



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

MORGAN SINDALL

Star Academy, Radcliffe – Temps 2

Addendum Geo-Environmental Report and Outline Remedial Strategy

PH/C5394/13776

BIM Ref. FS1013-BSL-XX-XX-T-O-1200

December 2024

EXECUTIVE SUMMARY	
Location and Brief Site Description	The site is located off Spring Lane, Radcliffe, M26 2SZ. It is situated approximately 0.5 km north of Radcliffe Town Centre, centred on National Grid Reference 378700, 407630. The school and leisure centre that previously occupied the site have been demolished, with underground infrastructure grubbed out. The site is level, surfaced with demolition crush.
Ground Conditions	Generalised ground conditions from the ground investigations comprise (top down): • Made ground encountered from ground level to between 2.10m and 2.40 bgl. • Natural strata encountered from 2.10m to between 3.20m and 3.50m bgl. • Solid geology was not encountered. • Groundwater recorded between 2.00m and 2.40m bgl.
Human Health - Soils Contamination	Testing on soils and comparison against the relevant screening criteria has revealed: • Presence of asbestos below trace concentrations at one location in the made ground. • Elevated concentrations of heavy metals and PAHs within the made ground. The above pose a risk to human health and require mitigation.
Controlled Waters – Surface and Groundwater Contamination	The following have been identified during the testing undertaken by Geotechnics for the wider site: • Exceedances of heavy metals, PAHs and a singular minor exceedance of petroleum hydrocarbons. However, based on the assessments carried out, the risk to controlled waters is considered to be low and no further action is required.
Ground Gas	Based on the monitoring to date for the wider site, the site is classified as CS1 – No protection is required.
Outline Remedial Strategy	Subject to regulatory approval, the following outline remedial strategy is recommended if soft landscaping is present (note: currently none anticipated): • Cover system with 450mm thick of 'clean' validated topsoil/subsoil in new soft landscaping areas including a geotextile marker layer at the base and / or a granular 'hard dig' layer. • Verification of the above with validation reports produced.
Mining Risk	The Temporary Accommodation Site lies outside of the Coal Authority Development High Risk Area, therefore- the risk from shallow unrecorded mine workings affecting the new building construction is considered to be low and no further action is required. Geogrid installation would be prudent within external areas of proposed hardstanding highways and car parking located in the Coal Authority Development High Risk Area where borehole coverage is limited.

This executive summary should be read in conjunction with the full report, reference PH/C5394/13776, and not as a standalone document. Document Version 2.3.

PROJECT QUALITY CONTROL DATA SHEET

Site Name:	Star Academy, Radcliffe – Temps 2		
Document Name:	Addendum Geo-Environmental Assessment and Outline Remedial Strategy		
Reference:	PH/C5394/13776		
Status:	-	19/12/2024	Original.

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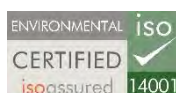


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DRAWINGS

Drawing Number	Rev	Title
FS1013-ALA-EX-ZZ-D-L-0101	C04	Temps Whole Site Plan – Draft
C5394/01	-	Site Location Plan
C5394/01A	-	Site Location Plan (Temporary Accommodation)
C5394/02A	D	Exploratory Hole Location Plan (Whole Site)
C5394/13	-	Exploratory Hole Location Plan - Temporary Accommodation 2

APPENDICES

Appendix	Title
Appendix A	BSL Methodology and Guidance
Appendix B	BSL Phase II Geo-Environmental Assessment Report – Temporary Accommodation
Appendix C	Exploratory Hole Logs
Appendix D	Coal Authority Report
Appendix E	BSL Remedial Strategy – Temporary Accommodation

1.0 INTRODUCTION

1.1 Context

This Addendum Geo-Environmental Outline Remedial Strategy has been produced by Brownfield Solutions Limited (BSL) for Morgan Sindall on a site off Spring Lane, Radcliffe and has been completed in general accordance with the following guidance:

-
- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
 - BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.
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1.2 Proposed Development

The proposed development involves the construction of second 'Temporary Accommodation' school building, which will be located in place of the now demolished school building previously occupying the site. This is in addition to the first 'Temporary Accommodation' building, which is present to the south of the new development and is understood to serve the same purpose but will allow an additional year's worth of students to provide additional time needed to complete the main school redevelopment which is being completed under a separate planning application.

The proposed development is shown on the draft Temp Whole Site Plan (drawing no. FS1013-ALA-EX-ZZ-D-L-0101 Rev C04) provided to BSL by the client.

1.3 Background and Scope

This report comprises a summary of the existing geo-environmental assessments which have already been undertaken over the Star Academy site, and will include an updated geo-environmental risk assessment and summary of remedial requirements specific to the proposed development, which will encompass a second temporary school accommodation site which lies within both the Temporary Accommodation Site Boundary (as shown on the Site Location Plan, drawing ref. C5394/01A) and the wider Star Academy Site Boundary (as shown on the Site Location Plan, drawing ref. C5394/01). The document explains how the works will be permitted under current regulatory regimes and has been produced in preparation for the submission of a future planning application for the development.

The scope of work for this document comprises a summary of the ground model, summaries of the of risk assessments carried out, a remedial assessment and any potential validation requirements. Given the existing Remediation Strategy which has been produced for the Temporary Accommodation Site, this document also intends to signpost various aspects of the existing Remedial Strategy which are relevant to the proposed development, in an effort to avoid repetition and ensure alignment with the existing Remedial Strategy requirements.

Note that geotechnical aspects are not specifically addressed within this document as it seeks to meet the requirements set out within LCRM. Geotechnical aspects should be considered within a Geotechnical Design Report in accordance with Eurocode 7 or a suitable site specific Earthworks Strategy.

1.4 Available Information

The following reports have been produced for the site and should be read in conjunction with this assessment (in date order):

Reports produced for the main school development but considered relevant to the whole site:

- Geotechnics, Desk Study Report, ref PC228400, dated May 2022.
- Geotechnics, Preliminary Ground Investigation Report with Interpretive Chapter, ref: PN224390, dated August 2022.
- BSL Coal Mining Risk Assessment, ref: PH/C5394/12312, issued August 2023.
- BSL Phase II Geo-Environmental Assessment Report, ref: PH/C5394/12387 Rev D, issued July 2024.
- BSL Remedial Strategy, ref: JM/C5394/12470 Rev A, issued July 2024.

Reports produced solely for the first Temporary Accommodation Site, considered wholly applicable to the new Temporary Accommodation Development:

- BSL Phase II Geo-Environmental Assessment Report, ref: CM/C5394/12669 Rev B, issued June 2024.
 - BSL Remedial Strategy – Temporary Accommodation, ref: PH/C5394/12924 Rev A, issued July 2024.
 - BSL Remedial Validation Report – Temporary Accommodation, ref: TM/C5394/13333 Rev B, issued November 2024.
-

It is assumed that the Local Planning Authority will have provided the above reports to the appropriate statutory consultees and the recommendations therein have been accepted.

1.5 Limitations

This report has been prepared for the sole use and reliance of the Client, Morgan Sindall. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report they rely on it at their risk and the authors owe them no duty of care or skill.

Current UK guidance and legislation has been used in the environmental assessment of the site, BSL is not liable for any subsequent changes in the guidance and legislation.

BSL have used reasonable skill, care and diligence in the production of this report. The findings and opinions conveyed via this report are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon. This report may not be relied upon by the client or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

The recommendations within this report are based upon the proposed site end use provided to BSL at the time of writing. If the end use or development layout changes from the proposal, then the recommendations may change or become invalid.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance.

2.0 SUMMARY OF PREVIOUS REPORTS

2.1 General

The summaries provided in the following section pertain to the whole site to provide information on the setting and context for the temporary accommodation site.

2.2 Geotechnics Desk Study Report

A summary of the relevant points from the Desk Study completed by Geotechnics (reference PC228400) is presented below:

- The site has been shown to have been developed from 1850, with a railway track transversing through the centre of the site. The site's features are generally related to railway development with associated goods yards and sidings, present until 1978. From 1987 a school is present onsite with associated playing fields and infrastructure.
- Mining has been evident on the historical maps from 1850 with a colliery (Whittaker's Bridge Colliery) being present from 1891 to 1909, 60m NW of the site.
- Superficial geology comprises glacial till (Secondary Undifferentiated Aquifer) comprising clay to sandy clay, unsorted, with common pebbles, cobbles and some boulders (Diamicton) is located within the northwest half of the site. In the southeast half of the site superficial deposits are shown to comprise Glaciofluvial Deposits described as undifferentiated sand and gravel with lenses of clay and stony clay.
- Solid geology is shown to be Upper Carboniferous (Pennsylvanian) (Secondary A Aquifer) strata of the Pennine Middle Coal Measures Formation which are described as mudstone and siltstone interbedded with fine- to medium grained sandstone, subordinate seatearths, marine bands and coal seams. The strata forms part of the Duckmantian (Westphalian B) Series.
- The site is not indicated to lie within a Source Protection Zone.
- Geological mapping show two coal seams are outcropping across the site from northeast to southwest.
- Geological mapping also shows another older coal seam outcropping with a similar strike is shown north of the Manchester, Bolton and Bury Canal. It is expected this seam runs below the site at depth.
- The site is in an area where the Coal Authority shows the site could be affected by past coal mining.
- A Coal Authority search carried out shows several coal seams are recorded to have been worked below the site.
- The nearest watercourse is the Manchester, Bolton and Bury Canal, 4m to the north.
- The site lies in an area with potential for groundwater flooding to occur at the surface.
- No radon protection measures are required.
- The risk to human health is considered to be medium to low.
- The risk to controlled waters is medium.
- The risk from ground gas is high to medium.

2.3 Geotechnics Preliminary Ground Investigation Report with Interpretive Chapter

A summary of the relevant points from the Preliminary Ground Investigation Report with Interpretive Chapter completed by Geotechnics (reference PN224390) is presented below:

- 5 No. Hand dug trial pits were excavated ranging in depths from 0.60m (HP02) and 1.20m BGL (HP05).
- 6.No Machine dug trail pits were excavated to 4.00m bgl.
- 3.No Soakaways (SA01 – SA03) tests were carried out within TP01 – TP03. SA01 and SA02 were carried out in adjacent pits to TP01 an TP02.
- 7 No. Dynamic Sample Boreholes (DS01 – DS07) were undertaken to depths between 3.45m to 5.45m bgl.

- 5 No. cable percussive boreholes with rotary follow-on boreholes (BH1 to BH4 including BH03A) to depth of between 2.45m and 51.50m bgl.
- Dynamic Cone Penetration Tests were carried out at 14 No. locations.
- 5 No. boreholes were installed for ground gas and groundwater monitoring.
- Made ground encountered included hardstanding of macadam, concrete, cobble setts and limestone gravel (sub base) from ground level to 0.10m to depths of 0.05m to 0.30m bgl.
- Topsoil was encountered from ground level to between 0.10m and 0.50m bgl.
- Granular made ground of sandy gravel was encountered across the majority of the eastern half of the site and north east from ground level to 0.30m bgl with thicknesses ranging from 0.40m to 2.60m.
- Cohesive made ground typically a sandy gravelly clay encountered from ground level to 0.30m bgl with a thickness of 0.30m to 1.70m.
- Glacial sand and gravels encountered were encountered from 0.10m to 2.80m bgl. Thickness from 0.20m to 3.90m were recorded.
- Glacial laminated clay was encountered in the upper, north-western part of the site only. This strata is described as slightly sandy clay with lenses of sand. This strata was encountered at 3.30m bgl to a depth of 3.50m bgl.
- Glacial till comprising of a slightly sandy slightly gravelly clay was encountered from 0.25m to 4.00m bgl. Thickness ranged between 0.10m and 18.70m.
- Pennine Middle Coal Measures consisting of mudstone, siltstone and sandstone. This geological unit was encountered from 12.60 to 20.50m. Coal was encountered between 16.40m and 48.00m bgl.
- Groundwater strikes were encountered in exploratory hoes BH01, BH02, BH03A, BH04, DS01 – DS06, TP01-TP02 and TP05-TP06. Depths ranged from 1.30m – 14.30m bgl.
- SPT results generally showed the granular made ground, glacial sand and gravel to be medium dense. Glacial Till was shown to be generally stiff to very stiff in nature. Variation of refusal depths indicate the likely presence of cobbles and boulders within Glacial Till.
- Exceedances in heavy metals and PAHs were recorded within the soils chemical testing.
- Several exceedances of EQS and DWS of heavy metals, TPH and PAH were detected within groundwater and leachate testing.
- Piled foundations into very stiff / stiff Glacial Till or socketed into the Pennine Middle Coal Measure are considered the most suitable for the predicted loads.
- Tree influence is anticipated to be an issue due to the effects of shrinking or swelling of clays on site. Suitable engineering strategies such as the use of a void or compressible material below ground beams / suspended floor slabs.
- The Design Sulphate Class for the site is DS-1 and ACEC Class AC-2z.
- CBR values of 3% should be adopted. Ground improvement strategies are recommended in potentially weakened zones.
- No significant risk to controlled water receptors were identified.
- No significant risk to human health receptors were identified.
- No significant sources of ground gas from the made ground or from underlying coal bearing bedrock or potential mine workings was identified.

2.4 BSL Coal Mining Risk Assessment

A summary of the relevant points from the CMRA (ref. PH/C5394/12312, dated August 2023) completed by BSL is presented below:

- The site is located within an area where coal seams are abundant and parts of the site are located within a development high risk zone.
 - The site lies within a fault block, strike-slip faults lie to the north and south of the site.
 - Two coals seams are recorded to subcrop onsite.
 - The dip of the coal seams range from 9° to 24° within the area around the site.
 - 11 named coal seams are recorded beneath the site, with a total of 7 seams historically worked according to the Coal Authority Consultants' Mining Report.
 - Geological memoir records and the Consultants Mining Report indicate the seams range in thickness from 0.80m to 4.60m.
 - The recorded workings are considered to present a low risk to the site due to the depth of workings presented in the Coal Authority report, supported by abandonment plans and outcrop calculations.
 - Due to the sub-cropping coal seams being indicated to be of workable thickness from coal memoir records, the risk from unrecorded mine entries is considered to be moderate.
 - As there are coal seams indicated to be dipping below the site at a shallow depth and are of workable thickness, the risk from unrecorded mine working is considered to be high.
 - The risk from recorded mine entries is considered to be low – no recorded mine entries are located on site, the closest being located approximately 40m east and 85m west of the site.
 - The risk from mine gas is considered to be moderate.
 - The risk from Coal Mining Geology is considered to be low.
 - The risk from coal mining surface hazards is considered to be low.
 - The risk from opencast mining is considered to be low.
 - Recommendations were for a series of rotary openholes to drilled to depth of 30m to 40m across the site to confirm or otherwise the presence of the coal seams or workings.
 - If evidence of potential influence from mine entries or coal workings is identified during construction, BSL should be consulted.
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3.0 GROUND MODEL

3.1 Description of Site

The site is located off Spring Lane, Radcliffe, M26 2SZ. It is situated approximately 0.5 km north of Radcliffe Town Centre, centred on National Grid Reference 378700, 407630 as shown on the Site Location Plan, Drawing No. C5394/01A.

The main site features and potential issues identified during the time of the intrusive investigation are detailed below.

Feature	Description
Site Area	The site covers approximately 0.05 hectares.
Site Access	Access to the site is gained off Spring Lane to the south.
Current Land Use and Site Features	The Temporary Accommodation site previously comprised a secondary school (Spring Lane School) and leisure centre (Radcliffe Leisure Centre) with associated hardstanding car parking areas. The school and leisure centre were demolished in April and May 2024, with underground infrastructure grubbed out. The site is level, surfaced with demolition material. A public footpath runs along the south-west border of the site (Banana Path). There are several manholes and services present in the proximity of the previous secondary school and leisure centre.
Potential Sources of Gross Contamination	Potential sources of gross contamination included the boiler house associated with the school development. There was also a chimney associated with the boiler house, although BSL understand this was disused and new gas boilers were installed in 2015 and 2019 for the school and leisure centre. A watching brief was undertaken throughout the demolition of the previous school building and leisure centre and no gross contamination was observed.
Vegetation / Ecology	Small clusters of trees are present near the entrance to the site off Spring Lane. A wooded area is also present to the west of the school building but lies outside of the temporary accommodation site.
Topography	The site generally appears to gently slope to the south-east.
Site Boundaries	The site is enclosed by steel palisade fencing along the eastern border of the site, a wooded area to the north of the site, steel railings to the west and Spring Lane to the south.
Surrounding Area	The site is set within a mixed commercial and residential area, with a park and ride car park present to the south, residential properties to the west, a railway to the east, the disused Manchester Bolton and Bury Canal to the north-west and a wooded area to the north.

3.2 Environmental Setting

Site History

The site has been shown to have been developed from 1850, with a railway track transversing through the centre of the site. The historical site features are generally related to the railway development with associated goods yards and sidings, present until 1978. From 1987 a school is present onsite with associated playing fields and infrastructure, and an associated disused boiler room which is located in the eastern area of the site.

The surrounding developments include both industrial and residential. Evidence of mining has been present on the historical maps from 1850 with a colliery (Whittaker's Bridge Colliery) being present from 1891 to 1909, 200m NW of the site. Various industrial works have been present within 100m of the site.

Published Geology and Hydrogeology

From the Desk Study Assessment and published geology, it was anticipated that ground conditions would comprise the following sequence of strata (top down):

- Made Ground; over
- Glaciofluvial Deposits; over
- Pennine Middle Coal Measures Formation.

Hydrogeology

Based on the inferred geology, a summary of the Environment Agency aquifer designations is presented in the table below:

Stratum	Coverage	Aquifer Designation
Glaciofluvial Deposits	Full Site	Secondary (A) Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Pennine Middle Coal Measures	Full Site	Secondary (A) Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The site does not lie within 500m of a Source Protection Zone.

Hydrology

The nearest named watercourse and surface water feature is the Manchester, Bolton and Bury Canal, 190m to the north-west of the site at it closest approach.

Radon

Information from the environmental database report and BGS Radon Report dated 11th October 2023 indicates the extent of the proposed new building is not in a radon affected area and therefore no radon protective measures are necessary in accordance with BRE Report 211 'Radon – Guidance on protective measures for new dwellings' 2023 Edition.

UXO Risk

There is no indication of former military use from the desk study. A non-specialist review of online Zetica mapping indicates the site to be in an area where the bomb risk is a low and no further consideration of UXO is required.

3.3 Summary of Ground Investigations

A copy of the BSL Phase II Geo-environmental Assessment Report (ref. CM/C5394/12669 Rev B) is presented in Appendix B; chapter 4.0 of this report includes full details of the previous intrusive investigations completed in the Temporary Accommodation site. However, a summary of the intrusive works completed to date is provided in the following section.

Pre-Demolition

The following site works were undertaken as part of the pre-demolition intrusive investigation within the vicinity of the temporary accommodation site between the dates of 8th August and 11th August 2023.

Method	Location Ref.	Range Depths (m bgl)	Purpose
Trial pits – JCB 3CX	TP108	2.20	Establish general ground conditions and gain coverage.

Method	Location Ref.	Range Depths (m bgl)	Purpose
Window sample boreholes – Tracked WS rig	WS104 WS106	1.20-5.45	Establish general ground conditions on site. Allow Standard Penetration Tests (SPTs) to be carried out and obtain samples for contamination testing.
Hand Excavated Pits	HP101 HP102	1.10-1.20	Establish general ground conditions and gain coverage in sensitive areas of the site pre-demolition.

Post-Demolition

The additional post demolition ground investigation and watching brief was subsequently undertaken across the temporary accommodation site between the dates of 20th and 30th May 2024.

Method	Location Ref.	Range Depths (m bgl)	Purpose
Trial Pits – JCB 3CX	TP301 TP302 TP303 TP304 TP306 TP307 TP310 TP315 TP316 TP317 TP318 TPSA301 - TPSA304 ASBTP01 - 05 ASBTP05-01 - 08	1.20 – 4.10	Establish general ground conditions and improve coverage within the temporary accommodation area post demolition. Obtain samples for contamination and geotechnical and testing and undertake hand shear vanes in cohesive strata to determine soil strengths to inform foundation design. TP303 located to target previous boiler house. TPSA304 located to target the previous school plant room. TP315 located to target historic goods shed. TPSA302B, 03, 04 Used for soakaway testing to obtain infiltration rates for drainage design. ASBTP01 – 05 positioned to collect samples along the line of a suspected asbestos pipe that was discovered and removed during the demolition phase. No logs available for ASBTP03-05 as samples were obtained from an existing open trench excavated by the demolition contractor. ASBTP05-1 – 8 to collect delineation samples on and around a positive asbestos ID above trace concentrations in ASBTP05.
Plate Load Tests	PL301-312	GL – 0.68	Test bearing pressures and obtain CBR values for temporary accommodation foundation design.

The surveyed locations of the exploratory holes are indicated on the Exploratory Hole Location Plan Temporary Accommodation 2, drawing ref. C5394/13 and copies of the relevant exploratory hole logs are presented in Appendix C.

With respect to the proposed Temporary Accommodation 2 building footprint, the most relevant exploratory holes are TP304, TP316, TP317 and TP318.

Third Party Investigations

In addition to the above, Geotechnics have carried out intrusive investigations in the vicinity of the temporary accommodation site, including 2 No. windowless sample boreholes (DS06 and DS07), 1 No. machine excavated trial pit (TP03) and 5 No. hand excavated trial pits (HD01-HD05).

3.4 Laboratory Testing

As part of the further assessment for potential contamination of the site, selected samples were taken for the purpose of chemical contamination testing within the temporary accommodation site.

The potential contaminative process on site were associated with railway infrastructure, with hydrocarbon odours encountered and ash with made ground observed, therefore the following suite of determinands were chosen to screen for potential site impacts at a UKAS approved laboratory:

Determinand	No of Samples
BSL Default Soil Suite: Arsenic, Cadmium, Chromium (III), Chromium (VI), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), water soluble sulphate (2:1 Extract), soil organic matter (SOM) and pH.	8
Petroleum Hydrocarbons (TPH CWG) inc BTEX and MTBE.	7
Asbestos Screen.	19
Asbestos Quantification	2
Waste Acceptance Criteria (WAC).	3

In addition to the testing above completed by BSL, 4 No. comprehensive testing suites including asbestos screen, metals, PAHs and TPH CWG were completed within the temporary accommodation site as part of the scope of works completed by Geotechnics.

The Chemical Laboratory Testing Results are included in the Phase II Geo-Environmental Assessment – Temporary Accommodation (ref. CM/C5394/12669 Rev B) which is presented in Appendix B.

3.5 Ground Conditions

Summary

A brief summary of the ground conditions encountered within the area of temporary 2 accommodation building footprint (TP304, TP316, TP317 and TP318) are presented in the table below:

Stratum	Range Depths - Top (m bgl)	Range Depths - Base (m bgl)	Range Thickness' (m)	Brief Description
Made Ground	0.00	2.10-2.40	2.10-2.40	Gravelly SAND.
Natural Superficial Strata	2.10-2.40	3.20-3.40	0.80-1.30	Sandy gravelly CLAY & SAND.

