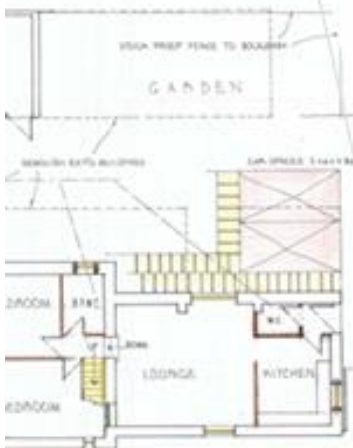




EARTH ENVIRONMENTAL
& GEOTECHNICAL

Remediation Strategy Report

Moorgate Farm East

Rochdale

May 2024

On behalf of

Morris Construction

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FOR
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Report A5635/23/SI

MAY 2024

Report Title:	Moorgate Farm East, Rochdale	
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Client:	Morris Construction	
Issue Date:	12th May 2024	
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1.0 INTRODUCTION

Appointment

Earth Environmental & Geotechnical Ltd (EEG) has been commissioned by Morris Construction, to produce a Remediation Strategy for a proposed development at Moorgate Farm East, Rochdale.

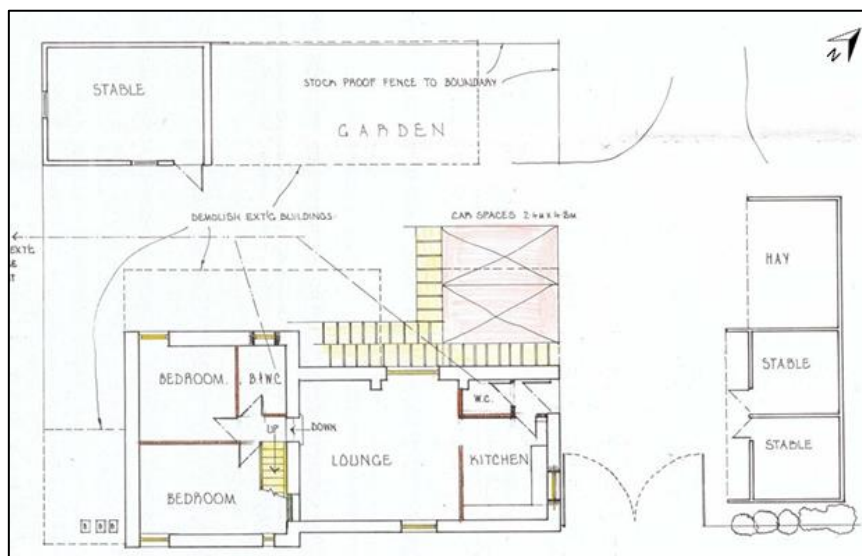
Proposed Development

It is understood that the client wishes to redevelop the site at Moorgate Farm East, Rochdale for residential end use.

The planned works comprise demolition of the existing external extensions to the barn, along with the partial demolition of the northern most stable and convert the existing barn into a 2-storey, 3-bedroom residential dwelling. A private garden and car parking is proposed as part of the development.

Figure 1 below shows the proposed development layout plan.

Figure 1: Proposed Development Layout Plan



Historical Information

A desk study was undertaken by GeoEnviro Solutions (ref. 2466-22 PI, dated October 2022).

The site history from this report has been summarised below:

The site has been occupied by a single main building in the southeast since the start of historical mapping in 1851, with multiple other, smaller buildings constructed and demolished across the site until the early 1990's. Since the 1990's, no further significant change has occurred on site.

The site is currently occupied by a vacant barn, with two stable buildings.

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 garden and areas of soft landscaping (if present).

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:

- EEG Ltd, Geo-Environmental Site Investigation Report, Moorgate Farm East, Rochdale (Reference A5635/23/SI, December 2023).

2.0 SITE LOCATION AND DESCRIPTION

The site is located approximately 2.3km northwest of Shaw & Crompton Centre, and approximately 3km southeast of Rochdale town centre.

The approximate National Grid Reference for the centre of the site is SD 92007 10449 (X: 392007, Y: 410449) with the closest postcode being OL16 4QL.

The site is a rectangular shaped parcel of land with access via Broad Lane to the southeast.

The site occupies an area of approximately 0.1 hectares.

The site is currently occupied by a vacant barn, with two sets of stables, both disused.

The site is currently used for the storage of materials and tools, assumed to be associated with the proposed build.

The surrounding area comprises agricultural land, with residential properties situated along Broad Lane.

A location plan is shown below as Figure 2. The red edge indicates the site ownership boundary.

