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Piling Risk Assessment

Proposed Commercial Development

Rhodes Business Park, Middleton

January 2025



Project Details

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1 Introduction

1.1 Development Outline

- 1.1.1 The proposed development is located within Middleton, approximately 1.15km southwest of the town centre, and it is understood that the scheme will comprise the construction of a single industrial unit with associated hardstanding utilised as a storage yard and for vehicular parking. There are 2 No. proposed layout options currently under consideration, with the overall unit size differing between 1,684 sqm and 1,856 sqm. Development proposals are presented in Appendix A.
- 1.1.2 The development scheme is controlled by Rochdale Borough Council under the planning reference: 23/01213/FUL, and is listed as follows

Erection of 1no. unit (Use Class B2/B8/E(g) (General Industry/Storage & Distribution/Commercial) together with associated service yard, car parking and landscaping.

- 1.1.3 The report is based on the project proposals and information outlined above; should the scheme change then it will be necessary to review the conclusions and recommendations presented in this report.

1.2 Brief

- 1.2.1 This report has been prepared following instructions received from our client Belshaw Building Consultancy Ltd, on behalf of our mutual Client, OLF1 PROPCO2 S.A.R.L. The overall brief of works is to complete a piling risk assessment in order to satisfy the requirements of the Environment Agency (EA).
- 1.2.2 The objectives of this report are outlined below:
- Review the findings of previously undertaken ground investigations.
 - Produce a risk assessment and method statement for proposed piling works in consideration of the possible migration of any identified contamination to underlying groundwater and surface waters during piling operations.

1.3 Guidance Documents

- 1.3.1 This report has been prepared based on our understanding of current best practice and specifically following guidance provided in the following documents.

Title	Document Reference	Publisher
Piling in layered ground: risks to groundwater and archaeology;	Science Report SC020074/SR, 2006.	Environment Agency
Piling into Contaminated Sites	NG&CLC report, 2002, (archived)	Environment Agency
Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention	NG&CLC report NC/99/73, May 2001, (archived)	Environment Agency

Table 1-A: Guidance documents

1.4 Previous Reports

1.4.1 This report incorporates and relies on information contained in the following reports:

Author	Document Title	Date & Document Reference	Report Context
Soiltechnics Ltd	Tier 1 Preliminary Risk Assessment	STV6211-R01 October 2023	Desk based study to assess potential geotechnical and geoenvironmental hazards on site
Soiltechnics Ltd	Ground Investigation Report	STV6211-R02 January 2024	Ground Investigation Report including assessment of geotechnical and geoenvironmental hazards. Includes appropriate GQRA contaminated land risk assessment to support the development.
Soiltechnics Ltd	Remediation Strategy	STV6211-R03 January 2025	Detailing remedial requirements and the verification plan with respect to geoenvironmental risks identified in the Ground Investigation Report.

Table 1-B: Summary of previous reports

1.5 Limitations

1.5.1 Soiltechnics disclaims any responsibility to our Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence in accordance with the terms of our contract, taking account of the resources, investigations and testing devoted to it by agreement with our Client. This report is confidential to our Client and Soiltechnics accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

2 Site Setting

2.1 Site Location

- 2.1.1 The site lies within Middleton, approximately 1.15km southwest of the town centre. The site is accessed from Silburn Way which lies adjacent to the site's north-western boundary.
- 2.1.2 The approximate postcode for the site is M24 4NE. The site currently comprises a lorry trailer parking area with surrounding soft landscaping, and an aerial site plan is presented below.
- 2.1.3 Commercial/light industrial units associated with the wider Rhodes Business Park are present beyond the northern and western boundaries of the site and include a natural stone supplier, a homeware store, and a boiler supplier. To the south and east is Alkrington Woods Nature Reserve beyond the River Irk, the channel of which forms the south-eastern boundary of the site.



