Case Study of Pipe Bursting In Shreveport, LA

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About PUCC

- Utility Contractor Since 1991
- Rehab Contractor Since 1995
- Rehabilitated Approximately 2,000,000 LF of Pipe with Trenchless Technologies
- Completed Projects in 14 Different States and District of Columbia
- Louisiana Became State Number 15 Last Year - Shreveport
- Offices in Knoxville & Portland, TN and Houston, TX
- Major Rehab Programs – Knoxville, Nashville, Atlanta, Jacksonville, Shreveport & Houston

Agenda

Pipe Bursting Multiple Projects Shreveport

- Shreveport Rehab Program – General Information
- Role of Pipe Bursting
- Multiple Pipe Types
  - HDPE – DIPS DR 17 Green Stripe
    - Must be De-Beaded
  - Restrained Joint PVC
  - Fusible PVC
- Multiple Soil Conditions & Pipe Sizes
- Multiple Pipe Bursting Systems

Issues

Shreveport Rehab Program – General Information

CITY OF SHREVEPORT

- Population of 200,000
- Bossier/Shreveport Population 400,000 (Ranks 111th)
- 122.35 Square Miles of Area
- 1,100 Miles of Sewer System
- Home to Several Casinos
- Per Capita Poverty 23.6%
- Median Income $38,583

Shreveport Rehab Program – General Information

CITY OF SHREVEPORT

- 2009 EPA Reported Shreveport to the Department of Justice
- Negotiated a 12 Year Master Plan & Remedial Measures Plan as Part of the Negotiated Consent Decree
- Budget of $500,000,000 (Rising)
- 5 Phases (Areas)
- Construction Began 2015
- Ends November 12, 2026

Shreveport Rehab Program – General Information

FUNDING SOURCES

- Rate Increase Initiated 2013
- Revenue Bonds (Based on Rate Increase)
- General Obligation Bonds
- State & Federal Grants & Loans
  - Stater Revolving Funds

Shreveport Rehab Program – General Information

WATER & SEWER RATES PRIOR TO OCTOBER 2013 (3,000 GALLONS & UNDER)

- Water Quantity ** $8.10
- Water Charges $4.25
- Wastewater Quantity * $11.61
- Wastewater Charges $3.87
- Total Monthly Bill $27.83

**Water Quantity 2.70 per 1000

* Wastewater Quantity 3.87 per 1000

WATER & SEWER RATES AFTER OCTOBER 2013 (3,000 GALLONS & UNDER)

- Water Quantity ** $9.15
- Water Charges $4.80
- Wastewater Quantity * $16.65
- Wastewater Charges $5.55
- Total Monthly Bill $36.15

**Water Quantity 3.05 per 1000

* Wastewater Quantity 5.55 per 1000

Role of Pipe Bursting

- When Is Pipe Bursting Used
  - When Existing Pipe is Too Deteriorated to Line
  - When Existing Pipe is Undersized
  - When Utility Conflicts Will Not Facilitate Open Cut
  - When Open Cut Would Require More Asphalt & Concrete Restoration
    - Moving Away From So Much Open Cut

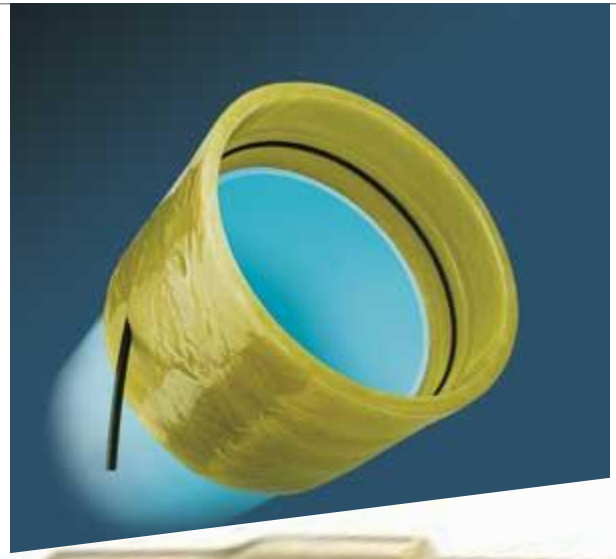
- When Is Pipe Bursting Not Used
  - When Existing Pipe Has Too Many Sags Neither Lining Nor Pipe Bursting will Correct
  - Some Sags Can Be Corrected by Pipe Bursting Process
  - Some Sags Can Be Corrected After Pipe Bursting Process (If They Still Remain)

