



Rochdale Borough Council

ROCHDALE STATION SQUARE

Flood Risk Assessment & Drainage Strategy





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WSP

8 First Street

Manchester

M15 4RP

Phone: +44 161 200 5000

WSP.com



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Signature				
Checked by	David Waters	David Waters		
Signature				
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EXECUTIVE SUMMARY

This Flood Risk Assessment and Drainage Strategy report has been prepared by WSP Ltd in support of a full planning application for the proposed Rochdale Station Square development. The scheme comprises works to public highways and the creation of an area of public realm to the north of Rochdale Railway Station.

The report has been written in due cognisance of the National Planning Policy Framework (NPPF) and the Rochdale Borough Council Level 1 and 2 Strategic Flood Risk Assessments (SFRA's) as well as other relevant local and national planning policy and guidance documents.

The Environment Agency's Flood Map for Planning indicates that the site is located in EA Flood Zone 1 and therefore has a low probability of flooding from rivers or the sea.

Surface water flooding ranges from very low to high risk within the site. This is primarily because the site is located at the bottom of a hill and is bound by the railway embankment to the south.

Other sources of flood risk including surface water, groundwater and sewers have been assessed within this report and are considered to present a low risk to the site.

The provision of Sustainable Drainage Systems (SuDS) has been considered and, where appropriate, have been included within the surface water drainage proposals.

It is not considered feasible to dispose of surface water drainage from this development to soakaways or directly to a watercourse. Therefore, it is proposed to discharge surface water from the site to the existing public combined sewer network utilising existing connections where possible. The main area of development is to be provided with new surface water drainage that predominantly comprises linear drainage to collect and convey surface water.

This Flood Risk Assessment and Drainage Strategy has concluded that the development is appropriate and can be occupied safely subject to implementation of the flood risk mitigation being carried out.

Contact name Subhaan Muhammad

Contact details 0161 200 9809 | Subhaan.Muhammad@wsp.com

1. PROJECT BACKGROUND

1.1. APPOINTMENT

- 1.1.1. WSP UK Ltd have been commissioned by Broadway Malyan architects on behalf of Rochdale Borough Council (hereafter referred to as “the Client”), to undertake a Flood Risk Assessment (FRA) and Drainage Strategy Report for the proposed re-development of Rochdale Station Square.

1.2. AIM OF STUDY

- 1.2.1. The aim of this study is to carry out a Flood Risk Assessment and Drainage Strategy of suitable scope and detail to support a full planning application for the site.

1.3. PROPOSED DEVELOPMENT

- 1.3.1. Rochdale Station Square will provide an important and much needed space for local communities and is an exciting opportunity to develop a new civic space to the north of the railway station that can create an enhanced gateway experience to the town, act as a catalyst for investment in the station area, and support the wider regeneration strategy of the town and borough.
- 1.3.2. These will be pedestrian prioritised routes and traffic calmed through design. Low kerbs, narrowed carriageways, widened footways and clear movement routes are proposed. Vehicle parking, loading, access and circulation is incorporated into the design. Taxi ranking is relocated to Station Road (east) as is the bus stop. Thresholds between the streets/Square create a transition point to mark the changing character and emphasise arrival within the square.
- 1.3.3. Movements within the square are simplified, reducing conflict points and prioritising pedestrians. A controlled access and bus route is incorporated within the square along Maclure Rd. A plaza is divided in to parts supporting both passive and formal activity. Outside Nye Bevin house a community garden provides space for informal dwell, meeting friends and health exercise. Next to the station a more open, flexible area provide a stage for events and activities.
- 1.3.4. Reference should be made to the extract of the proposed development masterplan shown below, which is included as Appendix A of this report.

Masterplan Extract



1.4. CONSULTATION

1.4.1. The following statutory consultees were contacted whilst preparing this report:

- Environment Agency (EA)
- Rochdale Borough Council (RBC) as Lead Local Flood Authority (LLFA); and
- United Utilities (UU).

1.5. REFERENCE

1.5.1. This FRA and Drainage Strategy has been developed in due cognisance of all relevant local and national planning policy information as outlined in Section 2 of this report, along with requirements outlined in consultation responses.

1.6. LIMITATIONS

1.6.1. This report has been written using data provided by third parties. Whilst every care has been taken to ensure this information is accurate and up to date, WSP cannot guarantee the accuracy of third party data, and the findings of this report are subject to change if the data is amended or updated after consultation. The recommendations made within this report are subject to review on receipt of further consultation responses.

2. PLANNING POLICY AND CONSULTATION

2.1. RELEVANT NATIONAL AND LOCAL PLANNING POLICY AND STRATEGY DOCUMENTS

2.1.1. The following documents were reviewed as part of this Flood Risk Assessment:

- National Planning Policy Framework (Updated July 2021) and Flood Risk and Coastal Change Guidance (August 2022)
- Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)
- Environment Agency Climate Change Guidance (Updated July 2021)
- Bury, Rochdale and Oldham Level 1 Strategic Flood Risk Assessment (November 2009)
- Bury, Rochdale and Oldham Level 2 Strategic Flood Risk Assessment (November 2009)

2.2. NATIONAL PLANNING POLICY

NATIONAL PLANNING POLICY FRAMEWORK

- 2.2.1. Chapter 14 of The National Planning Policy Framework (NPPF) ensures that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest flood risk.
- 2.2.2. Where new development is exceptionally necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and, where possible, reducing flood risk overall. This report has been written particularly in respect of paragraphs 167 (avoiding increasing flood risk elsewhere) and 169 (inclusion of SuDS).
- 2.2.3. Guidance on Flood Risk and Coastal Change has been published to accompany the NPPF. The guidance was last updated in August 2022.

DEFRA NON-STATUTORY TECHNICAL STANDARDS FOR SUSTAINABLE DRAINAGE SYSTEMS (MARCH 2015)

- 2.2.4. This document sets out non-statutory technical standards for sustainable drainage systems. It should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance.
- 2.2.5. For developments which were previously developed, the peak run-off rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield run-off rate from the development for the same rainfall event but should never exceed the rate of discharge from the development prior to redevelopment for that event.

- 2.2.6. Where reasonably practicable, for developments which have been previously developed, the run-off volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield run-off volume for the same event but should never exceed the run-off volume from the development site prior to redevelopment for that event.
- 2.2.7. The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.
- 2.2.8. The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water, (eg Pumping Station or Electricity Substation) within the development.
- 2.2.9. The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event is managed in exceedance routes that minimise the risks to people and property.

2.3. CONSIDERATION OF CLIMATE CHANGE

- 2.3.1. The Environment Agency 'Flood Risk Assessments: Climate Change Allowances' guidance was updated on 27th May 2022. The change focussed on the peak rainfall allowances, with them now being based on management catchments rather than at national scale. Peak rainfall allowances are provided for 1% annual exceedance probability (AEP) events and for 3.3% AEP events, and for 2 epochs rather than 3. The guidance on how to apply peak rainfall allowances has changed, using the central allowance for development with a lifetime up to 2100 and the upper end allowance for development with a lifetime from 2100 to 2125.
- 2.3.2. The guidance on climate change allowances states the following with respect to peak river flows:
"In flood zones 2 or 3a for:
 - *essential infrastructure – use the higher central allowance*
 - *highly vulnerable – use central allowance (development should not be permitted in flood zone 3a)*
 - *more vulnerable – use the central allowance*
 - *less vulnerable – use the central allowance*
 - *water compatible – use the central allowance*

In flood zone 3b for:

- *essential infrastructure – use the higher central allowance*
- *highly vulnerable – development should not be permitted*
- *more vulnerable – development should not be permitted*
- *less vulnerable – development should not be permitted*
- *water compatible – use the central allowance*

Apply the peak river flow allowances to developments and allocations where the strategic flood risk assessment shows an increased risk of flooding in the future. This includes locations that are currently in flood zone 1, but might be in flood zone 2 or 3 in the future.

To ensure the safety of people using the development when designing safe access, escape routes and places of refuge, use the central allowance for all development types except for essential infrastructure. Use the higher central allowance for this.

If the local planning authority consider the development is appropriate, even though it will not follow the flood zone compatibility categories for flood zones 2, 3a or 3b, use the higher central allowance.

Where it is appropriate to apply a credible maximum scenario, use the upper end allowance.”

- 2.3.3. Use of climate change allowances for peak rainfall are based on the development lifetime for each River Basin Management Catchment. Where developments have a lifetime extending beyond 2100, the Upper end allowances must be assessed for both the 1% and 3.3% annual probability events for the 2070s epoch (2061 to 2125). The development is to be designed so that the Upper end allowance in the 1% annual probability event results in:

- No increase in flood risk elsewhere
- The development is safe from surface water flooding

For developments with lifetime of between 2061 and 2100, the same approach is to be taken, but the central allowance is to be used for the 2070's epoch (2061 to 2125). For developments with lifetime up to 2060, the central allowance is to be used for the 2050's epoch (2022 to 2060).

- 2.3.4. Sea levels allowances vary on a regional basis and for each epoch as shown in Table 1 of the EA guidance. The higher central and upper end allowances are to be assessed.

