



Earth Environmental
& Geotechnical



Remediation Strategy

Liberty Northern Moor

Wythenshawe

November 2022

On behalf of

Liberty Care Developments



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CONTENTS

1.0	INTRODUCTION.....	1
	Appointment.....	1
	Proposed Development	1
	Historical Information.....	2
	Objective.....	2
	Sources of Information	2
2.0	SITE LOCATION AND DESCRIPTION	3
3.0	PREVIOUS SITE INVESTIGATIONS.....	4
	<i>Earth Environmental & Geotechnical Ltd, GeoEnvironmental Site Investigation Report, A4701/22, June 2022</i>	<i>4</i>
	Scope of Works	4
	Ground Conditions.....	4
	Soil Contamination Assessment.....	6
	Remedial Recommendations.....	6
4.0	LICENCES & APPROVALS	7
5.0	PROPOSED WORKS	8
	Aims	8
	Soil Contamination.....	8
	<i>Clean Cover Capping System – Specification</i>	<i>8</i>
	<i>Clean Cover Capping System & Topsoil – Verification & Validation</i>	<i>8</i>
6.0	SITE WORKS	10
	Site Organisation.....	10
	Welfare Facilities/Security	10
	Health & Safety	10
	Site Clearance	10
	Excavation of Subsurface Obstructions	10
	Unexpected Contamination.....	11
	Backfill of Excavations	11
	Control of Perched Groundwater.....	11
7.0	ENVIRONMENTAL MONITORING & CONTROLS.....	12
	General.....	12
	Noise Control.....	12
	Odour Control	12
	Dust Control.....	13
8.0	VALIDATION REPORT	14

APPENDICES

Appendix 1	EEG GeoEnvironmental Site Investigation Report, A4701/22, June 2022
Appendix 2	Assessment Criteria for Imported Soils in Garden Areas
Appendix 3	Report Limitations

FIGURES

Figure 1	Proposed Development Layout Plan
Figure 2	Site Location Plan
Figure 3	Exploratory Hole Location Plan (A4701/22)

TABLES

Table 1	Summary of EEG Soil Contamination
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1.0 INTRODUCTION

Appointment

Earth Environmental & Geotechnical Ltd (EEG) has been commissioned by Liberty Care Developments (the Client), to produce a Remediation Strategy for the proposed development at Northern Moor, Yew Tree Lane.

Proposed Development

It is understood that the client wishes to demolish Yew Tree Manor Care Home to construct a new Care Home with a larger building footprint. The existing access route from Yew Tree Lane will be retained but utilised as a vehicle exit only. Another access route will be developed along Yew Tree Lane to be utilised as a vehicle entrance.

A new vehicular parking area as well as a new substation in the southwest corner of the site, are also proposed as part of the development.

Figure 1 below shows the proposed development layout plan.

Figure 1 Proposed Development Layout Plan



Historical Information

The site was historically occupied by a dwelling, an L-shaped building and small outbuilding which were part of Beech House. Overtime, small outbuildings have developed on site, the existing dwelling has been extended, and several buildings fully or partially demolished.

Therefore, Made Ground is anticipated beneath the site.

The main dwelling building became a Maternity and Child Welfare Centre around 1957.

More recently the building became Yew Tree Manor Care home which is fully occupied by residents. Given the age of the building, and the multiple stages of redevelopment over the years, made ground and asbestos may be present.

Objective

The Remediation Strategy is intended to build on the site characterisation information and provide details on the remediation objectives necessary to protect potential receptors and render the site suitable for the proposed development.

In summary this document presents the technical detail behind the proposed remedial activities at the site and includes:

- Clean Cover System in areas of soft landscaping

This report has been prepared for the purpose of satisfying the requirements of the Local Planning Authority. Earth Environmental & Geotechnical Ltd reserves the right to amend this Remediation Strategy in the light of further information which may become available or future changes in contaminated land guidance, prior to site activities.

