

Trenchless TOOLS & METHODS

quick reference guide

Method: Horizontal Boring

Tool: **GRUNDOMAT®**
Pneumatic Piercing Tool

Capabilities:

- Bores up to 150 feet
- Install services, laterals, mains & conduit
- Tool diameters from 1.75 inches to 7 inches

GRUNDOMAT bores straight, while conventional tools may veer off course.

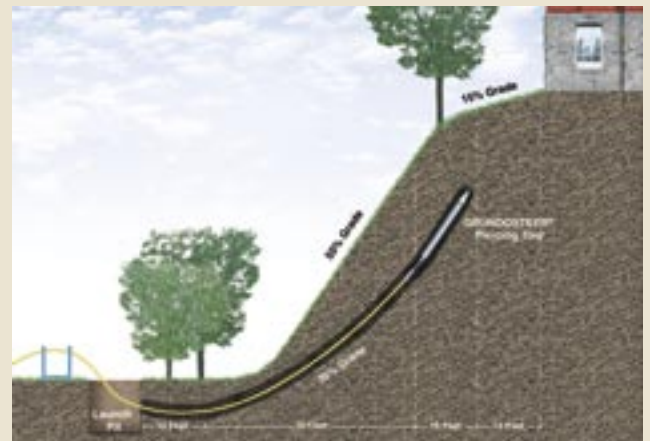


Method: Guided Boring

Tool: **GRUNDOSTEER®**
Steerable Pneumatic
Piercing Tool

Capabilities:

- Water & gas service lines & conduit installation with directional changes
- Bores up to 200 feet
- Steered from surface, no drilling fluid required



TT Technologies, Inc.

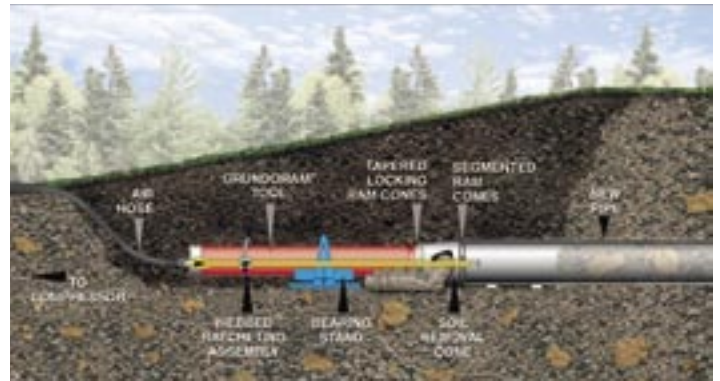
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Method: Pipe Ramming

Tool: GRUNDORAM® Pneumatic Pipe Rammer

Capabilities:

- Install casings from 4 inches through 147 inches in diameter and larger
- No surface slump or voids
- Horizontal, vertical, and angled applications



Method: Lateral Pipe Bursting

Tool: GRUNDOTUGGER® Lateral Pipe Bursting System

Capabilities:

- Replace 4-inch to 4-inch, 4-inch to 6-inch or 6-inch to 6-inch service laterals
- GRUNDOMAT piercing tools can assist in difficult soils
- Lightweight, no component over 70 pounds

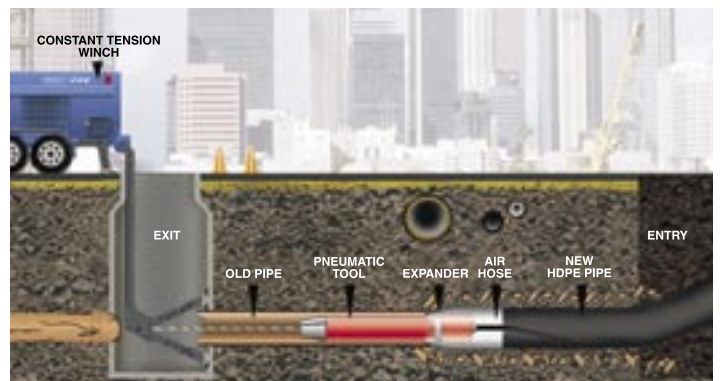


Method: Pneumatic Pipe Bursting

Tool: GRUNDOCRACK® Pneumatic Pipe Bursting System

Capabilities:

- Burst & replace fracturable pipes from 4 through 54 inches in diameter
- Replace size to size or increase existing diameter
- Lateral equipment available

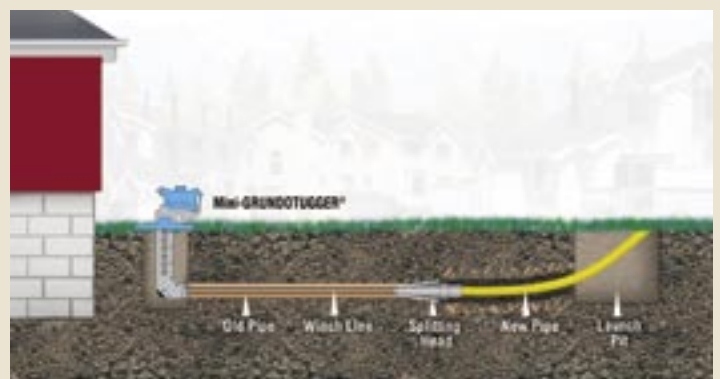


Method: Service Line Splitting

Tool: MINI-GRUNDOTUGGER® & GRUNDOCRACK JR.®

Capabilities:

- Split & replace ½-inch to 2-inch pipes quickly and easily
- Splits copper or plastic pipes
- Various accessory packages available



Method: HDD Assist–Conductor Barrel®

Tool: **GRUNDORAM® Pneumatic Pipe Rammer**

Capabilities:

- Ram casings through difficult soil conditions to more desirable drill starting points.
- Guide down-hole or mud motors to rocky soils through the conductor barrel.
- Provides friction free section for product pullback.



