RoC CONSULTING

Flood Risk Assessment & Outline Drainage Strategy

Plot 9b, First Street, Manchester

for

VITA Meadow Ltd



29/11/2024

COMPLEX CHALLENGES ...
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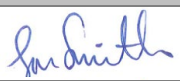
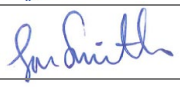
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Plot 9b First Street

for

VITA Meadow Ltd

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1.0 Introduction

1.1 Appointment

RoC Consulting has been commissioned by VITA Meadow Ltd to provide a site-specific Flood Risk Assessment and Outline Drainage Strategy in support of a planning application for the development of a purpose-built student accommodation scheme.

1.2 Proposed Development

The Proposed Development will encompass the erection of a purpose-built student accommodation (PBSA) building (Sui Generis), alongside ancillary amenity space, landscaping, secure cycle parking and other associated works; and use of Land east of River Street as a construction compound".

The Site comprises two areas.

The Proposed Development will be located entirely on 'Plot 9b', bound to the west by Medlock Street; to the north by land at Plot 9A of the FSDF area (currently being redeveloped into an office block of up to 9 storeys (pursuant to Planning Permission 132600/FO/2021); to the east by land at Plot 10A (currently being redeveloped into an office block of up to 13 storeys (pursuant to Planning Permission 136043/FO/2023) and to the south east by Hulme Street, and land at Plot 11 of the FSDF area (currently being redeveloped to deliver three co-living buildings of up to 45 storeys (pursuant to Planning Permission 125573/FO/2019 (as amended).

The Site also includes an area bound by the River Medlock to the north; Cambridge Street to the east; Machintosh Mills to the south and River Street and Annie Hornian Street to the west that will be used as a site compound for the construction phase of works (the 'Construction Compound').

Note that for the purpose of this flood risk and drainage strategy report, only the main site area encompassing Plot 9b will be discussed in detail in regard to flood risk and drainage. The 'Construction Compound' is acknowledged to be located in a higher flood risk zone, though is for a storage and compound area only and to be used for a two-year period during the construction of Plot 9b.

1.3 Aim of the Report

The aim of this report is to undertake a Flood Risk Assessment in accordance with the National Planning Policy Framework (NPPF) and current guidance to support a planning application for the site.

The detail and complexity of a Flood Risk Assessment should reflect the level of risk to the site. The NPPF is the official document and together with local planning standards regulates the assessment of flood risks and their appropriate mitigations to the planning process.

This report assesses flood risk to the site and any impact on flood risk to adjacent land and property due to the development proposals.
This report is intended to provide information and present proposals relating to the following:

- The existing topography, geology, and hydrogeology across the development
- The existing surface and foul water drainage systems within the vicinity of the site
- Identify existing overland flow paths
- Assess the risk of flooding due to fluvial, tidal, groundwater, surface water, flows from surcharged sewers and risks for other possible sources
- Develop mitigation measures for flood risk if required
- Potential constraints imposed by the regulatory bodies including the Environment Agency, Local Water Authority and Lead Local Flood Authority
- Develop an outline foul and surface water drainage strategy

As part of the development of this FRA, information has been obtained from United Utilities (UU).

The flood mapping information contained within this report has been obtained from the Environment Agency (EA) online flood maps and from further consultation.

1.4 Limitations

This report has been prepared for exclusive use by the client for the purpose of assisting them in evaluating the potential risk of flooding associated with the site, potential constraints imposed by drainage and in making a planning application.

RoC Consulting accepts no liability for any use of this document other than by the client (or its representatives acting on behalf of the 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 RoC Consulting. Any advice, opinions or recommendations within this document should be read and relied upon only in the context of the document as a whole.

RoC Consulting has endeavoured to assess all information provided to them during this appraisal. The report summarises from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.

The Flood Risk Assessment addresses the flood risk posed to and from the proposed development, the extent of which is shown on the Tim Groom Architects layout plan within Appendix B. This report has been undertaken with the assumption that the site will be developed in accordance with the above proposals 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.

2.0 Policy & Guidance

In carrying out our assessment and preparing this report, regard has been taken of the provisions of the development plans and a range of other material considerations. However, it is the Governments National Planning Policy Framework, Manchester City Council's Strategic and Preliminary Flood Risk Assessments (PFRA/ SFRA), the Local Flood Risk Management Strategy, LLFA SUDS Requirements for New Developments, CIRIA Guidance and the Non-Statutory Technical Standards for SUDS which provides the most up to date and specific guidance on the scope of Flood Risk Assessments and surface water management.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in England in March 2012, updated in July 2018 and most recently revised in July 2023.

The key aim of the NPPF is to ensure sustainable development through the planning process, considering the risks from climate change, flood risk and coastal change to avoid inappropriate development in areas at risk and directing development away from areas of high risk.

It advises that where development is necessary in areas of high risk, it should be safe, and that flood resilience should also be incorporated into the design. It also advises of the fact that new developments should not increase flood risk elsewhere and new developments should aid in mitigating flood risk to the wider area.

The NPPF's advice on climate change, flood and coastal change is set out in section 14 paragraphs 152-173, with the approach to planning for flood risk between paragraphs 159-169.

A Technical Guidance document was published in March 2012 to support the NPPF, which provided guidance on how flood risk should be assessed during the planning and development process. This document has been replaced online at www.gov.uk by the Planning Practice Guidance.

2.2 Planning Practice Guidance – Climate Change, Flood Risk & Coastal Change

The guidance on flood risk and coastal change is intended to help local planning authorities in the preparation of Local Plans, and neighbourhoods in preparing neighbourhood plans. It is also relevant to planning applications and, application for prior approval for certain types of permitted development.

For further guidance, it is recommended that the Environment Agency (EA) be contacted on applications where there is a risk of flooding i.e., sites within Flood Zones 2 and 3. There is also information on the role of Lead Local Flood Authorities (LLFA's) and when their advice may need to be sought in considering planning applications e.g., in critical drainage areas.

The document gives guidance on how flood risk should be assessed and accounted for within the context of the development:

- Flood zones - Table 1
- Flood risk vulnerability classification - Table 2
- Flood risk vulnerability and flood zone compatibility - Table 3
- The sequential test - if required
- The exception test - if required

2.3 Flood and Water Management Act 2010

This Flood Risk Assessment and Preliminary Drainage Strategy has been prepared in consultation with regulatory bodies and third parties. The views, advice and recommendations provided by the regulatory bodies and third parties represent their current standards and procedures.

The Flood and Water Management Act 2010 received Royal Assent on the 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.

The main areas affecting developers are:

- The LLFA became responsible for developing, maintaining, and applying local flood risk strategy, which must be consistent with national strategy and have input from the designated 'Flood Management Authorities' (FMA), which in addition to the council/unitary authority normally include the EA and local water company.

- The LLFA is required to approve and may adopt sustainable urban drainage systems (SUDS). The LLFA may be either a Unitary or County Council

- Non-statutory technical standards have been produced by Defra for England and the Welsh government for Wales. There is a requirement that SUDS will be designed and constructed in accordance with these which are consistent with the SUDS Manual. A practice guidance document was produced by the LASOO advisory group in support of the non-Statutory technical standards. In August 2019, LASOO was replaced with the Association of SUDS Authorities (ASA), the 'standards' remain current. A number of local authorities have also produced their own policy and guidance.

- The SUDS approval process is with the LLFA and the planning authority as part of the planning application. It should be noted that not all planning authorities are the LLFA and as such approval would be required from both authorities.

2.4 Manchester City Council Strategic Flood Risk Assessment, 2011

Local Planning Authorities are required to produce Local Development Frameworks (LDF), which are a portfolio of local development documents that collectively deliver the spatial planning strategy for the authority area.

The LDF's undergo a Sustainability Appraisal which assists Planning Authorities in ensuring their policies fulfil the principles of sustainability. Strategic Flood Risk Assessments (SFRAs) are one of the documents to be used as the evidence base for planning decisions and are a component of the sustainability appraisal process. Therefore, SFRAs should be used in the review or production of LDF's.

SFRA's assess the risk associated with all types of flooding and provides the information required to identify the amount of development permitted in an area; how the drainage systems in the area should function and how the risks in vulnerable areas can be reduced and/or mitigated. The National Planning Policy Framework states that Regional Planning Bodies (RPB's) or Local Planning Authorities should prepare SFRA's in consultation with the Environment Agency.

Manchester City, Salford City and Trafford Councils in partnership with JBA Consulting, produced the Level 1 and Level 2 SFRA, User Guide and Maps across four separate report volumes.

The SFRA indicates that the site primarily is located in Flood Zone 1 with the northwest corner shown to be in Flood Zone 2.

2.5 Manchester City Council Preliminary Flood Risk Assessment, 2011

The Flood Risk Regulations (the Regulations), which came into force on the 10th December 2009, and the Flood & Water Management Act (FWMA) which gained Royal Assent on the 8th April 2010 require all unitary authorities (such as Stockport Council) as designated Lead Local Flood Authorities to prepare a number of key documents including a Preliminary Flood Risk Assessment (PFRA) which focuses on local flood risk from surface water, groundwater, ordinary watercourses and canals.

The table below shows the elements of work required under the regulations.

Stage	Assessment of Plan	Description
1.0	Prepare a preliminary assessment report	The PFRA should focus on local flood risk from surface water, groundwater, ordinary watercourses, and canals
2.0	Determination and identification of flood risk areas	Flood risk areas are of significant risk identified on the basis of the findings of the PFRA, national criteria set by the UK Government secretary of state and guidance provided by the Environment Agency
3.0	Prepare flood hazard maps and flood risk maps in relation to each relevant flood risk area	The hazard and risk maps will show the likely extent depth, direction, speed of flow and probability of possible floods and their consequences
4.0	Prepare a flood risk management plan in relation to each relevant flood risk area	The flood risk management plans will set out what the risk management objectives are, the measures proposed to achieve those objectives and how the measures are to be implemented

The PFRA completes the first two stages in the process. The identification of flood risk areas will establish where the final two stages of preparing hazard and risk maps, and flood risk management plans are required.

The PFRA, maps and plans form part of the local Flood Risk Management Strategy that Manchester City Council as LLFA are required to prepare under the Flood and Water Management Act. This strategy sets out how the LLFA will manage local flood risk in their area and will cover areas not identified as being significant flood risk under the regulations.

2.6 Manchester City Local Flood Risk Management Strategy, 2014

As Lead Local Flood Authority, Manchester City Council has a duty to develop, maintain, apply, and monitor a strategy for local flood risk management. The local strategy will complement and support the National Flood and Coastal Risk Management Strategy, published by the Environment Agency (2011) and updated in August 2019.

The Manchester City Local Flood Risk Management Strategy (2014) focuses on local flood risk from surface water, groundwater and ordinary watercourses but also considers flooding from rivers. It identifies responsibilities for flooding within the Borough and the action plan identifies flood management actions designed to address flood risk.

The objectives of the strategy are to:

- Ensure that local flood risk is properly managed by using the full range of options in a coordinated way
- Reduce the likelihood, severity, and consequences of flooding from Ordinary Watercourses, from Groundwater, and from Surface Water runoff
- Seek opportunities to improve water quality and biodiversity through flood risk management activities

The LFRMS does not identify the development site as being one of the main areas specifically at risk with the exception of groundwater flooding. However, the mapping is based on a very broadscale approach based largely on geology. The likelihood of groundwater flooding occurring in Manchester is considered to be generally low.

2.7 SUDS Requirement for New Developments, Manchester City Council

The Lead Local Flood Authority have published a document that provides guidance on drainage and flood risk for new developments. A copy of this can be found in Appendix C of this report.

To avoid objection, the following three elements of evidence are required to be submitted:

1. Surface Water Management Statement for the site is submitted that is in line with the requirement of the NPPF Planning Practice Guidance

    - '*New development should only be considered in areas at risk of flooding if priority has been given to the use of sustainable drainage systems. Additionally, and more widely, when considering major development, as defined in the Town and Country Planning (Development Management Procedure) (England) Order 2015, sustainable drainage systems should be provided unless demonstrated to be inappropriate'*.
    - *The strategy should be accompanied by at least an outline layout of the proposed drainage systems with space allocation for the proposed attenuation in line with the relevant flow reduction requirements.*

2. Evidence that drainage hierarchy has been applied in line with NPPF PPG requirements. The aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable:

    - *into the ground (infiltration);*
    - *to a surface water body;*
    - *to a surface water sewer, highway drain, or other drainage system;*
    - *to a combined sewer.*

3. Evidence that one viable solution for draining the site is secured:

    - *Results of ground investigation carried out under Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Proposal of the attenuation that is achieving half emptying time within 24 hours. If no ground investigations are possible or infiltration is not feasible on site, evidence of alternative surface water disposal routes (as follows) is required*.
    - *Where surface water is connected to Main River, any works within or adjacent to the river that would affect it would require consent from Environment Agency. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority.*

To avoid or discharge a drainage condition, the following evidence is required.

- Evidence of consideration of green SUDS solution wherever practicable and viable in line with NPPF PPG Paragraph 051. SUDS should be designed to:
    - *reduce the causes and impacts of flooding;*
    - *remove pollutants from urban run-off at source;*
    - *combine water management with green space with benefits for amenity,* recreation and wildlife wherever practicable.

- For Greenfield site developments, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. to the Greenfield runoff rates;

- For Brownfield site developments, for all sites located within Conurbation Core Critical Drainage Areas, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates with an aim to reduce to Greenfield runoff rates wherever practicable;

- Where surface water runoff is to be disposed through infiltration, details of surface water attenuation that is adequate for infiltration capacity of the underlying soil is required. This capacity has to be assessed through site investigation carried out in line with Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Half emptying time of proposed attenuation within 24 hours should be achieved.

- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event in any part of a building; The NPPF suggests that 'for events with a return-period in excess of 30 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes. No flooding of property should occur as a result of a 1 in 100 year storm event (including an appropriate allowance for climate change)'.

- Assessment of overland flow routes for extreme events that is diverted away from buildings providing long and cross sections for the proposed drainage system and finished floor levels.

- Evidence that runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonably practical to the Greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;

- Hydraulic calculation of the proposed drainage system;

- Design construction drawings of proposed SUDS elements and flow controls;

- For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SUDS) is required.

- Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved.

2.8 CIRIA Guidance Development & Flood Risk

The CIRIA Guidance publication "C624 Development and Flood Risk – Guidance for the Construction Industry" defines 3 levels of FRA which can be undertaken:

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.
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 runoff. 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

This report will follow the format of a Level 2 Scoping Study.

2.9 C753 The SUDS Manual

This document provides best practice guidance on the planning, design, construction, operation, and maintenance of sustainable drainage systems (SUDS). This document provides detail on all the typical sustainable drainage systems and details on how they can be interconnected to not only provide the required drainage performance but also act as pollution control whilst enhancing the site wide Masterplan proposals.

SUDS should not be thought of as an individual component, but as an interconnected system designed to manage, treat, and make best use of surface water, from where it falls as rain to the point at which it is discharged into the receiving environment beyond the boundaries of the site.

A central design concept for SUDS is the SUDS Management Train. This describes the use of a sequence of components that collectively provides the necessary processes to control the frequency of runoff, the flow rates, and the volumes of runoff, and to reduce concentrations of contaminants to acceptable levels. There are six specific functions provided by SUDS components.

They are not independent, and one component may provide two or more functions.

2.10 Non-Statutory Technical Standards for SUDS, 2015

This document sets out the non-statutory technical standards for sustainable drainage systems.

They should be used in conjunction with the National Planning Policy Framework and associated Planning Practice Guidance.

The technical standards prescribe requirements for both Peak Flow and Volume Control with an emphasis on ensuring that these do not exceed the pre-development case and, where practicable, should not exceed greenfield rates and volumes for the 1 in 1 year and 1 in 100-year rainfall events.

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100-year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

3.0 Site Context

The site is located on the southern periphery of Manchester City Centre close to both the Mancunian Way Ring Road and Oxford Road & Deansgate railway stations and comprises a rectangular plot of land within the First Street Masterplan area.

The site is centred around NGR: SJ 472088 246252. The nearest postcode of M15 4RP. The total site area is approximately 0.2ha.

A site location plan is within Appendix A of this report.

3.1 Site Characterisation / Land Use

Development Area		The gross site area is approximately 0.26ha. Under the current proposals the site will provide circa 861 apartments across 33 storeys alongside amenity space, gym, collaboration spaces, cycle store, refuse etc.
Existing Surfacing and Current Use		The site is currently unoccupied hardstanding surfaced with concrete, asphalt and gravel which reflects its most recent use as a temporary car park and site compound. There is limited vegetation on the site which can be found around the site boundary.
Boundaries	North	Plot 9A currently under construction, beyond which is River Street, with further existing commercial and residential buildings within the First Street development area beyond.
	South	Hulme Street, beyond which lies the construction of further multi-level residential accommodation.
	East	A development plot (ASK Real Estate, Plot 10A).
	West	The A5103 Medlock Street.
Access	Vehicles	No vehicle parking is proposed.
	Pedestrians/Cycles	Predominantly from Hulme Street to the south.

A proposed site layout plan is within Appendix B of this report.

3.2 Topography

A topographic survey of the development site has been undertaken, a copy of which is within Appendix D of this report.

The topography of the site is generally level with a general fall from southwest to northeast. Levels in the northeast corner are around 32.00mAOD with levels in the southwest around 33.90mAOD.

