



Greenville Explodes Pathway For Sanitary Sewer Expansion

In-House Design-Build Project Succeeds Down Deep, Under Budget

The recent expansion and rehabilitation of the city of Greenville, SC, sanitary sewer system was the first time the utility department undertook the total design and construction of such a project. By doing so, the overall costs were reduced by more than 50 percent, and the project was completed on time and with zero time-loss injuries.

It was, however, not a typical installation because crews had to blast granite bedrock as deep as 22 feet in the center of the heavily populated downtown business area. Recently completed, the West End Wastewater Project was undertaken to improve sanitary sewer capacity, and support future growth and development.

"We're extremely proud of this project from many standpoints," stated Matthew "Oni" Maxey, P.E., assistant city engineer of wastewater operations for Greenville. "First and foremost, we're proud of the injury-free track record, then the budget

savings to the city and also because the local businesses did not lose one day of activity."

Project scope

The scope of the project included installing larger lines on University Street and Furman College Way, and rerouting existing lines behind the West End Market from private property into city right-of-way to improve access for maintenance. To construct the new lines, 15-inch diameter SaniTite HP pipe was selected, which is able to keep out groundwater and stormwater, thereby reducing waste treatment costs.

The city has some of the oldest gravity flow sewer mains in the country – about 120 years old – and is mostly vitrified clay pipe. "We have a very old utility system here," Maxey explained. "And it's a separate system, not a combined dual system that a lot of the large cities up north have.

"The West End was basically a re-

placement project, but not in exactly the same location or trench line. We took advantage of the fact that the city needed additional capacity and the system needed rehab. We also saw the value in engineering our own system. For example, we were able to cut some of the length off the distance it takes to transport the sewer from other trunk lines and connect to the regional utility. In total, we put a half mile of pipe into virgin soil and new trenches."

The biggest problem the utility faced was the granite bedrock, which had to be blasted and excavated. This had to be done in an area downtown that could not be closed and was surrounded by active businesses, schools and a major park. Maxey and his staff brought in Controlled Blasting Inc., Winder, GA. The firm did a pre-blasting evaluation to make sure all building foundations were secure and also examined them after blasting was complete. At one of the deepest points, 22 feet, the crew

found that the main fiber optic feed to the county EMS center was crossing the blasting pathway.

"It took three weeks to get through that particular point because Controlled Blasting could set up only small charges," explained Maxey. "Then we'd come in with a large trackhoe and scratch away at that rock, dig it out and they'd set another small charge. And every time they would blast, we would have to put all that soil back into the trench to be safe."

While blasting was being done, city crews worked concurrently at both the end of Furman College Way and in a section of the parking lot behind the West End Market to begin setting manholes and installing the new lines.

Pipe

Approximately 2,640 linear feet of the SaniTite HP pipe from Advanced Drainage Systems Inc. was used.

"We selected the ADS pipe be-

cause it could handle the capacity based on the velocity of the system. From a construction standpoint, the first thing we liked about the pipe was that it comes in longer stick lengths. These 20-foot long sticks mean the line has fewer joints, is easier to install and there's the favorable weight of the pipe," Maxey said.

The 15-inch diameter SaniTite HP pipe has a smooth interior and corrugated exterior. The pipe's stiffness and beam strength minimizes deflection and enhances long-term performance. It meets ASTM F2736, ASTM F2764 and exceeds ASTM D3212 for water tightness with dual-gaskets and banded reinforced bell.

"We managed to complete the project within 12 weeks from start to finish at a cost of just under \$750,000," he explained. "By our calculations, with present market conditions it came to about 50 cents on the dollar – that's what we would have paid an outside contractor to

do the project, about \$1.5 million. We kept everything open around us. We stored all the materials off site, and kept the retail stores open, the governor's school open, the EMS, the park – everything was open the whole time we were there. It was a very intense project. We brought in multiple crews working at various points on the project simultaneously."

Maxey is also very proud that there were no inquiries on the project. "We had a lot of people moving around, plus heavy equipment and blasting. Sometimes we had up to 30 people at any one time there," he reported. "And we had other staff doing ancillary functions such as traffic control, testing, doing video inspection of the line and cleaning the lines. With police and the fire departments assisting, there were probably 60 people involved."

FOR MORE INFORMATION:
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