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# DIGITAL COMMUNICATIONS ACADEMY, MANCHESTER

## PHASE II GEO-ENVIRONMENTAL INVESTIGATION

- Site Investigation Report
- DRAFT v1
- October 2008

EXTRACT

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# Executive Summary

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| **Site Location** | The site is located approximately 2km north of Manchester City centre at National Grid Reference (NGR) 385900, 400820. |
| **Site Description and Proposed Use** | The site occupies an area of approximately 9.9 hectares. The site is currently undeveloped and is occupied by a mixture of grassed open space, intermixed with areas of scrub and immature trees and crossed by a number of public footpaths. Moston Brook lies to the southeast of the southern part of the site and is culverted beneath the northern area of the site. There are no existing structures at the site, other than a brick retaining wall adjacent to the brook.<br><br>It is proposed that a new three to four story educational facility is to be constructed in the south west corner of the southern part of the site. A sports centre is proposed to the east of the main building. Car parking is to be constructed along the boundary with Moston Brook, with the remainder of the site being occupied by MUGA's, sports pitches and soft and hard landscaping. In order to create level development plots significant earthworks are proposed. |
| **Site Geology** | Published geological (BGS) mapping indicates that the site is underlain by Glacial Clay, although a layer of Made Ground would be anticipated. The Bradford Fault trends along Lathbury Road and as a consequence the southern portion of the site is underlain by Carboniferous Pennine Middle Coal Measures and Newton Heath Sandstones. The northern portion is underlain by Sherwood Sandstone of Triassic age. |
| **Local Hydrogeology** | The Carboniferous strata beneath the southern portion of the site are classified as Minor Aquifers, whilst the Sherwood Sandstone Formation beneath the northern portion of the site is classified as a Major Aquifer by the Environment Agency. |
| **Local Hydrology** | The nearest surface water feature to the site is Moston Brook, which is present immediately to the southeast and culverted beneath the northern part of the site. |
| **Site History** | The site has historically had a number of industrial uses, which include: smithy, dye works, chemical works, tool works, carpentry works, brick works and clay pit and refuse pit. A large proportion of the southern part of the site also had terraced residential housing until much of the site was cleared in the 1970's. Allotment gardens were historically present in the north of the site.<br><br>A review of the MCC data indicates that apartments were planned for the southern portion of the site in the 1960's and that piles were installed, which may still be in place. |
| **Ground Investigation Summary** | The SKM ground investigation encountered Made Ground in excess of 17m in depth in the northern portion, however in the area of the proposed school it was generally <2m. The Made Ground was underlain by glacial deposits comprising variable drift materials from soft to stiff clays which occasionally contained bands of silts and sand. Bedrock was encountered in both parts of the site with sandstones and mudstones in the southern part of the site, inferred to be Newton Heath Sandstone and Pennine Middle Coal Measures and interbedded sandstone and mudstone, inferred to be Sherwood Sandstone in the north.<br><br>Groundwater strikes were generally not encountered during the investigation although subsequent monitoring has recorded perched, laterally discontinuous groundwater within the Made Ground and underlying glacial deposits. Groundwater has also been encountered at depth within both the minor and major aquifers. |
| **Chemical Testing Results Summary** | Chemical testing of the soils collected from Made Ground deposits at the site recorded elevated heavy metals, PAH's, TPH, and the presence of a small number of VOC's and SVOCs. In addition a cement bound fragment of asbestos was identified at one location at the site. A detailed quantitative risk assessment (DQRA) has been carried out, which has determined that there are theoretical risks to site end users and as such remedial action will be required prior to development.<br><br>Soil leachate and groundwater testing has recorded elevated concentrations of determinands above the appropriate screening criteria. An assessment of the hydrogeological regime appears to indicate that the perched groundwater within the Made Ground has been impacted but deeper units within the Glacial Drift and underlying minor and major aquifers have not been impacted. |

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| **Environmental Conclusions & Recommendations** | Given the encountered exceedances of the Tier II screening criteria a remedial strategy will need to be developed, which should include an options appraisal of the most cost effective and pragmatic remedial solution. A simple cover system incorporating either a geotextile of capillary break layer would break the pollutant linkage thus mitigating the risk to site end users. The remedial strategy will need to be agreed with the Local Authority prior to implementation.<br><br>The observations regarding controlled waters will be confirmed by a further round of groundwater and surface water sampling, which will be presented as an addendum with the final gas monitoring results. The findings of which should be presented to the Environment Agency for their comment.<br><br>Given the elevated concentrations of contaminants recorded in the Made Ground suitable materials for pipes that are not affected by the encountered contaminants should be selected.<br><br>Any materials which are to be re-used as part of the site regrade will need testing at a frequency of one sample per 200$m^3$ for second generation materials and one sample per 1000m3 for first generation materials.<br><br>Characteristic Situation 3 gas mitigation measures including a gas specific gas membrane and ventilated sub-floor void are likely to be required at the site. Final gas mitigation design will be determined on completion of the gas monitoring in mid January 2009. |
| **Geotechnical Conclusions & Recommendations** | It is considered that a piled foundation solution would be the most practicable solution for the proposed structure, due to the depth of Made Ground under the majority of the proposed buildings. Piles should be designed to mobilise the majority of their strength through end bearing resistance into the rock with some resistance gained from skin friction within the Glacial Till. It would be prudent to probe the shallow Made Ground at proposed pile locations to ensure obstructions are not present.<br><br>As a piled foundation solution is considered most appropriate a suspended ground floor slab is recommended to prevent differential settlement between the slab and the buildings. Given the proposed site re-grade a ground bearing floor slab could be utilised for parts of the proposed academy building but would require a specialist gas mitigation design in order to accommodate underslab ventilation.<br><br>All materials excavated as part of the cut operation on site will need to be processed, possibly just by simple sorting and or crushing before they can be reused. Materials will subsequently require geotechnical and chemical testing to ensure they are suitable.<br><br>Areas that are to be filled may require benching to provide a level and stable platform onto which the fill can be placed. Some retaining wall structures may be required to support the currently proposed final site profile where the cut or filled faces exceed 20°. |