Pilot Tube Guided Boring & Pipe Ramming
With Case Histories
Pipe Ramming

BASICS

STANDARD RAMMING

- 4-in through 147-in casings
- 118-in, 122-in, 138-in & 147-in casings Successfully Rammed
- Eliminates Slump or Rise
- Tools Configure to a Range of Casing Diameters
THE PROCESS:
Typical Pipe Ramming Configuration
ROUTINE
12” Thru 36”

CHALLENGING
36” Thru 80”

ADVANCED
80” Thru 144”
Pipe Ramming

HDD TECHNIQUES
CONDUCTOR BARREL

- Ram Casing Through Difficult Soils
- Preferable Starting Point for Drilling
- Guide for Down-hole or Mud Motors
- Friction-Free Section for Pullback
Conductor Barrel Step 1 - Job Site

Pipe Rammer installs steel casings for clean bore start

Percussive Force
Conductor Barrel Step 2 - Job Site

Drilling starts in preferable soil conditions
Pipe Ramming

PIPE REMOVAL/ BORE SALVAGE

• Rammer Attached to Product Pipe
• Percussion Removes Pipe from Bore
• Salvage Job
• Bore Again
Product Pipe Removal/Bore Salvage-Job Site

Pipe Rammer removes product pipe or drill stem after bore fails.

Percussive Force
PULLBACK ASSIST

- Rammer Attached to Pipe During Pullback
- Percussion Keeps Pipe Moving
- Helps Prevent High Stress Levels
- Overcomes Hydrolock, Frees Pipe
Pullback Assist - Job Site

Pipe Rammer works with drill rig to assist pipe installation

Percussive Force
PIPE RAM RESCUE

- Used to Retrieve Stuck TBMs
- Reverse Line & Grade
- Casing Diameter Larger than Bore
- Ram Casing to Meet Trapped TBM
- Remove Spoil & Retrieve TBM
Pipe Ram Rescue-Job Site

TBM becomes trapped

Pipe Rammer installs steel casings to swallow up TBM
GBM BACKGROUND

- On Grade & Alignment Installation
- Highly Accurate Installations
- Theodolite Guidance System
- Video Monitoring of Illuminated Target
- Angled Steering Head Similar to HDD
GBM BACKGROUND

- Pilot Tubes Installed behind Steering Head
- Next, Auger Head Tube Sections Installed
- As Auger Sections Installed, Pilot Tube Sections Removed at Exit Pit
- Next, Pipe Adapter Installed
- Product Casing Attached to Adapter
- Thrust into Place
GBM BACKGROUND

- Not All Soil Conditions or Pipe Diameters Favorable for total GBM Installation
- Pipe Ramming Assist
- After Pilot Tubes Installed on Line & Grade
- Special Ramming Adapters
- Rammer takes place of Auger
- Installation remains on Line & Grade
PROJECT BACKGROUND

- Sanitary Sewer Main
- 36-inch Diameter inside 54-inch Casing
- 160 feet in length
- New Development
- Under Concrete Creek Channel
- Creek runs through town
- Feeds into MN River
PROJECT BACKGROUND

- Grade Sensitive Project
- Avoid slump & disturbance of concrete channel
- Unstable, saturated ground conditions
- Engineer utilized slump monitoring equip.
PROJECT SPECS

• Began @ 1% Downhill Grade
• 4-inch Pilot Tube
PROJECT SPECS

• Installed 4-inch to 24-inch Adapter
• Pushed into place
PROJECT SPECS

• Installed 24-inch to 54-inch Adapter
• Pushed into place
PROJECT SPECS

- Remove Auger
- Weld 54-inch by 20-ft casing to adapter
- Set up pipe rammer
- Cut out steel bulk head
- Loose material & water flow
- Sandbags & Underlayment fabric to lessen flow
Pipe Ramming

PROJECT RESULTS

• 1st Section Installed without incident
• Next section added and rammed in place
• Subsequent casing sections rammed in place
PROJECT RESULTS

- Casing installed on grade
- 24-in to 54-in Adapter Removed
- Spoil removed with auger
- Ramming Times: 20-50 Min/20-ft section
PROJECT RESULTS

- Slump Monitoring Results:
  - Front of Launch Pit Levee Edge - 2 ½ inches
  - Under Channel - ½ inch
  - Receiving Pit Levee Edge - 1 ¼ inches
  - All within tolerance
  - Less slumping than anticipated