
REMEDIATION METHOD STATEMENT

5 Carnatic Road,
Liverpool,
L18 8DR

Client: Carnatic Development Limited

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J21085



Document control

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1.0 INTRODUCTION

Consideration is being given to the redevelopment of this site, through the demolition of the existing structure and the construction of a new four-storey apartment block with basement and soft landscaping.

The site has previously been the subject of a ground investigation by GEA (Report Ref J21085, dated May 2021). The investigation revealed the presence of elevated concentrations of arsenic, lead, benzo (a) pyrene and total PAH.

This report sets out a formalised Remedial Method Statement and should be read in conjunction with the previous reports.

1.1 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigations carried out. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

2.0 THE SITE

The site is located off Carnatic Road approximately 100 m south of Mossley Hill Hospital and 850 m west of Mossley Hill railway station. The site is bounded by Carnatic Road to the south, detached residential properties with associated gardens to the north and east and the commercial Carnatic Spa with associated gardens to the west. The site is rectangular in shape with maximum dimensions of approximately 60 m north to south and 40 m east to west with an area of 0.31 hectares. It may be located by National Grid Reference 338350 387300.

The site is currently occupied by a two-storey brick residential building in the centre of the site measuring approximately 35 m west to east and 15 m north to south, with a garage on the eastern end of the building and a conservatory on the western end. The building has a brick paved driveway leading south to Carnatic Road. The rest of the site is vegetated with a grass lawn and the boundary of the site is lined with hedges and semi-mature trees.

2.1 Site History

The desk study indicated that the site was open fields and farmland with a small pond located in the southwestern corner in 1850, with the first residential building on site shown on the 1893 map. The 1927 map shows a hospital had been constructed approximately 100 m to the north with various other residential buildings being constructed within 100 m of site in the 1930's, 1950's, 1960's and 1980's.

The 1999 map shows the current building had been constructed with an extension being added between 2006 and 2021.

The report indicates that the site is not within a Radon Affected Area, as less than 1% of properties are above the Action Level and therefore no radon protection measures are necessary.

3.0 GROUND MODEL

The site was previously in use as a residential building since the 1890s. Therefore, it was not considered to have had a significantly contaminative past use. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- ❑ below a moderate thickness of made ground or topsoil, Glacial Till was present overlying the Chester Formation which was proved to the full depth investigated of 3.8 m;
- ❑ the Glacial Till was encountered in all Boreholes as light grey mottled brown silty, sandy clay with rare gravel. The clay generally became reddish brown between 0.7 m and 1.3 m. The Glacial Till extended to a maximum depth of 3.5 m;
- ❑ the Chester Formation consisted of reddish brown very clayey sand with rare gravel or light brown slightly silty sand, which was proved to a depth of 3.8 m, the maximum depth investigated;
- ❑ groundwater was not encountered during the site investigation, but later monitoring visits encountered groundwater between 0.35 m and 3.3 m; and
- ❑ contamination analyses measured elevated concentrations of arsenic, lead, benzo (a) pyrene and total PAH. Asbestos was not identified in this investigation.

4.0 CONCEPTUAL MODEL

The table below sets out the risk pathways that could potentially be present following the redevelopment of the site. This conceptual model is based upon the findings of the ground model developed in the light of the investigation findings and highlights areas where remedial work should be considered.

| SOURCE | RECEPTOR | PATHWAY | COMMENTS |
|--|--------------|--|---|
| Elevated concentrations of arsenic, lead, benzo (a) pyrene and total PAH | End users | Inhalation of contaminated soil or dust, through skin contact or inhalation within areas of soft landscaping | Consideration should be given to either the removal of shallow contaminated made ground or for the inclusion of a clean cover system in areas of soft landscaping. |
| | Site workers | Ingestion of contaminated soil or dust, through skin contact or inhalation | Appropriate protective equipment and working practices will be required during demolition and groundworks. Excavated soil should be kept damp and dust suppression implemented where necessary. |

5.0 RISK ASSESSMENT

The contamination testing has revealed the presence of elevated concentrations of arsenic, lead, benzo (a) pyrene and total PAH. Asbestos was not identified in this investigation.

