Design Considerations and Benefits of Pipe Bursting

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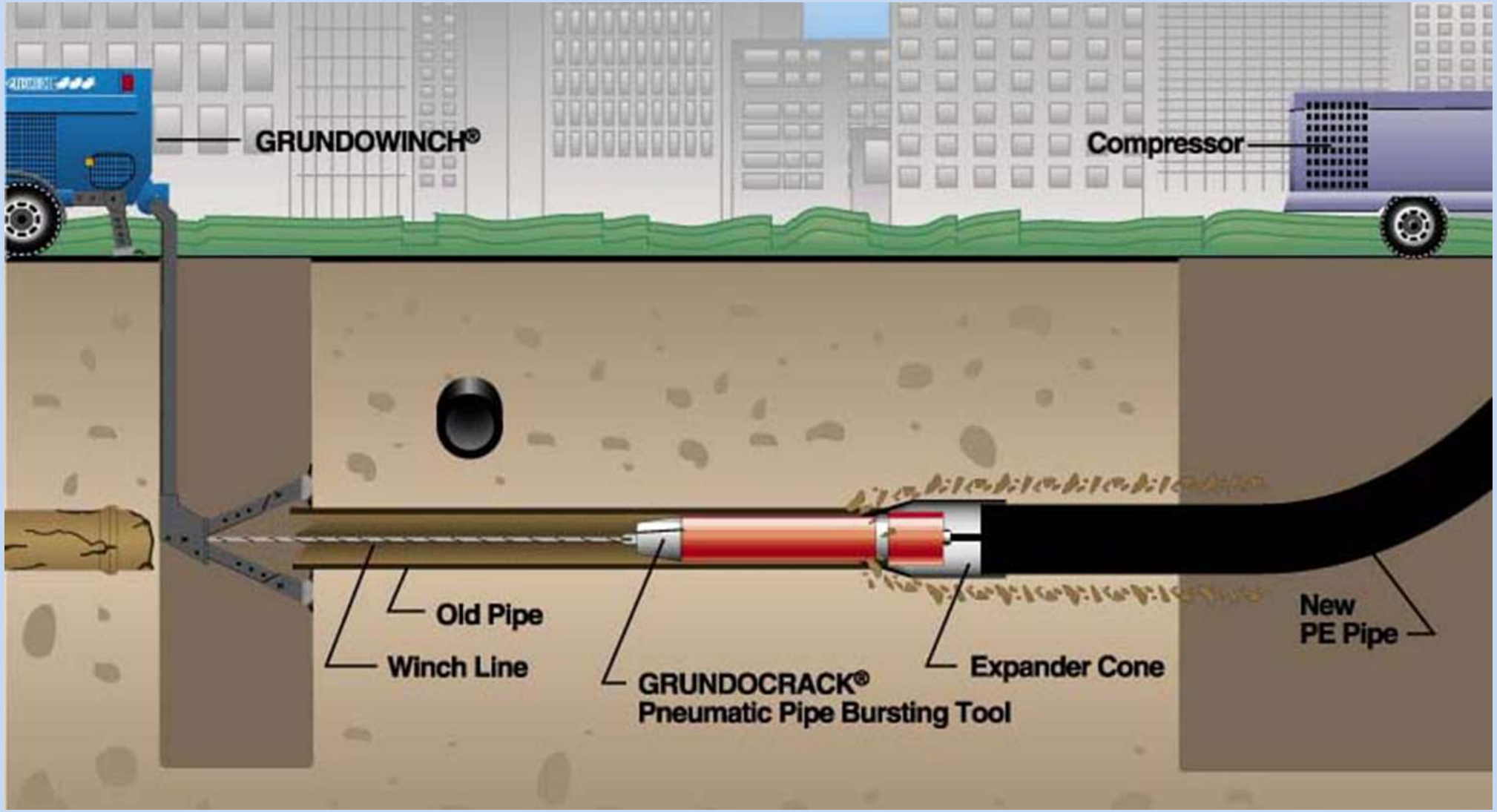
What is Pipe Bursting?

- Trenchless rehabilitation & replacement technology - staying in the existing pipe and utility corridor
- Fracture or split existing pipe while simultaneously installing a new “factory manufactured” pipe
- Replace aged, deteriorating, and capacity deficient mainline and lateral systems w/ same size or larger diameter pipes
- 4 inches to 36 inches in diameter

