THE UNDERGROUND UTILITIES EVENT
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Pipe Bursting Water Mains

Process, Design, Construction, and Case Studies

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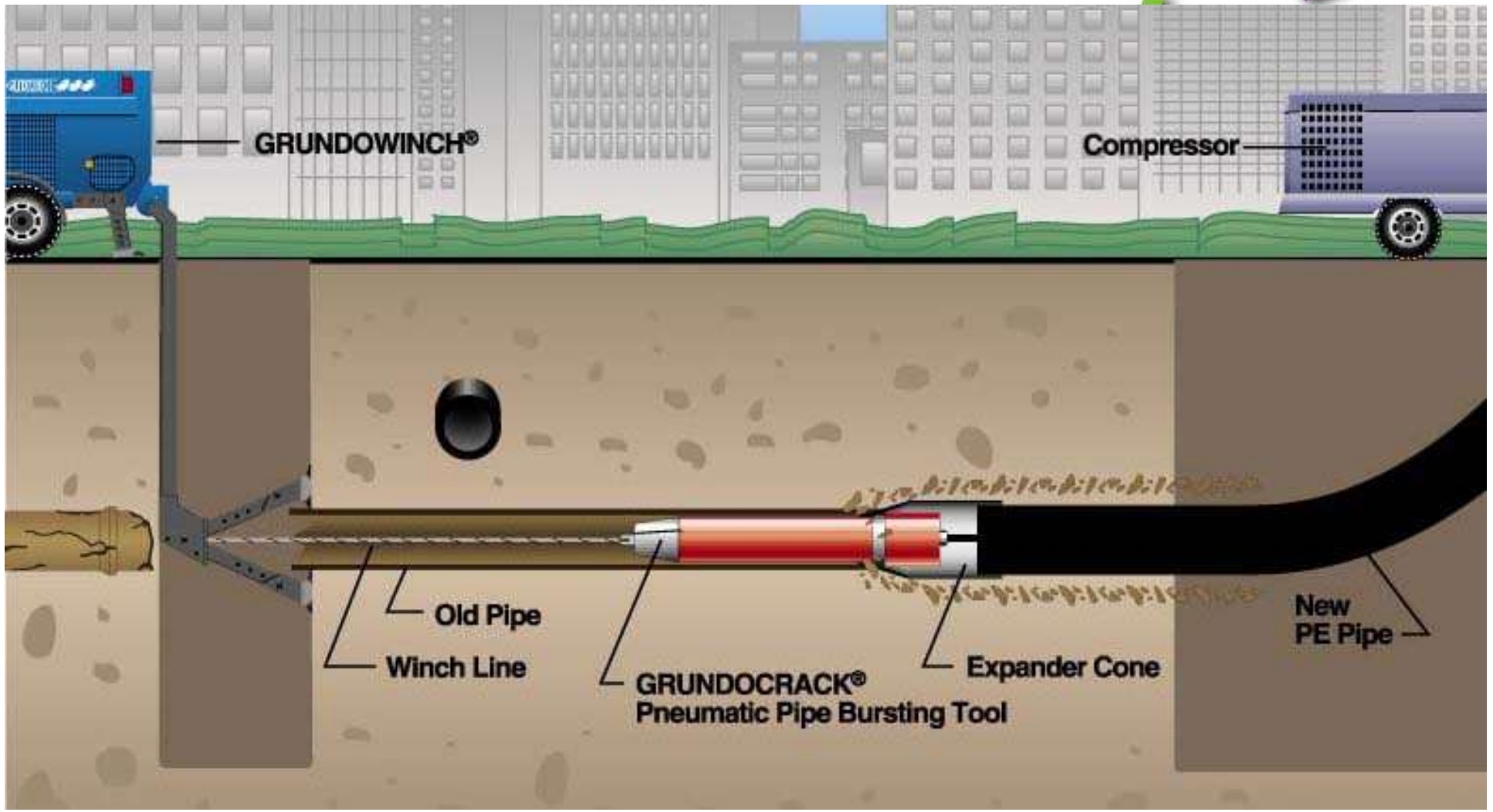
What is Pipe Bursting?

