

HIGH ENERGY IMPACT COMPACTION (HEIC) WORKS FOR A MAJOR MIXED USED DEVELOPMENT POLKEMMET COLLIERY, WHITBURN, SCOTLAND

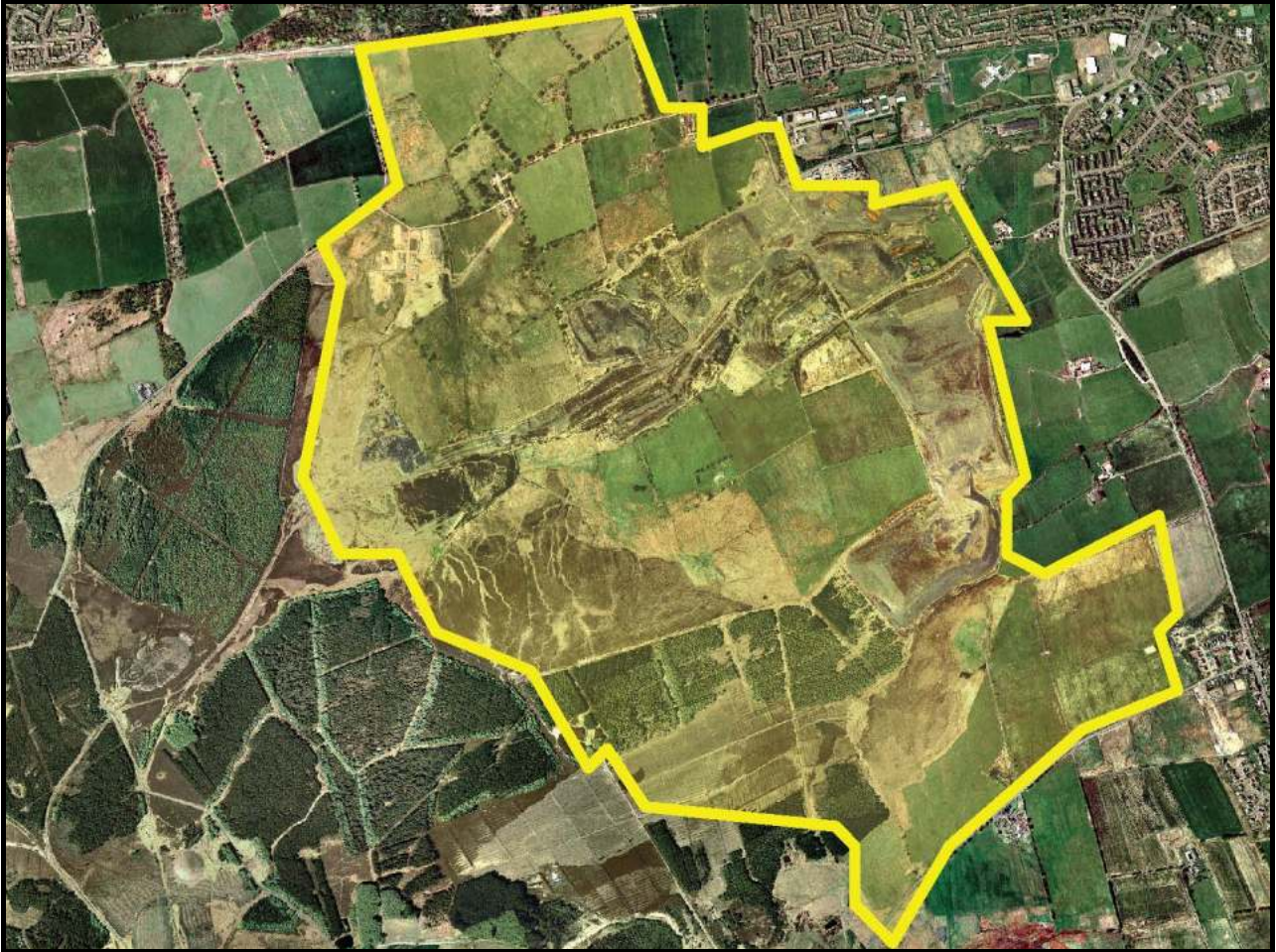
1.0 Job Facts

Date of HEIC works: June 2004 – to date
HEIC unit deployed: 3 & 5 Sided Units
Site area: 550 Ha
Site development: New town & Golf courses
Contract Duration: 3 years

2.0 Development Description

LANDPAC have been commissioned to carry out HEIC works at Polkemmet Colliery in Whitburn, Scotland. The proposed development occupies an area of approximately 550 Ha and includes the development of a new town and two PGA Golf Courses.

Plate1: 550 Ha Polkemmet Site.



3.0 Ground Conditions

The ground conditions at the site comprise Glacial Clays and Coal measures deposits of sandstones, mudstones, shale and siltstone.

4.0 Requirements works carried out by LANDPAC

LANDPAC were commissioned to carry out thick lift compaction works at the site. This is being achieved through the use of LANDPAC's 3 sided 25 kJ HEIC on coarse soils and 5 sided 15 kJ HEIC on fine soils. The specification for the works required an end product dry density of 95 % of standard proctor to be achieved.