3.3 Geology

Reference to the online British Geological Survey (BGS) map for the site indicates the following ground model:

Drift Geology: Glaciofluvial Sheet Deposits – Sand and Gravel
Solid Geology: Chester Formation – Sandstone

Soilscape England describes the soils as 'slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage'.

A search has also been completed using the BGS Borehole Scans facility to establish what (if any) historic site investigation or borehole data may be available for the development. The table below details the two closest available scans.

BHID	Direction	Distance	Made Ground	Clay	Sand	Clay
SJ89NW102	Southeast	150m	1.07m	2.59m	13.11m	9.45m
SJ89NW1229	Northeast	150m	1.40m	4.0m	-	-

There are no geological faults or features indicated within 500m of the site.

3.4 Hydrogeology

Reference to the DEFRA 'Magic Map' online Aquifer Designation Map indicates that the underlying superficial deposits are classed as a Secondary A Aquifer. The underlying Bedrock Geology is described as a Principal Aquifer.

Secondary A classification 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. These are generally aquifers formerly classified as minor aquifers.

Principal aquifers 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. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

3.5 Ground Water Protection Zones

The Environment Agency have defined Source Protection Zones (SPZs) for 2,000 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.

The proposed development site is located within Source Protection Zone 3 (Total Catchment).

The site is not located near to any sensitive groundwater abstraction points (e.g., for a potable water supply well). The nearest water abstraction point is indicated 175m to the northwest relating to the now defuncted Dunlop Rubber Works.

The nearest surface water feature is indicated 130m to the north in the form of the River Medlock (culverted). Water quality of this receptor indicates a GQA Grade of “E” (poor) and a flow rate of less than 0.31 cumecs.

There are four active water abstractions at the site or within 500m of the site boundary relating to borehole abstraction wells 384m to the southeast operated by Manchester Metropolitan University for use in heating networks.

There are multiple water discharge consents indicated within 250m of the site all of which relate to United Utilities storm water sewer overflows into the River Medlock associated with periods of high flow.

A number of historic pollution incidents have been noted in close proximity to the site relating to a range of incidents including water pollution incidents into the River Medlock to the north (the majority of which were Category 3 – Minor Incident).

The development of the site would be undertaken in a manner to ensure that no contamination of groundwater occurred.

3.6 Watercourses, Land Drainage, and other Waterbodies

As noted above, the nearest surface water feature is the River Medlock which is located circa 130m to the north of the site and is culverted.

No other water features are present in the vicinity.

3.7 Existing Flood Defences and other Structures

There are no formal flood defences in the vicinity of the site.

3.8 Existing Public Sewers

United Utilities Sewer Records show that the highways surrounding the development site are well served by a network of existing combined sewers (refer to Appendix E), these include:

- 600x500 vitrified clay sewer in Hulme Street
- 590x680 brick sewer flowing northward through the adjacent development site before changing to 610mm diameter concrete and turning east where it flows through the Plot10a site just inside the northern boundary. This sewer discharges to a combined sewer overflow (CSO) chamber in River Street
- 630mm diameter vitrified clay in River Street to the east discharging into the CSO chamber
- 300mm diameter vitrified clay outfall from the CSO flowing south along River Street
- 300mm diameter vitrified clay overflow from the CSO to the River Medlock
- 630x800 brick sewer flowing north within Medlock Street

3.9 Existing Private Sewers

A GPR survey was undertaken by Survey Operations in February 2020 and supplied to RoC for review. This has not indicated any historic drainage networks.

Notwithstanding the above, the GPR survey is limited and only identifies small sections of these networks so is not possible to determine exactly how much of the site these private sewers drained.

A copy of the GPR survey can be found in Appendix E alongside the public sewer records.

3.10 Historical Flood Records

No records of historical flooding in the vicinity are recorded in the SFRA.

An internet-based search did not uncover any flooding incidents at or in the vicinity of the site.

3.11 Flood Mapping

3.11.1 EA Flood Zone Map

The Environment Agency Flood Map indicates that the proposed Plot 9b development site is located in Flood Zone 1 (low risk).

Flood Zone 1 is land designated as having a greater than 1 in 1,000 annual probability of flooding from rivers.

Flood zone designations ignore the presence of any flood defences and only considers flooding from fluvial and tidal sources.

The temporary Contractor Compound is located within both flood zones 2 & 3.

3.11.2 SFRA Flood Zones Map

The Manchester City Council SFRA flood zone map also indicates the site is located in Flood Zone 1.

3.11.3 SFRA Groundwater Flood Map

The Manchester City Council SFRA Groundwater Flooding map indicates that the site is in an area at risk of groundwater flooding. However, the mapping is based on a very broadscale approach based largely on geology. The likelihood of groundwater flooding occurring in Manchester is considered to be generally low.

3.11.4 SFRA Surface Water Flood Map

The Manchester City Council SFRA surface water flood maps indicate that the site is located in an area of Very Low Susceptibility to surface water flooding.

3.11.5 EA Surface Water Flood Map

The Environment Agency flood mapping for surface water indicates that the site is at very low risk of flooding, with some localised low risk areas existing along River Street to the north.

4.0 Surface Water Management

4.1 Introduction

The National Planning Policy Framework (NPPF) and accompanying Technical Guidance indicate that surface water runoff should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.

Consideration should therefore firstly be given to using sustainable 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 runoff 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 the Building Regulations (2015) sets out a hierarchy for the disposal of surface water which encourages a SUDS approach.

Note, the drainage strategy wholly considered the main development site only. No drainage is proposed to the temporary contractor's compound.

4.2 Pre-Development Surface Water Runoff

The total area within the site boundary is approximately 0.26ha. This is currently unoccupied and surfaced with gravel reflecting its former use as a temporary car park and construction compound.

For the purposes of determining the existing rate of surface water runoff the site is considered to be greenfield.

The table below summarises the existing greenfield runoff rates for the development across a range of storm return periods.

DRAINED. AREA	Q_1 (L/S)	Q_{BAR} (L/S)	Q_{30} (L/S)	Q_{100} (L/S)
0.200 ha	1.4	1.6	2.8	3.4

Existing runoff calculations are within Appendix F of this report.

4.3 Methods of Surface Water Management

There are three methods that have been reviewed for the management and discharge of surface water 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 to watercourse
- Discharge to public sewerage system

Discharge via Infiltration

Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.

An intrusive investigation for this and the adjacent development site has previously been undertaken by TerraConsult on behalf of ASK Real Estate and provided to RoC for review. In addition, RoC Consulting have undertaken a Phase 1 Desk Study for the site which also provides information on expected ground conditions.

These indicate Made Ground up to depths of around 1.30m, underlain by clays for a further 5-7m. Sandstone bedrock was encountered in one borehole at over 8m.

Variable head permeability testing was undertaken as part of the TerraConsult intrusive investigation. These indicate infiltration rates between $1.06E^{-08}$ m/s to $9.35E^{-09}$ m/s.

Taking this into consideration, plus the fact the development building takes up the full red line boundary, infiltration is not considered to be a feasible method of surface water disposal for the development.

Discharge to Watercourse

As indicated earlier in this report, the nearest watercourse to the site is the River Medlock which is located circa 130m to the north of the site and is culverted.

No other water features are present in the vicinity.

To obtain a connection to this feature would require a significant off-site connection through third party land and therefore this method of surface water disposal is not considered to be practicable and has not been considered further.

Discharge to Public Sewer

The only public sewerage infrastructure in the vicinity of the site are all combined sewers. On the basis that infiltration is not considered to be viable, there are no surface water sewers or watercourses in the immediate vicinity and the existing development historically discharged to the public combined sewer network then this is the only viable solution.

It is therefore proposed that the development will mimic the existing drainage regime and discharge surface water to the combined sewer network.

To facilitate the development, a new private combined water drain will need to be constructed through the ASK Development Plot 10 site and outfall to the existing combined water sewer in River Street to the north.

A pre-development enquiry was submitted to United Utilities and a copy of their response is appended to this report.

UU have acknowledged that infiltration and discharge to watercourse are both not feasible methods of disposal.

UU have confirmed that a connection to the combined sewer in River Street would be acceptable at a peak rate not exceeding 5l/s.

4.4 Proposed Restricted Discharge Rates

Manchester City Council SUDS Requirement for Developers states that:

"*For Greenfield site developments, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. to the Greenfield runoff rates*".

Given the small development footprint and limited space within which to incorporate SUDS features & attenuation, it is proposed to restrict flows to a peak Greenfield runoff rate of 2.6l/s.

This will ensure that the proposed development will not increase flood risk elsewhere and is considered a minimum rate to prevent blockage.

United Utilities have confirmed in their pre-development enquiry response that they will accept a maximum discharge rate of 5.0 l/s to the combined sewer in River Street and therefore this rate provides a betterment to this.

4.5 Attenuation Requirements

The proposed restricted discharge rate above and development runoff generated by proposed impermeable areas results in a storage requirement during periods of intense rainfall.

Causeway Flow design software has been used to model the preliminary proposed drainage network and calculate the maximum storage volume required on-site for the Q_{100}-year storm events plus an allowance for climate change.

Proposed impermeable areas have been measured from the architect's layout. This may be subject to change pending further development of the site wide landscape proposals.

Attenuation Volume			
Gross Area (ha)	**Imp. Area (ha)**	**Max. Discharge (l/s)**	**Q_{100}+45% Volume (m3)**
0.26	0.183	3.40	105

It should be noted that these figures are indicative only and should not be relied upon for contractual or cost commitment purposes. Proposed drainage calculations are provided in Appendix H.

A copy of the drainage strategy can be found in Appendix G.

4.6 Surface Water Runoff Volume

It is a requirement of the Non-Statutory Sustainable Drainage Technical Standard that:

S5 *Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event, must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.*

S6 *Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with* ***S5*** *above the runoff volume must be discharge at a rate that does not adversely affect flood risk.*

Where possible, to comply with the above, SUDS techniques should be used to allow any additional volume to infiltrate naturally, therefore preventing this from discharging to receiving waters.

The pre-development discharge volume has been calculated at **28m^3**.

The post-development discharge volume (including an allowance for climate change) has been calculated at **90m^3** which represents an additional **62m^3**.

Compliance with the above can be technically difficult to achieve for Greenfield sites of this nature and therefore the reduced peak rate of runoff is applied.

4.7 SUDS Measures

Current policy and best practice encourage the use of Sustainable Drainage Systems (SUDS) and in particular infiltration systems.

The Environment Agency recommends that surface water runoff should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.

This approach involves using a range of 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 runoff from a site.

This can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements.

An assessment of potential SUDS measures has been undertaken based on current available site investigation data and the constraints of the proposed development site; this is presented below.

SUDS MATRIX		
SUDS Technique	**Description**	**Commentary**
Wetlands	As ponds, but the runoff flows slowly but continuously through aquatic vegetation that attenuates and filters the flow. Shallower than ponds.	Considered not viable due to urban nature of site
Ponds	Depressions used for storing and treating water. They have a permanent pool and bankside emergent and aquatic vegetation.	Considered not viable due to urban nature of site
Bioretention Areas	Vegetated areas for collecting and treating water before discharge downstream, or to the ground via infiltration.	Potential to introduce into external landscaped areas
Green Roofs	Vegetation roofs that reduce run off volume and rate.	Considered not viable due to scheme layout
Permeable Pavements	Allow inflow of rainwater into underlying construction / soil.	Potential to use in conjunction with bioretention areas to minimise hard drainage channels and gullies
Swales Shallow	Vegetated channels that conduct and / or retain water (and can permit infiltration when un-lined). The vegetation filters particulates.	Considered not viable due to urban nature of site
Infiltration Basins	Depressions that store and dispose of water via infiltration.	Considered not viable due to urban nature of site
Filter Strips	Vegetated steps of gently sloping ground designed to drain water evenly from impermeable areas and filter out silt and other particulates.	Potential to introduce into external landscaped areas
Detention Basin	Dry depressions designed to store water for a specified retention time.	Considered not viable due to urban nature of site
Infiltration Trenches	As filters drain, but allowing infiltration through trench base and sides.	Considered not viable due to ground conditions and poor permeability results returned from site investigation work
Filter Drain	Linear drains / trenches filled with a permeable material, often with a perforated pipe in the base of the trench.	Considered not viable due to ground conditions and poor permeability results returned from site investigation work
Sand Filters	Treatment devices using sand beds as filter media.	Considered not viable due to urban nature of site
Soakaways	Sub-surface structures that store and dispose of water via infiltration.	Considered not viable due to ground conditions and poor permeability results returned from site investigation work
Pipes, Subsurface Storage	Conduits and their accessories as conveyance measures and / or storage. Water quality can be targeted using sedimentation and filter media.	Incorporated as part of drainage strategy for conveyance and volumetric stroage of attenuation volumes
Silt Removal Devices	Manhole and / or proprietary devices to remove silt.	Potentially to be incorporated if required by United Utilities/ LLFA
Based on 'The SUDS Manual' CIRIA Guidance		

SUDS will be incorporated into the development drainage system wherever possible. However, based on the encountered ground conditions across the site infiltration-based SUDS are not considered to be technically feasible and therefore non-infiltration components will be incorporated as a method of surface water conveyance and water quality enhancement.

The design of the SUDS features would be undertaken at the detailed design stage in conjunction with the design of the piped drainage systems and other attenuation storage.

5.0 Foul Water Management

5.1 Introduction

It is proposed to install a new foul drainage system to serve the development.

The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 'Drainage and Sewer Systems Outside Buildings', the Local Authority Building Control specifications and requirements, Sewerage Sector Guidance (included in Appendix C) and the Civil Engineering Specification for the Water Industry.

5.2 Foul Water Capacity & Point of Connection

At the time of writing details of foul flow rates generated by the development were not available. However, an estimate has been undertaken based on appliances shown on the architect's layouts in accordance with BS EN 12056-2:2000.

The approximate peak foul flow generated through this methodology would be in the region of **4.4l/s**.

Based on the GPR survey it is not possible to utilise an existing connection to the public sewer network and therefore it is proposed to combine with the surface water at the final manhole and discharge to the newly constructed combined water drain passing north through the adjacent ASK developments Plot 10 and that outfalls to the combined public sewer in River Street to the north of the development site.

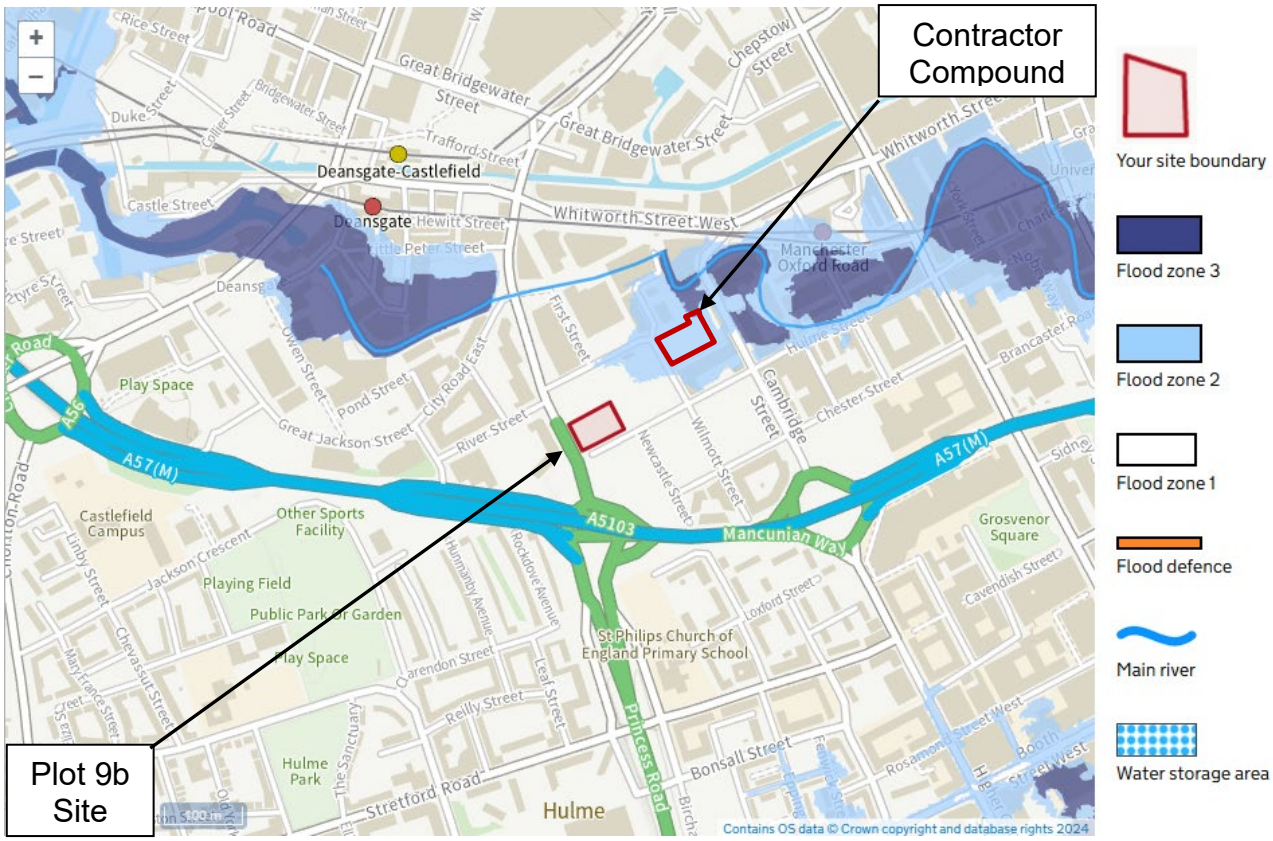
A pre-development enquiry was submitted to United Utilities and a copy of their response is appended to this report.