Two Main Types of Pipe Bursting Systems

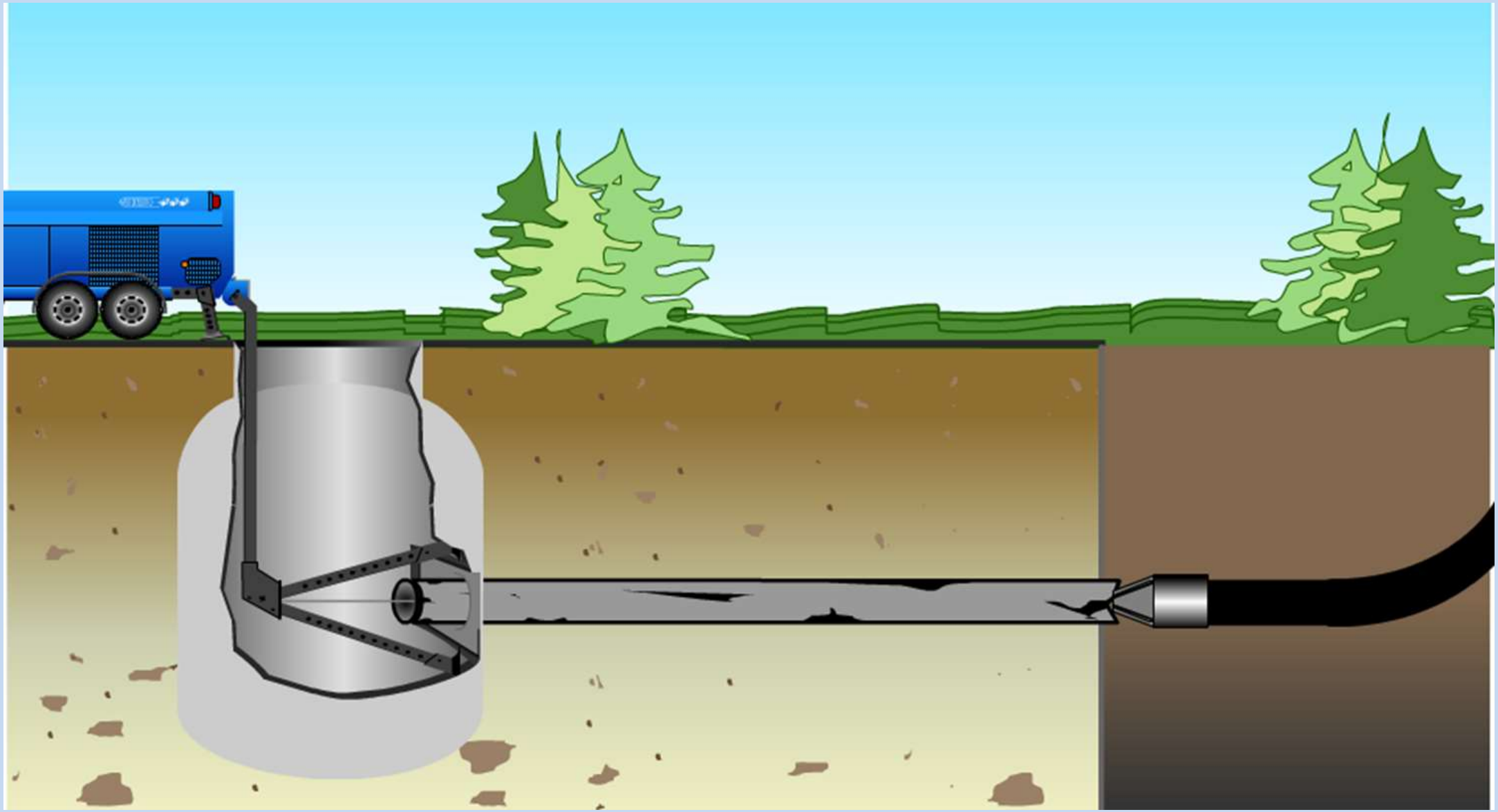
- Pneumatic Systems
- Static Systems

Pneumatic Pipe Bursting System

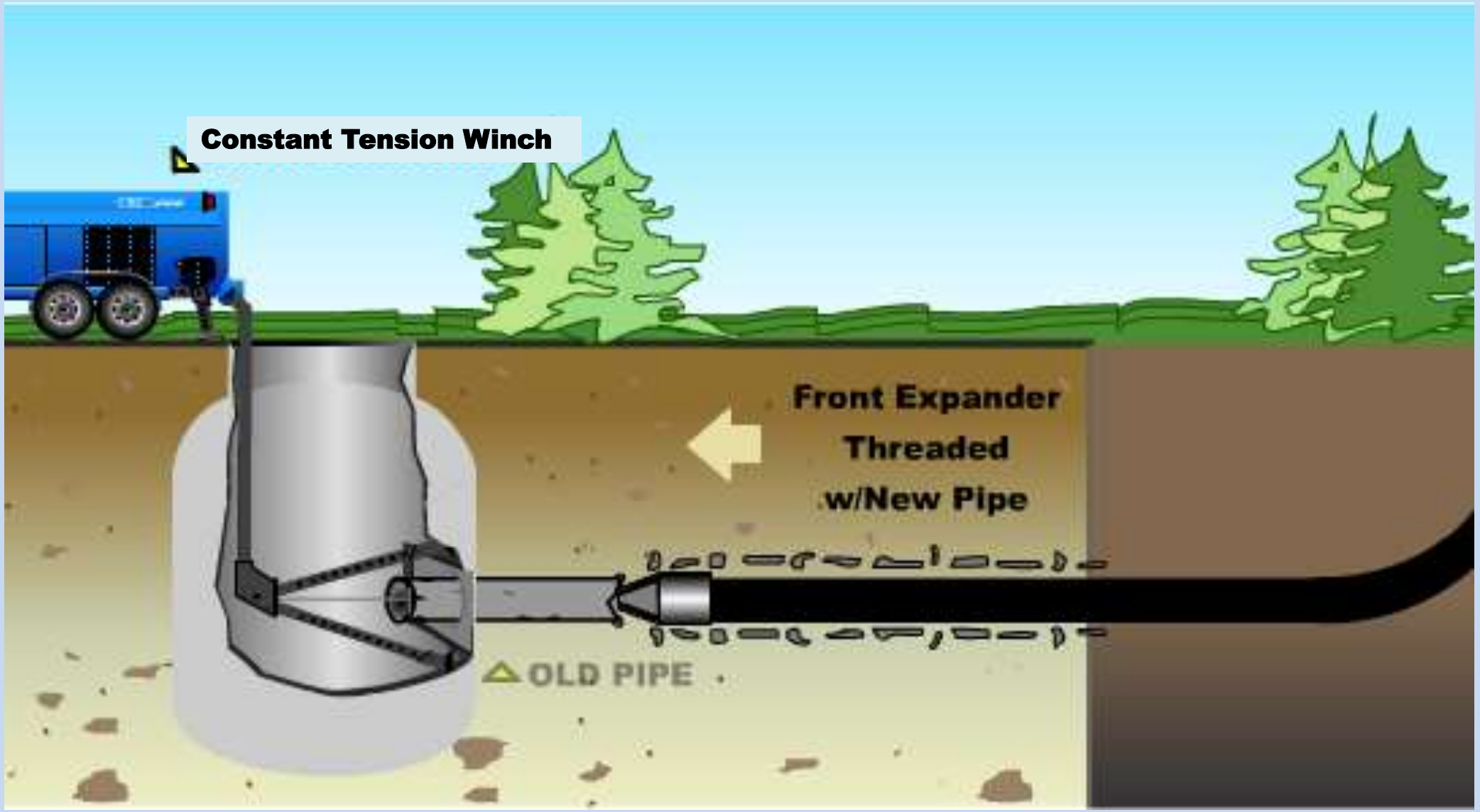


Pneumatic Pipe Bursting System

