

Case Study

Refresco UK – Tension Micropiles

ISCHEBECK
TITAN



In Partnership With:



NEIL TAYLOR
CONTRACTORS LTD

Client: Bachy Soletanche
Designing Engineer: Byland Engineering
Project Name: Refresco UK – Tension Micropiles
Project Location: Nelson, Lancashire
Main Contractor: Neil Taylor Contractors

Project Challenges and Background

This project is the home of an international beverage producer, in Nelson, Lancashire. Since new proprietors took ownership of the site in 2019, it was noted that significant ground movement had occurred within the staff car park, located adjacent to Pendle Water.

The new site owner was keen to remedy the situation; to restore the staff car park and to safeguard the factory, prior to additional investment. A 900mm diameter foul sewer, which passed through the site, had shown signs of distortion as it had moved with the ground.



Ground Conditions

When designing stabilisation schemes, ground investigations and their results play a very important part. Quality site and ground investigations allow the designers to give accurate and detailed design information to the contractor prior to commencement of work.

The ground conditions at this project comprised of ~15m of notoriously weak Glacial Laminated Clay, over more competent cohesive Glacial till with Pennine Coal Measures at ~30m depth. Additionally, artesian groundwater pressures more than 5m above the ground level were recorded within the bedrock strata which resulted in a greater than hydrostatic groundwater pressure profile. When combined with relic shear surfaces and low strength Laminated Clays, this presented the designer with a unique combination of ground conditions to overcome.

The solution was an embedded sheet pile wall along the site boundary adjacent to Pendle Water. This was subsequently backfilled to provide a working platform enabling construction of passive tension micropiles providing restraint to the top of the wall via a reinforced concrete capping beam, which encased the two elements.

The Ischebeck TITAN Solution

On this project, the solution used was 52/29 TITAN Hollow Threaded Bars. Ischebeck TITAN self-drill hollow bars were selected based on the potential for local collapsible granular horizons or groundwater within the glacial deposits. Availability of large drill bits and the unique bar thread pattern to control crack width, obviates the need for additional coatings or casings which potentially may not survive the self-drill installation process.

To compete with the differing ground conditions encountered in the UK, Ischebeck TITAN offer the designer a range of drill bit options to suit the conditions on site. All of these are manufactured to the highest quality in Germany and range from hardened clay bits for cohesive soils to carbide tipped button drill bits for reinforced concrete and rock. For this project the 175mm hardened clay drill bit attachment was selected for its unique cutting design and double flushing outlets on this drill attachment. This ensured a uniform width of borehole, whilst improving the surrounding ground and giving a widening factor of at least 20mm in the borehole.

The 175mm hardened clay drill bits were attached to the bars along with all the necessary ancillary components. Centralisers are used along the length of each TITAN bar to ensure the bar stays central to the borehole and that full encapsulation of grout is formed around the bar whilst drilling. Ischebeck TITAN's uniquely engineered couplers can accommodate both repeated loadings and dynamic load changes made possible by the central stop (steel ring with seals). Tightening against this central stop also achieves an optimum transfer of energy during drilling.



Ischebeck TITAN Support & Services

Ischebeck TITAN supported designers, Byland Engineering, with a selection of technical data and specifications to assist with the design of these ground anchors. This included the provision of mill certificates, yield stress results, current data sheets, product availability, and additional information relating to the components of the TITAN anchors.

Results

The key benefits of using Ischebeck TITAN self-drilled hollow bars were the control, accuracy and speed required to complete the project on schedule. Various piling techniques were previously discussed to stabilise the embankment, however due to the restrictive working room, difficult ground conditions, and the high loadings required for each bar, the anchors had to be installed with the speed and accuracy that the self-drilling process provides.



Find out more...



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