UU confirmed that they will accept foul flows to the public combined sewer in River Street at an unrestricted rate.

6.0 Sources of Flood Risk

6.1 Fluvial Flood Risk

Information relating to fluvial flood risk at the site has been obtained via the Environment Agency online flood mapping and via a Product 4 data request.



Examination of the Environment Agency online flood map above indicates that the main Plot 9b site is located in **Low-Risk** Flood Zone 1.

Flood Zone 1 is defined within the NPPF as a site to have a less than 1 in 1000 (< 0.1%) probability of river flooding in any one year.

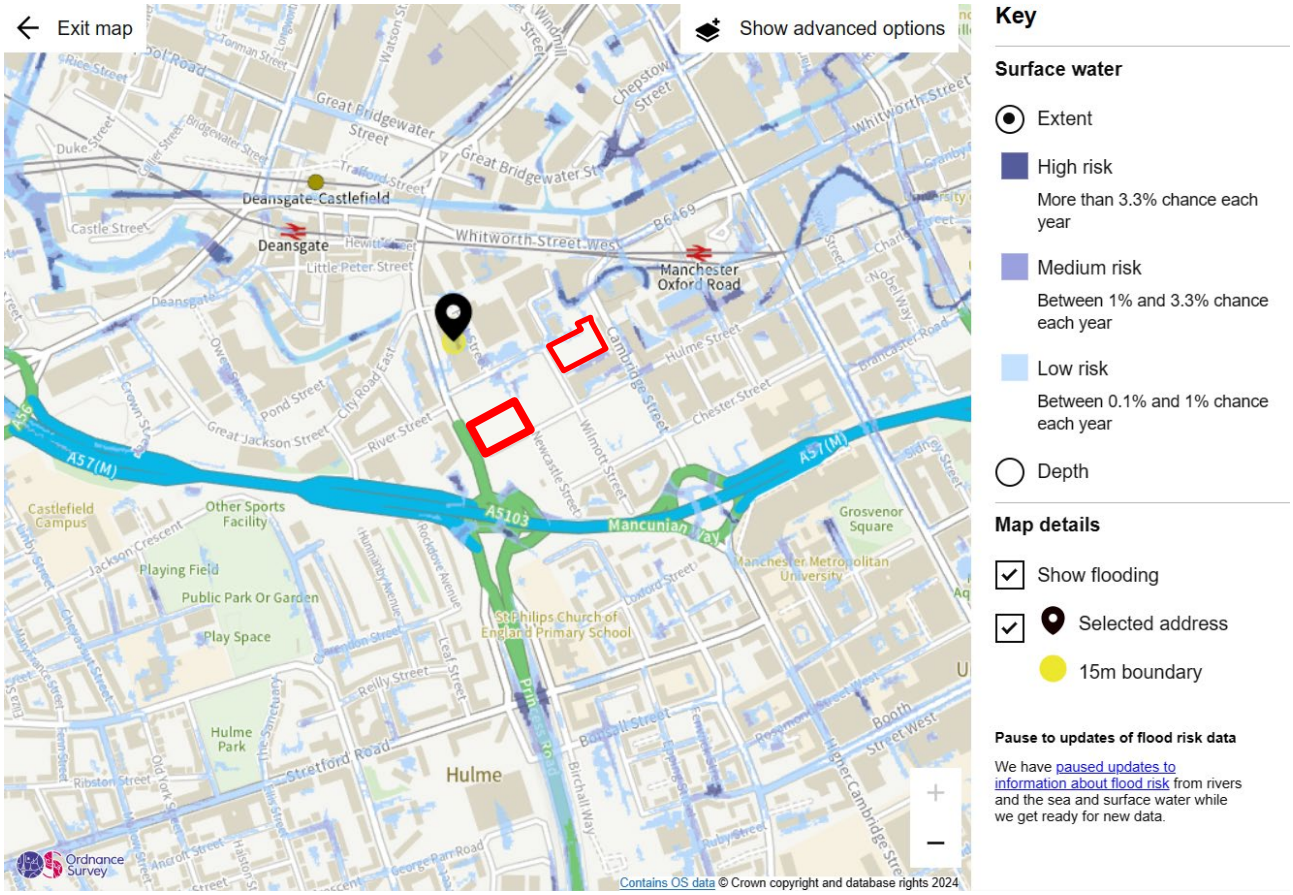
The nearest water feature to the development is the culverted River Medlock which is located circa 130m to the north of the development site.

The temporary contractor compound is located in **Medium Risk** Flood Zone 2. Defined within the NPPF as a site to have a less than 1 in 100 (< 1.0%) but greater than 1 in 1000 (>0.1%) probability of river flooding in any one year. As the site is purely a temporary compound, the sequential and exception tests are passed, and no further assessment is required.

6.2 Pluvial Flood Risk

Pluvial flooding is defined as flooding resulting from rainfall generated overland flow before runoff enters any watercourse or sewer.

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.



The Environment Agency pluvial flood map indicates that both the main development site and the temporary contractor compound area are not potentially susceptible to pluvial flooding.

The only flows that are therefore likely to be present on site are from direct rainfall on areas of hardstanding.

Overland flow paths on site and exceedance events will be catered for within the detailed design/levels strategy. This, in conjunction with a new drainage system, will be sufficient to maintain a **LOW** level of risk from pluvial flooding.

6.3 Tidal Flood Risk

The site is not considered to be at risk of tidal flooding due to its inland location.

6.4 Groundwater Flood Risk

In general terms, groundwater flooding can occur from three main sources, raised water tables, seepage and percolation, and groundwater recovery or rebound. If groundwater levels are naturally close to the surface, then this can present a flood risk during intense rainfall.

The Manchester City Council SFRA identifies that the site is in an area at risk of groundwater flooding. However, the mapping is based on a very broadscale approach based largely on geology. The likelihood of groundwater flooding occurring in Manchester is considered to be generally low.

Intrusive investigation works are intended to be undertaken in advance of detailed design to establish exact ground water levels. However, the site investigation undertaken by TerraConsult on behalf of ASK Real Estate indicates that ground water was encountered between 3.44m and 6.25m below ground level.

If required, measures would need to be introduced into the drainage scheme to deal with high groundwater to ensure that flooding to property does not occur. Given the development proposals do not include any basement then no such measures should be required.

Taking the above into consideration it is expected that any groundwater issues can be mitigated as required at the detailed drainage design stage. The risk to the site from groundwater flooding is therefore considered to be **LOW**.

6.5 Artificial Source – Canal Flood Risk

Generally, canals are owned and operated by the Canals & Rivers Trust (CRT). Water levels are regulated between normal and statutory levels by means of weirs and sluice gates and whilst a breach or overtopping of the structure is unlikely, the possible flood risk needs to be assessed.

There are no canals in close proximity to the site.

There is not considered to be any risk of flooding to the site from canals.

6.6 Artificial Source – Sewer Flood Risk

Given the topography of the site and the surrounding area it is unlikely that flooding from existing surcharged public sewers would impact on the proposed development site as it would likely be limited to the surrounding highway network and directed away from the development.

A response was awaited with respect to DG5 sewer flooding in the area and the response, when received, will be entered into a further revision of this report.

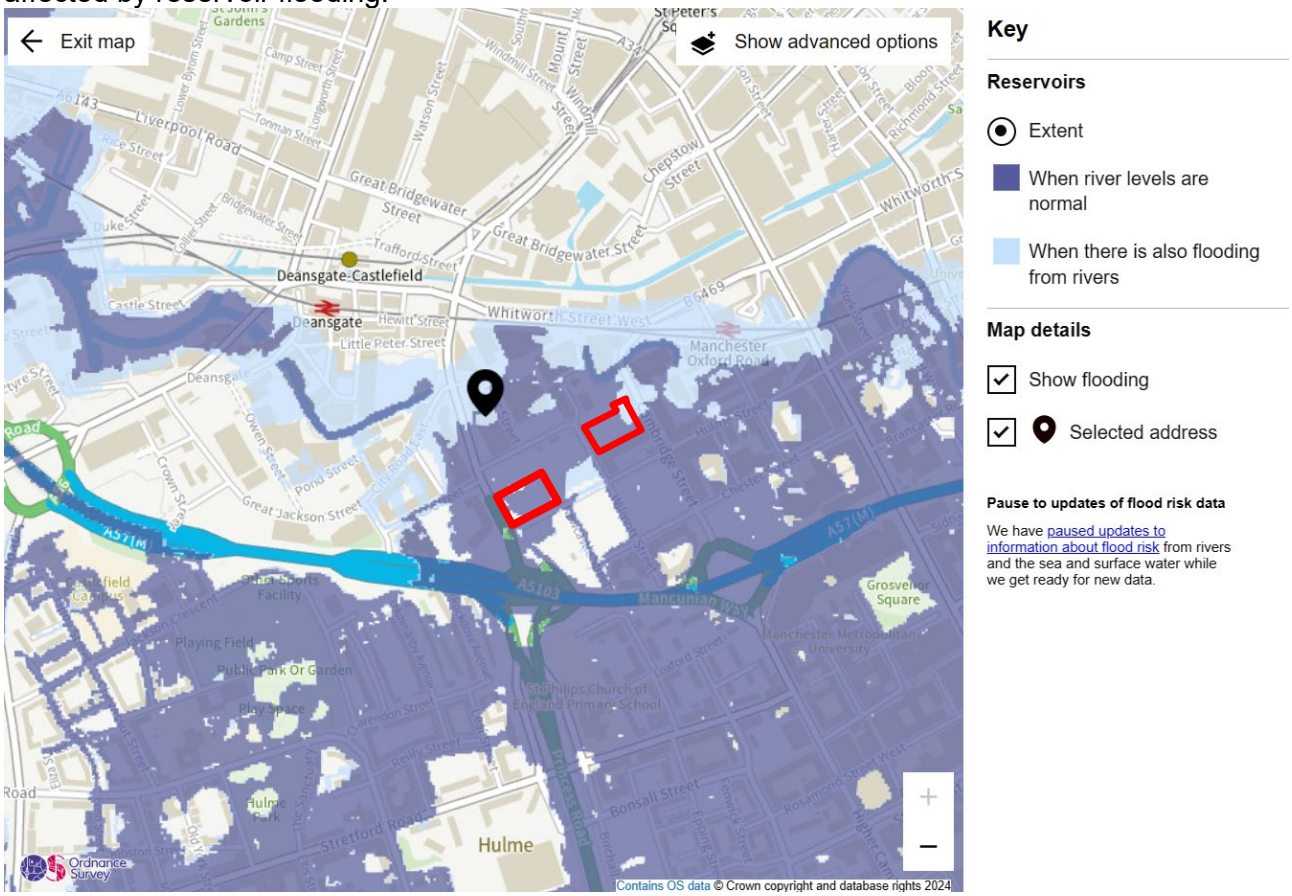
The new development proposed site surface water drainage system will be designed to maintain surface water flows below ground for up to and including the 1 in 100-year return period as a minimum. Flows above this and up to 100 year plus 45% allowance for climate change will be retained safely within the site.

Given the constraints of the site it is expected that surface flooding will need to be minimised and therefore it is likely all attenuation will be provided for below ground.

It is considered that the risk of flooding to the site from surcharged sewers can be considered as **LOW.**

6.7 Artificial Source – Reservoir Flood Risk

Review of the below Environment Agency reservoir flood map indicates that the site could be affected by reservoir flooding.



However, despite this the risk of reservoir flooding in the UK is very low as reservoirs are inspected regularly and any essential maintenance is carried out. Furthermore, the likelihood of this occurring at the same time as a fluvial flood event is experienced in the area are very remote. The risk of flooding from reservoirs is therefore considered **LOW.**

6.8 Flood Risk Vulnerability Classification

The proposed development is primarily residential and can be considered as 'More Vulnerable' within Table 2: Flood Risk Vulnerability Classification in the NPPF.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

Table 2: Flood risk Vulnerability and flood zone 'compatibility'

This type of development would be wholly appropriate for Flood Zone 1.

7.0 Residual Risks and Impacts

7.1 Flood Risk Management Measures

The surface water drainage management measures outlined above would ensure that runoff from the proposed development would mimic the existing scenario.

As a result of the restricted flow rate and proposed impermeable area, attenuation is required in the form of site control measures. Any new private drainage system will be designed in accordance with current design guidance and standards and attenuation will be provided along with potential SUDS measures such as bio-retention.

The use of SUDS measures, with controlled release of surface water to the combined sewer network will help to mitigate any potential flood risk impact from the development on the public sewer system.

Finished site levels will be engineered to provide positive drainage where required and prevent ponding. The accumulation of standing water will therefore not occur and thus not pose a risk.

Gradients of the hardstanding areas, where possible, will be designed to fall away from buildings such that any overland flow resulting from extreme events would be channelled away from entrances.

7.2 Off Site Impacts

The existing site primarily comprises areas of hardstanding with limited soft landscaping. It is anticipated through the introduction of soft landscaping within areas of public realm, impermeable areas will reduce slightly.

A survey of the existing drainage network indicates that the existing site is Greenfield with no current positive outfall to the public sewer.

To ensure that the proposed development will not increase flood risk elsewhere, surface water drainage discharge will be restricted. This restricted discharge in conjunction with surface water attenuation on site and a reduction in impermeable areas will mitigate against flood risk to the site and other land.

By reducing the post development peak runoff prior to its point of discharge from the site, this will reduce the potential for surface water flooding on the downstream network.

7.3 Residual Risks

The development and its drainage system will be designed to cope with the intense storm events up to and including the 100-year return period rainfall event with an allowance for climate change. If an extreme rainfall event exceeds the design criteria for the drainage network, it is likely that there will be some overland flows which are unable to enter the system.

Any overland flows generated by the proposed development will be directed away from any adjacent properties surrounding the site and towards the road network where it can follow natural flow paths.

As with any drainage system, blockages within the surface water system have potential to cause flooding or disruption. An appropriate maintenance regime is to be scheduled with a management company appointed to carry out the works.

7.4 Pollution Control

In accordance with CIRIA C753 publication 'The SUDS Manual' (2015), residential roofs and other roofs (applicable to high rise student accommodation) have a very low and low pollution hazard level respectively.

No parking or service yards are to be provided on the site and so this has not been considered.

The table below indicates the pollution hazard indices which is based on Table 26.2 from the SUDS Manual.

Pollution Hazard Indices				
Land Use	**Pollution Hazard Level**	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Residential Roofs	Very Low	0.2	0.2	0.05

8.0 Summary

The proposed development proposes the construction of an 861-unit multi-level accommodation alongside resident facilities across a gross site area of approximately 0.26ha.

The site is in an area identified as having a low probability of flooding on the Environment Agency Flood Map and is located in Flood Zone 1.

The Flood Risk Assessment (FRA) has reviewed all sources of flood risk to both the proposed development and to existing adjacent properties as a result of the development proposals, including fluvial, tidal, pluvial, groundwater, sewers and flooding from artificial sources. This report demonstrates that the development site is not at significant flood risk, nor does it increase flood risk off-site.

A pre-development enquiry was submitted to United Utilities and their response is appended to this report. They have confirmed that foul water can discharge unrestricted to the public combined sewer system in River Street. Surface Water is also able to discharge to this sewer at a peak rate of 5l/s.