Types & Sizes of Pipe Installed by Pipe Bursting In Shreveport

- HDPE
  - DR 17
  - DIPS
  - 8”, 10”, 12”, 16” 18”, & 24”
  - Must Be De-Beaded

Types & Sizes of Pipe Installed by Pipe Bursting In Shreveport

- Restrained Joint PVC
  - C900
  - DR 18
  - 8”, 10”, 12”, & 16”



Types & Sizes of Pipe Installed by Pipe Bursting In Shreveport

- Fusible PVC
  - C900
  - DR 18
  - 24”

Soil Conditions

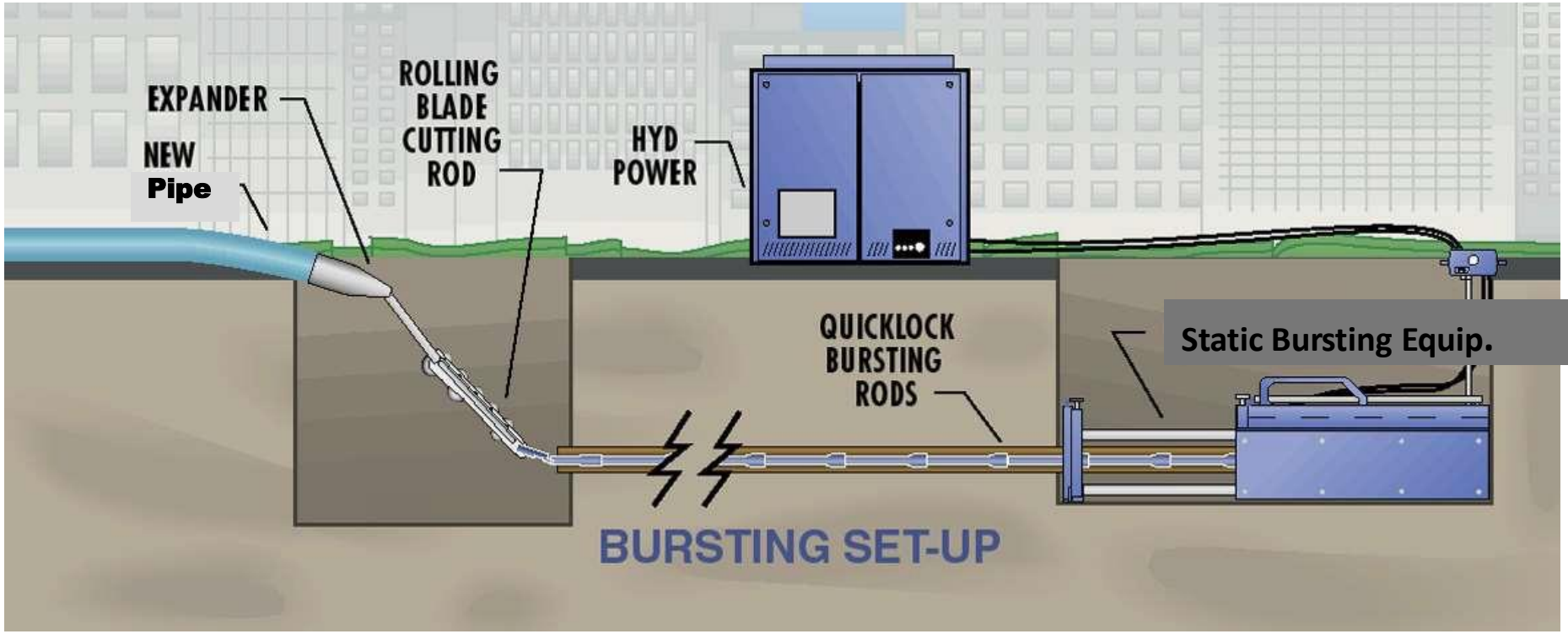
- Multiple Types of Soil in Shreveport
  - Wet & Mucky (Sticky)
  - Dry & Hard
  - Nice Compressible (Burstable) Clay

- Impact of Soils
  - Uncertainty of Approach
    - Pneumatic or Static
      - Two Pits or Reversible
    - Lubrication?
  - Upsizing is More Challenging/Limited
  - Lengths are Sometimes Limited
    - Many Times It Takes 2-3 Launches to Complete a Run

