# Cedar Mount Academy

## Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy

| Job Number | Report Date | Client |
|---|---|---|
| **LKC261292** | **23rd June 2026** | **Black Cat Building Consultancy** |

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Ground Investigation | Land Remediation | Project Management

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# DOCUMENT QUALITY ASSURANCE

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|---|---|
| **Site Address** | Gorton Education Village, 50 Wembley Road, Manchester, M18 7DT |
| **Report Title** | Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy |
| **Job Number** | LKC261292 |
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| **Written By** | Fraser Peers / Colin Wardle | | |
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# EXECUTIVE SUMMARY

### Site Details

| | |
|---|---|
| **Location** | Within Gorton Education Village, South-west of Wembley Road, Gorton, South-east Manchester.<br>Centred at National Grid Reference 388470E, 394810N. |
| **Area** | 750m$^2$. |
| **Topography** | 64 metres Above Ordnance Datum (AOD).<br>Site is approximately level. |
| **Current Site Use** | Outdoor communal courtyard within the Cedar Mount Academy grounds with covered shelter. |
| **Proposed Development** | Proposed extension to the west of the existing dining hall to include additional seating, a larger queuing area and 'survery' along with increased kitchen storage space. |

### Site Setting

| | |
|---|---|
| **Main Historical Features** | Onsite: Pink Bank Plantation, Pond, Playing Field / Open Space, School.<br>Surrounding Area: Ponds, Nico Ditch, Pit, Reservoir, Gorton Education Village. |
| **Geology / Hydrogeology** | Artificial: No BGS recorded artificial.<br>Superficial: Devensian Till (diamicton). Secondary Undifferentiated Aquifer.<br>Bedrock: Chester Formation (sandstone). Principal aquifer. |
| **Landfills / Infilled Ground** | No recorded landfills. Potentially infilled ground identified. |
| **Recommendations** | A Site Investigation was recommended to further assess geo-environmental and geotechnical risk. |

### Ground Investigation Work Undertaken

| | |
|---|---|
| **Date of Investigation:** | 26th May 2026 |
| **Intrusive Investigation Work Undertaken:** | 2no. window sample boreholes.<br>2no. hand excavated trial pits.<br>Contamination and geotechnical testing.<br>1no. Falling Head Test. |

### Ground Conditions

| | |
|---|---|
| **Made Ground** | Maximum depth of 3.2mbgl (northern area of the site).<br>Generally granular over silt /clay. Anthropogenic material encountered in the made ground comprised brick fragments, ash, clinker, coal, tarmacadam, plastic, concrete and whole bricks.<br>Slight organic odour noted in WS102 (north). |
| **Superficial** | Firm consistency medium to high strength gravelly sandy clay encountered in WS101C and WS102 from 0.70mbgl and 3.20mbgl respectively |
| **Groundwater** | Perched water encountered at 1.70 and 2.00mbgl in WS101C and WS102 respectively. |
| **Obstructions** | WS101, WS101A & WS101B encountered very dense limestone gravel between 0.30-0.56mbgl. |
| **Permeability** | Based on the results of the falling head tests, the permeability at test depth has been calculated within an order of magnitude of 10-6m/sec. |
| **Foundations** | Base of foundations not observed (excavated to 1.2-1.4mbgl). |

## Geotechnical Assessment

| | |
|---|---|
| **Allowable Bearing Pressure** | 70kN/m$^2$ from 3.20mbgl in the firm to stiff CLAY. |
| **Anticipated Foundation Type** | Strip and pad foundations would need to be placed at around 3.20mbgl and are not considered viable or economic. Although piled foundations are viable a ground improvement technique such as vibro granular columns will provide the most reliable and cost-effective option for the site. |
| **Other Considerations** | Geotechnical Category 1.<br>Consideration of effects of trees also needs to be considered.<br>Temporary supports of excavations will be required.<br>Detailed design should be carried out by structural engineer.<br>Concrete Requirements DS2-AC-2. |

## Contamination Risk Assessment

| **Pollutant Linkage** | | **Risk** | **Assessment** |
|---|---|---|---|
| 1 | - | - | No viable human health (direct contact) pollutant linkage. No soft landscaping proposed. |
| 2 | Naphthalene, Unknown volatile organic compounds | Low | Unlikely probability given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential volatiles is not anticipated. No recorded naphthalene above detection limits and TVOC measurements on site did not record significant values.<br>**Recommendation**: No remediation required. |
| 3 | Hazardous / Ground gas: methane, carbon dioxide | Moderate / Low | Unlikely probability given the composition of made ground beneath proposed building, age of made ground and lack of putrescible material encountered within strata. Also given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential gas is not anticipated. Low risk is assumed.<br>**Recommendations:** No remediation required. |
| 4 | PAHs, metals, other organic / inorganic compounds | Low | Unlikely probability given no significant mobile contaminants encountered and superficial till likely to limit the downward migration of contaminants into the Principal Aquifer.<br>**Recommendations:** No remediation required. |
| 5 | Naphthalene, Unknown volatile organic compounds | Low | Unlikely as no recorded naphthalene above detection limits on site.<br>**Recommendations:** No remediation required. |

PL1= Human health risk (direct contact). PL2= Human health (vapours). PL3= Gas risk. PL4= Controlled waters risk. PL5= Potable waters risk.

## Considerations During Development

| **Further Considerations** |
|---|
| Unexpected Contamination |
| Asbestos in Soil Management Plan |
| Stockpile Management |
| Disposal |
| Health and Safety Requirements |

## TABLE OF CONTENTS


**1. Introduction ..... 1**
**2. Summary of Preliminary Risk Assessment (PRA) ..... 2**
2.1. Phase 1 Preliminary Risk Assessment (PRA) ..... 2
2.2. Conceptual Model ..... 2
**3. Ground Investigation ..... 4**
3.1. Site Investigation Design and Methodology ..... 4
3.2. Sampling Protocol ..... 4
3.3. In-situ Testing ..... 5
3.4. Gas Monitoring ..... 5
**4. Ground Conditions ..... 6**
4.1. Geology ..... 6
4.2. Groundwater ..... 7
4.3. Permeability Tests ..... 7
**5. Geotechnical Assessment ..... 8**
5.1. Proposed Development ..... 8
5.2. Summary of Ground Conditions ..... 8
5.3. Foundation Conditions and Bearing Capacity ..... 8
5.4. Ground Floor Slabs ..... 11
5.5. Drainage ..... 11
5.6. Concrete Durability ..... 11
5.7. Excavations ..... 11
5.8. Construction Activity and Inspection ..... 12
**6. Generic Risk Assessment ..... 13**
6.1. Introduction ..... 13
6.2. Soil Risk Assessment ..... 13
6.3. Gas Risk Assessment ..... 14
6.4. Controlled Water Assessment ..... 14
6.5. Potable Water Supply ..... 14
6.6. Revised Contamination Conceptual Model ..... 15
**7. Summary Conclusions ..... 17**
7.1. Ground Conditions ..... 17
7.2. Geotechnical ..... 17
7.3. Contamination Assessment ..... 18
**8. Remediation Strategy ..... 19**
8.1. Other Considerations ..... 19


### Figures


Figure 1 – Site Location and Boundary Plan
Figure 2 – Proposed Development Plan
Figure 3 – Site Investigation Location Plan


### Appendices


Appendix A – Risk Matrix
Appendix B – Profile Logs
Appendix C – Certificates of Analysis (Soil)
Appendix D – Certificates of Analysis (Geotechnical)
Appendix E – Falling Head Tests
Appendix F – Generic Assessment Criteria Values
Appendix G – References

# 1. Introduction

LK Consult Ltd (LKC) has been commissioned to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for Cedar Mount Academy. The investigation was undertaken in support of a planning application to extend the existing food hall.

The following work has previously been undertaken:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC261292-A1-PRA-Cedar Mount Academy R0, dated 19th May 2026).

This investigation has been undertaken to confirm the ground conditions below the site and to allow a contamination and geotechnical assessment to be undertaken.

The investigation will aim to confirm the risks of the potential pollutant linkages identified in the PRA and recommend further assessment / remediation, as required.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary plan. Figure 2 indicates the proposed development.

| | |
|---|---|
| **Location** | Within Gorton Education Village, south-west of Wembley Road, Gorton, south-east Manchester.<br>Centred at National Grid Reference 388470E, 394810N. |
| **Area** | 750m$^2$. |
| **Topography** | 64 metres Above Ordnance Datum (AOD).<br>Site is approximately level. |
| **Current Site Use** | Outdoor communal courtyard within the Cedar Mount Academy grounds with covered shelter. |
| **Proposed Development** | Proposed extension to the west of the existing dining hall to include additional seating, a larger queuing area and 'survery' along with increased kitchen storage space. |

Table 1-1: Summary of site details.

# 2. Summary of Preliminary Risk Assessment (PRA)

## 2.1. Phase 1 Preliminary Risk Assessment (PRA)

Pertinent information has been summarised from the PRA in Table 2-1.

| | |
|---|---|
| **Main Historical Features** | Onsite: Pink Bank Plantation, Pond, Playing Field / Open Space, School.<br>Surrounding Area: Ponds, Nico Ditch, Pit, Reservoir, Gorton Education Village. |
| **Geology / Hydrogeology** | Artificial: No BGS recorded artificial.<br>Superficial: Devensian Till (diamicton). Secondary Undifferentiated Aquifer.<br>Bedrock: Chester Formation (sandstone). Principal aquifer. |
| **Landfills / Infilled Ground** | No recorded landfills. Potentially infilled ground identified. |

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

Table 2-2 summarises the geotechnical constraints.

| | |
|---|---|
| **Coal Mining** | Site is not within a Development High Risk Area. No further assessment required. |
| **Slope Stability** | No further assessment required. |
| **Made Ground** | Unknown depth and constituent of made ground across the site. |
| **Superficial** | Unknown strength of soils for foundation design. |
| **Bedrock** | Unknown depth to bedrock. |
| **Groundwater** | Unknown depth and variability of groundwater. |
| **Plasticity** | Plasticity of clay deposits should be confirmed. |
| **Sulphate** | Unknown sulphate content of the made ground and natural. |

Table 2-2: Summary of geotechnical constraints.

## 2.2. Conceptual Model

The preliminary contamination conceptual model using contaminant-pathway-receptor linkages based on guidance in LCRM[1] has been summarised in Table 2-3.

Each pollutant linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552[2]. The risk matrix is provided in Appendix A.

Due to the minor consequence associated with the phytotoxic effect to flora (i.e., loss of plants in a landscaping scheme), the overall risk for most sites will be very low to low. Where soils contain significant concentrations of heavy metals, in general there will other pollutant linkages (i.e., the risk to human health) that will trigger the requirement for remediation (e.g., a clean environmental cover system). As such the risk to flora associated with phytotoxic contaminants will not be considered further.

The risk to buildings associated with elevated sulphate will be considered as part of the geotechnical assessment and will not be included in the contamination risk assessment.

| PL | Contaminants of Concern (source) | Pathway | Receptor | Probability | Consequence | Risk | Assessment and Recommendations |
|---|---|---|---|---|---|---|---|
| 1 | - | - | - | - | - | - | No viable human health (direct contact) pollutant linkage. No soft landscaping proposed. |
| 2 | Naphthalene (PAHs - ash in made ground)<br>Unknown volatile organic compounds (made ground – infilled pond) | Inhalation of vapours.<br>Migration via permeable strata and preferential pathways. | Future site users. | Unlikely | Medium | Low | Unlikely probability given the nature of the development (kitchens / dining area is assumed to be well ventilated), there does not appear to be any confined spaces, and the build-up of potential volatiles is not anticipated.<br>**Recommendation**: Investigation work to confirm the ground conditions. No testing required unless evidence of significant volatile contaminants noted within the soil. |
| 3 | Hazardous / Ground gas: methane, carbon dioxide (made ground – infilled pond) | Migration via permeable strata and preferential pathways.<br>Inhalation of gas.<br>Explosion in confined spaces. | Future site users.<br>Buildings. | Unlikely | Severe | Moderate / Low | Unlikely probability given age of infilled pond onsite and surrounding historical infilled features.<br>**Recommendations:** Investigation work to confirm the ground conditions. Gas monitoring / precautionary gas protection measures only required if there is a significant gas source identified. |
| 4 | PAHs, metals, other organic / inorganic compounds (made ground – infilled pond) | Migration via permeable strata.<br>Perched waters migration. | Groundwater | Unlikely | Medium | Low | Unlikely probability given significant mobile contaminants not anticipated (given size of feature) and superficial till likely to limit the downward migration of contaminants into the Principal Aquifer.<br>**Recommendations:** Investigation work to confirm the ground conditions. No water sampling or leaching tests required unless evidence of significant potentially mobile contamination is identified in the soil. |
| 5 | Naphthalene (ash in made ground)<br>Unknown organic compounds (made ground – infilled pond) | Permeation of pipes.<br>Ingestion of tainted water supply. | Future site users.<br>Water pipes. | Likely | Medium | Moderate | Likely as made ground (of unknown constituents) could be present at potential pipeline depth.<br>**Recommendations:** Confirmation of depth and location of potable water pipes in the proposed extension area. If present within the made ground, sampling and analysis of soils at anticipated pipeline depths (c. 0.75-1.35mbgl). Water pipe assessment required. |

Table 2-3: Preliminary Contamination Conceptual Model.