- trenchless rehabilitation & replacement technology
- fracture or split existing pipeline while simultaneously installing new “factory manufactured” pipe
- replace aging or capacity deficient mainline and lateral systems with same size or larger diameter pipe
- 4 inches to over 36 inches in diameter

Process and Systems

- Two Main Types or Classes of Pipe Bursting Systems
- Pneumatic
- Static

Pneumatic Pipe Bursting System

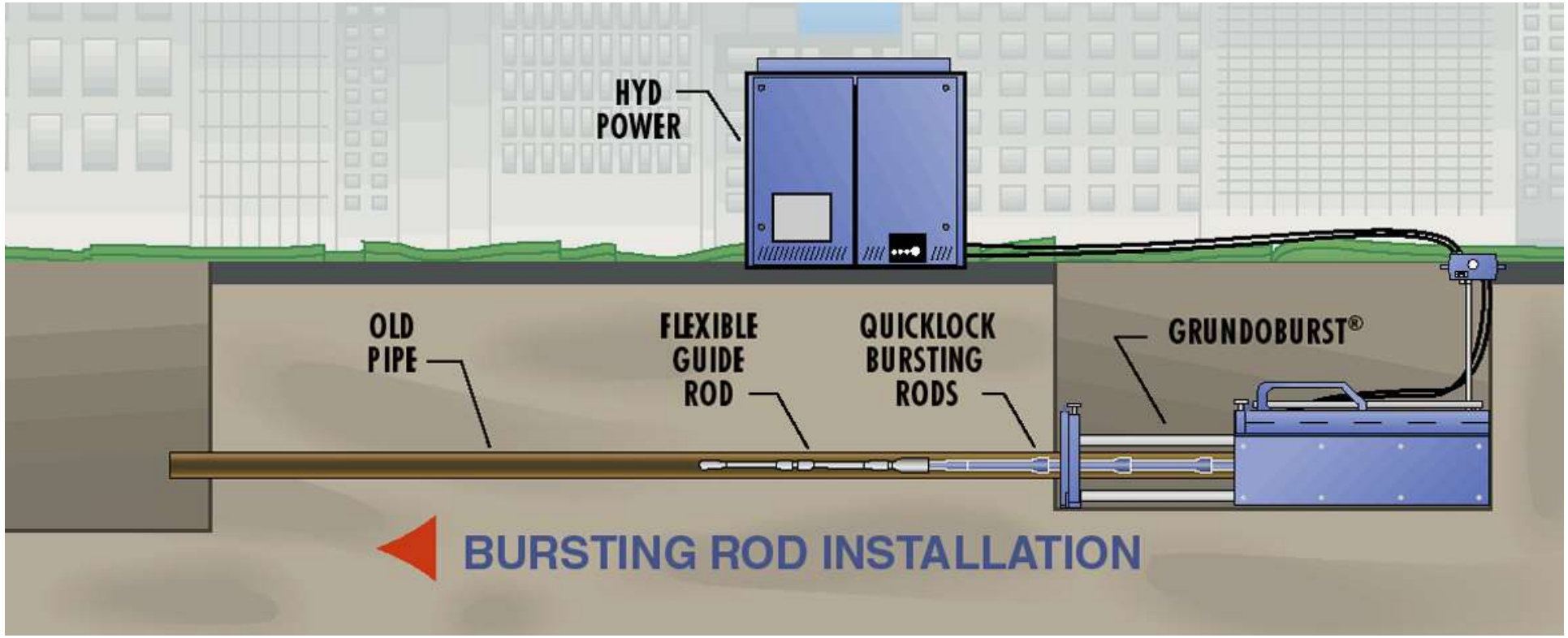


Capabilities – Pneumatic Systems

- Pipe Burst Existing Fracturable pipes only (Cast Iron, PVC and Asbestos Cement “Transite”)

