

SPARKLE STREET

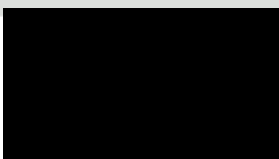
PILING RISK ASSESSMENT

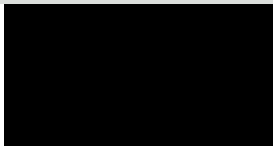
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Site Address: Sparkle Street, Manchester, M1 2NA

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1 INTRODUCTION

Curtins have been instructed by Foras (Sparkle Street) Ltd. to undertake a Piling Risk Assessment of a site located off Sparkle Street, Manchester, M1 2NA, where piled foundations are proposed to support construction of a new multi-storey residential development.

The proposed development plans are included within *Appendix A* of this report.

Published geological records indicate the site is underlain by Glacial Till (Secondary Undifferentiated Aquifer) and sandstone of the Chester Formation (Principal Aquifer). The site is not situated within a Source Protection Zone.

Historic mapping records indicate the presence of a former river channel (Shooters Brook) though the site, flowing from northeast to southwest. It is understood that Shooters Brook was diverted and culverted north of the site (beneath Store Street) in the 19th century.

Ground investigations have been undertaken by Curtins to determine the ground conditions beneath the site. The ground investigations have identified variable thicknesses of Made Ground, underlain by organic rich soils, granular and cohesive Glacial Till, including coarser granular Glacial deposits at the base, overlying sandstone of the Chester Formation. Deeper Made Ground and organic rich soils were typically recorded in the general vicinity of the historic river channel.

Due to the presence of the Principal Aquifer beneath the site, a piling risk assessment (PRA) has been produced in order to identify the risks associated with a piled foundation solution, as recommended in Curtins Phase 2 Ground Investigation Report (Ref. 1).

Furthermore, risks to human health associated with methodologies that bring potentially contaminated ground to the surface have been assessed.

This report has been written to address these recommendations and support discharge of related pre-commencement planning conditions.

It is understood that the preferred piling methodology is CFA piles, which have therefore been included in this Piling Risk Assessment.

The findings of this risk assessment should be reviewed in conjunction with the Phase 2 Ground Investigation Report and Remediation Strategy (Ref. 2).

1.1 Scope

This piling risk assessment provides an overview of the site's ground and groundwater conditions and considers the potential risks associated with the adoption of piled foundations to groundwater, construction workers and other potential receptors which may be impacted by the implications of piling.

The report identifies appropriate risk management and monitoring protocols that can be adopted to ensure any residual risk is brought within adequate and practicable limits.

This report considers the area designated in Section 2, further investigation will be required for piled foundations which may be required outside of this area.

1.2 References

In preparation of this report reference has been made to the following key guidance document:

- Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention National Groundwater & Contaminated Land Centre report NC/99/73 (EA Report 2001) (Ref. 3).

Reference is also made to the following geo-environmental reports undertaken for the site:

- Curtins (2024) Sparkle Street, Manchester, Phase 1 Preliminary Risk Assessment, ref. 082412-CUR-00-XX-RP-GE-001-P03, dated April 2024.
- Curtins (2025) Sparkle St, Manchester, Phase 2 Ground Investigation, ref. 082142-CUR-XX-XX-RP-G-0003-P05, dated December 2025
- Curtins (2025) Sparkle Street, Manchester, Remediation Strategy, ref. 082142-CUR-XX-XX-T-GE-00006-P01, dated December 2025.

It is assumed that the client is in receipt of these reports and that they will also be submitted to and accepted by Manchester City Council to discharge relevant planning conditions.

2 SITE SETTING

This section of the report summarises the site setting, history, geology, hydrogeology, hydrology and environmental conditions at the site with reference to the geo-environmental reports referenced previously. It is not the intention of this report to duplicate these reports, with the information below providing the background information to support the piling risk assessment and recommendations. For further background information the full reports should be consulted.

2.1 The Site Setting

The site is located south of Store Street and east of Sparkle Street in Manchester, and is occupied by the Gateway Industrial Estate comprising two buildings with several large brick / concrete plinths. A substation is present in the southwest corner of the western warehouse. The external areas are vacant, with a tarmac surface covering.

A large retaining wall is present at the south of the site, retaining ground to the south. The wall is supported by struts. A vegetated slope is present in the southwest.

A Site Location Plan is presented in Figure 1.

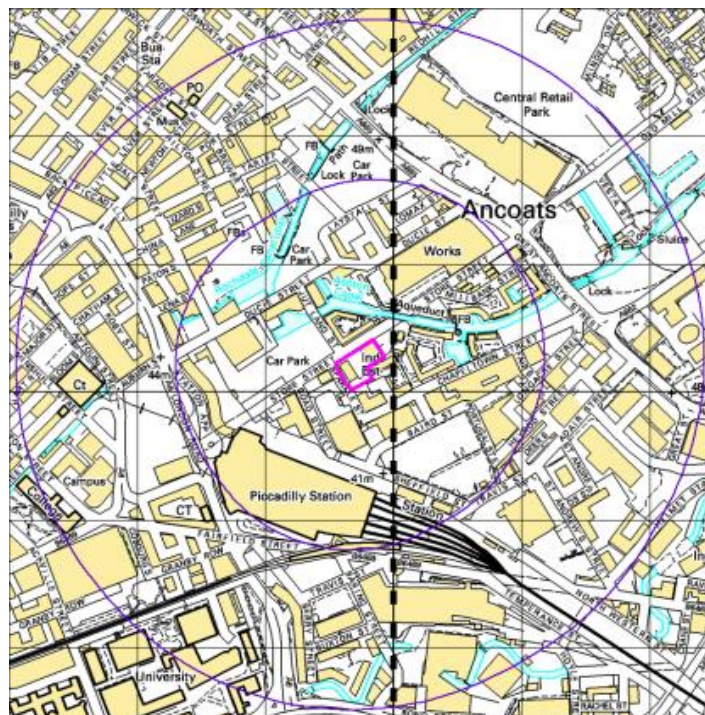


Figure 1 - Site Location Plan (Site boundary shown in pink).

2.2 Site History

Earliest mapping from 1787-1794 shows the site with Shooters Brook within the north east corner of the site, flowing down through the middle and exiting the site in the west. Large sloped river banks associated with Shooters Brook were recorded north and south of the channel extending across the majority of the site. A building off Chapel Street is noted within the south of the site with areas of empty space noted to the east and south of the building. Two buildings are noted immediately south of the site off Chapel Street.

By 1851 historical maps show the site to be vacant excepting a small depression within the centre of the site (potentially associated with a pond) along with a footpath running north to south within the western portion of site. By this time Shooters Brook is recorded as culverted under Store Street, immediately north of the site and is no longer recorded on site. From 1889 to 1978 the site was occupied by a Timber Yard and associated buildings along with Thompson McKay & Co occupying a large rectangular building within the east of the site, with various other small structures. From 1978 onwards, the Timber Yard no longer recorded and instead the site is occupied by two buildings in the east

and west, with an open yard in the centre. From 1996, the site is generally in its current configuration and is recorded as the Gateway Industrial Estate.

The area surrounding site has undergone numerous changes since earliest mapping, and consists of mixed land-use including residential, several manufacturing works, railway land, car parks and warehouses. Early mapping (1889 – 1891) depicts the surrounding area of the site as residential properties to the south and west, a Goods Station (railway), tin works and cotton mill to the north, and a Packing Case Manufactory to the east.

A large railway station and associated railway tracks are located 150m south-west of the site and from early mapping (1889) was known as London Road Station, which subsequently changed to Piccadilly Railway Station from 1958 onwards.

2.3 Hydrogeology and Hydrology

A study of the Envirocheck Report acquired for the Curtins Phase 1 report (Ref. 1) and the British Geological Survey (BGS) 1:50,000 mapping records (Bedrock and Superficial Editions) for Manchester (Sheet 085) (Ref. 4) indicates the following geological and hydrogeological succession underlying the site:

- Glacial Till
- Chester Formation (Sandstone)

The Chester Formation is classified as a Principal Aquifer.

The site is not situated within a Source Protection Zone. There are no recorded potable groundwater abstractions within 1km of the site.

The nearest surface water feature is located 37m north of the site, recorded to be the Ashton Canal. This is at a greater elevation than the site, and flows over the bridge located northeast of the site.

2.4 Ground Conditions

The ground conditions at the site broadly comprise a variable thickness of granular and cohesive Made Ground, underlain by granular and cohesive Glacial Till, granular Glaciofluvial Sheet Deposits and bedrock of the Chester Formation. Organic rich soils, likely associated with the historic Shooters Brook river bed, were recorded beneath Made Ground in various locations.

2.4.1 Made Ground

Beneath a surface covering of concrete (internal) or tarmac (External), variable Made Ground was encountered. The deepest Made Ground was recorded within the assumed footprint of the former Shooters Brook, and was shallower in other areas of the site.

Granular Made Ground was recorded in all exploratory holes directly beneath the hardstanding concrete/tarmac to maximum observed depths between 0.41m and 6.45m bgl. The composition of the granular Made Ground varied across the site, though was described as:

- Grey sandy gravel, with gravels comprising subangular sandstone.
- Grey/black very sandy very gravelly silty fine to coarse sand, with gravels comprising fine to coarse subangular brick, concrete and slate fragments.
- Black silty gravelly fine to coarse sand with gravels comprised of fine to coarse subangular brick, coal and glass fragments.
- Dark brown gravelly fine to coarse sand with cobbles, with gravels and cobbles comprising of brick and sandstone.
- Dark greyish brown silty gravelly fine to coarse sand with a medium cobble content. Gravel and cobbles comprise pottery, brick, and wood.

- TP104 observed Made Ground strata comprising, dark grey and brown sandy gravel with a medium cobble content and a low boulder content. Gravel comprised of brick, sandstone, ash, clinker, wood, pottery and limestone. Cobbles and boulders comprised of brick and wood. Large beams of timber were noted during excavation.
- TP105 encountered a grey silty slightly gravelly fine to coarse sand with a contamination odour and pockets of sandy clay from 2.10 to 2.50m bgl.
- WS102 encountered locally deep Made Ground deposits with granular Made Ground encountered from 5.60 to 6.45m bgl, where the position was terminated. The granular Made Ground was described as Dark grey clayey fine to coarse sand with a chemical odour.

Cohesive Made Ground was recorded in the following locations:

- BH03, comprising very soft brown gravelly organic rich silt between 1.26m and 2.00m bgl,
- WS03 comprising light brown very sandy gravelly clay, with fragments of brick, ash, concrete, coal, mudstone and sandstone (1.13m to 2.53m bgl) and light greyish brown very sandy gravelly clay with fragments of brick and concrete (2.53m to 2.75m bgl).
- WS04 comprising dark brown and black sandy gravelly clay with fragments of brick, concrete, clinker and coal (1.90m to 2.00m bgl) and dark brown very gravelly very sandy cobbly clay with fragments of brick and concrete (2.25m to 2.60m bgl).
- WS05 comprising Soft brown very sandy gravelly clay, with fragments of ash, brick, concrete, coal and clinker (1.20m to 1.70m bgl) and fragments of brick, mudstone, siltstone, sandstone and quartzite (1.70m to 3.00m bgl). This is underlain by very soft brown and grey sandy slightly gravelly clay with fragments of coal (3.00m to 4.90m bgl).
- In BH01 between 1.50m and 2.58m bgl a stratum of black very silty wood chippings was encountered.
- WS102, comprising reddish brown gravelly sandy clay, with fragments of brick, sandstone, ceramic and limestone (2.15m to 5.60m bgl).
- WS103, comprising greyish brown gravelly sandy clay, with fragments of brick (0.80m to 2.00m).
- WS104, comprising brown sandy slightly gravelly clay, with fragments of brick (3.20m to 4.00m bgl).
- WS106A, comprising brown mottled dark grey sandy gravelly clay with cobbles, with fragments of brick and sandstone (0.80m to 1.30m bgl), and brown very sandy clay (1.30m to 2.20m bgl).
- WS107, comprising brown gravelly sandy clay with cobbles, with fragments of brick (0.70m to 1.25m bgl).

Organic rich Made Ground deposits were encountered within TP102 and TP103, between 2.40m to 3.30m bgl and TP102 and 2.50m to 3.20m bgl, respectively, comprising dark grey very silty slightly gravelly fine to coarse sand with an organic odour and a low cobble content. Gravels and cobbles comprised brick and pottery.

2.4.2 Organic Rich Soils

Very soft organic silt deposits were encountered in WS05, BH03 and TP101 underlying Made Ground Deposits. Soils are typically described as very soft black very sandy organic silt or dark grey silty fine to medium sand. Soils were recorded between 4.90m and 5.00m bgl in WS05, 2.38m to 4.72m bgl (with soft reddish brown very sandy gravelly silt between 2.76m and 3.69m bgl) in BH03, and between 3.40m to an observed depth of 3.60m bgl in TP101. Organic deposits located around BH03, TP101, TP102 and TP103 are likely associated with Shooters Brook, shown in the

1787-1794 historical maps. Shooters Brook was culverted after 1794, no longer recorded on site. Organic Made Ground deposits are likely associated with the infilling of Shooters Brook.

2.4.3 Glacial Till

Cohesive Glacial Till deposits were encountered ten exploratory hole locations (BH01, BH02, BH03, WS02, WS03, WS05, TP101, WS101 WS106A and WS107) to maximum depths between 3.00m and 6.50m bgl. Soils are typically described as soft, firm or stiff brown, with some grey mottling, sandy to very sandy gravelly clay with gravels comprised of fine to coarse subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.

Granular Glacial Till deposits were encountered in six exploratory hole locations (BH01, BH02, WS02, WS04, WS05b, WS101 and TP105) to maximum depths between 5.64m (BH03) and 8.14m (BH01) bgl. Granular Glacial Till was typically described as a Medium dense or dense light brown or reddish-brown fine to coarse sand' and/or a 'reddish-brown very gravelly fine to coarse sand with gravels comprised of fine to coarse subrounded to subangular mudstone, siltstone and sandstone fragments or brown silty clayey fine to medium sand.

