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METHOD STATEMENT FOR FURTHER INVESTIGATION AND REMEDIATION OF CONTAMINATION FOR A PROPOSED RESIDENTIAL DEVELOPMENT, HINCKLEY ROAD, BURBAGE, LEICESTERSHIRE

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1. INTRODUCTION

1.1 This Method Statement has been prepared on instructions given by Stokes Evans Developments of Hall Farm Granary, St. Peters Road, Arnesby, Leicestershire LE8 5WJ and addresses the requirements of the Planning Condition of Hinckley and Bosworth Borough Council.

1.2 The site has been the subject of a Phase 1 (Desk Study) and Phase 2 (Intrusive Investigation) as detailed below and which are taken into account in drawing up this Method Statement for further investigation and remediation:

- Murray Rix Geotechnical Report GEOJOB/11-320R Report on a Desk Study for a Proposed Residential Development, Hinckley Road, Burbage, Leicestershire dated August 2011.
- Murray Rix Geotechnical Report Geojob/11-220R(A) Report on a Ground Investigation and Preliminary Contamination Risk Assessment for a Proposed Residential Development, Hinckley Road, Burbage, Leicestershire dated September 2011.

1.3 As shown on Figure 1, Appendix (i), the site is currently occupied by commercial premises to the south east and a bungalow to the north west. It is proposed to demolish the existing buildings and construct a residential development. The exact layout of the proposed development is not as yet decided. However, it is understood that the development will include private gardens. The site is within the village of Burbage, Leicestershire at and around National Grid Reference 444149E 292852N. It is roughly rectangular in shape and covers an area of approximately 0.14 ha.

1.4 The further geotechnical and contamination investigation, assessment and reporting is to be carried out in general accordance with the following:

- BS EN ISO 14688-1:2002. Geotechnical investigation and testing – Identification and classification of a soil – Part 1: Identification and description.
- BS EN ISO 14688-1:2005. Geotechnical investigation and testing – Identification and classification of a soil – Part 2: Principles for a classification.
- BS En ISO 22476-3:2005. Geotechnical investigation and testing – Field testing – Part 3: Standard Penetration Test.
- BS EN ISO 14689-1:2003. Geotechnical investigation and testing – Identification and classification of rock – Part 1: Identification and description.
- BS EN ISO 22475-1:2006. Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1: Technical principles for execution.
- BS EN 1997-1:2004 Eurocode 7: Geotechnical design – Part 1: General Rules.

- NA to BS EN 1997-1:2004. UK National Annex to Eurocode 7: Geotechnical design – Part 1: General Rules.
- BS EN 1997-2:2007. Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing.
- NA to BS EN 1997-2:2007. UK National Annex to Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing.
- Environment Agency and NHBC (2008) 'Guidance for the Safe Development of Housing on Land Affected by Contamination' R & D Publication 66. Environment Agency.
- Department of the Environment, Food and Rural Affairs and Environment Agency 2004. Model Procedures for the Management of Land Contamination. Contaminated Land Report 11).
- Leicestershire and Rutland Pollution Sub Committee on Land Contamination August 2009. A Guide to Developers of Potentially Contaminated Sites in Leicestershire and Rutland.

2. FINDINGS OF THE DESK STUDY

2.1 The main features of the Desk Study that are pertinent to the further investigation are outlined below.

2.2 The site was undeveloped land until around 1924 when buildings, possibly forming an extension to the Hosiery Manufactory to the south, crossed the site. These buildings were subsequently replaced with the existing bungalow and commercial premises. Around this time the buildings to the south are identified as a Builder's Yard and may extend onto part of the area under investigation.

2.3 The site comprises single and two storey commercial premises in the south east part of the site with a blacktop access off Hinckley Road which leads down to the rear of the buildings. The buildings are of brick construction. The north western part of the site is occupied by a traditional brick bungalow with gardens and a driveway. The front 2-storey part of the commercial premises has most recently been used for mobile phone sales. The rear single storey structure was noted as being used for garaging, workshops and storage.