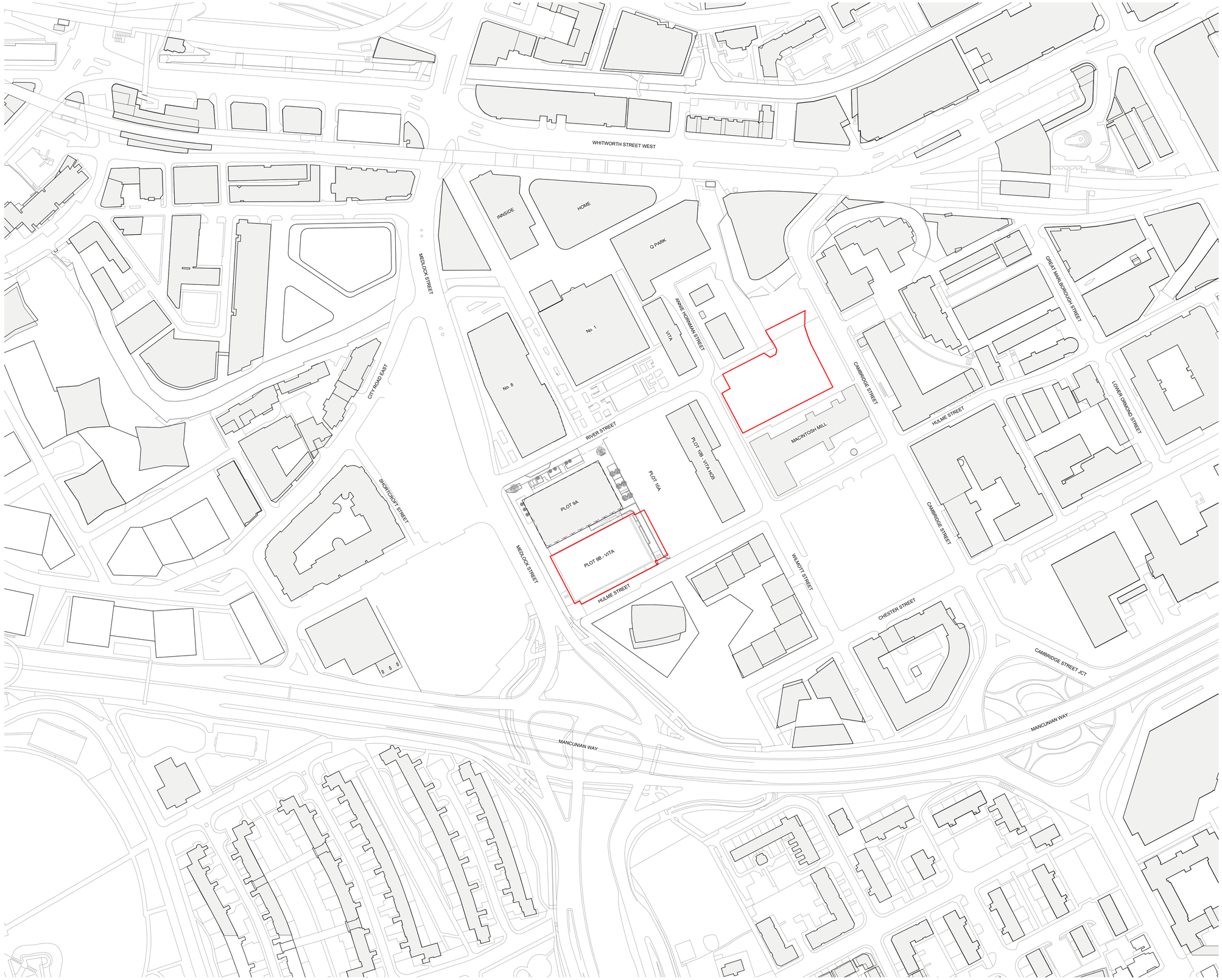
The primary option for surface water disposal would ordinarily be via infiltration. However, based on encountered ground conditions and the building taking up the full footprint, this is not considered to be feasible and therefore discharge will be to the public combined sewer network as per the previous site regime. This will be subject to agreement in principle with the LLFA.

Discharge from the site would be restricted to 3.4 l/s which represents the existing calculated Q_{100} greenfield runoff rate, considered to be the minimum to prevent blockage. UU have confirmed they will accept a maximum discharge of 5.0 l/s to the combined sewer system.

Foul water drainage is intended to combine with the surface water drainage system at the final outfall and will discharge to the combined public sewer in River Street via a private combined drain constructed through the ASK Development Plot 10 site.

This Flood Risk Assessment and Outline Drainage Strategy is considered to be commensurate with the development proposals and in summary, the development can be considered appropriate for Flood Zone 1 in accordance with the NPPF.

APPENDIX A – LOCATION PLAN



Existing Site Plan

1 : 1250

0m 25m 50m 125 m

N

General Notes

Use figured dimensions only. Do not scale off this drawing. All dimensions must be set out and checked by the contractor on site prior to commencement of construction. Any variations between drawings and site must be reported to TGA before work proceeds.

Drawings to be read in conjunction with Architectural Specification, Structural Engineer's Drawings and Specifications, Mechanical & Electrical Engineer's Drawings and Specifications, all Supplemental Information, including but not limited to; Detailed Fire Strategy, Acoustic Report, Thermal Report & Overheating Report.

No portion of the Works to commence without acceptance of the required submittals by the Employer.

Main Contractor to submit relevant documents to building regulation and legislation approval authorities as required to comply with the Specification.

Legend and Notes

Red Line Planning Boundary

Rev	Description	Date	By
P01	First Issue	18.10.24	LS

Title
Existing Site Location Plan

Drawing No.
VS9B-TGA-G100-PL-XX-95200

Revision
P01

Status

Scale
As indicated@A1

Project
Plot 9B_First Street

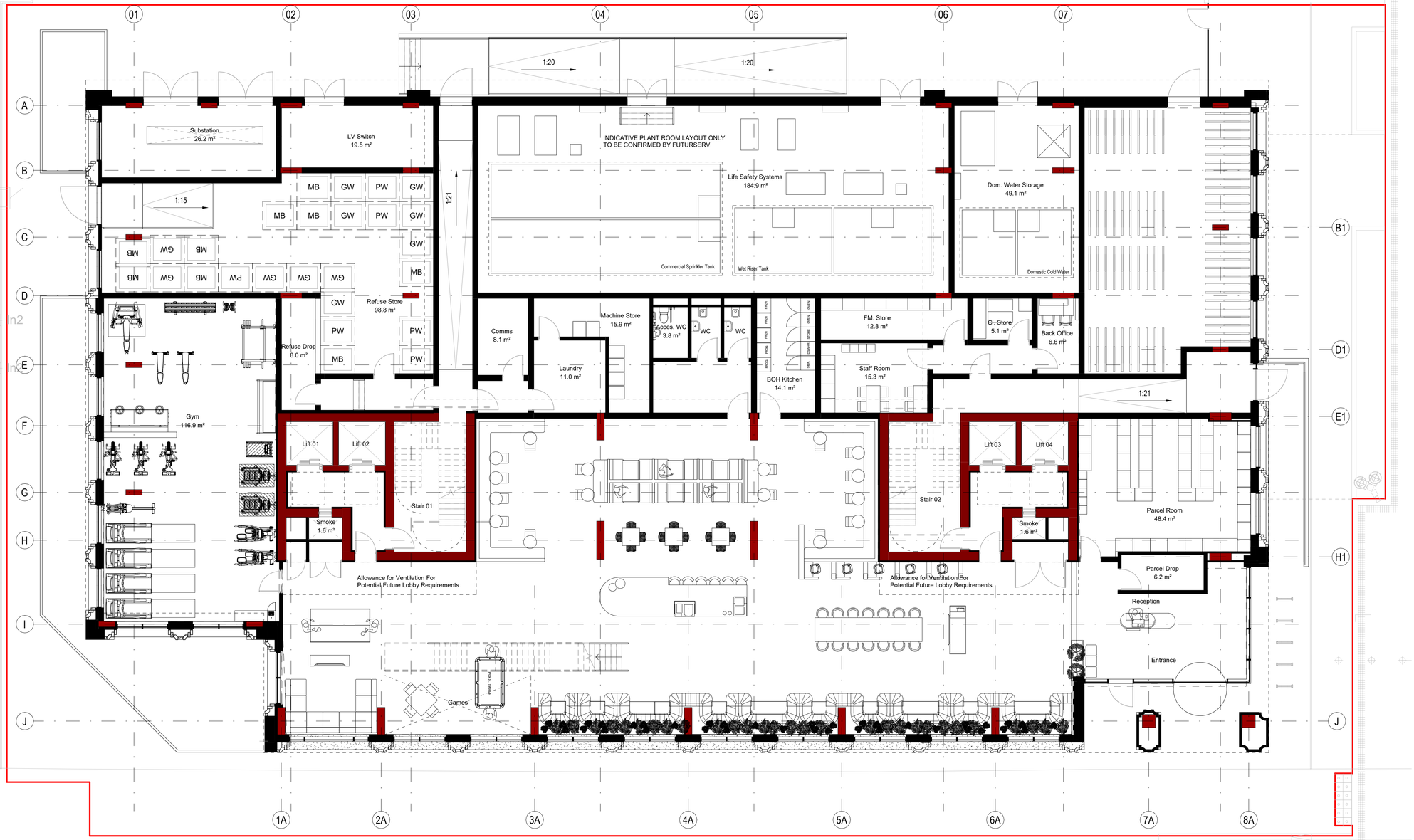
Client
VITA

TIM GROOM ARCHITECTS

Eastgate, 2 Castle Street, Manchester, M3 4LZ 0161 870 1152

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APPENDIX B – DEVELOPMENT LAYOUT



General Notes

Use figured dimensions only. Do not scale off this drawing. All dimensions must be set out and checked by the contractor on site prior to commencement of construction. Any variations between drawings and site must be reported to TGA before work proceeds.

Drawings to be read in conjunction with Architectural Specification, Structural Engineer's Drawings and Specifications, Mechanical & Electrical Engineer's Drawings and Specifications, all Supplemental Information, including but not limited to; Detailed Fire Strategy, Acoustic Report, Thermal Report & Overheating Report.

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Rev	Description	Date	By
P01	Preliminary Issue	13.03.24	LS
P02	Revised Brief Issue	27.03.24	LS
P03	Proposed building relocated to allow for facade projections	09.04.24	LS
P04	Developed Layouts	16.04.24	LS
P05	Design Team Issue	14.05.24	LS
P06	Co-ordination Issue	01.07.24	LS
P07	Design Team Issue	05.07.24	LS
P08	Massing Alterations	08.08.24	LS
P09	Revised Design Team Issue	03.09.24	LS
P10	Amendments to GL04, 05 and 08.	11.09.24	LS
P11	Amendments to suit Interior Design requirements	23.09.24	LS

Title
General Arrangement - Level 00 Sketch

Drawing No.
1207-TGA-XX-00-DR-A-10300

Revision
P11

Status

Scale
1 : 100@A1

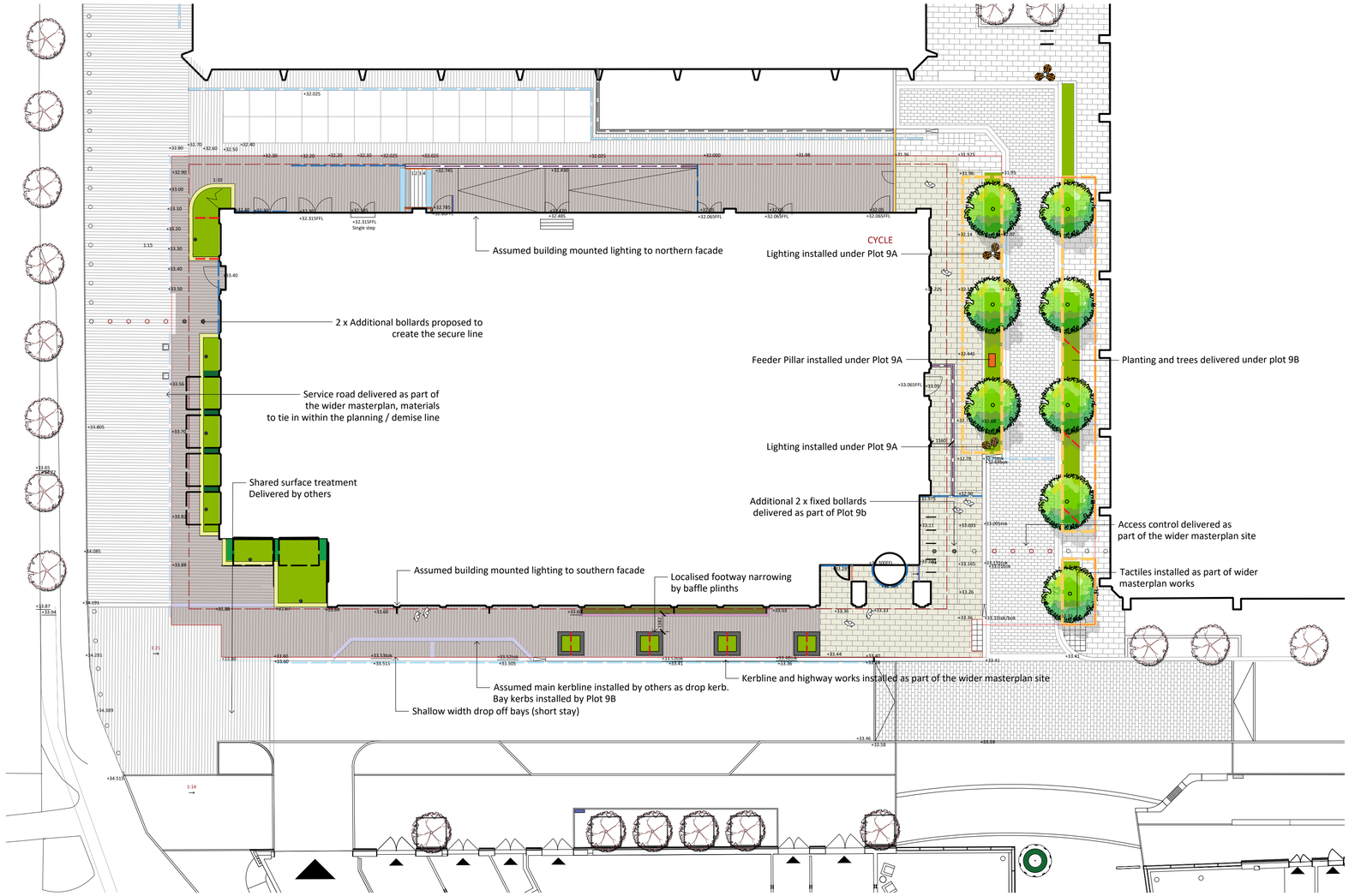
Project
Plot 9B_First Street

Client
VITA

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HARD LANDSCAPE

Established Masterplan Paving Installed Under Other Phases

Proposed Paving Type 1 - Concrete
Product: Hydro Lineo 40 by Hardscape (or similar approved)
Plan Size: 300 x 100 x 100
Colour: Standard Grey
Laying Bond: Stretcher Bond
Other: 5mm Butt jointed

Proposed Paving Type 2 - Granite Mix Setts
Product: 30% Kobra & 70% Royal White Mix by Hardscape (or similar approved)
Plan Size: 100x 300 x 63mm (depth tbc)
Finish: Flamed
Laying Bond: Stretcher Bond

Proposed Paving Type 2 - Yorkstone Flags
Product: Scoutmoor Yorkstone Flags to match existing First Street Surfacing
Plan Size: 400-900 x 300 x 63mm (depth tbc)
Finish: Sawn
Laying Bond: Min 100mm overlap

Proposed Edge Type 1 - Flush Planting Bed Surround
Product: Royal White Granite by Hardscape (or similar approved)
Plan Size: 200x900x150 (depth tbc)
Finish: Flamed
Upstand: 0mm

Proposed Edge Type 2 - Raised Planting Bed Surround
Product: Royal White Granite by Hardscape (or similar approved)
Plan Size: 300x900x250 (depth tbc)
Finish: Flamed
Upstand: 125mm

Proposed Edge Type 3 - Flush Kerb
Product: Royal White Granite by Hardscape (or similar approved)
Plan Size: 300x900x200 (depth tbc)
Finish: Flamed
Upstand: 0mm

Proposed Edge Type 4 - Wall and Balustrade
Product: Brick clad wall to match the architecture
Laying Bond: Staggered bond
Other: Brick on Edge copings - special ends

Proposed Edge Type 5 - Steps
Product: Royal White Granite by Hardscape (or similar approved)
Plan Size: 1100x300x175mm
Finish: Flamed
Other: Contrast nosing
Other: Corduroy s/s strip tactile pavings

FURNITURE

Proposed Bollard to Match Masterplan Furniture
Product: K8 Shallow Depth Terra Neptune SIngle by Frontier Pitts LTD (or similar approved)
Class Code:V/7500/64/90:0.0
Foundation: Shallow Mount

Proposed Lighting to Match Masterplan Furniture
Product: 3 head Multi Woody by IGuzzini or similar approved
Height: 5m
Materials: S/S

Proposed Lighting Bollard to Match Masterplan Furniture
Product: Unknown - to match the wider masterplan palette
iWay bollard Super Comfort round 180degrees

Proposed Cycle Stands to Match Masterplan Furniture
Product: S/S or similar approved

NB Baffles: Patternation and colour tone to tie with the architectural narrative

Proposed Movable Plinth Planter with Baffle
Product: Bespoke weighted Plinth Planter with Baffle
Plinth Materials: Granite 1800w x1800l x500h
Baffle Dimension: 1800w x 2500h
Other: 50% Porosity - Perforate Pattern (tbc)

Proposed Baffle - Building Entrance
Product: Bespoke
Dimension: 1200w x 3000h
Other: 50% Porosity - Perforate Pattern (tbc)

Proposed Baffle - Located in Planting Beds
Product: Bespoke
Dimension: 1800w x 3000h
Other: 50% Porosity - Perforate Pattern (tbc)

Proposed Fin - Southern Building Facade
Product: Bespoke
Dimension: 500w x 1800h
Other: Porosity? - Perforate Pattern (tbc)

Proposed Railings and Gate
Product: To Match Wider masterplan proposals
Other: To be ascertained if part installed under Plot 9A

Indicative Drainage Channel

Drainage Channel Delivered by Others

Proposed Feeder Pillar Delivered by Another Phase

SOFT LANDSCAPE

Trees Proposed on Other Development Plots

Proposed Tree Planting
Typical Species: Tilia Cordata
Size: 25-30cm (to be viewed against Plot 9A trees)
Other: Clear Stem 2m

Proposed Ornamental Planting
5L Ornamental planting stock at 5 per m2
70mm Depth Melcourt Bark Nuggets or similar approved

Proposed Hedge Type 1
Type: Evergreen
Size: 1.2m long x 0.5m wide x 1.5m high

Proposed Hedge Type 2
Type: Evergreen
Size: 1.6m long x 0.5m wide x 1m high

Proposed Hedge Type 3
Type: Evergreen
Size: 7m long x 0.5m wide x 1m high

Proposed Below Ground Structural Tree Cells
Product: Rootspace by GreenBlue Urban or similar approved
Sizes: Modules of 0.5m x depth cells 1m

GENERAL NOTES

1. This drawing is the copyright of TPM Landscape Ltd and cannot be reproduced in any form without the consent of the company.
2. This drawing is to be read in conjunction with detail landscape drawings, details and specification.
3. This drawing is to be read in conjunction with all relevant Architects', Engineer's, Specialists, Bills of Quantities and Specifications.
4. The insertion of any firm or proprietary brand on this drawing is an indication of the class or quality required and does not exclude the use of alternative materials that are equal in performance, quality and appearance, provided that they have been approved in writing by the Landscape Architect.
5. The Contractor is responsible for accurately ascertaining the position of underground services and responding to all relevant service easement requirements.
6. All dimensions are in millimetres unless stated otherwise, for the purposes of construction this drawing must not be scaled and only written dimensions used. Written and scaled dimensions to be checked on site, any discrepancies reported prior to work commencing. IF IN DOUBT PLEASE ASK.
7. All work and materials are to be in accordance with the relevant British Standards and Code of Practice.
8. All Proprietary products are to be used strictly in accordance with the manufacturer's instructions and details.

