HIGH ENERGY IMPACT COMPACTION (HEIC) WORKS FOR A COMMERCIAL DEVELOPMENT MANTON WOOD, WORKSOP, ENGLAND

Job Facts

Date of HEIC works	May 2004
HEIC unit deployed	3 Sided 27 kJ Unit
Site area	1.2 Ha
Site development	Commercial Portal framed Unit
Contract Duration	2 Weeks

Development Description

LANDPAC were commissioned to carry out HEIC works at Manton Wood in Worksop. The proposed development occupied an area of approximately 1.2 Ha and included a portal framed commercial building carrying a floor slab load of 50 kN/m^2 and foundation loadings on pads up to 3 m x 3m of 150 kN/m^2.

Plate 1 General View of site.

Ground Conditions

Site investigation information indicated that the site was underlain by Made Ground to a depth of about 2.5 mbgl. This in turn was found to overly weathered Sherwood Sandstone. Groundwater was not encountered in the boreholes put down during the site investigation. The Made Ground was suspected as having been placed under engineering control, however no confirmation of this was available.

Requirements of HEIC works carried out by LANDPAC

LANDPAC were commissioned to carry out HEIC works and through the use of CIR mapping and conventional geotechnical testing carried out by a third party Geotechnical Consultant, confirm that the finished platform was capable of carrying the proposed loadings within settlement tolerances (25 mm)

The works were started on 13 May 2004 and took two weeks to complete.

HEIC Process

The works were carried out using LANDPACs' three sided 27 kJ impact compactor with mapping carried out using LANDPACs' proprietary Continuous Impact Response (CIR) apping system.

Plate 2 Three sided impact compactor

The works were carried out according to the following methodology:

- Carry out initial ground level surveys
- Carry out initial CIR mapping (indicating pre treatment conditions)
- Carry out HEIC works in batches of 10 passes where possible
- Take ground surface levels and CIR readings after each set of ten HEIC passes
- Repeat HEIC and surveying until ground surface settlements <= 20 mm for 10 passes of the HEIC.
- Carry out analysis of CIR and settlement data and commission conventional Geotechnical testing. (This testing was carried out under the supervision of an independent Geotechnical Consultant)

Results of HEIC treatment

The HEIC process was successful in providing a verified finished working platform capable of carrying the proposed floor slab and foundation loadings within the prescribed tolerances. A summary of the conventional geotechnical testing which was carried out at the site is included on sheet 2.

Talbot House
204-226 Imperial Drive
Harrow
Middlesex HA2 7HH
Tel: 02084295136
Fax: 02084298797

Verification testing

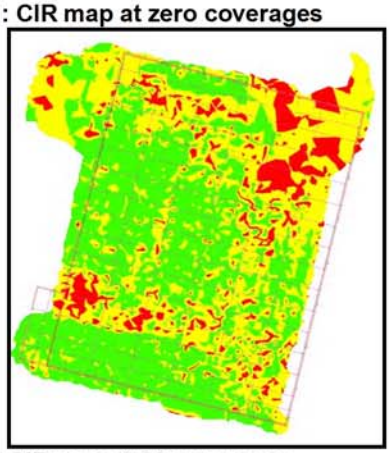
As part of the ground treatment package, LANDPAC included a suite of verification testing carried out under the supervision of an independent Geotechnical Consultant.

The verification testing for this site included a suite of dynamic probe testing, plate testing and zone load testing which when used in conjunction with LANDPACs' proprietry CIR mapping system allowed the Geotechnical Consultant to write a Verification report confirming that the requirements of the Specification had been achieved.

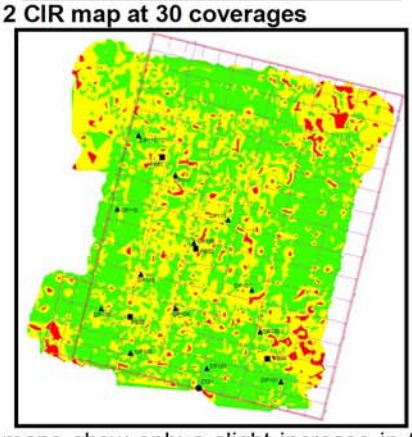
CIR Mapping

LANDPACs' CIR mapping system allows the deceleration of the impact compactor to be recorded at any point on the site and at any time and the data can be presented as a colour coded drawing. In the drawings below the deceleration increases from red to yellow and green.

Drawing 1: CIR map at zero coverages



Drawing 2 CIR map at 30 coverages

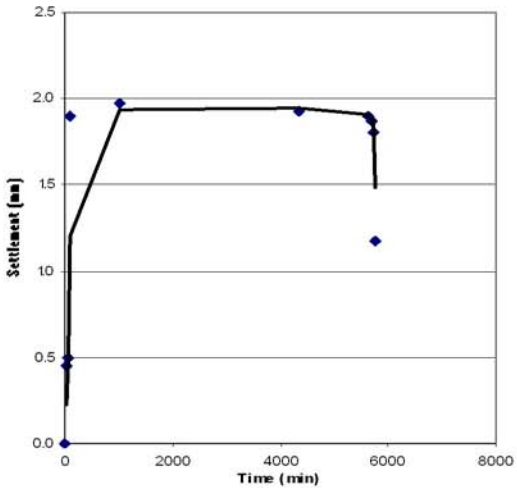


The CIR maps show only a slight increase in the rate of deceleration following HEIC works. The maps support the supposition that the materials were placed under Engineering control.

Zone testing

Two zone tests were carried out on 2 m x 2 m square plates which were loaded to apply a pressure of 100 kN/m^2. The tests were carried out 0.75 m below ground level at the proposed foundation level. A Plot of settlement versus time shown below.

Chart 1 : Plot of settlement versus time

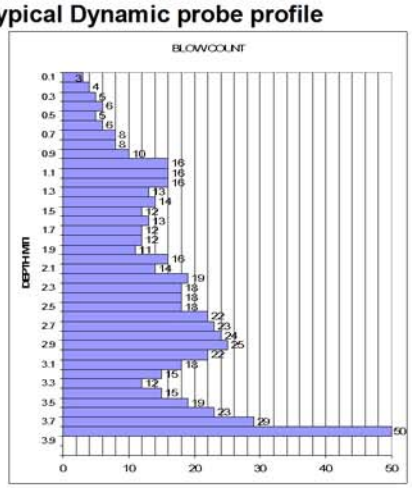


Both zone tests resulted in settlements of less than 2 mm at the maximum test load of 100 kN /m^2 and indicated a youngs modulus of around 100 MN/m^2.

Plate bearing tests and Dynamic Probing

Plate bearing tests were carried out at the ground surface which indicated much lower youngs moduli of around 5 MN/m^2. This was due to the dynamic imopact of the HEIC causing loosening of the near surface deposits within 200 to 300 mm of the surface.
A typical dynamic probe log confirms the strength profile suggested by the plate testing

Chart 2 Typical Dynamic probe profile



Talbot House
204-226 Imperial Drive
Harrow
Middlesex HA2 7HH
Tel: 02084295136
Fax: 02084298797