CaseStudy Pipe Jacking

Customer: Balfour Beatty

Location: Acton Town Statin, London

Project: Culvert Remediation using Pipe Jacking

OnSite Rail was asked to carry out remedial repairs to a brick drainage culvert at Acton Town Station platform. The actual area needing repair ran directly under the Piccadilly Line to Heathrow in close proximity to a set of points in constant use.

The proposed method was to install a Cured-In-Place Pipe (CIPP) solution using a UV liner. However, the CIPP proposal had to be abandoned when the pre-UV lining CCTV survey undertaken in February 2016 revealed that the deformation had exceeded 30% of the original 600mm diameter culvert, making CIPP no longer suitable for the application.

Since the Heathrow Rail Line is extremely busy, excavation was simply not an option. In addition, the timescales involved to complete the works were extremely tight; just two weeks!

OnSite's Head of Rail Services, James Sargeant immediately attended site upon being informed that CIPP would not be an option. James soon established that Pipe Jacking would be the most viable solution.

Site Engineer, Alex Duncan then prepared site-specific Method Statements, Risk Assessments and Safe Systems of Work for the Pipe Jacking solution. These documents were then provided to OnSite's client, Balfour Beatty for review and approval.

Following works approval, OnSite Rail Services were officially engaged to provide the no-dig structural lining solution known as 'Pipe Jacking' to the failing drainage beneath the station.

S Site

Just a quick note to say thanks for mobilising and delivering the pipe jacking work at very short notice. Could you please pass on my appreciation to your team for their professionalism and hard work. Most importantly we worked safely as a number of trains passed through the work area. This was excellence in delivery and great collaboration and team work. Well done!

Senior Project Manager, Track Partnership.

Pipe Jacking

The 'Pipe Jacking' technique was developed more than 50 years ago. The technology pushes pipes through the ground using a hydraulic jack. This solution enabled the new steel pipe to be positioned without further exacerbating the fracture in the old waste water line.

In order to provide strength, without compromising the set of points that ran above the fractured section of drainage pipeline, a new 400mm diameter steel pipe was jacked into the existing 600mm diameter culvert in 1.0m sections.

Each pipe segment was jacked-in in sequence and flash butt welded at the joint. The lining process requires each segment to be welded before another segment could be added.

possession. Finally the annulus between the brick and steel was filled with grout. Grouting seals any voids and further increases the overall strength of the remediated waste water culvert.
The works were completed without any accidents or incidents. This is a significant piece of critical works that could potentially cost so much more if an open cut method had been adopted. The non-dig approach negated temporary point removal, making a significant saving. More importantly, the risk of a drain collapsing under 44 Points which serve the busy Westbound Fast Piccadilly Line to Heathrow had been eliminated.





Pipe Jacking Case Study

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Lined in just over 24 hours

This weld-jack process was repeated at a rate of three segments an hour. The pipe jacking started on Saturday at 11:45 hours at the critical run of 66m with severe deformation, with the final pipe being jacked into place by Sunday 12:15 hours.

Due to the amount of time available at the weekend possession, another 19.0m of pipe out of the 28.4m were jacked in. The remaining 9.4m of liner was jacked-in in Engineering Hours postpossession. Finally the annulus between the brick and steel was filled with grout. Grouting seals any voids and further increases the overall strength of the remediated waste water culvert.

Below: Left, the brick culvert prior to remediation showing the serious deformation that precluded a CIPP lining solution. Right, the completed culvert.



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Pictured above: The Acton Town Station project combined very limited possession of a busy rail line with awkward access. As a result of OnSite's hard work, the Piccadilly-Heathrow line was closed for only 24 hours from late Saturday night, through to midnight Sunday, with final completion of associated works being delivered after the line was returned to service.

> Pictured right: The Pipe Jacking access point was located in the middle of the tracks at Acton Town. From this single access point lining pipes were jacked in both directions to existing catchpits.





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