REVISION NOTES

Rev	By	Description	Date
P2	KH	Coordinated Issue	xx/10/2024
P1	KH	First Issue	09/10/2024

Client
Vita Living

Project
First Street - Plot 9B

Description
Landscape Layout

Status
For Information

Scale @ A1	Drawn	Checked	Date
1:200	KH	KH	09.10.2024

Drawing number
Z19B-TPM-G710-PL-XX- 4645 101

Revision
P2

tpm landscape
chartered landscape architects
address: 4th Floor Studio 10 Little Lever St Manchester M1 1HR
tel: 0161 235 0600 fax 0601 email info@tpmlandscape.co.uk

APPENDIX C – LLFA SUDS GUIDANCE

Lead Local Flood Authority - Manchester City Council

SuDS Requirements for New Developments

The Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications which is being introduced from 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS).

Changes were made to the Town and Country Planning Policy and Guidance to give Local Authority Planning Departments the responsibility for ensuring that new developments are drained in a sustainable way, through the planning process, in consultation with the Lead Local Flood Authorities. As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems.

Decisions about the suitability of sustainable drainage provision are made by the Local Planning Authority. However, under the new consultation arrangements Manchester City Council, in its role as Lead Local Flood Authority, is a statutory consultee for all major applications with regards to sustainable drainage. All 'major' planning applications submitted from 15 April 2015 are required to include a Surface Water Drainage Statement.

Developers submitting the planning application to Manchester City Council are advised to:

- Assess the suitability of sustainable drainage systems in accordance with: paragraphs 051, 079 and 080 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change.

  Design sustainable drainage systems in line with national Non-Statutory Technical Standards for SuDS: *https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards*

  and local policies DM1, EN08, EN14 and EN17 of the Core Strategy.

- Assess surface water attenuation requirements that offer a reduction in surface water runoff rate in line with the 'Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010'. (Section 3.4.1 Critical Drainage Areas, page 31). Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates.

  http://www.manchester.gov.uk/downloads/download/3871/strategic_flood_risk_assessment-manchester_salford_trafford

- Submit hydraulic calculations and drawings to support the design along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPF (PPG).

- It will be essential that the type of sustainable drainage system for a site, along with details of its extent/position, is identified at the design stage of the whole scheme. This information will be required for both outline and full applications so it is clearly demonstrated that the SuDS can be accommodated within the development that is proposed. It will no longer be acceptable to leave the design of SuDS to a later stage to be dealt with by planning conditions.

- Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management. SuDS seek to mimic natural drainage systems and retain water on or near to the site, when rain falls, in contrast to traditional drainage approaches, which tend to pipe water off-site as quickly as possible. SuDS therefore offer significant advantages over conventional piped drainage systems.

Applicants are strongly advised to discuss their proposals with relevant planning officers at the pre-application stage to ensure that an acceptable SuDS scheme is submitted.

Minimum requirements for approval

In order to avoid objection, the following three elements of evidence are required:

- Surface Water Management Statement for the site is submitted that is in line with requirement of NPPF PPG Paragraph 079:

    - "New development should only be considered appropriate in areas at risk of flooding if priority has been given to the use of sustainable drainage systems. Additionally, and more widely, when considering major development, as defined in the Town and Country Planning (Development Management Procedure) (England) Order 2015, sustainable drainage systems should be provided unless demonstrated to be inappropriate".

    - The strategy should be accompanied by at least an outline layout of the proposed drainage systems with space allocation for the proposed attenuation in line with relevant flow reduction requirements.

- Evidence that drainage hierarchy has been applied in line with NPPF PPG Paragraph 080. The aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

    - into the ground (infiltration);
    - to a surface water body;
    - to a surface water sewer, highway drain, or another drainage system;
    - to a combined sewer.

- Evidence that one viable solution for draining the site is secured:

    - Results of ground investigation carried out under Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Proposal of the attenuation that is achieving half emptying time within 24 hours. If no ground investigations are possible or infiltration is not feasible on site, evidence of alternative surface water disposal routes (as follows) is required.

    - Where surface water is connected to Main River, any works within or adjacent to the river that would affect it would require consent from Environment Agency. An email of acceptance of proposed flows and/or new connection will suffice.

    - Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.

Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice.

- Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority. Consent forms can be obtained on the website at:

http://www.manchester.gov.uk/downloads/download/5567/land_drainage_consent_and_guidance.com

Avoiding or discharging drainage condition

- Evidence of consideration of green SuDS solution wherever practicable and viable in line with NPPF PPG Paragraph 051. SuDS should be designed to:
  - reduce the causes and impacts of flooding;
  - remove pollutants from urban run-off at source;
  - combine water management with green space with benefits for amenity, recreation and wildlife wherever practicable.

- For Greenfield site developments, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. to the Greenfield runoff rates;

- For Brownfield site developments, for all sites located within Conurbation Core Critical Drainage Areas, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates with an aim to reduce to Greenfield runoff rates wherever practicable;

- Where surface water runoff is to be disposed through infiltration, details of surface water attenuation that is adequate for infiltration capacity of the underlying soil is required. This capacity has to be assessed through site investigation carried out in line with Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Half emptying time of proposed attenuation within 24 hours should be achieved.

- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event in any part of a building; The NPPF suggests that 'for events with a return-period in excess of 30 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes. No flooding of property should occur as a result of a one in 100 year storm event (including an appropriate allowance for climate change)'.

- Assessment of overland flow routes for extreme events that is diverted away from buildings providing long and cross sections for the proposed drainage system and

finished floor levels;

- Evidence that runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonably practical to the Greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;

- Hydraulic calculation of the proposed drainage system;

- Design construction drawings of proposed SuDS elements and flow controls;

- For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SuDS) is required.

- Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved.

SuDS Maintenance

Maintenance of SuDS is essential for its proper operation and a clear management and maintenance plan for the lifetime of the development is required as part of the planning application.

In considering a development that includes a sustainable drainage system, Manchester City Council as local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance. Information sought by Manchester City Council would be no more than necessary, having regard to the nature and scale of the development concerned in line with NPPF Paragraph 081.

In some instances where no clear adoption of the drainage system is proposed, a drainage maintenance condition could be attached to the planning applications. In order to discharge this condition, the following evidence should be provided following *construction:*

- Verification report providing photographic evidence of construction as per design drawings;

- As built construction drawings if different from design construction drawings;

- Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

Applicants are strongly advised to discuss their proposals with relevant planning officers at the pre-application stage to ensure that an acceptable SuDS scheme is submitted.

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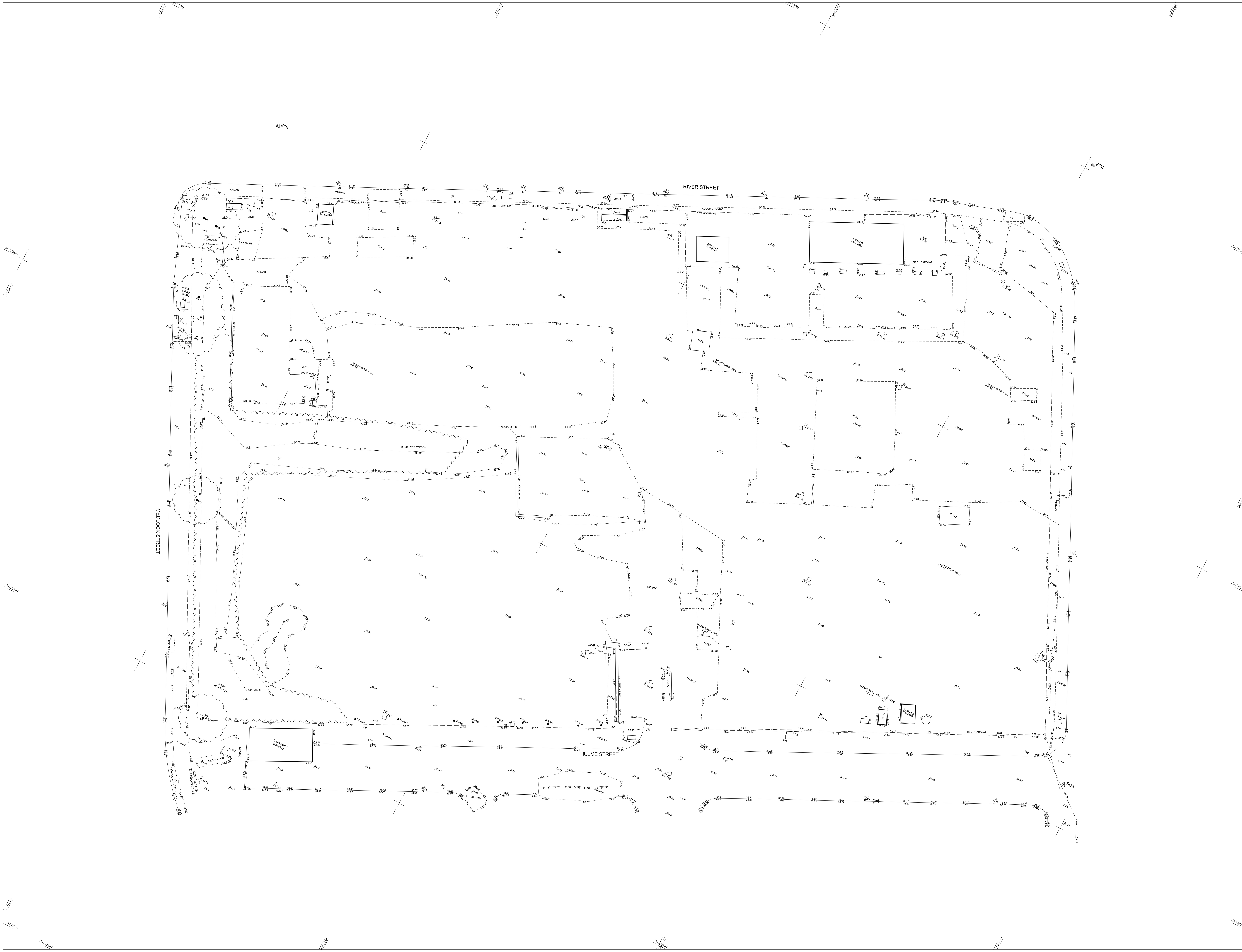
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Applicants are strongly advised to discuss their proposals with relevant planning officers at the pre-application stage to ensure that an acceptable SuDS scheme is submitted.

APPENDIX D – TOPOGRAPHIC SURVEY



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Note:
The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

Revision - Date - Description
A - 21/02/20 -Manhole added to Drawing.

SURVEY STATIONS			
Name	Easting	Northing	Height
SO1	383676.97	397290.56	31.40
SO2	383731.87	397307.08	30.74
SO3	383800.99	397351.03	30.78
SO4	383846.95	397256.79	32.79
SO5	383750.91	397269.20	31.14

Revision A :
Hulme Street added 16/3/20 as requested.

STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route
AB..........Air Brick
AV..........Air Valve
B/W.........Barbed Wire
BAR.........Barrier
BB..........Belisha Beacon
BH..........Borehole
BL..........Bed Level
BOL.........Bollard
BS..........Bus Stop
BT Box......British Telecom Box
BT..........British Telecom IC
BRTW........Brick Retaining Wall
BW..........Brick Wall
C/B.........Close Boarded
C/I.........Corrugated Iron
C/P.........Chestnut Paling
CB..........Control Box
CBW.........Concrete Block Wall
CCTV........Closed Circuit TV
CD..........Cable Duct
CEL.........Cellar Light
CH/L........Chain Link
CHY.........Chimney
CL..........Cover Level
CM..........Cable Marker
COL.........Column
CONC........Concrete
CP..........Catch Pit
CRTW........Concrete Retaining Wall
CTV.........Cable Television
CUL.........Culvert
CW..........Concrete Block Wall
DC..........Drainage Channel
DPC.........Damp Proof Course
DR..........Drain
DSW.........Dry Stone Wall
ECP.........Electricity Cable Pit
EIC.........Electricity Inspection Cover
EJ..........Expansion Joint
EJB.........Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL..........Eaves Level
ELB.........Electricity Box
EP..........Electricity Pole
ER..........Earth Rod
ETL.........Electricity Transmission Line
FB..........Flower Bed
FH..........Fire Hydrant
FL..........Floor Level
FP..........Flagpole
G*.*........Girth (of tree)
G...........Gulley
GAB.........Gabion
GIP.........Gas Inlet Pipe
GMKR........Gas Marker
GST.........Gas Stop Tap (Domestic)
GSV.........Gas Stop Valve (Mains)
HSE.........Housing
Ht..........Height
HV..........High Voltage
I/R.........Iron Railing
IC..........Inspection Cover
IL..........Invert Level
IP..........Inlet Pipe
KO..........Kerb Outlet
LB..........Letter Box
LP..........Lamp Post
MG..........Multi-Girth
MH..........Manhole
MKR.........Marker
MP..........Mooring Point
NP..........Street Name Plate
O/H.........Overhead
O/P.........Open Paling
OE..........Overhead Electric Wire
OP..........Outfall Pipe
OSBM........Ordnance Survey Bench Mark
OT..........Overhead Telecom Wire
P/C.........Post & Chain
P/R.........Post & Rail
P/W.........Post & Wire
PAV.........Paving
PB..........Pillar Box
PC..........Pedestrian Crossing
PP..........Petrol Pump
PT..........Post or Pillar
RE..........Rodding Eye
RS..........Road Sign
RTW.........Retaining Wall
RWP.........Rain Water Pipe
SAP.........Sapling
SL..........Sump Level
SoL.........Soffit Level
SP..........Sign Post
SPL.........Springing Level
SRTW........Stone Retaining Wall
SV..........Stop Valve (unspecified)
SVP.........Soil Vent Pipe
SW..........Stone Wall
TAC.........Tactile Paving
TB..........Traffic Bollard
TBM.........Temporary Bench Mark
TCB.........Telephone Call Box
TFR.........Taken From Records
TIE.........Anchor Point (Masts/Poles)
TL..........Traffic Light
TLB.........Traffic Light Control Box
TM..........Ticket Machine
TMC.........Tarmac
TP..........Telecommunications Pole
TPIT........Trial Pit
TS..........Trash Screen
U/C.........Under Construction
U/G.........Underground
UTL.........Unable to Lift (MH,IC etc)
UTS.........Unable to Survey
VDP.........Vehicle Detector Pad
VP..........Vent Pipe
W/M.........Wire Mesh
WL..........Water Level
WM..........Water Meter
WO..........Wash Out
WP..........Waste Pipe
WST.........Water Stop Tap (domestic)
WSV.........Water Stop Valve (mains)

