UCT educational sessions

Pipe Bursting Class C Projects

NO-DIG TEC TRENCHLESS TECHNOLOGY

John Newell

Pipe Bursting Defined.

The breaking of an existing pipe, expanding the broken pipe shards into the surrounding soil ……

while simultaneously pulling in the new HDPE line

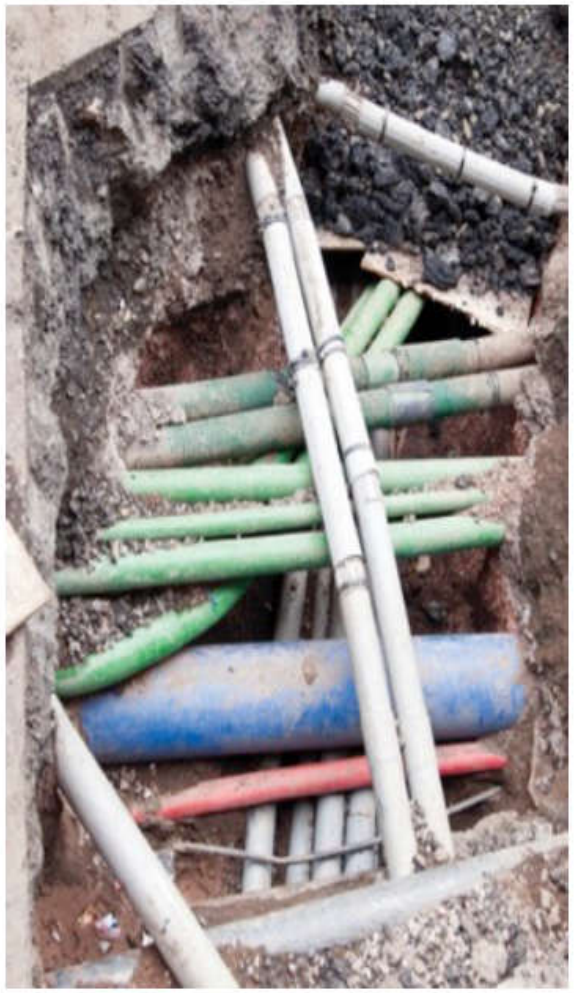
Open Cut Replacement Cost

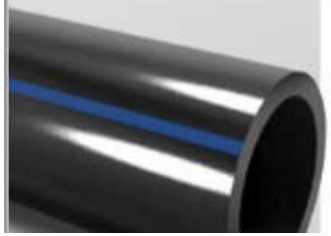
- Pavement saw-cutting
- Excavation
- Trucking spoil and dump fees
- Backfill and transport
- Compaction
- Concrete or asphalt repair
- Traffic control
- Bypass Pumping

Pipe Bursting Benefits

- Installs a new seamless pipe
- Ability to upsize
- Eliminates up to 85% of excavation
- Follows the path of the existing utility
- Less disturbance to traffic patterns
- Often more cost effective than open trench replacement
- Proven technology with 60,000,000 feet installed worldwide

- Reduced excavation minimizes environmental footprint
- Reduced carbon dioxide emissions from less machinery and shortened construction schedule
  - Pipe bursting is found to reduce greenhouse gas emissions over traditional open cut by 75-90%
- Reduces infrastructure congestion





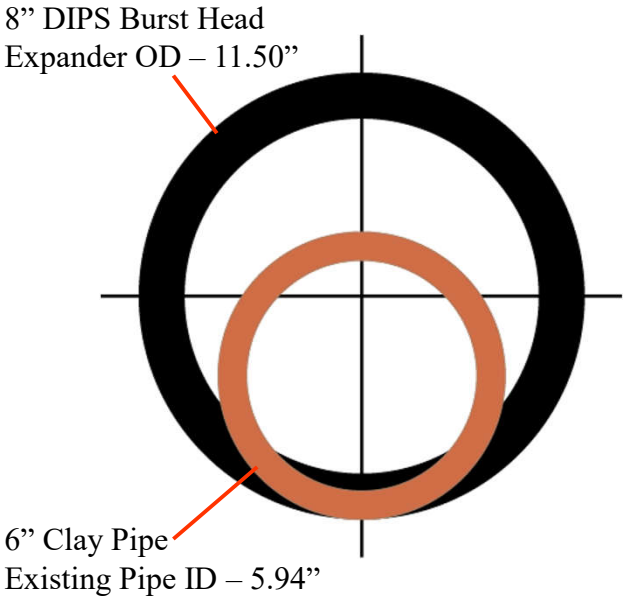

40
BUYERS


Schroeder
11800
LEFT-TURN SIGNAL
YIELD
WILLIE B JOHNSON RECREATION CENTER
RKM
DEERE
135C

What is Your Depth of Cover?

