



Keyhole Technology
Program

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Keyhole Technology Newsletter

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Nicor Field Trials of MINI-GRUNDOTUGGER®

The following article was submitted by Nicor Gas.

Field trials of the TT Technologies Mini-Tugger system were held at Nicor Gas in the fall of 2005 to determine the effectiveness of the technology in the replacement of copper services with new PE tubing. Five replacements were performed in two neighborhoods. The field trials were held during the month of October. The soil conditions during the fall are generally considered to be the "worst-case" scenario due to the lack of moisture in the ground surrounding the service line. The limiting factor for the technology was the tensile strength of the ¼-inch cable being used. The cable broke on multiple occasions causing additional rework and attempts to be made. After trial and error, a slower, more methodical approach was used and better able to cut the existing copper material while minimizing the number of times the cable broke. Considering the soil conditions, dry and predominately hard clay, this was somewhat expected. Refinement in the tool for future "undesirable" applications includes increasing the diameter of the cable which coincides with an increase in tensile strength. Additional tests are planned for Spring 2006 when soil conditions are optimal for splitting due to the increased moisture levels.

When the soil conditions were not as severe, the technology was impressive and worked according to expectations. Another goal was to determine if the tool could be used in the parkway. For this application, the small footprint and design of the tool



Above: Nicor truck and MINI-GRUNDOTUGGER®

Below: Small footprint excavation



met our requirement of minimizing the excavation and subsequent repair area. Based upon the field trials, we have concluded that the keyhole crew can make the restoration repairs themselves. This is due to the minimal disruption in the excavation area through the use of spading out a grass "coupon" and setting it aside while the work is performed. After job completion, the "coupon" is replaced over the excavation area. Based upon these assumptions, a paving and landscaping contractor is not required to return to the job site for additional restoration.

Did You Know?

The picture above:

- Shows the training room at the new Omega Tools (OTI) Allentown headquarters facility in Lehigh Valley, Pennsylvania.
- Was taken at the demonstration of Omega's new elevated pressure service abandonment equipment and tooling for keyhole applications.
- See page 2 for story.



Left: MINI-GRUNDOTUGGER® downhole shot

Omega Tools (OTI) Elevated Pressure Abandonments

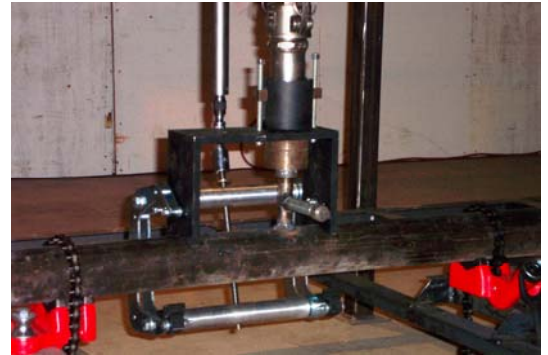


Above: Omega Tools (OTI) elevated pressure service abandonment equipment in the field at UGI.

Omega Tools (OTI) has unveiled its new keyhole elevated pressure service cutoff equipment and tooling for performing elevated pressure service abandonments. The process is “no-blow” and the pressure vessel developed by Omega is currently rated for 100 psi. The lower section of the equipment (see pictures) is called the “tee adaptor section.” For each style of tee, a special adaptor is created in order to seal the system and guarantee a no blow system. Currently, adaptor sections are being developed for Mueller tees (without plugs), some styles of saddle tees, and welded street tees.

OTI is currently performing keyhole elevated pressure service abandonments for UGI in the Lehigh Valley in Pennsylvania. The equipment and tooling is ready to be commercialized. Omega is currently looking for other utilities to work with. Working in the field at different utilities helps to uncover a wider range of tees with which the equipment can work.

Below: Elevated pressure abandonment equipment demo on the keyhole stand.



MBW Vapor Extraction Unit



From MBW's press release:

Determining the location of a leak in an underground gas line has long posed difficult problems for gas line emergency repair crews.

The conception of the Vapor Extraction Unit (V.E.U.) was developed by Atmos Energy. The unit uses integral LEL monitor alarms to notify operators when dangerous gas concentrations are approached. A bypass valve allows the operator to configure the unit as necessary.



