Ramming Saves Jack and Bore Project

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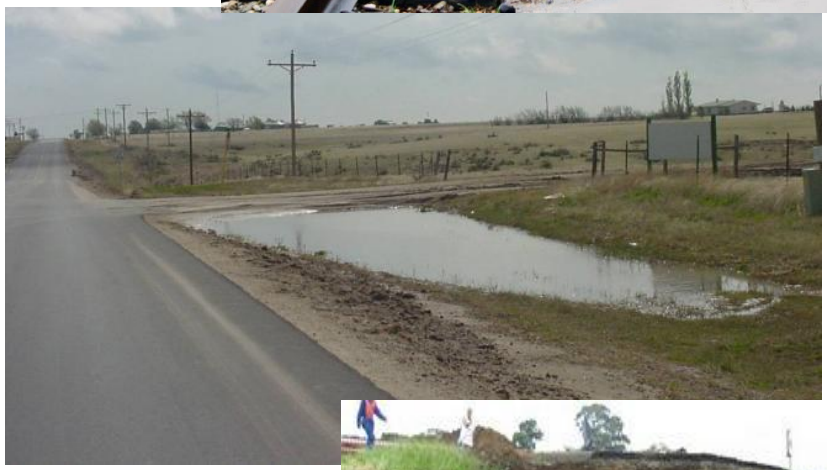
Facts about the US rail system

- Critical part of US transportation infrastructure.
- More than 150,000 miles of mainline rail routes.
- Moves more freight than any other rail system in any other country.

SOURCE: American Association of Railroads

Drainage problems

- Lack of maintenance
- Lack of inspection programs
- Lack of capacity/flow, flooding and liability
- Ponding of water causes pavement and sub grade deterioration and may lead to washout failures



Problems aren’t limited to rail.

Washout

- The failure rate has the potential to cause property damage and loss of life.
- Lack of maintenance and delays in repairs has translated into soaring construction expenditures.

