Oldham Road Phase 1, Rochdale Development

Drainage Strategy

boothking

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

P##: Preliminary (non-contractual) - review, comment or approval.
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Work in progress
S0: WIP

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S1: Coordination
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2: Concept
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1. Introduction & Scope

1.1. Introduction

Booth King Partnership Ltd. (BKP) were commissioned by our client Willmott Dixon Construction Ltd to carry out Drainage Strategy (DS) to support the planning application erection of the apartment block at Milnrow Road, Deeplish, Rochdale, Greater Manchester, England, OL16 1UA.

This DS 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 Assessment (SFRA). A full list of documents used to inform this report is shown in the Reference section.

Although the site has an area of less than 1 hectare, it lies within Flood Zone 1, therefore an FRA is not compulsory in accordance with the NPPF. The proposed development 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.

The Drainage Strategy Report considers the management of surface water run-off including climate change.

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 recently undertaken site topographical survey, Ground Investigation Report, and drainage record plans.

1.2. Scope

Our client Willmott Dixon Construction Ltd has requested Booth-King Partnership Ltd. to undertake a drainage design scheme and provide a drainage strategy for the purposes of planning permission from the Rochdale Borough Council for a site, shown in Figure 1.

2. Existing Site

2.1. Location

The site is located at the centre of Rochdale and is surrounded a mixture of houses, small businesses and the Central Retail Park to the east. The proposed development being 0.82ha, Phase 1(red line boundary) of a larger residential development (blue line boundary) and it is located at Ordnance Survey Grid Reference E: 389966, N: 413006.

A Site Location Plan can be found in Appendix A.

Figure 1. Existing Site

2.2. Site Levels

Several topographic surveys of the site have been completed with the latest showing that Phase 1 site slopes from the southwest boundary of site with levels circa 140.78m AOD towards the north boundary with low levels of 137.20m AOD to

The topographical survey is presented Appendix B.

2.3. Existing Drainage

Several CCTV and ground penetration radar surveys have conducted prior to the remediation and after. There were separate surface water network and foul water network are within the site boundary which have since been removed or abandoned.

During the above said surveys, several connections from the private network have been established to the United Utilities combined network.

There is a 600 x 900mm combined public sewer located to the east of the site within Oldham Road. The sewer flows in a north-westerly direction. There is a combined public sewer (225mm) located to the north of the site within Milnrow Road. The sewer flows in a westerly direction. There were also defects on this sewer limiting access to survey). There is a 900mm combined public sewer located to the west of the site within Drake Street (along the north-western side of the Metrolink tramline). The sewer flows in a north-easterly direction. There is a 750mm combined public sewer located to the south of the site within Richard Street. The sewer flows in a north-westerly direction, crosses below the tramline before connecting into the above mentioned 900mm sewer.

Refer to Appendix B for United Utilities Map.

Figure 2. United Utilities Map Extract

2.4. Geology

Made Ground is not indicated to be present on BGS mapping, made ground associated with historic development is present on site, in addition to the infilled canal basins and infilled canal.

The BGS maps confirm that the site is primarily underlain by Glaciofluvial Deposits (superficial deposits) comprising sand and gravel with some clay and silt.

The bedrock geology is described as the Pennine Lower Coal Measures Formation (sandstone, siltstone, mudstone, some coal).

The site is not located within a Groundwater Source Protection Zone

2.5. Hydrogeology

According to Phase 2: There are two groundwater abstraction points located within 1km of the site boundary. Both licences are noted to have been revoked. The nearest entry is recorded 453m northeast and is operated by Rochdale MBC for boiler feed and private water supplies (domestic).

No potable groundwater abstractions are located within 1km of the site.

The site is not located within a Source Protection Zone.

The nearest surface water feature is the River Roch, flowing east to west, recorded 221m north of the site. It has flow of less than 5 cumecs, and a River Quality GQA Grade C.

There are thirteen recorded surface water abstraction points located within 1km of the site boundary. The nearest are two abstractions for the production of energy (hydroelectric power) 248m to the north. Two further abstractions are located 249m north to transfer water between sources for remedial river/wetland support. There are no potable surface water abstractions within 1km of the site.

3. Flood risk

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

3.1. Fluvial/ Tidal Flooding

The site is currently located within an area defined as Flood Zone 1.

