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HDPE pipe is the only way for drinking water to cross the Chesapeake & Delaware Canal

NEWARK, Del. – A key component of Artesian Water Company's commitment to providing a reliable source of quality water to its customers was a system integration connecting two sides of the Chesapeake & Delaware Canal.

According to officials at Artesian, it was a complex process requiring detailed evaluation and assessment of materials and resources – and they chose high-density polyethylene (HDPE) pressure-application water pipe.

The Chesapeake & Delaware Canal is 14 miles long, 450 feet wide and 35 feet deep. It runs across Maryland and Delaware, joining the Delaware River with the Chesapeake Bay and the Port of Baltimore. Artesian has more than 70,000 metered customers, providing water service to about 231,000 residents, approximately 28 percent of Delaware's total population. Artesian's ability to successfully navigate the C&D Canal with 5,000 feet of 24-inch HDPE pipe enabled it to integrate previously separated portions of its supply system.

The 5,000 feet of HDPE pipe was installed with two 2,500-foot directional drills. The proactive project was implemented to maintain water supply reliability and connected Artesian's northern New Castle County system to their southern New Castle County system, adding redundancy to its potable water and fire protection service capacity. It also significantly improved the hydraulics of Artesian's overall system.

Working on a tight timeline, contractors finished the work between January and June, 2004. It is the largest such project completed by Artesian Water to date.

“Our standard water pipe material for crossing large bodies of water or for use in corrosive soils is HDPE,” said Adam Gould, project manager on the C&D Canal job. “This was the biggest project of its kind we've done, and because of its flexibility, HDPE was the only pipe we would have used to do it.”

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Contractors faced the added challenge of a 150-foot drop in elevation from the water main on land to a depth of 50 feet below the canal bottom. Larry Anderson of Spring & Associates said a 50-foot to 70-foot drop is normal.

Camille Rubeiz, P.E., director of engineering for the Plastics Pipe Institute, says polyethylene is the only commonly used pipe material that is truly flexible.

“Most of the polyethylene pipe manufacturers give a rule of thumb that their products can be curved to a radius approximately 25 times the diameter of the pipe,” Rubeiz said. “This can be a real advantage when installing water pipe in an application like a major waterway.

“It’s the combination of flexibility and leak-free joints that allows for unique and cost-effective types of installation methods that the rigid PVC and ductile iron pipes can’t use with bell-and-spigot connections,” Rubeiz added. “Installation methods like Horizontal Directional Drilling, Pipe Bursting, Sliplining, Plow and Plant, Submerged or Floating Pipe can save considerable time and money in most potable water applications.”

CDM, Inc. was responsible for charting the pipe’s course with design drawings and working with the owner of the canal, the US Army Corps of Engineers, on the proper permits. CDM’s engineers, Artesian project managers and the Army Corps worked together to finish the project ahead of deadline.

“The directional drilling with HDPE pipe is conducive to minimizing disturbances during the project,” said Bill Cesanek, AICP, vice-president for CDM.

About PPI

The Plastics Pipe Institute (PPI) is the major trade association representing all segments of the PE piping industry. Member companies share a common interest in broadening market opportunities that make effective use of plastic piping for water and gas distribution, sewer and wastewater, oil and gas production, industrial and mining uses, power and communications, duct and irrigation. More information is available at www.plasticpipe.org.

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