Sources of Information

The following reports have previously been prepared for the site by Earth Environmental & Geotechnical Ltd and should be read in conjunction with this Remediation Strategy:

- Earth Environmental & Geotechnical Ltd, GeoEnvironmental Site Investigation Report (reference A4701/22, June 2022).

2.0 SITE LOCATION AND DESCRIPTION

The site is located off Yew Tree Lane, Wythenshawe, approximately 7km from Manchester City Centre. The approximate National Grid Reference for the centre of the site is SJ8213690583 (X: 382136, Y: 390583) with the closest postcode being M23 0EA.

The site investigation area is a roughly rectangular shaped parcel of land with current access via Yew Tree Lane to the south and Willenhall Road to the east. The maximum dimensions of the site are 57m north to south and 53m east to west. The site occupies an area of approximately 0.27hectares.

At the time of the investigation, the site was occupied by Yew Tree Manor Nursing Home which was inhabited by residents. To the front of the building is an area of soft landscaping, with a driveway and vehicle parking areas surfaced in tarmac. The care home is accessed via a set of steps and a ramp leading to the front entrance. There is a temporary cabin located to the west of the building entrance.

A location plan is shown below as Figure 2.

Figure 2: Site Location Plan



3.0 PREVIOUS SITE INVESTIGATIONS

As mentioned in Section 1, an Integrated Phase I & Phase II GeoEnvironmental Site Investigation report has been prepared for the site by Earth Environmental & Geotechnical Ltd, and the recommendations in this Remediation Strategy are based primarily on the findings of said report, which is summarised below.

Earth Environmental & Geotechnical Ltd, GeoEnvironmental Site Investigation Report, A4701/22, June 2022

Scope of Works

The site investigation was conducted on the 6th April 2022 and comprised:

- 5 window sample boreholes (WS1 - WS5) to a maximum depth of 5.00m bgl;

Standard Penetration Tests (SPTs) were conducted in the window sampler boreholes, and soil samples were retrieved from the exploratory holes at regular intervals for geotechnical and chemical analysis. Soils were logged by an on-site engineer.

An exploratory hole location plan is presented as Figure 3, overleaf.

Ground Conditions

The recorded ground conditions are summarised as follows:

- **Made Ground** – Variable Made Ground was encountered in all exploratory hole locations to a maximum depth of 1.20m bgl, comprising:
 - Tarmac
 - Gravelly SAND containing red brick and siltstone
 - Slightly silty slightly gravelly SAND containing red brick, sandstone and siltstone (cobbles of red brick in WS5)
- **Topsoil** – Encountered in all borehole locations WS2 and WS3 to a maximum depth of 0.50m bgl, comprising:
 - Slightly silty SAND
- **Superficial Deposits** – were encountered in all exploratory locations to a maximum depth of 5.00m bgl. Comprising:
 - Medium dense sandy GRAVEL containing siltstone and sandstone (WS3 only)
 - Loose to dense SAND and GRAVEL containing siltstone and sandstone
 - Dense to medium dense gravelly SAND containing siltstone and sandstone
 - Medium dense silty gravelly SAND containing sandstone and siltstone
 - Medium dense silty SAND
 - Medium dense silty clayey SAND (WS4 only)
 - Soft to stiff slightly sandy CLAY.

Figure 3: Exploratory Hole Location Plan (A4701/22)



Soil Contamination Assessment

Seven soil samples were retrieved from the boreholes for chemical analysis.

Samples were analysed for the following suite of contaminants: Asbestos, Arsenic, Beryllium, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Cyanide, Thiocyanate, Phenol, Sulphate (SO₄), Sulphide, pH, Sulphur, Soil Organic Matter and speciated Polyaromatic Hydrocarbons (PAH), and Speciated Petroleum Hydrocarbons.

Three soil samples collected from the boreholes were found to contain concentrations of contaminants in exceedance of assessment criteria values relevant to a residential end use with plant uptake.

A summary of the soil contamination encountered is shown in Table 1, below.

