

Ingleton Wood LLP

Remedial Strategy

**Land at Rear of 163 to 173
The Roundway
Tottenham
London
N17 7HE**

**Report No: 21.08.016c
December 2022**

DOCUMENT RECORD

Report Title	Remedial Strategy Report
Development	New Residential Development
Project Address	Land at Rear of 163 to 173 The Roundway, Tottenham, London, N17 7HE
Project Number	21.08.016c
Client	Ingleton Wood LLP

	<u>Signature</u>	<u>Name and Qualifications</u>
Prepared By:		Adam Jones Associate Director MGeol(Hons), FGS
Checked By:		Lee Chippington Associate Director BSc(Hons), MSc, FGS

For and on behalf of ListersGeo, trading name of Listers Geotechnical Consultants Ltd

Issue No	Date	Status
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REMEDIAL STRATEGY

INTRODUCTION

This Remedial Strategy describes the remediation to be undertaken at the Land at Rear of 163 to 173 The Roundway, Tottenham, London, N17 7HE.. The proposed site plan is provided in Appendix A.

Instructions to undertake this reporting were received from Ingleton Wood in their email dated 21st October 2022.

The site has been subject to a number of previous investigations undertaken by ListersGeo as outlined below:

- 21.08.016 – Ground investigation dated November 2021
- 21.08.016a – Supplementary Ground Gas Monitoring due to be issued in December 2022
- 21.08.016b – Discovery Strategy issued in November 2022

It is proposed to redevelop the site to accommodate a pre-fabricated/modular building to comprise of five terraced residential 'units'/properties surrounding by paving with limited soft landscaping. As the development does not cover the whole site, it is considered that the existing soft landscaping will remain surrounding the development. A proposed site layout plan is provided in Appendix A.

This report has been prepared for the sole use of the client and their professional advisors. This report shall not be relied upon by third parties without the express written authority of ListersGeo. If an unauthorised third party comes into possession of this report they must not rely on it and the authors owe them no duty of care and skill.

CONTAMINATION RISK ASSESSMENT

The site was previously occupied agricultural land, was developed with allotment gardens in the 1930s but has since become disused and overgrown. A track was installed on the site in 2017.

The previous investigation identified elevated concentrations of PAHs encountered within the Topsoil and Made Ground soils that have the potential to cause significant harm to the future end users. The exposure route of primary concern for the contamination is 'direct soil ingestion'.

It was therefore considered necessary to implement remedial measures at the site to break the source-pathway-receptor linkage between the contaminated soils and the end users, which would also protect the surrounding residents. For the construction workers at the site, different measures will need to be taken.

PROPOSED REMEDIAL MEASURES

ListersGeo recommended that a carefully designed clean soil cover system should be placed over areas where the contaminated Made Ground and/or Topsoil are present. This applies to the garden and soft landscaped areas at this site. A proposed development plan indicating the areas designated for soft landscaping is provided in Appendix A.

In areas of soft landscaping (and private gardens if present), a 600mm thick cover system formed of clean material, certified clean prior to use should be used. This material should include at least 180mm of clean Topsoil. It is understood that the Hill Group will be responsible for installing the cover system which will comprise of 300mm of Subsoil with 300mm of Topsoil over the top.

The imported material will be certified clean by an environmental engineer prior to placement.

The cover system may be created by either raising site levels or removing some of the soil to create the cover depth required.

If all of the contaminated Made Ground soils are removed, then the landscaping specification may revert back to the guidelines provided in the NHBC Standards.

The plots do not have individual gardens/areas of soft landscaping. Hence, it is proposed to verify the thickness of the cover system at say eight locations across the site.

IMPORTED TOPSOIL AND SUBSOIL SPECIFICATION

The source of any soils imported to the site must be specified and delivery notes connecting the soils from the supplier to the site must be provided.

Any Topsoil or Subsoil imported to the site requires testing for a range of contaminants to ensure that the soil is suitable for the particular development. The analysis should include a range of metals, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), boron, phenol and asbestos.

Normally the supplier will have undertaken chemical testing on the soils prior to sale. The geoenvironmental engineer performing the remediation verification will need to review the chemical testing results to validate the imported soil, prior to the cover system being constructed.