Figure 2: Site Location Plan



3.0 PREVIOUS SITE WORKS

The recommendations in this Remediation Strategy are based primarily on the findings of the Phase 1 and 2 Geo-Environmental Site Investigation report conducted in December 2023 (Reference A5635/23/SI), which is summarised below:

- 4no. window sample boreholes (designated WS1 - WS4 inclusive) were completed to a depth of 4.00-5.00mbgl; WS1, WS2 and WS4 were noted to refuse in very stiff clay; WS3 was noted to refuse in very dense sand.
- Standard Penetration Tests (SPTs) were undertaken in the boreholes in accordance with BS EN ISO 22476-3¹.
- 50mm diameter standpipes were installed in all the window sample boreholes at depths between 4.00m - 5.00m below ground level.
- Groundwater observations were noted where possible.
- Soil samples were retrieved from the exploratory holes at regular intervals for geotechnical and chemical analysis. Soils were logged by an on-site engineer.
- 4no. gas monitoring visits were conducted 13th of October and the 8th of November 2023.
- A detailed gas risk assessment was undertaken and categorised the site as CS1, therefore gas protection measures were not recommended.

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 holes to a maximum depth of 0.40mbgl, comprising:

- Concrete.
- Slightly silty, gravelly SAND, containing gravel of red brick, concrete, and rare clinker.
- Sandy GRAVEL of red brick and concrete.

Superficial Deposits - Variable superficial deposits were encountered in all exploratory hole locations to a maximum depth of 5.00mbgl, comprising:

- CLAY with varying quantities of silt, sand and gravel of quartzite and sandstone.
- SAND with varying quantities of clay, silt and gravel of quartzite and sandstone.
- SILT with varying quantities of clay, sand and gravel of quartzite and sandstone.

Groundwater

Groundwater was encountered during the fieldwork, exclusively in WS4 at 3.00mbgl. Subsequent groundwater monitoring identified water in all installed borehole locations, at depths between 0.26m - 2.91mbgl.

Figure 3: Exploratory Hole Location Plan



Soil Contamination Assessment

5no. soil samples were retrieved from the boreholes for chemical analysis.

Asbestos Screen, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Cyanide, Phenol, Sulphate (SO₄), Sulphide, pH, Soil Organic Matter, Speciated Polyaromatic Hydrocarbons (PAH) and Speciated Petroleum Hydrocarbons.

All exceedances are included below:

- *Benzo(b)fluoranthene in the sample taken from WS3 at 0.20mbgl (4.17 mg/kg) and WS4 at 0.3mbgl and (4.83mg/kg)*
- *Dibenzo(a,h)anthracene in the sample taken WS3 at 0.20mbgl (4.17 mg/kg) WS4 at 0.3mbgl and (4.83mg/kg)*

Conclusions & Recommendations

Soil Contamination

Based on the results of the chemical testing, PAHs were identified within the made ground on site. The source of the contamination is expected to be the degraded ash (brick) and clinker noted in the made ground.

At the concentrations identified, the contaminants are considered to pose a potential risk to future site users (residents) in gardens and soft landscaped areas, where made ground may be exposed / in contact with homegrown produce. The principal pathways are the ingestion pathways (soil, dust, and homegrown produce) and dermal contact.

The probability of PAH contamination affecting site users is likely. With a medium consequence, the risk is moderate, and remediation is recommended.

Further details are provided in Section 5.

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) Site Waste Management Plan;
- (iv) 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;
- (v) General condition survey of boundary features.

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 report previously prepared for the site by EEG Ltd.

Soil Contamination

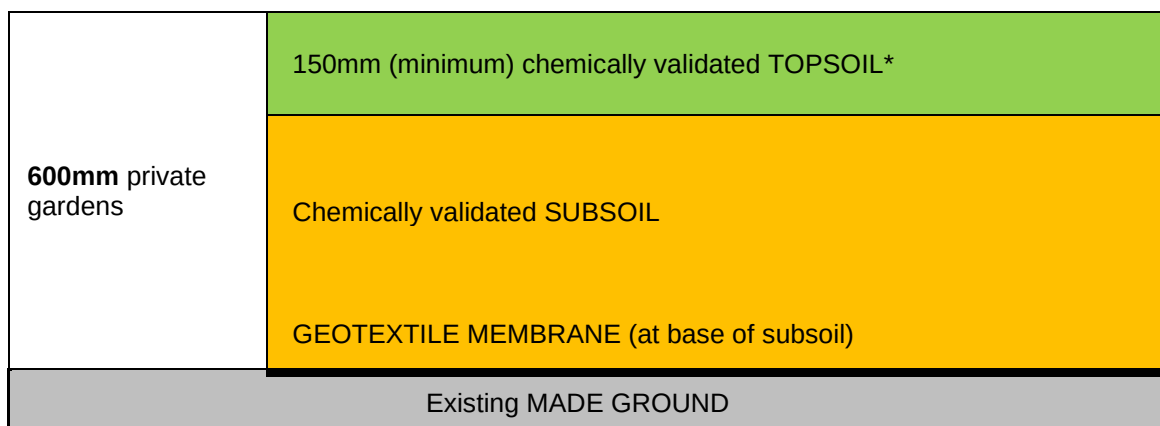
Environmental Cover System

In gardens and soft landscaping areas, remediation will be required (clean environmental cover soils). The environmental cover system should be constructed as follows:

- Private Gardens: 600mm thick environmental cover system comprising: Geotextile membrane at the base and at least 600mm comprising clean inert fill and sufficient topsoil for a growing medium.
- Shared Landscaping: 450mm thick environmental cover system comprising: Geotextile membrane and at least 300mm comprising clean inert fill and sufficient topsoil for a growing medium.

