Kennedy Redford

Project:

University of Manchester Campus

Report Title:

Drainage Strategy

Client: GRAHAM

Revision Date: 19/2/2025

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PROJECT					ORIGINATOR				ZONE			LEVEL			TYPE			DIS		NUMBER				
U	M	R	F	-	K	R	D	-	X	X	-	X	X	-	R	P	-	C	-	0	0	5	0	0

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2 Document History and Validation

2.1 Revision History

Revision	Issue Date	Reason for Issue
Rev-	22 November 2024	Draft First Issue
Rev A	13 December 2024	Draft Second Issue
Rev B	10 January 2025	Draft Third Issue
Rev C	24 January 2025	Planning Issue
Rev D	13 February 2025	Planning Issue
Rev E	17 February 2025	Document Reference Number Change from REP-UOM-DST-JH-241118 to UMRF-KRD-XX-XX-RP-C-00500
Rev F	19 February 2025	Planning Issue (Appendices Update)

2.2 Document Validation (Latest Issue)



Principal Author
JONATHAN HUNT



Checked By
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3 Introduction

3.1 Purpose of Report

This drainage strategy (DS) has been prepared for John Graham Construction Ltd for the Fallowfield Campus development at 293 Wilmslow Road, Fallowfield, Manchester, M14 6HD (herein 'the development site').

This document has been submitted as part of a Reserved Matters Application relating to landscaping, appearance, scale and layout, pursuant to the approval of an outline planning application in January 2024 ref. 138126/OO/2023. It is specifically prepared to meet the requirements of Condition 22. This is provided in italics here, with the corresponding responses provided below each point:

"Prior to the commencement of development within each phase with the exception of demolition and site clearance, a surface water drainage scheme prepared in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards shall be submitted to and approved in writing by the City Council as local planning authority. The submitted scheme shall set out the drainage strategy for the whole site and shall include the following:

1. *A finalised drainage layout showing all components, outfalls, levels and connectivity;*
   Response: The most recent drainage layout is provided in Appendix F. A finalised drawing will be produced in line with the project programme, prior to the beginning of the construction stage.

2. *Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable;*
   Response: Refer to Section 4.2 Surface Water Strategy and 4.2.1 Water Treatment for a discussion of the SuDS components proposed within the design.

3. *Progression through the drainage hierarchy shall be evidence based and supported by site investigation and feasibility study. 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.*
   Response: Refer to Section 4.2 Surface Water Strategy for a discussion of the SuDS hierarchy and the justification for the proposed discharge methodology.

4. *Details of surface water attenuation that offers a reduction in surface water runoff rate to the following criteria: discharge to the Fallowfield Brook ordinary watercourse shall achieve Greenfield rates (either by direct connection or by outfall from public surface water sewer into the brook). Discharge to the combined public sewer shall achieve at least a 50% reduction in runoff rate compared to the existing rates with the aim of reducing to the Greenfield rates, as the site is located within the Levenshulme Fallowfield Critical Drainage Area;*
   Response: Site discharge rate restricted to greenfield runoff into the existing surface water culvert. Refer to Section 4.2 Surface Water Strategy and Section 4.2.2 Flow Rate for full discussion.

5. *Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;*
   Response: The proposed hardstanding area is less than the existing hardstanding area and by default the proposed volume of discharge is no more than existing.

6. *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 with allowance for 45% climate change in any part of a building;*
   Response: Refer to Infodrainage calculations in Appendix G. There is no flooding in the 1 in 30year+40% climate change event. There is some minor flooding during the 1 in 100year+45% climate change event but this will be contained within swale or landscape areas and in locations away from the proposed buildings by controlling the site levels to fall away from the buildings. This will be further refined through the detailed design stage.

7. *Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.*
   Response: The proposed levels design directs overland flows away from building locations. This design will be developed further to demonstrate the flow routes within the site during exceedance events.

8. *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.*
   Response: Refer to email 'RE: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester' (Appendix H) between Kennedy Redford and United Utilities. Within the correspondence United Utilities agree to a temporary connection of 100l/s into the United Utilities combined sewer. This is to temporarily facilitate stormwater flows from the first phase of the development until a permanent connection can be made into the surface water culvert to the south of the site. At this point the temporary connection will be removed.

9. *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.*
   Response: Surface water is proposed to discharge to the ordinary watercourse/culvert at greenfield runoff rates in accordance with the planning requirements. This was originally agreed between Buro Happold and Manchester City Council in a meeting held 8th June 2023 and is referenced in Section 5.2.1 of their Drainage Strategy 0053454-BHE-XX-XX-RP-C-0001 *'A meeting with a representative from the Manchester City Council (MCC), in its capacity as the Lead Local Flood Authority (LLFA), was held 08 June 2023. As part of the consultation a data screening was undertaken which identified that the culverted Fallowfield Brook runs in close proximity to the south-east corner of the site. The LLFA stated that where possible, surface water should discharge to Fallowfield Brook at greenfield runoff rates in accordance with the drainage hierarchy.'*

10. *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.*
    Response: Noted – Proposed connection works to watercourse will be agreed with MCC as LLFA prior to commencement of works.

11. *Where surface water is connected to ordinary watercourse, evidence of pollution control measures (preferably through SuDS) is required.*
    Response: Refer to section 4.2.1 Water Treatment for a discussion of pollution control measures.

12. *Hydraulic calculation of the proposed drainage system.*
    Response: Refer to Appendix G for stormwater calculations. These will be further refined as the design develops, but demonstrate the feasibility of the scheme to control stormwater events to the agreed discharge rate from site.

13. *Construction details of flow control and SuDS elements.*
    Response: Construction details to be supplied once available.

This report will describe the drainage principles upon which the drainage design has been developed, whilst taking into consideration climate change and flood risk for the lifetime of the development site. Drawings, calculations, modelling outputs and other relevant information will be discussed and are supplied as supporting appendices.

This report will reference and should be read in conjunction with the Fallowfield Campus Redevelopment Project Flood Risk Assessment UoMF-BH-XX-XX-RP-CW-0001 Rev P02 produced by Buro Happold. The report is enclosed in Appendix A.

3.2 Site Overview

3.2.1 Existing Site

The development is for the demolition and replacement of the existing Fallowfield Campus student residences with new purpose-built student accommodation, including associated support buildings and new utility networks.

The existing site covers an area of approximately 7.82Ha, with approximately 4.28Ha of hardstanding in the form of buildings, circulation routes and courtyards. The site has an extensive covering of trees, the majority of which will be maintained as part of the development.

The site location plan is enclosed within Appendix B.

3.2.2 Topography

The existing development levels broadly fall from north to south from a high of 44.5m above ordinance datum (AOD) in the north to a low of 38.9m AOD in the south. There are some localised steeper slopes within the site to facilitate access to the buildings and accommodate the flat building floor plates over large areas.

The topographical survey drawing is enclosed in Appendix C.

3.2.3 Hydrogeology

Overland flows on site will follow the surface topography, moving from north to south towards Mosely Road. These flows will be primarily intercepted by the existing drainage network within the site.

There are two watercourses identified within 250m of the site:

- Fallowfield Brook – This is a culverted watercourse flowing from east to west beneath Mosely Road immediately to the south of the site. The watercourse has sections of open channel further upstream and downstream of the culverted section. A survey is programmed to be carried out to ascertain the exact line and level of this watercourse.
- Cringle Brook – This is located approximately 500m south of the site in a mix of open channel and culverted sections.

3.2.4 Geology

3.2.4.1 Natural Ground

A Phase 1 Desk Study report of the ground conditions on site was undertaken by Buro Happold in 2023. This summarised the ground conditions across the site taken from an intrusive investigation carried out by Coffey in 2015.