2.4 Published geological information indicates the site as underlain by drift deposits comprising -

Pleistocene deposits (Wolston Glacial Succession) -
Oadby Till: mainly grey pebbly clay with chalk
Wolston Sand and Gravel: yellow or red sand and gravel
Wolston Clay: grey stoneless clay and silt
Thrussington Till: mainly red or brown pebbly clay

These overlie solid deposits comprising -

Triassic deposits -
Mercia Mudstone Group: red-brown clays and mudstones with subordinate sandstones

2.5 The drift deposits comprising the Oadby Till are classed as Unproductive Strata. The underlying solid deposits of the Mercia Mudstone are designated a Secondary B Aquifer. The site is not in a groundwater source protection zone.

2.6 The nearest surface water feature listed in the Envirocheck report is 240m from the site beyond St Catherine's Church to the south east.

2.7 For groundwater, the sensitivity is assessed as L1 (Low) to L2 (Very Low) and for surface water (excluding coastal water) the sensitivity is appraised as L1 (Low).

2.8 The site does not lie in an area where radon protection measures are necessary in new dwellings. While some localised infilling of small ponds, a graveyard and similar features have been identified in surrounding areas, these are deemed to represent point sources of possible ground gases sufficiently distanced from the site not to affect it. No gas monitoring was proposed unless the intrusive investigation highlighted conditions of concern (see section 3.5)

2.9 The Desk Study identified the need for some preliminary contamination sampling and testing to quantify potential risks associated with previous site usage including a Hosiery Manufactory, Builder's Yard and commercial premises.

3. FINDINGS OF PRELIMINARY INTRUSIVE INVESTIGATION

3.1 Four exploratory boreholes (WS1 to WS4) were drilled at the site by windowless sampling techniques and two hand auger holes (HA1 and HA2) excavated by hand in the rear garden area of the bungalow. The investigation positions are shown on Figure 1, Appendix (i). The boreholes were sunk to depths between 4.45 and 5.45m and the hand auger holes to depths of 0.55 and 0.90m. A concrete floor was cored in the location of WS2 to facilitate drilling.

3.2 Floor construction of concrete was present in WS2 in the workshop/garage to the rear of the commercial building; and blacktop was present in the positions of WS3 and WS4. Below the surface construction and elsewhere from ground level, shallow fill materials were encountered. The materials included varying proportions of black ash, glass, gravel, crushed concrete, clay, brick, clinker and topsoil and extended to depths between 0.45 and 0.60m below ground level.

3.3 Underlying the forgoing were deposits of the Oadby Till. These comprised gravelly, occasionally sandy, clays which extended to the full depth of investigation.

3.4 No groundwater seepage was detected in the investigation holes during the fieldwork. However, the very soft deposits between 1.00 and 2.10m depth in WS4 were notably wet.

3.5 No ground gas monitoring was deemed necessary particularly bearing in mind the presence of relatively low permeability clays with only shallow surface fill.

3.6 The results of the laboratory testing have indicated slightly elevated PAHs in the ash fill in WS2. It is recommended that all ash fill is removed from garden areas. The extent of the ash will need to be carefully identified and care taken not to spread it around the site

during demolition works. This includes the ash fill in WS4 and the surround to the old pipe in position HA2 which need to be chased back but is likely to be present elsewhere at the site. Careful consideration also needs to be given to the physical properties of the remainder of the existing fill and its suitability to remain in garden areas.

3.7 The elevated lead in the natural ground in HA2 is also of concern and further investigation should be carried out in this area to verify or otherwise the findings of the intrusive investigation (note that the suspect ash fill surrounding the pipe in this area may have led to cross contamination of the underlying natural ground and should be removed as required by 3.6).

3.8 This Method Statement has been drawn up as required by the Phase 2 Investigation Report in order to detail the recommended remedial measures and testing requirements. This includes Waste Acceptance Criteria (WAC) testing of materials to be removed from site, supply of Conveyance and Delivery Notes, approvals of imported soils and other matters to be addressed in ensuring the site is fit for purpose.