The Local Authority may require independent chemical testing of the soils to be imported, to demonstrate that the imported soils are clean and suitable for use. With the soft landscaped areas at this development, testing will be undertaken at a rate of approximately one sample per 50m³, or a minimum number of three samples from the imported supply of both Topsoil and Subsoil. This is in accordance with NHBC Technical Extra, Issue 08, November 2012 for the number of plots.

The testing is recommended to be undertaken either on samples collected from a segregated stockpile at the supplier's depot, or on-site, but prior to placement in the designated areas, lest the soil be found to be unsuitable.

If the Imported Topsoil or Subsoil is found to be unsuitable for use and has already been placed, then it will be removed and replaced with a more suitable verified supply.

The Imported Topsoil or Subsoil should contain levels of contaminants at or below the current Category 4 Screening Levels (C4SLs) or Suitable for Use Levels (S4ULs) for residential end use.

Following the Environment Agency regulatory position statement, *RPS 190 Use of manufactured topsoil*, up to 1,000 tonnes of manufactured Topsoil may be imported without an environmental permit. The Imported Topsoil

must follow *BS 3882:2015 Specification for topsoil*. It is recommended that confirmation on the soil quality is sought from the landscape specialist for the project.

It should be noted that newly placed topsoil will settle over time and may not then fulfil the full thickness requirement of the cover system. Consideration to a combination of Topsoil and Subsoil, or overfilling of the areas, should be given to reduce this effect. Compaction of fine-grained Topsoil may also lead to reduced drainage capacity.

Delivery notes for the Imported Topsoil and Subsoil must be retained for inspection and copies forwarded to the geoenvironmental consultant for inclusion in the Post Remediation Verification Report.

SITE WON SUBSOIL

Based upon the human health risk assessment, the Subsoil portion of the remediation described above could comprise site won natural soils, such as the London Clay, if considered suitable for the landscaping regime. If this is the case, then approval will be necessary from the Local Authority and the soils must be clearly segregated from any Made Ground prior to re-use. Disturbed natural soils can be difficult to validate if they are mixed with other materials on site, such as fragments of building materials including brick or concrete.

GROUND WORKERS

For construction workers and maintenance workers that are exposed to the ground, there is a short-term exposure risk (at each site they attend contributing to an overall lifetime exposure risk) and the pathways of primary concern are 'direct soil ingestion' and 'dermal contact'. Protective measures that are different to those taken to protect the long-term exposure group (such as end-users of the site) are therefore required.

In order to reduce the risk from contamination to as low as reasonably practicable for the construction workers it is recommended that appropriate health and safety measures be implemented along with the use of Personal Protective Equipment (PPE). All personnel coming into contact with the soil, groundworkers in particular, should be instructed to use gloves with on-site to avoid dermal contact and restrict inadvertent hand-to-mouth ingestion. Washing facilities should be provided for the site staff and should be used prior to eating or smoking. Reference should be made to the HSE document, "Protection of Workers and the General Public During Development of Contaminated Land" (HSG 66,1991).

DISCOVERY STRATEGY

A Discovery Strategy to cater for unforeseen ground conditions if encountered on-site during the groundworks has been prepared under ListersGeo report reference 21.08.016b dated November 2022. All groundworkers or site visitors coming into contact with the ground should be made aware of the potential for contamination.

Observations should be made during the course of the groundworks and records kept, including photographs, of the soils encountered, and any areas subject to reduced level dig or significant excavation.

Should suspicious materials or soils or groundwater be uncovered that appear grossly contaminated or are significantly different to those encountered during the ground investigation, work must cease in that area and

the incident reported to the site manager. Further assessment will be required by an independent geoenvironmental consultant and any necessary amendments made to the Remedial Strategy.

Unexpected contamination might include visual impacts of oils, oil or chemical odours, soils with high levels of made-made materials, vivid colouration of the soil or suspected asbestos. Personal physical symptoms may also be an indicator of contamination.

Any suspected materials already excavated should lie above and be covered with impermeable membrane to prevent run-off and leaching, to await sampling and testing. Unless unsafe, such excavations will not be backfilled until approval is provided by the validation engineer.

Site records and photographic evidence should be retained for inspection and a signed statement by the Developer will be required for the verification reporting, even where unexpected contamination is not encountered.

GAS PROTECTION

In accordance with BR 211, 'Radon: guidance on protective measures for new dwellings', radon protection measures are not necessary in the construction of new dwellings or extensions without underground rooms on this site.

