

Spring Newsletter

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Truro Service Station – Vibro Stone Columns

GeMech have been on site in Higher Besore, slightly to the West of Truro, throughout March & April, installing vibro stone columns through Soft/Loose historic quarry fill to facilitate the construction of a new service station.

Initial site investigation work confirmed the presence of a backfilled quarry with an irregular plan area and variable depth, spanning the site from its Southwestern corner through to the Northeastern corner. The quarry fill comprised interbedded Soft/Loose Clay/Gravel, extending to a maximum 8.5m depth below pre-existing site levels.

The greatest depths of historic quarry fill exist below the proposed concrete forecourt & tank farm base areas, with only a small area at the North of the main kiosk building affected by the presence of the historic quarry.

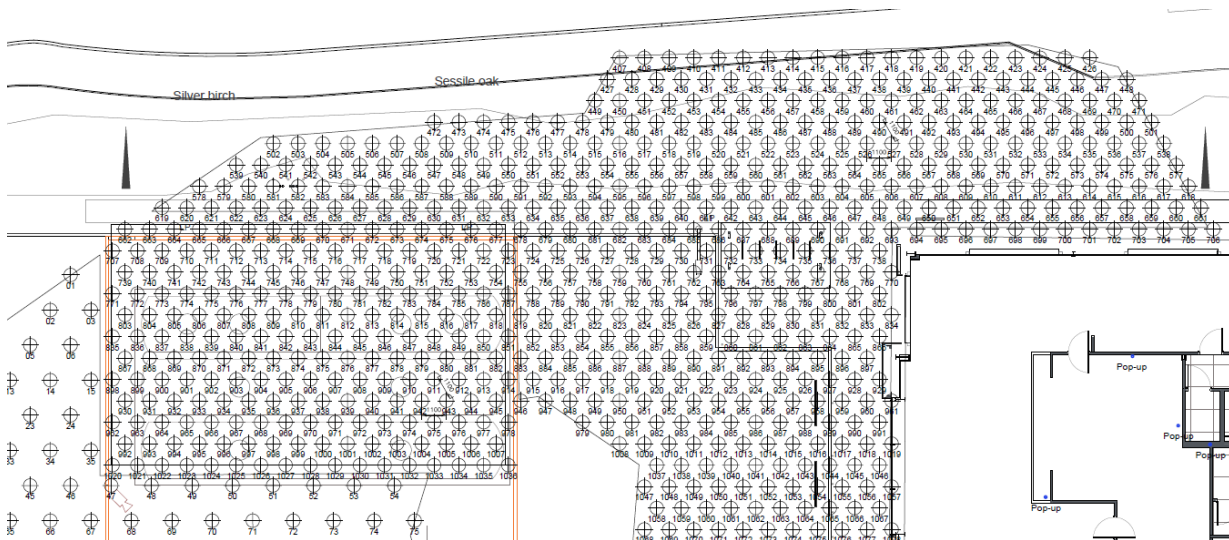
Existing site levels prior to ground improvement fell from 99.0A.O.D in the Southwestern corner, down to 90.0m A.O.D in the Northwestern corner, requiring a significant cut and fill exercise to achieve a final forecourt level near 94.50 A.O.D.



The requirement for the placement of a significant depth of Engineered Fill in the Northeastern corner of site, in combination with a final 10kPa surcharge, led to both total and differential concerns.

To overcome this, GeMech worked with the Client's team to develop a Ground Improvement system using high area replacement ratio Vibro Stone Columns coupled with a period of static surcharging, to minimize total settlement and limit differential movement between the deep quarry fill & shallow bedrock areas.

Using our in-house vibro stone column design capabilities, which use Jie Han's method for estimating consolidation rates (**Simplified Method for Consolidation Rate of Stone Column Reinforced Foundations, Jie Han, 2001**), we specified a height and duration for static surcharging, sufficient to match the long-term settlement estimates between the two potential extreme design conditions.



Following the completion of our vibro ground improvement works, one of our CFA rigs will be delivered to site to install CFA bearing piles, socketed into the shallow weathered Mudstone bedrock, supporting the canopy foundations and main kiosk building.

