

LORETO RC CHORLTON

PHASE 1: PRELIMINARY RISK ASSESSMENT

Job Number: LKC 23 1250

Date: May 2023

Client: The Board of Governors of Loreto High School



INCREASING LAND VALUE

LK
GROUP

LK Consult			
Document Verification			
Site Address	Loreto High School, Nell Lane, Chorlton, Manchester, M21 7SW		
Report Title	Phase 1: Preliminary Risk Assessment		
Job Number	LKC 23 1250	Document Ref.	CL-602-LKC 23 1250-01
Date Issued	May 2022	Report Version	R0
Prepared By	Christopher Kay	Reviewed By	Hannah Moss

Revision Record			
Revision No.	Date	Nature of Revision	Approved By

DISCLAIMER

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

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

This report is prepared solely for the benefit of The Board of Governors of Loreto High School. It may not be relied upon by, or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

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

Contents

1	Introduction	1
2	Historical Review	2
3	Environmental Setting.....	3
4	Site Reconnaissance.....	5
5	Preliminary Contamination Conceptual Site Model	7
5.1	Introduction.....	7
5.2	Potential Contaminants	7
5.3	Potential Receptors	8
5.4	Potential Pathways	8
5.5	Preliminary Contamination Conceptual Model	8
6	Preliminary Geotechnical Risk Assessment.....	11
7	Summary Conclusions and Recommendations	12
7.1	Summary Conclusions.....	12
7.2	Recommendations.....	13

Figures

- Figure 1: Site Location and Boundary Plan
Figure 2: Proposed Development Plan

Appendices

- Appendix A: Historical Maps
Appendix B: Envirocheck Report
Appendix C: Zetica UXO Unexploded Bomb Risk Map and Pre-Desk Study Assessment
Appendix D: Risk Evaluation

1 Introduction

LK Consult Ltd (LKC) has been commissioned to carry out a Phase 1 Preliminary Risk Assessment (PRA) for Loreto RC High School, Chorlton.

In accordance with current guidance (including LCRM¹ and the National Planning Policy Framework (NPPF)²), the PRA will include a site reconnaissance, site history, geology, hydrogeology, hydrology, mineral search, and a landfill search. Information gathered from the desk study and site reconnaissance will be used to develop a contamination conceptual model for the site.

In addition, the information gathered will be used to identify potential geotechnical constraints associated with the redevelopment of the site.

Based on the findings of this report, an appropriate site investigation can be derived, if required.

Site details are provided in Table 1-1. Figure 1 shows the site location and boundary. Figure 2 shows the proposed development plan.

Site Location	North-east of Nell Lane, north-west of Mauldeth Rd West, Chorlton, Manchester. Centred at approximate National Grid Reference 382740E 393060N.
Approximate Area	200m ² .
Topography	32 metres Above Ordnance Datum (AOD). Site is approximately level.
Current Site Use	Site comprises a small parcel of land that forms part of the wider Loreto High School grounds. A shipping container currently used as an office is present on site.
Purpose of Report	Planning.
Planning Ref.	136346/FO/2023
Proposed Development	Proposed inclusion unit at Loreto RC High School. It is assumed that no new soft landscaping is proposed, and that the planning boundary will comprise the footprint of the building only for the purpose of this assessment.

Table 1-1: Summary of site details

¹ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

² "National Planning Policy Framework." The Ministry of Housing, Communities and Local Government. Published March 2012, Updated July 2021.

2 Historical Review

In compiling the site history, LKC consulted Envirocheck historical mapping (Appendix A) and aerial photography.

Table 2-1 summarises features on site. Table 2-2 summarises potentially contaminative land uses within approximately 50m and potentially infilled features within approximate 250m.

Site Features	Location on Site	Dates Present		Comments
		From	To	
Vacant	Whole Site	1848	1894	
Nursery	Whole Site	1907	1966	Site forms part of wider nursesey area. Not present from 1978 mapping onwards.
School Grounds	Whole Site	1972	2023	Site forms part of wider area associated with current Loreto High School. See Table 2-2.
Path	W	1978	1992	Not indicated on any mapping from 1999 mapping.
Playground / Communal Area	W	2023	Present	Identified from 2023 aerial photography.

