Have any questions?
01342 719 362

Project Report

A 400m segregation barrier was required within the six foot at Westbourne Park Station to divide the Network Rail and Crossrail Tracks.

Due to the depth of ballast being over 1000mm, the proposed segregation barrier solution would utilise multiple concrete foundations, involving multiple RRV's, ballast removal, waste management, onsite concrete shuttering and mixing. This method of installation was estimated to take more than 20 weekend shifts with an initial budget of over £1million, deeming the works uneconomical for the client and the network.

SOLUTION

Following the success of Anchor Systems (International) Ltd foundation systems use within rail sector, we were approached by Network Rail to discuss the use of our Anchor Screw foundation solution and asked to offer a design and installation cost for the segregation barrier. Anchor Systems worked with the design team at Network Rail to understand the project requirements and work together to develop the solution. Our traditional 'off the shelf' Anchor Screw foundations would not work on the project due to the presence of a concrete track drainage located approximately 1000mm below the ballast level. This challenge was overcome by Anchor Systems conducting a ground penetration radar (GPR) survey of the 400m section of works to identify the accurate location and depth of the concrete drain. During the survey, the GPR technician marked out every installation location and gave clearance of services and obstructions (bore hole clearance) to ensure that safe and efficient installation could take place. Following the GPR survey, the Anchor Screw design was modified, reducing its overall length to 850mm to ensure clearance from the existing drain while at the same time being able to achieve the vertical and lateral load requirements for the segregation barrier in line with NR standards. Following the adoption of Anchor Systems Geotechnical Design, samples were manufactured and onsite acceptability tests of the Anchor Screw were conducted to confirm installation times, foundation capacity and validate the design.

A total of five tests were conducted along with five trial pits to confirm the GPR survey results. All five test anchors were installed and tested within one four-hour night shift and removed using the same installation equipment. The product design, manufacture, and mobilisation for anchor suitability testing was all carried out by Anchor Systems and our installation partner within a one-week time frame.

Following on from the test results, the geotechnical design report GDR was updated and resubmitted to NR for approval.

Approval of the design was granted with Network Rail and all interested parties. Anchor Systems continued to offer the turnkey solution by working with our approved contractor Arbourtech Services Ltd to complete the supply and installation element of the project.

LOCATION
Westbourne Park London

CLIENT
Network Rail and Crossrail

SPECIALIST INSTALLER
Arbourtech Services Ltd

PRINCIPLE CONTRACTOR
Colas Rail

ANCHOR SYSTEM USED
Anchor Screw foundation system and GRP handrail interface manufactured and supplied by Anchor Systems (International) Ltd

Westbourne Park

THE RESULTS

Anchor Systems worked with Colas Rail and Network Rail to offer a complete solution with one of our approved installers to guarantee workmanship and onsite efficiency. The entire solution was offered at a saving of 30% for the design, testing, supply, installation, and commissioning of the barrier.

- Over 300 Anchor Screws were installed at 1500mm spacings along Westbourne Park within 14 night shifts, including the erecting of the barrier
- Delivering a massive reduction in project costs compared to the original solution
- Huge reduction in relative project ecological footprint through reduction of workforce, heavy machinery/RRV's, concrete, waste management, water consumption and material delivery miles
- A saving to the network of over 30%

THE ENVIRONMENT

Over and above the project benefits, the Anchor Screw offers further benefits to the network and local environment, including:

- On average the Anchor Screw foundation offers a carbon reduction of over 70%. Example project reports with carbon calculated output can be seen at anchorsystems.co.uk
- All materials are recyclable, easily removable, and reusable
- Made in the UK from 100% recycled steel, with a minimum design life of 50 years
- Anchor Screw can be designed to offer 100+ year design life solution
- No wet trades, curing times or excavation
- No requirement for RRV's
- Materials can all be transported by hand and with track trollies
- Portable and lightweight installation equipment
- Reduction in hours on site and workforce required during installation
- Zero HAVS (Hand Arm Vibration)
- Installation head offers low noise pollution output offering lower disturbance to local residents
- Adjustable domed head to ensure the asset or interface is always level and offers horizontal and lateral adjustment to ensure the route is straight. The patented dome head of the Anchor Screw and interface plate offers 14° overall tolerance

ANCHOR SYSTEMS (INTERNATIONAL) LTD
Caring for the Environment

"The Anchor Screw system helped to significantly reduce construction time and provided greater tolerance to satisfy gauging requirements on the Westbourne Park Barrier Scheme. Throughout the design stage, Network Rail design and Anchor Systems collaborated to produce a bespoke post that could be installed entirely within the ballast formation. This system has many other applications and can offer significant efficiencies whilst providing a more environmentally friendly option compared with alternative foundation types."