# 3. Ground Investigation

## 3.1. Site Investigation Design and Methodology

The investigation was carried out on 26th May 2026 and comprised the following:

- 2no. window sample boreholes drilled to maximum 5.45 metres below ground level (mbgl) (ref. WS101(A-C) to WS102).
- 1no. falling head test carried out in WS101C.
- 2no. hand dug foundation pits (using hand auger / spade) excavated to 1.20-1.40mbgl adjacent to the existing building (ref. FP101-FP102).

All site investigation locations are shown in Figure 3.

The locations were chosen to allow adequate assessment of ground conditions across the extension area.
WS101 had to be re-positioned three times due to very dense made ground (unable to penetrate). The repositioned boreholes are referenced WS101A, WS101B & WS101C. The final position of the window sample boreholes (where a depth of 5.45mbgl was achieved) was to the west of the proposed extension area.

All profile logs are provided in Appendix B and are in line with BS14688-1[4] and BS5930[5].

## 3.2. Sampling Protocol

*3.2.1. Soil Sampling (Contamination)*

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation[7].

Soil was collected for onsite testing for total volatile organic compounds (TVOCs) using a photoionisation detector (PID) fitted with a 10.6eV lamp and moisture trap. A plastic zip bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested. Results of the PID readings are presented on the profile logs (Appendix B). The onsite monitoring was carried out in line CIRIA C665[8] to aid in screening samples for volatile analysis.

Soil samples of approximately 500g were recovered in amber jars and plastic tubs. All the samples were sent to DETS laboratory for chemical testing.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix C. Table 3-2 shows the soil testing undertaken.

| Testing | No. Samples | Justification |
|---|---|---|
| Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen. | 2 | A basic suite with a broad selection of contaminants where no significant evidence of contamination was identified (except for rare to occasional brick, tarmacadam, plastic, ash and concrete). |

Table 3-1: Summary of Soil Testing.
Notes:
If asbestos present during screen identification and quantification will be undertaken.
Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, and boron; SOM=Soil Organic Matter.

*3.2.2. Soil Sampling (Geotechnical)*

Soil samples taken during the investigation were collected in tubs and bulk bags, to be sent to Murray Rix Laboratories and Dets for geotechnical testing.

Further details are given in the laboratory report presented in Appendices C and D. Table 3-3 shows the geotechnical testing undertaken.

| Testing | No. Samples |
|---|---|
| Atterberg Limits (plasticity testing) | 2 |
| BRE Suite Short | 2 |

Table 3-2: Summary of Geotechnical Testing Undertaken.

Additional pH and water soluble sulphate tests were also included in the contamination results (Appendix C).

*3.2.3. Water Sampling / Leaching Testing*

Groundwater sampling / leaching testing was not carried out as part of this investigation.

A low risk was identified in the preliminary contamination conceptual model for controlled waters (Pollutant Linkage 4) and further action was only recommended if significant soil contamination was identified on site. Based on the ground conditions encountered, LKC did not consider testing to be required. This is discussed further in Section 6.4.

## 3.3. In-situ Testing

*3.3.1. Geotechnical Testing*

In-situ geotechnical tests were performed in the boreholes to further characterise the sub-soil conditions. The following tests were undertaken:

- Standard Penetration Tests (SPTs) were performed in the window sample boreholes at approximately 1m intervals.
- Pocket penetrometer tests (giving undrained shear strength) were performed in the window sample boreholes within cohesive strata.

Pocket penetrometer tests were not always possible due to the friable or gravel rich nature of some of the clay deposits.

The results are provided within Appendix B.

*3.3.2. Falling Head Test*

LKC undertook a falling head test in WS101C to assess the permeability of the ground. The tests were carried out in general accordance with guidance given in BS5930[9] and BS22282[10].

The tests were carried out in the window sample casing within the borehole during drilling work.

The results are presented in Appendix E.

## 3.4. Gas Monitoring

Gas monitoring was not carried out as part of this investigation.

A moderate / low risk was identified in the preliminary contamination conceptual model for gas (Pollutant Linkage 3) and further action was only recommended if significant organic / putrescible material was identified on site. Based on the ground conditions encountered, LKC did not consider gas monitoring to be required. This is discussed further in Section 6.3.

# 4. Ground Conditions

## 4.1. Geology

The ground conditions beneath the site are summarised below. Logs are provided in Appendix B.

*4.1.1. Made Ground*

Locations excavated in the south (WS101(A-C)) on the grassed area encountered gravelly slightly silty sand to between 0.10-0.40mbgl, underlain by a limestone gravel to at least 0.30-0.56mbgl (in WS101(A-B).

WS101C encountered gravelly sandy clay from 0.40mbgl to 0.70mbgl.

Locations carried out in the north, within the school yard (WS102, FP101 & FP102) encountered tarmacadam to 0.10mbgl over a limestone gravel sub-base to 0.25-0.30mbgl.

FP101 & FP102 encountered sandy gravel with varying quantities of anthropogenic material to the base of the pits.

WS102 encountered gravelly clayey sand from beneath the limestone gravel at 0.30mbgl to 2.20mbgl beneath which is a sandy silt with rare brick fragments and slight organic odour to 3.20mbgl.

The deeper made ground in the north is assumed to be associated with the former pond in this area of the site.

Anthropogenic material encountered in the made ground comprised brick fragments, ash, clinker, coal, tarmacadam, plastic, concrete and whole bricks.

*4.1.2. Natural Strata*

Superficial strata was encountered in WS101C and WS102 from 0.70mbgl and 3.20mbgl respectively to completion at 5.45mbgl. In both locations the superficial comprised firm consistency medium to high strength gravelly sandy clay.

WS101C encountered a band of gravelly clayey sand between 1.70mbgl to 2.00mbgl.

*4.1.3. Contamination*

There was no visual / olfactory evidence of hydrocarbons or volatile contaminants in any locations. The PID recorded a maximum of 0.5ppm TVOC in the samples.

*4.1.4. Obstructions*

WS101, WS101A & WS101B encountered very dense limestone gravel between 0.30-0.56mbgl, which could not be penetrated by hand digging.

*4.1.5. Foundation Pits*

2no. foundations pits were undertaken, FP101 on the eastern wall and FP102 in the northern wall.

FP101 encountered concrete to the base of the pit (1.4mbgl) with steps out at 0.47mbgl and 0.61mbgl. The depth to the base of the concrete was not confirmed. Polystyrene was present along the outer edge of the concrete.

FP102 encountered breeze blocks to the base of the pit (1.2mbgl). The depth to the base of the breeze blocks was not confirmed.

## 4.2. Groundwater

*4.2.1. Groundwater Levels*

Groundwater strikes were recorded during the investigation in the boreholes. This data is provided in the profile logs (Appendix B). Perched groundwater strikes were recorded at 1.70mbgl and 2.00mbgl in WS101C and WS102 respectively. True groundwater was not encountered in any locations.

*4.2.2. Contamination*

No evidence of contamination was identified in the groundwater during investigation work or monitoring. No free phase hydrocarbons were detected.

## 4.3. Permeability Tests

*4.3.1. Falling Head Tests*

The results of the falling head tests are presented in Appendix E.

BS5930[11] indicates that if '$H_o$' is taken as the groundwater 'Head' above baseline conditions following the addition of water at the start of the permeability test; and 'H' is the measured groundwater 'Head' above baseline conditions at any given time during the test, then the time taken to reach a head ratio ($H/H_o$) of 0.37 is used to calculate the permeability of the soils.

Where slow progress was observed and $H/H_o$ of 0.37 could not be reached in the field, the basic lag time was calculated using the available data.

Based on the results of the falling head tests, the permeability at test depth has been calculated within an order of magnitude of $10^{-6}$m/sec.

# 5. Geotechnical Assessment

## 5.1. Proposed Development

It is understood that the proposed development will comprise an extension to the existing dining hall. Details of the proposed loadings are not known and therefore a line loading of 75kN/m has been assumed for preliminary assessment purposes only.

The finished ground levels have not been provided and it is therefore anticipated that they will not vary significantly from current levels. However, should the development proposals or finished levels be altered then the comments/recommendations in this section may require revising.

The depths of any underground engineering works (sewers etc.) are unknown and therefore have not been considered in the following assessment. Any such works should be designed so as not to influence, or compromise, proposed or existing foundations or ground stability.

Given the nature of the proposed development the structure meets the criteria of Geotechnical Category 1 of Eurocode 7[12].

Given the nature of the development the acceptable risk from settlement is a total settlement value of 25mm for a masonry structure.

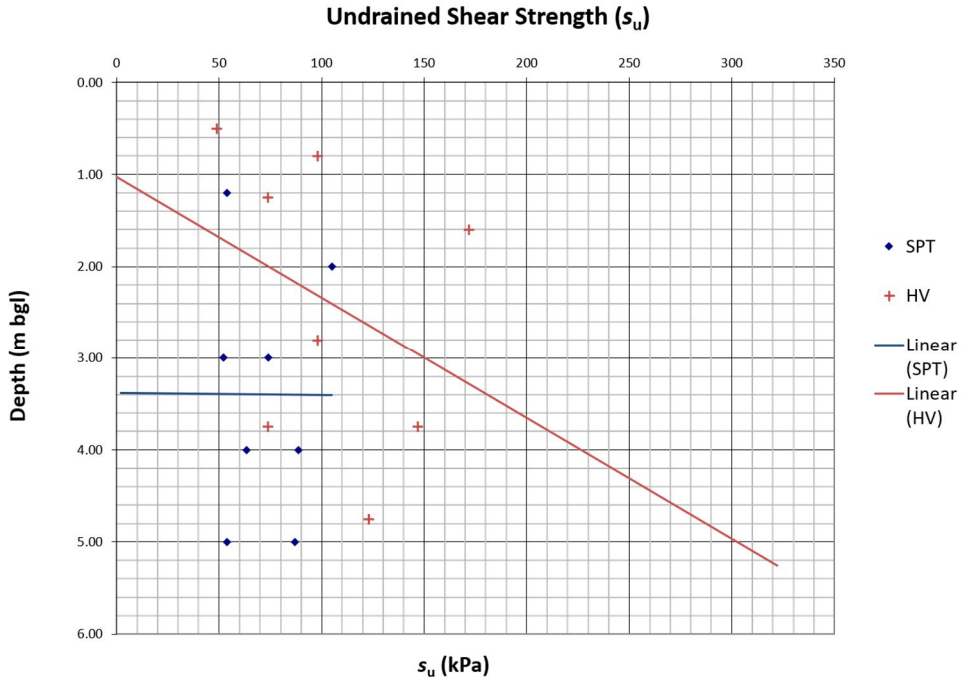
## 5.2. Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1, and typically comprises made ground up to 3.20mbgl over natural granular and cohesive superficial deposits of sand and clay to the completion depths investigated.

## 5.3. Foundation Conditions and Bearing Capacity

*5.3.1. General*

The natural cohesive material has been assessed using in-situ testing by SPT, and Pocket Penetrometer (PP) to obtain the undrained shear strength ($s_u$) of the material. The results of the testing have been plotted against depth and is shown in Graph 5-1.




Graph 5-1: Summary of $S_u$ Vs. Depth from In-Situ and PP Testing.

Graph 5-1 demonstrates that the strength of the cohesive deposits to be fairly uniform throughout depth, with results of SPTs giving $s_u$'s of between 52 and 105kPa, averaging 72kPa. The results of the PP's are more varied, ranging between 49 and 172kPa, disregarding the two high values of 174 and 149kPa which are considered to be due to encountering gravel, an average $s_u$ of 86 kPa is obtained.

It is considered that the natural superficial cohesive material will offer an $s_u$ of 70kPa.