Made Ground – General

Made ground was encountered in all the holes within the area of the second temporary accommodation, it should be noted that the ground investigation undertaken in this area of the site was done post-demolition of the previous school/leisure centre buildings. Made ground was encountered down to a maximum depth of 2.40m bgl (TP316).

The upper layer of made ground comprised greyish brown gravelly sand with high cobble content. Anthropogenic constituents included brick and concrete with occasional rebar and plastic representing crushed demolition rubble. This was encountered within all exploratory holes in the area of the temporary accommodation from ground level to between 0.40m and 1.80m bgl, though generally in thicknesses greater than 0.60m.

Underlying this, a lower layer of made ground was encountered, comprising dark blackish brown gravelly sand, occasionally slightly clayey and occasionally with cobbles. Anthropogenic constituents included ash, brick, clinker, slag and rare glass. This was encountered within all exploratory holes to between 2.10m and 2.40m bgl.

Natural Superficial Strata

The natural superficial strata generally consisted of firm to stiff brown gravelly sandy clay proven to depths of 3.40m bgl. An orangish brown clayey sand was encountered locally within TP304 between the depths of 3.30m and 3.50m bgl.

Groundwater

The depths to groundwater and locations present during site works are shown in the table below:

Location	Depth During Site Works (m)	Comments
BSL – TP304	2.30	Medium seepage
BSL – TP316	2.40	Medium seepage
BSL – TP317	2.00	Medium seepage
BSL – TP318	2.00	Medium seepage

From the groundwater observations made to date and the ground conditions on site, the groundwater appears to represent a shallow perched groundwater body often present at the base of the granular made ground at the interface between the made ground and the underlying natural cohesive.

Observations

During the works undertaken by BSL, observations for both visual and olfactory evidence of contamination were undertaken.

Ash was observed as a moderate constituent within the deeper made ground stratum encountered during the post demolition investigation in the majority of exploratory holes.

During the post demolition works, which took place alongside the demolition of the site allowing a watching brief, no evidence of gross hydrocarbon contamination was noted.

A suspected asbestos cement pipe was encountered by the demolition contractor and was subsequently removed prior to BSL commencing the post-demolition investigation works. No other evidence of visible asbestos within soils or below the building footprint has been noted to date.

Obstructions

There were frequent obstructions encountered throughout the made ground on site during the pre-demolition works, whereas fewer obstructions were observed during the post demolition works. It is likely that the apparent reduction in frequency of obstructions was either due to the majority of underground features having been grubbed out by the demolition contractor, or due to the method of investigation comprising trial pitting rather than window sampling and hand pitting, which can typically refuse on cobbles and boulders.

Geotechnical Assessment

A geotechnical assessment is outside the scope of this report. Further information regarding geotechnical recommendations can be found in the Phase II Geo-Environmental Assessment Report – Temporary Accommodation (ref. CM/C5394/12669 Rev B) which is presented in Appendix B.

Mine Workings and Treatment

The site is located within an area where coal seams are abundant and is noted to be within the coal mining reporting area, although the proposed temporary accommodation building is understood to be outside of the development high risk area based on our assessment of a recently acquired Coal Authority Report which is included within Appendix D.

Following the intrusive investigation over the wider site, the overall risk from shallow unrecorded mine workings is considered to be low, although given the lack of coverage in other parts of the site outside of the main development building footprint, including the area of the proposed temporary accommodation, consideration should be given to the installation of to a geogrid across roads and car parking areas, as a form of mass subsidence prevention.

Further details of the mining risk assessment and findings of the coal mining investigation can be found in the Coal Mining Risk Assessment (ref. PH/C5394/12312) and chapter 7.8 of the Phase II Geo-Environmental Assessment Report – Temporary Accommodation (ref. CM/C5394/12669 Rev B) which is presented in Appendix B.

4.0 SUMMARY OF GEO-ENVIRONMENTAL RISK ASSESSMENT

4.1 General

Full details on the laboratory testing results and a comprehensive risk assessment can be found within Section 8.0 Phase II Geo-Environmental Assessment Report – Temporary Accommodation (ref. CM/C5394/12669 Rev B) which is presented in Appendix B.

A brief summary of the identified contamination and Conceptual Site Model is presented in the following sections.

4.2 Human Health Risks

Made ground underlies the whole temporary accommodation site; heavy metal contamination (arsenic and lead) was encountered above residential without homegrown produce screening levels within four soil samples within close proximity to the temporary accommodation site.

PAH contamination above residential without homegrown produce screening values is also present within three soil samples within the surrounding area of the temporary accommodation site. In addition, several additional exploratory hole locations on the wider site have been found to contain elevated concentrations of PAHs, which are likely attributable to ash and clinker within the granular made ground, which was encountered throughout the temporary accommodation site.

Asbestos has also been detected at trace (<0.001% w/w) within one sample of made ground, taken from the location of a former asbestos cement pipe which has recently been removed during demolition.

The above are considered to pose a risk and require further consideration and mitigation.

4.3 Permanent Ground Gases and Vapours

A summary of the ground gas monitoring carried out by BSL is presented below:

- The available data set for the wider site exceeds the minimum requirements suggested by the guidance for assessment.
- Whilst no monitoring wells have been installed within the immediate vicinity of the proposed temporary accommodation building, the potential source of concern (made ground) has been targeted and monitored in close proximity; the similarity in ground conditions in addition to the consistent site history across the eastern part of the site means the dataset for the onsite made ground can be used to assess the gas generation potential of the primary ground gas source.
- It is considered that the ground gas concentrations and flows have been monitored to enable a predication of “worst case” conditions; rapid and short pressure decreases are within the dataset.
- Although the methane concentrations place the site into CS2 based on the gas screening values, the levels are likely caused by the disturbance and oxygenation of the low organic content within the made ground; this is considered to be a highly limited low volume source.
- The organic made ground responsible for the methane concentrations is highly localised, has not been encountered elsewhere on site, and is therefore not representative of the ground conditions as a whole.
- Soft organic clays are geotechnically unsuitable and are likely to be removed anyway as part of the enabling works and earthworks programme likely to be required to create a development platform.
- In addition, the location in question is well away from the proposed temporary building site, further reducing the risk.
- The typical threshold concentration for carbon dioxide of 5% has been exceeded on a number of occasions within the spot monitoring data.

- Despite the carbon dioxide concentrations, the dataset as a whole is characterised by very low to negligible flow rates and low methane concentrations.
- However, based on the conceptual site model, likely generation sources and detailed assessment via ternary plots, the carbon dioxide concentrations are likely due to microbial respiration, where there is no requirement to increase the characteristic situation simply because the carbon dioxide concentration exceeds 5%.
- The gas flows from the rotary boreholes have been discounted due to the groundwater being above the response zone and creating a piston effect.
- CL:AIRE Research Bulletin RB17 states the minimum level of ventilation required to deal with condensation is capable of dealing with quite onerous ground gas regimes. In addition, the requirements of Part L of the building regulations relating to the air tightness of buildings also leads to the need for a well-sealed floor slab (NHBC Foundation, 2009).
- Therefore, the structures on the development will also have an inherent level of ground gas protection, thus adding an additional layer of mitigation to the already low assessed level of risk.
- Based on the evidence suggesting an absence of coal mining beneath the site, high ground water table, low permeability superficial deposits, and gas monitoring data, the overall risk from mine gases has been assessed as low.

The site has been assessed as Characteristic Situation 1 (CS1) in respect to permanent ground gases (carbon dioxide and methane) and no specific gas protection measures are required.

4.4 Risk to Controlled Waters

Chemical testing of groundwater to date shows exceedance of the Environmental Quality Standards (EQS) and Drinking Water Standards (DWS) for various metals as well as minor exceedances in short chain aliphatic hydrocarbons and PAHs. However, these were not considered to represent a significant risk of pollution of Controlled Waters due to the following reasons:

- There does not appear to be any clear linkage between contaminant concentrations within soils and leachates when compared to exceedances within groundwater.
- No visual or olfactory evidence of gross contamination has been encountered during the site investigations within the temporary accommodation site to date, including during post-demolition investigation targeting former plant rooms and railway infrastructure.
- There is no indication under present conditions of pollution of controlled waters and conditions following development of the site will not be any worse, indeed they may improve with increased hard cover and water retaining imported garden soils.
- The post-demolition ground investigation has confirmed the widespread presence of cohesive superficial deposits immediately underlying the shallow made ground, and a consistent perched groundwater body indicating very low permeability of the cohesive soils, as confirmed by infiltration testing.
- Based on the above, the cohesive soils are likely acting as an aquiclude inhibiting lateral and vertical contaminant migration.
- It would be technically challenging and probably disproportionately costly to remove the contaminants from the water to the pre-input stage.
- The above is especially pertinent given the generally minor and highly localised exceedances of PAHs.
- The nearest named watercourse is the Manchester, Bolton 190m away from the site at its closest approach, and >250m from the isolated highest exceedance of PAH in TP307, which provides considerable distance for attenuation and contaminant degradation.
- The site is underlain by low permeability clays which will.
- The site does not lie within 500m of an SPZ.
- There are no potable (sensitive) water abstractions within 2000m.

Based on the above, the site is not considered to pose an unacceptable risk to controlled waters. Therefore, no specific remedial requirements for controlled waters are necessary.

4.5 Conceptual Site Model

The Conceptual Site Model for the Temporary Accommodation Site is reproduced below.

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
On site Made Ground associated with former railway development. Metals, PAH's, asbestos, Petroleum Hydrocarbons	Root uptake, ingestion, direct contact, inhalation of dusts	End-users	Low likelihood	Medium	Moderate/low	From the testing of made ground undertaken by BSL and Geotechnics, exceedances of asbestos (trace in one location), heavy metals and PAHs have been detected within the made ground. In this instance, residential without homegrown produce has been selected for the initial screening criteria due to the nature of the development. The contamination has been encountered is likely attributed to the made ground associated with the historical railway development. The proposed temporary development will act a barrier for any contamination within the made ground and as such a pathway is not likely in these areas. Although if there are any areas of general soft landscaping, a pathway could exist between the contamination and end-users. Therefore, the risk is considered to be moderate/low.
On site Made Ground Metals and organic contamination	Migration into/chemical attack of water supply pipelines	Water Pipelines / End users	Likely	Medium	Moderate	Contaminants within the soil/groundwater could potentially attack the clean potable water supply pipe, contaminants should be assessed in accordance with the relevant guidance to determine the correct pipe material and level of precautions required.
Made Ground Ground Gas (carbon dioxide and methane)	Migration into confined spaces, inhalation and asphyxiation/explosion	End-users / property / structures	Unlikely	Medium	Low	Made ground is present onsite but is unlikely to be a significant source based on the encountered depths, lack of significant concentrations of putrescible or organic material, etc. The wider site ground gas monitoring data is characterised in general by low flow rates, low methane although concentrations of carbon dioxide exceeding 5% have been encountered on a number of occasions. The majority of the site is underlain by impermeable cohesive deposits, it is not suitable as a reservoir for storing ground gases and accumulation of gases in significant concentrations is unlikely to occur. Based on the detailed risk assessment carried out, the overall risk from ground gases is considered to be low.
Onsite Bedrock Geology – Coal Measures.	Migration into confined spaces, inhalation and asphyxiation/explosion	End-users / property / structures	Unlikely	Medium	Low	Two monitoring wells were installed within the bedrock strata (RO103 & RO104). Some high flow readings were recorded within the deep rotary open boreholes but as the groundwater was recorded above the response zone in both of these, these flows can be attributed to a piston effect of the groundwater rising, further increased by the purging of the groundwater which took place during each visit. Due to this, the flows from RO103 and RO104 are not considered representative of the bedrock geology, and this means a GSV cannot be calculated. The concentrations of methane and carbon dioxide recorded in these wells were both low.

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
						In addition to the monitoring data, no evidence of coal workings was encountered and the high groundwater table means any deeper workings are highly likely to be flooded. There are also no mine entries on or close to the site. Based on the monitoring dataset and conceptual site model, the overall risk from mine gases impacting the site is considered to be low and no mitigation with respect to mine gases is considered necessary.

Controlled Waters						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
Made Ground PAH's, Metals	Overland flow, / migration through saturated zone	Unnamed Inland River 130m E (Surface waters)	Unlikely	Medium	Low	It is considered contaminants associated with the made ground and other past industrial uses are unlikely to impact the River. This is due to the low permeability of the clays underlying the area, which will inhibit lateral migration, and the potential for contaminants to attenuate and degrade over this distance. Therefore, a low risk is posed to the river from the made ground.
	Leaching through unsaturated zone / Migration through saturated zone	Secondary Undifferentiated/ Secondary A Aquifer (Ground-water)	Unlikely	Medium	Low	Although elevations of both PAHs and heavy metals have been detected within the made ground in the east section of the site, it is unlikely to impact controlled waters. Typically, the made ground is underlain by cohesive deposits and therefore this will reduce migration potential of contaminants, furthermore the site is not within a source protection zone and there are no groundwater abstractions within 200m of the site. Groundwater testing has been undertaken as part of the Geotechnics investigation, which revealed elevations in Copper, Iron, Lead, Manganese, Nickel, and Zinc, although Geotechnics' assessment suggests these are typical of natural background concentrations. No gross contamination has been observed on site. Therefore, the risk is considered to be low.
	Migration through saturated zone	Secondary A Aquifer (Ground-water)	Unlikely	Medium	Low	Bedrock across the site is overlain by impermeable natural clay strata which will likely break the pathway from any contamination migration downwards from the made ground. In addition, the new development will likely result in betterment of drainage and will therefore reduce leaching into the saturated zone. In any case, the existing groundwater quality within the Coal Measures is likely to be of low quality due to historical workings in the surrounding area, and the absence of any gross contamination means it is likely to be disproportionately costly to remove contaminants from the groundwater given the site's setting and potential receptors.

4.6 Outline Remedial Measures

The ground conditions within the extents of the temporary accommodation site have been broadly consistent during all phases of investigation to date (BSL pre- and post-demolition, and Geotechnics pre-demolition) with elevated concentrations of metals and PAHs identified within the made ground attributed to ash, which are considered to pose a risk to human health.

It should also be noted that no gross contamination was encountered during the demolition or redevelopment of the first phase of temporary accommodation, with BSL maintaining a partial presence on site during the latter stages of demolition and lifting of floor slabs to confirm the absence of gross contamination.

With respect to the human health risks posed by the general made ground, where soft landscaping areas are present a cover of “clean” subsoil and topsoil should be provided to break the pathway to site end users. This should be 450mm thick in soft landscaping areas in accordance with BRE 465. This will allow plants to be grown and prevent undesirable soils being brought to the surface. The inclusion of an engineered element, such as geotextile marker layer at the base and / or a coarse granular ‘hard dig’ layer, is recommended due to the very high concentrations of Benzo(a)pyrene recorded within the made ground and trace concentrations of asbestos in the made ground which is assumed across the temporary accommodation site.

Prior to import or re-use of clean cover soils, they should be tested to confirm chemical suitability. After installation of the clean cover, soil depths should be verified by a suitably qualified independent geo-environmental engineer, such as BSL.

The inclusion of a cover system containing a degree of cohesive material, together with the hard cover supplied by the proposed development, will have the effect of reducing rainfall infiltration and consequently contributing to a general betterment of groundwater and surface water quality.

Although there is considered to be a risk from heavy metal and PAH contamination within the made ground, the current proposed development for the temporary accommodation does not include any soft landscaping areas as part of the development. As stated in the CSM within the site wide Phase II Geo-Environmental Assessment Report, the pathway to end-users is considered to be linked through soft landscaping areas, therefore as this development will not have any soft landscaping, a pathway to end-users is unlikely to exist as the hardstanding will be acting as a break layer and therefore no remedial measures will be required.

Utilities - Pipeline Risk Assessment

The level of protection for the clean potable water supply pipes should be determined using the local water company risk assessment criteria in accordance with UKWIR.

A United Utilities water supply pipe risk assessment has been completed for the purposes of the new water supply, which is required for the main school redevelopment, to be completed under a separate planning application. At the time of writing the separate Remedial Strategy produced for the Temporary Accommodation (BSL report ref. PH/C5394/12924 Rev A) details of the proposed water connection were not fully understood, therefore the Remedial Strategy contained references to the pipeline risk assessment (completed for the main school development) in error. The pipeline risk assessment for the main school development confirms that the main school will require barrier pipe for the potable water supply.

It should be noted that the new water feed will be drawn predominantly from an existing water main running northwards from Spring Lane towards the north-eastern corner of an existing sports pitch on site and very limited new water services are to be installed as part of the new temporary accommodation building.

Given the temporary nature of the new building, which is only anticipated to be open for 18 months while the new permanent school is constructed, the installation of barrier pipe is considered highly onerous as the PE pipe which has been installed is highly unlikely to undergo any significant degradation over this short time period. In addition, given the majority of the length of the water supply is utilising existing service runs, the installation of barrier pipe over the short distance between the meter and the new temporary building would likely be ineffective and consideration is also given to the fact that the existing water main has served the former school and leisure centre for many years with no reports of ill health

On the balance of risk and given the factors discussed above, the potential for exposure to contaminants within the made ground via the potable water supply pipe is considered to be very low to negligible and barrier pipe is not considered necessary for the Temporary Accommodation site.

Ground Gas Protection Systems

Based on the ground gas monitoring results to date, no mitigation measures are required, and no radon protection is required for new buildings at this location.

General

It is recommended that the approval of the Regulators (Local Authority / Environment Agency) is obtained in regard to the above prior to any irrevocable action is taken at the site.

It should be noted that a Remedial Strategy has already been produced for the Temporary Accommodation Site, report ref. PH/C5394/12924 Rev A, and is presented in Appendix E. This Strategy has already been approved for the existing Temporary Accommodation Site and has been implemented under Bury Council Planning Condition No. 70002.

In addition, the writing and approval of a Materials Management Plan (MMP) or suitable exemptions/permits will be required to allow re-use of suitable material at the site, if required, although limited groundworks are anticipated for the new temporary accommodation building therefore implementation of an MMP may not be required.

Once remediation is complete, verification reports will need to be produced by a suitably qualified independent geo-environmental engineer, such as BSL, in order to achieve regulatory sign off

5.0 SUMMARY OF REMEDIATION STRATEGY

5.1 General

A detailed Remediation Strategy including options appraisal has been completed for the Temporary Accommodation site (BSL report reference PH/C5394/12924 Rev A). Given the similarity in the proposed end use (i.e receptor) and the identified geo-environmental risks are effectively unchanged, the existing Remedial Strategy for the Temporary Accommodation Site is considered wholly applicable to the new Temporary Accommodation development, and is presented in Appendix E.

A brief summary of the key remedial requirements and verification requirements is presented in the following section for ease of reference, however this should be read in conjunction with the Remedial Strategy for the Temporary Accommodation site, report reference PH/C5394/12924 Rev A.

In summary, based on the site investigations undertaken at the site and the contaminant sources identified within the CSM, the following require appraisal to determine the most suitable remedial options:

- General Made Ground – Pervasive contamination in the form of arsenic, lead, PAHs and localised trace asbestos has been identified within the made ground, presenting a risk to human health (site end users).

5.2 Summary of Site Remediation Requirements

Following an options appraisal in the Remedial Strategy (See chapter 4.0 within the Remedial Strategy ref. PH/C5394/12924 Rev A, presented in Appendix E), remedial measures were selected for each of the identified sources. Full details are available within the Remedial Strategy, with the key requirements summarised in the table below.

Source	Remediation Method	Further Details / Remedial and Verification Requirements	Relevant Section(s) of Remedial Strategy – See Appendix E.
Made Ground - Arsenic, Lead, PAHs, asbestos	Installation of Clean Cover System	In proposed new soft landscaping areas, a 450mm cover system comprising “clean” validated topsoil/subsoil should be installed. A warning geo-membrane or hard dig layer should also be installed at the base of the clean cover system. Imported topsoil and subsoil, and any materials re-used to require chemical testing as per Appendix A. Thickness of clean cover system requires validation Note: A Cover System is only required in areas of new soft landscaping which are not currently expected to be required.	5.0 – Detailed Requirements: 5.5 – Cover Layer 5.8 – Testing 7.0 – Verification Plan 7.1 – Clean Cover System

In addition to the specific remedial requirements listed in the tables above which are intended to mitigate the risks from known sources, it was recommended that a watching brief be maintained during the groundworks and construction for any evidence of contamination and BSL consulted for advice.

With reference to the remedial requirements, “clean” soils are defined by the site-specific Human Health Remediation Targets, presented in Appendix E, which are derived from C4SLs/S4ULs for a residential without plant uptake end use.

5.3 Summary of Site Verification Requirements

On receipt of all information, the appointed Geo-Environmental Engineer will compile a Verification Report(s). The report will be a concise document that provides records and collected evidence of the remediation carried out at the site. The final report should contain:

- Introduction, including description of the project and background to the works.
- Summary references to site investigation data, risk assessments and the Remedial Strategy.
- A description of the works undertaken and any treatment records, if applicable.
- Details of chemical validation testing, if applicable.
- Reference to the MMP (if utilised), records of where material was moved from/imported from/to and final destinations, including volumes, suitable for use criteria, QP declaration references etc.
- The size and extent of any remedial excavations (lateral extent and depth plotted on suitable plans), if applicable.
- Details of how any out of specification materials were dealt with and final destination, including waste transfer notes.
- Appropriate site plans and photographic record.
- Cover system validation records, if any new soft landscaping areas implemented.
- Conclusions, detailing any additional works that may be required.
- Details of any long-term monitoring requirements, if any.

This should then be submitted to the regulators and warranty providers for approval, which should close out the requirements of the Remedial Strategy.