Table 1: Summary of EEG Soil Contamination

Location	Contaminant
WS3 (0.50m)	Inorganic Lead
WS5 (0.40m)	Inorganic Lead
WS5 (1.20m)	Inorganic Lead

No asbestos was identified in the samples collected from the site.

One soil sample (WS3 at 0.50m) was classified as Hazardous in accordance with WM3.1, due to an acidic pH (5.4).

Two of the soil samples were also submitted for Waste Acceptance Criteria (WAC) testing, with the sample from WS1 at 0.30m classified as inert waste and the sample from WS3 at 0.50m classified as hazardous waste due to an acidic pH.

The remaining soils were generally classified as Non-Hazardous for the purpose of off-site disposal.

Remedial Recommendations

Soil Contamination

Based on the results of the chemical testing, exceedances of the assessment criteria for inorganic contaminants were observed in three samples collected from the site, referring to lead in WS3 at 0.50m bgl and in WS5 at 0.40m and 1.20m bgl. However, it was noted that when the results were compared to a screening criterion relevant to a residential end use *without* homegrown produce, only the sample from WS3 was in exceedance.

Remedial measures were recommended for the site, including the implementation of a 0.60m thick cover system using clean topsoil and subsoil in the proposed garden/ soft landscaped areas. It was also advised that areas of proposed hardcover would not require any remediation as these areas effectively seal contamination beneath.

4.0 LICENCES & APPROVALS

Various licences, permits and approvals are required at various stages before certain works can commence. Some activities can start before all such approvals are in place.

- (i) Approval of this Remediation Method Statement;
- (ii) All documentation in accordance with the CDM 2015 Regulations
- (iii) A signed declaration by qualified person of the Material Management Plan (MMP) in accordance with CL: AIRE Waste Code of Practice, Version 2, March 2011. This would allow for reuse of excavated soils after demonstration of suitability for use. MMP will be created with due consideration to all proposed remediation and enabling works operations prescribed within this document and will be undertaken by a Qualified Person and a signed declaration submitted to the EA prior to re-use of materials on the site. The importation of material for use within the proposed construction of a development platform will be subject to the compliance with the EEG Protocol for the importation of materials as set out within the specification for material import included within the Appendix of this report.
- (iv) A U1 Standard Rules Permit will be registered for the site which allows the re-use of up to 3000m³ of material within construction with up to 25,000m³ of material permissible to be re-used in the construction of roads.
- (v) A T5 Standard Rules permit allows the screening and recovery of up to 3000m³ of material for sub-sequent re-use in construction will also be registered.

The processing of recycled aggregates will be completed using LAPC Part B Licensed Plant with the appropriate deployment notification to the Local Authority prior to commencement of works. All materials that are recovered as recycled aggregate will be compliant with the requirements of the WRAP protocol and the EEG validation testing requirements and as such would not be deemed to be a waste material.

All materials that are recovered under the WRAP Protocol, U1 or T5 exemptions must be analysed to demonstrate that they are both chemically and structurally suitable for use within the context of the development.

The relevant LAPC, U1, T5 and WRAP Licenses, Exemption and Protocols provides the legislative framework for material compliance during the site remediation and enabling works to be completed by the specialist contractor under the supervision EEG.

5.0 PROPOSED WORKS

Aims

The remediation aims are to resolve contamination issues to protect human and environmental receptors and render the site suitable for the proposed end use and satisfy the requirements of the Local Planning Authority and Insurance bodies (NHBC).

The remediation strategy for the site has been developed following review and assessment of the site investigation reports previously prepared for the site.

Soil Contamination

As the contamination hotspot identified in WS3 is located below the proposed new building, remediation of this area is not considered necessary, as the hardstanding will block any contamination pathway to the future end users.

The soft landscaping area surrounding WS5 will require the following remedial measures following further soil sampling and chemical testing.