educational sessions

General rule is one (1) foot of cover for every inch of expansion



Expander OD (11.50)

−

Existing Pipe ID (5.94)

=

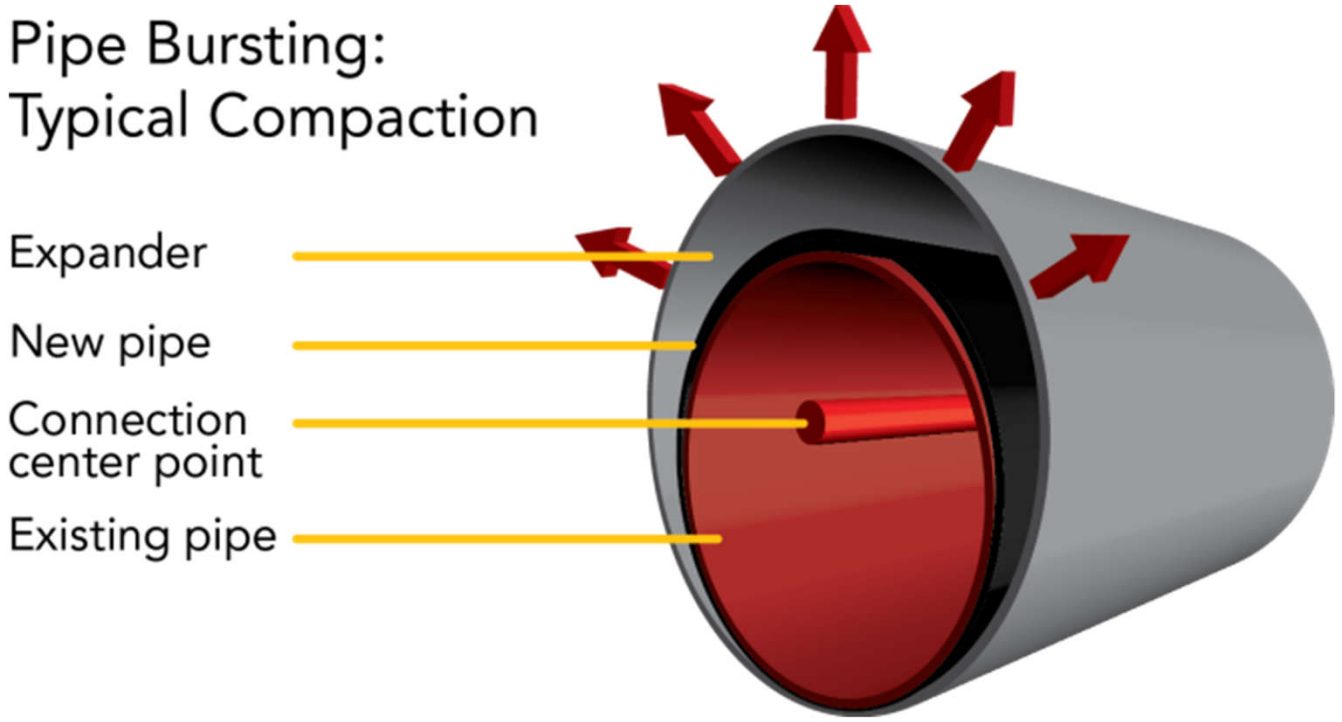
Calculated minimum cover: 5.56 feet

Note: any compaction recedes over time. The deeper the line, the less chance of surface disruption

Upsizing – Expansion

educational sessions

(Where the material is displaced to)



Approximately 90% of compaction occurs upwards from the existing line.