It is thus considered that the soils at this site do pose a risk to protected waters, structures, or ecological systems and could pose a potential risk to human health through the inhalation of soil derived dust.

6.0 REMEDIAL OBJECTIVES

Based on the above risk assessment the following remedial objectives have been established for this development;

- ❑ to protect end users and provide a suitable growing medium for plant growth; and
- ❑ protect ground workers who will be exposed to the soil.

7.0 REMEDIAL PROPOSALS

The site investigation and risk assessment have identified potential risks to end users of the site and as such remedial measures will be implemented to ensure the safe development of the site. To address the remedial objectives the remedial measures will comprise:

- ❑ the removal of contaminated made ground; and
- ❑ the installation of clean imported soil in all areas of soft landscaping.

The details of these remedial measures are set out below.

7.1 Landscaped Areas

At this stage, removal of the contaminated soil as part of the soft landscaping may be viable as the test results show the contaminants are only present within the made ground. Therefore, removal of the made ground will remove the identified contaminants and allow retention of the topsoil.

It may also be recommended that a cover thickness of imported subsoil and topsoil of 600 mm should be specified to ensure successful plant growth, in accordance with recommendations from BRE. It may be possible to reduce the thickness of cover required, but this will need to be determined once final levels have been established and the concentrations of potential contaminants within the imported material are known. The location of the contaminants does appear to be located primarily in the front of the site at Boreholes Nos 1, 2 and 3. It is possible that remediation methods could be focused in these areas, although it may require more testing to confirm.

Precautions will not be required in the footprint of the buildings or in areas of hardstanding as these should provide an effective barrier to any contaminants.

7.2 Site Workers

A programme of working should be identified to protect workers handling any soil and to avoid contact with any contaminants present. The method of site working should be in accordance with guidelines set out by HSE and CIRIA and the requirements of the Local Authority Environmental Health Officer. As with any site, a watching brief should be maintained during the

groundwork, and if suspicious soils are encountered then a suitably qualified engineer should inspect the soils and further testing carried out if required.

8.0 MONITORING OF REMEDIAL MEASURES

This section sets out how the remedial measures will be validated.

8.1 Landscaped Areas

Importation and installation of soil

Prior to the importation of any topsoil for use within landscaped areas, certification will be provided and approved by GEA. The suitability of the material will be assessed against the GEA Screening Values, which are based on C4SL or LQM/CIEH S4UL for a residential without plant uptake end use, a copy of which is enclosed. Photographs of the installation will be taken by the contractor along with records of the levels before and after installation, and these will be included in the validation report. In addition to the photographic evidence and the ground level records, confirmation of the correct installation of the clean cover layer will be validated by a series of trial holes and / or hand auger boreholes undertaken by GEA. In support of the visual examination, further samples of the material will be taken by GEA for laboratory testing and assessment against the adopted screening values for a residential without plant uptake.

Frequency of analysis

Confirmatory soil samples will be taken at a rate of one sample per 50m³ of certified material and a minimum of three samples per source.

Documentation

The validation report will include waste transfer documents for all exported and imported material, photographs of the capping layer, details of the certified imported soil and the results of the validation testing together with the thickness of the imported clean cover layer.

8.2 Site Workers

Site work will be carried out in accordance with guidelines set out by HSE and CIRIA and all appropriate PPE will be worn.

8.3 Unknown Contamination

Where any odorous, discoloured, or suspicious material is identified during construction, work in that area will cease until GEA return to site to investigate, assess the risk posed by the material. Unless testing confirms the material to pose an acceptable level of risk, all such materials will be excavated and disposed of off-site.

9.0 VALIDATION

On completion of the remedial works, a report will be prepared documenting the satisfactory undertaking of the remediation proposals and of any duty of care under the waste management legislation, together with an assessment of the suitability of the soils remaining beneath the site in respect of the proposed student accommodation. The report will include written and photographic records of the site inspections carried out, together with the results of the validation analyses and will present an assessment of the condition of the remediated site with respect to the end use.