

# Long-Life HOBAS for High Point Sanitary Sewer



IN 1859, WHEN HIGH POINT was named after the “highest point” on the North Carolina Railroad between Goldsboro and Charlotte, city founders knew that its central location would attract industry and commerce. Today, High Point draws visitors from 50 states and more than 100 countries for the biannual International Home Furnishings Market, the largest event of its kind in the world.

In 1989 the City of High Point determined it had to replace a major sanitary sewer. The existing sewer was concrete, so they decided to replace it with a pipe that would provide a longer service life. Two of the major factors affecting projected service life are an inherently corrosion resistant pipe and a leak free system. Both of these requirements were included in the specifications.

Thalle Construction Co., Inc. of Hillsborough, N.C., was named as the contractor and Davis-Martin-Powell & Associates, Inc. of High Point was the consulting engineer for the project named Deep River Outfall Segment 2.

## Long Term Solution

Ben Palmer of Davis-Martin-Powell & Associates, Inc., said, “Basically, the line that was replaced was 40 years old, constructed of concrete pipe. It had reached its life, undersized, deteriorating. It had several point failures in the line just from the degradation of the concrete. That was really the driving force behind replacing the whole line. And they were looking for a replacement material that was going to be resistant to the hydrogen sulfide gasses that were present in the line. And, that led them to the HOBAS pipe.”

Ed Powell, president of Davis-Martin-Powell & Associates, echoed Palmer’s comments, saying, “We wanted a pipe that would be inert to the hydrogen sulfide and HOBAS fit the bill.”

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*The crushed granite used for backfill was placed up to 70 percent of the O.D. on the shallower depths. For the deeper covers of more than 15 feet, they placed the same material 12 inches over the top of the HOBAS pipe.*

*An excavator is used to lower a section of HOBAS pipe in the trench during the construction of Deep River Outfall Segment 2 in High Point, N.C.*

Palmer continued, "The city had installed a short segment of 66-inch HOBAS pipe into a new wastewater pumping station that they had built in the early 90's, which actually was the starting point for this major outfall replacement. They had also used some 36-inch HOBAS for a section of the force main coming out of the station. That was really their first experience with HOBAS, they liked what they saw and that was what led to the selection of HOBAS for the remainder of the outfall line."

#### Deep Direct Bury

Commenting on the depth of the project, Palmer said, "There were a number of discussions between the city and HOBAS regarding the depth it was going to have to be installed at and HOBAS assured us that with proper installation, it could withstand those burial depths. During and after the installation, there was no noticeable deflection of the pipe. So, we felt pretty comfortable based on the information that HOBAS had provided. "The segment 2 project is completed and performing as promised. The main trunk line for segment 3 is nearing completion."

Since HOBAS centrifugally cast, fiberglass reinforced polymer mortar pipe was the only product that inherently fits the city's requirements without any add on coatings or linings, it was the only pipe named in the specs. Powell explained, "HOBAS CCFRPM pipe can be fabricated into a variety of fittings such as elbows, wyes and tee-base manhole risers, so the city could have the required qualities throughout. The FWC couplings on the main line could also connect to the fittings maintaining the leak free quality."

The City of High Point began specifying HOBAS pipe for a variety of applications in the early 1990's, and has used more than 10 miles of this pipe in a variety of applications for corrosive environments including sanitary sewers and foul air. Of the many jobs, Deep River Outfall Segment 2 and Segment 3 are the most recent. Powell said, "When the entire Deep River outfall replacement is complete,



including all of the jobs since we started using HOBAS, more than 40 miles of HOBAS pipe will have been used."

Thalle Construction installed 13,700 feet of HOBAS 54- to 66-inch sewer pipe at depths of 35 to 60 feet. The deep sewer construction included more than 200,000 cubic yards of pre-cut benching and restoration, 74,000 cubic yards of rock excavation, 1,427 feet of 96 and 90-inch diameter tunnels and the removal of 4,500 feet of the existing aerial sewer crossings.

Much of the line was installed through granite in a rock quarry and required blasting. Ed Kuehnel, project manager for Thalle, was involved in every aspect. He said, "It was definitely a tough job, up to 60 feet in the ground with an average depth of about 40 feet. We had one 800-foot run that was 60 feet deep from end to end.

"There was a tremendous amount of earthwork involved just to get to the point where you could install the pipe. We had to excavate and build ourselves a bench at 20 feet. We had to get the earth down to a 20-foot cut. The biggest challenges were the depth and the rock. We had to drill and blast to get the mass rock and trench rock out.

Bedding was six to 12 inches deep, depending on the depth of the excavation, using crushed granite. After the

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installation crew put the bedding down, they laid the pipe on the bedding and adjusted the final line and grade. The same material was used for backfill. On the shallower depths, it was placed up to 70 percent of the O.D. For the deeper covers of more than 15 feet, they placed the same material 12 inches over the top of the pipe. The pipe embedment material was available from the rock quarry that the pipeline traverses.

Usually when pipeline construction goes this deep, the engineers strongly consider tunneling. In High Point, the mixed face conditions and hilly terrain were negative factors for tunneling. The wide-open area of the project allowed for the deep direct bury with the benched construction and only a minimum of tunneling. Powell said, "The HOBAS was ideal. It was easy to handle for direct bury and worked just as well in the tunnels."

The extreme depth extending to about 60-feet in much of the line eliminated the need for several lift stations that would have been needed in a shallower installation. Choosing a deeper installation and a pipe system with an extended, maintenance free life, the City of High Point demonstrated that it recognizes the long-term benefits of investing in infrastructure.

### Performance Confidence

"The job turned out really well. We were very pleased with the pipe. It was the first time that I personally had worked with that pipe. It's easy to install. It's lighter so your rigging and equipment can be lighter."

Because of the depth, the engineers specified a pipe stiffness of 72 psi for all of the installation and had full confidence in the structural characteristics of the HOBAS pipe, so there was no question about its strength.

Greg Hall, High Point project engineer, commented on the city's acceptance of the new line. He said, "We air test each joint independently. On pipes of 30-inch and larger, a test pressure of 3.5 psi would apply. We've had less than six joints fail and every one of those would be classified as an installation problem. Minimal effort was required to correct all six prior to job completion.

This project was one of many phases that High Point is undertaking to replace the interceptor system on the east side of town. As it neared completion, the city continued its reliance on HOBAS, starting a new job using 54-inch pipe. "Overall, counting this job and two previous jobs, we've put in 10 miles of HOBAS pipe. We have not used any RCP in a long time but we do know from surrounding communities that they have had considerable problems with it.

"We've been more than pleased with the performance of the HOBAS pipe and the installation has gone smoothly. "The precautions in handling the pipe are no greater than with any other material."

### Superior Technical Service

The sections that were replaced had some significant infiltration problems. Hall said, "It's hard for us to put a figure on infiltration because that segment is only phase four out of six, so it's hard to get a number till the whole project is built. I can't give any numbers but I know that infiltration has definitely decreased."

Hall also addressed future plans, "HOBAS will continue to be allowed for use on any project we have. The company is great to work with. In fact that is something we were talking about last week in the public services department. Their technical support and their technical people are Johnny-on-the-spot. If we've got any questions – they're right on top of it."

#### Year of construction

2004

#### Total length of pipe

13,700 feet

#### Diameter

54- to 66-inch

#### Stiffness class

72 psi

#### Installation method

Direct Bury

#### Application

Sanitary sewer

#### Client

City of High Point

#### Installer

Thalle Construction

#### Advantages

High stiffness, long term solution