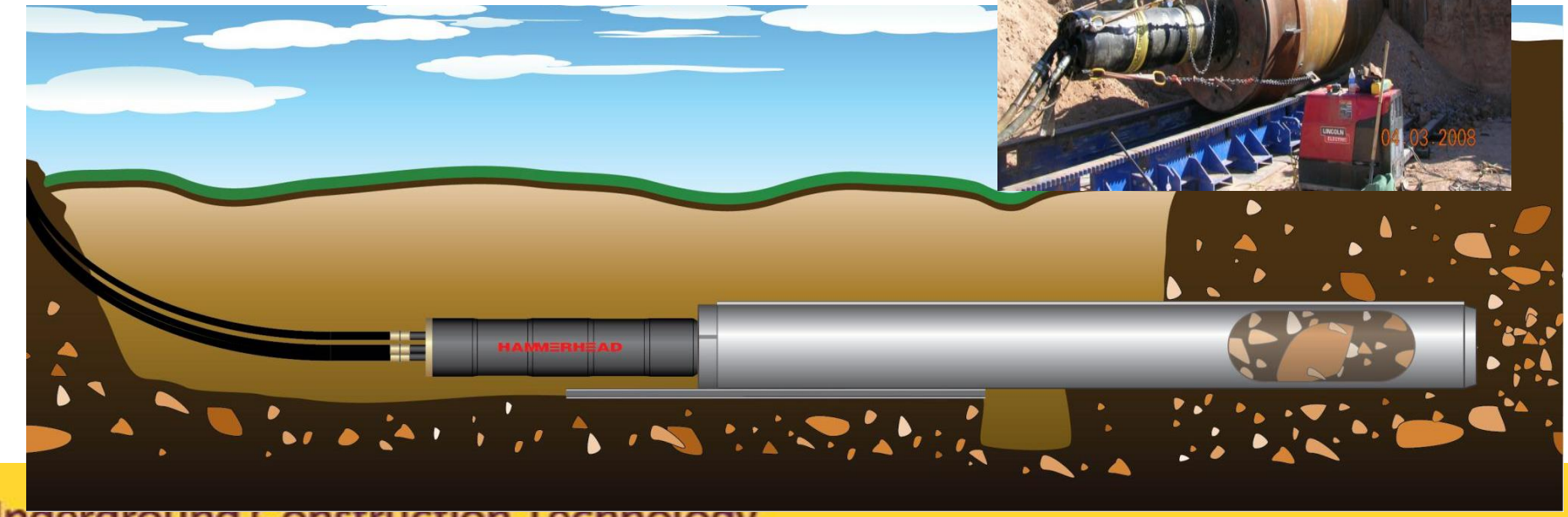
Band failures and sink holes

How do maintain and replace existing, while installing new infrastructure under this transportation?

Auger Boring- Most Common Method

Pipe Ramming

- A pneumatic hammer installs an open ended steel casing that is cleaned out during and after completion of pipe installation.



Pipe Swallowing Case
Culvert Replacement Method

- An oversized casing is rammed over existing culvert. After installation is complete, old culvert and spoil is removed. Steel casing can serve as the drainage culvert or as a carrier pipe for another pipe inserted within.

PATENT PENDING- Pipe Crushing System Culvert Replacement

- An oversized casing is rammed while crushing the existing culvert. After installation is complete, old culvert and spoil is removed. Steel casing can serve as the drainage culvert or as a carrier pipe for another pipe inserted within.

Pipe ramming applications

- Steel casing installation for:
- Water
- Sewer
- Gas
- Drainage culverts

Advantages

- Trenchless
- Able to swallow rock as large as the inside diameter of the casing
- Method does not remove soil until casing is installed
- Minimizes voids
  - Roads
  - Railroads
- Reduced soil compaction

Preferred for adverse soil conditions

- Free flowing sand
- Cobble conditions
- Large rock formations
- Excessive ground water
- Unsupported jacking pit

