

Flood Risk Statement and Drainage Strategy

Proposed Residential Development – 13 new dwellings

Cross Lane and Varey Street

Southway Housing Trust

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1.0 EXECUTIVE SUMMARY

- 1.1 SCP have been commissioned by Southway Housing Trust to provide a Flood Risk Statement (FRS) and Drainage Strategy (DS) report in respect of a Planning Application for 13 new dwellings on two new sites at Cross Lane and Varey Street, Manchester.
 - 1.2 The existing site is currently a greenfield site.
 - 1.3 The Flood Risk Statement has reviewed all sources of flood risk to both the proposed development and to the adjacent areas as a result of the development proposals and has identified the site as being at low risk of flooding from fluvial and pluvial sources; therefore, the development site is Flood Zone 1.
 - 1.4 The site is in an area with less than 0.1% risk of fluvial flooding (Flood Zone 1) and based on NPPF 2021 the development proposal is wholly suitable in terms of flood risk as it is a more vulnerable development.
 - 1.5 Discharge via infiltration has the potential to be utilised as the information provided by Magic Map and BGS suggests that the soil conditions are suitable. Further infiltration testing will be required to determine if this is a viable option. However, for the purpose of this report, discharge via infiltration has currently been discounted due to unconfirmed soil conditions and site constraints.
 - 1.6 Discharge via watercourse has been eliminated as a suitable option for discharging surface water flow at this stage as there are no main river or minor watercourses present within the land ownership or within close vicinity of the site.
 - 1.7 Discharge via surface water system has been identified as a **suitable choice** as there is a surface water sewer present on Cross Lane and on Varey Street. Therefore, this option has been chosen as the preferred method for discharging surface water flow.
 - 1.8 Onsite attenuation in the form of attenuation tanks and oversized pipes will be provided in order to account for climate change at 45%, with water quality management techniques being implemented in order to provide treatment to surface water flows.
 - 1.9 The proposed surface water discharge rate for each development is restricted to 2.5 l/s for maintenance purposes and to reduce blockages. The discharge rate will need to be accepted and confirmed by the LLFA and United Utilities through the planning process. The discharge from the site will be controlled by a flow control.
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- 1.10 The foul water for the development is proposed to discharge into the existing combined sewer in Cross Lane. The discharge rate for Site 1 will be: 4.1 l/s with the discharge rate from Site 2 at 3.5 l/s.

2.0 INTRODUCTION

Appointment

- 2.1 SCP have been commissioned by Southway Housing Trust to provide a Flood Risk Statement and Drainage Strategy to support a planning application for two development sites comprising of 13 new dwellings located on existing greenfield land at Cross Lane and Varey Street, Manchester.

Proposed Development

- 2.2 The current development proposal is to provide two sites comprising of 13 new dwellings.
- 2.3 Site 1 is located on Cross Lane which consists of 8 new dwellings, comprising of 4 2-bedroom dwellings, 4 1-bedroom dwellings, associated landscaping and car parking.
- 2.4 Site 2 is located on Varey Street which consists of 5 new dwellings, comprising of 1 3-bedroom dwellings, 4 1-bedroom dwellings, associated landscaping and car parking.
- 2.5 The site lies within the Environment Agency flood zone 1 based on a review of their Flood Risk Map for Planning, see Appendix G.
- 2.6 The total development area of both sites is 1855m² which equates to 0.1855 ha.
- 2.7 The total impermeable area draining into the proposed drainage network is 1023m² which equates to 0.1023 ha, see Appendix C.
- 2.8 See Appendix A for a Proposed plan of the sites.

Objective of Strategy

Scope of the Flood Risk Assessment

- 2.9 The objective of the strategy is to undertake a site-specific Flood Risk Statement in accordance with the National Planning Policy Framework 2021 (NPPF).
- 2.10 The detail and complexity of a Flood Risk Statement should reflect the level of risk to the site. The NPPF 2021 is the official document that regulates the assessment of flood risks and their appropriate mitigations to the planning process.
- 2.11 The 'Technical Guidance to the National Planning Policy Framework' was superseded in 2014 and this has been replaced with Planning Practice Guidance 2016 which is available on the
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www.gov.uk webservice. In developing a site, Developers and applicants need to consider flood risk to and from the development site.

2.12 A site-specific flood risk statement should:

- Consider whether a proposed development is likely to be affected by current or future flooding from all sources of flooding [NPPF 2021] rivers, groundwater, and sewers.
- Establish whether it will increase flood risk elsewhere;
- Identify whether the measures proposed to deal with these effects and risks are appropriate;
- Review the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;
- Assess whether the development will be safe and pass the Exception Test, if applicable.

2.13 The site-specific flood risk statement should also be:

- Proportionate to the risk and appropriate to the scale, nature and location of the site;
- Take the impacts of climate change into account;
- Consider both the potential adverse and beneficial effects of flood risk management infrastructure including raised defences, flow channels, flood storage areas and other artificial features together with the consequences of their failure;
- Consider the vulnerability of those that could occupy and use the site, taking account of the Sequential and Exception Tests and the vulnerability classification including arrangements for safe access/egress;
- Consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- Consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
- include the assessment of the remaining (known as 'residual') risks after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development or land use;
- Consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems;
- Be supported by appropriate data and information, including historical information on previous events.

2.14 This report therefore assesses flood risk to the site and any impact on flood risk to other land because of the development proposals.

Scope of the Drainage Strategy

- 2.15 The scope of the drainage strategy is to set out the principles of the drainage design for the proposed development and summarise the reasoning behind the chosen design.
- 2.16 The drainage strategy will utilise the hierarchy for disposal of surface waters generated as runoff on the site to ensure that there is not a potential exacerbation of flood risk elsewhere as a result of undertaking the development. This will be undertaken in accordance with widely accepted best practise principles such as detailed in industry guidance such as the C753 SUDS Manual, Design and Construction Guidance, Building Regulations Part H and applicable sections of the National Planning Policy Framework (NPPF) and Planning Policy Guidance (PPG).
- 2.17 The Drainage Strategy aims to provide guarantee that the proposed surface water drainage, safely and appropriately conveys all flows derived from the site to appropriate discharge or attenuation locations, to ensure sustainable and safe site operation. This should be done in accordance with prescribed best practice, building codes and prioritise the incorporation of sustainable urban drainage systems, or SUDS, where appropriate and practicable for the management of surface water.
- 2.18 Additionally, the drainage strategy will identify potential connection points and discharge rates for surface and foul water generated on the site through the sites occupancy and proposed development type.

Limitations

- 2.19 This report has been prepared for exclusive use by Southway Housing Trust for the purpose of assisting them in evaluating the potential risk of flooding associated with the site, proposed drainage strategy and in making a Planning Application.
 - 2.20 SCP accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the Client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of SCP. Any advice, opinions or recommendations within this document should be read and relied upon only in the context of the document as a whole.
 - 2.21 SCP has endeavoured to assess all information provided to them during this assessment and therefore this report has been compiled from a number of external sources.
 - 2.22 The Flood Risk Statement addresses the flood risk posed to and from the proposed development, the extent of which is shown on the Proposed Site Plan, see Appendix A
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- 2.23 This report has been undertaken with the expectation that the site will be developed in accordance with the proposals included within this report, without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

3.0 POLICY & GUIDANCE

- 3.1 In carrying out our assessment and preparing this report, regard has been taken of the provisions of the development plan and a range of other material considerations. However, it is the Government's National Planning Policy Framework 2021 which provide the most up to date and specific guidance on the Scope of Flood Risk Assessments and drainage requirements.

National Planning Policy Framework

- 3.2 The National Planning Policy Framework (NPPF) was published in England in March 2012, re-issued in July 2018 and revised in 2019 and re-issued in September 2021. As a result, the previous NPPF, all previous Planning Policy Guidance Notes (PPGs) and Planning Policy Statements (PPSs) were superseded. This included PPS25: Development and Flood Risk, along with its supplement on Development and Coastal Change. These were replaced with the Planning Practice Guidance for Flood Risk and Coastal Change, available on the gov.uk website. <https://www.gov.uk/guidance/flood-risk-and-coastal-change>
- 3.3 One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.
- 3.4 It advises that where new development is necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible should reduce flood risk overall.
- 3.5 The NPPF's flood risk advice is all set out in Chapter 14 of the Framework document, meeting the challenge of climate change, flooding and coastal change.
- 3.6 This document has been prepared in accordance with the recommendations and the policies contained within the NPPF 2021 and the associated Planning Practice Guidance 2016.
- 3.7 The National Planning Policy Framework 2021 (NPPF) and accompanying Planning Practice Guidance indicate surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.
- 3.8 Consideration should therefore firstly be given to using sustainable urban drainage (SUDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. Approved document Part H of
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the Building Regulations (2012) sets out a hierarchy for the disposal of surface water which encourages a SUDS approach, as detailed above.

Flood and Water Management Act 2010

- 3.9 The Flood and Water Management Act 2010 received Royal Assent on 8th April 2010. This Act provides duties on the Environment Agency, Local Authorities, Developers and other bodies to manage flood risks. The Act has significant planning and design implications for Developers.
- 3.10 It should be noted that these standards and procedures are being reviewed by the respective regulatory bodies and third parties against the requirements imposed by the Flood and Water Management Act 2010. The advice and recommendations provided may change when associated regulations have been issued in order to implement the full scope of the Act.

LLFA Technical Requirements

- 3.11 The main areas affecting Developers are:
- Lead Local Flood Authority (LLFA) or regional Water Authority to adopt and maintain sustainable urban drainage systems (SUDS).
 - Approval fees and non-performance bonds to be standardised.
 - DEFRA prepared and issued Non-statutory SuDS technical standards document in 2015, which should be used along with the SuDS Manual (C753); Non-statutory Technical Standards for SuDS: Practice Guidance, LASOO 2016; and LLFA policy and guidance documentation.
 - Changes to the rights to connect to sewers will restrict automatic connection rights to only Section 104 sewer schemes or approved SUDS schemes constructed to a new national sewer or new SUDS standard respectively.
 - Two options for the SUDS approval process. Either directly to the SUDS Approval Body or as a combined application to the Planning Authority as part of the Planning Application.
- 3.12 Manchester's Local Development Framework contains the following policy for consideration with regards to flood risk:
- Policy EN 14 - Flood Risk

The general principles of Policy EN 14 include:

- Development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).
- All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In Critical Drainage Areas, evidence to justify the surface water run-off approach / rates will be required.
- The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

3.13 Further guidance for consideration by Manchester City Council is the Local Flood Risk Management Strategy (LFRMS). The overall aim of the LFRMS is to ensure that local flood risk is properly managed by using the full range of options in a coordinated way. This will be achieved by meeting overarching objectives for managing local flood risk:

- Reduce the likelihood, severity and consequences of flooding from Ordinary Watercourses, from Groundwater and from Surface Water run-off.
- Seek opportunities to improve water quality and biodiversity through flood risk management activities.

3.14 Manchester City Council has a Strategic Flood Risk Assessment (SFRA). A review of the SFRA has identified the following key objectives:

- To investigate and identify the extent and severity of flood risk to the area. At present and in the future.
 - Contribute to the Council's Sustainability Appraisal.
 - Enable the Council to apply the Sequential Test and the Exception Test.
 - Provide strategic flood risk guidance and advice to planners and developers.
 - Help local planning authorities to identify specific locations where further and more detailed flood risk data and assessment work is required.
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CIRIA Guidance

3.15 The CIRIA publication 'C624 Development and Flood Risk – Guidance for the Construction Industry', define three levels of FRA which can be undertaken:

Table 1 - Levels of Flood Risk Assessment

FRA Level	Description/Scope
Level 1	Screening Study to identify whether there are any flooding or surface water management issues related to a development site that may warrant further consideration. This should be based on readily available existing information, including the SFRA, Environment Agency Flood Map and Standing Advice. The Screening Study will ascertain whether a FRA is required.
Level 2	Scoping Study to be undertaken if the Level 1 FRA indicates that the site may lie within an area that is at risk of flooding or that the site may increase flood risk due to increased run-off. This Study should confirm the sources of flooding which may affect the site and should include the following: • An appraisal of the availability and adequacy of existing information; • A qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere; • An appraisal of the scope of possible measures to reduce the flood risk to acceptable levels. • The Scoping Study may identify that sufficient quantitative information is already available to complete a FRA appropriate to the scale and nature of the development.
Level 3	Detailed Study to be undertaken if the Level 2 FRA concludes that further quantitative analysis is required to assess flood risk issues related to the development site. The Study should include: • Quantitative appraisal of the potential flood risk to the development; • Quantitative appraisal of the potential impact of development site on flood risk elsewhere; • Quantitative demonstration of the effectiveness of any proposed mitigation measures.

3.16 A Level 1 flood risk assessment is sufficient as the site is at very low risk of flooding and in Flood Zone 1.

4.0 EXISTING SITE CHARACTERISTICS

Site Location

- 4.1 The development site is split into two locations; Site 1 is located south of Cross Lane and Site 2 is located east of Varey Street, Manchester, M18 8WY. The area is predominantly residential which is made up mainly of terraced houses.
- 4.2 An approximate postcode for the development area is M18 8WY and OS Co-ordinates 388927E, 396285N.



Figure 1 – Site Plan (source: Google Earth Pro, 2023)

Table 2 – Site Description

Area	0.1855 hectares or 1855m ²
Existing Surfacing	The existing site is a greenfield site
General Topography	The general topography of Site 1 gradually falls from east to west. The levels range from approximately 72.160AOD in the east to 70.800AOD in the south. The general topography of Site 2 falls from the middle of the site to the boundaries due to there being a grass bank in the centre. The levels range from approximately

		74.380AOD at the top of the grass bank to 73.31AOD at the bottom of the bank.
Current Use		The site is currently undeveloped
Previous Use		Currently unknown
Watercourses		The Gore Brook River is circa 390m to the south
Boundaries	North	Site 1: Cross Lane Site 2: Gospel Hall Church and residential housing
	East	Site 1: Chapman Street Site 2: The Cotton Tree Public House
	South	Site 1: Residential Housing Site 2: Cross Lane
	West	Site 1: Car parking area Site 2: Varey Street
Access	Vehicular	The sites are currently undeveloped
	Pedestrian	The sites are currently undeveloped

4.3 The existing development site is currently a greenfield site.

4.4 An assessment of the existing greenfield runoff rates has been undertaken using the ICP method on Micro-drainage. Calculations are summarised in Table 3 and can be found in Appendix E.

Table 3 – Existing Runoff Rates

Return Period (Yr.)	Existing Runoff Rate (l/s)
1 Year	0.9 l/s
30 Year	1.8 l/s
100 year	2.2 l/s

Existing Public Sewers

- 4.5 Records from United Utilities have shown that there is a 600mm combined sewer present along Cross Lane which flows from east to west. A 225mm surface water sewer is also present along Cross Lane, flowing east to west.
- 4.6 Additionally, there is a surface water sewer and a 300mm combined water sewer present on Varey Street, flowing north to south.

Watercourses, Land Drainage and other Waterbodies

- 4.7 There are no main river or minor watercourses present within the land ownership or close vicinity of the site.
- 4.8 The nearest watercourse to the site is the Gore Brook River which is located approximately 390 metres from the development site and the Gorton Lower Reservoir which is located around 500 metres south-east of the development site.