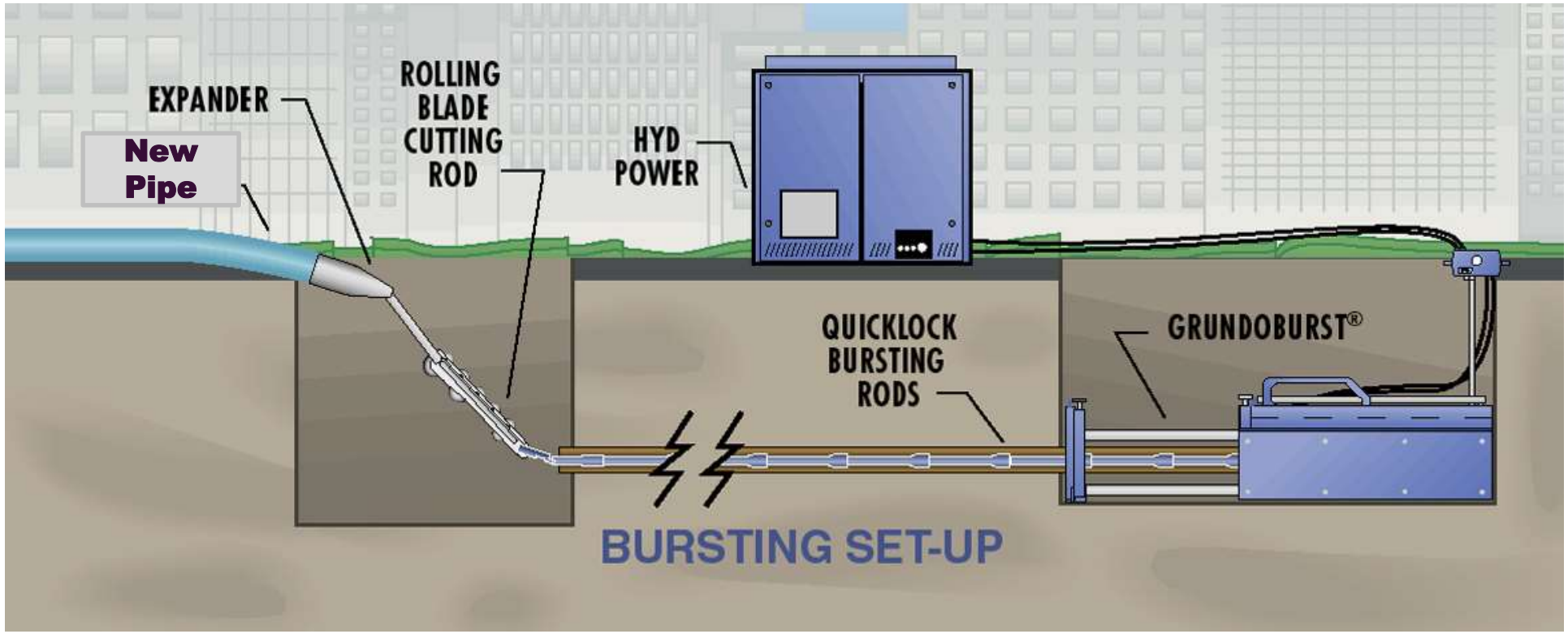
- New Pipe - only HDPE

Static Pipe Bursting System - Step 1

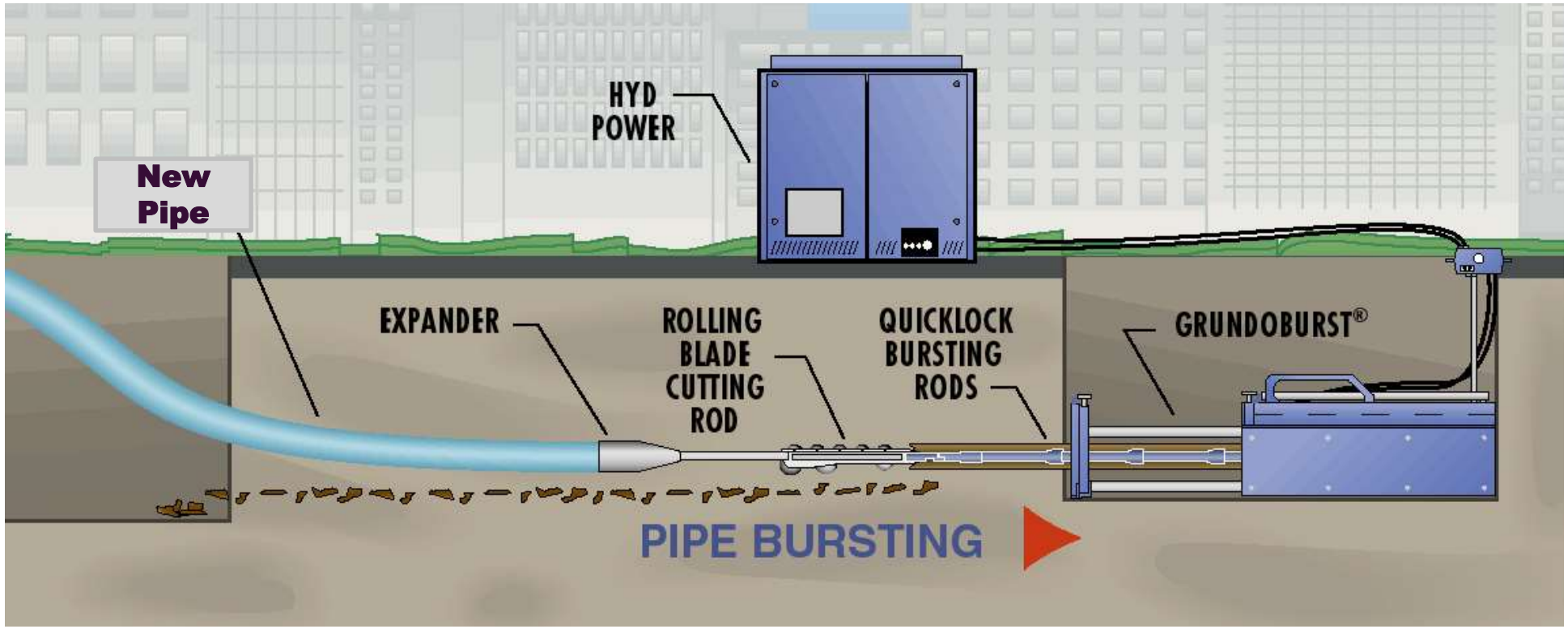


(most commonly used system in water pipeline bursting)

Static Pipe Bursting System - Step 2



Static Pipe Bursting System - Step 3