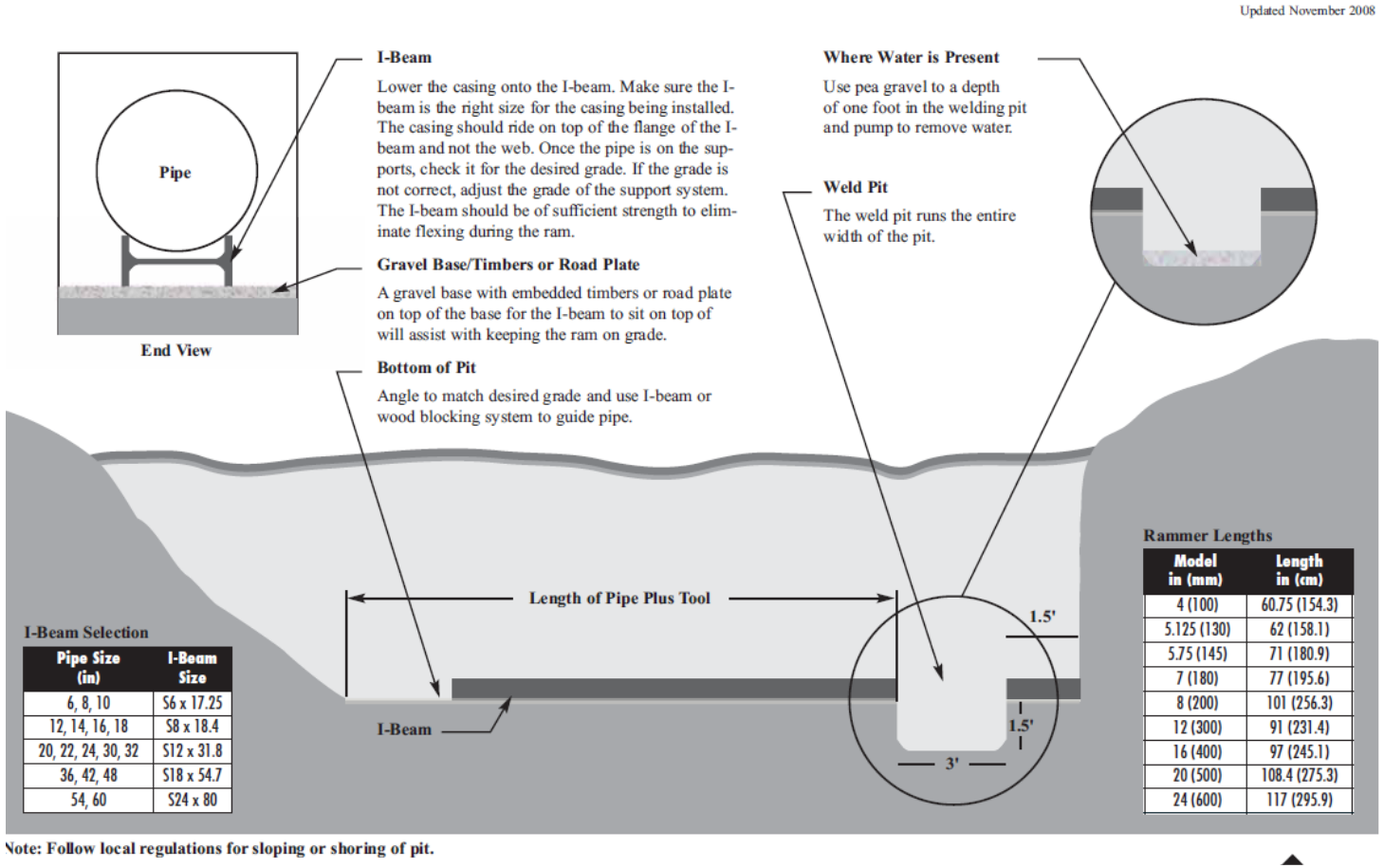
Swallows large obstructions

- Rock swallowed during ram
- Spoil removed post ram

PIPE RAMMING AS THE PREFERRED METHOD FOR CULVERT INSTALLATION AND REPLACEMENT

METHOD IMPLEMENTATION

Ram site layout

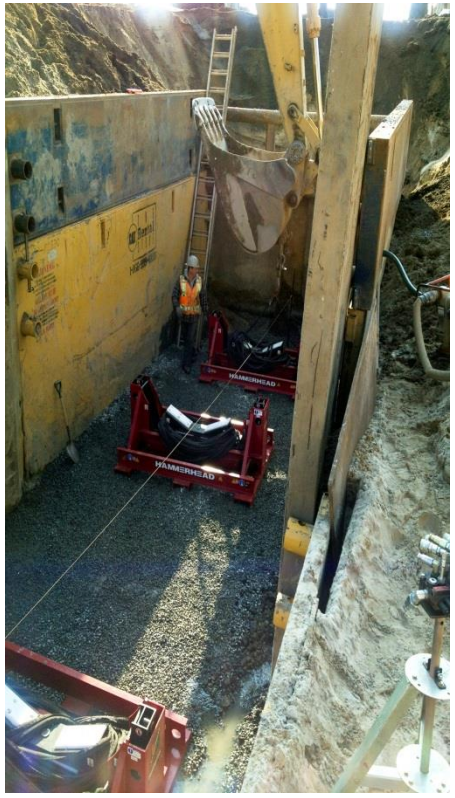


Note: Follow local regulations for sloping or shoring of pit.