HAMMERHEAD

Host Materials

- Cast Iron
- Clay tile
- PVC
- Concrete
- Reinforced Concrete
- Asbestos Cement
- Ductile Iron
- Steel

IPBA Project Classification

educational sessions

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						

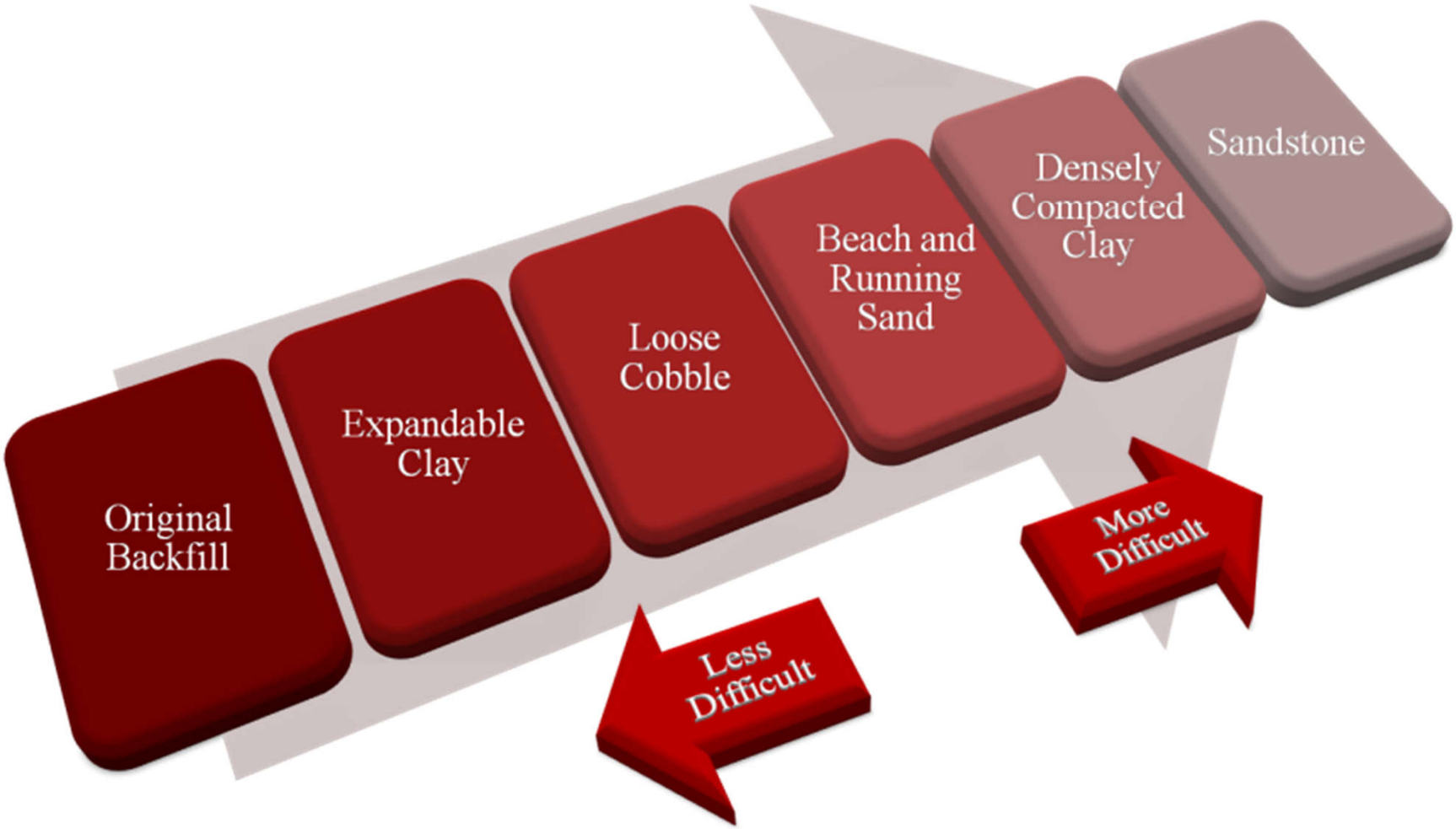
Project classifications per IPBA (International Pipe Bursting Association) pipe bursting specification.

