





Earth Environmental
& Geotechnical

Remediation Strategy

The Albion Inn

Burnage

April 2024

On behalf of

H & K Developments Ltd

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REMEDIATION STRATEGY

THE ALBION INN

BURNAGE

FOR

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Report A5595/24/RMS/ **April 2024**

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EARTH ENVIRONMENTAL & GEOTECHNICAL

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1.0 INTRODUCTION

Appointment

Earth Environmental & Geotechnical Ltd (EEG) has been commissioned by H & K Developments Ltd (the Client), to produce a Remediation Strategy for a proposed residential development at the Albion Inn, Burnage.

Proposed Development and Planning Applications

The proposed development is to convert the current building on site (the former public house/inn) to 11no. new residential apartments, with a two-storey extension with basement to the rear of the building, soft landscaping, and a car park of hardstanding to the east of the site.

A planning permission (application no. 134949/FO/2022) was granted on the 9th June 2023.

Figure 1 below shows the proposed development layout plan.

Figure 1: Proposed Development Layout Plan



Objectives

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:

- Design/validation of clean cover system in soft landscaping areas.

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:

- Phase I Geo Environmental Desk Study Report for The Albion Inn, Burnage, by Earth Environmental & Geotechnical Ltd (Reference A5595/23/FDS, dated October 2023).

- GeoEnvironmental Site Investigation Report, for The Albion Inn, Burnage, by Earth Environmental & Geotechnical Ltd (Reference A5595/SI/V2, dated February 2024).

2.0 SITE LOCATION AND DESCRIPTION

The site is in Burnage, approximately 7km south of Manchester city centre. The approximate National Grid Reference for the centre of the site is SJ 86269 91810 (X: 386269, Y: 391810) and the postcode is M19 1NA.

The site is a pentagon shaped parcel of land with current access via Burnage Lane immediately north of the site. The maximum dimensions of the proposed site are approximately 43m west to east and 28m north to south. The site occupies an area of approximately 0.14 hectares.

The site is located within an urban area and is the surrounding area is comprised of residential properties with large mature trees of suspected Willow to the western boundary of the site.

A location plan is shown below as Figure 2.

Figure 2: Site Location Plan



3.0 PREVIOUS SITE INVESTIGATIONS

As mentioned in Section 1, two reports have been prepared for the site by EEG Ltd and are discussed below.

Phase I Geo Environmental Desk Study Report for The Albion Inn, Burnage, by Earth Environmental & Geotechnical Ltd (Reference A5595/23/FDS, dated October 2023).

The desk study highlighted that historically, the site has been developed since the start of the historical mapping in 1849. The site has been continuallu occupied by the Albion Inn (Public House) since at least the 1938 maps.

BGS digital mapping shows that the site is underlain by no known artificial deposits, superficial deposits of Devensian Till (Clay) and bedrock geology of the Chester Pebble Bed formation (sandstone).

The potential onsite source is historical made ground associated with construction of the existing buildings.

Potential offsite sources include an electrical substation adjacent to the northwest of the site with potential for PCB contamination.

Therefore, the Phase I concludes that the risk from soil contamination to end users is concluded to be **LOW** to **MODERATE** based on the current proposed development.

The risk to controlled waters is concluded to be **LOW** due to the absence of any significant sources of mobile contamination.

The risk from ground gas to end users and construction workers is **LOW**.

A Phase II GeoEnvironmental Site Investigation was recommended to examine the ground conditions for the design of foundations, floor slabs, and pavement construction for the proposed development.

As part of the geotechnical investigation, it was recommended that soil samples were recovered for contamination testing as well as a ground gas risk assessment.

The full report can be viewed in Appendix 1.

GeoEnvironmental Site Investigation Report, for The Albion Inn, Burnage, by Earth Environmental & Geotechnical Ltd (Reference A5595/SI/V2, dated February 2024).