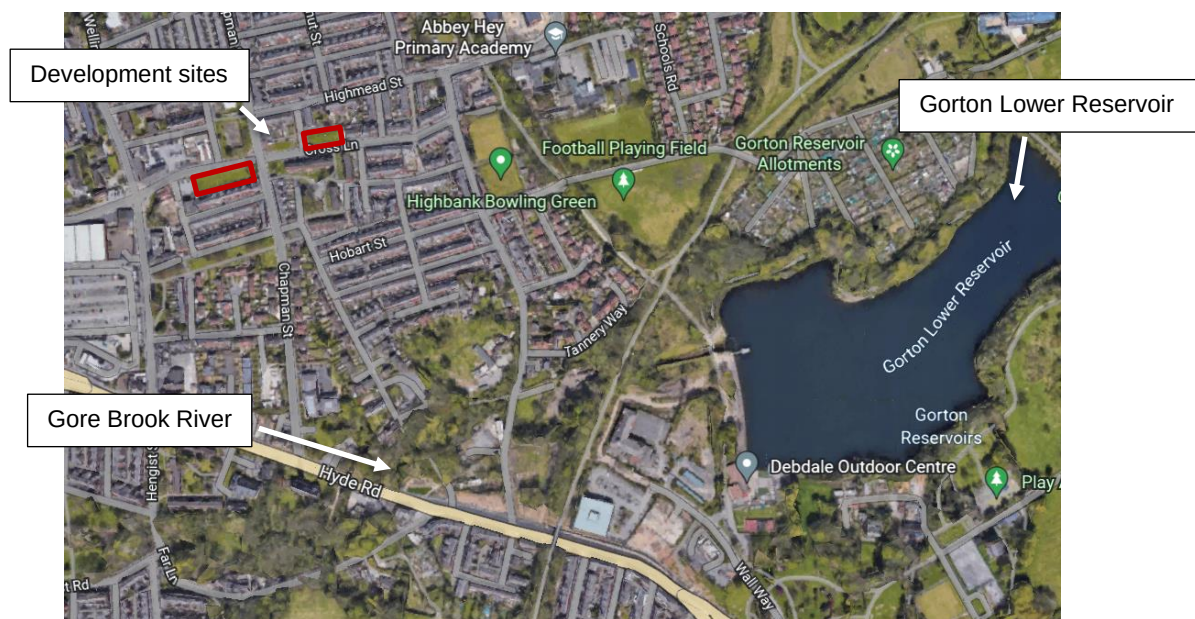


Figure 2: Nearest Watercourse to Development site (source: Google Earth Pro, 2023)

Existing Flood Defences and Other Structures

- 4.9 There are no flood defences recorded on any maps within close proximity to the application site.

Historical Land Use

- 4.10 The historical land use of the development area is unknown.

Geology

- 4.11 Ground Investigation reports have not been provided, therefore the geology information has been based on freely accessible information from Magic Maps and British Geology Survey (BGS).
 - 4.12 Information taken from Magic Maps online service indicates that the site is located within a Bedrock geological area designed by the EA as Principal Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage.
 - 4.13 The superficial deposits for the development area are classified by the Environment Agency as Secondary (A) Aquifer. These layers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
 - 4.1 The site is located within an area identified as 'Slowly permeable seasonally wet acid loamy and clayey soils', as provided on Magic Map website.
 - 4.2 Magic Maps identified the development site as being medium – low groundwater vulnerability.
 - 4.3 Magic maps also identifies the site as not being within a priority of Flood Risk Management Priorities for England for Countryside Stewardship zone.
 - 4.4 The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally applies, to a groundwater source.
 - 4.5 The proposed development site is identified by the Environment Agency as not being located within any of the source protection zones.
 - 4.6 Information provided on British Geology Survey (BGS) has stated that the bedrock geology of the development site is 'Chester Formation – Sandstone' with superficial deposits consisting of 'Till, Devensian – Diamicton'.
 - 4.7 See Appendix H for all map extracts from Magic Maps and BGS.
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5.0 DEVELOPMENT PROPOSALS

- 5.1 The development proposal consists of 13 dwellings across two sites including associated landscaping and parking facilities. The most current plan of each site provided by BTP Architects can be found within Appendix A.
- 5.2 The total development area of both sites is 0.1855ha, and 0.1023ha (55%) will be draining into the drainage network.



Figure 3: Proposed Site 1 Plan

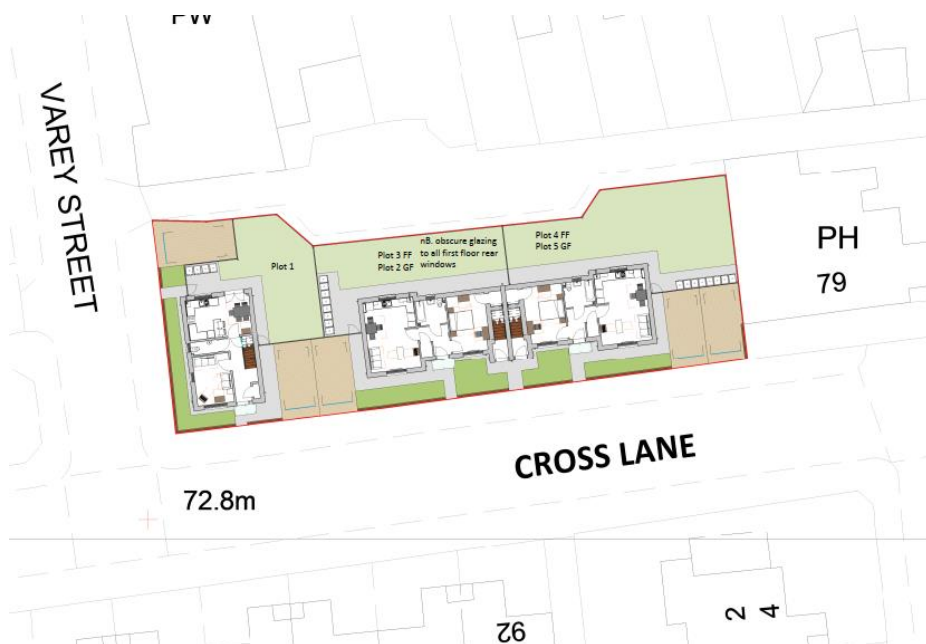


Figure 4: Proposed Site 2 Plan

- 5.3 The surface water sewer system for Site 1 is proposed to connect into an existing surface water sewer system on Cross Lane, whilst the foul water is proposed to connect into an existing combined sewer system located on Cross Lane.
 - 5.4 The surface water sewer system for Site 2 is proposed to connect into an existing surface water sewer system on Cross Lane, whilst the foul water is proposed to connect into an existing combined sewer system also located on Cross Lane.
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6.0 FLOOD RISK ASSESSMENT

Sources of Flood Risk

Source	Definition	Likelihood
Fluvial	River Flood	Low
Pluvial	Surface Water Flooding	Low
Coastal - Sea	Tidal Surge	Not Applicable
Coastal - Estuarine	Tidal Surge	Not Applicable
SWS, FWS, CS, CSO	Sewer Flooding	Low
Groundwater	Emergence from ground	Low / Unknown

- 6.1 Information relating to flood risk at the site has been obtained via Environment Agency's online flood mapping tool and Manchester City Council's Strategic Flood Risk Assessment maps from their website. This information has been presented below.
- 6.2 Additional information has been requested from the Environment Agency, in the form of their Product 4. The information provided in the Product 4 includes flood zones, defences and storage areas, areas benefiting from defences, statutory main river designations, historic flood event outlines and more detailed information from computer river models.
- 6.3 The response received regarding the Product 4 request, the Environment Agency stated that because the site does not fall within 150 metres of an area at risk of flooding from rivers or sea, they do not hold any detailed flood modelling data that would impact the site.

Fluvial Flood Risk (River Flood)

- 6.4 Examination of flood maps from the Environment Agency shows that the site is located within an area classified as Flood Zone 1 with the risk of flooding as very low and having a 0.1% (1 in 1000) chance of flooding, see Appendix G.
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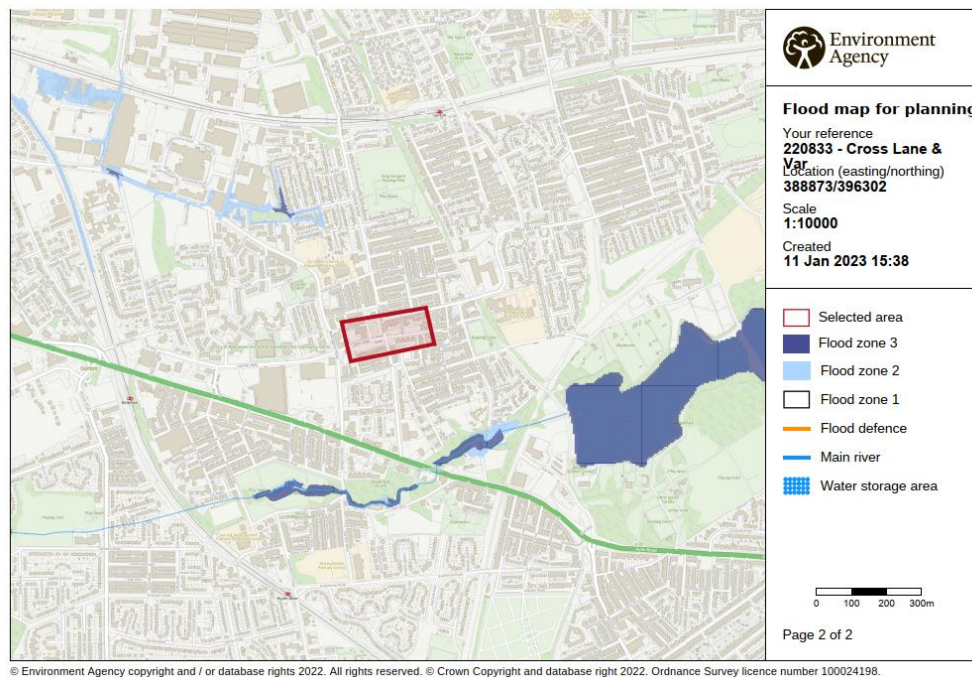


Figure 5: Environment Agency's Flood Map for Planning (Source: EA online maps 2023)

Pluvial Flood Risk (Emergence from Ground Surface Flooding)

- 6.5 Pluvial flooding is defined as flooding resulting from rainfall-generated overland flow before runoff enters any watercourse or sewer.
- 6.6 It is usually associated with high intensity rainfall events but can also occur with low intensity rainfall or melting snow where ground is saturated, frozen, developed or otherwise has low permeability resulting in overland flow and ponding in depressions in the topography. Large catchment areas are particularly prone to this type of flooding.
- 6.7 The Environment Agency Flood Mapping shows the development area does not indicate pluvial flooding; however, the adjacent roads of Cross Lane and Vary Street are subject to low-risk surface water flooding, see Figure 6.
- 6.8 The areas of surface water flooding have a flood depth of below 300mm, see Figure 7.



Figure 6: Environment Agency's flooding from surface water (Source: EA online maps 2023)

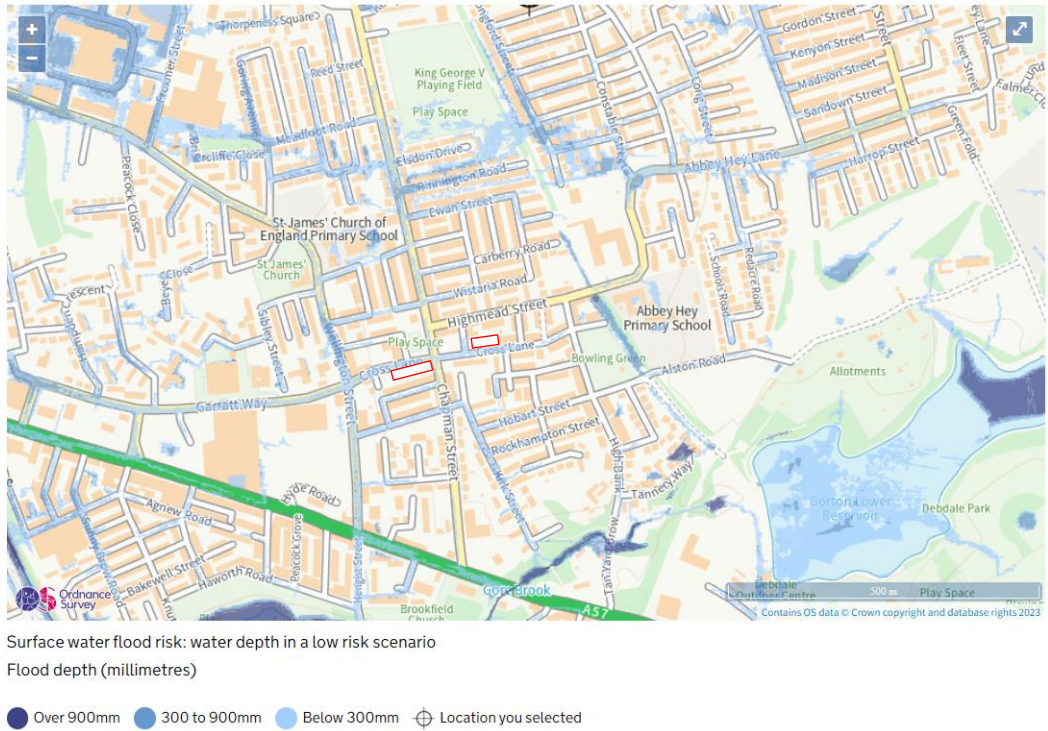


Figure 7: Environment Agency's flooding from surface water – low-risk depths (Source: EA online maps 2023)

Environment Agency Reservoir or Canal Failure Flood Map

- 6.9 The Environment Agency online flood mapping shows that the development site is not at risk of flooding from reservoirs or canal failures, see Figure 8.

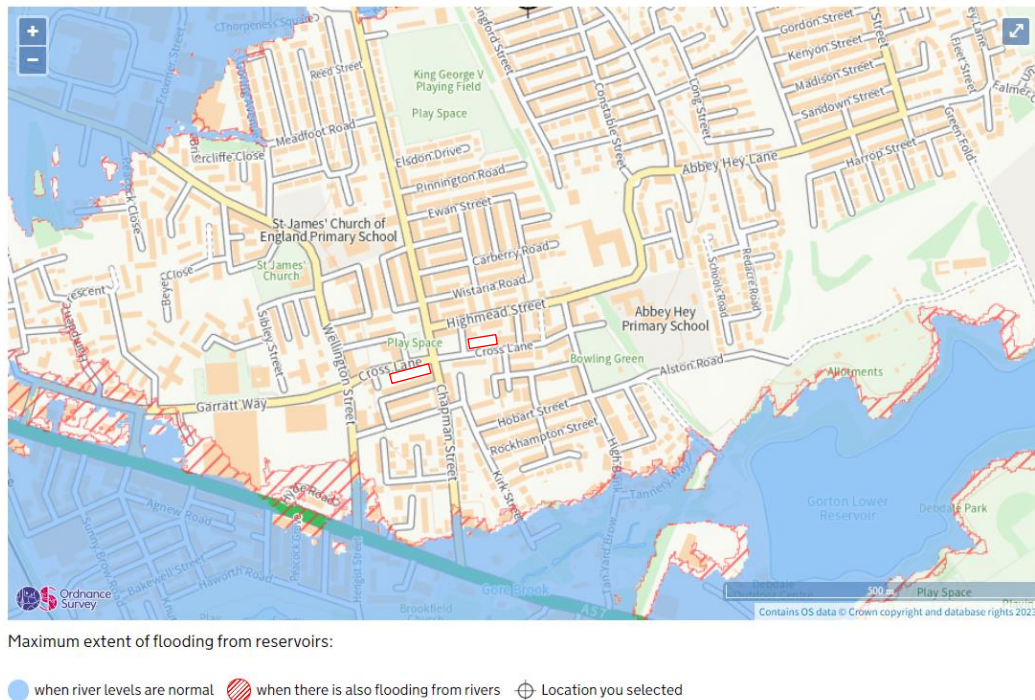


Figure 8: Environment Agency's flooding from reservoirs (Source: EA online maps 2023)

Groundwater Flood Risk

- 6.10 In general terms, groundwater flooding can occur from three main sources; raised water tables, seepage and percolation, and groundwater recovery or rebound.
- 6.11 If groundwater levels are naturally close to the surface, then this can present a flood risk during intense rainfall.
- 6.12 As reviewed on the Magic Maps online website, information relating to the groundwater and geology for the UK is available to be reviewed for specific areas. This has been completed for the development. The site is in a medium – low risk area for groundwater vulnerability.
- 6.13 The site is not located within the groundwater source protection zone.
- 6.14 Following a review of Manchester City Council's Strategic Flood Risk Assessment Groundwater flooding map, it is apparent that there are no significant ground water issues identified within the area, see Appendix I.