This investigation found made ground to a depth of between 0.2m – 2.60m across the development area. The made ground was underlain by superficial deposits of clay and sand of up to 3m thick where present. This in turn is underlain by weathered sandstone bedrock and mudstone (Chester Formation).

3.2.4.2 Ground Conditions

Ground conditions have also been reviewed using The British Geology Survey (BGS) mapping data and the Cranfield Soil and AgriFood Institute (CSAI), Soilscapes viewer.

The soilscapes viewer referred to the soil as 'slowly permeable seasonally wet acid loamy and clayey soils' with 'impeded drainage'.

The BGS map survey identified the bedrock geology as Chester Formation - Sandstone. Sedimentary bedrock with the superficial deposits of Till, Devensian - Diamicton. Sedimentary,

3.2.5 Existing Sewers

United Utilities (UU) records identify multiple sewers within Mosely Road, Wilmslow Road and Whitworth Lane.

A 225mm surface water sewer drains from north to south in Whitworth Lane adjacent the eastern site boundary. This appears to terminate soon after it passes the start of a 375mm combined sewer which also drains from north to south in Whitworth Lane. It is anticipated the surface water sewer connects into the combined drain which continues south. This combined sewer enters a 525mm combined sewer in Mosely Road and continues draining from east to west in the nearside of the road to the southern site boundary. A second larger combined sewer (1050mm) also drains from east to west in Mosely Road in the far side of the road from the site.

Both sewers combine adjacent the southwest corner of the site at the junction of Mosely Road and Wilmslow Road before joining a 1900mm combined sewer which drains northwards in Wilmslow Road to the west of the site. A 500mm combined sewer also begins at the junction of Mosely Road and Wilmslow Road and drains northwards within the nearside of Wilmslow Road from the west site boundary.

3.2.6 Existing Drainage

The Locate Surveys Ltd 'Utility Survey' drawing No. 12650FG:250:1:2 identifies the existing drainage systems across the site and is enclosed in Appendix D.

The existing site is drained via a network of combined water drains which collect foul flows from the existing buildings and surface water flows from the roofs and surrounding hardstanding areas. These drains leave the site in six separate locations. Two connections leave the site from the west into a combined sewer in Wilmslow Road, three connections leave the site form the east connecting into the combined sewer in Whitworth Lane, and one connection leaves the site from the south into the sewer in Moseley Road.

3.2.7 Proposed Development

This Reserved Matters Application provides detail regarding the 29new accommodation blocks, including a central amenity hub for the Fallowfield student campus. The development will include a mixture of new and existing pedestrian access routes with provision of strategic enhanced routes for maintenance vehicle access.

The proposed impermeable areas will cover an area of approximately 3.63Ha with the remaining areas to consist of new or retained landscaping, trees and SuDS features.

The proposed site plan is enclosed in Appendix E.

4 Proposed Drainage Strategy

This section of report provides information used in the development of the drainage design and the principles that were followed. The drainage strategy uses sustainable principles and will aim to promote approaches in keeping with the nature of the existing site and current legislation.

This section has been prepared in relation to satisfy condition 22 from the outline planning conditions and should be read in conjunction with the proposed drainage layouts enclosed in Appendix F, and the calculation output files provided in Appendix G.

4.1 Design Standards and Guidance

The following design standards, industry guidance, government guidance and literature are used in the development of this drainage strategy.

British Standards and European Norms (BS EN)

- BS EN 752: Drain and sewer systems outside buildings
- BS EN 12056: Gravity drainage systems inside buildings

Construction Industry Research and Information Association (CIRIA)

- C753: The SuDS manual

Department of Communities and Local Government (DCLG)

- Building Regulations Approved Document H: drainage and waste disposal published 2010
- National Planning Policy Framework (NPPF) published 2012
- Flood risk and coastal change Planning Policy Guidance, published 6 March 2014
- Climate Change Planning Policy Guidance, published 12 June 2014
- Water supply, wastewater and water quality Planning Policy Guidance, published 23 March 2015

Department of Environment, Food and Rural Affairs (DEFRA)

- Non-Statutory Technical Standards for Sustainable Drainage – Practice Guidance published 2015

Water Research Centre

- Sewerage Sector Guidance Appendix C – Design And Construction Guidance Version 2.2, 29 June 2022.

4.2 Surface Water Strategy

All proposed drainage systems should give preference to the SuDS hierarchy, which sets out that schemes should aim to mimic natural drainage as closely as possible, and that discharge of

surface runoff should be dealt with in the following ways (in order of preference) (Department for Communities and Local Government, 2014):

- Into the ground (infiltration)
- To a surface water body
- To a surface water sewer, highway drain, or another drainage system
- To a combined sewer

As summarised in Section 2.2.4 of this report, the 2015, Coffey site investigation found made ground to a depth of between 0.2m – 2.60m across the development area. The made ground was found to contain elevated levels of heavy metals and PAH's. Beneath the made ground was superficial deposits of clay and sand. The site lies in an area defines as having 'slowly permeable seasonally wet acid loamy and clayey soils' with 'impeded drainage' by the Cranfield Soil and AgriFood Institute (CSAI), Soilscapes viewer.

Based on the presence of elevated contaminates within the made ground and anticipated low infiltration rate potential, infiltration cannot be relied on to dispose of all surface water from the development. Following the hierarchy, the next most appropriate discharge method would be a connection into the nearest surface water body. For this site the outfall location is the culverted Fallowfield Brook adjacent the south of the site. It is therefore proposed that surface water will be collected and drained southwards to discharge to a new connection into Fallowfield Brook, to the south of the development.

A gravity surface water drainage system will collect flows from the buildings and hardstanding areas. The collected surface water will discharge via a flow control device into the culverted section of Fallowfield Brook.

Most building roof areas will be a green roof construction and/or will include some form of equivalent flow control to restrict flows from the roof areas to equivalent greenfield runoff rates from the rainwater pipe outlets. A range of sustainable drainage (SuDS) techniques will be used to collect surface water from the external areas as well as attenuate and provide enhancement to water quality and provide environmental amenity across the site. Within the hardstanding areas, in addition to more traditional forms of surface water collection such as gullies and channel drains, there will be areas of permeable paving to treat and attenuate water at source. Within the landscaped areas, where space allows, drainage features such as swales, filter trenches and dry basins will be used to create water features that complement and enhance the natural environment. To provide additional attenuation, these areas will be underlain by geocellular tanks or open graded stone layers.

To minimise flood risk, the drainage system will be designed to accommodate rainfall volumes below ground (or within pond areas) for all storms up to a 1 in 30-year return period event. For larger storms, up to and including a 1 in 100-year event plus climate change, the drainage network and proposed site levels will be designed to control any flood water on site within designated areas, without impacting the proposed buildings, foundations or emergency access to/from site.

The proposed construction works will progress from north to south through the site. The final connection point into the culverted Fallowfield Brook is from the southern edge of the site. This will create the need for several temporary discharge points to enable each progressive section of the site to be drained before the final connection point in the south is constructed. Once the final site outfall becomes live all the temporary discharge points will be removed and the completed system will discharge via the single southern outfall. The United Utilities sewerage map identifies the culvert as a private watercourse. The connection into the watercourse will therefore be subject to approval by Manchester City Council (MCC), the Lead Local Flood Authority (LLFA).

4.2.1 Water Treatment

Tree pits, planted dry basins, swales and green roofs will reduce the volume of discharge through root uptake and transpiration.

These design elements in addition to permeable paving and filter trenches will improve the quality of discharge by filtration and natural biological processes which will help to break down pollutants from accidental spillages and maintenance vehicle use. Water passing through these features will be slowed as part of this filtration process and the initial wetting of materials, increasing the time it takes for water to enter the below ground piped drainage network. This will reduce the risk of large storm events overwhelming the drainage network.

