Extraction of 1950's Petroleum Lines – EPA Mandate

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Pneumatic Hammer Pipe Extraction

Project Overview

- Part of a new gas main installation project for Exxon Mobile,
- Laney Directional Drilling required to extract an existing 1,110-foot., 8-inch steel gas main
- Under the Colorado River

Pneumatic Hammer Pipe Extraction

Project Overview

- Developed an extraction approach utilizing pneumatic pipe ramming
- Estimated that the existing pipe would be able to withstand approximately 250,000 lbs. of pulling force

Pneumatic Hammer Pipe Extraction

Project Overview

- Two-tiered approach was developed
- Included a braided cable blocking system providing static pull force
- Two pneumatic pipe ramming tools
- One on the extraction side of the pipe providing percussive pulling force
- One on the insertion side of the pipe providing percussive pushing force

Pneumatic Hammer Pipe Extraction

Project Overview

- A 400-ton, 12-part block system was created
- A D-8 Cat dozer winch applied the pulling force to the block system
- Utilized 1.25-in. diameter cables

Pneumatic Hammer Pipe Extraction

Project Overview

- Exposed approximately 250 feet of the existing pipe on the extraction side of the river
- On the other side, approximately 150 feet of pipe was exposed
- Ramming pit was created

Pneumatic Hammer Pipe Extraction

Project Overview

- A 36-inch diameter extraction cylinder was developed
- Housed a 24-inch diameter pneumatic pipe ramming tool
- Transfer percussive pulling force from the rammer to existing 8-inch steel pipe
- As well as the static pull force from the block system

Pneumatic Hammer Pipe Extraction

Project Overview

- Wings on each side made the connection to the block system
- Cylinder placed over the ramming tool
- Rear flair contained within cylinder, making the final connection with the rammer

Pneumatic Hammer Pipe Extraction

Project Overview

- Connection between the extraction cylinder & the 8-inch steel pipe was made with a fabricated sleeve
- Reduced from 36 inches to 8 inches.
- A section of 8-inch heavy wall pipe welded in place made the final connection between the sleeve and the existing 8-inch pipe

Pneumatic Hammer Pipe Extraction

Project Overview

- On the other side of the river:
- Fabricated ram cone & a section of heavy walled 8-inch steel pipe made the connection between the 18-inch diameter pneumatic pipe ramming tool and the back of the 8-inch steel pipe
- The rammer was supported by a cradle held in place by an excavator.

Pneumatic Hammer Pipe Extraction

Project Overview

- Began with percussive force from the insertion side of the pipe.
- Then static and percussive pulling force was added on the extraction side
- Pipe began to move
- Estimated between 170,000 to 200,000 lbs. of pulling force was exerted on the existing 8-inch pipe

Pneumatic Hammer Pipe Extraction

Project Overview

- Start to finish the project took 18 days
- Including all the prep work and final restoration
- Actual extraction took 3 days to complete
- The entire 1,110-foot length of pipe was extracted in a single piece

Questions?

Thank You

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