Scope of Works

The site investigation was conducted on 15th January 2024 comprised:

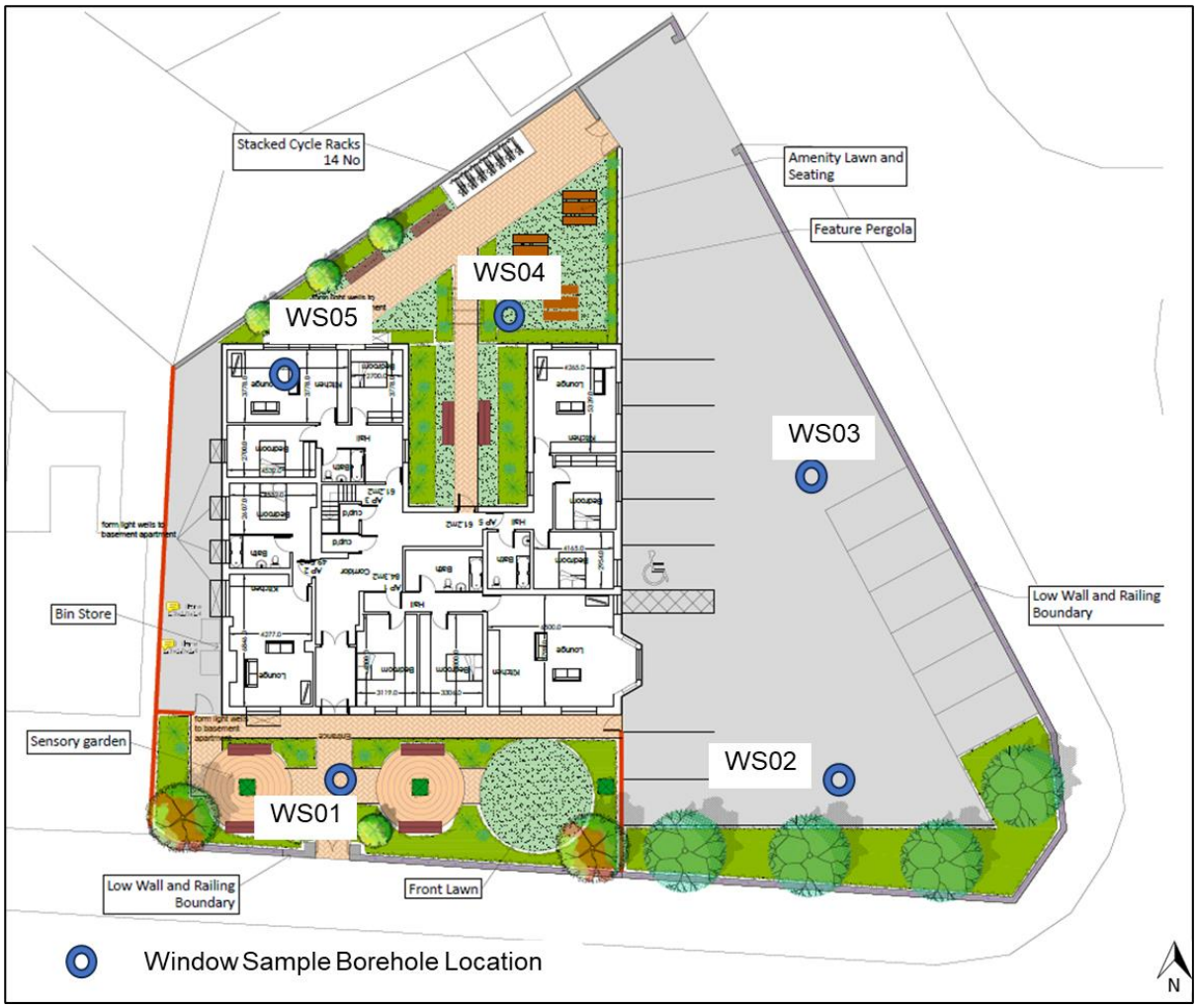
- 5 window sample boreholes (WS01 – WS05) were advanced to depths of between 2.00 and 2.60 mbgl.

- 50mm diameter standpipes were installed in 5 window sample boreholes at depths between 2.00 and 2.60 mbgl.

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

An exploratory hole location plan compared to the proposed development is presented in Figure 3, below.

Figure 3: Exploratory Hole Location Plan



Ground Conditions

BGS digital mapping shows that the site is underlain by no known artificial deposits, superficial deposits of Devensian Till (Clay) and bedrock geology of the Chester Pebble Bed formation (sandstone).