- 6.15 The groundwater level is currently unknown for the development site and could be determined following Ground Investigations being complete.

Sewer Flood Risk

- 6.16 There are existing United Utilities sewers located within the immediate vicinity of the site. There are both surface water sewers and combined sewers present along Cross Lane and surrounding side roads.
- 6.17 It is not known whether there are any existing flood issues with these existing sewers.

Historical Flooding Information

- 6.18 There is no historical flooding available on the DEFRA Spatial Data website.
- 6.19 The Environment Agency stated, within the information provided, that they do not hold records of historic flood events from rivers and/or the sea affecting the area local to the development site.

Flood Risk Vulnerability Classification

- 6.20 An assessment of the proposed development type (“Building used for dwelling houses” developments are considered “More Vulnerable” within the NPPF) against the appropriate Environment Agency’s flood zones (site is located in Flood Zone 1) as per *Table 2: Flood Risk Vulnerability Classification* of the NPPF has highlighted that the site is considered to be classified as ‘more vulnerable’.
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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

- 6.21 Therefore, the site location is considered as suitable and flood risk to people, property and the environment is considered low, providing that the proposed fluvial flood risk mitigation measures of providing surface water management techniques, such as the use of SUDS or attenuation controls are identified and correctly implemented to ensure potential localised flooding and contaminated surface water runoff issues are avoided.

7.0 SUSTAINABLE URBAN DRAINAGE SYSTEMS

- 7.1 CIRIA guidance sets out 4 key pillars for SuDS; water quality, water quantity, amenity and biodiversity. These 4 pillars provide guidance on design criteria that should be achieved on a scheme wherever possible.
- 7.2 As part of the drainage strategy, a SuDS assessment has been completed for the development site, in-line with standard guidance CIRIA SuDS Manual [C753] and the following is summarised:

SuDS	Present	Potential	Reason
Soakaways	No	Potentially	Requires further tests to determine if viable
Attenuation underground cellular storage Tank	None	Yes	Control flow off site
Pond	No	No	Site Constraints / not practical
Flow Control	No	Yes	Maintain discharge rate
Oil / petrol interceptors	No	No	Awaiting confirmation from United Utilities on final public surface water sewer discharge location
Landscape Relief areas	No	Yes	To be reviewed upon site investigation results
Silt Traps	No	Yes	Prevent silt entering Attenuation tank
Green Roofs	No	No	Due to proposed design of roofs
Water Butts	No	Potentially	To be discussed with Client / Architect
Rainwater Harvesting	No	Potentially	To be discussed with Client / Architect
Filter Strips	No	Yes	To be reviewed upon site investigation results
Filter Trenches	No	Yes	To be reviewed upon site investigation results
Tree Pits	No	Potentially	To be reviewed upon site investigation results
Swales	No	No	Site constraints / not practical
Permeable Pavement	No	Yes	To be discussed with Client / Architect
Infiltration Basins	No	No	Site constraints / not practical
Detention Basin	No	No	Site constraints / not practical

- 7.3 In summary, SuDS features can be implemented on the development site. However, further discussions and investigations are required to identify the most appropriate features for this site.

8.0 DRAINAGE STRATEGY

Introduction

- 8.1 The National Planning Policy Framework 2021 (NPPF)¹ and accompanying Planning Practice Guidance² indicate surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.
- 8.2 Consideration should therefore firstly be given to using sustainable urban drainage (SuDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements.
- 8.3 Approved document Part H of the Building Regulations (2010)³ sets out a hierarchy for the disposal of surface water which encourages a SuDS approach, as detailed above.

Climate Change

- 8.4 There are indications that the climate in the UK is changing significantly, and it is widely believed that the nature of climate change will vary greatly by region. Current expert opinion indicates the likelihood that future climate change would produce more frequent short duration and high intensity rainfall events with the addition of more frequent periods of long duration rainfall.
- 8.5 The withdrawn NPPF 2012 Technical Guidance Table 5 states that the recommended national precautionary sensitivity ranges for increase of peak rainfall intensity is 30% until 2115. However, The Environment Agency (EA) issued new advice which updated previous climate change allowances outlined in the NPPF 2012 Technical Guidance.
- 8.6 The updated EA allowances have now been directly linked to River Basin Catchments. The climate change allowance has been reviewed using the Environment Agency's website to locate the River Basin Catchment for the site's location. Site 1 is in the Upper Mersey Catchment Basin and the Irwell Management Catchment, whilst Site 2 is in the Upper Mersey Catchment Basin.

¹ Department for Communities and Local Government 2021 – National Planning Policy Framework

² Department for Communities and Local Government 2016 – Planning Practice Guidance

³ HM Government Building Regulations 2010 – Approved Document part H

8.7 The below figure, an extract from the Environment Agency’s website, indicates the climate change considerations for the two catchments.

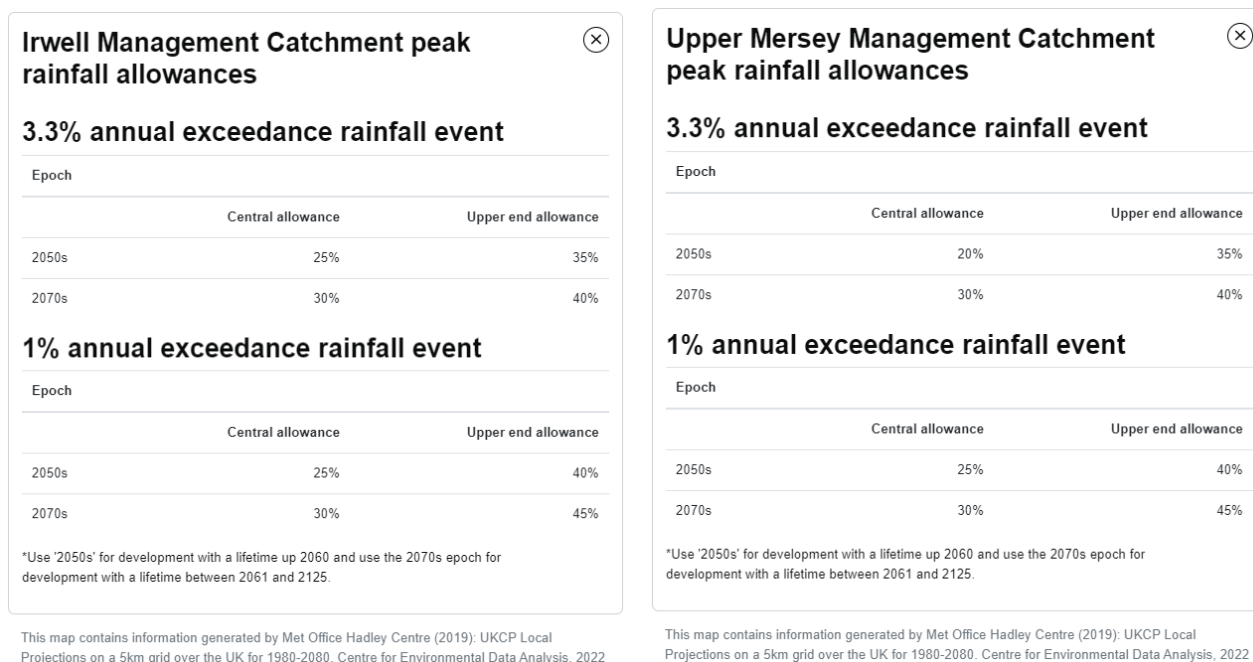


Figure 9: Environment Agency’s climate change considerations (Source EA website 2023)

- 8.8 As recommended by the EA, both the central and upper end allowances have been considered for the purpose of surface water drainage strategy and assessment of exceedance flow pathways.
- 8.9 Therefore, the climate change allowance for each development site has been identified at 45%. This is due to the development having a lifetime between 2061 and 2125. Additionally, the 1% annual exceedance rainfall event is utilised as the 3.3% rainfall is not a requirement.

Existing Site Drainage

- 8.10 As both sites are undeveloped, it is expected that there is no drainage within the site boundaries.
- 8.11 From the asset records obtained from United Utilities, there is a combined and surface water sewer network present along Cross Lane and Varey Street, see Appendix D.

Methods of Surface Water Management

- 8.12 As set out in Part H of the Building Regulations, there are three methods that have been reviewed for the management and discharge of surface water for the site which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed:

- Discharge via infiltration

- Discharge via watercourse;
- Discharge via surface water system;

Drainage Strategy: Site 1 – Cross Lane

Proposed Site Drainage

Discharge by Infiltration

- 8.13 The available information on the development site as identified in Section 4, suggests that the soils are suitable for infiltration. However, no infiltration testing has been complete.
- 8.14 Testing in accordance with BRE365 will be required to determine if this is a viable option.
- 8.15 For the purpose of this report, due to the unconfirmed soil conditions and site constraints, infiltration has been discounted as a suitable option.

Discharge by watercourse

- 8.16 There are no main river or minor watercourses present within the land ownership or close vicinity of the site.
- 8.17 The nearest watercourse to the site is the Gore Brook River which is located approximately 390 metres from the development site.
- 8.18 As there are no suitable options for discharge via watercourse, this option has been discounted as a suitable choice.

Discharge by Surface Water System

- 8.19 United Utilities Asset maps have been obtained, see Appendix D. These plans show surface water and combined sewer systems on Cross Lane.
- 8.20 As surface water sewer systems are located on Cross Lane, discharge via surface water system is a suitable option to be utilised for the Surface Water Drainage Strategy.

Surface Water Drainage Strategy

- 8.21 As noted above in the hierarchy review, discharge via surface water sewer is the preferred method for the purpose of this report. However, upon completion of Ground Investigations, infiltration will be considered and applied where appropriate.
-

- 8.22 The proposed impermeable area for Site 1 is 0.0621ha which consists of private driveways, roofs and footways. All these areas will generate surface runoff.
- 8.23 The general principle of the surface water drainage strategy for this site is to collect the surface water runoff and restrict the discharge flow to an existing surface water system on Cross Lane.
- 8.24 The discharge rate is supposed to match the existing greenfield runoff which is 2.2l/s. However, for the purpose of maintenance and reduced risk of blockages, a minimum rate of 2.5l/s should be used. Though, this is subject to confirmation with United Utilities.
- 8.25 The discharge from the site will be controlled by a flow control to ensure that the rate of 2.5 l/s is not exceeded.
- 8.26 Due to the surface water flow being restricted, attenuation will be required for the site.
- 8.27 The volume of attenuation potentially required for the development site has been calculated based on an impermeable area of 621m² and to cater for up to the 1 in 100-year storm + 45% climate change.
- 8.28 The attenuation will be provided in the form of an underground cellular storage tank and oversized pipes, a calculation for estimated attenuation requirements has been completed during the detailed design stage, see Table 4 for attenuation requirement.

Table 4 - Attenuation Requirements for Site 1

Rainfall Method	Maximum Volume (m ³)
Unit 1	30m ³

- 8.29 See Appendix F for Micro-drainage calculations.
- 8.30 For the purpose of this report, a proposed drainage layout has been prepared, see Appendix B.
- 8.31 The drainage layout is subject to proposed levels and RWP locations.
- 8.32 Detailed surface water calculations for the network will need to be completed during the post-planning stage to ensure suitable attenuation volumes and carrier drains are provided.
- 8.33 Areas of exceedance will be considered in the detailed design phase once proposed finished levels have been finalised. The development will be designed to ensure all flows from up to and including the 1 in 100 years plus 45% will be attenuated below ground, controlled surface ponding
-

will be acceptable up to the 1 in 100 year event plus 45% climate change and no flooding off site will occur due to the development.

- 8.34 Urban Creep has not been considered due to the nature of the proposed development being a housing and apartment block combination with private gardens & car parking preventing the opportunity for future extensions or other significant changes to the proposed site layout.

Drainage Strategy: Site 2 – Varey Street

Proposed Site Drainage

Discharge by Infiltration

- 8.35 The available information on the development site as identified in Section 4, suggests that the soils are suitable for infiltration. However, no infiltration testing has been complete.
- 8.36 Testing in accordance with BRE365 will be required to determine if this is a viable option.
- 8.37 For the purpose of this report, due to the unconfirmed soil conditions and site constraints, infiltration has been discounted as a suitable option.

Discharge by watercourse

- 8.38 There are no main river or minor watercourses present within the land ownership or close vicinity of the site.
- 8.39 The nearest watercourse to the site is the Gore Brook River which is located approximately 390 metres from the development site
- 8.40 As there are no suitable options for discharge via watercourse, this option has been discounted as a suitable choice.

Discharge by Surface Water System

- 8.41 United Utilities Asset maps have been obtained, see Appendix D. These plans show surface water and combined sewer systems on Cross Lane and Varey Street.
- 8.42 As sewer systems are located on Cross Lane and Varey Street, discharge via surface water system is a suitable option to be utilised for the Surface Water Drainage Strategy.
-

Surface Water Drainage Strategy

- 8.43 As noted above in the hierarchy review, discharge via surface water system is the preferred method for the purpose of this report. However, upon completion of Ground Investigations, infiltration will be considered and applied where appropriate.
- 8.44 The proposed impermeable area for Site 2 is 0.0402ha which consists of a private driveways, roof and footways. All these areas will generate surface runoff.
- 8.45 The general principle of the surface water drainage strategy for this site is to collect the surface water runoff and restrict the discharge flow to an existing surface water sewer system on Cross Lane.
- 8.46 The discharge rate is supposed to match the existing greenfield runoff which is 2.2l/s. However, for the purpose of maintenance and reduced risk of blockages, a minimum rate of 2.5l/s should be used. Though, this is subject to confirmation with United Utilities.
- 8.47 The discharge from the site will be controlled by a flow control to ensure that the rate of 2.5l/s is not exceeded.
- 8.48 Due to the surface water flow being restricted, attenuation will be required for the site.
- 8.49 The volume of attenuation potentially required for the development site has been calculated based on an impermeable area of 402m² and to cater for up to the 1 in 100-year storm + 45% climate change.
- 8.50 The attenuation will be provided in the form of an underground cellular storage tank, a calculation for estimated attenuation requirements has been completed during the detailed design stage, see Table 5 for attenuation requirement.