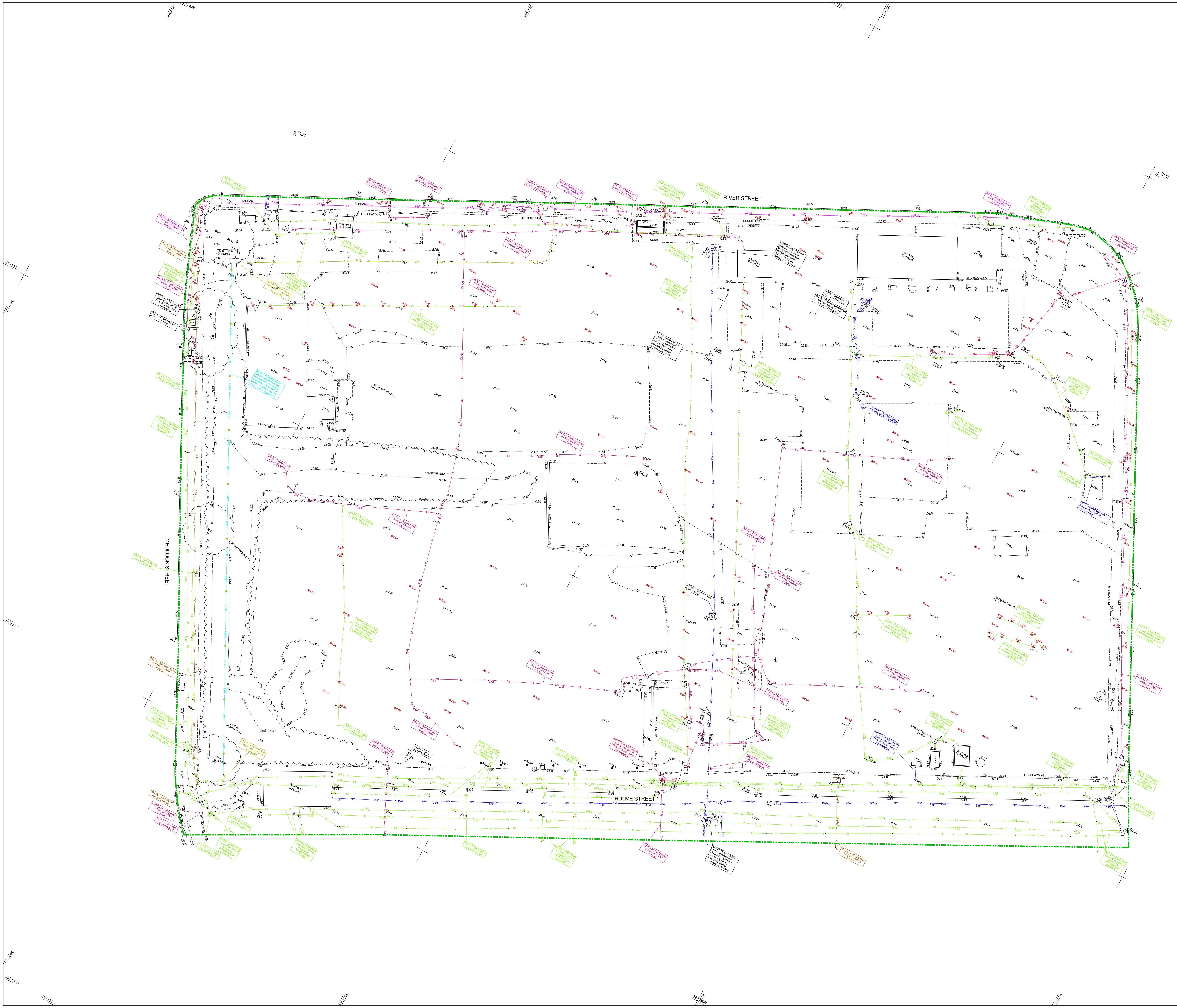
Survey Operations
Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk — www.survops.co.uk

Client
Chroma Consulting UK Limited

Drawing Title
Topographical Survey of Land at:
Plot 9 First Street
Manchester

Scale(s)	1:200	Surveyor	DC
Date	Feb 20	Drawn	DC
Job Number	20A187	Checked	TP

Sheet Size & Drg Number & Revision
A0 20A187/001 A



STORM WATER SEWERS
FOUL WATER SEWERS
WATER MAIN
GAS MAIN
ELECTRIC CABLES
CABLE DUCTING
BT (UNDERGROUND)
CABLE TV
CLOSED CIRCUIT TV
UNIDENTIFIED FEATURE
UNIDENTIFIED PIPE
UNIDENTIFIED CABLE
UNPROVEN FEATURE
END OF TRACE
LATERAL CONNECTIONS
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD. (SURVEYED **** ****)
CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
COVER POSITION FROM CCTV REPORT - NOT SURVEYED ON TOPOGRAPHICAL SURVEY.
0.6d APPROXIMATE DEPTH OF BURIED SERVICE

UNIDENTIFIED - A buried feature or utility that has been located, but we are unable to state what it is.

UNPROVEN - The assumed location of a reported feature or utility, usually taken from records, but not found during the utility trace (due to various conditions).

CAUTION - Electric pot ended cables, even when they are live, are unable to be detected or traced.

UNDERGROUND UTILITIES SERVICES DISCLAIMER

We have endeavoured to locate existing services using records provided by Statutory Authorities as a guide. Some apparatus were untraceable and details have therefore been taken from Utility Record Drawings, which may be of poor quality. Consequently we cannot guarantee accuracy of information taken from such records.

Where indicated, no allowance has been made for sub-surface entry into manholes, other chambers or confined spaces below ground level. Therefore any details relating to depths, sizes etc, are taken from the surface and as such will be approximate.

We have endeavoured to supply you with the most accurate data possible by using methods and equipment that are at the forefront of our industry. We have taken great care in the detection of pipework and buried features, but as with all methods of detecting underground or buried utilities the information provided is based on results obtained from electromagnetic techniques, and as such may be liable to distortion or errors beyond the reasonable control of the operator or his instruments.

It is the responsibility of the user under Health & Safety (HSG47) Guidelines to satisfy himself of the suspected location of any services prior to excavation of the services shown.

NOTE 1

This utility survey has been undertaken using:
A: Radiodetection RD4000 + RD4000 TXO
B: Mala Geoscience Ground Probing Radar

NOTE 2

Power carrying features shown on this drawing are shown as an individual service line. This does not necessarily represent the number of cables actually present and it is possible that there could be multi numbers of cables including HV, LV and communications transmission cables following the same trace line. These could be at different depths, the trace signal from the deeper cables being masked by signal emitted from the shallower service above. Cable runs could also be present running parallel to the single line shown.

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Note:
The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS

Name	Easting	Northing	Height
SO1	383676.97	397290.56	31.40
SO2	383731.87	397307.08	30.74
SO3	383800.99	397351.03	30.78
SO4	383846.95	397256.79	32.79
SO5	383750.91	397269.20	31.14

STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route	IL..........Invert Level
AB..........Air Brick	IP..........Inlet Pipe
AV..........Air Valve	KO..........Kerb Outlet
B/W.........Barbed Wire	LB..........Letter Box
BAR.........Barrier	LP..........Lamp Post
BB..........Belisha Beacon	MG..........Multi-Girth
BH..........Borehole	MH..........Manhole
BL..........Bed Level	MKR.........Marker
BOL.........Bollard	MP..........Mooring Point
BS..........Bus Stop	NP..........Street Name Plate
BT Box......British Telecom Box	O/H.........Overhead
BT..........British Telecom IC	O/P.........Open Paling
BRTW........Brick Retaining Wall	OE..........Overhead Electric Wire
BW..........Brick Wall	OP..........Outfall Pipe
C/B.........Close Boarded	OSBM........Ordnance Survey Bench Mark
C/I.........Corrugated Iron	OT..........Overhead Telecom Wire
C/P.........Chestnut Paling	P/C.........Post & Chain
CB..........Control Box	P/R.........Post & Rail
CBW.........Concrete Block Wall	P/W.........Post & Wire
CCTV........Closed Circuit TV	PAV.........Paving
CD..........Cable Duct	PB..........Pillar Box
CEL.........Cellar Light	PC..........Pedestrian Crossing
CH/L........Chain Link	PP..........Petrol Pump
CHY.........Chimney	PT..........Post or Pillar
CL..........Cover Level	RE..........Rodding Eye
CM..........Cable Marker	RS..........Road Sign
COL.........Column	RTW.........Retaining Wall
CONC........Concrete	RWP.........Rain Water Pipe
CP..........Catch Pit	SAP.........Sapling
CRTW........Concrete Retaining Wall	SL..........Sump Level
CTV.........Cable Television	SoL.........Soffit Level
CUL.........Culvert	SP..........Sign Post
CW..........Concrete Block Wall	SPL.........Springing Level
DC..........Drainage Channel	SRTW........Stone Retaining Wall
DPC.........Damp Proof Course	SV..........Stop Valve (unspecified)
DR..........Drain	SVP.........Soil Vent Pipe
DSW.........Dry Stone Wall	SW..........Stone Wall
ECP.........Electricity Cable Pit	TAC.........Tactile Paving
EIC.........Electricity Inspection Cover	TB..........Traffic Bollard
EJ..........Expansion Joint	TBM.........Temporary Bench Mark
EJB.........Electricity Junction Box	TCB.........Telephone Call Box
EL SUB STN..Electricity Sub Station	TFR.........Taken From Records
EL..........Eaves Level	TIE.........Anchor Point (Masts/Poles)
ELB.........Electricity Box	TL..........Traffic Light
EP..........Electricity Pole	TLB.........Traffic Light Control Box
ER..........Earth Rod	TM..........Ticket Machine
ETL.........Electricity Transmission Line	TMC.........Tarmac
FB..........Flower Bed	TP..........Telecommunications Pole
FH..........Fire Hydrant	TPIT........Trial Pit
FL..........Floor Level	TS..........Trash Screen
FP..........Flagpole	U/C.........Under Construction
G*.*........Girth (of tree)	U/G.........Underground
G...........Gulley	UTL.........Unable to Lift (MH,IC etc)
GAB.........Gabion	UTS.........Unable to Survey
GIP.........Gas Inlet Pipe	VDP.........Vehicle Detector Pad
GMKR........Gas Marker	VP..........Vent Pipe
GST.........Gas Stop Tap (Domestic)	W/M.........Wire Mesh
GSV.........Gas Stop Valve (Mains)	WL..........Water Level
HSE.........Housing	WM..........Water Meter
Ht..........Height	WO..........Wash Out
HV..........High Voltage	WP..........Waste Pipe
I/R.........Iron Railing	WST.........Water Stop Tap (domestic)
IC..........Inspection Cover	WSV.........Water Stop Valve (mains)

Survey OPERATIONS

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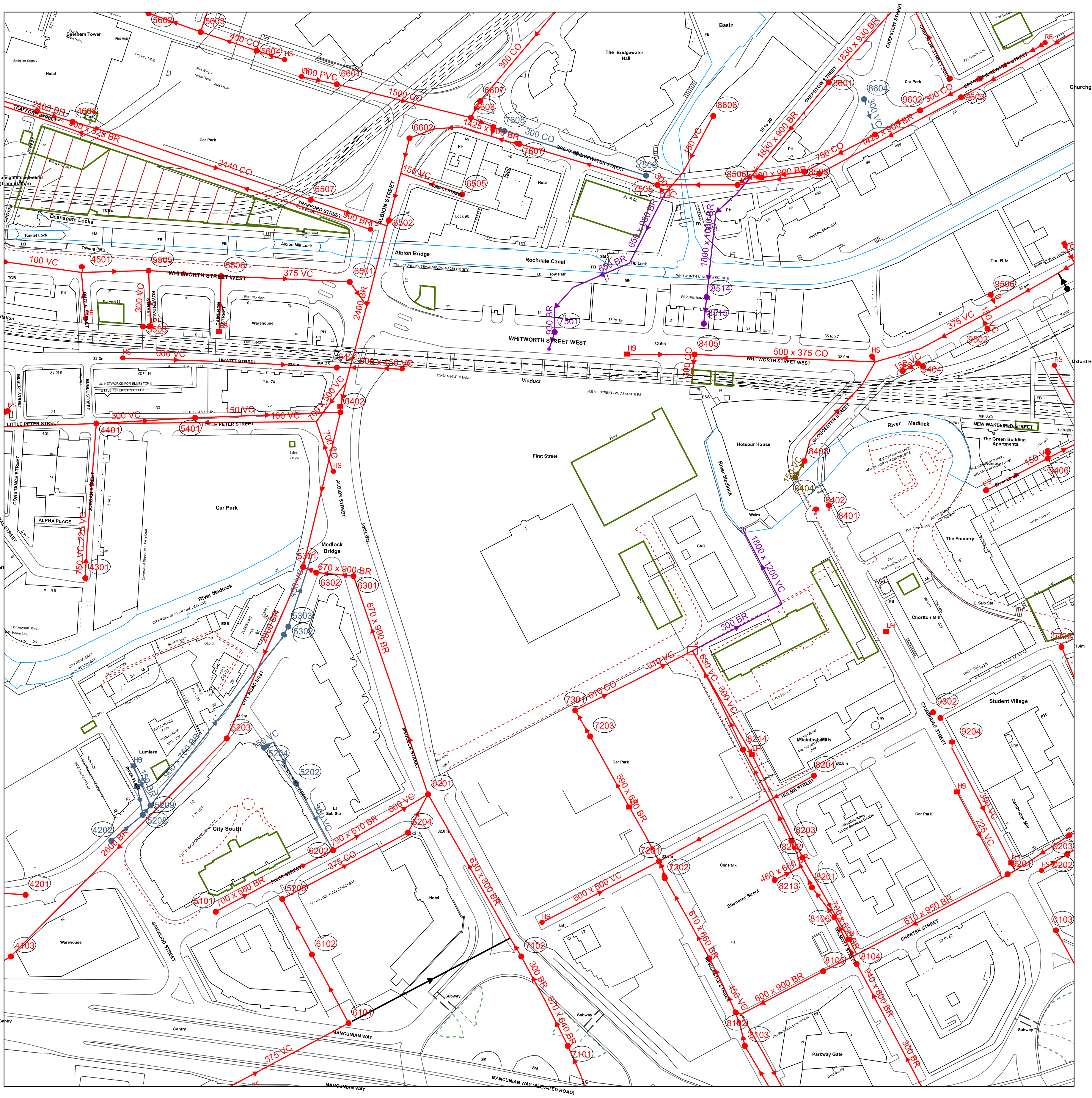
Client
Chroma Consulting UK Limited

Drawing Title
Utility Survey of Land at:
Plot 9 First Street
Manchester

Scale(s)	1:200	Surveyor	DC
Date	Feb 20	Drawn	IT
Job Number	20B029	Checked	SO

Sheet Size & Drg Number & Revision
A0 20B029/001

APPENDIX E – SEWER RECORDS



Refno	Cover	Func	Invert	Size.x	Size.y	Shape	Matl	Length	Grad
4103	33.46	CO							
4104	32.93	CO							
4201	33.28	CO	31.45	225		CI	VC	86.15	84
4202		SW	0	830	580	EG	BR	22.02	
4301	28.73	CO	25.33	750		CI	VC	19.03	
4401	30.31	CO							
4404		CO							
4501	33.52	CO	26.52	375		CI	VC	36.01	
4608		CO	0	2400		CI	BR	27.9	
4609		CO							
5101	34.1	CO	30.15	700	580	EG	BR	36.24	117
5202	33.5	SW	30.06	300		CI	VC	3.61	
5203	32.79	CO							
5204		SW	0	150		CI	VC	5.83	
5205	34.42	CO							
5208		SW							
5209		SW							
5301	32.32	CO							
5302	32.45	SW	25.84	450		CI	VC	8.06	
5303		SW	0	450		CI	VC	41.11	
5401		CO							
5503	33.4	CO	30.67	300		CI	VC	34.02	8
5505	33.83	CO							
5506	34.08	CO							
5602	35.48	CO							
5603	35.59	CO							
5604	35.71	CO							
6101	33.74	CO	28.74	375		CI	CO	41.82	199
6102	34.7	CO							
6201	31.75	CO	27.54	630	800	RE	BR	62.3	92
6202	33.39	CO	29.44	790	610	EG	BR	30.02	94
6204	32.35	CO							
6301	32.03	CO	26.18	670	900	RE	BR	10.05	32
6302	32.33	CO	25.48	450		CI	VC	7.62	3
6401	33.64	CO							
6402	33.36	CO							
6501	34.91	CO							
6502	36.02	CO							
6505	35.94	CO		150		CI	VC	34.92	
6507	9.01	CO							
6601	35.88	CO							
6602	36.37	CO							
6603	37.02	CO	31.39	1500		CI	CO	13	10
6607	38.01	CO							
7101	31.73	CO	28.06	670	640	EG	BR	26.83	
7102	34.29	CO	0	300		CI	BR	11.45	
7201	33.22	CO							
7202	33.49	CO	27.59	600	780	RE	BR	5.1	510
7203	30.57	CO	26.75	590	680	RE	BR	8.06	403
7301	30.46	CO	26.68	610		CI	CO	35.78	156
7501	33.14	OV	27.68	1330	900	EG	BR	9.49	
7505	37.28	CO							
7506	37.31	SW	34.55	300		CI	CO	79.7	347
7607	37.09	CO							
7608	37.09	SW							
7609	37.12	CO							
8101	34.27	CO	27.89	610	660	RE	BR	25.06	167
8102	34.55	CO	27.78	450		CI	VC	3.16	
8103	34.59	CO	27.92	600	510	FT	BR	9.22	
8104	34.45	CO	30.54	740	620	FT	BR	14.32	95
8105	34.38	CO							
8106	34.07	CO	30.23	720	580	FT	BR	10	125
8201	33.69	CO	30.07	720	600	FT	BR	6.71	
8202	33.34	CO	25.23	300		CI	VC	59.55	
8203	33.27	CO	29.41	760	560	FT	BR	28.18	28
8204	33.53	CO	29.85	600	500	FT	BR	47.01	45
8213	33.6	CO	30.37	460	660	RE	BR	15.65	
8214	31.33	CO	27.36	590	640	RE	BR	29.97	59
8401	30.6	CO							
8402	30.6	CO							
8403	30.8	CO	25.75	375		CI	VC	66.33	
8404	30.6	FO	26.55	150		CI	VC	5.83	15
8405	32.34	CO							
8502	36.36	CO	23.56	1400	900	EG	BR	44.41	444
8503	36.47	CO	31.55	750		CI	CO	23.19	63
8504	36.93	CO							
8506	36.98	CO							
8514		OV							
8515		OV							
8601	36.5	CO							
8604	35.93	SW	33.35	300		CI	VC	19.92	25
8606		CO	0	150		CI	VC	49.49	
9201	34.12	CO	24.48	940	620	EG	BR	1.41	
9204	32.62	CO	24.97	300		CI	VC	74.24	
9301	32.21	CO							
9302	32.22	CO							
9403		CO	0	150		CI	VC	3.15	
9404		CO							
9406		CO							
9407		CO							
9502		CO	0	150		CI	VC	7.37	
9506		CO		0		CI		7.87	
9601	36.54	CO							
9602	36.14	CO							
9603	36.26	CO							
9604	36.45	CO	33.34	300		CI	CO	36.24	59
9609	36.22	CO	29.73	300		CI	VC	50.54	
0103		CO							
0104	32.41	CO	28.37	1100	600	EG	BR	50.12	
0201	34.75	CO	24.93	900	610	EG	BR	18.79	
0202	34.27	CO							
0203	34.37	CO	0	970	620	EG	BR	34.67	
0205		CO	0	680	600	RE	VC	80.23	
0302	31.5	CO							
0402	30.83	CO	25.93	300		CI	VC	44.55	
0416		CO							
0502	34.06	CO							
0602	37.86	CO							
4402		CO							
4505		CO							
4603		CO	0	830	550	UN	VC	79.39	
4605		CO							
4606		CO							
5201		CO							
5402		CO	0	600		CI	VC	58.03	
5403		CO							
5606		CO	0	450		CI	CO	15.81	
5607		CO	0	300		CI	PVC	19.42	
5610		CO	0	2440		CI	CO	106.57	
6203		CO							
6304		CO							
6305		CO							
6404		CO	0	600	450	EG	VC	17.03	
6405		CO	0	700		CI	VC	28.46	
6408		CO							
6503		CO	0	900		CI	BR	140.09	
7104		CO	0	600	500	EG	VC	71.12	
7105		CO							
7106		CO							
7205		CO							
7206		CO							
7302		CO							
7303		CO							
7502		OV	0	930		CI	BR	27.87	
7508		OV	0	650		CI	BR	32.7	
8111		CO							
8112		CO							
8113		CO							
8114		CO							
8115		CO							
8205		CO							
8206		CO							
8207		CO							
8208		CO							
8209		CO							
8302		OV	0	1800	1200	EG	VC	45.18	
8304		CO							
8410		FO							
8501		CO							
8511		OV							