Reversible Pneumatic Systems



Reversible Pneumatic Systems



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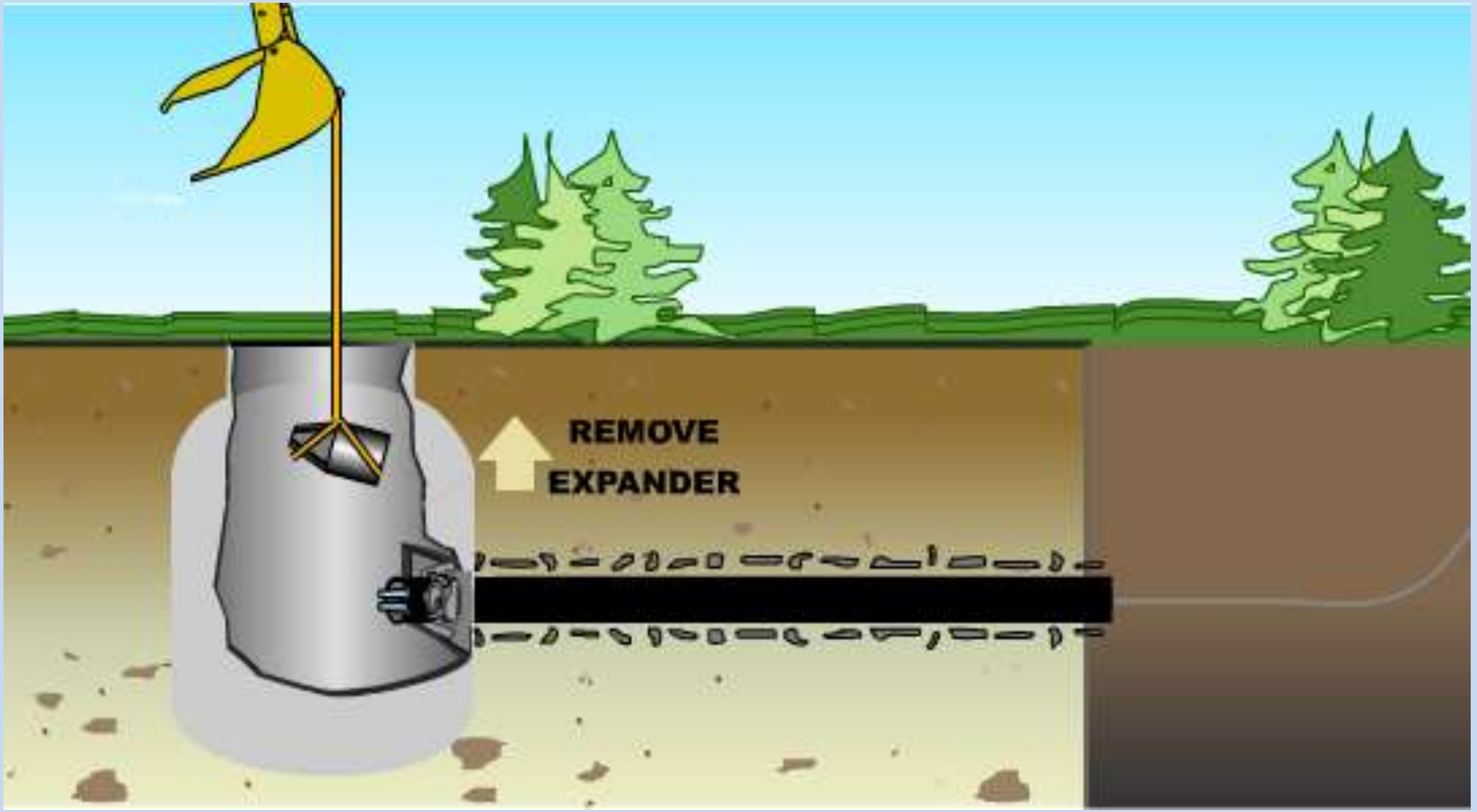
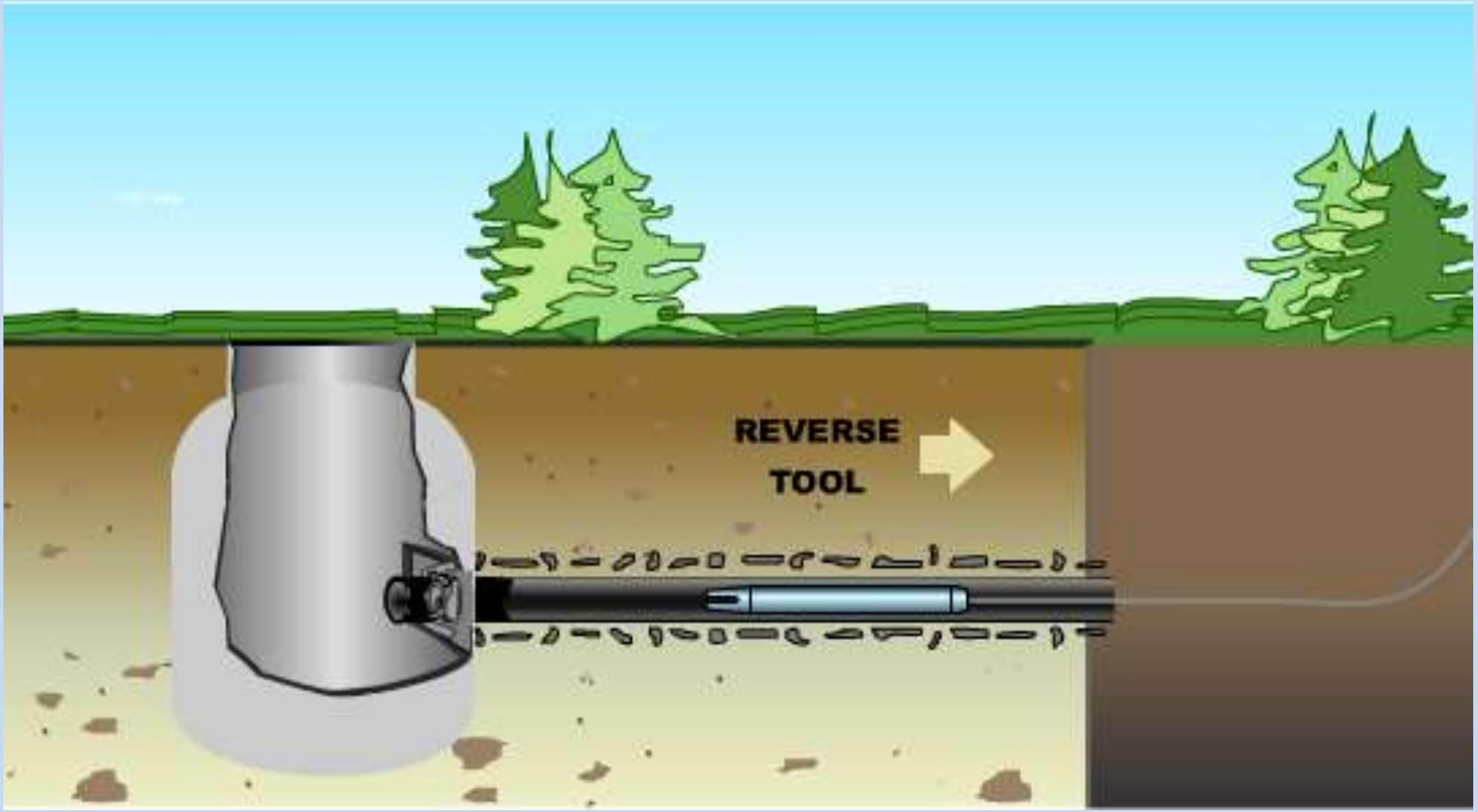


