



Hopwood Hall College, Rochdale
Remediation Strategy & Build Phase Verification Plan

Job Number
LKC251085

Report Date
25th April 2025

Client
Willmott Dixon Construction Ltd

DOCUMENT QUALITY ASSURANCE

Site Address	Saint Marys Gate (A58), Rochdale. OL12 6RY.
Report Title	Remediation Strategy & Build Phase Verification Plan
Job Number	LKC251085
Client	Willmott Dixon Construction Ltd

Revision	0	Date of Issue	25/04/2025
Document Ref:	LKC251085-C1-RMS-Hopwood College		
Status	Final		
Written By	P Dunn		
Approved By	E. Khadun		

DISCLAIMER

This report has been prepared by LK Consult Ltd (LKC) who have exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant, experienced in preparing reports of a similar scope.

However, to the extent that the report is based or relies upon information contained in records, reports or other materials provided to LKC, which have not been independently produced or verified, LKC gives no warranty, representation, or assurance as to the accuracy or completeness of such information.

This report is prepared solely for the benefit of the client named above. It may not be relied upon by 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.

Those using this information in subsequent assessments or evaluations do so at their own risk.

TABLE OF CONTENTS

1.	Introduction	3
1.1.	Background	3
1.2.	Summary of Previous Findings.....	3
2.	Remediation Strategy	6
2.1.	Aims and Objectives.....	6
2.2.	General Site-Wide Remediation Works	6
2.2.1.	Watching Brief for Unexpected Contamination.....	6
2.2.2.	Asbestos in Soils Management	6
2.2.3.	Segregation & Removal of Unsuitable Material	7
2.2.4.	Materials Management	7
2.2.5.	Construction Activity & Inspection	7
2.2.6.	Control of Water	8
2.2.7.	Stockpile Management.....	8
2.2.8.	Disposal.....	8
2.3.	Build Phase Remediation	8
2.3.1.	Environmental Cover System	8
2.3.2.	Potable Water Pipes	9
3.	Verification Plan	10
3.1.	Pre-construction Verification	10
3.2.	Environmental Cover Soils Verification	10
3.3.	Verification of Potable Water Pipes	11
3.4.	Site Verification Report	11

Appendices

Appendix A – Drawings

Appendix B – Example of Cover Soils Depth Validation

Appendix C – Remediation Target Criteria for Cover Soils

Appendix D – References

1. Introduction

1.1. Background

LK Consult Ltd (LKC) has been commissioned to carry out a Remediation Strategy & Build Phase Remediation Strategy & Verification Plan for Hopwood College, Rochdale in support of a planning application to partially demolish the existing college building and replace with a new four storey college building, water tank, and substation.

LKC have been provided with the following pertinent ground investigation reports:

- Preliminary Risk Assessment Report for Hopwood College, Rochdale (report reference TE1880-TE-00-XX-RP-GE-001-V01, dated 30th January 2025).
- Ground Investigation Report Hopwood Hall College, Rochdale (report reference TE1880-TE-00-XX-RP-GE-002-V02, dated 3rd March 2025).

Two previous reports have been reviewed as part of the Preliminary Risk Assessment (PRA) above, but it is understood that no reliance on the information is available and therefore is not considered as part of this report.

The Remediation Strategy is required to determine the work necessary in order to ensure the site is “suitable for use” for the proposed development with regards to potential contaminated land pollutant linkages.

A summary of the site details is presented in Table 1-1. The site location and proposed development are included in Appendix A.

Location	Hopwood Hall College, Rochdale Campus, St Mary's Gate, Rochdale OL12 6RY. Centred at National Grid Reference 389299E 413363N.
Area	1.75 hectares
Topography	Site area is approximately level at c.119.5 metres above ordnance datum (AOD). College Road to the north is at approximately 120mAOD and River Roch to the south is at approximately 188.8mAOD
Current Site Use	Current college building with car parking. An oil: water interceptor understood to be present in the ‘drop off’ lane in the northeast corner. A brick retaining wall separates the level site with the embankment adjacent to the River Roch, south of the site. The surrounding site is mainly commercial with residential areas beyond. College Road abuts the site to the north, and St Mary’s Gate to the east. The River Roch is along the southern boundary of the site.
Proposed Development	Partial demolition of the existing college buildings in the east of the site and construction of a new college building in the north, a water tank and small ancillary building in the centre, and a substation in the northwest of the site. The remainder of the site will comprise car parking and soft landscaped areas

Table 1-1: Summary of site details.

1.2. Summary of Previous Findings

Table 1-2 summarises the site details, historical review, environmental settings and site reconnaissance taken from the PRA.

Main Historical Features	The course of the River Roch previously ran through the site. Holland Street cotton mill occupied much of the east of the site along with several smaller mills and dyeworks (including a tank) in the west of the site at extending offsite beyond the site boundaries. Holland Street and presumed residential properties northeastern corner of the site. By the 1960s the mill in the east of the site had been replaced with Rochdale Technical College. Some of the smaller mills/works were still shown in the northwest of the site at this time, alongside allotment gardens. By the late 1960s/early 1970s the River Roch had been diverted along the southern boundary of the site. Allotments and buildings in the northwest of the site were no longer shown, with a large building labelled as Rochdale College now present across the majority of the west and centre of the site. By 2012 the smaller buildings in the southeast of the site have been demolished. The west/centre of the site was resurfaced for car parking. The immediate surrounding area predominantly comprised industrial/commercial land uses including mills and dyeworks, a cattle market, warehouses, unnamed works, with some terraced residential properties. The majority of the surrounding industry was demolished by the 1960s to 1980s.
Geology / Hydrogeology	Artificial: Previous site investigations identified made ground between 0.95-6.80m deep, with the deepest within the infilled course of the River Roch. No BGS recorded artificial on site. Made Ground recorded 50m south of site. Superficial: Alluvium (Secondary A aquifer) in the north. Glaciofluvial deposits (Secondary A aquifer) across the remainder of the site. Bedrock: Pennine Lower Coal Measures (Secondary A aquifer). There are no Source Protection Zones, potable, non-potable or surface water abstractions recorded within 250m of the site. The nearest surface water feature is the River Roch located beyond the southern site boundary
Landfills / Infilled ground	Potentially infilled ground (infilled former course of the River Roch) on site. A recorded landfill approximately 200m west of the site.
Previous Investigations	Geotechnical recommendations included piled foundations. Contamination testing of soils on site identified 'low concentrations' of asbestos fibres in made ground. Ground gas monitoring indicated no significant sources of ground gas were present.

Table 1-2: Summary of site details, historical review and environmental settings.

The PRA identified a 'moderate to very high risk' for the identified pollutant linkages and site investigation was recommended. A site investigation was undertaken and comprised:

- 26no. window sample boreholes drilled up to 5.45 metres below ground level (mbgl).
- 5no. cable percussion boreholes drilled to 4.20-7.59mbgl.
- 7no. rotary boreholes drilled to between 0.30-40.00mbgl.
- 4no. hand pits excavated to 0.86-1.52 mbgl.
- 1no. soakaway pit to 1.98mbgl.
- 6no. gas monitoring visits over a three-month period.
- Soil, soil leachate and groundwater sampling and laboratory analysis.