A diagram of a typical environmental cover system is shown in Figure 4 below.

Figure 4 Soil Cover System



Where natural strata are encountered within the depth of the proposed environmental cover system, then level reduction may cease, and geotextile may be omitted pending inspection by EEG (with suitable photographic evidence) and upfilling with suitably chemically validated soils as per section 8.1 of the site investigation report (ref. A5635/23/SI).

Chemical Validation of Imported Soils

Chemical validation of all imported and site-won soils to be used on site in gardens and soft landscaping areas should be undertaken. A certificate of analysis and source details must be provided for all imported soils.

A summary of the required imported material sampling requirements is presented in Table 1 and is based on YALPAG (The Yorkshire and Lincolnshire Pollution Advisory Group) "Technical Guidance for Developers, Landowners and Consultants, Version 4.1 June 2021.

The material should be sampled at source to allow for potential failures prior to delivery, with confirmatory sampling undertaken on importation to site. Where site constraints do not allow this, any imported material should be separated based on source and soil type. Validation samples should be taken prior to placement in gardens to ensure suitability for use.

Material Type	Source	Suite of Analysis	Sampling Rate	Minimum Sampling Frequency
Topsoil / Subsoil	Greenfield / manufactured / site-won natural	Suite A*	1 sample per 100m ³	3no. per source
	Brownfield / unknown	Suite B**	1 sample per 50m ³	6no. per source
Crushed hardcore, stone, brick	Onsite or offsite	Suite B**	1 sample per 500m ³	3no. per source

Notes for Table 1

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

Any soil with visual or olfactory evidence of hydrocarbons should be rejected.

In addition, it should be ensured that the topsoil material is suitable as a growing medium and no undesirable material is present (in line with BS3882).

Imported material to be used in gardens will be compared against residential with plant uptake criteria (as used in the contamination risk assessment in Section 5 of the site investigation report undertaken by EEG in December 2023).

Where clean imported soil source is Greenfield then suitable evidence will be provided to support this (e.g. grid reference or boundary location of original source together with information about the environmental checks undertaken).

Potable Water Pipes

It is recommended that the Water Pipeline Risk Assessment is provided to the water supply company once the location and depth of potable water pipes are known. Additional investigation and risk assessment may be requested.

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.

Inground Obstructions

During the site investigation, no significant obstructions were identified.

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 SITE COMPLETION AND VALIDATION REPORT

All remediation and validation work should be documented in a Site Completion Report. The Site Completion Report will allow discharge of relevant planning conditions.

Soil Cover

The soil cover would be verified within the proposed gardens and areas of soft landscaping (minimum 4no. locations).

All cover system trial pit validation locations shall be logged in accordance with the guidance in BS5930 and photographed to show the location (including legible identification signage), all of the pits including base, the arisings, and a legible depth gauge to the required depth below ground level.

Photographs shall include the membrane or break layer where installed, these will be taken prior to placement of the materials above.

The following would be provided within the report:

- Photographs of any stockpiles and quarantine areas
- Proof that the depth of inert cover has been installed
- Proof of the quality of the material to be used as inert cover
- Proof there is a geotextile separator and visual warning membranes if used between the made ground and suitable for use soils.
- Proof of the method of placement and different layers if appropriate
- Proof of the completed project
- Inclusion of geographic background features which will aid locating the photograph
- Inclusion of site identification boards within the photos which show the date, position taken i.e. corner of plot 3 and the site name.
- Inclusion of photographs of site stockpiles and quarantine areas.

The photographs need to prove beyond doubt that the images have been taken from the specific area stated.

APPENDIX 1

EEG LTD GEOENVIRONMENTAL SITE INVESTIGATION REPORT – MOORGATE FARM EAST, ROCHDALE (REFERENCE A5635/23/SI, DECEMBER 2023)

APPENDIX 2

ASSESSMENT CRITERIA FOR IMPORTED SOILS IN PRIVATE GARDENS AND SOFT LANDSCAPING & EXTERNAL AREAS

Assessment Criteria Based on Residential with Homegrown Produce End Use

Inorganic Compounds	Assessment Criterial - 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 Criteria - 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%		

Material should have a maximum stone size of 75mm and be free of foreign debris including building waste, materials, or contaminants e.g. brick, glass, asbestos, and plasterboard.

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.

The above criteria are to determine if material is chemically clean, for suitability as a growing medium in accordance with BS3882:2015 for Topsoil and BS8601:2013 Specification for Subsoil and Requirements for Use.

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 2024 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.