Reversible Pneumatic Systems



Reversible Pneumatic Systems

Reversible Pneumatic Systems

Reversible Pneumatic Systems

Reversible Pneumatic Systems

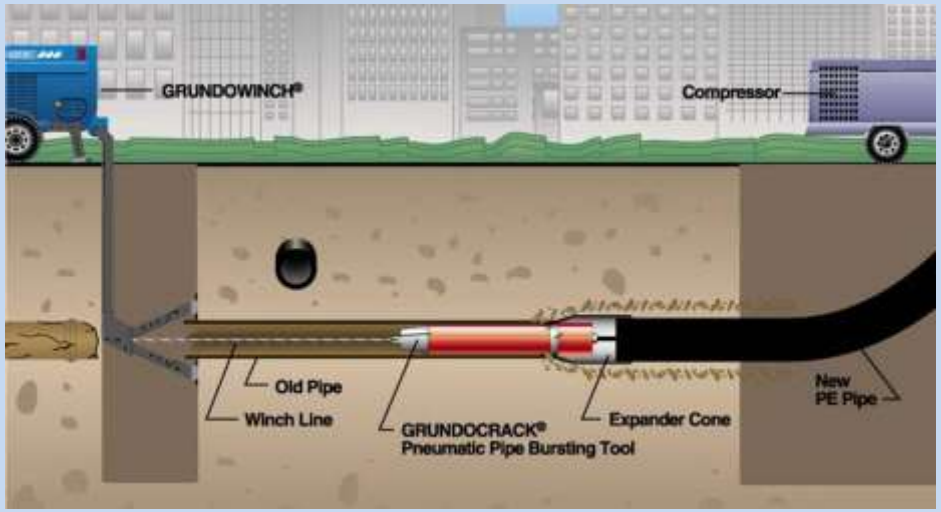
Reversible Pneumatic Systems

CAPABILITIES: PNEUMATIC SYSTEMS

- **Pipe Burst Existing Fracturable pipes only**

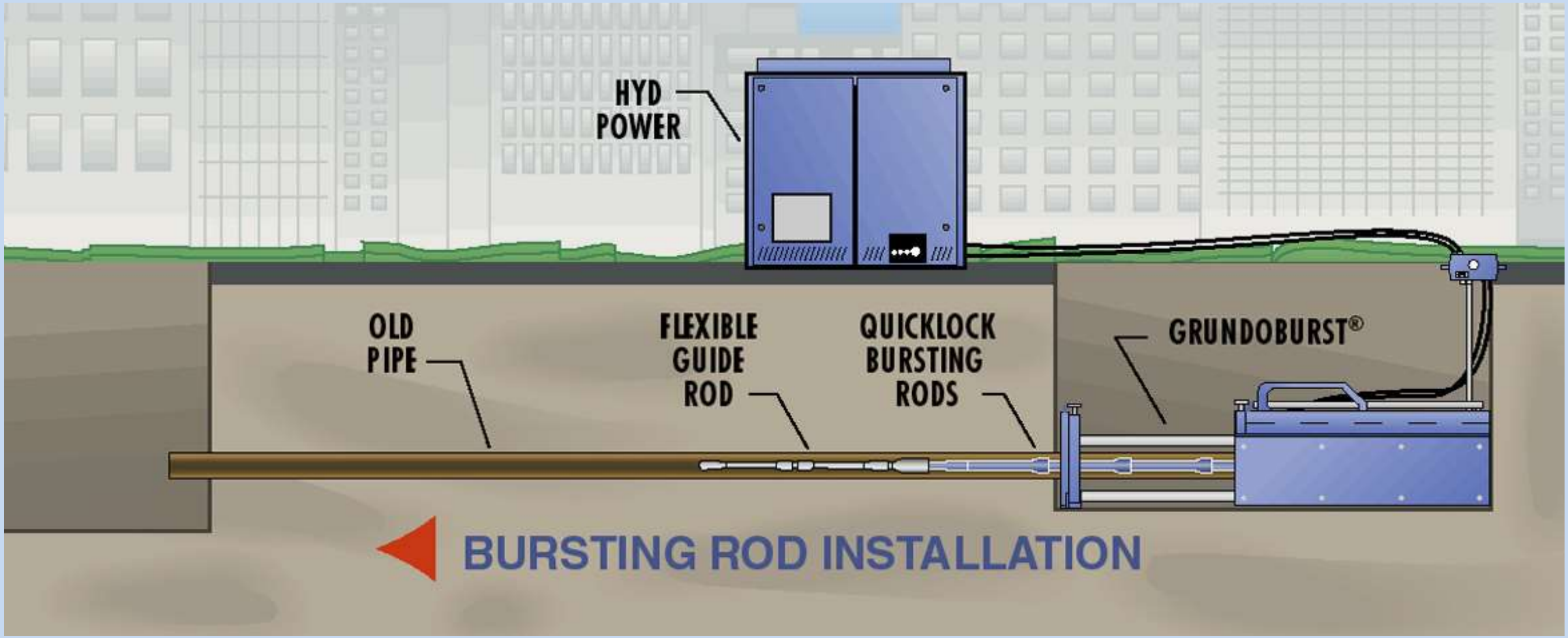
  (VCP, Concrete, Cast Iron, PVC and Asbestos Cement “Transite”)

