

Rochdale Road 2

Flood Risk Assessment



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This document uses revision codes in accordance with ISO EN 19650:

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1. Introduction & Scope

1.1. Introduction

Booth King Partnership Ltd. (BKP) were commissioned by McGoff Group Projects Ltd. to carry out Flood Risk Assessment (FRA planning application) for Erection 17 storey residential amenity building (Use Class C3 (a)), with associated access, landscaping, public realm, infrastructure and other associated works on land off Rochdale Road, Manchester, M4 4HY, and Demolition of existing vacant building on site, comprising of ground floor retail and a first floor apartment at 85 Rochdale Road, Manchester, M4 4HY.

This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change (www.gov.uk/guidance/flood-risk-and-coastal-change) and Planning Practice Guidance, as well as Environment Agency (EA) Guidance and the local Strategic Flood Risk Assessment (SFRA) Level 1 & 2. A full list of documents used to inform this report is shown in the Reference section.

Although the site lies within Flood Zone 1 and has an area of 0.148 hectares, as the FRA is compulsory in accordance with the NPPF, the site lies within a CDA (Critical Drainage Area). The proposed developments should not increase the risk of flooding elsewhere and this FRA has therefore been prepared to demonstrate that this has been achieved. Consideration has also been given to BREEAM accreditation, including the requirements of Pol 03, the risk of pollution to controlled waters and the site conditions prior to, during and after development.

This report aims to identify and assess the risks of all forms of flooding to and from the site and demonstrate how these flood risks will be managed, taking climate change into account. The Flood Risk Assessment also considers the management of surface water run-off and outlines the proposed drainage strategy.

It is the assumption wherever possible that ground levels post-development will remain as close to existing as is practical. If this or other key assumptions change, then the conclusions within this report may need to be reassessed to check that they are still applicable.

This report is based on information obtained from the topographical survey, architect's plans, CCTV Survey and drainage record plans.

1.2. Scope

The client has requested Booth-King Partnership Ltd. to carry out a flood risk assessment of the entire site, located within Flood Zone 1, as part of the planning permission process with Manchester Council.

2. Existing Site

2.1. Location

The site is located at 85 Rochdale Road in Manchester, a predominately industrial area. The site covers an area of approximately 0.148 Ha, and it is located at Ordnance Survey Grid reference E: 384695, N: 399115.

Industrial buildings and associated car parks border the site to the north. Gould Street and existing buildings, including The Marble Arch pub borders the site to the west. Clive Street and existing car parks border the site to the east. Rochdale Road borders the site to the south.

A Site Location Plan can be found in Appendix A.

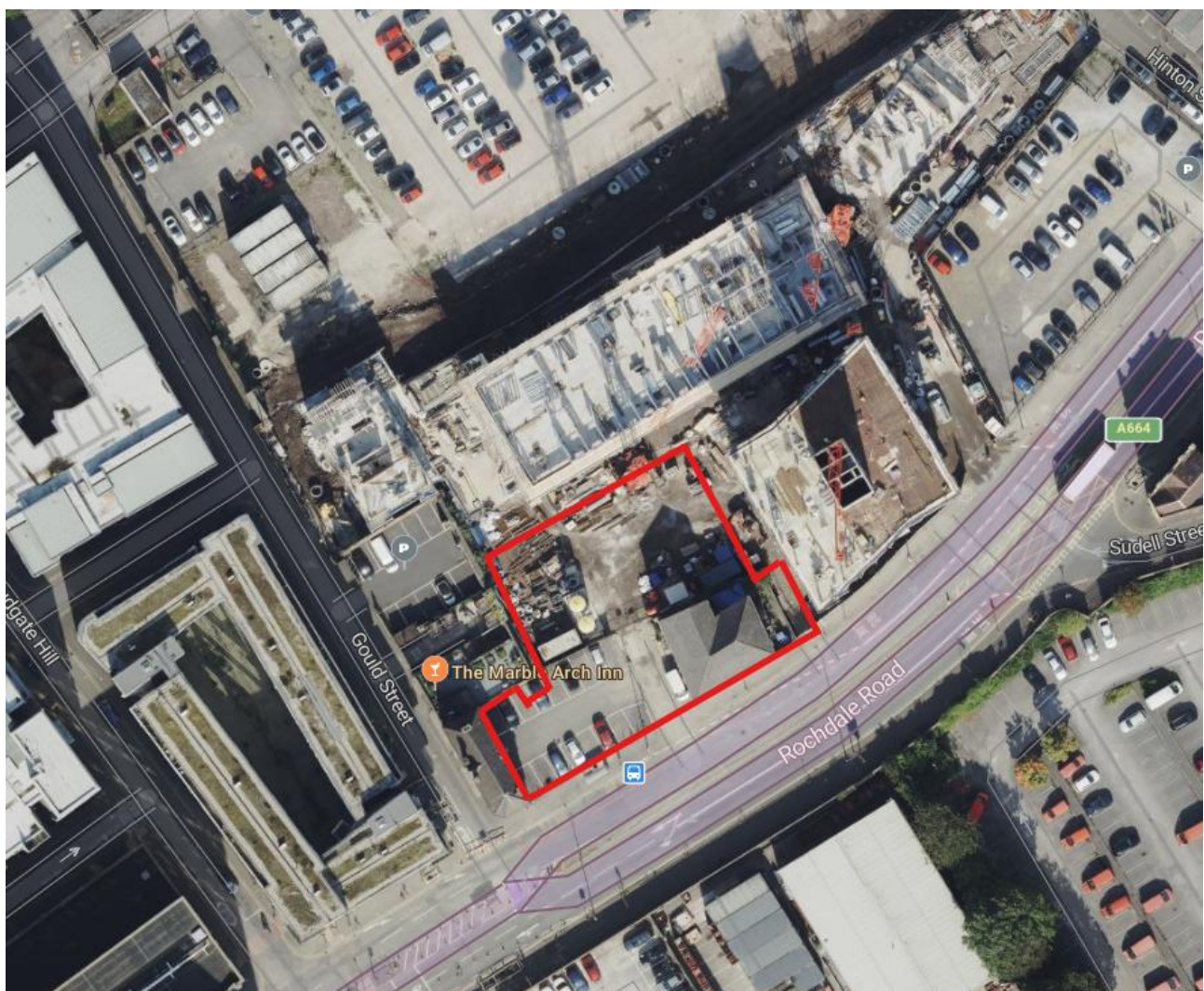


Figure 1. Existing Site

2.2. Site Levels

A topographic survey of the site shows that the site levels vary from 52.00m AOD, at the south boundary of the site and the lowest level of 51.27m AOD at the north part of the site, Phase 1 of the development.

The topographical survey is presented Appendix B.

2.3. Existing Drainage

A private drainage network currently serves the existing car park and surround buildings. A drainage survey has confirmed that this network has no off-site connections requiring retention; therefore, it will be decommissioned and removed as part of the site works.

A review of United Utilities (UU) sewer records indicates the presence of a 2362mm brick-built (BR) combined sewer within Rochdale Road to the south. Additionally, a 500x760mm BR UU combined sewer runs along Rochdale Road, reducing to 750x375mm BR as it extends north into Gould Street to the west. A further 750x500mm UU combined sewer is located in Clive Street to the east.

Several surface water and foul water manholes forming part of the existing private drainage network were constructed during Phase 1 of the overall development works.

As part of the planning application process, a pre-development enquiry was submitted to United Utilities to confirm that the proposed surface water and foul water discharge rates from the development are acceptable for connection to the combined sewer network.

Surface water and foul water from Phase 2 of the development will discharge into the existing manholes installed during Phase 1 of the scheme.

Refer to Appendix C for United Utilities Asset Map, CCTV survey and UU response.

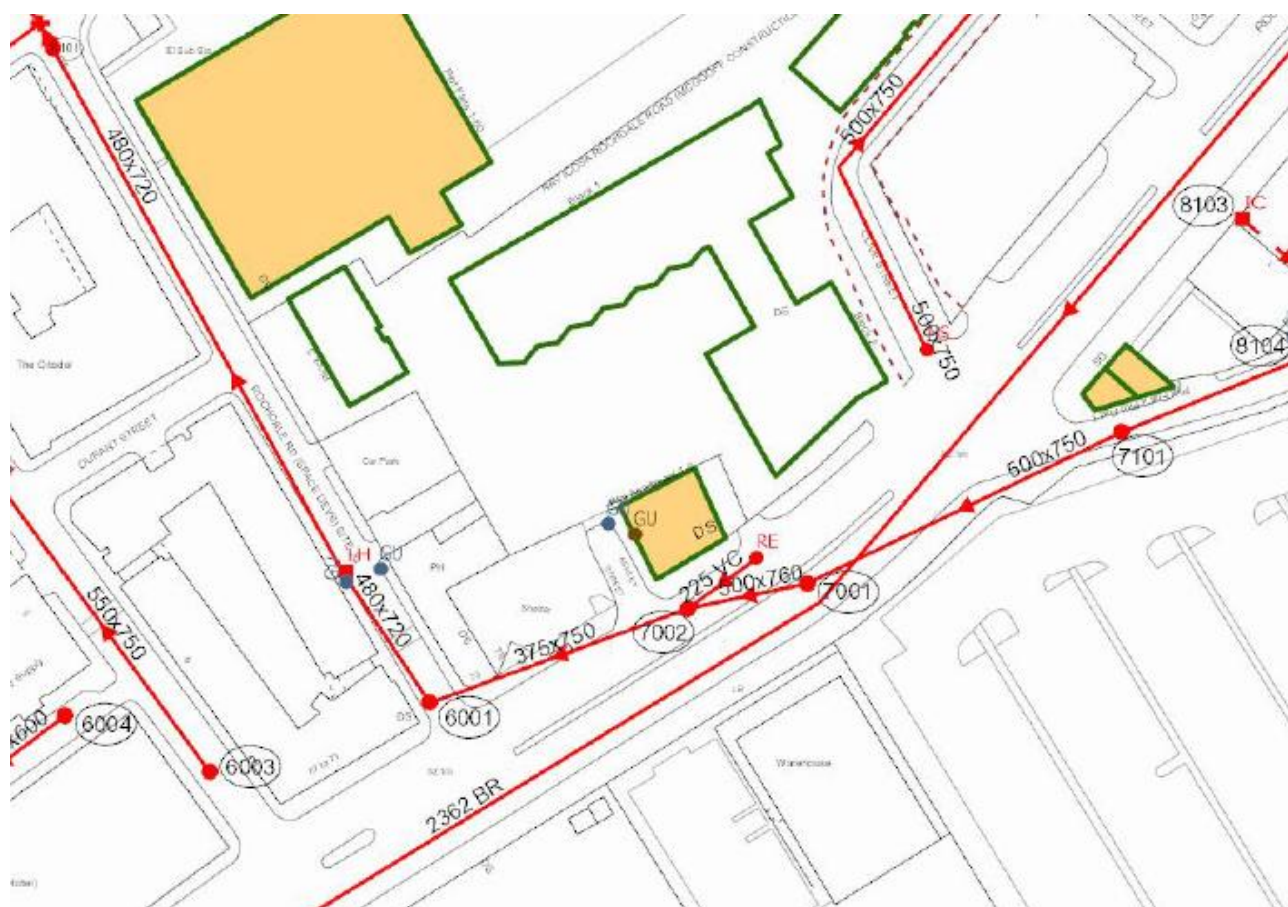


Figure 2. United Utilities Maps Extract

2.4. Geology

A Ground Investigation was carried out on 24th to 28th June 2025 and comprised the following:

- 6no. window sample boreholes drilled to 0.4-5.95 metres below ground level (mbgl) (ref. WS101 to WS106).
- 1no. cable percussion borehole drilled to 27.00mbgl with follow on rotary core to 37.5mbgl (ref. BH103).

All site investigation locations are shown in Figure 3.

The locations were chosen to allow adequate assessment of ground conditions across the site.

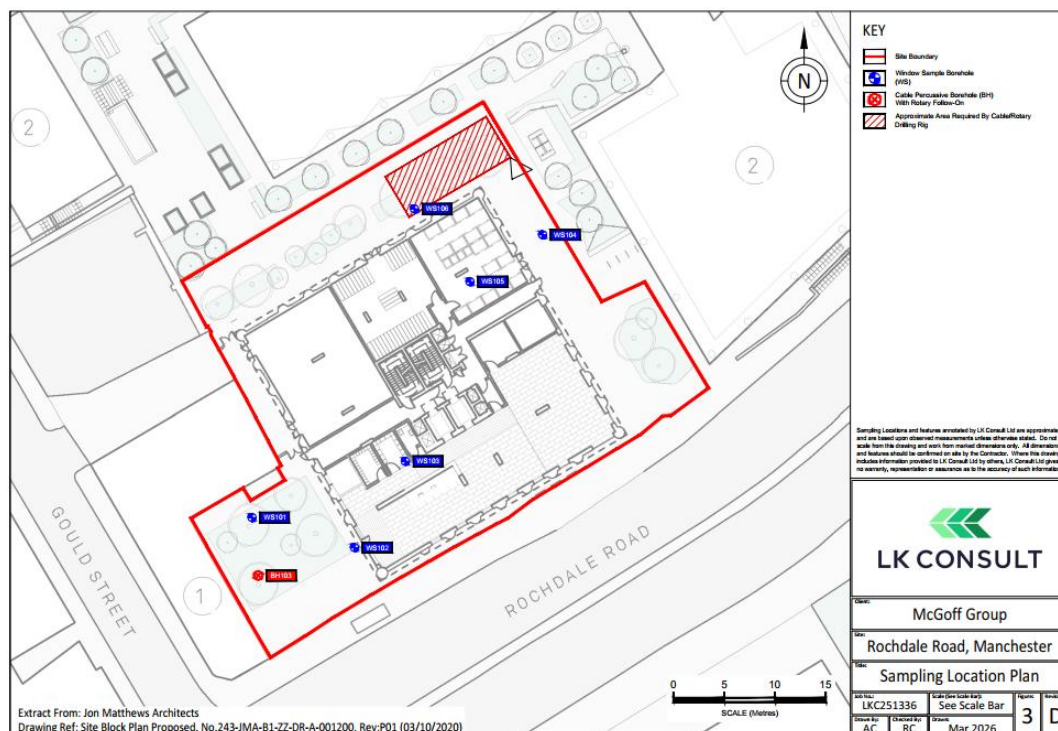


Figure 3. Ground Investigation Plan Extract

The ground conditions beneath the site are summarised below. Logs can be provided upon request.

Made Ground

Made ground was recorded in all boreholes to depths of 0.05-2.50mbgl. The made ground generally comprised very gravelly slightly silty sand with anthropogenic material such as, brick, clinker, ceramic, metal, glass, ash, plastic.

Made ground clay was recorded in WS101 and BH103 only, comprising gravelly slightly sandy silty clay with anthropogenic material such as, brick, coal and ceramic to a depth of 4.00-4.94mbgl. WS101 assumed to a depth of 4.94 due to SPT-C undertaken.

Made ground within boreholes WS104-WS106 was significantly different to the boreholes undertaken within the carpark area. Anecdotal evidence suggests that the made ground material comprised crushed fill material, this was confirmed by window sample boreholes and comprised very sandy gravel with anthropogenic material such as, brick, slate, coal, glass, ash clinker and concrete.

Natural Strata

Superficial strata comprised stiff to very stiff gravelly sandy silty clay with rare coal fragments, recorded to depths of 21.00mbgl.

Possible sandstone boulder encountered at 21.00 – 21.50mbgl.

