

The Keyhole Process



1. Locating

The first step in the keyhole process is pipe location. Precise location of facilities is important due to the reduced size of excavations through keyholes. GTI researchers are developing new, advanced technologies for locating plastic pipe, cast-iron joints, and pipe leaks.



2. Coring

Common keyhole methods involve creating a pavement opening only 12 to 18 inches in diameter, usually made with a circular-drill core-hole cutter, allowing for remote access to the facilities. Restoration is accomplished by replacing the cut-pavement coupon after repairs are made.



3. Vacuum Excavation

Once the core has been cut and removed, vacuum excavation is used to excavate down to the pipe. Debris removed from the hole is stored in a tank on the vacuum truck, and, ideally, the debris can be re-used to backfill the keyhole. GTI has conducted comprehensive research on safety aspects related to vacuum excavation.



4. Construction & Maintenance Activities

With the help of specialized, long-handled tools, construction and maintenance can be conducted through a keyhole opening. Activities currently performed through keyholes include: potholing/depth checks, valve box cleanouts, meter guard installations, plastic pipe squeeze-offs, service installation and abandonment, cathodic protection, and cast-iron joint sealing.



5. Backfill & Pavement restoration

Backfill and soil compaction are integral to the effective replacement of the cut core. Using the proper materials during backfill and core replacement will prolong the life of the pavement. To improve the process, GTI is conducting studies on measurement devices to assure proper soil compaction.

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