Table 5 - Attenuation Requirements for Site 2

Rainfall Method	Maximum Volume (m ³)
Unit 1	17m ³

- 8.51 See Appendix F for Micro-drainage calculations.
- 8.52 For the purpose of this report, a proposed drainage layout has been prepared, see Appendix B.
- 8.53 The drainage layout is subject to proposed levels and RWP locations.
-

- 8.54 Detailed surface water calculations for the network will need to be completed during the post-planning stage to ensure suitable attenuation volumes and carrier drains are provided.
 - 8.55 Areas of exceedance will be considered in the detailed design phase once proposed finished levels have been finalised. The development will be designed to ensure all flows from up to and including the 1 in 100 years plus 45% will be attenuated below ground, controlled surface ponding will be acceptable up to the 1 in 100 year event plus 45% climate change and no flooding off site will occur due to the development.
 - 8.56 Urban Creep has not been considered due to the nature of the proposed development being a housing and apartment block combination with private gardens & car parking preventing the opportunity for future extensions or other significant changes to the proposed site layout.
-

9.0 WATER QUALITY MANAGEMENT

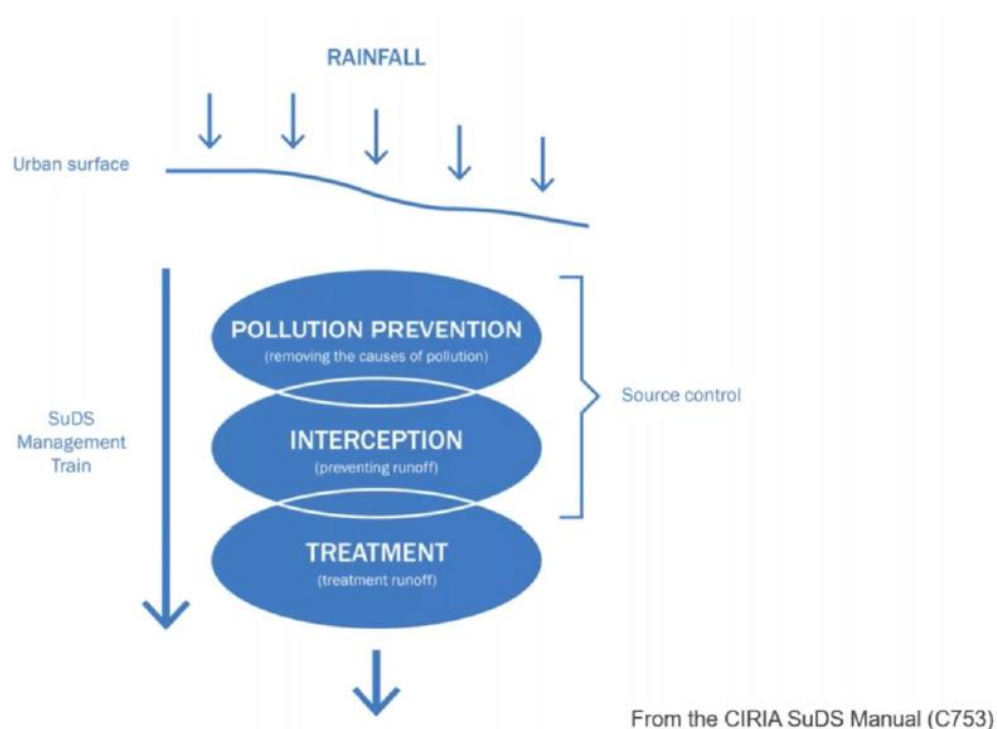
9.1 Water Quality Management options have been reviewed for the development site, in-line with standard guidance CIRIA SuDS Manual [C753] and the following is summarised:

The following are general notes and identified stages to consider on water quality:

9.2 The most important rainfall event to manage in terms of water quality is frequent rainfall events – low rainfall / high pollutant % [supposed to when you get high rainfall and diluted pollution %].

- Sunlight [UV light] brakes down pollution.
- Pollution on the surface is easier to identify and remove / maintain.
- Remove sediment / pollution as early as possible.
- Review the state of the receiving [downstream] waterbody.
- Sediment sinks and hydrocarbons / oils float.

3 Stages of water quality management



General Design Summary for this Site:

9.3 All water will be treated on site through a three-stage process which includes sumps in [1] all gullies, [2] catch pits, [3] water storage.

- Gullies provide sediment to sink
- Catchpits enable sediment to sink
- Water storage aids to dilute any pollution in the water

Pollution Hazard Levels

9.4 Table 4.3 and 26.2 from the SuDS manual provides pollution hazard levels and values for different elements of a development, the following has been identified:

Element	Pollution hazard level
Driveways	Low/medium
Other areas	Low

9.5 Based on the above water quality assessment which has identified this site pollution hazard levels and values, the following mitigation measures and the resulting pollution sufficiency have been assessed:

Pollution	Mitigation	Pollution sufficiency summary
Driveways – low/medium pollution hazard level	Gullies / drainage channels with sumps	sufficient
Other areas – low pollution hazard level	Catchpits	sufficient

9.6 The following items that can be implemented on this site:

1. On the surface pollution prevention

- Manage routing activities – silts and sediments, hydrocarbons and oils, metals, micro plastics, and pesticides

1. Interception –

- capture the rainfall for using / tree pits [potential tree pits on this site TBC]

2. Treatment – drainage elements –

- Gullies & catchpits
-

10.0 FOUL WATER MANAGEMENT

- 10.1 The foul water system will be designed and constructed in accordance with the current Building Regulations Part H, BS EN:752 drainage and sewer systems outside buildings, the local authority building control specifications and requirements, Design and Construction Guidance (DCG) and the Civil Engineering Specification for the Water Industry 7th Edition.
- 10.2 It is proposed to construct a new foul water drainage system to serve the proposed development sites.

Foul Water Capacity and Point of Connection

Site 1 – Cross Lane

- 10.3 The foul water drainage is proposed to connect to an existing combined sewer drainage network in Cross Lane to the north of the development site. The exact outfall location is to be confirmed during detailed design once drainage surveys are conducted and United Utilities confirm that there is a suitable outfall for the proposed development.
- 10.4 The proposed foul network is outlined within the proposed drainage strategy in Appendix B.
- 10.5 The proposed foul flows have been determined using Building Regulations Part H flow rates. As Site 1 has 8 dwellings, the proposed foul peak flow is 4.1 l/s.

Site 2 – Varey Street

- 10.6 The foul water drainage is proposed to connect to an existing combined sewer drainage network in Cross Lane to the south of the development site. The exact outfall location is to be confirmed during detailed design once drainage surveys and United Utilities records to confirm that there is a suitable outfall for the proposed development have been received.
- 10.7 The proposed foul network is outlined within the proposed drainage strategy in Appendix B.
- 10.8 The proposed foul flows have been determined using Building Regulations Part H flow rates. As Site 2 has 5 dwellings, the proposed foul peak flow is 3.5 l/s.
-

11.0 MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK

- 11.1 Attenuation has been proposed in the form of one storage tank per site with flow control site measures. The new drainage system will be designed in accordance with the current design guidance and standards.

Flood Risk Management Measures

- 11.2 All drainage features should be located in open areas which are accessible.
- 11.3 Gradients of the hardstanding areas, where possible, should be designed to fall away from buildings such that any overland flow resulting from extreme events would be channelled away.
- 11.4 The proposed levels should be designed to drain away from the vehicle access and pedestrian access, and therefore is considered that access and egress will not be at an increased risk.
- 11.5 The Attenuation tanks will be provided below ground and will attenuate volumes up to 100 year plus 45% climate change allowance.

Residual Risks

- 11.6 As with any drainage system, blockages within the surface water system have potential to cause flooding or disruption. It is important that any drainage systems not being offered for adoption to either the Water Company or the Local Authority has an appropriate maintenance regime scheduled which would be advised to prospective property owners where appropriate.
- 11.7 Any overland flows generated by the proposed development must be directed away from any adjacent existing properties surrounding the site and towards the highway network where it can follow natural flow paths.

Maintenance

- 11.1 Requirements for ongoing maintenance of the drainage network will form part of the Operation and Maintenance manual for the site and will be undertaken by the building management. Any specialist or proprietary products that are specified at detailed design will have a manufacturer specific maintenance regime which will be included within the document.
- 11.2 All surface water arrangements outlined above are subject to approval by United Utilities.
-

12.0 SUMMARY

- 12.1 SCP have been commissioned by Southway Housing Trust to provide a Flood Risk Statement and Drainage Strategy in respect of a planning application for two new development sites comprising of 13 new dwellings, landscaping and associated parking.
 - 12.2 The total area for the site is calculated as being approximately 0.1855ha.
 - 12.3 The existing site is currently a greenfield site.
 - 12.4 The Flood Risk Statement has reviewed all sources of flood risk to both the proposed development and adjacent areas to the site that are potentially at risk because of the proposed development, including fluvial, pluvial, groundwater and sewers.
 - 12.1 The Environment Agency's mapping shows the site is currently at low risk of fluvial flooding.
 - 12.2 The Environment Agency's mapping shows that the site is at risk of pluvial flooding.
 - 12.3 The site is in an area with less than 0.1% risk of fluvial flooding (Flood Zone 1) and based on NPPF 2021 the development proposal is wholly suitable in terms of flood risk as it is a more vulnerable development.
 - 12.4 Discharge via infiltration has currently been discounted due to unconfirmed soil conditions and site constraints.
 - 12.5 Discharge via watercourse has been discounted as a suitable choice as there are no main river or minor watercourses present within the land ownership or close vicinity of the site,
 - 12.6 The surface water sewers present on Cross Lane, discharge via surface water system has been identified as a preferred choice for the purpose of this report.
 - 12.7 Prior to detailed drainage design, ground investigations must be completed.
 - 12.8 The proposed surface water discharge rate for the development is restricted to 2.5l/s. The discharge rate will need to be accepted and confirmed by the LLFA through the planning process and United Utilities.
 - 12.9 The discharge from each site will be controlled by a flow control.
 - 12.10 An onsite attenuation tank is proposed to account for climate change at 45%, with water quality management techniques being implemented in order to provide treatment to surface water flows.
-

- 12.11 SuDS features can be implemented on the development site. However, further discussions and investigations are required to confirm their suitability for detailed design.
 - 12.12 The foul water system is proposed to connect to an existing combined drainage network on Cross Lane for Site 1 and Site 2. The proposed peak flow for development Site 1 is 4.1 l/s and Site 2 is 3.5 l/s, as per Building Regulations Part H.
 - 12.13 The surface water and foul water proposals are subject to approval and agreement with United Utilities.
 - 12.14 The development site will not be at any greater flood risk and mitigation is in place in the form of attenuation storage to prevent risk of flooding the site.
 - 12.15 In accordance with the NPPF 2021 and other relevant guidelines and policies, the development is suitable in this location.
-

Appendix A

Proposed Development Plan

105 Proposed Site Plan PL
1 : 200

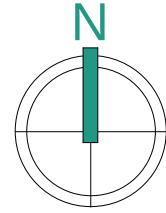
DO NOT SCALE FROM THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE BY CONTRACTOR
PRIOR TO CONSTRUCTION

Schedule of Accommodation

1B2P GF	50.0m ²	2no
1B2P FF	54.4m ²	2no
2B3P House	70.1m ²	4no

Total Units 8no

100% Car Parking



Floor Schedule

Area	Family and Type
160 m ²	Floor: BTP - Car Parking
113 m ²	Floor: BTP - Front Garden
156 m ²	Floor: BTP - Paving
197 m ²	Floor: BTP - POS
282 m ²	Floor: BTP - Rear Garden
907 m ²	



3D Visual

F	11.01.23	MA	Boundaries updated in line with client feedback.
E	25.11.22	OM	Layout updated in line with planners feedback
D	28.04.22	MA	Layout updated onto topographical and tree survey. Car parking area excluded from site. Density reduced to 8 dwellings.
C	02.09.21	MA	Dwelling areas updated. Additional bins indicated. Boundary wall indicated.
B	25.06.21	MA	Bins indicated. Additional notes added.
A	19.11.20	MA	Roof to 2-bed dwellings amended.
Rev	Date	Int	Description



Client:
Southway Housing Trust
Project:
Cross Lane

Description:
Proposed Site Plan

Purpose of Issue:

Planning

Drawn By:	Checked By:	Date:	Scale @ A1:
MA	MA	12/11/20	1 : 200
Job No:	Status Code:	Drawing No:	Rev:
3809	S0	105	F

File Identifier:
CL-BTP-00-SP-DR-A-3809_105

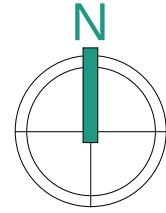
Elizabeth House, 486 Didsbury Road, Heaton Mersey, Stockport, SK4 3BS
t 0161 443 1221 e info@bernardtaylor.co.uk w www.btparchitects.co.uk

Schedule of Accommodation

1B2P GF	50.0m ²	2no
1B2P FF	54.4m ²	2no
3B4P House	86.3m ²	1no

Total Units 5no

100% Car Parking

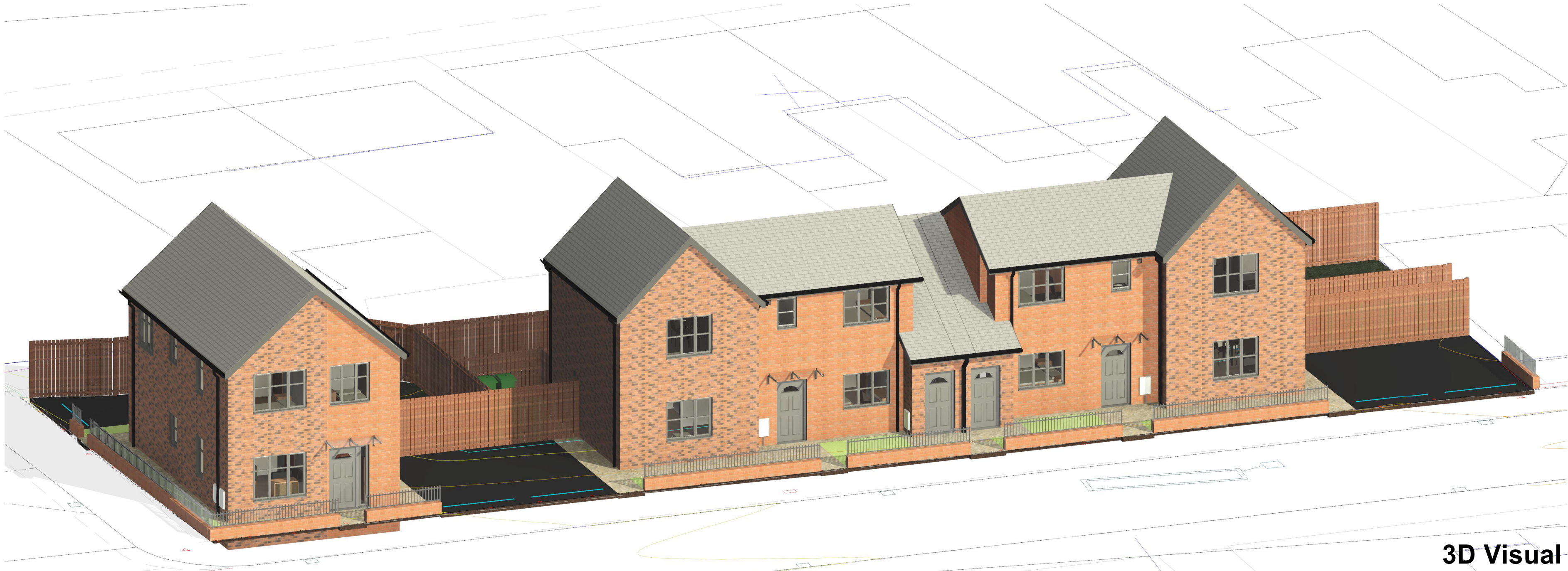


Floor Schedule

Area	Family and Type
92 m ²	Floor: BTP - Car Parking
46 m ²	Floor: BTP - Front Garden
119 m ²	Floor: BTP - Paving
178 m ²	Floor: BTP - Rear Garden
436 m ²	



106 Proposed Site Plan PL
1 : 200



3D Visual

F	13.01.23	MA	Site Plan updated on topographical survey.
E	12.01.23	OM	Additional fencing to divide shared bins with private garden for cottage flats
D	06.12.22	OM	Site Boundary Line updated
C	29.11.22	OM	Layout updated in line with planners feedback
B	02.09.21	MA	Dwelling areas and schedule updated. Boundary walls and railings indicated. Additional bins indicated.
A	25.06.21	MA	Bin storage indicated. Telescopic bollards and obscure windows annotated on plan.
Rev	Date	Int	Description