Horizon of clay recoded to a depth of 23.00mbgl with cobly gravelly slightly silty SAND recorded to 26.50mbgl.

Slightly weathered sandstone bedrock was encountered from 26.50-37.00mbgl.

Contamination

There was no visual / olfactory evidence of hydrocarbons or volatile contaminants in any locations. The PID recorded a maximum of 0.2ppm TVOC in the samples.

2.5. Hydrology

Reference to Ordnance Survey Mapping indicates that the nearest surface water feature is River Irk which is located 336m northwest to the site.

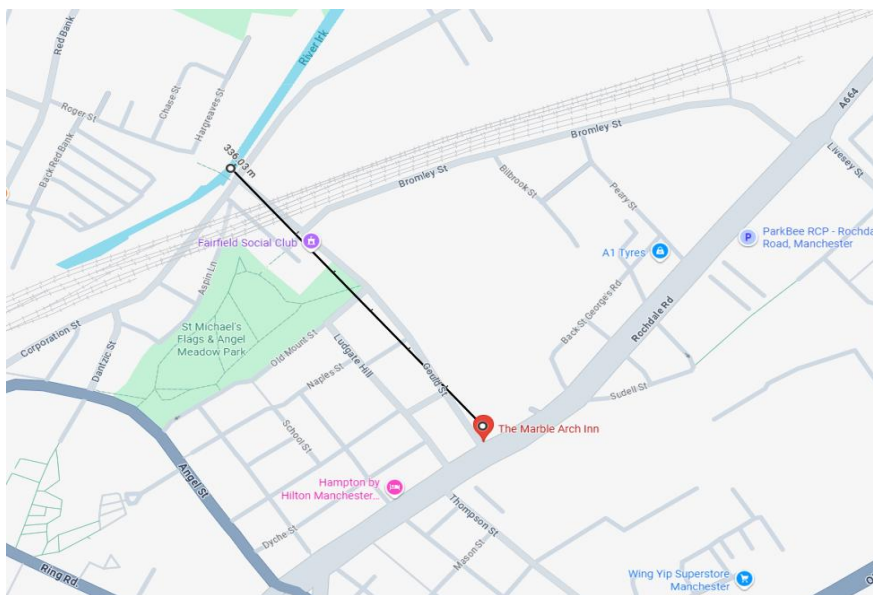


Figure 4. Google Maps

There are no records of active Red List discharge consents (potentially harmful discharges to surface waters) within 500m.

The site lies in Flood Zone 1 and is not at risk of flooding from rivers or the sea. There are no recorded historical flood events or records of flood defences within 250m.

There are no flood storage areas within 250m.

The site lies outside Source Protection Zones.

3. Flood risk

The Environment Agency Flood Maps for Planning indicate that the site is located wholly within Flood Zone 1.

The vulnerability of the site to flooding from rivers and other sources has been considered and the local SFRA has been taken into account. Typical sources of flooding include fluvial, tidal, surface water, groundwater and anthropogenic sources such as sewer flooding and reservoir flooding. These are all considered in this Section.

3.1. Flood Zones

The probability of flooding from rivers and the sea is modelled by the EA for the whole of the UK and mapped as Flood Zones which categorise areas according to the likelihood of flooding occurring. The zones are defined by the predicted extent of flooding during annual exceedance probability (AEP) events.

The maps are based on a broad assessment of areas using digital mapping techniques. Extracts from the EA flood maps for the site and its surroundings are included here for reference purposes.

The flood zones are defined In Table 3.1 of the NPPF as follows:

Flood Zone	Definition
Zone 1 – Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding.
Zone 2 – Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding
Zone 3a – High Probability	Land having a 1 in 100 or greater annual probability of river flooding. or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b – The Functional Floodplain	Land where water has to flow or be stored in times of flood (1 in 20 or greater annual probability of river or sea flooding).

Key features of the Flood Map for Planning are:

- Where an area benefits from formal flood defences providing a minimum standard of protection, the defended area may be indicated as an area benefiting from flood defences.
- The Flood Zone classifications do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.
- Flood Zone 3b (functional floodplain) is not separately distinguished from Flood Zone 3a.

Flood Risk Vulnerability and Flood Zone Incompatibility

Table 2 of the NPPF classifies the compatibility of different development end uses, based on their vulnerability to flooding, against the defined flood zones for rivers and sea, and an extract of the table is provided below.

Table 2: Flood risk vulnerability and flood zone 'incompatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

✓ Exception test is not required

X Development should not be permitted

The site is proposed to be used for residential use which falls within the 'highly vulnerable' classification within Table 2. All uses, including residential are deemed appropriate in Flood Zone 1.

3.2. Flooding from Sea/ Tidal Flooding

The development is not considered to be at risk from tidal flooding.

3.3. Surface Water Flooding

Figure 5, which presents the Environment Agency's surface water flood map, indicates that the majority of the site is at very low risk of flooding. However, areas located beyond the north-eastern boundary are identified as being at high risk.

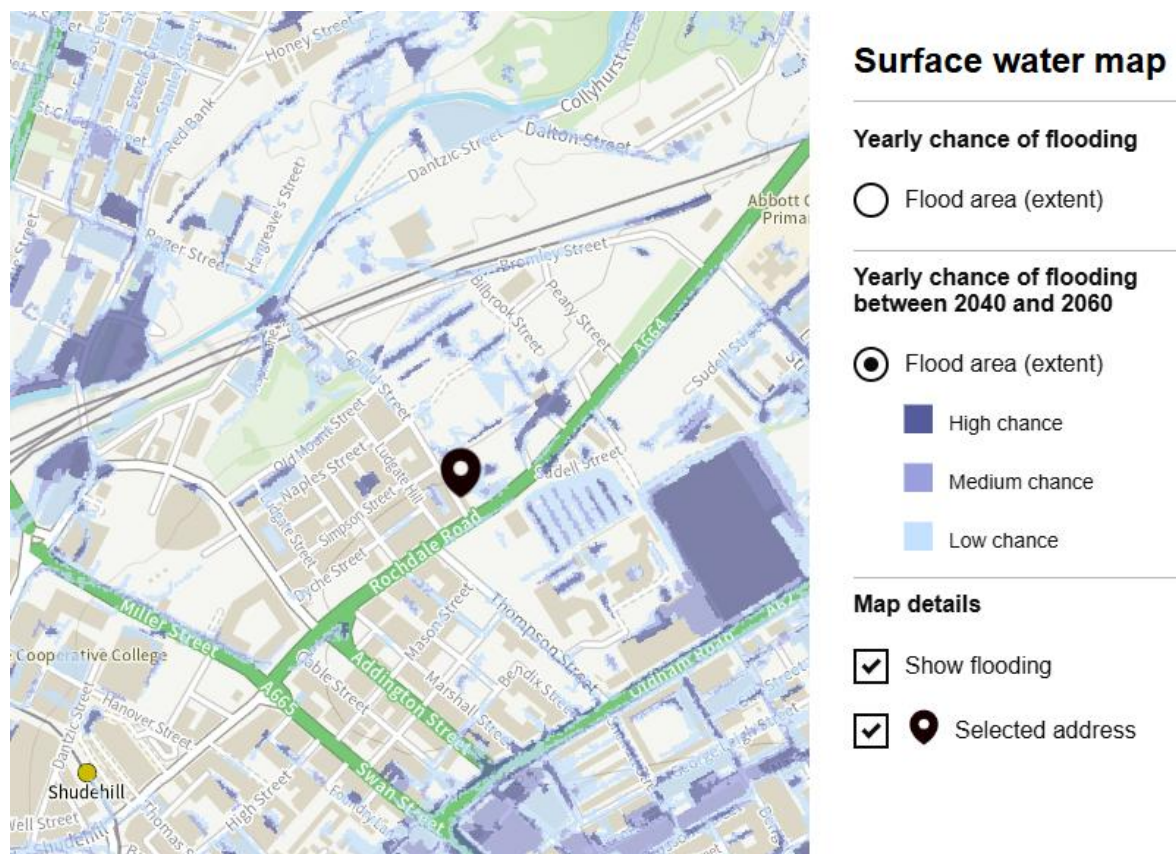


Figure 5. EA - Surface Water Flooding

This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems. Surface water flooding from on-site sources is considered in Section 5 of this report.

3.4. Groundwater Flooding

According to the Manchester Flood Risk Assessment Level 1 (March 2011), Groundwater water flooding occurs when the water table rises after prolonged rainfall to emerge above ground level remote from a watercourse. It is most likely to occur in low-lying areas underlain by permeable rock (aquifers) and groundwater recovery areas, after pumping for mining or industry has ceased. Warmer, wetter winters due to climate change may have significant impacts on groundwater levels.

Groundwater flooding is caused by the emergence of water from beneath the ground, either at point or diffuse locations. The occurrence of groundwater flooding is usually local and unlike flooding from rivers, does not generally pose a significant risk to life due to the slow rate at which the water level rises. However, groundwater flooding can cause significant damage to property, especially in urban areas and can pose further risks to the environment and ground stability.

There are several mechanisms that increase the risk of groundwater flooding including prolonged rainfall, high in-bank river levels, artificial structures, groundwater rebound, and mine water rebound. Properties with basements or cellars or properties that are located within areas deemed to be susceptible to groundwater flooding are at particular risk. Development within areas that are susceptible to groundwater flooding will generally not be suited to infiltration SuDS; however, this is dependent on detailed site investigation and SuDS evaluation with the drainage strategy of each development with the whole site.

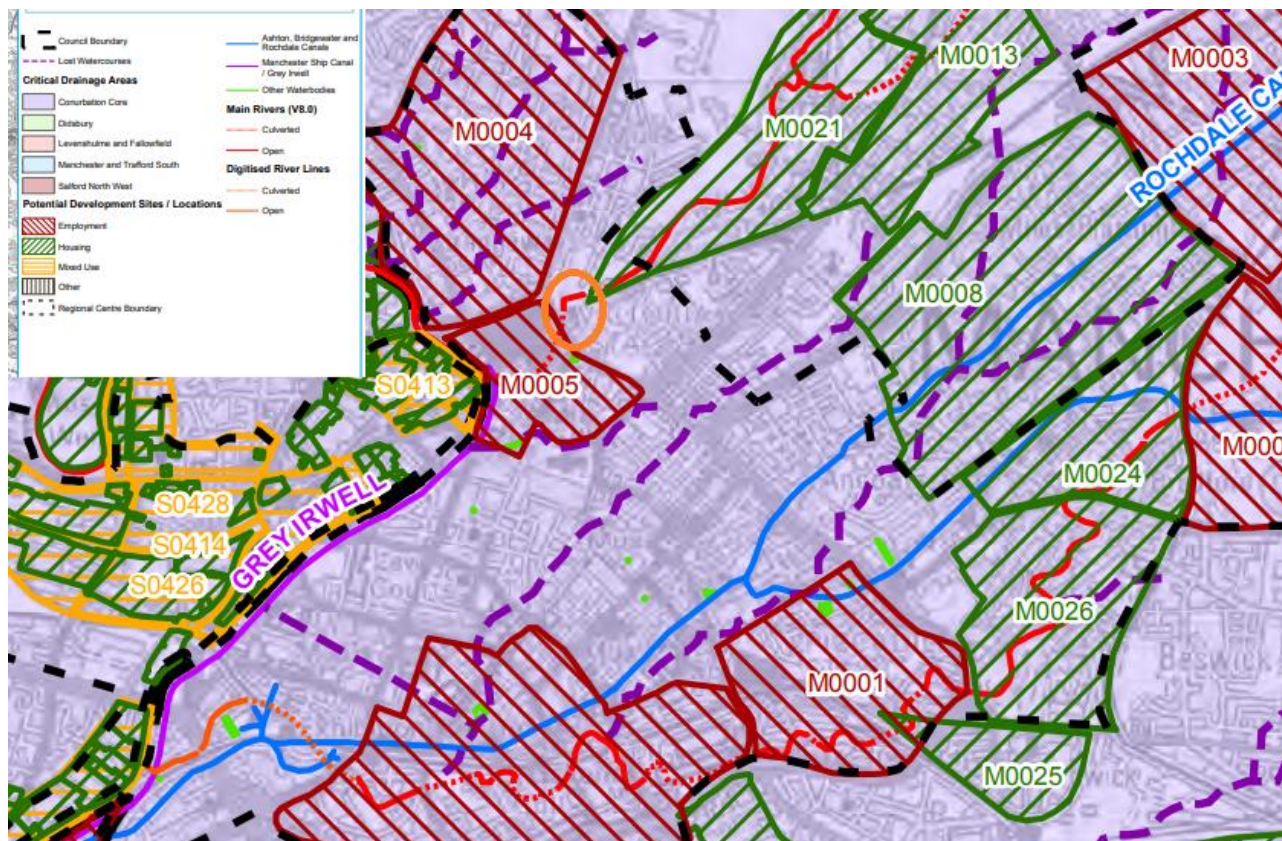


Figure 6. SFRA Level 2 – SFRA SS 4.5 Critical Drainage Areas.

Reviewing the information from the SFRA, our site to be in a high-risk zone of 75% risk of flooding from groundwater.

The overall risk to the development from potential flooding from groundwater is considered to be high, however, the proposed development will be designed where practicable to do so, with levels to minimise the risk of groundwater flooding to the building.

Levels around the building directing the water away from the building should groundwater flooding occur. The site has existing buildings on, the proposed buildings will be set to at least the same level or higher than existing finished floor levels to mitigate groundwater flooding. The nature of the development proposals will raise the site levels to mitigate groundwater flooding.

Further consultation with the LLFA will be undertaken which may provide additional information on groundwater flooding.

The overall risk to the development from potential flooding from groundwater is therefore considered to be low.

No groundwater strikes were recorded, unknown groundwater strike during rotary core drilling due to water flush used.

3.5. Flooding from Anthropogenic Sources

Flooding from a reservoir can occur as a result of a dam failure. Reservoir flooding will cause very fast flowing water to flow down the natural water path in large quantities. Reservoir flooding is extremely rare in the UK due to very strict regulations and mandatory assessments

Reservoirs

Flooding from reservoirs is unlikely in this area.

Figure 7. EA – Reservoirs

Flooding from reservoirs is extremely unlikely. An area is considered at risk if people's lives could be threatened in the event of a dam or reservoir failure, but the associated hazard is high. The EA data indicates that for the site, water depths as a result of reservoir failure are very low.

4. Surface Water

In accordance with the NPPF and SFRA, consideration should be given to natural water flows at the site. The development should be safe for its lifetime and should not adversely affect flow or increase flood risk elsewhere, including increasing run-off rates. The disposal of surface water should be dealt with in a sustainable way and climate change should also be accounted for. The site drainage strategy is discussed in Section 5.

4.1. Development Proposals

Erection of a 17-storey residential apartment building (Use Class C3 (a)), with associated access, amenity, landscaping, public realm, infrastructure and other associated works. Demolition of existing vacant building on site, comprising of ground floor retail and a first floor apartment.