A summary of the ground conditions encountered is given in Table 1, overleaf:

Table 1: Summary of Ground Conditions Encountered

Hole	Depth to Stratum (m)				Ground water (m bgl)
	MADE GROUND		SUPERFICIAL	BEDROCK	
	GRANULAR	COHESIVE			
WS01	GL–0.40		0.40-2.20	2.20-2.50*	-
WS02	GL-0.26	0.26-0.70	0.70-1.30	1.30-2.50*	-
WS03	GL-0.60		0.60-1.47	1.47-2.00*	-
WS04	GL-0.85		0.85-1.40	1.40-2.00*	-
WS05	GL-0.40		0.40-1.90	1.90-2.60*	-
*Refusal in bedrock					

The sequence of strata encountered beneath the site was as follows:

Hardstanding

Hardstanding was encountered in all exploratory borehole locations.

Black bound macadam was encountered in WS02 and WS03 to depth of between 0.06 and 0.1 mbgl.

Concrete was encountered in WS02, WS04 and WS05 to a depth of between 0.06 and 0.25 mbgl.

Granular Made Ground

Granular Made Ground materials generally comprised, dark brown sand fine to coarse gravel and brown slightly gravelly fine to coarse sand was encountered in all exploratory borehole locations to depths of between 0.26 to 0.85 mbgl.

Cohesive Made Ground

Cohesive made ground materials generally comprised firm, dark brown sand gravelly clay was encountered in WS02 at a depth of 0.26 to 0.70 mbgl.

Superficial Deposits [Devensian Till]

Superficial deposits considered to represent Devensian Till, were encountered in all exploratory holes, and generally comprised.

- **CLAY** was encountered in all exploratory holes, and generally comprising:
  - Firm dark grey slightly sandy slightly gravelly CLAY with roots and rootlets.
  - Firm to stiff grey mottled brown sandy to very sandy CLAY.
  - Soft brown CLAY.
  - Brown silty gravelly CLAY.
  - Brown sandy CLAY.
  - Brown sandy gravelly CLAY.

- **SAND** was encountered in WS03 and WS05 generally comprising.
  - Light brown fine to coarse SAND.

- Brown fine to medium SAND.

Bedrock Geology [Chester Pebble Formation]

Deposits consider representing the Chester Pebble Bed Formation were encountered in all exploratory hole locations and generally comprised dense reddish brown, orange fine to coarse sand from depth of between 1.30 to 2.60 mbgl.

Groundwater

Groundwater was not encountered during the site investigation.

Visual and olfactory evidence of contamination

No visual or olfactory indications of contamination were identified during the site investigation.

Soil Contamination Assessment

Chemical analysis was carried out on seven soils samples retrieved from the boreholes.

Samples were analysed for the following suite of contaminants: Asbestos, Arsenic, 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 (TPH).

Three samples were assessed for Polychlorinated Biphenyls contamination (PCB's).

The results of chemical testing were compared to screening criteria for Residential End Use with homegrown produce at a Soil Organic Matter Content of 1% and can be viewed in Table 2 overleaf.