DEVELOPMENT LIFESPAN AND APPLICABLE ALLOWANCES

- 2.3.5. The contingency allowances for climate change that are potentially applicable to this site are:

Peak River Flows

River Basin District: North West; Management Catchment: Irwell

Table 2-1 – Irwell Management Catchment Peak River Flow Allowances

	Central	Higher	Upper
2020s	12%	15%	24%
2050s	19%	26%	43%
2080s	35%	46%	75%

Peak Rainfall (3.3% AEP);

- Central – 25% (2050's); 30% (2070's)
- Upper End – 35% (2050's); 40% (2070's)

Peak Rainfall (1% AEP);

- Central – 25% (2050's); 30% (2070's)
- Upper End – 40% (2050's); 45% (2070's)

Sea Level Rise;

- Higher Central – 4.5mm / year (2000 to 2035); 7.3 mm / year (2036 to 2065); 10 mm / year (2066 to 2095); 11.2 mm / year (2096 to 2125);
- Upper End – 5.7mm / year (2000 to 2035); 9.9 mm / year (2036 to 2065); 14.2 mm / year (2066 to 2095); 16.3 mm / year (2096 to 2125).
-

2.4. LOCAL PLANNING POLICY

ROCHDALE CORE STRATEGY 2016

The following policies, relevant to flood risk and drainage form part of the Rochdale Borough Council Core Strategy 2016.

Policy S04 – To promote a greener environment

To do this we will focus on: ...

3. Reducing the likelihood of flooding through appropriate flood risk management, especially in Rochdale town centre and parts of Littleborough and Heywood; ...

5. Maximising the value of our green open areas and countryside to provide opportunities for recreation, amenity, biodiversity and flood management;

Policy G1 – Tackling and adapting to climate change

New developments will be expected to:

Address the impacts of climate change by incorporating comprehensive adaptation measures, including:

iii. the incorporation of appropriate water conservation and management measures, such as Sustainable Drainage Systems (SuDS), including ensuring that the rate of run-off on 'greenfield' sites is not increased and on 'brownfield' sites is significantly reduced, and avoiding the use of impermeable surfaces;

Policy G8 – Managing water resources and flood risk

We will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;

b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;

c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised

sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;

d. Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';

e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;

f. The avoidance of culverting, and support the opening up of existing culverts wherever possible;

g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;

h. Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater or the derogation of the quantity of groundwater;

i. The incorporation of measures to improve water quality; and

j. The taking of opportunities to improve the habitat value of watercourses and water bodies.

In addition, we will identify additional flood storage areas which will be protected from development

ROCHDALE BOROUGH COUNCIL STRATEGIC FLOOD RISK ASSESSMENT

- 2.4.1. The Bury, Rochdale and Oldham Level 1 and Level 2 Strategic Flood Risk Assessment was prepared by JBA Consulting in November 2009.
- 2.4.2. The Level 1 SFRA provides a spatial assessment of flood risk within Rochdale, introducing the key sources and mechanisms of flood risk. A key output of the Level 1 SFRA are the various maps including Flood Zones, Surface Water flooding and Critical Drainage Areas.
- 2.4.3. The Level 2 SFRA provides greater detail than the Level 1 SFRA particularly focussing on the mechanisms of flooding in Rochdale's key urban areas along the River Roch to enable application of the Sequential and Exceptions Tests in these areas.

EXISTING SITE

2.5. SITE LOCATION

- 2.5.1. The site is located in Rochdale town centre, immediately north of the Rochdale railway station. The scheme is being promoted by Rochdale Borough Council and comprises the creation of a public realm area to the station frontage. This will be achieved through stopping up of existing highways.
- 2.5.2. Reference should be made to Figure 0-1 – Site Location Plan

Figure 0-1 - Site Location Plan



- 2.5.3. Table 0-2 summarises the general characteristics of the site as it currently exists. A copy of the topographic survey is included in Appendix B.

Table 0-2 – General Site Characteristics

Characteristic	Description
Site address	Station Road, Rochdale, OL11 1DN
Grid reference	389880, 412682
Area (Ha)	1.195Ha
Existing / previous site usage	Adopted highways
Surroundings	South: Rochdale Railway Station East: Station Road West: Station Road, Dowling Street, Lower Tweedale Street North: Maclure Road
Topography	The site is relatively flat, with levels varying by up to 1m.

2.6. EXISTING DRAINAGE

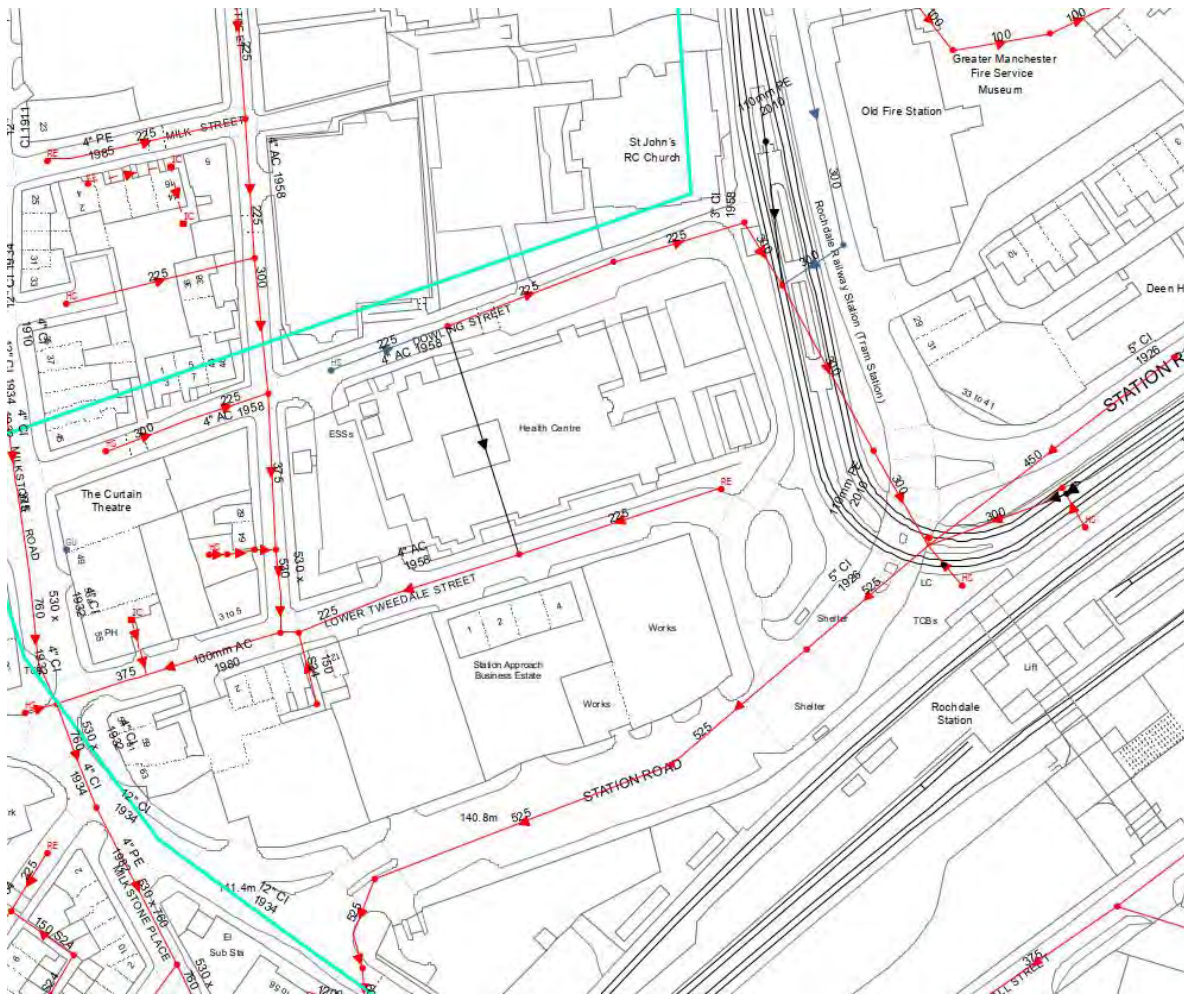
PUBLIC SEWERS

- 2.6.1. Reference should be made to the United Utilities (UU) Public Sewer Records, a full copy of which is included in Appendix C. There are numerous public sewers within the vicinity of the proposed development in the area, with the majority being combined sewers.
- 2.6.2. Records indicate that the existing sewers generally flow from north to south and from east to west. The sewer records indicate that the majority of the network in this area is a combined foul and surface water system, with pipe diameters within the scheme extents typically varying between 225mm and 525mm.

PRIVATE DRAINAGE

- 2.6.3. There is a short length of private drainage within the vicinity of the existing taxi rank and which discharges into the existing United Utilities combined sewer in Station Road. This is presumed to be highway drainage as surveys have shown this to receive incoming connections from existing highway gullies.
- 2.6.4. Surveys have indicated the presence of numerous private connections between buildings and the United Utilities public sewer. These are not affected by the proposed scheme and there are no plans to modify these connections in any way.

Figure 0-2 - Public Sewer Records Extract



2.7. EXISTING WATERCOURSES

- 2.7.1. There are no watercourses within the vicinity of the site.
- 2.7.2. The closest identified watercourse is the River Roch, located approximately 650 to the north of the site. Sudden Brook is located approximately 700m to the south of the scheme.

2.8. EXISTING FLOOD DEFENCE INFRASTRUCTURE

- 2.8.1. The site is not within an area which benefits from the protection of nearby formal flood defences.

