



Mason and Marlowe

SUSTAINABLE URBAN DRAINAGE (SuDs)

PROPOSAL: FOUR STOREY BLOCK OF FLATS TO CREATE
FOUR APARTMENTS FOLLOWING DEMOLITION OF EXISTING
PROPERTY

ADDRESS: 39-41 RICHMOND ST, MANCHESTER M1 3WB

Date: 05/09/2023

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1 Executive summary

This report assesses the feasibility of a range of Sustainable Drainage Scheme (SuDS) options in support of the Site development process. A SuDS strategy is proposed to ensure surface water runoff can be managed effectively over the lifetime of the development.

Table 1: SuDS suitability

Risk	Issue	Result
Discharge Location	What is the infiltration potential at the Site?	High
	What is the potential to discharge to surface water features?	High
	What is the potential to discharge to sewers?	High
	What is the potential to discharge to highway drains?	High
Flooding	What is the fluvial flood risk at the Site?	Very Low (No records)
	What is the pluvial flood risk at the Site?	Negligible: 1 in 100 year, 0.3m - 1.0m (within 50m)
	What is the groundwater flood risk at the Site?	Moderate (Moderate-High within 50m)
Pollution	Is the groundwater on site a protected resource?	No
	Is the surface water on site feature a protected resource?	No

1.1 Summary of existing and proposed development

The site is situated in the Village area of Manchester City Centre, on Richmond Street, which is within Whitworth Street conservation area, at the heart of Manchester's Gay Village and is under the control of Manchester City Council. The street runs parallel to Bloom Street and Canal Street and links Sackville Street to Princess Street. The site consists of a small two-storey building, currently used as a night club. It rendered grey, with a touch of black paint in certain areas. The site is within a busy part of the city centre close to all the local amenities. The neighbouring property 58 Richmond Street is a grade two-listed building built in 1911.

The site is bound to the north by public pavements extending along Richmond Street, and to the east by a small hard paved car parking facility. Its remaining boundaries are adjoined by developments of commercial buildings fronting on to Richmond Street and Canal Street respectively. The surface topography along Richmond Street and within the small car parking facility immediately adjacent the north-eastern section of the site was seen to be sensibly flat with surface cover comprising a combination of concrete block and black bituminous paving.

Given that the site and its immediate environs are currently developed for mixed commercial land uses, it is assumed that buried services associated with these properties may extend beneath the site.

Development proposals comprise the construction of a four-storey block of flats to create four apartments following demolition of existing property.

- High quality contemporary housing for private market sale.
- Onsite rented private parking
- 1 no. 1 bedrooms, 2 bathrooms
- no. 2 bedrooms, 2 bathrooms

- Lift provision for residents as well as disabled persons
- Modern internal arrangements
- Private roof terrace that maximizes views over the surrounding city

1.2 Summary of discharge routes

Data indicates the Site has a moderate to high potential for infiltration, primarily due to the high permeability of the underlying geology, which is artificial ground or made ground, generally granular and permeable and will permit vertical and lateral transmission of groundwater.

Water framework directive (WFD), Surface water body catchments on the site is Medlock (Lumb Brook to Irwell), and Operational catchment is Roch Irk Medlock. The WFD surface water body, 18m SE of the site, Rochdale Canal, with overall rating: Moderate [2019]. Whereas, the WFD Ground water bodies, on site, are Manchester and East Cheshire Permo-Triassic Sandstone Aquifers, with overall rating: Poor [2019].

Ordnance Survey (OS) mapping street observation indicates 6 surface water features are located within 250m of the site. The highway gullies are located within Richmond St., indicating the presence of the highway drainage network. The regulated drainage and water search confirms the Site is located within Manchester city public sewer network and currently discharges to this. Hence, discharging to sewer from the proposed development recommended to maintain existing context.

1.3 Proposed SuDS strategy

The development will utilise Sustainable Urban Drainage (SuDs) design in accordance with the NPPF for Planning Applications hierarchy as follows:

- Discharge rainwater into surface water sewer.

Due to the layout of the proposed development, as the development only shows to occupy the existing building footprint, there is no need for additional surface water drainage features. The development will not adversely affect the surface water flood risk to the surrounding area. The proposed application will utilise the existing drainage arrangements on site. All surface water runoff generated by the proposed development up to 1:100 year rainfall event (plus climate change) will be discharged into surface water sewer.

1.4 SuDS & drainage network maintenance

The management and maintenance of the SuDS features is undertaken by Manchester city council.

2 Site Analysis

2.1 Physical Context

The surrounding buildings are a number of retail and other commercial premises, public houses, the rear of which make up the Richmond Street elevation. The streetscape is then composed entirely a patchwork of red brick, render, fencing, and mechanical and electrical ductwork.