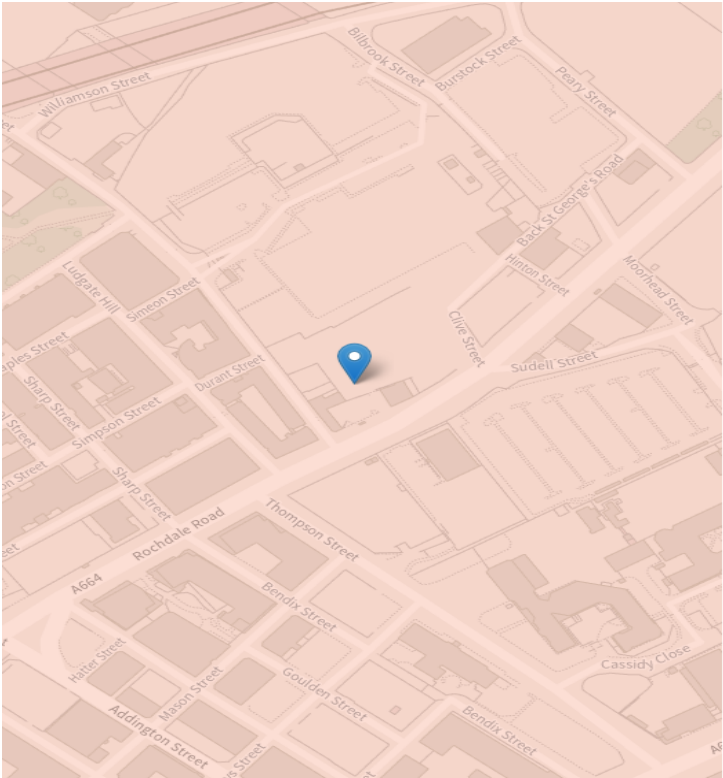
The proposed site layout can be found in Appendix A.

4.2. Climate Change

There is evidence to suggest that the climate is changing with sea levels predicted to continue to rise along with more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall. The NPPF recommends that the effects of climate change be accounted for in FRA, with consideration of the EA flood maps and local authority SFRA.

Increased rainfall or higher intensity short-duration rainfall may increase as a result of climate change. The Department for Environment Food & Rural Affairs have developed an interactive map and requires all new development to allow for a 45% increase in rainfall to allow for climate change for the Irwell Catchment peak rainfall allowances.

A 45% increase is therefore being allowed for within the new surface water drainage design to take account of climate change. Climate change may also lead to variations in groundwater level which will also be considered during the drainage design.



**Irwell Management
Catchment peak rainfall
allowances**

**3.3% annual exceedance
rainfall event**

Epoch	3.3% annual exceedance rainfall event	
	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%

**1% annual exceedance
rainfall event**

Epoch	1% annual exceedance rainfall event	
	Central allowance	Upper end allowance
2050s	25%	40%
2070s	30%	45%

*Use '2050s' for development with a lifetime up 2060 and use the 2070s epoch for development with a lifetime

Figure 9. Climate Change Allowance Interactive Map

4.3. Sustainable Drainage Systems (SuDS)

SUDS are a desirable way to manage surface water disposal within new developments and SUDS methods for surface water drainage management are discussed further within the SUDS Manual.

The types of benefits that can be achieved by SUDS will be dependent on the site, but fit broadly into four categories: water quantity, water quality, amenity and biodiversity. These are also referred to as the four pillars of SUDS design (Figure 10):

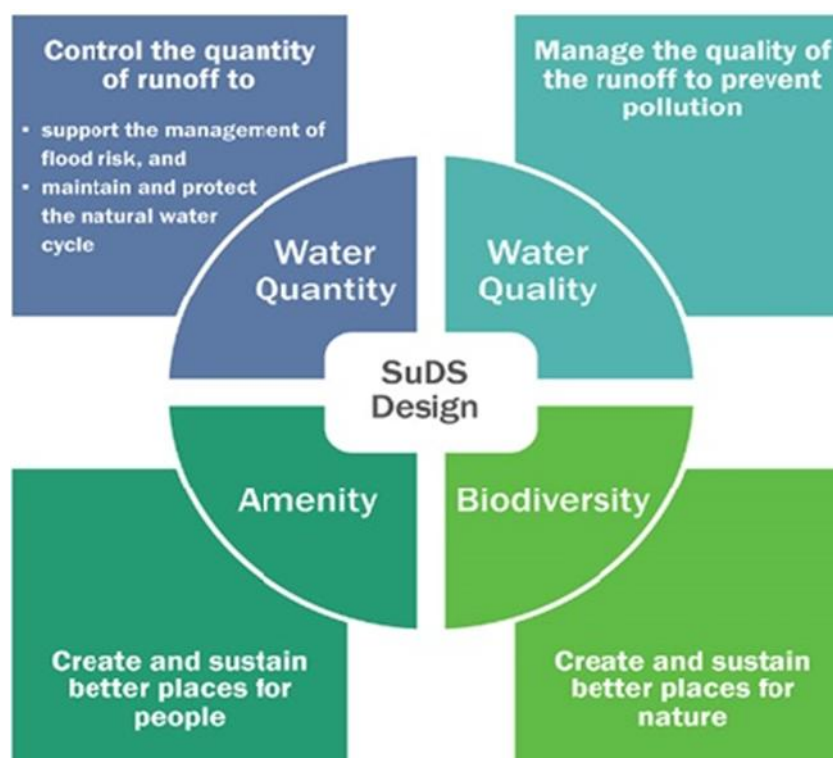


Figure 10. Four Pillars of SuDS

The proposed development will address the above 4 pillars of SuDS design criteria with the inclusion of a range of sustainable features through a comprehensive treatment train.

- **Water Quantity:** the quantity of run-off from the site will be significantly reduced, as set out in more detail in the Drainage Strategy in Section 5, whilst taking account of likely increases in future rainfall due to climate change.
- **Water Quality:** the quality of run-off from the site is improved by the inclusion of cellular attenuation in the form of a blue/green roof. The flows arising from the building roofs will initially be treated via a network of pipes. All flows will be collated within the site prior to discharge into existing private network.
- **Biodiversity** will be addressed by the existing green areas and vegetation areas around the overall development, as well as by the inclusion of a significant planting regime creating a better environment for nature to thrive.
- **Amenity** is provided through the proposed green areas, which presents the opportunity to create visually attractive areas within the proposed site which have the ability to connect people to water. Such features have been shown to improve the well-being of people that live within the proposed development.

5. Drainage Strategy

It is proposed to erect a new domestic building with associated landscape areas, refer proposed drainage general arrangement for layout and details provided in Appendix E.

5.1. Proposed Foul Water Network

Foul flow from this site will be allowed to drain into the public combined sewer system.

Although the preferred point of discharge for United Utilities would be to the 225mm diameter public combined sewer (Manhole reference SJ84997002, Grid reference 384714, 399088) within Rochdale Road located South of the proposed development at a maximum pass forward flow of an unrestricted rate, it is proposed that the existing foul manhole from Phase 1 to be the final discharge point for the Phase 2 of the development.

Drainage Strategy drawings can be found in Appendix E.

5.2. Proposed Surface Water Network

Sustainable drainage, developed in accordance with the principles of sustainable development, is collectively known as Sustainable Drainage Systems (SuDS). At a given site, SuDS are designed to manage the environmental risks associated with urban runoff while also enhancing the surrounding environment where possible. The key objectives of SuDS are to minimise the impact of development on both the quantity and quality of surface water runoff, while maximising opportunities for amenity and biodiversity enhancement (CIRIA C753, 2015).

The 'Management Train Approach' should form the foundation of the surface water drainage strategy for the proposed development. Its primary aim is to treat and control runoff as close to the source as possible, thereby protecting downstream environments and enhancing the site's overall amenity value.

This approach applies a hierarchy of drainage techniques to progressively reduce pollution, flow rates, and stormwater discharge volumes from the site. The key stages are outlined below:

1. Prevention – Incorporating good site design and management practices to minimise runoff and pollution, including the use of rainwater harvesting and reuse systems.
2. Source Control – Managing runoff at or near its point of origin through measures such as soakaways, green roofs, and permeable pavements.
3. Site Control – Managing surface water at a local scale using methods such as below-ground storage or attenuation systems, detention basins, and large infiltration devices.
4. Regional Control – Managing surface water from multiple areas or sites through features such as wetlands and balancing ponds.

SuDS techniques can be applied to all development sites; however, an assessment of the existing site conditions is necessary to identify any potential limitations.

- Land Use Characteristics: The size and nature of the development plot provide opportunities to incorporate a variety of source control and site control SuDS features, both above and below ground.
- Site Characteristics: The presence of cohesive clay soils and potential ground contamination render infiltration-based SuDS techniques unsuitable.
- Catchment Characteristics: The site is classified as brownfield land.
- SuDS techniques can be applied to all development sites; however, an assessment of the existing site conditions is necessary to identify any potential limitations. Land Use Characteristics: The size and nature of the development plot provide opportunities to incorporate a variety of source control and site control SuDS features, both above and below ground. Site Characteristics: The presence of cohesive

clay soils and potential ground contamination render infiltration-based SuDS techniques unsuitable.
catchment Characteristics: The site is classified as brownfield land.

Infiltration has been determined to be unfeasible and is therefore excluded from consideration as a drainage solution.

The proposed design philosophy is as follows:

- Surface water will be treated using the ‘Management Train’ approach, ensuring contaminants are removed and contained within SuDS features prior to discharge.
- Due to the presence of cohesive clay soils and potential contamination, infiltration techniques are not considered viable.
- The site will discharge to the combined sewer system in Rochdale Road at a controlled rate of 3.0 l/s, as agreed with United Utilities.
- Source control measures will include the use of rain gardens.
- Site control measures will incorporate bluroof systems.
- The design will seek to minimise the proportion of impermeable surfaces within the development wherever practicable.

The outline drainage strategy involves collecting runoff from roof areas through blue roof system and other hardstanding surfaces and conveying it via new below-ground surface water drainage pipework, which will ultimately discharge into the combined sewer system.

Although the site is clasified as a brownfield site, in this case it is treated as a greenfield site and the discharge rates were calculated as below.

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	1.0	l/s
Flow rate 2 year (l/s)	1.1	l/s
Flow rate 10 years (l/s)	1.6	l/s
Flow rate 30 years (l/s)	2.0	l/s
Flow rate 100 years (l/s)	2.4	l/s
Flow rate 200 years (l/s)	2.7	l/s

Figure 11. Greenfield Run Off Calculation

The flow rate 100 years discharge rate is identified as 2.4 l/s, and it is suggested that the 1 in 100 year event discharge rates to be used.

Flows arising from the proposed development will be restricted to 3.0 l/s for the 1 in 100-year (+45%CC) event, as agreed with United Utilities.

The site drainage network will be designed in accordance with current best practice to have sufficient capacity not to flood both during the critical 1 in 30-year storm (plus 40% allowance for climate change) and 1 in 100-year storm event (plus 45% allowance for climate change). In this way the risk of off-site flooding, which could

result in damage to other buildings and essential services, will be minimised and the risk of flooding elsewhere should not be increased as a result of the development proposals.

A Hydrobrake flow control device will be installed to regulate the discharge into the final combined manhole, which will then discharge into the existing combined Phase 1 manhole, as shown on the drainage strategy drawing.

Silt is to be prevented from entering the drainage system by the use of trapped gullies, channels with silt traps, French drains with silt traps or by the use of Sustainable Drainage techniques.

Further discussion with the appropriate approving bodies will be required to finalise the Drainage Strategy.

Causeway Flow output for the Critical Storm is enclosed in Appendix F.

6. Conclusion

This Flood Risk Assessment (FRA) has been prepared by Booth King Partnership Ltd. (BKP) on behalf of McGoff Group Projects Ltd. in support of the planning application for the proposed development Rochdale Road, Manchester, M4 4HY.

The assessment has been undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF), Planning Practice Guidance: Flood Risk and Coastal Change, Environment Agency (EA) guidance, and the Local Strategic Flood Risk Assessment (SFRA) Levels 1 and 2.

The key findings of this assessment are summarised as follows:

- The site is located entirely within Flood Zone 1, indicating a low probability of fluvial or tidal flooding in accordance with EA mapping.
- There are no recorded historic flood events affecting the site. The risk of flooding from reservoirs, sewers, or artificial sources is considered low.
- The risk of groundwater flooding is assessed as low, based on site levels and the proposed finished floor levels which will be set at or above existing ground levels to mitigate residual risk.
- The risk of surface water flooding is considered to be very low within the site boundary. Localised ponding identified to the north-east lies outside the development footprint and does not pose a risk to the proposed buildings.

Surface water management for the proposed development has been designed in accordance with Sustainable Drainage System (SuDS) principles and the Management Train Approach, ensuring treatment and attenuation of runoff as close to source as practicable.

Due to the presence of cohesive clay soils and potential ground contamination, infiltration-based SuDS techniques are not considered viable. As such, the proposed drainage strategy will discharge to the combined sewer in Rochdale Road at a controlled rate of 3.0 l/s for the 1 in 100-year event, including a 45% allowance for climate change, in agreement with United Utilities.

The proposed surface water drainage network has been designed to ensure:

- No flooding occurs within the site for up to the 1 in 30-year storm event (+40% CC); and
- All surface water is safely managed on site during the 1 in 100-year storm event (+45% CC) without increasing flood risk to third parties.

Source control measures, including permeable paving and water butts, together with site control features such as blue/green roof systems, have been incorporated to reduce runoff volumes, improve water quality, and deliver biodiversity and amenity benefits.

The proposed foul water drainage system will discharge to the existing combined sewer via manholes constructed as part of Phase 1 of the wider development.

Overall, the proposed development will:

- Not increase flood risk to the site or surrounding areas;
- Will be safe for its lifetime
- Provide a sustainable and robust drainage solution; and
- Comply with NPPF, EA, and local planning policy requirements for flood risk management and surface water control.

It is therefore concluded that the proposed development is appropriate in flood risk terms and that the proposed drainage strategy is technically feasible, sustainable, and in full accordance with relevant planning and environmental standards.

7. Maintenance Plan

The Drainage network has been designed with minimal maintenance in mind. The maintenance is generally of a 'common sense' approach and is to comprise:

- Regular day to day care: - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a drainage feature.
- Occasional tasks: - managing vegetation in wet areas and removing any silt that builds up in the drainage features.
- Remedial work: - repairing damage when, and where, necessary.

Specific recommendations for each feature are provided in the following sections and should be referred to in the first instance if there are any issues. Please contact Booth King Partnership Ltd. if any further advice is required.

During the works the Contractor, subject to agreement from their client, will ensure that all drains on which the proposed drainage works rely will be jetted out and made good as required to ensure correct operation.