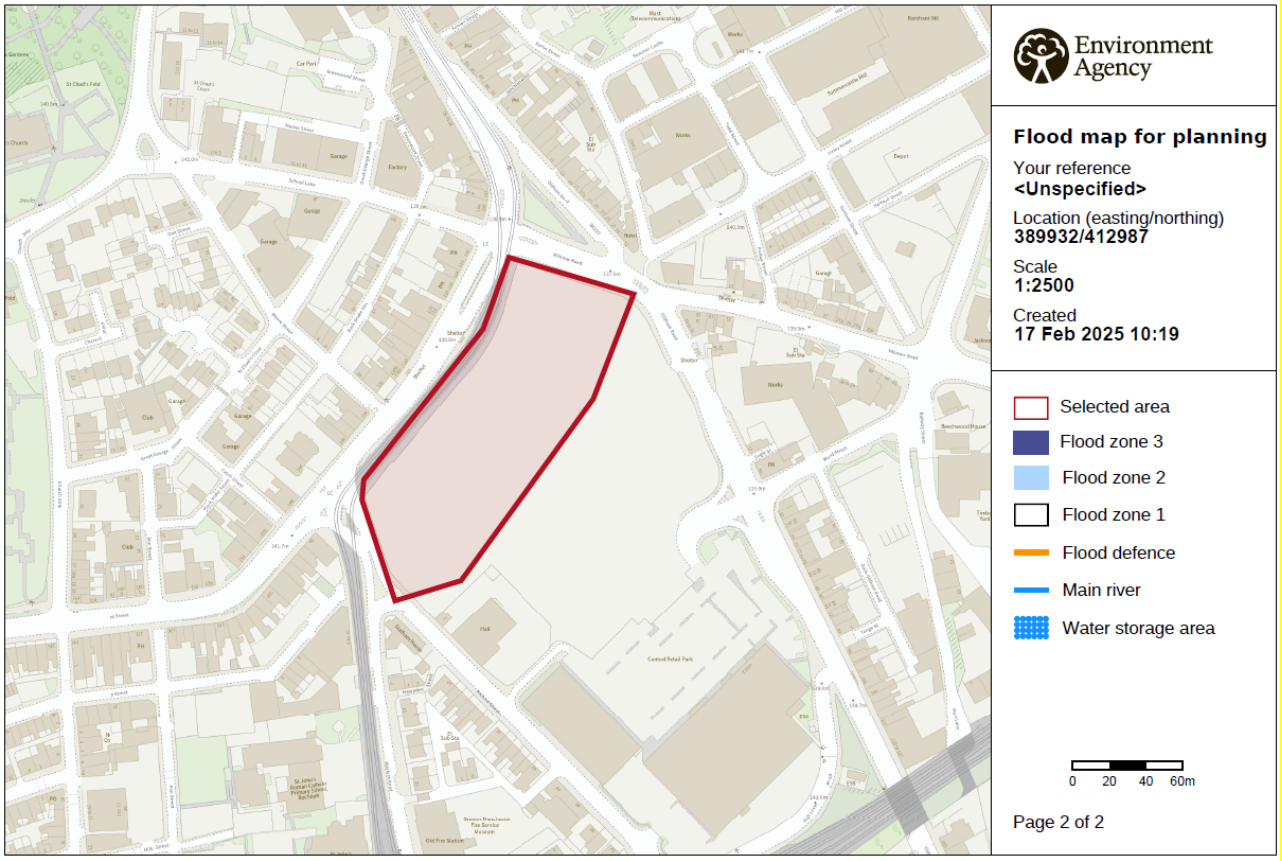

Figure 3. Extract from EA Flood Map for Planning

No further action is required.

3.2. Surface Water Flooding

The EA's surface water flood map shown in Figure 5 shows the flooding risk is low for most of the site, however within the centre of the overall development, with small areas that are identified as high chance.