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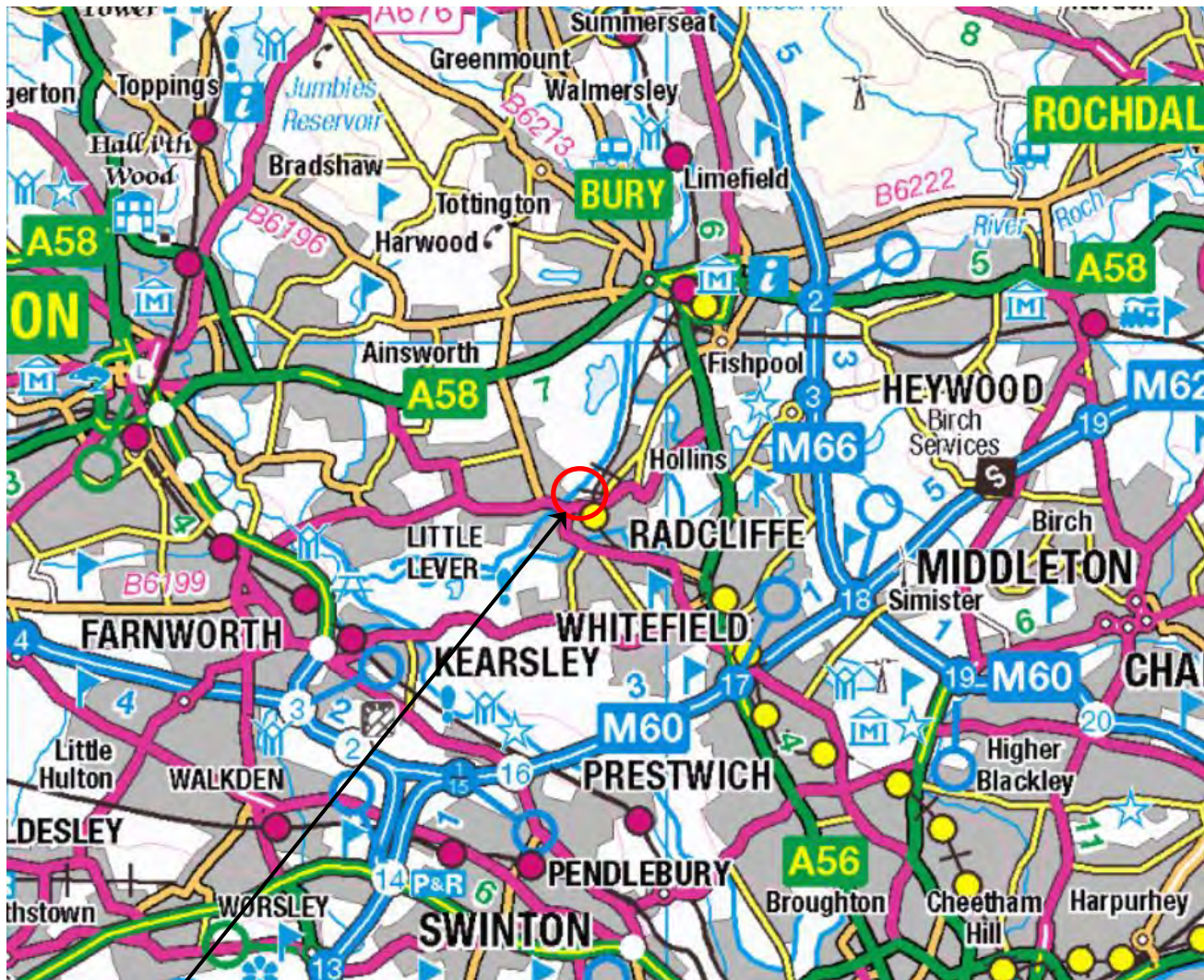
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DRAWINGS



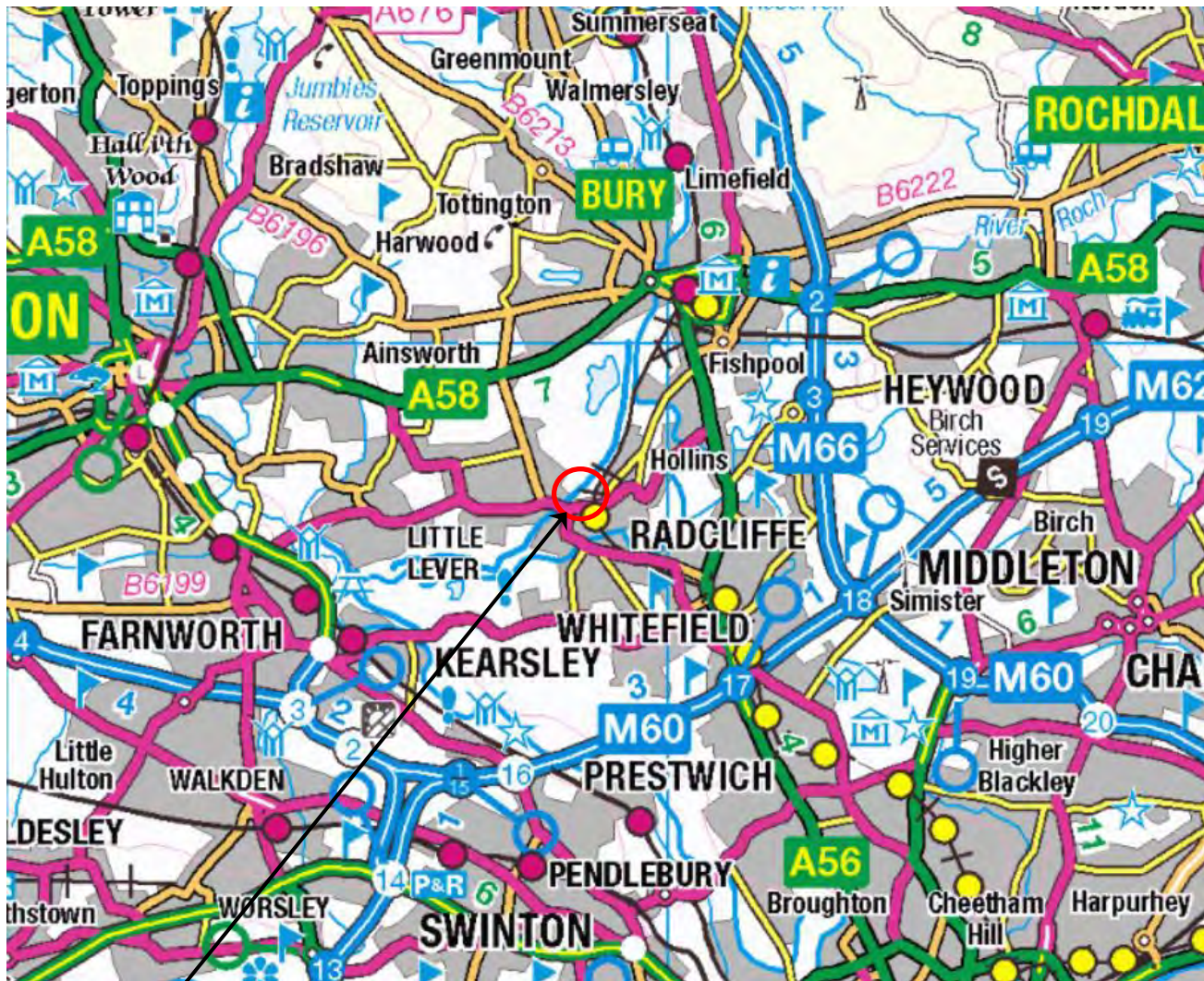
SITE LOCATION

NEAREST POSTCODE: M26 2SZ

SITE ENTRANCE WHAT3WORDS:
///CHAIR.VERGE.SINGLE



REV	DATE	DESCRIPTION	BY	CKD
 BROWNFIELD SOLUTIONS LTD IDEAS • ENVIRONMENTAL • ENGINEERING • CREATIVE				
CLIENT MORGAN SINDALL				
PROJECT TITLE STAR ACADEMY, RADCLIFFE, MANCHESTER				
DRAWING TITLE SITE LOCATION PLAN				
DRAWING No. C5394/01	REVISION -	SCALE NTS	DATE 16/06/23	
DRAWN BY SD		CHECKED BY PH		



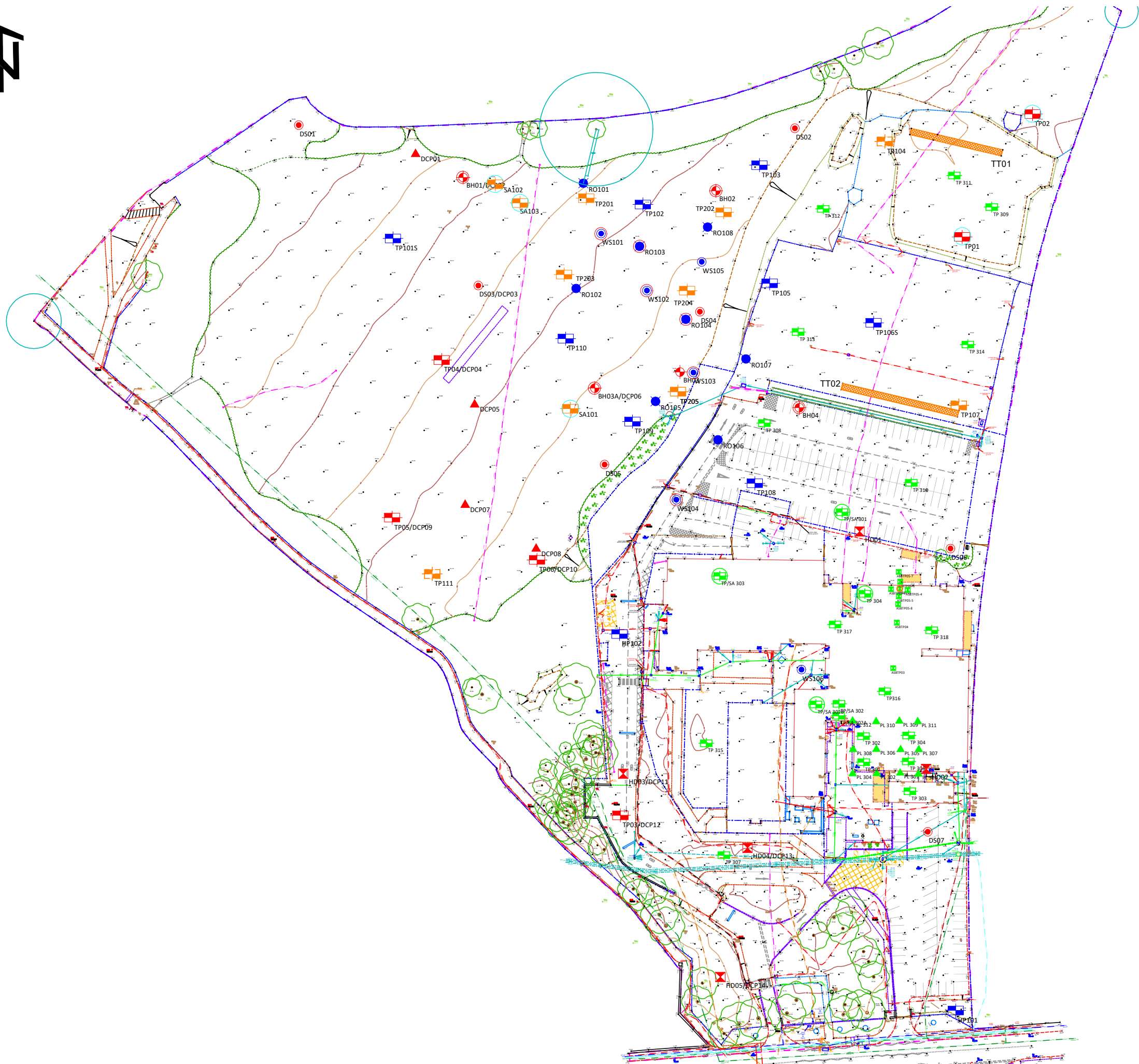
SITE LOCATION

NEAREST POSTCODE: M26 2SZ

SITE ENTRANCE WHAT3WORDS:
///CHAIR.VERGE.SINGLE



REV	DATE	DESCRIPTION	BY	CKD
 BROWNFIELD SOLUTIONS LTD SOLEY ENVIRONMENTAL ENGINEERING CONSULTANCY				
CLIENT MORGAN SINDALL				
PROJECT TITLE STAR ACADEMY, RADCLIFFE, MANCHESTER				
DRAWING TITLE SITE LOCATION PLAN (TEMPORARY ACCOMMODATION)				
DRAWING No. C5394/01A	REVISION -	SCALE NTS	DATE 11/03/23	
DRAWN BY PH		CHECKED BY TM		



	APPROXIMATE SITE BOUNDARY
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	ROTARY OPEN BOREHOLE
	BOREHOLE INSTALLATION
	ADDITIONAL TRIAL PIT
	ADDITIONAL TRIAL TRENCH
	ADDITIONAL SLIT TRENCH
	SOAKAWAY INFILTRATION TEST

	HAND EXCAVATED TRIAL PIT
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	CABLE PERCUSSIVE/ROTARY CORE BOREHOLE
	PLATE LOAD TEST.LWD.TRL-DCP
	SOAKAWAY INFILTRATION TEST
	BOREHOLE INSTALLATION

	TRIAL PIT
	PLATE LOAD TEST
	SOAKAWAY INFILTRATION TEST
	ASBESTOS TRIAL PIT
	ASBESTOS IDENTIFICATION

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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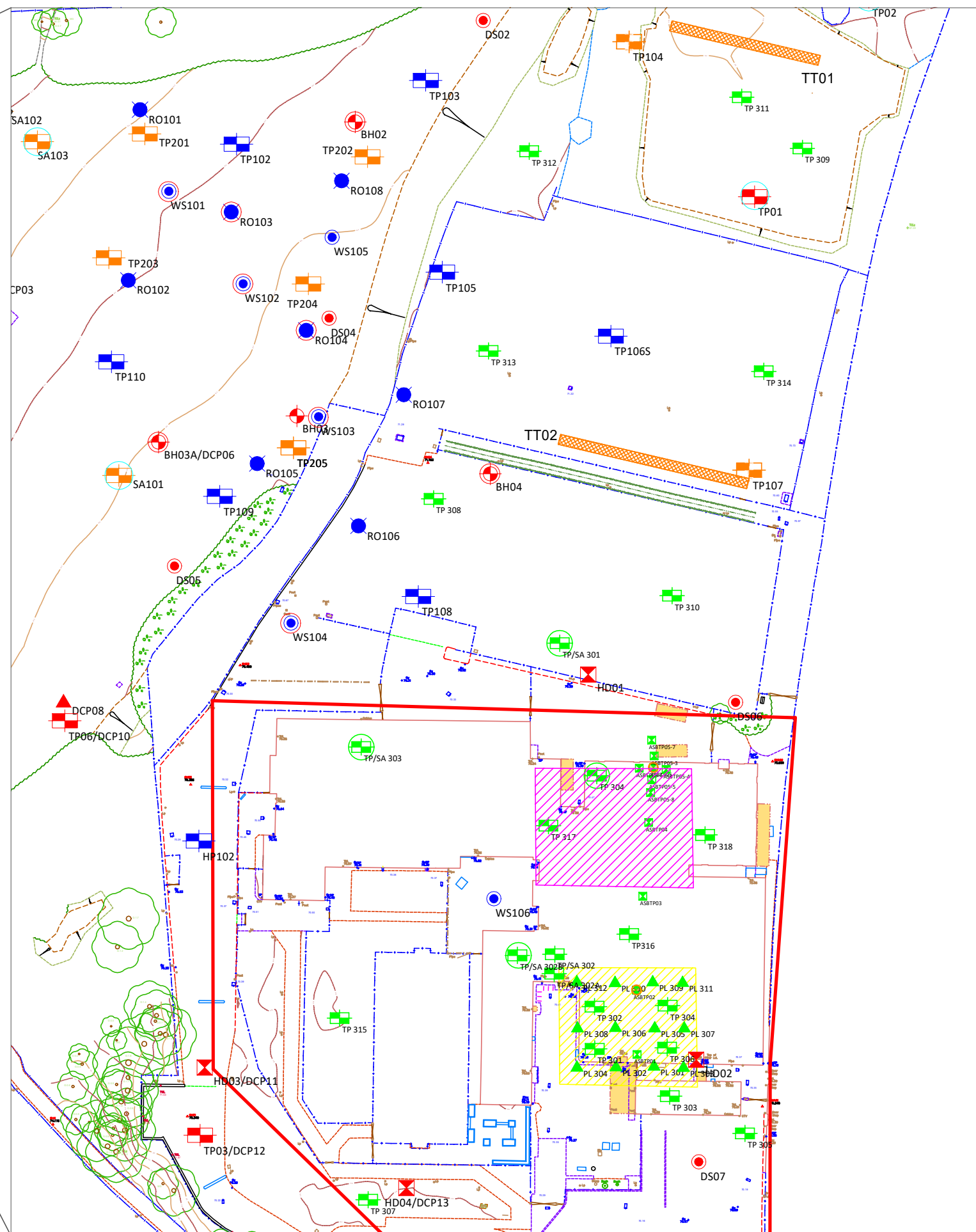
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STAR ACADEMY, RADCLIFFE

EXPLORATORY HOLE LOCATION PLAN

DRAWING No. C5394/02A	REVISION D	SCALE NTS	DATE 08/07/24
DRAWN BY JEM		CHECKED BY TM	



	APPROXIMATE SITE BOUNDARY
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	ROTARY OPEN BOREHOLE
	BOREHOLE INSTALLATION
	ADDITIONAL TRIAL PIT
	ADDITIONAL TRIAL TRENCH
	ADDITIONAL SLIP TRENCH
	SOAKAWAY INFILTRATION TEST

TEST TECHNIQUES (2022)	
	HAND EXCAVATED TRIAL PIT
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	CABLE PERCUSSIVE/ROTARY CORE BOREHOLE
	PLATE LOAD TEST.LWD.TRL-DCP
	SOAKAWAY INFILTRATION TEST
	BOREHOLE INSTALLATION
	APPROXIMATE LOCATION OF TEMPORARY ACCOMMODATION BUILDING (TEMPS 1)
	APPROXIMATE LOCATION OF TEMPORARY ACCOMMODATION BUILDING (TEMPS 2)

POST-DEMOLITION SI (2024)	
	TRIAL PIT
	PLATE LOAD TEST
	SOAKAWAY INFILTRATION TEST
	ASBESTOS TRIAL PIT
	ASBESTOS IDENTIFICATION

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
3. DRAWING NOT FOR CONSTRUCTION PURPOSES.

[illegible]

CLIENT

MORGAN SINDALL

PROJECT TITLE

STAR ACADEMY, RADCLIFFE

DRAWING TITLE

EXPLORATORY HOLE LOCATION PLAN
TEMPORARY ACCOMMODATION 2

DRAWING No. C5394/13	REVISION -	SCALE NTS	DATE 16/12/2024
DRAWN BY PH		CHECKED BY TM	

APPENDIX A

BSL Methodology and Guidance

APPENDIX B

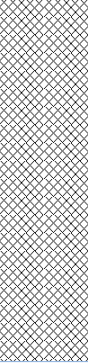
BSL Phase II Geo-Environmental Assessment - Temporary Accommodation

[FS1013-BSL-XX-XX-T-O-1003-P03 PHASE II GEO-ENVIRONMENTAL REPORT JULY 2024 \(TEMPORARY ACCOMMODATION\).PDF](#)

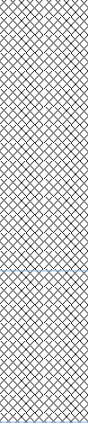
Should there be any issues accessing the report via the above link, please contact Brownfield Solutions.

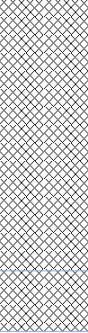
APPENDIX C

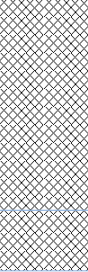
Exploratory Hole Logs

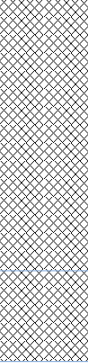
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBT01 Sheet 1 of 1 Hole Type TP Scale 1:25 Logged JEM Checked TM	
PROJECT NO: C5394						CO-ORDS: 378766E, 407536N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.30m OD			
CLIENT: MORGAN SINDALL						DATES: 22/05/24			
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.60	ES					MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0	
				1.20	69.10		End of Trial Pit at 1.20m	2.0	
								3.0	
								4.0	
								5.0	
Remarks		1. Service clearance undertaken by GeoUK using EM and GPR and by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

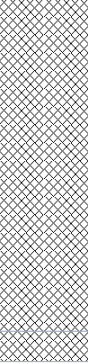
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTPO2 Sheet 1 of 1 Hole Type TP Scale 1:25 Logged JEM Checked TM	
PROJECT NO: C5394						CO-ORDS: 378766E, 407549N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.37m OD			
CLIENT: MORGAN SINDALL						DATES: 22/05/24			
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.70	ES		0.70	69.67		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		1.0
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		
						1.20	69.17	End of Trial Pit at 1.20m	
								3.0	
									4.0
								5.0	
Remarks		1. Service clearance undertaken by GeoUK using EM and GPR and by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTP05 - 01,02 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378770E, 407592N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 30/05/24		Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.90	ES		0.90			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		1.0
	1.30	ES		1.40			MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		
	End of Trial Pit at 1.40m								2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

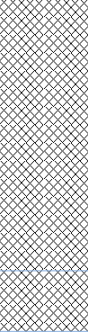
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTPO5 - 03 Sheet 1 of 1 Hole Type TP Scale 1:25 Logged JEM Checked TM	
PROJECT NO: C5394						CO-ORDS: 378770E, 407595N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:			
CLIENT: MORGAN SINDALL						DATES: 31/05/24			
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.90	ES		0.90			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
				1.10			MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		1.0
							End of Trial Pit at 1.10m		
									2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

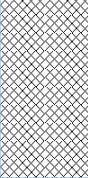
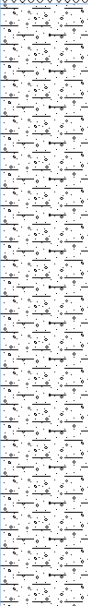
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTP05 - 04	
PROJECT NO: C5394						CO-ORDS: 378772E, 407592N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 01/06/24		Scale 1:25	
						Logged JEM		Checked TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.70	ES		0.70			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
				0.90			MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		1.0
							End of Trial Pit at 0.90m		
									2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

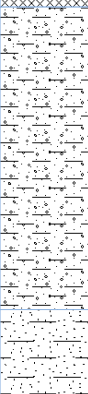
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTP05 - 05	
PROJECT NO: C5394						CO-ORDS: 378769E, 407590N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 02/06/24		Scale 1:25	
						Logged JEM		Checked TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.90	ES		0.90			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
				1.20			MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. End of Trial Pit at 1.20m		1.0
									2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

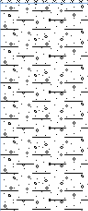
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTP05 - 06	
PROJECT NO: C5394						CO-ORDS: 386767E, 407593N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 03/06/24		Scale 1:25	
						Logged JEM		Checked TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	1.10	ES		1.10 1.20			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0	
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. End of Trial Pit at 1.20m	2.0	
								3.0	
								4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

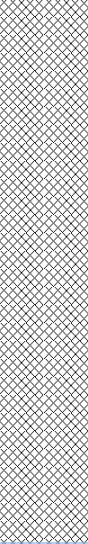
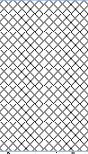
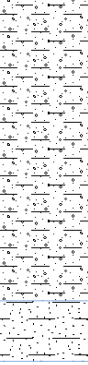
 BROWNFIELD SOLUTIONS LTD					Trial Pit Log		No. ASBTP05 - 07	
PROJECT NO: C5394					CO-ORDS: 378769E, 407597N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE					LEVEL:		Hole Type TP	
CLIENT: MORGAN SINDALL					DATES: 04/06/24		Scale 1:25	
							Logged JEM	
							Checked TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.40	ES		0.10			MADE GROUND: Black asphalt.	
			0.40	MADE GROUND: Yellowish brown sand and gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone.				
			0.60	MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.				
							End of Trial Pit at 0.60m	
							1.0	
							2.0	
							3.0	
							4.0	
							5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

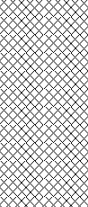
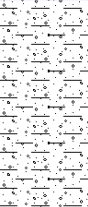
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. ASBTP05 - 08	
PROJECT NO: C5394						CO-ORDS: 378769E, 407587N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL:		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 05/06/24		Scale 1:25	
						Logged JEM		Checked TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.90	ES		0.90			MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
				1.10			MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		1.0
							End of Trial Pit at 1.10m		
									2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