Site Conditions

- Depth and original fill of utility
- Surrounding utilities
- Traffic flow patterns
- Temporary service needs

Soil Conditions

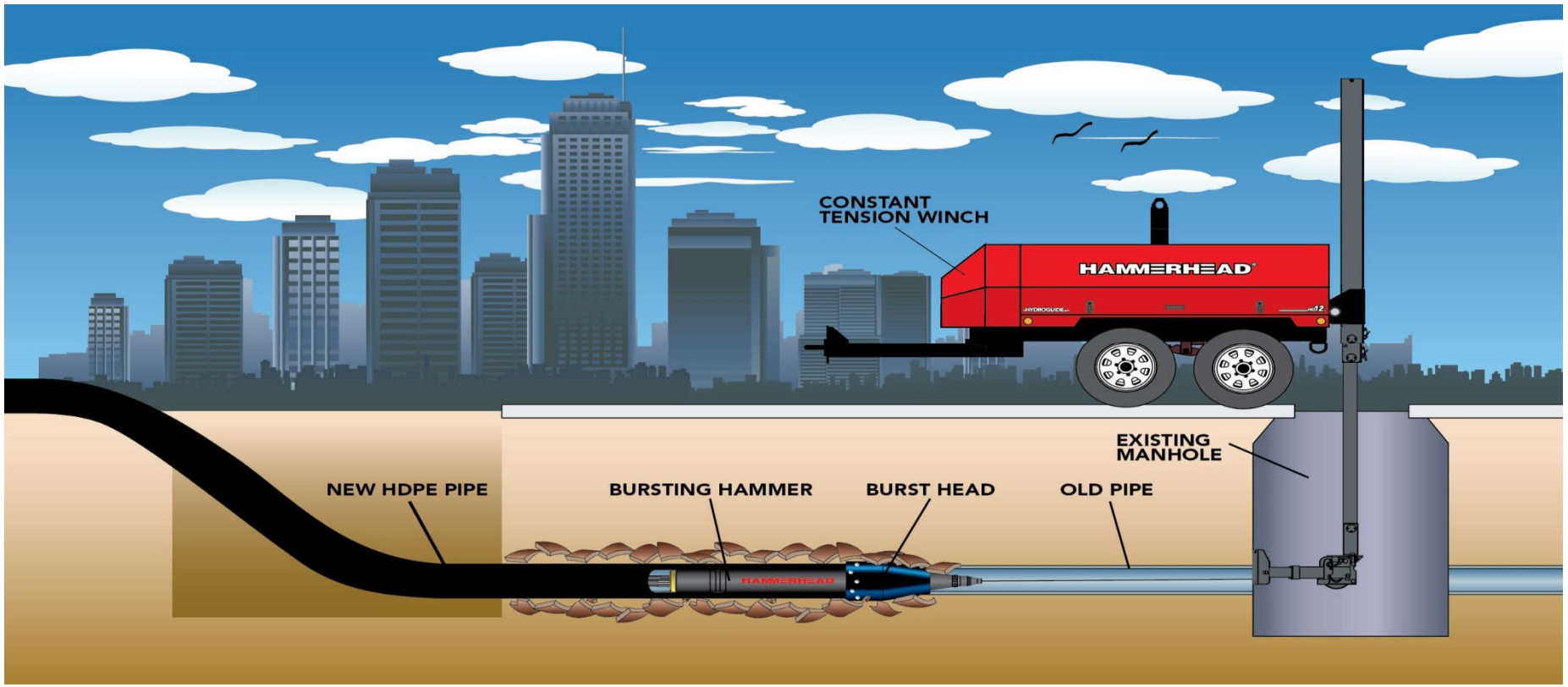
educational sessions



PNEUMATIC PIPE BURSTING – COMPONENTS

UCT educational sessions

Pneumatic Pipe Bursting – Process Illustration



MANHOLE EXITING

Operational Video

Static Bursting Systems