3.8 The primary concerns at the site are the risks to end users. The available data indicates that some remedial measures will be necessary, in the near surface soils, to safeguard the health of end users. Groundwater resources and surface water can be affected by the migration of contaminants. However, clays are present at the site with no evidence of a water table or mobile contaminants.

4. OBJECTIVES OF FURTHER INVESTIGATION AND INSPECTIONS

4.1 The concerns and objectives at the site are:

- The elevated PAHs in the ash fill is of concern and will require removal from garden areas. The extent of ash fill needs to be established and care taken during demolition operations not to spread it around the site.
- The extent and significance of the apparent lead contamination in the natural soils around position HA2 in the rear garden to the bungalow needs to be established and remediated as necessary.
- As necessary, WAC testing needs to be undertaken for materials to be removed from site to tip.

5. REMEDIATION METHODOLOGY AND REQUIREMENTS

5.1 Based on the findings of the initial investigation, it is likely that contaminated soils are of limited extent and excavation of unsuitable materials and removal to tip will be the most cost effective solution. For the purpose of this Method Statement the ground is designated as Fill or Natural Materials.

5.2 The existing structures at the site need to be demolished and below ground construction broken out with care. Spreading the ash fill (contaminated with PAHs) around the site must be avoided. Inspections shall be taken to ensure that no ash fill or otherwise suspect fill materials remain in garden areas. All suspect ashy materials are to be removed to tip.

5.3 An area of at least 5.0m by 5.0m around the position of HA2, where elevated lead has been detected in the natural soils, should be stripped of all fill materials and the natural soils excavated to 0.50m depth. Samples shall be taken from around and below the affected area for analysis to ensure that levels of lead are below the relevant Critical Concentration of 450mg/kg. All suspect materials are to be removed to stockpile for further testing or to tip.

5.4 A designated excavator and operator will be used in remediation operations. Prior to starting excavation, the machine operator will have been instructed on site by Murray Rix Geotechnical.

5.5 All works will be under the general supervision of Murray Rix Geotechnical who will inspect, sample and test the ground in order to establish the severity of any contamination and its extent. Soil samples will be recovered in amber glass jars. Samples will be placed in cool boxes and transported to the testing laboratory as quickly as possible.

5.6 Any imported soils will have to be shown to be suitable for purpose.

5.7 Laboratory testing will be carried out at UKAS and MCERTS accredited laboratories.

5.8 During the demolition works and proposed further investigative works, to avoid the spread of potentially contaminated soils, suspect materials not removed from site immediately will be stockpiled on an impervious surface such as polythene to await removal from site or approval to remain on site following testing. Designated areas will be set aside for stockpiling of materials. All contaminated materials to be removed from site shall be disposed of at a suitable waste disposal facility.

5.9 All unsupervised excavations will be fenced off to prevent unauthorised access.

5.10 Site works are to comply with all relevant guidelines and legislation. In particular, attention is drawn to the HSE document 'Protection of workers and the general public during development of contaminated land'.

5.11 Reasonable steps shall be taken to reduce the risk of raising dust caused by the excavation and movement of site materials during the works. This is to reduce the risk to site operatives and the risk of nuisance to neighbouring properties. Damping down may be necessary in dry windy weather.

5.12 There will be a strict requirement for site operatives to maintain a high standard of personal hygiene particularly in relation to eating, drinking and smoking.

6. VALIDATION

6.1 Following the investigation and remediation of the site, a validation report shall be prepared in accordance with the requirements of CLR11 (see section 1.4), and shall include the following information:

- The sequence of operations undertaken in investigation and remediation of the site including the methodology.

- Records of inspections undertaken.
- The materials removed from site and the Conveyance Notes.
- The disposal site and the Delivery Notes for materials removed from site.
- The sampling and laboratory testing carried out.
- A photographic record.
- Notes on areas remediated.
- The results of testing of any imported materials including topsoil.
- Details of all other matters that come to light during the works.
- A statement as to the suitability of the site for end use and that the remediation has been carried out to the desired standard.