The gullies and channels will be trapped reducing the volume of sediment entering the drainage network. Catchpit chambers will also be used upstream of attenuation tanks and basins to reduce sediment entering the network.

Water quality will be assessed using the pollution indices methodology set out within the CIRIA SuDS Manual (C753). Most of the site is categorised low risk land use classification, as commercial roofs and low traffic roads, with the most onerous usage areas categorised as medium for a commercial yard/delivery area. A proprietary hydrocarbon interceptor will be used to supplement the treatment provided from the SuDS features to reduce the level of pollutants in the site discharge to an acceptable standard.

4.2.2 Flow Rate

In line with the planning conditions and the Buro Happold Drainage Strategy (0053454-BHE-XX-XX-RP-C-0001), discharge into the Fallowfield Brook will need to be restricted to greenfield runoff rates for the existing site.

The greenfield runoff rate for the site has been calculated using two different methods, The IH124 method on the HR Wallingford website calculates QBAR for the site as 48.7 l/s. However, if using the FEH statistical method, QBAR is calculated as 63.0 l/s.

Provided the detailed design calculations for the proposed site are based on the FEH method the discharge rate for greenfield will be taken as 63 l/s to ensure a consistent assessment.

4.2.3 Climate Change

A climate change allowance will be added to the assessed rainfall rates in line with the Department for Environment Food & Rural Affairs (DEFRA) climate change mapping service.

The site falls within the 'Upper Mersey Management Catchment' and in accordance with the guidance will be assessed based on the 'Upper end allowance' for a residential development with a lifetime of between 2061 and 2125. For the Upper Mersey Catchment this specifies that a climate change allowance of 40% should be applied to the 1 in 30yr return period storm events, and a climate change allowance of 45% should be applied to 1in100 year storm events.

4.2.4 Hydraulic Modelling

Infodrainage calculations are being produced for the surface water drainage system. The system is being designed in accordance with the strategy discussed in this report and will conform to the following:

- No flooding during any storm event up to 1in30 years + 40% climate change.
- During the 1in100 year + 45% climate change event, flooding to be contained within low-risk site areas without impacting access to/from site or flooding any buildings or basements. In the event of flooding in other areas of the site during this event no flood water will be allowed to leave the site.
- The peak flow rate offsite will be restricted to no more than greenfield runoff rates.

4.3 Proposed Foul Water

A new system of foul water drainage will be constructed for the proposed development in accordance with BS EN 752 and Building Regulations Part H. The foul flows will be collected in a separate gravity foul water drainage system than the stormwater drainage.

Foul flows will be discharged into the surrounding United Utilities combined water sewers using 6 No. existing connections to minimise the distance and depth of the drainage, and spread the concentration of drainage discharge across multiple location to minimise the impact on the surrounding sewer network during times of peak usage. 2No. connections will be made to the east into the combined sewer Whitworth Lane, 2No. connections will be made to the west into the combined sewer in Wilmslow Road, and 1No. connection will be made to the south into the combined sewer Moseley Road.

Each of these indirect connections will be subject to S106 Agreements with United Utilities.

4.3.1 Proposed Flow Rate

It is proposed to connect to the existing combined sewer at 5 different outfall locations, the outfalls are labelled in red in Figure 1 below.

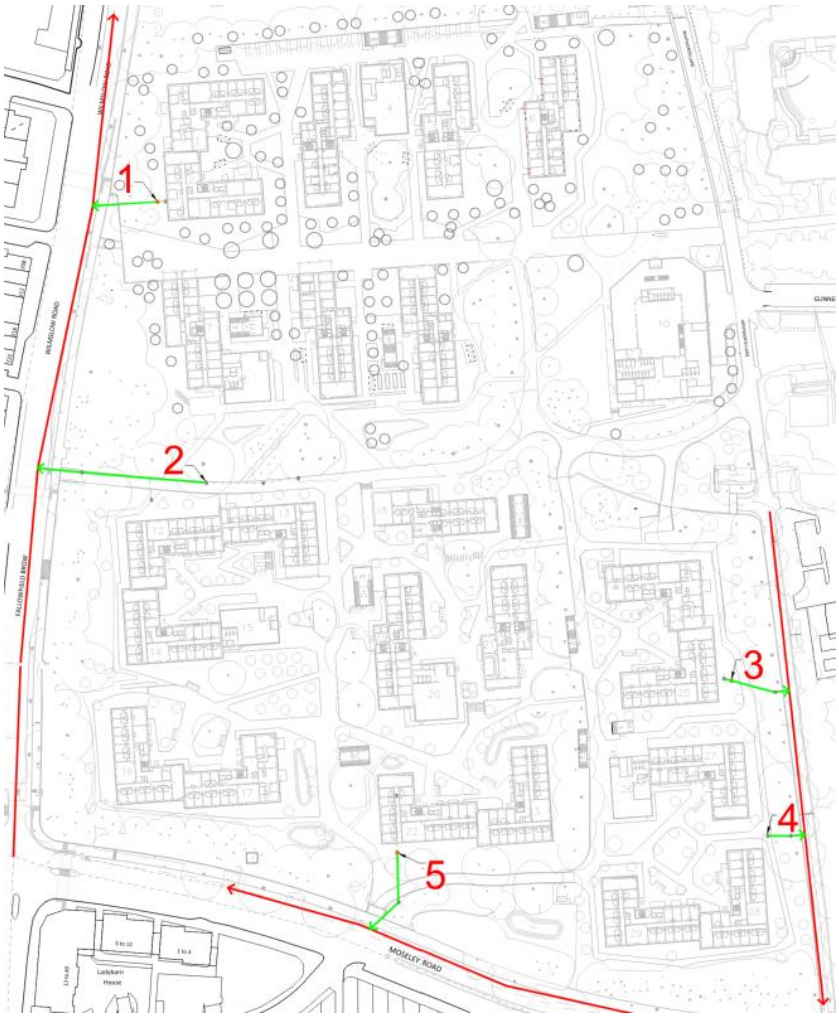


Figure 1- FW Outfall Connections

Foul flow rates for the student accommodation blocks have been calculated based on the population within the catchment of each of the 5No. site connections using a rate of 150 l/p/day:

	Population	Average Dry Weather Flow (DWF) (l/s)	Peak Flow (6xDWF) (l/s)
Outfall 1	1318	2.288	13.728
Outfall 2	604	1.049	6.294
Outfall 3	696	1.208	7.248
Outfall 4	323	0.561	3.366
Outfall 5	420	0.729	4.374

5 Flood Risk

5.1 Flood Risk Summary

For a detailed discussion of the flood risk for the proposed development site reference should be made to the Flood Risk Assessment ref. UoMF-BH-XX-XX-RP-CW-0001 Rev P02 produced by Buro Happold in August 2023. A summary of the flood risk is provided within this section.

5.1.1 Fluvial and coastal

The site is located in Flood Zone 1. This represents land having less than 1 in 1,000 annual probability of river or sea flooding. This is categorised as low risk.

5.1.2 Artificial sources

There are 5No.reservoirs located upstream of Gore Brook which is approximately 400m north of the development site. The site is outside of the extents of flooding predicted on the Environment Agency reservoir flood risk map. There are multiple sewers within Whitworth Lane, Wilmslow Road and Moseley Road. Whilst there is the potential for flows to enter the site if the sewers in Whitworth Lane were to flood to sufficient depth, the overall flood risk is considered to be low given the topography of the site, and that these assets are maintained by United Utilities.