*5.3.2. Plasticity*

Clay samples were subjected to Atterberg Limits (plasticity) and Moisture Content testing. Results are provided in Appendix D.

The clay is classified as medium plasticity.

The modified plasticity index as detailed in Chapter 4.2-D5 of the NHBC standards (modified plasticity index = plasticity index x % less than 425µm sieve / 100%) characterises the clay as having a modified plasticity index of 22 – 23%, returning a medium volume change potential.

*5.3.3. Foundations Options*

Two hand excavated foundation inspection pits have been undertaken against the existing buildings as shown on Figure 3. The foundation pits were advanced to a maximum depth of 1.40mbgl however the depth of the foundations was not proven in either exploratory hole.

The made ground is not suitable for a founding material due to the inherent variability of the material. Foundation options are therefore:

- Deep strip foundations into the underlying firm to stiff Clay.
- Conventional strip footings on vibro granular columns.
- Pad foundations; and
- Deeper pile foundations.

These options are discussed in the following Sections.

*5.3.4. Strip Foundations*

Deep strip foundations should be constructed at least 150mm into the underlying firm to stiff clay encountered below 3.20mbgl at the location of WS102 which is in the centre of the footprint of the proposed extension. At this depth an Allowable Bearing Capacity of 120kN/m² has been calculated using a Factor of Safety of 3 and an undrained shear strength of 70kN/m² taken from Graph 5.1.

Atterberg Limit determinations, summarised in Section 5.4.2, show the clay to be of medium plasticity and as such the sides of the foundations may require protection using clay board or similar.

Foundations deeper than 2.50mbgl require specialist structural engineer design and 3mbgl is considered the practical depth limit for strip foundations, as such it is not considered feasible to use strip foundations without some form of ground improvement.

*5.3.5. Ground Improvement*

The use of ground improvement techniques such as vibro granular columns will allow shallow foundations to be utilised within the made ground. The vibro granular columns should provide an Allowable Bearing Capacity of around 150kN/m² but will also remove variability within the made ground. Specialist advice should be sought from a suitably experienced contractor regarding Allowable Bearing Capacity and settlements.

It should be noted that the stone columns provide a pathway for gas and vapour migration, and additional mitigation measures may be required to help prevent the ingress into properties.

*5.3.6. Pad Foundations*

Based upon the $s_u$ obtained from the in-situ testing of cohesive natural strata, an assessment has been made on a pad foundation supporting column loads. For preliminary assessment purposes, two size pads ($1m^2$ and $2m^2$) have been considered at a depth of 3.50mbgl.

The Bearing Capacity values were calculated applying Design Approach 1 of Eurocode 7 with Combinations 1 and 2, where partial factors were applied to actions and ground parameters, respectively. For the partial factor Rv on bearing capacity, the value used is 1.5 instead of 1.0 for a more conservative value.

No additional loads (live or static or horizontal) have been added as surcharge into the analysis.

The following analysis are for assessment purposes only and foundation design should be undertaken by a specialist contractor.

In the preliminary analysis, undrained shear strength values of 70kPa are used at a depth 3.50mbgl. Groundwater was assumed to be present at 7.00mbgl. The assumed unit weight of $19kN/m^3$ for the CLAY.

| Pad Size | Pad Depth (mbgl) | Combination 1 | Combination 2 |
|---|---|---|---|
| | | Allowable Load (kN) | Allowable Load (kN) |
| $1m^2$ (1.00m x 1.00m) | 3.50 | 176 | 183 |
| $2m^2$ (1.42m x 1.42m) | | 360 | 376 |

Table 5-1: Summary of Pad ABC.

Table 5-1 shows that a bearing resistance of approximately $176kN/m^2$ is achieved with a pad size of $1m^2$ and $360kN/m^2$ with a pad size of $2m^2$ at depth of 3.50mbgl using the more conservative Combination 1 of EC7 Design Approach 1.

The above is for assessment purposes only, foundation design should be undertaken by a specialist contractor.

*5.3.7. Piled Foundations*

As an alternative, consideration may be given to the use of piled foundations to transfer loadings through any deep made ground / poor ground conditions and bear within the firm to stiff clay encountered below 3.20mbgl.

Bored piles are recommended due to the presence of infrastructure buildings in the local area that could be affected by vibrations, should driven piles be used. However, arisings from bored piles will have to be disposed of.

Casing is required while drilling the piles due to the presence of granular material within the made ground. This will help minimise ground disturbance and prevent collapse into the borehole causing areas of weakness.

For preliminary purposes the following initial pile carrying capacities have been calculated. When undertaking these preliminary calculations, the following parameters have been used:

- Modelling based on assumed strata of made ground to 3.20mbgl, natural clay to >5.45mbgl.
- Groundwater not present.
- The made ground has an assumed unit weight of $18.00kN/m^3$.
- Average undrained shear strength value of 70kPa within the clay (conservative Nc value of $9^{13}$).
- Adhesion Factor of 0.45 for a bored pile.
- Global Factor of Safety of 3.
- Assuming no shaft friction in the made ground.
- This does not consider the potential for negative skin friction due to settlement of the made ground.
- Settlement of pile has not been considered.

| Depth (mbgl) | Pile Carrying Capacity (kN) | | |
|---|---|---|---|
| | 300mm dia | 450mm dia | 600mm dia |
| 5 | 39 | 72 | 114 |
| 6 | 51 | 90 | 138 |

Table 5-2: Preliminary Pile Carrying Capacity.

The above examples are not intended to constitute any form of recommendation regarding pile size or type, but merely to illustrate the use of above ground coefficients. Pile design should be undertaken by a specialist contractor to allow them to reduce the Factor or Safety based on their extensive pile testing data and for the design of appropriate piling scheme.

Up to 3.20m of made ground has been recorded within the exploratory holes and consideration must be given to the potential for negative skin friction to influence the piles.

Should a piled foundation solution be the preferred option, then warranty providers such as LABC, may require further information on ground conditions to a minimum of 5m below the base of the pile.

*5.3.8. Foundation Recommendations*

Deep strip foundations and pad foundations below 3.20m depth are generally not economic and whilst a piling solution is viable a ground improvement technique such as vibro granular columns will provide the most reliable and cost-effective option for the site.

## 5.4. Ground Floor Slabs

Due to the presence of substantial thickness of made ground across the site ground bearing floor slabs, whilst viable, will require detailed design to accommodate variability of the formation and account for differential settlement.

If vibro granular columns are used for the foundations, then this could be extended to the floor slab to improve formation conditions and reduce the risk of damage from settlement. However, it may be more reliable to opt for suspended floor slabs.

Where suspended floor slabs are employed ventilation of the under-floor void will be required to address condensation issues. This would also assist in the mitigation of potential gas ingress issues.

## 5.5. Drainage

The presence of substantial depths of made ground across the site may result in settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

The soil infiltration tests show some soakage potential for the made ground; however, the underlying clay is likely to be of low permeability. Therefore, as the lateral continuity of the made ground cannot be assured it is not recommended that soakaways are used for disposal of surface water runoff.

## 5.6. Concrete Durability

Based upon the results of the chemical analyses (Appendix C), subsurface concrete can be designed in accordance with Design Sulphate Class DS-2, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-2 in accordance with the recommendations provided in BRE Special Digest 1 (2005).

## 5.7. Excavations

Site observations indicated that excavations should be feasible in the near surface with normal plant, however obstructions were identified in the near surface including very dense limestone gravel (sub-base). It is anticipated that any obstructions will be grubbed out during the reduced level dig for the sub structure works.

Due to the variability of the made ground all excavations should be supported or battered back in accordance with guidance contained in CIRIA R97[14].

## 5.8. Construction Activity and 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 R97[15] utilised.
- De-watering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond.
- Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan. Particular account should be taken of the gas risk.
- The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

# 6. Generic Risk Assessment

## 6.1. Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM[16]). Information gathered from the risk assessment has been collated in the revised contamination conceptual model in Section 6.6.

## 6.2. Soil Risk Assessment

### *6.2.1. Methodology*

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs) [17, 18].
- LQM Suitable 4 Use Levels (S4ULs) [19, 20, 21, 22, 23].

The proposed development is for a school food hall extension with no soft landscaping. As a conservative measure, the assessment criteria for residential use without plant uptake has been used as this takes into account the presence of buildings and the most sensitive receptors.

All criteria have been generated using the CLEA V1.06 model[24] based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

A summary of the generic assessment criteria used in this assessment is provided in Appendix F.

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

Based on this distribution of data LKC considers B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

### *6.2.2. Soil Results Comparison against Assessment Criteria*

All analysis sheets are presented in Appendix C.

Results have been compared to the relevant assessment criteria and no elevated contaminants were identified.

Asbestos was identified, as detailed in Table 6-1.

| Sample Location | ID | Type | Total Asbestos (%) |
|---|---|---|---|
| WS102 (0.30-1.00m) | Amosite | Microscopic board fragment | 0.008 |

Table 6-1: Details of Asbestos Identified.

### *6.2.3. Direct Contact Risk – Pollutant Linkage 1*

No elevated contaminants have been identified. However, amosite asbestos was identified in WS102.

The development does not include any soft landscaping therefore there is no pathway or pollutant linkage associated with the asbestos within the soil once the development is complete.

However, further consideration will be required during construction to ensure that appropriate measures are in place to limit the risk to construction workers and nearby land users (including school users). This is discussed further in Section 8.2.

### *6.2.4. Risk from Inhalation of Vapours – Pollutant Linkage 2*

No visual / olfactory evidence of volatile contaminants was identified during the investigation. The PID did not detect any significant TVOCs.

LKC therefore consider the probability of volatile contaminants affecting site users as unlikely. The consequence is expected to be medium, giving a low risk and no remediation is required.

## 6.3. Gas Risk Assessment

Gas monitoring was not carried out as part of this assessment. The PRA identified a moderate / low risk and recommended further assessment if a significant gas source was identified.

Made ground was recorded to a maximum depth of 3.20mbgl in WS102 (northern area of the proposed development) which is likely to be associated with the former pond in this area of the site.

The slightly organic nature of the deeper made ground (slight organic odour sandy silt at 2.20-3.20mbgl) is assumed to be associated with the base of the former pond. Given the age of the pond (not present since 1938 mapping) and minimal organic matter, it is considered unlikely that this material would be a significant source of gas. The made ground above (0.30-2.20mbgl) comprised clayey sand with some anthropogenic material including brick, ash and clinker. No organic or putrescible material was encountered at this depth.

NF94 highlights that 'substantial proportions of putrescible materials such as vegetation, food waste, paper, cardboard, wood are required to be a source of gas in the ground.' There was no observable organic matter or putrescible matter in the made ground sand or silt (just a slight odour). Given only a slight organic odour, a low PID measurement and absence of organic material this stratum is not considered to be a significant source of gas.

It is expected that the foundations will include sub-floor ventilation, which will limit the migration of potential gas into the extension. The proposed extension is a dining extension including a survery and kitchen. There are no confined spaces, and the rooms are assumed to require ventilation given the nature of their use.

LKC considers the probability of gas posing a risk to site users as unlikely. The consequence is severe, which gives a moderate / low risk. Given the known ground conditions, LKC considers there to be a low risk and no further action is required with respect to Pollutant Linkage 3.

## 6.4. Controlled Water Assessment

The PRA identified a low risk with respect to controlled waters as no significant source of mobile contamination was anticipated. Furthermore, although a Principal Aquifer is present below the site, no abstractions have been identified within influencing distance and the site is not located in a Source Protection Zone. The surface water is not considered to be a significant receptor. Given the absence of any true groundwater and the presence of clay superficial strata it is unlikely any contamination will be a risk to the principal aquifer.

No evidence of significant mobile contamination was identified on the site, there were no exceedances encountered for metals and PAHs in the soils.

The site investigation did not identify any significant sources of likely mobile contamination within the soils. This confirms an unlikely probability of onsite contamination affecting controlled waters. With a medium consequence the risk is anticipated to be low, and no remediation is required.

## 6.5. Potable Water Supply

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination. Only contaminants of concern, based on the preliminary conceptual model and ground conditions encountered, were analysed.

No elevated VOCs (based on naphthalene only) have been identified in the made ground tested across site.

The probability of organic contaminants affecting potable water pipes is unlikely. Given the consequence is considered to be medium, the risk (Pollutant Linkage 5) is anticipated to be low and no remediation is likely to be required.

## 6.6. Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-3) has been revised following the risk assessments undertaken in Sections 6.1-6.5. The revised contamination conceptual model follows the same methodology and guidance used in the preliminary contamination conceptual model. The risk matrix is provided in Appendix A.

