

## Macon GA., Turns To Trenchless

# Macon, Ga., Turns to Trenchless

by James W. Rush

The Macon Water Authority has roots dating back to the 1880s when it was tasked with providing water and fire hydrants for the fledgling central Georgia city. Today, Macon Water provides water and sewer services for the city of 113,000.

Recently, the Authority was faced with installing a new sewer line to a treatment plant. Portions of the Swift Creek Interceptor Sewer Replacement project alignment intersected two state highways, an interstate highway and railroad tracks.

Making the project even more difficult was the fact that the installations were to be completed well below the groundwater table. Conditions were so bad, in fact, that test holes could only be dug 5 ft deep before pumps and shoring were needed.

In addition, the gravity sewer line needed to be installed with tight line and grade accuracy, and settlement to the roadway would not be tolerated.

To accomplish the task, Atlanta Boring & Tunneling Inc. devised a dewatering plan in conjunction with a Bores Head from National Tunnel Equipment, Indianapolis, to make the tricky project a reality.

Atlanta Boring & Tunneling Inc. is a family-owned business that was founded in Atlanta by Paul W. Graham in 1967. The company has roots in the boring industry, as Graham and Leo Barbera, formerly the president of American Augers and now with Horizontal Equipment Mfg. Inc., worked together in 1968 to design rock heads and other boring equipment. The company has grown to 37 employees and has five crews.

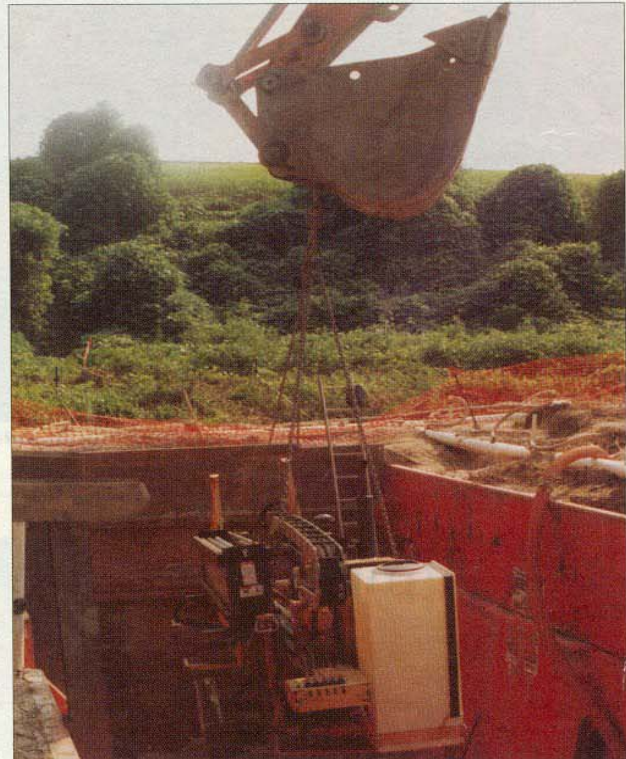
So, it came as no surprise that Atlanta Boring had the answer when subcontracted by general contractor Gary's Grading & Pipeline Inc., Lawrenceville, Ga., to perform the crossings. The first thing Atlanta Boring did was devise a plan to address the groundwater issue. Atlanta Boring contacted Ben Mann from Thompson

Pump's Ravenel, S.C., to discuss the design of a well-point system, and developed a plan to install 2- to 3-in. slotted horizontal drain pipes along the alignment via directional drilling.

The well-point system was used for all jacking and receiving pits. Conditions were so bad that a 12-in. pump was utilized. In all, crews installed about 60 well points per pit. Two horizontal drain pipes were installed underneath the alignment to keep excess water and material from flowing through the face of the tunneling machine.

The Bores Head was used to install 54-in. steel casing, supplied by Valiant Steel, Norcross, Ga. It was selected because of its ability to maintain the tight line and grade tolerances. "Accuracy was critical," said Chris Graham, vice president of Atlanta Boring & Tunneling Inc. "We couldn't get that kind of accuracy with a typical auger boring machine."

The Bores Head is equipped with four hydraulic rams at the cutterhead that are controlled by an operator near the face. The operator can adjust line and grade based on a self-leveling laser that serves as a target. Steering auger boring units is more difficult because the augers must be removed to get to the face, according to Len Liotti of National Tunnel Equipment. In addition,



Directional drilling was used to install horizontal drain pipes along the alignment of the bores. Here, a Vermeer rig is lowered into the pit.

tion, typical auger boring units cannot effectively be steered horizontally.

Material is excavated by the cutterhead, which is driven by a 160-hp electric motor. Spoil is then removed via a 16-in. cased auger along the invert. The casing is then jacked in behind the lead section. The risk of over-excavation at the face is reduced because the operator can monitor the amount of material being excavated, Liotti said.

The project consisted of four separate drives, ranging from 140 to 360 ft. Ground conditions included running sand and clay below the groundwater table. Crews used 20- or 40-ft lengths of casing, depending on the length of the drive.



Atlanta Boring & Tunneling crews prepare to launch a drive of 54-in. casing for Macon (Ga.) Water Authority.

“The longer lengths of casing cuts down welding and setup time, but on the shorter runs it was more economical to use shorter lengths and because we didn’t have to construct 65-ft pits,” Graham said.

Lengths of the drives were: 180 ft under a state highway; 360 ft under I-16; 300 ft under an entrance ramp to I-16 and a state highway; and 140 ft under a railroad track. On the longest bore, crews achieved a best day of 60 ft and were getting at least 40 ft per day. This section was completed in 12 calendar days.

Monitoring of the roadways and railroad track showed no settlement resulting from the bores. Following installation of the casing, 42-in. DIP was inserted to serve as the carrier pipe.

In all, it took five months to complete the project. The result was that Macon Water Authority got a sewer line installed, with no disruption, that could serve the community for the next 100 years.

**James W. Rush** is editor of *Trenchless Technology*.