2.4.4 Coarser Glacial Deposits

Coarser Glacial deposits were encountered in all BH01, and BH02 directly beneath the Glacial Till deposits described above. This deposit is also likely of Glacial origin but was much coarser and typically described as very dense greyish brown very sandy gravel of mixed lithology. Soils were encountered from depths of 8.14m bgl (BH01) and 6.88m bgl (BH02). No recovery of soil was recorded in BH03 between 5.91m and 8.00m bgl. It is possible that Glaciofluvial Sheet Deposits were washed away during the drilling process with the use of water flush.

2.4.5 Chester Formation

Highly weathered sandstone was encountered in BH03 between 8.00m and 9.50m bgl, comprising very dense reddish brown very gravelly sand with gravels comprised of fine to coarse subangular sandstone fragments.

Competent bedrock of the Chester Formation was encountered at 10.33m bgl (BH01) 8.22m bgl (BH02) and 9.50m bgl (BH03). The Chester Formation is characterised by reddish brown very weak to weak medium to coarse grained sandstone.

Fractures are generally horizontal to sub-horizontal, very closely to closely spaced, locally widely spaced, planar, rough and clean. Fractures with sand or clay infill were also recorded. Vertical and inclined fractures were also recorded.

Where non-intact rock was recovered, this was typically recorded as reddish brown silty fine to coarse sand, reddish brown medium and coarse sand, reddish brown gravelly medium to coarse sand, with fine to coarse fragments of sandstone and mudstone, or reddish-brown gravel of sandstone and mudstone.

2.5 Observed Potential Contamination

A summary of the observed contamination during the Curtins ground investigations are presented in Table 1.

Table 1 - Visual and Olfactory Evidence of Contamination

Exploratory Hole ID	Depth (m bgl)	Strata	Description
BH01	1.65 – 2.58	Made Ground	Strong hydrocarbon odour and iridescent sheen on soils.
BH02	0.08 – 0.46	Made Ground	Asbestos Fragment (Chrysotile Cement)
BH03	2.38 – 2.76	Organic Rich Soils	Slight organic odour
	3.69 – 4.72	Organic Rich Soils	Slight organic odour
WS05	4.90 – >5.00	Organic Rich Soils	Strong organic odour
WS102	5.60 – 6.45	Made Ground	Strong chemical odour

Exploratory Hole ID	Depth (m bgl)	Strata	Description
WS106A	2.20 – 2.50	Made Ground	Strong hydrocarbon odour
TP101	3.40 – 3.60	Organic Rich Soils	Slight organic odour
TP102	2.40 – 3.30	Organic Rich Made Ground Soils	Slight organic odour
TP103	2.50 – 3.20	Organic Rich Made Ground Soils	Slight organic odour
TP105	1.80 – 2.10	Made Ground	Hydrocarbon odour

No free phase contamination was encountered.

2.6 Obstructions Encountered

WS106 encountered concrete at 0.60m bgl which could not be excavated and was attempted three times which found the same obstruction.

TP102 encountered red brick at 3.35m bgl which

No further obstructions were encountered as part of the ground investigation works.

2.7 Groundwater

No groundwater was encountered during the initial site investigation works. It was not possible to determine groundwater strikes within the bedrock formation due to the use of water/air mist flush.

Perched water was recorded within TP101 at 2.20m bgl, at the base of the Made Ground. The strike recorded a fast infiltration rate.

Damp strata was noted within WS101 from 2.40m to 2.64m bgl within the natural granular deposits.

Notwithstanding, perched water may be encountered in other areas of the site, or during construction, accounting for variability beyond the findings of this investigation.

Six groundwater monitoring visits have been undertaken between the 25th May and 2nd August 2023. A summary of the groundwater levels recorded during the siteworks is presented in *Table 2*.

Table 2 - Groundwater Level Monitoring Results

Borehole Ref.	Installation Strata	Response Zone m bgl (m AOD)	Depth, m bgl (m AOD)					
			25/05/2023	12/06/2023	05/07/2023	14/07/2023	18/07/2023	02/08/2023
WS01	0.50-1.20	Made Ground	Dry	Dry	Dry	Dry	Dry	Dry
WS03	1.50-2.50	Made Ground	(1)	(1)	(1)	(1)	(1)	(1)
WS05	4.00-5.00	Made Ground	Dry	Dry	Dry	5.00	4.98	4.97
BH01	20.00-30.00	Chester Formation	10.42	10.30	10.47	10.40	10.49	(2)
BH02	10.00-15.00	Chester Formation	10.31	10.26	10.34	10.36	10.39	10.24

Borehole Ref.	Installation Strata	Response Zone m bgl (m AOD)	Depth, m bgl (m AOD)					
			25/05/2023	12/06/2023	05/07/2023	14/07/2023	18/07/2023	02/08/2023
BH03	15.00-25.00	Chester Formation	10.72	10.65	10.70	10.69	10.77	10.51

(1) Borehole damaged by warehouse vehicles unable to monitor groundwater level.

(2) Borehole tap was stuck within the pipe due to vehicle compaction, therefore unable to monitor groundwater level.

2.8 Unexploded Ordnance

Risk mapping for UXO's has placed the site in a **Moderate**-risk area. Moderate-risk areas are those with a bombing density of 10-49 bombs per 1000 acres and contain potential WWII targets. A UXO find was reported east of the site. Further action to mitigate UXO risk is essential to Moderate-risk areas.

The Principal Contractor for future construction works will need to undertake their own assessment, relevant to their own proposed scope of works.

2.9 Contamination Risk Assessments and Remediation

During the Curtins 2023 and 2025 ground investigations a programme of environmental chemistry testing was undertaken on soil samples obtained of the Made Ground and natural soils.

Contamination risk assessments and recommendations undertaken by Curtins are summarised below.

2.9.1 Soils

The Phase 2 investigation environmental chemistry results were compared with Generic Assessment Criteria for soils with respect to human health for a '*Residential without plant uptake*' end use for a 1% w/w SOM for Made Ground. Several exceedances were identified including:

- Metals (Lead)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- C8-C16 aliphatic hydrocarbons
- C8 – C16 Aromatic hydrocarbons
- 1,2,4-Trimethylbenzene

These exceedances are reported in *Table 3, overleaf*.

Table 3 - Summary of Contaminant Concentrations Exceedances Vs. Residential without plant uptake 1%SOM GACs

Determinant	GAC Threshold (mg/kg)	Concentration (mg/kg)						
		BH01 (0.40-0.50)	BH01 (1.40-1.50)	BH01 (2.20-2.40)	WS01 (0.60-0.70)	BH03 (0.40-0.50)	WS102 (5.60-6.45)	TP105 (2.20-2.40)
Lead	310	-	-	-	444	565	-	-
Aliphatic Hydrocarbon EC8-EC10	27	-	72	729	-	-	-	-
Aliphatic Hydrocarbon EC10-EC12	130	-	256	1500	-	-	-	-
Aliphatic Hydrocarbon EC12-EC16	1100	-	1150	3670	-	-	-	-
Aromatic Hydrocarbon EC8-EC10	47	-	-	375	-	-	-	-
Aromatic Hydrocarbon EC10-EC12	250	-	-	1030	-	-	-	-
Aromatic Hydrocarbon EC12-EC16	1800	-	-	4190	-	-	-	-
Benzo(a)anthracene	11	15.7	-	-	-	-	-	-
Benzo(a)pyrene	3.2	14.2	-	-	-	3.44	-	-
Benzo(b)fluoranthene	3.9	14.2	-	-	-	-	4.46	-
Dibenzo(ah)anthracene	0.31	1.35	-	-	0.33	0.54	-	-
1,2,4-Trimethylbenzene	0.41	-	-	0.763	-	-	-	-

All soil were screened for asbestos, positive identification was reported within three samples. The results are summarised below in *Table 4*.

Table 4 - Positively Identified Asbestos

Borehole Ref.	Depth (m bgl)	Strata	Determinant	Asbestos in Soil Quantification (% w/w)
BH01	0.40	Made Ground	Chrysotile Loose Fibres	<0.001
BH02	0.08	Made Ground	Chrysotile Cement	15
WS106A	2.20	Made Ground	Chrysotile Cement	<0.001

2.9.2 Controlled Waters

The site is underlain by a Principal Aquifer, associated with the Chester Formation. The nearest surface water feature is a canal located 37m north of the site, however it is located substantially above the existing site level.

With consideration of the preliminary conceptual site model, the primary risk receptor for Controlled Waters is the Principal Aquifer (Chester Formation) underlying the site. As such the results of laboratory analysis of groundwater have been assessed against the UK Drinking Water Standards (DWS). In the absence of UK DWS, a comparison against WHO standards has been used.

Three groundwater samples were obtained during the ground investigation. Elevated concentrations of contaminants of concern, with respect to the relevant guideline values, are summarised in Table 5.

Table 5 - Chemical Exceedances in Groundwater (Vs. UK DWS)

Exploratory Hole I.D.	Depth (m bgl)	Strata	Determinant	Concentration (µg/l)	UK DWS /WHO Guideline Value (µg/l)
BH01	10.47 – 26.90	Chester Sandstone	Benzo(a)pyrene	0.02	0.01
BH02	10.34 – 12.72	Chester Sandstone	>C21-C35 Aliphatic Hydrocarbons	780	300
			>C21-C35 Aromatic Hydrocarbons	111	90
			Total Hydrocarbons	920	300

A very marginal exceedance of Benzo(a)pyrene was recorded in the sample obtained from BH01 within the Chester Formation. Benzo(a)pyrene concentrations in the other two samples were recorded below the limit of detection of the analysis methodology.

Elevated long chain (>C21 – C35) hydrocarbons were recorded in BH02, also within the Chester Formation. The other two samples obtained identified very low TPH concentrations.

A very limited (0.46m) thickness of Made Ground was identified in BH02, with no notable sources of hydrocarbon contamination within the exploratory hole log.

The superficial deposits are likely to afford some protection to the bedrock aquifer though the presence of cohesive spoils and dense granular deposits.

It is considered that the elevated concentrations identified are associated with the wider industrial land use of Manchester city centre and not indicative of site won contamination.

, The site is not located within a Source Protection Zone, and the absence of a potable groundwater abstraction within 1km of the site.

No further action is required to address risks to controlled waters.

2.9.3 Aggressive Ground Conditions

The site has been classified in accordance with BRE Special Digest 1 (Ref. 5). Based on the laboratory test results it is considered that a Design Sulphate Class may be taken as DS-1 with an ACEC class of AC-1 for the Glacial Till, Glaciofluvial Sheet Deposits, weathered bedrock and the Chester Formation sandstone bedrock, however DS-2 and AC-2 mixes will be required in Made Ground soils and organic rich soils.

2.9.4 Remediation Strategy

A Remediation Strategy has been produced (Ref. 6) to inform remedial action to be undertaken at the site, prior to commencement of piling activities.

Broadly, remedial works involve the removal of hydrocarbon contaminated soils in the vicinity of BH01, identified during the 2023 ground investigation. This is primarily to remove human health risk but also reduces risk to groundwater further.

This risk assessment has been undertaken in anticipation of future ground conditions, following removal of these soils.

3 PILING RISK ASSESSMENT

It is understood that at the current design stage, the adoption of CFA piles, socketed into the underlying Chester Formation sandstone, is the preferred piling solution. This method has been selected with consideration of minimal ground vibration as well as groundwater protection aspects.

This Piling Risk Assessment will cover the use of CFA piling techniques to assess their suitability for the site.

It is important that the chosen piling contractor is contacted at the earliest opportunity to advise the suitability of their piles pertaining to the ground conditions at the site. This risk assessment should be updated should any change to proposed piling technique be made.

3.1 Continuous Flight Auger (CFA)

CFA piles essentially involve driving a large auger into the ground, with soils within the radius of the auger brought to surface and replaced with concrete on withdrawal of the auger through the auger stem (See Figure 2). The displacement of the surrounding ground is governed by the speed of rotation of the auger relative to the speed of vertical penetration. Theoretically, it is possible to adjust the speeds so that the volume of soils displaced laterally and removed as arisings is equal to the volume of concrete placed.

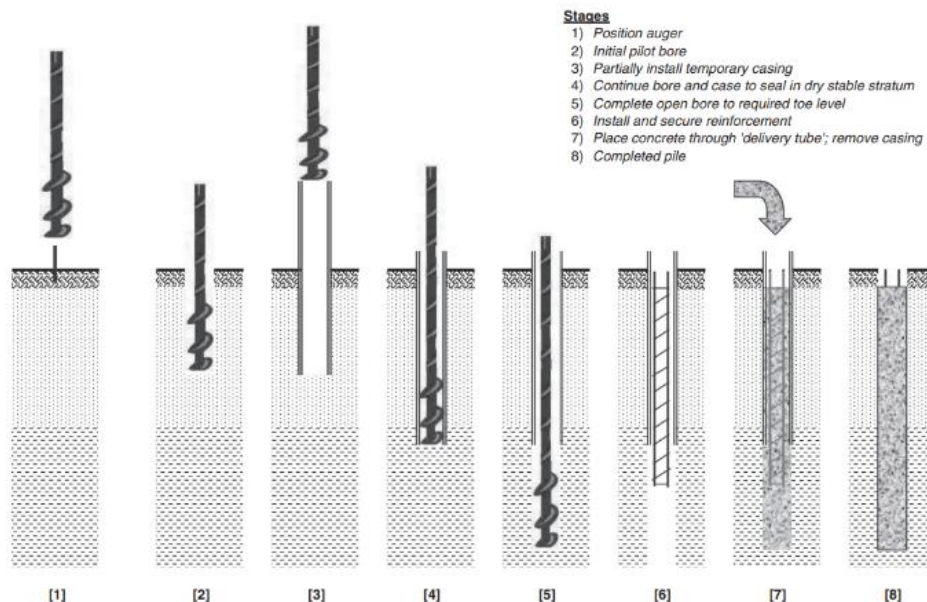


Figure 2 - CFA Piling Methodology

CFA piling can be used with or without casing. The use of casing reduces the risk associated with the migration of potentially contaminated groundwater and can be safely removed and captured during the piling process.