Table 2: Soil Results Comparison with C4SL/S4UL Values

Determinand	C4SL/S4UL Levels Residential with home grown produce (SOM 1%) (mg/kg)	WS01 0.3m MG	WS01 0.6m MG	WS02 0.5m MG	WS02 0.5m MG	WS03 0.3m MG	WS04 0.3m MG	WS05 0.3m MG	No of Exceedances
Metals									
Arsenic	37	12	5	15	27	8	4	< 2	0
Beryllium	1.7	1	< 0.5	0.6	1.2	< 0.5	< 0.5	< 0.5	0
Boron	290	< 1	< 1	2	1.3	< 1	< 1	< 1	0
Cadmium	22	< 0.2	< 0.2	2.1	0.9	0.3	< 0.2	< 0.2	0
Chromium	910	10	10	16	13	6	5	< 2	0
Chromium VI	21	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0
Copper	2400	44	11	32	55	26	14	< 4	0
Lead	200	79	17	47	121	39	27	5	0
Mercury	1.2	1.2	< 1	< 1	< 1	< 1	< 1	< 1	0
Nickel	180	16	7	12	16	8	< 3	< 3	0
Selenium	250	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0
Vanadium	410	23	13	33	30	11	7	2	0
Zinc	3700	45	20	173	138	29	15	3	0
Petroleum Hydrocarbons									
Benzene	0.2	**0.736**	**0.561**	0.107	0.045	< 0.002	< 0.002	< 0.002	**2**
Toluene	130	0.259	0.028	0.012	0.007	< 0.005	< 0.005	< 0.005	0
Ethylbenzene	47	0.045	0.027	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
o-xylenes	60	0.217	0.126	0.004	0.003	< 0.002	< 0.002	< 0.002	0
m-xylenes	59	0.072	0.039	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
p-xylenes	56	0.736	0.561	0.107	< 0.002	< 0.002	< 0.002	< 0.002	0
Aliphatic EC >5-6	42	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aliphatic EC >6-8	100	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Aliphatic EC >8-10	27	16	< 2	3	< 2	4	< 2	< 2	0
Aliphatic EC >10-12	130 (v)	8	< 2	15	< 2	2	< 2	< 2	0
Aliphatic EC >12-16	1100 (s)	7	< 3	254	< 3	10	< 3	< 3	0
Aliphatic EC >16-21	65000 (s)	16	< 3	753	3	55	< 3	< 3	0
Aliphatic EC >21-35	65000 (s)	154	< 10	1878	42	46	56	21	0
Aromatic EC >5-7	70	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aromatic EC >7-8	130	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Aromatic EC >8-10	34	15	< 2	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >10-12	74	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >12-16	140	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >16-21	260	4	< 3	11	32	< 3	< 3	< 3	0
Aromatic EC >21-35	1100	60	< 10	318	608	< 10	< 10	< 10	0
Polycyclic Aromatic Hydrocarbons									
Naphthalene	15	0.48	< 0.1	0.42	0.16	0.23	< 0.1	< 0.1	0
Acenaphthylene	170	< 0.1	< 0.1	< 0.1	< 0.1	0.13	< 0.1	< 0.1	0
Acenaphthene	210	0.91	< 0.1	0.13	< 0.1	2.47	< 0.1	< 0.1	0
Fluorene	170	0.96	< 0.1	0.35	< 0.1	1.97	< 0.1	< 0.1	0
Phenanthrene	95	10	< 0.1	1.37	0.98	19.70	< 0.1	< 0.1	0
Anthracene	2400	1.86	< 0.1	0.22	0.21	8.56	< 0.1	< 0.1	0
Fluoranthene	280	8.89	< 0.1	0.88	1.03	35.80	< 0.1	< 0.1	0
Pyrene	620	7.98	< 0.1	0.87	0.96	28.50	< 0.1	< 0.1	0
Benzo(a)anthracene	7.2	3.03	< 0.1	0.54	0.57	**16**	< 0.1	< 0.1	**1**
Chrysene	15	2.86	< 0.1	0.61	0.50	13.40	< 0.1	< 0.1	0
Benzo(a)pyrene	5	2.32	< 0.1	0.42	0.62	**13.60**	< 0.1	< 0.1	**1**
Benzo(b)fluoranthene	2.6	0.82	< 0.1	< 0.1	0.20	**5.61**	< 0.1	< 0.1	**1**
Benzo(k)fluoranthene	77	2	< 0.1	0.35	0.50	13.60	< 0.1	< 0.1	0
Indeno(1,2,3-cd) pyrene	27	0.90	< 0.1	< 0.1	0.26	6.74	< 0.1	< 0.1	0
Dibenzo (a, h) anthracene	0.24	0.21	< 0.1	< 0.1	< 0.1	**1.82**	< 0.1	< 0.1	**1**
Benzo(ghi)perylene	320	0.75	< 0.1	< 0.1	0.22	5.55	< 0.1	< 0.1	0
Phenols									
Phenol	280	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0

Based on the results present in Table 2, seven contaminant concentrations were found in exceedance of the screening criteria relevant to a Residential End Use. The elevated contaminants of concern are summarised in Table 3, below.