Ground conditions as reported in the Ground Investigation Report are summarised in Table 1-3 below.

Hardstanding	Asphalt was encountered in the car park across the site to depths between 0.05m and 0.35m bgl. A concrete slab (0.21-0.47m thick) was encountered across the footprint of the former building within the present-day car park
Made Ground	Reported to a maximum depth of 6.50m bgl and was found to be thickest within the former infilled watercourse. Made Ground comprised both granular and cohesive deposits, with a layer of suspected Pulverised Fuel Ash (PFA) identified across the site, thickest beneath the former building footprint within the present-day car park area. Other anthropogenic materials encountered within the Made Ground include brick, concrete, sandstone, limestone, clinker/slag, plastic, metal, glass, timber, and occasional rebar.
Superficial	Made Ground is underlain by superficial deposits in some instances (six locations), comprising Alluvium (clay) and Glaciofluvial Deposits (silty sand) up to 5.66mbgl.
Bedrock	The Made Ground and superficial deposits were found to be underlain at depths between 3.30m and 6.50m bgl by bedrock of the Pennine Lower Coal Measures, found to comprise mudstone with interbedded sandstone and siltstone.
Groundwater	Shallow groundwater has been monitored across the site at depths between 0.10m and 4.14m bgl and a separate deeper confined, locally artesian, groundwater body has been reported within the deep sandstone bands at RH101 and RH103C (sandstone bands present from depths of 28.50m bgl and 32.00m bgl). The head of water reported during one groundwater monitoring visit at RH103C was reported as 0.04m.
Obstructions	Concrete slab was recorded below the asphalt surfacing, with possible PFA Silt (in made ground) recorded below. Window sample holes often refused within this material, with SPTs recording refusals. Numerous other instances of obstructions were reported during the site investigation in window sample boreholes, typically refusing on cobbles of concrete and brick within the upper metre.
Other Observations	Observations of contamination mainly included ashy gravel and clinker. No hydrocarbon odours were reported in the Ground Investigation Report, although strong hydrocarbon odours (most likely associated with wood noted in the logs) were recorded in made ground at 5.3m in the northeast of the site under previous investigations.

Table 1-3: Summary of Ground Conditions.

Results of the soil laboratory testing did not identify any elevated contaminants when compared to published criteria for a commercial land use scenario. When using a Public Open Space (park) (POSpark) criteria, only one result for benzo(a)pyrene was reported marginally above the assessment criteria. A moderate/low risk was determined.

Some trace concentrations of VOCs and SVOCs were also reported above limits of detection. The report includes discussion and risk assessment of trace contaminants and, in each instance considers that pollutant linkages are not viable or the risk is low.

Asbestos fibres mainly comprising chrysotile and amosite bundles were reported in ten window sample borehole locations at concentrations ranging from <0.001-0.021%w/w. A moderate risk was considered appropriate for future site users.

Some marginal exceedances of water quality standards for *inter alia* metals and PAHs were reported in groundwater, leachate and surface water samples. Largely based on the limitations of the assessment criteria and the environmental setting of the site, the risk to controlled waters is considered low.

No significant gas concentrations or flow rates were recorded during the gas monitoring and Characteristic Situation¹ was recommended. The report also identifies that the site lies within a radon area where <1% of properties are above action level and therefore no radon protection measures are needed.

2. Remediation Strategy

2.1. Aims and Objectives

LKC consider the remediation works may be spilt in to the 'pre-construction' (or enabling works) phase and the 'build phase' (i.e. during the residential development works) phase.

The recommendations provided below are considered appropriate for the site based on the site investigation work undertaken. LKC consider that adequate information has been presented and do not deem further investigation works necessary.

LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

The following remediation is required – further details are provided in the following sections.

- A watching brief for unexpected contamination during earthworks.
- 450mm of suitable clean environmental cover soils in in Public Open Space areas.
- Appropriate disposal of waste soil material to a licensed recycling facility (if required for build phase).

In addition to the above remediation recommendations, a potable water pipeline risk assessment is also likely to be required by the utility provider before a new connection is made. It is considered likely that the findings of the risk assessment will indicate that remediation (barrier pipe) will be required.

LKC recommend that the proposed works are prior approved by the regulators prior to the commencement of construction works.

2.2. General Site-Wide Remediation Works

2.2.1. *Watching Brief for Unexpected Contamination*

A watching brief will be maintained for evidence of previously unidentified contamination during earthworks and development works. If evidence of contamination is identified, then works in the area will stop and LKC and the Local Authority informed.

If any unexpected contamination is encountered, LKC shall undertake further delineation works, and this may include collection of appropriate samples for laboratory analysis to further characterise the material and allow a risk assessment to be undertaken or removal of the impacted material to quarantine.

Soil samples will be taken and analysed for a suite of contaminants representative of the impacted material. To determine that significantly impacted soils have been removed, LKC shall collect verification samples from the base and sides of the excavation.

Quarantined material may be removed offsite to a licensed treatment facility, or an assessment made of its potential for treatment and / or retention on site.

2.2.2. *Asbestos in Soils Management*

Due to the presence of asbestos containing material, it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations.

This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, and it is recommended that an appropriate 'Asbestos Management Strategy' is

developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733¹.

This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring.

With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. As per the risk assessment, soil containing small concentrations of asbestos fibres or rare small pieces of cement bound asbestos is suitable for retention on site beneath hardstanding or clean cover soils.

Should significant quantities of fibrous asbestos be present or large quantities of cement bound asbestos remain in soils following hand picking, then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill. Guidance on removing asbestos cement is described in HSE (2012)².

2.2.3. Segregation & Removal of Unsuitable Material

There is potential for some unidentified geotechnically or chemically unsuitable material to be encountered during enabling works.

Such materials will undergo appropriate investigation and testing to ascertain their suitability for re-use, if feasible. Should material be considered either chemically or geotechnically unsuitable then this material will be removed from site under the protocols described in the following sections.

2.2.4. Materials Management

To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered.

This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used):

- 5,000 tonnes (c. 3,500m³) treatment of crushed concrete/stone.
- 1,000 tonnes (c. 750m³) use of non-hazardous soil.
- 5,000 tonnes (c. 3,500m³) use of clays, sand, gravel, brick, concrete, stone etc.
- 50,000 tonnes (c. 33,000m³) use of bituminous material to be used in roadways.

A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered before material movement starts onsite.

If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'.

2.2.5. Construction Activity & Inspection

The following activities and inspections should be incorporated into the site works:

- Due to the variability of the soils at the site it is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations and pavement construction.
- Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97³ utilised.

- Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan

2.2.6. Control of Water

It is considered that significant de-watering is unlikely to be required across the majority of the site. Some localised ingress of small volumes of perched groundwater should be anticipated. Most excavations will be limited to above the groundwater level.

However, where significant organic contamination is present, or in order to chase out deeper obstructions some localised excavation below the groundwater table may be required.

Where relict structures are found to retain fluid contaminants, they should be drained first.

Arrangements should be made to prevent ponding in shallow excavations; the Contractor should ensure that ground levels are of sufficient gradient to enable the collection of surface water run-off in sumps or grips. Pumping from over-excavated sumps may be required to maintain satisfactory working conditions.

Contingency arrangements to remove groundwater (including contamination groundwater if encountered) from excavations and/or relict structures should be allowed.

Small volumes of pumped fluids/ groundwater should be stored in appropriate, sealed tanks/containers and analysed for a range of determinants prior to disposal to suitable facility. Alternatively, a temporary discharge licence, including their requirements for treatment/ testing should be agreed with local utility providers (united utilities) prior to start on site.

2.2.7. Stockpile Management

Stockpiled material should be suitably managed. The source of each stockpile should be recorded and appropriate validation testing for the proposed re-use or potential offsite disposal should be undertaken as required. Depending on the nature of the material the potential for dust generation will be mitigated by dampening down and covering as required.

Material should be segregated by type and source. For example, construction / demolition arisings, site won subsoil, etc.

A quarantine area for suspect contaminated soils should be established on site. This should comprise an impermeable lined area with a small bund to prevent run off and to minimise the risk of contaminating other areas of the site. The material should also be covered to minimise the generation of vapours, fibres, dust and possible nuisance to adjacent receptors, and to prevent rainwater ingress which may mobilise soluble contaminants as required.

2.2.8. Disposal

Material required to be removed from site should be undertaken under an appropriate duty of care and the results of chemical analysis should be provided to a licensed landfill for confirmation of waste classification.

2.3. Build Phase Remediation

2.3.1. Environmental Cover System

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

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

A diagram of a typical environmental cover system is shown in Plate 2-1 below.

450mm soft landscaping (minimum)	150mm (minimum) chemically validated TOPSOIL*
	Chemically validated SUBSOIL GEOTEXTILE MEMBRANE (at base of subsoil)
Existing MADE GROUND	

Plate 2-1: Typical Environmental Cover System Construction.

Notes:

Hardstood areas– No Remediation Required.

*Thickness of topsoil should not exceed 300mm as part of a 600mm cover soils or 150mm as part of 450mm cover soils.

Where natural strata are encountered within the depth of the proposed environmental cover system, then level reduction may cease, and geotextile may be omitted pending inspection by LKC (with suitable photographic evidence) and upfilling with suitably chemically validated soils as per section 3.2.

An example of cover system depth validation is presented in Appendix B.

2.3.2. Potable Water Pipes

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

3. Verification Plan

The Remediation Strategy as outlined above should be carried out in accordance with a Verification Plan. Land Contamination Risk Management (LCRM)⁴ states.

“You will need to produce a verification plan. This will be a part of the remediation strategy. It will need to set out all of the data requirements, including compliance criteria and monitoring details. This will establish a ‘lines of evidence’ approach which will verify remediation is working or has worked.”

3.1. Pre-construction Verification

The findings of a watching brief should be provided for inclusion within the completion report. This should include any additional testing and assessment for unexpected contamination, disposal and stockpile management.

Waste records such as disposal tickets and waste carrier licences should be provided in the Site Completion Report. Photographic evidence of removal and waste removal tickets should be retained and included in the Site Completion Report.

3.2. Environmental Cover Soils Verification

Works should be carried out as described in Section 2.3.1. The separation geotextile laid at the base of the excavation shall comprise Terram Hi-Viz or equivalent.

The contractor for the works or the source of imported material is not currently known and should be confirmed as part of validation works.

The verification plan for the works is provided in Table 3-1.

Activity	Responsibility	Information to be provided in Site Completion Report.
1) Installation of geotextile	Contractor to provide delivery notes. Contractor / site manager to provide photographic evidence of the installation across the landscaped areas.	Delivery notes. Photographs.
2) Validation of imported subsoil and topsoil	Contractor to identify soil sources and confirm to LKC. LKC to collect soil samples for chemical validation.	Details of validation sampling, quantities required, soil risk assessment and statement of suitability.
3) Validation of cover layer depth	LKC to excavate inspection trial holes at 50m spacing in soft landscaping areas. Depth measurement using a staff.	Photographs Statement if correct depth provided.

Table 3-1: Verification of Environmental Cover Layer.

The validation of cover layer depths should be undertaken on a 50m spacing, with depth measurements using a staff, photographic evidence and a statement of correct depths provided.

Were reduced level excavations are taken to within natural strata, then this should be inspected by LKC to confirm removal of the made ground, with a full photographic record included in completion report.

Chemical validation of all imported soils to be used on site in soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

It is recommended that imported soils are sampled at source prior to import to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. Validation samples should be taken prior to placement in gardens to ensure suitability for use and following placement in gardens to ensure absence of cross contamination and ultimate suitability for use.

A summary of the required imported material sampling requirements is presented in Table 3-2 and is based on the YALPAG guidance (2021)⁵.

Material Type	Source	Suite of Analysis	Sampling Rate
Topsoil / Subsoil	Greenfield / manufactured / site-won natural	Suite A*	1 sample per 50m ³
	Brownfield / unknown	Suite B**	
Subsoil	Quarried sand	No testing required. Certification of material provenance is required.	
Gravel break layer	Quarried stone	No testing required. Certification of material provenance is required.	
	Recycled stone (6F2 / screened)	Suite B*	1 sample per 500m ³

Table 3-2: Sampling requirements for imported and site won soils.

Notes:

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

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

*Minimum sampling rate of 3 samples per source.

**Minimum sampling rate of 6 samples per source.

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

It should be ensured that the matrix of imported topsoil is suitable as a growing medium in line with BS3882⁶. Topsoil shall be free of weeds, roots or perennial weeds, pests, diseases, debris, tree roots, sticks, subsoil and foreign matter and shall be capable of being broken down to a fine tilth. LKC advise this information is provided by the supplier before material is imported onto site.

Soils to be used in areas of soft landscaping will be compared to POS_{resi} criteria (as used in the contamination risk assessment).

Remedial target criteria are presented in Appendix C.

3.3. Verification of Potable Water Pipes

Confirmation of the findings of the water pipeline assessment should be obtained. Validation of pipeline installation should include delivery notes of pipe materials, photographs of installed pipe and confirmation of connections.