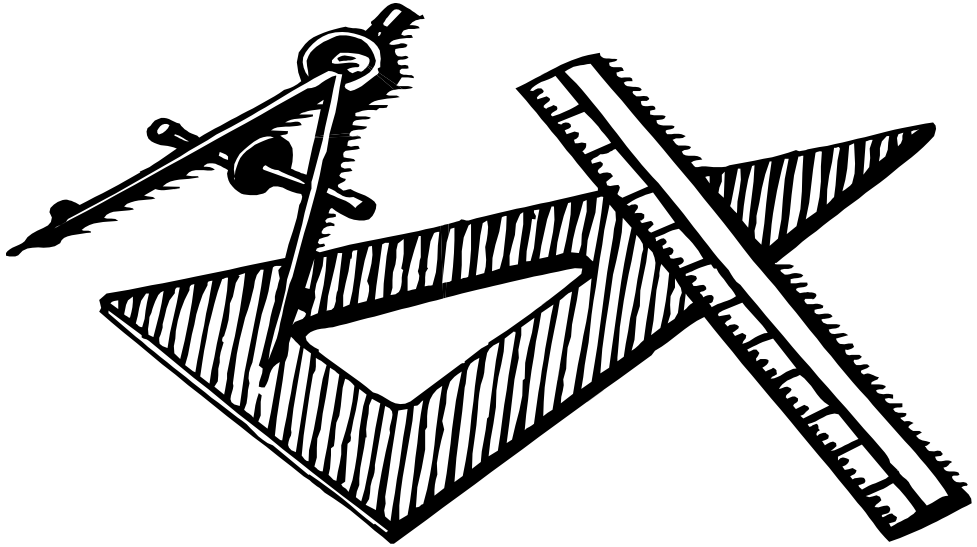
Capabilities – Static Systems

- Pipe Burst Not Only Existing Fracturable Pipe but, also Non-Fracturable Pipe (HDPE, Ductile Iron, Steel)

- Accessories used to help split fittings & repairs

- New Pipe - All types (FPVC, HDPE, Restrained Joint PVC, Restrained Joint Ductile Iron)