2.9. GEOLOGY AND HYDROGEOLOGY

- 2.9.1. A site investigation has not been undertaken as the scheme comprises public realm works that will not require deep foundations, and no structures are proposed which would require a detailed understanding of existing ground conditions. Reliance has therefore been placed upon British Geological Society (BGS) records to establish the likely ground conditions in the vicinity of the site.
- 2.9.2. BGS borehole records in the vicinity of the site indicate typical depths of made ground of between 0.8m and 1.5m deep.

- 2.9.3. BGS records indicate bedrock geology comprising of Pennine Lower Coal Measures Formation, consisting of mud, sandstone and siltstone. Superficial deposits comprise glaciofluvial deposits primarily consisting of sand and gravel.

3. CONSULTATION

3.1. THE ENVIRONMENT AGENCY (EA)

- 3.1.1. The Environment Agency flood maps for planning indicate the entirety of the site is located in Flood Zone 1. A copy of the flood map for planning is included in Appendix D.
- 3.1.2. Product 4 flood risk assessment information has been requested and this report will be updated accordingly upon receipt.

3.2. ROCHDALE BOROUGH COUNCIL (RBC)

- 3.2.1. Rochdale Borough Council were contacted to provide advice on matters relating to flood risk to the site and also their requirements in terms of a surface water drainage strategy.

3.3. UNITED UTILITIES (UU)

- 3.3.1. A pre-development enquiry has been submitted to United Utilities giving an overview of the scheme and proposed surface water drainage strategy. United Utilities have confirmed that, in principle, they have no objection to the existing connections being maintained whereby surface water discharges at an unrestricted rate into the public sewerage system

4. DEFINITION OF FLOOD RISK

- 4.1.1. The potential risk of flooding to the site from all current and future sources of flooding has been assessed in accordance with the National Planning Policy Framework. A detailed assessment the flood risk and associated flood risk ratings are presented in Sections 5.2 to 5.6.
- 4.1.2. Table 5-1 below summarises the findings of the assessment. It should be noted that the designation of risk outlined in Table 5-1 is prior to the inclusion of any mitigation measures, which may subsequently act to reduce the risk.

Table 4-1 – Degree of Risk from Each Source of Flooding

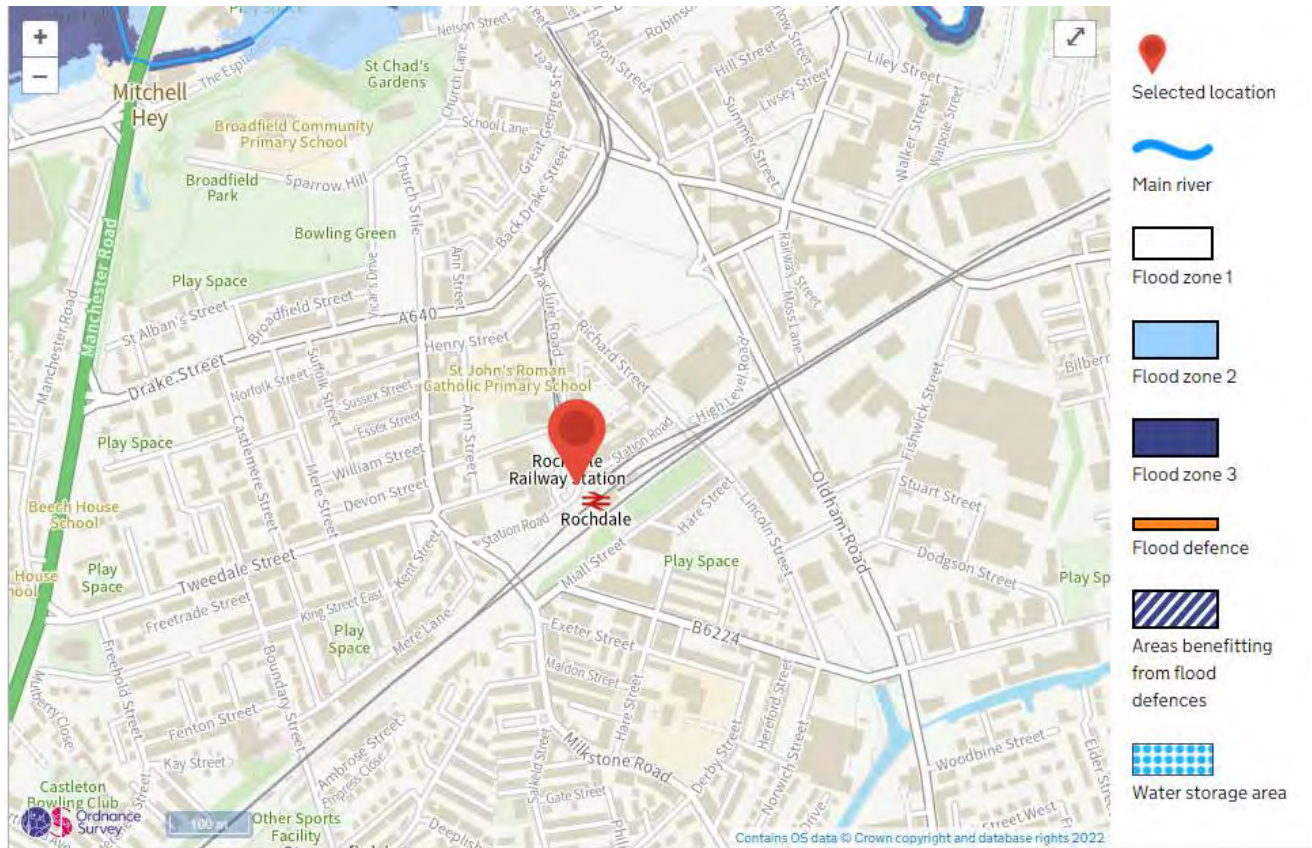
Source		Risk
Fluvial		Low
Surface Water		Very Low to High
Sewer		Low
Groundwater		Low
Tidal		Not at risk
Artificial Sources	Reservoir	Not at risk
	Canal	Not at risk

4.2. FLUVIAL FLOOD RISK

FLOOD MAPS

- 4.2.1. The National Planning Policy Framework (NPPF) categorises flood risk as follows:
- **Zone 1 (low probability)** – Land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%);
 - **Zone 2 (medium probability)** – Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year; and
 - **Zone 3a (high probability)** - Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
 - **Zone 3b The Functional Floodplain** - This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map).

Figure 4-1 - EA Flood Maps for Planning



4.2.2. Based on the above, the risk to the development from fluvial flooding is considered to be low, as is the impact of development on flood risk elsewhere.

4.3. SURFACE WATER FLOODING

4.3.1. The EA descriptions for the High, Medium and Low risk scenarios for surface water flooding are as follows:

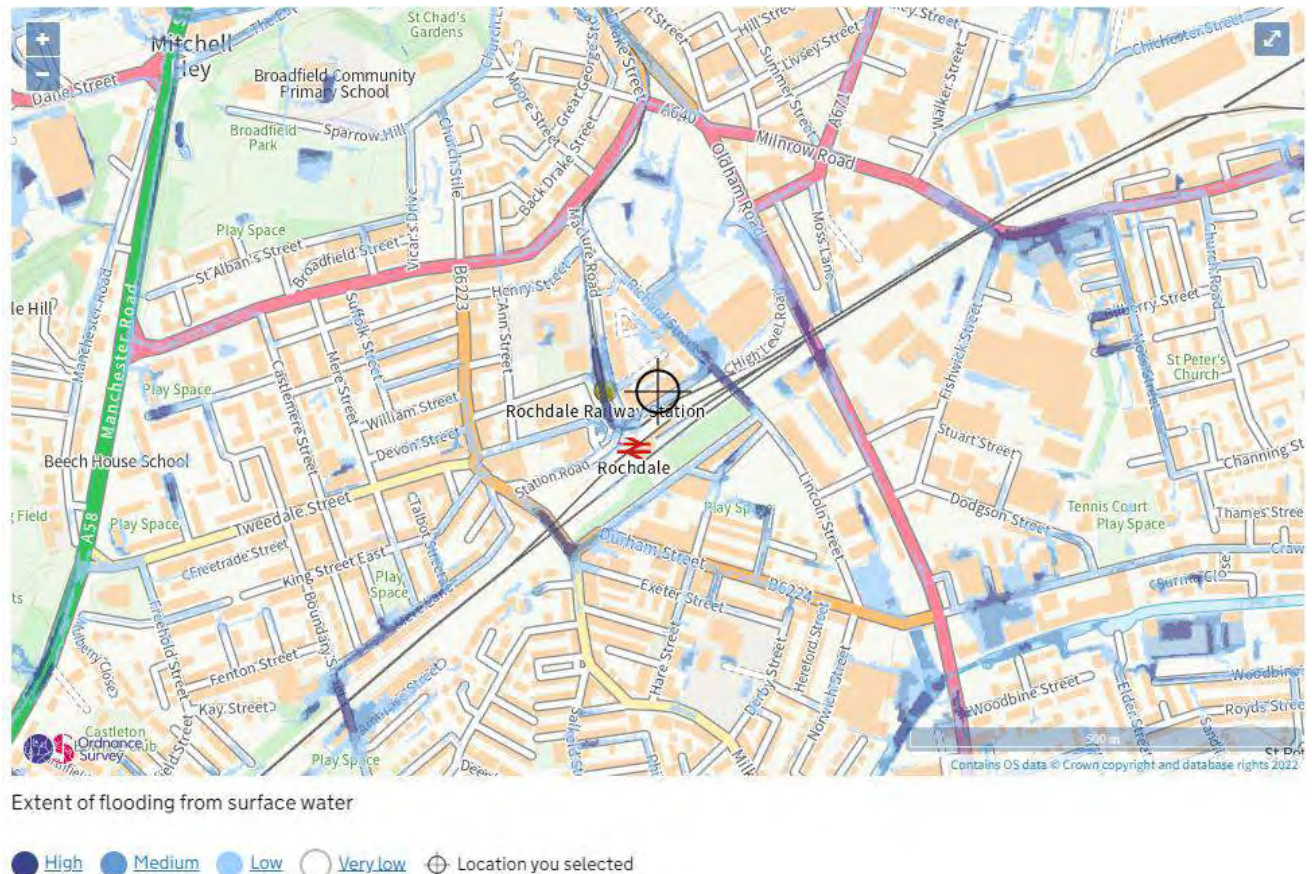
- **High risk** means that each year this area has a chance of flooding of greater than 3.3%.
- **Medium risk** means that each year this area has a chance of flooding of between 1% and 3.3%.
- **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1%.
- **Very Low risk** means that each year this area has a chance of flooding of less than 0.1%.