- **New Pipe - HDPE only**

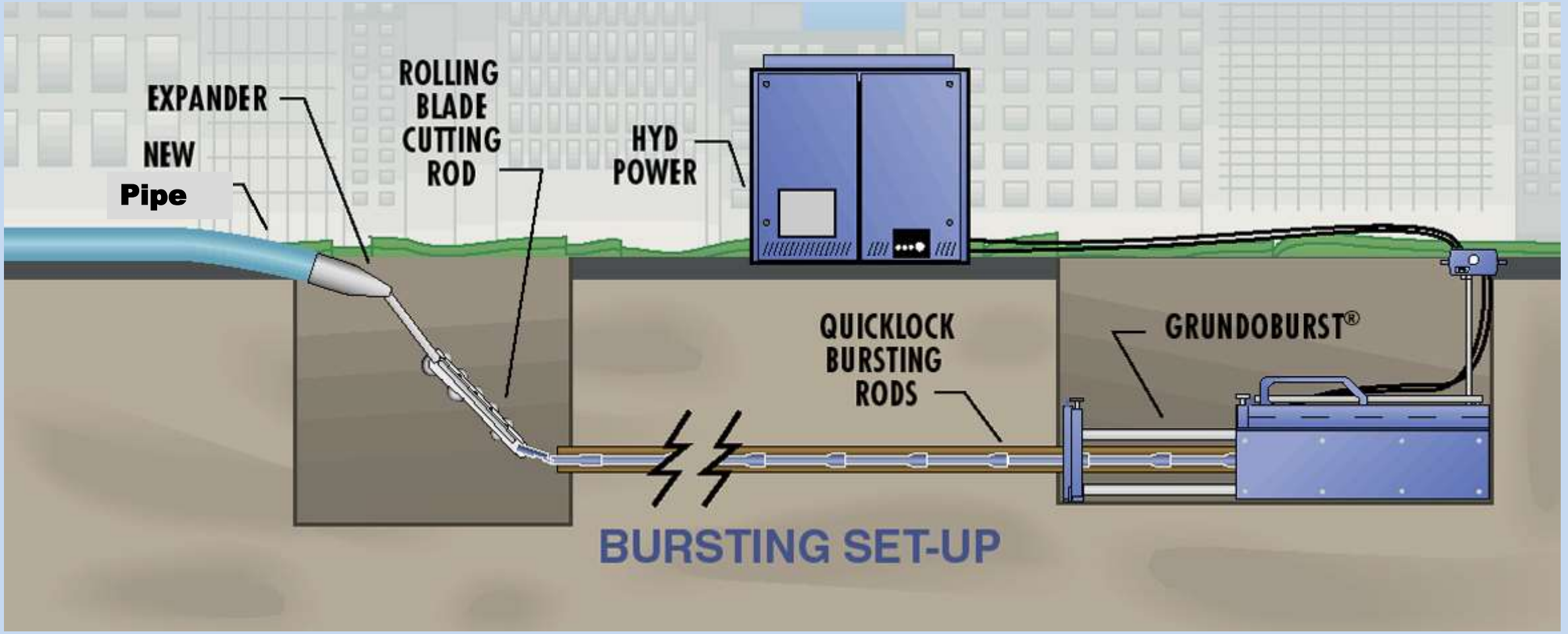


Static Pipe Bursting Systems

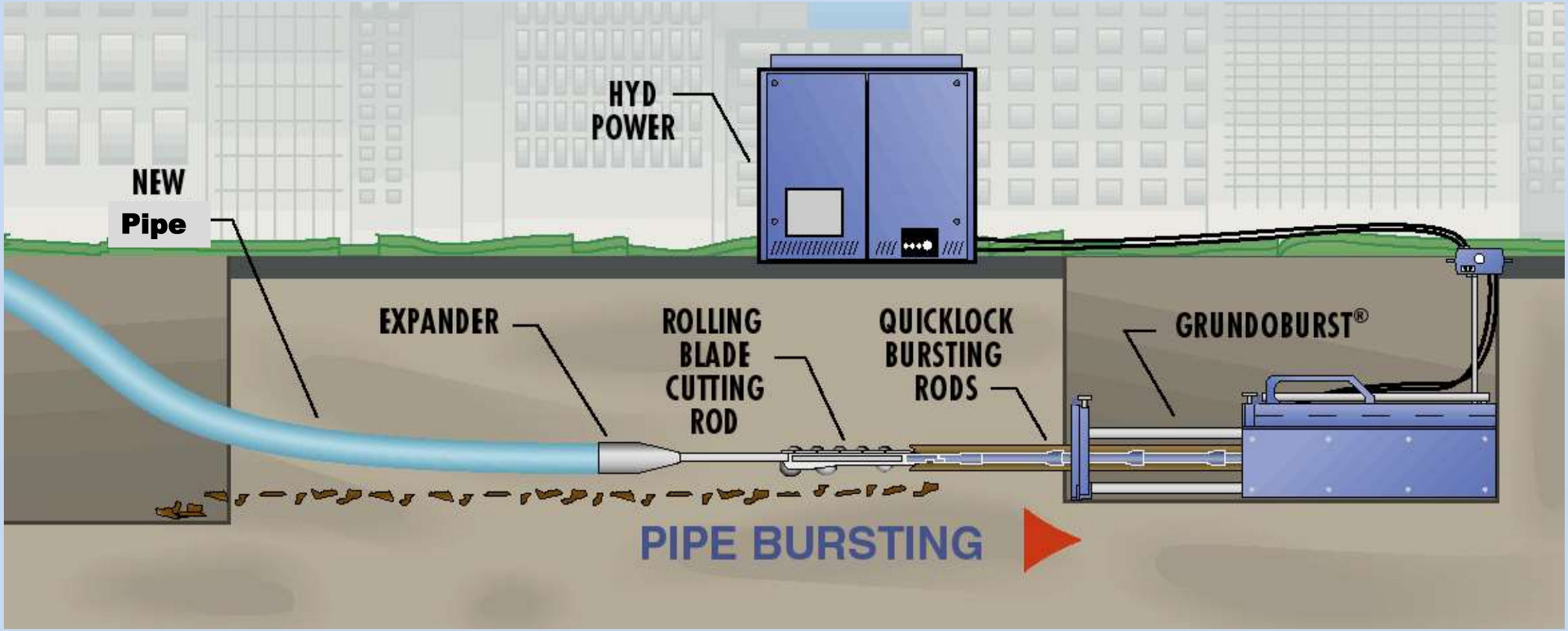
Static Bursting Step 1



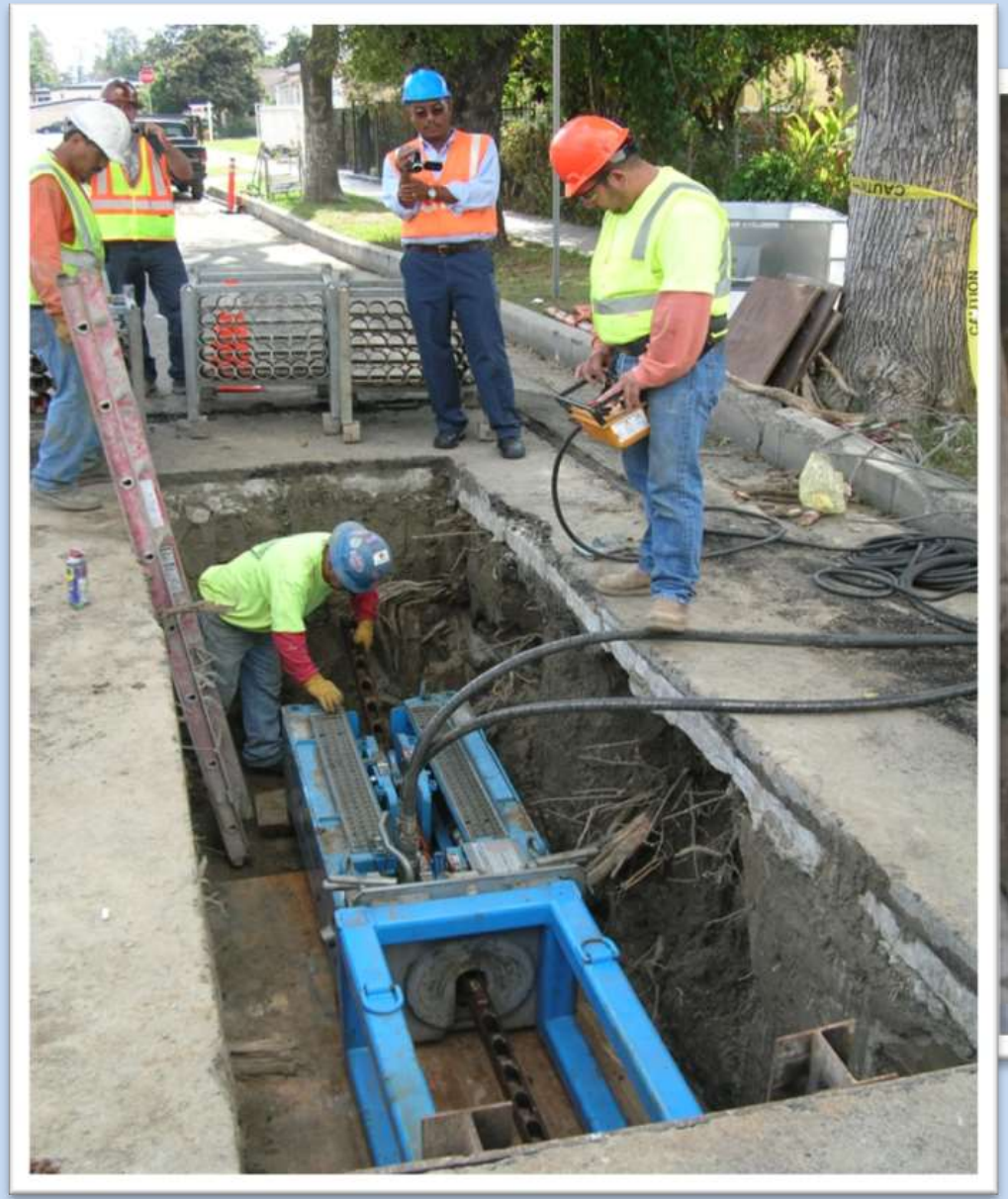
Static Bursting Step 2



Static Bursting Step 3



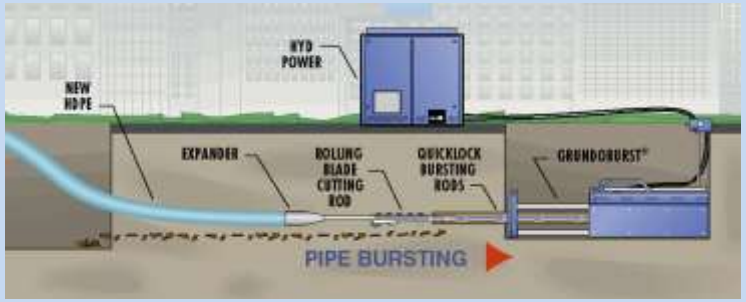
Static Bursting




SPEED
LIMIT
25

Capabilities: Static Systems

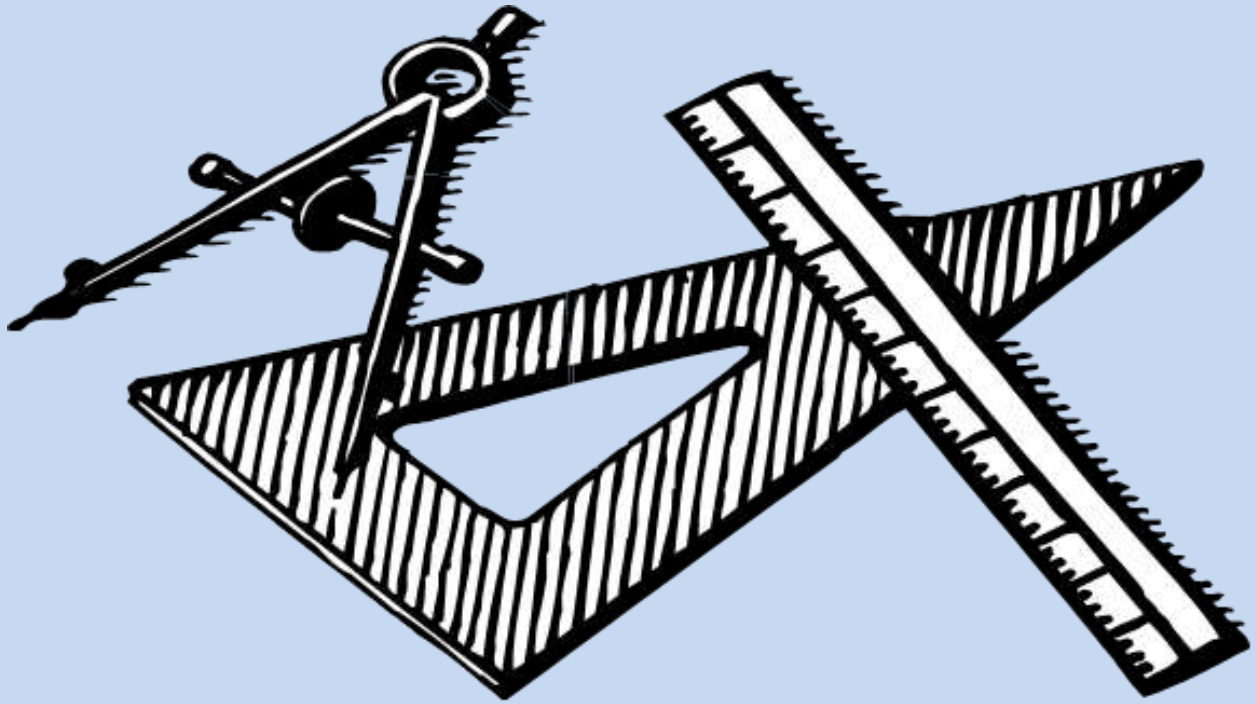
- Pipe Burst not only Existing Fracturable Pipe but, also Non-Fracturable Pipe (HDPE, Ductile Iron, Steel)
- Accessories used to help split mechanical repairs & fittings
- New Pipe - All types (FPVC, HDPE, Restrained Joint PVC, Ductile Iron, VCP)
- Attachments used to split fittings



Specialized Tooling

New Factory Manufactured Pipe

Design Considerations



IPBA Classifications of Difficulty and Increase of New Pipe Diameter

