



CASE STUDY AYKLEY HEADS, DURHAM



GROUND IMPROVEMENT

CLIENT

Durham County Council

MAIN CONTRACTOR

Durham County Council

SCOPE OF WORKS

Rigid Inclusions

ACHIEVEMENTS

Completed on time
Completed on budget

Project Brief

Roger Bullivant were approached by the technical team at Durham County Council to assist with a foundation solution for a new office building on Plot C at Aykley Heads, Durham.

The development formed part of a wider scheme to develop the Aykley Heads area as part of the council's plan to relocate its current HQ. The area is already home to a number of businesses and the re-development aims to attract thousands of high quality jobs, worth up to £400 million to the county's economy.

Durham County Council, Construction Manager said:
"I found Roger Bullivant as a contractor to be very professional throughout, from pre-construction to the works being completed on site. I would have no hesitation in using them again on any future projects."



ROGER BULLIVANT LIMITED

T. 0845 838 1801 www.roger-bullivant.co.uk info@roger-bullivant.co.uk



GROUND IMPROVEMENT



Key Issues/Requirements

- Roger Bullivant were requested to provide guidance and a solution for the use of Rigid Inclusions (RIs) to provide adequate bearing for 20kPa and 200kPa bearing pressures for the internal slab and steel portal frame structure.
- Ground conditions generally comprised of loose to medium dense sands overlying medium dense to dense sands. RIs was proposed adopting a 300mm/600mm column to 8m depths beneath strip and pad locations and a 5m depth for the slab areas.
- The basic principle behind the RI process is to offer settlement reduction through the installation of concrete inclusions below a load transfer platform to distribute the load imposed by the slab. The inclusions act as a reinforcing element within the soil profile and relies on the interaction between the load transfer mat, soil and inclusion to support the structure.
- A finite element design was undertaken to evaluate the predicted settlements for the applied loads. The proposed 5m and 8m RIs with a 400mm deep load transfer platform formed the final design.

Solution

- RB installed 227 Nr. 300mm/600mm RIs to depths of 8m underneath all pad and strip foundation locations and 175 Nr. 300mm/600mm RIs to depth of 5m for the area underneath the slab.
- RIs were validated by carrying out a series of plate load tests and a zone test to ensure that the recorded settlements were in accordance with the design calculations.
- Despite encountering one area on site which contained some obstructed ground which required some additional pre-boring work, RB completed the ground improvement works on budget and within the scheduled programme time.
- The benefits of the RI technique allow for a thinner ground bearing slab, vibration free installation, minimal spoil removal, easier trimming of the columns.