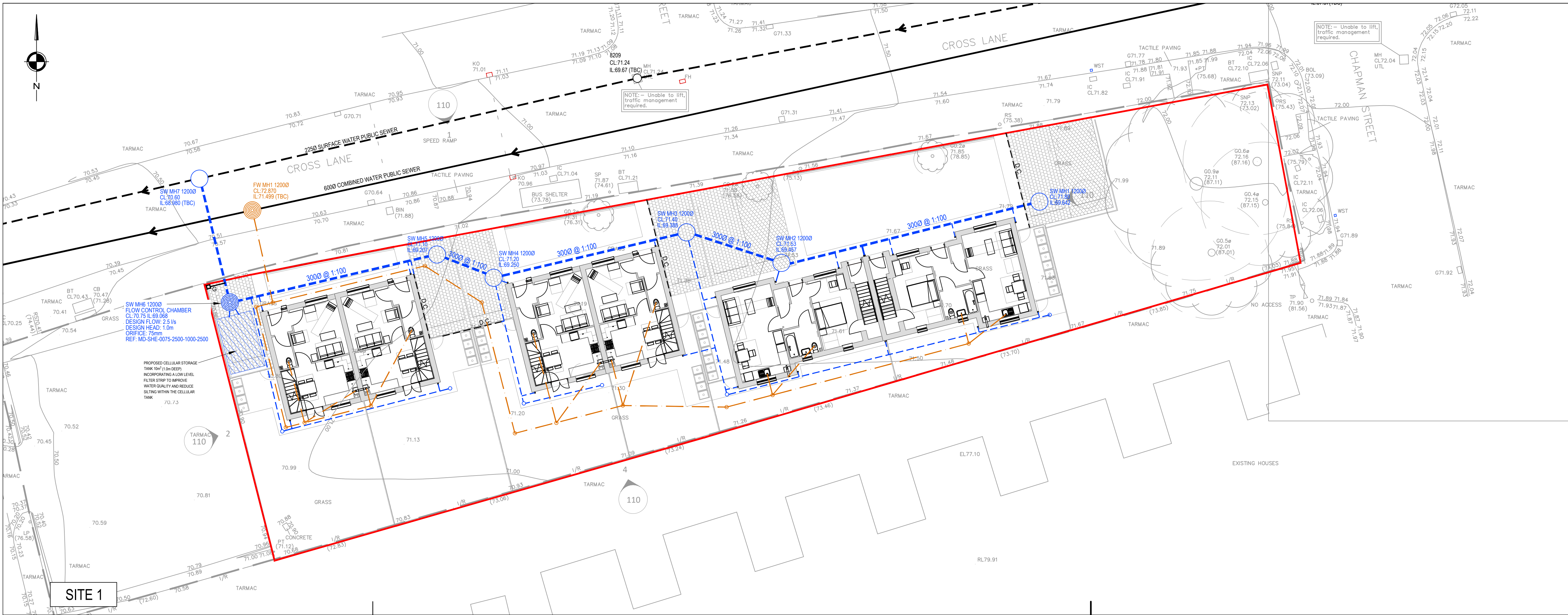
Client:
Southway Housing Trust
Project:
Varey Street

Description:
Proposed Site Plan

Purpose of Issue: Planning			
Drawn By:	Checked By:	Date:	Scale @ A1:
MA	MA	12/11/20	1 : 200
Job No:	Status Code:	Drawing No:	Rev:
3810	S3	106	F
File Identifier: VS-BTP-00-SP-DR-A-3810_106			

Appendix B

Proposed Drainage Layout



NOTES

1.

ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

2.

ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN (OD) UNLESS NOTED OTHERWISE.

3.

ALL COORDINATES ARE IN METRES RELATED TO ORDNANCE SURVEY NATIONAL GRID.

4.

ALL MATERIALS AND WORKMANSHIP WILL BE AS DEFINED IN THE SPECIFICATION UNLESS NOTED OTHERWISE.

5.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.

6.

THIS DRAWING HAS BEEN BASED UPON SURVEY/OS INFORMATION SUPPLIED BY A THIRD PARTY AND SCP SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.

7.

ALL LEVELS, DIMENSIONS AND LOCATIONS ARE TO BE CHECKED BY THE MAIN CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON SITE.

8.

ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH LOCAL AUTHORITY ADOPTABLE RESIDENTIAL ROAD SPECIFICATION AND STANDARD DETAILS.

KEY

PROPOSED SURFACE WATER SEWER

FLOW CONTROL CHAMBER

PROPOSED FOUL WATER SEWER

PROPOSED ATTENUATION STORAGE

PROPOSED NEW GULLY AND CONNECTION (LOCATION INDICATIVE)

PROPOSED ACO DRAINAGE CHANNEL

EXISTING COMBINED WATER SEWER

EXISTING SURFACE WATER SEWER

SITE BOUNDARY

OUTFALL LEVELS TO BE CONFIRMED FOLLOWING DRAINAGE CCTV SURVEY TO CONFIRM LEVELS

COVER LEVELS AND INVERT LEVELS TO BE REVIEWED DURING DETAILED DESIGN

REVISONS

REV	DESCRIPTION	DATE	BY
A	ISSUED FOR INFORMATION	16.01.23	LC

Client Name:

ALDERLEY GROUP

Project Title:

CROSS LANE MANCHESTER

Drawing Title:

PROPOSED DRAINAGE STRATEGY

Date:

16.01.2023

Drawn By:

LC

Scale:

1:150 @ A1

Checked:

AMO

Status:

PLANNING

Approved:

NMc

Drawing No.

SCP-220833-0000-SK01

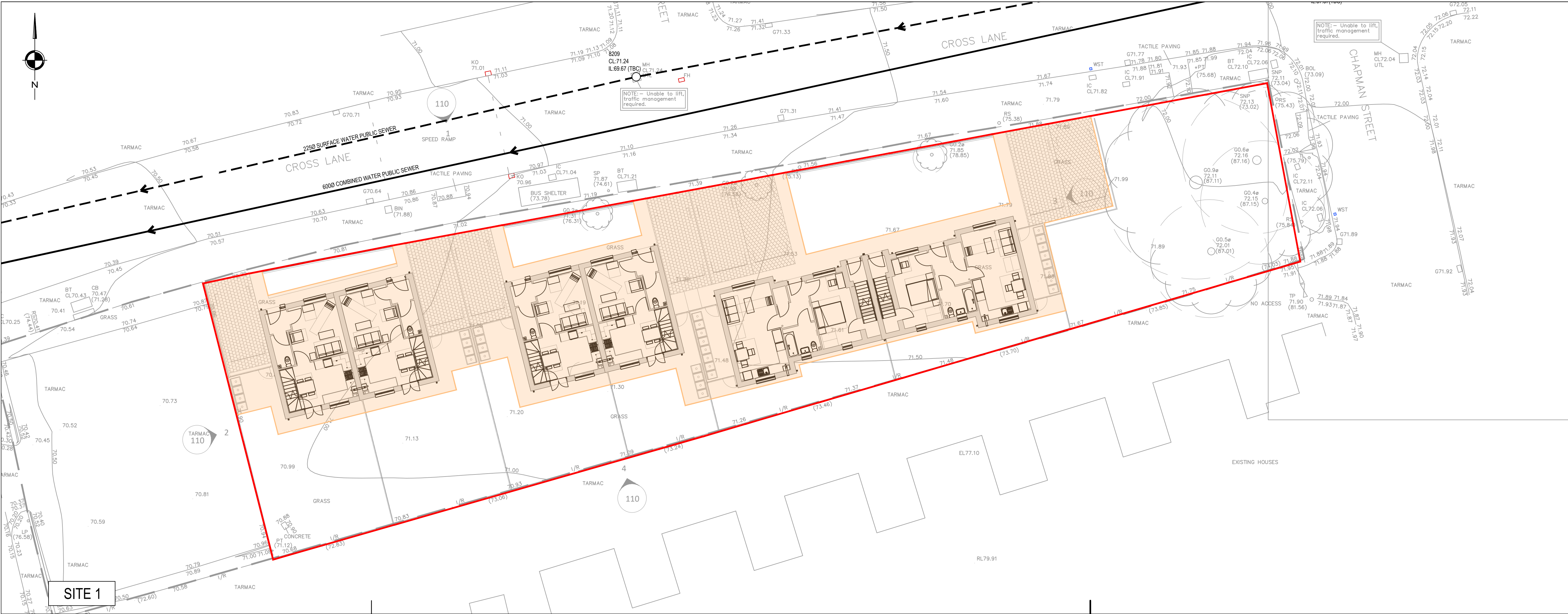
Rev.

A

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Appendix C

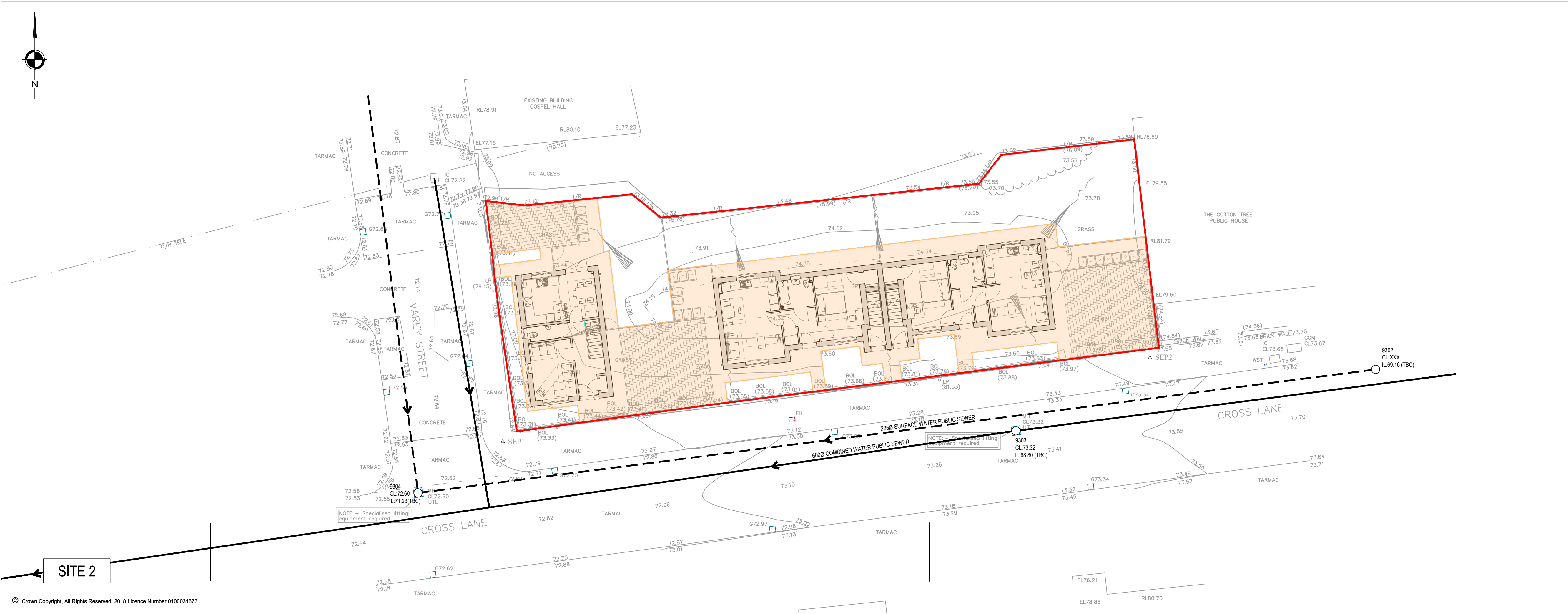
Proposed Catchment Plan



- NOTES
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM NEWLYN (OD) UNLESS NOTED OTHERWISE.
 3. ALL COORDINATES ARE IN METRES RELATED TO ORDNANCE SURVEY NATIONAL GRID.
 4. ALL MATERIALS AND WORKMANSHIP WILL BE AS DEFINED IN THE SPECIFICATION UNLESS NOTED OTHERWISE.
 5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND DOCUMENTATION ASSOCIATED WITH THE PROJECT.
 6. THIS DRAWING HAS BEEN BASED UPON SURVEY/OS INFORMATION SUPPLIED BY A THIRD PARTY AND SCP SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.
 7. ALL LEVELS, DIMENSIONS AND LOCATIONS ARE TO BE CHECKED BY THE MAIN CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON SITE.
 8. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH LOCAL AUTHORITY ADOPTABLE RESIDENTIAL ROAD SPECIFICATION AND STANDARD DETAILS.

KEY

- PROPOSED IMPERMEABLE CATCHMENT
- EXISTING COMBINED WATER SEWER
- EXISTING SURFACE WATER SEWER
- SITE BOUNDARY



REVISIONS

REV	DESCRIPTION	DATE	BY
A	ISSUED FOR INFORMATION	16.01.23	LC

SCP

Transportation Planning : Infrastructure Design

Colwyn Chambers, 19 York Street, Manchester, M2 3BA, Tel 0161 832 4400, www.scptransport.co.uk, Email info@scptransport.co.uk

Client Name: ALDERLEY GROUP

Project Title: CROSS LANE MANCHESTER

Drawing Title: PROPOSED CATCHMENT PLAN

Date: 16.01.2023	Drawn By: LC
Scale: 1:150 @ A1	Checked: AMO
Status: PLANNING	Approved: NMc
Drawing No: SCP-220833-0000-SK02	Rev: A

Appendix D

[United Utilities Records](#)

Lauren Campton

SCP Colwyn Chambers
19 York Street,
Manchester,
M2 3BA

FAO:

How to contact us:

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

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E-mail: propertysearches@uuplc.co.uk

Your Ref: 220833 - Cross Lane & Varey Street
Our Ref: UUPS-ORD-457932
Date: 16/01/2023

Dear Sirs

Location: 62 CROSS LANE, MANCHESTER, M18 8WY

I acknowledge with thanks your request dated 16/01/2023 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 effect.
- 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.