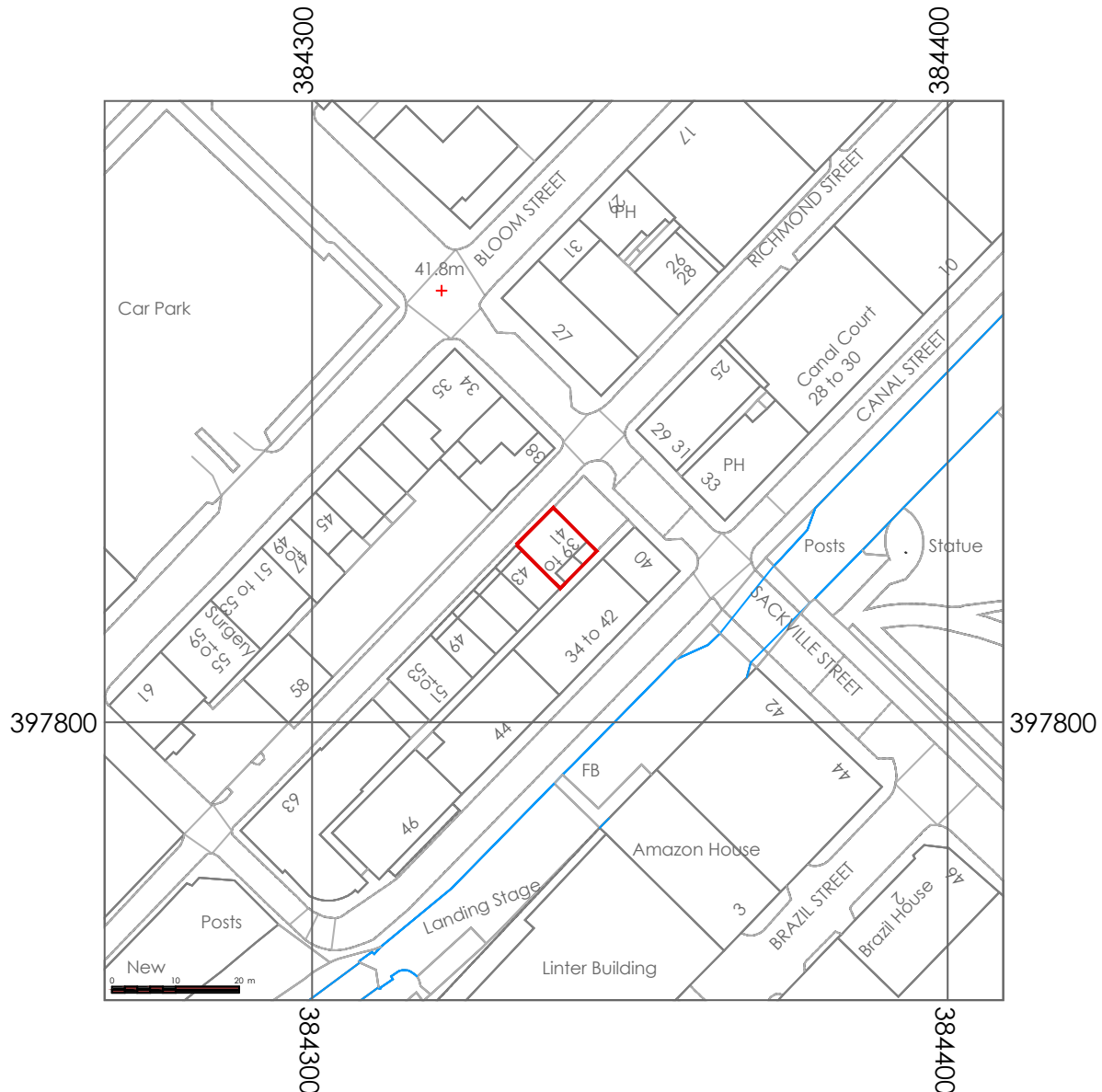


Fig. 1: Site marked in red



Fig. 2: Aerial Imagery

2.2 Geology

The British Geological Survey (BGS) 1:10, 000 Scale Drift Geological map indicate that the study site is underlain by artificial made ground deposits of an unknown composition thickness and extent, overlying natural drift deposits and bedrock of high permeability, comprising gravel sand silt and clay deposits of glacial origin (Croft, et al., 2012). In other words, the ground is Likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater (see Table 2 below).

The solid geology is documented to comprise the Chester Formation (formerly Chester Pebble Beds Formation) of the Sherwood Sandstone Group comprising red – brown horizontally-bedded conglomerate with subordinate lenticular beds of trough cross-bedded pebbly sand with localised argillaceous mudstone bedding of the Early Triassic Period (Olenekian Age).

Refer to Appendices for Geological maps.

Table 2: Geological Information (source: Groundsure)

GEOLOGY		
Data	Distance	Comments
Artificial Ground	On Site	Artificial ground and/or reworked ground deposits associated with the development of the site & its immediate surroundings.
Superficial Deposits / Drift Geology	On Site	Diamicton of glacial origin
Permeability of Drift Cover	Maximum Permeability	High
	Maximum Permeability	Low
Bedrock and Solid Geology	On Site	Chester Formation
Permeability of Bedrock: On Site	Maximum Permeability	High
	Maximum Permeability	Moderate
Geological Lines of Weakness	On Site	No records
	<250m	None
Radon Affected Area	On Site	Less than 1% of properties
Radon Protection	On Site	No Radon Protection Measured required
MINING, GROUNDWORKINGS AND NATURAL CAVITIES		
Data	Distance	Comments
Natural cavities	<500m	No records
BritPits	<500m	No records
Surface ground workings	<250m	19-21m SE: Canal 24m SE: Canal 115m NE: Ponds 147m E: Unspecified Wharf 174m NE: Unspecified Wharf 242m E: Unspecified Ground Workings
Underground workings	<1000m	No records
Historical Mineral Planning Areas	<500m	No records
Non-coal mining	<500m	No records
Mining cavities	<1000m	914m SE: Manchester. Mineral: Firestone, Hearthstone, Honestone, Ragstone, Sandstone, Scythestone, Silver Sand, Whetstone
Coal mining	On Site	The site is located within a coal mining area as defined by the Coal Authority
Brine areas	On Site	No records
Gypsum areas	On Site	No records
Tin mining	On Site	No records
Clay mining	On Site	No records
HAZARDS		
Data	Distance	Comments
Maximum shrink swell clays	On Site	Very Low
Maximum running sands	On Site	Very Low
Maximum compressible deposits	On Site	Very Low
Maximum collapsible deposits	On Site	Very Low
Maximum landslides	On Site	Very Low