Figure 2-A: Aerial photograph and approximate site boundary

2.2 Site Geology

2.2.1 A summary of the geology across the site is provided below.

Stratum	Brief description	Top depth range (m bgl)	Thickness (m)
Soft and hard surfacing	Topsoil in north of site comprising dark brown sand with rootlets.	G.L	0.15 – 0.2
	Asphalt surfacing with granular sub-base.		0.2 – 0.3
Made Ground	Clayey gravelly sand and sandy gravel including brick, concrete, clinker, coal, glass and ash.	0.15 – 0.3	1.2 – 2.05
Alluvium	Very loose to loose gravelly silty sand and localised very soft to soft sandy silt/silty clay.	1.4 – 2.2	6.9
	Becoming medium dense and dense silty sand below depths of 4.0-5.8m.		
Devensian Till (CP01 only)	Stiff to very stiff sandy gravelly clay	8.6	>6.67

Table 2-A: Ground model

2.3 Hydrogeology & Groundwater Sensitivity

2.3.1 The general hydrogeological profile of the site is provided in the table below.

Stratum	Aquifer Designation	Groundwater commentary
Alluvium	Secondary A Aquifer	Groundwater encountered at 1.0-3.0 m bgl and remained stable once encountered (likely in hydraulic continuity with adjacent River Irk water level).
Devensian Till	Secondary A Aquifer	Groundwater not encountered during ground investigation. Likely to be present within granular horizons.
Pennine Lower Coal Measures Formation	Secondary A Aquifer	Groundwater not encountered during ground investigation. No pertinent information could be gathered from reviewing publicly available borehole data.

Table 2-B: Hydrogeological model

2.3.2 Groundwater levels are expected to vary seasonally and in response to weather events.

2.3.3 The site is not located within a Source Protection Zone.

2.3.4 There are no recorded potable abstraction licenses and no active groundwater abstraction licenses associated with industrial processes within 1km of the site. The closest groundwater abstraction is located approximately 1,150 m southwest of the site utilised for manufacturing.

2.4 Chemical Contamination

2.4.1 Potential sources of contamination associated with historic land use on site and within the surrounding area include the former print works and cotton mills, associated tanks, and infilled filter beds, disposal pits and sand pits.

2.4.2 Inclusions of suspected lime waste were encountered within Made Ground at two locations (WS04 and WS05) from 0.5-1.6 m bgl.

2.4.3 No other significant visual or olfactory evidence of contamination was noted, except for the presence of anthropogenic materials contained within the Made Ground (ash, brick, concrete, clinker-like material).

2.4.4 Elevated heavy metals, PAH and TPH have been encountered within the Made Ground on site. The table below details the maximum levels of contamination encountered.

Strata	Depth (m bgl)	Max Lead (mg/kg)	Max Arsenic (mg/kg)	Max Total PAH (mg/kg)	Max Total TPH (mg/kg)
Made Ground	0.05-2.00	710	350	28	2300

Table 2-C: Soil contaminant concentration summary

2.4.5 Soil leachate testing indicated leachable levels of arsenic in Made Ground within WS01 and WS04 above DWS screening criteria. Levels were measured at 19 and 230 µg/l respectively compared to the screening value of 10 µg/l. No other leachable levels of heavy metals exceeding the DWS values were identified.

2.4.6 Elevated arsenic above DWS values was encountered within groundwater from WS02 and WS03. Levels were measured at 34 and 530 µg/l respectively compared to the screening value of 10 µg/l. No other levels of heavy metals in the groundwater exceeding the DWS values were identified.

2.4.7 Groundwater results from the groundwater body in the Alluvium directly below the Made Ground indicated all levels of PAH and TPH were below the laboratory detection limits. This suggests that elevated PAH and TPH within the soil is not leaching to groundwater.

2.4.8 Elevated Phenol was recorded in groundwater within WS03. However, as phenol was not recorded above the detection limit in soils across the site and no gross hydrocarbon contamination or free oil phase (NAPL) was encountered, it is likely that this relates to an isolated occurrence and is unlikely to present significant risk.