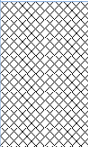
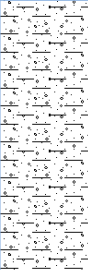
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP301		
PROJECT NO: C5394						CO-ORDS: 378758E, 407537N		Sheet 1 of 1		
								Hole Type TP		
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.52m OD		Scale 1:25		
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Logged	Checked	
								JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
	Depth (m)	Type	Results							
	0.20-0.60	ES		0.60	69.92		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0		
	0.50	D								MADE GROUND: Dark blackish brown slightly clayey gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.
	0.60-1.00	ES								
		1.50	D		2.10	68.42		Firm light brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0	
		2.50	D HSV	46kPa						
	3.50	HSV	29kPa	4.10	66.42		Becoming soft from 3.50m bgl.	3.0		
						End of Trial Pit at 4.10m		4.0		
								5.0		
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.10m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

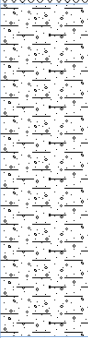
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP302	
PROJECT NO: C5394						CO-ORDS: 378758E, 407545N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.43m OD		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Scale 1:25	
								Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.50-1.00	ES		0.50	69.93		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0	
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		
	2.20	D HSV	61kPa	2.20	68.23		Firm greyish brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0	
	3.00	D HSV	53kPa	3.20	67.23		Orangish brown clayey fine to coarse SAND.	3.0	
	3.50	D		3.50	66.93		End of Trial Pit at 3.50m	4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.20m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.	
								TP303	
								Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378773E, 407528N		Hole Type	
								TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.44m OD		Scale	
								1:25	
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Logged	Checked
								JEM	TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.20-0.60	ES					MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		1.0
	1.30 1.30-1.70	D ES		1.30	69.14		MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		2.0
	3.10 3.20	D HSV	49kPa	3.10	67.34		Firm brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.		3.0
	3.70	D HSV	42kPa	3.80	66.64		End of Trial Pit at 3.80m		4.0
									5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 3.00m bgl as a small seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

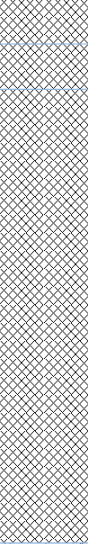
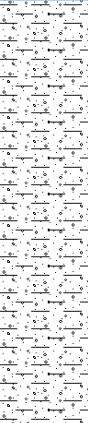
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378772E, 407546N		TP304
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.52m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
▼	0.30-0.70	ES					MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0
				1.80	68.72			
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	2.0
	2.40	HSV	50kPa	2.30	68.22			
	2.50	D					Firm brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	3.0
	3.00	D						
	3.30	HSV	55kPa	3.30	67.22			
	3.50	D		3.50	67.02		Orangish brown clayey fine to coarse SAND.	
							End of Trial Pit at 3.50m	4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.30m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
								TP306
								Sheet 1 of 1
PROJECT NO: C5394						CO-ORDS: 378772E, 407537N		Hole Type
								TP
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.60m OD		Scale
								1:25
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Logged
								Checked
								JEM
								TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.70-1.30	ES		0.70	69.90		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	
	1.50	D					MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	1.0
	2.80	D		2.80	67.80		Firm brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	3.0
	3.00	HSV	43kPa					
	3.60	D		3.50	67.10		Light brown slightly gravelly fine to coarse SAND. Gravel is subrounded fine to coarse of mudstone and sandstone.	
				3.80	66.80		End of Trial Pit at 3.80m	4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 3.50m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.	
PROJECT NO: C5394						CO-ORDS: 378714E, 407508N		TP307	
								Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.62m OD		Hole Type	
								TP	
CLIENT: MORGAN SINDALL						DATES: 23/05/24		Scale	
								1:25	
								Logged	Checked
								JEM	TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.00-0.50	ES					MADE GROUND TOPSOIL: Grass over brown slightly gravelly sandy clay with frequent rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick, concrete, porcelain, clinker, mudstone and sandstone.		
	0.70-1.30	ES		0.50	70.12		MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	1.0	
				1.30	69.32				
	1.80	D		1.45	69.17	MADE GROUND: Sandstone blockwork recovered as subrounded boulders of sandstone up to 250mm in diameter.			
						MADE GROUND: Dark blackish brown slightly clayey gravelly fine to coarse sand of constituents including ash with moderate cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles are subangular to subrounded of brick and concrete up to 200mm in diameter.	2.0		
				2.30	68.32				
	2.80	D					Stiff brown mottled light brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal. <i>Friable from 2.30m bgl.</i>	3.0	
			3.20	67.42					
End of Trial Pit at 3.20m								4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.00m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.	
								TP308	
PROJECT NO: C5394						CO-ORDS: 378727E, 407645N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.14m OD		Hole Type	
CLIENT: MORGAN SINDALL						DATES: 28/05/24		TP	
								Scale	
								1:25	
								Logged	Checked
								JEM	TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.50-1.00	ES		0.15	70.98		MADE GROUND: Black asphalt.		
				0.30	70.83		MADE GROUND: Yellowish brown sand and gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone.		
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		
	2.70	HSV	121kPa	2.10	69.04		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.		
	3.00	D		3.20	67.94		End of Trial Pit at 3.20m		
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 1.80m bgl as a large seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP309	
PROJECT NO: C5394						CO-ORDS: 378799E, 407713N		Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.90m OD		Hole Type TP	
CLIENT: MORGAN SINDALL						DATES: 23/05/24		Scale 1:25	
								Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.20-0.60	ES	114kPa	0.20	71.70		MADE GROUND TOPSOIL: Grass over brown slightly gravelly sandy clay with frequent rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick, concrete, porcelain, clinker, mudstone and sandstone.		1.0 <

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP310 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378778E, 407610N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.33m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
▼	0.30-0.50	ES		0.15 0.30	70.18 70.03		MADE GROUND: Black asphalt.	1.0	
							MADE GROUND: Yellowish brown sand and gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone.		
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		
	1.20	D						Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0
2.00	D HSV	41kPa		1.80	68.53				
2.80	HSV	55kPa		3.20	67.13			3.0	
							End of Trial Pit at 3.20m	4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 1.50m bgl as a large seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings on completion to scheduled depth.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	



No.

TP311

Sheet 1 of 1

CO-ORDS: 378787E, 407723N

LEVEL: 71.81m OD

DATES: 23/05/24

Logged

Checked

JEM

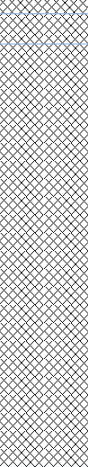
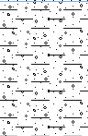
TM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
				0.30	71.51		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0
	0.60	ES					MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles are subangular to subrounded of brick up to 200mm in diameter.	
	0.80	D		0.80	71.01			
				1.30	70.51		MADE GROUND: Dark blackish brown gravelly clayey fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	2.0
	1.60	D					Brown slightly clayey gravelly fine to coarse SAND. Gravel is subrounded to rounded of mudstone and sandstone.	
				1.90	69.91			
	2.10	D		2.20	69.61	Very stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	4.0	
						Shear vane attempted at 2.10m bgl but would not shear, indicating shear strength likely to be >150 kpa.		
						End of Trial Pit at 2.20m		
								3.0
								4.0
								5.0

1. Service clearance undertaken by BSL Engineer using CAT and Genny.
2. Groundwater encountered at 2.20m bgl as a medium seepage.
3. Sides unstable with spalling of granular made ground on the long faces.
4. Hole backfilled with arisings on completion to scheduled depth.

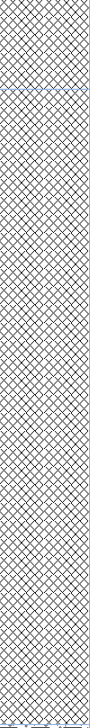
ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

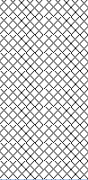
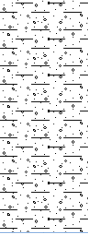
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.	
PROJECT NO: C5394						CO-ORDS: 378745E, 407712N		TP312	
								Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.62m OD		Hole Type	
								TP	
CLIENT: MORGAN SINDALL						DATES: 23/05/24		Scale	
								1:25	
								Logged	Checked
								JEM	TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
				0.15	71.47	     	TOPSOIL: Grass over brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. Yellowish brown slightly clayey gravelly fine to coarse SAND. Gravel is subrounded to rounded of mudstone and sandstone.		
	0.30	ES		0.45	71.17		Very stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal. <i>Shear vane attempted at 0.70m bgl but would not shear, indicating shear strength likely to be >150 kpa.</i>		
	0.60	D							
					1.20		70.42	End of Trial Pit at 1.20m	

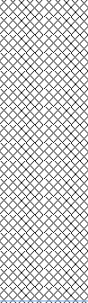
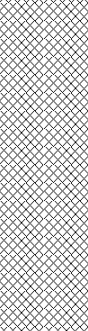
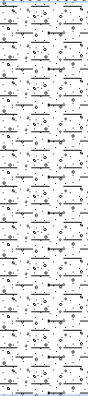
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378737E, 407673N		TP313
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.23m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 23/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.30	ES		0.05	71.18		MADE GROUND: Brown subangular to subrounded fine to coarse gravel of mixed lithologies. MADE GROUND: Light grey sand and gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of limestone.	
				0.15	71.08			
	1.00	D					MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	1.0
	2.00	D		1.55	69.68		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal. <i>Friable from 1.55m bgl.</i>	2.0
				2.00	69.23			
							End of Trial Pit at 2.00m	
								3.0
								4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 1.50m bgl as a small seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings on completion to scheduled depth.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

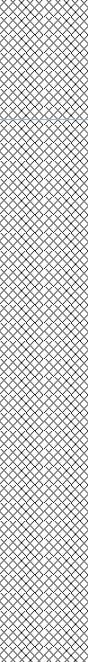
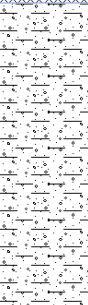


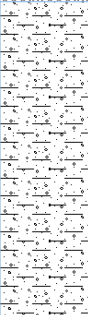
ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

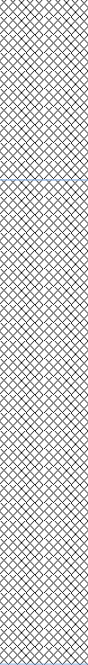
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP315 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378708E, 407543N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.36m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 20/05/24		Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.00-0.30	ES					MADE GROUND TOPSOIL: Grass over brown slightly gravelly sandy clay with frequent rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick, concrete, porcelain, clinker, mudstone and sandstone.		
	0.30-1.00	ES		0.30	70.06		MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles are subangular to subrounded of brick up to 200mm in diameter.	1.0	
	1.50	D							
	2.50	D		2.40	67.96		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.		
	2.80	HSV	107kPa				Too friable to obtain HSV beyond 3.00m bgl.	3.0	
	3.50	D		3.60	66.76		End of Trial Pit at 3.60m	4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

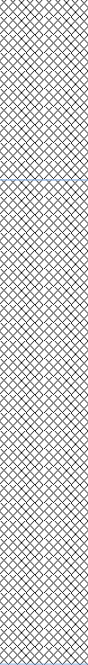
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378765E, 407560N		TP316
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.57m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 23/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.00-0.60	ES		0.60	69.97		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0
	1.00-1.50	ES					MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with moderate cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles are subangular to subrounded of brick and concrete up to 200mm.	
	2.00	D		2.40	68.17		Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0
	2.60	HSV	45kPa					
	3.00	D		3.20	67.37		End of Trial Pit at 3.20m	3.0
								4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.40m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

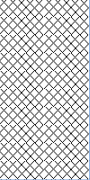
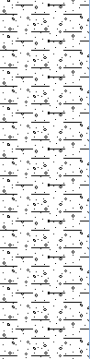
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378749E, 407581N		TP317
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.64m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.20-0.60	ES					MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	
				1.00	69.64		MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	1.0
	1.50	D						
				2.10	68.54		Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0
	2.50	D						
	3.00	HSV	55kPa					3.0
				3.40	67.24		End of Trial Pit at 3.40m	
								4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.00m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

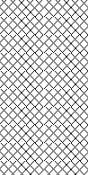
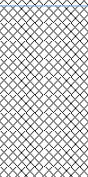
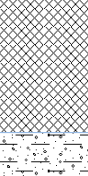
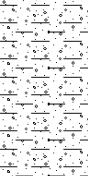
 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TP318 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378780E, 407579N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.75m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Logged JEM	Checked TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.40-0.60	ES		0.40	70.35		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0	
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with moderate cobble and boulder content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles and boulders are subangular to subrounded of brick and concrete up to 600mm.		
	2.30	D			2.20		68.55		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.
2.50	HSV	88kPa							3.0
				3.20	67.55		End of Trial Pit at 3.20m	4.0	
								5.0	
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.00m bgl as a large seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

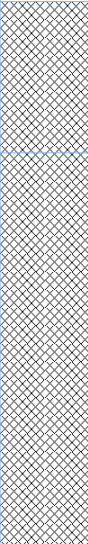
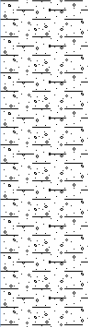
BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TPSA301	
PROJECT NO: C5394						CO-ORDS: 378751E, 407616N		Sheet 1 of 1	
								Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.62m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Logged	Checked
								JEM	TM
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.30-0.70	ES		0.15	70.47		MADE GROUND: Black asphalt.		
				0.30	70.32		MADE GROUND: Yellowish brown sand and gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone.		
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. <i>Slight hydrocarbon odour encountered from 0.30m - 1.60m bgl.</i>		
	2.30	HSV	113kPa	1.65	68.97		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.		
	2.50	D		2.70	67.92		End of Trial Pit at 2.70m		

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TPSA302 Sheet 1 of 1 Hole Type TP Scale 1:25 Logged JEM Checked TM	
PROJECT NO: C5394						CO-ORDS: 378750E, 407556N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.39m OD			
CLIENT: MORGAN SINDALL						DATES: 22/05/24			
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
				0.60	69.79		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		1.0
				2.20	68.19		Concrete obstruction encountered across base of hole at 2.20m bgl, unable to proceed deeper. End of Trial Pit at 2.20m		2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by GeoUK using EM and GPR and by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole terminated due to concrete obstruction across the base of the hole, relocated to TPSA302A. 5. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. TPSA302A Sheet 1 of 1 Hole Type TP Scale 1:25 Logged JEM Checked TM	
PROJECT NO: C5394						CO-ORDS: 378750E, 407552N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.46m OD			
CLIENT: MORGAN SINDALL						DATES: 22/05/24			
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
				0.60	69.86		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.		
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.		1.0
				2.20	68.26		Concrete obstruction encountered across base of hole at 2.20m bgl, unable to proceed deeper. End of Trial Pit at 2.20m		2.0
									3.0
									4.0
									5.0
Remarks		1. Service clearance undertaken by GeoUK using EM and GPR and by BSL Engineer using CAT and Genny. 2. No groundwater encountered. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Hole terminated due to concrete obstruction across the base of the hole, relocated to TPSA302B. 5. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378744E, 407555N		TPSA302B
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.51m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 22/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
▼	0.60-1.20	ES		0.60	69.91		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	1.0
	2.00	D		2.30	68.21		Firm brown mottled light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0
	3.00	D HSV	45kPa	3.50	67.01		End of Trial Pit at 3.50m	3.0
								4.0
								5.0
Remarks		1. Service clearance undertaken by GeoUK using EM and GPR and by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 2.30m bgl as a medium seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Trial pit used for infiltration testing. Infiltration test undertaken between 2.50m and 3.50m bgl. 5. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378713E, 407596N		TPSA303
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.64m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.60-1.00	ES		0.60	70.04		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash with moderate cobble and boulder content. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass. Cobbles and boulders are subangular to subrounded of brick and concrete up to 600mm.	1.0
	1.80	D		1.60	69.04		Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	
	2.00	HSV	76kPa					2.0
				2.60	68.04		End of Trial Pit at 2.60m	
								3.0
								4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 1.50m bgl as a small seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Trial pit used for infiltration testing. Infiltration test undertaken between 1.30m and 2.60m bgl. 5. Hole backfilled with arisings upon completion.					ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378759E, 407591N		TPSA304
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.38m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 28/05/24		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						JEM	TM	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.50-1.00	ES		0.50	69.88		MADE GROUND: Greyish brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete, rebar and occasional plastic. Cobbles are subrounded of concrete up to 200mm in diameter.	1.0
							MADE GROUND: Dark blackish brown gravelly fine to coarse sand of constituents including ash. Gravel is subangular to subrounded fine to coarse of brick, clinker, slag and rare glass.	
	2.00	D		1.80	68.58		Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare coal.	2.0
	2.40	HSV	56kPa	2.90	67.47		End of Trial Pit at 2.90m	3.0
								4.0
								5.0
Remarks		1. Service clearance undertaken by BSL Engineer using CAT and Genny. 2. Groundwater encountered at 1.60m bgl as a large seepage. 3. Sides unstable with spalling of granular made ground on the long faces. 4. Trial pit used for infiltration testing. Infiltration test undertaken between 1.40m and 2.90m bgl. 5. Hole backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BOREHOLE RECORD - Dynamic Sampler

Project **STAR RADCLIFFE** Engineer **MOTT MACDONALD LIMITED** Borehole Project No **DS07**
 Client **DEPARTMENT FOR EDUCATION** National Grid Coordinates **378778.2 E 407514.7 N** Ground Level **70.31 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD
0.05- 0.20	B	(DRY)			S5	MADE GROUND: Black tarmacadam. [TARMACADAM]	G.L.		70.31
0.20- 0.40	B						0.05		70.26
0.20	ES						0.20		70.11
0.40- 1.20	B						0.40		69.91
0.50	ES								
1.00	ES								
1.20- 2.00	B								
1.20- 1.65	D								
2.00- 2.45	D	(DRY)			S5	MADE GROUND: Dark grey gravelly slightly silty fine to coarse sand. Gravel is angular to subangular fine to coarse of sandstone and coal. [GRANULAR MADE GROUND]	1.20		69.11
2.30- 2.80	D					MADE GROUND: Loose dark grey sandy angular to subangular fine to coarse gravel of sandstone and coal. Sand is of ash. [GRANULAR MADE GROUND] Between 2.00-3.00m, poor recovery.			
2.80- 3.00	D	(DRY)			S10	MADE GROUND: Firm orangish brown sandy gravelly clay. Gravel is angular to subangular fine to coarse of mudstone, siltstone, sandstone and traces of ceramic fragments. [COHESIVE MADE GROUND] At 3.00m, no recovery.	2.80		67.51
3.00- 3.45							3.45		66.86
						End of Borehole			

Boring				Progress					Groundwater				
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed
1.20	0.40	Inspection Pit	NS/SW	G.L.			13/05/22	08:00					
3.45	0.10	Dynamic Sampler	NS/SW	3.45		DRY	13/05/22	10:00					
None encountered.													

Remarks **Inspection pit hand excavated to 1.20m depth and no services were found.**
AGS sample = 1 x 1litre plastic tub, 2 x 258ml amber glass jars and 1 x 60ml VOC vial.
Dynamic Sample Borehole DS07 collapsed to 2.80 depth on completion.
Backfill details from base of hole: bentonite seal up to 0.20m, arisings up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by **HM**
 Checked by **JK**
 Figure **1 of 1**
 07/08/2022

geotechnics

APPENDIX D

Coal Authority Report



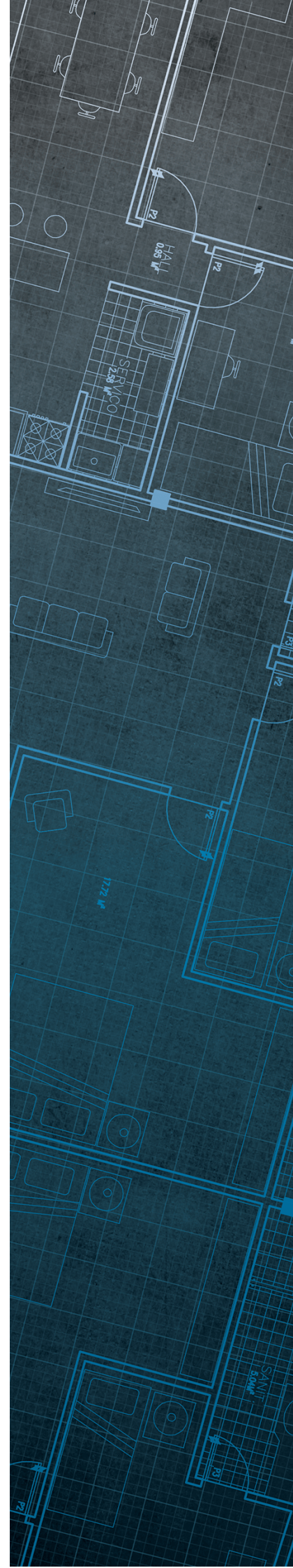
The Coal
Authority

Consultants Coal Mining Report

Radcliffe, Bury, M26 2sz
Greater Manchester

Date of enquiry:	2 December 2024
Date enquiry received:	2 December 2024
Issue date:	2 December 2024

Our reference:	51003466684001
Your reference:	BRO-E59-HGB-RP2-PL9



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GROUNDSURE LIMITED

Enquiry address

Radcliffe, Bury, M26 2sz
Greater Manchester

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

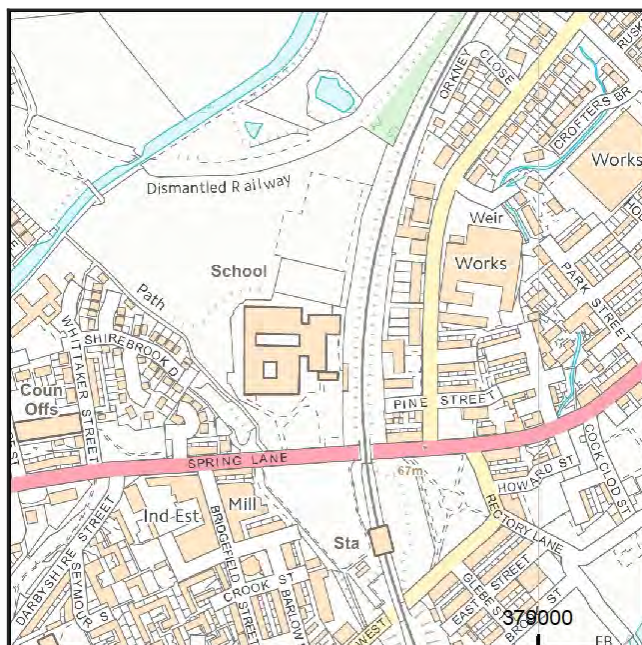
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ROGER	Coal	3Z30	124	Beneath Property	9.5	South-East	190	1883
unnamed	RAMS	Coal	3YQV	143	West	9.5	South-East	170	1893
unnamed	WIGAN FIVE FEET	Coal	3YR5	177	North-East	8.9	South-East	120	1887
unnamed	CANNEL	Coal	3YPB	301	Beneath Property	9.5	South-East	130	1893