The revised contamination conceptual model is presented in Table 6-2.

Where a very low risk or low risk is identified no specific remediation is required.

Where there is a moderate / low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

| PL | Contaminants of Concern (source) | Pathway | Receptor | Probability | Consequence | Risk | Recommendations |
|---|---|---|---|---|---|---|---|
| 1 | - | - | - | - | - | - | No viable human health (direct contact) pollutant linkage. No soft landscaping proposed. |
| 2 | Naphthalene (PAHs - ash in made ground)<br>Unknown volatile organic compounds (made ground – infilled pond) | Inhalation of vapours.<br>Migration via permeable strata and preferential pathways. | Future site users. | Unlikely | Medium | Low | Unlikely probability given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential volatiles is not anticipated. No recorded naphthalene above detection limits and TVOC measurements on site did not record significant values.<br>**Recommendation**: No remediation required. |
| 3 | Hazardous / Ground gas: methane, carbon dioxide (made ground – infilled pond) | Migration via permeable strata and preferential pathways.<br>Inhalation of gas.<br>Explosion in confined spaces. | Future site users.<br>Buildings. | Unlikely | Severe | Moderate / Low | Unlikely probability given the composition of made ground beneath proposed building, age of made ground and lack of putrescible material encountered within strata. Also given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential gas is not anticipated. Low risk is assumed.<br>**Recommendations:** No remediation required. |
| 4 | PAHs, metals, other organic / inorganic compounds (made ground – infilled pond) | Migration via permeable strata.<br>Perched waters migration. | Groundwater | Unlikely | Medium | Low | Unlikely probability given no significant mobile contaminants encountered and superficial till likely to limit the downward migration of contaminants into the Principal Aquifer.<br>**Recommendations:** No remediation required. |
| 5 | Naphthalene (ash in made ground)<br>Unknown organic compounds (made ground – infilled pond) | Permeation of pipes.<br>Ingestion of tainted water supply. | Future site users.<br>Water pipes. | Unlikely | Medium | Low | Unlikely as no recorded naphthalene above detection limits on site.<br>**Recommendations:** No remediation required. |

Table 6-2: Revised Contamination Conceptual Model.

# 7. Summary Conclusions

## 7.1. Ground Conditions

Ground conditions are summarised in Table 7-1 below.

| | |
|---|---|
| **Made Ground** | Maximum depth of 3.2mbgl (northern area of the site).<br>Generally granular over silt /clay. Anthropogenic material encountered in the made ground comprised brick fragments, ash, clinker, coal, tarmacadam, plastic, concrete and whole bricks.<br>Slight organic odour noted in WS102 (north). |
| **Superficial** | Firm consistency medium to high strength gravelly sandy clay encountered in WS101C and WS102 from 0.70mbgl and 3.20mbgl respectively. |
| **Groundwater** | Perched water encountered at 1.70 and 2.00mbgl in WS101C and WS102 respectively. |
| **Obstructions** | WS101, WS101A & WS101B encountered very dense limestone gravel between 0.30-0.56mbgl (unable to dig through). |
| **Permeability** | Based on the results of the falling head tests, the permeability at test depth has been calculated within an order of magnitude of 10-6m/sec. |
| **Foundations** | Base of foundations not observed (excavated to 1.2-1.4mbgl). |

Table 7-1: Summary of Ground Conditions.

## 7.2. Geotechnical

Geotechnical observations and conclusions are contained in Table 7-2 below, more detailed discussions are contained within Section 5.

| | |
|---|---|
| **Geotechnical Category** | The proposed development is considered to fall within Geotechnical Category 1 of Eurocode 7. |
| **Exposed Existing Foundations** | FP101 and FP102: External pits were advanced to depths of 1.40m and 1.20mbgl respectively. The base of the foundations were not reached in either pit. |
| **Allowable Bearing Pressure** | 70kN/m$^2$ from 3.20mbgl in the firm to stiff CLAY. |
| **Anticipated Foundation Type** | Strip and pad foundations would need to be placed at around 3.20mbgl and are not considered viable or economic. Although piled foundations are viable a ground improvement technique such as vibro granular columns will provide the most reliable and cost-effective option for the site. |
| **Shallow Groundwater** | Shallow groundwater was not recorded within any of the exploratory holes. |
| **Concrete Requirements** | Based on BRE Digest 2005[36] – DS-2 AC-2 recommended. |
| **Services** | Services – consideration to the presence of services running through the site. Services may need to be re-routed. |
| **Temporary support of excavation** | Due to the variable nature of the made ground temporary support of excavations will be required. |
| **Plasticity** | Consideration will need to be given to the shrink / swell of the clay strata if it is to be used as founding strata, particularly where trees/hedges are present. Foundations may need to be deepened. A medium volume change potential has been calculated for the site. |

Table 7-2: Geotechnical Conclusions Table.

## 7.3. Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 7-3.

| PL | Contaminant | Risk | Recommendations |
|---|---|---|---|
| 1 | - | - | No viable human health (direct contact) pollutant linkage. No soft landscaping proposed. |
| 2 | Naphthalene, Unknown volatile organic compounds | Low | Unlikely probability given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential volatiles is not anticipated. No recorded naphthalene above detection limits and TVOC measurements on site did not record significant values. **Recommendation**: No remediation required. |
| 3 | Hazardous / Ground gas: methane, carbon dioxide | Moderate / Low | Unlikely probability given the composition of made ground beneath proposed building, age of made ground and lack of putrescible material encountered within strata. Also given the nature of the development (kitchens / dining area is assumed to be well ventilated), the build-up of potential gas is not anticipated. Low risk is assumed. **Recommendations:** No remediation required. |
| 4 | PAHs, metals, other organic / inorganic compounds | Low | Unlikely probability given no significant mobile contaminants encountered and superficial till likely to limit the downward migration of contaminants into the Principal Aquifer. **Recommendations:** No remediation required. |
| 5 | Naphthalene, Unknown volatile organic compounds | Low | Unlikely as no recorded naphthalene above detection limits on site. **Recommendations:** No remediation required. |

Table 7-3: Summary Risk Table.
PL=Pollutant Linkage.
PL1= Human health risk (direct contact). PL2= Human health (vapours). PL3= Gas risk. PL4= Controlled waters risk. PL5= Potable waters risk.

# 8. Remediation Strategy

The recommendations/requirements provided below are considered appropriate for the site based on the site investigation work undertaken. LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

A summary of remediation requirements is included in Table 8-1.

| PL | Recommendation |
|---|---|
| 1 | No remediation required. |
| 2 | No remediation required. |
| 3 | No remediation required. |
| 4 | No remediation required. |
| 5 | No remediation required. |

Table 8-1: Remediation Summary.

Based on the findings of the site investigation and risk assessment, no remediation is required. A watching brief for any unexpected contamination should be maintained during groundworks (refer to Section 8.2.). Additional consideration should also be given to the risk to workers and offsite receptors during groundworks and construction. This is discussed further in Section 8.1.

## 8.1. Other Considerations

*8.1.1. Unexpected Contamination*

The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required.

Impacted soils should be placed on an impermeable surface to await further assessment, treatment, or removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant.

To determine that significantly impacted soils have been removed, verification samples will be collected from the base and sides of the excavation. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.

Validation requirements should include a log of work undertaken, including photographs and details of any sampling undertaken and validation of any potential additional remedial work.

*8.1.2. Asbestos in Soils Management Plan*

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.

LKC recommend that an appropriate 'Asbestos Management Strategy' is developed in line with CIRIA C733[38].

*8.1.3. Stockpile Management*

Stockpiled material should be suitably managed. Material should be segregated by type and source. For example, construction / demolition arisings, site won subsoil. Stockpiles may also require covering to minimise the generation of vapours, fibres, dust, and possible nuisance to adjacent receptors, and to prevent rainwater ingress. The source of each stockpile should be recorded and appropriate validation testing for re-use or potential offsite disposal should be undertaken as required.

### *8.1.4. 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.

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 validation report.

### *8.1.5. Health and Safety Considerations*

In working with, removing, or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance[39]) should be adopted by all workers involved with site enabling and construction works.

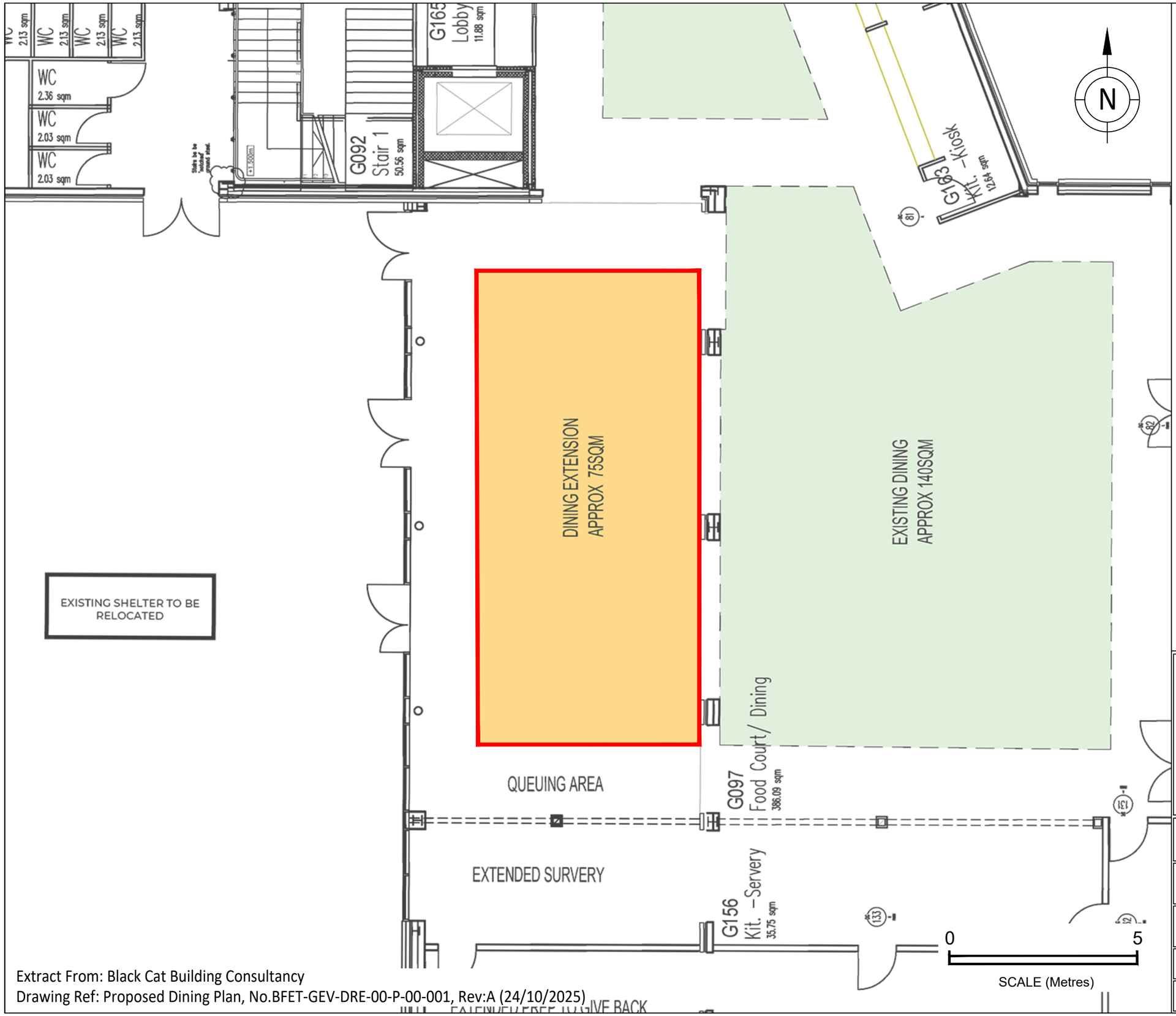
# Figures







| | | | | | |
|---|---|---|---|---|---|
| Client: Black Cat Building Consultancy | | | | Title: Site Location & Boundary Plan | LK CONSULT |
| Site: Cedar Mount Academy, Manchester | | | | Scale (see scale bar): 1:10,000 & 1:250 @ A4 | Figure: 1 |
| Job No.: LKC 261292 | Drawn By: AE | Checked By: RC | Drawn: May 2025 | | Revision: |




EXISTING SHELTER TO BE RELOCATED

## KEY

Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

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Client: Black Cat Building Consultancy

