

# UNDER RIVER HDPE PIPE PULL WINS FOR FORT WAYNE

## Large Diameter HDD Project Provides Reliable Water Main for Utility



By: Plastics Pipe Institute, Inc. (PPI)

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**- JON HALL, P.E., PROJECT MANAGER, FORT WAYNE CITY UTILITIES**

The latest improvement to the Fort Wayne City Utilities’ water supply required the use of high-density polyethylene (HDPE) pipe horizontally directionally drilled (HDD) under the Maumee River. A total of approximately 4,500 feet of 16-inch, HDPE PE 4710 DR11 DIPS CC3 rated pipe was used to connect to the city’s water supply on the north and south sides of the river. Going underground and not affixing the pipe to the nearby bridge was required due to the winter temperatures, which would cause the water in the HDPE pipe to freeze. The *Maplecrest Road Feeder Main – Maumee River Crossing* project was designed and supervised by Fort Wayne City Utilities.

“There’s a bridge on Maplecrest Road that we basically laid the pipe parallel to, but installed it under the river,” explained Connor Swain, project engineer for Midwest Mole (Greenfield, IN) who installed the pipe. “Our depth under the river was about 10 feet but there was an island between the banks and there we were about 30 feet deep. This part of the project was 2,490 feet total. We took it from a hydrant in the Fort Wayne Biosolids Handling Facility on the north side of the river, under the river up on the south side of the river. We had surveyor stakes every

50 feet and created a drilling path profile.”

“This project provided another connection across the river to increase the reliability of our water system,” said Andrew Schipper, P.E., water program manager for Fort Wayne City Utilities. “Fort Wayne has three rivers running through downtown providing separation of the water distribution system for significant parts of the city. Adding a transmission main connection nearly four miles from the confluence of those rivers significantly increased the reliability for areas on both the north and south side

of the river on this side of town. Anytime you have a river crossing, the complexity of construction increases significantly due to unknowns under the river, the length of the crossing, and the need for significant bends in the main. The total cost for both phases of this project was \$650,000 and was completed in December 2019.”

Fort Wayne City Utilities is the largest municipally-owned utility in Indiana, with 1,430 miles of mains with 106,000 services and providing water to more than 300,000 residents in three counties.

“Fort Wayne’s capital program for the last five years now, has been using HDPE for all new and replacement water mains.” Schipper continued. The Maplecrest River crossing is the largest HDD installed transmission main under a river that we’ve ever done. I would only use HDPE pipe for that.”

Jon Hall, P.E., Fort Wayne’s project manager said, “At this river crossing it was nearly 600 feet from bank to bank. The bore



*Under the river segment was fused all in one long run*



*Took patience to work through cobble and hard consolidated clay under the river*

was also under the Maplecrest road trail which needed to be maintained for public access during construction and is part of Fort Wayne’s award-winning trail system. Another obstacle that was successfully located and drilled under was a 48-inch diameter reinforced concrete sanitary sewer main running parallel to the river. The length of the river crossing when including setbacks and items to cross to get back to grade made this a 1,000-foot bore. Midwest Mole was quite creative on this one. It was on the higher end of difficulty, probably a seven or an eight. We haven’t done a 16-inch HDD river crossing before.

It is a great relief to have such a successful project as this one completed.”

According to the Plastics Pipe Institute, Inc. (PPI), the major North American trade association representing the plastics pipe industry, PE 4710 is the highest performance classification of HDPE piping material for water applications. “PE 4710 HDPE pipe is tough, durable and

flexible, meeting AWWA C906 and ASTM F714 standards,” stated Camille George Rubeiz, P. E., F. ASCE, senior director of engineering for the Municipal and Industrial Division of PPI and co-chair of the HDPE Municipal Advisory Board (MAB). “The MAB is fortunate to have the Fort Wayne Water Utility as an active member of the Board.

“PE 4710 compounds offer an excellent level of performance for trenchless and open cut installations. This means PE 4710 HDPE pipe can be used with increased flow capacities plus increased resistance to surge pressure, fatigue and slow crack growth. The ANSI/AWWA C906-15 standard includes PE 4710 for sizes up to 65 inches and recognizes the increased durability and reliability of HDPE pressure pipe used in water systems.”

“We used a Vermeer D80x100 directional drill rig to basically get our pilot path,” Swain explained, “and hooked on a 16-inch reamer, pulling that all the way back to the drill, set up a 24-inch reamer, pulled that all the way back and put the 24-inch reamer on again. Then swab it, and once the crew finished that pass they went ahead and installed the product pipe, which was 16-inch in the 24-inch hole. We took off the reamer, threw it in the back of a truck, drove around and drilled back out. It was very hard consolidated clay under the river plus some cobble. We really had to work our way through it. It just took patience.”

The Midwest Mole three-man crew used a fluted reamer with a cutting rig which was able to bore a path through the clay and cobblestone. Drilling fluids included Max Bore bentonite, Swaco platinum packet and also from Baroid.

“We had foreman, drill operator and a laborer,” he continued, “reaming and running using 100 - 120 gallons of fluid a minute at a maximum pressure 125 psi or about 12,000 pounds of push pressure. We drilled out to the opposite end, then we put the reamer on the south side of the river and pulled it back to the drill on the north side of the river. The install under the river took about two weeks. We made good time.”

The 50-foot lengths of the HDPE pipe were manufactured by WL Plastics (Ft. Worth, Texas), provided by ISCO Industries (Louisville, KY) and were fused together using a McElroy TracStar® 500. “For under the river we were able to fuse it all up in one run which was really nice. Each joint took about 30 minutes to fuse,” Swain said.

“The normal operating pressure is 100 psi at the river crossing bottom elevation of 710 feet above sea level,” Schipper said. “We successfully pressurized the main to 165 psi to expand and stabilize the main before lowering to the test pressure of 155 psi for an hour. We were pleased to observe no leakage from the main on the first try.”

PPI is the major trade association representing the plastic pipe industry. More information can be found at [https://plasticpipe.org/municipal\\_pipe/advisory/](https://plasticpipe.org/municipal_pipe/advisory/)

**ABOUT THE MUNICIPAL ADVISORY BOARD:**

*The mission of the Municipal Advisory Board (MAB) is to improve the design, installation, and operation of municipal HDPE water piping systems through the creation of partnerships among utilities, researchers, designers, contractors, and the HDPE industry. MAB serves as an independent, non-commercial adviser to the Municipal & Industrial Division of the Plastics Pipe Institute, Inc.*




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