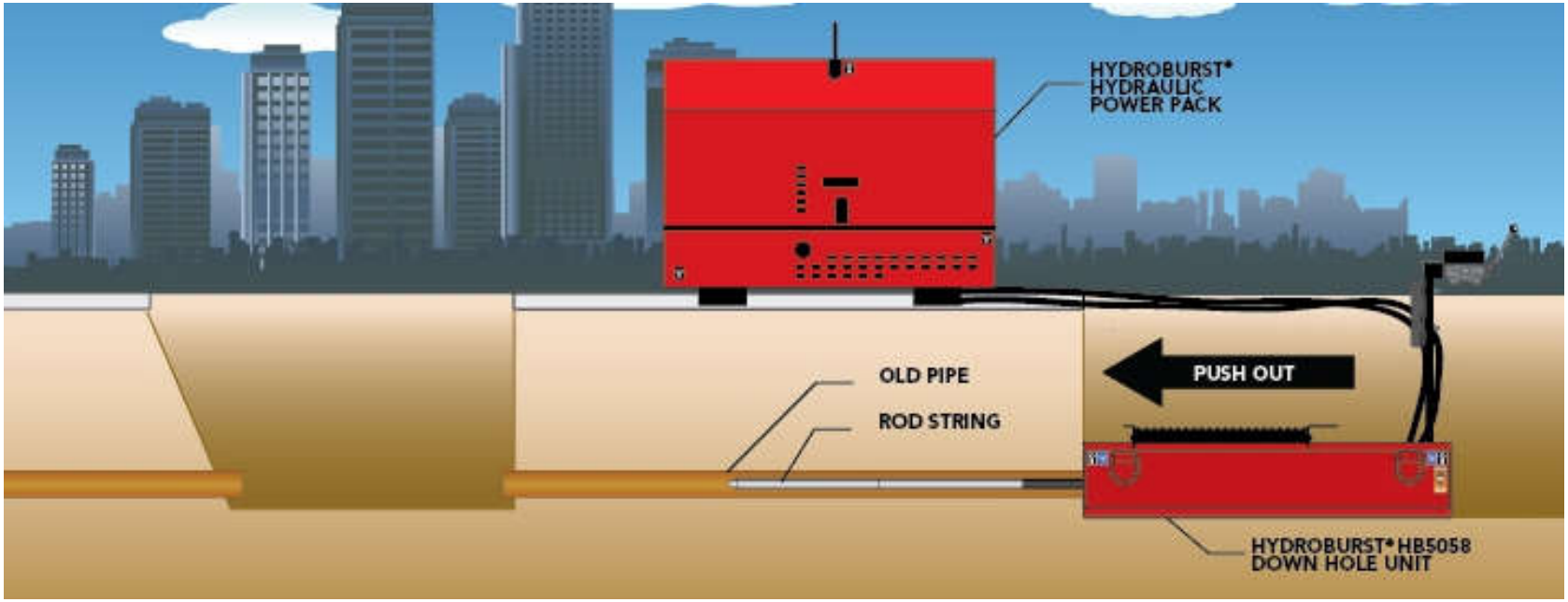
- Easy to operate
- No pipe contamination
- Continuous HDPE pipe
  - Less or no fusion time
  - Pre-chlorination
- Compact
  - Minimal surface disruption

Static Bursting Systems

educational sessions

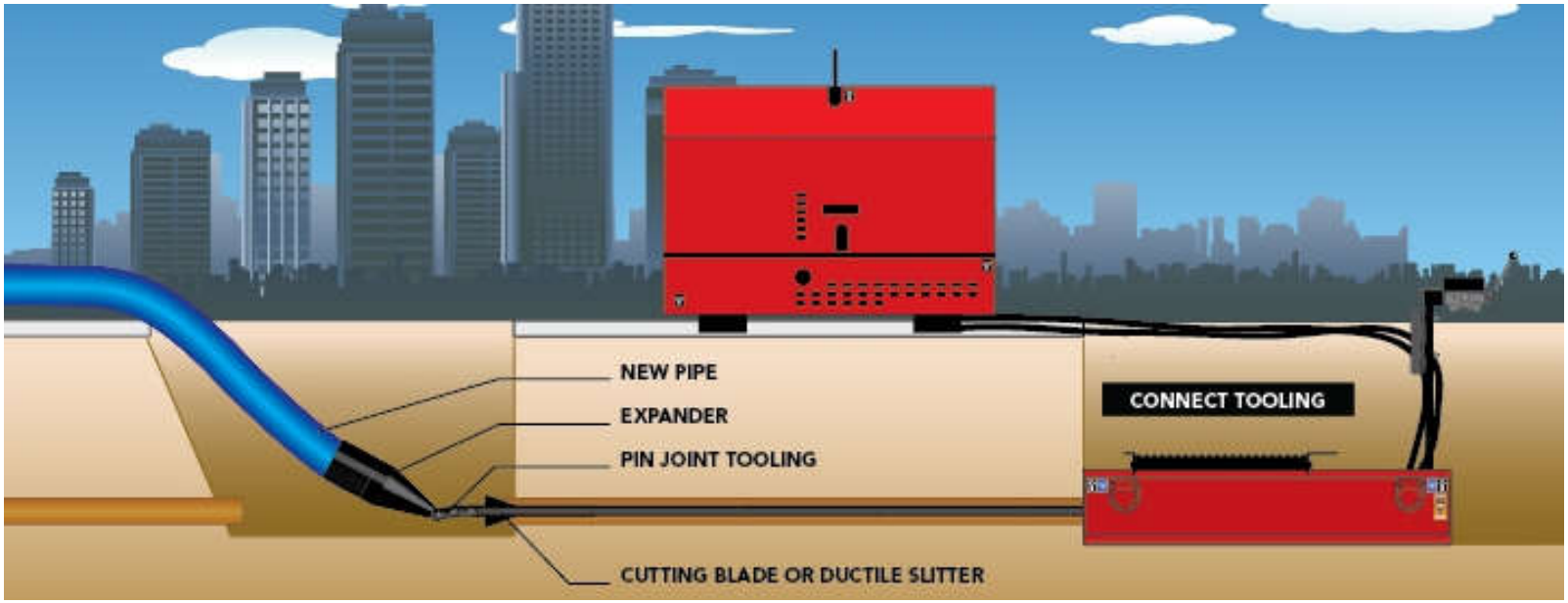
- High tonnage pull back force
- Bursting Head/Slitter
  - Breaks existing pipe
  - Expands surrounding soil
  - Pulls in new pipe

