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Unprecedented
Pipeline Growth

Microtunneling
In Savannah

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On the cover:

Pipe is lowered into a specially designed trench as part of the \$140 million Eagle Mountain Connection Pipeline Project in Texas. Boyer Inc., of Houston, was contracted to carry out the subaqueous pipeline and outlet structure part of the job. (Photo by John Boykin, Boykin Photography of Garland, TX)



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Microtunneling

Trenchless Method Protects, Preserves City's Historic Areas



The city of Savannah, located on Georgia's Emerald Coast between South Carolina and Florida, is one of the world's most beautiful cities, a place where visitors step back in time to the relaxed pace of the Old South.

Founded in 1733, the downtown historic district has preserved elegant architecture from another time. Cobblestone streets, century-old live oaks, picturesque squares and magnificent homes along with fine dining, entertainment and shopping make Savannah a comfortable and interesting place to live and a popular tourist attraction.

As in other historic cities, much of Savannah's underground utility infrastructure is old, and rehabilitating and replacing outdated water and sanitary and storm sewer pipelines while minimizing surface damage is critical. Protecting historic buildings near buried infrastructure is a challenge.

To help meet that challenge, the city recently employed the trenchless method of microtunneling on a portion of a stormwater improvements program to alleviate flooding in a residential section of downtown where historic buildings are being repaired and renovated, many of them with tenants. The Alice/Tattnall Stormwater Relief System Project 2 contained approximately 2,700 linear feet of 54-inch diameter reinforced concrete pipe (RCP), all installed via microtunneling.

"We investigated microtunneling in the early stages of planning to reduce disruption of traffic during construction and to re-

move the risk to adjacent historic structures posed by sheet pile installation required for the deep cuts," said Mark Anderegg, senior project manager for the Savannah Stormwater Management Department.

Project owner was the city of Savannah and the consulting engineering firm was Hussey, Gay, Bell & DeYoung, Savannah. BRH Garver Construction LP, Houston, was the primary contractor and its personnel completed the microtunneling.

Complex

Microtunneling is often regarded as the most complex trenchless method of new construction. Remote-controlled equipment excavates small-diameter tunnels without the need to send personnel into the excavation. The cutting head is laser guided, providing highly-accurate control of line and grade. As the cutting head proceeds, jacking equipment pushes new pipe into place. Spoil is removed either by an auger system or by slurry. Most machines use the slurry system for diameters 24 inches and larger.

David Ellett, BRH Garver project manager, said four microtunnel drives of 760, 636, 520 and 740 feet were carried out.

"There was no planned open-cut on our project, other than to tie existing inlets into new manholes," said Ellett. "All the pipe was installed under pavement. Tunneling conditions were in predominately fine sand with some instances of silt and clay.

The drives were continuous; approximately 1,300 linear feet on Turner Boulevard and 1,300 linear feet on Montgomery Street. Each of the two reaches was broken down into two drives."

Two jacking shafts and three receiving shafts were used on the project with the deepest 25 feet at the floor, the shallowest 17 feet. Ellett said the area's high water table made shaft installation difficult. Because Savannah is very old, there are many buried utilities, both live and abandoned.

"It was not uncommon to uncover three or four unknown steel lines in each pit," he added. "Each street had a jacking pit located at the proposed manhole location closest to the midpoint of the segment. We tunneled both directions from each jacking shaft. Due to the manhole spacing requirements of the city, we also installed shafts at intermediate points in the tunnel to install manholes."

The microtunneling machine used was a Soltau RVS 600. The Rinker RCP pipe installed had an outside diameter of 68.5 inches. Slurry separation was accomplished using Brandt shakers, hydro-cyclone and centrifuge. Working hours, said Ellett, generally were 12-hour shifts with a small night crew running the slurry plant 24 hours a day. Work was completed over an 11-month period.

The city's Anderegg said Savannah's first microtunneling project went smoothly, and the city is satisfied with the result.

Microtunneling

“We will consider using the method again when it is appropriate for project conditions,” he added.

In business more than 30 years, BRH Garver has established a reputation for completing difficult and one-of-a-kind civil construction projects throughout Texas and the southern half of the United States.

“BRH Garver performed the first microtunnel job in North America in 1984,” said Ellett. “That makes us the oldest MT contractor in the United States.”

Project capabilities encompass all aspects of civil contracting. In addition to microtunneling, utility projects include all types underground water and sewer line construction, sewer repair and sliplining, tunneling and boring, welded steel pipelines, drainage and site work, concrete culverts and foundations, sewage and water treatment plants and pumping stations.

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