Maintenance Activity	Required Action	Frequency
Inspection	Inspect for sediment and debris in pre-treatment component such as gullies, sump units and catch pits.	Monthly for the first year and on a 6-monthly basis thereafter.
Gutters	Clear gutters and any leaf guards.	On a 6-monthly basis or as required following inspection regime.
Sump Units	Remove all obstructions and debris from all sump units (gullies, channels and catch pits).	On a 6-monthly basis or as required following inspection regime.
Pipe Work	Inspect all pipework for all silt accumulation and high pressure jet any pipe work which has silt accumulation. Care is to be taken that any silts within the pipework are not flushed using chamber bungs.	On a 6-monthly basis or as required following inspection regime.
Manholes	Covers should be lifted and inspected for litter and debris to ensure that the runs are free flowing.	On a 6-monthly basis or as required following inspection regime.
Flow Control	Check flow control manhole to ensure emptying is occurring. Little to no water should be present after consecutive days of dry weather). Check function of the emergency drain down. Check for build-up of debris and silt. Clear and remove as necessary.	6 monthly basis. After extreme events.
Blue/Green Roof	Perform regular inspections: Carry out inspections at least quarterly and following any significant storm events to identify debris, blockages, or damage.	6 monthly basis. After extreme events

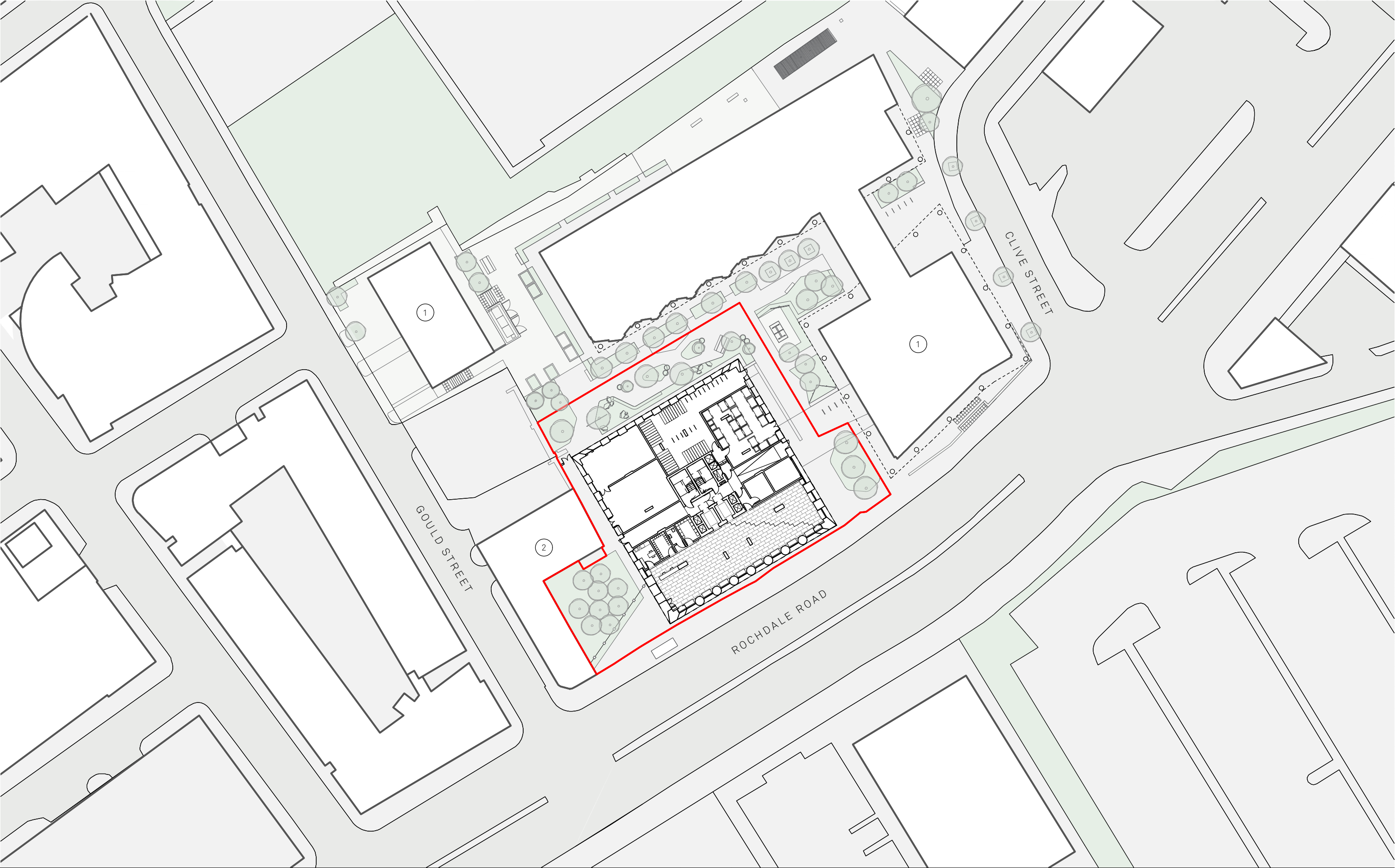
	Inspect outlets: Check all outlets, drainage chambers, and flow control devices for blockages or debris accumulation (e.g., leaves, sediment). Check overflows: Ensure overflow routes are unobstructed and capable of discharging freely; remove any debris as necessary. Verify drainage performance: Confirm that outlets are draining effectively and that the pebble margins around inspection chambers remain intact. Inspect chambers: Ensure all inspection chamber covers are securely fitted and properly locked. Maintain accessibility: Keep all roof access routes unobstructed and safe for maintenance personnel at all times. Record maintenance activities: Keep accurate and up-to-date records of all inspection and maintenance actions undertaken.	As per manufacture's guidance.
--	---	---------------------------------------

8. References

1.	C753. The SuDS Manual. CIRIA. 2015.
2.	Planning Practice Guidance. http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
3.	National Planning Policy Framework. March 2012.
4.	Environment Agency Indicative Flood Mapping
5.	Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA LEVEL 1 SFRA Final March 2010
6.	Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA LEVEL 2 SFRA Final March 2011
7.	MST_CriticalDrainageAreas_Current_SS_4.5
8.	Rochdale Road, Manchester Preliminary Risk Assessment. LK Consult July 2025
9.	Rochdale Road, Manchester Phase 2 Geo – Environmental Investigation, Risk Assessment and Outline Remediation Strategy. LK Consult September 2025
10.	Manchester's Local Development Framework Core Strategy Development Plan Document Adopted 11th July 2012
11.	Addendum to Manchester Core Strategy 2024
12.	Joint statement by Manchester City Council Salford City Council Trafford Council Environment Agency MANCHESTER SALFORD TRAFFORD STRATEGIC FLOOD RISK ASSESSMENT
13.	EA: Accounting for residual uncertainty: updating the freeboard guide. Report – SC120014
14.	Code of Practice Flows and Loads – 4 Sizing Criteria, Treatment Capacity for Sewage Treatment Systems
15.	PLACES FOR EVERYONE JOINT DEVELOPMENT PLAN DOCUMENT FOR BOLTON, BURY, MANCHESTER, OLDHAM, ROCHDALE, SALFORD, TAMESIDE, TRAFFORD AND WIGAN 2022 to 2039 ADOPTED 21 MARCH 2024

APPENDIX A

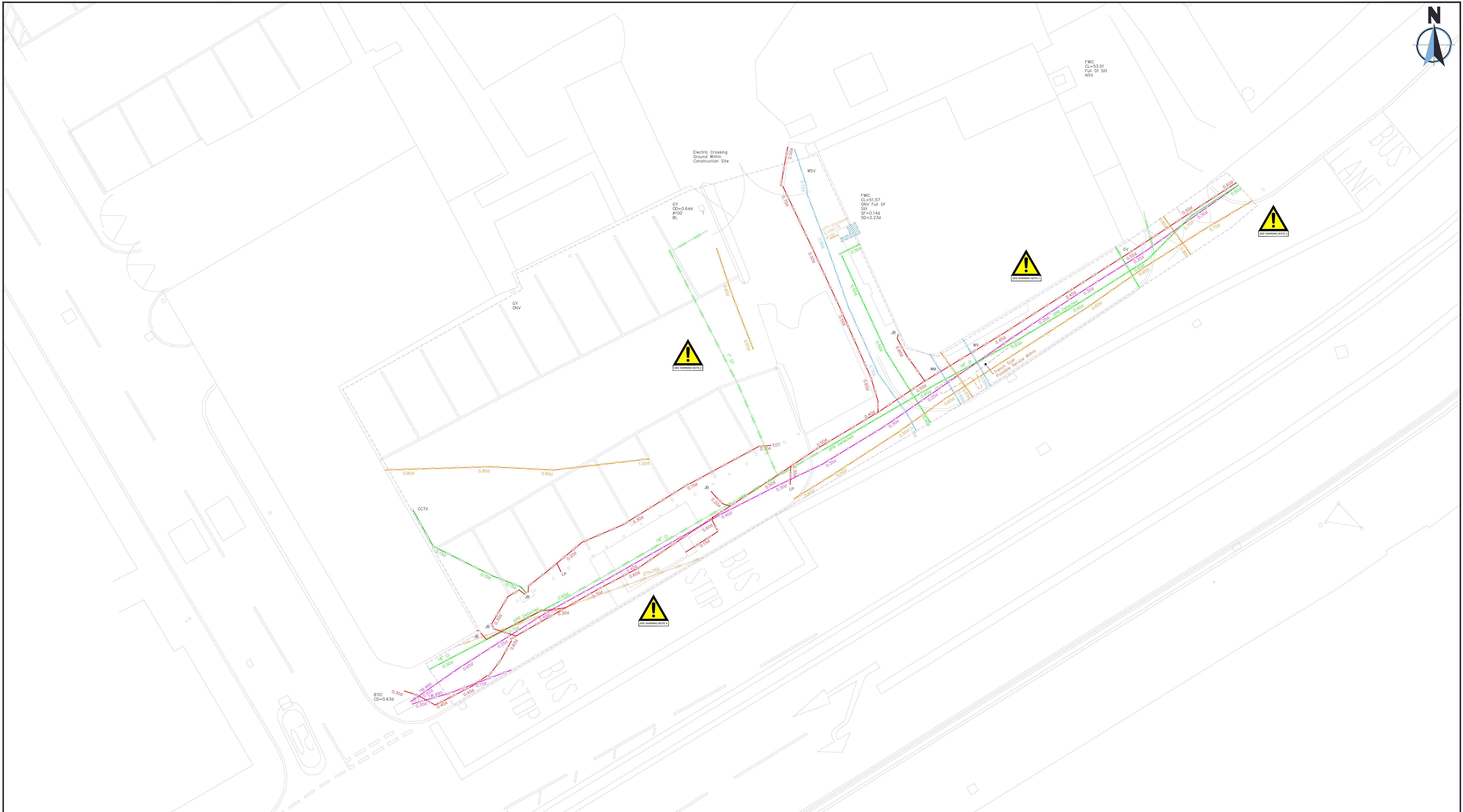
LOCATION PLAN & PROPOSED ARCHITECT'S LAYOUT



Key: Application Boundary 1 Rochdale Road Phase 1 2 Marble Arch Inn		North: 		Project: 85 Rochdale Road		Title: Proposed Site Plan		Jon Matthews Architects Union, 2-10 Albert Square, Manchester, M2 6LW 0161 974 3690	
				Status: Information	Scale: 1:500 @ A3	Date: 18/03/26	Drawing No: 243-JMA-MP-00-DR-A-000200	Rev: P01	Copyright of this drawing is vested in Jon Matthews Architects and must not be copied or reproduced without written consent. Figured dimensions only are to be taken from this drawing. Do not scale from this drawing. For full company disclosure please visit www.jonmatthewsarchitects.com

APPENDIX B

TOPOGRAPHICAL SURVEY

[illegible]

Utility Line Types

Drainage Systems	
CW ——— CW	Combined Drainage Flow Direction >
PW ——— PW	Foul Drainage Flow Direction >
DWA - - - DWA	Surface Water Drainage Flow Direction
Electrical Systems	
ELE ——— ELE	Electric Route
EARTH ——— EARTH	Earth
Gas Systems	
GAS ——— GAS	Gas Supply
OIL ——— OIL	Oil Supply
Telecom Systems	
BT ——— BT	British Telecom
Unknown ——— Unknown	Unknown/Private
Water Systems	
WTB ——— WTB	Water Supply
Control	
CCTV ——— CCTV	CCTV
Unknown	
GPRL ——— GPRL	Ground Penetrating Radar Linear Feature
EMA ——— EMA	Electromagnetic Locator Linear Feature
Survey Area	
SURVEY AREA ——— SURVEY AREA	Survey Area

Client	
►McGoff Group Projects Ltd	
Site	
►Morley Drive	
►Congleton	
►CW12 3LF	
Drawing Title	
►Standard Utility Survey	
Project Number	Scale
250641	1:100
Surveyed By	Drawn By
JH	JH
Status	Sheet
FINAL	1 OF 1
Drawn Date	
01/07/2025	
Checked By	
JH	
Revision	
A	
Drawing Number	
PROJECT - ORIGINATOR - TYPE - UNIQUE SEQUENTIAL NUMBER	
250641-CDNW-DR-001	



CDNW
Drainage & Utility Mapping

CLEAR DRAINS NORTH WEST
UNIT 3
WARRINGTON ROAD
GLAZEBOURY
CHESHIRE
WA3 5NX

APPENDIX C

CCTV SURVEY – UU RECORD MAPS – PRE-DEVELOPMENT RESPONSE

Booth King

Calico
55 Mosley Street, Booth King
MANCHESTER,
M2 3HQ

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: 15286 - Rochdale Rd, Manchester
Our Ref: UUPS-ORD-675856
Date: 04/09/2025**

Dear Sirs

Location: THE MARBLE ARCH 73 ROCHDALE ROAD, MANCHESTER, M4 4HY

I acknowledge with thanks your request dated 04/09/2025 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