Maximum ground dissolution of soluble rocks	On Site	Negligible
HYDROLOGY AND HYDROGEOLOGY		
Data	Distance	Comments
Aquifer in Made Ground Deposits	On Site	Made Ground: Unproductive: Likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.
Aquifer within Superficial Drift Deposits	On Site	Diamicton: Secondary Undifferentiated: These are drift deposits with low permeability that have negligible significance for water supply or river base flow
Aquifer within Bedrock Deposits	On Site	Chester Formation - Principal: Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
Groundwater Abstraction Licences	<1000m	96m SE: West Contracting. Licence No: NW/069/0006/001 288m NW: British Telecom. Licence No: 2569007069 747m S: Manchester Metropolitan University. Licence No: NW/069/0006/003 940m E: Moseley Rubber Co Ltd. Licence No: 2569006001
Surface Water Abstraction Licences	<1000m	No Records
Potable Water Abstraction Licences	<1000m	No Records
Source Protection Zones	<500m	485m SW: Type: 3 [Total catchment]
Source Protection Zones (confined aquifer)	<500m	No Records
Water Network (OS Mastermap)	<250m	25m SE: Canal 38m S: Canal 38m S: Inland river not influenced by normal tidal action 122m SE: Inland river not influenced by normal tidal action 242m S: Inland river not influenced by normal tidal action
Surface water features	<250m	6nr surface water features within 250m of the study site
WFD Surface water body catchments	On Site	On Site: Medlock (Lumb Brook to Irwell). Operational catchment: Roch Irk Medlock
WFD Surface water bodies	<250m	18m SE: Rochdale Canal. Overall rating: Moderate [2019]
WFD Groundwater bodies	<250m	On Site: Manchester and East Cheshire Permo-Triassic Sandstone Aquifers. Overall rating: Poor [2019]
FLOODING		
Data	Distance	Comments
Risk of Flooding from Rivers and Sea (RoFRaS)	<50m	No records
Historical Flood Events	<250m	No records
Flood Defences	<250m	No records
Areas Benefitting from Flood Defences	<250m	No records
Flood Storage Areas	<250m	No records
Flood Zone 2	<50m	No records
Flood Zone 3	<50m	No records
Surface water flooding: Highest risk	On Site	Negligible
	<50m	1 in 100 year, 0.3m – 1.0m
Groundwater flooding: Highest risk	On Site	Moderate
	<50m	Moderate – High

2.3 Hydrogeological Interpretation

Table 2: Hydrological Information

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made / Reworked Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
Diamicton	These are drift deposits with low permeability that have negligible significance for water supply or river base flow	Secondary Undifferentiated
Chester Formation	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers	Principal

2.4 Topography

The surface topography along Richmond Street and within the small car parking facility immediately adjacent the northeastern section of the site was seen to be sensibly flat with surface cover comprising a combination of concrete block and black bituminous paving.

Given that the site and its immediate environs are currently developed for mixed commercial land uses, it is assumed that buried services associated with these properties may extend beneath the site.

2.5 Flood risk

Both the fluvial and pluvial flood risks were found to be very low or negligible. This proposed development is located in Flood Zone 1, an area with a low probability of flooding. No external works are proposed in this development. Ground water flood risk is moderate at the site and is considered moderate – high, 50m away from the site location.

The conclusions made on groundwater conditions are based on data from historical data, information supplied by Groundsure, and observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

3 Surface Water Drainage:

All surface water runoff generated by the proposed development up to 1:100 year rainfall event (plus climate change) will be discharged into surface water sewer. The proposed application will utilise the existing drainage arrangements on site and provide betterment were appropriate.

4 References and data providers

Crofts R.G et.al (2012) 'Geology of the Manchester district: a brief explanation of the geological map Sheet 85 Manchester (England and Wales)' BRITISH GEOLOGICAL SURVEY, Keyworth, Nottingham.

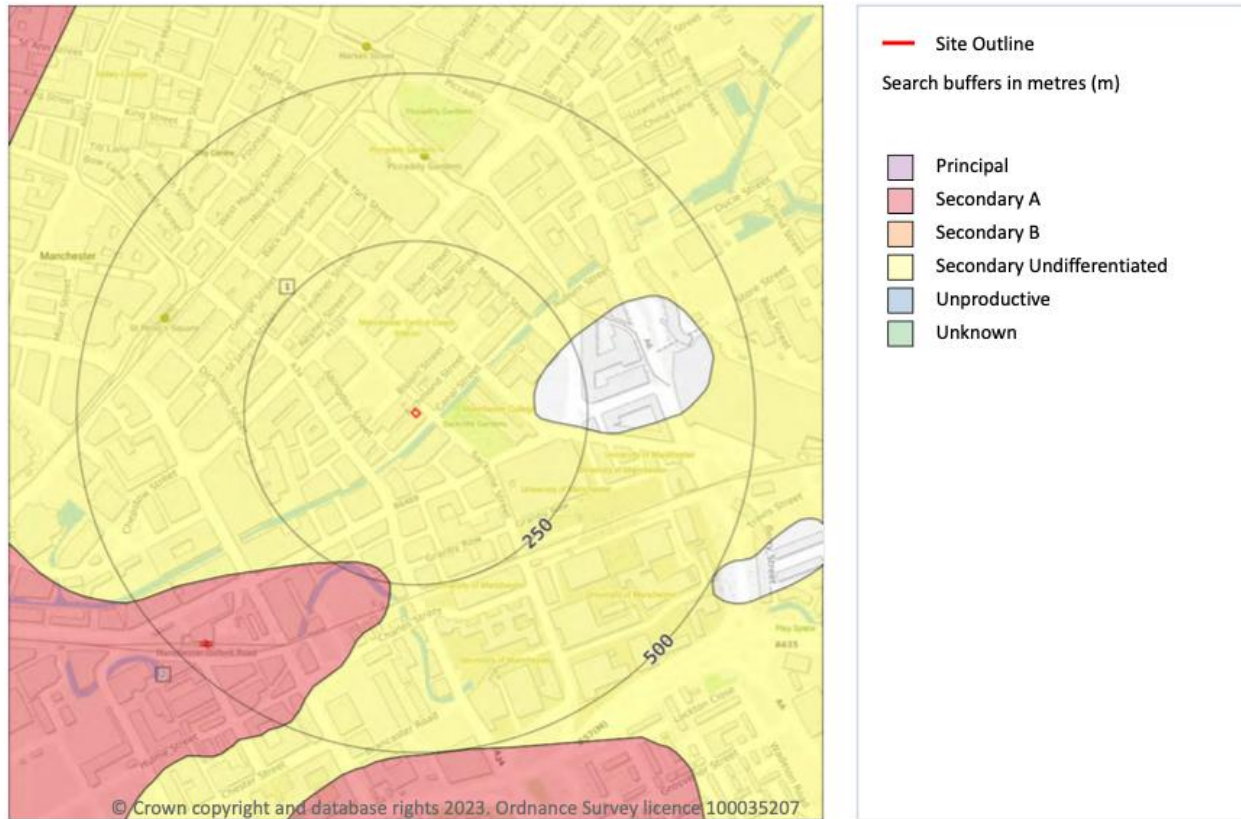
BRITISH GEOLOGICAL SURVEY (BGS) 1:50, 000 scale Sheet 085 Manchester (2010 - 2011), and 1:10, 000 scale (Solid and Drift Editions) geological mapping data.