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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Reinno	Cover	Fib	Invert	Size	x	y	Shape	Matl	Length	Grad
8001	66.65	0.00	72.22	305	0	0	5.861456	VC	62.00696	11
8002	72.22	0.00	72.22	305	0	0	5.861456	VC	62.00696	11
7303	70.72	58.71	68.71	225	0	0	5.861456	VC	34.75688	11
7512	73.66	69.16	60.00	100	0	0	5.861456	VC	22.10436	11
8004	72.22	0.00	69.02	375	0	0	5.861456	VC	34.75688	11
8008	72.22	0.00	72.22	305	0	0	5.861456	VC	23.5372	11
8009	72.22	0.00	72.22	305	0	0	5.861456	VC	23.5372	11
8007	72.82	51.75	71.30	300	0	0	5.861456	VC	91.04427	11
8010	72.22	0.00	69.02	375	0	0	5.861456	VC	17.22006	11
8014	68.08	0.00	68.08	100	0	0	5.861456	PVC	17.19515	11
8015	72.22	0.00	69.02	375	0	0	5.861456	VC	23.5372	11
8045	72.38	0.00	68.55	600	0	0	5.861456	VC	47.07441	11
8100	71.28	57.33	71.33	225	0	0	5.861456	VC	43.41659	11
8101	71.28	57.33	71.33	225	0	0	5.861456	VC	21.63311	11
8041	69.72	0.00	64.65	630	0	0	5.861456	VC	13	11
8102	71.28	57.33	71.33	225	0	0	5.861456	VC	50.80354	11
8101	68.87	0.00	65.77	225	0	0	5.861456	VC	116.7604	11
8102	71.28	57.33	71.33	225	0	0	5.861456	VC	118.0042	11
8104	74.04	0.00	68.93	600	0	0	5.861456	VC	41.43607	11
8105	72.22	0.00	69.02	375	0	0	5.861456	VC	2.385193	11
8010	68.43	0.00	67.04	100	0	0	5.861456	PVC	19.48136	11
8040	72.84	0.00	71.87	225	0	0	5.861456	VC	14.31782	11
8200	71.52	58.71	68.85	1200	0	0	5.861456	VC	17.78083	11
8104	72.22	0.00	69.02	375	0	0	5.861456	VC	101.0445	11
8105	72.22	0.00	69.02	375	0	0	5.861456	VC	92.5431	11
8154	72.23	70.68	72.25	100	0	0	5.861456	VC	170.8801	11
8105	72.22	0.00	69.02	375	0	0	5.861456	VC	45.09889	11
8044	72.57	0.00	71.31	225	0	0	5.861456	VC	6.760024	11
8003	67.49	0.00	66.80	150	0	0	5.861456	VC	15.15333	11
8001	69.01	0.00	68.53	100	0	0	5.861456	VC	22.22107	11
5002	68.1	0.00	62.98	300	0	0	5.861456	VC	55.00305	11
5003	68.1	0.00	62.98	300	0	0	5.861456	VC	11.7847	11
5008	68.84	0.00	67.82	225	0	0	5.861456	VC	22.30594	11
5009	68.84	0.00	67.82	225	0	0	5.861456	VC	70.30	11
5100	75.84	74.28	74.78	300	0	0	5.861456	VC	60.67154	11
5101	75.84	74.28	74.78	300	0	0	5.861456	VC	42.5364	11
7105	67.38	0.00	62.49	375	0	0	5.861456	VC	39.14624	11
8040	74.08	0.00	71.12	375	0	0	5.861456	VC	45.89177	11
8041	69.72	0.00	64.65	630	0	0	5.861456	VC	30.67572	11
5005	76.3	74.12	74.10	300	0	0	5.861456	VC	20.8011	11
5006	76.3	74.12	74.10	300	0	0	5.861456	VC	20.8011	11
8020	73.95	72.71	73.00	300	0	0	5.861456	VC	97.7462	11
8021	72.46	69.72	69.72	100	0	0	5.861456	VC	45.89177	11
7505				150	0	0	5.861456	VC	15.765	11
7506				150	0	0	5.861456	VC	15.765	11
8000	68.91	0.00	67.39	225	0	0	5.861456	PVC	17.64844	11
8111	70.75	0.00	67.69	225	0	0	5.861456	PVC	10.49774	11
8112	70.75	0.00	67.69	225	0	0	5.861456	PVC	3.351196	11
8111	70.75	0.00	67.69	225	0	0	5.861456	VC	35.7514	11
8112	70.75	0.00	67.69	225	0	0	5.861456	VC	14.30238	11
8210	71.99	70.67	70.67	100	0	0	5.861456	VC	45.76558	11
8211	72.29	69.27	69.27	100	0	0	5.861456	BR	13.42479	11
7619				150	0	0	5.861456	VC	6.324035	11
8411	69.55	0.00	63.91	750	0	0	5.861456	BR	148.4413	11
8400	69.19	0.00	67.76	300	0	0	5.861456	VC	13.9254	11
8105	72.22	0.00	69.02	375	0	0	5.861456	VC	24.35971	11
8106	72.22	0.00	69.02	375	0	0	5.861456	VC	24.35971	11
8105				0	0	0	5.861456	VC	48.27577	11
8106				0	0	0	5.861456	VC	48.27577	11
8008	72.26	0.00	69.02	375	0	0	5.861456	VC	11.84878	11
8008	72.46	0.00	69.02	375	0	0	5.861456	VC	8.21221	11
8001	72.4	0.00	71.01	300	0	0	5.861456	VC	57.87271	11
8001	72.4	0.00	71.01	300	0	0	5.861456	VC	57.87271	11
4002	74.14	0.00	74.14	300	0	0	5.861456	VC	22.56103	11
4003	74.14	0.00	74.14	300	0	0	5.861456	VC	44.24007	11
8111	73.9	72.22	73.22	150	0	0	5.861456	VC	9.408621	11
7223				150	0	0	5.861456	VC	64.77504	11
8038	68.2	0.00	68.70	100	0	0	5.861456	VC	24.97534	11
8038	68.2	0.00	68.70	100	0	0	5.861456	VC	23.06719	11
8034	72.46	0.00	69.02	375	0	0	5.861456	BR	25.45491	11
8007	72.4	0.00	71.33	225	0	0	5.861456	VC	56.86921	11
8007	72.4	0.00	71.33	225	0	0	5.861456	VC	88.05504	11
8002	72.68	0.00	72.68	300	0	0	5.861456	VC	23.08679	11
8002	72.68	0.00	72.68	300	0	0	5.861456	VC	59.0504	11
8020	70.12	0.00	69.36	600	0	0	5.861456	VC	19.13121	11
8021	70.12	0.00	69.36	600	0	0	5.861456	VC	63.00032	11
8025				150	0	0	5.861456	VC	7.775502	11
8021	68.08	0.00	64.39	100	0	0	5.861456	VC	91.28686	11
8020	72.41	0.00	69.02	375	0	0	5.861456	VC	22.30608	11
8107	71.33	0.00	67.5	300	0	0	5.861456	VC	61.07373	11
8107	71.33	0.00	67.5	300	0	0	5.861456	VC	27.45575	11
7210	69.87	0.00	68.42	225	0	0	5.861456	VC	9.848858	11
7211	69.87	0.00	68.42	225	0	0	5.861456	VC	51.36932	11
8308				150	0	0	5.861456	VC	17.2527	11
8308	72.9	71.68	72.68	100	0	0	5.861456	VC	34.1321	11
5307	68.53	0.00	66.31	300	0	0	5.861456	VC	103.846	11
8034				100	0	0	5.861456	VC	1.43461	11
8034	75.42	0.00	71.94	300	0	0	5.861456	VC	9.219544	11
8502	74.61	0.00	72.1	300	0	0	5.861456	VC	23.5372	11
7016	69.5	0.00	66.69	225	0	0	5.861456	VC	16.8625	11
7016	69.5	0.00	66.69	225	0	0	5.861456	VC	34.11335	11
7016	69.5	0.00	66.69	225	0	0	5.861456	VC	11.70703	11
8308	76.15	0.00	71.38	580	0	0	5.861456	BR	46.52596	11
8308	76.15	0.00	71.38	580	0	0	5.861456	VC	8.222468	11
8002	72.86	0.00	71.73	225	0	0	5.861456	VC	42.9364	11
8021	74.84	0.00	73.23	300	0	0	5.861456	VC	72.69112	11
8021	74.84	0.00	73.23	300	0	0	5.861456	VC	34.5826	11
8308	74.12	0.00	72.89	225	0	0	5.861456	VC	20.40193	11
8110	71.45	0.00	70.28	225	0	0	5.861456	VC	115.4374	11
8110	71.45	0.00	70.28	225	0	0	5.861456	VC	46.474	11
8229	66.39	0.00	61.39	375	0	0	5.861456	VC	2.650498	11
8200	68.08	0.00	66.89	375	0	0	5.861456	VC	80.19978	11
8200	68.08	0.00	66.89	375	0	0	5.861456	VC	45.77862	11
6306	69.49	0.00	65.15	630	0	0	5.861456	VC	38.29995	11
6306	69.49	0.00	65.15	630	0	0	5.861456	VC	12.4111	11
7515	72.17	0.00	70.92	225	0	0	5.861456	VC	25.70992	11
7515	72.17	0.00	70.92	225	0	0	5.861456	VC	4.977792	11
7214	69.4	0.00	68.14	225	0	0	5.861456	VC	159.803	11
7214	69.4	0.00	68.14	225	0	0	5.861456	VC	22.0672	11
6405	73.85	0.00	72.72	225	0	0	5.861456	VC	6.324555	11
6501	68.32	0.00	64.16	450	0	0	5.861456	VC	20.91292	11
7311	70.1	0.00	68.64	225	0	0	5.861456	VC	6.29338	11
8002	72.99	0.00	71.48	225	0	0	5.861456	PVC	26.36089	11
8002	72.99	0.00	71.48	225	0	0	5.861456	PVC	20.36922	11
8030	73.47	0.00	70.34	375	0	0	5.861456	VC	75.18463	11
1212	73.31	0.00	71.86	300	0	0	5.861456	VC	88.0551	11
8030	73.47	0.00	70.34	375	0	0	5.861456	VC	43.01377	11
8034	71.43	0.00	70.29	225	0	0	5.861456	VC	63.00032	11
8034	71.43	0.00	70.29	225	0	0	5.861456	VC	67.47502	11
8003	65.52	0.00	64.28	225	0	0	5.861456	VC	34.05877	11
8003	65.52	0.00	64.28	225	0	0	5.861456	VC	28.16581	11
8004	71.04	0.00	70.33	225	0	0	5.861456	VC	72.70490	11
8004	71.04	0.00	70.33	225	0	0	5.861456	VC	47.29694	11
8001	69.01	0.00	66.25	300	0	0	5.861456	VC	6.0473	

#	Rebo	Cover	Fur	Invert	Size	z	Size	y	Shape	Mat	Length	Grad
#8208	CO		0	225					PVC	53.89165		
#9402	74.73	SW	62.1	375					BR	19.14640	1:22	
#8511	72.25	CO	69.23	600					BR	19.14640	1:14	
#8205	72.21	CO	69.97	300					PVC	26.25252	1:93	
#6000	66.73	CO	63.73	225					PVC	4.089756	1:5	
#7104	67.5	SW	66.26	225					CO	37.46333	1:9	
#1019	73.65	SW	72.4	150					PVC	9.325787	1:21	
#8204	73.11	CO	0	225					VC	25		1:14
#8203	68.73	SW	65.46	300					CO	35.43529	1:7	
#0904	63.66	CO	57.28	900					CO	54.12947		
#7501	70.18	SW	69.15	225					VC	43.43511	1:50	
#8208	72.69	CO	71.4	225					CO	16.2882	1:203	
#8603	72.3	SW	68.11	375					VC	13.14676		
#8113		SW	0	150					VC	5.414074		
#9211	73.57	CO	69.37	300					VC	31.14482	1:55	
#7012	69.66	CO	64.16	150					VC	96.16552	1:62	
#8102	70.54	SW	69.13	225					VC	23.08679	1:46	
#8011	68.01	CO	66.96	150					PVC	13.70732	1:19	
#7023	67.29	CO	63.6	375					VC	17.02039	1:31	
#7209	69.74	CO	66.88	450					VC	21.92326	1:28	
#5304	72.4	SW	71.23	225					VC	51.62364		
#6006	67.46	CO	64.76	225					VC	27.71951	1:32	
#8004	71.45	CO	68.71	300					VC	21.93171	1:50	
#8022		CO	0	100					VC	1.915959		
#7002	72.82	CO	67.73	225					VC	65.51336		
#8106	70.12	CO	68.37	225					VC	45.08679	1:59	
#8008	69.86	CO	66.1	150					VC	64.93887	1:41	
#8114		CO	0	150					VC	3.981319	1:21	
#8405	69.71	SW	68.61	225					VC	0.087373		
#8001	70.52	CO	67.73	225					VC	31.755		
#6412	69.67	CO	64.46	700					BR	45.27692	1:62	
#7402	70.03	CO	69.03	300					VC	6.403124	1:71	
#0003		CO	0	100					VC	2.357189		
#8001	70.02	CO	68.11	225					VC	41.15607	1:20	
#9131		CO	0	100					VC	1.494344		
#8003	73.68	CO	68.17	600					VC	22.2036		
#6801	69.11	CO	66.32	225					VC	89.73995	1:42	
#1014	72.64	CO	71.88	225					VC	42.26346		
#9319		CO	0	225					VC	1.312623		
#0304	74.22	CO	69.63	600					BR	14.14214	1:61	
#8005	71.52	CO	68.8	300					VC	21.40033	1:31	
#7502	69.6	CO	67.1	225					VC	20.96975		
#8008	71.52	CO	69.08	225					VC	23.5372		
#8209	71.14	SW	69.67	225					VC	53.10573		
#8101		CO	0	150					VC	16.7677		
#1211		CO	0	225					VC	21.17077		
#1201	75.71	SW	72.77	300					VC	67.92522		
#9319	69.82	CO	0	150					VC	126.9525		
#0405		CO	0	225					VC	7.33973		
#8008	72.74	CO	69.89	300					VC	11.4558	1:54	
#6506	72.22	CO	70.57	225					VC	20.81553	1:15	
#8001	71.52	CO	69.08	225					VC	10.74254	1:29	
#7018	67.36	CO	65.57	150					PVC	12.26006	1:16	
#8305		CO	0	225					VC	20.3908		
#8122		CO	0	150					MAC	6.34068		
#9401	71.74	CO	70.92	150					VC	75.84712		
#7509	72.25	CO	67.88	300					VC	11.1834	1:280	
#8008	72.44	CO	69.7	300					VC	66.7077		
#8012	67.75	CO	66.88	150					PVC	12.75552	1:69	
#8120		CO	0	150					VC	3.81768		
#9402	72.57	SW	69.8	1070					BR	125.5149		
#8008	67.93	SW	64.23	600					CO	27.06273	1:135	
#8115		CO	0	150					VC	16.1322		
#7103	69.34	CO	68.38	225					VC	54.66979	1:29	
#8002	72.57	SW	69.8	1070					BR	125.5149		
#8013	67.58	CO	65.7	150					PVC	13.04421	1:81	
#7908	67.4	CO	65.11	375					VC	33.11607	1:11	
#7106	67.89	CO	64.34	375					VC	44.0116	1:880	
#8023		CO	0	100					VC	2.240699		
#6002	67.04	CO	63.18	375					VC	20		1:80
#7017	65.54	SW	65.54	0					UN	0.5263448		
#8105	72.38	CO	70.42	225					VC	6.420041		
#9609		CO	0	150					VC	0.6952158	1:17	
#7023	66.35	CO	63.72	375					PVC	10.2038	1:38	
#7009	72.22	SW	68.12	750					BR	96.8848		
#8203		CO	0	150					VC	13.17977		
#7504		CO	0	150					VC	29.8481		
#8401	69.6	SW	67.1	300					VC	32.3454	1:115	
#7407	72.18	CO	67.84	300					VC	52.32975	1:104	
#0403	75.19	SW	74.3	225					VC	43.17406	1:29	
#7005	70.97	CO	66.65	300					VC	64.25729	1:35	
#9407		CO	0	225					VC	49.1968		
#0016		CO	0	2279835					UN	2.279835		
#8313	72.35	CO	69.41	225					VC	3.84211	1:137	
#0406	75.35	CO	72.48	300					VC	37.36306	1:156	
#6502	68.51	CO	63.78	450					VC	39.05125	1:122	
#8119		CO	0	150					VC	6.474168		
#7211	69.07	SW	67.07	300					VC	50.28917	1:61	
#8115	73.43	CO	0	300					VC	32.24154		
#9108	71.98	CO	70.19	225					VC	7.28011	1:12	
#8404	73.78	SW	71.32	375					VC	23.78973		
#8020		CO	0	100					VC	2.177693		
#6408		SW	0	225					VC	3.84211		
#912		CO	0	150					VC	11.02105		
#0221		CO	0	100					VC	2.82342		
#7511		CO	0	150					VC	12.22044		
#7307	70.73	CO	68.73	225					VC	57.97413	1:17	
#7107	68.7	SW	67.67	225					VC	63.3877	1:46	
#0011	76.09	CO	73.8	225					VC	28.14785	1:30	
#9403		CO	0	375					VC	60.78382		
#8208		CO	0	225					VC	12.9692		
#8208		CO	0	225					VC	1.695276		
#0319		CO	0	225					VC	49.1968		
#7107	68.08	CO	65.71	225					VC	11.87572		
#0305	73.03	CO	70.05	600					BR	32.14652	1:84	
#8200	71.79	CO	70.59	225					VC	17.54509	1:20	
#7906		CO	0	150					VC	8.05406		
#6140	69.46	SW	67.77	300					VC	23.08679	1:2300	
#9210	73.15	CO	71.82	225					VC	50.03999		
#9111		CO	0	225					VC	62.16912		
#8108	73.13	SW	70.14	225					VC	63.12686	1:54	
#0509	75.95	SW	73.33	750					CO	29.87317	1:64	