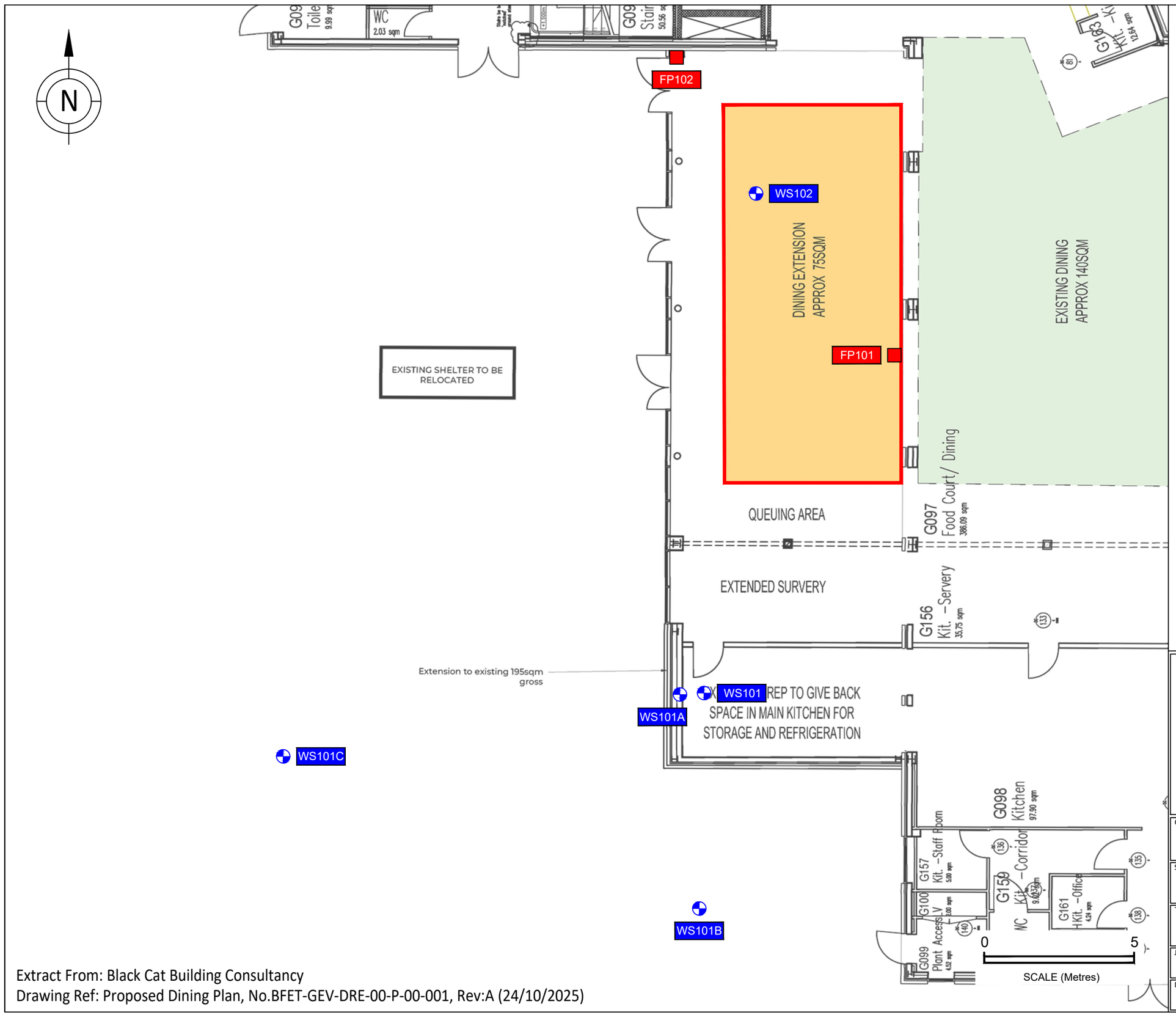
Site: Cedar Mount Academy

Title: Proposed Development Plan

| Job No.: | Scale (See Scale Bar): | Figure: | Revision: |
|---|---|---|---|
| LKC261292 | 1:100 @ A3 | 2 | |

| Drawn By: | Checked By: | Drawn: |
|---|---|---|
| AC | AE | May 2026 |

Extract From: Black Cat Building Consultancy
Drawing Ref: Proposed Dining Plan, No.BFET-GEV-DRE-00-P-00-001, Rev:A (24/10/2025)




## KEY

- Site Boundary
- Window Sample Borehole (WS)
- Foundation Inspection Pit (FP)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT

Client: Black Cat Building Consultancy

Site: Cedar Mount Academy

Title: Site Investigation Location Plan

| Job No.: | Scale (See Scale Bar): | Figure: | Revision: |
|---|---|---|---|
| LKC261292 | 1:125 @ A3 | 3 | |

| Drawn By: | Checked By: | Drawn: |
|---|---|---|
| AC | FP | May 2026 |

Extract From: Black Cat Building Consultancy
Drawing Ref: Proposed Dining Plan, No.BFET-GEV-DRE-00-P-00-001, Rev:A (24/10/2025)

# Appendix A – Risk Matrix

## RISK EVALUATION

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552[42]. It involves the classification of the:

- Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- Magnitude if the probability (likelihood) of the risk occurring (Table B).

| **Consequence (Severity)** | | |
|---|---|---|
| **Classification** | **Definition** | **Example** |
| **Severe** | Short term (acute) risk to human health likely to results in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA.<br>Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource.<br>Catastrophic damage to buildings/properties.<br>A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000). | High Concentrations of cyanide on the surface of an informal recreation area.<br>Major spillage of contaminants from site into controlled waters.<br>Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied). |
| **Medium** | Chronic damage to Human Health ('significant harm' as defined in DETR, 2000).<br>Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution).<br>A significant change in a particular ecosystem, or organism forming part of such ecosystem. | Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria.<br>Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary).<br>Death of a species within a designated nature reserve. |
| **Mild** | Pollution of non-sensitive water resources.<br>Significant damage to crops, buildings, structures, and services ('significant harm' as defined in DETR, 2000).<br>Damage to sensitive buildings/structures/services or the environment. | Pollution of non-classified groundwater.<br>Damage to building rendering it unsafe to occupy (e.g., foundation damage resulting in instability). |
| **Minor** | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve.<br>Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc).<br>Easily repairable damage to buildings, structures, and services. | The presence of contaminants at such concentrations that protective equipment is required during site works.<br>The loss of plants in a landscaping scheme.<br>Discoloration of concrete. |

Table A. Classification of Consequence

| **Probability (Likelihood)** | |
|---|---|
| **Classification** | **Definition** |
| **High Likelihood** | There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution. |
| **Likely** | There is a pollutant linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur.<br>Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| **Low Likelihood** | There is a pollutant linkage and circumstances are possible under which an event could occur.<br>However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term. |
| **Unlikely** | There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term. |

Table B. Classification of Probability.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

| | | Consequence | | | |
|---|---|---|---|---|---|
| | | **Severe** | **Medium** | **Mild** | **Minor** |
| **Probability** | **High Likelihood** | **Very High Risk** | **High Risk** | Moderate Risk | Moderate / Low Risk |
| | **Likely** | **High Risk** | Moderate Risk | Moderate / Low Risk | Low Risk |
| | **Low Likelihood** | Moderate Risk | Moderate / Low Risk | Low Risk | Very Low Risk |
| | **Unlikely** | Moderate / Low Risk | Low Risk | Very Low Risk | Very Low Risk |

Table C. Comparison of Consequence against Probability

Once the risk has been determined the corresponding action can be assessed (Table D).

| Risk | Action Required |
|---|---|
| **Very High Risk** | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR there is evidence that sever harm to a designated receptor is currently happening.<br>This risk, if realised, is likely to results in a substantial liability.<br>Urgent investigation (if not already undertaken) and remediation are likely to be required. |
| **High Risk** | Harm is likely to arise to a designated receptor from an identified hazard.<br>Realisation of the risk is likely to present a substantial liability.<br>Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term. |
| **Moderate Risk** | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.<br>Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. |
| **Low Risk** | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. |
| **Very Low Risk** | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. |

Table D. Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

# Appendix B – Profile Logs

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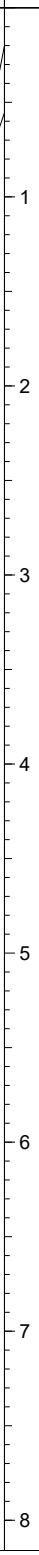
# Window Sample Borehole Log

Location Number: **WS101**

| | | | |
|---|---|---|---|
| Project Name: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 | |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | | |
| Equipment: Window Sample Rig: Premier Compact 110 Series | | Logged By: FP | Scale: 1:40 |

Page Number: Sheet 1 of 1

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) |
|---|---|---|---|---|---|
| 0.30-0.70 | 50 (11,18/50 for 255mm) | 0.20 | | MADE GROUND: Brown gravelly slightly silty SAND with frequent brick fragments, occasional rootlets and limestone fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone and anthropogenic material. | |
| | | 0.56 | | MADE GROUND: Limestone GRAVEL. Gravel is fine to coarse, subangular comprising limestone. Probable sub-base. | |
| | | | | End of Borehole at 0.56m | |




Remarks:

Borehole dry and stable.

WS101 refused against very dense limestone GRAVEL and so was repositioned 0.50m west to WS101A.

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# Window Sample Borehole Log

Location Number: **WS101A**

| | | | |
|---|---|---|---|
| Project Name: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 | |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | | |
| Equipment: Window Sample Rig: Premier Compact 110 Series | | Logged By: FP | Scale: 1:40 |

Page Number: Sheet 1 of 1

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) |
|---|---|---|---|---|---|
| 0.10-0.40<br>0.10-0.40<br><br>0.40-0.80 | D<br>PID=0.0ppm<br><br>50 (25 for 40mm/50 for 55mm) | 0.10<br><br><br>0.50 | | MADE GROUND: Brown gravelly slightly silty SAND with frequent brick fragments, occasional rootlets and limestone fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone and anthropogenic material.<br>MADE GROUND: Limestone GRAVEL. Gravel is fine to coarse, subangular comprising limestone. Probable sub-base.<br>End of Borehole at 0.50m | |

1 2 3 4 5 6 7 8

Remarks:

Borehole dry and stable.

WS101A refused against very dense limestone GRAVEL and so was repositioned 5.00m south to WS101B.

# Window Sample Borehole Log

LK CONSULT

Location Number: **WS101B**

| | | | |
|---|---|---|---|
| Project Name: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 | |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | | |
| Equipment: Window Sample Rig: Premier Compact 110 Series | | Logged By: FP | Scale: 1:40 |

Page Number: Sheet 1 of 1

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) |
|---|---|---|---|---|---|
| 0.10-0.30<br>0.10-0.30 | D<br>PID=0.1ppm | 0.10<br><br>0.30 | | MADE GROUND: Brown gravelly slightly silty SAND with frequent brick fragments, occasional rootlets and limestone fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone and anthropogenic material.<br>MADE GROUND: Reddish brown sandy GRAVEL of predominately brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising anthropogenic material.<br>End of Borehole at 0.30m | |

1 2 3 4 5 6 7 8

Remarks:

Borehole dry and stable.

WS101B refused against very dense limestone GRAVEL and so was repositioned 15.00m north-west to WS101C.