The need for gas protection measures will be summarised in our report reference 21.08.016a.

GROUNDWATER AND THE ENVIRONMENT

The groundwater risk assessment established that there was no significant risk to the groundwater and the surrounding environment from the contamination identified at the site itself.

Should concerns be raised by the Environment Agency, Local Authority or the Canals and Rivers trust given its proximity to the Moselle Brook about foundation works on this site a 'Foundation Works Risk Assessment Report' may be required, and provision made for mitigation measures to be incorporated into the foundation design.

POST REMEDIATION VERIFICATION

The remedial measures undertaken at the site will be independently verified once completed to ensure the pollutant linkage to the end users of the site has been removed.

Validation reporting will be undertaken and the Remediation Strategy updated as necessary for regulatory approval.

The Discovery Strategy will be implemented throughout the groundworks.

Disposal tickets for waste soils removed from the remediated areas, and transfer notes for any asbestos removed, will be retained for inclusion in the Verification report.

The chemical suitability of any Imported Topsoil and/or Subsoil will be verified by a geoenvironmental consultant. If required by the Local Authority, supplementary sampling, testing and assessment of the Topsoil and Subsoil by an independent geoenvironmental consultant will also be undertaken.

The thickness of the clean soil cover/imported soils will be independently checked by way of a small intrusive investigation using hand digging equipment and photographic evidence.

A Post Remediation Verification Report will be prepared detailing the verification and validation/ works listed above.

WATER SUPPLY PIPES

The water supply service pipes on site will be installed to a suitable specification as agreed with the local water supply company. The installation will be approved by the supplier/installer of the pipes.