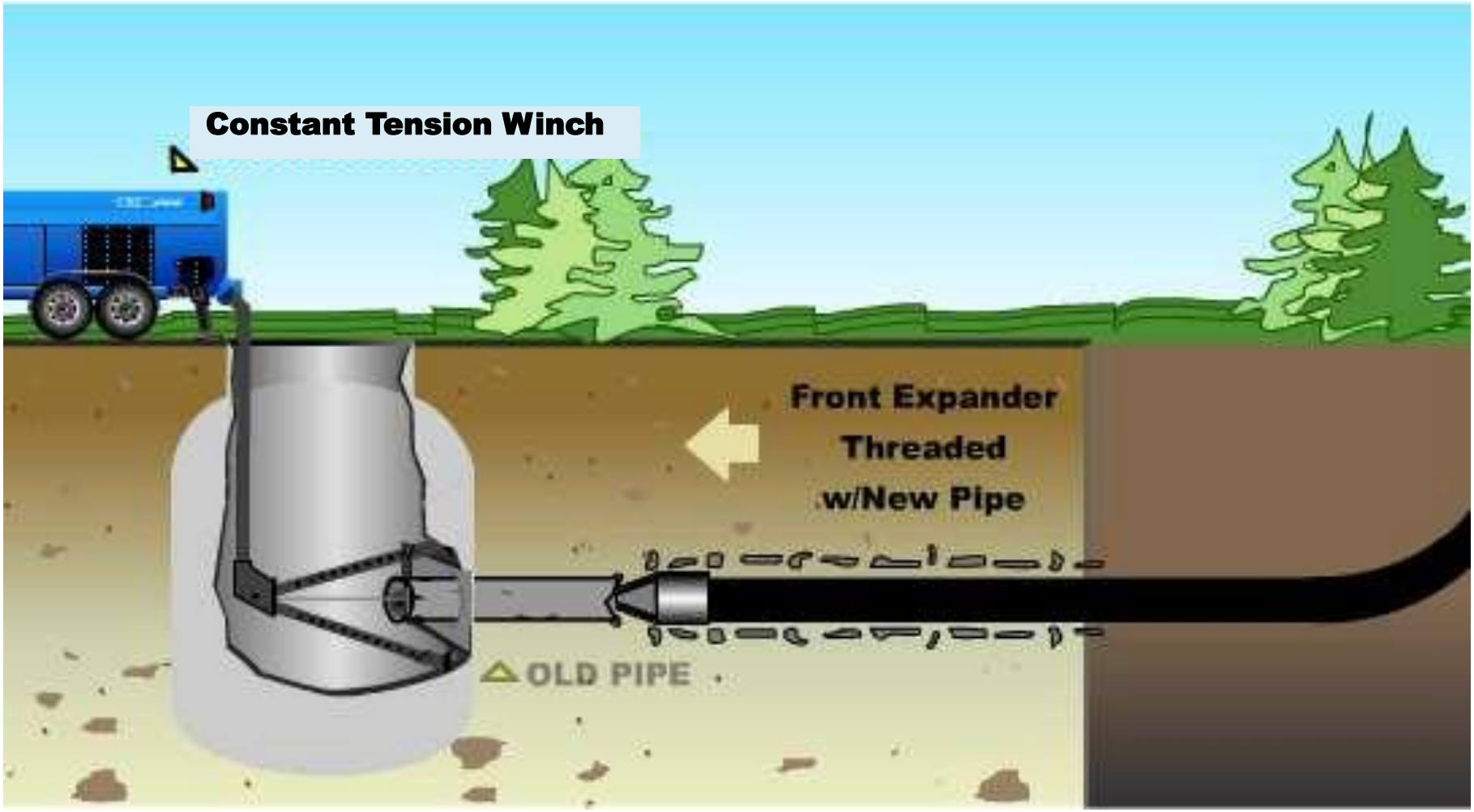
Pipe Bursting Systems

- Pneumatic Systems
- Static Systems

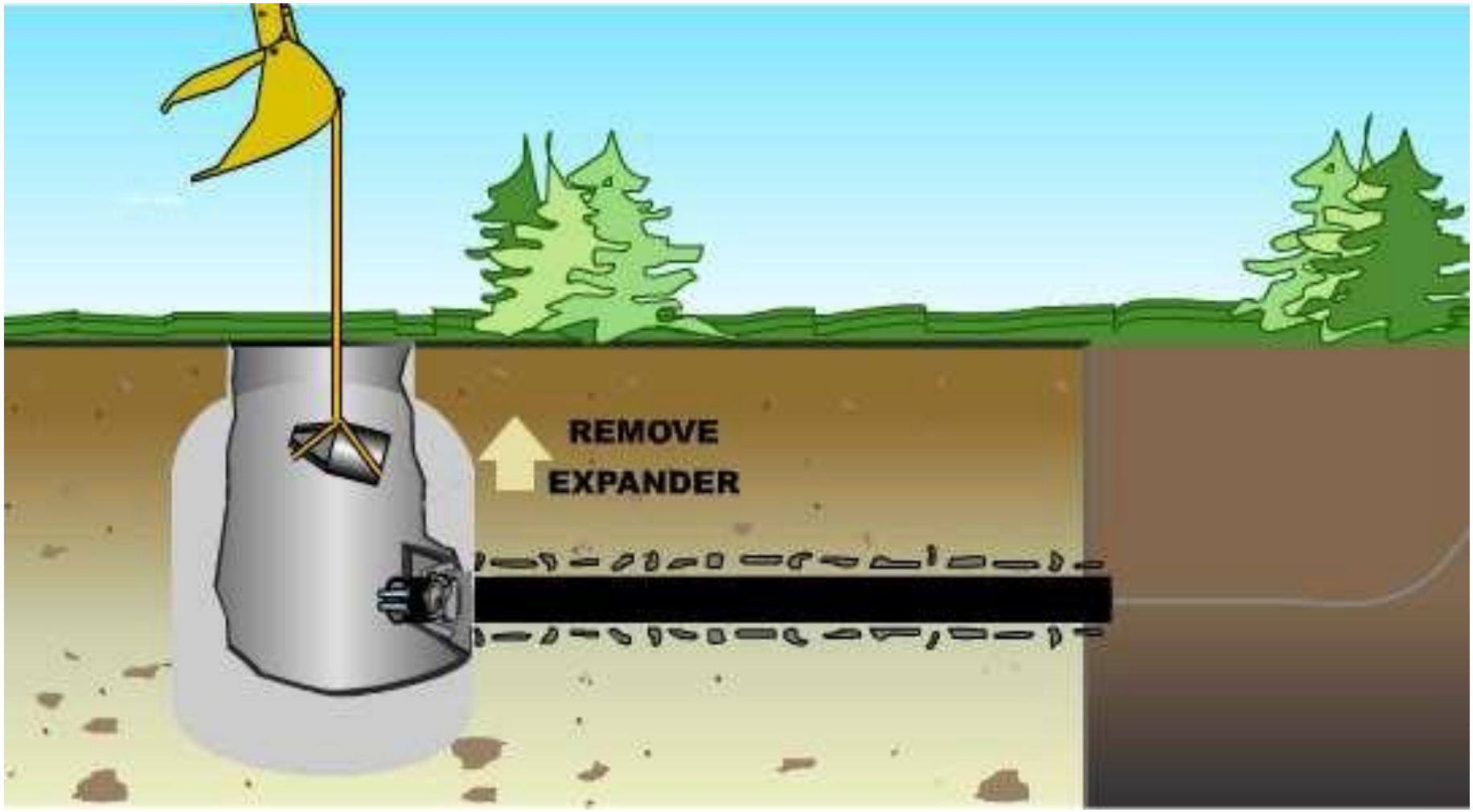
Static Bursting Requires Two Pits



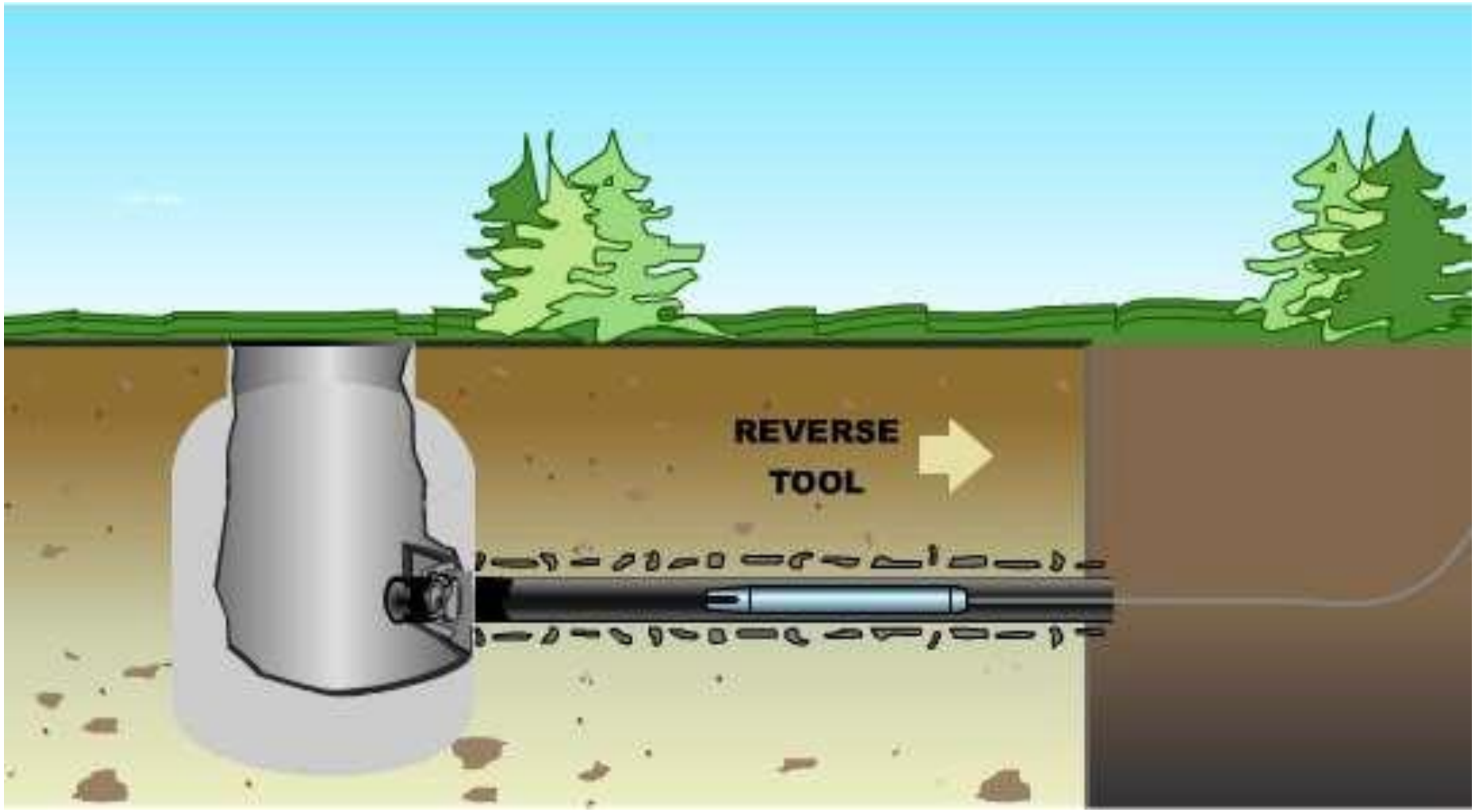
Reversible Pneumatic Systems



Reversible Pneumatic Systems



Reversible Pneumatic Systems



When & Why Static or Pneumatic? Shreveport (Red)

Pneumatic

1. Can Only Install HDPE
2. Fracturable Pipe – Clay, Concrete, AC, Cast, or PVC
3. Special Tooling like Cutters are not necessary
4. Reversible Hammers Can Be Installed with Only 1 Pit
5. Normal, Dry, & Easily Compressible Soils are Anticipated

Note: 90% of all Pipe Bursting is done with Pneumatic Hammers due to Reversible Capability and Speed.

Static

1. Pulling In Non-HDPE Pipe – FPVC, RJPVC, & RJDIP
2. Non-Fracturable Pipe – Ductile Iron, HDPE, or Steel
3. Special Tooling is required (Cutters)
4. Static Bursting Requires 2 Pits
5. Soils Dictate
    1. Wet, Sticky, Mucky & Hard Soils

Note: About ½ of Pipe Bursting in Shreveport is Static

Reasons We Use Static Systems In Shreveport

- **Greater Pulling Forces than Winch & Hammer Required to Overcome Sticky Mucky Soils & Hard Resistant Soils**
- **New Pipe - All types (FPVC, HDPE, Restrained Joint PVC, Ductile Iron, VCP)**
- **Requires Two Pits**

Shreveport Pipe Issues

Uncertainty of Which Type of Equipment To Use

Soils – Hard, Wet, Mucky, Sticky
- Sometimes Requires Static Bursting or Lubrication