4.3.2. It should be noted that flooding from surface water is difficult to predict as rainfall location and volumes are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding. The modelling used to predict this flooding is coarse and does not accurately take into consideration the public drainage network, highway drainage and other drainage features and is likely to be overestimating the predicted flood extent.

4.3.3. The Environment Agency Map of long-term flood risk from surface water indicates that the risk of surface water flooding varies across the site from high to very low. This is because the area lies at the bottom of a hill with land falling from north to south towards the railway embankment.

- 4.3.4. The area of highest risk is concentrated around the Metrolink station on Maclure Road. This is likely to be due to raised platforms which may trap surface water. Areas of Station Road directly north and north-east of the railway station are shown to be at low or medium risk of surface water flooding. Lower Tweeddale Street is shown to be allow risk of surface water flooding.

Figure 4-2 - EA Surface Water Flood Map



4.4. SEWER FLOODING

- 4.4.1. There are no known instances of sewer flooding within the site area. Sewer capacity is managed by United Utilities.
- 4.4.2. The proposed scheme will not increase discharge to public sewers. The inclusion of area of soft landscaping, trees and SuDS features will provide a reduction in discharge to the public sewer network.
- 4.4.3. The risk of sewer flooding is considered to be low.

4.5. GROUNDWATER FLOODING

- 4.5.1. Groundwater flooding occurs when the water table, the level of water below the ground, rises above the ground surface or into cellars and basements. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks.

4.5.2. The Level 1 SFRA notes that there are relatively few reported incidents of groundwater flooding in Rochdale and furthermore that the risk posed by groundwater flooding is likely to remain remote within the region.

4.5.3. It is therefore considered that the risk of groundwater flooding of the site is low.

4.6. TIDAL / COASTAL FLOOD RISK

4.6.1. The site is remote from tidal influences and is therefore not at risk of tidal or coastal flooding.

4.7. ARTIFICIAL SOURCES FLOODING

4.7.1. Non-natural or artificial sources of flooding can include canals, reservoirs, lakes, etc. The potential effects of flood risk management infrastructure and other structures need to be considered.

CANAL / RIVER INTERACTION

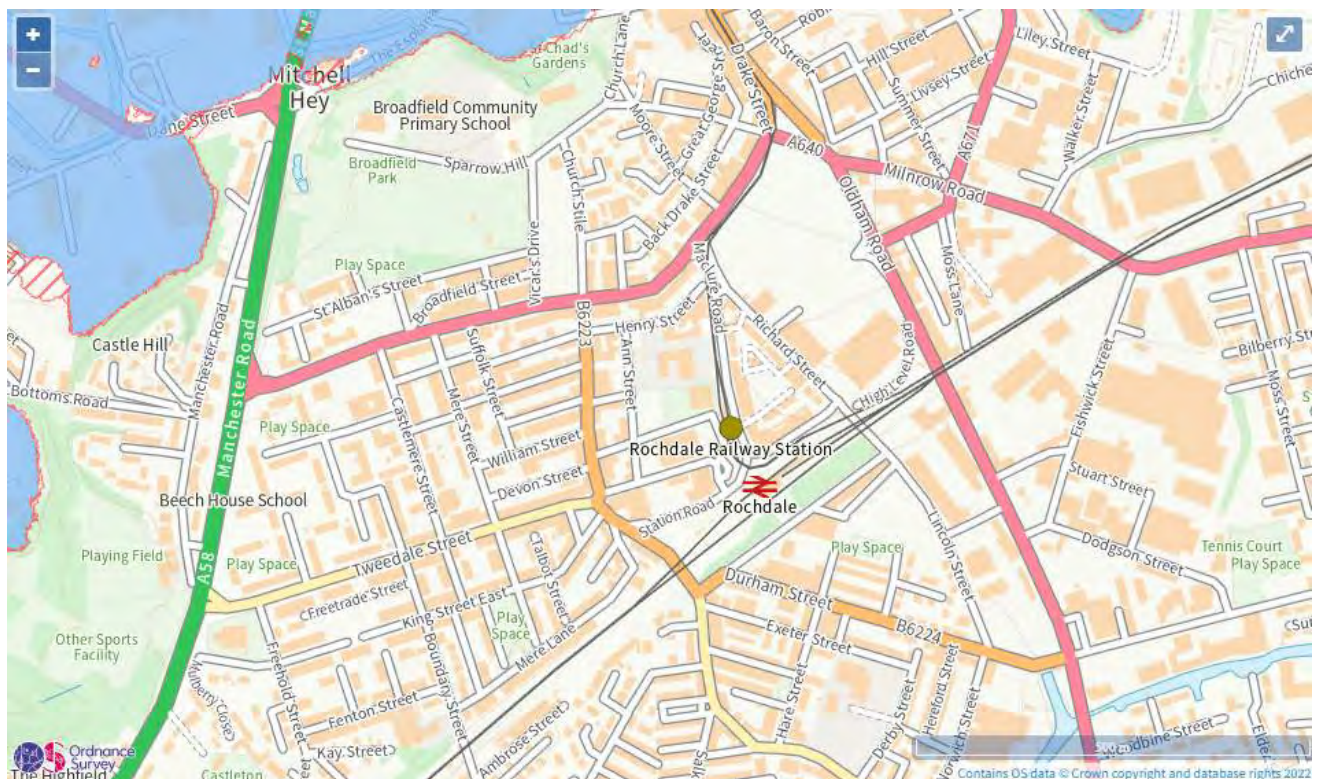
4.7.2. The closest canal to the site is the Rochdale Canal, located approximately 600m to the south.

4.7.3. The site is not considered to be at risk of flooding from canals.

RESERVOIRS

4.7.4. Figure 5-3 below shows an extract from the EA Reservoir Flood Map which indicates that the site is not within an area that could be affected by flooding from reservoirs in the event of a reservoir failure.

Figure 4-3 - EA Reservoir Flood Map Extract



4.7.5. Based on the above, it is considered that the site is not at risk of flooding from reservoir failure.

5. NPPF SEQUENTIAL AND EXCEPTION TEST

5.1. THE SEQUENTIAL TEST

- 5.1.1. The Sequential Test, within the National Planning Policy Framework, aims to steer all new developments to areas at the lowest risk of flooding and to ensure that the development type proposed is appropriate by reference to the flood risk.
- 5.1.2. The area of development is within Flood Zone 1 and is not intended to be changed from its current use (public highway). The development is therefore considered to meet the requirements of the Sequential Test.

5.2. THE EXCEPTION TEST

- 5.2.1. Table 2 of the Flood Risk and Coastal Change Guidance (August 2022) shows that all land uses are appropriate in Flood Zone 1 areas and therefore an Exception Test is not required for this site.

6. SURFACE WATER DRAINAGE STRATEGY

- 6.1.1. For details of the outline surface water drainage proposals for the site, reference should be made to the WSP Drainage Strategy drawing (70097916-WSP-01-XX-DR-C-008), a copy of which is included in Appendix E of this report.

6.2. DISPOSAL OF SURFACE WATER

- 6.2.1. The method for removal of surface water from the site has been selected in accordance with the hierarchy outlined in Building Regulations Part H as summarised below:

- Infiltration to the ground
- Discharge to a watercourse
- Connection to a public sewer

SOAKAWAYS

- 6.2.2. Building Regulations Part H states any infiltration device should not be constructed within 5 metres of any building or road to avoid the infiltrated water having a negative impact on nearby structures. The main area of development is adjacent to the existing Rochdale Town Centre Metrolink station and is bounded by buildings on all sides. GPR surveys have shown the site to be underlain with extensive statutory undertakers' equipment, severely limiting the available space for infiltration structures.
- 6.2.3. The limited geotechnical information available suggests that ground conditions beneath the site are likely to comprise a significant depth of made ground, with variable conditions at deeper depths.
- 6.2.4. Maintenance of soakaways in public realm areas is noted to be particularly challenging, and it is also noted that there is limited space to accommodate soakaways due to the extensive presence of existing utilities within the site extents.
- 6.2.5. Disposal of surface water by means of soakaways is therefore unlikely to be the preferred solution and has not been considered further at this stage.