Table 2-1: Summary of site features. Dates based on available historical map editions.

Surrounding Area Features	Distance (m)	Direction	Dates Present		Comments
			From	To	
Loreto High School	11	W	1972	Present	Labelled 'Marist RC High School for Girls' in 1972 mapping. Labelled 'St Thomas Aquinus RC High School' between 1978 and 1992 mapping. Labelled 'Loreto High School' from 2007 mapping.
Electricity Sub-Station	33	SW	1978	Present	
Pond	186	NE	1848	1848	Not present from 1894 mapping onwards.
Pond	233	NW	1894	1923	Not present from 1934 mapping onwards.

Table 2-2: Summary of potentially contaminative features within 50m and potentially infilled features with 250m. Dates are based on available historical map editions.

3 Environmental Setting

A summary of environmental settings is presented in Table 3-1, based on a review of available environmental data.

Categories ^(data sources)		Details
Geology ^{1, 2}	Artificial	- No BGS recorded artificial.
	Superficial	- Glaciofluvial sheet deposits (sand and gravel).
	Bedrock	- Wilmslow Sandstone Formation (Sandstone).
	BGS Logs (<50m)	- None.
Hydro-geology ¹	Aquifer	- Superficial
	Designation	- Bedrock
	Source Protection Zone (SPZ)	- Site not within an SPZ.
	Groundwater Abstractions (100m)	- None.
Hydrology ¹	Surface Water Courses (100m)	- None.
	Flooding risk	- Flood Zone 1.
	Surface Water Abstractions (100m)	- None.
	Discharge Consents (onsite)	- None.
	Pollution Incidents (onsite)	- None.
Minerals & Mining ^{1,3,4}	Coal Mining	- Not within a Coal Reporting Area. - Not within a Development High Risk Area.
	Surface Mineral Extractions (250m)	- None.
	Cheshire Brine Compensation District	- Not within Compensation District. - Not within Consultation Area.
	Non-Coal Mining Area	- No Hazard.
Ground Stability ¹	Collapsible Ground	- Very low hazard.
	Compressible Ground	- No hazard.
	Ground Dissolution	- No hazard.
	Landslide	- Very low hazard.
	Running Sand	- Very low hazard.
	Shrinking / Swelling Clay	- No hazard.
Landfill Sites (250m) ¹	Known / Registered	- 120m SW – “Nell Lane”. Information not supplied.
	Potentially Infilled Land (non-water and water), based on Envirocheck Report	- 1no. features: 246m NW.
	Potentially infilled sites, based on LKC historical review	- 2no. features: See Table 2-1 and Table 2-2.

Table 3-1: Summary of the environmental setting.

Notes: Distance in brackets is the distance from site that features are included. Where no distance given, features relate to onsite only.

Data Sources:

1 Envirocheck Report (Appendix A & B)

2 BGS Sheet 98 1:50,000

3 BGS GeoIndex <http://mapapps2.bgs.ac.uk/geoindex/home.html>

4 The Coal Authority Web Mapping Services (WMS) /

Interactive Map Viewer <http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>

Categories ^(data sources)		Details
Radon Potential ¹		- <1% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions.
Designated Sites (50m) ¹		- None.
Contemporary Trade Directory (50m) ¹		- None.
Fuel Station Entries (50m) ¹		- None.
Unexploded Ordnance Risk (UXO) – Zetica Risk Map	Zetica Risk Map ⁵	- Bomb Risk: Moderate. - Strategic Targets: None identified within 100m
	Pre-Desk Study Assessment	- Detailed UXO desk study required.

Table 3-1 (continued): Summary of the environmental setting.

Notes: Distance in brackets is the distance from site that features are included. Where no distance given, features relate to onsite only.