3.4. Site Verification Report

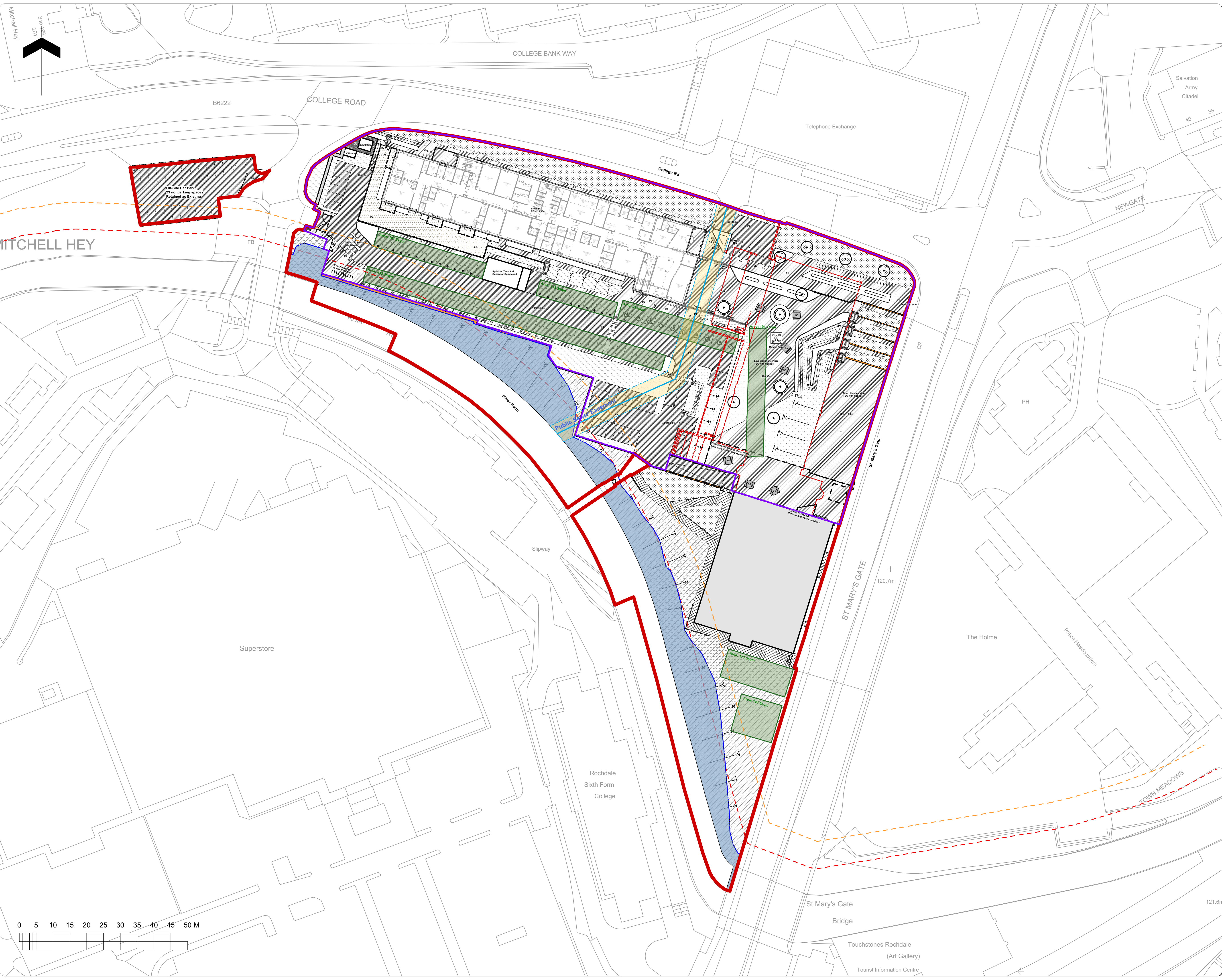
The following Verification Reports should be provided to satisfy the outstanding contaminated land planning conditions:

- **Pre-construction Phase Report:** Site level reduction details, offsite disposal information, validation testing of site won material to be used in soft landscaping,

findings of the watching brief including details of any unexpected contamination and verification testing.

- **Build-phase Construction Report:** Validation testing of any imported subsoil and topsoil, completion of UU potable water supply document and/or discussion with UU and details of installation.

Appendix A – Drawings



- Notes**
1. Do not scale from this drawing
 2. To be read in conjunction with Project Risk Register REF: FS0939-ALA-XX-XX-RR-L-0001
 3. To be read in conjunction with Landscape Outline Specifications REF: FE012-ALA-ZZ-XX-SP-L-0001
 4. To be read in conjunction with all submitted Landscape Architect's drawings.
 5. To be read in conjunction with all other consultants' drawings.

KEY

Site

- Planning Application Boundary
- Extent of Works
- Proposed Level
- Existing Level
- Gradient
- Proposed Building
- Existing Building to be demolished
- 8 metres from River Roach
- 15 metres from River Roach
- Flood Zone 3 Boundary
- Canopy / Building Overhang
- Potential Location of PFI panels Within Landscape (1400watts) 100C
- Proposed Tree
- Proposed Multi-stem Tree
- Grass Seed
- Arboreal Planting
- Hedge Planting
- Meadow Planting
- Shrub Meadow Planting
- Paving
- Paved Area Macadam
- Vehicular Macadam
- Wet Paved Surface
- Concrete Surface
- Concrete Paving
- Gravel Paving

Furniture

- Steps and Handrails
- Cycle Stands
- Door Protection Barrier
- Existing Relocated Seating Bench
- Existing Relocated Plastic Table
- Existing Relocated User Bin
- Existing Relocated Retained
- Existing Relocated Relocated
- Relocated

Fencing and Structures

- Existing Fencing Retained
- Proposed Fencing
- Proposed Gates
- Brick Wall
- Existing Wall Retained

- NOTES:**
- Block B FFL subject to confirmation by EA
 - Vehicular access layout in abeyance
 - Levels to college plaza subject to college approval
 - LV switchroom and Substation location subject to LPA approval
 - Final number of parking spaces subject to LPA approval
 - Wall to highway ownership and further treatment subject to Curtins' further investigation
 - Visitor parking subject to LPA approval

ID	RISK	MITIGATION	DATE MITIGATED
RESIDUAL PROJECT RISKS			

DATE	REV	DESCRIPTION OF REVISION	DRAWN BY	APPROVED BY
REVISIONS				

DEIR:
DEIR 150

STATUS
S3 - RIBA STAGE 3 - DRAFT CP's

ares
LANDSCAPE
ARCHITECTS

Ares Landscape Architects LTD
Gatecrasher,
51 Eyre Lane
Sheffield
S1 4RB
t: 0114 276 2000
e: hello@aresdesign.co.uk
w: ares.eu.com