2.4.9 Overall, the Ground Investigation Report identified a low risk to groundwater due to the underlying Devensian Till acting as an aquitard to the underlying bedrock aquifer. However piling has the to create a preferential pathway through the aquitard and therefore further assessment is required.

2.5 Gaseous Contamination

2.5.1 Infilled filter beds and a disposal pit are present on site. Further infilled features are located within 250 m of the site.

2.5.2 A registered historic landfill site is recorded 66m northeast relating to a former reservoir on Manchester Old Road accepting inert waste only. No further historical landfills are located within 250m of the site.

2.5.3 No significantly elevated Methane was encountered on site. Marginally elevated carbon dioxide has been recorded beneath the site however this is likely a result of aerobic respiration and oxidation of organic matter. Such processes are typically low risk and gas generation volumes are low. Minimal flow rates been recorded to date at low atmospheric pressure events. A CS-1 designation applies to the site.

3 Review of Piling Methods

3.1 Introductions

3.1.1 There is a wide variation in the design and installation methods used within the piling industry. As a result, a number of different approaches to creating a generic classification system may be taken.

3.1.2 The NG&CLC report NC/99/73 identified three main basic types of pile foundations:

- Displacement piling (such as driven piles).
- Non-displacement and replacement piling (such as CFA).
- Penetrative ground improvement (such as vibro stone columns).

3.2 General Characteristics of CFA Piles

3.2.1 Non-displacement piling techniques, such as CFA, involve the extraction of a core of soil and its subsequent replacement by the pile. Excavated soil is brought to the ground surface in the form of arisings, and the pile is formed by casting concrete in situ. Displacement of the soil surrounding the pile is minimised and there is minimal radial or vertical soil movement or densification as a result of this method.

3.3 General Characteristics of Driven Piles

3.3.1 Small driven (displacement) piles comprise steel sheet, H, I, hollow tube sections, or hybrids such as auger piles. Large displacement piles may consist of pre-cast concrete elements, closed-end steel tube or timber sections or may be cast in situ inside a casing or in a pre-formed void. Displacement piling methods involves the pile being forced into the ground, which then causes the soil to be displaced without the removal of soil to the ground surface.

3.3.2 Soil displacement occurs generally in a radial horizontal direction and there is little downwards vertical movement of soil under the toe of the pile. In general, the mechanism of radial soil displacement leads densification of the soil surrounding the pile and generally this will lead to a reduction in permeability of the penetrated soil.

3.4 General Characteristics of Ground Improvement Piles

3.4.1 Ground improvement solutions are varied and can include the compaction and densification, often undertaken in tandem with the installation of granular or rigid inclusions, such as vibro stone or controlled modulus columns (CMC). The installation of CMC involves primarily the lateral displacement of surrounding soils by boring, and subsequent injection of grout or concrete through the boring column. The installation of CMC creates minimal spoil.

4 Adopted Foundation Solution

4.1 General Approach

- 4.1.1 Due to the variable compaction and potential for void spaces to be present within the Made Ground, loose sands and soft clays, the geotechnical solution for the site comprises will likely comprise ground improvement through the use of controlled modulus columns.
- 4.1.2 As yet Soiltechnics have not been provided with a ground improvement scheme but have been informed that the likely treatment depth will be to the top of the Devensian Till.

5 Piling Risk Assessment

5.1 General Context

5.1.1 With regards to piling activities, concerns about water protection are likely to be most severe when:

- Contaminants are present on the site and groundworks may allow them to migrate.
- Piling would breach a low permeability layer or connect two previously discrete aquifers.
- The site overlies a Principal or Secondary Aquifer.
- The site is located within a Source Protection Zone.
- The water table is shallow or likely to be intersected by piles.
- The geological strata are fractured or fissured.
- Works are close to a surface water body and run-off from arising's could contaminate such waters.