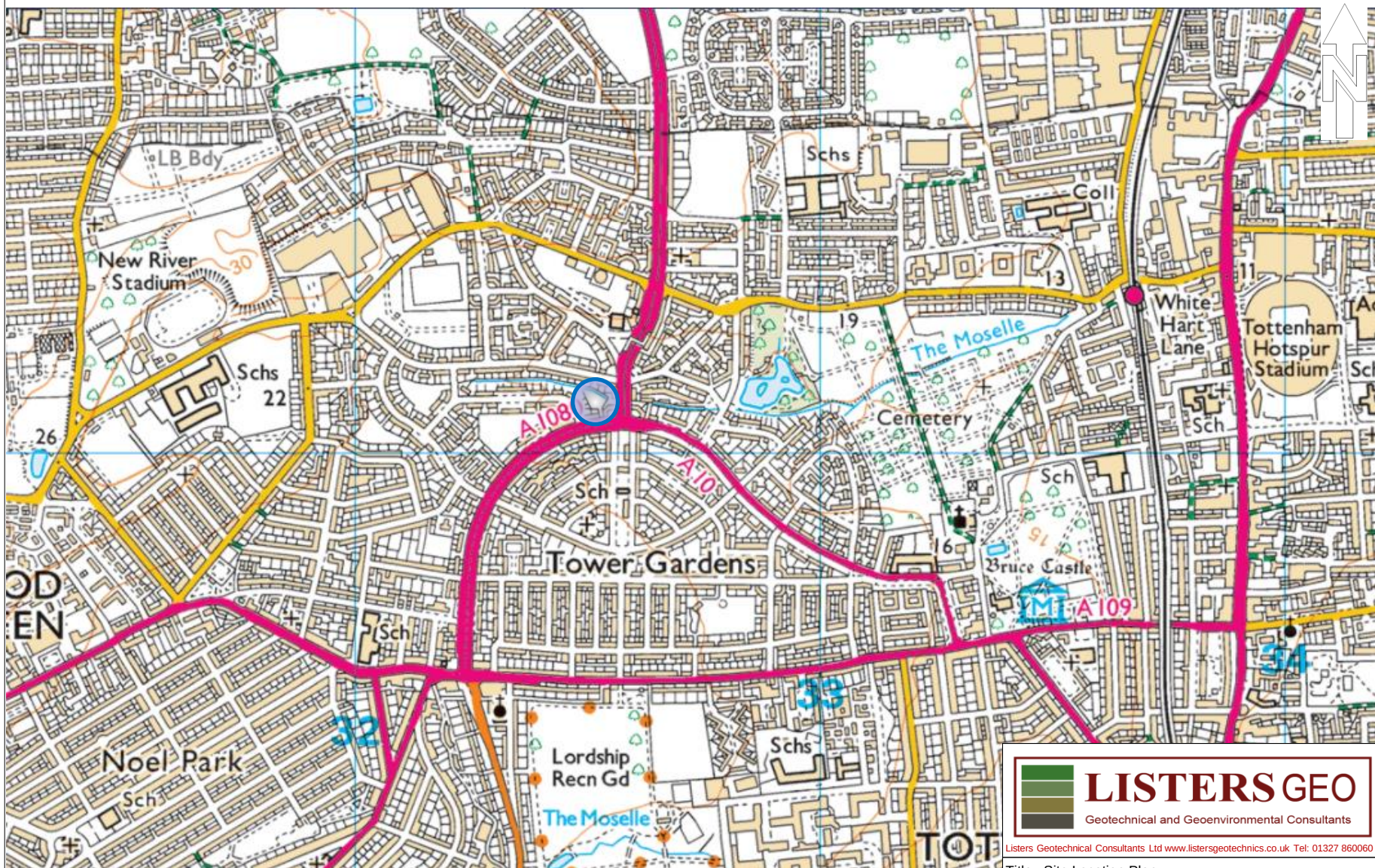
APPROVAL

This report should be agreed with the relevant local Regulatory Authority as soon as possible.

REFERENCES

1. British Standards Institution (BSI), Site Investigations: Code of Practice, BS 5930:2015+A1:2020, 2020.
2. BSI, Investigation of Potentially Contaminated Sites: Code of Practice, BS 10175:2011+A2:2017, 2017.
3. Association of Geotechnical and Geoenvironmental Specialists (AGS), Site Investigation Asbestos Risk Assessment, AGS Interim Guidance, 2013.
4. CIRIA, Asbestos in soil and made ground: good practice site guide, C765, 2017.
5. BRE, Radon: Guidance on Protective Measures for New Buildings, BR 211, 2015.
6. BRE, Reducing Radon: Underground Rooms – Cellars and Basements, Quick Guide 7, 2015.
7. NHBC, NHBC Standards, Chapter 4.1 Land Quality – Managing Ground Conditions, 2020.
8. Environment Agency, Land contamination: risk management, October 2020
<https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>
9. Department for Environment, Food and Rural Affairs (DEFRA), SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, 2014.
10. Land Quality Management (LQM), The LQM/CIEH S4ULs for Human Health Risk Assessment, S4UL3032, 2015.
11. The Society of Brownfield Risk Assessment (SoBRA), Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater, 2017.
12. Health and Safety Executive (HSE), Protection of Workers and the General Public during Development of Contaminated Land, HS(G) 66, 1991.
13. CAR-SOIL™, Control of Asbestos Regulations, 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, CL:AIRE 2016.
14. EA, Remedial Target Methodology, Hydrogeological Risk Assessment for Contaminated Land, 2006.
15. BRE, Cover Thickness Design for Regeneration, BR 465, 2004.
16. UK Water Industry Research (UKWIR), 'Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites', 10/WM/03/21, 2010.

APPENDIX A PLANS





LISTERS GEO

Geotechnical and Geoenvironmental Consultants

Listers Geotechnical Consultants Ltd www.listersgeotechnics.co.uk Tel: 01327 860060

Title: Site Location Plan		
Site: Land at Rear of 163 to 173 The Roundway, Tottenham, London, N17 7HE		
Scale: NTS	Job Number: 21.08.016	Drawn By: AJ

Key:
 Approximate site location



Key:

 Continuous Tube Sampler Borehole
  Cable Tool Percussion Borehole
  Hand Auger Borehole

 Approximate Site Boundary
  Monitoring Well Installation
  TRL-DCP

Extract from plan provided by Ingleton Wood LLP Drawing No. RNDWAY-IW-XX-00-DR-A-0520 Status S2_29.07.2021



Listers Geotechnical Consultants Ltd www.listersgeotechnics.co.uk Tel: 01327 860060

Title: Exploratory Hole Location Plan – Proposed Site Layout

Site: Land at Rear of 163 to 173 The Roundway, Tottenham, London, N17 7HE

Scale: NTS

Job Number: 21.08.016

Drawn By: AJ