5.1.3 Overland flows

The topography of the site directs overland flows southwards. Surface water flood risk mapping has identified a flood risk from overland flows entering the site from Whitworth Lane in the east. These flows enter the site near the southeast corner and drain towards Moseley Road. There is also the potential for overland flows to become trapped behind the existing boundary walls along the southern edge of the site. This risk needs to be reviewed as part of the proposed site design, and it is recommended a surface water flow wayleave is provided at the southeast of the site to allow water to progress along a more defined route, and that FFL's are raised 300mm above the 0.1% EA flood level in this area to protect the buildings from the associated flood risk.

5.1.4 Groundwater

The 2015 Geotechnical Investigation undertaken by Coffey Geotechnics identified groundwater in the made ground observed between a depth of 0.51m and 1.94m below ground level. It was inferred that this was locally perched water above a less permeable Glacial Till strata. Much of the made ground on site (in particular beneath building and crane matt footprints) will be removed as part of the construction process. Groundwater flood risk is therefore considered to be low, although it should be taken into consideration as a potential risk during the construction stage.

6 Maintenance

Maintenance of the foul and surface water drains for the development will fall under a private maintenance plan and be the responsibility of the site owner.

A maintenance regime should be enacted regularly as part of the normal facilities management duties. A maintenance schedule should be established following construction and updated as necessary throughout the lifetime of the building. A record maintenance log should be kept and updated accordingly.

The following schedule should be used as the basis of maintenance at the site.

	Maintenance Activity	Frequency of activity (months)				
		1	3	6	12	A/R
	Manholes (General)					
1	Check cover is not damaged and fits securely			X		
2	Check inlet and outlet are free flowing and not obstructed			X		
3	Check security of fitting for all manhole ironmongery			X		
4	Check benching for scour or build-up of debris			X		
5	Check joints in construction for damage or inflow				X	
6	Record maintenance inspection in log book			X		
	Gullies & drainage channels					
7	Check grating is undamaged and fits securely	X				
8	Inspect internal gully/sump chamber, remove debris from traps and check outfall is clear and free flowing			X		
9	Record maintenance inspection in log book	X				
	Conveyance Pipes					
10	Carry out flow test between manholes to ensure free flow of system				X	
11	Jetting and clearance of blockages, debris or silt					X
12	Inspection by CCTV – should problem arise as a result of the flow test					X
13	Cutting of growth into pipe					X
14	Record maintenance inspection in log book				X	X
	Attenuation Structure					
19	Inspect inlet/outlet chambers for evidence of poor operation, and clear when necessary.			X		
20	Visual inspection of overflow pipes and vent pipes				X	
21	Remove sediment from pre-treatment sump chamber			X		
22	Monitor any inspection chambers. Check for water level and silt at base of tank				X	

23	Record maintenance inspection in log book			X		
	Pond					
27	Inspection	X				
28	Litter and Debris Removal	X				
29	Grass Cutting					X
30	Shoreline vegetation management		X			
31	Aquatic vegetation management		X			
32	Sediment management		X			
33	Weed and invasive plant control					X
34	Shrub management					X
35	Vegetation replacement				X	
36	Record maintenance inspection in log book					X
	Petrol Interceptors					
37	Maintenance as per manufacturers specification					X
38	Record maintenance inspection in log book					X
	Swale/Bioretention/Trees					
39	Inspection	X				
40	Litter and debris removal	X				X
41	Grass cutting					X
42	Weed and invasive plant control	X				X
43	Shrub management (including pruning)	X				X
44	Sediment management		X			
45	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.					X
46	Structure rehabilitation / repair					X
47	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours.	X				X
48	Repair erosion or other damage by re-turfing or reseeding					X
49	Inspect vegetation coverage			X		
50	Relevel uneven surfaces and reinstate design levels					X
51	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface					X
52	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip					X
53	Remove and dispose of oils or petrol residues using safe standard practices					X

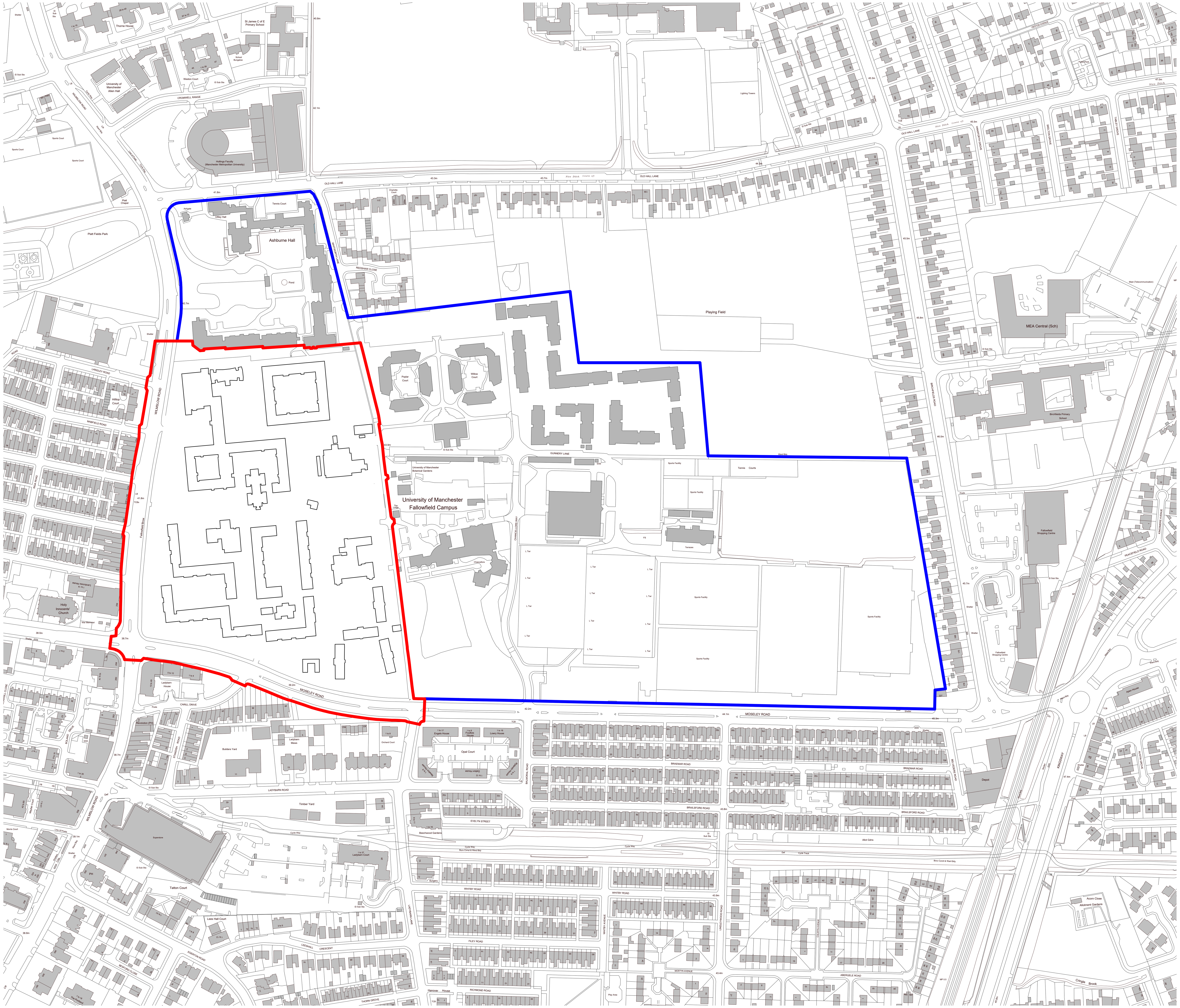
54	Inspect inlets, outlets and overflows for blockages, and clear if required.	X				
55	Record maintenance inspection in log book	X				X

Appendix A

Fallowfield campus redevelopment project flood risk assessment, UoMF-BH-XX-XX-RPXCW-0001.