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	378407-007	378836 407535		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

NW1556	3428A	16820
NW1060	3001A	NW983

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
36.0	North

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

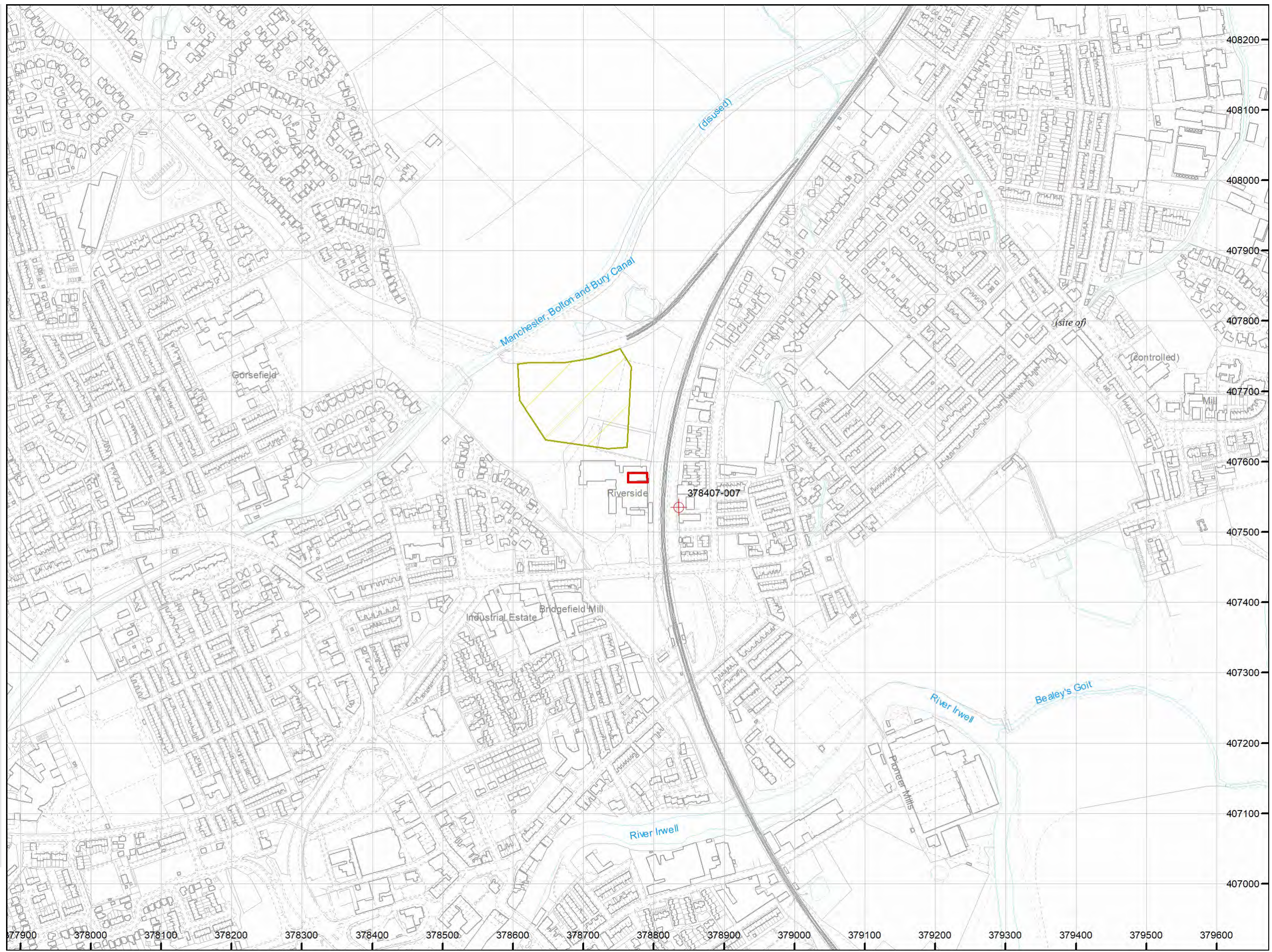
Key

Approximate position of the enquiry boundary shown 

Disused mine shaft 

Site investigations 

How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com



APPENDIX E

BSL Remedial Strategy – Temporary Accommodation



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

MORGAN SINDALL

Star Academy, Radcliffe

Remedial Strategy – Temporary Accommodation

PH/C5394/12924 Rev A

BIM Ref. FS1013-BSL-XX-XX-T-O-1005

Revision: P02

July 2024

EXECUTIVE SUMMARY OF REMEDIAL PROPOSALS	
Remedial Requirements	Verification Requirements
Removal of all hardstanding, floor slabs basement structures, relic foundations etc across the site alongside removal of existing drainage runs.	Crush materials destined for re-use to meet chemical criteria as per Appendix A.
Excavation, screening and engineering / re-use of soils to an appropriate specification.	Materials destined for re-use to meet chemical criteria as per Appendix A.
Installation of engineered clean cover system in limited new soft landscaping areas which should comprise (top down): • 450mm “clean” validated topsoil/subsoil. • Warning geo-membrane or 100mm hard dig layer Elsewhere hardstanding and/or existing MUGA pitches will break the pathway to site end users/ human health. For areas of proposed trees, a tree pit will need to be excavated and additional subsoil provided above the hard dig layer / membrane. The above is subject to agreement with the local authority, and requirements should be confirmed at the earliest opportunity.	Imported topsoil and subsoil, and any materials re-used to require chemical testing as per Appendix A. Thickness of clean cover system requires validation.
On completion of the above follow the final verification reporting requirements.	Final verification and reporting to include (but not limited to): • Any treatment, if undertaken. • All sampling locations and test results. • All the material imported to the site (including volume, source and chemical composition). • All the material exported from the site (including volume, destination and chemical composition). • Clean cover thickness validation records.

This executive summary should be read in conjunction with the full report, reference PH/C5394/12924 Rev A, and not as a standalone document.

PROJECT QUALITY CONTROL DATA SHEET

Site Name:	Star Academy, Radcliffe		
Document Name:	Remedial Strategy – Temporary Accommodation		
Reference:	PH/C5394/12924 Rev A		
BIM Ref.	FS1013-BSL-XX-XX-T-O-1005		
Status:	Original / P01	12/03/2024	Original.
	Rev A / P02	08/07/2024	Updated following post-demolition investigation and watching brief.

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DRAWINGS		
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FS1013-ALA-EX-ZZ-D-L-0001-S4	P02	Whole Site Plan
C5394/01A	-	Site Location Plan (Temp Accommodation)
C5394/10	E	Exploratory Hole Location Plan Temporary Accommodation

APPENDICES	
Appendix	Title
Appendix A	Chemical Specification for Soils
Appendix B	BSL Guidance -Re-use of Waste and Disposal

1.0 INTRODUCTION

1.1 Context

This Remedial Strategy has been produced by Brownfield Solutions Limited (BSL) for Morgan Sindall on a site off Spring Lane, Radcliffe and has been completed in general accordance with the following guidance:

-
- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
 - BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.
-

1.2 Background and Scope

This Remedial Strategy is to set out how the remediation of the site will be undertaken and how the works will be validated. The document explains how the works will be permitted under current regulatory regimes, and has been produced to address comments made by Bury Council Development Control on 5th March 2024 (Reference CL295.050324.1) and to support the discharge of condition 4 of Bury Metropolitan Borough Council Planning Reference 70002 (Temporary Accommodation).

The scope of work for this document comprises a summary of the ground model, summaries of the of risk assessments carried out, a remedial options appraisal (LCRM Stage 2), Remedial Strategy (LCRM stage 3) implementation details and any validation requirements.

Note that geotechnical aspects are not specifically addressed within this document as it seeks to meet the requirements set out within LCRM. Geotechnical aspects should be considered within a Geotechnical Design Report in accordance with Eurocode 7 or a suitable site-specific Earthworks Strategy.

1.3 Proposed Development

The proposed development involves the construction of a 'Temporary Accommodation' school building in the place of the current school building onsite, to be constructed post-demolition. The building will consist of modular units, approximately two storeys high with associated infrastructure and hardstanding as show on the Temps Whole Site Plan, drawing No. FS1013-ALA-EX-ZZ-D-L-0101-S2-P06 provided to BSL by Renaissance Associates Ltd.

It is assumed that the temporary accommodation development will remain onsite until the 'super teaching block' with a sports hall annexe and extensive MUGA / Sports Pitches is developed as part of the wider site. The remedial works required for the redevelopment of the wider site are detailed separately in BSL Remedial Strategy ref. JM/C5394/12470 and remedial requirements detailed in this strategy only pertain to the Temporary Accommodation development.

1.4 Available Information

The following reports have been produced for both the wider site and temporary accommodation site, and should be read in conjunction with this assessment (in date order):

-
- Geotechnics, Desk Study Report, ref PC228400, dated May 2022.
 - Geotechnics, Preliminary Ground Investigation Report with Interpretive Chapter, ref: PN224390, dated August 2022.
 - BSL Coal Mining Risk Assessment, ref: PH/C5394/12312, issued August 2023.
 - BSL Phase II Geo-Environmental Assessment Report, ref: PH/C5394/12387, issued October 2023.
-

-
- BSL, Earthworks Specification, reference TM/C5394/12618, dated November 2023.
 - BSL Phase II Geo-Environmental Assessment Report, ref: CM/C5394/12669 Rev B, issued June 2024.
-

It is assumed that the Local Planning Authority will have provided the above reports to the appropriate statutory consultees and the recommendations therein have been accepted.

1.5 Limitations

This report has been prepared for the sole use and reliance of the Client, Morgan Sindall. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report they rely on it at their risk and the authors owe them no duty of care or skill.

Current UK guidance and legislation has been used in the environmental assessment of the site, BSL is not liable for any subsequent changes in the guidance and legislation.

BSL have used reasonable skill, care and diligence in the production of this report. The findings and opinions conveyed via this report are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

The recommendations within this report are based upon the proposed site end use provided to BSL at the time of writing. If the end use or development layout changes from the proposal, then the recommendations may change or become invalid.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance.

2.0 GROUND MODEL SUMMARY

2.1 Description of Site

The site is located off Spring Lane, Radcliffe, M26 2SZ. It is situated approximately 0.5 km north of Radcliffe Town Centre, centred on National Grid Reference 378700, 407630 as shown on the Site Location Plan, Drawing No. C5394/01A.

The main site features and potential issues identified during the time of the intrusive investigation are detailed below.

Feature	Description
Site Area	The site covers approximately 0.05 hectares.
Site Access	Access to the site is gained off Spring Lane to the south.
Current Land Use and Site Features	The site previously comprised a secondary school (Spring Lane School) and leisure centre (Radcliffe Leisure Centre) with associated hardstanding car parking areas. The school and leisure centre have since been demolished, with underground infrastructure grubbed out. The site is level, surfaced with demolition material. A public footpath runs along the south-west border of the site (Banana Path). There are several manholes and services present in the proximity of the secondary school and leisure centre.
Potential Sources of Gross Contamination	Potential sources of gross contamination included the boiler house associated with the school development. There was also a chimney associated with the boiler house, although BSL understand this was disused and new gas boilers were installed in 2015 and 2019 for the school and leisure centre.
Vegetation / Ecology	Small clusters of trees are present near the entrance to the site off Spring Lane. A wooded area is also present to the west of the school building but lies outside of the temporary accommodation site.
Topography	The site generally appears to gently slope to the south-east.
Site Boundaries	The site is enclosed by steel palisade fencing along the eastern border of the site, a wooded area to the north of the site, steel railings to the west and Spring Lane to the south.
Surrounding Area	The site is set within a mixed commercial and residential area, with a park and ride car park present to the south, residential properties to the west, a railway to the east, the disused Manchester Bolton and Bury Canal to the north-west and a wooded area to the north.

2.2 Environmental Setting

Site History

The site has been shown to have been developed from 1850, with a railway track transversing through the centre of the site. The historical site features are generally related to the railway development with associated goods yards and sidings, present until 1978. From 1987 a school is present onsite with associated playing fields and infrastructure, and an associated disused boiler room which is located in the eastern area of the site.

The surrounding developments include both industrial and residential. Evidence of mining has been present on the historical maps from 1850 with a colliery (Whittaker's Bridge Colliery) being present from 1891 to 1909, 200m NW of the site. Various industrial works have been present within 100m of the site.

Published Geology and Hydrogeology

From the Desk Study Assessment and published geology, it was anticipated that ground conditions would comprise the following sequence of strata (top down):

- Made Ground; over
- Glaciofluvial Deposits; over
- Pennine Middle Coal Measures Formation.

Hydrogeology

Based on the inferred geology, a summary of the Environment Agency aquifer designations is presented in the table below:

Stratum	Coverage	Aquifer Designation
Glaciofluvial Deposits	Full Site	Secondary (A) Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Pennine Middle Coal Measures	Full Site	Secondary (A) Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The site does not lie within 500m of a Source Protection Zone.

Hydrology

The nearest named watercourse and surface water feature is the Manchester, Bolton and Bury Canal, 190m to the north-west of the site at it closest approach.

Radon

Information from the environmental database report and BGS Radon Report dated 11th October 2023 indicates the extent of the proposed new building is not in a radon affected area and therefore no radon protective measures are necessary in accordance with BRE Report 211 'Radon – Guidance on protective measures for new dwellings' 2023 Edition.

UXO Risk

There is no indication of former military use from the desk study. A non-specialist review of online Zetica mapping indicates the site to be in an area where the bomb risk is a low and no further consideration of UXO is required.

2.3 Ground Conditions

Observed Geology and Groundwater

From the investigations carried out within the temporary accommodation site area, the ground conditions can be summarised as below (top down):

-
- Made ground encountered from ground level to between 0.60m and >3.45m bgl, where proven the base of the made ground was generally circa 2.00m – 2.50m bgl.
 - Natural strata encountered from 2.00m to between 3.20m and 4.10m bgl.
 - Solid geology was not encountered.
 - Perched groundwater recorded between 1.10m and 3.50m bgl.
-

Contamination Observations

During the works undertaken by BSL, observations for both visual and olfactory evidence of contamination were undertaken.

Ash and clinker were observed to be a constituent within made ground in the majority of exploratory holes.

A slight hydrocarbon odour was recorded within the granular made ground within TP108 during pre demolition works. A slight hydrocarbon odour was recorded within the granular made ground within TP108 during pre-demolition works and within TPSA301.

During the post demolition works, which took place alongside the demolition of the site allowing a watching brief, no evidence of gross hydrocarbon contamination was noted.

A suspected asbestos cement pipe was encountered by the demolition contractor and was subsequently removed prior to BSL commencing the post-demolition investigation works. No other evidence of visible asbestos within soils or below the building footprint has been noted to date

3.0 SUMMARY OF RISK ASSESSMENTS

3.1 General

The pre and post demolition phases of site investigation has confirmed the following:

- Localised asbestos, heavy metal and PAH contamination within the made ground.
- Impaction of shallow groundwater in superficial deposits (Secondary A Aquifer) by metals and minor exceedances recorded in PAHs and petroleum hydrocarbons.

3.2 Human Health Risks

Made ground or made ground topsoil underlies the whole site, with heavy metal contamination (arsenic and lead) encountered above residential without homegrown produce screening levels identified within four soil samples spread across the temporary accommodation site.

PAH contamination above residential without homegrown produce screening values is also present within three soil samples located in the temporary accommodation site. In addition, several additional exploratory hole locations on the wider site have been found to contain elevated concentrations of PAHs, which are likely attributable to ash and clinker within the granular made ground, which was encountered throughout the temporary accommodation site.

Asbestos has also been detected at trace (<0.001% w/w) within one sample of made ground, taken from the location of a former asbestos cement pipe which has recently been removed during demolition.

Based on the above, mitigation measures will be required.

It was considered unlikely that the site is being affected by offsite contamination sources as the site is underlain by clay strata and therefore contamination is unlikely migrate onto the site.

3.3 Permanent Ground Gases and Vapours

A summary of the ground gas monitoring carried out by BSL is presented below:

- The available data set for the wider site exceeds the minimum requirements suggested by the guidance for assessment.
- Whilst no monitoring wells have been installed within the immediate vicinity of the proposed temporary accommodation building, the potential source of concern (made ground) has been targeted and monitored in close proximity; the similarity in ground conditions in addition to the consistent site history across the eastern part of the site means the dataset for the onsite made ground can be used to assess the gas generation potential of the primary ground gas source.
- It is considered that the ground gas concentrations and flows have been monitored to enable a predication of “worst case” conditions; rapid and short pressure decreases are within the dataset.
- Although the methane concentrations place the site into CS2 based on the gas screening values, the levels are likely caused by the disturbance and oxygenation of the low organic content within the made ground; this is considered to be a highly limited low volume source.
- The organic made ground responsible for the methane concentrations is highly localised, has not been encountered elsewhere on site, and is therefore not representative of the ground conditions as a whole.
- Soft organic clays are geotechnically unsuitable and are likely to be removed anyway as part of the enabling works and earthworks programme likely to be required to create a development platform.
- In addition, the location in question is well away from the proposed temporary building site, further reducing the risk.

- The typical threshold concentration for carbon dioxide of 5% has been exceeded on a number of occasions within the spot monitoring data.
- Despite the carbon dioxide concentrations, the dataset as a whole is characterised by very low to negligible flow rates and low methane concentrations.
- However, based on the conceptual site model, likely generation sources and detailed assessment via ternary plots, the carbon dioxide concentrations are likely due to microbial respiration, where there is no requirement to increase the characteristic situation simply because the carbon dioxide concentration exceeds 5%.
- The gas flows from the rotary boreholes have been discounted due to the groundwater being above the response zone and creating a piston effect.
- CL:AIRE Research Bulletin RB17 states the minimum level of ventilation required to deal with condensation is capable of dealing with quite onerous ground gas regimes. In addition, the requirements of Part L of the building regulations relating to the air tightness of buildings also leads to the need for a well-sealed floor slab (NHBC Foundation, 2009).
- Therefore, the structures on the development will also have an inherent level of ground gas protection, thus adding an additional layer of mitigation to the already low assessed level of risk.
- Based on the evidence suggesting an absence of coal mining beneath the site, high ground water table, low permeability superficial deposits, and gas monitoring data, the overall risk from mine gases has been assessed as low.

The site has been assessed as Characteristic Situation 1 (CS1) in respect to permanent ground gases (carbon dioxide and methane) and no specific gas protection measures are required.

3.4 Risk to Controlled Waters

Chemical testing of groundwater to date shows exceedance of the Environmental Quality Standards (EQS) and Drinking Water Standards (DWS) for various metals as well as minor exceedances in short chain aliphatic hydrocarbons and PAHs. However, these were not considered to represent a significant risk of pollution of Controlled Waters due to the following reasons:

- There does not appear to be any clear linkage between contaminant concentrations within soils and leachates when compared to exceedances within groundwater.
- No visual or olfactory evidence of gross contamination has been encountered during the site investigations within the temporary accommodation site to date, including during post-demolition investigation targeting former plant rooms and railway infrastructure.
- There is no indication under present conditions of pollution of controlled waters and conditions following development of the site will not be any worse, indeed they may improve with increased hard cover and water retaining imported garden soils.
- The post-demolition ground investigation has confirmed the widespread presence of cohesive superficial deposits immediately underlying the shallow made ground, and a consistent perched groundwater body indicating very low permeability of the cohesive soils, as confirmed by infiltration testing.
- Based on the above, the cohesive soils are likely acting as an aquiclude inhibiting lateral and vertical contaminant migration.
- It would be technically challenging and probably disproportionately costly to remove the contaminants from the water to the pre-input stage.
- The above is especially pertinent given the generally minor and highly localised exceedances of PAHs.
- The nearest named watercourse is the Manchester, Bolton 190m away from the site at its closest approach, and >250m from the isolated highest exceedance of PAH in TP307, which provides considerable distance for attenuation and contaminant degradation.
- The site is underlain by low permeability clays which will.
- The site does not lie within 500m of an SPZ.
- There are no potable (sensitive) water abstractions within 2000m.

Based on the above, the site is not considered to pose an unacceptable risk to controlled waters. Therefore, no specific remedial requirements for controlled waters are necessary.

3.5 Summary

A summary of the findings of the previous investigations and assessments where a risk is present (i.e. an unacceptable source-pathway-receptor linkage) which requires mitigation is presented in the table below.

Source	Receptor
<- Poses an unacceptable risk to ->	
Elevated concentrations of heavy metals (arsenic and lead), PAHs, and trace asbestos present within the made ground	Human health / construction workers (Residential without homegrown produce screening criteria adopted)
Hydrocarbons above laboratory limits of detection in made ground and groundwater	Water Pipe/ Human Health

Based on the above, it was recommended that a Remedial Strategy was prepared that identifies the specific remediation requirements for the site.

4.0 REMEDIAL OPTIONS APPRAISAL

4.1 Remediation Options

This section has been produced in general accordance with the requirements of LCRM: Stage 2 Options Appraisal.

The Investigations and risk assessment have concluded that the site will require remediation is the action required to prevent, minimise, remedy or mitigate the effects of the identified unacceptable risks listed in the section above.

The remediation of the site will need to ensure that upon completion of the development, the ground conditions at the site can be shown to be appropriate for the intended use and that they will not pose unacceptable contamination risks to the identified receptors.

For the options appraisal, there are 3 steps to follow:

-
- 1) Identify feasible remediation options.
 - 2) Do a detailed evaluation of options.
 - 3) Select the final remediation option.
-

The objectives of the remediation will be to sever one or more of the linkages within the source-pathway-receptor (S-P-R) model. There are three broad approaches which can be adopted:

-
- Remove or treat the source of pollutants.
 - Remove or modify the migration pathway.
 - Remove or modify the behaviour of the receptor.
-

The options appraisal process considers the available remedial techniques to achieve the above based on following key criteria:

-
- Effectiveness.
 - Practicality.
 - Durability.
 - Relative Cost.
 - Relative Operational Time (in terms of installation or the activity).
 - Sustainability.
-

The feasibility of each of the listed remedial option is assessed in terms of effectiveness at treating the contamination, which is broken down into; effective (Yes), partially effective (Partially) or not effective (No).

The listed techniques are also assessed in terms of relative cost ranging from negligible cost (£) through moderately expensive (££) to prohibitively expensive (£££).

Timescales over which the remediation technique is operational has been relatively assessed as weeks, months, years and decades. If a given technique is only effective over a period in the order of years to decades then its overall feasibility is diminished.

A sustainable approach can help to ensure that the benefit of doing the remediation is greater than its impact.

