Submerged—HDPE Water Line Saves Money, Time

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The use of high density polyethylene (HDPE) for a 29,000-foot lake crossing, saved the Henry County Water Company (HCWC) close to $500,000 and reduced construction time.

In early 1997, engineers with The Larkin Group, a consulting engineering firm headquartered in Kansas City, Mo., designed a new 2.4 mgd water treatment plant and the associated raw and finished water transmission mains for HCWC in Clinton, Mo. The new main crosses the South Grand River arm of Truman Reservior transmitting raw water to the plant.

Intake pumping rate for the new plant is 1,650 gpm, expandable to 2,500 gpm as demand for portable water increases. The plant, which is about 35 percent complete, will feature dual upflow reactor clarifiers and five filter cells with anthracite/sand dual media and simultaneous air/water backwash. The plant will have an extensive SCADA system to monitor and control operations and remote systems. It will be on line in early 1999.

Larkin engineers specified 29,000 feet of AWWA C-906 HDPE for the raw water transmission line. While most of the 5-mile line is 18-inch pipe, designers planned for future growth, specifying 24-inch pipe for the 1,100-foot submerged lake crossing. This transmission line is one of the longest and largest HDPE water lines in the Midwest, according to Bryan Fletcher, a regional sales manager for ISCO Industries

The contractor, The Garney Companies (Kansas City, Missouri) operated trenching equipment from a four-piece barge that supported the track-driven excavator digging the 48-inch deep trench on the lake bottom. Installation of the submerged line took just three days.

Typically, such an installation would require a separate casing pipe to submerge the pipe. Sections would need to be assembled on barges, lowered to the lake bottom, and placed in the trenches. With HDPE, the process was faster.

- Garney's crew fused the entire 1,100-foot pipeline from the lakeshore. They capped the ends, making the pipeline buoyant.
- Connecting concrete weights directly to the empty pipe every 12 feet, the crew floated the entire 1,100-foot pipe out across the lake. Even with the concrete weights, the pipe floated on the surface of the water. A stell cable stretched across the lake provided a guide for positioning.
- Once the pipe was in correct alignment with the trench below, the end caps were removed. Twenty thousand gallons of lake water flooded the pipe, adding enough weight to sink the pipe into the lake bottom trench. Backfill was not required since the concrete weights hold the pipe in position in the trench and natural sedimentation will fill in the trench over time.