5.1.2 The main concerns in relation to piling and the impact on controlled waters are as follows:

- The creation of preferential flow paths, allowing contaminated groundwater and leachates to move downwards through aquitard layers.
- The breaching of impermeable covers by piling or penetrative ground improvement, allowing surface water infiltration into contaminated ground (thus creating leachate) or allowing the escape of landfill or ground gases.
- Contaminated arising's being brought to the surface by piling work, with the risks of subsequent exposure to site workers and residents, and the need for appropriate handling.
- The effects of aggressive ground conditions on materials used in piles.
- Driving contaminated materials downwards into an aquifer during construction/installation.
- Concrete or grout contamination of groundwater and any nearby surface waters.

5.1.3 The Environment Agency's decision in relation to piling proposals will be based on the overall risk that such operations are likely to present, the techniques used, mitigation measures used (if any) and proposed quality assurance and control methods.

5.2 Source-pathway-receptor (SPR) linkages scenarios

5.2.1 Six potential S-P-R linkages have been considered by the Environment Agency, as follows. The scenarios are described in detail in the following sections.

1. Creation of preferential pathways, through a low permeability layer (an aquitard), to allow potential contamination of an underlying aquifer.
2. Creation of preferential pathways, through a low permeability surface layer, to allow upward migration of landfill gas, soil gas or contaminant vapours to the surface.
3. Direct contact of site workers and others with contaminated soil arisings which have been brought to the surface.
4. Direct contact of the piles or engineered structures with contaminated soil or leachate causing degradation of pile materials (where the secondary effects are to increase the potential for contaminant migration).
5. The driving of solid contaminants down into an aquifer during pile driving.
6. Contamination of groundwater and, subsequently, surface waters by concrete, cement paste or grout.

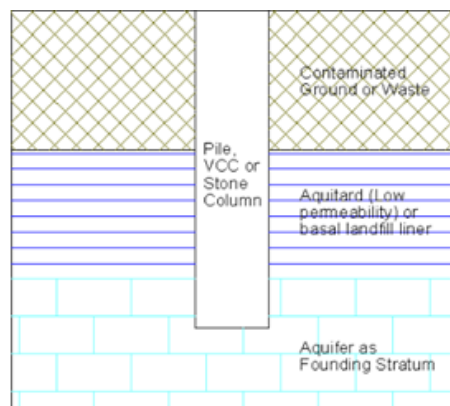
Scenario 1: Creation of preferential pathways, through an aquitard, to allow potential contamination of an underlying aquifer.

General Context:

Contaminated soils and/or groundwater may migrate along a pile stone column, pile/soil interface or through disturbed ground located immediately adjacent to the pile and into the aquifer at depth in which the pile is end bearing.

Typically, contaminated ground is situated above a clay layer which overlies aquifer bearing strata such as Chalk. Perched groundwater may exist above the clay layer which prevents downward migration. Penetration of the aquitard layer may potentially create a migration pathway for contaminants.

Schematic:



General Considerations:

- Are there polluting substances in the ground that are in a leachable or mobile form?
- Is the groundwater directly underneath the site, or in strata penetrated by engineered structures, considered to be in a Principal or Secondary Aquifer, or is the groundwater in hydraulic continuity with a surface water body?
- Will the piling or ground improvement method of choice breach a low permeability layer (aquitard) or the basal liner of a closed landfill site, or penetrate an aquifer?
- Is there a hydraulic gradient that could cause contaminants in near surface deposits to migrate into an underlying aquifer or surface water body?
- Is the pile made out of a material (e.g. timber) that could allow passage of contaminants?
- Will the piling or ground improvement method of choice have the potential to create a preferential flow path for the migration of contaminated perched water or leachate into an aquifer or surface water body?

Discussion:

Elevated levels arsenic above DWS values have been encountered in both Made Ground leachate and underlying shallow groundwater within the Alluvium at two locations on site.

Shallow groundwater has been encountered in within the Secondary A Aquifer in the Alluvium. Groundwater within the underlying Pennine Middle Coal Measures has not been encountered and is likely to be at depth.