3.2 Piling Risk Assessments

Within the EA Report (2001), the six Source-Pathway-Receptor scenarios are identified as:

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 arising 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; and*
6. *Contamination of groundwater and, subsequently, surface waters by concrete, cement paste or grout.*

This piling risk assessment (Table 6), addresses aspects 1, 4, 5 and 6 only, in keeping with the objectives of this report (assessing the risk to groundwater). Other aspects should be appropriately dealt with through engineering design and suitable on-site management.

The risk assessment methodology follows that presented in *Appendix C*.

Table 6 - Tabulated Risk Assessment: CFA Piles

Aspect		Potential Consequence	Potential Probability	Potential Risk	Risk Management Options Available	Resultant Risk
1. Creation of preferential pathways, through a low permeability layer (an aquitard), to allow potential contamination of an underlying aquifer.	Glacial Till and Glaciofluvial Sheet Deposits	Mild Pollution of Secondary Undifferentiated Aquifer	Unlikely - Exploratory hole logs indicate presence of interbedded granular and cohesive soils, with varying proportions of silt. Silt and clay fractions likely to limit migration of groundwater beneath the site. - No groundwater bodies have been identified within Made Ground. Localised perched water may be present within Made Ground. - Hydrocarbon contamination (oily sheen, hydrocarbon odour and elevated TPHs in soil samples) identified in BH01. These materials are to be removed from site as part of the remediation works, as detailed in the Remediation Strategy, prior to construction. - CFA piling essentially self-sealing with concrete, therefore no resultant pathway.	Very Low	- Temporary casing can be used to create a seal around the auger and stop potential groundwater migration during drilling. - Pile to be grouted in stages, and casing removed while concrete is still wet, to self-seal and mitigate against potential preferential pathways through the superficial soils to the underlying Principal Aquifer.	Very Low
	Chester Formation	Medium Pollution of sensitive water resources in groundwater, although not abstracted in the immediate vicinity.		Low		Low
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).		Mild Damage to sensitive buildings/structures/services or the environment.	Likely (Made ground) Soluble sulphate concentrations in soils meet a Design Sulphate class of DS-2/AC-2 where piling through Made Ground or organic rich soils.	Moderate/Low	Use appropriate concrete designation (DS-2 & AC-2) as a minimum.	Low
5. The driving of solid contaminants down into an aquifer during pile driving.		Mild Pollution of non-sensitive water resources	Low Likelihood (Piling into Glacial Till) - Auger may enable downward movement of soil into the underlying generally low permeability superficial soils. - Hydrocarbon contamination (oily sheen, hydrocarbon odour and elevated TPHs in soil samples) identified in BH01. These materials are to be removed from site as part of the remediation works, as detailed in the Remediation Strategy, prior to construction.	Very Low	- Auger rotation speed to match the downward progression of the pile to prevent downward movement of soils. - Use of temporary casing to ensure stability of Made Ground soils during piling activities. Install casing and drill pile positions in stages, to seal off Made Ground soils prior to further progression into superficial soils and contamination areas. Implement clean drilling techniques where required. - Bottom up concrete pouring techniques to be utilised where appropriate to minimise likelihood of Made Ground soils falling into pile bore when casing is removed.	Very Low
		Medium Pollution of sensitive water resources (Principal Aquifer)	Unlikely (Chester Formation) Although some solid contamination may be driven down using this method, it is unlikely to come into contact with the Principal Aquifer at depth.	Low		Low
6. Contamination of groundwater and, subsequently, surface waters by concrete, cement paste or grout.		Mild Pollution of non-classified groundwater resources in groundwater.	Low Likelihood Concrete comes into contact with natural ground and could potentially bleed into the surrounding strata and ground water.	Low	- Cement content of the concrete will need to be closely monitored so that this in itself does not 'bleed' into groundwater. - Bottom up concrete pouring techniques to be utilised where appropriate.	Low
		Medium Pollution of sensitive water resources (Principal Aquifer)	Low Likelihood Concrete comes into contact with natural ground and could potentially bleed into the surrounding strata and ground water.	Moderate/Low		Low

4 SUMMARY AND RECOMMENDATIONS

A Remediation Strategy has been produced by Curtins outlining the measures to be undertaken at the site.

This Piling Risk Assessment has been undertaken with reference to ground conditions anticipated following the completion of a development plateau from which piling activities will be undertaken.

The risk assessment presented herein has concluded that the suitability of various pile types is subject to their location on site, and the location specific ground conditions determined in the Ground Investigation Report.

A Low Risk has been determined for the use of CFA piles at the site, providing the risk management measures detailed in Table 7 are implemented during the works:

Table 7 - Risk Management Options

Pile Type	Risk Management Options
CFA Piles	• Site workers and visitors to wear appropriate PPE during site work. • Auger rotation speed to match the downward progression of the pile to prevent downward movement of soils. • Install casing and drill pile positions in stages, to seal off Made Ground soils prior to further progression into superficial soils and contamination areas. Implement clean drilling techniques where required. • Piles to be installed with 'bottom up' technique to mitigate potential for downward migration of groundwater contamination. • Bleed tests to be undertaken on concrete used to ensure suitable composition so not to impact groundwater. • Use of DS-2 & AC-2 concrete mix as a minimum.

The following considerations should also be taken into account:

- *The piling contractor should prepare and submit relevant method statements for approval prior to piling works commencing;*
- *Where arisings are generated, they should be classified, handled and disposed of in compliance with relevant best practice and regulatory requirements;*
- *The piling contractor should make allowance for the provision of appropriate PPE and welfare facilities based on soil and groundwater chemical analysis results within the Phase 2 Ground Investigation Report;*
- *The piling contractor undertaking excavations should undertake their own risk assessments with regard to UXO risk at the site; and*
- *In the event of uncovering any areas of unexpected contamination during the piling works, including odorous or stained soils, works should be ceased with the advice of the appointed environmental consultant sought immediately.*

This document should be forwarded to the Planning Authority for discharge of a relevant planning condition where applicable, before piling works commence, to disclose the risks associated with specific piles types, and ensure the appropriate risk management measures are adhered to.

5 REFERENCES

1. Curtins (2024) *Phase 1 Preliminary Risk Assessment, Sparkle Street, Manchester*, Ref. 082142-CUR-00-XX-RP-GE-001
2. Curtins (2025) *Phase 2 Ground Investigation Report, Sparkle Street, Manchester*, Ref. 082142-CUR-XX-XX-RP-G-00003_P05
3. Environment Agency (2001) *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention National Groundwater & Contaminated Land Centre report NC/99/73 (EA Report 2001)*.
4. British Geological Survey (BGS) 1:50,000 (Bedrock and Superficial Edition, Sheet No. 085, 2011) for Manchester
5. Building Research Establishment. (2005) BRE Special Digest 1, 'Concrete in Aggressive Ground'. 2005
6. Curtins (2025) *Remediation Strategy, Sparkle Street, Manchester*, Ref. 082142-CUR-XX-XX-T-GE-00006-P01

APPENDICES

Appendix A – Drawings

Appendix B – Exploratory Hole Logs

Appendix C – Risk Assessment Rationale

Appendix A - Drawings

- Curtins Drawing, Exploratory Hole Location Plan - 082142-CUR-00-XX-DR-GE-80003-P01.
- Simpson Haugh (Architect) Drawings

Additional GI Exploratory Hole Location Plan

-  Window sample borehole Location (max depth 5m bgl).
-  Window sample boreholes to 5m with rotary core follow on to 35m.
-  Hand Excavated Trial Pit to maximum depth of 1.2m bgl.
-  Delineation Trial Pits
-  Delineation Window Sample boreholes
-  Foundation Trial Pit Location
-  Sub-station Window Sample Borehole

All proposed locations subject to GPR utility clearance.
It is assumed that free and unobstructed access is available to all proposed exploratory hole locations.

Project Name: Sparkle Street

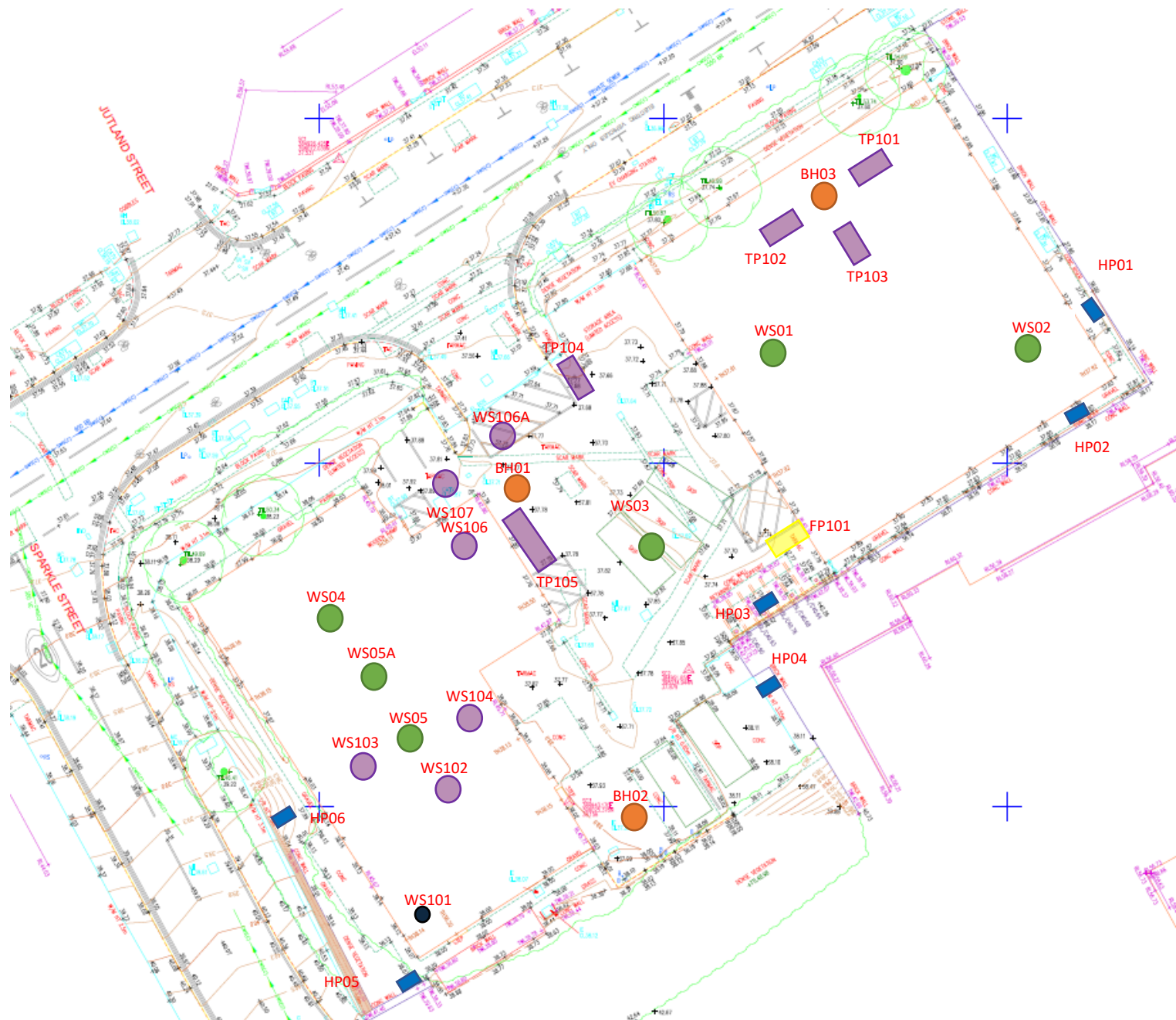
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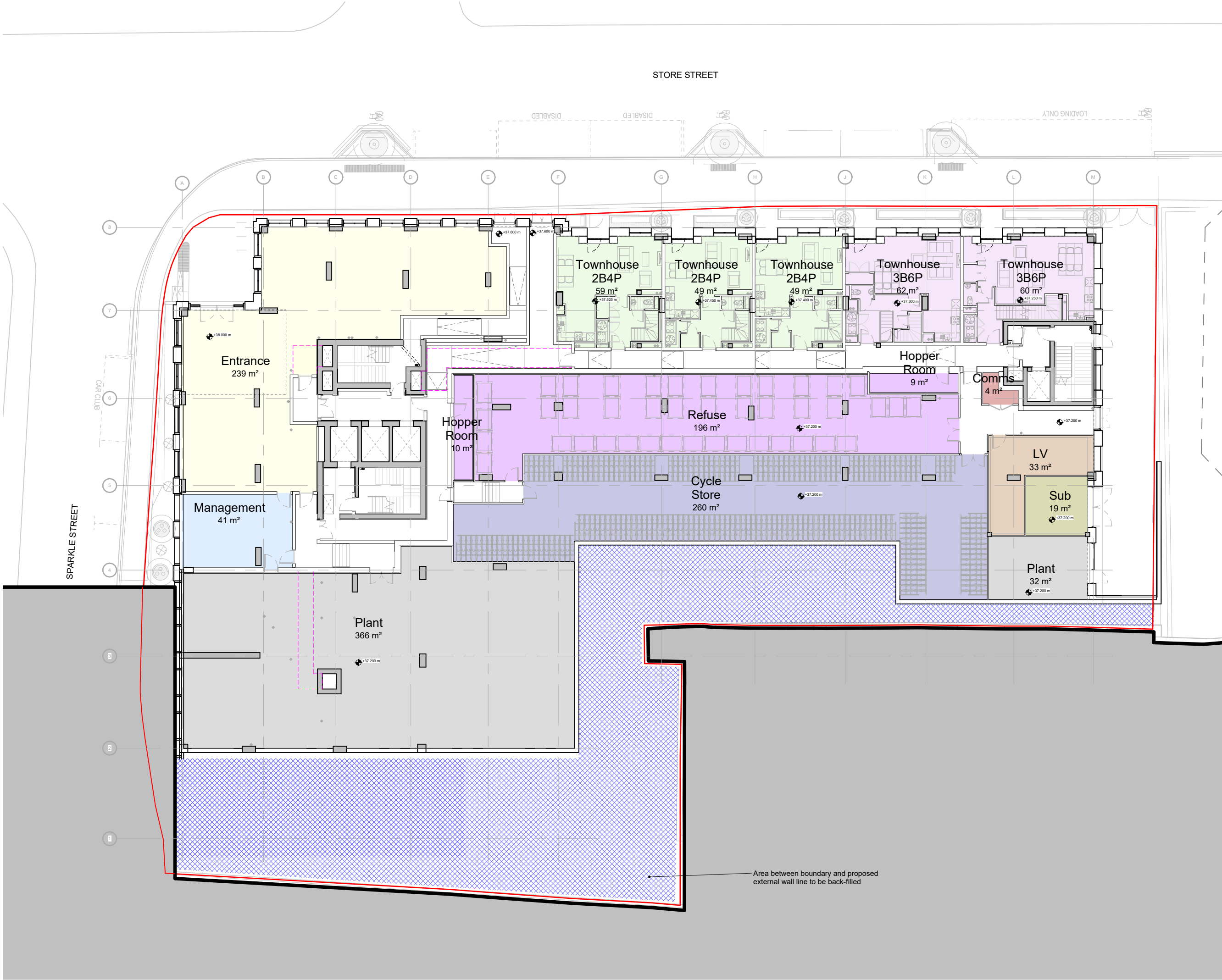
Drawing Name: Additional Ground Investigation
Exploratory Hole Location Plan