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:

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
- Cutoff
- 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
- ▽ Change of Characteristic

MANHOLE FUNCTION

- | | |
|----|---------------|
| FO | Foul |
| SW | Surface Water |
| CO | Combined |
| OV | Overflow |

SEWER SHAPE

- | | | | |
|----|-------------|----|-------------|
| CI | Circular | TR | Trapezoidal |
| EG | Egg | AR | Arch |
| OV | Oval | BA | Barrel |
| FT | Flat Top | HO | HorseShoe |
| RE | Rectangular | UN | Unspecified |
| SQ | Square | | |

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 Culverted |
| 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:

62 CROSS LANE,
MANCHESTER,
M18 8WY

Scale: 1:1250

Date: 16/01/2023

Sheet: 1 of 1

1 of 1

Printed by: Property Searches

Property Searches



Appendix E

Existing Greenfield Discharge Calculations

SCP		Page 1																								
Colwyn Chambers 19 York St Manchester M2 3BA																										
Date 16/01/2023 13:56 File	Designed by micro.drainage Checked by																									
XP Solutions		Source Control 2020.1.3																								
<u>ICP SUDS Mean Annual Flood</u> Input <table> <tr> <td>Return Period (years)</td> <td>100</td> <td>Soil</td> <td>0.450</td> </tr> <tr> <td>Area (ha)</td> <td>0.186</td> <td>Urban</td> <td>0.000</td> </tr> <tr> <td>SAAR (mm)</td> <td>856</td> <td>Region Number</td> <td>Region 10</td> </tr> </table> Results 1/s <table> <tr> <td>QBAR Rural</td> <td>1.0</td> </tr> <tr> <td>QBAR Urban</td> <td>1.0</td> </tr> <tr> <td>Q100 years</td> <td>2.2</td> </tr> <tr> <td>Q1 year</td> <td>0.9</td> </tr> <tr> <td>Q30 years</td> <td>1.8</td> </tr> <tr> <td>Q100 years</td> <td>2.2</td> </tr> </table>			Return Period (years)	100	Soil	0.450	Area (ha)	0.186	Urban	0.000	SAAR (mm)	856	Region Number	Region 10	QBAR Rural	1.0	QBAR Urban	1.0	Q100 years	2.2	Q1 year	0.9	Q30 years	1.8	Q100 years	2.2
Return Period (years)	100	Soil	0.450																							
Area (ha)	0.186	Urban	0.000																							
SAAR (mm)	856	Region Number	Region 10																							
QBAR Rural	1.0																									
QBAR Urban	1.0																									
Q100 years	2.2																									
Q1 year	0.9																									
Q30 years	1.8																									
Q100 years	2.2																									
©1982-2020 Innovyze																										

Appendix F

Storage Estimate Calculations

SCP		Page 2
Colwyn Chambers 19 York St Manchester M2 3BA		
Date 25/01/2023 15:36 File	Designed by micro.drainage Checked by	
XP Solutions	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	69.782	0.714	0.0	2.5	2.5	20.3	O K
240 min Winter	69.729	0.661	0.0	2.5	2.5	18.8	O K
360 min Winter	69.585	0.517	0.0	2.5	2.5	14.7	O K
480 min Winter	69.465	0.397	0.0	2.5	2.5	11.3	O K
600 min Winter	69.369	0.301	0.0	2.5	2.5	8.6	O K
720 min Winter	69.296	0.228	0.0	2.5	2.5	6.5	O K
960 min Winter	69.208	0.140	0.0	2.3	2.3	4.0	O K
1440 min Winter	69.152	0.084	0.0	1.8	1.8	2.4	O K
2160 min Winter	69.131	0.063	0.0	1.3	1.3	1.8	O K
2880 min Winter	69.122	0.054	0.0	1.1	1.1	1.5	O K
4320 min Winter	69.112	0.044	0.0	0.8	0.8	1.3	O K
5760 min Winter	69.107	0.039	0.0	0.6	0.6	1.1	O K
7200 min Winter	69.103	0.035	0.0	0.5	0.5	1.0	O K
8640 min Winter	69.100	0.032	0.0	0.4	0.4	0.9	O K
10080 min Winter	69.098	0.030	0.0	0.4	0.4	0.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
180 min Winter	24.339	0.0	38.0	142
240 min Winter	19.650	0.0	40.9	182
360 min Winter	14.410	0.0	45.0	248
480 min Winter	11.570	0.0	48.2	312
600 min Winter	9.751	0.0	50.8	370
720 min Winter	8.475	0.0	52.9	426
960 min Winter	6.786	0.0	56.5	532
1440 min Winter	4.953	0.0	61.9	744
2160 min Winter	3.607	0.0	67.6	1108
2880 min Winter	2.877	0.0	71.9	1464
4320 min Winter	2.088	0.0	78.3	2192
5760 min Winter	1.662	0.0	83.1	2944
7200 min Winter	1.391	0.0	86.9	3608
8640 min Winter	1.202	0.0	90.1	4408
10080 min Winter	1.062	0.0	92.9	5104

SCP		Page 3
Colwyn Chambers 19 York St Manchester M2 3BA		
Date 25/01/2023 15:36 File	Designed by micro.drainage Checked by	
XP Solutions	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 70.750

Cellular Storage Structure

Invert Level (m) 69.068 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	30.0	0.0	1.001	0.0	0.0
1.000	30.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-2500-1000-2500
Design Head (m) 1.000
Design Flow (l/s) 2.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 75
Invert Level (m) 69.068
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.5	Kick-Flo®	0.627	2.0
Flush-Flo™	0.307	2.5	Mean Flow over Head Range	-	2.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.1	1.200	2.7	3.000	4.1	7.000	6.2
0.200	2.4	1.400	2.9	3.500	4.5	7.500	6.4
0.300	2.5	1.600	3.1	4.000	4.7	8.000	6.6
0.400	2.5	1.800	3.3	4.500	5.0	8.500	6.8
0.500	2.4	2.000	3.4	5.000	5.3	9.000	7.0
0.600	2.1	2.200	3.6	5.500	5.5	9.500	7.1
0.800	2.3	2.400	3.7	6.000	5.7		
1.000	2.5	2.600	3.9	6.500	6.0		

SCP		Page 1
Colwyn Chambers 19 York St Manchester M2 3BA		
Date 25/01/2023 15:32	Designed by micro.drainage	
File	Checked by	
XP Solutions		Source Control 2020.1.3

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 41 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	71.952	0.427	0.0	2.5	2.5	6.9	O K
30 min Summer	72.069	0.544	0.0	2.5	2.5	8.8	O K
60 min Summer	72.122	0.597	0.0	2.5	2.5	9.6	O K
120 min Summer	72.095	0.570	0.0	2.5	2.5	9.2	O K
180 min Summer	72.036	0.511	0.0	2.5	2.5	8.3	O K
240 min Summer	71.972	0.447	0.0	2.5	2.5	7.2	O K
360 min Summer	71.856	0.331	0.0	2.5	2.5	5.3	O K
480 min Summer	71.771	0.246	0.0	2.5	2.5	4.0	O K
600 min Summer	71.712	0.187	0.0	2.4	2.4	3.0	O K
720 min Summer	71.672	0.147	0.0	2.3	2.3	2.4	O K
960 min Summer	71.627	0.102	0.0	2.1	2.1	1.6	O K
1440 min Summer	71.599	0.074	0.0	1.6	1.6	1.2	O K
2160 min Summer	71.583	0.058	0.0	1.2	1.2	0.9	O K
2880 min Summer	71.575	0.050	0.0	0.9	0.9	0.8	O K
4320 min Summer	71.566	0.041	0.0	0.7	0.7	0.7	O K
5760 min Summer	71.561	0.036	0.0	0.6	0.6	0.6	O K
7200 min Summer	71.558	0.033	0.0	0.5	0.5	0.5	O K
8640 min Summer	71.555	0.030	0.0	0.4	0.4	0.5	O K
10080 min Summer	71.553	0.028	0.0	0.4	0.4	0.5	O K
15 min Winter	72.015	0.490	0.0	2.5	2.5	7.9	O K
30 min Winter	72.157	0.632	0.0	2.5	2.5	10.2	O K
60 min Winter	72.224	0.699	0.0	2.5	2.5	11.3	O K
120 min Winter	72.180	0.655	0.0	2.5	2.5	10.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	122.610	0.0	9.2	22
30 min Summer	82.167	0.0	12.3	33
60 min Summer	52.627	0.0	15.8	54
120 min Summer	32.623	0.0	19.6	88
180 min Summer	24.339	0.0	21.9	120
240 min Summer	19.650	0.0	23.6	152
360 min Summer	14.410	0.0	25.9	214
480 min Summer	11.570	0.0	27.8	272
600 min Summer	9.751	0.0	29.2	328
720 min Summer	8.475	0.0	30.5	386
960 min Summer	6.786	0.0	32.6	498
1440 min Summer	4.953	0.0	35.7	736
2160 min Summer	3.607	0.0	38.9	1100
2880 min Summer	2.877	0.0	41.4	1468
4320 min Summer	2.088	0.0	45.1	2160
5760 min Summer	1.662	0.0	47.8	2896
7200 min Summer	1.391	0.0	50.1	3600
8640 min Summer	1.202	0.0	51.9	4320
10080 min Summer	1.062	0.0	53.5	5024
15 min Winter	122.610	0.0	10.3	22
30 min Winter	82.167	0.0	13.8	34
60 min Winter	52.627	0.0	17.7	58
120 min Winter	32.623	0.0	21.9	96

SCP		Page 2
Colwyn Chambers 19 York St Manchester M2 3BA		
Date 25/01/2023 15:32	Designed by micro.drainage	
File	Checked by	
XP Solutions		Source Control 2020.1.3

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	72.075	0.550	0.0	2.5	2.5	8.9	O K
240 min Winter	71.969	0.444	0.0	2.5	2.5	7.2	O K
360 min Winter	71.798	0.273	0.0	2.5	2.5	4.4	O K
480 min Winter	71.698	0.173	0.0	2.4	2.4	2.8	O K
600 min Winter	71.643	0.118	0.0	2.2	2.2	1.9	O K
720 min Winter	71.618	0.093	0.0	2.0	2.0	1.5	O K
960 min Winter	71.599	0.074	0.0	1.6	1.6	1.2	O K
1440 min Winter	71.583	0.058	0.0	1.2	1.2	0.9	O K
2160 min Winter	71.572	0.047	0.0	0.8	0.8	0.8	O K
2880 min Winter	71.566	0.041	0.0	0.7	0.7	0.7	O K
4320 min Winter	71.559	0.034	0.0	0.5	0.5	0.6	O K
5760 min Winter	71.555	0.030	0.0	0.4	0.4	0.5	O K
7200 min Winter	71.552	0.027	0.0	0.3	0.3	0.4	O K
8640 min Winter	71.550	0.025	0.0	0.3	0.3	0.4	O K
10080 min Winter	71.549	0.024	0.0	0.3	0.3	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
180 min Winter	24.339	0.0	24.5	130
240 min Winter	19.650	0.0	26.4	162
360 min Winter	14.410	0.0	29.0	222
480 min Winter	11.570	0.0	31.1	276
600 min Winter	9.751	0.0	32.8	328
720 min Winter	8.475	0.0	34.2	378
960 min Winter	6.786	0.0	36.5	496
1440 min Winter	4.953	0.0	39.9	730
2160 min Winter	3.607	0.0	43.6	1104
2880 min Winter	2.877	0.0	46.4	1460
4320 min Winter	2.088	0.0	50.5	2176
5760 min Winter	1.662	0.0	53.6	2856
7200 min Winter	1.391	0.0	56.1	3600
8640 min Winter	1.202	0.0	58.1	4368
10080 min Winter	1.062	0.0	59.9	5000

SCP		Page 3
Colwyn Chambers 19 York St Manchester M2 3BA		
Date 25/01/2023 15:32 File	Designed by micro.drainage Checked by	
XP Solutions	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 73.500

Cellular Storage Structure

Invert Level (m) 71.525 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	17.0	0.0	1.001	0.0	0.0
1.000	17.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0075-2500-1000-2500
Design Head (m) 1.000
Design Flow (l/s) 2.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 75
Invert Level (m) 71.525
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.5	Kick-Flo®	0.627	2.0
Flush-Flo™	0.307	2.5	Mean Flow over Head Range	-	2.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.1	1.200	2.7	3.000	4.1	7.000	6.2
0.200	2.4	1.400	2.9	3.500	4.5	7.500	6.4
0.300	2.5	1.600	3.1	4.000	4.7	8.000	6.6
0.400	2.5	1.800	3.3	4.500	5.0	8.500	6.8
0.500	2.4	2.000	3.4	5.000	5.3	9.000	7.0
0.600	2.1	2.200	3.6	5.500	5.5	9.500	7.1
0.800	2.3	2.400	3.7	6.000	5.7		
1.000	2.5	2.600	3.9	6.500	6.0		

Appendix G

[Environment Agency Flood Map For Planning](#)

Flood map for planning

Your reference	Location (easting/northing)	Created
220833 - Cross Lane & Var	388873/396302	11 Jan 2023 15:38

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)

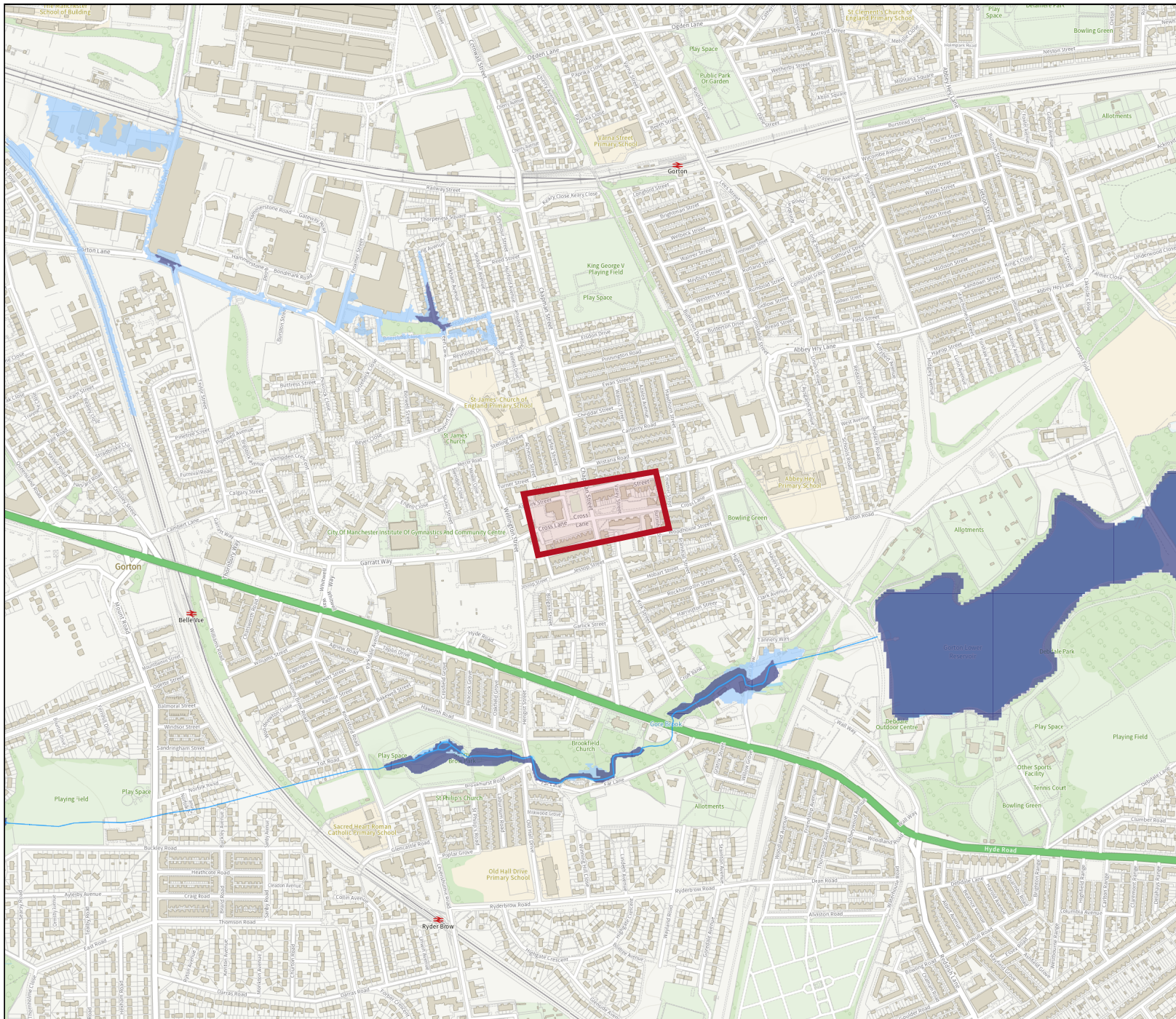
Notes

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 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
**220833 - Cross Lane &
Var**
Location (easting/northing)
388873/396302