E.J. Murray BSc, PhD, CEng, FICE, CGeol, FGS, MaPS

Appendix (i)

Figure 1: The Site and Investigation Location Plan (from initial investigation)

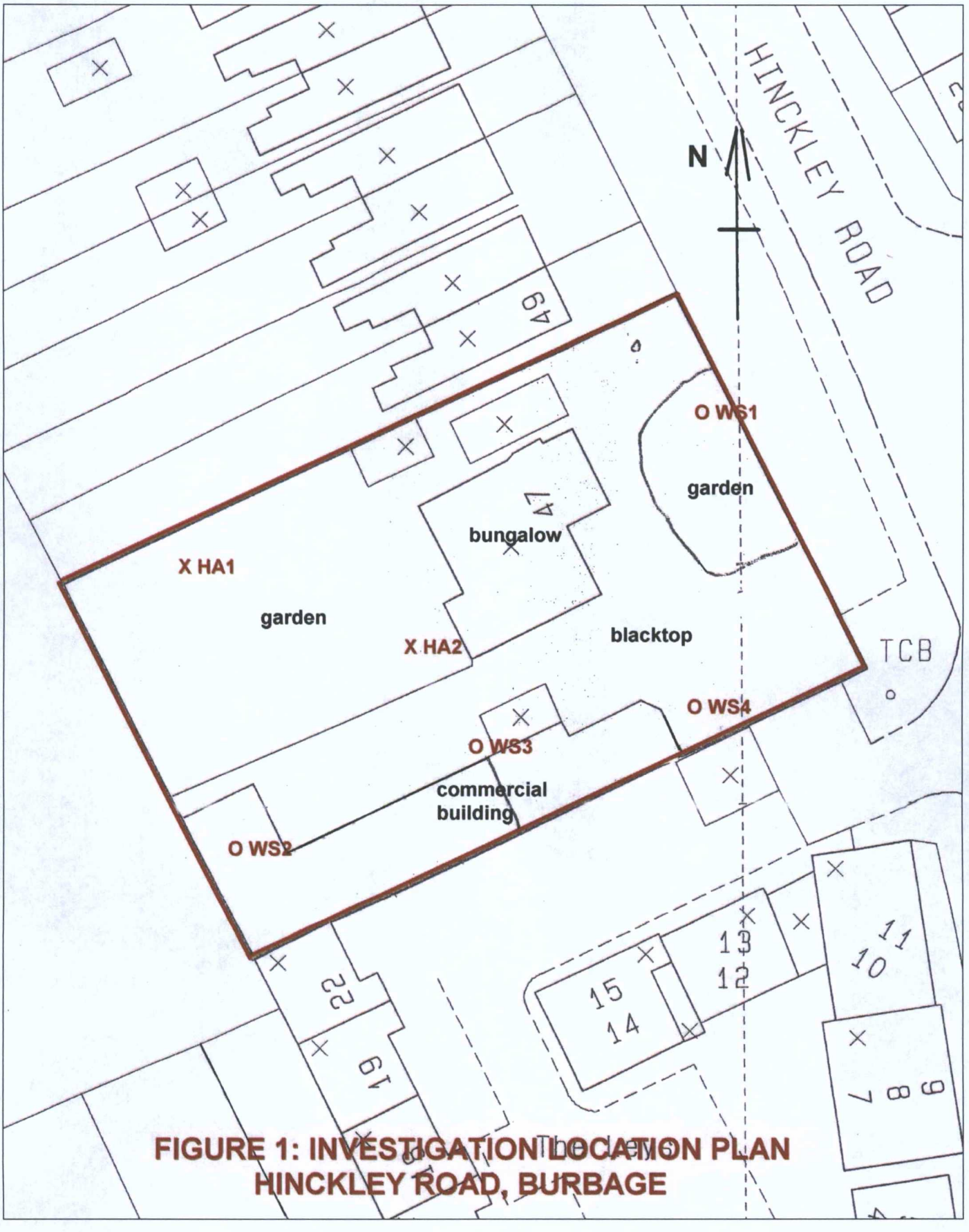

FIGURE 1: INVESTIGATION LOCATION PLAN
HINCKLEY ROAD, BURBAGE