Groundsure: <https://www.groundsure.com/sources-reference>).

5 Appendices

5.1 Appendix 1: Geological, Hydrological, and Environmental data

Superficial aquifer



Records within 500m – Aquifer status of groundwater held within superficial geology.

ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	231m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

Bedrock aquifer



The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

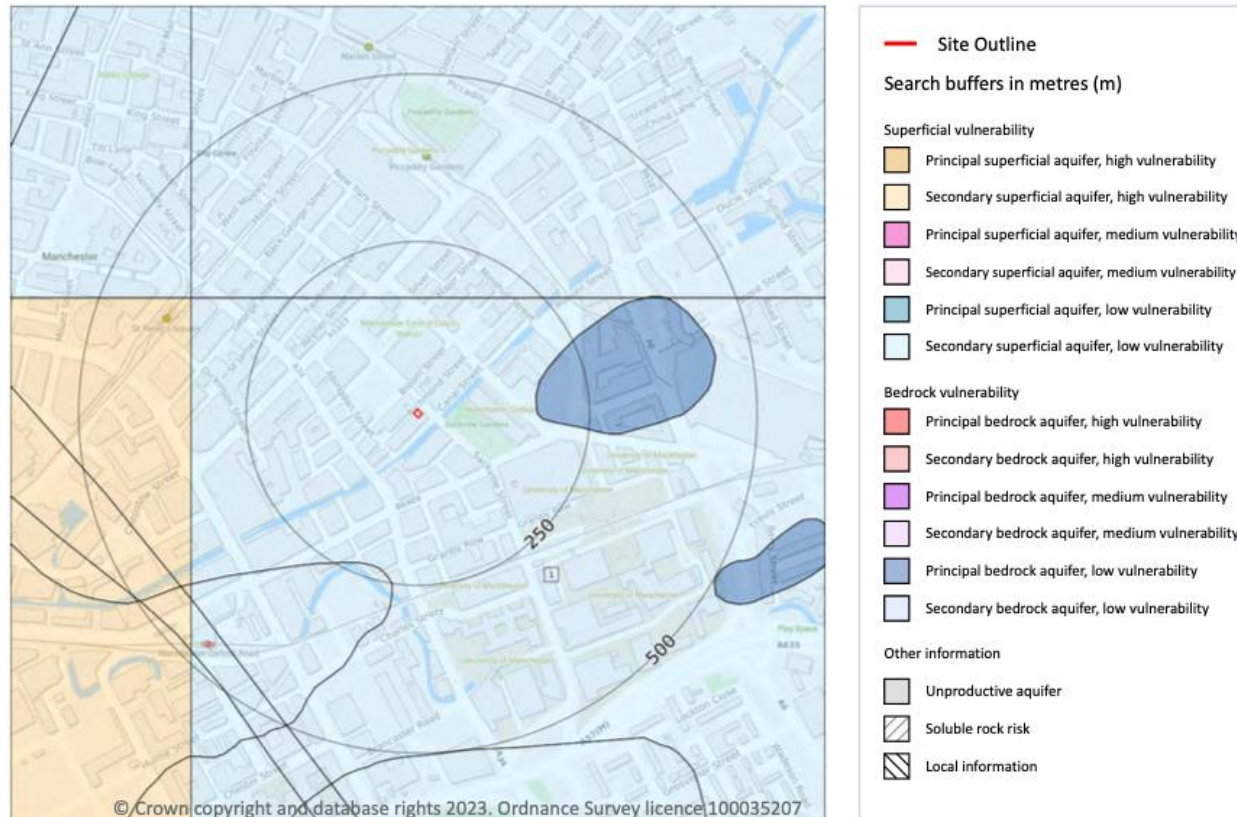
Records within 500m – Aquifer status of groundwater held within bedrock geology.

ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	433m SW	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

Bedrock geology at 1:10,000 scale.

ID	Location	LEX Code	Description	Rock age
1	On site	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch
3	420m SW	MM-MDST	Manchester Marls Formation - Mudstone	Late Permian Epoch [Obsolete name]

Groundwater vulnerability



An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one-kilometre square grid (Records within 50m). There are none on the site and none within 50m of the site. Groundwater vulnerability is described as High, Medium or Low as follows:

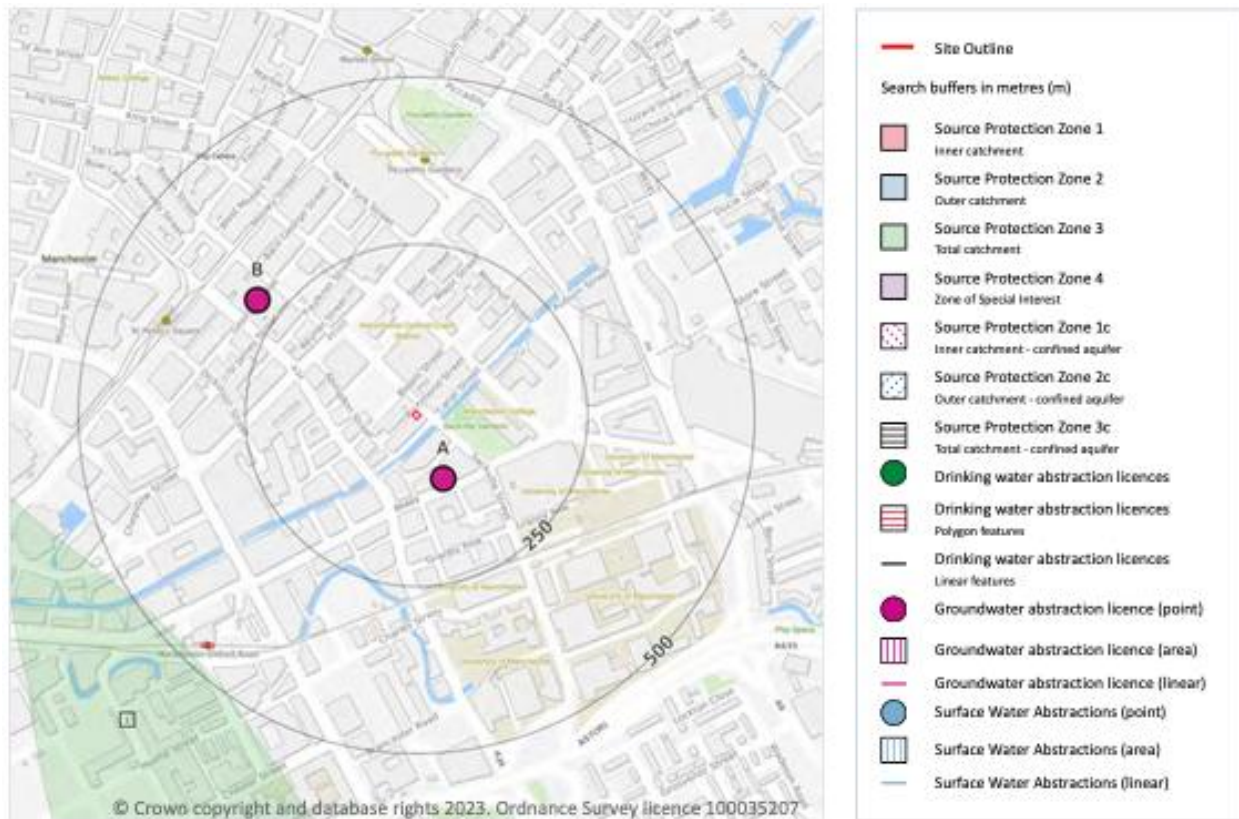
High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.

Medium - Intermediate between high and low vulnerability.

Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300- 550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures

Abstractions and Source Protection Zones



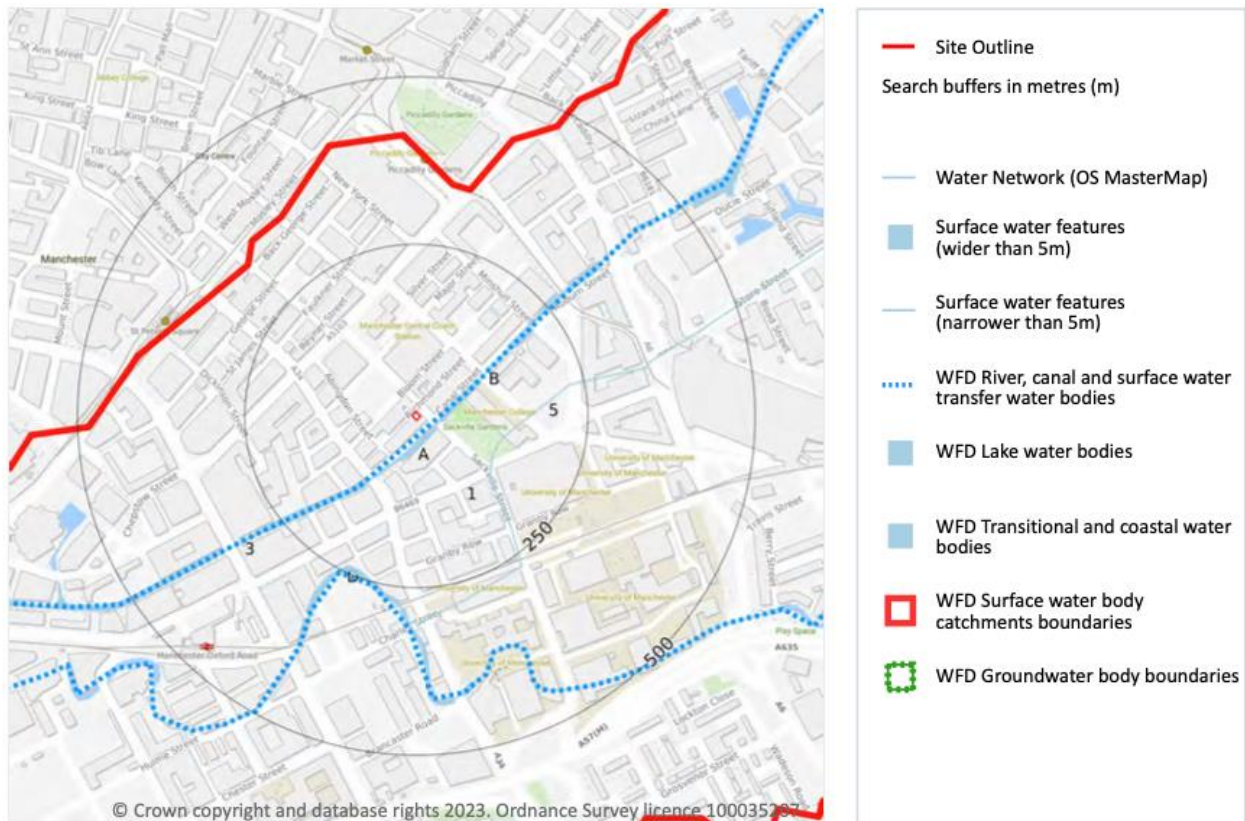
The map above shows, licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area. Records show 57 water abstraction sites within 2000m.

