



SOUTHGATE STEMS SANITARY SEWER OVERFLOW: MI CITY IMPROVES WASTEWATER SYSTEM AND RECEIVES RECOGNITION FROM APWA

Michigan city improves wastewater system and receives recognition from APWA

Homes along Plum Avenue in Southgate, Mich., were built in the 1950s and the sanitary collection system had surpassed its service life of 50 years. During the past five years there has been an increase in the number of homes that experienced basement backups mainly due to infiltration of stormwater into the sanitary system.

To save residents from recurring backup of sewage into their basements, Hennessey Engineers (Southgate, Mich.) designed a relief sewer line using polypropylene pipe that sped construction and solved the problem quicker than expected. The end-result alleviated basement backups and surcharging of the sanitary sewer system and corrected structural damages. The pipe, due to its construction and the engineered resin used, will also extend the predicted useful life of this relief line.

“In January 2012, the city was awarded an S2 grant for a detailed analysis of the system,” explained R. Ryan Kern, P.E., project engineer for Hennessey. This included video examination of the line inspection of manholes, an analysis of the capacity, smoke testing and geotechnical analysis for relief sewer. “We found pipe with longitudinal, circumferential and multiple cracking, offset joint, holes in the pipe plus deformed and broken pipe,” said Kern. “We even found one section with a utility pole going through the pipe.”

Smoke testing revealed two areas where stormwater was entering the sanitary sewer, and the capacity analysis determined that the existing pipes did not meet the necessary capacity require handle flows during large wet-weather events.

Kern’s design called for using cured-in-place pipe linings and the installation of separate relief sewer pipeline along Plum Avenue that would allow excess flows during large wet



To prevent recurring backups of sewage into the basements of Southgate residents, engineers designed a relief sewer line using polypropylene pipe.

weather event be diverted through the relief sewer and be discharged into the Southgate-Wyandotte Drainage District Interceptor. The relief sewer would be constructed of 12- and 15-inch diameter SaniTite® pipe, a product of Advanced Drainage Systems Inc. (ADS). It was installed by CI Contracting Inc (Brighton, Mich.).

“When these subdivisions were built in the 1950s and 1960s, the homes and population were small,” stated Tori Durliat, director of marketing for ADS. But as time went on, bathrooms were added to homes and more people moved into the area. This created a strain on the system. “Plus the aging vitrified clay pipe was cracking, separating and allowing water to infiltrate into the system she said.

The city of Southgate has both separated and combined sewer systems, both of which flow into the Wayne County Interceptor system. The Southgate-Wyandotte District is a combined system and serves the eastern area of the city - the area most impacted by overflow - and where the pipe is undersized to serve the Plum Avenue neighborhood. The S2 study pointed out that the relief sewer would be needed to alleviate the overloading to the system.



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The project used some 900 linear feet of 12-inch and 1,700 linear feet of 15-inch diameter SaniT HP pipe. In diameters from 12 to 30 inches, SaniTite HP pipe utilizes an enhanced dual wall construction, providing increased pipe stiffness, which meets or exceeds the industry standard of pipe. The additional stiffness and beam strength enhances jobsite performance in stringent line and grade requirements. The pipe profile is completed with a smooth interior, which provides additional strength and

excellent flow characteristics. The pipe is made from an engineered grade of polypropylene, which is inert to the effects of hydrogen sulfide present in sanitary sewers. It meets ASTM F2736 and exceeds ASTM D3212 for water tightness with dual-gaskets and banded reinforced bell.

“It was a new product for us to use,” said Mark Gaworecki, Hennessy project manager. “We felt the Plum Avenue project would be a good test case. We’re always looking for pipe that can provide benefits such as the long length - 20 feet versus 8 foot RCP sections. Plus it was easy to handle and the availability of product were all pluses and made the job go quicker.”

The job was completed a month earlier than expected. Delivery from the ADS plant in Wooster, Ohio, provided a logistical advantage.

The pipe was installed using cut-and-cover at depths ranging from 12 to 22 feet. “The engineer needed a pipe that would structurally handle the load,” explained Durliat. “With the ability to handle maximum burial depths of more than 40 feet, SaniTite HP was the product of choice. It is fast becoming a favorite for use in sanitary plus stormwater applications.” Many cities today are also aggressively pursuing the replacement of their combined sewer overflow (CSO) pipelines to separate stormwater from the existing sanitary sewer system. This reduces capacity stress on the treatment plant and helps to meet local, state and federal environmental protection requirements. “We’ve had CSO projects use 60-inch diameter SaniTite HP pipe,” Durliat added.

“It was also the first time for us to use this pipe,” said Kevin Irrer of CI Contracting. “We had use the ADS N-12 pipe for many years on stormwater projects.” For this job, his crew especially liked the longer length of pipe and ease of laying it, particularly since the original task depth was 17 fe deep. “We had to be that far down to pick up the existing line and tie in,” he explained.

Irrer’s company, along with the city of Southgate and Hennessey Engineers, received the Americ

Public Works Association (APWA) Michigan Downriver Branch Project of the Year Award for 201

“We were very honored to be presented with this award,” said Hennessey’s Kern.

Not only was the award a symbol of the project’s success, validation also came from a real-life situation. Irrer explained, “In August 2014 Michigan had a large rain event. They said it was a 10 year storm.” The system did exactly what it was designed to do: take overflow stormwater so it wouldn’t flood basements.



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About the Company: Advanced Drainage Systems Inc. (NYSE: WMS) is a leading producer of hi performance thermoplastic corrugated pipe , providing a comprehensive suite of water manage products and superior drainage solutions for use in the construction and infrastructure marketpla Additional information can be found at www.ads-pipe.com.