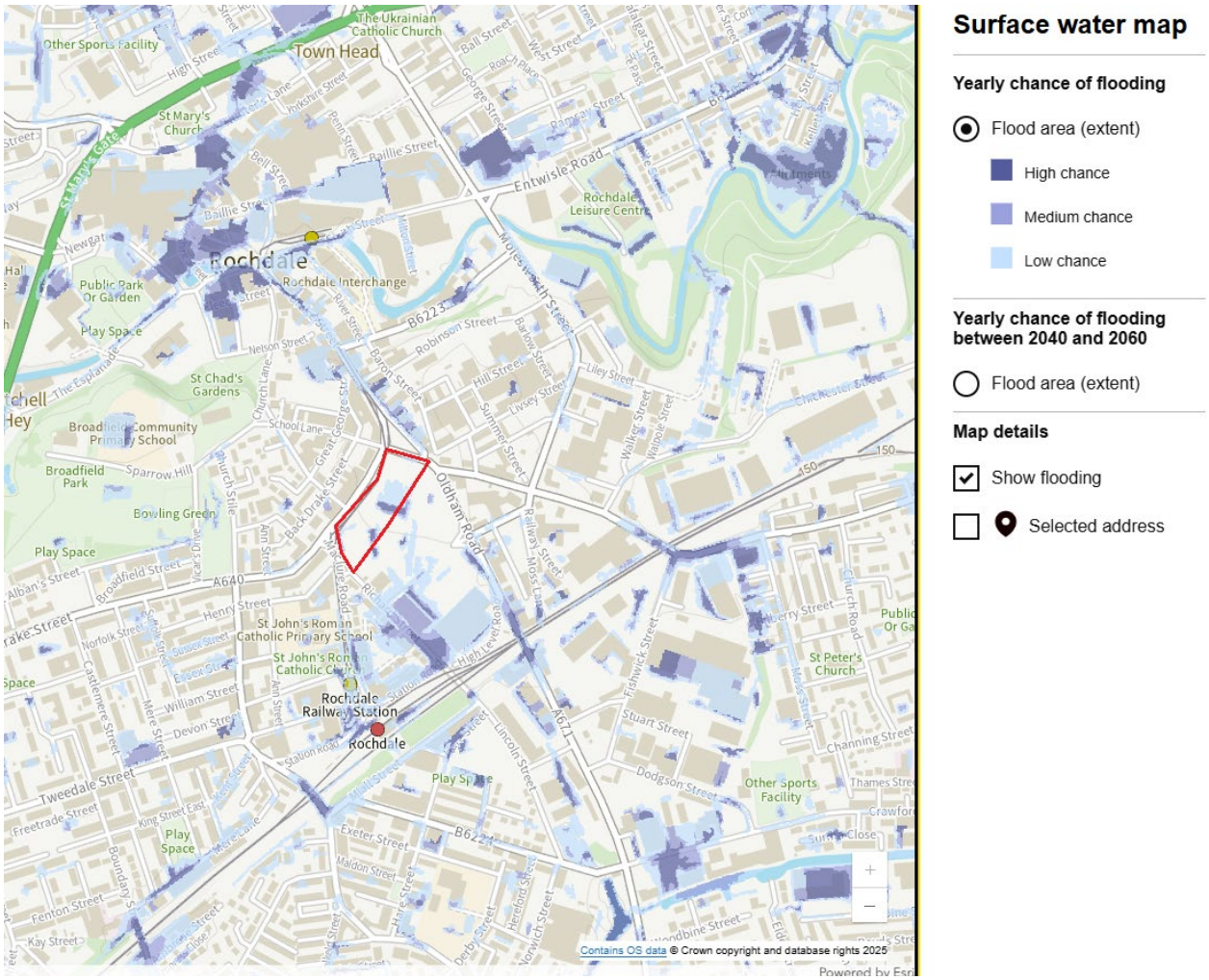

Figure 4. EA - Surface Water Flooding

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.

3.3. Groundwater Flooding

According to Rochdale Borough's Strategy for Flood Risk Management 2014- 2024 (issued March 2014) to Groundwater flooding occurs where water levels in rock and soil are high enough for the water to appear near to or above ground. It can be caused by rainfall either locally or some distance away. Whilst this is uncommon as a type of flooding, limited smaller scale flooding, often of cellars and under floors has occurred. Further work to identify areas where this is a significant source of flood risk will be undertaken by the LLFA working with other risk management agencies. An illustration of areas susceptible to groundwater flooding can be seen in figure below.

