

A VISIT TO THE BIRTHPLACE OF US MICROTUNNELLING

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In 1986, microtunnelling was officially introduced as a trenchless technique to the US market for the installation of sewer lines in the River Oaks Microtunnelling Project in Houston, Texas. During construction, BRH-Garver Construction President and Founder Mike Garver pioneered the use of the method, overcoming the challenging new geology faced by the first MTBMs in the US.

In January 2018, Great Southern Press Publisher Annie Ferguson and Event Manager Rebecca Burns, along with Louisiana Tech University (LA Tech) Trenchless Technology Center (TTC) Associate Director of International Operations Dr Tom Iseley and his colleague Saleh Behbahani had a lunch meeting with Mr Garver and BRH-Garver Construction Vice President David Ellett in Houston, Texas, where they revisited and discussed the historic River Oaks Microtunnelling Project completed just over 30 years ago.

INTRODUCTION TO THE US

Microtunnelling has been used in Japan and Europe since the 1970s; however, until BRH Garver bought the first microtunnel boring machine (MTBM) for the River Oaks project in Houston, it had not been used in the US. It was in 1986 that the first microtunnelling project for non-person entry diameter size in the US was initiated on the project in Houston.

The River Oaks project involved the installation of approximately 6.1 km of 10 inch (254 mm), 18 inch (457 mm) and 21 inch (533 mm) diameter sanitary sewer lines in a very affluent residential neighbourhood. It was very interesting to learn from Mr Garver what it was like to evaluate, bid and construct a project of this magnitude with a technology that did not exist in the US at the time.

BRH-Garver was awarded the US\$9.7 million contract for the River Oaks microtunnelling project; however, it did not start out as a microtunnelling project. The original design was to replace the existing sanitary sewer system utilising traditional open cut methods.



A: Annie Ferguson, David Ellett, Mike Garver, Tom Iseley and Rebecca Burns visit the River Oaks microtunnelling site.
B: The birthplace of microtunnelling in the US: River Oaks, Houston, 1987.

LIMITING DISRUPTION

An open cut approach was unacceptable to the residents of River Oaks. They insisted on methods that minimised the disruption and destruction to society and the environment.

It did not matter to these residents that this project was being mandated by a federal consent decree – they simply did not want their sidewalks, roads and trees destroyed to install sewer lines.

The project's original design was based on conventional person-entry size utility tunnelling and placing the small diameter sewers inside the tunnel and grouting the annular space; it also permitted the use of microtunnelling.

BRH-Garver was experienced with the type of tunnelling that was specified but decided to investigate the microtunnelling process. It made a strategic decision to base its bid on microtunnelling using the experience of Japanese and German microtunnelling equipment manufacturers.

TACKLING THE CHALLENGE

Mr Garver emphasises that this project was very challenging, adding that his company had to work closely with MTBM

manufacturers Iseki and Soltau, as many adaptations were needed to modify the equipment for Houston's ground conditions. Even though the machine had worked well in Japan, on the first day of the job, the MTBM ran off into the dirt and stalled.

Mr Garver and his team had to dig a new shaft from the surface to reach the machine. When excavation hit metal, crews loosened the machine and pointed it once more; again, it jammed. The MTBM machine vendor offered to return Mr Garver's money and take the machine back, but he was in no position to accept the offer as returning the machine would have caused a US\$10,000 per day late penalty clause.

With a suspicion that the water saturated silts, sands and clays of Houston's geology must have been imposing different forces on the operating cycle of the machine compared to the rocky, heterogeneous sands of Japan, Mr Garver opened the slurry passageways through the cutter face.

He eventually got the machine operational again and the ground-breaking project was subsequently completed, despite the MTBM failing five times during the alignment.

BUILDING A LEGACY

Mr Garver's reputation as an innovator and pioneer is now acknowledged within the industry. He now supports and encourages others professionals to move into the cutting edges of Trenchless Technology.

He is one of the original founders of the Gulf Coast Trenchless Association and a founding member, and corporate supporter, of the TTC.

In 1990, he sponsored the first US conference on microtunnelling technology, setting up a microtunnelling field demonstration on his company grounds, which was run for engineers, contractors and clients to see the benefits of the application.

BRH-Garver's vision in the microtunnelling field also resulted in the total meters excavated with the microtunnelling method rising from 27,432 m in 1989 to nearly 304,800 m in 1998.

These achievements, and his dedication and active participation in the industry, supported the selection of Mr Garver as a well-deserved candidate for the 1995 *Trenchless Technology* Person of the Year Award. ①

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