

Unlocking a former open cast mine for development

Church Gresley, Derbyshire

Client: Taylor Wimpey

Value: £3m

Site area: 8ha

Timeframe: 12 months

End use: 306 private and affordable homes

Challenge

Ground engineering and enabling works to unlock this infilled former open cast mine for development of 306 new homes.

As part of the earthworks specification, which would enable a cost-effective reinforced strip foundation to be used, we needed to achieve:

- An end-product compaction of 95%
- A Net Allowable Bearing Pressure of 80kN/m²
- A CBR of 5% or higher
- Post-construction differential settlement of fill material under a self-weight of no more than 1in

Works would be delivered next to a residential area, with our team supporting community engagement and carrying out extensive environmental monitoring throughout the project.

Solution

We worked with Taylor Wimpey during land acquisition stage, devising an acceptable foundation and geotechnical solution and achieving NHBC approval.

This included creating bespoke 3D models detailing the depth and layers of excavated material.

Once onsite, our team conducted additional site investigations to categorise the nature of fill and create an earth-

-works design to meet the specification. We carried out trial pitting and applied trial compaction pads to the end-product specification.

Skip tests were also conducted to analyse settlement to prove our proposed foundation solution. Where settlement was not at target, this subsequently informed future sur-charge mounds to accelerate the process.

We designed and delivered a full programme of ground engineering and enabling works, including the integrated delivery of managing drilling and grouting of mine workings.

Our team excavated 500,000 tonnes of material, with 99.9% of soils processed and reused within the foundation. When soils were too wet, we modified them using a low carbon Ground Granulated Blast Furnace Slag (GGBS) binder.

All works were carried out concurrently, shortening the programme and enabling phased release of the site for development.

RESULTS

- Unlocked a complex site for development, with early involvement
- 99.9% of material processed and reused on site
- Cut programme time through phased and concurrent works
- Improved sustainability profile through use of carbon-zero binder