Source Protection Zones



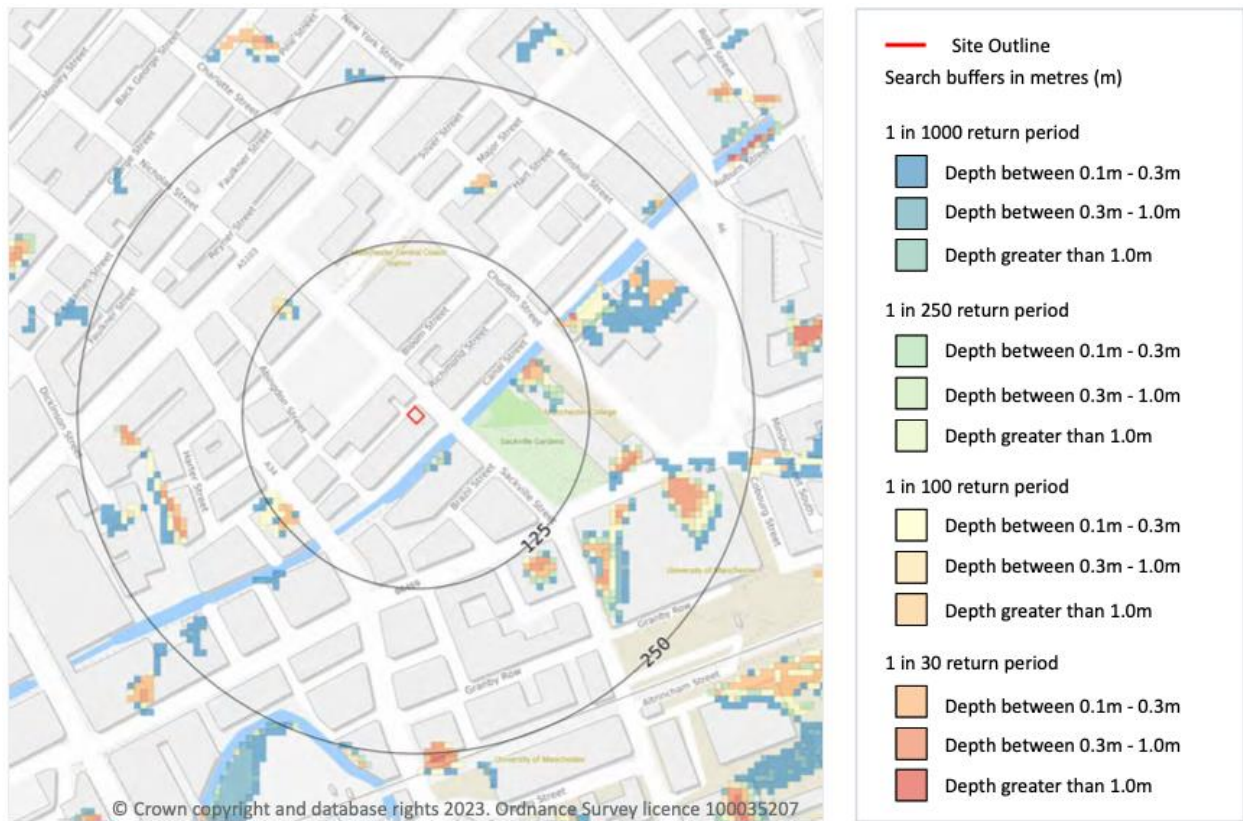
Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination. Only one source protection zones within 500m SW of the site was identified.

Hydrology



Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal. The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments. Results summarised in Table 2.

Surface water flooding



Highest risk on site	Negligible
Highest risk within 50m	1 in 100 year, 0.3m - 1.0m