The table below summarises the possible remedial options and assesses each against the six key criteria listed above:

Remedial Activity	Effective	Relative Cost	Operational Time	Comments (Practicality / Sustainability / Durability)	Feasible
Civil Engineering Methods					
Cover System	Yes	£	Weeks	Will prevent contact between site end users and shallow contaminated soils, breaking the S-P-R linkage.	Yes - considered a suitable remediation option to mitigate the risk to human health.
Excavation and Disposal (may also require pre-treatment by screening & sorting).	Yes	£££	Weeks	This will effectively remove the source of the contamination, but is much less sustainable compared to other feasible options (excessive cost, take up of landfill space, transport issues, need to replace with clean material)	No – gross contamination not encountered and given the made ground is widespread over a large site excavation and disposal would be disproportionately costly and unsustainable.
Materials Management (Excavation and Re-Use of Suitable Materials)	Yes	££	Weeks	Excavation and re-use of any suitable materials and potential re-use of treated materials at a suitable depth. Would need to be undertaken in association with a Materials Management Plan (MMP) prepared in accordance with the CLAIRE Definition of Waste Code of Practice and signed off by a Qualified Person.	Yes – in conjunction with other options.
Stabilisation and Solidification	Yes	££	Weeks to months	Mixing of cement/lime into soils to effectively bind contamination to minimise migration from soil to vapour and dissolved phases and reduce the mobility of contaminants in soils. Bench trials would be required to determine the most suitable binder formulation and to prove that solidification/stabilisation will be effective in reducing leachate concentrations. Option would still require a cover system to mitigate human health risks.	Yes - but discounted as it is considered there is no need for such an aggressive remediation technique and would be disproportionate to the level of risk.
New water supply pipelines	Yes	£	Weeks	A pipeline risk assessment will be required to determine the most suitable pipe materials for potable water supply.	Yes – in conjunction with other options.
Biological Methods					
Not considered to be relevant to the subject site.					

Remedial Activity	Effective	Relative Cost	Operational Time	Comments (Practicality / Sustainability / Durability)	Feasible
Chemical Methods					
Not considered to be relevant to the subject site.					
Physical Methods					
Soil Washing	Yes (for PAH and VOCs but not on lead)	£££	Months	Large scale plant and equipment in a limited space; need to treat process streams (water, sediment) and route to appropriate off-site disposal, as required. Will potentially result in a significant proportion of soils, which are geotechnically unsuitable without extensive treatment.	No – discounted due to disproportionate cost, timing and unsustainability creating geotechnically unsuitable material that would require replacement / further treatment/ remedial measures.
Hand Picking (of ACM)	Yes	£	Weeks	Hand picking visible ACM fragments using trained operatives during excavation works.	Yes – potentially feasible if visible fragments of ACM are encountered within the soils.
Passive Methods					
Not considered to be relevant to the subject site.					

4.2 Selected Remedial Options

Based on the above remedial options appraisal, the most appropriate approaches to the residual risks are listed below:

- Treatment and/or re-use of suitable soils on site under CL:AIRE CoP.
- Undertake a water supplier pipeline Risk Assessment for water feed, and install barrier pipe and/or clean service corridors if necessary.
- Utilise an engineered clean cover system.

The options selected have been chosen because they are considered to be effective, can be carried out practically within the available time periods and are commercially viable with due consideration of the temporary nature of the development. Furthermore, the options selected seek to promote sustainability.

4.3 Site Remediation Requirements

The key requirements are summarised in the table below:

Source	Contaminants of Concern	Remediation Method	Further Details / Remedial Requirements
Made Ground	Asbestos, Arsenic, Lead, PAHs	Installation of Clean Cover System	In proposed new soft landscaping areas, a 450mm cover system comprising "clean" validated topsoil/subsoil should be installed. A warning geo-membrane or hard dig layer should also be installed at the base of the clean cover system.

In addition to the specific remedial requirement detailed on the table above which are intended to mitigate the risks from known sources, it is recommended that a watching brief be maintained during any further groundworks and construction for any evidence of contamination and BSL consulted for advice.

Detailed requirements are discussed in section 5.0 below. Note where the word "clean" is used from here on, the definition of this shall mean chemically suitable for the intended use.

5.0 DETAILED REMEDIAL REQUIREMENTS AND OTHER CONSTRAINTS

5.1 General

This section is intended to fulfil the requirements of LCRM Stage 3: Remediation and Verification.

All remedial works are to be overseen by suitably experienced and qualified site staff and a site watching brief will be in place alongside regular visits by a suitably qualified person to undertake the necessary verification works described.

The table below provides a summary of requirements in terms of the approximate order of works. It should be noted that the precise sequencing has not yet been confirmed by an appointed Contractor. This Remedial Strategy may also be subject to revision, dependant on the requirements of the regulators.

Task	Description
1.	Pre-Commencement Approval of this Remedial Strategy with the Local Authority, Warranty Provider (e.g. NHBC) and Environment Agency (EA) prior to site works commencing. Appointment of contractor for the works, who is to obtain appropriate permits, licences and approvals. Other appointments as per CDM requirements. Production and declaration of a Materials Management Plan (MMP) under the DoWCoP prior to any works commencing or confirmation of waste exceptions (U1) to be in place.
2.	Site Clearance and Demolition Works Subject to all necessary ecological and arboricultural surveys being undertaken and appropriate mitigation measures in place, the site should be cleared and any vegetation below areas of proposed development should be stripped in accordance with Series 200 of the Specification for Highway Works. A watching brief should be maintained during and clearance/soils strip for any previously unidentified contamination.
3.	Excavation and Re-use of Site Won Material and Importation of Soils (Earthworks) Excavation, screening, treatment (if required) and engineering / re-use of soils where suitable (eg: reuse of trace asbestos impacted soils under hard standing or building footprints), to an appropriate Earthworks Specification in accordance with SHW Series 600.
4.	Installation of a Clean Cover System Installation of "clean" validated cover system with warning geomembrane or hard dig layer in new soft landscaping areas where required to provide growing medium. Imported and site-won soils to be used as part of the cover layer should meet the chemical criteria outlined in Appendix A.
5.	Verification and Reporting of Remedial Work The landscaped areas where a cover system has been placed will require depth validation. Collation of information relating to site clearance, chemical testing, any remedial works, remedial verification, material movements and waste transfer documentation where appropriate. A closure Verification Report will be required to close out the declared Materials Management Plan and submitted to CL:AIRE. Complete remedial validation report in line with regulatory guidance and warranty provider requirements. The report should be submitted to the Local Authority and warranty provider for approval following completion.

5.2 Demolition Works

It should be noted that, as of July 2024, demolition works on site have been completed.

Issues surrounding demolition of any remaining above ground buildings is outside the scope of this report, it is assumed that all existing above ground buildings and structures will be removed to ground level prior to remedial works commencing, following completion of any enabling works such as asbestos removal where present.

The excavation of all hardstanding areas, slabs, basement structures, relict foundations and similar below ground obstructions, will be undertaken with materials stockpiled and tested to determine their fate (on-site re-use or off-site disposal) in accordance with a Materials Tracking System.

All excavations should be suitably benched or otherwise supported for the duration of the works in accordance with relevant industry guidance.

Redundant drainage associated with the previous development will require chasing out. Existing connections to be located and capped to prevent contaminated groundwater entering the off-site drainage. The contractor should locate and record connection points and maintain off site connection pipework to allow for future connection if required.

A watching brief should be maintained during demolition and clearance/soils strip for any previously unidentified contamination and BSL consulted for advice in the event any evidence of contamination is identified. Specifically a watching brief should be carried out within the area of the boiler house and plant rooms, where the potential for localised contamination is greater than elsewhere on site.

5.3 Utilities

Given the presence of heavy metals and mild olfactory evidence of hydrocarbons locally within the shallow made ground and natural soils, a United Utilities Pipeline Risk Assessment will be required to ensure the correct material is selected for the potable water supply pipe.

Further advice is contained in UKWIR Report 10/WM/03/21 – ‘Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites’.

5.4 Earthworks

General Considerations

Work procedures should be designed to minimise the risk of dust becoming airborne by suitable means, such as keeping the exposed soils damp or covered at all times. It is important that the control measures in place are sufficiently robust to prevent release of contaminated dust into the surrounding environment.

Geotechnical Considerations

Whilst geotechnical aspects are not specifically considered within this Remedial Strategy, all earthworks should be undertaken in accordance with an appropriate Earthworks’ Specification. Based on cut and fill volumetrics supplied by the client, limited earthworks are anticipated within the temporary accommodation site.

During groundworks any unsuitable materials (e.g. timber, metals and plastics) should be removed during screening should be segregated and stored in a suitable location prior to off-site disposal to a suitable licence facility. Where practicable materials should be re-used or recycled.

The contractor should be responsible for controlling groundwater entry into excavations.

Materials Management

Any works involving the movement of soils within the site boundary shall be done in accordance with a Materials Management Plan (MMP) under the CL:AIRE Definition of Waste Code of Practice (CoP). Further guidance is presented in Appendix B.

Due to the earthworks programme to be implemented on site which will involve re-use of significant volumes of site-won material, the client intends to implement an MMP under the DoWCoP. To implement the DoWCoP, there is a requirement to notify the Environment Agency and Local Authority of the intention to use the code of practice in principle, after which there is a 21-day notice period for their response.

In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

- The aims and objectives of the project meet the requirements of the Waste Framework Directive.
- The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
- There is certainty of use (i.e. materials tacking which should be in place as part of good site practice in any case).
- Quantity (the quantity of materials used should be known).

Information on existing site levels, proposed levels, volumes generated (e.g. foundation / drainage excavation arisings) would need to be known in order to complete the MMP.

If the DoWCoP is the chosen route, it is an absolute that the MMP should be in place and declared by a Qualified Persons (QP) before works commence, otherwise excavated soils could constitute an illegal deposit of waste and enforcement action could be taken by the EA and HMRC.

In regard to “clean” naturally occurring soils only that are to be re-used on their site of origin, these are covered by a Waste Framework Directive (WFD) exclusion. So long as the project can prove the four criteria (listed above) then permits or the DoWCoP are not required. However, many projects still use the DoWCoP to ensure compliance.

Re-use of soils containing asbestos should comply with the CL:AIRE publication ‘Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials’ (CAR-SOILTM) and CAR 2012.

In terms of the re-use of brick/concrete crush materials, the DoWCoP does cover aggregates, but only on the site of origin and the EA WRAP aggregate Quality Protocol might best apply to ensure quality standards.

Imported Materials and Materials for Re-use

Any soils or materials imported or to be re-used as part of the works should be tested for chemical compliance and suitability in line with the guidance stipulated in Appendix A and the proposed end use.

Based on the chemical testing completed to date, site-won made ground should not be considered for re-use within the cover system. However, it will be possible to re-use soils from the temporary accommodation site, which are impacted with heavy metals and PAHs, beneath the cover system across the wider site, given the earthworks and levels raise required across the wider site, provided this is completed in accordance with a declared MMP under the DoWCoP. Whilst none have been encountered to date, any grossly contaminated soils would be unsuitable for re-use and would require disposal off-site to a suitably licenced waste facility.

Any imported material should be approved by BSL and the Local Authority prior to being imported onto site.

Where feasible, imported topsoil should ideally conform to the requirements of BS 3882:2015 (Specification for Topsoil and requirements for use), or as agreed with the client. Imported subsoil should ideally also conform to the requirements of BS 8601:2013 (Specification for subsoil and requirements for use), or as agreed with the client.

In addition, all materials must be free from aggressive / invasive weeds (such as Japanese Knotweed and Giant Hogweed) and bulk vegetative growth.

Asbestos Impacted Soils

The reuse of excavated soils contaminated by asbestos should also be carried out in accordance with "Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance (shortened name CAR-SOILS™)" with work requirements assessed by a competent person in line with the Joint Industry Working Group (JIWG) Decision Support Tool for CAR 2012 Work Categories (i.e. are the works notifiable or not and are they non-licensed or licensed).

The presence of asbestos within the ground will require a safe system of work to be set up on site to deal with the asbestos risk from the made ground. This may include, but be not limited to:

-
- Personal working in the vicinity of the ACM should be suitably trained and competent in line with CAR 2012.
 - Careful segregation of stockpiles on site.
 - Defining transport routes.
 - Cleaning down of machinery in designated areas.
 - Suitable PPE, RPE and decontamination unit for ground workers.
 - Damping down of soils to prevent dust migration.
 - Air quality reassurance monitoring (before/during/after works).
-

Note that a reduction in control methods is possible if natural factors are present (e.g. wet ground or raining).

Re-use of Asbestos Impacted Soils

In terms of materials placement (i.e. re-use), if implemented, the following criteria will deliver a site that is suitable for use in terms of asbestos risk (applicable to the built environment only):

-
- Soils between finished ground level to 0.60m depth must be characterised by nil asbestos.
 - Soils below 0.60m depth or directly beneath building plots (i.e. below hardstanding, floor slabs, driveways etc) and adopted highways/pavements must be characterised by asbestos at or <0.001% w/w asbestos.
 - For soils >1.00m below finished ground levels, asbestos in soils should be <0.1% w/w and providing that asbestos contaminated soils are placed below this depth, then it is considered that there is no risk to human health. Efforts should be made to remove any visible ACM, providing it is practical to do so and does not generate any increased level of risk.
-

These criteria have been used on similar sites to the satisfaction of the local regulatory authority.

Records of all activities undertaken, especially where soils containing 0.1% w/w to 0.001% w/w are placed below 1.00m, should be kept in a Health & Safety file for future reference, noting that this primarily applies

to persons engaged in excavation works below 1.00m depth. CAT B training is likely to be required for operatives excavating below these depths, although the contractor should undertake their own risk assessments to confirm requirements.

5.5 Cover Layer

A cover system comprising “clean” validated topsoil/subsoil should be placed in proposed soft landscaped areas, which are relatively limited in extent as detailed on the Temps Whole Site Plan drawing, ref. FS1013-ALA-EX-ZZ-D-L-0101-S2 Rev P06.

A further area of existing soft landscaping containing numerous trees to be retained is located in the far southwestern corner of the temporary accommodation red line boundary, and will ultimately form part of the meadow planting area of the whole site redevelopment, as shown on the Whole Site Plan, drawing ref. FS1013-ALA-EX-ZZ-D-L-0001-S4 Rev P02. The existing soft landscaping area will be segregated from the temporary accommodation site by secure fencing which will facilitate the safe redevelopment of the wider site, whilst also inhibiting access to this area by site end users and will mitigate the potential for end users’ direct contact with the soils, effectively breaking the primary pathway. Therefore, with due consideration for the temporary nature of the redevelopment, installation of a cover system in the area of existing landscaping is considered disproportionate to the risk from the made ground, notwithstanding the presence of numerous trees and root protection zones which are to be retained and protected during the development and will preclude extensive groundworks in this area.

Elsewhere, in areas of existing or new hard standing and existing MUGA pitches to be retained, these structures will effectively break the pathway between end users and the made ground and act as an effective cover layer.

Imported soils to be used as part of the cover layer should meet the chemical criteria outlined in Appendix A.

It should be noted that the screening criteria and scenarios adopted within Appendix A are conservative, thus an exceedance of a contaminant will not necessarily deem the material to be unsuitable. Any exceedances detected and overall material suitability will be assessed on a case-by-case basis, with the results included and discussed in the Validation Report.

The installation of a clean cover system will break the pathway to human health from the heavy metal, PAH and asbestos contamination within the made ground and act as a growing medium.

The cover layer in new soft landscaping areas should comprise (top down):

-
- 450mm “clean” validated topsoil/subsoil.
 - Warning barrier membrane/ geotextile or 100mm thick hard dig layer (ideally “clean” first generation quarried MOT Type 1 or similar).
-

For areas of proposed trees, a tree pit will need to be excavated and additional subsoil provided, further guidance over suitable thickness should be obtained from a landscape architect.

Site drainage should be taken into consideration with the implementation of the clean cover layer. It is also essential to provide a structured, uncompacted and well-aerated soil profile for the successful establishment and subsequent growth of plants and grass. However, where heavy machinery and large volumes of soil are excavated and stored, soil structure can easily be destroyed by over-compaction,

leading to poor drainage and failed garden planting. This can often be mitigated by careful site planning or rotavating the soils as required.

The above is subject to agreement with the Local Authority and the warranty provider, and requirements should be confirmed at the earliest opportunity.

5.6 Records

Accurate records and as-built drawings will need to be kept, updated and provided for all aspects of the remedial works as they progress.

The construction works should be devised in a way to allow the maximum re-use of site won materials adhering to current waste regulations. To allow this and demonstrate compliance with Waste Management Licensing Regulations the Contractor should maintain an accurate Materials Management Plan (MMP). These shall show the source, description, classification and placement location of all fill used on the site. The plans shall be revised regularly with archive versions maintained for future reporting purposes. The MMP should show the extent of any excavations undertaken on site.

5.7 Stockpile Management

Segregation of materials and stockpiles should be maintained, and accurate records kept to avoid the potential for cross contamination. Good site practice for stockpile management includes, but is not limited to:

-
- Damping down of the site surface, excavations and stockpiles to prevent the generation of dust (wind blown asbestos fibres can contaminate “clean” topsoil stockpiles potentially resulting in expensive disposal costs).
 - Stockpiles sizes should be kept to a minimum to reduce ‘wind whip’ causing potentially hazardous material to be blown from the pile.
 - Once at the intended size, stockpiles should be “sealed” to ensure no excess materials are placed and mixed into the stockpiled to prevent cross contamination.
 - Clean, validated material proposed for re-use as part of the cover system should ideally be placed on a suitable polythene membrane or clean concrete hardstanding to prevent any cross contamination.
 - Appropriate loading of plant to prevent spillages.
 - Appropriate signage should be displayed so that site workers/visitors are aware of the intended use and are alerted to the potential hazards associated with the material to be stored on site.
-

Examples of good site practice for stockpile management are presented below:



5.8 Testing

Prior to commencing any works the Contractor will submit to the Clients Representative (Suitably qualified Geo-environmental Engineers) details for the testing laboratories to be used together with their UKAS and MCERTS accreditations (as appropriate). The Clients Representative will approve the laboratories subject to them holding the relevant certifications. Alternatively, providing the Client's Representative is a suitably qualified Engineer, then they may attend site to obtain samples for appropriate testing.

Tests carried out by a laboratory without the approval of the Client's Representative will be rejected.

All samples will be taken in accordance with relevant guidance (e.g. BS 10175:2011+A2:2017).

The contractor is responsible for the testing of the physical properties of any imported or processed material to be used in the engineering works. This applies to both site won and any imported materials.

Site won material shall be tested to confirm its chemical suitability. Contaminated material for disposal should be tested to define the most economical disposal route. In addition, any material to be imported to the site shall be tested and its suitability demonstrated prior to it being brought to the site.

The geotechnical suitability of site-won materials will be confirmed before reuse, by appropriate earthworks testing, in accordance with an Earthworks Specification (preparation of which is outside the scope of this remedial strategy).

5.9 Permits

The appointed contractor will need to hold or obtain relevant waste permits or exemptions (where applicable) in accordance with the Environmental Permitting Regulations 2016 to carry out waste recovery, treatment and re-use activities on site. Alternatively, waste recovery and re-use operations shall be in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP), 2011 and an approved Materials Management Plan (MMP) declared under the DoWCoP by a Qualified Person (QP).

A crusher/screener will also require a waste permit or exemption. Aggregates should be processed in accordance with relevant WRAP Quality Protocol to produce a non-waste product.

It is the contractor's duty of care to ensure that any waste to be treated or disposed off-site is transported by a licenced waste carrier and that the waste facility is licenced, permitted or holds an appropriate exemption.

Evidence of the above should be maintained and provided on request along with any waste transfer or consignment notes for materials removed off-site.

5.10 Surface Water Runoff

The contractor should provide and maintain means to intercept surface run off in accordance with good site practice. Run-off from the site shall not be allowed to enter adjacent waterways or drainage gullies without the permission of the Drainage and Highway Authorities.

Surface waters from the site shall be discharged to the mains sewer under consent from the local Water Authority.

It should be noted that groundwater impacted by hydrocarbons may require some form of treatment prior to discharge, alternatively if only small amounts of water are encountered, this could be stored and removed to a suitable waste disposal facility.

5.11 Unexpected Contamination

If any unexpected contaminated materials are encountered by the contractor, then works should cease in that area and the contractor should consult BSL for advice prior to any irrevocable action at the site.

6.0 STAKEHOLDERS AND RESPONSIBILITIES

6.1 Key Stakeholders

A summary of the key project stakeholders is presented below (not exhaustive):

Client / Developer	Consultant / Engineer	Contractor	CDM Stakeholders	Regulators
Department for Education / Morgan Sindall	Brownfield Solutions Ltd (BSL)	Demolition, Remediation and Groundworks Contractors (PP O Connor/Chartrange)	Principal Contractor (Morgan Sindall) Principal Designer (TBC) Health and Safety Executive (HSE)	Bury Council (regulator – Human Health risk and planning consent) Environment Agency (EA) (regulator – controlled waters and waste regulation) Warranty provider (TBC)

6.2 Client

The remediation works will come under the umbrella of CDM 2015 Regulations. The Client is responsible for formally appointing a Principal Designer and Principal Contractor, otherwise the Client assumes the role of Principal Designer. All pre-construction information will need to be made available to the appointed duty holders and sufficient time and resources allowed.

6.3 Consultant/Engineer (Client's Representative)

A suitably qualified Geo-Environmental Engineer/consultant should be appointed as the client's representative to oversee the works, who will have a visiting role throughout and provide advice when required.

They should be responsible for:

- Providing appropriate supervision of the remedial works (either part time or full time).
- Monitoring the works to ensure compliance with this strategy and specification.
- Audit testing of materials. (However, it is the responsibility of the contractors to demonstrate the suitability/acceptability and the compliance of the material with the specification).
- Approval of test results.
- Validation of the works.

They will maintain records of the works to include the following:

- Record sheets to include a summary of the activities.
- Aspects relating to Environmental Control or non-compliance with this strategy.
- Test Results.

Liaison will be carried out with relevant regulators prior to commencing on site. The design of the Remedial Strategy can be adapted to avoid unnecessary delays at a later date.

Validation information will be supplied to the Local Authority for approval in a Verification Report. The report will include relevant site records and stand as certification that the remedial works have been carried out in accordance with this strategy.

6.4 Contractor

The contractor appointed to oversee the development construction works should comply with the following regulations, guidance and legislation relating to the works:

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- Environmental Protection Act 1990.
 - Health and Safety Executive “Protection of Workers and the General Public during the Redevelopment of Contaminated Land”, HS(G)66, HMSO 1991.
 - Duty of Care Regulations 1991.
 - Water Resources Act 1991.
 - Water Industry Act 1991.
 - Environment Act 1995.
 - The Control of Substances Hazardous to Health Regulations 2002.
 - Hazardous Waste Regulations.
 - Control of Asbestos Regulations (CAR) 2012.
 - Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance (shortened name CAR-SOIL™).
 - The Construction, Design and Management Regulations 2015.
-

The contractor should provide adequate supervision for all the site works. This shall include a suitably experienced Remediation Engineer or Site Manager who will validate the work and maintain records allowing preparation of a validation report for the works.

The appointed contractors will be responsible for maintaining all records in connection with the works.

Records shall include details of:

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- All the material imported to the site (including volume, source and chemical composition).
 - All the material exported from the site (including volume, destination and chemical composition).
 - The size and extent of the remedial excavations (lateral extent and depth plotted on suitable plans).
 - Any treatment undertaken.
 - Details of the contractor’s waste exemptions, if applicable.
 - Discharge of any groundwater.
-

6.5 CDM Stakeholders - Health & Safety

The appointed Principal Contractor (PC) will need to produce a Construction Phase Plan for the work, prepare risk assessments and method statements. The PC will be responsible for the coordination of welfare and H&S matters on-site including sub-contractors.

