

CASE STUDY

PROJECT: GEOTECHNICAL SITE INVESTIGATION

LOCATION: NORWICH CASTLE

VALUE: £15K

BACKGROUND

Harrison Group was contracted by Morgan Sindall to carry out several phases of site investigation work at Norwich Castle during 2020 and 2021.

The work was part of the ambitious project to restore the castle keep back to the original layout that existed in the 12th century.

As the proposed alterations to the building's structure would increase loadings on internal walls and foundations, the investigations were required to provide ground information to aid pile design, give clearance to proceed at a number of proposed piling locations and for the safe construction of temporary works.



Site work at the castle overlooking Norwich

Previous site investigation at Norwich castle had identified granular made-ground with cohesive bands up to 10m depth, forming the structure of the castle mound.

Also, a Saxon burial site may have been encountered, with historical investigation findings revealing the presence of bone fragments at around 8.5m depth.

Underlying this, sand and gravel of the Crag Group and Norwich Chalk had been encountered.

SCOPE OF WORK

For this current phase of work, a number of investigative techniques were employed, including: -

- Cable percussive borehole (electric-powered low headroom rig) to a depth of 25m
- Dynamic Continuous Sampling (DCS) boreholes
- Dynamic Probe Testing (DPT)
- Plate Bearing Testing (PBT), completed within the Castle Meadow area of the site in order to provide information for construction of a temporary crane base
- In-situ California Bearing Ratio tests for temporary works

Archaeologists worked alongside Harrison Group as they were required to pre-dig the drilling locations, in order to check for artefacts, prior to the intrusive works being undertaken.



Low-headroom drilling rig

Due to the large quantity of made-ground encountered, which is inherently variable, geotechnical laboratory testing was considered of limited use in yielding meaningful results.

However, potential reaction of the soil with buried concrete was a consideration, and soil samples were sent to a UKAS/MCERTS accredited laboratory for testing.



CBR testing

DCS / DPT rig and crew

Pile installation was programmed as part of the development works, to be undertaken (by others) around the castle keep.

To assist with this, Harrison Group provided factual data as their works progressed, to allow the piling contractor to assess the suitability of anticipated piling locations and as an aid to their pile design before mobilising to site.

OUTCOME

All site operations were carried out successfully whilst respecting COVID-19 rules.

Harrison Group was also flexible with the site works and liaised closely with Morgan Sindall to prioritise their needs, completing the work on time and within budget.