

# Keyhole Technology

At

Southwest Gas Corporation



# What is Keyhole?

- 18” to 24” diameter core precision cut through pavement
- Core set aside for reinstatement after repairs
- Underground facilities exposed by vacuum excavation
- Repairs made from the surface using long-handled tools
- Hole is then backfilled to base of pavement
- *Utilibond Grout* is then mixed with water and poured into the hole
- Core is reinserted back into the hole and bonded to the pavement for a permanent restoration
- Road is re-opened to traffic within 30 minutes to an hour





# Chronological Order of Keyhole Events At Southwest Gas

- 1999
  - Research began on keyhole processes and economic feasibility
- Spring of 2001
  - First live demos of coring equipment at SWG Tempe facility
    - Demonstration was coordinated with Gas Technology Institute (GTI)



Completed core

# Chronological Order of Events

cont.'

- Summer of 2002
  - Demo at SWG Tempe facility, including vendors of various tools and products used for “Keyhole Processes”
- Winter of 2002
  - Presentation to the City of Phoenix for jurisdictional approval of “Keyhole” processes for a pilot program in the corridor of the Light Rail



# Chronological Order of Events

cont.'

- Spring 2003
  - Field demo for the City of Phoenix, Scottsdale, Gilbert, as well as several other utilities in the Phoenix metropolitan area on Washington St.
    - Demo included one 18” core, vacuum excavation, Trenton patch, backfill utilizing the “Soil Compaction Supervisor” and the reinstallation of the original core



# Current Keyhole Uses

- Currently SWG is using Keyhole procedures in main and service replacement, anode installation, bond wire installation, locating wire repairs, repairing minor nicks in the pipe wrap, and Subsurface Utility Engineering (SUE) work



# Bond Wire Installation



## New Service Installation



## Emergency Shut offs



Timberline TR650

# Recent Developments and Approvals



**Phoenix**: Approval on case by  
case basis

43<sup>rd</sup> Ave. & Glenrosa



# Recent Developments and Approvals



Queen Creek: Approval on case  
by case basis

Ellsworth Loop & Ocotillo



# Recent Developments and Approvals

Gilbert: Approval on case  
by case basis

Greenfield and Winchester



# Recent Developments and Approvals

**Scottsdale**: Approval on  
case by case  
basis

Scottsdale City Bldg.



# Recent Developments and Approvals

Chandler: Approval on case  
by case basis

Arizona Ave.



# Benefits

- Better repair for roadways
- One stop Shop
- Aesthetically pleasing
- Less traffic disruption
- Minimal trips to set up traffic control
- Safer for employees



Questions???