Data Sources:

1 Envirocheck Report (Appendix A & B)

5 Zetica UXO Unexploded Bomb Risk Map and Pre-Desk Study Assessment (Appendix C)

4 Site Reconnaissance

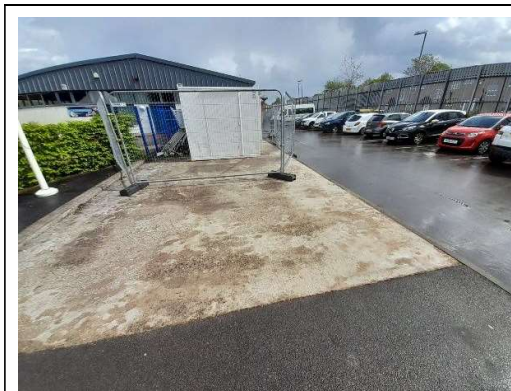
A site reconnaissance was carried out on 05 May 2023. Hand dug trial holes were not undertaken as the site is covered by hardstanding ground.

Relevant features identified on site are summarised below:

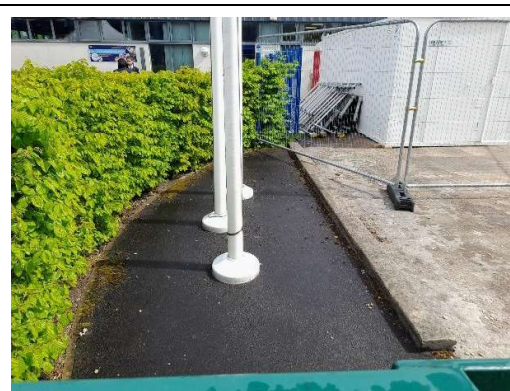
- Site comprises a small parcel of land that forms part of the wider Loreto High School grounds. A shipping container currently used as an office is present on site.
- A concrete slab (good condition) is present across part of the site in the east and southeast, with, tarmacadam (good condition) covering the remainder of the site surface. There are three flagpoles on site and hedges were noted in the west and southwest of site.
- Heras fencing currently surrounds the container.
- No access restrictions noted for site investigation.
- No significant visual or olfactory evidence of contamination identified.

The surrounding area comprises the Loreto Roman Catholic High School.

Relevant photographs are provided in Plate 4-2.



Photograph 1: View of site from SW looking NE.



Photograph 2: View of flag poles on site looking NE.



Photograph 3: Existing building on site.



Photograph 4: View of playground in N of site.

Plate 4-2: Site photographs.

Relevant features are also shown on Plate 4-3.