CLIENT:
Hopwood Hall College

PROJECT TITLE:
Hopwood Hall College

DRAWING TITLE:
Site Landscape Plan - Overview

DRAWING SCALE:
1:500

PAPER SIZE:
A1

DRAWN BY:
BS

APPROVED BY:
-

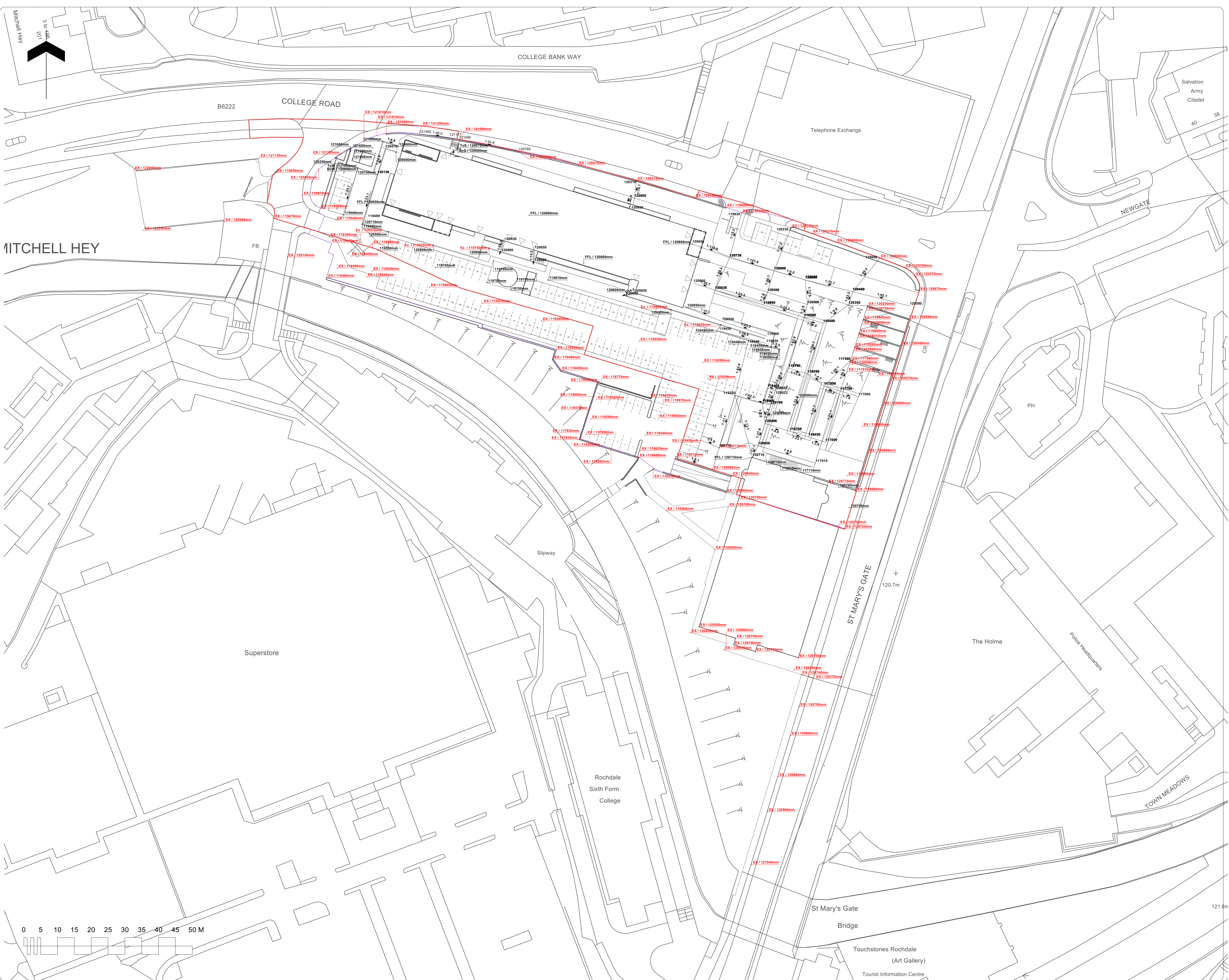
DRAWN DATE:
10/02/2023

ALA PROJECT CODE:
ALA775

DRAWING NUMBER:
FE012-ALA-00-XX-DR-L-0001

STATUS:
S3

REVISION:
P04



Note

1. Do not scale from this drawing
2. To be read in conjunction with Project Risk Register REF: FS0939-ALA-XX-XX-RR-L-0001
3. To be read in conjunction with Landscape Outline Specifications REF: FE012-ALA-ZZ-XX-SP-L-0001
4. To be read in conjunction with all submitted Landscape Architect's drawings.
5. To be read in conjunction with all other consultants' drawings.

KEY

EX / 16mm Existing Level
+ 8mm Proposed Level
1:0 Gradient

RESIDUAL PROJECT RISKS

ID	RISK	MITIGATION	DATE MITIGATED

REVISIONS

DEIR:
DEIR 150

STATUS
S5 - Suitable for DfE Review & Acceptance



Ares Landscape Architects LTD
Gatecrasher,
51 Eyre Lane
Sheffield
S1 4SB
t: 0114 276 2000
e: hello@aresdesign.co.uk
w: ares.eu.com

CLIENT:
Hopwood Hall College

PROJECT TITLE:
Hopwood Hall College

DRAWING TITLE:
Levels Plan

DRAWING SCALE:	DRAWN BY:	DRAWN DATE:
1:500	LS	02/12/2024
PAPER SIZE:	APPROVED BY:	ALA PROJECT CODE:
A1	MM	ALA866

DRAWING NUMBER:	STATUS:	REVISION:
FE0012-ALA-XX-XX-D-L-0006	S5	P05

Appendix B – Examples of Cover Soils Depth Validation

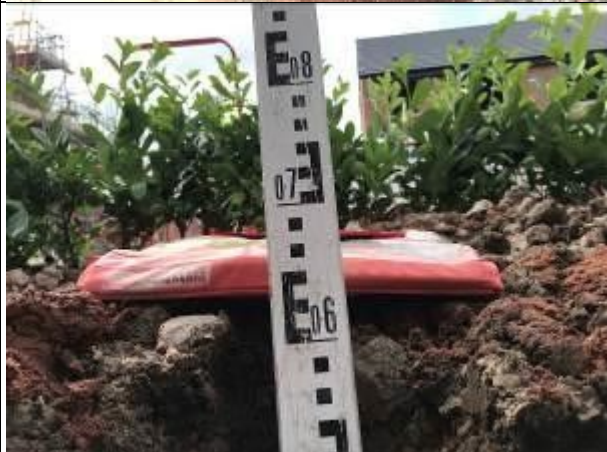
Plot 1



View of garden to front of Plot 1.



View of soil in capping layer excavation.



Depth measurement in garden area to the front of Plot 1 (*circa* 640mm).