Table 3: Summary of Contaminants

Location	Contaminant	Area
WS01 @ 0.30 m	Benzene	
WS01 @ 0.60 m	Benzene	
WS03 @ 0.30 m	Benzo(a)anthracene	
WS03 @ 0.30 m	Benzo(a)pyrene	
WS03 @ 0.30 m	Benzo(b)fluoranthene	
WS03 @ 0.30 m	Dibenzo (a, h) anthracene	

Polychlorinated Biphenyl's contamination (PCB's).

Three samples were assessed for PCB's, WS03 at 0.3 mbgl, WS04 at 0.3 mbgl and WS05 at 0.5 mbgl. All three samples returned result below the limit of detection for all PCB Congeners.

Asbestos fibres and fragments were not identified during the site investigation.

Ground Gas Assessment

Radon

The site is recorded to be located within an area where less than 1% of properties are above the radon action level and therefore no radon protection measures were deemed necessary.

Carbon Dioxide, Methane and Oxygen

The ground gas risk assessment has been conducted using the principles of RB 17 (ISSN 2047-6450), as the site has been categorised as low risk in the Phase 1 Desk Study and thus ground gas monitoring was not undertaken.

The made ground across the site is less than one metre in thickness and did not contain any biodegradable material, additionally it is estimated to be older than 20 years based on the previous Phase 1 investigation.

The chemical testing results available in Appendix 2 with relevant Soil Organic Matter and calculated Total Organic Carbon (TOC) summarised in Table 4 below.

Table 4: Soil Organic Matter Data

Location	WS01	WS01	WS02	WS02	WS03	WS04	WS05
Depth (mbgl)	0.30	0.60	0.20	0.50	0.30	0.30	0.50
SOM (%)	16.8	2	2.4	9.4	4.2	1.6	1
TOC (%)	9.7	1.2	1.4	5.5	2.4	0.9	0.6

*Conversion of SOM to TOC is SOM/1.724

Although WS01, WS02 and WS03 have TOC >1%, these samples are taken from boreholes are not located within the area of the proposed extension, and the impermeable cohesive ground conditions make any limited gas migration unlikely.

Whereas WS04 and WS05 have a TOC <1% and are hence a low risk to ground gas.

Thus, using Table 1 of RB 17 (ISSN 2047-6450), and WS04 and WS05 a characteristic situation of CS1 can be applied to the site.

Protection Measures

On the basis of the foregoing preliminary assessment, ground gas protection measures are not considered necessary at the site.

Conclusions and Recommendations

Soil Contamination

Based on the results of the chemical testing, seven exceedances in contaminants were observed in the soil samples analysed.

To break potential pollutant linkages to future residential end users, it is recommended that affected garden areas should be capped with imported clean cover soils.

Asbestos

Asbestos fibres and fragments were not identified in any of the soil samples tested.

Ground Gas

Based on Ground Gas Risk assessment utilising the principles of RB17 a low-risk rating has been assigned to the site.

As a result, ground gas protection measures are not required.

Recommendations

Due to the presence of contaminated soils a remediation strategy is required for the site.

The full report can be viewed in Appendix 2.

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

Due to the elevated concentration of contaminants encountered at WS01, WS02 and WS03, against screening criteria of residential end use with homegrown produce a clean cover system is required in these areas.

Additionally, the made ground encountered and site conditions at the rear of the proposed development (WS04 and WS05) the same clean cover system should be utilised for the proposed soft landscaping areas.

Clean Cover System in Garden Areas

A 600mm thick capping layer should be installed in the areas of soft landscaping of the proposed property with a minimum thickness of 150mm of topsoil to facilitate plant growth.

The imported soil should be free from any deleterious components e.g. glass, plastic, wood, ash and metal soils. The soil will need to be validated to use it does not contain any potential contaminants above the assessment criteria for a residential end use with plant uptake assessment criteria. The soil material within the cover system should ideally meet the requirement of BS3882:2015 specification for topsoil.

As the existing material on site, compositionally, is not suitable as a growing medium, topsoil for the soft landscaping areas will need to be imported.