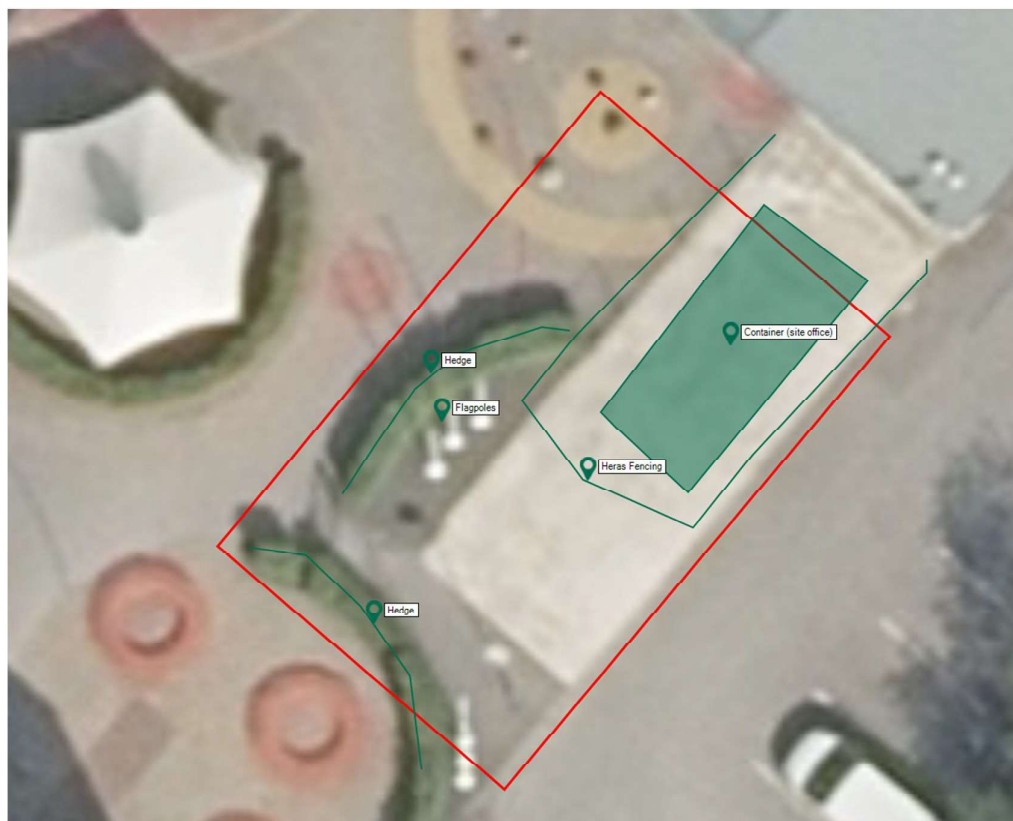


Plate 4-3: Plan showing relevant site walkover features.

5 Preliminary Contamination Conceptual Site Model

5.1 Introduction

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and whether further site investigation work is required.

The Sections below are therefore divided into potential contaminant, potential pathway and potential receptor as described in LCRM³, on the premise that, if there is no pollutant linkage, then there will be no risk to the receptor. The final Section provides an assessment of the potential pollutant linkages that may still be present on the site if redevelopment were to occur.

5.2 Potential Contaminants

Potential viable contamination sources are detailed in Table 5-1. These are split into onsite sources, offsite sources and underlying geology.

Potential Source	Contaminants
On Site	
Shallow Made Ground below some or all of site (levelling, path, communal area / playground, general made ground)	- Assuming predominantly reworked natural soils with possible demolition rubble, ash and clinker: Asbestos, heavy metals, sulphates, PAHs ⁴ . Not expected to be a significant source of gas given anticipated depth and nature of Made Ground.
Nursery	- Assuming the use of ash and clinker for drainage: heavy metals, sulphates, PAHs ⁵ . - Possible limited pesticide use, including organophosphates, organochlorides, chlorophenols, aldrin, dieldrin, atrazine and DDT. Significant contamination risk not expected given time since last feature annotated as nursery (1966 mapping).
Surrounding Area	
Electricity Sub-station	- PCBs and mineral oils. - Given distance from site (33m), there is no significant contamination risk from feature given contaminants are relatively immobile.
Surrounding area	- No significant contamination sources within influencing distance of the site.
Landfills / offsite potentially infilled features within 250m	- Given size, distance and age of features, there is not considered to be a significant source of hazardous gas.
Underlying Geology	
Radon Affected Area	- <1% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions. - No further consideration required.
Superficial / Bedrock	- Glaciofluvial sheet deposits over Wilmslow Sandstone Formation. - No significant contamination sources identified. - Although not identified as sulphate / sulphide bearing strata ⁶ there could be some localised raised concentrations. This is considered further in the geotechnical assessment.

³ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

⁴ Defra (2002). "Potential Contaminants for the Assessment of Land". R&D Publication CLR 8.

⁵ Defra (2002). "Potential Contaminants for the Assessment of Land". R&D Publication CLR 8.

⁶ BRE (2005). "Concrete in Aggressive Ground". SD1.

Table 5-1: Potential contamination sources.

5.3 Potential Receptors

Potential receptors are detailed in Table 5-2.

Receptors	
Human Health	- Future site users (including site users, visitors and site workers). - Offsite land users.
Controlled Waters	- Secondary A Aquifer (Superficial); Principal Aquifer (Bedrock). - No surface water within influencing distance.
Buildings.	
Potable water pipes.	

Table 5-2: Potential receptors.

5.4 Potential Pathways

Potential pathways are detailed in Table 5-3.

Pathways		
Soil	Human Health ⁷ (commercial land use with no soft landscaping assumed)	- Inhalation of vapours outside. - Inhalation of vapours inside. - Omitted: ingestion of soil, ingestion of soil-derived indoor dust, dermal contact with soil, dermal contact with soil-derived indoor dust, inhalation of soil-derived outdoor dust, inhalation of soil-derived indoor dust, ingestion of contaminated home-grown produce and ingestion of soil attached to home-grown produce.
		- Windblown dust and fibres to adjacent receptors.
		- Direct contact with receptors (services).
Water		- Surface run-off over impermeable surface. - Site is relatively flat; therefore, surface run-off will be limited.
		- Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution). - Site is predominantly hardstood; therefore, infiltration is likely to be limited.
Water and Gas		- Migration through potentially permeable strata and preferential pathways. - Superficial (sand and gravel) is likely to be relatively permeable. - Bedrock (sandstone) likely to be relatively permeable. - Preferential pathways: services.
Gas		- Migration into buildings (e.g., via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).