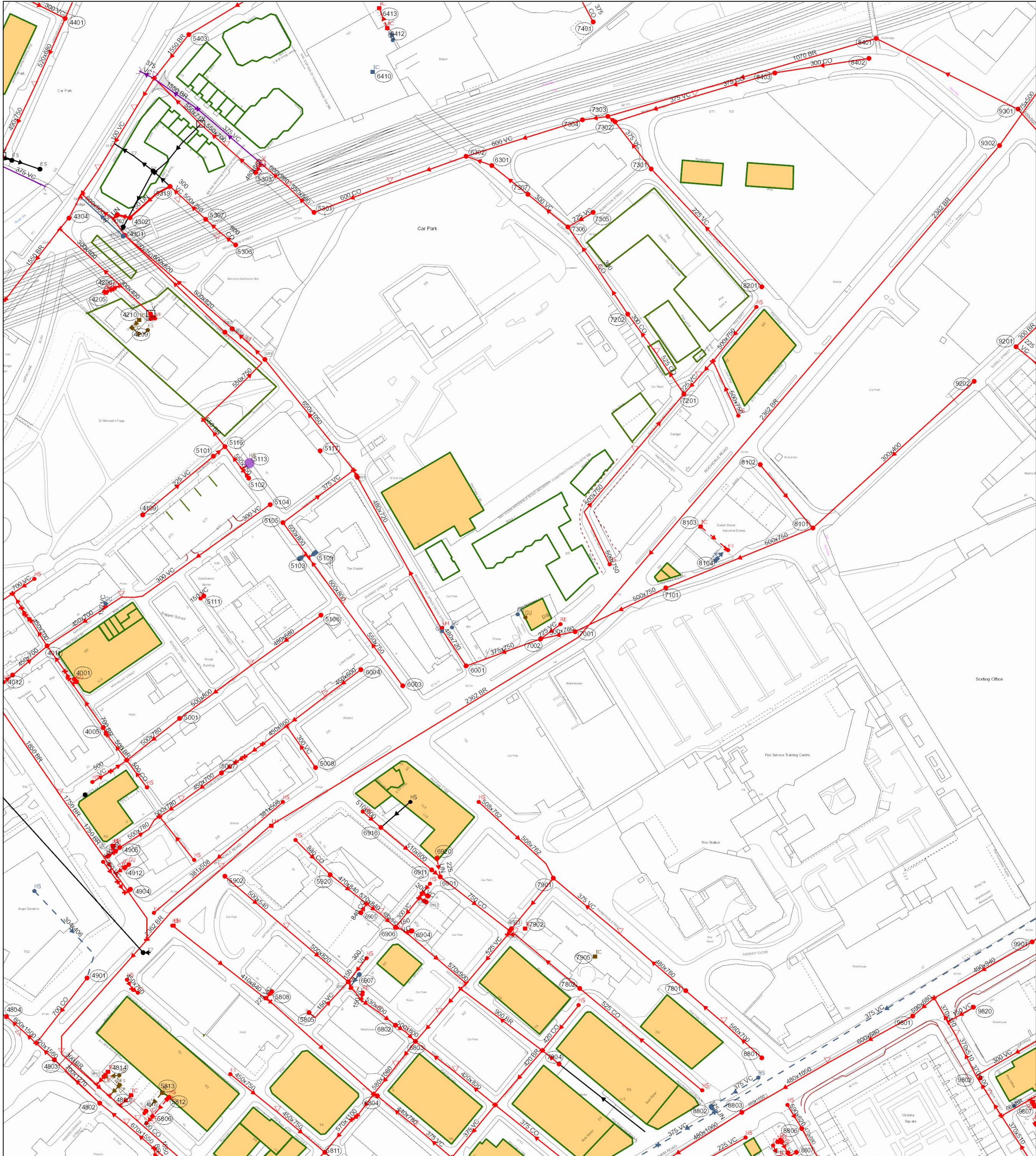
Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
8904	51.19	CO	42.28	150		VC	3.162718	1 in 236	
7303	46.04	CO	42.86	1070		BR	14.14214	1 in 68	
5920		CO	0	470		BR	25.6125	1 in 68	
8807	50.07	CO	46.56	225		VC	73.92564	1 in 35	
7201	52.02	CO	44.38	500		BR	19.41649	1 in 35	
7101	52.5	CO	46	500		BR	55.4617	1 in 35	
5102	43.81	CO	40.27	550		BR	5.096149	1 in 68	
7302	46	CO	42.23	375		VC	4.23	1 in 68	
7801	50.56	CO	45.66	480		BR	47.50789	1 in 22	
8101	53	CO	48.5	500		BR	87.48428	1 in 10	
8302	39.89	CO	37.25	600		VC	44.58621	1 in 354	
7305	46.61	CO	43.77	225		VC	16.12452	1 in 117	
4901	46.59	CO	0	750		CO	45.60702	1 in 142	
6905	51.09	CO	0	840		CO	5.830592	1 in 253	
4302	30.36	CO	26.83	750		UN	7.076675	1 in 139	
5007	40.99	CO	46.28	450		BR	27.20294	1 in 117	
8102	52.4	CO	43.53	600		BR	53.1122	1 in 142	
8803	50.13	CO	42.6	480		BR	84.0595	1 in 142	
7401		CO	0	375		CO	86.35392	1 in 253	
8102	52.4	CO	46.29	500		CO	45.43227	1 in 142	
8201		CO	0	225		VC	89.14034	1 in 59	
4012	44.24	CO	41.19	450		BR	24.53049	1 in 182	
7301	48.08	CO	43.43	375		VC	32.80244	1 in 182	
4904	46.62	CO	46.12	300		VC	3.855551		
6804	50.42	CO	42.69	500		BR	2.236088		
8806	50.14	CO	46.8	470		BR	37.58989	1 in 73	
8902	50.46	CO	46.96	500		BR	44.88751	1 in 82	
9201	53.13	CO	47.48	300		BR	38.06938		
4312	31.02	SW	26.45	600		VC	32.50048		
9901	51.21	CO	43.93	490		BR	62.26556		
6906	51.13	CO	46.28	480		BR	3.162718		
5001	48.51	CO	45.07	500		BR	37.51351		
6908	50.97	CO	45.74	500		BR	1.14214	1 in 12	
7304	45.38	CO	42.78	600		VC	67.52222	1 in 328	
4303	30.05	CO	26.81	450		UN	3.278529	1 in 83	
5106	49	CO	48.5	480		BR	48.71041	1 in 139	
5105	45.55	CO	39.3	375		VC	48.80041	1 in 12	
4304	29.73	CO	24.22	1550		VC	57.51391	1 in 40	
5101	42.45	CO	40.75	225		VC	8.360955	1 in 42	
4804	47.24	CO	36.68	600		BR	21.24778	1 in 12	
5306	34.57	CO	30.4	600		CO	11.27618	1 in 12	
6802	51.34	CO	48.72	300		VC	4.472136	1 in 21	
8819		CO	0	100		VC	2.11434	1 in 21	
7201	50.66	CO	45.8	525		CO	26.82705	1 in 40	
8802	50.73	CO	43.75	370		VC	24.58675	1 in 42	
5201	39.28	CO	28.45	1400		CSB	12.72792	1 in 73	
5403		CO	0	1550		BR	30.51046	1 in 47	
4802	49.38	CO	38.55	700		BR	34.65545	1 in 77	
5008	51.32	CO	48.13	360		VC	28.51785	1 in 72	
5116	42.35	CO	40.25	550		BR	18.96739	1 in 27	
5202	36.82	CO	27.75	600		BR	78.37738	1 in 27	
7002	51.92	CO	0	375		BR	43.65776	1 in 130	
8403	49.01	CO	46.64	375		CO	45.88028	1 in 130	
5104	44.8	CO	42.51	300		VC	98.29898	1 in 130	
8802		SW	0	375		UN	3.695551	1 in 26	
5307	32.1	CO	28.44	500		BR	18.51881	1 in 73	
4109	42.86	CO	41.14	225		VC	50.74684	1 in 83	
6301	41.01	CO	38.13	300		VC	14.86607	1 in 21	
6907	50.9	SW	49.66	150		VC	8.602325	1 in 77	
8801	50.23	CO	46.44	560		BR	28.3196	1 in 44	
5301	53.6	CO	46.64	1070		BR	87.26655	1 in 15	
6101	45.7	CO	38.65	480		BR	4.472136	1 in 21	
5319	30.33	CO	27.17	750		UN	28.244	1 in 83	
6003	51.36	CO	48.22	550		BR	55.80323	1 in 21	
8401		CO	0	1070		BR	154.1201	1 in 77	
4401	30.58	CO	27.66	520		BR	41.62932	1 in 44	
5303	33.27	CO	26.83	580		BR	21.26029	1 in 15	
5203	36.71	CO	31.7	550		BR	76.79148	1 in 13	
4815		CO	0	150		VC	6.191207	1 in 13	
5301	36.74	CO	32.93	550		BR	19.78699	1 in 47	
7306	45.48	CO	42.07	300		VC	28.42534	1 in 47	
6004	50.84	CO	48.03	450		BR	25		
4805	46.07	CO	0	500		BR	28.30447		
4011	44.27	CO	40.77	450		BR	18.64332		
4803	46.69	CO	37.73	720		BR	13.43362	1 in 12	
7307	43.35	CO	41.46	300		VC	25.6125	1 in 48	
6803	50.54	CO	42.93	550		BR	17.50449		
7202	48.7	CO	43.3	300		VC	28.84441	1 in 54	
5805		CO	0	150		VC	31.37608	1 in 7	
9302		CO	0	2362		BR	592.1557	1 in 167	
5811	50	CO	41.61	580		BR	14.14214	1 in 32	
8802	50.8	CO	44.83	500		BR	7.211102	1 in 3	
9202	53	CO	49.62	300		CO	120.3412	1 in 22	
8402	50.69	CO	47.83	300		VC	52.61079	1 in 51	
5111		CO	0	150		VC	2.231356	1 in 3	
4301	31.14	CO	26.64	600		CO	33.27229	1 in 3	
6001	51.68	CO	42.44	480		BR	120.1335	1 in 22	
4818		CO	0	150		VC	1.430078	1 in 51	
6803		CO	0	525		VC	1.376653	1 in 3	
7801	51.21	CO	44.19	525		VC	36.31802	1 in 22	
6801	51.4	CO	46.1	750		CO	48.48632	1 in 51	
6990	51.2	CO	45.39	525		VC	2.168287	1 in 3	
5808		CO	0	225		VC	5.14886	1 in 51	
6916	54.41	CO	47.08	510		BR	36.40085	1 in 3	
6920	48.65	CO	46.53	225		UN	10.37003		
6911	51.58	CO	44.05	510		BR	6.124572		
7802		CO	0	525		CO	48.32351		
7804		CO	0	420		CO	11.78991		
4203	31.49	CO	28.44	300		BR	88.58699		
4005	47.34	CO	43.55	450		BR	33.51515		
8820		CO	0	150		VC	16.17017		
6803	51.34	CO	0	300		VC	3.695551		

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

All point assets follow the standard colour convention:
red - combined
blue - surface water
brown - foul
purple - overflow

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Ww Pumping Station

Septic Tank

Control Kiosk

DNM Network Monitoring Point

Change of Characteristic

MANHOLE FUNCTION

FO Foul

SW Surface Water

CO Combined

OV Overflow

SEWER SHAPE

CI Circular

EG Egg

OV Oval

FT Flat Top

RE Rectangular

SQ Square

TR Trapezoidal

AR Arch

BA Barrel

HO HorseShoe

UN Unspecified

SEWER MATERIAL

AC Asbestos Cement

BR Brick

PE Polyethylene

RP Reinforced Plastic Matrix

CO Concrete

CSB Concrete Segment Bolted

CSU Concrete Segment Unbolted

CC Concrete Box Culvert

PSC Plastic / Steel Composite

GRC Glass Reinforced Plastic

DI Ductile Iron

PVC Polyvinyl Chloride

CI Cast Iron

SI Spun Iron

ST Steel

VC Vitrified Clay

PP Polypropylene

PF Pitch Fibre

MAC Masonry, Coursed

MAR Masonry, Random

U Unspecified

Address or Site Reference:
THE MARBLE ARCH 73 ROCHDALE ROAD,
MANCHESTER,
M4 4HY

Scale: 1:1250 Date: 04/09/2025

Sheet: 1 of 1

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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**Project**

Project Name: McGoff - Rochdale Road Manchester - Report
Project Date: 11/06/2025
Inspection Standard: MSCC5 Sewers & Drainage GB (SRM5 Scoring)

Table of Contents

Project Name	Project Number	Project Date
McGoff - Rochdale Road Manchester - Report		11/06/2025

Project Information	P-1
Scoring Summary	P-3
Section Item 1: SVP > Downstream (SVPX)	1
Section Item 2: Upstream > MH1 (UpstreamX)	3
Section Item 3: GY1 > MH1 (GY1X)	5

Project Information

Project Name	Project Number	Project Date
McGoff - Rochdale Road Manchester - Report		11/06/2025

Client

Company: McGoff Group Projects Ltd
Contact: JP Singleton
Street: 1 St Georges Court
Town or City: Altrincham Business Park
County: Altrincham
Post Code: WA14 5UA

Site

Street: Rochdale Road
Town or City: Manchester
Post Code: M4 4HY

Contractor

Company: Clear Drains North West Ltd
Description: Drainage Contractor
Contact: Paul Sheehy
Department: Director
Street: Genesis Centre
Town or City: Birchwood, Warrington
County: Cheshire
Post Code: WA3 7BH
Mobile: 07393 576591
Email: paul@cdnw.co.uk

Project Date	11/06/2025
---------------------	------------

Scoring Summary

Project Name
 McGoff - Rochdale Road Manchester - Report

Project Number

Project Date
 11/06/2025

Structural Defects

Section	PLR	Grade	Description
All inspected pipes are in an acceptable structural condition (< grade 3).			

Service / Operational Condition

- Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.
- Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.
- Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	SVPX	4	Settled deposits, other, 25% cross-sectional area loss
2	UpstreamX	4	Settled deposits, other, 35% cross-sectional area loss
3	GY1X	4	Multiple defects

Abandoned Surveys

Section	PLR	Description
1	SVPX	Survey abandoned
3	GY1X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

Section Inspection - 11/06/2025 - SVPX

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
1	1	11/06/25	8:14	Not Specified	No Rain Or Snow	No	SVPX
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
Not Specified		Not Specified		Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	SVP
Road:	Rochdale Road	Inspected Length:	1.90 m	Upstream Pipe Depth:	
Location:		Total Length:	1.90 m	Downstream Node:	DOWNSTREAM
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:		Dia/Height:	100 mm		
Flow Control:	No flow control	Material:	Polyvinyl chloride		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:

Recommendations:

Scale:	1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
--------	------	--------------	------	-------------	------	-------	-------

 Depth: m
 SVP

	0.00	OC	Start node, other special chamber, reference: SVP: Access Point	00:00:00			
	0.00	WL	Water level, 5% of the vertical dimension	00:00:05			
	1.18	DEX	Settled deposits, other, 25% cross-sectional area loss: Debris	00:00:21	SVPX_653 28533-de1 5-448c-b2	4	
	1.22	WL	Water level, 70% of the vertical dimension	00:00:30			
	1.66	CUW	Loss of vision, camera under water	00:00:36			
	1.90	SA	Survey abandoned: Due to debris in line	00:01:01			

Construction Features

Miscellaneous Features

Structural Defects

Service & Operational Observations

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	5.0	2.6	5.0	4.0

Section Pictures - 11/06/2025 - SVPX

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Downstream	SVPX		



SVPX_65328533-de15-448c-b234-7b42f5602805_20250702_081949_138.jpg, 00:00:21, 1.18
m

Settled deposits, other, 25% cross-sectional area loss

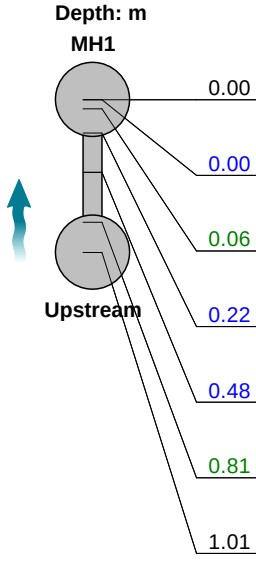
Section Inspection - 11/06/2025 - UpstreamX

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
2	1	11/06/25	8:14	Not Specified	No Rain Or Snow	No	UPSTREAMX
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
Not Specified		Not Specified		Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	UPSTREAM
Road:	Rochdale Road	Inspected Length:	1.01 m	Upstream Pipe Depth:	
Location:		Total Length:	1.01 m	Downstream Node:	MH1
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:		Dia/Height:	100 mm		
Flow Control:	No flow control	Material:	Polyvinyl chloride		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:

Recommendations:

Scale:	1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
							
		0.00	MH	Start node, manhole, reference: MH1	00:00:00		
		0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
		0.06	DEX	Settled deposits, other, 35% cross-sectional area loss: Debris/Foul	00:00:02	Upstream X_75af98c5-4840-4e	4
		0.22	WL	Water level, 25% of the vertical dimension	00:00:15		
		0.48	CUW	Loss of vision, camera under water	00:00:21		
		0.81	LU	Line deviates up	00:00:33		
		1.01	OCF	Finish node, other special chamber, reference: Upstream: SVP	00:00:40		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	5.0	5.0	5.0	4.0

Section Pictures - 11/06/2025 - UpstreamX

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Upstream	UPSTREAMX		



UpstreamX_75af98c5-4840-4e05-8e32-fbbf7a5213de_20250702_082131_967.jpg, 00:00:02,
0.06 m

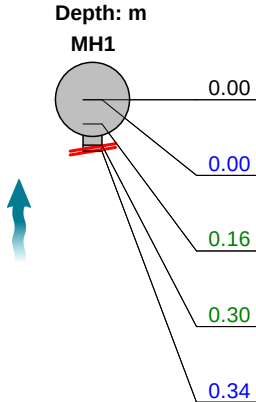
Settled deposits, other, 35% cross-sectional area loss