Sam Fletcher CEng MICE - Senior Design Engineer (Building & Civils)
Network Rail

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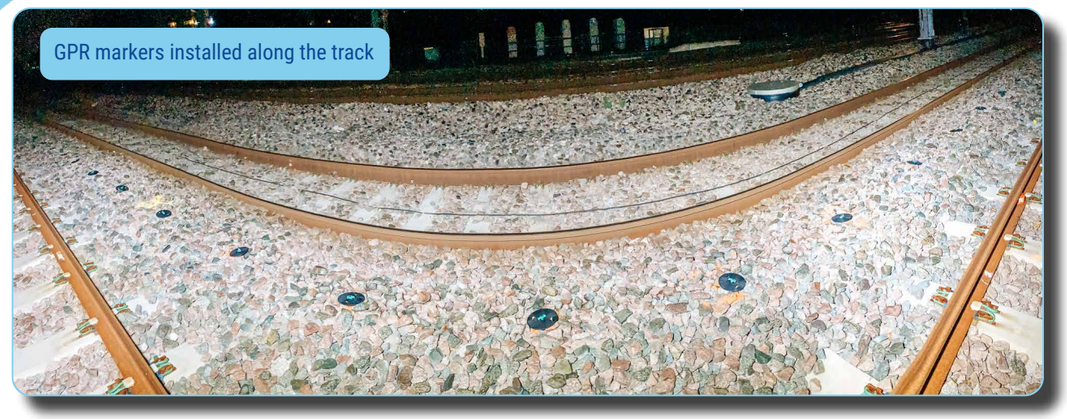
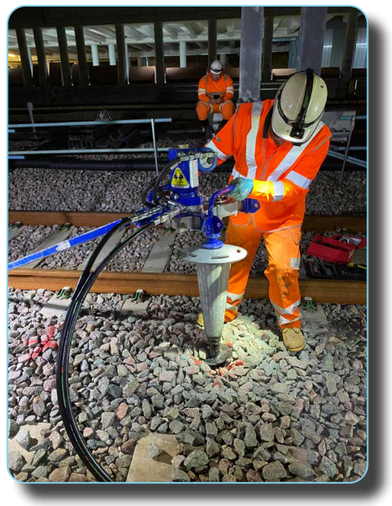
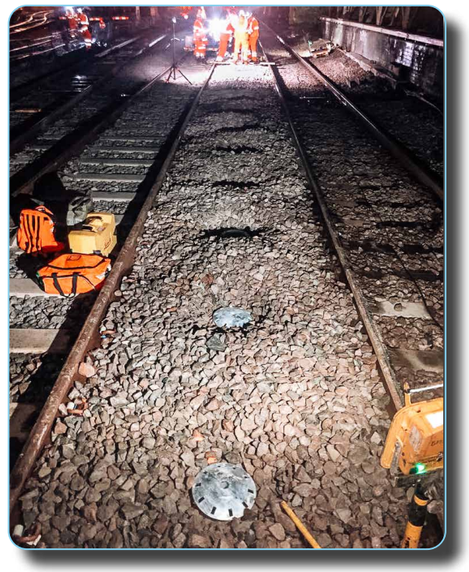
Project Images


GPR markers installed along the track



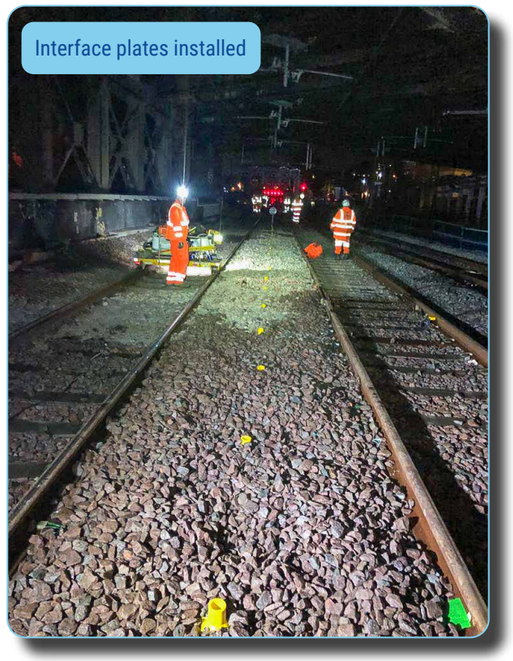
Above: Anchor Screw being driven into ground with torque head and power pack.

Right: Interface plate being aligned to installed Anchor Screw. Line of installed Anchor Screws in the ground.



Westbourne Park


Fully installed handrail


Interface plates installed


Testing the anchors


Interface plates installed