Table 5-3: Potential pathways.

5.5 Preliminary Contamination Conceptual Model

The Preliminary Contamination Conceptual Site Model (PCCSM) is illustrated in Table 5-4 and has identified five generic potential pollutant linkages.

Each linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552⁸.

⁷ EA (2008). "Updated Technical Background to the CLEA Model". Science Report – SC050021/SR3.

⁸ CIRIA (2001). "Contaminated Land Risk Assessment: A Guide to Good Practice". C552.

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix D.

Where LKC identified a low to very low risk, targeted or low-density intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what category the pollutant linkage will fall into (i.e., moderate or low risk will be chosen).

Where LKC identifies a moderate or higher risk, intrusive investigation work or precautionary remedial measures will be recommended.

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 the majority of 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.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance⁹) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

⁹ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land". London HMSO.

Loreto RC Chorlton
Phase 1: Preliminary Risk Assessment

PL	Pathway	Receptor	Contaminants of Concern (CoC)	Probability	Consequence	Risk	Recommendations
1	- Dermal contact. - Inhalation of soil, fibres and dust. - Ingestion of soils, dust. - Windblown dust.	- Future site users. - Offsite receptors.	- ACM - Heavy metals - PAHs		-		No viable human health pathways as no soft landscaping. No pollutant linkage therefore no further assessment required. Should soft landscaping be proposed, precautionary soil sampling may be required. Watching brief during groundworks.
2	- Inhalation of vapours. - Migration via permeable strata and preferential pathways.	- Future site users. - Offsite receptors.	Volatile contaminants: - PAHs.	Unlikely (given site history, site conditions and proposed end use)	Medium	Low	Watching brief during groundworks.
3	- Inhalation of gas. - Migration via permeable strata and preferential pathways. - Explosion in confined spaces.	- Future site users. - Buildings. - Offsite land users.	Ground / hazardous gas: - Carbon dioxide - Methane	Unlikely (given limited viable gas source and limited pathway)	Severe	Moderate / Low (low assumed given no significant sources anticipated)	Watching brief during groundworks.
4	- Surface run-off. - Migration via permeable strata and preferential pathways. - Perched waters migration.	- Groundwater (Principal Aquifer; Secondary A Aquifer).	Mobile contaminants: - Heavy metals - PAHs	Unlikely (Although)	Medium	Low	Watching brief during groundworks.
5	- Ingestion of tainted water supply.	- Future site users. - Water pipes.	Organic contaminants - Naphthalene	Unlikely (Significant contamination not anticipated at pipeline depth given site history. Limited contamination anticipated)	Medium	Low	Watching brief during groundworks. A water pipeline risk assessment should be completed if potable pipelines proposed. Barrier piping unlikely to be required.

Table 5-4: Preliminary Contamination Conceptual Site Model.

Notes: PL = Pollutant Linkage. Contaminant of Concern (CoC) - See Table 5-1 for contamination sources. Site conditions based on observations during site reconnaissance.

6 Preliminary Geotechnical Risk Assessment

Table 6-1 summarises the possible geotechnical constraints of the site, based on the site history, environmental settings and site reconnaissance. Investigation work will be required to confirm the risks and provide a detailed geotechnical assessment and foundation design.

Coal Mining	Site is not within a Development High Risk Area. No further assessment required.
Slope Stability	Site is relatively flat. No significant slope stability risk anticipated. No further assessment required.
Envirocheck Ground Stability Hazards	No to very low hazard identified. No further action required.
Made Ground	Unknown depth and constituent of made ground across the site. Initial information indicates relatively shallow made ground.
Superficial	Unknown strength of soils for foundation design. Sand and gravel anticipated below the site.
Bedrock	Unknown depth to bedrock.
Groundwater	Unknown depth and variability of groundwater.
Plasticity	No clay recorded on site. Plasticity of cohesive strata, if present, should be confirmed.
Sulphate	Unknown sulphate content of the made ground and natural.
Road / Pavement Design	Unknown CBR values for footpath and road design.