5.0 Benefits of HEIC system

The use of LANDPACs HEIC system has resulted in cost savings and programme reduction due to the following:

- The ability to place fills in lifts up to 1.2 m thick.
- Speed of HEIC units allow the compaction of up to 80 000 m³ per week (using two HEIC units).
- Reduction in effort spreading layers.
- Increase in maximum allowable particle size due to the use of thick layers.
- Reduction in exposure and deterioration of soils.
- Reduction in verification testing due to the use of LANDPACs Continuous Impact Response system allowing better targeting of test locations.

6.0 Details of Works

The works at the site comprise an open cast coal mining operation and the preparation of a development platform for the new town and golf courses. 8,000,000 m³ of fill is to be placed and compacted. The coal mining and earthmoving operation is being carried out using a fleet of 21 CAT 777 trucks each with a nominal payload capacity of 100 Tonnes. These are service by 4 no RH120C excavators.

Plate 2: Earthmoving operations.



Following completion of the mining operation, the resulting holes are backfilled with the overburden materials spread in layers of up to 1.2 m in thickness.

Plate 4 LANDPAC 3 & 5 Sided HEICs



7.0 Verification testing

Verification testing is being carried out at the site under the supervision of the consulting engineer for the works. The testing includes insitu density testing using Nuclear Density tests and Sand Replacement testing, Plate Load testing, Zone Testing and monitoring of settlement pins.

The testing is being carried out with the benefit of LANDPACs Continuous Impact Response mapping system which allows the Engineer to target the testing at the most critical portions of the site, i.e. those areas which

Excavation proceeds until the coal has been fully removed resulting in excavations of up to 40 m deep.

Plate 3 HEIC works and backfilling



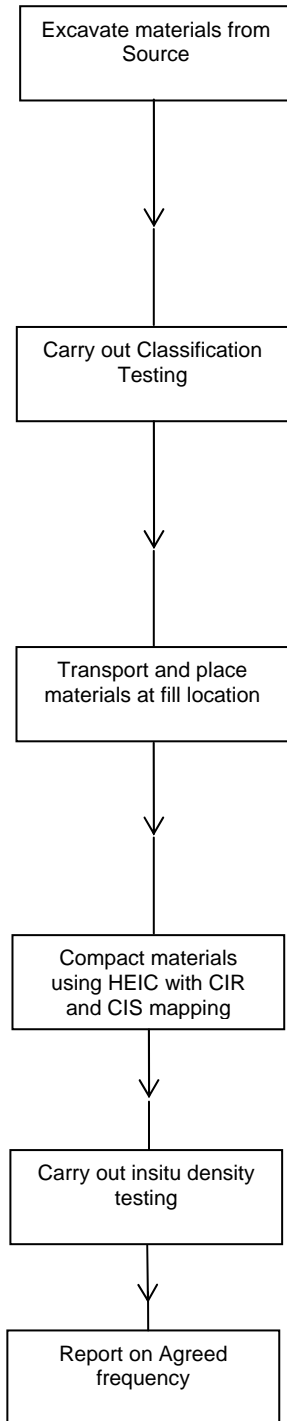
The layers are then compacted using either LANDPACs 3 sided or 5 sided HEIC unit.

are indicated on the CIR maps as being weaker than the surrounding soils. This ability to target the testing is resulting in the test programme being cut by 50% over what was originally envisaged.

The results of the testing to date are confirming conformance with the Specification.

8.0 Control of Works

Outlined below are details of the quality control system for the Polkemmet site. The system is designed to ease the data management burden at the site and allow effective checks to be carried out which will confirm compliance with the Specification. The system is set within an electronic database generated and managed by LANDPAC with data provided as indicated to allow the entire production chain to be tracked. The system addresses controls to be exercised during earthworks only and not post construction monitoring.

PRODUCTION CHAIN

DETAILS

Records of material source (by reference to site key plan) material type and quantities to be maintained by earthworks contractor and submitted electronically by email at the end of each day and hard copies to be signed and submitted weekly

Testing to include 2.5 and 4.5 kg compaction testing (per 100 000 m³ & material change), and Atterberg Limit Determination (per 50 000 m³ & material change) to be carried out on samples recovered from source in accordance with the Specification requirements.

Earthworks Contractor to sign declaration stating layer thickness < 1.2 m, formation dry, particle size <2/3 layer thickness and Specification requirements have been complied with. Documents to be submitted daily electronically and signed hard copies weekly to LANDPAC.

LANDPAC to produce CIR & CIS data and cross check stated layer thicknesses based on CIS data. Hard copies of CIR & CIS plots to be submitted weekly to the Engineer.

Insitu density testing carried out according to Engineers instructions in accordance with the Specification. Data to be supplied electronically to LANDPAC for inclusion in database.

NOTES

The information provided on the electronic submission will be included in a database.

Frequency of testing will be cross referenced with records on material movement quantities for inclusion in database.

The information will be included in a database.

A standard form for electronic transfer of CIR & CIS data will be prepared by LANDPAC.