Section Inspection - 11/06/2025 - GY1X

Item No.	Insp. No.	Date	Time	Client's Job Ref	Weather	Pre Cleaned	PLR
3	1	11/06/25	8:14	Not Specified	No Rain Or Snow	No	GY1X
Operator		Vehicle		Camera	Preset Length	Legal Status	Alternative ID
Not Specified		Not Specified		Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	GY1
Road:	Rochdale Road	Inspected Length:	0.34 m	Upstream Pipe Depth:	
Location:		Total Length:	0.34 m	Downstream Node:	MH1
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:		Dia/Height:	100 mm		
Flow Control:	No flow control	Material:	Polyvinyl chloride		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
							
		0.00	MH	Start node, manhole, reference: MH1	00:00:00		
		0.00	WL	Water level, 5% of the vertical dimension	00:00:01		
		0.16	DER	Settled deposits, coarse, 25% cross-sectional area loss	00:00:09	GY1X_7f4f-ee2f-65b9-41a1-b31a	4
		0.30	DER	Settled deposits, coarse, 50% cross-sectional area loss	00:00:34	GY1X_29b-f5b28-bf27-4cca-b2cf	4
		0.34	SA	Survey abandoned: Due to debris in line	00:00:52		

Construction Features
Structural Defects
Miscellaneous Features
Service & Operational Observations

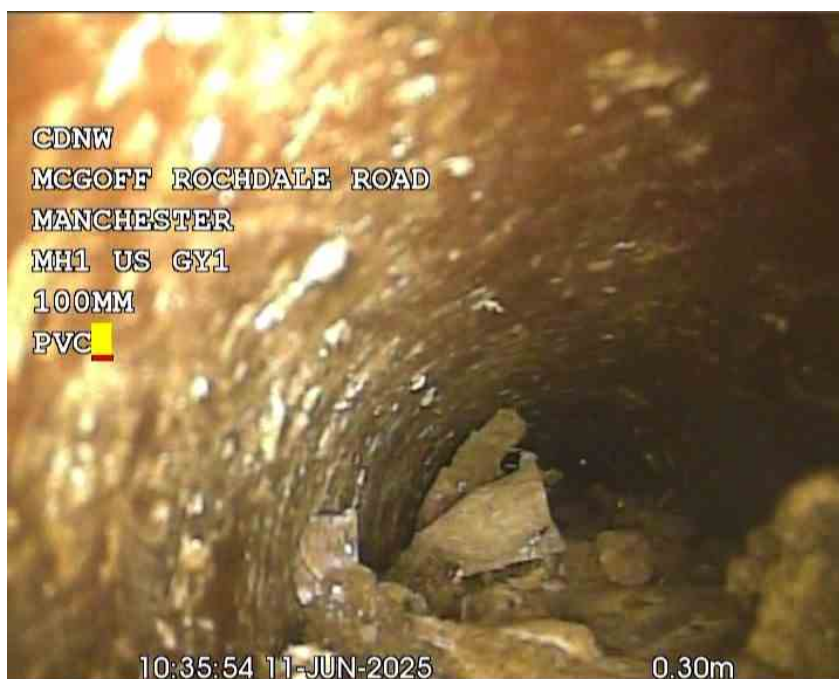
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	2	8.0	38.2	13.0	5.0

Section Pictures - 11/06/2025 - GY1X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	GY1X		



GY1X_7f4fee2f-65b9-41a1-b31a-f40cde79bea1_20250702_082329_146.jpg, 00:00:09, 0.16 m
Settled deposits, coarse, 25% cross-sectional area loss



GY1X_29bf5b28-bf27-4cca-b2cf-62dd3ef05ab5_20250702_082404_810.jpg, 00:00:34, 0.30 m
Settled deposits, coarse, 50% cross-sectional area loss

Pre Development Enquiry Guidance

Version 1 (September 24)

(This document should be read in conjunction with PDE response letter)



Water for the North West

Comment no.	Technical Guidance
General Guidance	
1	Sewer Access If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below: https://www.unitedutilities.com/builders-developers/working-near-our-assets/ Sewer Adoption Under S104 If you intend to offer sewers for adoption, design per current Design and Construction and local practices which have now replaced Sewers for Adoption 6th Edition.. S104 Pre-Design Assessment We recommend submitting a pre-design assessment. This is a free service to discuss the high level design and potential challenges. Please see link to application form in guidance sheet. Adoption of Sewers • Designs must comply with current Design & Construction Guidance. • S104 1b Pre-design assessment, and S104 for adoption of new sewers applications can be found at Sewer adoptions - United Utilities • Submit pre-design assessment to SewerAdoptions@uuplc.co.uk. • No construction should commence until detailed design is approved in writing. Sewer Connections: • Formal S106 application required for sewer connections. Application details available at: www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/ Water Assets • Contact DeveloperServicesWater@uuplc.co.uk regarding clean water assets on site. • Further information: Water pre-development - United Utilities Additional Considerations • Land drainage, overland flows, and track drainage are not accepted into public sewer network. Useful Resources: • Codes for Adoption: www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/ • Design & Construction Guidance: www.water.org.uk/sewerage-sector-guidance-approved-documents/ • United Utilities website: www.unitedutilities.com/builders-developers/ Contact Information: • Main contact number: 0345 6723 723 • Sewer Adoptions and Pre-Development: SewerAdoptions@uuplc.co.uk
2	Flooding Events Please note that United Utilities Water Limited (UW) can only record and check flooding events which are reported to us, and we must comply with our Regulators instructions on the qualification of flooding events. Our response does not include: • any sewer flooding events caused by blockages or collapses which are the result of third-party actions, natural events, or other actions over which UW has no control and not a facet of sewer capacity; • any historical sewer flooding events that have been resolved from investment in our infrastructure.

	Further consideration. - For low-lying sites, care should be taken to ensure that the property is not at increased risk of flooding. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme. - Consult Lead Local Flood Authority (LLFA) for surface water drainage concerns. - Check Environment Agency guidelines if site is in a Groundwater Source Protection Zone.
3	Asset Protection - Due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records. We ask that you proceed with caution and conduct adequate site investigation works. If any uncharted sewers are identified while conducting your investigation, we ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records. - Obtain asset data records before planning development United Utilities - Property Search : - Please be aware that any proposed diversion may require modelling. This process may take up to 6 months to reach an acceptable design. - Maintain minimum easement in line with our easement local practice, unless there is a formal easement in place, in which case the specified easement width would apply. easement-local-practice.pdf (unitedutilities.com) - Contact United Utilities for guidance on work near assets or if diversion is necessary.
4	Surface Water Drainage Hierarchy Follow the hierarchy as per National Planning Practice Guidance: 1. Infiltration 2. Discharge to waterbody 3. Discharge to surface water sewer or highway drain 4. Discharge to combined sewer (last resort) For guidance, The Northwest SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted. The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area). The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining the cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities. SuDS (Sustainable Drainage Systems) - Prioritise multi-functional SuDS in accordance with national planning policy. - Design SuDS components as per CIRIA SuDS Manual (C753). - Consult the North West SuDS Pro-Forma for required evidence at each stage of the drainage hierarchy. Infiltration Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible. A detailed evidence-based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal. Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website: https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below: https://www.gov.uk/government/publications/groundwater-protection-position-statements Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site. Surface Water Discharge Rates Please note the given discharge rate is based on the site area believed to be developed. If there are significant areas of the site that will not be developed, the discharge rate should be reduced accordingly.
5	Please note that this guidance is current as of the date of issue. Always check for the most up-to-date regulations and guidelines when planning your development.

United Utilities Grasmere House, 2nd Floor
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

25th September 2025

Dear **Eleni**

Pre-Development Enquiry for **87 Rochdale Rd, Manchester M4 4HY** UU Reference Number: **08147821**

We have assessed your application based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your strategy will need review by other authorities as part of the planning process. We advise conducting necessary site investigations to confirm viability of your proposals.

Modelled Flood Risk [Please see the image at the end of this letter for details](#)

I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

[Please see comment 2 of the attached guidance sheet](#)

Asset Protection

1. We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of the proposed development.

[Please see comment 3 of the attached guidance sheet and Working Near Our Pipelines Guidance document](#)

Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer system.

Our preferred point of discharge would be to the 225mm diameter public combined sewer within Rochdale Road located South of your proposed development at a maximum pass forward flow of an unrestricted rate.

Manhole reference SJ84997002, **Grid reference** 384714, 399088

[Please see the images at the end of this letter for clarification](#)

Surface Water

Follow the National Planning Policy Guidance drainage hierarchy and Provide evidence for discounting higher options before considering public sewer discharge. Consult the Lead Local Flood Authority regarding surface water concerns.

[Please see comment 4 within the guidance sheet](#)

Infiltration

[Please see comment 4 within the guidance sheet](#)

Public Sewer

United Utilities will consider a connection to the 225mm diameter public combined sewer within Rochdale Road located to the South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities requests that any agreed rate does not exceed **5l/s**.

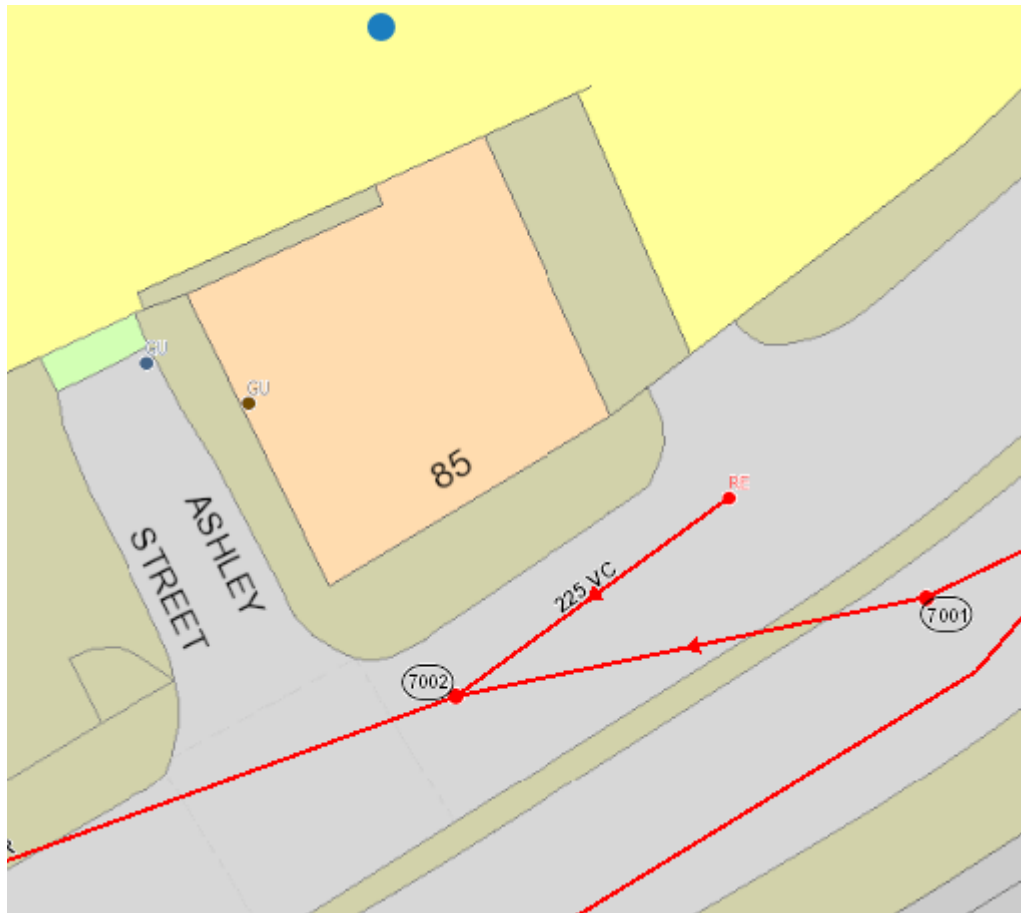
Manhole reference SSJ84997002, Grid reference 384714, 399088

[Please see images at the end of this letter for clarification](#)

Site Images



Foul and Surface Water Connection:



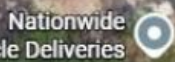


Clive St

Gould St



NCP Manchester
Gould Street



Nationwide
Vehicle Deliveries

MH1 - FULL OF FOUL
IN CHAMBER AND
LINES POOR CCTV
VISION



SVP

MH2 - NO
CCTV ACCESS

GY - NO
CCTV ACCESS

GY1

GY - NO
CCTV ACCESS



Rochdale Road



The Marble Arch Inn



Mobile Crane
Hire Manchester



Manchester CV

Lomas Laser & Beauty
| Training Academy...

GY - NO
CCTV ACCESS

A664

A664

A664

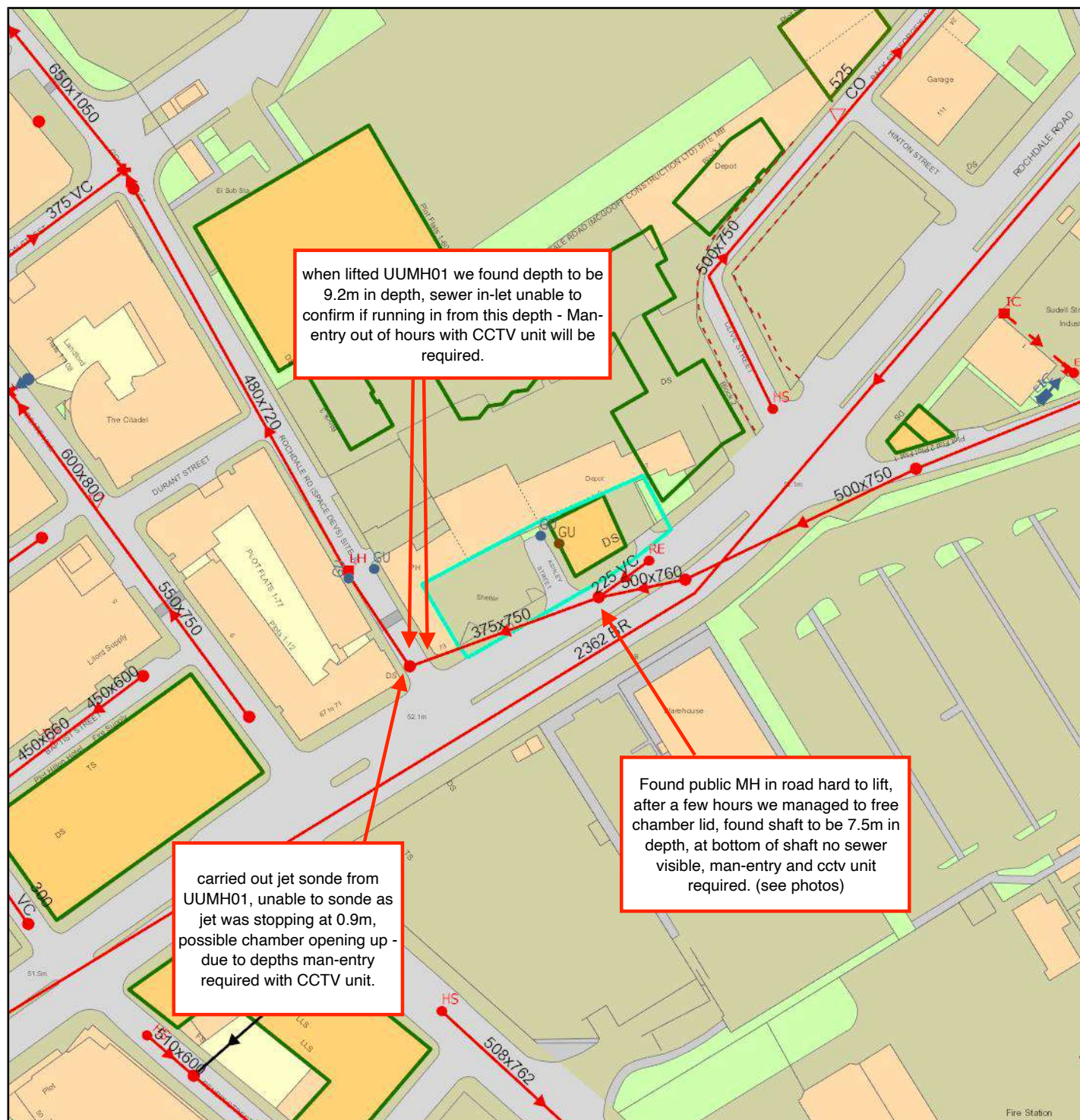
A664

Judgate Hill

Rochdale Rd

SEWER RECORD

85 Rochdale Road, Manchester, M4 4HY



The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water PLC will not accept any liability for any damage caused by the actual positions being different from those shown.