Appendix C – Remediation Target Criteria for Cover Soils

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{resi}	POS ^{park}	Source
Metals	Inorganic Arsenic	N/A	37	40	49	640	79	168	DEFRA C4SL
	Beryllium	N/A	1.7	1.7	35	12	2.2	63	LQM S4UL
	Boron	N/A	290	11,000	45	240,000	21,000	46,000	LQM S4UL
	Cadmium	N/A	26	149	4.9	410	220	880	DEFRA C4SL
	Chromium (III)	N/A	910	910	18,000	8,600	1,500	33,000	LQM S4UL
	Chromium (VI)	N/A	21.0	21.0	170.0	49	23.0	250	DEFRA C4SL
	Copper	N/A	2,400	7,100	520	68,000	12,000	44,000	LQM S4UL
	Lead	N/A	200	310	80	2,330	630	1,300	DEFRA C4SL
	Elemental Mercury	N/A	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}	LQM S4UL
	Inorganic Mercury	N/A	40	56	19	1,100	120	240	LQM S4UL
	Methylmercury	N/A	11	15	6.0	320	40	68	LQM S4UL
	Nickel (2015 update)	N/A	130	180	53	980	230	800	LQM S4UL
	Selenium	N/A	250	430	88	12,000	1,100	1,800	LQM S4UL
	Vanadium	N/A	410	1,200	91	9,000	2,000	5,000	LQM S4UL
Zinc	N/A	3,700	40,000	620	730,000	81,000	170,000	LQM S4UL	
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000	LQM S4UL
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000	LQM S4UL
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000	LQM S4UL
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000	LQM S4UL
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000	LQM S4UL
		2.5%	5,400	35,000	950	540,000	74,000	150,000	LQM S4UL
		6%	11,000	37,000	2,200	540,000	74,000	150,000	LQM S4UL
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49	LQM S4UL
		2.5%	11	14	6.5	170	29	56	LQM S4UL
		6%	13	15	13	180	29	62	LQM S4UL
	Benzo(a)pyrene (only)	1%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		2.5%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		6%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
	Benzo(a)pyrene (surrogate marker Coal Tar)	1%	0.8	1.2	0.32	15	2.2	4	LQM S4UL
		2.5%	1.0	1.2	0.67	15	2.2	5	LQM S4UL
		6%	1.1	1.2	1.20	15	2.2	5	LQM S4UL
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13	LQM S4UL
		2.5%	3.3	4.0	2.1	44	7.2	15	LQM S4UL
		6%	3.7	4.0	3.9	45	7.2	16	LQM S4UL
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400	LQM S4UL
		2.5%	340	360	470	4,000	640	1,500	LQM S4UL
		6%	350	360	640	4,000	640	1,600	LQM S4UL
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370	LQM S4UL
		2.5%	93	110	75	1,200	190	410	LQM S4UL
		6%	100	110	130	1,200	190	440	LQM S4UL
	Chrysene	1%	15	30	4.1	350	57	93	LQM S4UL
		2.5%	22	31	9.4	350	57	110	LQM S4UL
		6%	27	32	19	350	57	120	LQM S4UL
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1	LQM S4UL
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3	LQM S4UL
		6%	0.3	0.32	0.43	3.6	0.58	1.4	LQM S4UL
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300	LQM S4UL
		2.5%	560	1,600	130	23,000	3,100	6,300	LQM S4UL
		6%	890	1,600	290	23,000	3,100	6,400	LQM S4UL
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000	LQM S4UL
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000	LQM S4UL
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000	LQM S4UL
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150	LQM S4UL
		2.5%	36	46	21	510	82	170	LQM S4UL
		6%	41	46	39	510	82	180	LQM S4UL
	Naphthalene	1%	15	15	65	1,600*	11,000*	8,400*	DEFRA C4SL
		2.5%	36	36	130	3,700*	15,000*	17,00*	DEFRA C4SL
		6%	85	85	200	8,400*	1,200*	1,900*	DEFRA C4SL
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200	LQM S4UL
		2.5%	220	1,500	38	22,000	3,100	6,200	LQM S4UL
		6%	440	1,500	90	22,000	3,100	6,300	LQM S4UL
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000	LQM S4UL
		2.5%	1,200	3,800	270	54,000	7,400	15,000	LQM S4UL
		6%	2,000	3,800	620	54,000	7,400	15,000	LQM S4UL
	Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	LQM S4UL
		2.5%	0.98	1.2	0.67	15	2.2	4.7	LQM S4UL
		6%	1.1	1.2	1.2	15	2.2	4.8	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{resi}	POS ^{park}	Source
BTEX Compounds	Benzene	1%	0.87	0.38	0.017	27	72	90	LQM S4UL
		2.5%	0.17	0.70	0.034	47	72	100	LQM S4UL
		6%	0.37	1.4	0.075	90	73	110	LQM S4UL
	Toluene	1%	130	880 (869) ^{vap}	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}	LQM S4UL
		2.5%	290	1,900	51	110,000 (1,920) ^{vap}	56,000	95,000 (1,920) ^{vap}	LQM S4UL
		6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360)	LQM S4UL
	Ethylbenzene	1%	47	83	16	5,700 (518) ^{vap}	24,000	17,000 (518) ^{vap}	LQM S4UL
		2.5%	110	190	39	13,000 (1,220) ^{vap}	24,000	22,000 (1,220) ^{vap}	LQM S4UL
		6%	260	440	91	27,000 (2,840) ^{vap}	25,000	27,000 (2,840) ^{vap}	LQM S4UL
	o-xylene	1%	60	88	28	6,600 (478) ^{sol}	41,000	17,000 (478) ^{sol}	LQM S4UL
		2.5%	140	210	67	15,000 (1,120) ^{sol}	42,000	24,000 (1,120) ^{sol}	LQM S4UL
		6%	330	480	160	33,000 (2,620) ^{sol}	43,000	33,000 (2,620) ^{sol}	LQM S4UL
	m-xylene	1%	59	82	31	6,200 (625) ^{vap}	41,000	17,000 (625) ^{vap}	LQM S4UL
		2.5%	140	190	74	14,000 (1,470) ^{vap}	42,000	24,000 (1,470) ^{vap}	LQM S4UL
		6%	320	450	170	31,000 (3,460) ^{vap}	43,000	32,000 (3,460) ^{vap}	LQM S4UL
	p-xylene	1%	56	79	29	5,900 (576) ^{sol}	41,000	17,000 (576) ^{sol}	LQM S4UL
		2.5%	130	180	69	14,000 (1,350) ^{sol}	42,000	23,000 (1,350) ^{sol}	LQM S4UL
		6%	310	430	160	30,000 (3,170) ^{sol}	43,000	31,000 (3,170) ^{sol}	LQM S4UL
Aliphatic									
EC 5-6	1%	42	42	730	3,200 (304) ^{sol}	570,000(304) ^{sol}	95,000 (304) ^{sol}	LQM S4UL	
EC>6-8	1%	100	100	2,300	7,800 (144) ^{sol}	600,000	150,000 (144) ^{sol}	LQM S4UL	
EC>8-10	1%	27	27	320	2,000 (78) ^{sol}	13,000	14,000 (78) ^{vap}	LQM S4UL	
EC>10-12	1%	130 (48) ^{vap}	130 (48) ^{vap}	2,200	9,700 (48) ^{sol}	13,000	21,000 (48) ^{vap}	LQM S4UL	
EC>12-16	1%	1,100 (24) ^{sol}	1,100 (24) ^{sol}	11,000	59,000 (24) ^{sol}	13,000	25,000 (24) ^{sol}	LQM S4UL	
EC>16-35	1%	65,000 (8.48)	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f	LQM S4UL	
EC>35-44	1%	65,000 (8.48)	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f	LQM S4UL	
Aliphatic									
EC 5-6	2.5%	78	78	1,700	5,900 (558) ^{sol}	590,000	130,000 (558) ^{sol}	LQM S4UL	
EC>6-8	2.5%	230	230	5,600	17,000 (322) ^{sol}	610,000	220,000 (322) ^{sol}	LQM S4UL	
EC>8-10	2.5%	65	65	770	4,800 (190) ^{vap}	13,000	18,000 (190) ^{vap}	LQM S4UL	
EC>10-12	2.5%	330 (118) ^{vap}	330 (118) ^{vap}	4,400	23,000 (118) ^{vap}	13,000	23,000 (118) ^{vap}	LQM S4UL	
EC>12-16	2.5%	2,400 (59) ^{sol}	2,400 (59) ^{sol}	13,000	82,000 (59) ^{sol}	13,000	25,000 (59) ^{sol}	LQM S4UL	
EC>16-35	2.5%	92,000 (21)	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f	LQM S4UL	
EC>35-44	2.5%	92,000 (21)	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f	LQM S4UL	
Aliphatic									
EC 5-6	6%	160	160	3,900	12,000 (1,150) ^{sol}	600,000	180,000 (1,150)	LQM S4UL	
EC>6-8	6%	530	530	13,000	40,000 (736) ^{sol}	620,000	320,000 (736) ^{sol}	LQM S4UL	
EC>8-10	6%	150	150	1,700	11,000 (451) ^{vap}	13,000	21,000 (451) ^{vap}	LQM S4UL	
EC>10-12	6%	760 (283) ^{vap}	760 (283) ^{vap}	7,300	47,000 (283) ^{vap}	13,000	24,000 (283) ^{vap}	LQM S4UL	
EC>12-16	6%	4,300 (142) ^{sol}	4,400 (142) ^{sol}	13,000	90,000 (142) ^{sol}	13,000	26,000 (142) ^{sol}	LQM S4UL	
EC>16-35	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f	LQM S4UL	
EC>35-44	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	1%	70	370	13	26,000 (1,220) ^{sol}	56,000	76,000 (1,220) ^{sol}	LQM S4UL	
EC>7-8(toluene)	1%	130	860	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}	LQM S4UL	
EC>8-10	1%	34	47	8.6	3,500 (613) ^{vap}	5,000	7,200 (613) ^{vap}	LQM S4UL	
EC>10-12	1%	74	250	13	16,000 (364) ^{sol}	5,000	9,200 (364) ^{sol}	LQM S4UL	
EC>12-16	1%	140	1,800	23	36,000 (169) ^{sol}	5,100	10,000	LQM S4UL	