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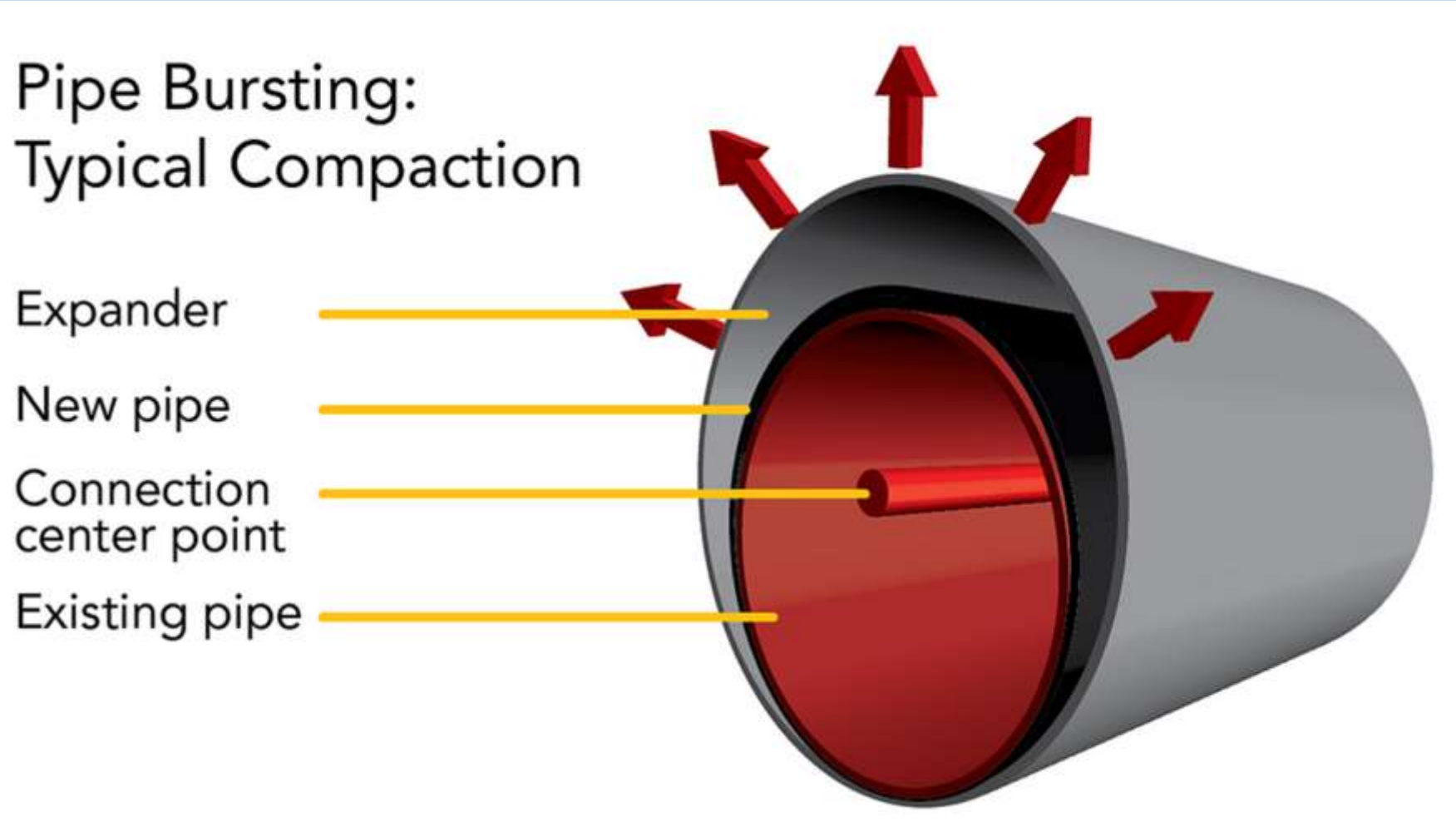
IPBA CLASSIFICATION	Degree of Difficulty	Depth of Pipe (ft)	Existing Pipe ID (in)	New Pipe Diameter Comparitive to Existing Pipe	Burst Length (ft)	Original Trench Width	Soil Type
A	Minimal	<12	2 – 12	Size on Size	0 – 350	Relatively wide trench compared to expander head outside diameter.	Compressible soils outside trench (loose sand, gravel, soft clay).
B	Moderate	>12 to <18	12 – 18	Single Upsize	350 – 500	Trench width less than 4" wider than the expander head outside diameter.	Moderately compressible soils outside trench (medium dense to dense sand, medium to stiff clay).
C	Comprehensive	>18 +	20 – 36	Double / Triple Upsize	500 – 1,000	Incompressible soils outside trench.	Constricted trench geometry (width less than or equal to outside diameter of burst head).
D	Developmental						