© United Utilities Water PLC 2025. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office, Crown copyright 0000813445 and United Utilities Water PLC copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

Measurements report

Job information

Job annotation: 85 Rochdale road manchester
Job name: 2025-10-18-Job01
Created: 18-10-2025 05:17:11
Creator:

Coordinate system information

Name: OSGB 1936-GRID
OSTN15
Transformation type: Cartographic

Parameters		Datum		Ellipsoid	
Projection:	UK_OSTN15	Name:	WGS84	Name:	WGS84
Lat. origin:	N 49°00'00"	Type:	Molodensky	Major semiaxis:	6378137.000000m
Long. origin:	W 2°00'00"	Shift. X:	0.000000m	Inv.flattening:	298.25722356
False East:	400000.000m	Shift. Y:	0.000000m		
False North:	-100000.000m	Shift. Z:	0.000000m		
Scale:	0.999601	Rotation about X:	0.00000000		
		Rotation about Y:	0.00000000		
		Rotation about Z:	0.00000000		
		Scale:	0.00000000		
Elevation:	Geoid				
Geoid:	OSGM15				

Points

Point name	Latitude	Longitude	Height	E	N	Z	Code Description
UU MH01 - UN...	N 53°29'17"	W 2°13'57"	102.808m	384673.222m	399074.084m	51.796m	
SIGNAL VERY ...	N 53°29'17"	W 2°13'57"	102.847m	384674.536m	399073.207m	51.835m	
UU MH02 - NO...	N 53°29'18"	W 2°13'55"	103.089m	384715.974m	399088.644m	52.077m	

GNSS measurements

GNSS base

Base name:	3751				
Instrument height:	0.000m				
Latitude:	S 0°00'00"	ECEF X:	6378137.000m	E:	0.000m
Longitude:	W 0°00'00"	ECEF Y:	0.000m	N:	0.000m
Height:	0.000m	ECEF Z:	0.000m	Z:	0.000m
Instrument:	GeoMax-GNSS Zenith 06				

Measurements

				Time span	RMS		
Point name	Latitude	ECEF X	E	Meas. data	Sol.	Sat.	Code
H. Antenna	Longitude	ECEF Y	N	Meas. time	2D	GDOP	Description
	Height	ECEF Z	Z	Duration	1D	HDOP	
				Epochs	3D	VDOP	
UU MH01 - UNABL... 2.000m	N 53°29'17"	3800326.719m	384673.222m	18-10-25	RTK Fixed	32	
	W 2°13'57"	-148149.726m	399074.084m	05:33:41	0.010m	0.0	
	102.808m	5103136.720m	51.796m	5"	0.010m	0.6	
				15	0.014m	0.9	
SIGNAL VERY POO... 2.000m	N 53°29'17"	3800327.494m	384674.536m	18-10-25	RTK Fixed	31	
	W 2°13'57"	-148148.437m	399073.207m	05:36:10	0.010m	0.0	
	102.847m	5103136.232m	51.835m	4"	0.010m	0.6	
				15	0.014m	0.8	
UU MH02 - NO SE... 2.000m	N 53°29'18"	3800316.740m	384715.974m	18-10-25	RTK Fixed	31	
	W 2°13'55"	-148106.585m	399088.644m	06:01:31	0.010m	0.0	
	103.089m	5103145.695m	52.077m	6"	0.010m	0.6	
				15	0.014m	0.8	

APPENDIX D

FLOOD MAP FOR PLANNING

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	384690/399096	30 October 2025 17:35

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

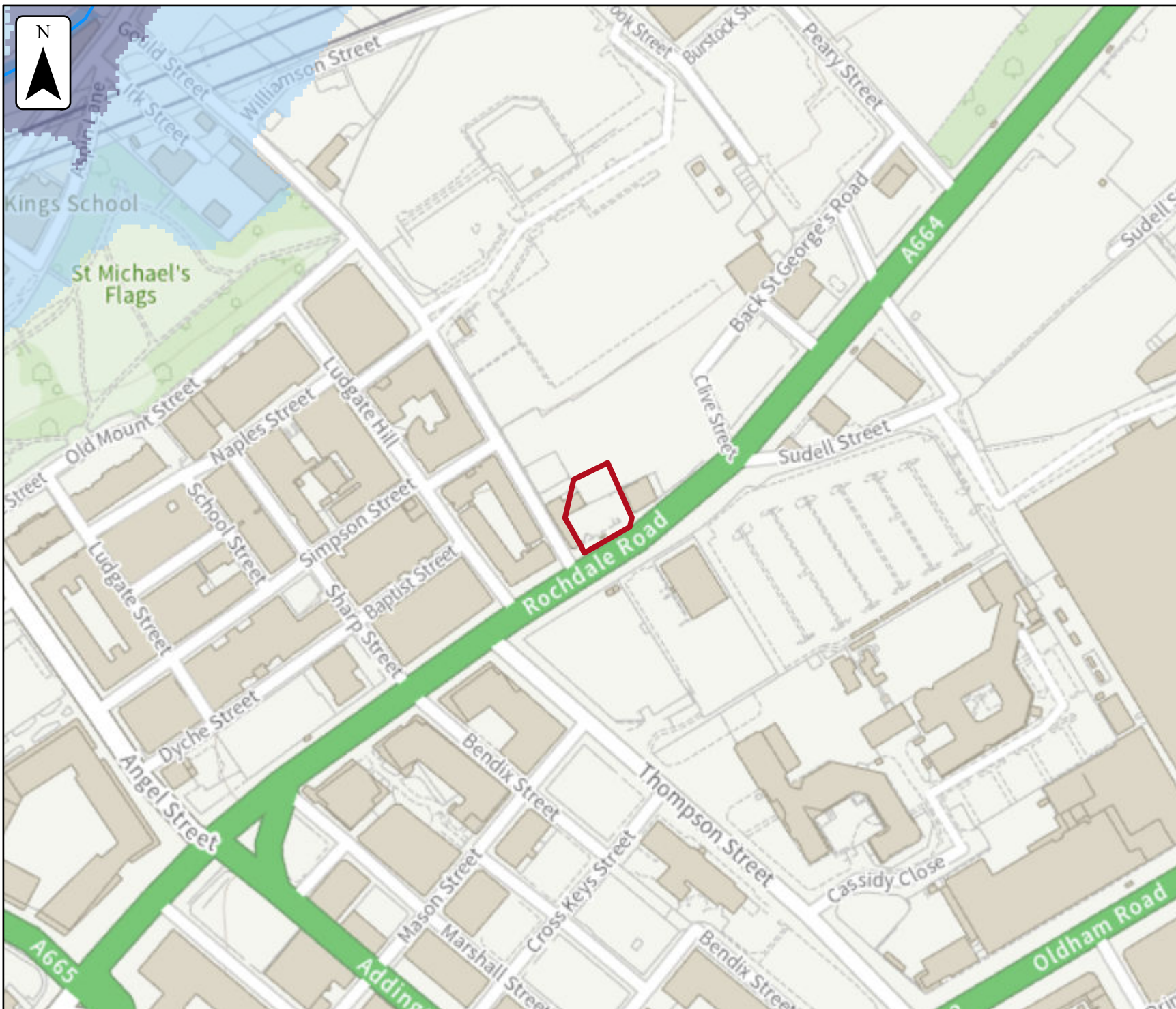
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

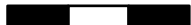
Unspecified

Location (easting/northing)
384690/399096

Scale
1:2,500

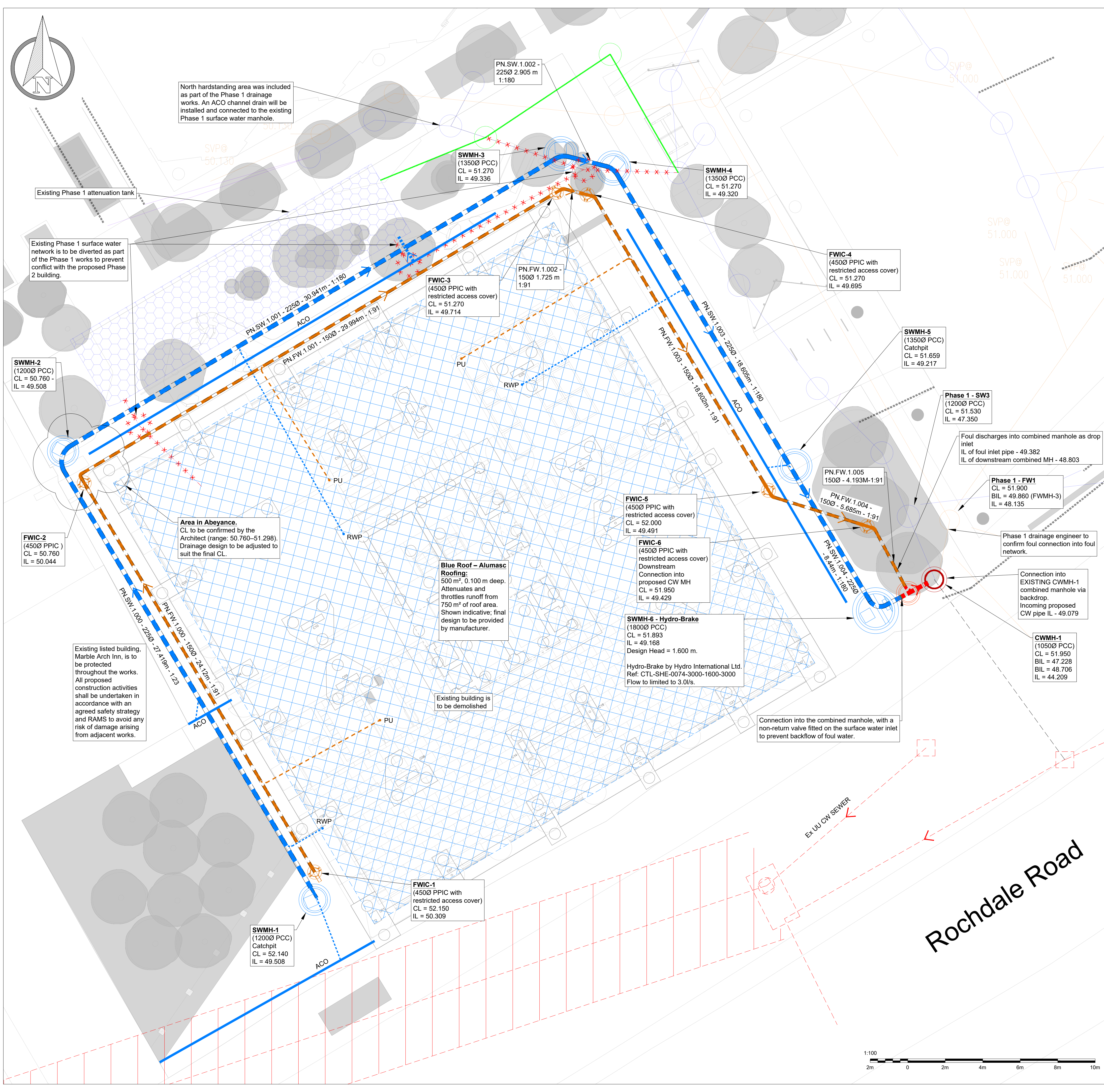
Created
30 Oct 2025 17:35

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

APPENDIX E

DRAINAGE DRAWINGS



TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available. This office is to be made aware of any discrepancies found on site.

DRAINAGE NOTES:

- All adoptable works to be in accordance with SSG appendix C where applicable.
- All manhole cover levels to be confirmed by Architect.
- Clay pipes to be flexibly jointed and comply with the requirements of BS EN 295.
- Concrete pipes to be flexibly jointed and comply with the requirements of BSEN 1916 and BS 5911.
- Plastic pipes (PVC-U) to be flexibly jointed and comply with the requirements of BS EN 1401-1 1998.
- All surface water pipes to be laid at a gradient no flatter than 1:80 (UNO).
- All foul water pipes to be laid at a gradient no flatter than 1:40 (UNO).
- For minimum depths requiring pipe protection refer to drainage details drawings.
- Protection to drains and gully connections may be concrete bed surround between cover depths of 450mm to 200mm.
- Until final surface is placed, heavy traffic is not to be allowed over pipe trenches without special precautions.
- Pipes and fittings are to be laid in accordance with the manufacturers recommendations.
- All Manholes should be concrete manhole rings (UNO).
- All SVP & RWP positions TBC by Architect.
- Rodding access is to be provided at all pop-ups & RWPS.
- For setting out of all pop-up positions refer to Architect's details.
- Civil engineering contractor to arrange for:
 - Own services and temporary supplies.
 - Pathway & partial closure as deemed required by their method statement, including costs.
 - Temporary adequate over pumping as deemed required by civil engineers method of construction.
- The contractor should confirm the locations for existing services prior construction.

DRAINAGE LINE TYPES KEY:

REF.	DESCRIPTION
----	Existing FW network
----	Existing SW network
- x x x x x -	Existing drainage to be grubbed up
-----	Proposed FW network
-----	Proposed SW network
-----	Existing UU Combined 375mm BR pipe
=====	Site Boundary
[Blue Grid Pattern]	Alumasc Blue Roof
	3m Easement for UU Existing Pipe
[Circle with Cross]	Existing combined water manhole (part of phase 1 drainage)
----	Rerouted drainage run

NOTES:

- Do not scale from this drawing.
- This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
- This drawing is to be read in conjunction with all relevant contractual documents.
- Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
- All dimensions shown on this drawing are in millimeters unless noted otherwise.
- If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
- This document uses revision codes in accordance with ISO EN 19650: P, Preliminary (non-contractual) - review, comment or approval. C, Contractual - Approved for stage completion.
- This document uses status codes in accordance with ISO EN 19650: Work in progress: S0 - WIP Shared (non-contractual): S1 - Coordination, S2 - Information, S3 - Review, S4 & S5 - Approval. Published (contractual): A1, An, etc. (where "n" relates to the project stage)
- This document uses project stages in accordance with the IStructE Structural Plan of Work 2020: 2 - Concept, 3 - Coordination, 4 - Technical Design, 4.5 - Production Design, 5 - Construction, 6 - Handover.
- Only documents with a revision code C# (where 'F' relates to a revision number) and status code A4 or A5 are suitable for construction. Any deviations to that which is on site is not the liability of BKPL.