Push out rod

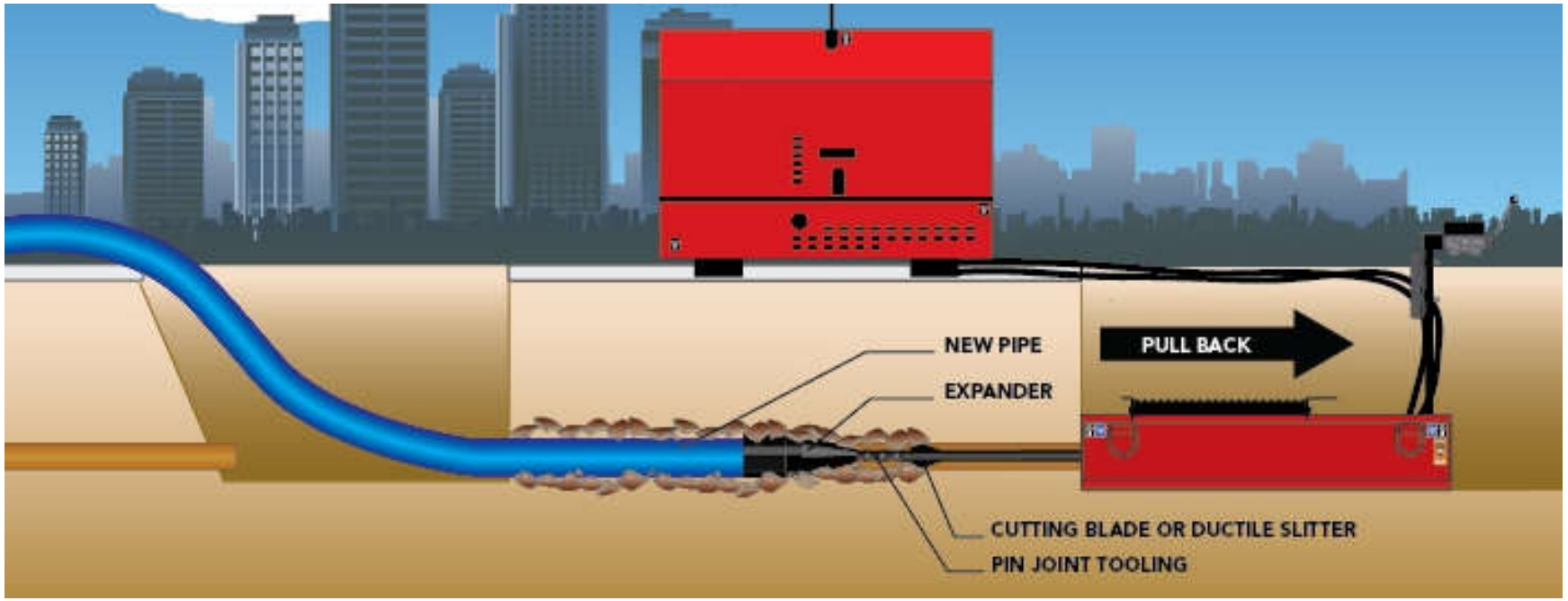

HYDROBURST*
HYDRAULIC
POWER PACK
OLD PIPE
ROD STRING
PUSH OUT
HYDROBURST* HB5058
DOWN HOLE UNIT

Attach tooling and pipe

educational sessions



Pull back

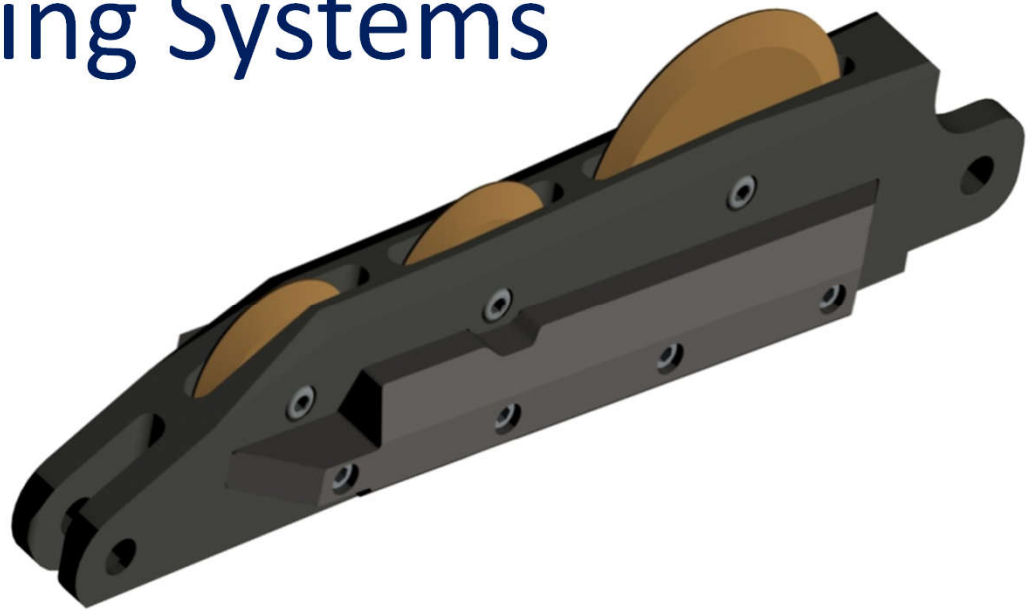

NEW PIPE
EXPANDER
PULL BACK
CUTTING BLADE OR DUCTILE SLITTER
PIN JOINT TOOLING

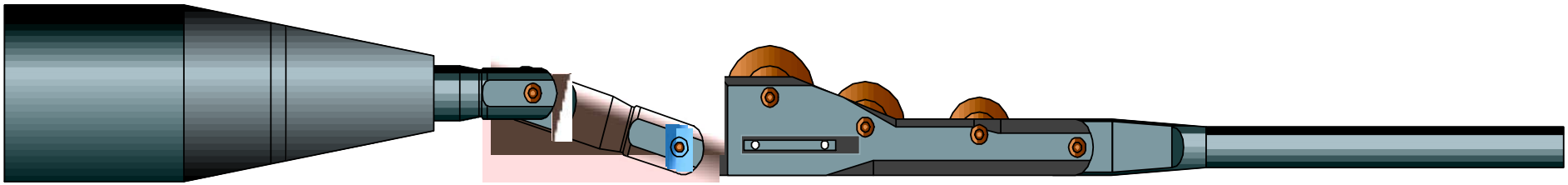
Mainline Pipe Bursting

- Static Systems
  - Full range of equipment for projects from 2”- 24”
    - HB3038
    - HB5058
    - 100XT
    - HB125
    - HB175

Static Pipe Bursting Systems

- Ductile Slitter
  - Ductile iron
  - Steel





Open Cut VS: Bursting Cost Comparison

educational sessions

Project #1 7,250’ existing 8” VCP replacing with 8” DIPS HDPE and replacing 40, 4’ pre-cast manholes.

Open cut=$281,262.00 **Pipe Burst=$162,422.00**

Project #2 2,569’ existing 8” VCP replacing with 8” DIPS HDPE and replacing 10, 4’ pre-cast manholes.