WATERCOURSE

- 6.2.6. There are no existing watercourses within the immediate vicinity of the proposed scheme. Disposal of surface water into a watercourse is not feasible and has not been considered further.

PUBLIC SEWER

- 6.2.7. There are several United Utilities surface water sewers within the vicinity of the site. However, these are all short lengths of pipe that flow into the United Utilities combined sewer system.
- 6.2.8. There is therefore no advantage to be gained from prioritising connections to the surface water sewers over the combined sewer system, and the drainage strategy will include discharges to both the surface water and combined sewerage systems.
- 6.2.9. Following consultation with Rochdale Borough Council, it is proposed that for the highway amendments on Station Road, Lower Tweedale Street, and Dowling Street, the drainage system will comprise kerbs and gullies. Existing falls will be maintained wherever possible to maximise the opportunity for existing gullies to be relocated to align with proposed kerb lines. Additional gullies will be provided where necessary to ensure all areas are effectively drained and to prevent water from ponding at low points.
- 6.2.10. Within Station Square, surface water drainage will comprise linear drainage which will outfall to the existing public sewer. Where possible existing gully connections will be reused to minimise the need for intrusive works to establish new connections.

6.3. SUSTAINABLE DRAINAGE SYSTEMS

- 6.3.1. The provision of Sustainable Drainage Systems (SuDS) has been considered and will, where appropriate, be included within the surface water drainage proposals.
- 6.3.2. It is proposed to provide tree pits at strategic locations in accordance with the typical detail shown on drawing ref 70097916-WSP-01-XX-DR-C-008. All tree pits will include a layer of granular filter material to maximise the volume of water that can be retained and will include a small diameter perforated pipe at the base of the pit to discharge runoff into the public sewer at a reduced rate.
- 6.3.3. Areas of soft landscaping have been integrated into the site masterplan at various locations across the site. The localised nature of these areas makes them suitable for infiltration, providing a small reduction in runoff volume.
- 6.3.4. Where possible, footway levels will be designed to maximise the volume of water that will freely flow into tree pits and areas of soft landscaping to act as a means of source control and reduce the rate at which water is discharged into the public sewer.

6.4. IMPERMEABLE AREAS

- 6.4.1. The existing site area is 1.19Ha and has been assessed as being 96.5% impermeable, with a net impervious area of 1.115Ha.
- 6.4.2. The proposed drainage strategy achieves a small reduction to 91.2% impermeable, with a net impervious area of 1.09Ha.

6.5. DISCHARGE RATES

- 6.5.1. The entirety of the existing site is designated as public highway which has been proven to discharge to the public sewerage system via approximately 60No gully connections.
- 6.5.2. It is difficult to accurately assess the existing discharge rate, however for the existing impervious area of 1.19Ha this can be estimated as being approximately 265l/s, based on the Rational Method for a rainfall intensity of 85mm/hr.

- 6.5.3. The proposed drainage strategy will have a similar discharge profile to the existing highway layout, albeit with a reduced number of connections which may result in increases in the time of concentration. For the proposed impervious area of 1.09Ha, using the methodology outlined above, the proposed discharge rate will be approximately 257l/s.
- 6.5.4. It can therefore be assumed that the proposed scheme will achieve a reduction in peak discharge rate of approximately 3%. However, this may be improved slightly as a result of the proposed tree pits (the runoff from which is difficult to quantify), and the reduced number of outfalls to the public sewer.
- 6.5.5. A copy of the drainage area assessment is included within Appendix F.

6.6. WATER QUALITY

- 6.6.1. The proposed scheme will limit vehicular access to Station Square, with vehicle movements limited to deliveries. This will result in a small improvement to water quality.
- 6.6.2. The proposed tree pits will also provide some measure of water treatment prior to discharging into the existing public sewerage system.
- 6.6.3. Due to the nature of the proposed public realm works there is limited scope for other SuDS features to provide water quality treatment for this site.

6.7. MAINTENANCE

- 6.7.1. Reference should be made to the Drainage Inspection and Maintenance Schedule, included as Appendix G of this report.

7. MITIGATION / MANAGEMENT OF FLOOD RISK

7.1. ACCESS AND EGRESS

- 7.1.1. The proposed scheme is limited to works within public highways and areas of public realm. No buildings or changes to existing building accesses are proposed as part of the scheme. The site is within Flood Zone 1 and is therefore unlikely to be affected by flooding from tidal or fluvial sources.
- 7.1.2. The Environment Agency Map of long-term flood risk from surface water indicates that there is a very low to high risk of surface water flooding across the site. This risk will remain unchanged due to the localised nature of the proposed highway and public realm works.
- 7.1.3. For the proposed highway works Station Road, Lower Tweeddale Street, and Dowling Street, it is anticipated that footway crossfalls will remain as existing. For the public realm works in Station Square, longitudinal channels will be developed towards the centre of the square, away from existing buildings and infrastructure.
- 7.1.4. The Metrolink infrastructure including station platforms and track drainage system will be unaffected by the works. The risk of surface water flooding here will remain as existing.
- 7.1.5. Safe access and egress to and from buildings will be maintained following completion of the works. Access to higher ground and areas of lower surface water flood risk is available to the north (Maclure Road) and west (Station Road and Dowling Street).

7.2. DRAINAGE AND EXCEEDANCE FLOW ROUTES

- 7.2.1. The proposed surface water drainage system will be designed in accordance with the drainage strategy set out in section 7 of this report. Whilst the hydraulic performance of the public sewerage system is unknown, the proposed scheme will not increase flood risk to the site or elsewhere in the local catchment.
- 7.2.2. Reference should be made to the WSP Exceedance - Overland Flow Routes drawing that is appended to this report (Appendix H) and which shows the likely route of exceedance flows in the event of failure or design exceedance of the existing public sewer. These routes remain unchanged from the current

7.3. FLOOD RISK POST MITIGATION

7.3.1. Table 7-1 below, summarises the risk of all sources of flooding post mitigation

Table 7-1 - Degree of Risk from Each Source of Flooding Post Mitigation

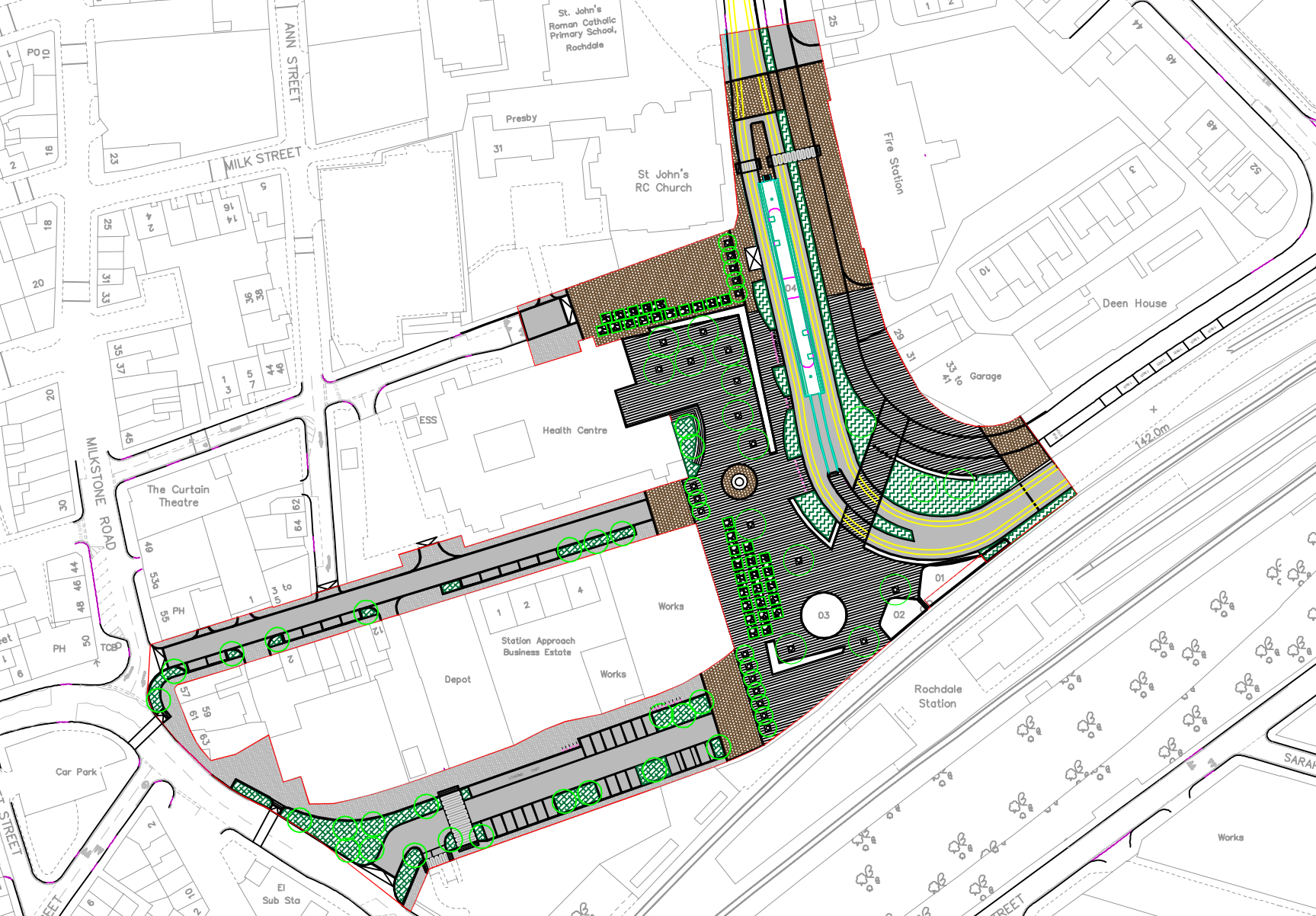
Source		Risk
Fluvial		Low
Surface Water		Very Low to High
Groundwater		Low
Sewer		Low
Tidal		Not at risk
Artificial Sources	Reservoir	Not at risk
	Canal	Not at risk

7.3.2. This Flood Risk Assessment and Drainage Strategy has concluded that the development is appropriate and can be occupied safely subject to implementation of the flood risk mitigation being carried out.