Drawing No: 082142-CUR-00-XX-DR-GE-80003-P01

Produced by: J Provis

27/11/2025





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Project Title
**Sparkle Street
Manchester**

Drawing Title
**General Arrangement Plan
Ground Floor**

Status		
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SHP Project No	Scale	1 : 250@A3
10413		
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Project Title
**Sparkle Street
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Drawing Title
**General Arrangement Plan
Level 01**

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Project Title
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Drawing Title
General Arrangement Plan
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Project Title
**Sparkle Street
Manchester**

Drawing Title
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Levels 03-08**

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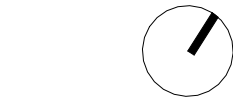
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Project Title
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Drawing Title
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Drawing Title
General Arrangement Plan
Level 10

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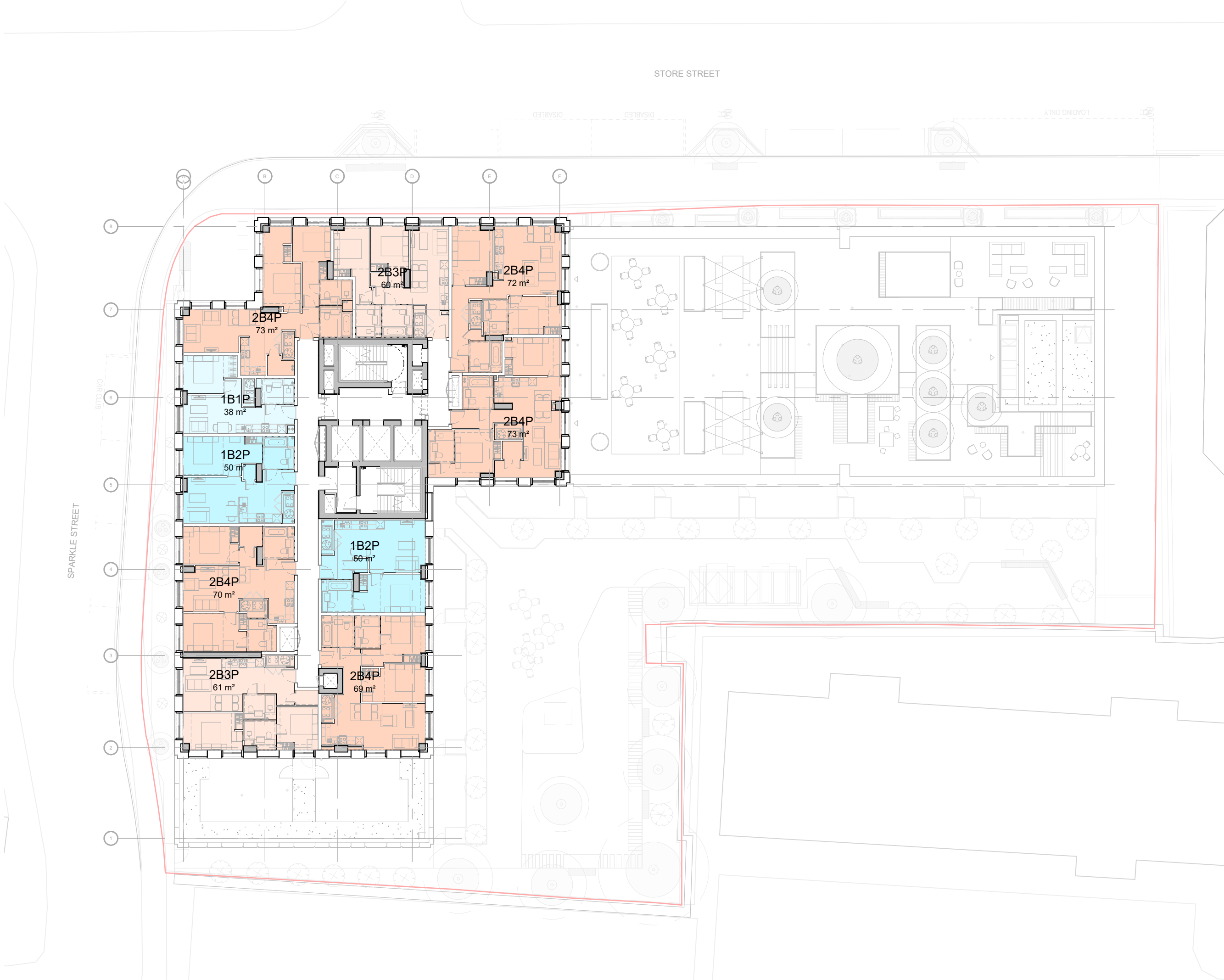
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Levels 11-24**

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Project Title
**Sparkle Street
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Level 25**

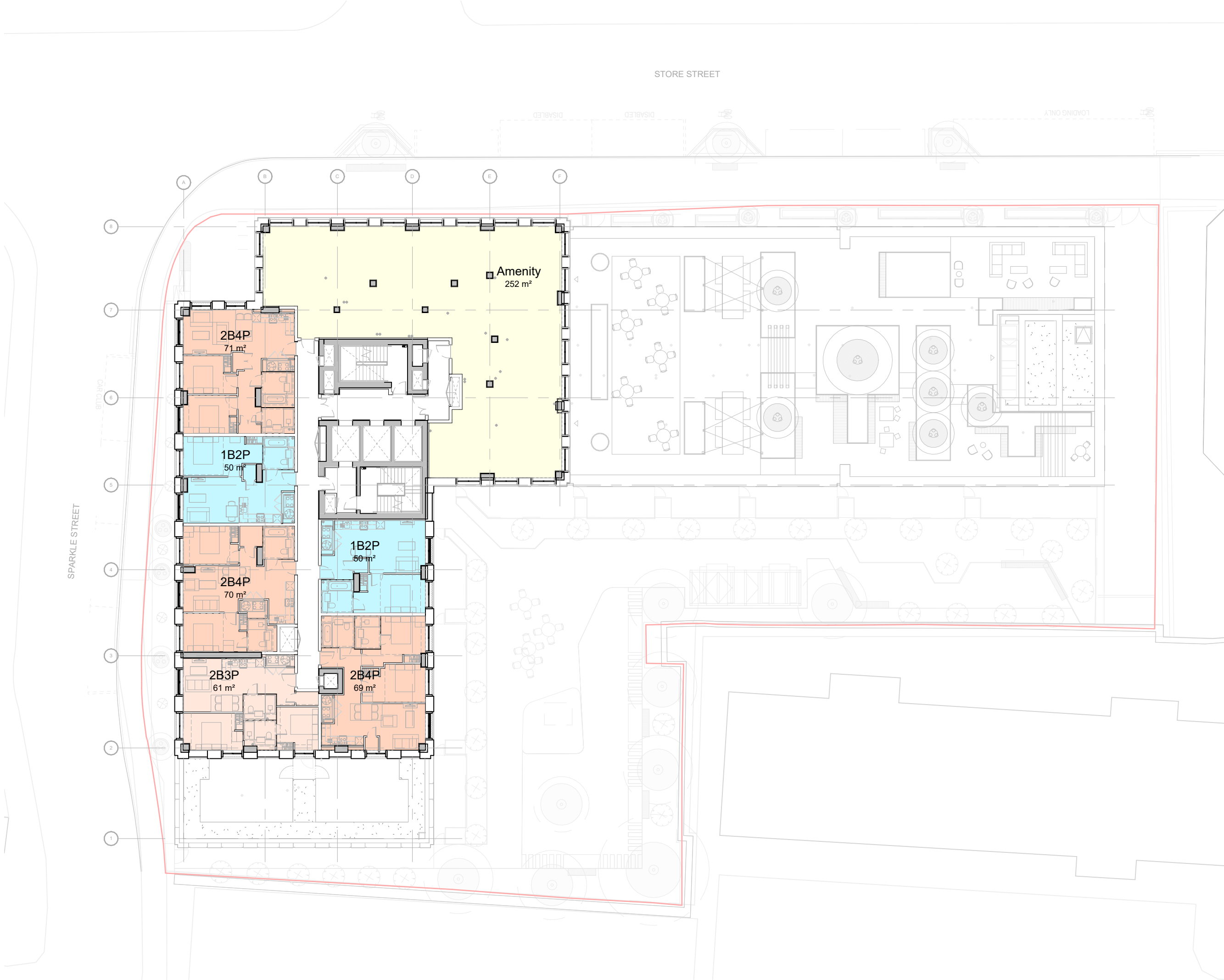
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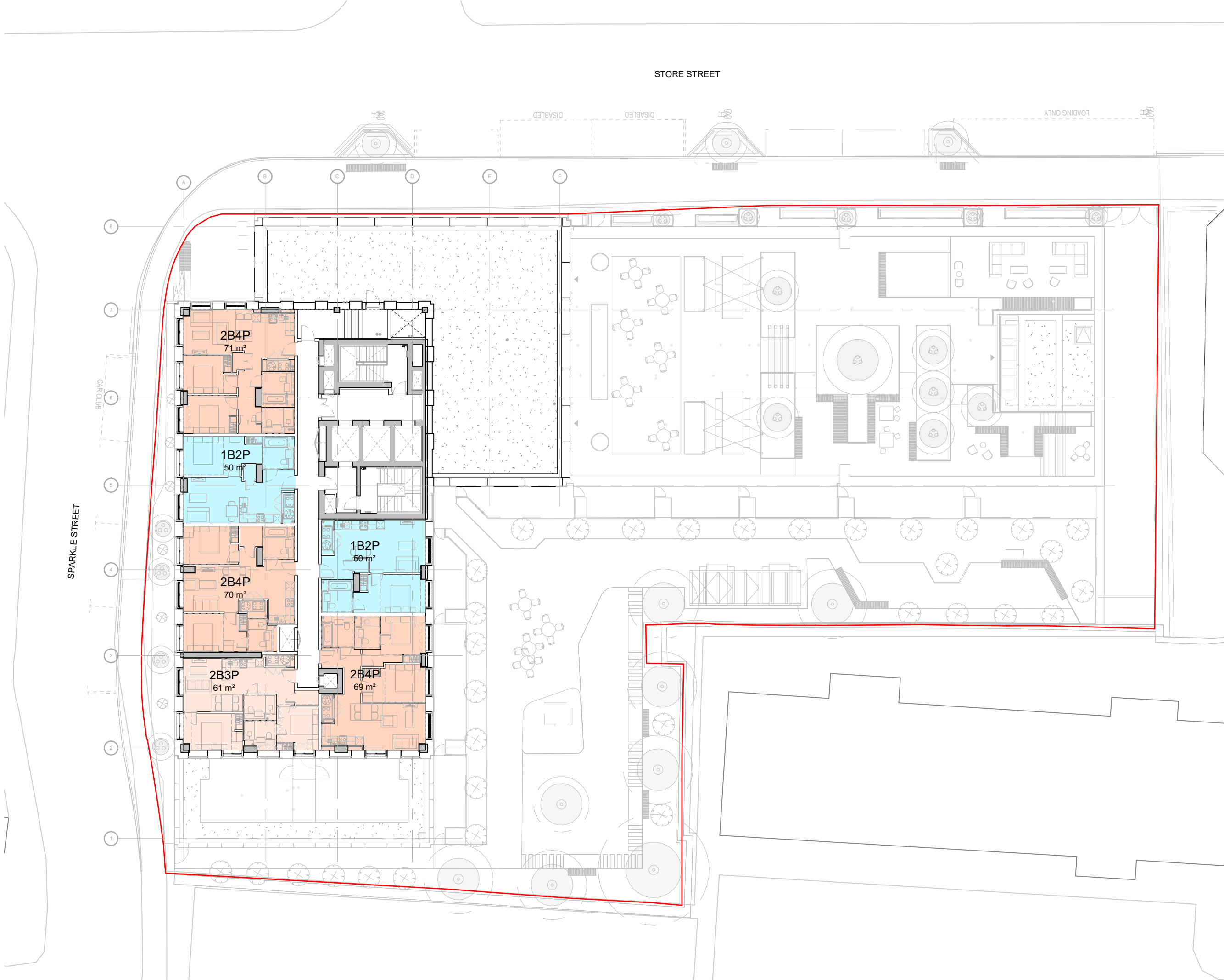
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Project Title
**Sparkle Street
Manchester**