Design Considerations

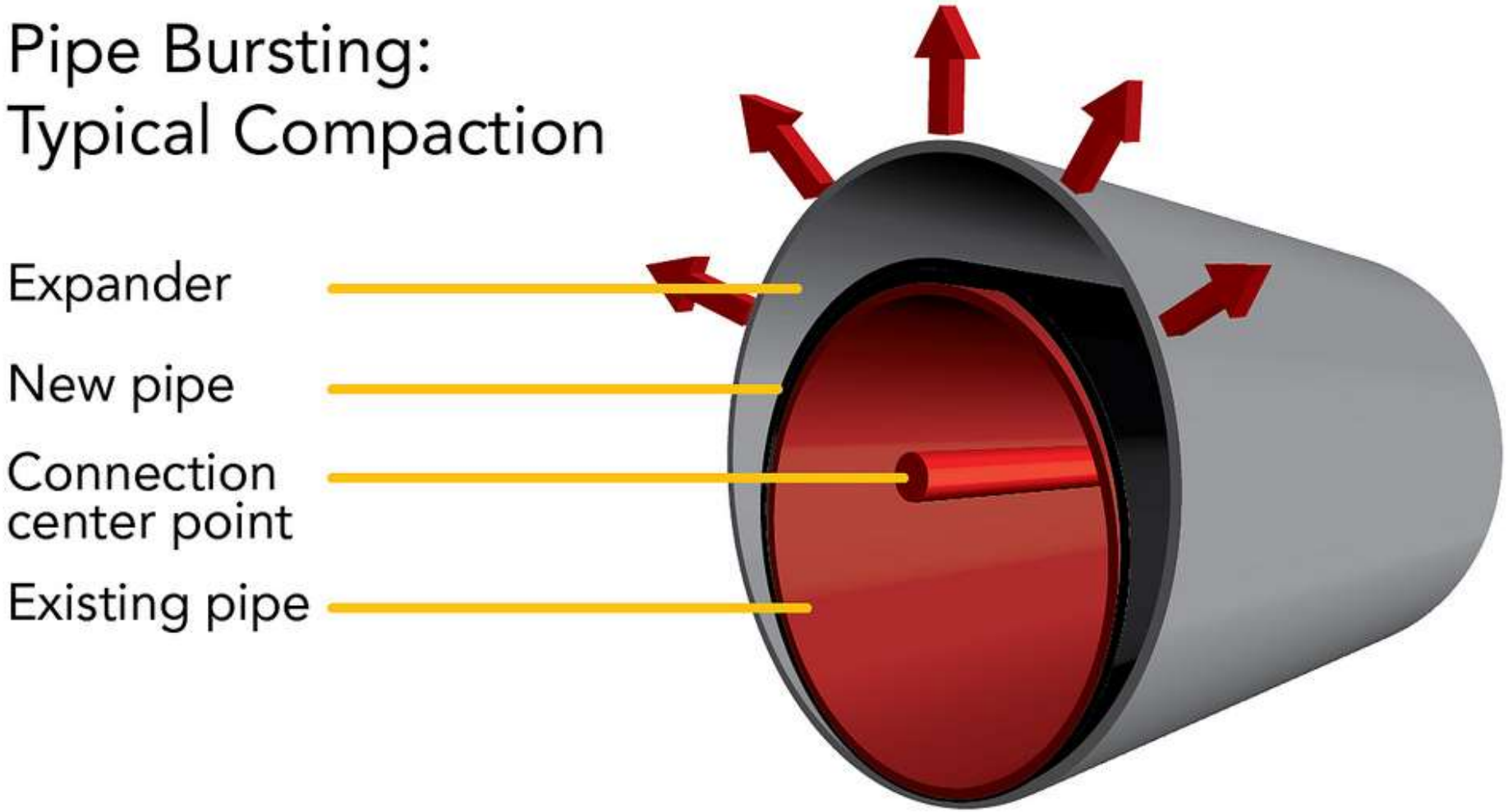


Classifications of Difficulty and Increase of New Pipe Diameter

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						

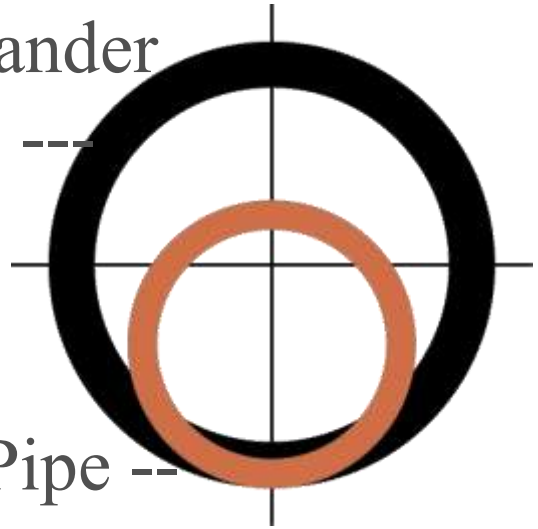
Per IPBA (International Pipe Bursting Association) – a Division of NASSCO