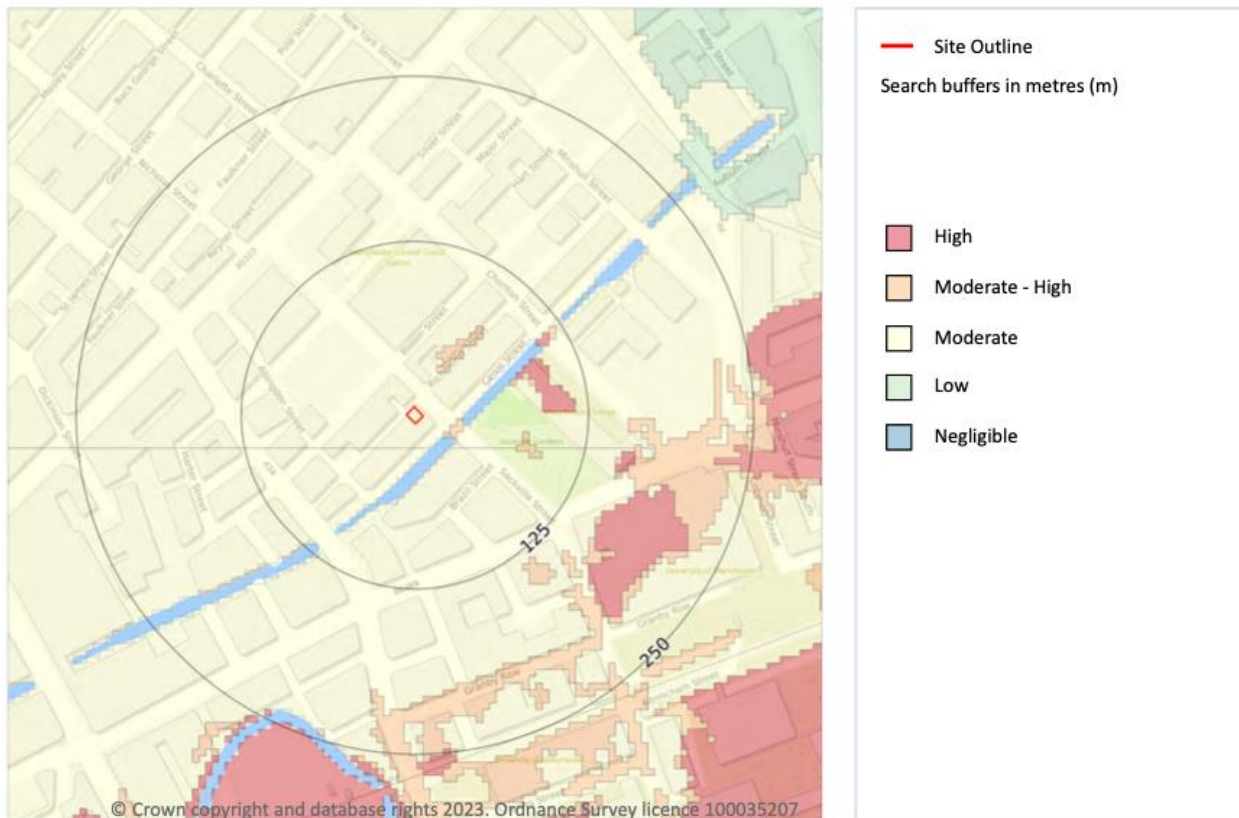
Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