Drawing Title
**General Arrangement Plan
Level 27**

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Drawing Title

General Arrangement Plan
Roof Level

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Appendix B – Exploratory Hole Logs

- Exploratory Hole Logs

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 28/04/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.40 - 0.50	ES				0.10 0.25 0.69			MADE GROUND: Black tarmac MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments. MADE GROUND: Black very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick, concrete and clinker fragments. MADE GROUND: Reddish brown slightly silty gravelly cobbly sand. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick fragments. Cobbles are occasional subangular brick fragments. <i>N=5 (3,1/2,1,1,1)</i>	1
		1.40 - 1.50	ES				1.50 1.65			MADE GROUND: Black very sandy silty gravel. Sand is fine to coarse. Gravel is fine subangular wood. <i>From 1.50 to 2.58m material has a strong hydrocarbon odour and an iridescent sheen.</i> MADE GROUND: Greenish brown very sandy silty gravel. Sand is fine to coarse. Gravel is fine subangular wood. <i>N=28 (3,6/6,7,8,7)</i>	2
		2.20 - 2.40	ES				2.58 2.88			Medium dense black very silty SAND. Sand is fine to coarse. Dense light brown very silty gravelly SAND. Sand is fine to coarse. Gravels are frequent rounded to subangular mudstone, siltstone, sandstone and quartzite fragments. <i>N=44 (7,8/7,10,15,12)</i>	3
		3.00 - 3.30 3.00 - 3.50	B ES							<i>N=35 (7,8/9,9,7,10)</i>	4
										<i>N=35 (5,8/9,9,9,8)</i>	5
							5.27 5.50			Dense light brown and black mottled very silty gravelly SAND. Sand is fine to coarse. Gravels are frequent rounded to subangular mudstone, siltstone, sandstone and quartzite fragments. Very dense light brown very silty gravelly SAND. Sand is fine to coarse. Gravels are frequent rounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	6
		6.00 - 6.50	D				6.00 6.50			Firm greyish brown very sandy gravelly CLAY. Sand is fine to coarse. Gravels are frequent fine to coarse rounded to subangular mudstone, siltstone and sandstone fragments. <i>N=50 (7,8/50 for 255mm)</i> Very dense reddish brown gravelly Sand. Sand is medium to coarse. Gravels are fine to coarse rounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	7
		7.50 - 8.00	B								8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

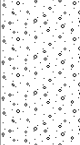
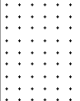
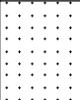
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 28/04/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description				
				TCR	SCR	RQD								
							8.14			N=50 (25 for 125mm/50 for 110mm) Very dense greyish brown very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse sub-rounded to subangular of mixed lithologies.	9			
							8.66			No recovery (suspected very dense sandy gravel).				
										N=50 (25 for 50mm/50 for 70mm)		10		
		10.33 - 11.00	20	100	75	46	10.33			Very weak to weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, close to medium spaced, planar, rough, clean. From 10.13 to 10.44m 1 No. 0-10 degrees, undulating, rough, clean fracture.			11	
			12							From 10.63 to 10.66m 1 No. 45 degree, planar, rough, clean fracture.				
		11.00 - 12.50	NI	100	97	59	12.60			From 10.68 to 10.71m recovered as non-intact brown clayey medium to coarse sand.				12
			38							From 11.13 to 11.18m recovered as non-intact coarse sand.				
			7							From 11.18 to 11.42m fractures are closely to very closely spaced.				
											From 11.2 to 11.25m 1 No. vertical, rough, clean fracture.			
		12.50 - 14.00	24	84	61	31	13			Very weak to weak, reddish brown medium to coarse SANDSTONE. Fractures are 0-10 degrees, close to very close spaced, planar, rough, clean. From 12.9 to 13.05m recovered as non-intact medium to coarse sand.	14			
			NI							From 13.12 to 13.19m recovered as non-intact medium to coarse sand.				
			29							From 13.39 to 13.46m recovered as non-intact medium to coarse sand.				
			NI							From 13.46 to 13.49m recovered as non-intact extremely weak coarse subangular gravel comprising mudstone.				
			11							From 13.76 to 14.00m no recovery.				
			AZCL											
		14.00 - 15.50	12	100	99	52				From 14.46 to 14.52m sandstone is very weak.		15		
			11							From 15.85 to 15.95m recovered as non-intact gravelly medium to coarse sand with gravels comprised of very weak fine to coarse subangular mudstone.			16	
			NI							From 15.95 to 16.08m 1 No. vertical, planar, rough, clean fracture.				
							Continued on next sheet							

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 28/04/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description							
				TCR	SCR	RQD											
		15.50 - 17.00	16	100	76	38	18.50			From 16.18 to 16.38m recovered as non-intact gravelly medium to coarse sand with gravels comprised of very weak fin to coarse subangular mudstone.	17						
			NI														
			12														
		17.00 - 18.50		NI	100	80				37	From 17.54 to 17.63m recovered as non-intact fine to coarse sand.	18					
				9													
			18.50 - 20.00										100	100	69	Weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, closely to medium spaced, planar, rough, clean.	19
		10															
				20.00 - 21.50	95	95				84	From 20.53 to 20.69m 2 No. stepped, undulating, rough, clean closely spaced fractures.	20					
			AZCL														
		21.50 - 23.00	7										100	100	77	From 21.43 to 21.50m no recovery.	21
			23.00 - 24.50	AZCL	93	85				85	From 23.00 to 23.10m no recovery. From 23.10 to 23.18m non-intact drilling induced fractures recovered as subangular gravel. From 23.19 to 23.31m 1 No. 45 degrees, planar, rough, clean fracture.	22					
																From 23.88 to 24.00m 1 No. 45 degrees, planar, rough fracture with brown fine to coarse clayey sand infill.	23
															Continued on next sheet	24	

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

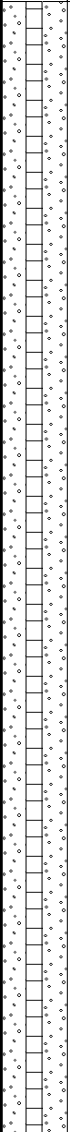
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 28/04/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description		
				TCR	SCR	RQD						
			8								25	
		24.50 - 26.00		100	100	75				From 24.42 to 24.50m 1 No. 45 degrees, planar, rough, clean fracture.		
			8							From 25.07 to 25.08m 1 No. 0-10 degrees, undulating, rough, clean fracture.		26
		26.00 - 27.50		100	100	88				From 25.31 to 25.32m 1 No. 0-10 degrees, undulating, rough fracture with brown clay infill.		
			10	90	90	73				From 26.30 to 26.51m 1 No. 45 degrees, planar, smooth fracture with grey clay infill. From 26.30 to 26.54m sandstone is very weak.		27
		27.50 - 29.00										
			6	90	90	73				From 26.98 to 27.04m 1 No. 45 to 50 degrees, planar, rough, clean fracture.		28
	AZCL	90	90	73	From 28.07 to 28.10m 2 No very closely spaced band of very weak reddish brown mudstone.	29						
	NI	100	91	59	From 28.45 to 29.00m no recovery.	30						
29.00 - 30.50												
	7	100	90	68	From 29.70 to 29.84m recovered as non-intact medium to coarse gravelly sand with gravels comprised if fine to coarse subangular sandstone.	31						
	21	100	100	68	From 2 No. 30.12 to 30.50m very weak closely to very closely spaced fractures.	32						
	13	100	100	68	From 30.82 to 30.86m sandstone is very weak.	33						
30.50 - 32.00												
	9	100	100	68	From 31.04 to 31.16m 1 No. vertical, planar, rough, clean fracture. From 31.21 to 31.22m 1 No. 45 degrees, planar, rough, clean frature.	34						
		100	100	68	From 31.57 to 31.59m 1 No. 45 degrees, planar, rough, clean fracture.	35						
					Continued on next sheet	36						

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 28/04/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		32.00 - 33.50	10	100	100	88	35.00		</		

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 03/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.08			MADE GROUND: Black tarmac	
		0.40	ES				0.46			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete, slate and asbestos cement fragments.	
		0.46	ES				0.91			Soft grey and brown mottled very sandy gravelly CLAY. Sand is fine to coarse. Gravel is frequent fine to coarse subangular to subrounded mustone and siltstone fragments.	1
		1.70 - 2.00	B				2.00			Dense reddish brown very clayey gravelly SAND. Sand is fine to coarse. Gravels are frequent fine to coarse subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	
							2.20			N=30 (1,2/6,10,8,6)	
							2.60			Medium dense light grey very silty SAND. Sand is fine to coarse.	2
							2.80			N=19 (4,5/4,4,5,6)	
		2.80 - 3.00	D				3.00			Stiff light grey sandy gravelly CLAY. Sand is fine to coarse. Gravels are frequent fine to coarse subrounded to subangular mudstone, siltstone and sandstone fragments.	
							3.18			Medium dense light grey very silty SAND. Sand is fine to medium.	3
							3.50			Stiff light grey sandy gravelly CLAY. Sand is fine to coarse. Gravels are frequent fine to coarse subrounded to subangular mudstone, siltstone and sandstone fragments.	
		4.00 - 4.45	D				3.71			Very dense light brown very gravelly SAND. Sand is fine to coarse. Gravels are fine to coarse subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	4
							5.00			N=50 (10,15/50 for 150mm)	
										Soft light brown sandy gravelly CLAY. Sand is fine to coarse. Gravels are frequent subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	
										Very dense light brown very gravelly SAND. Sand is fine to coarse. Gravels are fine to coarse subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	5
		5.50 - 6.50	B							Stiff brownish grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse sub-rounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	
										Very dense reddish brown slightly gravelly SAND. Sand is fine to coarse. Gravels are frequent fine to coarse subrounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	6
										N=50 (25 for 85mm/50 for 75mm)	
										N=50 (11,13/50 for 125mm)	
		7.00 - 7.50	B				6.88			Very dense greyish brown very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse sub-rounded to subangular of mixed lithologies.	7
							8.00			From 7.79m to 8.00m No recovery.	8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

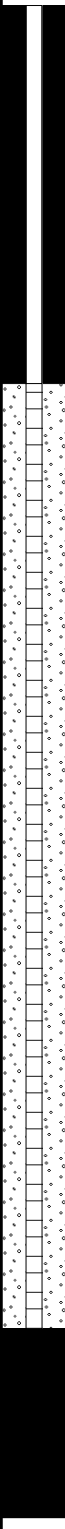
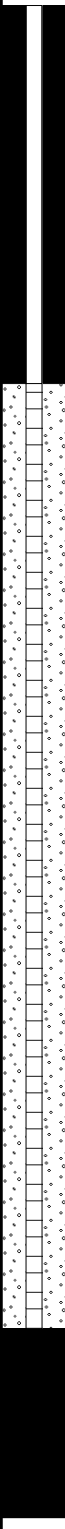
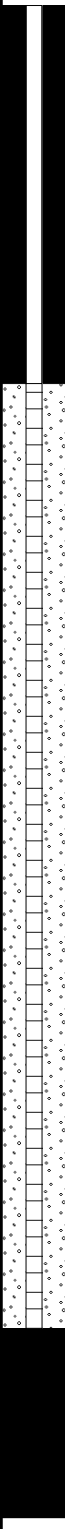
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 03/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		8.00 - 9.50	11	100	88	50	8.22			Very dense greyish brown very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse sub-rounded to subangular of mixed lithologies. <i>N=50 (25 for 60mm/50 for 70mm)</i>	
										Very weak to weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, closely to very closely spaced, planar, rough, clean.	
										From 8.34 to 8.36m 1 No. 30 degrees, undulating, rough, clean fracture.	9
										From 8.64 to 8.80m 1 No. vertical, rough, clean fracture.	
										From 8.83 to 8.84m 1 No. 45 degrees, planar, rough, clean fracture.	
										From 9.21 to 9.44m 1 No. vertical, planar, rough, clean fracture.	
		9.50 - 11.00	NI	100	85	28	10.22			From 10.00 to 10.22m recovered as non-intact gravelly medium to coarse sand with gravels comprised of fine to coarse sub-rounded to subangular mudstone and sandstone fragments.	10
			15							Weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, closely to very closely spaced, planar, rough, clean.	
										From 10.48 to 10.51m 1 No. stepped, undulating, rough, clean fracture.	11
										From 11.00 to 12.33m fractures are very close to medium spaced.	
		11.00 - 12.50	10	89	87	47				From 11.59 to 11.61m 1 No. 0-10 degrees, undulating, rough fractures with medium to coarse sand infill.	
			10							From 11.90 to 11.93m recovered as non-intact recovered as silty fine to coarse sand.	12
			AZCL							From 12.33 to 12.50m no recovery.	
		12.50 - 14.00	14	97	97	36				From 13.05 to 13.09m 4 No. 10-20 degrees, planar, rough fractures with fine to coarse sand infill.	13
										From 13.54 to 13.55m 1 No. 45 degrees, undulating, rough, clean fracture.	
										From 13.66 to 13.67m 1 No. 45 degrees, undulating, rough fracture with medium to coarse sand infill.	14
										From 13.95 to 14.00m no recovery.	
										From 14.15 to 14.18m 1 No. 45 degrees planar, rough, clean fracture.	
		14.00 - 15.50	12	100	100	65				From 14.49 to 14.51m 1 No. 45 degrees, planar, rough, clean fracture.	15
										From 14.62 to 14.63m 1 No. 0-10 degrees, undulating, rough, clean fracture.	
										From 14.84 to 15.50m sandstone is coarse grained with frequent fine to coarse subrounded gravels comprising quartzite.	
										From 15.50 to 15.67m no recovery.	
			AZCL				15.88			Weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, very closely to medium spaced, planar, rough, clean.	16
			25							From 15.97 to 15.98m 1 No. 45 degrees, undulating, rough, clean fracture.	