The Principal Designer/Client will review the Construction Phase Plan and notify the local office of the Health and Safety Executive (HSE) of the works prior to commencing (via form F10). Unless otherwise agreed with the client, the table below provides a broad outline of the overall project team.

All works should be carried out in a manner that will safeguard all site employees. This should include but not be limited to; site induction for all staff and visitors, training/safety awareness training, issue of Personal Protective Equipment (PPE) and the provision of suitable welfare facilities. Further advice is

provided within HSE publication 'HSG 66 Protection of Workers and the General Public during Redevelopment of Contaminated Land'.

The works should be carried out in a manner to protect against damage to property or nuisance to property or persons on the site or within its immediate vicinity. Noise and dust issues should be considered. Members of the public should be excluded from the works areas and the contractor should maintain suitable security to ensure unauthorised persons cannot access the works.

Appropriate temporary protection and warning signs should be erected to warn of hazards that may result as a consequence of the works.

6.6 Regulators

Implement the regulations and environmental standards set by government. The contents of this report will need to be agreed in advance of works with the regulators.

7.0 VERIFICATION PLAN

7.1 Clean Cover System

Soils used within the top 450mm in proposed soft landscaping areas will comply with the chemical specification and testing frequencies provided within Appendix A.

Prior to importing any soils, test results for the proposed import will be provided to the client's representative, alongside the confirmation of the source (greenfield/brownfield/recycled etc).

Once installed by the groundworks contractor, there is a requirement to provide evidence of the chemical suitability and depths of the clean cover system, with inspections to be carried out by a suitably qualified Geo-environmental Engineer in a randomly selected part of the landscaping area. Confirmatory photographs will be taken for inclusion in the validation report. An example of good practice for depth validation is provided below:



In areas of soft landscaping/public open space (POS), validation pits should be excavated at a frequency of circa one pit per 25m x 25m area of POS.

Minor variances in the thickness of individual soils layers cover may be tolerated during validation, provided the overall clean cover system is a minimum depth of 450mm to minimise soils mixing and includes an engineered element such as a warning membrane or hard dig layer. If the thickness is varied, the topsoil layer should be a minimum thickness of 100mm in accordance with warranty provider standards.

If the cover system is deemed to be insufficient, the groundworks contractor will be informed and advised on how much more material is needed for the cover system to be meet requirements, with additional verification pits re-excavated after rectification to confirm that a sufficient thickness of soil is present.

7.2 Contingency Planning

Should significantly contaminated material be encountered during the development (e.g. gross hydrocarbon impaction) then a suitably qualified geo-environmental engineer should be consulted for advice. Measures may include the excavation of the material which should stockpiled on 2000-gauge polythene sheeting, sampled and tested for an appropriate range of contaminants.

Once the laboratory analysis of the material is available, an assessment will be undertaken to determine whether it will need to be disposed off-site to a suitable facility or if the materials could be retained on site re-used with or without some form of treatment within regulatory requirements.

Depending on the nature of any such impact it may be necessary to undertake validation testing of the excavation faces in order to demonstrate that no such materials are left in-situ.

Should gross asbestos contamination be identified, then all works should cease until an Asbestos Management Plan is put into place (if not done so already) and remedial requirements are confirmed by a suitably qualified geo-environmental engineer. Note remedial works under such instances may be classified as either licenced or non-licenced and may be notifiable to the Health and Safety Executive (HSE). Works would need to comply with CAR 2012 and CARSOILS™.

7.3 Reporting

On receipt of all information, the appointed Geo-Environmental Engineer will compile a Verification Report(s). The report will be a concise document that provides records and collected evidence of the remediation carried out at the site. The final report should contain:

-
- Introduction, including description of the project and background to the works.
 - Summary references to site investigation data, risk assessments and the Remedial Strategy.
 - A description of the works undertaken and any treatment records.
 - Details of chemical validation testing.
 - Reference to the MMP (if utilised), records of where material was moved from/imported from/to and final destinations, including volumes, suitable for use criteria, QP declaration references etc.
 - The size and extent of any remedial excavations (lateral extent and depth plotted on suitable plans).
 - Details of how any out of specification materials were dealt with and final destination, including waste transfer notes.
 - Appropriate site plans and photographic record.
 - Conclusions, detailing any additional works that may be required.
 - Details of any long-term monitoring requirements, if any.
-

This should then be submitted to the regulators and warranty providers for approval, which should close out the requirements of this Remedial Strategy.

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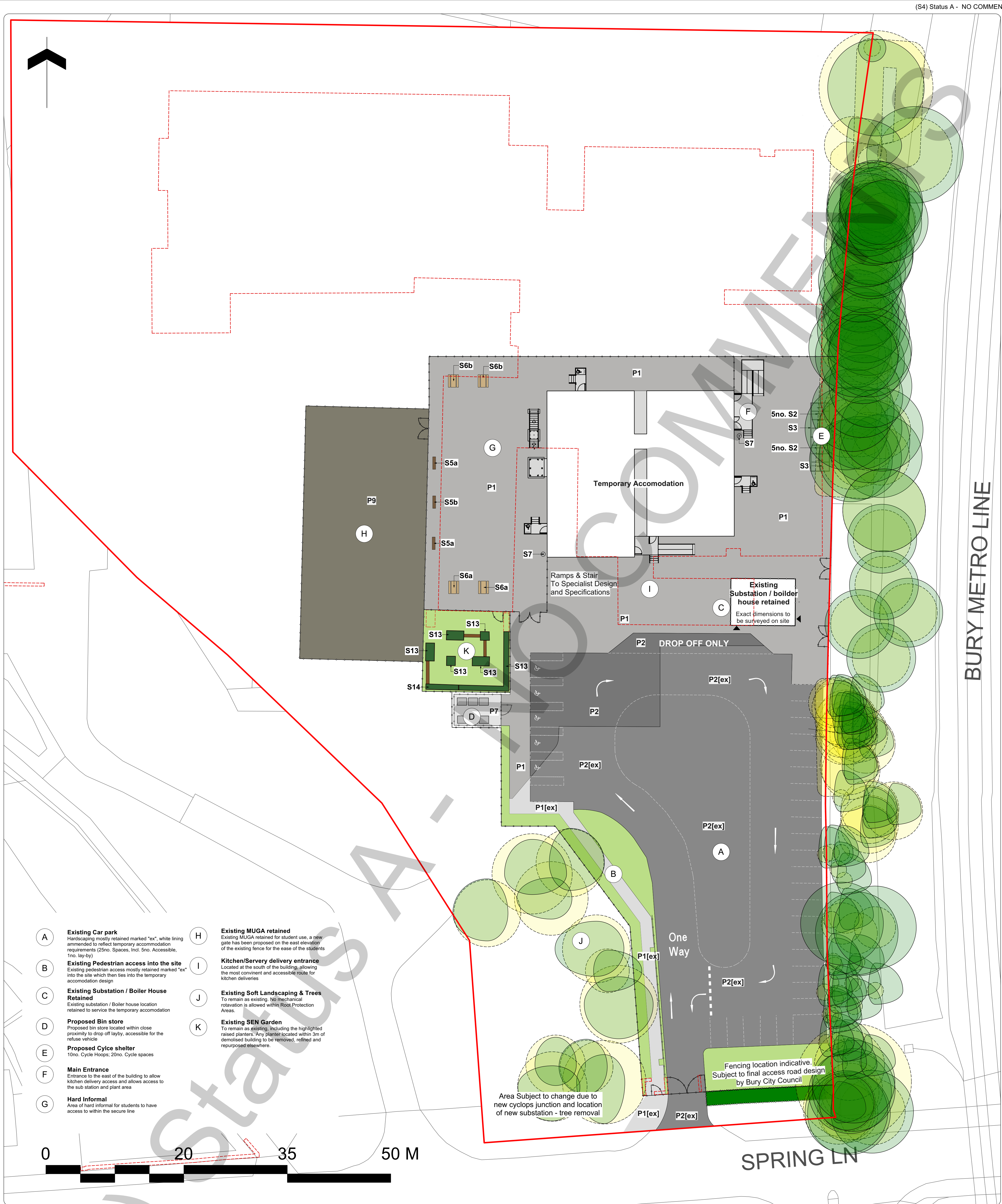
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DRAWINGS



- A** Existing Car park
Handscaping mostly retained marked "ex", while lining amended to reflect temporary accommodation requirements (25no. Spaces, Ind. 5no. Accessible, 1no. lay-by)
- B** Existing Pedestrian access into the site
Existing pedestrian access mostly retained marked "ex" into the site which then ties into the temporary accommodation design
- C** Existing Substation / Boiler House Retained
Existing substation / Boiler house location retained to service the temporary accommodation
- D** Proposed Bin store
Proposed bin store located within close proximity to drop off layby, accessible for the refuse vehicle
- E** Proposed Cycle shelter
10no. Cycle Hoops; 20no. Cycle spaces
- F** Main Entrance
Entrance to the east of the building to allow kitchen delivery access and allows access to the sub station and plant area
- G** Hard Informal
Area of hard informal for students to have access to within the secure line
- H** Existing MUGA retained
Existing MUGA retained for student use, a new gate has been proposed on the east elevation of the existing fence for the ease of the students
- I** Kitchen/Servery delivery entrance
Located at the south of the building, allowing the most convenient and accessible route for kitchen deliveries
- J** Existing Soft Landscaping & Trees
To remain as existing. No mechanical retention is allowed within Root Protection Areas.
- K** Existing SEN Garden
To remain as existing. Including the highlighted raised planters. Any planter located within 3m of demolished building to be removed, refined and repositioned elsewhere.

Note			
1. Do not scale from this drawing			
2. To be read in conjunction with Project Risk Register REF: FS1013-ALA-EX-XX-T-L-0002			
3. To be read in conjunction with all other Landscape Architect's drawings			
4. To be read in conjunction with Outline Landscape Specification REF: FS1013-ALA-EX-XX-SP-L-0001			
1.	Falling on stairs and ramps.	Stairways and ramps to be designed by specialists.	16.11.2023
2.	Collision between pedestrians and vehicles in car park.	Pedestrian barrier, kerbs, road markings to clearly denote parking.	16.11.2023
3.	Collision between pedestrians and cyclist accessing cycle storage facilities	School to manage speed on site. Clear wayfinding to be developed.	16.11.2023
5.	Collision pedestrians / windows	Windows unopenable.	16.11.2023
ID	RISK	MITIGATION	DATE MITIGATED
RESIDUAL PROJECT RISKS			

KEY		Hard Surfaces		Furniture		Fencing and Structures	
Site		P1 Proposed Pedestrian Macadam To Engineer's Specification		S2 Cycle Stands To be Reused in Permanent Scheme		S5 Seating Bench To be Reused in Permanent Scheme	
P1 Proposed Building		P1 [ex] Existing Pedestrian Macadam Retained		S3 Cycle Shelter To be Reused in Permanent Scheme		S6 Picnic Table To be Reused in Permanent Scheme	
P2 Existing Building to be demolished		P2 Proposed Vehicular Macadam To Engineer's Specification		S4 Door Protection Barrier To be Reused in Permanent Scheme		S7 Litter Bin To be Reused in Permanent Scheme	
P2 [ex] Existing Vehicular Macadam Retained		P7 Proposed Concrete Surfacing To Engineer's Specification		S8 Bollards To be Reused in Permanent Scheme		S13 Existing Raised Planter and Seating To be retained and refined as part of Temporary Scheme	
P5 Existing MUGA Permeable Surface Retained		P5 [ex] Existing MUGA Permeable Surface Retained		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters	
P7 Existing Tree Retained		P7 Existing Tree Retained		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters	
P7 Root Protection Area (RPA)		P7 Root Protection Area (RPA)		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters		S14 Proposed Raised Planter and Seating To be repurposed from demolished raised planters	
Planting		Planting		Planting		Planting	
P1 Details refer to Planting Plan		P1 Details refer to Planting Plan		P1 Details refer to Planting Plan		P1 Details refer to Planting Plan	
P1 Existing Grass Area to be Overseeded		P1 Existing Grass Area to be Overseeded		P1 Existing Grass Area to be Overseeded		P1 Existing Grass Area to be Overseeded	
P1 Proposed Hedge Planting		P1 Proposed Hedge Planting		P1 Proposed Hedge Planting		P1 Proposed Hedge Planting	

NOTE: Furniture and Fencing to be reused in permanent scheme

DIE DESIGN DELIVERABLE REF :		n/a	
23/01/2024	P08	Building location moved north to retain substation and boiler house. Existing SEN garden to be retained including raised planters.	MDS BS
24/11/2023	P05	Updated for CPN Temporary fencing to windows removed	BS -
16/11/2023	P04	Issued for draft CPs	ECJ BS
11/08/2023	P03	Issued for ITT	PH BS
DATE	REV	DESCRIPTION OF REVISION	DRAWN BY
REVISIONS			

STATUS :		S2 - For Planning	
ares		Ares Landscape Architects LTD Galacrossher, 51 Eyre Lane Sheffield S1 4RB t: 0114 276 2000 e: hello@aresdesign.co.uk w: ares.eu.com	
CLIENT :		Morgan Sindall	
PROJECT TITLE :		Star Radcliffe Academy, Bury	
DRAWING TITLE :		Temps Whole Site Plan	
DRAWING SCALE :	1:250	DRAWN BY :	PH
PAPER SIZE :	A1	APPROVED BY :	BS
DRAWING NUMBER :	FS1013-ALA-EX-ZZ-D-0101	STATUS :	S2
REVISION :	P06	DATE :	06/07/2023



Note

- Do not scale from this drawing
- To be read in conjunction with Project Risk Register REF: FS1013-ALA-EX-XX-RR-L-00001
- To be read in conjunction with all other Landscape Architect's drawings
- To be read in conjunction with Outline Landscape Specification REF: FS1013-ALA-EX-XX-SP-L-0001

1	Obeying in dry retention basin	2.4m fencing. End user access restricted. Basin to be 600mm deep. Basin to dry out during a maintenance event. Retaining slope.	31.07.23
2	Falling on stairs while accessing sport pitches	Stairways to be wide. Hand rails provided at intervals.	31.07.23
3	Collision between pedestrians and vehicles accessing amenity parking area	Refer to signage vehicle speed. Refer to signage vehicle speed. Refer to signage vehicle speed.	31.07.23
4	Collision between pedestrians and vehicles in car park	Landscaping features to stop vehicles from leaving the road and parking area. Road markings to clearly define parking.	31.07.23
5	Collision between pedestrians and cyclists accessing cycle storage facilities	See note (pedestrian) cycle storage. School to be signed speed on site. Clear signage.	31.07.23
6	Collision with contact with underground utilities and services	Tree pits to be located in close proximity to existing underground services. Avoidance of services to be a gradient of 1:10. 1.1m grid and call lines during construction.	31.07.23
7	Falling from height - 1.5m grassed bank to east of north gate	Obstructed. Clear access to window openings.	31.07.23
8	Collision between pedestrians and open windows	Obstructed. Clear access to window openings.	31.07.23

ID	RISK	MITIGATION	DATE
RESIDUAL PROJECT RISKS			

KEY	
Site	
	Planning Application Boundary
	Extent of Works
	Proposed Building
	Existing Building to be demolished
	Existing Tree Retained
	Root Protection Area (RPA)
	Existing Tree to be removed
	Proposed Contours

Planting	
Details refer to Planting Plan	
	Proposed Tree
	Proposed Multi-stem Tree
	Grass Seed
	Amenity Planting
	Meadow Planting
	Swale Meadow Planting
	Woodland Planting
	Artificial Turf
	Hedge

Hard Surfaces	
	P1 Pedestrian Macadam To Engineer's Specification
	P2 Vehicular Macadam To Engineer's Specification
	P3 Permeable Concrete Block Paving Refer to School Specific Outline Specification for Details
	P4 Coloured Pedestrian Macadam To Engineer's Specification
	P5 MUGA Permeable Surface To Engineer's Specification
	P6 Concrete Block Paving Refer to School Specific Outline Specification for Details
	P7 Concrete Surfacing To Engineer's Specification
	P8 Corduroy Tactile Paving Refer to School Specific Outline Specification for Details
	P9 Sensory Trail Refer to School Specific Outline Specification for Details
Furniture	
	S1 Steps and Handrails Refer to School Specific Outline Specification for Details
	S2 Cycle Stands Refer to School Specific Outline Specification for Details

Fencing and Structures	
	S3 Cycle Shelter Refer to School Specific Outline Specification for Details
	S4 Door Protection Barrier Refer to School Specific Outline Specification for Details
	S5 Seating Bench Refer to School Specific Outline Specification for Details
	S6 Picnic Table Refer to School Specific Outline Specification for Details
	S7 Litter Bin Refer to School Specific Outline Specification for Details
	S8 Bollards Refer to School Specific Outline Specification for Details
	S9 Ecological Enhancement Features Refer to School Specific Outline Specification for Details
	S10 Bespoke Star Seating Refer to School Specific Outline Specification for Details
	S11 Seating to habitat area Refer to School Specific Outline Specification for Details
	S12 PV Canopy Refer to School Specific Outline Specification for Details

DIE DESIGN DELIVERABLE REF :			
150			
11/09/2023	P02	Issued for ITT	PH BS
31/07/2023	P01	Updated with latest building and access road. Landscape design progressed.	PH BS
DATE	REV	DESCRIPTION OF REVISION	DRAWN BY
REVISIONS			

STATUS :
S4 - ITT

ares
LANDSCAPE
ARCHITECTS

Client :
Morgan Sindall

PROJECT TITLE :
Star Radcliffe Academy, Bury

DRAWING TITLE :
Whole Site Plan

DRAWING NUMBER :
FS1013-ALA-EX-ZZ-D-L-0001

STATUS :
S4

REVISION :
P02

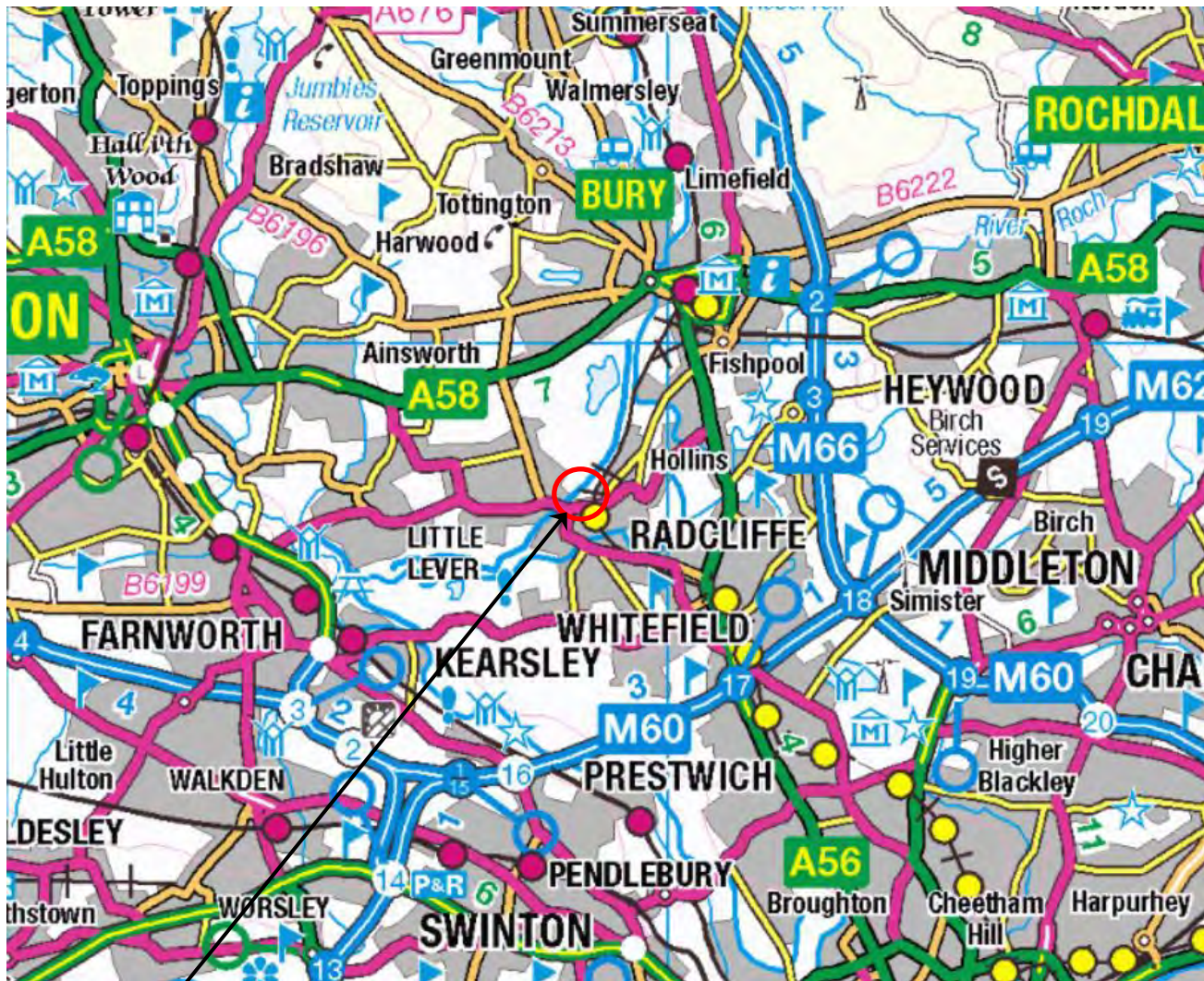
Area Landscape Architects LTD
Galscraher,
51 Eyre Lane
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t: 0114 276 2000
e: hello@aresdesign.co.uk
w: ares.eu.com