Groundwater flooding



Highest risk on site

Moderate

Highest risk within 50m

Moderate-High

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

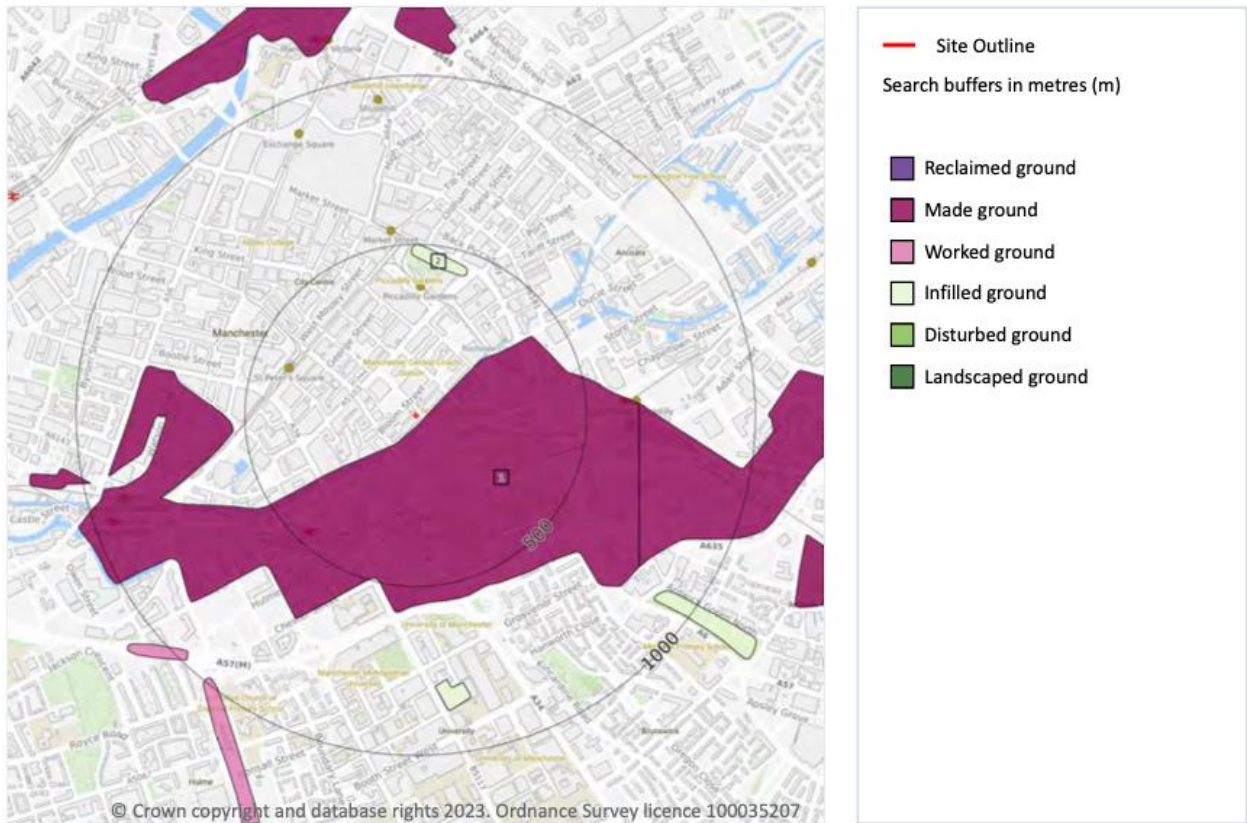
Geology 1:10,000 scale - Availability



An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SJ89NW

Geology 1:10,000 scale - Artificial and made ground

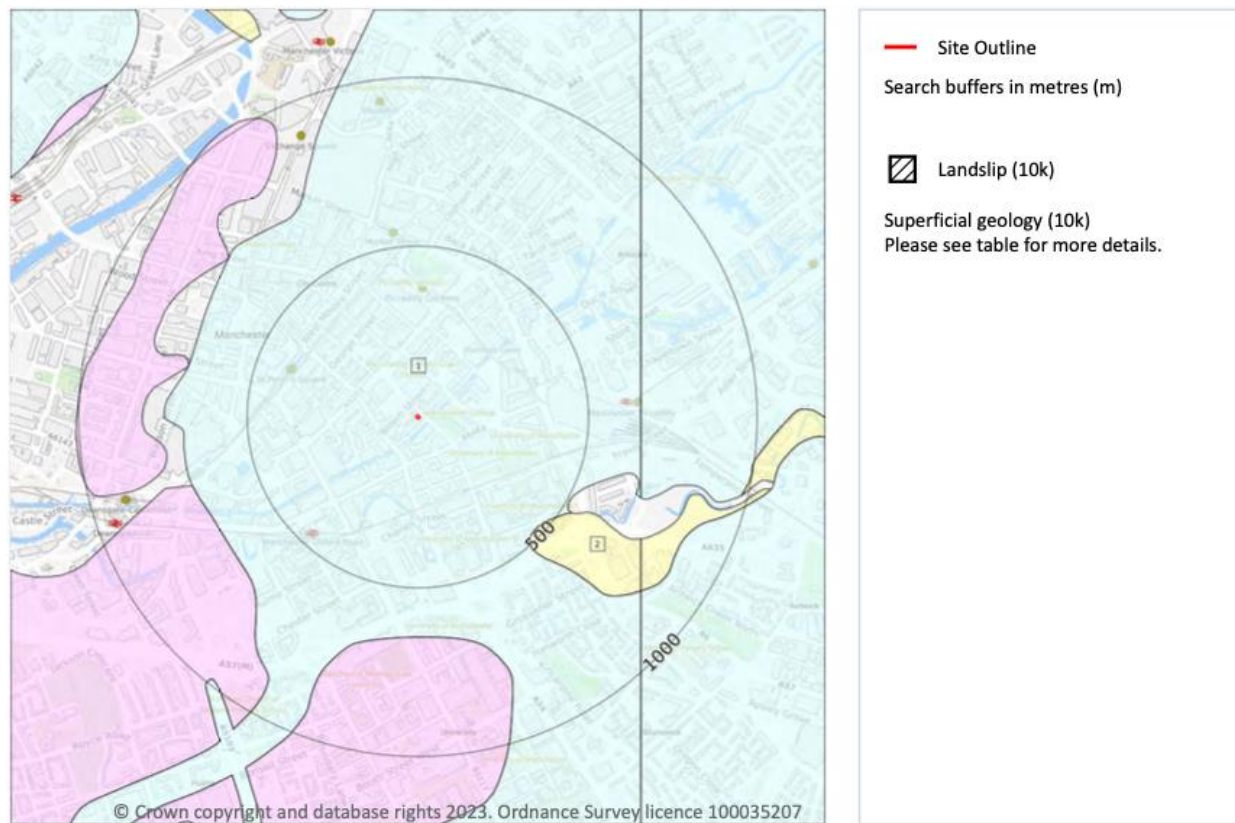


Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

There are two records within 500m of the site

ID	Location	LEX Code	Description	Rock description
1	18m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	429m N	WMGR-ARTDP	Infilled Ground	Artificial Deposit

Geology 1:10,000 scale - Superficial

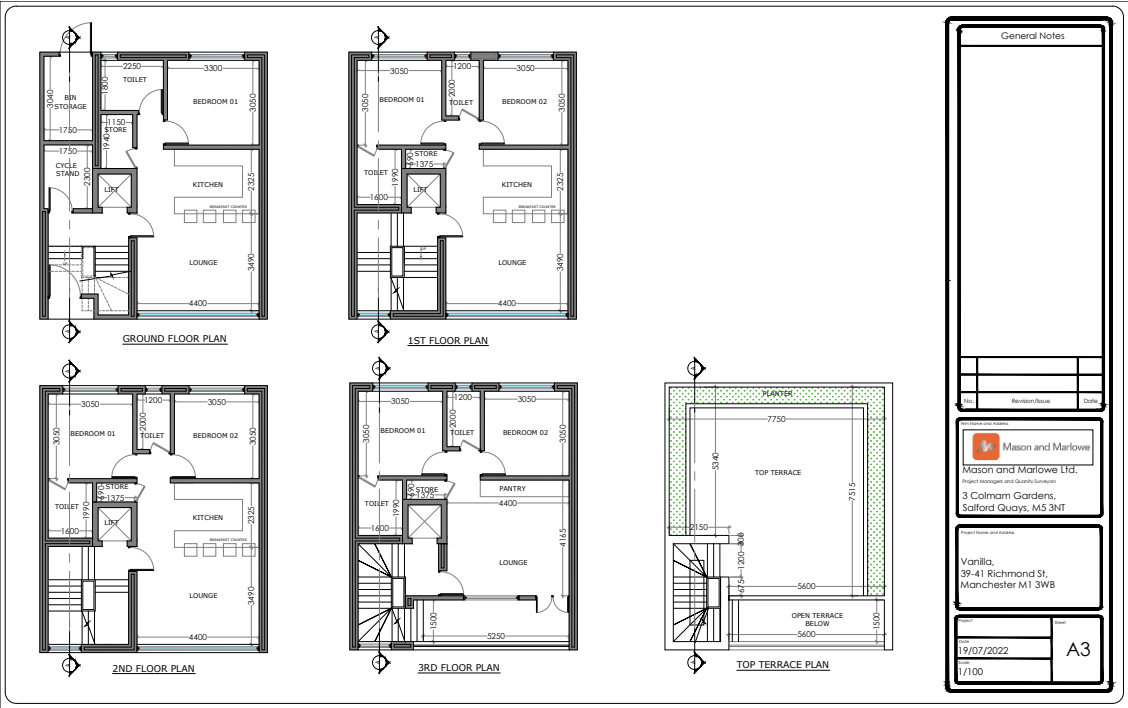


Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

There are two records within 500m of the site

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
2	477m SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel

5.2 Appendix 2: Site Drawings and Photos



Proposed floor plans