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 03/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00	11	89	75	63				From 16.29 to 16.31m 1 No. 0-10 degrees, undulating, rough, clean fracture.	
		17.00 - 18.50	NI	100	89	76				From 16.71 to 16.72m 1 No. 0-10 degrees, undulating, rough, clean fracture.	17
			8							From 17.00 to 17.08m recovered as non-intact medium to coarse sand.	
			NI								
			7							From 17.73 to 17.81m as non-intact medium to coarse sand.	18
		18.50 - 20.00	12	78	78	37				From 18.50 to 18.76m sandstone is closely to very closely spaced.	
										From 18.81 to 18.86m 1 No. 0-10 degrees, planar, rough fracture with brown clay infill.	19
		20.00 - 21.50		71	71	63				From 18.93 to 18.98m 1 No. 50-60 degrees, planar, rough, clean fracture.	
			AZCL							From 19.73 to 20.00m no recovery. (Drillers noted core lost to flush)	20
			8								
			AZCL							From 20.80 to 20.82m 1 No. fracture 10-20 degrees, planar, rough fracture with brown clay infill.	21
		21.50 - 23.00		100	89	73				From 20.97 to 20.98m 1 No. 10-20 degrees, undulating, rough fracture with fine to medium sand infill.	
										From 21.04 to 21.50m no recovery. (Drillers noted core damaged by drilling process)	
			10								22
			NI								
		23.00 - 24.50	15	85	83	67				From 22.36 to 22.38m 1 No. 20-30 degrees, undulating, rough, clean fracture.	
			NI							From 22.60 to 22.66m non-intact recovered as a medium to coarse sand.	23
										From 22.86 to 22.97m non-intact recovered as a medium to coarse gravelly sand with gravels comprised of fine to coarse subangular sandstone.	
			8							From 23.10 to 23.12m 1 No. 0-10 degrees, planar, rough fracture with fine to medium sand infill.	
										From 23.23 to 23.24m 1 No. 0-10 degrees planar, rough fracture with brown clay infill.	
										From 23.37 to 23.38m 1 No 20-30 degrees, planar, rough, clean fracture.	24

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 03/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
			AZCL								
		24.50 - 26.00	19	100	100	62				From 24.50 to 24.64m sandstone is very weak.	
										From 24.50 to 25.04m sandstone is closely to very closely spaced.	
		10				From 25.02 to 25.03m very weak reddish brown mudstone.					
						From 25.14 to 25.15m 1 No. vertical, planar, rough, clean fracture.					
						From 25.32 to 25.39m 1 No. 60-70 degrees, planar, rough, clean fractures.					
		26.00 - 27.50	5	91	91	83				From 25.65 to 25.66m 1 No. 10-20 degrees, undulating, rough, clean fracture.	
										From 25.72 to 25.74m 1 No. 0-10 degrees, undulating, rough, clean fracture.	
										From 25.87 to 25.88m 1 No. 0-10 degrees, planar, rough fractures with brown clay infill.	
		13				From 26.66 to 26.67m to 1 No. 45 degrees, planar, rough, clean fractures.					
						From 26.97 to 27.02m 2 No. 0-10 degrees, undulating, rough closely to very closely spaced fractures with fine to coarse sand infill.					
		AZCL				From 26.97 to 27.22m fractures are closely to very closely spaced.					
		27.50 - 29.00		88	88	72				From 27.36 to 27.68m no recovery.	
										From 27.68 to 27.78m 1 No. vertical, planar, rough, clean fractures.	
		8				From 28.12 to 28.14m 1 No. 0-10 degrees, planar, rough fracture with fine to medium clayey sand infill.					
						From 28.34 to 28.35m 1 No. 10-20 degrees, planar, rough fracture with fine to medium clayey sand infill.					
						From 28.61 to 28.62m 1 No. 10-20 degrees, planar, rough, clean fracture.					
		24		93	93	67				From 28.97 to 29.22m sandstone is closely to very closely spaced.	
		6									
										From 30.20 to 30.25m 2 No. 10-20 degrees, undulating, rough, clean close to very closely spaced fractures.	
		AZCL								From 30.39 to 30.50m no recovery.	
		5		100	100	85					
		21								From 31.39 to 32.02m 2 No. 0-10 degrees, undulating, rough, clean fractures.	
										From 31.81 to 32.00m fractures are close to very closely spaced.	
										Continued on next sheet	

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
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Co-ords: -

Hole Type
RC

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Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 03/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		32.00 - 33.50	6	90	90	83	35.00			From 32.59 to 32.95m 3 No. 45 degrees, planar, rough, clean closely spaced fractures.	33
			AZCL							From 33.35 to 33.50m no recovery.	34
		33.50 - 35.00	6	100	100	90				From 34.56 to 34.58m 1 No. 0-10 degrees, rough, clean fracture.	35
										End of borehole at 35.00 m	36
											37
											38
											39
											40

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 11/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.40 - 0.50	ES				0.17 0.34			CONCRETE with subangular recycled concrete aggregate. MADE GROUND: Dark grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick and concrete fragments. MADE GROUND: Black very gravelly cobbly sand. Sand is fine to coarse and contains ash. Gravel is frequent fine to coarse subangular brick, concrete and clinker fragments. Cobbles are occasional subangular brick fragments. <i>N=6 (1,0/0,1,2,3)</i>	1
							1.26			MADE GROUND: Very soft brown gravelly sandy organic silt. Sand is fine to medium. Gravel is frequent fine subangular brick fragments.	
		2.50 - 2.60	D				2.00 2.38			MADE GROUND: Dark brown to black very clayey gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick and concrete fragments. <i>N=8 (1,1/2,2,2,2)</i>	2
		2.80 - 2.90 2.80 - 3.00 3.00 - 3.45	ES D D				2.76			Very soft black and brown mottled very sandy organic SILT. Sand is fine to medium. Slight organic odour. Soft reddish brown very sandy gravelly SILT. Sand is fine to coarse. Gravel is occasional subrounded mudstone fragments. <i>N=7 (1,1/1,2,2,2)</i>	3
		3.70 - 3.80	D				3.69			Very soft black sandy organic SILT. Sand is fine to coarse. Slight organic odour. <i>N=9 (1,1/2,2,2,3)</i>	4
		4.00 - 4.45	D				4.72			Dense greyish brown very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular of mixed lithologies. <i>From 4.72m to 5.00m No recovery. N=37 (13,9/7,7,10,13)</i>	5
		5.70 - 5.80	D				5.32 5.64 5.91			Reddish brown gravelly silty SAND. Sand is fine to coarse. Gravel occasional subangular to subrounded mudstone and sandstone fragments. Firm very sandy gravelly CLAY. Sand is fine to coarse. Gravel is occasional fine to medium subrounded to subangular mudstone fragments. No recovery (Drillers noted lost to flush - suspected very dense sandy gravel). <i>N=50 (5,5/50 for 245mm)</i>	6
		6.50 - 6.95	D				8.00				7
										Continued on next sheet	8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 11/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		8.50 - 8.80	B				9.50			Reddish brown slightly gravelly SAND. Sand is fine to coarse. Gravels are fine to coarse subangular sandstone fragments. (Highly weathered sandstone). <u>N=50 (4, 4/50 for 275mm)</u>	9
		9.50 - 11.00	13	75	75	37				Very weak to weak, reddish brown medium to coarse grained SANDSTONE. Fractures are 0-10 degrees, closely to very closely spaced, planar, rough, clean. <u>N=50 (25 for 30mm/50 for 50mm)</u> <u>From 10.01 to 10.03m 1 No. 0-10 degrees, undulating, rough fracture with fine to medium sand infill.</u> <u>From 10.32 to 10.35m 1 No. 30-40 degrees, planar, rough, clean fracture.</u> <u>From 10.62 to 11.00m bgl no recovery.</u>	10
			AZCL								
		11.00 - 12.50	NI	69	66	35			<u>From 11.19 to 11.25m recovered as non-intact medium to coarse sand.</u>		
			16						<u>From 11.55 to 11.56m 1 No. 0-10 degrees, undulating, rough, clean fracture.</u>		
			10						<u>From 12.04 to 12.76m no recovery.</u>		
			AZCL								
		12.50 - 14.00		84	84	64	12.76			Weak, reddish brown medium to coarse grained SANDSTONE. fractures are 0-10 degrees, closely to medium spaced, planar, rough, clean. <u>From 13.35 to 13.68m 4 No 0-10 degrees, undulating, rough closely to very closely spaced fractures with fine to medium sand infill.</u>	13
			9							<u>From 14.00 to 14.49m non-intact drilling induced fractures recovered as subangular gravel.</u>	
		14.00 - 15.50	16	74	42	20			<u>From 15.11 to 15.50m no recovery.</u>		15
			AZCL						<u>From 15.50 to 15.59m 2 No. 0-10 degrees, undulating, rough fractures with brown clayey fine to coarse sand infill.</u> <u>From 15.88 to 15.91m 1 No. 0-10 degrees, undulating, rough fractures with brown clay infill.</u>		
				11						Continued on next sheet	

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 11/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description					
				TCR	SCR	RQD									
		15.50 - 17.00		100	100	59				From 16.15 to 16.19m fractures are very closely spaced.	17				
			5							From 16.59 to 16.60m fractures are very closely spaced.					
										From 16.86 to 16.88m 1 No. 0-10 degrees, undulating, rough, clean fracture.					
		17.00 - 18.50	9	95	95	79				From 17.43 to 17.45m 1 No.45 degrees, planar, rough, clean fracture.	18				
										From 18.06 to 18.09m 2 No. undulating, rough, clean fractures.					
			AZCL							From 18.42 to 18.50m no recovery.					
		18.50 - 20.00	10	100	96	69				From 18.98 to 19.00m 1 No. 0-10 degrees, planar, rough fractures with fine to medium sand infill.	19				
			NI							From 19.12 to 19.14m 1 No. 45 degrees, planar, rough, clean fractures.					
			10							From 19.22 to 19.28m recovered as non intact very weak reddish brown coarse subangular mudstone gravel.					
		20.00 - 21.50			72	49				36	From 19.49 to 19.57m 1 No. vertical, undulating, rough, clean fracture.	20			
											From 20.32 to 20.39 non intact recovered as very weak mudstone.				
			NI	From 20.69 to 20.94m non-intact drilling induced fractures recovered as subrounded cobble.											
			17	From 21.08 to 21.50m no recovery.											
		21.50 - 23.00		100	100	88				From 21.66 to 21.68m 1 No. stepped, rough, clean fracture.	22				
			7							From 22.89 to 22.91m 1 No.10-20 degrees, undulating, rough, clean fracture.					
										From 23.42 to 23.43m 1 No. 0-10 degrees, rough, clean fracture.					
		23.00 - 24.50		85	85	51				From 23.49 to 23.53m 1 No. 45 degree, undulating, rough, clean fracture.	24				
														Continued on next sheet	

Continued on next sheet

24

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

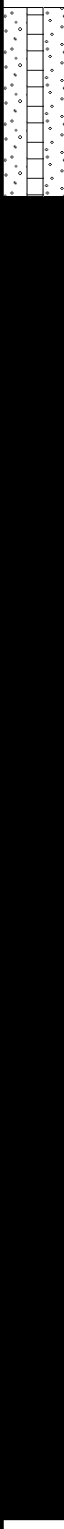
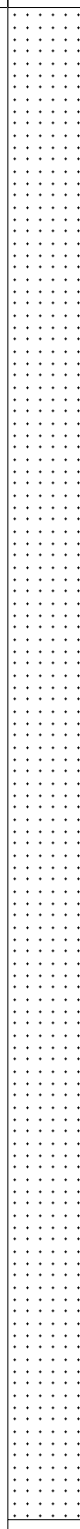
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 11/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description					
				TCR	SCR	RQD									
										From 24.26 to 24.50m no recovery. From 24.77 to 24.86m fractures are closely to very closely spaced. From 25.20 to 25.25m 2 No. 0-10 degrees, undulating, rough, clean fractures. From 25.39 to 25.41m 1 No. 0-10 degrees, planar, rough fracture with brown fine to medium sand infill. From 25.90 to 26.00m very closely spaced fractures. From 26.40 to 26.41m 1 No. 10-20 degrees, planar, rough, clean fracture. From 26.89 to 26.91m 1 No. 45 degrees, planar, rough, clean fracture. From 28.84 to 28.89m 1 No. 30-40 degrees, undulating, rough fractures with blue/grey clay infill. From 28.94 to 29.00m no recovery. From 29.43 to 29.44m 1 No. 0-10 degrees, undulating, rough, clean fracture. From 29.62 to 29.69m 1 No. 45 degrees, rough, clean fracture. From 30.41 to 30.50m no recovery. From 31.52 to 31.53m 1 No. 10-20 degrees, planar, rough, clean fracture.					
			AZCL												
		24.50 - 26.00	7	100	100	85						25			
		44													
		9													
		26.00 - 27.50	5	100	100	95						26			
		27.50 - 29.00											96	96	72
		29.00 - 30.50	9	94	94	67						29			
		AZCL													
		30.50 - 32.00		100	100	96						30			
												31			
												32			

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
RC

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 11/05/2023

Logged By
RT

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		32.00 - 33.50	4	100	100	100	35.00			From 33.28 to 33.31m 1 No. 10-20 degrees, planar, rough, clean fracture.	33
		33.50 - 35.00	11	100	100	94				From 34.27 to 35.00m closely to very closely spaced. From 34.28 to 34.29m 1 No. 0-10 degrees, planar, rough fracture with fine to medium sand infill. From 34.64 to 34.67m 1 No. 45 degrees undulating, rough, clean fracture. From 34.97 to 34.98m 1 No. 0-10 degrees, undulating, rough, clean. End of borehole at 35.00 m	34 35 36 37 38 39 40