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 investigations, no significant obstructions were identified within the made ground, 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 standard procedures.

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 than 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.

- 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 should be developed for installation of the soil cover system.

Soil Cover System

A soil cover system is required for garden areas, as such any imported material use to construct the soil capping layer will require chemical validation to confirm that suitable material has been used.

If the material is not suitable for use it will be removed offsite.

The soil cover should be verified by sampling to the required chemical analysis specification and frequency as specified in Appendix 3, for the purpose, type of cover, origin, and volume of imported material.

It is advised that an existing laboratory testing certificate from the proposed source of important material is forwards to EEG, if available prior importation to ensure that the imported soil is suitable for use. The test certificate should be for same suite of contaminants as the validation testing as set out in Appendix 3.

To ensure the correct thickness of important material has been installed validation trial pits are required. All cover system trial pit validation locations should be logged in accordance with the guidance in BS5930 and photographed to show the location (including legible identification signage), including the base, the arisings, and a legible depth gauge to the required depth below ground level.

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

The soil contamination element of the validation report should include:

- Confirmation of the suitably of important topsoil/subsoil for use on-site, if required including chemical analysis results/test certificates.
- Photographs confirming placement of and depth of fill material and topsoil cover system.

APPENDIX 1

PHASE I GEO ENVIRONMENTAL DESK STUDY REPORT FOR THE ALBION INN, BURNAGE, BY EEG (REFERENCE A5595/23/FDS, DATED OCOTBER 2023).

APPENDIX 2

GEOENVIRONMENTAL SITE INVESTIGATION REPORT, FOR THE ALBION INN, BURNAGE, BY EEG (REFERENCE A5595/SI/V2, DATED FEBRUARY 2024.

APPENDIX 3

ASSESSMENT CRITERIA FOR IMPORTED SOILS IN GARDEN AREAS

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.

Assessment Criteria for Imported Soils in Garden Areas

Determinand	Assessment Criteria
Metals	
Arsenic	37
Beryllium	1.7
Boron	290
Cadmium	11
Chromium	910
Chromium VI	6
Copper	2400
Lead	200
Inorganic Mercury	40
Nickel	180
Selenium	250
Vanadium	410
Zinc	3700
Petroleum Hydrocarbons	
Benzene	0.087
Toluene	130
Ethylbenzene	47
m-xylenes	59
p-xylenes	56
o-xylenes	60
Aliphatic EC >5-6	42
Aliphatic EC >6-8	100
Aliphatic EC >8-10	27
Aliphatic EC >10-12	130
Aliphatic EC >12-16	1100
Aliphatic EC >16-21	65000
Aliphatic EC >21-35	65000
Aromatic EC >5-7	70
Aromatic EC >7-8	130
Aromatic EC >8-10	34
Aromatic EC >10-12	74
Aromatic EC >12-16	140
Aromatic EC >16-21	260
Aromatic EC >21-35	1100
Polycyclic Aromatic Hydrocarbons	
Naphthalene	2.3
Acenaphthylene	170
Acenaphthene	210
Fluorene	170
Phenanthrene	95
Anthracene	2400
Fluoranthene	280
Pyrene	620
Benzo(a)anthracene	7.2
Chrysene	15
Benzo(b)fluoranthene	2.6
Benzo(k)fluoranthene	77
Benzo(a)pyrene	2.2
Indeno(1,2,3-cd)pyrene	27
Dibenz(a,h)anthracene	0.24
Benzo(ghi)perylene	320
Phenols	
Phenol	280
Asbestos Fibres	<0.001%

Frequency of Testing and chemical analysis for soil type and cover usage

Purpose	Classification	Testing Frequency	Chemical Analysis
Garden Areas	Topsoil	1 sample per 100m³ from greenfield source 1 sample per 50m³ from brownfield source [Minimum of 3 per source]	• Inorganic Compounds; • Speciated Polycyclic Aromatic Hydrocarbons; • Speciated Petroleum hydrocarbons; • Asbestos Screen • Phenols
	Sub-Soil	1 sample per 100m³ from greenfield source 1 sample per 50m³ from brownfield source 1 sample per 100m³ from site won source [Minimum of 3 per source]	

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

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 4

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.