EC>16-21	1%	260 ^f	1,900 ^f	46 ^f	28,000 ^f	3,800 ^f	7,600 ^f	LQM S4UL	
EC>21-35	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>35-44	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	2.5%	140	690	27	46,000 (2,260) ^{sol}	56,000	84,000 (2,260) ^{sol}	LQM S4UL	
EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) ^{sol}	56,000	95,000 (1,920) ^{sol}	LQM S4UL	
EC>8-10	2.5%	83	110	21	8,100 (1,500) ^{vap}	5,000	8,500 (1,500) ^{vap}	LQM S4UL	
EC>10-12	2.5%	180	590	31	28,000 (899) ^{sol}	5,000	9,700 (899) ^{sol}	LQM S4UL	
EC>12-16	2.5%	330	2,300 (419) ^{sol}	57	37,000	5,100	10,000	LQM S4UL	
EC>16-21	2.5%	540 ^f	1,900 ^f	110 ^f	28,000 ^f	3,800 ^f	7,700 ^f	LQM S4UL	
EC>21-35	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>35-44	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	6%	300	1,400	57	86,000 (4,710) ^{sol}	56,000	92,000 (4,710) ^{sol}	LQM S4UL	
EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360)	LQM S4UL	
EC>8-10	6%	190	270	51	17,000 (3,580) ^{vap}	5,000	9,300 (3,580) ^{vap}	LQM S4UL	
EC>10-12	6%	380	1,200	4	34,000 (2,150) ^{sol}	5,000	10,000	LQM S4UL	
EC>12-16	6%	660	2,500	130	38,000	5,100	10,000	LQM S4UL	
EC>16-21	6%	930 ^f	1,900 ^f	260 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>21-35	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	
EC>35-44	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	
Aliphatic +Aromatic >EC44	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
	6%	1,900 ^f	1,900 ^f	3,000 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{resi}	POS ^{park}	Source
Chloalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	0.0071	0.0092	0.0046	0.67	29	21	LQM S4UL
		2.5%	0.0110	0.0130	0.0083	0.97	29	24	LQM S4UL
		6%	0.0190	0.0230	0.0160	1.7	29	28	LQM S4UL
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) ^{vap}	LQM S4UL
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) ^{vap}	LQM S4UL
		6%	39	40	240	3,000	140,000	100,000 (6,392)	LQM S4UL
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800	LQM S4UL
		2.5%	3.4	8.0	0.89	550	1,400	2,100	LQM S4UL
		6%	7.5	17	2.0	1,100	1,400	2,300	LQM S4UL
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500	LQM S4UL
		2.5%	2.8	3.5	1.9	250	1,400	1,800	LQM S4UL
		6%	6.4	8.2	4.4	560	1,400	2,100	LQM S4UL
	Tetrachloroethene (PCE)	1%	0.31	0.32	2.00	24	3,200	1400	DEFRA C4SL
		2.5%	0.70	0.71	4.8	55	3,300	1900	DEFRA C4SL
		6%	1.60	1.60	11.0	130	3,400	2,500	DEFRA C4SL
	Tetrachloromethane (carbon tetrachloride)	1%	0.03	0.03	0.45	2.9	890	190	LQM S4UL
		2.5%	0.06	0.06	1.0	6.3	920	270	LQM S4UL
		6%	0.13	0.13	2.4	14	950	400	LQM S4UL
	Trichloroethene (TCE)	1%	0.009	0.010	0.032	0.7	76.0	41.0	DEFRA C4SL
		2.5%	0.020	0.020	0.072	1.5	78.0	51.0	DEFRA C4SL
		6%	0.043	0.045	0.160	3.4	79.0	69.0	DEFRA C4SL
	cis 1,2-dichloroethene	1%	0.46	0.50	0.890	38	3,800	2,000	DEFRA C4SL
		2.5%	0.78	0.84	1.70	64	3,800	2,400	DEFRA C4SL
		6%	1.50	1.60	3.60	120	3,900	3,100	DEFRA C4SL
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600	LQM S4UL
		2.5%	1.7	2.1	0.83	170	2,500	2,800	LQM S4UL
		6%	3.4	4.2	1.7	350	2,500	3,100	LQM S4UL
	Trans-1,2 Dichloroethene	1%	0.9	0.9	3.7	69	13,000	5,600	DEFRA C4SL
		2.5%	1.6	1.7	7.5	120	13,000	7,000	DEFRA C4SL
		6%	3.3	3.4	16.0	260	13,000	9,100	DEFRA C4SL
	Chloroethene (vinyl chloride)	1%	0.006	0.015	0.0017	1.1E+00	7.8	18.0	DEFRA C4SL
		2.5%	0.010	0.019	0.0031	1.4E+00	7.8	19.0	DEFRA C4SL
		6%	0.017	0.029	0.0058	2.20	7.8	19.0	DEFRA C4SL
	2,4,6-Trinitrotoluene (TNT)	1%	1.6	65	0.24	1,000	130	260	LQM S4UL
		2.5%	3.7	66	0.58	1,000	130	270	LQM S4UL
		6%	8.1	66	1.4	1,000	130	270	LQM S4UL
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) ^{sol}	LQM S4UL
		2.5%	250	13,000	38	210,000	26,000	51,000	LQM S4UL
		6%	540	13,000	85	210,000	27,000	53,000	LQM S4UL
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) ^{vap}	LQM S4UL
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) ^{vap}	LQM S4UL
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) ^{vap}	LQM S4UL
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30	LQM S4UL
		2.5%	6.6	7.4	6.1	170	18	31	LQM S4UL
		6%	7.1	7.5	9.8	170	18	31	LQM S4UL
	Dieldrin	1%	0.97	7.0	0.17	170	18	30	LQM S4UL
		2.5%	2.0	7.3	0.41	170	18	30	LQM S4UL
		6%	3.5	7.4	0.96	170	18	31	LQM S4UL
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300	LQM S4UL
		2.5%	7.8	620	1.2	9,400	1,200	2,400	LQM S4UL
		6%	17.4	620	2.7	9,400	1,200	2,400	LQM S4UL
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26	LQM S4UL
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26	LQM S4UL
		6%	0.14	6.6	2.2E-02	140	16	27	LQM S4UL
	Endosulfanns (2 isomers)	1%	7.4	160 (3.0E-03) ^{vap}	1.2	5,600 (3.0E-03) ^{vap}	1,200	2,300	LQM S4UL
		2.5%	18	280 (7.0E-03) ^{vap}	2.9	7,400 (7.0E-03) ^{vap}	1,200	2,400	LQM S4UL
		6%	41	410 (1.6E-02) ^{vap}	6.8	8,400 (1.6E-02) ^{vap}	1,200	2,500	LQM S4UL
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15	LQM S4UL
		2.5%	0.2	3.8	3.2E-02	65	8.1	15	LQM S4UL
		6%	0.46	3.8	7.7E-02	65	8.1	16	LQM S4UL
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}	LQM S4UL
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}	LQM S4UL
		6%	2.4	2.4	32	290	14,000	2,900	LQM S4UL
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}	LQM S4UL
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}	LQM S4UL
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}	LQM S4UL
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}	LQM S4UL
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}	LQM S4UL
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}	LQM S4UL
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}	LQM S4UL
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120	LQM S4UL
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130	LQM S4UL
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190	LQM S4UL
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190	LQM S4UL
		6%	22	38	7.0	830	100	190	LQM S4UL
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30	LQM S4UL
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30	LQM S4UL
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	^{POS} resi	^{POS} park	Source
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^g	94	0.13 ^g	3,500	620	1,100	LQM S4UL
		2.5%	2.0	150	0.30	4,000	620	1,100	LQM S4UL
		6%	4.5	210	0.70	4,300	620	1,100	LQM S4UL
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110	LQM S4UL
		2.5%	0.52	29	8.0E-02	400	60	120	LQM S4UL
		6%	1.2	31	0.19	400	60	120	LQM S4UL
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300	LQM S4UL
		2.5%	0.29	0.29	10	22	11,000	1,900	LQM S4UL
		6%	0.62	0.62	23	47	11,000	2,700	LQM S4UL
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48	LQM S4UL
		2.5%	0.7	0.78	0.61	66	25	50	LQM S4UL
		6%	1.6	1.8	1.4	120	25	51	LQM S4UL
	Phenol	1%	120	440 (460)	23	440 ^{dir} (26,000)	440 ^{dir} (10,000)	440 ^{dir} (7,600)	LQM S4UL
		2.5%	200	690	42	690 ^{dir} (30,000)	690 ^{dir} (10,000)	690 ^{dir} (8,300)	LQM S4UL
		6%	380	1,200	83	1,300 ^{dir} (34,000)	1,300 ^{dir} (10,000)	1,300 ^{dir} (9,300)	LQM S4UL
sol/vap = solubility/vapour limit (potentially use if free product identified, although highly conservative)									
* = naphthalene C4SL exceeds the CLEA calculated soil saturation concentration (76 mg kg-1 for 1% SOM, 183 mg kg-1 for 2.5% SOM and 432 mg kg-1 for 6% SOM)									
f = oral, dermal and inhalation exposures compared to oral HCV									
dir = S4ULs based on threshold protective of direct skin contact with phenol)brackets long term exposure for illustration purposes)									
g = derived based on 2,3,4-tetrachlorophenol									