Clean Cover Capping System – Specification

Areas of landscaping and private garden areas within the vicinity of identified contamination (WS5) will need to be capped with a suitable thickness of uncontaminated cover soils to break the potential contamination linkage, as follows:

- Placement of a geotextile membrane at the base of the clean cover within affected garden areas to maintain soil separation between the inert growing medium and the residual underlying soils and to act as physical marker for future works.
- A minimum total thickness of clean imported soil of 600mm placed in the garden/ soft landscaping areas.
- Clean cover may comprise a combination of subsoil and topsoil. Topsoil is to comprise no less than the upper 150mm.

Clean Cover Capping System & Topsoil – Verification & Validation

Soils to be used in garden areas must not contain contaminant concentrations above the assessment criteria for a residential end use with plant uptake assessment criteria (see Appendix 2) and be free of deleterious components e.g., glass, plastic, wood, ash, and metal solids.

Evidence will be required to demonstrate the suitability of the imported materials to be used and that the capping has been installed in line with the specification outlined above. Validation will require:

- Chemical analysis of soils will be carried out at source to ensure suitability for use, prior to being used/imported.
- Relevant source test data for imported soils will be provided to confirm all determinants are at concentrations below the relevant assessment criteria. Testing should be carried out at a frequency of **one sample per 100m³ batch of soil.**

- Imported soils should be stockpiled on receipt and sampled from the stockpile prior to placement and undergo appropriate chemical analysis to confirm it is suitable for use.
- Following confirmation that material is suitable for use, the material is to be placed in line with the above specification.
- Following placement of topsoil, trial holes will be formed periodically across the garden areas to confirm the correct implementation. Each pit will be inspected, photographed and the depths/thicknesses of the subsoil and topsoil measured by the consultant engineer.
- A validation report will be provided for approval by the Environmental Health Contaminated Land Officer at the LA.

In accordance with the current requirements of the regulatory authorities, validation samples will be collected from all materials that are to be subject to movement under the protocols outlined within this Remediation Strategy, or for materials to be imported onto site to facilitate the proposed residential development.

All samples will subsequently be stored in cooled boxes prior to submission to a UKAS / MCERTS accredited laboratory.

All samples will be collected using appropriate PPE and sampling equipment that will be cleaned at each sampling location.

QA procedures and laboratory chain of custody forms will be documented within the site records and presented within the final validation report for the site.

Where material is found to contain concentrations of potential contaminants at levels more than the site-specific screening criteria (as detailed within Appendix 2), EEG will undertake further assessment and recommendations on the appropriate use for the material in question, which may involve the disposal of such materials off-site to a suitable waste management facility.

6.0 SITE WORKS

Outlined below are some of the main task and activities associated with the remediation works.

Site Organisation

Site works will be supervised throughout by a suitably qualified Engineer, who will report to a Project Manager. Supervision may be part-time for certain activities but will be full-time during the removal of any contaminated soil/fill and any placement of fill to an engineering specification.

Welfare Facilities/Security

Initial mobilisation works will include the establishment of appropriate office and welfare facilities. Such facilities may include but are not restricted to; office accommodation, canteen facilities, washroom/drying room, toilets, wheel wash, car parking, stores, and security unit.

The site should be secured by fencing to prevent unauthorised access onto the site during the enabling works.

Health & Safety

All site personnel will undergo a site-specific health and safety induction prior to commencement of work on site.

The Engineer will be informed prior to any proposed entry of a confined space or deep excavation. Entry will be restricted to suitably qualified and equipped personnel.

Works will be carried out about current statutory requirements and guidance by the Health & Safety Executive "Protection of workers and the general public during the redevelopment of contaminated land". Protective clothing, footwear and gloves will be required with hand washing and boot-washing facilities made available. Smoking will be limited to designated areas.

Site Clearance

Any trees currently under a preservation order should be identified and agreed with relevant authorities prior to the commencement of the works. All trees subject to a Tree Preservation Order should be clearly identified and protected by chestnut paling with fluorescent tape.

The site should then be cleared of all residual debris, fly tipped materials, any vegetation, shrubs, bushes, and unprotected trees as instructed by the client.