Refno	Cover	Func	Invert	Size.x	Size.y	Shape	Matl	Length	Grad
9102		CO							
9207		CO	0	610	550	EG	BR	16.64	
9208		CO	0	610	950	RE	BR	110.48	
9209		CO							
9402		CO	0	500		CI	VC	3.61	
9501		CO							
0209		CO							
0210		CO							
0406		CO	0	508	381	EG	VC	129.29	
0520		CO		300		CI	VC	37.74	
0525		CO							
4105		CO							
4303		CO							
4607		CO							
4691		CO							
4692		CO	0	500	750	UN	BR	18.38	
5206		SW							
5207		SW							
5210		SW							
5211		SW							
5502		CO							
5508		CO							
5609		CO							
6403		CO							
6406		CO							
6407		CO	0	700	500	EG	VC	26.4	
6504		CO							
6506		CO							
6508		CO							
6606		CO							
7103		CO							
7204		CO							
7401		CO							
7611		CO							
8108		CO							
8109		CO							
8110		CO							
8215		CO							
8216		CO							
9202		CO							
9203		CO							
9205		CO							
9206		CO							
9303		CO							
9401		CO	0	500	375	EG	CO	97.08	
9503		CO	0	375		CI	VC	78.24	
9504		CO							
9507		CO							
9615		CO							
9616		CO	0	1425	900	EG	BR	38.95	
9617		CO							
0403		CO							
0417		CO							
0508		CO							
0526		CO							
0612		CO							
6103		CO							
0507		CO							
7504		CO	30.31	300		CI	VC	6.41	1
8301		CO	0	300		CI	BR	54.14	
8507		CO							

WASTE WATER SYMBOLOGY

Foul / Surface / Combined / Overflow

- Manhole
- Manhole, Side Entry
- MainSewer, Public
- MainSewer, Private
- MainSewer, S104
- Rising Main, Public
- Rising Main, Private
- Rising Main, S104
- Highway Drain, Private

Foul / Surface / Combined

- WW Site Termination
- Air Valve
- Cascade
- Non Return Valve
- Extent of Survey
- Flow Meter
- Gulley
- Hatch Box
- Head of System
- Hydrobrake / Vortex
- Inlet
- Inspection Chamber
- Bifurcation
- Catchpit
- Contaminated Surface Water
- WW Pumping Station
- Sludge Pumping Station
- Sewer Overflow
- T Junction/Saddle
- LampHole
- OilInterceptor
- PenStock
- Pump
- RoddingEye
- Soakaway
- Summit
- Valve
- Valve Chamber
- Washout Chamber
- DropShaft
- WW Treatment Works
- Septic Tank
- Vent Column
- Network Storage Tank
- Orifice Plate
- Vortex Chamber
- Penstock Chamber
- Blind Manhole

- Sludge Main, Public
- Sludge Main, Private
- Sludge Main, S104

ABANDONED PIPE

- MainSewer
- Rising Main
- Highway Drain
- Sludge Main

Foul / Surface / Combined / Overflow

- Screen Chamber
- Discharge Point
- Outfall

- Control Kiosk
- Unspecified

LEGEND

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	DI	Ductile Iron
BR	Brick	PVC	Polyvinyl Chloride
PE	Polyethylene	CI	Cast Iron
RP	Reinforced Plastic Matrix	SI	Spun Iron
CO	Concrete	ST	Steel
CSB	Concrete Segment Bolted	VC	Vitrified Clay
CSU	Concrete Segment Unbolted	PP	Polypropylene
CC	Concrete Box Culverted	PF	Pitch Fibre
PSC	Plastic/Steel Composite	MAC	Masonry, Coursed
GRC	Glass Reinforced Concrete	MAR	Masonry, Random
GRP	Glass Reinforced Plastic	U	Unspecified

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

United Utilities Water Limited 2014. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office.Crown and United Utilities copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

OS Sheet No:

Scale: 1: 1250 Date: 23/02/2015

211 Nodes

Sheet 1 of 1

United Utilities
helping life flow smoothly

SEWER RECORDS

OS Sheet No:

Scale: 1: 1250 Date: 23/02/2015

Printed By: Jodie Lloyd

APPENDIX F – EXISTING DRAINAGE CALCULATIONS

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Paul Graveney
Site name:	Plot 9B First Street
Site location:	Manchester

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

Site Details

Latitude:	53.47153° N
Longitude:	2.24652° W
Reference:	3346246404
Date:	Nov 01 2024 14:38

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.26

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	879	879
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	1.64	1.64
1 in 1 year (l/s):	1.43	1.43
1 in 30 years (l/s):	2.79	2.79
1 in 100 year (l/s):	3.41	3.41
1 in 200 years (l/s):	3.88	3.88

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

APPENDIX G – DRAINAGE STRATEGY PLAN

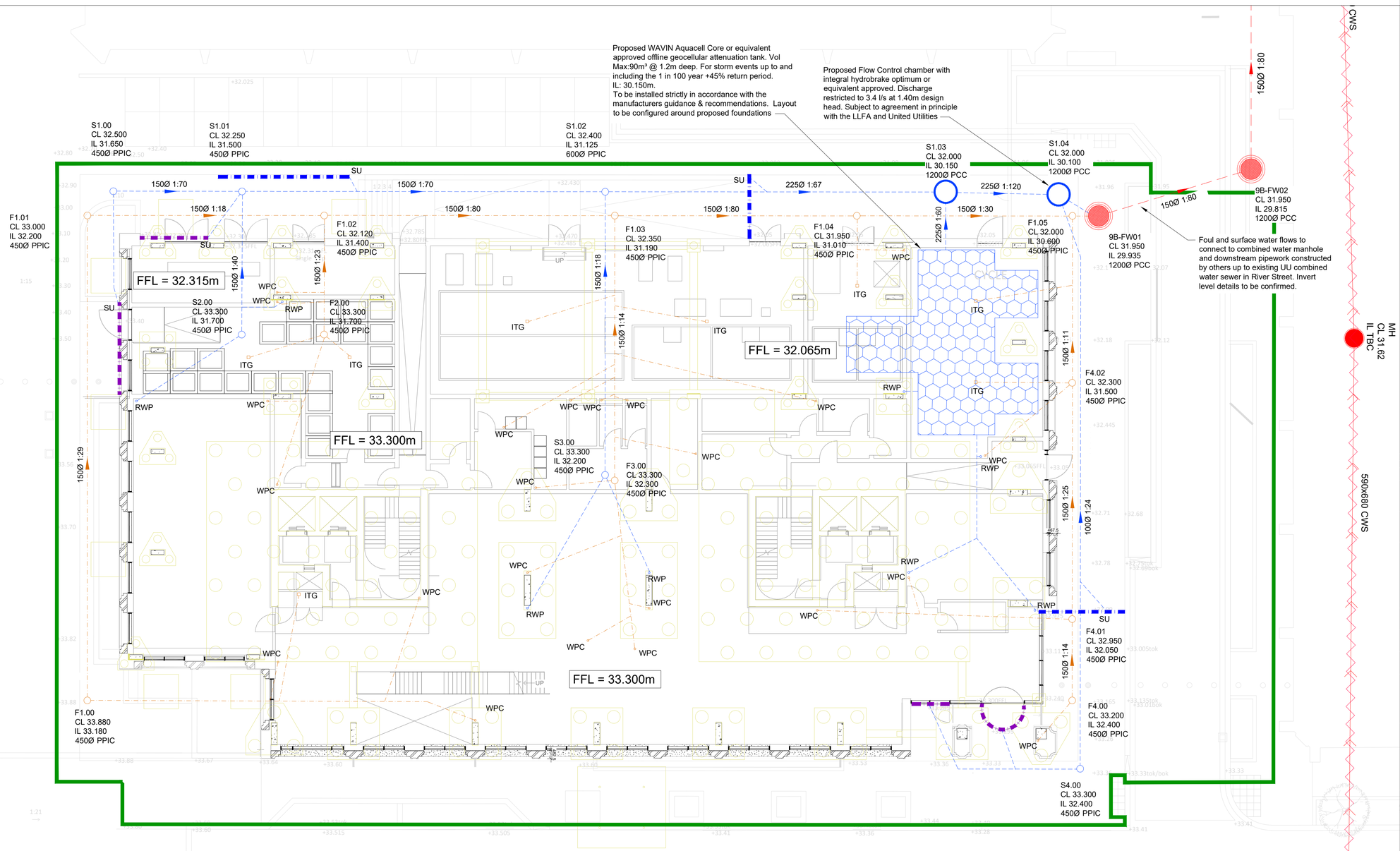
DRAINAGE LEGEND

- EXISTING COMBINED WATER SEWER
- EXISTING COMBINED WATER SEWER ABANDONED
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED COMBINED WATER DRAINAGE (BY OTHERS)
- PROPOSED DRAINAGE CHANNEL (SPEC BY OTHERS)
- PROPOSED THRESHOLD DRAIN (SPEC BY OTHERS)
- GEOCELLULAR ATTENUATION
- WPC WASTE POINT CONNECTION (FOUL)
- RWP RAINWATER PIPE
- ITG INTERNAL TRAPPED GULLY (WADE OR SIMILAR)
- SITE BOUNDARY

CAVEAT NOTES

ALL DRAINAGE INFORMATION ON THIS DRAWING IS SUBJECT TO POTENTIAL CHANGE AS THE SCHEME IS DEVELOPED AS THE FOLLOWING INFORMATION IS EITHER YET TO BE FINALISED OR DETERMINED.

- PLANNING CONSENT & CONDITION DISCHARGE
- ABOVE GROUND DRAINAGE POP-UPS PROVIDED BY OTHERS
- FOUL FLOW RATES / DISCHARGE UNITS
- EXTERNAL LAYOUT AND LEVELS PROVIDED BY OTHERS
- CONFIRMATION OF OFF SITE COMBINED DRAINAGE ROUTING AND LEVELS. INCLUDING S106 CONNECTION APPROVAL.



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NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
4. BEFORE STARTING ANY WORKS, CONTRACTOR TO CHECK INVERT LEVELS AND POSITIONS OF EXISTING DRAINS, SEWERS, INSPECTIONS CHAMBERS AND MANHOLES AGAINST INFORMATION SHOWN ON THIS DRAWING.
5. ROCKER PIPES ARE TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.
6. CLASS Z CONCRETE SURROUND TO BE PROVIDED FOR PIPES WITH COVER LESS THAN 1.2m ABOVE THE CROWN OF THE PIPE FOR ROADS AND 0.6m FOR SOFT AND PEDESTRIAN AREAS ONLY AND UNDER ALL FOUNDATIONS AND WHERE PIPES LAID WITHIN 1m OF FOUNDATIONS.
7. CONNECTIONS TO EXISTING PUBLIC SEWERS IN ACCORDANCE WITH UNITED UTILITIES REQUIREMENTS, TO BE APPROVED / AGREED WITH THE WATER AUTHORITY.
8. PROPOSED COVER LEVELS ARE APPROXIMATE AND SHALL BE CHECKED BY THE CONTRACTOR ON SITE TO SUIT THE EXACT FINISHED LEVEL AND GRADIENT.
9. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY AND IN CONJUNCTION WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICE AND 'SEWERS FOR ADOPTION' 7th EDITION.
10. ACCESS COVERS AND FRAMES SHALL COMPLY WITH THE LOADINGS SPECIFIED AND TO BS EN 124 AND KITEMARKED OR IF RECESSED COVERS ARE SPECIFIED THEN IN ACCORDANCE WITH FACTA ASSOCIATION EQUIVALENT. ALLOW FOR RECESS MANHOLE COVERS TO ACCEPT LANDSCAPE ARCHITECT FINISHES TO ALL NON-ASPHALT EXTERNAL AREAS.
11. THE PROPOSED BUILDING LAYOUTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. REFER TO ARCHITECTS PLANS FOR PRECISE LOCATION SETTING OUT INFORMATION AND DETAILS
12. FOR SETTING OUT DIMENSIONS OF SSS, SVP'S, RWP'S, FLOOR GULLY'S & OTHER DRAINAGE 'POP UP' LOCATIONS, REFER TO ARCHITECTS OR MECHANICAL & ELECTRICAL ENGINEERS DRAWINGS.
13. ALL DRAINAGE PIPEWORK SHOWN SHALL BE 100mm DIAMETER FOR FOUL AND 150mm FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL DRAINAGE PIPEWORK SHALL BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE STATED.
14. ALL UNDERSLAB DRAINAGE SHALL BE LAID AT GRADIENTS OF 1:80 MIN. FOR FOUL PIPEWORK AND 1:100 MIN. FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL UNDERSLAB DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE. USE OF SHORT / LONG RADIUS BENDS IS ACCEPTABLE PROVIDED THEY ARE KEPT TO A MINIMUM AND USED WHERE UNAVOIDABLE.
15. AT LEAST ONE SOIL PIPE AT THE HEAD OF EACH FOUL RUN SHALL BE VENTED TO THE ATMOSPHERE. ALL RAINWATER PIPES SHALL HAVE ABOVE GROUND RODDING ACCESS.
16. ALL PRIVATE DRAINAGE PIPEWORK FOR FOUL AND SURFACE WATER SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF UPVC TO BS EN 1401-1, UNLESS NOTED OTHERWISE. SURFACE WATER CAN ALSO BE CONSTRUCTED WITH POLYPIPE TWINWALL PIPES.
17. CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300MM.
18. WHERE NEW DRAINAGE IS SITUATED WITHIN 5 METRES OF NEW OR EXISTING TREES THE PIPEWORK SHALL BE ENCASED IN CONCRETE TO REDUCE THE RISK OF ROOT INGRESS.
19. ALL NEW DRAINAGE INSTALLATIONS TOGETHER WITH ANY EXISTING DRAINAGE RETAINED SHALL BE JETTED AND CCTV SURVEYED UPON COMPLETION. CONTRACTOR TO ENSURE THAT THE DRAINAGE SYSTEM IS FULLY OPERATIONAL, FREE OF EXCESS DEBRIS/SILT AND ALL IDENTIFIED FAULTS RECTIFIED.
20. ATTENUATION STORAGE CALCULATIONS INCLUDE CLIMATE CHANGE ALLOWANCE OF 40% IN ACCORDANCE WITH CURRENT ENVIRONMENT AGENCY GUIDELINES.