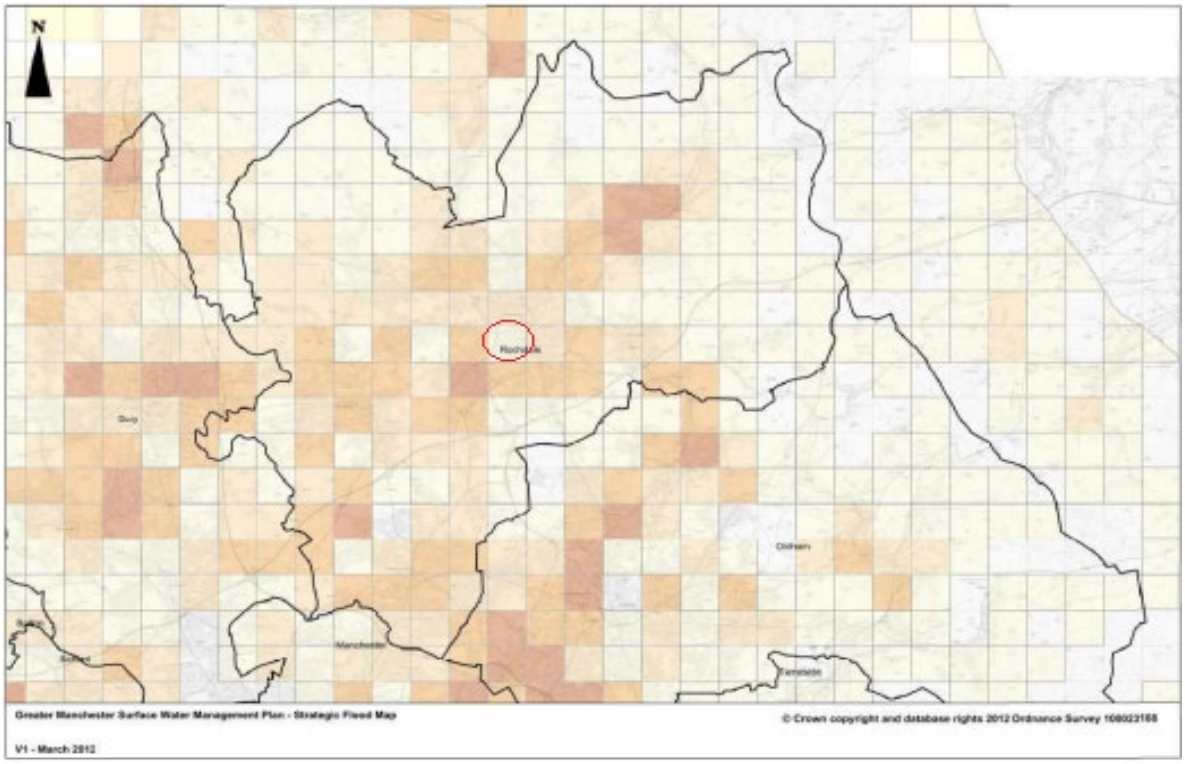

Figure 5. Local Flood Risk Management Strategy

Based on the results of Neighbourhood, Rochdale Phase 2 Ground Investigation conducted by Curtisn Ltd (July 2021), groundwater monitoring standpipes were installed within twelve of the window sample boreholes and twelve of the cable percussive boreholes.

Groundwater was located and the results can be found in Neighbourhood, Rochdale Phase 2 Ground Investigation Curtins Ref: 075882-CUR-00-XX-RP-GE-001 V02 issued July 2021.

3.4. Flooding from Anthropogenic Sources

Flooding from a reservoir and can occur from 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.

What a reservoir is	A reservoir is a large natural or artificial lake that is designed to collect and store water.
How we check an area's risk	We use predicted scenarios to understand the risk of flooding from 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.

Figure 6. Extract from https://check-long-term-flood-risk.service.gov.uk/ground-water

4. Surface Water

In accordance with the NPPF and SFRA, consideration should be given to natural water flows at the site. The development 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

A Proposed Site Layout has been provided by Leach Rhodes Walker Architects, and it is understood that the site is to be developed to erection of an apartment block at the heart of Rochdale.

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 DS, 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 in the 1 in 100year event to allow for climate change for the Irwell Management Catchment peak rainfall allowances.

A 45% increase for the 1 in 100 year event 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.

