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2022 TECHNICAL AWARDS ENTRY FORM

Entry Deadline: Friday 22nd April 2022

Please tick which categories you are entering (entries may be submitted in multiple categories)

- Landbased Pipeline Project Award
- Landbased Pipeline Technology Award
- Utility Pipeline Project Award
- Utility Pipeline Technology Award
- Subsea Pipeline Project Award
- Subsea Pipeline Technology Award

1. Brief title of entry: Phase 1 lining of 36" water main on Seven Sisters Road in London.....
2. Company name: Thames Water/Agility Alliance/MorrisonWS/Die Draw



3. Signed: 
4. Date: 22nd April 2022
5. Company contact name: Steve Brogden, Managing Director, Die Draw Ltd
6. Telephone: 0333 433 0478
7. Email: steve.brogden@diedraw.com

8. Precis of your entry (50 words):

500m of 900mm SDR 26 PE 100 polyethylene potable water pipe was installed into a 36" 150-year-old cast iron main under Seven Sisters Rd in London using the Die Draw technique.

The location presented unique challenges requiring selection of a technology that minimized installation size while achieving minimum bore requirements post-installation.



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9. Summary of entry:

Many of our aged assets remain in remarkably good condition with cast iron water pipes older than 100 years, frequently maintaining high integrity apart from minor leakage around joints and pinholes. Apart from ongoing leakage, there remains a very occasional risk of failure when, for example, traffic loadings occur for which these pipelines were not originally designed.

It is therefore essential to replace or repair. Replacement of aged utility pipes in a large metropolis such as London is extremely difficult, due to the enormous costs and interruption. Due to the large number of joints, repair becomes an ongoing task with regular interventions required.

The optimum solution is frequently to rehabilitate. Using a polyethylene liner pipe that still retains full pressure bearing capacity, which enables the existing pipe to remain with only the limited access of an entry point and exit point required for each discrete section of lining. Use of a technique that can pull long individual lengths in one go becomes a distinct advantage. Slip lining, folded lining, and the different reduction technologies were considered for this project.

Die Draw was selected most suitable as any pipe size can be reduced, and by careful die design the reduction can be matched to the requirements of the specific pipeline achieving very long pull-ins. This is the first known deployment for Thames Water and in such a congested urban environment anywhere in the world.

Some of the challenges were:

- Traffic management on and around one of London's busiest roads
- Finding locations for launch and reception pits
- Determining space for welding and road closures for long strings of pipe
- Transferring winch load into a pipeline with ~300mm between adjacent live mains
- Transferring winch forces at an angle of 90° between adjacent pipes
- Cleaning the host pipeline of tuberculation
- Determining the ID of the host and any obstructions using camera and Lidar surveys
- Removal of obstructions prior to lining
- Transferring load around a 40° bend inside the host pipe
- Restraint of host pipes in a culvert including installation of strain gauges

A technical first was to design a frame that enabled the linear winch to be set at 90° to the reception pit transferring 100t_e load on the rope into the pit between two live mains transferring the load in such a way such that they weren't at risk of being disturbed.

In summary the achievements were:

- Business benefitted by replacement liner pipe with minimum 50-year life at lowest cost
- Liner pipeline is fully structural meeting minimum bore requirements
- Minimal traffic disruption and public inconvenience
- Die Draw liner reduction technique provided only workable solution
- Entry scope of 500m installed of a total 625m between 29th and 31st March 2021
- Safe transfer of winch forces between adjacent pipelines at 90° and through culvert at 40°
- Low environmental impact