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

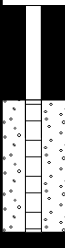
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 04/05/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.18			CONCRETE with subangular recycled concrete aggregate.	
		0.60 - 0.70	ES		0.45			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments.	
		1.20		50 (3,2/50 for 245mm)	1.32			MADE GROUND: Black very gravelly sand. Sand is fine to coarse and contains ash. Gravels are frequent fine to coarse sub-angular and sub-rounded	1
								End of borehole at 1.32 m	2
									3
									4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 04/05/2023 - 04/05/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.30	ES		0.17 0.41			CONCRETE with subangular recycled concrete aggregate. MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments. Dense reddish brown very clayey very gravelly SAND. Sand is fine to coarse. Gravels are frequent fine to coarse subangular to subrounded mudstone, siltstone and sandstone fragments.	1
		1.20 1.20 - 1.50	B	N=48 (5,8/9,12,13,14)					
		2.00 2.00	D	N=18 (3,3/3,4,5,6)	2.00			Firm grey very sandy gravelly CLAY. Sand is fine to coarse. Gravel is frequent fine to coarse subangular to subrounded mudstone, siltstone and sandstone fragments.	2
		3.00 3.00 - 3.45	D	N=30 (4,4/6,7,8,9)					3
		4.00		N=34 (13,10/7,9,8,10)	3.71 3.81 4.00 4.17			Dense reddish brown SAND. Sand is fine to coarse. Firm grey very sandy gravelly CLAY. Sand is fine to coarse. Gravel is frequent fine to coarse subangular to subrounded mudstone, siltstone and sandstone fragments. Dense reddish brown SAND. Sand is fine to coarse.	4
		4.60 - 4.80	B		4.56			Firm grey very sandy gravelly CLAY. Sand is fine to coarse. Gravel is frequent fine to coarse subangular to subrounded mudstone, siltstone and sandstone fragments.	5
		5.00		50 (25 for 135mm/50 for 105mm)	4.87 5.00			Dense reddish brown very clayey very gravelly SAND. Sand is fine to coarse. Gravels are frequent fine to coarse subangular sandstone fragments. Dense greyish brown gravelly SAND. Sand is fine to coarse. Gravels are frequent fine to coarse sub-angular to subrounded mudstone, siltstone and sandstone fragments.	6
								End of borehole at 5.00 m	7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

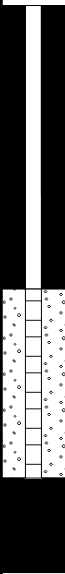
Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 25/04/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.19	ES	N=5 (0,0/1,1,1,2)	0.19			CONCRETE with subangular recycled concrete aggregate.	1
		0.44			0.44			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments.	
		1.20			1.13			MADE GROUND: Black very gravelly sand. Sand is fine to coarse. Gravel is fine to coarse subangular brick, concrete, clinker and glass.	
		2.00						MADE GROUND: Light brown very sandy gravelly clay. Sand is fine to coarse and contains ash. Gravel is frequent subangular brick, concrete, coal, mudstone and sandstone fragments.	
		2.80 - 3.00	D	N=4 (0,0/1,1,1,1)	2.53			MADE GROUND: Light greyish brown very sandy gravelly clay. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick and concrete fragments.	3
		3.00			2.75			Firm grey and brown mottled very sandy gravelly CLAY. Sand is fine to coarse. Gravels are frequent fine to coarse rounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	
				N=50 (0,1/50 for 285mm)	3.00			End of borehole at 3.00 m	4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 24/04/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.17			CONCRETE with subangular recycled concrete aggregate.	
					0.54			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments.	
		1.20		N=6 (1,1/1,1,2,2)				MADE GROUND: Dark brown to black very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick and concrete fragments.	1
		1.70 - 1.80	ES		1.69			MADE GROUND: Light brown very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick, concrete, clinker and coal fragments.	
		2.00		N=10 (3,5/3,2,2,3)	1.90			MADE GROUND: Dark brown and black mottled sandy gravelly clay. Sand is fine to coarse. Gravel is frequent fine to coarse subrounded to subangular brick, concrete, coal and mudstone fragments.	2
					2.00			MADE GROUND: Black silty gravelly sand. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick, coal and glass fragments.	
					2.25			MADE GROUND: Dark brown very gravelly sandy slightly cobbly clay. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick and concrete fragments. Cobbles are occasional subangular brick fragments.	
		2.70 - 3.00	B		2.60			Light brown gravelly SAND. Sand is fine to coarse. Gravels are frequent rounded to subangular mudstone and sandstone fragments.	
		3.00		50 (10,11/50 for 225mm)	3.00			End of borehole at 3.00 m	3
									4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 24/04/2023 - 24/04/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15 0.23						CONCRETE with subangular recycled concrete aggregate.	
		1.20 1.30 - 1.50	ES	N=7 (1,1/1,1,2,3)	1.20			MADE GROUND: Reddish brown slightly silty gravelly sand. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick fragments.	1
					1.70			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments.	
		2.00 2.00 - 2.45	D	N=5 (5,4/2,1,1,1)				MADE GROUND: Soft light brown very sandy gravelly clay. Sand is fine to coarse and contains ash. Gravels are frequent fine to coarse subangular brick, concrete, coal, clinker fragment.	2
		3.00		N=30 (1,2/4,13,11,2)	3.00			MADE GROUND: Soft light brown very sandy gravelly CLAY. Sand is fine to coarse. Gravel is frequent rounded to subangular brick, mudstone, siltstone, sandstone and quartzite fragments.	3
		4.00		N=0 (0,0/0,0,0,0)				MADE GROUND: Very soft brown and grey mottled sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine sub-angular coal fragments.	4
		4.80 - 5.00 5.00	D	N=0 (0,0/0,0,0,0)	4.90 5.00			Very soft black oranic sandy SILT. Sand is fine to medium. Strong organic odour. End of borehole at 5.00 m	5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Project Name: Sparkle Street

Project No.
B082142

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:40

Client: JRL Construction Management Limited

Dates: 25/04/2023 - 25/04/2023

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.19			CONCRETE with subangular recycled concrete aggregate.	
					0.35			MADE GROUND: Grey very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse sub-angular brick, concrete and slate fragments.	
								MADE GROUND: Black very gravelly sand. Sand is fine to coarse. Gravels are fine to coarse subangular brick, concrete, clinker, coal and glass fragments.	
		1.20		N=2 (1,0/1,0,1,0)	1.00			MADE GROUND: Firm black very gravelly cobbly clay. Sand is fine to coarse and contains ash. Gravels are frequent fine to coarse subangular brick, concrete and coal fragments. Cobbles are occasional subangular brick fragments.	1
					1.59			MADE GROUND: Black gravelly sand. Sand is fine to coarse. Gravels are frequent fine to coarse subangular brick, concrete and coal fragments. Cobbles are occasional subangular brick fragments.	
		2.00		N=5 (2,1/2,1,1,1)	2.00			MADE GROUND: Dark brown to black very gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick, concrete, clinker, coal and glass fragments.	2
					2.46			MADE GROUND: Soft brown and black mottled very sandy gravelly clay. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick, concrete, coal, ceramic and glass fragments.	
		3.00		N=4 (0,1/1,1,1,1)	3.00			MADE GROUND: Black and grey very silty gravelly sand. Sand is fine to coarse. Gravel is frequent fine to coarse subangular brick and coal fragments.	3
					3.76			No recovery. Drillers advised a cobble was being pushed down by the sampler.	
		4.00		N=11 (0,1/2,3,4,2)	4.00			Light brown slightly gravelly SAND. Sand is fine to coarse. Gravels are frequent rounded to subangular mudstone, siltstone, sandstone and quartzite fragments.	4
					4.80			End of borehole at 5.00 m	
		5.00		N=50 (9,9/50 for 285mm)	5.00				5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. No Groundwater encountered.

Curtins				Trial Pit Log			Trialpit No HP01 Sheet 1 of 1		
Project Name: Sparkle Street				Project No. B082142		Co-ords: - Level:		Date 04/05/2023	
Location: Sparkle Street, Manchester				Dimensions (m):		0.55		Scale 1:40	
Client: JRL Construction Management Limited				Depth 0.35		0.39		Logged	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
				0.11			MADE GROUND: Black very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded flint fragments. MADE GROUND: Grey very sandy gravel. Sand is fine to coarse. Gravel is medium to coarse subangular concrete fragments. Reddish brown clayey gravelly fine to coarse SAND. Gravel is frequent fine to coarse subrounded to subangular mudstone, siltstone and sandstone fragments. End of pit at 0.35 m		
				0.19					
				0.35					
									1
									2
									3
									4
									5
									6
									7
									8
Remarks: Foundation Pit to investigate foundations beneath existing retaining wall.								AGS	
Stability: Stable.									

Curtins				Trial Pit Log			Trialpit No HP02 Sheet 1 of 1		
Project Name: Sparkle Street				Project No. B082142		Co-ords: - Level:		Date 04/05/2023	
Location: Sparkle Street, Manchester				Dimensions (m):		0.5		Scale 1:40	
Client: JRL Construction Management Limited				Depth 0.46		0.41		Logged	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
				0.13			MADE GROUND: Black very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded flint fragments. MADE GROUND: Grey very sandy gravel. Sand is fine to coarse. Gravel is medium to coarse subangular concrete fragments. Reddish brown clayey gravelly fine to coarse SAND. Gravel is frequent fine to coarse subrounded to subangular mudstone, siltstone and sandstone fragments. End of pit at 0.46 m		
				0.31					
				0.46					
									1
									2
									3
									4
									5
									6
									7
									8
Remarks: Foundation Pit to investigate foundations beneath existing retaining wall.								AGS	
Stability: Stable.									

Project Name:	Sparkle Street	Project No.	B082142	Co-ords:	-	Level:		Date	25/04/2023
Location:	Sparkle Street, Manchester			Dimensions (m):	0.48			Scale	1:40
Client:	JRL Construction Management Limited			Depth	0.93	0.31		Logged	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.44			TOPSOIL: Friable black fine to coarse sand with frequent rootlets.	
				0.93			MADE GROUND: Reddish brown cobble comprising brick with poorly bonded mortar.	
							End of pit at 0.93 m	1
								2
								3
								4
								5
								6
								7
								8

Remarks:	Foundation Pit to investigate foundations beneath existing retaining wall.	
Stability:	+Stable.	

Project Name: Sparkle Street

Project No.
B082142

Co-ords:	-
Level:	

Date
25/04/2023

Location: Sparkle Street, Manchester

Dimensions
(m):

0.66

Scale
1:40

Client: JRL Construction Management Limited

Depth
0.88

0.32

Logged

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.13			MADE GROUND: Black very sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded flint fragments.
				0.88			MADE GROUND: Reddish brown very gravelly very cobbly clayey fine to coarse sand. Gravels are frequent fine to coarse subangular brick and concrete fragments. Cobbles are frequent subangular brick fragments.
							End of pit at 0.88 m

Remarks:	Foundation Pit to investigate foundations beneath existing retaining wall.
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Stability: Stable.



Curtins				Trial Pit Log			Trialpit No FP101 Sheet 1 of 1			
Project Name: Sparkle Street Additional Investigation				Project No. 082142.302		Co-ords: - Level:		Date 05/11/2025		
Location: Sparkle Street, Manchester				Dimensions (m):		0.8		Scale 1:25		
Client: Foras (Sparkle Street) Limited				Depth 0.70		1.3		Logged JP		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
				0.10			Dark grey TARMACADAM. <i>From ground level to 0.6m bgl: Brick wall foundation.</i>			
				0.40			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.			
				0.70			MADE GROUND: Dark brown gravelly fine to coarse sand with cobbles. Gravel is fine to coarse, angular to subangular of brick and sandstone. Cobbles are subangular of brick.			
							<i>From 0.6m to 0.7m bgl: Concrete step foundation, protruding out 0.4m. Step was excavated 0.1m but would not be excavated further due to proximity to services.</i> End of pit at 0.70 m			
Remarks: Machine Excavated Trial Pit to 0.7m bgl. Position was undertaken by Civic Archeology. No water strikes were noted during trial it progression. Trial pit terminated due to proximity to services.									AGS	
Stability: Stable										

Project Name: Sparkle Street Additional Investigation

Project No.
082142.302Co-ords: -
Level:Date
05/11/2025

Location: Sparkle Street, Manchester

Dimensions
(m):

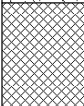
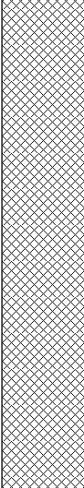
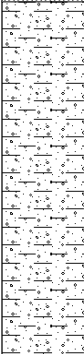
3.7

Client: Foras (Sparkle Street) Limited

Depth
3.60

1.3

Scale
1:25Logged
JP

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			Grey CONCRETE with a plastic membrane on the base.	
				0.55			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.	
							MADE GROUND: Dark brown gravelly fine to coarse sand with cobbles. Gravel is fine to coarse, angular to subangular of brick and sandstone. Cobbles are subangular of brick.	1
				2.20			Firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone. <i>From 2.20m to 3.60m bgl: Trial pit collapsed from 3.6 to 2.2m bgl due to perched groundwater at 2.2m bgl.</i>	2
				3.40			Dark grey organic silty fine to medium SAND with an organic odour and pockets of sandy silt.	3
				3.60			End of pit at 3.60 m	4
								5

Remarks: Machine Excavated Trial Pit to 3.60m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. A perched groundwater strike was noted at 2.20m bgl with a fast infiltration rate and causing sidewall collapse of the trial pit. Trial pit was terminated due to an unstable side wall.