<https://gemech.co.uk/blog/advantages-and-disadvantages-of-vibro-stone-columns/>

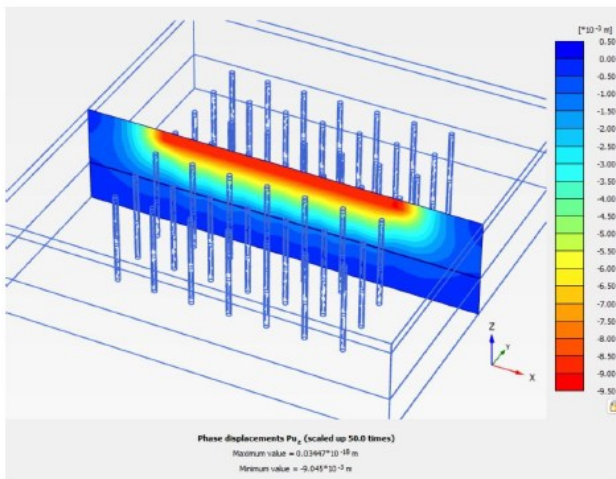
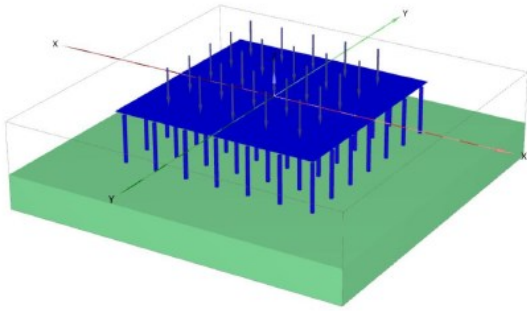
Glossop Fire Station – Steel Cased Bottom Driven Rigid Inclusions

Originally intended as a vibro ground improvement project, the demolition work that was completed by the Principal Contractor to remove the existing building foundations significantly loosened the shallow Made Ground, leading to issues with preparing a safe working platform for one of our 45.0t + vibro ground improvement rigs.



To facilitate the Client's desire to remain with a ground improvement approach, permitting the use of ground bearing slabs and foundations, we worked with the Client to develop an alternative rigid inclusion solution, using small diameter steel cased bottom driven piles installed with one of our 9.0t driven piling rigs. This allowed a safe and efficient piling platform to be constructed over the disturbed soil and avoided any requirement for redesigning the foundation and slab to be suspended over bearing piles.

The rigid inclusion technique is most commonly associated with displacement augering methods, where the inclusions are installed using large rotary drilling rigs. The use of steel cased bottom driven piles installed with a restricted access mini rig is an unusual adaptation of the technique and opens the option for using a rigid inclusion solution on smaller constrained sites, with unfavorable access conditions, or where restricted headroom conditions exist.



At GeMech we can offer Rigid Inclusions using a wide range of techniques, including displacement and replacement augered piling, alongside pre-cast and steel cased bottom driven mini piles installed with our restricted access 9.0t mini Vermeer HL2500 piling rigs.

<https://gemech.co.uk/blog/what-are-rigid-inclusions/>

Malago Road, Bristol – CFA Bearing Piles

From January through to early March, GeMech have been installing CFA bearing piles, as well as a contiguous piled wall for repeat client Watkin Jones purpose built student accommodation, at Malago Road, Bedminster Bristol.

Work on this project started over a year ago, with GeMech's in-house design team producing pile design and managing submission in line with Gateway 2 of the Building and Safety Act.

As well as the complexities of the BSR process, risk assessment and method statements were produced, and works completed compliant with neighbouring Network Rail line and the River Malago (EA) requirements.

We installed 150no. 450mm diameter, and 119no. 600mm diameter bearing piles to depths of up to 17.0m to facilitate the construction of the 3no. purpose build student accommodate blocks and temporary works crane bases. In addition to these bearing piles, we also installed 106no. 450mm diameter and 26no. 600mm diameter fully reinforced contiguous wall piles to depths up to 15.0m.

Our Comacchio CH300 was selected to complete the works, ideal for penetrating the Mercia Mudstone present. Works were completed within programme, achieving a 97% quality and safety audit score from the client alongside very positive feedback. A credit to our site team.



<https://gemech.co.uk/solutions/augered-piling/>



Bristol International Airport – Percussively Drilled ODEX Bearing Piles

GeMech have been delivering percussively drilled (ODEX) bearing piles to facilitate the Western and Southern Terminal Extension at Bristol Airport for Farrans Construction over the first few months of 2026.

The Southern Terminal extension provided a number of complexities – with works completed ‘airside’ requiring onerous work permit system. Our Hutte 203 was selected for restricted access and working room, with headroom limited as little as 2.30m.

The larger Hutte 204 was used for the West Terminal Extension, where headroom was unrestricted, capable of installing increased casing length and production rates with works completed ahead of programme.

Rotary percussive ODEX techniques were selected owing to the complex ground conditions present. Superficial deposits overlay the very competent Black Rock Limestone, Karstic in nature with solution features encountered in the West Terminal Extension.

To negate risk of solution features piles were designed as 220mm diameter socket length within the Black Rock Limestone, with depths ranging from 4.50m to 11.0m.



<https://gemech.co.uk/solutions/odex-piling/>