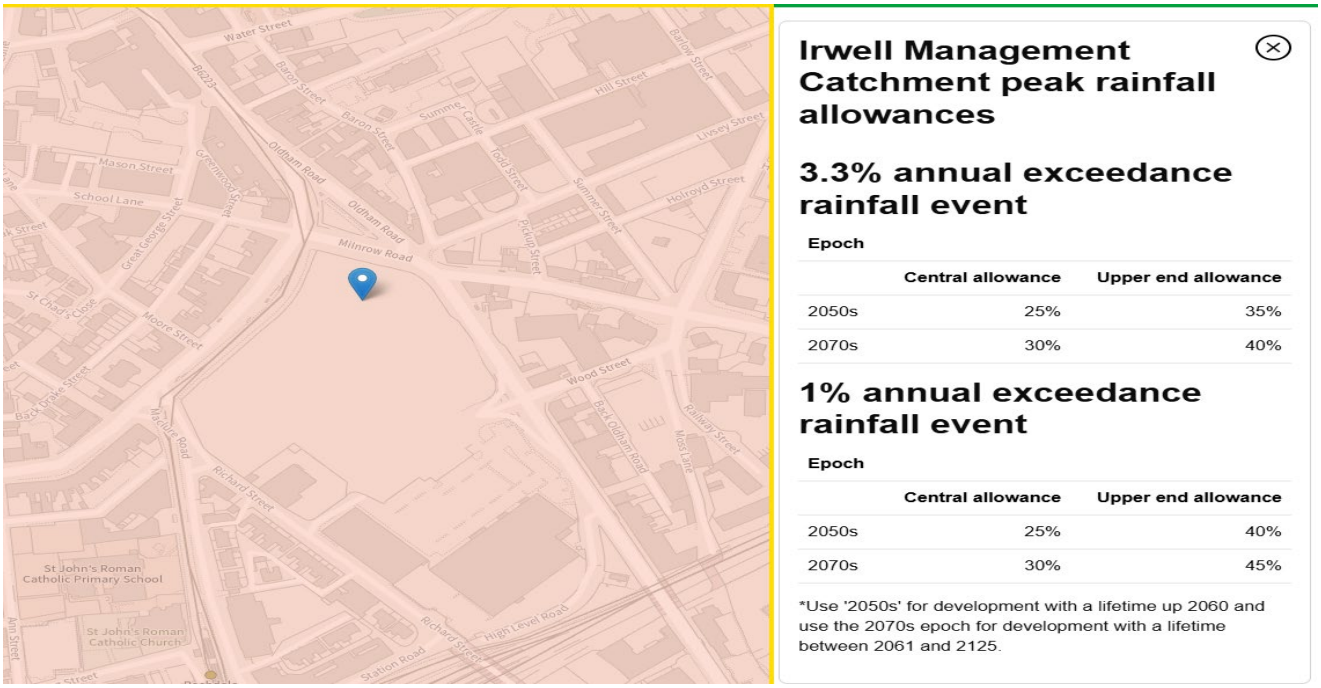

Figure 9. Climate Change Allowance Interactive Map

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 8):

