



# CASE STUDY NATIONAL MEMORIAL ARBORETUM, STAFFS



## GROUND IMPROVEMENT

### CLIENT

National Memorial Arboretum

### MAIN CONTRACTOR

Stepnell

### SCOPE OF WORKS

Vibro stone columns

## Project Brief

The high profile National Memorial Arboretum in Staffordshire was granted permission to build a permanent £5.6m events building to replace a temporary marquee structure.

The new 2,500m<sup>2</sup> building would house flexible event spaces and meeting rooms to accommodate a wide range of activities as well as catering facilities for banqueting feasts for up to 300 people.

Construction company Stepnell was selected to build the multi-million pound complex and asked Roger Bullivant Limited (RB) to consider the best foundation solution.

RB had previously worked successfully on Arboretum projects, having delivered the precast piled foundations for the memorial wall.

## Key Issues/ Requirements

- The site specific ground conditions comprised variable made ground deposits of both loose granular and soft cohesive soils to depths in excess of 5m, overlying stiff clays of the Mercia Mudstone Group.
- Given the anticipated ground conditions, traditional shallow foundations and floor slab construction was not considered a viable solution, and an alternative foundation solution was required to adequately support the proposed structure.
- RB reviewed the available site investigation data and observed additional in-situ trial pits to ensure compatibility with the proposed ground improvement solution using vibro stone columns.





# GROUND IMPROVEMENT



## Solution

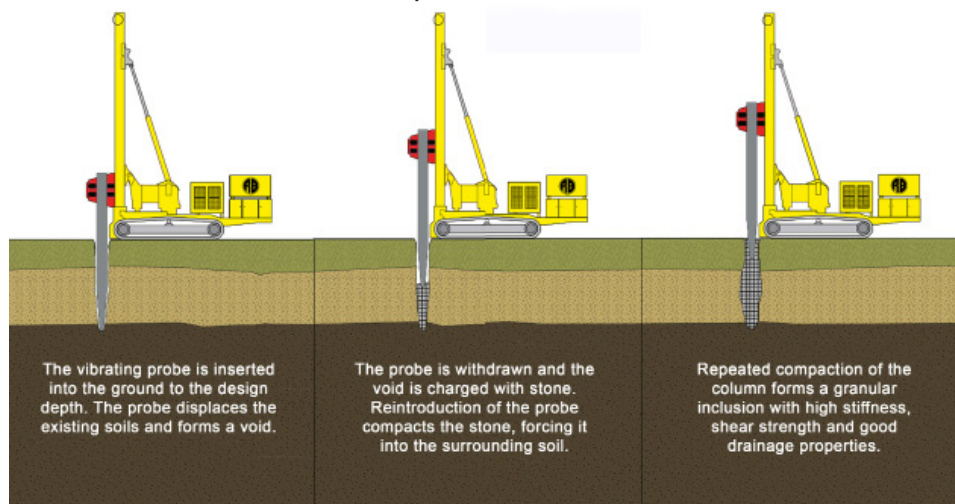
- By installing circa 550 vibro stone columns, RB was able to improve the bearing capacity of the in-situ soils to provide an allowable bearing capacity of 125 kN/m<sup>2</sup> beneath lightly reinforced shallow foundations and 25kN/m<sup>2</sup> beneath the ground bearing floor slab.
- Stone columns were validated using a series of in-situ geotechnical tests to confirm the successful installation of the columns and to ensure total and differential settlement were within acceptable tolerances.
- By successfully implementing the ground improvement scheme, RB delivered a significant economic saving on the overall foundation solution and negated any potential health and safety issues relating to deep excavation of foundation trenches.
- RB completed the contract to budget and in the scheduled time.
- The new build follows the opening of the Remembrance Centre, which was also built by Stepnell, and launched to the public in October 2016.
- The building is being constructed to complement the Remembrance Centre, and will be a single storey complex, built with steel frames and feature timber cladding, with extensive windowed views of the arboretum grounds.

**Sarah Montgomery, Managing Director at the National Memorial Arboretum, said:** "We are delighted that planning permission was granted for our new events building.

"Our site has growing visitor numbers and hosts more than 200 events every year, including those attended by members of the Royal Family. This new flexible building, with extensive facilities, will provide a modern event space to replace our existing events marquee.

**Construction Director from Stepnell, Bill Haynes said:** "After the highly successful Remembrance Centre project, everyone is pleased and excited to be continuing our excellent working relationship with the arboretum through this second project."

### The RB top feed Vibro Process



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