Appendix B

Site location plan by Sheppard Robson, drawing no. 6952-SRA-XX-XX-DR-A-00100 Rev P02,



1 Location Plan
00100 1 : 2000

A1

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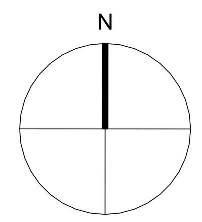
DO NOT SCALE FROM THIS DRAWING
The contractor shall check and verify all dimensions on site and report any discrepancies in writing to Sheppard Robson before proceeding work

FOR ELECTRONIC DATA ISSUE
Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated in text on the drawing.

NOTE:
Application Boundary
Ownership Boundary

REV.	DATE	AMENDMENT
P01	10/07/2023	First Issue
P02	18/08/2023	Issued for Planning

KEYPLAN



CLIENT

University of Manchester

The University of Manchester

SHEPPARD ROBSON

27th Floor City Tower Piccadilly Plaza Manchester M1 4BT
T: +44 (0)161 233 8900 E: enquiries@sheppardrobson.com

PROJECT
Fallowfield Student Accommodation

SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
As indicated	**18/08/2023**	**MM**	**NM**	**RG**

Location Plan

STATUS	PURPOSE FOR ISSUE	SR NO.
S2	**Planning**	**6952**

DRAWING NO.: **6952 - SRA - XX - XX - DR - A - 00100**
REV.: **P02**

Appendix C

Topographical survey carried out by Malcolm Hughes charted land surveyors, drawing no. 59252/1 dated 1/12/22.



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin (RUIN)
Passage
Wall with Height Retaining Wall (1.2) R/W

FENCE STYLES AND DESCRIPTIONS

Close Boarded C/B
Corrugated Iron C/I
Chestnut Paling C/P
Chainlink C/L
Handrail H/R
Interwoven INT
Iron Railings I/R
Lattice LAT
Miscellaneous Misc
Palisade PAL
Post & Chain P/C
Post & Rail P/R
Post & Wire P/W
Post & Barbed Wire B/W
Wire mesh W/M
Wire
Yorkie
Hurdle Insetstyle

ROADS

Kerbs
Edge of Surfacing
Pedestrian Crossing
Track
Footpath

STREET FURNITURE

Bollards
Cable Box
Coal Chute
Closed Circuit TV
Drain
Electricity Pole
Flood Light
Flag Staff
Lamp Post
Letter Box
Name Plate (street)
Mooring Ring
Mile Post or Mooring Post
Service Marker
Mile Stone
Post
Parking Meter
Reflector Post
Reading Eye
Road Sign
Speed Camera
Information Sign
Slip
Traffic Light
Telegraph Pole
Traffic Light Push Button Post
Traffic Light Control
Control Box
British Telecom Box
Electricity Box
Gas Box

INSPECTION CHAMBERS AND PIPES

Inspection Cover
Inspection Cover (Elec)
Manhole
British Telecom Cover
Inspection Cover (Comms)
Cable TV
Inspection Cover Traffic Signals
Gully
Kerb Outlet
Vent Pipe
Down Pipe
Non Water Pipe
Soil Pipe
Gas Pipe
Unable to lift cover
Stop Tap
Stop Valve
Lamphole
Hydrant
Earth Rod
Gas Valve
Water Meter
Washout
Reading Eye

GEOTECHNICAL INFORMATION

Borehole
Trial Pit
Monitor Pin
Probe Hole
Window Sample

GENERAL INFORMATION

Petrol Pump
Basement Light
Footbridge
Dish Type Channel
Slot Type Channel
Grille Type Channel
Tactile Paving
Crash Barrier
Column
Stanchion
Car Vacuum
Offset Pit
Air Valve
Trough
Chimney
Telephone Call Box

OVERHEAD FEATURES

Electricity Pylon
Electricity
Telephone

WATER FEATURES

Canal
Stream
Ditch
Weir
Culvert
Grip (Land Drain)
Spring

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

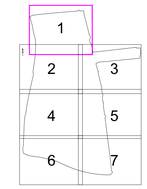
LEVEL AND HEIGHT INFORMATION

Standard Spot Height
Precision Spot Height
Bridge Level
Bridge Soffit Level
Soffit Level
Threshold Level
Cover Level
Invert Level
Pipe Soffit Level
Floor Level
Finished Floor Level
Top of Tank Level
Eave Level
Ridge Level
Roof Hip Level
Flat Roof Level
Top of Canopy Level
Underside of Canopy Level
Window Sill Level
Window Head Level
Springing Level
Arch Level
Cable Level
Top of Wall Level
Underside of Beam Level
General Height

SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
O.S. Bench Mark

Sheet Index



Rev.	Date	Description

MALCOLM HUGHES
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65 Cross Street, Sale, Manchester
M33 7HF, Tel: 0161 905 1265
www.malcolmhughes.co.uk
survey@mhlls.co.uk

Accreditations: RICS, The Survey Association, ICES, Safecontractor, FSC 19126

Client
RIDER LEVETT BUCKNALL UK LIMITED
8 PRINCESS PARADE, LIVERPOOL
L3 1DL

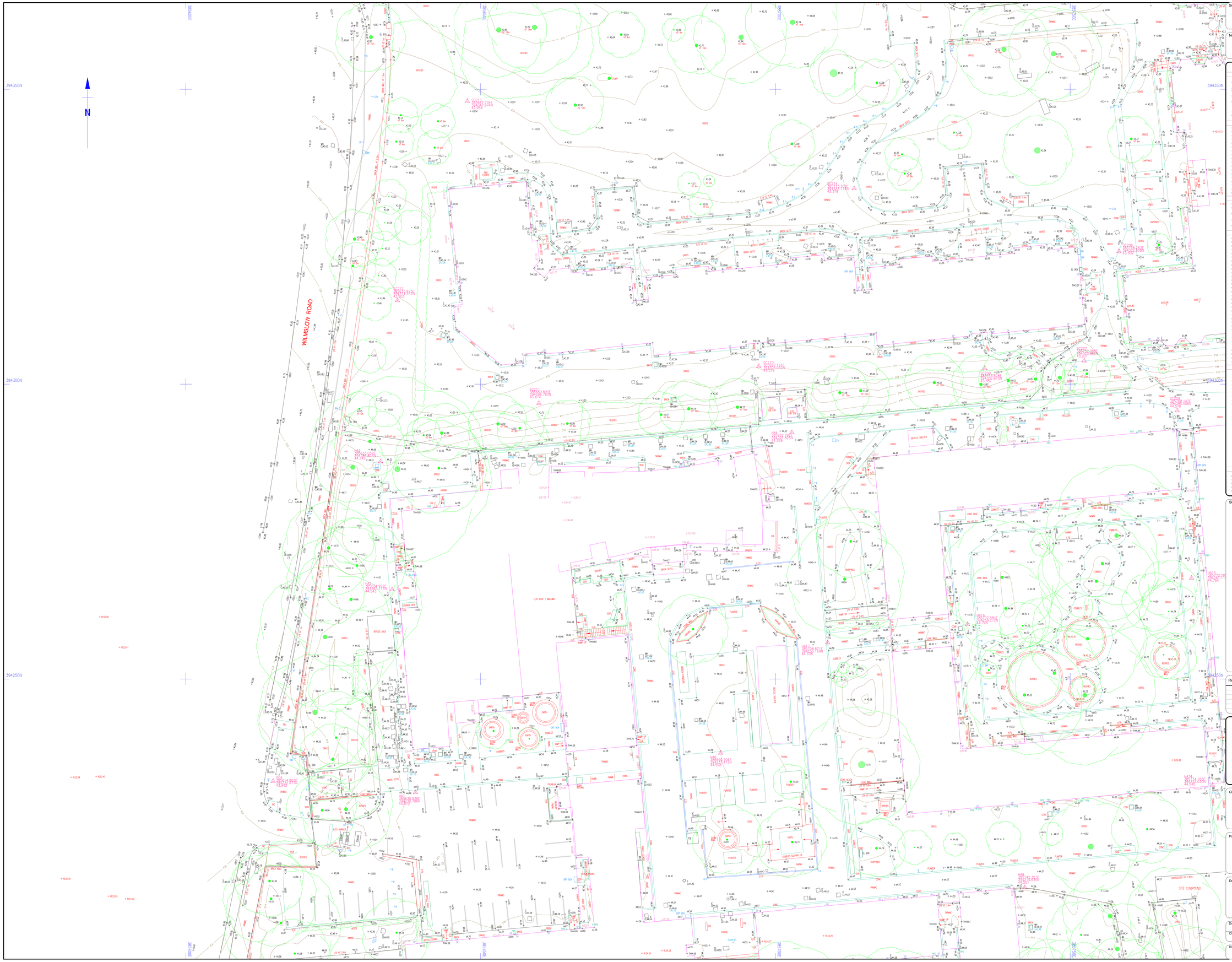
Project
UNIVERSITY OF MANCHESTER
FALLOWFIELD