MBW Vapor Extraction Unit

Current applications for the Vapor Extraction Unit include pinpointing of leaks on cast iron pipes and residual gas remediation. Some use the unit for removal of residual gas to reduce hazardous situations. Pinpointing of leaks has also become a major tool used to prevent digging dry holes.

Keyspan and Con Edison Win Approval for Keyhole Coring and Reinstatement from New York City DOT



1. Coring unit with conventional repair in foreground.



2. Coring begins.



3. 13-inch asphalt core



4. Temporary road plate



5. Vacuum excavation

The following article was submitted by Utilicor Technologies, Inc.

Facilitated by GTI, and under the direction of Gerry Lundquist, George Mirtsopoulos and Cosmo Iannicco, crews from KeySpan Energy Delivery and Utilicor Technologies performed demonstrations of the keyhole coring and reinstatement process, and an abandon gas service cut-off, for the New York City Department of Transport on March 9th, 2006.

In addition to the Utilicor coring equipment and Utilibond, the demonstration included the Excavac vacuum excavation system, service cut-off tools from various manufacturers and the Soil Compaction Supervisor from MBW.

The pictures literally tell the story from a comparison of a conventionally excavated and repaired rectangular utility cut (seen in the foreground of the first picture), to the reinstated core that is almost invisible, at the end.

The reaction to the process from DOT was enthusiastic. "This is a great process," said one of the officials. "There's no jack-hammering to disrupt or damage the roadbed or the surrounding pavement and it is much quieter than other methods. The fast-setting Utilibond allows you to reopen the road to traffic within 30 minutes of the repair. That cuts the time on the road and means less inconvenience to the public. That is very important to a government agency responsible to the public. The Soil Compaction Supervisor, with a downloadable audit feature, is also something that we are interested in. It's not hard to approve a system like this."

Gerry Lundquist, Manager of Field Operations, and George Mirtsopoulos, Resource Planner, Field Operations, who have taken the lead in introducing and rolling-out coring at Keyspan, agree. "Our crews have been using the Minicor skid-steer coring attachment and Utilibond on a pilot basis for more than a year now, and have achieved impressive results. We have seen increased customer satisfaction. No more jack-hammers, no debris left behind to dispose of and no waiting for paving restoration. At the end of the day the only thing left to mark our presence is a small circle in the pavement that is almost invisible. Now, that's progress."



6. Turning off the gas



7. Compaction (note wire from Soil Compaction Supervisor)



8. Mixing the Utilibond



9. Pouring Utilibond in the hole



10. Reinstated core—almost invisible

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ESI pneumatic universal handle for keyhole use

MBW Vibration Suppressor

The following was written by MBW.

The main purpose of using the MBW Vibration Suppressor is to reduce the level of hand/arm vibration being transferred to the operator while engaging a pogo-stick tamper. A pogo-stick tamper is a common industry tool that has fallen behind the progression toward modern health/safety standards. In fact, pogo-stick tampers without the MBW Vibration Suppressor attachment can expose the operator to hand/arm vibration much higher than gas powered rammers. These hand/arm levels are extremely dangerous and degenerative to the operator's elbows, wrists, fingers and shoulders over long periods of time.

What makes the MBW Vibration Suppressor such an impor-

tant upgrade for pogo-stick tampers is a reduction of up to 70% of the hand/arm vibration.

The MBW Vibration Suppressor requires little maintenance, weighs 7 pounds and can be used for extended periods.

At the GTI labs:

Nick Daniels, a technician at the Gas Technology Institute, operated a pogo-stick with and without the Vibration Suppressor. Afterwards, he gave these comments: "Without the suppressor, the movement of the compactor is very jerky. With the suppressor, the movement of the compactor is very fluid." Nick said that the suppressor greatly reduced the shock/vibration that he felt from the recoiling compactor.



Above: Vibration Suppressor attached to a pogo-stick.



ESI pneumatic handle and attachment for tracer wire connection

One application of the pneumatic arm developed under the former keyhole project is for connection of tracer wire. The arm can accommodate attachments for many keyhole tasks.