Open cut=$123,056.00 **Pipe Burst=$51,485.00**

Project #3 2,771’ existing 8” VCP replacing with 8” DIPS HDPE and replacing 13, 4’ pre-cast manholes.

Open cut=$130,764.00 **Pipe Burst=$62,447.00**

Project #4 4,200’ existing 8” VCP replacing with 8” DIPS HDPE and replacing 16, 4’ pre-cast manholes.

Open cut=$206,353 **Pipe Burst=$111,823.00**

Total Savings=$353,258.00

Pipe Bursting Project Implementation

educational sessions

- Utilized HDPE pipe because of its flexibility and strength and longest trenchless track record
- Previous pilot test used FPVC but it failed through rapid crack propagation

Pipe Bursting Project Implementation

UCT educational sessions

- PE4710 pipe can be bent to a radius 25 times the nominal pipe diameter, see AWWA M55, table 8-2
- Eliminates many fittings required for directional changes
- Refer to PPI PE Handbook chapter 16, pipe bursting
- HDPE is easy to handle in the field

Pipe Bursting Project Implementation

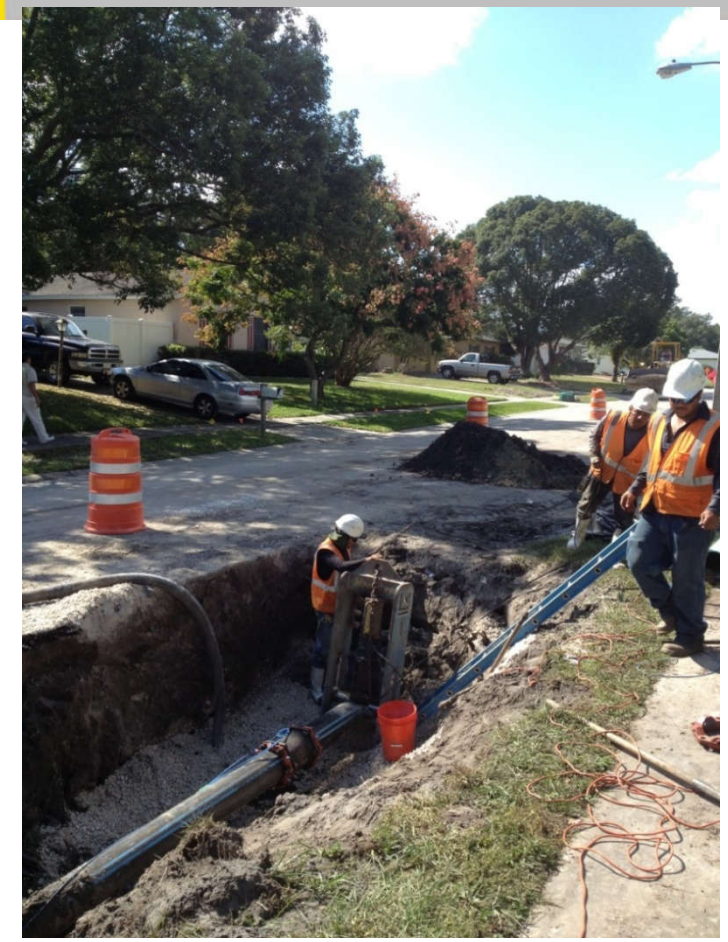
- PE4710 butt fused joints per:
  - ASTM F2620, heat fusion
  - PPI TR33, generic butt fusion procedure
  - PPI TN42, training guidelines
- HDPE fused joints are stronger than original pipe
- Thrust block required when connected to jointed pipe – see AWWA M55, chapter 8, installation

Pipe Bursting Project Implementation

UCT educational sessions

Pipe Bursting Project Non-Invasive to Residents

educational sessions



- Bypass pumping eliminated through accepted outages
- 300-400 lf per day of bursting production
- 2-3 month project duration for urban neighborhoods minimizes resident impact
- Minimal Excavations compared to open-cut or directional boring
  - Reduces restoration costs and time
  - Reduces time construction crews are present in front of residents

Pipe Bursting Sites

educational sessions

Thank You for Attending

educational sessions

QUESTIONS?

NO-DIGTEC, LLC

John Newell, Presenter

Web: www.NO-DIGTEC.com · Email: John@pipeburster.com

Quotes & Project Planning: estimating@pipeburster.com

(972) 488-9910