Stability: Unstable due to water ingress

Curtins				Trial Pit Log			Trialpit No TP102 Sheet 1 of 1			
Project Name: Sparkle Street Additional Investigation				Project No. 082142.302		Co-ords: - Level:		Date 05/11/2025		
Location: Sparkle Street, Manchester				Dimensions (m): Depth 3.35		4.2 1.2		Scale 1:25		
Client: Foras (Sparkle Street) Limited								Logged JP		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
				0.20			Grey CONCRETE with a plastic membrane on the base.			1 2 3 4 5
				0.40			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.			
				0.80			MADE GROUND: Dark brown gravelly fine to coarse sand with cobbles. Gravel is fine to coarse, angular to subangular of brick and sandstone. Cobbles are subangular of brick.			
				1.50			MADE GROUND: Light brown mottled reddish brown gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular of brick, pottery and concrete.			
				2.40			MADE GROUND: Dark greyish brown silty gravelly fine to coarse sand with a medium cobble content. Gravel is fine to coarse, angular to subangular of brick, pottery and wood. Cobbles are subangular of brick, pottery and wood.			
				3.30			MADE GROUND: Dark grey very silty slightly gravelly fine to coarse sand with an organic odour and a low cobble content. Gravel is fine to coarse, angular to subangular of brick and pottery. Cobbles are subangular of brick and pottery.			
				3.35			MADE GROUND: Red brick. End of pit at 3.35 m			
Remarks: Machine Excavated Trial Pit to 3.35m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during trial it progression. Trial pit terminated on a brick structure.										
Stability: Stable										



Date
05/11/2025

Logged
JP

2 -

3 -

4 -

5 -

Stability: Stable

Project Name: Sparkle Street Additional Investigation

Project No.
082142.302

Co-ords: -
Level:

Date
05/11/2025

Location: Sparkle Street, Manchester

Dimensions (m):

3.1

Depth
2.50

1.7

Scale
1:25

Logged
JP

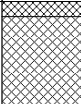
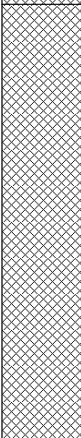
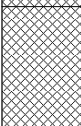
Client: Foras (Sparkle Street) Limited

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.05			Dark grey TARMACADAM.	
				0.40			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.	
							MADE GROUND: Dark grey and brown sandy gravel with a medium cobble content and a low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick, sandstone, wood, pottery and limestone. Cobbles and boulders are angular to subangular of brick and wood.	1
	1.80 - 1.90	ES		1.90			Brown very clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone.	2
				2.50			End of pit at 2.50 m	3
								4
								5

Remarks: Machine Excavated Trial Pit to 2.5m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during trial it progression. Trial pit reached target depth.

Stability: Stable



Curtins				Trial Pit Log			Trialpit No TP105 Sheet 1 of 1		
Project Name: Sparkle Street Additional Investigation				Project No. 082142.302		Co-ords: 384937.40 - 398048.29 Level: 37.70		Date 05/11/2025	
Location: Sparkle Street, Manchester						Dimensions (m): 4.2		Scale 1:25	
Client: Foras (Sparkle Street) Limited						Depth 2.80		Logged JP	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	2.20 - 2.40	ES		0.05	37.65		Dark grey TARMACADAM.		
				0.35	37.35		MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.		
				1.80	35.90		MADE GROUND: Brown slightly gravelly silty fine to coarse sand. Gravel is fine to coarse, subangular of brick.		
				2.10	35.60		MADE GROUND: Grey silty slightly gravelly fine to coarse sand with a chemical odour and pockets of sandy clay. Gravel is fine to coarse, subangular of brick and ceramic.		
			2.50	35.20		At 2.1m bgl: Contamination observed within the trial trench was no longer observed 5.2m from the original delineation borehole. Brown silty clayey fine to medium SAND.			
			2.80	34.90		End of pit at 2.80 m			
Remarks: Machine Excavated Trial Pit to 2.8m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during trial it progression. Trial pit reached target depth.									
Stability: Stable									



Project Name: Sparkle Street Additional Investigation

Project No. 082142.302

Co-ords: -

Hole Type WS

Location: Sparkle Street, Manchester

Level:

Scale 1:25

Client: Foras (Sparkle Street) Limited

Dates: 03/11/2025 - 03/11/2025

Logged By JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50 - 0.60	ES		0.15			Grey CONCRETE	
					0.30			MADE GROUND: Reddish brown fine to medium sand.	
								MADE GROUND: Greyish brown mottled reddish brown clayey gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular of brick, limestone, sandstone and concrete.	
					0.80				
		1.20		N=2 (1,1/0,1,0,1)				Soft brown sandy CLAY. Sand is fine to coarse.	1
		2.00		N=2 (1,0/1,0,1,0)	2.10			Firm brown sandy CLAY. Sand is fine to coarse.	2
					2.40			Loose slightly clayey fine to coarse SAND. <i>From 2.40m to 2.64m bgl: Strata is slightly damp.</i>	
					2.64			Stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone.	
		3.00		N=50 (10,11/50 for 275mm)				<i>From 3.00m to 3.45m bgl: Strata is very stiff.</i>	3
					3.45			End of borehole at 3.45 m	4
									5

Remarks

Window Sample Borehole to 3.45m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. Damp strata was noted from 2.40m to 2.64m bgl. Borehole terminated due to refusal in SPT.

Project Name: Sparkle Street Additional Investigation

Project No.
082142.302

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:25

Client: Foras (Sparkle Street) Limited

Dates: 03/11/2025 - 04/11/2025

Logged By
JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.14			Grey CONCRETE	
					0.45			MADE GROUND: Grey gravelly fine to coarse sand. Gravel is fine to coarse, subangular of brick and sandstone.	
		1.20		N=17 (4,4/5,5,4,3)				MADE GROUND: Reddish brown sand gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick, and sandstone.	1
		2.00		N=5 (2,1/2,1,1,1)	2.15				2
		3.00		N=8 (2,2/2,2,2,2)				MADE GROUND: Reddish brown gravelly sandy clay. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick, sandstone, ceramic and limestone.	3
		4.00		N=10 (2,3/2,3,3,2)					4
		5.00		N=13 (3,2/3,4,3,3)					5
Continued on next sheet									

Remarks

Window Sample Borehole to 6.45m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole reached the target depth.



Project Name: Sparkle Street Additional Investigation

Project No.
082142.302

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:25

Client: Foras (Sparkle Street) Limited

Dates: 03/11/2025 - 04/11/2025

Logged By
JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		6.00	ES	N=40 (3,3/5,8,12,15)	5.60			MADE GROUND: Dark grey clayey fine to coarse sand with a chemical odour.	6
		5.60 - 6.45			6.45				
								End of borehole at 6.45 m	7
									8
									9
									10

Remarks

Window Sample Borehole to 6.45m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole reached the target depth.

Project Name: Sparkle Street Additional Investigation

Project No. 082142.302

Co-ords: -

Hole Type WS

Location: Sparkle Street, Manchester

Level:

Scale 1:25

Client: Foras (Sparkle Street) Limited

Dates: 03/11/2025 - 03/11/2025

Logged By JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.20		N=9 (3,3/2,2,3,2)	0.12			Grey CONCRETE	1
					0.40			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.	
					0.80			MADE GROUND: Reddish brown sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick.	
								MADE GROUND: Greyish brown gravelly sandy clay. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick.	
		2.00		N=6 (1,2/1,1,2,2)	2.00			End of borehole at 2.00 m	2
									3
									4
									5

Remarks

Window Sample Borehole to 2.00m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole terminated due to barrel misalignment.

Project Name: Sparkle Street Additional Investigation

Project No.
082142.302

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:25

Client: Foras (Sparkle Street) Limited

Dates: 03/11/2025 - 03/11/2025

Logged By
JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			Grey CONCRETE	
					0.40			MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.	
		1.20		N=26 (3,4/4,6,8,8)				MADE GROUND: Very dark grey gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular of brick, wood, sandstone and ceramic.	1
		2.00		N=8 (12,10/2,2,2,2)					2
		3.00		N=6 (1,2/2,1,2,1)	3.20			MADE GROUND: Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick.	3
		3.80		50 (25 for 60mm/50 for 95mm)	4.00			MADE GROUND: Dark grey and reddish brown sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick.	4
					4.15			End of borehole at 4.15 m	5

Remarks

Window Sample Borehole to 4.15m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole terminated due to refusal in SPT.

Project Name: Sparkle Street Additional Investigation

Project No. 082142.302

Co-ords: 384934.02 - 398048.95

Hole Type WS

Location: Sparkle Street, Manchester

Level: 37.80

Scale 1:25

Client: Foras (Sparkle Street) Limited

Dates: 04/11/2025 - 04/11/2025

Logged By JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.05			0.05	37.75		Dark grey TARMACADAM	1
		0.40			0.40	37.40		MADE GROUND: Grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.	
		0.80			0.80	37.00		MADE GROUND: Dark brown gravelly fine to coarse sand with cobbles. Gravel is fine to coarse, angular to subangular of brick and sandstone. Cobbles are subangular of brick.	
		1.20		N=5 (7,4/2,1,1,1)	1.30	36.50		MADE GROUND: Brown mottled dark grey sandy gravelly clay with cobbles. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick and sandstone. Cobbles are subangular of brick.	2
		2.00		N=15 (4,0/1,2,2,10)	2.20	35.60		MADE GROUND: Very sandy clay. Sand is fine to medium.	
		2.20 - 2.50	ES		2.50	35.30		MADE GROUND: Dark grey fine to medium sand with a chemical odour.	
		2.70		50 (25 for 125mm/50 for 180mm)	3.10	34.70		Stiff brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and coal. <i>From 2.70 to 3.10m bgl: Strata is very stiff.</i>	3
								End of borehole at 3.10 m	4
									5

Remarks

Window Sample Borehole to 3.10m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole terminated due to refusal in SPT.

Project Name: Sparkle Street Additional Investigation

Project No.
082142.302

Co-ords: -

Hole Type
WS

Location: Sparkle Street, Manchester

Level:

Scale
1:25

Client: Foras (Sparkle Street) Limited

Dates: 04/11/2025 - 04/11/2025

Logged By
JP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.05			0.05			Dark grey TARMACADAM	1
					0.70			MADE GROUND: Brown gravelly sandy clay with cobbles. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick. Cobbles are subangular of brick.	
		1.20		N=28 (6,2/5,6,8,9)	1.25			Stiff brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and coal.	2
		1.50 - 1.60	ES						
		2.00		N=50 (7,8/50 for 275mm)	2.30			End of borehole at 2.30 m	3
									4
									5

Remarks

Window Sample Borehole to 2.30m bgl. Position was GPR cleared and CAT scanned by Avoin Maa and a Curtins Engineer. No water strikes were noted during drilling. Borehole terminated due to refusal in SPT.

Appendix C – Risk Assessment Rationale

The qualitative risk assessment of environmental harm is designed to establish connecting links between a hazardous source to a potential receptor via an exposure pathway.

The qualitative risk assessment corresponds with the proposed piling operations on site.

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risk to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected to the hazardous source by one or several exposure pathways such as direct contact for example. Risks are generally managed by isolating the receptor or intercepting the exposure pathway or by isolating or removing the hazard.

Without the three essential components of a source, pathway and receptor there can be no risk. Therefore, the presence of hazard on a site does not necessarily mean there is a risk.

By considering where a viable pathway exists which connects a source with a receptor the risk assessment in Section 3.0 and Table A4.1 identifies where pollutant linkage exists. If there is no pollutant linkage there is no risk and only where a pollutant linkage is established does the risk assessment, consider the level of risk.

The risk assessment considers the likelihood of a particular event taking place (accounting for the presence of the hazard and receptor and the integrity of the exposure pathway) in conjunction with the severity of the potential consequence (accounting for the potential severity of the hazard and the sensitivity of the receptor).

In the risk assessment the consequence of the hazard has been classified as severe or medium or mild or minor and the probability (likelihood) of the circumstances actually occurring classified as high likelihood or likely or low likelihood or unlikely.

The consequences and probabilities are subsequently cross-correlated to give a qualitative estimation of the risk using Department of the Environment risk classifications as detailed in the table below and as referenced in CIRIA C552.

		Consequence			
		Severe	Medium	Mild	Minor
Probability (Likelihood)	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

In accordance with DoE guidance, the following categorisation of **consequence** has been developed.

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem or organisation forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of such ecosystem.	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a Principal or Secondary A aquifer. Death of a species within a designated nature reserve. Lesser toxic and asphyxiate effects.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater (inc. Secondary B aquifers). 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. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

In accordance with DoE guidance, the following categorisation of **probability** has been developed.

Classification	Definition
High Likelihood	There is a pollution 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 pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. 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 pollution linkage and circumstances are possible under which an event could occur. 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 pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

In accordance with DoE guidance, the following categorisation of **risk** has been developed.

Classification	Definition
Very High Risk	There is a <i>high probability</i> that <i>severe harm</i> could arise to a designated receptor from an identified hazard at the site without appropriate further action.
High Risk	<i>Harm is likely to arise</i> to a designated receptor from an identified hazard at the site without appropriate further action.
Moderate Risk	<i>It is possible</i> that without appropriate further action <i>harm could arise</i> to a designated receptor. It is relatively <i>unlikely</i> that any such harm would be <i>severe</i> , and if any harm were to occur it is <i>more likely</i> that such harm would be <i>relatively mild</i> .
Low Risk	<i>It is possible</i> that <i>harm could arise</i> to a designated receptor from an identified hazard. It is <i>likely</i> that, at worst, if any harm was realised any effects would be <i>mild</i> .
Very Low Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.

The term 'risk' in this instance refers to the risk that the source, pathway, receptor linkage for a given source of contamination is complete. It does not refer to immediate risk to individuals or features present on the site from potential contaminants and is intended to be used as a tool to assess the necessity of further investigation or risk management operations.