Appendix A

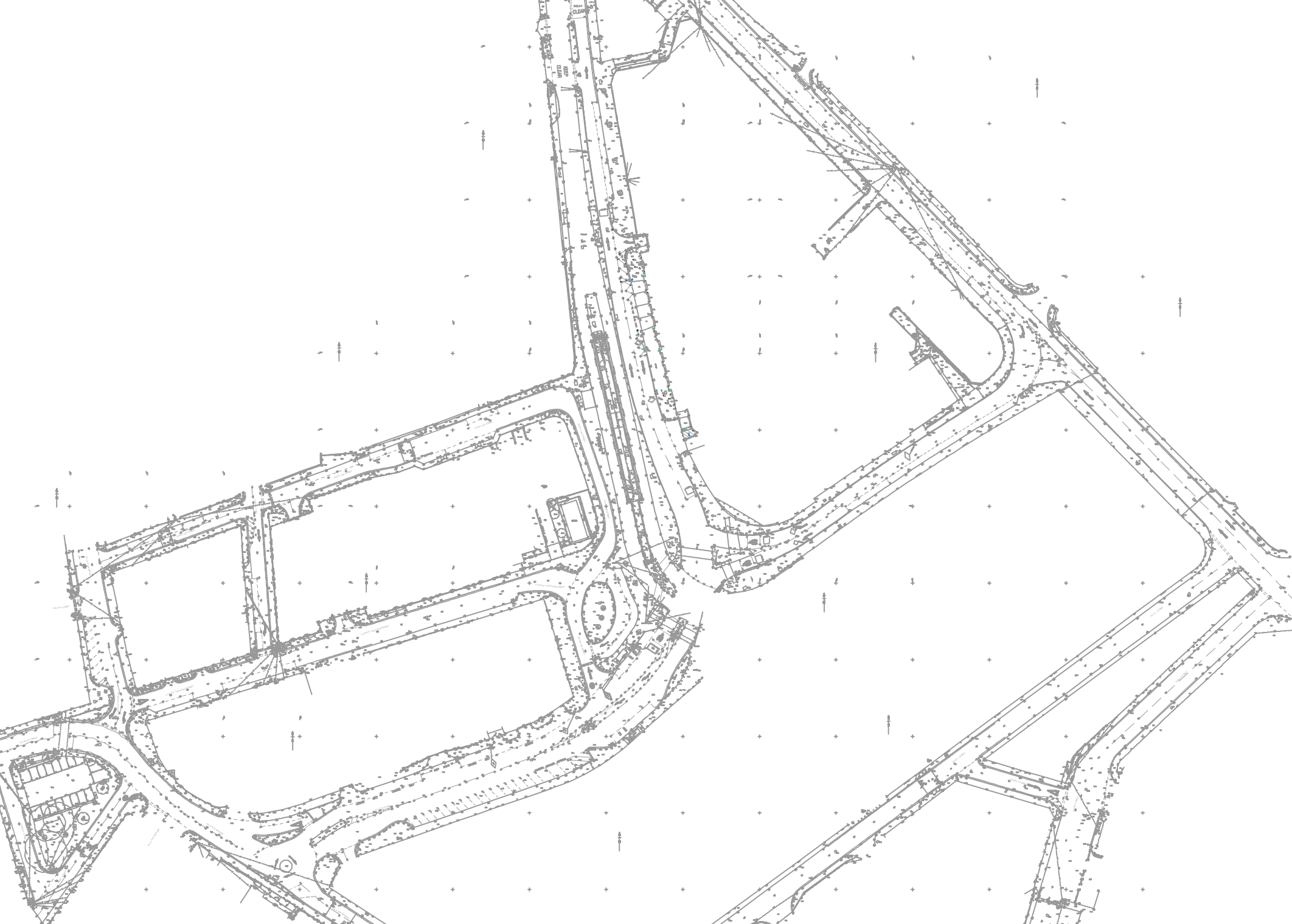
PROPOSED SITE MASTERPLAN

wsp



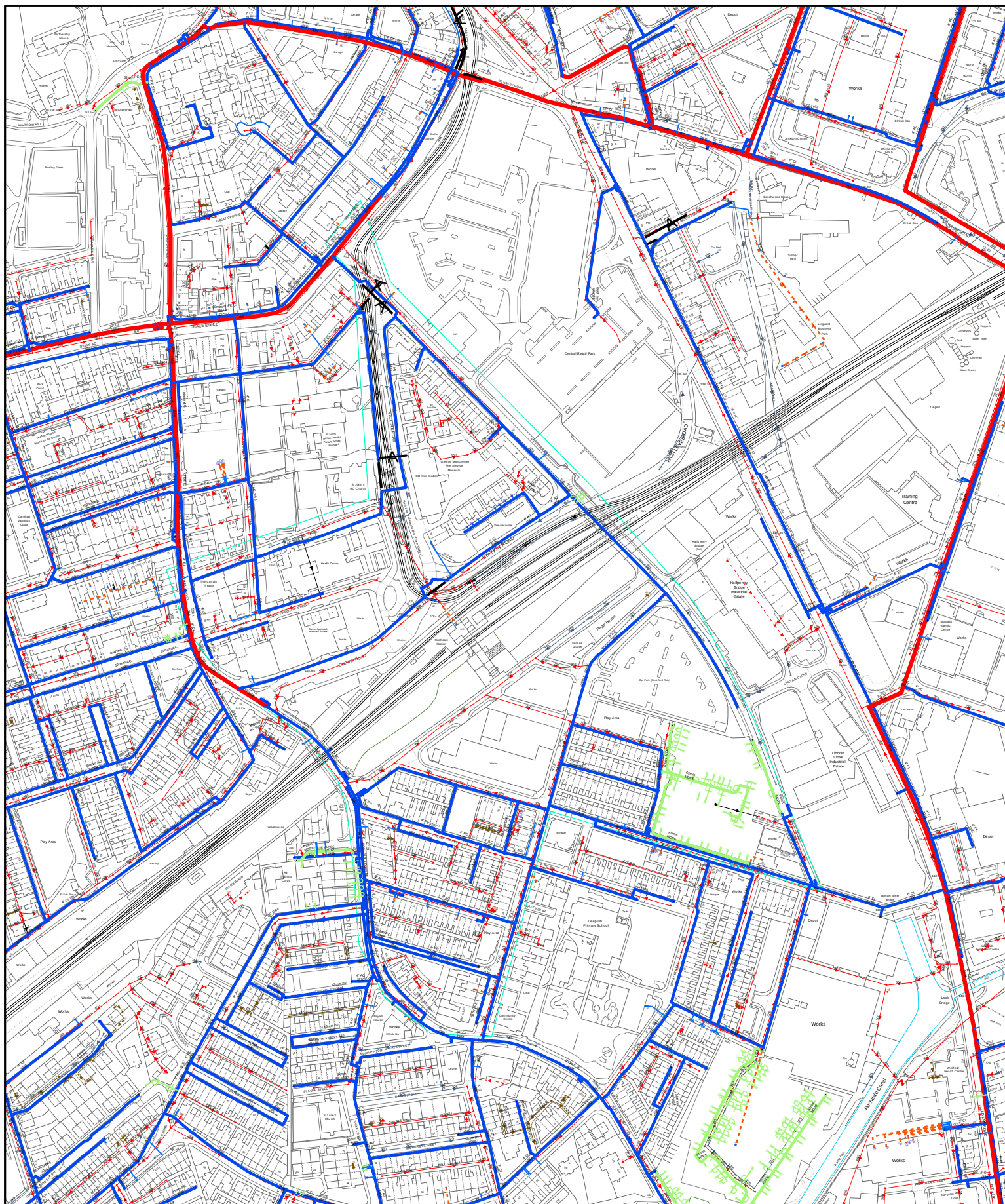
Appendix B

TOPOGRAPHICAL SURVEY **wsp**



Appendix C

wsp
PUBLIC SEWER RECORDS



Date: 11/08/2020

Extract from maps of public sewers and water mains

Printed By:
Property Searches

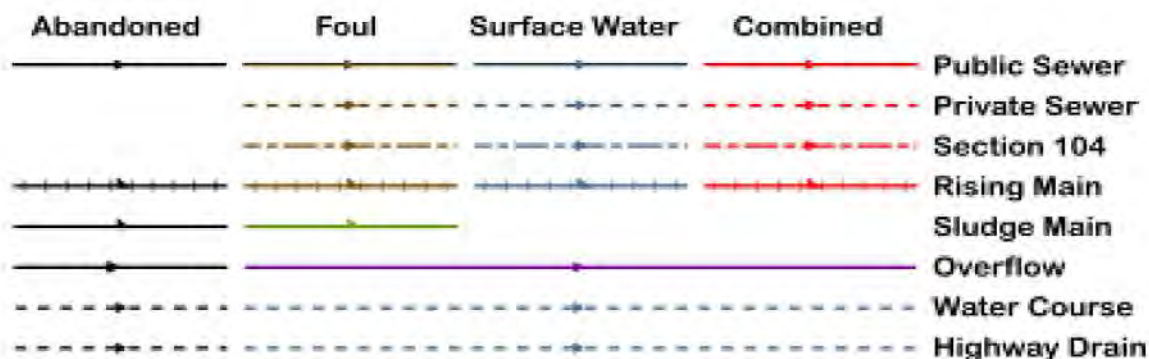
Site off Miall Street Rochdale



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.

