

Case Study

Site Investigation Haywood Homes



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Geotechnology has developed close working relationships with several developers working across the UK. This partnership approach has enabled working practices to be optimised and the approach and execution of Phase I and II investigations to be streamlined. Providing key geotechnical and environmental information at an early stage has also enabled developers to accommodate site constraints into their site development plans. This case study uses the findings of a Phase I and II investigation completed for Haywood Homes to illustrate the services provided by Geotechnology.

Desk study review of historical maps, geological base plans and the environmental setting of the site indicated that the site was in a potentially ecologically sensitive area and that there was an extensive history of mining in the surrounding area. Detailed evaluation of the mining report and mine abandonment plans obtained from the Coal Authority revealed several apparent inconsistencies.

The report showed the position of three shafts at the site while the abandonment plans did not show any shallow workings below the site. Consultation with the Coal Authority revealed that the shafts were positioned on the basis of an 1880 1st edition Ordnance Survey plan, rather than mine plans. Review of the geological plans showed the underlying structure to be complex, comprising a series of faults and folds with limited potential for surface outcrop

Geotechnology routinely undertakes Phase I Hazard Identification and Assessment studies on behalf of a range of residential and commercial property developers. These studies enable a Conceptual Site Model to be developed which then provides a framework for the preliminary evaluation of risks to the environment, human health and the development. In many cases, these studies are



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followed by a Phase II Risk Estimation and Evaluation investigation that typically involves intrusive site investigation, sampling and testing of environmental media and risk evaluation. Where the Phase II investigation results reveal the levels of soil contaminants in the near surface to be above generic assessment criteria, Geotechnology has derived site specific human health assessment criteria and undertaken more detailed site investigations.

Based on the findings of the Phase I assessment a conceptual site model was developed that identified several potential risks to the proposed development and pollution linkages. To better understand the magnitude of these risks and to provide detailed information upon which the developer could make an informed judgement a

Phase II investigation was designed. The principle objectives of the investigation were to locate and investigate the mine shafts, to evaluate the geotechnical properties of shallow ground conditions and to assess the level of potential contamination. Access to the site was good, enabling a statistically robust grid based sampling plan to be developed based on the results of the Phase I investigation and the site development plan. This grid was set out using a company owned GPS survey instrument.

To investigate the potential mine shafts Geotechnology used a phased approach having pegged out their approximate positions using the GPS survey system. was first carefully excavated and inspected using a backhoe excavator. The aim of the soil scrape was to identify any changes in



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ground conditions that may reveal the presence of backfill. At two of the three locations this approach was successful but the depth of the backfill could not be determined. Rotary drilling was therefore undertaken to determine the depth of the backfill and also at other site locations to verify the occurrence of shallow coal seams.



The first phase of trial pitting and ground condition mapping revealed the site to principally consist of topsoil overlying in-situ glacial till. In places the topsoil consisted of a soft peat. In close proximity to the identified mine shafts, thin layers of made ground were encountered. Chemical testing of the materials encountered revealed slightly elevated levels of several metals across the site, most notably in the topsoil but also in the localised areas of made ground. Statistical evaluation of the datasets revealed the data from the topsoil and made ground to be representative of two separate sample populations with no outliers.



To further evaluate the source and occurrence of elevated metals, a second stage of site investigation was undertaken. Discussions were also initiated with the local contaminated land officer. The additional testing comprised infill sampling of the grid established during the first stage and also the collection of samples over short vertical profiles within the material. This additional sampling and testing revealed no vertical distinctions and reinforced the statistical evaluations completed following the first stage of sampling.



The findings of the Phase II investigations prompted a review of the layout of the site development and initiated dialogue with the local authority at an early stage. Derivation of site specific assessment criteria and other options are now being considered. An appraisal of materials management options for the topsoil and made ground are also being developed.