Table 6-1: Summary of geotechnical constraints.

7 Summary Conclusions and Recommendations

7.1 Summary Conclusions

Table 7-1 summarises the site details, historical review, environmental settings and site reconnaissance.

Current Site Use	Site comprises a small parcel of land that forms part of the wider Loreto High School grounds. A shipping container currently used as an office is present on site.
Proposed Development	Commercial building with no soft landscaping. Proposed inclusion unit at Loreto RC High School.
Main Historical Features	Onsite: Nursery, Path, Communal Area / playground. Surrounding Area: Pond, Electricity Sub-Station.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Glaciofluvial deposits (sand and gravel). Secondary A Aquifer. Bedrock: Wilmslow Sandstone Formation, Principal Aquifer.
Landfills / Infilled ground	No recorded landfills. Potentially infilled ground identified.
Site walkover	Site consists of a small parcel of land that forms part of the wider Loreto High School grounds. A shipping container currently used as an office is present. A concrete slab is present across part of the site with the remainder tarmac. There are 3 flagpoles on the site and hedges were noted in the west and south-west of site. No access restrictions noted for the site investigation.

Table 7-1: Summary of site details, historical review, environmental settings and site reconnaissance.

A preliminary contamination conceptual site model has been produced by LKC, which is summarised in Table 7-2.

Pollutant Linkage		Risk	Recommendations
PL1: Contaminants posing a risk to future site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and home-grown produce).	ACM, heavy metals, PAHs	-	No viable human health pathways as no soft landscaping. No pollutant linkage therefore no further assessment required. Should soft landscaping be proposed, precautionary soil sampling may be required.
PL2: Volatile contaminants posing a risk to future site users via the inhalation of vapours.		Low	Watching brief during groundworks.
PL3: Gas (carbon dioxide and methane) posing a risk to buildings and future site users via the migration of gas into building causing explosion and asphyxiation.		Moderate / Low	Watching brief during groundworks.
PL4: Mobile contamination posing a risk to controlled waters via the migration through permeable strata.		Low	Watching brief during groundworks.
PL5: Organic contaminants posing a risk to water pipes.		Low	Watching brief during groundworks.

Table 7-2: Summary risk table.

Where moderate / low risk had been identified, the assumed risk is shown in bold.

A preliminary geotechnical assessment has been carried out by LKC. Table 7-3 summarises the geotechnical constraints.

Coal Mining	Site is not within a Development High Risk Area. No further assessment required.
Slope Stability	Site is relatively flat. 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	No clay recorded onsite.
Sulphate	Unknown sulphate content of the made ground and natural.
Road / Pavement Design	Unknown CBR values for footpath and road design should be calculated.

Table 7-3: Summary of geotechnical constraints.

7.2 Recommendations

Recommendations are provided in Table 7-4.

Further assessment recommendations	Watching brief during construction work (groundworks). To be agreed with the local authority.
Type of investigation work	As only low risks identified, watching brief recommended. Environmental consultant to inspect the ground during groundworks and to be consulted if any unexpected contamination identified. Further assessment may be required.
Importation of soils	Any topsoil or subsoil brought on to the site for use in any future soft landscaping if proposed, should be suitably chemically validated prior to its use on site, according to Local Authority guidance.
Reporting	Information from the above can be used to carry out a contamination and geotechnical assessment and provide a remediation strategy for the site.

Table 7-4: Recommendations.

Further Considerations are summarised in Table 7-5.

Unexploded Ordnance	A moderate risk from unexploded ordnance (UXO) has been identified. It is recommended that a detailed UXO desk study is carried out to confirm the risk. The detailed desk study will confirm if any special precautions need to be considered before any intrusive work is carried out.
----------------------------	--

Table 7-5: Further considerations.

Figures



Client: The Board of Governors of Loreto High School				Title: Site Location & Boundary Plan			
Site: Loreto RC, Chorlton							
Job No: LKC 23 1250		Drawn By: CK	Checked By: CC	Drawn: May 2023	Scale (see scale bar): 1:25,000 & 1:1000 @ A4		Figure: 1

