

West Side Diversion Tunnel Project



Location: Davenport, Iowa
 Owner: City of Davenport, Iowa
 Designer: Stanley Consultants
 Contractors: McCarthy Improvement Co. Inc./Bellamy Foley Construction Co., Jay Dee Contractors Inc., Langman Construction
 Manufacturers: Thompson Pipe Group, Press Seal Corp., NOV Ameron, Hydro Gate, Gerdau, Croell Redi-Mix
 Cost: \$51 million
 Size: 3.1 miles

To relieve stress on its sewer system, reduce overflows and prevent basement backups, the city of Davenport, Iowa, embarked on a project to increase the system's capacity via a 3.1-mile sanitary sewer. The West Side Diversion Tunnel extends from near the Mississippi River, through various Davenport neighborhoods, to underdeveloped areas in the northwest part of the city. It is designed to reduce overflows and relieve existing overloaded sewers.

A 60-in.-diameter, 1.4-mile gravity sewer portion of the tunnel, installed 40 to 140 ft deep via a tunnel boring machine, was particularly complex. The line also incorporates a hydraulic jump and two helicoidal drop shafts designed to reduce odors and minimize pipe corrosion. The hydraulic jump slows the wastewater flow before it is gently dropped into the riverfront interceptor. The helicoidal drop structures route wastewater in a circular manner around the inside of the manhole as it moves down the vertical drop. A set slope maintains the water's centrifugal force and then gently releases the wastewater at the bottom of the drop.

During construction, two major

floods impacted the area, requiring workers to plug the upstream end of newly installed pipe and pump out portions of the pipe that were flooded downstream. Additionally, a large seam of rejuvenating water was encountered during tunneling, requiring continuous dewatering. The team drilled additional soil borings, installed piezometers to measure the water level and redesigned the pipe profile to minimize the volume of water encountered, making it possible to continue tunneling with the same boring machine.

The project ultimately was completed on time and \$9 million under budget. As an added benefit, it opened up 5,800 acres of land for residential development, 3,200 acres for industrial development and 400 acres for commercial development.

"This is a milestone project for the city of Davenport. The tunnel is sustainable, requiring no electricity or mechanical maintenance to function. It improves the quality of life by reducing overflows and basement backups from the existing sewers," said Pat Mullin, project manager for Stanley Consultants. "And it encourages economic growth by opening up nearly 10,000 acres for future development." 