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn By	Survey Date
AS 01/12/22	October 2022
Checked by	Scale
ED 01/12/22	1 : 200

Drawing No: 59252/1

Revision:



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building - Open Sided
Ruin — RUIN
Passage
Wall with Height Notation — WALL 1.8m
Retaining Wall — RTW

FENCE STYLES AND DESCRIPTIONS

Close Boarded — C/B
Corrugated Iron — C/I
Chestnut Paling — C/P
Chainlink — C/L
Hoarding — H/B
Interwoven — IWL
Iron Railings — I/R
Lattice — LAT
Miscellaneous — Misc
Palisade — PAL
Post & Chain — P/C
Post & Rail — P/R
Post & Wire — P/W
Post & Barbed Wire — B/W
Wire mesh — W/M
Gate
Fence Arrowhead

GENERAL INFORMATION

Petrol Pump — PP
Basement Light — BL
Footbridge — FB
Dish Type Channel
Slot Type Channel
Grate Type Channel — BGC 441.3m
Tactile Paving — TAC
Crash Barrier — C/BR
Column — COL
Stanchion — STAN
Car Vacuum — VAC
Offset Pin — o OP
Air Valve — o AV
Trough — T/L
Chimney — CHY
Telephone Call Box — TCB

OVERHEAD FEATURES

Electricity Pylon — EPYLON
Electricity — EL
Telephone — TEL

WATER FEATURES

Canal — Canal
Stream — Stream
Ditch — Ditch
Weir — Weir
Culvert — Culvert
Grip (Land Drain) — Grip
Spring — SPR

ROADS

Kerbs
Edge of Surfacing
Pedestrian Crossing — PC
Track — Track
Footpath — Footpath

RELIEF AND VEGETATION

Hedge — Hedge
Edge of wood/Bushes — Edge of wood/Bushes
Stump — STUMP
Individual Tree — Individual Tree
Slopes with Height Greater than 1m — Slopes with Height Greater than 1m
Cliff Face — Cliff Face
Marsh — Marsh
Reeds — Reeds

STREET FURNITURE

Belisha Beacon — BB
Bus Stop — BS
Bollard — B
Grid Gully — GG
Cast Chute — CC
Closed Circuit TV — CCTV
Drain — DR
Electricity Pole — EP
Flood Light — FL
Flag Staff — FS
Lamp Post — LP
Letter Box — LB
Name Plate (street) — NP
Mooring Ring — MR
Mile Post or Mooring Post — MP
Service Marker — MK
Mile Stone — MS
Post — P
Parking Meter — PM
Reflector Post — RP
Reading Eye — RE
Road Sign — RS
Speed Camera — S/CAM
Information Sign — SIGN
Stay — SY
Traffic Light — TL
Telegraph Pole — TP
Traffic Light Push Button Post — TLP
Traffic Light Control — TLC/P
Control Box — C BOX
British Telecom Box — BT BOX
Electricity Box — EL BOX
Gas Box — GAS BOX

INSPECTION CHAMBERS AND PIPES

Inspection Cover — IC
Inspection Cover (Elec) — IC/EL
Manhole — MH
British Telecom Cover — BT
Inspection Cover (Comms) — IC/COM
Cable TV — CATV
Inspection Cover Traffic Signals — IC/TL
Gully — G
Kerb Outlet — KO
Vent Pipe — o VP
Down Pipe — o DP
Rain Water Pipe — o RWP
Soil Pipe — o SVP
Gas Pipe — o G-PIPE
Unable to lift cover — U/L
Stop Tap — o ST
Stop Valve — o SV
Lamphole — o LH
Hydrant — o HYD
Earth Rod — o ER
Gas Valve — o GV
Water Meter — o WM
Washout — o WO
Reading Eye — o RE

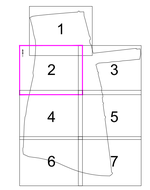
GEOTECHNICAL INFORMATION

Borehole — BH
Dup Pit — DP
Monitor Pin — o MON
Probe Hole — o PH
Window Sample — o WS

SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
O.S. Bench Mark

Sheet Index



Rev.	Date	Description

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Accreditations: RICS, The Survey Association, ICES, RICS Regulated, PE Invest

Client
RIDER LEVETT BUCKNALL UK LIMITED
8 PRINCESS PARADE, LIVERPOOL
L3 1DL

Project
UNIVERSITY OF MANCHESTER
FALLOWFIELD

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn By	AS	01/12/22	Survey Date: October 2022
Checked By	ED	01/12/22	Scale: 1 : 200

Drawing No: 59252/2

Revision:



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin (RUIN)
Flowage
Wall with Height Retaining Wall (e.g. R/W 1.2m)

FENCE STYLES AND DESCRIPTIONS

Close Boarded (C/B)
Corrugated Iron (C/I)
Chestnut Paling (C/P)
Chainlink (C/L)
Handrail (H/R)
Interwoven (WV)
Iron Railings (I/R)
Lattice (LAT)
Miscellaneous (Misc)
Palisade (PAL)
Post & Chain (P/C)
Post & Rail (P/R)
Post & Wire (P/W)
Post & Barbed Wire (B/W)
Wire mesh (W/M)
Wire (WIRE)
Kerbs (KERB)
Edge of Surfacing (EOS)
Pedestrian Crossing (PEDX)
Track (TRACK)
Footpath (FP)

STREET FURNITURE

Belisha Beacon (BB)
Bus Stop (BS)
Bollard (B)
Cats Eye (CE)
Cast Chute (CC)
Closed Circuit TV (CCTV)
Drain (DR)
Electricity Pole (EP)
Flood Light (FL)
Flag Staff (FS)
Lamp Post (LP)
Letter Box (LB)
Name Plate (street) (NP)
Mooring Ring (MR)
Mile Post or Mooring Post (MP)
Service Marker (MK)
Mile Stone (MS)
Post (P)
Parking Meter (PM)
Reflector Post (RP)
Reading Eye (RE)
Road Sign (RS)
Speed Camera (S/CAM)
Information Sign (SIGN)
Stay (SY)
Traffic Light (TL)
Telegraph Pole (TP)
Traffic Light Push Button Post (TLP)
Traffic Light Control (TLC/P)
Control Box (C/BOX)
British Telecom Box (BT BOX)
Electricity Box (EL BOX)
Gas Box (GAS BOX)

