

Client: Babcock / Vodafone  
Site: 2/3G Node Site  
Location: Westway, Mughull

## Project Description

GTL Partnership was employed by Vodafone/Babcock to design, supply and install a foundation solution to accommodate a Vodafone 2G/3G Street Pole – Type 7000 series.

GTL were tasked with providing a complete solution that could be constructed including tower erection in two days. The limited footprint was to accommodate the 12m mast and equipment cabinet.



## Geotechnical Ground Conditions

The soil investigation indicated clay overlaid with sands and gravels.

Dynamic Probe results were used for the design of the piles.

However, during pile installation underground obstructions were encountered at 2000mm.

## Helical Pile Design

GTL designed for additional dead load to provide stability against OTM of the grillage that was deemed necessary resulting from the information attained whilst installing.

Due to these unforeseen obstructions GTL revised the design accordingly.

The obstructions reduced the depth of the driven pile from 3000mm design depth, to an actual depth of 1800 ~ 2000mm.

This reduced the factor of safety of the piles from 3:1 to 1.25:1 (without the mass of the grillage being considered); this was considered to be insufficient. In order to increase the factor of safety to an acceptable level the grillage was modified by the introduction of a continuous steel plate (15mm thick) welded to the underside of the grillage with the depth of the grillage then being filled with concrete. The additional weight increased the deadweight of the grillage base.

GTL designed the helical piled foundation compound with loads of 3kN in compression, 4kN in Tension and 15kNm moment force.



To mitigate time lost GTL adapted their piles on site and subsequently installed them to refusal. In parallel the grillage was modified to incorporate the design amendments.

GTL continue to utilise this balanced solution where high rock head is encountered.