

CASE STUDY

GROWING TENNESSEE TOWN CHOOSES RESTRAINED JOINT PVC FOR NEW WATER TRANSMISSION LINE

When an elevated water storage tank ran dry due to the increased demand on the county's water supply, city officials realized something had to be done. A 24-year-old, eight-inch pipe simply was no longer sufficient to serve residents of this Memphis suburb.

CHALLENGE

Located 28 miles east of Memphis, Oakland, Tennessee is one of the region's fastest-growing towns where rapid population growth caused significant strain on a transmission line running from the Oakland Water Treatment Plant to the western portion of Fayette County. The City of Oakland required a new transmission line with pipe of a significantly larger diameter than the previous installation. Moreover, the new pipeline would need to run under a major highway and a 15-foot creek on the other side of the road.



APPLICATION

King Engineering drew up plans for a new, 14,500-foot transmission line with pipe at least twice the diameter of the previous larger-diameter pipe. They narrowed down the pipe options to high-density polyethylene (HDPE) pipe and restrained joint polyvinyl chloride (PVC), but decided to leave the choice between the two up to Revell Construction, the project contractor.

Revell Construction chose 16-inch Certa-Lok® C900/RJ PVC pipe by Westlake Pipe & Fittings. The project team recognized PVC pipe as stronger than HDPE with 40 percent less wall thickness for an equivalent pressure rating, thereby significantly improving flow performance. By working with a smaller diameter pipe, the project required less pipe material creating a more cost effective and practical installation.

SOLUTION

The majority of pipe, nearly 13,000 feet, was installed using the open trench method. However the biggest challenge of the project was determining 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 employed the directional drilling method for 1,520 feet of pipe.

"There wasn't much of a choice because the pipe needed to go underneath a state highway and a creek," says Ken King, president of King Engineering. "Open cut was out of the question."

The Revell crew created a 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. For the long bore, Revell Construction subcontracted to Memphis Boring & Tunneling and its larger Vermeer D80x100 directional drill with 80,000 pounds of pullback.

Memphis Boring & Tunneling made a 720-foot bore underneath the creek through hard, red sand and then backreamed it three times due to debris encountered along the way.

Application:
Water & Force Main
Sewer

Project Type:
Horizontal Directional
Drilling

Owner:
Oakland Water
Department

Product Used:
Certa-Lok® C900/RJ
PVC Pipe

Contractor:
Revell Construction

Driller:
Memphis Boring &
Tunneling

Engineer:
King Engineering

Jimmy Dodson, vice president of Memphis Boring & Tunneling, 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 pulled back a lot quicker than I thought it would. It's a good product and in the right application, you can't find anything to beat it."

Memphis Boring & Tunneling finished its portion of the project in ten days after which Revell Construction completed the remaining pipe installations and connections. Once operational, the new transmission line with its eight-inch pipeline created capacity for 950 more customers.

"The new pipeline allows Oakland to continue providing quality service to the growing western part of rural Fayette County, just as they have since we installed their first transmission line," King added.