Expansion – Where does it go?



Expansion – Where does it go?

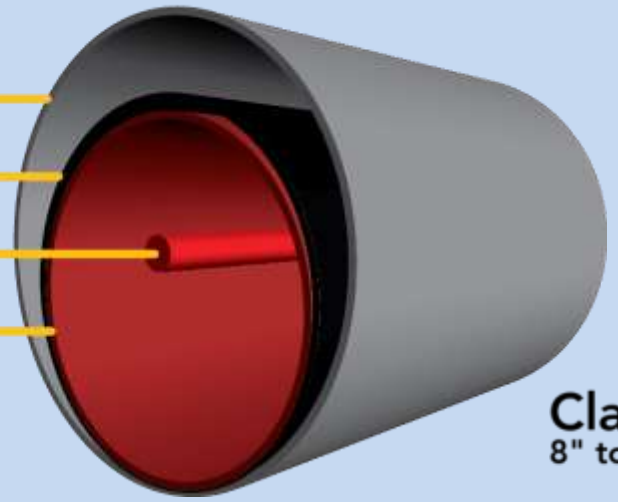
Class A Pipe Burst
8" to 8" (size on size)

Expander OD: 10.35"

New pipe OD: 8.625"

Connection center point

Existing pipe ID: 8.00"



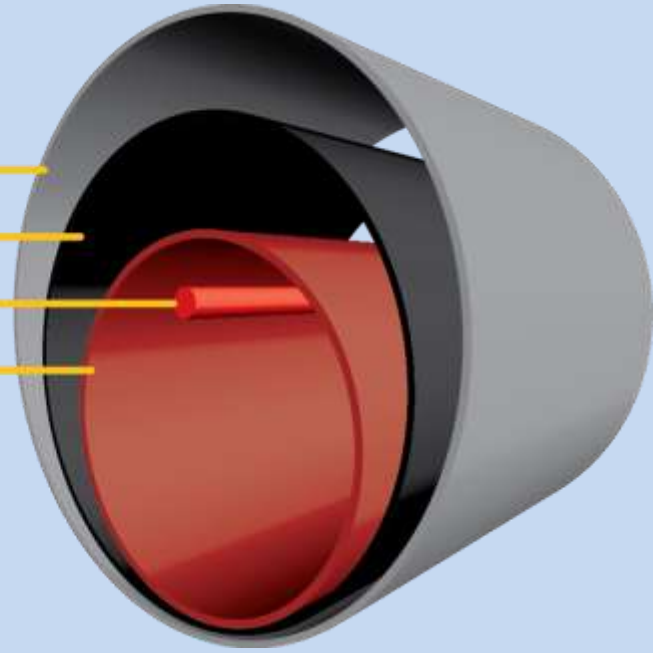
Class B Pipe Burst
8" to 10" (single upsize)

Expander OD: 12.90"

New pipe OD: 10.75"

Connection center point

Existing pipe ID: 8.00"



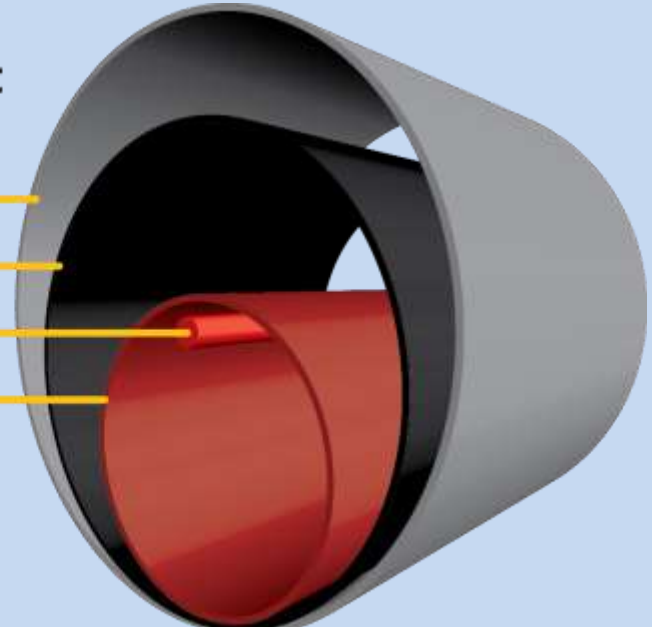
Class C Pipe Burst
8" to 12" (Double Upsize)

Expander OD: 15.30"

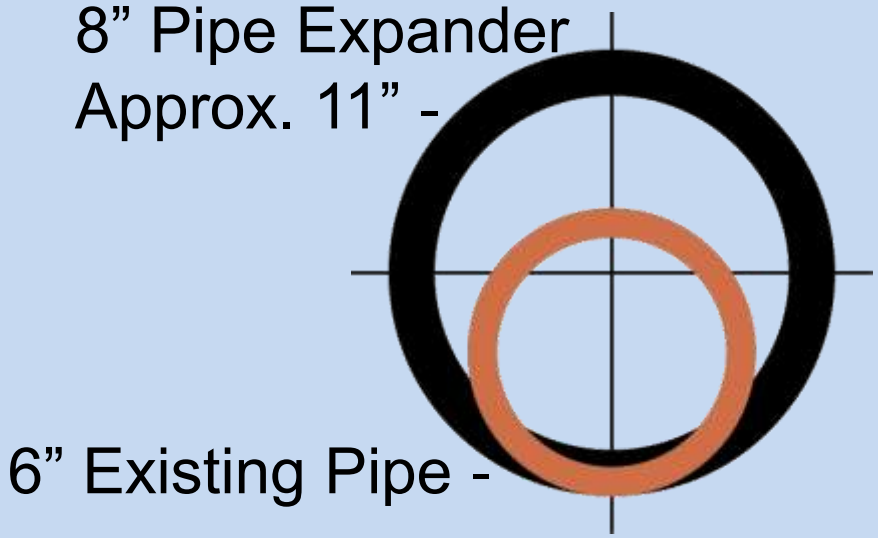
New pipe OD: 12.75"