Depth – Much of the System is 15-20’ Deep
- Typically Requires Static Bursting

Easement Work – Deep & Tight
- Buildings Are Often Encroaching on the Sewer Mains
- Typically Requires Static bursting

Utility Conflicts
- Gas Lines Were Often Laid Right Over the Sewer Lines
- Causes Lots of Down Time & Re-Design
- Typically Requires Static Bursting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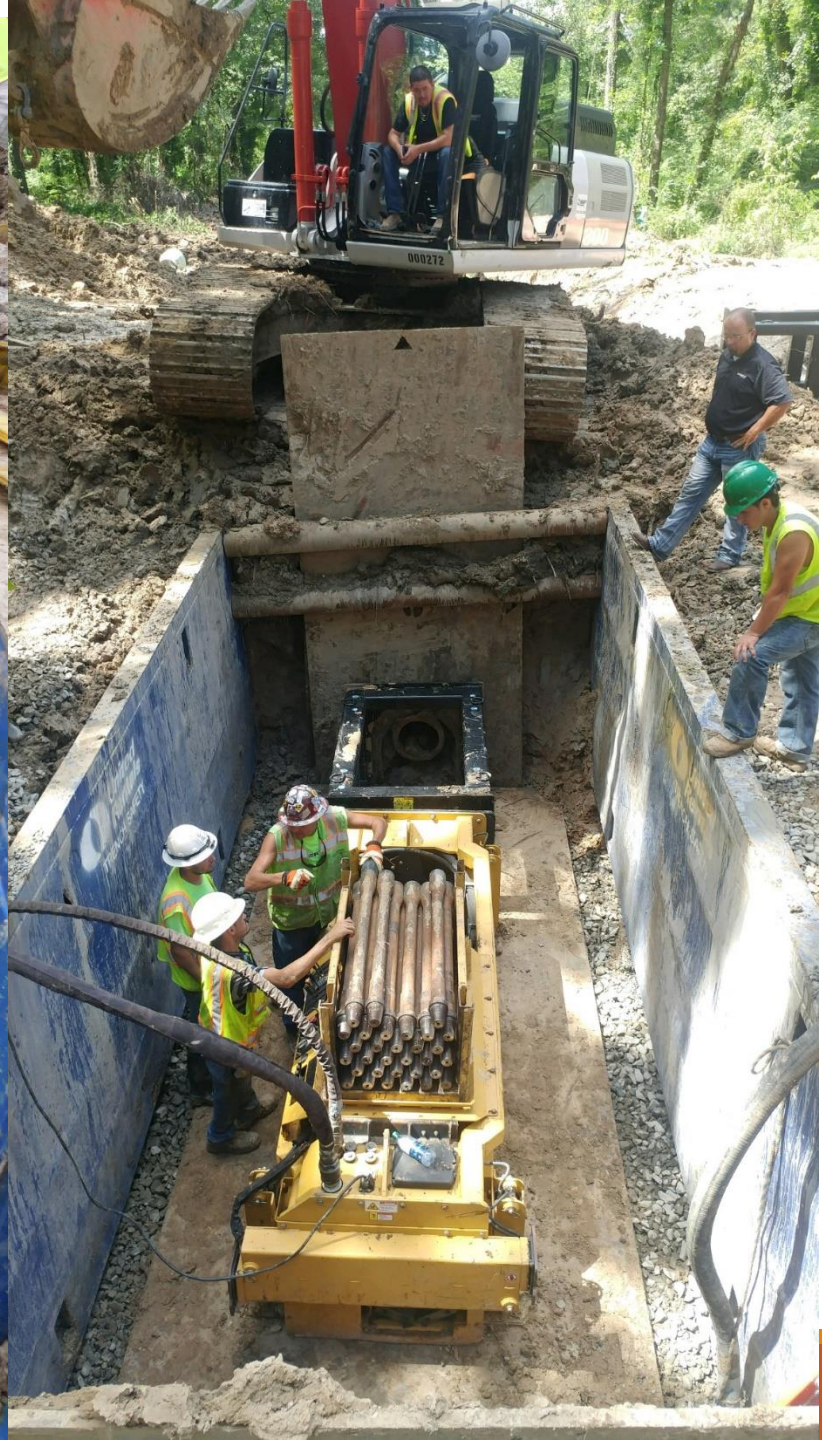

Questions?