

## Innovative Keyhole Technology Adds Savings To Atmos Energy's Business

In North America, traffic disruption due to utility maintenance or roadwork is no longer just a nuisance or inconvenience to be endured, but has reached a stage where it affects not only the lives of millions of people but the functioning of the entire national economy.



Bell joint encapsulation is shown being carried out with long handled tools.

According to surveys carried out by the Ontario Ministry of Transportation, road congestion in the Toronto region costs businesses approximately \$2 billion a year in lost time and productivity, primarily due to delays caused by truck deliveries. Federal Express and UPS report that every five additional minutes of congestion or traffic disruption per day costs them \$40 million a year. And at the neighborhood level, municipal roadwork and utility repairs directly affect local merchants and shopkeepers when access to their premises is restricted or customer parking is lost.

So when innovative utilities, like TXU Gas, now Atmos Energy, employ a new keyhole technology to expedite gas utility maintenance and construction work on Dallas streets, they not only generate substantial economic savings for their customers but benefit the entire community as well.

Marc Chapman, Atmos Energy's Manager of Repair and Construction, sees tremendous advantages in the coring and reinstatement process.

"Cities in Texas continue to upgrade their paving requirements for utilities when cutting streets to perform maintenance," says Chapman. "These requirements include items such as 100% flowable fill, slurry sealing entire blocks of streets, panel to panel concrete replacement, and color matching of existing pavement. By partnering with the cities in the metro area, Atmos energy has been able to implement this new technology and eliminate these types of requirements by using the coring and keyhole technology. The coring technology in certainly the way of the future and will continue to be



View of an 18-inch core that was removed and set aside

one of our main tools in minimizing paving expense and improving relations with municipalities."

The technology, known as Utilicoring, involves a very robust, purpose-built, truck-mounted, rotary cutting unit that works through a complete 270° arc or a highly maneuverable skid-steer mounted Minicor™ unit that quickly and cost-effectively core an 18" diameter hole through asphalt, asphalt-concrete and reinforced concrete road systems and sidewalks to enable crews to vacuum excavate, and view subsurface activity or repair underground plant from the road surface using long-handled tools.

After the repair has been completed, the hole is backfilled to the level of the base of the pavement and the core or "coupon" that was originally cut from the pavement, is reinserted back into the road surface where it is permanently bonded by a specially engineered bonding compound (Utilibond™) that creates a bond stronger than the original pavement. The extremely rapid strength gain of Utilibond allows the road to be opened to traffic within 30 minutes of the repair.

According to tests conducted by the University of Illinois at Urbana-Champaign, the bond strength of the core of pavement restored in this manner exceeds the AASHTO H-25 load bearing standard by a factor of five times and is capable of supporting the combined weight of five transit buses (over 50,000 lbs) in just 30 minutes.

Frank Guzman, Atmos Energy's Dallas Construction and Maintenance Supervisor also speaks highly of the process. "We used to saw cut and jack hammer the pavement, truck the spoil, vacuum down to the pipe and when we were finished, close it up again with a temporary patch. Scheduling these activities was both time consuming and a real headache. This rotary coring process simplifies everything and results in a permanent pavement repair that allows the

road to be reopened to traffic within half an hour."

Enbridge Gas Distribution has been using the coring and reinstatement process in Toronto for more than 12 years and the City has approved it as a permanent repair. Taxpayers benefit from the reduced impact that this type of utility-cut excavation and reinstatement has on the road itself and from the longer road-life and better pavement performance that results.

According to independent testing that compared the effectiveness of the keyhole cutting and restoration technique with conventional excavation and repair methods conducted between 2001-2003

for the City of Toronto, the keyhole method was found to be superior. While the conventional repair sagged and leaked, the keyhole section repaired with Utilibond continued to perform well



Core reinstated back in the roadway.

throughout the full life of the experiment. The surface of the restored keyhole remained level with the road profile, the grout (Utilibond™) surrounding the core remained intact with no cracking or separation, and the subsurface sand cover and surrounding clay under the keyhole were exposed to much lower levels of moisture (one of the major causes of erosion and premature degeneration of the roadway) compared with the conventionally restored cut.

The keyhole coring and reinstatement process results in fewer potholes and call-backs for the contractor or the utility and greater convenience for the public", says Colin Donohue, Vice President of Field Operations of Utilicor Technologies, the company that manufactures and distributes the coring trucks and the Utilibond™.