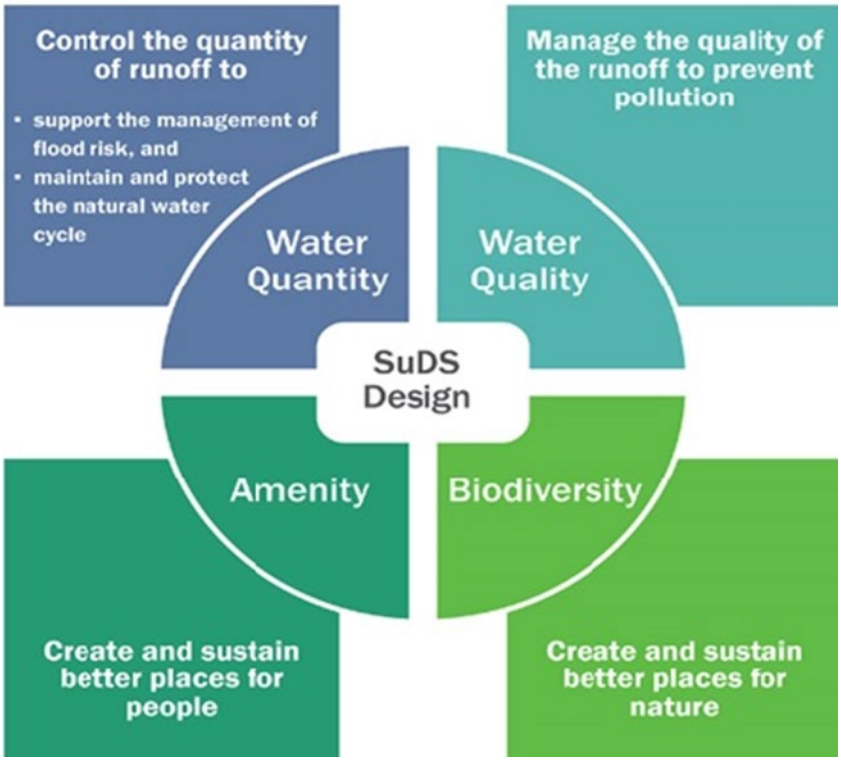

Figure 10. Four Pillars of SuDS

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 increased as the impermeable area is increased, 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 attenuation tank at a restricted discharge rate. The flows arising from the building roof will initially be treated via a network of pipes. All flows will be collated within the site prior to discharge restricted into United Utilities Combined Sewer Network.
- **Biodiversity** will be addressed by the green areas and vegetation areas around the site, 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 of an apartment block at the centre of Rochdale provided in Appendix A.

5.1. Proposed Foul Water Network

It is proposed to install a new gravity system to the development discharging to a combined manhole within the site prior discharging. The foul network discharging into a United Utilities Asset.

Drainage Strategy drawings can be found in Appendix C.

5.2. Proposed Surface Water Network

In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration. A review of the available geological information for the surrounding area indicates potential groundwater contamination; therefore, infiltration is not recommended. Discharge to a watercourse has been also eliminated as no watercourse is close to the site and the intension is for the proposed surface water flows arising from the roofs of the buildings are to be discharge with a restricted flow into a manhole within the site before discharging into the combined UU Sewer Network.

Based on previous experience, any developers seeking to develop should be aiming to achieve as close to Greenfield runoff rates as possible.

Previous discussion have come to an agreement with the overall development discharge rate to 26 l/s. it is proposed that the Phase 1 to discharge at the resticted flow of 5 l/s.

Flows arising from the proposed development Phase 1 will be restricted to 5.0 l/s + 45%CC event.

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 devices which control the rate of discharge into the dedicated surface water sewer to the proposed discharge rate.

Both proposed foul and surface water networks come together within the site to a combined network.

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

6. Conclusions & Recommendations

6.1. Conclusions

This Drainage Strategy Report follows guidance set out in the NPPF and the 'Planning Practice Guidance – Flood Risk and Coastal Change' and follows Environment Agency Guidance Note 1.

A review of the EA Indicative Flood Mapping and other relevant data indicates that the site is located within a tidally defined Flood Zone 1, therefore no further actions are required.

There are no recorded historical flood events.

Surface water run-off produced by the proposed development is to discharge with a restricted flow into the Combined United Utilities Sewer Network.

Flows arising from the proposed development will be restricted to 5.0 l/s + 45%CC event.

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.
Attenuation Tank	Ensure that ventilation pipework is free of obstruction.	6 monthly basis. After extreme events

	If jetting through the tank is required, this must be done following the jetting and clearance of upstream sumps	

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.	Topographical survey.
6.	BURY ROCHDALE AND OLDHAM STRATEGIC FLOOD RISK ASSESSMENT VOLUME I – SFRA User Guide. Final report December 2009
7.	BURY ROCHDALE AND OLDHAM STRATEGIC FLOOD RISK ASSESSMENT VOLUME III – Level 2 SFRA. Final Report November 2009
8.	Rochdale Borough's Strategy for Flood Risk Management 2014- 2024. March 2014
9.	Level 1 Strategic Flood Risk Assessment for Greater Manchester – Bolton MBC Sites Assessment Final Report February 2019
10.	Oldham Council Hybrid SFRA Volume I: User Guide Final January 2010
11.	Level 1 Strategic Flood Risk Assessment for Greater Manchester - Update Final Report March 2019
12.	Neighbourhood, Rochdale Phase 2 Ground Investigation Curtins Ref: 075882-CUR-00-XX-RP-GE-001 Revision: V02 Issue Date: 23 July 2021
13.	Neighbourhood, Rochdale Phase 1 Preliminary Risk Assessment Curtins Ref: 075882-CUR-00-XX-RP-GE-001 Revision: V01 Issue Date: 07 October 2020
14.	Enabling Works, Neighbourhood, Rochdale Flood Risk Assessment and Drainage Strategy Curtins Ref: (075882) NHRH-CUR-00-XX-RP-C-92001 Revision: V01 Issue Date: 09 July 2021
15.	https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall
16.	Manchester City, Salford City and Trafford Council Level 2 Hybrid SFRA LEVEL 2 SFRA Final March 2011

APPENDIX A

LOCATION PLAN – PHASE 1 ARCHITECT'S PROPOSED DEVELOPMENT