Excavation of Subsurface Obstructions

During the site investigation, obstructions comprising red brick cobbles were identified within the made ground at WS5, in the location of historical, demolished buildings, which could pose obstacles during excavations and construction.

Any material identified as potentially contaminated should be stockpiled on a non-permeable membrane, and tested for suitability for either re-use on site, or offsite disposal.

Should the material be removed from site, waste acceptance criteria testing should be undertaken, and the material disposed of in a suitably licensed facility. The development of a Materials Management Plan (MMP) in line with the CL: AIRE Code of Practice may be required to remove or re-use soils.

Unexpected Contamination

If during site clearance works or other excavations, material with visual or olfactory evidence of previously unrecorded contamination is encountered, the principal contractor should contact Earth Environmental & Geotechnical.

These soils should be then sampled, and chemical analysis carried out. The environmental consultant shall decide upon the chemical suitability of the material, to either remain on site or if it is likely to present a risk to receptors.

If the soils present a risk, the materials should be removed from site or remediated as per the specification in Section 5.0.

Any excavated material identified as potentially contaminated should be stockpiled on a non-permeable membrane, and tested for suitability for either re-use on site, or disposed offsite.

If prolonged stockpiling is unavoidable, these soils should be covered with a non-permeable membrane at the end of each working day, to prevent the possibility of leachate migrating from the soils due to infiltration.

Should the material be removed from site, waste acceptance criteria testing should be undertaken, and the material disposed of in a suitably licensed facility. The development of a Materials Management Plan (MMP) in line with the CL:AIRE Code of Practice may be required to remove or re-use soils.

Backfill of Excavations

All excavations shall, prior to backfilling, be surveyed to ascertain their spatial extent and depth. Excavations (to remove relict structures, contamination etc) should be backfilled with suitable materials as agreed with the Engineer and subjected to nominal compaction.

However, where an excavation conflicts with the footprint of a proposed highway, compaction in general accordance with the Specification for Highway Works Table 6/1 will be required.

Control of Perched Groundwater

The regional groundwater table is unlikely to be encountered during remediation earthworks; however, discontinuous perched groundwater may be present within Made Ground. If encountered during the excavation works, this perched water will be recovered by pumping from open excavations. Dependant on volumes recovered, some form of temporary storage may also be required.

Provision should be made for pumping from sumps and appropriate excavation support for all excavations.

7.0 ENVIRONMENTAL MONITORING & CONTROLS

General

All works should be carried out in a manner that minimises impact on the environment and generates adequate and accurate records to demonstrate remediation works have been carried out to the required standard and in accordance with all applicable legislation. All such records should be collated on contract completion (or sooner as required) and included within the contract completion report. Appropriate progress reports should be provided in a format and at a frequency as agreed with the client and project manager including on-going monitoring/validation information.

Comprehensive records should be maintained throughout the project. These should be collated on contract completion into a completion and validation report, which should be submitted to the appropriate regulators for approval. It will be presented in an appropriate manner to allow interested third parties to fully understand the whole remediation process.

The records should include correspondence with the regulators & other third parties, environmental monitoring data, validation testing, comprehensive as-built drawings, photographs, collation of all site investigation reports, operational method statements & risk assessments, construction phase health & safety plan and confirmation of post remediation considerations especially in respect of interaction with initial construction (groundwork's).

Noise Control

Earthworks will only take place during normal working hours 8.00am – 6.00pm Monday to Friday and 8.00am to 13:00pm on Saturdays with no working on Sundays or Bank Holidays. The site manager shall assess noise and its impact upon neighbours through the working day and to ensure the following mitigation measures are being utilised:

All plant and machinery will be fitted with adequate silencers and will not be operated unless in good condition.

Noise levels will be as per normal for a project of this nature. Pneumatic breakers will be used but location and hours of use controlled whenever possible.

Should residents make any complaints regarding noise associated with the works, the site manager shall investigate. Such investigation may include the use of portable monitoring equipment to record noise levels at the location of the complainant. The nature of the complaint and findings of the investigation shall be discussed with the local EHO. If the complaint is upheld appropriate remedial action shall be taken. Such action may include the adjustment of working hours or the alteration of site practices and working methods.