DRAINAGE ANNOTATION KEY:

REF.	DESCRIPTION
SW	Surface water drainage
FW	Foul water drainage
CW	Combined water drainage
MH	Manhole
IC	Inspection chamber
PCC	Precast concrete chamber
PPIC	Polypropylene inspection chamber
GU	Gully
CL	Cover level (m)
IL	Invert level (m)
SVP	Soil vent pipe
PU	Pop up
RWP	Rainwater downpipe

P03	25/03/26	Site boundary updated amended drainage	SHR
P02	04.12.25	Site boundary updated	AA
P01	31.10.25	Preliminary Issue - Issued for Planning	EZ
REV.	DATE	REVISION DETAILS	INITIALS
CURRENT DRAWING REVISION CHECKED BY			
CURRENT DRAWING REVISION APPROVED BY			
AA			

DRAWING STATUS:	PROJECT STAGE:
S3	Stage 2

boothking
PARTNERSHIP LIMITED

CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM MANCHESTER EDINBURGH
Tel: 01706 822 022 Tel: 0161 694 7087 Tel: 0131 229 1547

PROJECT:

Rochdale Road 2

TITLE:

Proposed Drainage GA

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:100	EZ	Oct '25	P03	15286

DRAWING REF:

15286-BKP-XX-XX-DR-C-0500



APPENDIX F

SURFACE WATER CALCULATIONS

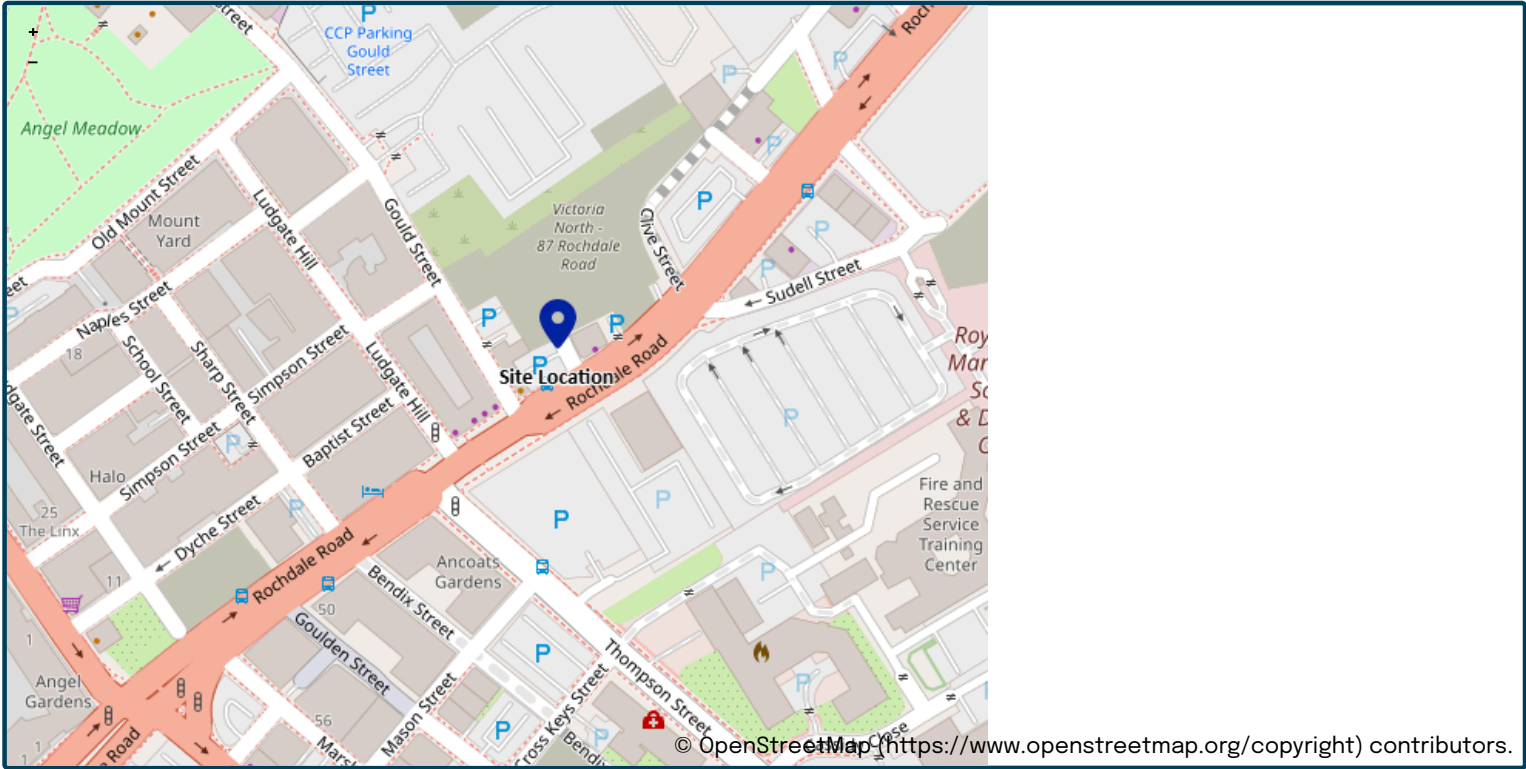
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	30/10/2025
Calculated by	Eleni Zachara
Reference	15286
Model version	2.2.1

Location

Site name	Rochdale Road
Site location	Manchester



Site easting (British National Grid)	384698
Site northing (British National Grid)	399090

Site details

Total site area (ha)	0.136	ha
----------------------	------------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	920	mm
BFIHOST19scaled	0.333	
QMed-QBar conversion	1.075	1.075
QMed (l/s)	1.1	l/s
QBar (FEH statistical 2025) (l/s)	1.2	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	10	10
1 year growth factor	0.87	
2 year growth factor	0.93	
10 year growth factor	1.38	
30 year growth factor	1.7	
100 year growth factor	2.08	
200 year growth factor	2.37	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	1.0
Flow rate 2 year (l/s)	1.1
Flow rate 10 years (l/s)	1.6
Flow rate 30 years (l/s)	2.0
Flow rate 100 years (l/s)	2.4
Flow rate 200 years (l/s)	2.7

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.1) developed by HR Wallingford and available at uksuds.com (<https://www.uksubs.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksubs.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node Blue Roof Online Depth/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 51.800

Depth (m)	Flow (l/s)
0.100	5.850

Node SWMH-6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	49.168	Product Number	CTL-SHE-0074-3000-1600-3000
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

Node Blue Roof Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	51.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	50

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	500.0	0.0	0.100	500.0	0.0	0.101	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH-1	11	50.716	0.016	1.1	0.0178	0.0000	OK
15 minute winter	SWMH-2	11	49.539	0.031	1.5	0.0346	0.0000	OK
15 minute winter	SWMH-3	12	49.369	0.033	1.5	0.0471	0.0000	OK
15 minute winter	SWMH-4	12	49.357	0.037	2.3	0.0532	0.0000	OK
30 minute winter	SWMH-6	23	49.293	0.125	2.3	0.3191	0.0000	OK
30 minute winter	CWMH-1	23	49.103	0.024	2.0	0.0000	0.0000	OK
30 minute winter	SWMH-5	23	49.293	0.076	2.0	0.1083	0.0000	OK
240 minute winter	Blue Roof	168	51.812	0.012	1.8	5.7715	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH-1	1.000	SWMH-2	1.0	0.501	0.010	0.0605	
15 minute winter	SWMH-2	1.001	SWMH-3	1.5	0.470	0.039	0.1038	
15 minute winter	SWMH-3	1.002	SWMH-4	1.5	0.381	0.038	0.0114	
15 minute winter	SWMH-4	1.003	SWMH-5	2.3	0.525	0.060	0.1378	
30 minute winter	SWMH-6	1.005	CWMH-1	2.0	0.845	0.024	0.0085	5.3
30 minute winter	SWMH-5	1.004	SWMH-6	1.6	0.171	0.041	0.1520	
240 minute winter	Blue Roof	Depth/Flow	SWMH-1	0.7				

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH-1	11	50.719	0.019	1.6	0.0218	0.0000	OK
15 minute winter	SWMH-2	11	49.546	0.038	2.4	0.0425	0.0000	OK
15 minute winter	SWMH-3	12	49.378	0.042	2.4	0.0605	0.0000	OK
15 minute winter	SWMH-4	12	49.366	0.046	3.7	0.0660	0.0000	OK
30 minute winter	SWMH-6	25	49.362	0.194	3.2	0.4944	0.0000	OK
30 minute winter	CWMH-1	25	49.105	0.026	2.3	0.0000	0.0000	OK
30 minute winter	SWMH-5	25	49.362	0.145	3.0	0.2070	0.0000	OK
240 minute winter	Blue Roof	168	51.816	0.016	2.3	7.5297	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH-1	1.000	SWMH-2	1.6	0.561	0.015	0.0819	
15 minute winter	SWMH-2	1.001	SWMH-3	2.4	0.516	0.061	0.1451	
15 minute winter	SWMH-3	1.002	SWMH-4	2.3	0.424	0.060	0.0160	
15 minute winter	SWMH-4	1.003	SWMH-5	3.6	0.548	0.093	0.2828	
30 minute winter	SWMH-6	1.005	CWMH-1	2.3	0.877	0.028	0.0094	8.0
30 minute winter	SWMH-5	1.004	SWMH-6	2.3	0.172	0.059	0.2800	
240 minute winter	Blue Roof	Depth/Flow	SWMH-1	0.9				

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH-1	11	50.730	0.030	4.1	0.0335	0.0000	OK
60 minute winter	SWMH-2	62	49.812	0.304	4.0	0.3433	0.0000	SURCHARGED
60 minute winter	SWMH-3	62	49.811	0.475	4.0	0.6799	0.0000	SURCHARGED
60 minute winter	SWMH-4	62	49.811	0.491	4.0	0.7026	0.0000	SURCHARGED
60 minute winter	SWMH-6	62	49.810	0.642	4.1	1.6351	0.0000	SURCHARGED
15 minute summer	CWMH-1	25	49.106	0.027	2.5	0.0000	0.0000	OK
60 minute winter	SWMH-5	62	49.811	0.594	3.9	0.8495	0.0000	SURCHARGED
120 minute winter	Blue Roof	94	51.834	0.034	8.0	16.1947	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH-1	1.000	SWMH-2	4.1	0.734	0.037	0.2687	
60 minute winter	SWMH-2	1.001	SWMH-3	4.0	0.524	0.103	1.2306	
60 minute winter	SWMH-3	1.002	SWMH-4	2.4	0.422	0.063	0.1155	
60 minute winter	SWMH-4	1.003	SWMH-5	3.9	0.419	0.101	0.7399	
60 minute winter	SWMH-6	1.005	CWMH-1	2.5	0.895	0.030	0.0099	26.8
60 minute winter	SWMH-5	1.004	SWMH-6	2.3	0.173	0.060	0.3511	
120 minute winter	Blue Roof	Depth/Flow	SWMH-1	2.0				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH-1	11	50.735	0.035	5.7	0.0392	0.0000	OK
240 minute winter	SWMH-2	228	50.561	1.053	3.7	1.1907	0.0000	FLOOD RISK
240 minute winter	SWMH-3	228	50.560	1.224	2.9	1.7516	0.0000	SURCHARGED
240 minute winter	SWMH-4	228	50.560	1.240	3.3	1.7742	0.0000	SURCHARGED
240 minute winter	SWMH-6	228	50.559	1.391	3.2	3.5399	0.0000	SURCHARGED
240 minute winter	CWMH-1	228	49.107	0.028	2.8	0.0000	0.0000	OK
240 minute winter	SWMH-5	228	50.559	1.342	2.8	1.9208	0.0000	SURCHARGED
120 minute winter	Blue Roof	94	51.848	0.048	11.2	22.6669	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH-1	1.000	SWMH-2	5.6	0.813	0.052	0.5854	
240 minute winter	SWMH-2	1.001	SWMH-3	2.9	0.479	0.075	1.2306	
240 minute winter	SWMH-3	1.002	SWMH-4	2.7	0.419	0.070	0.1155	
240 minute winter	SWMH-4	1.003	SWMH-5	2.8	0.397	0.073	0.7399	
240 minute winter	SWMH-6	1.005	CWMH-1	2.8	0.924	0.034	0.0107	56.3
240 minute winter	SWMH-5	1.004	SWMH-6	2.7	0.143	0.069	0.3511	
120 minute winter	Blue Roof	Depth/Flow	SWMH-1	2.8				

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH-1	11	50.733	0.033	5.1	0.0374	0.0000	OK
180 minute winter	SWMH-2	176	50.320	0.812	3.5	0.9184	0.0000	SURCHARGED
180 minute winter	SWMH-3	176	50.319	0.983	3.1	1.4071	0.0000	SURCHARGED
180 minute winter	SWMH-4	176	50.319	0.999	3.3	1.4298	0.0000	SURCHARGED
180 minute winter	SWMH-6	176	50.318	1.150	3.4	2.9275	0.0000	SURCHARGED
180 minute winter	CWMH-1	176	49.106	0.027	2.6	0.0000	0.0000	OK
180 minute winter	SWMH-5	176	50.319	1.102	2.8	1.5764	0.0000	SURCHARGED
120 minute winter	Blue Roof	94	51.843	0.043	10.1	20.5146	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH-1	1.000	SWMH-2	5.1	0.786	0.047	0.5730	
180 minute winter	SWMH-2	1.001	SWMH-3	3.1	0.479	0.081	1.2306	
180 minute winter	SWMH-3	1.002	SWMH-4	2.5	0.402	0.064	0.1155	
180 minute winter	SWMH-4	1.003	SWMH-5	2.8	0.401	0.072	0.7399	
180 minute winter	SWMH-6	1.005	CWMH-1	2.6	0.901	0.031	0.0101	46.2
180 minute winter	SWMH-5	1.004	SWMH-6	2.5	0.148	0.064	0.3511	
120 minute winter	Blue Roof	Depth/Flow	SWMH-1	2.5				

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SWMH-1	52	50.764	0.064	5.6	0.0729	0.0000	OK
240 minute winter	SWMH-2	160	50.760	1.252	4.7	1.4160	6.8496	FLOOD
60 minute winter	SWMH-3	53	50.762	1.426	6.4	2.0411	0.0000	SURCHARGED
60 minute winter	SWMH-4	53	50.762	1.442	8.7	2.0641	0.0000	SURCHARGED
120 minute winter	SWMH-6	90	50.762	1.594	4.4	4.0579	0.0000	SURCHARGED
60 minute winter	CWMH-1	53	49.108	0.029	3.0	0.0000	0.0000	OK
60 minute winter	SWMH-5	53	50.762	1.545	6.9	2.2115	0.0000	SURCHARGED
120 minute winter	Blue Roof	94	51.863	0.063	14.7	29.7496	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SWMH-1	1.000	SWMH-2	5.6	0.766	0.052	0.6737	
240 minute winter	SWMH-2	1.001	SWMH-3	3.7	0.479	0.096	1.2306	
60 minute winter	SWMH-3	1.002	SWMH-4	4.7	0.408	0.123	0.1155	
60 minute winter	SWMH-4	1.003	SWMH-5	6.9	0.480	0.179	0.7399	
120 minute winter	SWMH-6	1.005	CWMH-1	3.0	0.941	0.036	0.0112	52.9
60 minute winter	SWMH-5	1.004	SWMH-6	4.1	0.195	0.107	0.3511	
120 minute winter	Blue Roof	Depth/Flow	SWMH-1	3.7				

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