allow them to continue to provide quality service to the growing western part of rural Fayette County, as they have since we installed the first transmission line out there in 1980," he says.

King Engineering was founded in 1955; Revell Construction went into business in 1970; and Memphis Boring & Tunneling was established in 1968.

FOR MORE INFORMATION

Restrained joint PVC:
Certainteed, (866) CT4-PIPE, www.certainteed.com

HDD rigs:
Vermeer, (888) 837-6337, www.vermeer.com