REV.	DATE	DETAILS	DRN.	CHK.
P02	01.11.24	GENERAL UPDATES	PG	JAS
P01	18.06.24	FIRST ISSUE	PG	JAS

DRAWING STATUS
PRELIMINARY

RIBA STAGE
RIBA STAGE 2

RoC CONSULTING
Commercial Wharf
6 Commercial Street
Manchester M15 4PZ
T 0161 214 5390
W rocconsulting.com

DRAWN PG	DATE JUNE 24	SCALES 1:125
CHECKED JAS	DATE JUNE 24	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE --DO NOT SCALE--
APPRVD. JAS	DATE JUNE 24	EMAIL FOR DRAWINGS info@rocconsulting.com

CLIENT
VITA STUDENT

PROJECT TITLE
PLOT 9B
FIRST STREET

DRAWING TITLE
FOUL & SURFACE DRAINAGE
GENERAL ARRANGEMENT

DRAWING No.	REV.
Z1-ROC-G580-PL-XX-DR01	P01

4470

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COMPLEX CHALLENGES ...
MADE SIMPLE

APPENDIX H – DRAINAGE CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	10	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100	150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
S2.00	0.040	4.00	33.300	450	1.600
S1.00	0.005	4.00	32.500	450	0.850
S1.01	0.005	4.00	32.250	450	0.750
S3.00	0.065	4.00	33.300	450	1.100
S1.02	0.007	4.00	32.400	600	1.275
TANK	0.053	4.00	32.065	100	1.865
S1.03			32.000	1200	1.850
S4.00	0.008	4.00	33.300	450	0.900
S1.04			32.000	1200	1.900
EX			31.950	1200	1.880

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S2.00	S1.01	8.000	0.600	31.700	31.500	0.200	40.0	150	4.08	50.0
2.000	S1.00	S1.01	7.000	0.600	31.650	31.550	0.100	70.0	100	4.13	50.0
1.001	S1.01	S1.02	21.000	0.600	31.500	31.200	0.300	70.0	150	4.42	50.0
3.000	S3.00	S1.02	16.000	0.600	32.200	31.300	0.900	17.8	150	4.11	50.0
1.002	S1.02	S1.03	20.000	0.600	31.125	30.825	0.300	66.7	225	4.63	50.0
4.000	TANK	S1.03	3.000	0.600	30.200	30.150	0.050	60.0	225	4.03	50.0
1.003	S1.03	S1.04	6.000	0.600	30.150	30.100	0.050	120.0	225	4.71	50.0
5.000	S4.00	S1.04	33.000	0.600	32.400	31.000	1.400	23.6	100	4.34	50.0
1.004	S1.04	EX	2.000	0.600	30.100	30.070	0.030	66.7	225	4.73	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.596	28.2	5.4	1.450	0.600	0.040	0.0	44	1.232
2.000	0.921	7.2	0.7	0.750	0.600	0.005	0.0	21	0.574
1.001	1.203	21.3	6.8	0.600	1.050	0.050	0.0	58	1.072
3.000	2.400	42.4	8.8	0.950	0.950	0.065	0.0	46	1.894
1.002	1.604	63.8	16.5	1.050	0.950	0.122	0.0	78	1.351
4.000	1.691	67.2	7.2	1.640	1.625	0.053	0.0	50	1.114
1.003	1.192	47.4	23.7	1.625	1.675	0.175	0.0	113	1.194
5.000	1.596	12.5	1.1	0.800	0.900	0.008	0.0	20	0.976
1.004	1.604	63.8	24.8	1.675	1.655	0.183	0.0	97	1.504

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	8.000	40.0	150	Circular	33.300	31.700	1.450	32.250	31.500	0.600
2.000	7.000	70.0	100	Circular	32.500	31.650	0.750	32.250	31.550	0.600
1.001	21.000	70.0	150	Circular	32.250	31.500	0.600	32.400	31.200	1.050
3.000	16.000	17.8	150	Circular	33.300	32.200	0.950	32.400	31.300	0.950
1.002	20.000	66.7	225	Circular	32.400	31.125	1.050	32.000	30.825	0.950
4.000	3.000	60.0	225	Circular	32.065	30.200	1.640	32.000	30.150	1.625
1.003	6.000	120.0	225	Circular	32.000	30.150	1.625	32.000	30.100	1.675
5.000	33.000	23.6	100	Circular	33.300	32.400	0.800	32.000	31.000	0.900
1.004	2.000	66.7	225	Circular	32.000	30.100	1.675	31.950	30.070	1.655

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S2.00	450	Manhole	Adoptable	S1.01	450	Manhole	Adoptable
2.000	S1.00	450	Manhole	Adoptable	S1.01	450	Manhole	Adoptable
1.001	S1.01	450	Manhole	Adoptable	S1.02	600	Manhole	Adoptable
3.000	S3.00	450	Manhole	Adoptable	S1.02	600	Manhole	Adoptable
1.002	S1.02	600	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
4.000	TANK	100	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
1.003	S1.03	1200	Manhole	Adoptable	S1.04	1200	Manhole	Adoptable
5.000	S4.00	450	Manhole	Adoptable	S1.04	1200	Manhole	Adoptable
1.004	S1.04	1200	Manhole	Adoptable	EX	1200	Manhole	Adoptable

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2.00	1.942	71.409	33.300	1.600	450	0	1.000	31.700	150
S1.00	-42.274	93.517	32.500	0.850	450	0	2.000	31.650	100
S1.01	0.754	93.754	32.250	0.750	450	1 2 0	2.000 1.000 1.001	31.550 31.500 31.500	100 150 150
S3.00	45.921	57.145	33.300	1.100	450	0	3.000	32.200	150
S1.02	44.732	93.041	32.400	1.275	600	1 2 0	3.000 1.001 1.002	31.300 31.200 31.125	150 150 225
TANK	89.186	68.318	32.065	1.865	100	0	4.000	30.200	225
S1.03	87.997	92.090	32.000	1.850	1200	1 2 0	4.000 1.002 1.003	30.150 30.825 30.150	225 225 225
S4.00	116.048	23.151	33.300	0.900	450	0	5.000	32.400	100
S1.04	113.909	87.574	32.000	1.900	1200	1 2 0	5.000 1.003 1.004	31.000 30.100 30.100	100 225 225
EX	132.689	87.336	31.950	1.880	1200	1	1.004	30.070	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Node S1.04 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	30.100	Product Number	CTL-SHE-0082-3400-1400-3400
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.4	Min Node Diameter (mm)	1200

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	75.0	0.0	1.200	75.0	0.0	1.201	0.0	0.0

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	1.000
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	10
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	10
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)	1.200	Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)	0.200	Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m³)	-28
Full Bore Velocity	✓		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991	1 year 240 minute summer	18.475	4.882
1 year 15 minute winter	76.857	30.991	1 year 240 minute winter	12.274	4.882
1 year 30 minute summer	71.439	20.215	1 year 360 minute summer	14.169	3.646
1 year 30 minute winter	50.133	20.215	1 year 360 minute winter	9.210	3.646
1 year 60 minute summer	48.435	12.800	1 year 480 minute summer	11.185	2.956
1 year 60 minute winter	32.179	12.800	1 year 480 minute winter	7.431	2.956
1 year 120 minute summer	30.053	7.942	1 year 600 minute summer	9.182	2.511
1 year 120 minute winter	19.966	7.942	1 year 600 minute winter	6.274	2.511
1 year 180 minute summer	23.233	5.979	1 year 720 minute summer	8.203	2.199
1 year 180 minute winter	15.102	5.979	1 year 720 minute winter	5.513	2.199

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 960 minute summer	6.768	1.782	30 year 1440 minute summer	10.161	2.723
1 year 960 minute winter	4.483	1.782	30 year 1440 minute winter	6.829	2.723
1 year 1440 minute summer	4.949	1.326	100 year +45% CC 15 minute summer	505.670	143.087
1 year 1440 minute winter	3.326	1.326	100 year +45% CC 15 minute winter	354.856	143.087
30 year 15 minute summer	268.706	76.035	100 year +45% CC 30 minute summer	332.000	93.944
30 year 15 minute winter	188.566	76.035	100 year +45% CC 30 minute winter	232.982	93.944
30 year 30 minute summer	174.929	49.499	100 year +45% CC 60 minute summer	222.268	58.739
30 year 30 minute winter	122.757	49.499	100 year +45% CC 60 minute winter	147.669	58.739
30 year 60 minute summer	116.589	30.811	100 year +45% CC 120 minute summer	134.215	35.469
30 year 60 minute winter	77.459	30.811	100 year +45% CC 120 minute winter	89.169	35.469
30 year 120 minute summer	70.438	18.615	100 year +45% CC 180 minute summer	101.219	26.047
30 year 120 minute winter	46.797	18.615	100 year +45% CC 180 minute winter	65.795	26.047
30 year 180 minute summer	53.298	13.715	100 year +45% CC 240 minute summer	78.690	20.795
30 year 180 minute winter	34.645	13.715	100 year +45% CC 240 minute winter	52.280	20.795
30 year 240 minute summer	41.604	10.995	100 year +45% CC 360 minute summer	58.701	15.106
30 year 240 minute winter	27.641	10.995	100 year +45% CC 360 minute winter	38.157	15.106
30 year 360 minute summer	31.221	8.034	100 year +45% CC 480 minute summer	45.550	12.038
30 year 360 minute winter	20.295	8.034	100 year +45% CC 480 minute winter	30.262	12.038
30 year 480 minute summer	24.324	6.428	100 year +45% CC 600 minute summer	36.875	10.086
30 year 480 minute winter	16.160	6.428	100 year +45% CC 600 minute winter	25.195	10.086
30 year 600 minute summer	19.756	5.404	100 year +45% CC 720 minute summer	32.556	8.725
30 year 600 minute winter	13.498	5.404	100 year +45% CC 720 minute winter	21.879	8.725
30 year 720 minute summer	17.490	4.687	100 year +45% CC 960 minute summer	26.340	6.936
30 year 720 minute winter	11.754	4.687	100 year +45% CC 960 minute winter	17.448	6.936
30 year 960 minute summer	14.215	3.743	100 year +45% CC 1440 minute summer	18.700	5.012
30 year 960 minute winter	9.416	3.743	100 year +45% CC 1440 minute winter	12.567	5.012

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S2.00	10	31.748	0.048	6.0	0.0316	0.0000	OK
15 minute winter	S1.00	10	31.672	0.022	0.7	0.0060	0.0000	OK
15 minute winter	S1.01	10	31.563	0.063	7.4	0.0184	0.0000	OK
15 minute summer	S3.00	10	32.251	0.051	9.7	0.0677	0.0000	OK
15 minute winter	S1.02	10	31.210	0.085	18.1	0.0336	0.0000	OK
60 minute winter	TANK	49	30.338	0.138	10.4	10.4581	0.0000	OK
60 minute winter	S1.03	49	30.338	0.188	9.1	0.2130	0.0000	OK
15 minute winter	S4.00	10	32.421	0.021	1.2	0.0071	0.0000	OK
60 minute winter	S1.04	49	30.338	0.238	5.1	0.2693	0.0000	SURCHARGED
15 minute summer	EX	1	30.070	0.000	3.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S2.00	1.000	S1.01	6.0	1.032	0.213	0.0473	
15 minute winter	S1.00	2.000	S1.01	0.7	0.575	0.096	0.0085	
15 minute winter	S1.01	1.001	S1.02	7.4	1.077	0.347	0.1438	
15 minute summer	S3.00	3.000	S1.02	9.7	1.906	0.229	0.0814	
15 minute winter	S1.02	1.002	S1.03	18.0	1.350	0.283	0.2674	
60 minute winter	TANK	4.000	S1.03	6.7	0.552	0.099	0.0917	
60 minute winter	S1.03	1.003	S1.04	5.1	0.453	0.108	0.2258	
15 minute winter	S4.00	5.000	S1.04	1.2	1.000	0.094	0.0390	
60 minute winter	S1.04	Hydro-Brake®	EX	3.0				19.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.00	10	31.783	0.083	14.6	0.0549	0.0000	OK
15 minute winter	S1.00	10	31.684	0.034	1.8	0.0094	0.0000	OK
15 minute winter	S1.01	10	31.613	0.113	18.2	0.0331	0.0000	OK
15 minute summer	S3.00	10	32.286	0.086	23.8	0.1147	0.0000	OK
15 minute winter	S1.02	10	31.275	0.150	44.5	0.0588	0.0000	OK
120 minute winter	TANK	116	30.681	0.481	16.3	36.3573	0.0000	SURCHARGED
120 minute winter	S1.03	116	30.682	0.532	13.2	0.6013	0.0000	SURCHARGED
15 minute winter	S4.00	10	32.433	0.033	2.9	0.0111	0.0000	OK
120 minute winter	S1.04	114	30.682	0.582	5.0	0.6587	0.0000	SURCHARGED
15 minute summer	EX	1	30.070	0.000	3.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S2.00	1.000	S1.01	14.6	1.216	0.518	0.0973	
15 minute winter	S1.00	2.000	S1.01	1.8	0.630	0.249	0.0265	
15 minute winter	S1.01	1.001	S1.02	18.1	1.313	0.853	0.2900	
15 minute summer	S3.00	3.000	S1.02	23.8	2.382	0.561	0.1599	
15 minute winter	S1.02	1.002	S1.03	44.5	1.667	0.698	0.5337	
120 minute winter	TANK	4.000	S1.03	-10.5	0.549	-0.156	0.1193	
120 minute winter	S1.03	1.003	S1.04	5.0	0.475	0.106	0.2386	
15 minute winter	S4.00	5.000	S1.04	2.9	1.288	0.230	0.0740	
120 minute winter	S1.04	Hydro-Brake®	EX	3.1				56.6

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.00	11	32.335	0.635	27.5	0.4181	0.0000	SURCHARGED
15 minute winter	S1.00	11	32.155	0.505	3.9	0.1399	0.0000	SURCHARGED
15 minute winter	S1.01	11	32.142	0.642	28.7	0.1874	0.0000	FLOOD RISK
15 minute winter	S3.00	10	32.575	0.375	44.8	0.5022	0.0000	SURCHARGED
15 minute winter	S1.02	11	31.521	0.396	73.0	0.1555	0.0000	SURCHARGED
180 minute winter	TANK	176	31.320	1.120	24.5	84.6176	0.0000	SURCHARGED
180 minute winter	S1.03	176	31.320	1.170	18.7	1.3228	0.0000	SURCHARGED
15 minute winter	S4.00	10	32.447	0.047	5.5	0.0159	0.0000	OK
180 minute winter	S1.04	176	31.319	1.219	3.5	1.3789	0.0000	SURCHARGED
15 minute summer	EX	1	30.070	0.000	3.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S2.00	1.000	S1.01	24.6	1.397	0.872	0.1408	
15 minute winter	S1.00	2.000	S1.01	5.3	0.676	0.731	0.0548	
15 minute winter	S1.01	1.001	S1.02	28.0	1.591	1.317	0.3697	
15 minute winter	S3.00	3.000	S1.02	41.3	2.547	0.975	0.2817	
15 minute winter	S1.02	1.002	S1.03	73.2	1.841	1.148	0.7847	
180 minute winter	TANK	4.000	S1.03	-16.4	-0.413	-0.244	0.1193	
180 minute winter	S1.03	1.003	S1.04	3.1	0.345	0.065	0.2386	
15 minute winter	S4.00	5.000	S1.04	5.5	1.528	0.438	0.1185	
180 minute winter	S1.04	Hydro-Brake®	EX	3.2				71.3

Flow+ v12.0 Copyright © 1988-2024 Causeway Technologies Ltd

APPENDIX I – CORRESPONDENCE

Paul Graveney

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 30 April 2024 09:41
To: Paul Graveney
Cc: Jon Smith
Subject: RE: 05628848 Pre Development Enquiry - Plot 9B, First Street, Manchester

Categories: Filed by Newforma

CAUTION: This email originated from outside the Organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning Paul,

For and on behalf of Anthony Laithwaite

Pre Development Enquiry for: Plot 9b, First Street, Manchester UU Reference Number : 05628848
We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.
If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:
https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water
Foul flow from this site will be allowed to drain into the public foul water/combined sewer at any convenient connection point at an unrestricted rate. There appears to be multiple combined sewers in and around the site. If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.
In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water
All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.
Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.
The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).
The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration
Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.
A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.
Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs
If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:
https://www.gov.uk/government/publications/groundwater-protection-position-statements
Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage
If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer
In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.
Once evidence is provided as outlined above, United Utilities will consider a connection to drain into the public foul water/combined sewer at any convenient connection point at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s. There appears to be multiple combined sewers in and around the site.
As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels
For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage
United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 8m which is measured 4m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer. **Please be aware, this would be classed as a critical asset, and would be a UU led Diversion.**
Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:
https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site
It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:
https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application
Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:
https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/
We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.
If we can be of any further assistance please don't hesitate to contact us further.

Many thanks and kind regards,

United Utilities
Water for the North West

Jordan Houghton
Developer Engineer
Developer Services & Metering
Customer Services
T: 07500671544
unitedutilities.com

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---------- Original Message ----------
From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]
Sent: 23/04/2024 11:59
To: paul.graveney@rocconsulting.com
Cc: jon.smith@rocconsulting.com
Subject: 05628848 Pre Development Enquiry - Plot 9B, First Street, Manchester

Good Morning,

Please accept this email as receipt of your application received on 22/04/2024 for the above development. This has now been logged on our system and the job reference is 05628848 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Anthony Laithwaite for technical assessment. You will receive their response within 10 working days.

Kind regards

Water for the North West

Lois Williams
Developer Services Assistant
Developer Services & Metering
Customer Services
unitedutilities.com
Tel: 0345 072 6067 Option 2 for Wastewater Services)
Direct Tel:

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated

Visit: *https://unitedutilities.thewowawards.co.uk/nominate*

---------- Original Message ----------
From: Paul Graveney [paul.graveney@rocconsulting.com]
Sent: 22/04/2024 12:07
To: wastewaterdeveloperservices@uuplc.co.uk
Cc: jon.smith@rocconsulting.com
Subject: Pre Development Enquiry - Plot 9B, First Street, Manchester

Good Afternoon,

Please find attached our pre development enquiry for a high rise student accommodation development known as Plot 9B, First Street, Manchester.

Regards

Paul

Paul Graveney

BEng (Hons) CEng MICE

Civil Engineer

T: 0161 214 5390

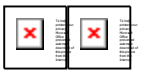
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