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Ancillary Entry Information

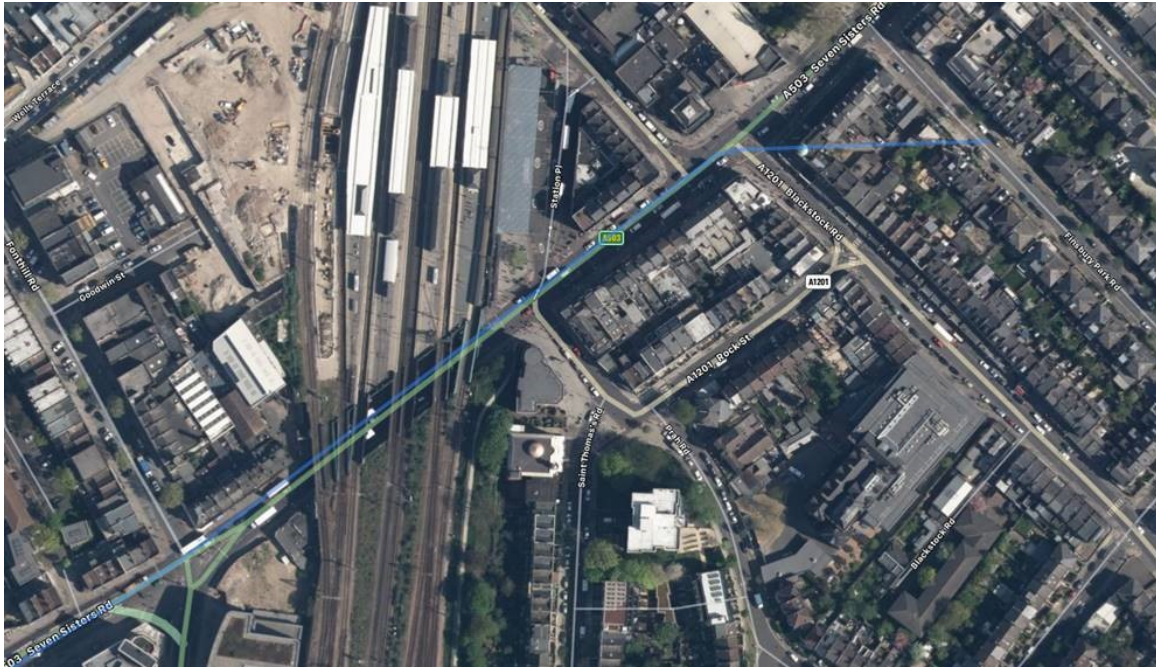


Image 1: Overview of site location, the launch pit is to the left on Seven Sisters Rd with the reception pit for the winch is to the right on Finsbury Park Rd



Image 2: Looking from launch pit with the tow head and pipe string along Seven Sisters Rd



Image 3: Liner passing through die at launch pit



Image 4: Host pipe in culvert with straps showing proximity of adjacent pipelines



Image 5: Host pipe at reception pit showing proximity of adjacent pipelines

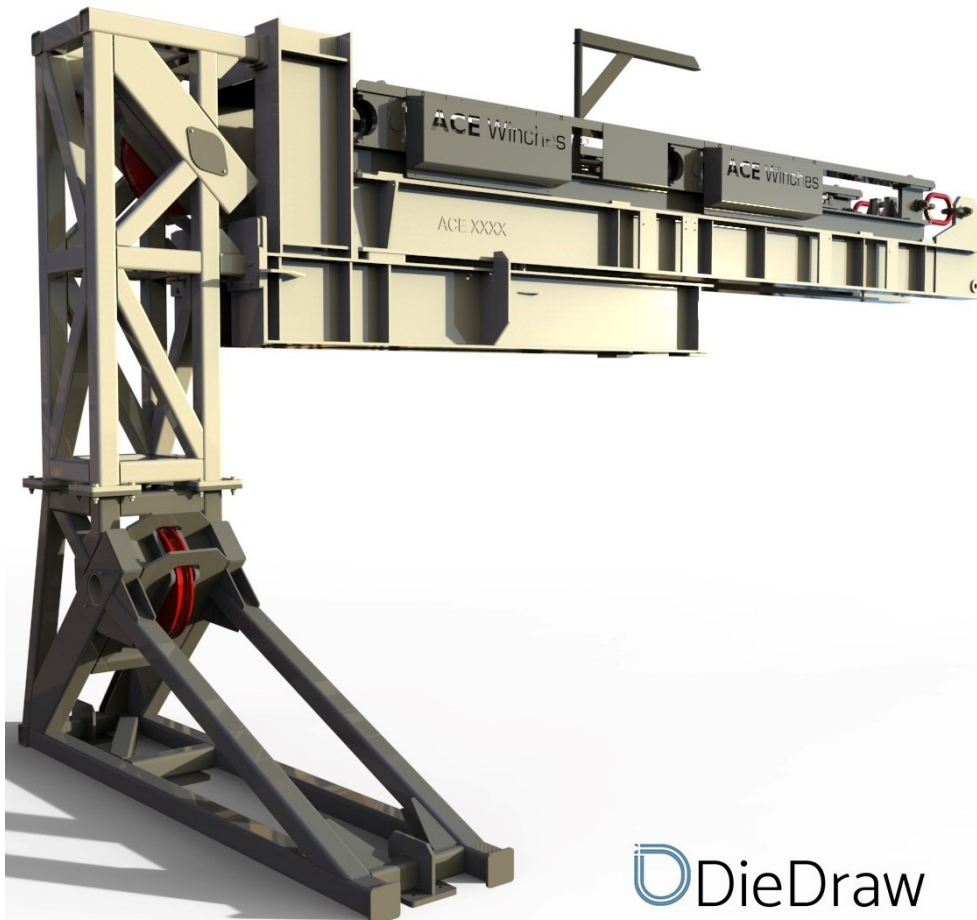


Image 6: Frame and sheave arrangement designed to support winch and transfer load to host in pit