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Wastewater Symbolology



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

- | | |
|------------------|--------------------------|
| Manhole | Side Entry Manhole |
| Head of System | Outfall |
| Extent of Survey | Screen Chamber |
| Rodding Eye | Inspection Chamber |
| Inlet | Bifurcation Chamber |
| Discharge Point | Lamp Hole |
| Vortex | T Junction / Saddle |
| Penstock | Catchpit |
| Washout Chamber | Valve Chamber |
| Valve | Vent Column |
| Air Valve | Vortex Chamber |
| Non Return Valve | Penstock Chamber |
| Soakaway | Network Storage Tank |
| Gully | Sewer Overflow |
| Cascade | Ww Treatment Works |
| Flow Meter | Ww Pumping Station |
| Hatch Box | Septic Tank |
| Oil Interceptor | Control Kiosk |
| Summit | |
| Drop Shaft | Change of Characteristic |
| Orifice Plate | |

Appendix D

wsp
FLOOD MAP FOR PLANNING

Flood map for planning

Your reference
ssa

Location (easting/northing)
389880/412682

Created
5 Oct 2022 14:44

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)

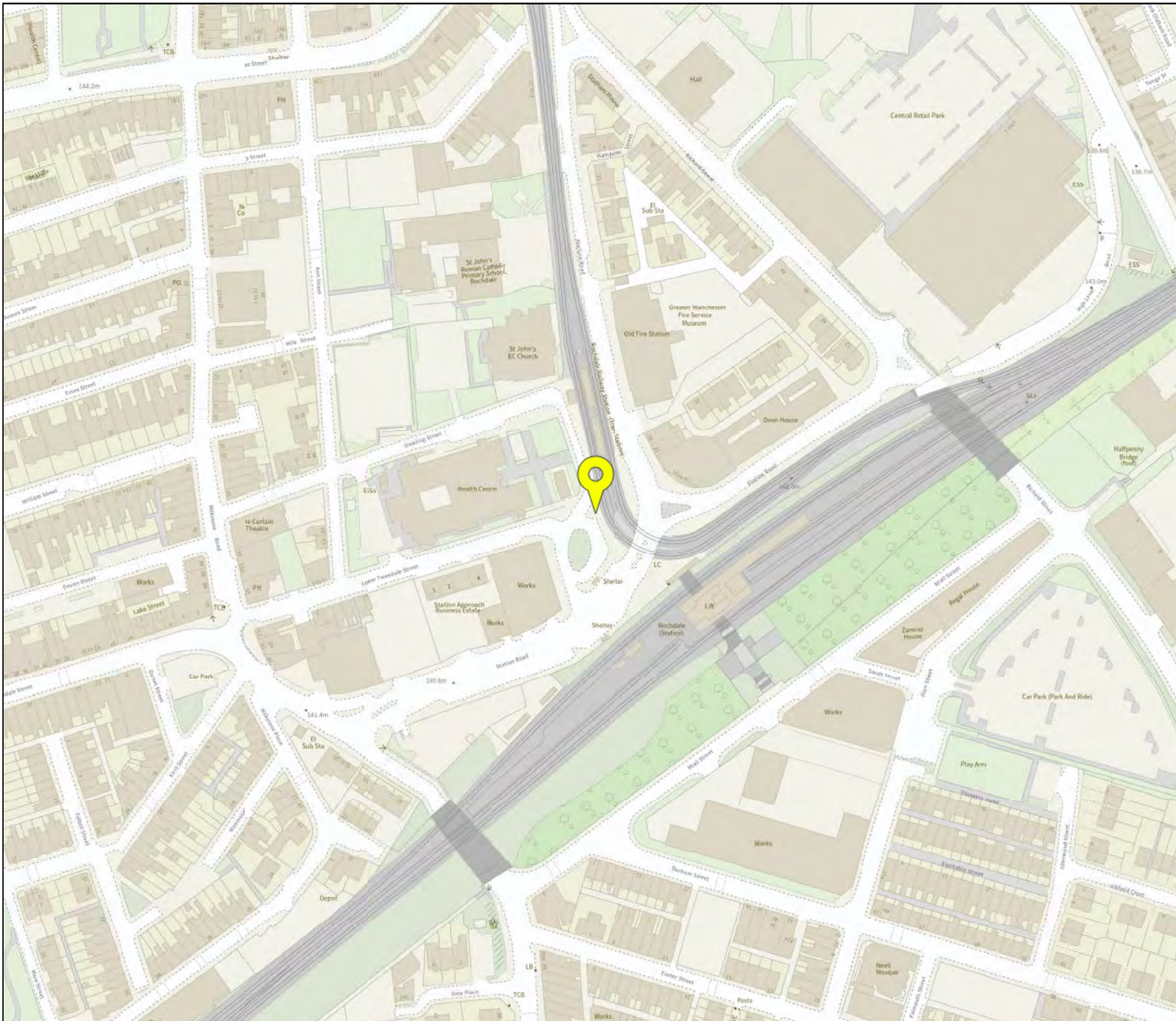
Notes

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 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Your reference
ssa

Location (easting/northing)
389880/412682

Scale
1:2500

Created
5 Oct 2022 14:44



Appendix E

wsp

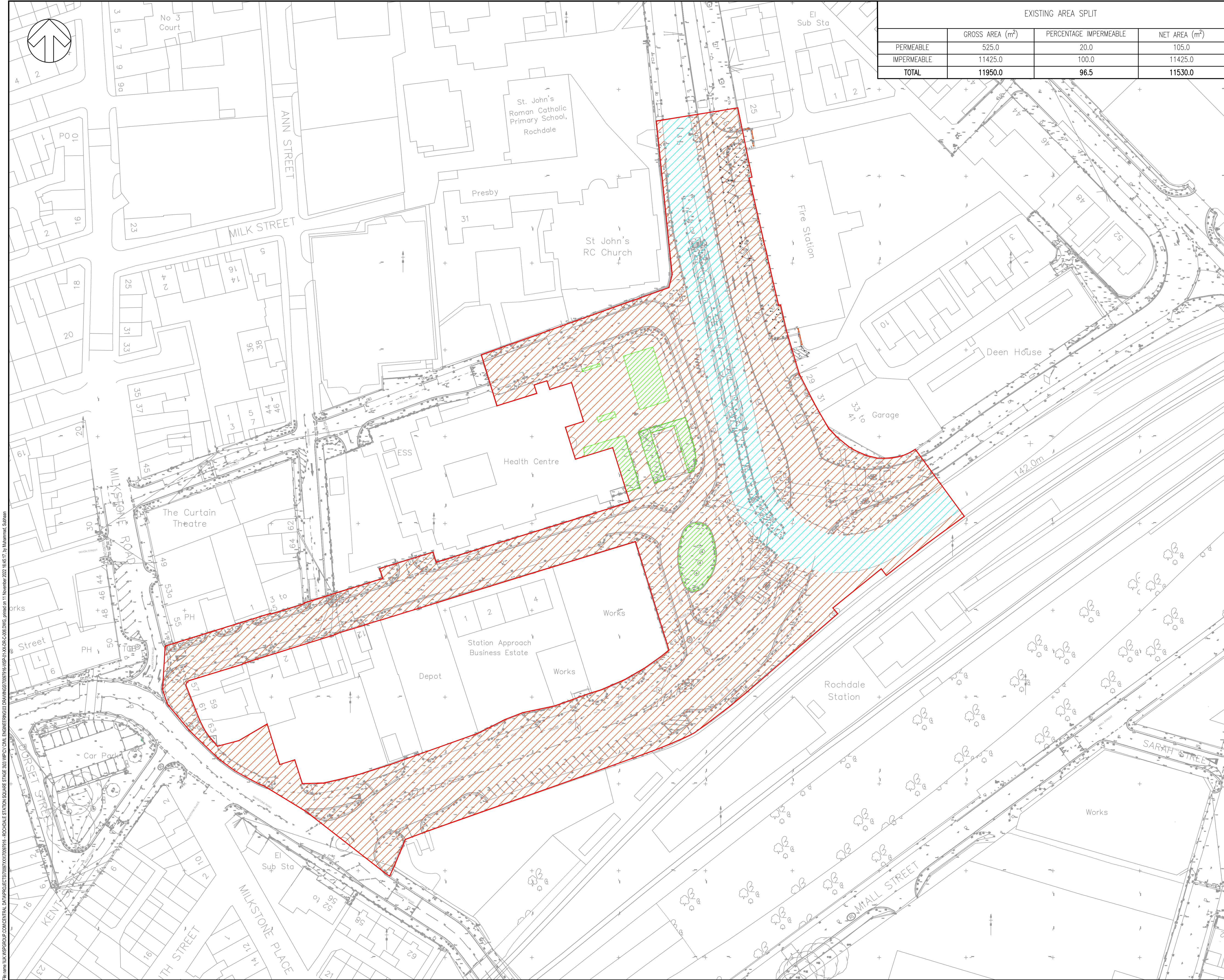
DRAINAGE STRATEGY

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

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Appendix F

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DRAINAGE AREA ASSESSMENT



EXISTING AREA SPLIT			
	GROSS AREA (m²)	PERCENTAGE IMPERMEABLE	NET AREA (m²)
PERMEABLE	525.0	20.0	105.0
IMPERMEABLE	11425.0	100.0	11425.0
TOTAL	11950.0	96.5	11530.0