Scale
1:10000

Created
11 Jan 2023 15:38

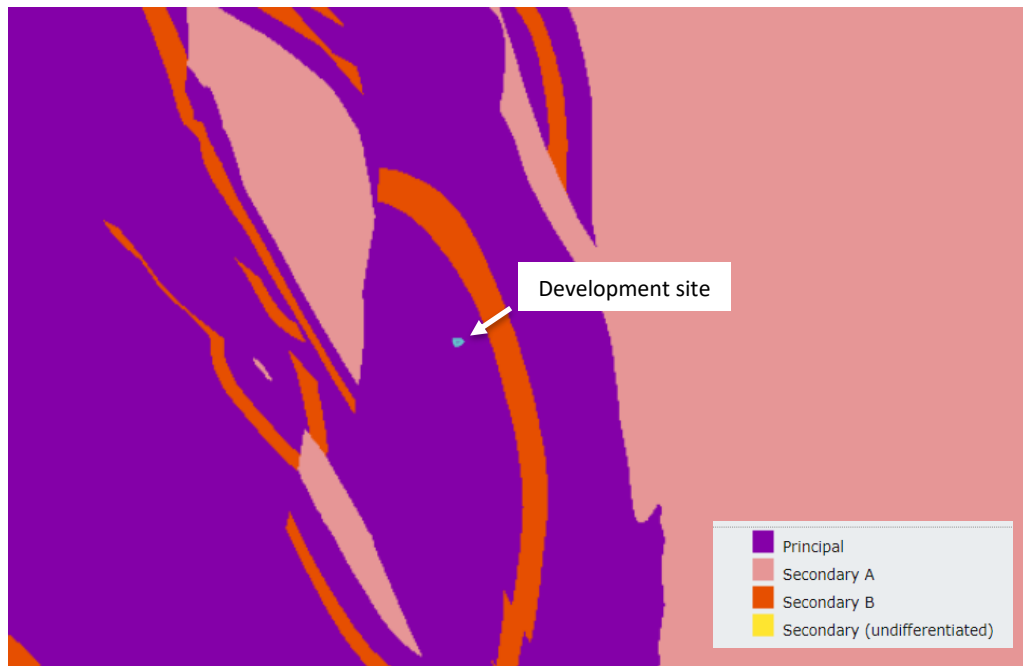
-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 100 200 300m

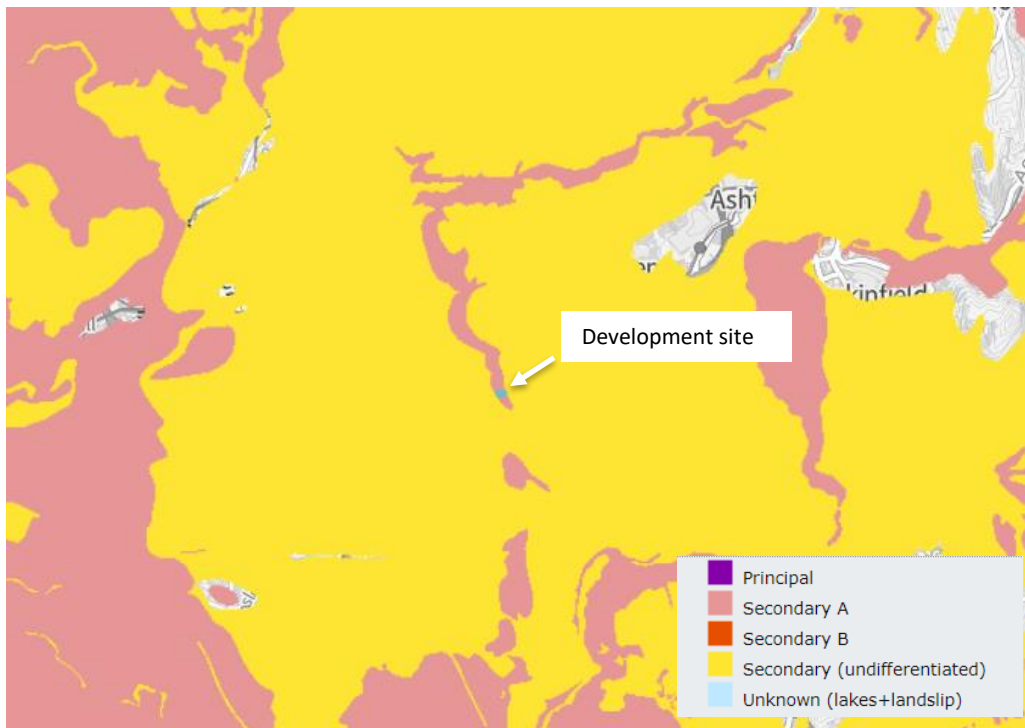
Appendix H

Extracts From Magic Maps And BGS

Extract 1: Magic Maps Bedrock Classifications



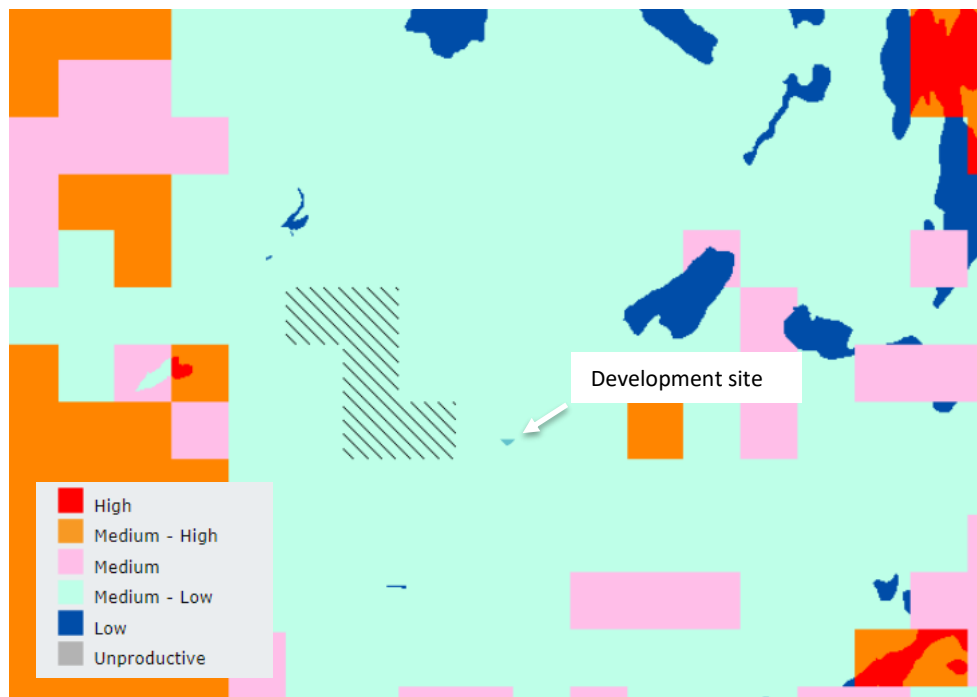
Extract 2: Magic Maps Superficial Drift Classifications



Extract 3: Magic Maps Soil Classifications



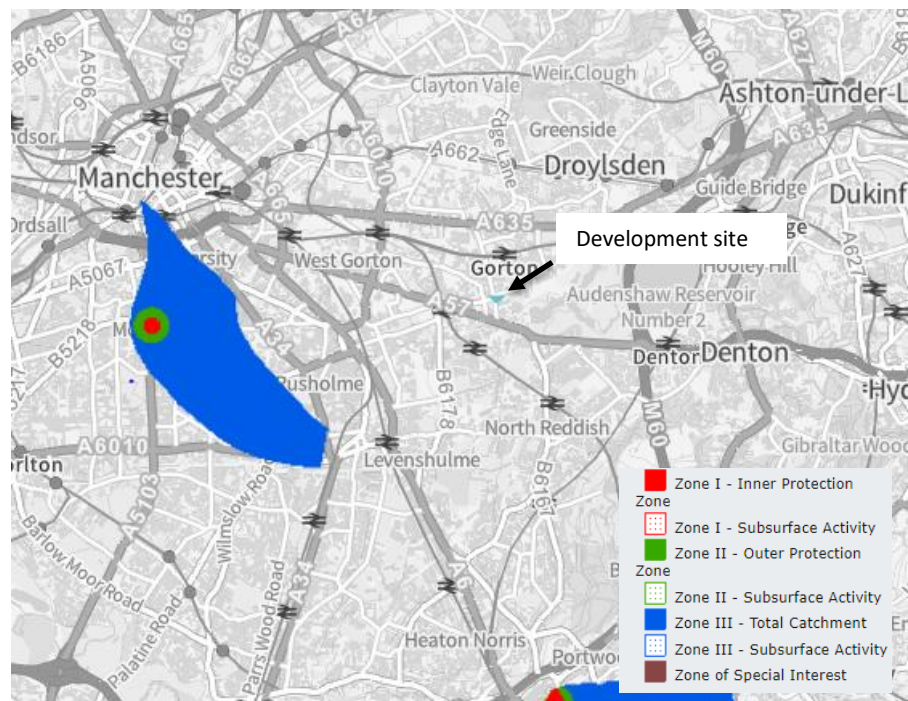
Extract 4: Magic Maps Groundwater Vulnerability



Extract 5: Magic Maps Flood Risk Management Priorities



Extract 6: Magic Maps Source Protection Zones



Extract 7: BGS Soil Classification



Geology



Bedrock geology



Chester Formation - Sandstone. Sedimentary bedrock formed between 250 and 247.1 million years ago during the Triassic period.

[More Information](#)

Superficial deposits

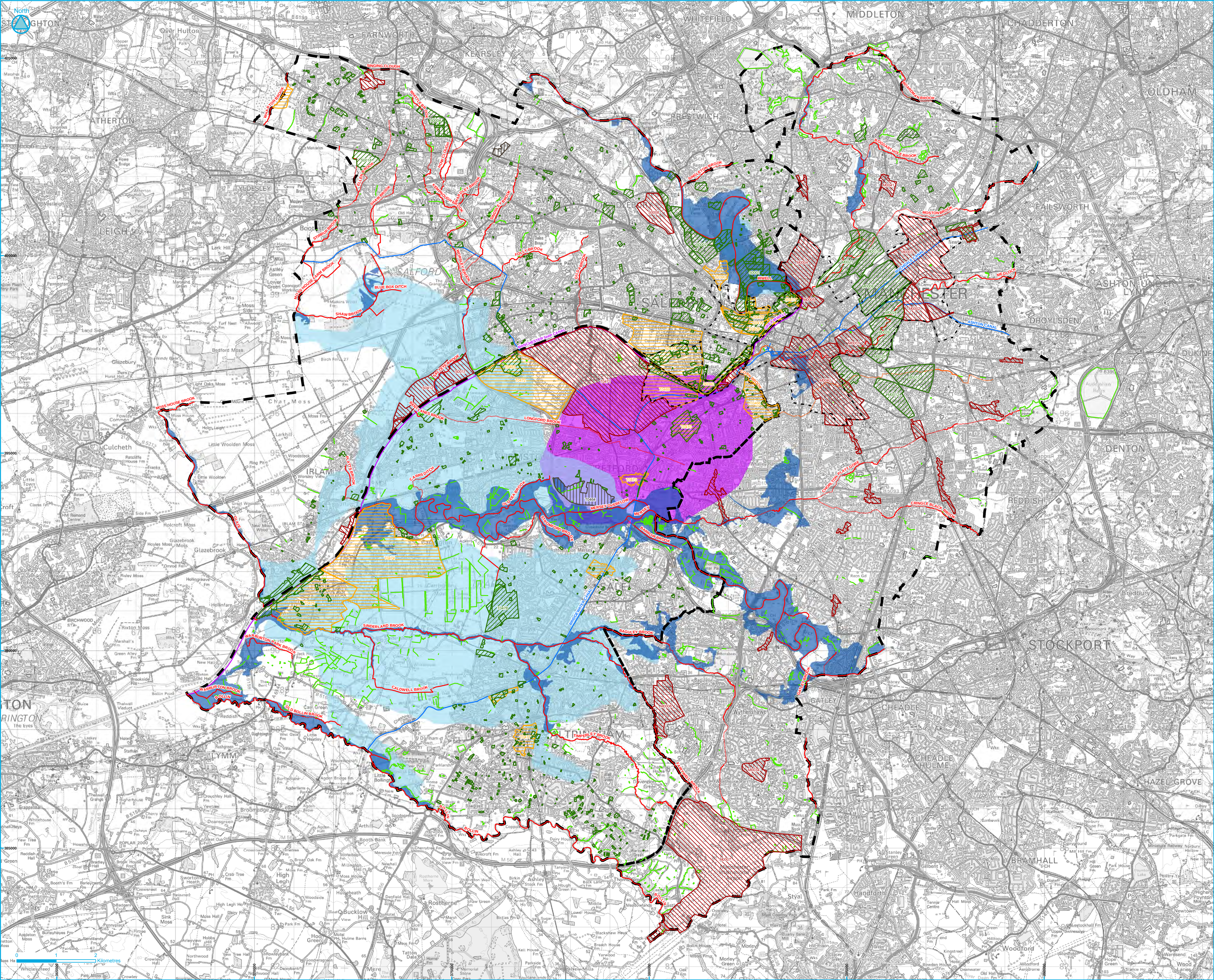


Till, Devensian - Diamict. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

[More Information](#)

Appendix I

[MCC SFRA Groundwater Flood Map](#)



- Council Boundary
- Ashton, Bridgewater and Rochdale Canals
- Manchester Ship Canal / Grey Inwell
- Other Waterbodies
- Main Rivers (V8.0)**
 - Culverted
 - Open
- Digitised River Lines**
 - Culverted
 - Open
- Potential Development Sites / Locations**
 - Employment
 - Housing
 - Mixed Use
 - Other
- Regional Centre Boundary

The map has been produced in accordance with PPS25: Development and Flood Risk and its Practice Guide. This map shows areas that are potentially at risk from groundwater flooding and should be used to scope suitable mitigation measures in a site specific Flood Risk Assessment.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The information on the map is based on Environment Agency potential groundwater rebound areas, data from the Coal Authority, BGS drift geology mapping and Defra Groundwater Emergence Maps.

The River Inwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Groundwater Flooding

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