Connection center point

Existing pipe ID: 8.00"



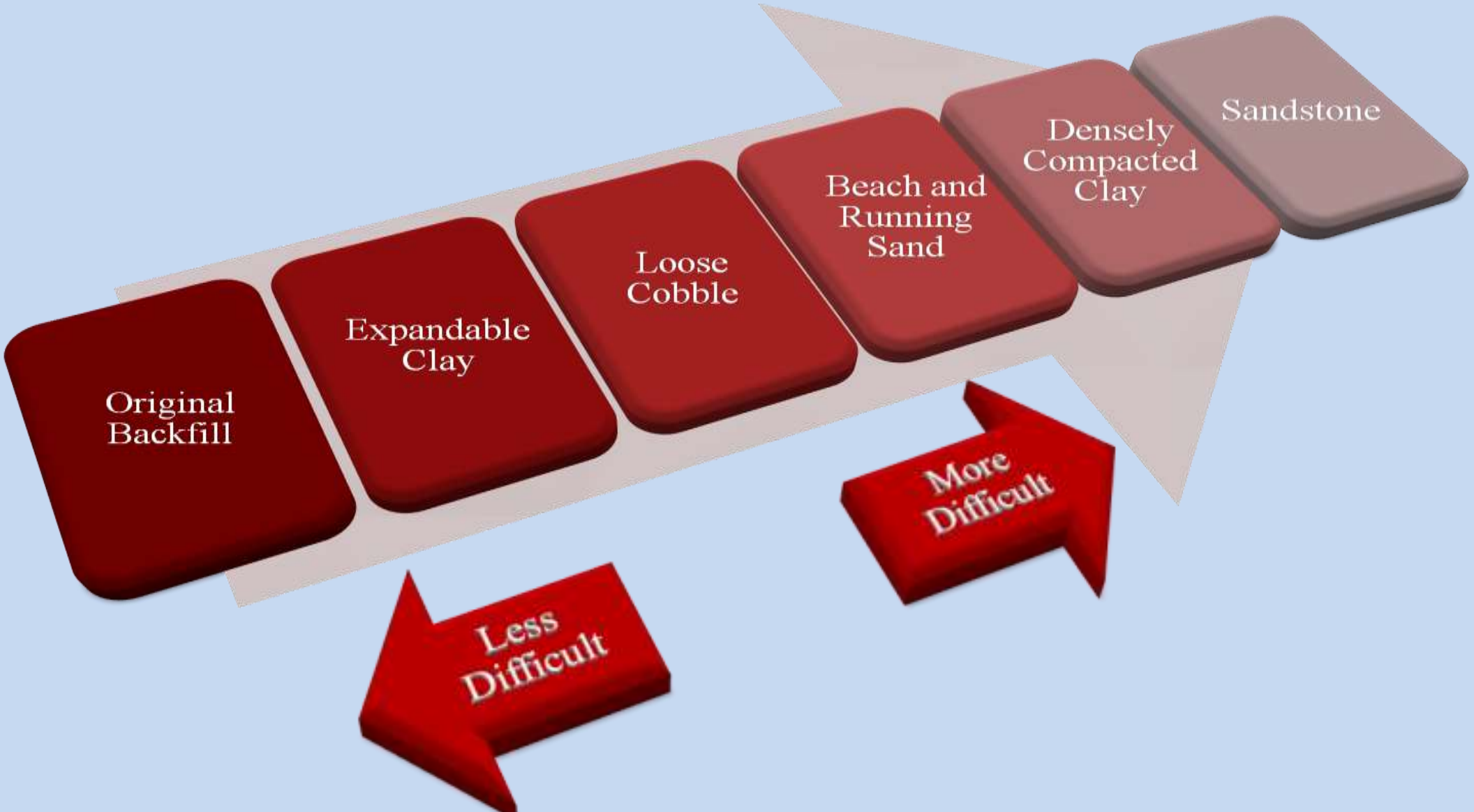
Burst Depth of Cover



Rule of Thumb:
10 x upsize difference in diameters

- 6” to 8” requires an 11” O.D. expander
- The differential is 5” (11” expander – 6” pipe)
- 5” x 10 = 50” or 4’-2” min. depth to prevent “heaving”

Soil Conditions



Lubrication Port - Pipe Bursting

Lubrication Port - Pipe Bursting

Construction

Bypass Systems

Service Connections - Laterals

Crossing Utilities

Fuse Pipe

Pipe Burst

New Factory Manufactured Pipe

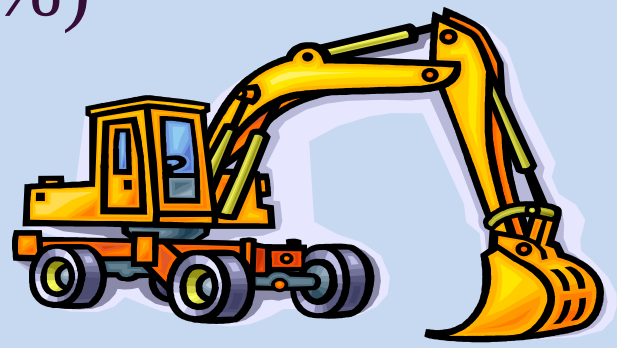
Service and Manhole Reconnect

Mainline Connections

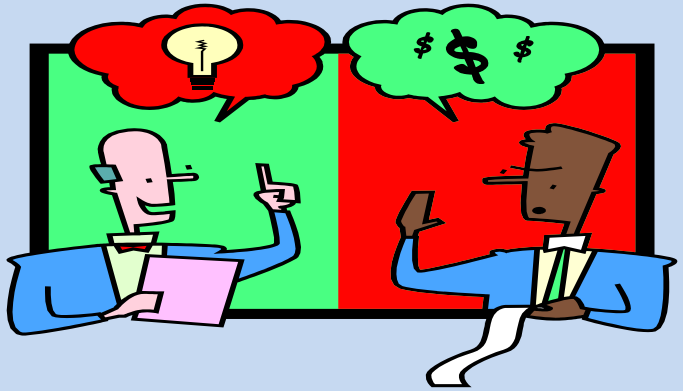
Resurface

Bursting vs. Open Cut
"Direct Costs"

- Less material removed and replaced
- Less Dewatering
- Less equipment and labor
- Utilizes existing pipe, utility corridor and ROW
- Lower cost overall (Savings bet. 20-50%)



Bursting vs. Open Cut
"Indirect Costs"



- Smaller work zone or "footprint"
- Less disturbance to traffic
- Less Impact to businesses
- Less time
- Less emissions – lower carbon foot print "Green Benefits"

Bursting vs. other rehabilitation options (Slip-lining, CIPP, etc.)

- No reduction in inside diameter (improved hydraulic capacity)
- Same size or Increased pipe diameters
- Factory Manufactured Pipe (vs. “field manufactured” CIPP, epoxy, and CML, etc.)
- Hard service reconnects (not simply “reinstated”)
- Better return on investment - engineering economic life (new pipe)

Questions?

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