The CMC ground improvement solution will likely pile through the overlying interbedded loose granular and soft cohesive deposits. It is not anticipated that the Devensian Till will be penetrated and therefore the groundwater within the Alluvium is considered the primary groundwater body at risk from piling. While boring through interbedded low and high permeability bands within the Alluvium could create a preferential pathway, CMCs laterally displace soils which will create lower permeability surroundings. The open bore is filled quickly using pressure injected ground and therefore no pathways will remain once installed.

The Devensian Till will act as an effective aquitard to the underlying Secondary A Aquifer in the bedrock. As the piled foundation solution is a short-length solution and does not key into the bedrock no preferential pathway will be created to the aquifer. Furthermore, the overlying cohesive deposits will create a seal around the columns inhibiting vertical migration.

Scenario 1: Creation of preferential pathways, through an aquitard, to allow potential contamination of an underlying aquifer.

Outcome:

Low risk for all pile types.

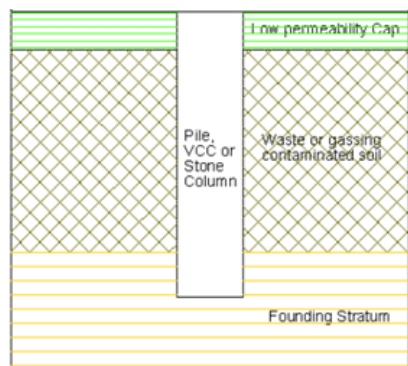
Scenario 2: Creation of preferential pathways to allow migration of landfill gas, soil gas or contaminant vapours to the surface.

General Context:

Gases derived from landfill waste or contaminated ground may migrate into the development via pathways created by pile/stone columns, along the pile/soil interface or through disturbed ground located immediately adjacent to the pile.

Typically, this scenario will be encountered where the development is constructed over a former landfill site or over potentially gas generating fill (used to raise levels), or where volatile hydrocarbon contamination exists. An impermeable cap may be present which manages the gassing regime.

Schematic:



General Considerations:

- Is the contamination considered to present a potential source of either landfill gas (for example, waste materials giving rise to methane, sulphur dioxide and carbon dioxide) or volatile organic compounds (for example, BTEX volatilising from hydrocarbon contaminated soils)?
 - Will the piling or ground improvement method of choice have the potential to create a preferential flow path for the migration of gas or vapour to surface?
 - Will the risks arising from accumulation of landfill gas or contaminant vapours in enclosed spaces in the proposed development be mitigated by the incorporation of standard gas protection measures into the building design?
 - Is the release of gases to atmosphere acceptable from an air quality point of view?
-

Discussion:

Ground gas monitoring has indicated that marginally elevated levels of carbon dioxide and no elevated levels methane are present on site. The site is classified as CS-1

The site is not located within a coal mining reporting area and there is no risk from mine gases. No recorded or historic landfills are present within 1km of the site.

No significant actively generating ground gas source has been identified, and therefore the migration of ground gases to surface is not considered to pose a significant risk.

Outcome:

Low risk for all pile types.

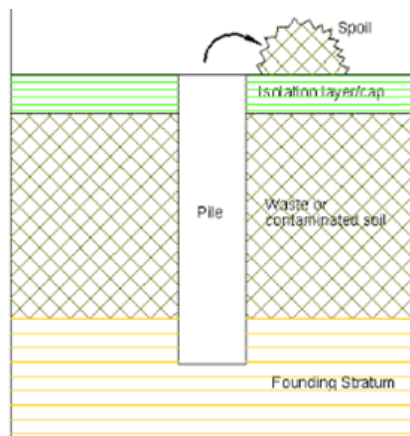
Scenario 3: Direct contact of site workers and others with contaminated soil arising's that have been brought to the surface.

General Context:

Construction workers may come into direct contact with contaminated arisings from piling works, from which contamination may also run-off and migrate towards surface waters.