DRAWN BY :
PH

APPROVED BY :
BS

DRAWN DATE :
06/07/2023

ALA PROJECT CODE :
ALA805



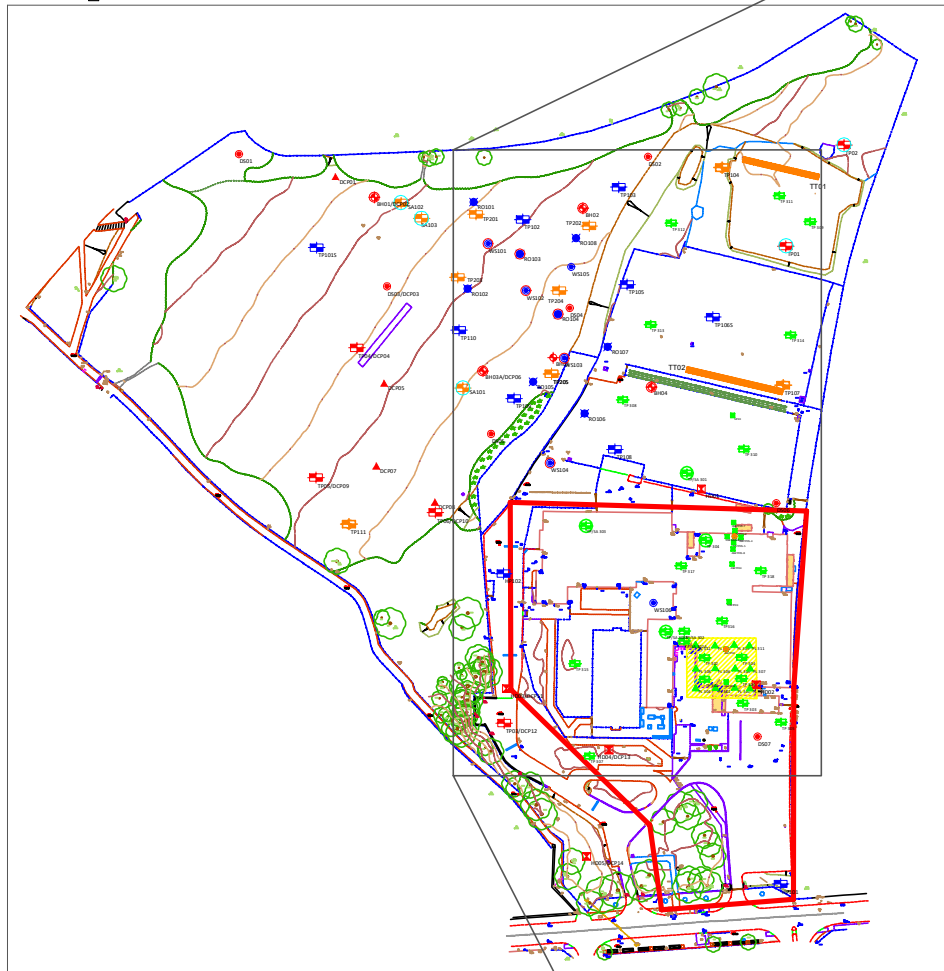
SITE LOCATION

NEAREST POSTCODE: M26 2SZ

SITE ENTRANCE WHAT3WORDS:
///CHAIR.VERGE.SINGLE



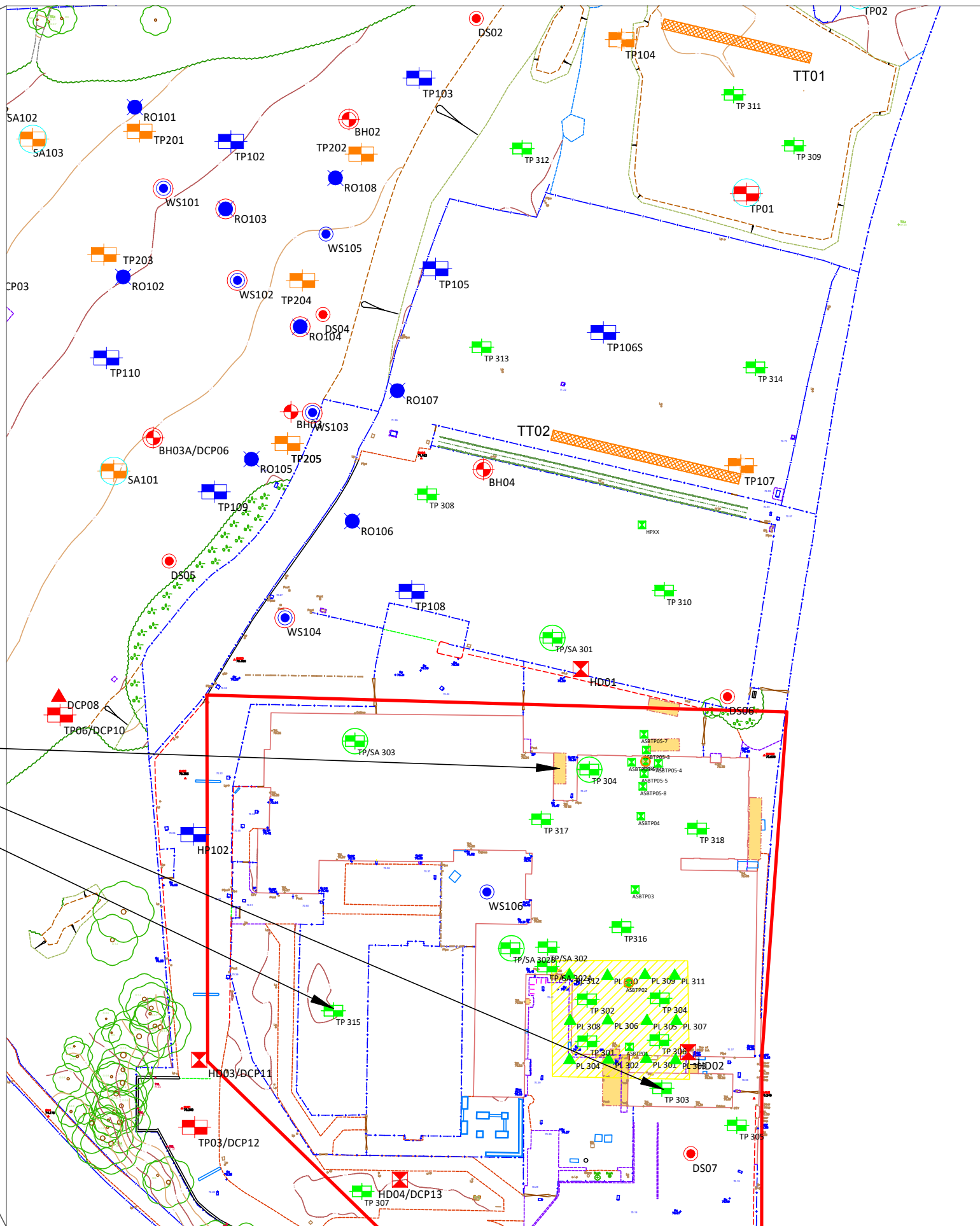
REV	DATE	DESCRIPTION	BY	CKD
 BROWNFIELD SOLUTIONS LTD IDEAS • ENVIRONMENTAL • PAITAL • ENGINEERING • TRADING • CONSULTANCY				
CLIENT MORGAN SINDALL				
PROJECT TITLE STAR ACADEMY, RADCLIFFE, MANCHESTER				
DRAWING TITLE SITE LOCATION PLAN (TEMPORARY ACCOMMODATION)				
DRAWING No. C5394/01A	REVISION -	SCALE NTS	DATE 11/03/23	
DRAWN BY PH		CHECKED BY TM		



TARGETING SCHOOL PLANT ROOM

TARGETING BOILER HOUSE

TARGETING HISTORIC GOODS SHED



KEY	
	APPROXIMATE SITE BOUNDARY
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	ROTARY OPEN BOREHOLE
	BOREHOLE INSTALLATION
	ADDITIONAL TRIAL PIT
	ADDITIONAL TRIAL TRENCH
	ADDITIONAL SLIP TRENCH
	SOAKAWAY INFILTRATION TEST
GEOTECHNICS (2022)	
	HAND EXCAVATED TRIAL PIT
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	CABLE PERCUSSIVE/ROTARY CORE BOREHOLE
	PLATE LOAD TEST.LWD.TRL-DCP
	SOAKAWAY INFILTRATION TEST
	BOREHOLE INSTALLATION
	APPROXIMATE LOCATION OF TEMPORARY ACCOMMODATION BUILDING
POST-DEMOLITION SI (2024)	
	TRIAL PIT
	PLATE LOAD TEST
	SOAKAWAY INFILTRATION TEST
	ASBESTOS TRIAL PIT
	ASBESTOS IDENTIFICATION

NOTES

- ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
- DRAWING NOT FOR CONSTRUCTION PURPOSES.

REV	DATE	DESCRIPTION	BY	CKD
A	13/12/23	INCLUDING PROPOSED POST-DEMO SI	TM	XX
B	22/04/24	POST-DEMO SI SCOPE UPDATE AFTER RENAISSANCE COMMENT	TM	XX
C	09/05/24	POST-DEMO SI SCOPE UPDATE AFTER EARTHWORKS CONTRACTOR COMMENT	TM	XX
D	14/05/24	UPDATE AFTER SITE WALKOVER AND MEETING WITH DEMOLITION CONTRACTOR	TM	XX
E	13/06/24	UPDATE AFTER POST-DEMOLITION INVESTIGATION	JEM	TM



CLIENT
MORGAN SINDALL

PROJECT TITLE
STAR ACADEMY, RADCLIFFE

DRAWING TITLE
**EXPLORATORY HOLE LOCATION PLAN
TEMPORARY ACCOMODATION**

DRAWING No.	REVISION	SCALE	DATE
C5394/10	E	NTS	13/06/2024
DRAWN BY		CHECKED BY	
JEM		TM	

APPENDIX A

Chemical Specification for Soils

Quality Control Methodology for Imported and Re-used Soils

Prior to Importation and Re-use

Reliable testing results should be provided, or samples should be obtained at the source and tested prior to either importation to the subject site or re-use on site of origin as early as possible.

The frequency and scope of testing will vary depending on the source, the required testing for possible sources is provided below. These rates are based on professional judgement and acceptance of similar criteria used on similar sites to the satisfaction of the local regulatory authority. Results should be compared to the acceptance criteria also with this appendix.

Material Use	Testing Frequency*	Suite of Analysis					
		1	2	3	4	5	6
Topsoil							
Greenfield Source including Site Won (Top 450mm)	*1 per 250m³						
Brownfield/Recycled Source including Site Won (Top 450mm)	**1 per 150m³						
Subsoil							
Greenfield Source (Top 450mm)	*1 per 250m³						
Brownfield/Recycled Source (Top 450mm)	**1 per 150m³						
Site Won (Top 450mm)	*1 per 150m³						
First Generation (i.e. quarried sand)	No testing required. Certificate of material provenance is required.						
Physical Stone Break Layer							
First Generation (i.e. quarried stone)	No testing required. Certificate of material provenance is required.						
Site Generated / Imported 6F2	*1 per 500m³						
General Fill***							
Site Generated / Imported 6F2	*1 per 1000m³						
Site Won Made Ground	*1 per 250m³						
	*1 per 1000m³						
Site Won Natural Arisings on Brownfield Site	*1 per 1500m³						
Site Win Natural Arisings on Greenfield Site	*1 per 2000m³						

Notes

1 – BSL Default Suite - Arsenic, Cadmium, Chromium (total and hex), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), water soluble sulphate (2:1 Extract), soil organic matter, and pH.

2 – Asbestos ID (and Quantification if detected).

3 – TPH Analysis - Speciated Total Petroleum Hydrocarbons (TPH CWG) including BTEX and MTBE.

4 – VOC Analysis - Volatile Organic compounds (VOCs) by GC-MS (ex TIC).

5 – SVOC Analysis - Semi-Volatile Organic compounds (SVOCs) by GC-MS (ex TIC).

6 – Visual Inspection & on-site screening for VOC using calibrated PID.

* - Minimum of 3 samples per source.

** Minimum of 6 samples per source.

***To be used at depths >450mm bgl or below building/hardstanding.

The testing should be undertaken at a UKAS accredited laboratory and be MCERTS accredited and all results should be below existing residential guideline values which are presented in Appendix A.

Topsoil/Subsoil

The above specification is to determine if material is chemically clean, for suitability as a growing medium reference should be made to BS3882:2015 Specification for Topsoil and BS 8601:2013 Specification for Subsoil and Requirements for Use.

In addition to the above sampling frequencies and testing, all imported topsoil/subsoil should also confirm to the following criteria:

-
- Have a maximum stone size of 75mm.
 - Be clean and free of foreign debris including building waste materials or contaminants e.g. brick, glass, asbestos and plasterboard, etc.
-

For imported soils, approval should be obtained from the Local Authority prior to importing to site.

Site Won Crushed Hardcore/Concrete (for use below building/hardstanding only)

In addition to the above sampling frequencies and testing; for re-use of hardcore/concrete (Grade 6) on the site of origin, BSL proposes the following inspection criteria:

-
- No visual contamination (oil staining etc).
 - Limited deleterious material (organics, wood, etc).
 - Limited metal.
 - No visible asbestos containing material (ACM).
 - Quantifiable Asbestos at or <0.001 w/w%.
-

Production of Grade 6 materials should be done under WRAP quality protocols or similar. Inspections and sampling would need to be carried out by a qualified geo-environmental engineer. For geotechnical performance, reference should be made to Series 600 Earthworks Guidance.

If the above criteria for asbestos is exceeded, then further consideration and assessment will be required. Works would need to be undertaken in compliance with the Control of Asbestos Regulations (CAR) 2012 and an Asbestos Plan of Works may be required.

Post Importation

The imported soils should be inspected on site to confirm it is the same material inspected at source and it is suitable for use. Once imported to site, tests should also be undertaken to confirm the batch is suitable prior to use and has not been contaminated in transit.

A management plan should be in place on site for storage and transportation. The material should be stockpiled separately and well segregated on site to prevent cross contamination in accordance with good site practice.

Accurate records of movement of soils should be kept in order to be incorporated in the final verification report.

Approval should be obtained from the Local Authority prior to use on site.

Validation and Verification Report

Site

A final verification report should be issued to the Local Authority/Warranty Provider (e.g. NHBC) detailing records of the re-use and importation of soils, alongside their use on the site.

Cover Layer

Once the chemical suitability of soils used for a cover system in soft landscaping and garden areas has been confirmed, the material can be placed in these areas.

The depth of the cover layer should be recorded, and photographs taken as evidence to be issued to the Local Authority/warranty provider in the verification report.

Approval for the placement of the cover layer should be obtained from the Local Authority/Warranty Provider.

Human Health Remediation Targets			Import (for use at any depth) and site won re-use in cover system soft landscaping areas <450mm; Based on residential without plant uptake (1% SOM) ^[1]	Re-use on site of origin only. Re-use only permitted beneath hardstanding; buildings, roads, car parks, pavements etc. Re-use Criteria based on Human health - Commercial (1%SOM)
Source	Contaminant	Unit		
LQM S4UL	Arsenic	mg/kg	40	640
LQM S4UL	Cadmium	mg/kg	85	190
LQM S4UL	Chromium (III)	mg/kg	910	8600
LQM S4UL	Chromium (VI)	mg/kg	6	33
LQM S4UL	Copper	mg/kg	7100	68000
C4SL	Lead	mg/kg	330	2300
LQM S4UL	Mercury, Elemental	mg/kg	1.2	58
LQM S4UL	Nickel	mg/kg	180	980
LQM S4UL	Selenium	mg/kg	430	12000
LQM S4UL	Zinc	mg/kg	40000	730000
LQM S4UL	Acenaphthene	mg/kg	3000	760
LQM S4UL	Acenaphthylene	mg/kg	2900	84000
LQM S4UL	Anthracene	mg/kg	31000	83000
LQM S4UL	Benz(a)anthracene	mg/kg	11	520000
LQM S4UL / DEFRA C4SL	Benzo(a)pyrene	mg/kg	3.2	170
LQM S4UL	Benzo(b)fluoranthene	mg/kg	3.9	35
LQM S4UL	Benzo(ghi)perylene	mg/kg	360	44
LQM S4UL	Benzo(k)fluoranthene	mg/kg	110	3900
LQM S4UL	Chrysene	mg/kg	30	1200
LQM S4UL	Dibenz(a,h)anthracene	mg/kg	0.31	350
LQM S4UL	Fluoranthene	mg/kg	1500	3.5
LQM S4UL	Fluorene	mg/kg	2800	23000
LQM S4UL	Indeno(1,2,3,cd)pyrene	mg/kg	45	63000
LQM S4UL	Naphthalene	mg/kg	2.3	500
LQM S4UL	Phenanthrene	mg/kg	1300	190
LQM S4UL	Pyrene	mg/kg	3700	22000
LQM S4UL	TPH Aliphatic EC 5 - 6*	mg/kg	42	54000
LQM S4UL	TPH Aliphatic EC 6 - 8*	mg/kg	100	3200
LQM S4UL	TPH Aliphatic EC 8 - 10*	mg/kg	27	7800
LQM S4UL	TPH Aliphatic EC 10 - 12*	mg/kg	130	2000
LQM S4UL	TPH Aliphatic EC 12 - 16*	mg/kg	1100	9700
LQM S4UL	TPH Aliphatic EC 16 - 35*	mg/kg	65000	59000
LQM S4UL	TPH Aliphatic EC 35 - 44*	mg/kg	65000	1600000
LQM S4UL	TPH Aromatic EC 5 - 7*	mg/kg	370	1600000
LQM S4UL	TPH Aromatic EC 7 - 8*	mg/kg	860	26000
LQM S4UL	TPH Aromatic EC 8 - 10*	mg/kg	47	56000
LQM S4UL	TPH Aromatic EC 10 - 12*	mg/kg	250	3500
LQM S4UL	TPH Aromatic EC 12 -16*	mg/kg	1800	16000
LQM S4UL	TPH Aromatic EC 16 - 21*	mg/kg	1900	36000
LQM S4UL	TPH Aromatic EC 21 - 35*	mg/kg	1900	28000
LQM S4UL	TPH Aromatic EC 35 - 44*	mg/kg	1900	28000
LQM S4UL	Benzene	mg/kg	0.38	28200
LQM S4UL	Toluene	mg/kg	880	27
LQM S4UL	Ethyl Benzene	mg/kg	83	56000
LQM S4UL	Xylene - o	mg/kg	88	5700
LQM S4UL	Xylene - m	mg/kg	82	6600
LQM S4UL	Xylene - p	mg/kg	79	6200
CL:AIRE 2010	MTBE (methyl tert-butyl ether)	mg/kg	49	5900
NA	Asbestos (No visual ACM)	% w/w	None Detected	7900
pH	B53882	pH Units	NA	<0.001%

^[1] Site won soils may be re-used anywhere on site below 450mm depth clean cover or hardstanding, providing there are no visual/olfactory signs of gross contamination. Organic materials should be placed away from proposed structures.

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See LQM/CIEH S4ULs Human Health Risk Assessment document for notes regarding derivation.

Criteria for PAH and TPH assumes an SOM of 1%.

*Soil matrix should contain no free product.

**Asbestos in soils below 1.00m bgl not defined

All imported material to have chemical concentrations less than the above levels for the site, with the exception of pH which is a range.

Test results to be provided to the engineer prior to placing soils, where appropriate.

All tests result to be undertaken by a UKAS Laboratory holding accreditation for the relevant tests.

APPENDIX B

BSL Guidance – Re-use and Disposal of Waste

Re-Use Of Waste - Guidance Note

Definition of Waste

The Environment Agency considers waste to be “...any material that is discarded, or intended to be discarded...” This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

CL:AIRE: Code of Practice

Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE DoWCoP), also commonly referred to as a “Materials Management Plan”.

The developer/contractor is advised to complete all works under the DoWCoP.

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site.

The Code of Practice requires 4 No. Factors to be addressed:

1. Protection of human health and protection of the environment.
2. Suitability of use, without further treatment.
3. Certainty of use.
4. Quantity of material.

In order to satisfy these requirements the following are required:

- i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
- ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
- iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
- iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
- v) Volume calculations.
- vi) Planning permission for the development.
- vii) Contractual details to be clear, regarding who steps in if a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.

Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.

Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Alternatives include the EA U1 exemption (soils and stones <1000 tonnes and aggregates <5000 tonnes) and the Waste Framework Directive, which applies to naturally occurring soils used on site of origin only. Aggregates can also fall under the EA WRAP Quality Protocols.

Waste Classification For Soils

Introduction

Waste producers have a duty of care to classify the waste they are producing:

- before it is collected, disposed of or recovered.
- to identify the controls that apply to the movement of the waste.
- to complete waste documents and records.
- to identify suitably authorised waste management options.
- to prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept **hazardous, non-hazardous** or **inert** wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e the hazard assessment. The most common EWC waste codes related to soil are:

17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific "hazardous properties" which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

Waste Definitions

Inert	- Will not undergo any significant physical, chemical or biological transformations. - Will not dissolve. - Will not burn. - Will not physically or chemically react. - Will not biodegrade. - Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. - Has insignificant total leachability and pollutant content. - Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) the **WAC is not relevant**. Furthermore the WAC limits **cannot be used to make an assessment of whether a waste is hazardous**. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations ¹	Non-Hazardous Waste		Hazardous Waste	
	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	Above hazardous WAC limit values
WAC testing				
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill ²	HAZARDOUS landfill	PRE-TREATMENT ³

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).

2 Individual sites may have certain limit values pre-determined in their licence.

3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

For contaminated land specific consideration must be given to the following before proceeding;

- The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
- The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of **marker compounds** is optional; however it is recommended that where possible the marker compounds should be used.

WM3 states:

If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:

- The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
- This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
- The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

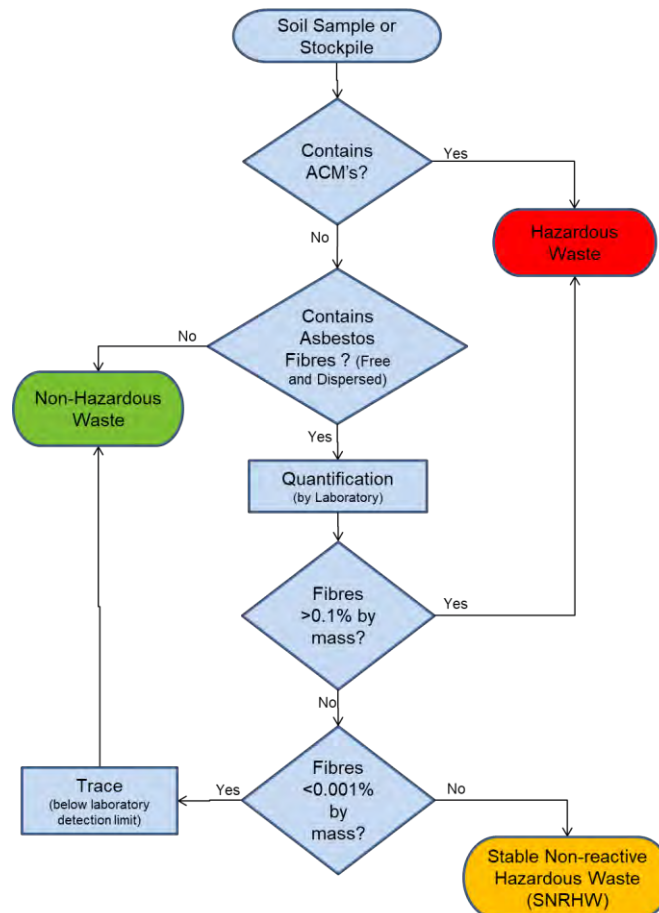
Additional Asbestos Guidance Notes

Disposal

The 1st Edition of WM3 “Guidance on the classification and assessment of waste”, details the way in which Asbestos is assessed within soils.

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's)



Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site¹. These levels are often termed “trace” by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)¹. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	Insulation materials and asbestos-containing construction materials
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and “*other suitable materials*” may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether or not the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four hour period. The control limit is not a ‘safe’ level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 “the release of dispersed asbestos fibres from soil” 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m³.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (eg by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use

The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation. There is currently a Joint Industry Working Group (JIWG) tasked with producing a Code of Practice for Asbestos in Soil, Made Ground and Construction & Demolition Material that will clarify in due course the position of the various government agencies.

Asbestos containing materials can remain in situ under a suitable cover system which may be hardsurfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Preliminary publications from JIWG (April 2015) provide guides for decision making in relation to construction. These are at a “Beta” test stage and further publications will be provided in due course.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk. There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required. The re-use of soils containing asbestos at concentrations above hazardous waste levels is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

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