# Window Sample Borehole Log

LK CONSULT

Location Number: **WS101C**

| | | |
|---|---|---|
| Project Name: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | |
| Equipment: Window Sample Rig: Premier Compact 110 Series | Logged By: FP | Scale: 1:40 |
| | | Page Number: Sheet 1 of 1 |

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) | Water Strikes |
|---|---|---|---|---|---|---|
| 0.00-0.40 | D | | | MADE GROUND: Brown gravelly slightly silty SAND with frequent brick fragments, occasional rootlets and limestone fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone and anthropogenic material. | | |
| 0.00-0.40 | ES | | | | | |
| 0.00-0.40 | PID=0.0ppm | | | | | |
| 0.40-0.70 | D | 0.40 | | MADE GROUND: Firm consistency medium strength brown gravelly sandy CLAY with rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone, limestone and anthropogenic material. | | |
| 0.40-0.70 | ES | | | | | |
| 0.40-0.70 | PID=0.1ppm | 0.70 | | | | |
| 0.50 | PP=49.0kPa | | | Firm consistency medium to high strength brown gravelly sandy CLAY with occasional pockets of sand. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. | 1 | |
| 0.70-1.20 | D | | | | | |
| 0.70-1.20 | ES | | | | | |
| 0.70-1.20 | PID=0.1ppm | | | | | |
| 0.80 | PP=98.1kPa | | | | | |
| 1.10-1.55 | N=11 (3,2/2,2,3,4) | | | | | |
| 1.20-1.65 | SPT | | | | | |
| 1.25 | PP=73.6kPa | | | | | |
| 1.50-2.00 | D | 1.70 | | Greyish brown gravelly clayey SAND. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone and mudstone. | | |
| 1.60 | PP=171.7kPa | | | | | |
| 2.00-2.45 | SPT | 2.00 | | Firm consistency medium to high strength brown gravelly sandy CLAY with occasional pockets of sand. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone | 2 | |
| 2.00-2.45 | N=23 (3,3/5,6,6,6) | | | | | |
| 2.60-3.00 | D | | | | 3 | |
| 2.80 | PP=98.1kPa | | | | | |
| 3.00-3.45 | SPT | | | | | |
| 3.00-3.45 | N=17 (2,2/3,4,5,5) | | | | | |
| 3.75 | PP=73.6kPa | | | | | |
| 4.00-4.45 | N=15 (4,4/4,4,3,4) | 4.00 | | No Recovery in SPT at 4.00mbgl and 10% recovery in sampler. Strata undetermined due to sand recovered likely to be from upper strata falling into borehole. | 4 | |
| 5.00-5.45 | SPT | 5.00 | | Firm consistency brown gravelly sandy CLAY with occasional pockets of sand. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone | 5 | |
| 5.00-5.45 | N=13 (3,2/3,3,3,4) | | | | | |
| | | 5.45 | | End of Borehole at 5.45m | 6 | |
| | | | | | 7 | |
| | | | | | 8 | |

Remarks:

Perched water encountered at 1.70mbgl within sand strata.
Borehole unstable between 1.70-2.00mbgl within sand strata.

# Window Sample Borehole Log

LK CONSULT

Location Number: **WS102**

| | | |
|---|---|---|
| Project Name: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | |
| Equipment: Window Sample Rig: Premier Compact 110 Series | Logged By: FP | Scale: 1:40 |
| | | Page Number: Sheet 1 of 1 |

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) | Water Strikes |
|---|---|---|---|---|---|---|
| | | 0.05 | | MADE GROUND: TARMACADAM. | | |
| 0.30-1.00 | D | 0.30 | | MADE GROUND: Limestone GRAVEL. Gravel is fine to coarse, subangular comprising limestone. Probable sub-base. | | |
| 0.30-1.00 | ES | | | MADE GROUND: Reddish brown, black and brown gravelly clayey SAND with frequent brick fragments, occasional ash, clinker, limestone and coal. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded comprising anthropogenic material and limestone. | | |
| 0.30-1.00 | PID=0.2ppm | | | | | |
| 1.00-2.00 | D | | | | 1 | |
| 1.20-1.65 | N=21 (3,4/4,5,6,6) | | | | | |
| 2.00-2.45 | N=5 (7,4/2,1,1,1) | | | | 2 | ▼ |
| 2.20-3.20 | D | 2.20 | | MADE GROUND: Soft consistency light grey with slight organic odour sandy SILT with rare brick fragment. Sand is fine to medium. | | |
| 2.20-3.20 | ES | | | | | |
| 2.20-3.20 | PID=0.5ppm | | | | | |
| 2.75 | PP=24.5kPa | | | | | |
| 3.00-3.45 | SPT | | | | 3 | |
| 3.00-3.45 | N=12 (1,2/2,3,3,4) | | | | | |
| 3.20-4.00 | D | 3.20 | | Firm consistency high strength brown gravelly sandy CLAY with occasional pockets of sand. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. | | |
| 3.20-4.00 | ES | | | | | |
| 3.20-4.00 | PID=0.3ppm | | | | | |
| 3.75 | PP=147.2kPa | | | | | |
| 4.00-4.45 | SPT | | | | 4 | |
| 4.00-4.45 | N=21 (3,5/5,5,5,6) | | | | | |
| 4.75 | PP=122.6kPa | | | | | |
| 5.00-5.45 | N=21 (3,4/4,5,5,7) | | | | 5 | |
| | | 5.45 | | End of Borehole at 5.45m | | |
| | | | | | 6 | |
| | | | | | 7 | |
| | | | | | 8 | |

Remarks:

Perched water encountered at 2.00mbgl within made ground sand strata.
Borehole stable.

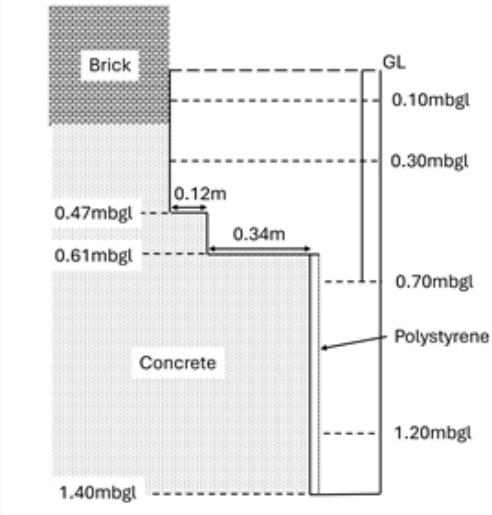
LK CONSULT

# Trial Pit Log

Location Number: **FP101**

| | | |
|---|---|---|
| Project: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | |
| Equipment: Hand Excavation Tools | Logged By: FP | Scale: 1:15 / Page Number: Sheet 1 of 1 |

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | | Level (m) |
|---|---|---|---|---|---|---|
| | | 0.10 | | MADE GROUND: TARMACADAM. | | |
| | | | | MADE GROUND: Limestone GRAVEL. Gravel is fine to coarse, subangular comprising limestone. Probable sub-base. | | |
| 0.30-0.70<br>0.30-0.70<br>0.30-0.70 | D<br>ES<br>PID=0.0ppm | 0.30 | | MADE GROUND: Light grey sandy GRAVEL with frequent limestone, occasional concrete fragments, brick fragments, rare tarmacadam, plastic and ash. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising anthropogenic material and limestone. | 0.5 | |
| 0.70-1.20<br>0.70-1.20<br>0.70-1.20 | D<br>ES<br>PID=0.1ppm | 0.70 | | MADE GROUND: Light brownish grey sandy GRAVEL with frequent limestone, occasional concrete fragments, whole bricks, brick fragments, rare tarmacadam, plastic and ash. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising anthropogenic material and limestone. | 1.0 | |
| | | 1.20 | | Concrete footing. | | |
| | | 1.40 | | End of Trial Pit at 1.40m | 1.5 | |






| Pit Dimensions | | | Pit Stability |
|---|---|---|---|
| Pit Length (m) | Pit Width (m) | Pit Depth (m) | Stable |
| 0.70 | 0.30 | 1.40 | |

Remarks:
Trial pit excavated to investigate foundations of existing building.
Trial pit dry and stable.
Concrete encountered beneath brickwork to 0.47mbgl before stepping out 0.12m and again at 0.61mbgl by 0.34m.
3cm thick layer of polystyrene encountered on side of concrete from 0.61mbgl to at least 1.40mbgl.
Base of concrete not encountered in trial pit to at least 1.40mbgl.

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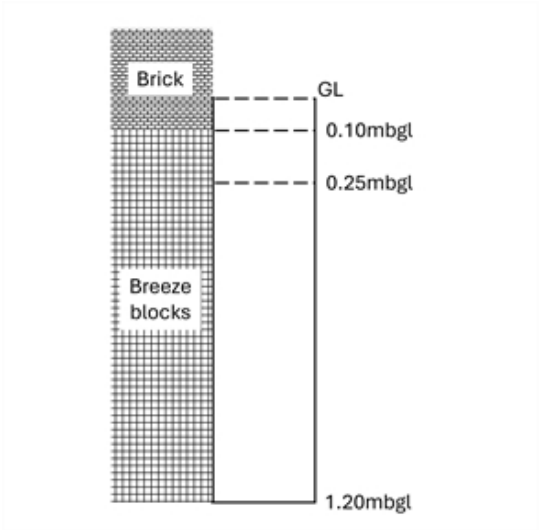
# Trial Pit Log

Location Number: **FP102**

| | | |
|---|---|---|
| Project: Cedar Mount Academy, Manchester | Client: Black Cat Building Consultancy Ltd | Date: 26/05/2026 - 26/05/2026 |
| Project No. : LKC261292 | Contractor: D & I Drilling Ltd | |
| Equipment: Hand Excavation Tools | Logged By: FP | Scale: 1:15 |
| | | Page Number: Sheet 1 of 1 |

| Depth (m) | Samples / Tests | Depth (m) | Legend | Stratum Description | Level (m) |
|---|---|---|---|---|---|
| 0.10-0.25<br>0.10-0.25 | D<br>PID=0.0ppm | 0.10 | | MADE GROUND: TARMACADAM. | |
| 0.25-0.50<br>0.25-0.50 | D<br>PID=0.0ppm | 0.25 | | MADE GROUND: Light brownish grey sandy GRAVEL with frequent limestone, occasional concrete fragments, whole bricks, brick fragments, rare tarmacadam, plastic and ash. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising anthropogenic material and limestone. | |
| | | | | MADE GROUND: Limestone GRAVEL. Gravel is fine to coarse, subangular comprising limestone. Probable sub-base. | |
| | | 1.20 | | End of Trial Pit at 1.20m | |

0.5
1.0
1.5






| Pit Dimensions | | | Pit Stability |
|---|---|---|---|
| Pit Length (m) | Pit Width (m) | Pit Depth (m) | Stable |
| 0.30 | 0.30 | 1.20 | |

Remarks:
Trial pit excavated to investigate foundations of existing building.
Trial pit dry and stable.
Breeze blocks encountered beneath brickwork from 0.10mbgl.
Base of breezeblocks not encountered in trial pit to at least 1.20mbgl.

# Appendix C – Certificates of Analysis (Soil)

# Certificate of Analysis

| | | | |
|---|---|---|---|
| *Certificate Number* | 26-12739 | *Issued:* | 09-Jun-26 |

*Client* LK Consult Limited
Unit 29
Eton Business Park
Eton Hill Road
Radcliffe
Manchester
M26 2ZS

*Our Reference* 26-12739

*Client Reference* ~ LKC261292

*Order No* ~ PO-CO02992

*Contract Title* ~ Cedar Mount Academy

*Description* 4 Soil samples.

*Date Received* 28-May-26

*Date Started* 28-May-26

*Date Completed* 09-Jun-26

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Reyhan Irfan
Operations Manager