Typically, if contamination is present at the site, piling works are likely to mix contaminated and uncontaminated soils leading to an increase volume of contaminated soils requiring offsite disposal. Such arisings are likely to provide a risk of causing harm to human health and potentially to surface waters. Where arisings fulfil the definition of controlled waste, there is a 'duty of care' on the operator to ensure the safe disposal of that material.

Schematic:



General Considerations:

- Are contaminants present in the soil or groundwater at sufficient concentrations to pose a hazard to human health or the environment?
- Will the piling or ground improvement method of choice have the potential to bring potentially contaminated soil arisings to the surface?
- Are measures in place to contain and dispose of arisings in a safe manner?

Discussion:

Ground improvement by CMC creates minimal surface spoil, as the bores are formed by lateral displacement, therefore are generally low risk.

Investigations carried out to date have shown no elevated contamination posing an acute risk to construction workers has been encountered at depth on site.

No acute risk to construction workers from asbestos has been identified. Therefore, standard PPE and hygiene precautions would be adequate to protect against health risks.

Outcome:

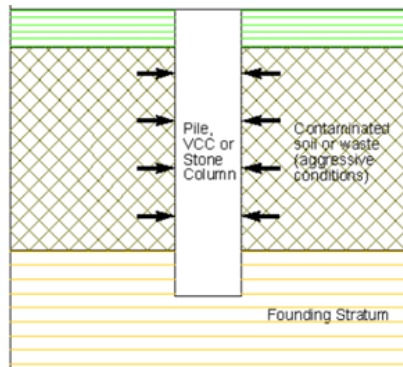
Low risk for all pile types.

Scenario 4: Direct contact of the piles or engineered structures with contaminated soil or leachate causing degradation of pile materials.

General Context:

Contaminated soils/waste or leachate in direct contact with the pile may cause degradation of the materials used to construct such. Some contaminants maybe be extremely aggressive towards construction materials and may reduce or eliminate their load carrying capacity, potentially resulting in failure of the structure, in addition to potentially creating migration pathways.

Schematic:



General Considerations:

- Does the nature of the soil or leachate contamination present a risk to the performance or durability of the pile material?

Discussion:

The ground investigation assessed the nature of ground conditions at the site.

Elevated sulphate has been identified within Made Ground, and a concrete class DS-2 AC-2 should apply.

No precautions against other potential aggressive conditions such as magnesium or ammonia are required.

Outcome:

Concrete classification DS-2 AC-2 should be adopted.

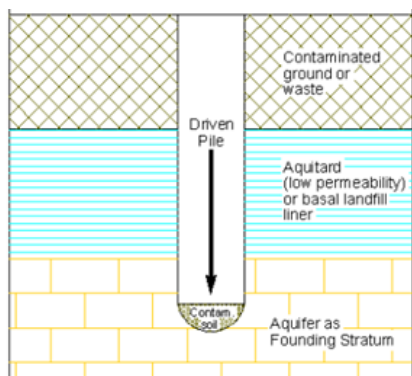
Scenario 5: The driving of solid contaminants down into an aquifer during pile driving.

General Context:

Contaminated soils may potentially be driven down into the underlying aquifer during piling operations either from being in contact with the side and end of the pile or by 'plugging' of an open-ended pile.

During piling works, soils are primarily displaced laterally but there is the potential for soil in contact with the sides and base of the pile to be dragged down slightly before being displaced laterally. Open ended tubular piles may also become 'plugged' causing near surface soils to be transported down to founding level. The effects of this can be significantly reduced with the use of a pointed or convex driving shoe.

Schematic:



General Considerations:

- Are there polluting substances in the ground that are in a leachable or mobile form?
- Is the groundwater directly underneath the site, or in strata penetrated by engineered structures, considered to be in a Principal or Secondary Aquifer or is the groundwater in hydraulic continuity with a surface water body?
- Will the piling or ground improvement method of choice breach a low permeability layer (aquitard) or the basal liner of a closed landfill site or penetrate an aquifer?
- Does the chosen piling method involve use of blunt-ended solid or closed-end piles that could drag down soil or open-ended tubular piles that could become 'plugged' with soil?