Odour Control

Works may produce odours, but good site practice and associated mitigation measures should ensure fugitive odours are kept to an absolute minimum. Such controls may include:

- Additional covers will be applied to stockpiles if they are contributing to fugitive odours.
- Areas of excavation i.e., area of exposed contaminated soils, will be kept to a minimum and covered/re-instated as soon as is practicably possible.

- Odour suppressing equipment shall be utilised at appropriate locations at appropriate times.

If a complaint is made regarding odours from nearby residents, the site manager shall respond by attending the complainant's property to assess the nature and level of odour nuisance including monitoring where appropriate. Appropriate mitigation measures as described herein shall then be enforced including, if necessary, suspension of excavation works until the prevailing weather conditions become more favourable.

Dust Control

Earthworks may produce dust during prolonged periods of dry weather. The site manager shall assess dust and its impact upon neighbours through the working day and ensure the following mitigation measures are being utilised to control dust:

- The use and maintenance of good quality site roads;
- Enforcing speed limits of site plant and;
- Dust suppression via water applied by towed bowser, particularly in the vicinity of locations where trace asbestos fibres have been detected in soils.

8.0 VALIDATION REPORT

A Validation Report would be developed that would detail the design and installation of the topsoil in garden areas.

The emplaced topsoil element of the validation report should include:

-  Chemical testing of imported soils.
-  Thickness measurement of emplaced soil cover system thickness.
-  Photographs of trial holes to determine emplaced soil cover system thickness.
-  Trial hole logs in accordance with BS5930 Code of Practice for Site Investigations.

APPENDIX 1

EEG GEOENVIRONMENTAL SITE INVESTIGATION REPORT, A4701/22, JUNE 2022

APPENDIX 2

ASSESSMENT CRITERIA FOR IMPORTED SOILS IN GARDEN AREAS

Assessment Criteria for Imported Soils in Garden Areas

Inorganic Compounds	Assessment Criteria - Residential with Homegrown Produce (mg/kg)		
Arsenic	37		
Cadmium	11		
Chromium (III)	910		
Chromium (VI)	6		
Lead	200		
Mercury	1.2		
Nickel	180		
Selenium	250		
Copper	2400		
Zinc	3700		
Organic Compounds	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130 (48) ^{vap}	330 (118) ^{vap}	760 (283) ^{vap}
Aliphatic EC >12-16	1100 (24) ^{sol}	2400 (59) ^{sol}	4,300 (142) ^{sol}
Aliphatic EC >16-35	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aliphatic EC >35-44	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aromatic EC 5-7	70	140	300
Aromatic EC >7-8	130	290	660

	Assessment Criterial - Residential with Homegrown Produce (mg/kg)		
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aromatic EC>8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260 ^f	540 ^f	930 ^f
Aromatic EC >21-35	1,100 ^f	1,500 ^f	1,700 ^f
Aromatic EC >35-44	1,100 ^f	1,500 ^f	1,700 ^f
Asbestos Fibres	< 0.001%		

The site-specific risk-based criteria are based upon DEFRA/EA CLEA 1.07 modelling assuming a sandy loam with 1% Soil Organic Matter and pH of 7.

Purpose	Classification	Testing Frequency	Chemical Analysis
Source Testing & Suitability For Use	Topsoil	1 sample per 100m ³ [Minimum of 3 per source]	➤ Inorganic Compounds; ➤ Speciated Polycyclic Aromatic Hydrocarbons; ➤ Speciated Petroleum hydrocarbons; ➤ Asbestos Identification.
	Sub-Soil	1 sample per 100m ³ [Minimum of 3 per source]	

The sampling frequency for materials intended for landscaping is to be managed under the Remediation Strategy.

APPENDIX 3

REPORT LIMITATIONS

LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd based on a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2022 and should be read considering any subsequent changes in legislation, statutory requirements and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full of those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.



Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.