Site prep: casing placement

Rail system

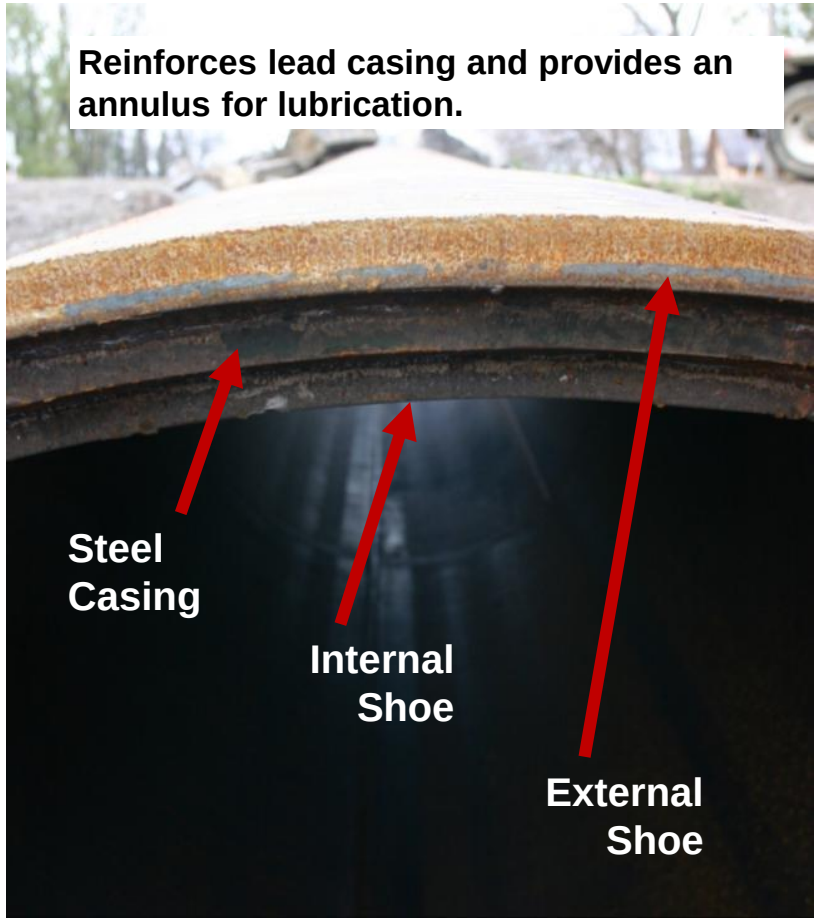
I-beam



Pipe Mule™ Leveling System

Steel casing prep

SOIL SHOE

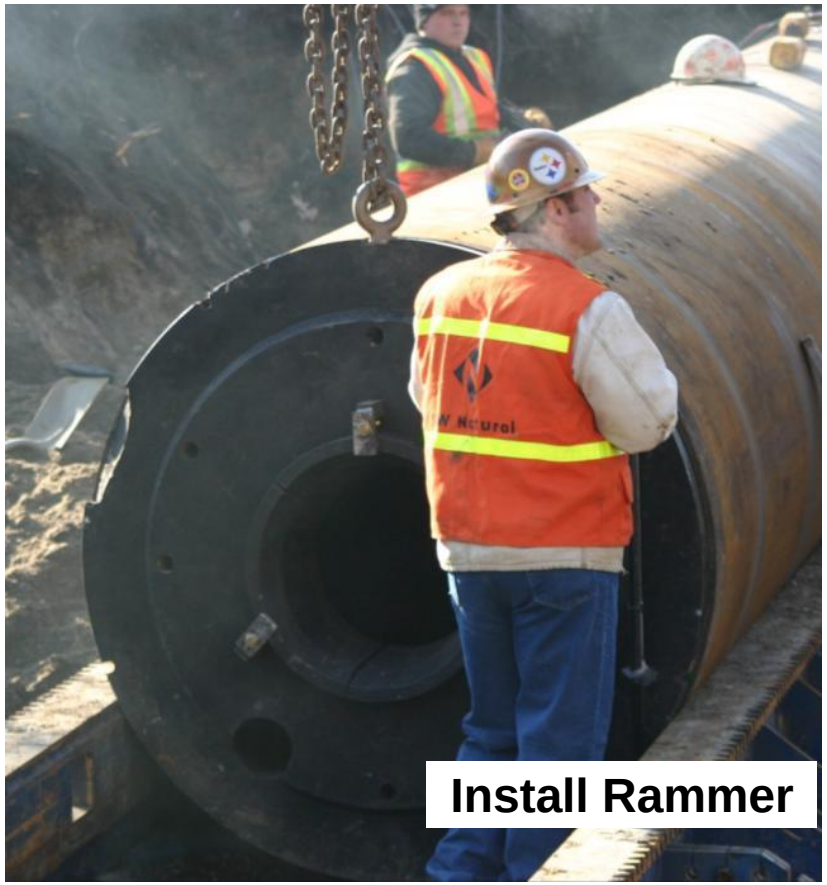


LUBRICATION

Collets and rammer

Install Pushing Collets/Collars

Collets and collars help to distribute the ramming force to the face of the pipe.
The collets also lock the rammer into place.



Install Rammer

The rammer is locked into the collets when the tool is started.

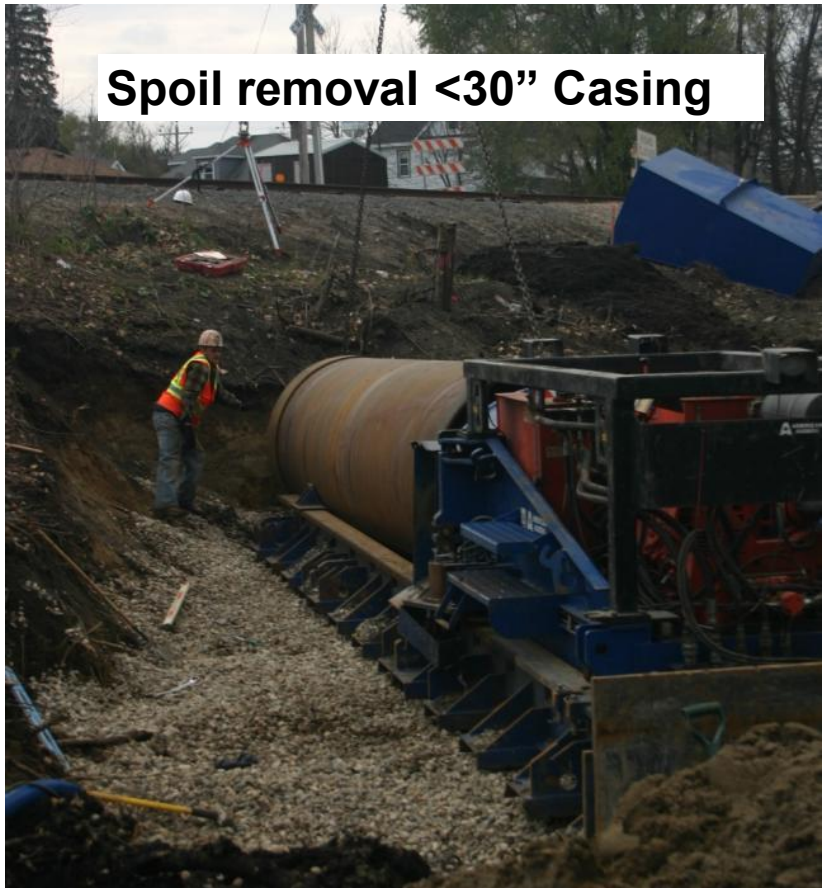
Spoil removal

Spoil removal for >30” and/or large spoil/culverts

Seal kit

Air and/or water pressure. Seal kit for air pressure removal.

Spoil removal <30” Casing



Manual excavation, HDD culvert cleaning tools, jet washing, auger boring wherever applicable.

Case Study

T&T Pipe Renovations

Colombia City, IN DOT R-34928

200’ of 42” Casing Installation

84” Existing Culvert

After 20’ of 42” Casing installed the backstop gave way.

Difficult Jacking Pit

3-4 Days of Ramming

3-4 Days of Ramming

Pilot Tube – Exit Pit

Pipe Ram is complete

QUESTIONS?

Alan Goodman, HammerHead Trenchless