Discussion:

Field observations of the soils beneath the site and laboratory testing indicate an overall low level of contamination; however, localised pockets of lime waste were observed in two locations, and elevated leachable levels of arsenic have been detected in soils above DWS values.

The underlying Pennine Middle Coal Measures Formation at depth is classed as a Secondary A Aquifer.

The CMC ground improvement solution will laterally displace soils so minimal drag down of contaminants is likely to occur. The subsequent pressure injection of grout will also severely restrict the leaching potential to the groundwater in the Alluvium of any materials which are dragged down.

The Devensian Till will act as an effective aquitard to the underlying Secondary A Aquifer in the bedrock.

Outcome:

Low risk for all pile types.

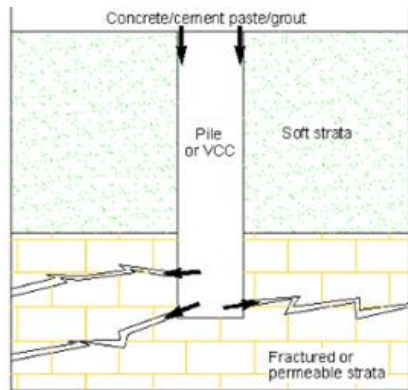
Scenario 6: Contamination of groundwater and, subsequently, surface waters by wet concrete, cement paste or grout.

General Context:

Groundwater or surface waters may become contaminated with concrete/cement paste or grout used during piling operations which flows within highly permeable or fractured strata.

Loss of concrete, cement paste, or grout may occur in fast flowing groundwater, typically associated with limestone/chalk deposits or permeable gravel formations. Until the concrete, cement paste or grout sets (which is typically in minutes), migration may occur. Use of retarder additives could extend this setting period to a few hours; however, their effectiveness would be reduced by dilution. The impact of such a scenario is likely to be localised.

Schematic:



General Considerations:

- Does the chosen piling or penetrative ground improvement method involve the introduction of wet concrete, cement paste or grout into the ground?
- Is the groundwater directly underneath the site, or in strata penetrated by engineered structures, considered to be in a Principal or Secondary Aquifer or is the groundwater in hydraulic continuity with a surface water body?
- Is the aquifer characterised by highly fissured or granular strata?
- Is the groundwater in the aquifer fast-flowing?

Discussion:

Installation of CMC involves the injection of concrete/grout through the boring column.

The site is not near a groundwater abstraction point or within a SPZ.

The underlying Secondary A Aquifer within the bedrock will not be penetrated. Groundwater encountered within the Alluvium is not likely to be fast flowing due to high the silt/clay content. Migration is unlikely to occur. Lateral displacement during CMC bore prior to grout injection will densify the surrounding soils, and therefore minimise the potential for grout loss.

Outcome:

Negligible risk for driven piles. Low risk for all other pile types.

6 Conclusion

- 6.1.1 The preferred foundation solution on site is ground improvement by CMCs.
- 6.1.2 Two instances of elevated leachable arsenic within soils, and arsenic in shallow groundwater exceeding DWS values have been identified on site.
- 6.1.3 It is not anticipated that the Devensian Till will be penetrated by the installation of CMCs and therefore the groundwater within the Alluvium is considered the primary groundwater body at risk from piling. CMCs laterally displace soils which will create lower permeability surroundings. The open bore is filled quickly using pressure injected ground and therefore no pathways will remain once installed. Furthermore, the cohesive deposits will create a seal around the columns inhibiting migration.
- 6.1.4 Underlying Devensian Till will act as an effective aquitard for migration of both solid and groundwater contamination to the underlying bedrock aquifer.
- 6.1.5 The risk assessment does not indicate any unacceptable risk posed to the underlying Secondary Aquifers from a CMC ground improvement solution. Elevated sulphate has been identified within Made Ground and therefore concrete classification DS-2 AC-2 should be adopted. No other mitigation measures are required on site.