INSPECTION CHAMBERS AND PIPES

Inspection Cover (IC)
Inspection Cover (Elec) (IC/EL)
Manhole (MH)
British Telecom Cover (BT)
Inspection Cover (Comms) (IC/COM)
Cable TV (CATV)
Inspection Cover Traffic Signals (IC/TL)
Gully (G)
Kerb Outlet (KO)
Vent Pipe (+ VP)
Down Pipe (+ DP)
Rain Water Pipe (+ RWP)
Soil Pipe (+ SVP)
Gas Pipe (+ G.PIPE)
Unable to lift cover (UTL)
Stop Tap (+ ST)
Stop Valve (+ SV)
Lamphole (+ LH)
Hydrant (+ HYD)
Earth Rod (+ ER)
Gas Valve (+ GV)
Water Meter (+ MW)
Washout (+ WO)
Reading Eye (+ RE)

GEOTECHNICAL INFORMATION

Borehole (BH)
Trial Pit (TP)
Monitor Pin (+ MON)
Probe Hole (+ PH)
Window Sample (+ WS)

GENERAL INFORMATION

Petrol Pump (PP)
Basement Light (BL)
Footbridge (FB)
Dish Type Channel
Slot Type Channel
Grille Type Channel (inc. arrows)
Tactile Paving (TAC)
Crash Barrier (C/BR)
Column (COL)
Standpipe (STAN)
Car Vacuum (VAC)
Offset Pit (+ OP)
Air Valve (+ AV)
Trough (TR)
Chimney (CHY)
Telephone Call Box (TCB)

OVERHEAD FEATURES

Electricity Pylon (ELPYLON)
Electricity (ELEC)
Telephone (TEL)

WATER FEATURES

Canal
Stream
Ditch
Weir
Culvert
Drip (Land Drain) (DRN)
Spring (SPR)

ROADS

STREET FURNITURE

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump (STUMP)
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

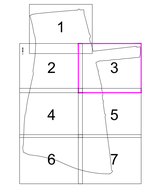
LEVEL AND HEIGHT INFORMATION

Standard Spot Height (+ 123.45)
Precision Spot Height (+ 123.456)
Bench Mark (+ BM 123.45)
Brick Level (+ BL24.62)
Soffit Level (+ SL25.62)
Threshold Level (+ THR.68)
Cover Level (+ CL26.45)
Invert Level (+ IL25.13)
Pipe Soffit Level (+ PSL5.00)
Floor Level (+ FL6.00)
Finished Floor Level (+ FFL6.02)
Top of Tank Level (+ TT7.00)
Eave Level (+ EL7.00)
Ridge Level (+ RL9.00)
Roof Hip Level (+ RHL8.50)
Flat Roof Level (+ FRL7.00)
Top of Canopy Level (+ TOP/CT7.00)
Underside of Canopy Level (+ SOF/CS6.00)
Window Sill Level (+ WSL8.00)
Window Head Level (+ WHL9.00)
Springing Level (+ SPL8.50)
Arch Level (+ AL7.00)
Cable Level (+ CHT8.00)
Top of Wall Level (+ TW.W10.00)
Underside of Beam Level (+ UBL8.50)
General Height (+ H79.00)

SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
O.S. Bench Mark

Sheet Index



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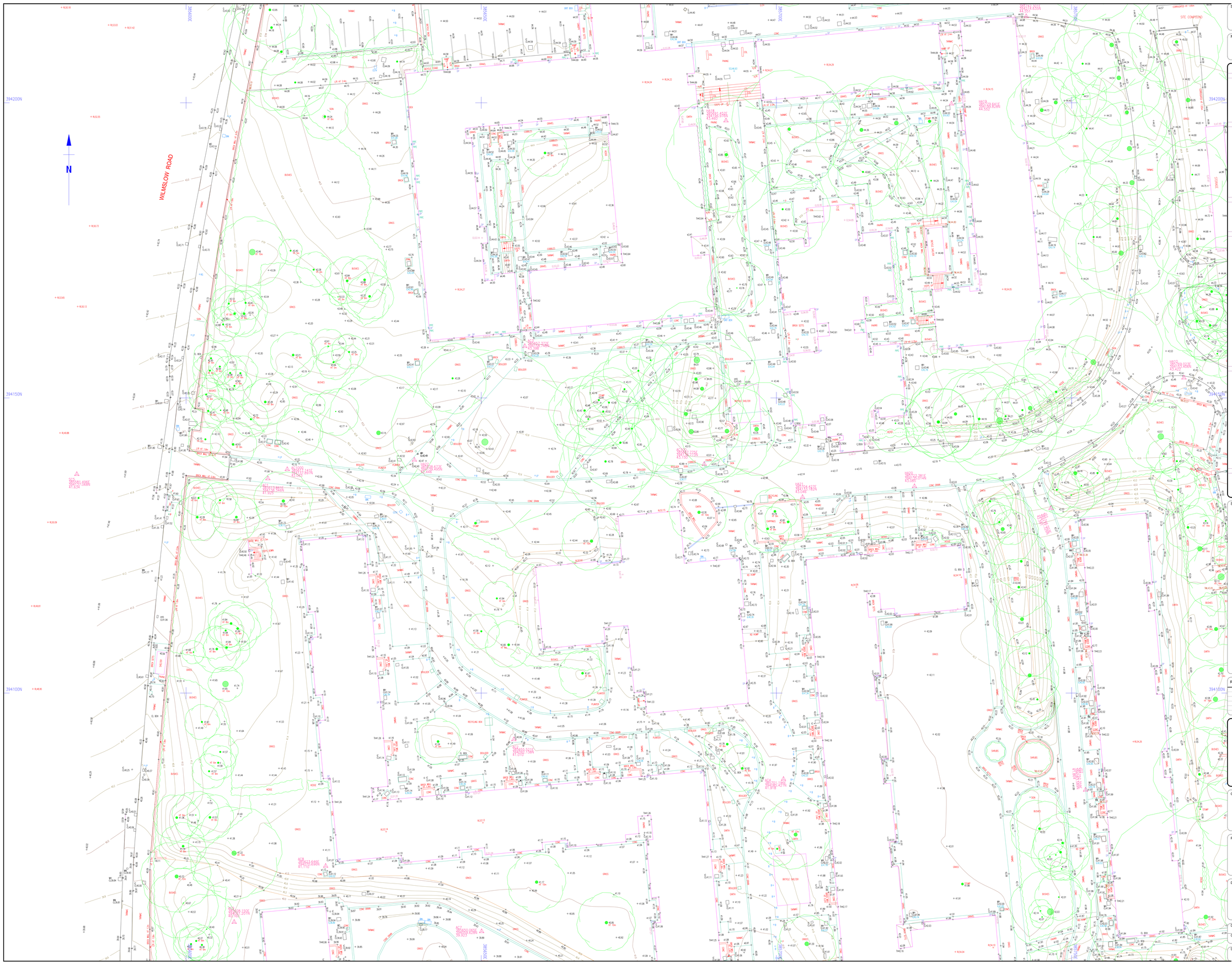
Project
UNIVERSITY OF MANCHESTER
FALLOWFIELD

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn By	Survey Date
AS 01/12/22	October 2022
Checked by ED 01/12/22	Scale 1 : 200

Drawing No: 59252/3

Revision:



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin
Hoarding
Wall with Weight Retaining Wall

FENCE STYLES AND DESCRIPTIONS

Close Boarded
Corrugated Iron
Chestnut Paling
Chainlink
Handrail
Interwoven
Iron Railings
Lattice
Miscellaneous
Palisade
Post & Chain
Post & Rail
Post & Wire
Post & Barbed Wire
Wire mesh
Solid
Kerbs
Edge of Surfacing
Pedestrian Crossing
Track
Footpath