“Upsizing” – Expansion (where it goes)



Burst Depth of Cover

8” Pipe Expander
Approx. 11” ---



6” Existing Pipe --

<u>rule of thumb:</u>
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 approx. 4’-2” min. depth to prevent “heaving”

Soil Conditions

Degree of Difficulty Increases

Lubrication

Lubrication

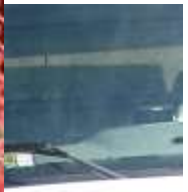
Construction

Temporary Bypass Pipelines

- Common Practice – minimal cost
- Maintain water & fire services
- Allows for the Trenchless Technology process
- Minimum impact on public and environment (predictable/manageable)

Temporary Bypass Pipelines

- Demand Considerations - residential, commercial, industrial, and fire protection
- Utility provides criteria
- Contractor or Utility
  determines size, layout and permits




2 HOUR
PARKING
9 A.M. - 6 P.M.


ROAD
CLOSED


CASE


STOP


1032


CAUTION

Fused HDPE

Fusible PVC


Restrained
Joint PVC

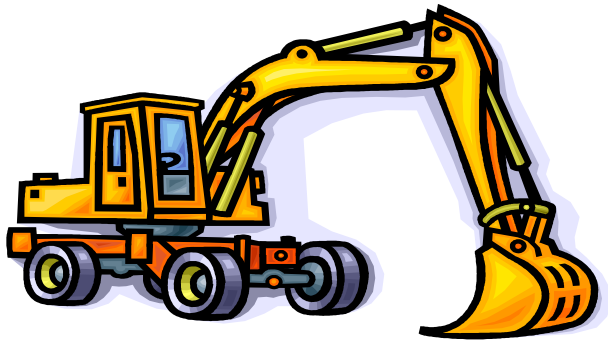

Restrained Joint
Ductile Iron


LAS
VIRGENES
DISPOSAL
818-889-9400

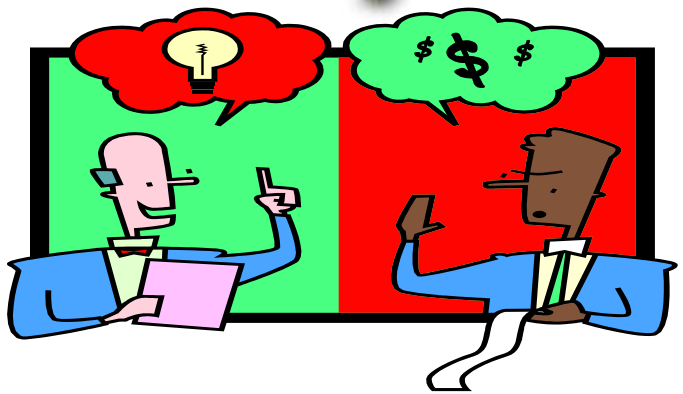
Pipe Bursting vs. Open Cut

"Direct Costs"

- Less material removed and replaced
- Less Dewatering
- Less equipment and labor
- Utilizes existing utility corridor and ROW
- Lower cost overall



Pipe Bursting vs. Open Cut

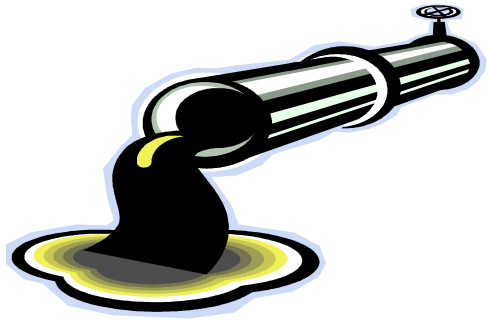


"Indirect Costs"

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

Pipe Bursting vs. other rehabilitation Options Sliplining, CIPP, Cement lining, etc.

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



Savings by Water Agencies…

	City of Billings, MT	Consolidated Water, CO	Cheyenne Water, WY	Lee's Summit, MO	Greensboro, NC
Approx. Footage thru 2014	18,215	167,740	20,990	43,100	38,080
Existing Pipe Diameter	4-8"	4-8"	4-8"	4-8"	2-8"
New Pipe Diameter	8-12"	4-8"	8-12"	6-8"	6-8"
Savings over Open Cut	50%	50%	20%	23%	20% +

Nationally – Savings between 20-50% using pipe bursting over traditional open cut.

Questions?

Thank You! ,

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