Appendix A Drawings



KEY

Red Line Boundary Area : 1.22 Acres / 0.4951 Hectares

Schedule of Accommodation

UNIT 1	sqm	sqft
Warehouse (GIA)	1,856	19,973
Office Area	112	1,205
Total Area	1,968	21,183

2No. x Level Access Doors

19 Car Parking Spaces (Inc. 2 DDA & 2 EV Spaces)
10 Cycle Spaces
1 Motorcycle Space
(Car parking shown to LPA car parking standards 1:100sqm)

Separate Carpark

8 Car Parking Spaces (Inc. 1 DDA & 2 EV Spaces)
1 Motorcycle Space
(Car parking shown to LPA parking standards, 10% DDA and 2.5% PTW of total parking)

NOTE

Drawing is based on Topographical survey : SiteScan Number P16158 Revision A, dated 04.06.16.

The red line boundary is indicative and based on site survey information. Actual site boundary to be confirmed with Land Registry Title Plan.

All trees are shown indicatively and an Arboricultural Survey will need to be carried out to confirm tree sizes, location and species. TPO search information and also (RPA) tree root protection areas to be confirmed, to ascertain the full extent of development area.

Extent of River Irk is shown indicatively for illustrative purposes and a more detailed site survey would be required to confirm the River Irk boundary and extent.

Environmental Agency Information indicates the site is located within Flood Zone 3.

Revisions:
P01: Initial Concept 03. 10.08.23 DM



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**PROPOSED SITE PLAN
OPTION 03**

Status PRELIMINARY

Drawn by : DM Checked by : RM

Date 08/08/2023

Document Number:
XXX-PHP-ZZ-ZZ-DR-A-4694-005-P01

Scale@ A3 1:500 20m

Copyright reserved. Dimensions to be checked on site. Discrepancies to be reported before proceeding.

N



KEY

Red Line Boundary Area : 1.22 Acres / 0.4951 Hectares

Schedule of Accommodation		
UNIT 1	sqm	sqft
Warehouse (GIA)	1,684	18,124
Office Area	112	1,205
Total Area	1,796	19,329

2No. x Level Access Doors

17 Car Parking Spaces (Inc. 2 DDA & 2 EV Spaces)
10 Cycle Spaces
1 Motorcycle Space
(Car parking shown to LPA car parking standards 1:100sqm)

Separate Carpark

10 Car Parking Spaces (Inc. 1 DDA & 2 EV Spaces)
1 Motorcycle Space
(Car parking shown to LPA parking standards, 10% DDA and 2.5% PTW of total parking)

NOTE

Drawing is based on Topographical survey : SiteScan Number P16158 Revision A, dated 04.06.16.

The red line boundary is indicative and based on site survey information. Actual site boundary to be confirmed with Land Registry Title Plan.

All trees are shown indicatively and an Arboricultural Survey will need to be carried out to confirm tree sizes, location and species. TPO search information and also (RPA) tree root protection areas to be confirmed, to ascertain the full extent of development area.

Extent of River Irk is shown indicatively for illustrative purposes and a more detailed site survey would be required to confirm the River Irk boundary and extent.

Environmental Agency Information indicates the site is located within Flood Zone 3.

Revisions:
P01: Initial Concept 02. 10.08.23 DM



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Rhodes Business Park, Middleton Manchester

PROPOSED SITE PLAN
OPTION 02

Status	PRELIMINARY
Drawn by : DM	Checked by : RM
Date	08/08/2023

Document Number:							
Project Code	Zone	Level-Info	Type	Role	Job No.	Dwg No.	Revision
XXX-PHP-ZZ-ZZ-DR-A-4694-004-P01							
Scale@ A3				1:500		N 	
0 10m				20m			
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