Emergency Sanitary Sewer Line Repair Done Down Deep

Crumbling pipe undermined upstate New York Island.

By Advanced Drainage Systems (ADS)

The Crew at Grand Island Prep for an Emergency Repair Using 30-inch Diameter SaniTite HP Pipe to Replace 35-year-old, 30-inch Diameter Asbestos Cement Pipe (ACP) That Failed Due to “Swamp Gas”.

THE FINAL STRAW for a long section of the sanitary sewer line here was a sinkhole “large enough for a dump truck” and sewage that flooded local residences and businesses during August 2013. Running under Whitehaven Road, the main east/west multi-lane street, the 35-year-old, 30-inch diameter asbestos cement pipe (ACP) failed due to “swamp gas” – hydrogen sulfide gas, a naturally occurring result of decomposing sewage present in all gravity flow sanitary sewers. Six hundred and fifty feet of 30-inch diameter SaniTite® HP triple-wall polypropylene pipe replaced the failed ACP at depths of 22 to 24 feet.

Due to the extreme nature of the pipe failure and because the Town of Grand Island is surrounded by the Niagara River, it was imperative that the destroyed pipe between Grand Island Blvd. and Stony Point Road be replaced to prevent further damage to homes and buildings, and to stop any effluent from flowing into the Niagara River, eventually over Niagara Falls, causing a potential environmental disaster. The USD 500,000 emergency repair took a month to complete.

Since the 1700’s the Town of Grand Island has been a resort, a lumber town, a colonial battleground, part of the City of Buffalo and part of nearby Town of Tonawanda. Today, it is the home for more than 20,000 residents and hundreds of businesses, ranging from small stores to major corporations with 500 people and more. The island town is eight miles from Niagara Falls.

“We had an asbestos cement pipe that over the years was being eaten away by hydrogen sulfide gas,” explained John Whitney, P.E., Grand Island engineer. “This pipe originates upstream and the end of it is a tributary to a very long force main. Sewage goes septic in that force main. When it gets discharged into the gravity sewer, which is the 30 inch ACP, hydrogen sulfide gas mixes with air and you end up with various permeations of sulfuric acid. That is very destructive to cement and the pipe got so thin it just collapsed. It had already caused a sinkhole the size of a dump truck and 27 feet deep.”

Among other plastics, polypropylene is inert to the effects of hydrogen sulfide present in sanitary sewers, making it a highly recommended material of choice to replace deteriorating infrastructure across the country. SaniTite® HP has been used in similar emergency repairs to replace failed infrastructure in Kentucky, Mississippi, Ohio, and Pennsylvania.

“In other sections also, there was a tremendous amount of dirt that had infiltrated into the pipe from cracks,” he said. “We ran a camera in there and looked upstream from one of the downstream manholes and saw that the dirt went right to the ceiling of the pipe. And because the pipe was in such a deteriorated condition, we would not have been able to
We replaced it in the same trench with the SaniTite HP pipe. SaniTite HP pipe is a product of Advanced Drainage Systems, Inc. (ADS) (NYSE: WMS) (Hilliard, Ohio). Manufactured in 30 to 60 inch (750-1500mm) diameters, it is available in triple-wall construction, as was used for this project, that provides a smooth interior and exterior wall design supported by a corrugated structural core for improved stiffness and greater beam strength to minimize deflection and enhance long-term performance. It meets ASTM F2736, ASTM F2764 and also exceeds the requirements of ASTM D3322 for water tightness with dual-gaskets and banded reinforced bell. Rugged and lightweight, the pipe is easily handled with minimal equipment and crew. Its stick length reduces the number of joints, which also saves time and labor and makes for a more secure system versus the severe-ton weight of each short section of comparable concrete pipe.

According to Bill Kelley of Lock City Supply (Lockport, NY), who provided the materials for the job, “This was a very deep cut near a very busy highway, and the repair had to be done quickly and safely. Not only is the pipe we used a good quality product, but it was also easy to install, and we could get it delivered to the job site from a nearby plant. If ever there was a case to prove the benefits of this pipe, this was it. It truly is the next generation of the pipe.”

Aside from the depth, the project also had other challenges including a one-and-a-half inch rainstorm, a ductile iron pipeline that had to be cut and reinstalled, plus high-voltage electric lines overhead.

“The break was right in front of a water pumping station with a three million gallon water tank,” Whitney explained, “and there was a 16-inch ductile iron water transmission main which we had to cross. The only way to do this was to physically isolate it, cut the line, run the new sanitary line and then reinstall the iron pipe.

“We were also adjacent to the National Grid power transmission lines coming out of Niagara Falls that carry 230,000 volts. This meant that we had to have a high-voltage certified electrician with us and have the equipment grounded all the time.” During the repair, the crew used eight inch and 12-inch pumps to bypass the area. A doghouse manhole was used to tie in the new SaniTite HP pipe with the existing ACP.

“The new pipe worked out great. The procurement was very rapid, the cost was favorable and it went together very well,” said Whitney.

Advanced Drainage Systems (ADS) is the leading manufacturer of high-performance thermoplastic corrugated pipe, providing a comprehensive suite of water management products and superior drainage solutions for use in the construction and infrastructure marketplace. Its innovative products are used across a broad range of end markets and applications, including non-residential, residential, agriculture and infrastructure applications. The company has established a leading position in many of these end markets by leveraging its national sales and distribution platform, its overall product breadth and scale and its manufacturing excellence. Founded in 1966, the company operates a global network of approximately 57 manufacturing plants and over 33 distribution centers.