- NOTES:
- ALL DIMENSIONS ARE IN METERS UNLESS STATED OTHERWISE.
 - THE LOCAL AUTHORITY IS ROCDALE BOROUGH COUNCIL.
 - THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION PROVIDED BY 3RD PARTIES:
 - MASTERPLAN – BROADWAYMALYAN BM36072–C–L–100 COSTING
 - TOPO SURVEY – MALCOLM HUGHES TOPOGRAPHICAL SURVEY 56653/1–56653/19
 - METROLINK HAS A SEPARATE DRAINAGE SYSTEM WHICH IS NOT PART OF THE SCHEME, THE AREA IS NOT INCLUDED. REFER TO EXISTING AREA SPLIT TABLE.

- KEY:
- SITE BOUNDARY
 - IMPERMEABLE AREA
 - PERMEABLE AREA
 - METROLINK

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

P02	30/09/2022	SM	METROLINK EXTENTS ADDED & TABLE UPDATED	DW	DW
P01	09/09/2022	SS	FIRST ISSUE	DW	DW
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S3 - FOR REVIEW

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CLIENT: ROCDALE BOROUGH COUNCIL

ARCHITECT: BROADWAYMALYAN

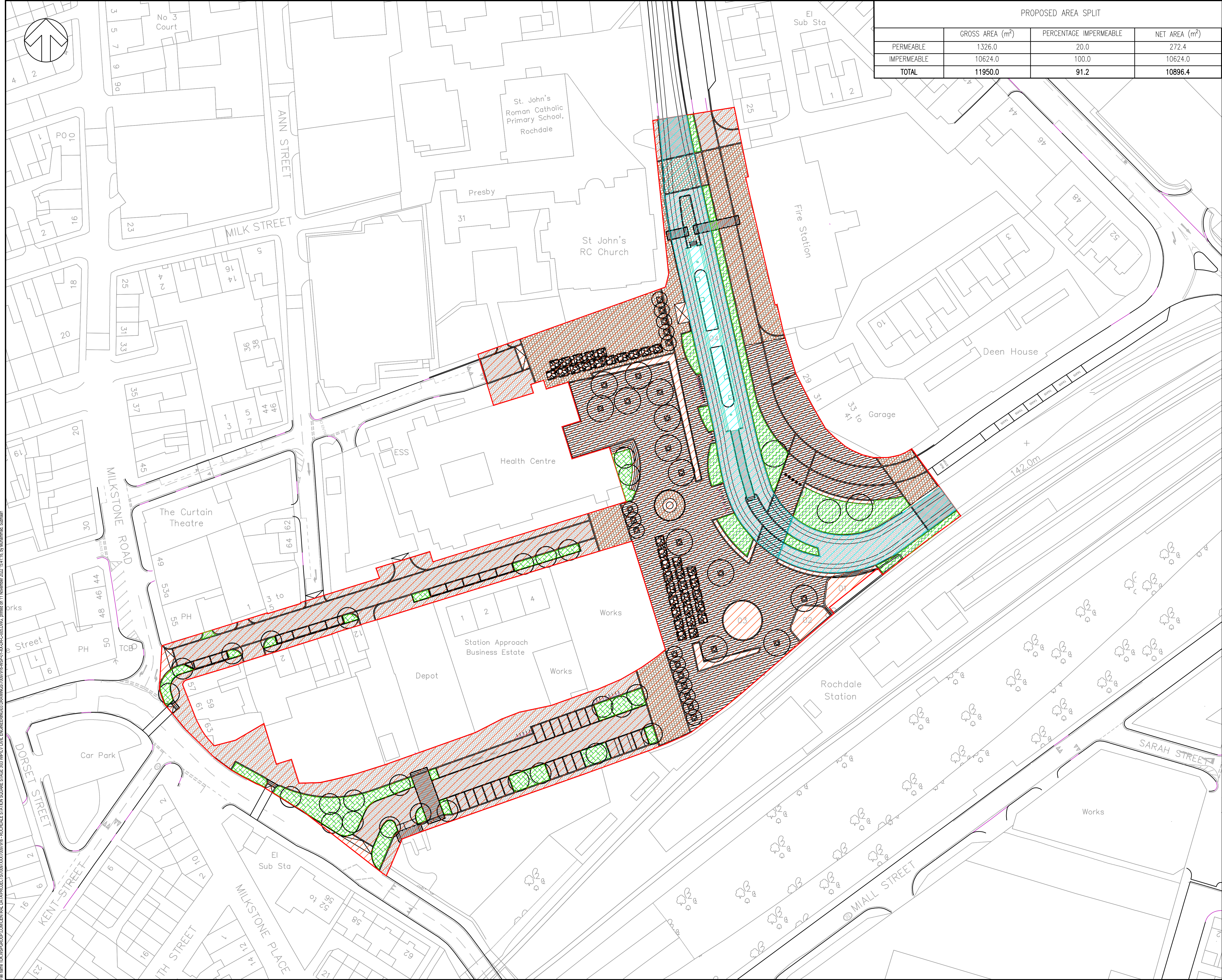
SITE/PROJECT: ROCDALE STATION SQUARE

TITLE: EXISTING SITE PERMEABILITY ASSESSMENT

SCALE @ A1: 1:500	CHECKED: DW	APPROVED: DW
PROJECT NO: 70097916	DESIGNED: SS	DRAWN: SS
		DATE: September 22

DRAWING NO: 70097916-WSP-01-XX-DR-C-006	REV: P02
---	----------

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PROPOSED AREA SPLIT			
	GROSS AREA (m ²)	PERCENTAGE IMPERMEABLE	NET AREA (m ²)
PERMEABLE	1326.0	20.0	272.4
IMPERMEABLE	10624.0	100.0	10624.0
TOTAL	11950.0	91.2	10896.4

- NOTES:
- ALL DIMENSIONS ARE IN METERS UNLESS STATED OTHERWISE.
 - THE LOCAL AUTHORITY IS ROCSDALE BOROUGH COUNCIL.
 - THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION PROVIDED BY 3RD PARTIES:
 - MASTERPLAN – BROADWAYMALYAN BM36072–C–L–100 COSTING
 - TOPO SURVEY – MALCOLM HUGHES TOPOGRAPHICAL SURVEY 56653/1–56653/19
 - METROLINK HAS A SEPARATE DRAINAGE SYSTEM WHICH IS NOT PART OF THE SCHEME, THE AREA IS CLASSED TO BE IMPERMEABLE. REFER TO TABLE.

- KEY:
- SITE BOUNDARY
 - IMPERMEABLE AREA
 - PERMEABLE AREA
 - METROLINK

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

P03	11/11/2022	SM	UPDATED TO SUIT NEW MASTERPLAN	RV	RV
P02	30/09/2022	SM	METROLINK EXTENT ADDED	DW	DW
P01	09/09/2022	SS	FIRST ISSUE	DW	DW
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S3 - FOR REVIEW



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CLIENT: ROCSDALE BOROUGH COUNCIL

ARCHITECT: BROADWAY MALYAN

SITE/PROJECT: ROCSDALE STATION SQUARE

TITLE: PROPOSED DEVELOPMENT PERMEABILITY ASSESSMENT

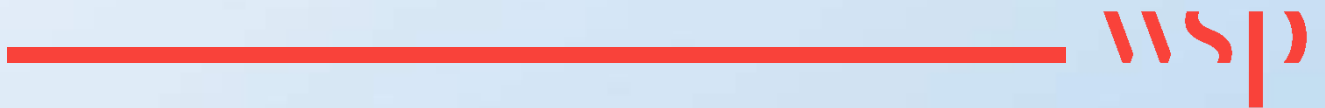
SCALE @ A1: #####	CHECKED: DW	APPROVED: DW
PROJECT NO: 70097916	DESIGNED: SS	DRAWN: SS
		DATE: November 22

DRAWING NO: 70097916-WSP-01-XX-DR-C-005	REV: P03
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Appendix G

DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE



COMPONENT	FREQUENCY	MAINTENANCE STRATEGY
ACO – Drain	6 Months	Jetting hose flushes out silt and detritus. Use of suction hose which removes the silt and detritus.
SuDs Tree Pits	Monthly	Regularly swept clean, removing leaves and detritus material in order to prevent moss growth or possible tanning staining. Tree to be watered during periods of dry weather. Inspection of inlets, outlets and control structures.
	Yearly	Silt removal from soakways and cellular storage
Gullies	6 Months	Drain rods inserted to clear any blockages. Clear the area around the gully of any debris. Rinse the gully to flush the pipe clear of any blockages.
Landscape Area	Fortnightly	Grass to be mown fortnightly during growing season.



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Manchester
M15 4RP

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