Appendix D- References

¹ CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

² HSE (2012). "Removing Asbestos Cement (AC) Debris." A11 Asbestos Essential – Non-licenced Tasks.

³ CIRIA R97. "Trenching Practice 2nd Edition". CIRIA 1983.

⁴ <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm/lcrm-stage-3-remediation-and-verification>

⁵ YALPAG (2021). "Verification Requirements for Cover Systems: Technical Guidance for Developers, Landowners and Consultants." Yorkshire and Lincolnshire Pollution Advisory Group. V. 4.1-June 2021.

⁶ The British Standards Institution (BSI Standards), April 2015, "Specification for topsoil", BS 3882:2015 - TC.

Based across the UK with
offices in Manchester, Liverpool,
Swindon and Glasgow.

Manchester (Head Office)

Unit 29
Eton Business Park
Eton Hill Rd, Radcliffe
M26 2ZS

0161 763 7200
info@thelkgroup.com

Manchester (Ancoats Office)

84 Silk Street
Ancoats
Manchester
M4 6BJ

0161 763 7200
info@thelkgroup.com

Glasgow

Wright Business Centre
1 Lonmay Road
Glasgow
G33 4EL

0141 773 6269
info@thelkgroup.com

Swindon

39 Bowman House Business Centre
Bowman Court
Whitehill Lane
Royal Wootton Bassett
Swindon
SN4 7DB

01793 987390
info@thelkgroup.com



LK GROUP