Method: HDD Assist–Pullback Assist

Tool: **GRUNDORAM® Pneumatic Pipe Rammer**

Capabilities:

- Rammer attached to product pipe during pullback.
- Percussive action keeps pipe moving and helps prevent high levels of pullback stress.
- Percussive power frees immobilized product pipes.



Method: HDD Assist–Bore Salvage

Tool: **GRUNDORAM® Pneumatic Pipe Rammer**

Capabilities:

- Rammer attached to product pipe after pullback fails.
- Percussive action pulls product pipe, removing it from the bore.
- Salvage the job and bore again.

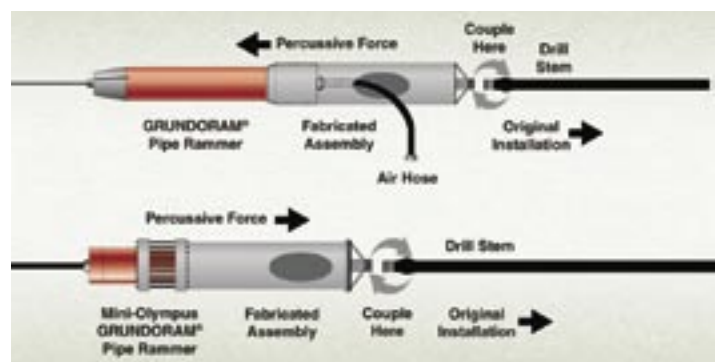


Method: HDD Assist–Drill Stem Recovery

Tool: **GRUNDORAM® Pneumatic Pipe Rammer**

Capabilities:

- Pipe Rammer fitted with a special sleeve.
- Stuck drill stem welded to the back of the rammer sleeve.
- Percussive power frees drill stem, saving time and money.

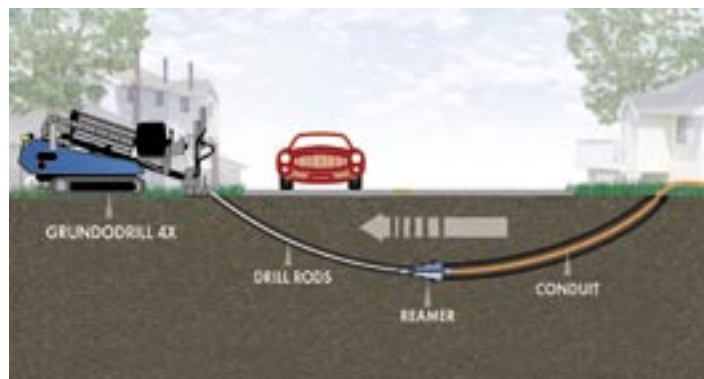


Method: Compact Directional Drilling

Tool: GRUNDODRILL® 4X

Capabilities:

- Computerized Smart Vice™ system simplifies the drilling process
- Maximum drilling power in tight working conditions
- Ideal for “last mile” installations
- 9,800 lbs. of pullback and thrust

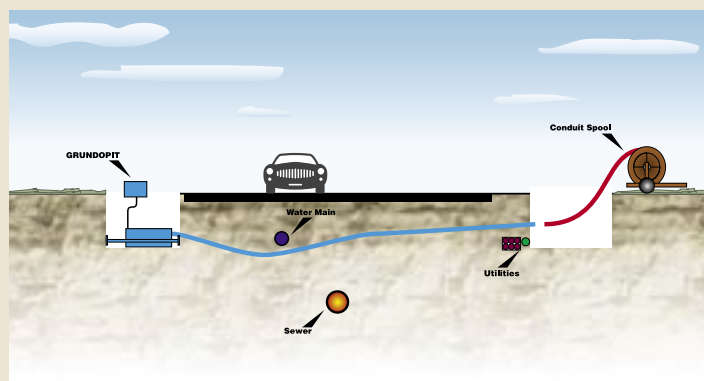


Method: Directional Drilling

Tool: GRUNDOPIT® Pit Launched Mini-Directional Drill

Capabilities:

- Ideal for installing water services, electrical conduit, gas services, etc. in tight working conditions, over difficult runs
- Anchored by four hydraulically operated telescopic bracing supports allowing for perfect alignment and maximum thrust and pull back
- Easy to use and highly portable



Method: Static/Hydraulic Pipe Bursting

Tool: GRUNDOBURST® Static Pipe Bursting System

Capabilities:

- Burst & replace ductile iron and steel pipes
- Special bladed cutting wheels split pipe
- Burst & replace 4-inch through 48-inch pipes and larger