2139

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 26-12739
*Client Ref* ~ LKC261292
*Contract Title* ~ Cedar Mount Academy

| | Lab No | 2693316 | 2693317 | 2693318 | 2693319 |
|---|---|---|---|---|---|
| | Sample ID ~ | FP101 | WS101C | WS102 | WS102 |
| | Depth ~ | 0.70-1.20 | 0.00-0.40 | 0.30-1.00 | 1.00-2.00 |
| | Other ID ~ | | | | |
| | Sample Type ~ | ES | ES | ES | D |
| | Sampling Date ~ | 26/05/2026 | 26/05/2026 | 26/05/2026 | 26/05/2026 |
| | Sampling Time ~ | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | |
| Asbestos Quantification (Gravimetric) | DETSC 1102 | 0.001 | % | | | 0.008 | |
| **Preparation** | | | | | | | |
| Moisture Content | DETSC 1004 | 0.1 | % | | 9.1 | 10 | |
| **Metals** | | | | | | | |
| Arsenic | DETSC 2301# | 0.2 | mg/kg | | 5.3 | 6.7 | |
| Cadmium | DETSC 2301# | 0.1 | mg/kg | | 0.2 | 0.4 | |
| Chromium | DETSC 2301# | 0.15 | mg/kg | | 14 | 9.3 | |
| Chromium, Hexavalent | DETSC 2204* | 1 | mg/kg | | < 1.0 | < 1.0 | |
| Copper | DETSC 2301# | 0.2 | mg/kg | | 19 | 39 | |
| Lead | DETSC 2301# | 0.3 | mg/kg | | 24 | 64 | |
| Magnesium Aqueous Extract (2:1) | DETSC 2076* | 10 | mg/l | < 10 | | | < 10 |
| Mercury | DETSC 2325# | 0.05 | mg/kg | | < 0.05 | < 0.05 | |
| Nickel | DETSC 2301# | 1 | mg/kg | | 13 | 8.8 | |
| Selenium | DETSC 2301# | 0.5 | mg/kg | | < 0.5 | < 0.5 | |
| Vanadium | DETSC 2301# | 0.8 | mg/kg | | 14 | 12 | |
| Zinc | DETSC 2301# | 1 | mg/kg | | 40 | 55 | |
| **Inorganics** | | | | | | | |
| pH | DETSC 2008# | | pH | 11.8 | 10.1 | 9.8 | 11.0 |
| Organic matter | DETSC 2002# | 0.1 | % | | 1.2 | 0.8 | |
| Chloride Aqueous Extract (2:1) | DETSC 2055 | 1 | mg/l | 16 | | | 9.2 |
| Nitrate Aqueous Extract as NO3 (2:1) | DETSC 2055 | 1 | mg/l | 1.6 | | | < 1.0 |
| Sulphate Aqueous Extract as SO4 (2:1) | DETSC 2076# | 10 | mg/l | 110 | 200 | 900 | 270 |
| **PAHs** | | | | | | | |
| Naphthalene | DETSC 3303# | 0.03 | mg/kg | | < 0.03 | < 0.03 | |
| Acenaphthylene | DETSC 3303# | 0.03 | mg/kg | | < 0.03 | < 0.03 | |
| Acenaphthene | DETSC 3303# | 0.03 | mg/kg | | 0.04 | 0.05 | |
| Fluorene | DETSC 3303 | 0.03 | mg/kg | | < 0.03 | < 0.03 | |
| Phenanthrene | DETSC 3303# | 0.03 | mg/kg | | 0.25 | 0.37 | |
| Anthracene | DETSC 3303 | 0.03 | mg/kg | | 0.05 | 0.07 | |
| Fluoranthene | DETSC 3303# | 0.03 | mg/kg | | 0.38 | 0.62 | |
| Pyrene | DETSC 3303# | 0.03 | mg/kg | | 0.38 | 0.61 | |
| Benzo(a)anthracene | DETSC 3303# | 0.03 | mg/kg | | 0.13 | 0.20 | |
| Chrysene | DETSC 3303 | 0.03 | mg/kg | | 0.14 | 0.22 | |
| Benzo(b)fluoranthene | DETSC 3303# | 0.03 | mg/kg | | 0.22 | 0.35 | |
| Benzo(k)fluoranthene | DETSC 3303# | 0.03 | mg/kg | | 0.07 | 0.14 | |
| Benzo(a)pyrene | DETSC 3303# | 0.03 | mg/kg | | 0.15 | 0.26 | |
| Indeno(1,2,3-c,d)pyrene | DETSC 3303# | 0.03 | mg/kg | | 0.07 | 0.10 | |
| Dibenzo(a,h)anthracene | DETSC 3303# | 0.03 | mg/kg | | < 0.03 | < 0.03 | |
| Benzo(g,h,i)perylene | DETSC 3303# | 0.03 | mg/kg | | 0.08 | 0.12 | |
| PAH - USEPA 16, Total | DETSC 3303 | 0.1 | mg/kg | | 2.0 | 3.1 | |

# Summary of Asbestos Analysis
# Soil Samples

*Our Ref* 26-12739
*Client Ref* ~ LKC261292
*Contract Title* ~ Cedar Mount Academy

| Lab No | Sample ID | Material Type | Result | Comment* | Analyst |
|---|---|---|---|---|---|
| 2693317 | WS101C 0.00-0.40 | SOIL | NAD | none | Michael Kay |
| 2693318 | WS102 0.30-1.00 | SOIL | Amosite | Amosite present in microscopic board fragment | Michael Kay |

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

# Summary of Asbestos Quantification Analysis
# Soil Samples

*Our Ref* 26-12739
*Client Ref* ~ LKC261292
*Contract Title* ~ Cedar Mount Academy

| | |
|---|---|
| **Lab No** | 2693318 |
| **Sample ID** ~ | WS102 |
| **Depth** ~ | 0.30-1.00 |
| **Other ID** ~ | |
| **Sample Type** ~ | ES |
| **Sampling Date** ~ | 26/05/2026 |
| **Sampling Time** ~ | |

| Test | Method | LOQ | Units | |
|---|---|---|---|---|
| Total Mass% Asbestos (a+b+c) | DETSC 1102 | < 0.001 | Mass % | **0.008** |
| Gravimetric Quantification (a) | DETSC 1102 | < 0.001 | Mass % | 0.008 |
| Detailed Gravimetric Quantification (b) | DETSC 1102 | < 0.001 | Mass % | na |
| Quantification by PCOM (c) | DETSC 1102 | < 0.001 | Mass % | na |
| Potentially Respirable Fibres (d) | DETSC 1102 | < 0.001 | Fibres/g | na |
| Breakdown of Gravimetric Analysis (a) | | | | |
| Mass of Sample | | | g | 971.09 |
| ACMs present* | | | type | Board |
| Mass of ACM in sample | | | g | 0.1850 |
| % ACM by mass | | | % | 0.019 |
| % asbestos in ACM | | | % | 40 |
| % asbestos in sample | | | % | 0.008 |
| Breakdown of Detailed Gravimetric Analysis (b) | | | | |
| % Amphibole bundles in sample | | | Mass % | na |
| % Chrysotile bundles in sample | | | Mass % | na |
| Breakdown of PCOM Analysis (c) | | | | |
| % Amphibole fibres in sample | | | Mass % | na |
| % Chrysotile fibres in sample | | | Mass % | na |
| Breakdown of Potentially Respirable Fibre Analysis (d) | | | | |
| Amphibole fibres | | | Fibres/g | na |
| Chrysotile fibres | | | Fibres/g | na |

* Denotes test or material description outside of UKAS accreditation.
% asbestos in Asbestos Containing Materials (ACMs) is determined by
by reference to HSG 264.
Recommended sample size for quantification is approximately 1kg
# denotes deviating sample
The results are based on dry weight.

# Information in Support of the Analytical Results

*Our Ref* 26-12739
*Client Ref* ~ LKC261292
*Contract* ~ Cedar Mount Academy

## Containers Received & Deviating Samples

| Lab No | Sample ID ~ | Date Sampled ~ | Containers Received | Holding time exceeded for tests | Incorrect container for tests |
|---|---|---|---|---|---|
| 2693316 | FP101 0.70-1.20 SOIL | 26/05/26 | GJ 250ml, GJ 60ml, PT 1L | | |
| 2693317 | WS101C 0.00-0.40 SOIL | 26/05/26 | GJ 250ml, GJ 60ml, PT 1L | | |
| 2693318 | WS102 0.30-1.00 SOIL | 26/05/26 | GJ 250ml, GJ 60ml, PT 1L | | |
| 2693319 | WS102 1.00-2.00 SOIL | 26/05/26 | PT 1L | | |

Key: G-Glass P-Plastic J-Jar T-Tub

Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

## Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 250µm sieve
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

## Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

# Appendix D – Certificates of Analysis (Geotechnical)

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

# TEST REPORT

**Client** LK Consult Ltd

**Address** Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

**Contract** LKC 26 1292, Cedar Mount Academy

**Job Number** MRN 26004/53
**Date of Issue** 16 June 2026


Approved Signatories
S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

7 Decision Rule Basis: Unless instructed/agreed otherwise and noted on the individual test certificates included in this report, the adopted decision rule will be one of simple acceptance.

# MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

**TEST CERTIFICATE**

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

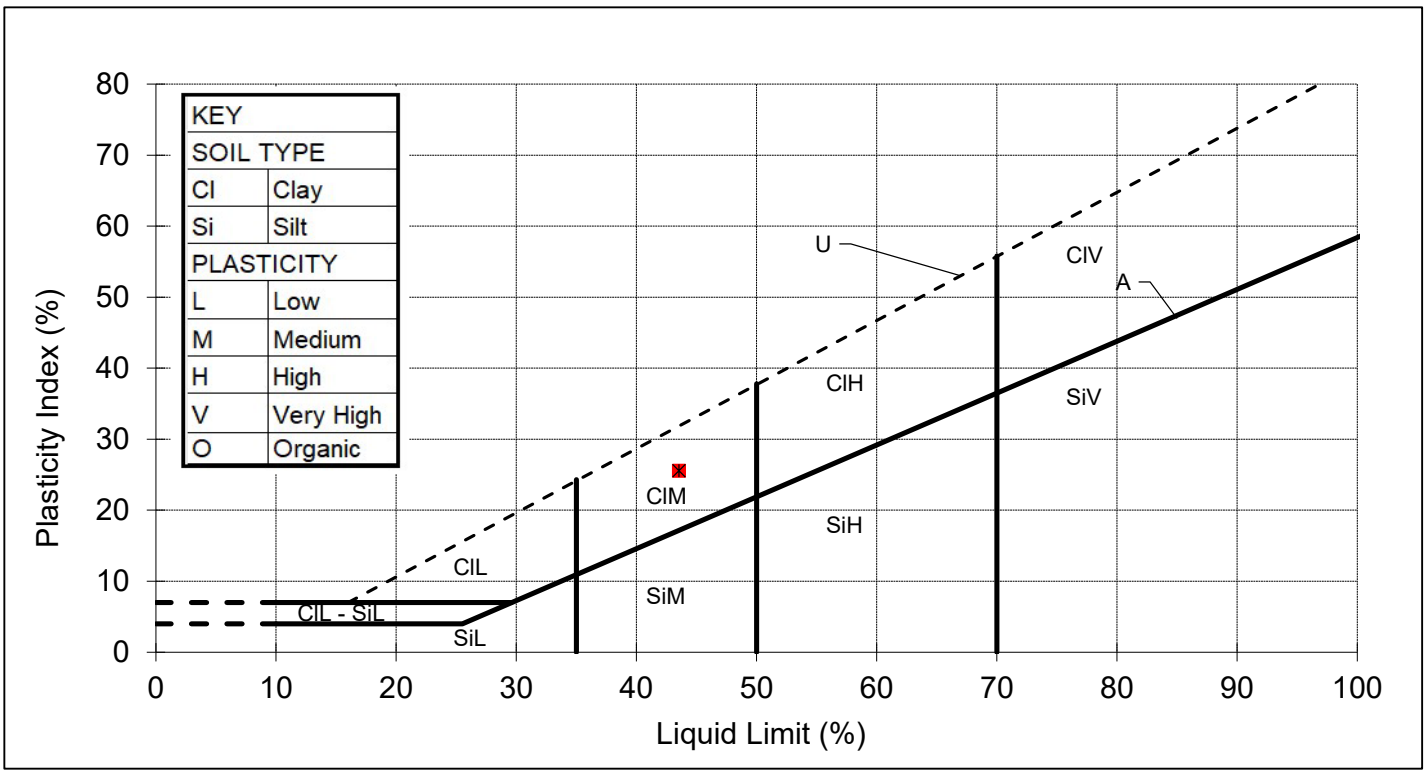
| | |
|---|---|
| CLIENT | LK Consult Ltd |
| SITE | LKC 26 1292, Cedar Mount Academy |
| JOB NUMBER | MRN 26004/53 |

| | | | |
|---|---|---|---|
| SAMPLE LABEL | WS101C 0.7-1.7m | DATE SAMPLED | 26-May-26 |
| SAMPLE No. | 6116401 | DATE RECEIVED | 28-May-26 |
| DATE TESTED | 02-Jun-26 | SAMPLED BY | Client |

| | | | |
|---|---|---|---|
| MATERIAL | Brown silty slightly sandy slightly gravelly CLAY | | |
| ADVISED SOURCE | Site Investigation Sample | WATER CONTENT | Increasing |
| PRE TREATMENT | As received | % RET. 425um BY | Hand picked |

| Test Readings mm (average) | | Water Content % | Correction Factor | Correction factor from Clayton and Jukes 1978 |
|---|---|---|---|---|
| Determination 1 (avg) | 19.5 | 43.1 | 1.010 | |
| Determination 2 (avg) | 19.5 | 43.1 | | |

| Natural Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Passing 425 micron (%) |
|---|---|---|---|---|
| 18.6 | 44 | 18 | 26 | 90 |




REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director) DATE 16-Jun-26

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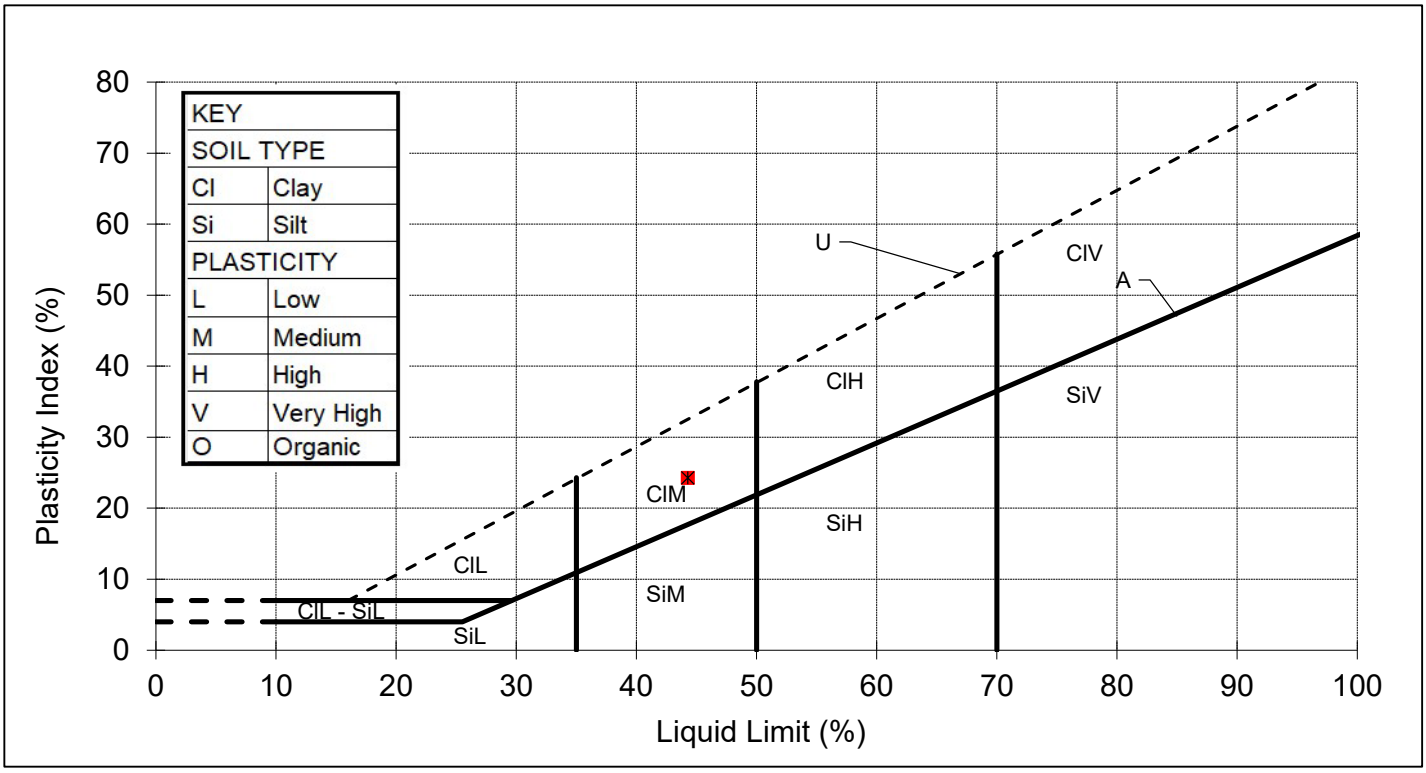
| | |
|---|---|
| CLIENT | LK Consult Ltd |
| SITE | LKC 26 1292, Cedar Mount Academy |
| JOB NUMBER | MRN 26004/53 |

| | | | |
|---|---|---|---|
| SAMPLE LABEL | Ws102 2.2-3.2m | DATE SAMPLED | 26-May-26 |
| SAMPLE No. | 6116402 | DATE RECEIVED | 28-May-26 |
| DATE TESTED | 02-Jun-26 | SAMPLED BY | Client |

| | | | |
|---|---|---|---|
| MATERIAL | Brown silty slightly sandy slightly gravelly CLAY | | |
| ADVISED SOURCE | Site Investigation Sample | WATER CONTENT | Increasing |
| PRE TREATMENT | As received | % RET. 425um BY | Hand picked |

| Test Readings mm (average) | | Water Content % | Correction Factor | Correction factor from Clayton and Jukes 1978 |
|---|---|---|---|---|
| Determination 1 (avg) | 21.2 | 45.0 | 0.981 | |
| Determination 2 (avg) | 21.2 | 45.2 | | |

| Natural Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Passing 425 micron (%) |
|---|---|---|---|---|
| 35.1 | 44 | 20 | 24 | 92 |




REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director) DATE 16-Jun-26

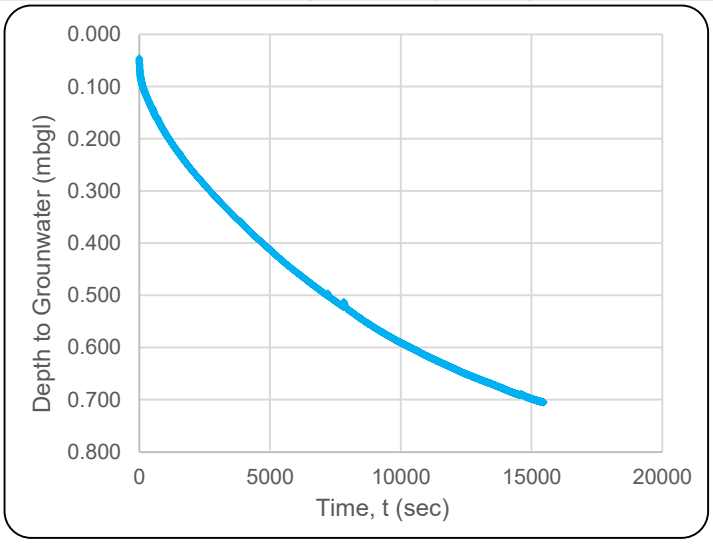
# Appendix E – Falling Head Tests

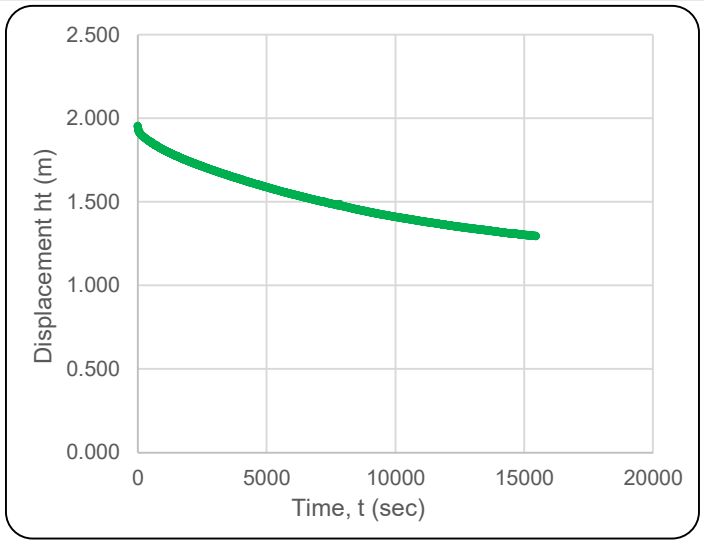
# Variable Head Test Permeability - Bouwer-Rice Method

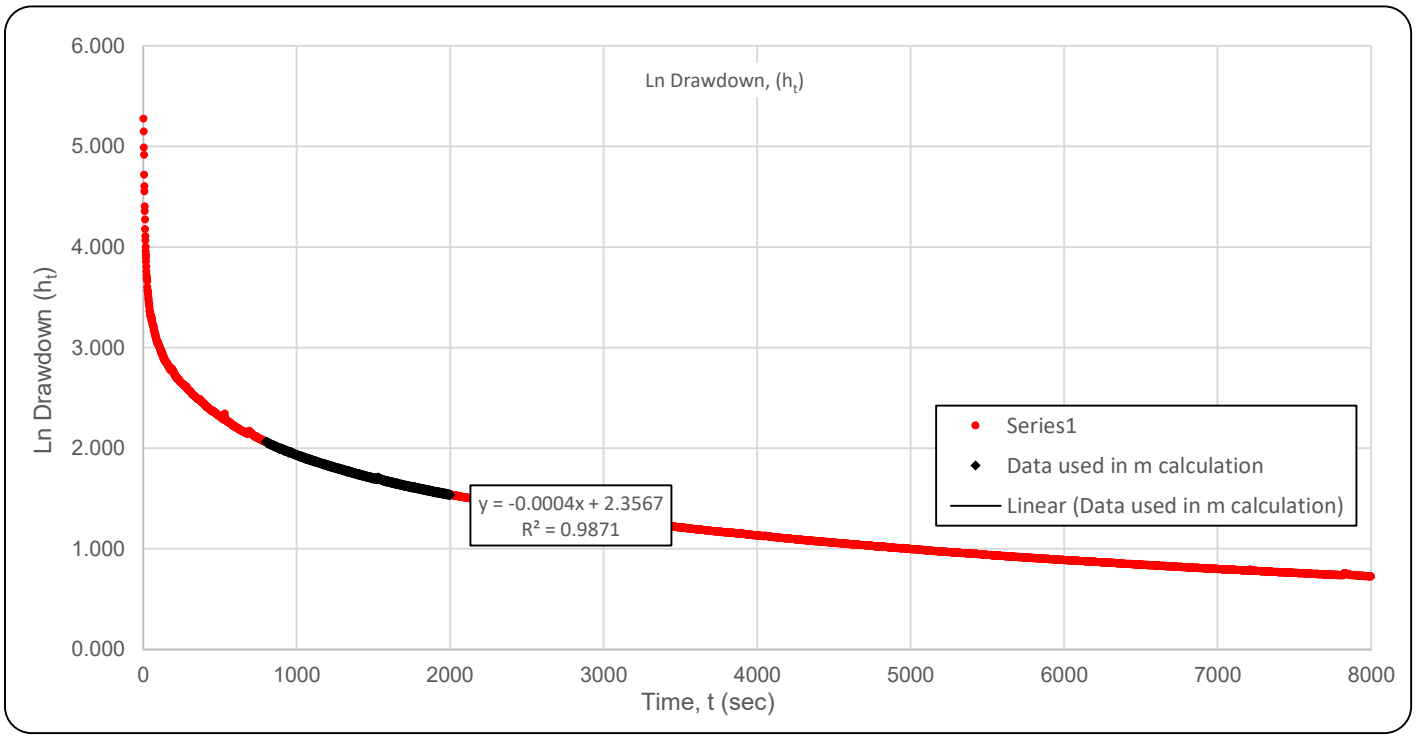
LK CONSULT

| | | | |
|---|---|---|---|
| **Site Name** | Cedar Mount Academy | **Engineer** | FP |
| **Project** | LKC261292 | **Date** | 26/05/2026 |
| **Location** | WS101C | **Type of test** | Falling Head Test |
| **Client** | Black Cat Building Consultancy | **Rest Water Level** | 0.045 |
| **Water Level at t=0** | **0.045** | **Strata at Test Depth** | Slightly gravelly very sandy CLAY |
| **Maximum Head** | **1.955** | **Well Response Zone** | 1.00-2.00mbgl |

| | | | |
|---|---|---|---|
| **Permeability Rate (K)** | **3.87E-06** | **m/sec** | $k = \frac{r^2 \cdot \ln\left(Re/R\right)}{2 \cdot L} \cdot \frac{1}{t} \cdot \ln\left(\frac{h_o}{h_t}\right)$ |




Bouwer-Rice Method (1976) - in accordance with BS EN ISO 2282-2:2012

# Appendix F – Generic Assessment Criteria Values

# 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 | 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 | 1600 f | 11000 f | 800 f | C4SL |
| | | 2.5% | 36 | 36 | 130 | 3700 f | 15000 f | 1200 f | C4SL |
| | | 6% | 85 | 85 | 200 | 8400 f | 17000 f | 1900 f | 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% | 0.087 | 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 |
| | | 6% | 0.87 | 3.3 | 0.180 | 98 | 140 | 230 | C4SL |
| | 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 |
| Petroleum Hydrocarbons | **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% | 0.11 | 0.16 | 0.05 | 12.0 | 300 | 300 | DEFRA C4SL |
| | | 2.5% | 0.18 | 0.24 | 0.10 | 17.0 | 310 | 330 | DEFRA C4SL |
| | | 6% | 0.31 | 0.41 | 0.19 | 29.0 | 310 | 330 | DEFRA C4SL |
| | 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-Trinitritoluene (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)
f=naphthalene is based on comparison of inhalation exposure with TDI(inhal) for localised effect
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 G – References

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