STREET FURNITURE

Belisha Beacon
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Bollard
Cats Eye
Coal Chute
Closed Circuit TV
Drain
Electricity Pole
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Mooring Ring
Mile Post or Mooring Post
Service Marker
Mile Stone
Post
Parking Meter
Reflector Post
Rodding Eye
Road Sign
Speed Camera
Information Sign
Stay
Traffic Light
Telegraph Pole
Traffic Light Push Button Post
Traffic Light Control
Control Box
British Telecom Box
Electricity Box
Gas Box

INSPECTION CHAMBERS AND PIPES

Inspection Cover
Inspection Cover (Oval)
Manhole
British Telecom Cover
Inspection Cover (Comms)
Cable TV
Inspection Cover Traffic Signals
Gully
Kerb Outlet
Vent Pipe
Down Pipe
Rain Water Pipe
Soil Pipe
Gas Pipe
Unable to lift cover
Stop Tap
Stop Valve
Lamphole
Hydrant
Earth Rod
Gas Valve
Water Meter
Washout
Rodding Eye

GEOTECHNICAL INFORMATION

Borehole
Trial Pit
Monitor Pin
Probe Hole
Window Sample

GENERAL INFORMATION

Petrol Pump
Basement Light
Footbridge
Dish Type Channel
Slot Type Channel
Grille Type Channel
Tactile Paving
Crash Barrier
Column
Stanchion
Car Vacuum
Offset Pit
Air Valve
Trough
Chimney
Telephone Call Box

OVERHEAD FEATURES

Electricity Pylon
Electricity
Telephone

WATER FEATURES

Canal
Stream
Ditch
Weir
Culvert
Grip (Land Drain)
Spring

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

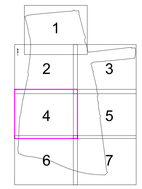
LEVEL AND HEIGHT INFORMATION

Standard Spot Height
Precision Spot Height
Bridge Level
Brink Level
Soffit Level
Threshold Level
Cover Level
Invert Level
Pipe Soffit Level
Floor Level
Finished Floor Level
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Roof Hip Level
Flat Roof Level
Top of Canopy Level
Underside of Canopy Level
Manhole Sill Level
Window Head Level
Springing Level
Arch Level
Cable Level
Top of Wall Level
Underside of Beam Level
General Height

SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
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Project
UNIVERSITY OF MANCHESTER
FALLOWFIELD

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn By	AS	Survey Date	October 2022
Checked By	ED	Scale	1 : 200
	01/12/22		

Drawing No: 59252/4

Revision:



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin — RUIN
Passage
Wall with Height Retaining Wall — R/W

FENCE STYLES AND DESCRIPTIONS

Close Boarded — C/B
Corrugated Iron — C/I
Chestnut Paling — C/P
Chainlink — C/L
Handrail — H/R
Interwoven — IW/
Iron Railings — I/R
Lattice — L/T
Miscellaneous — Misc
Palisade — PAL
Post & Chain — P/C
Post & Rail — P/R
Post & Wire — P/W
Post & Barbed Wire — B/W
Wire mesh — W/M
Stile
Gate — <gate>
Kerbe Inaccessible

ROADS

Kerbs
Edge of Surfacing
Pedestrian Crossing — PC
Track — TRACK
Footpath — FP

STREET FURNITURE

Belisha Beacon — BB
Bus Stop — BS
Bollard — B
Cats Eye — CE
Coal Chute — CC
Closed Circuit TV — CCTV
Drain — DR
Electricity Pole — EP
Flood Light — FL
Flag Staff — FS
Lamp Post — LP
Letter Box — C/LB
Name Plate (street) — NP
Mooring Ring — MR
Mile Post or Mooring Post — MP
Service Marker — MK
Mile Stone — MS
Post — P
Parking Meter — PM
Reflector Post — RP
Reading Eye — RE
Road Sign — RS
Speed Camera — S/CAM
Information Sign — SIGN
Stay — SY
Traffic Light — TL
Telegraph Pole — TP
Traffic Light Push Button Post — TLP
Traffic Light Control — TLC/P
Control Box — C/BOX
British Telecom Box — BT BOX
Electricity Box — EL BOX
Gas Box — GAS BOX

INSPECTION CHAMBERS AND PIPES

Inspection Cover — IC
Inspection Cover (Other) — IC/OTH
Manhole — MH
British Telecom Cover — BT
Inspection Cover (Comms) — IC/COM
Cable TV — CATV
Inspection Cover Traffic Signals — IC/TL
Gully — G
Kerb Outlet — KO
Vent Pipe — o VP
Down Pipe — o DP
Rain Water Pipe — o RWP
Soil Pipe — o SVP
Gas Pipe — o G-PIPE
Unable to lift cover — UTL
Stop Tap — o ST
Stop Valve — o SV
Lamphole — o LH
Hydrant — o HYD
Earth Rod — o ER
Gas Valve — o GV
Water Meter — o MW
Washout — o WO
Reading Eye — o RE

GEOTECHNICAL INFORMATION

Borehole — BH
Trial Pit — TP
Monitor Pin — o MON
Probe Hole — o PH
Window Sample — o WS

GENERAL INFORMATION

Petrol Pump — PP
Basement Light — BL
Footbridge — FB
Dish Type Channel
Slot Type Channel
Grate Type Channel — Mod. 441.34m
Tactile Paving — TAC
Crash Barrier — C/BR
Column — COL
Stanchion — STAN
Car Vacuum — VAC
Offset Pill — o OP
Air Valve — o AV
Trough — TR
Chimney — o CHY
Telephone Call Box — TCB

OVERHEAD FEATURES

Electricity Pylon — E.P.PYLON
Electricity — ELEC
Telephone — TEL

WATER FEATURES

Canal — CANAL
Stream — STREAM
Ditch — DITCH
Weir
Culvert — CULVERT
Grip (Land Drain)
Spring — o SPR

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump — o STUMP
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

LEVEL AND HEIGHT INFORMATION

Standard Spot Height — + 123.45
Precision Spot Height — + 123.456
Bench Mark — BM 123.45
Bridge Level — + BL24.62
Soffit Level — + SL25.62
Threshold Level — + THR.98
Cover Level — + CL26.45
Invert Level — + IL25.15
Pipe Soffit Level — + PSL15.00
Floor Level — + FL6.00
Finished Floor Level — + FFL6.00
Top of Tank Level — + TT7.00
Eave Level — + EL7.00
Ridge Level — + RL9.00
Roof Hip Level — + RH8.50
Flat Roof Level — + FRL7.00
Top of Canopy Level — + TOP/CT7.00
Underside of Canopy Level — + SOF/CS5.00
Window Sill Level — + WSL8.00
Window Head Level — + WHL9.00
Springing Level — + SPL8.50
Arch Level — + AL7.00
Cable Level — + CHTR.55
Top of Wall Level — + TW.NV.50
Underside of Beam Level — + UBL8.50
General Height — + HTR.00

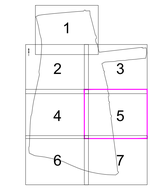
SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
O.S. Bench Mark

GEOTECHNICAL INFORMATION

Borehole — BH
Trial Pit — TP
Monitor Pin — o MON
Probe Hole — o PH
Window Sample — o WS

Sheet Index



Rev.	Date	Description

MALCOLM HUGHES
CHARTERED LAND SURVEYORS
65 Cross Street, Sale, Manchester
M33 7HF. Tel: 0161 905 1205
www.malcolmhughes.co.uk
survey@mhls.co.uk

Accreditations: RICS, The Survey Association, ICES, RICS CPD Scheme, Acenet

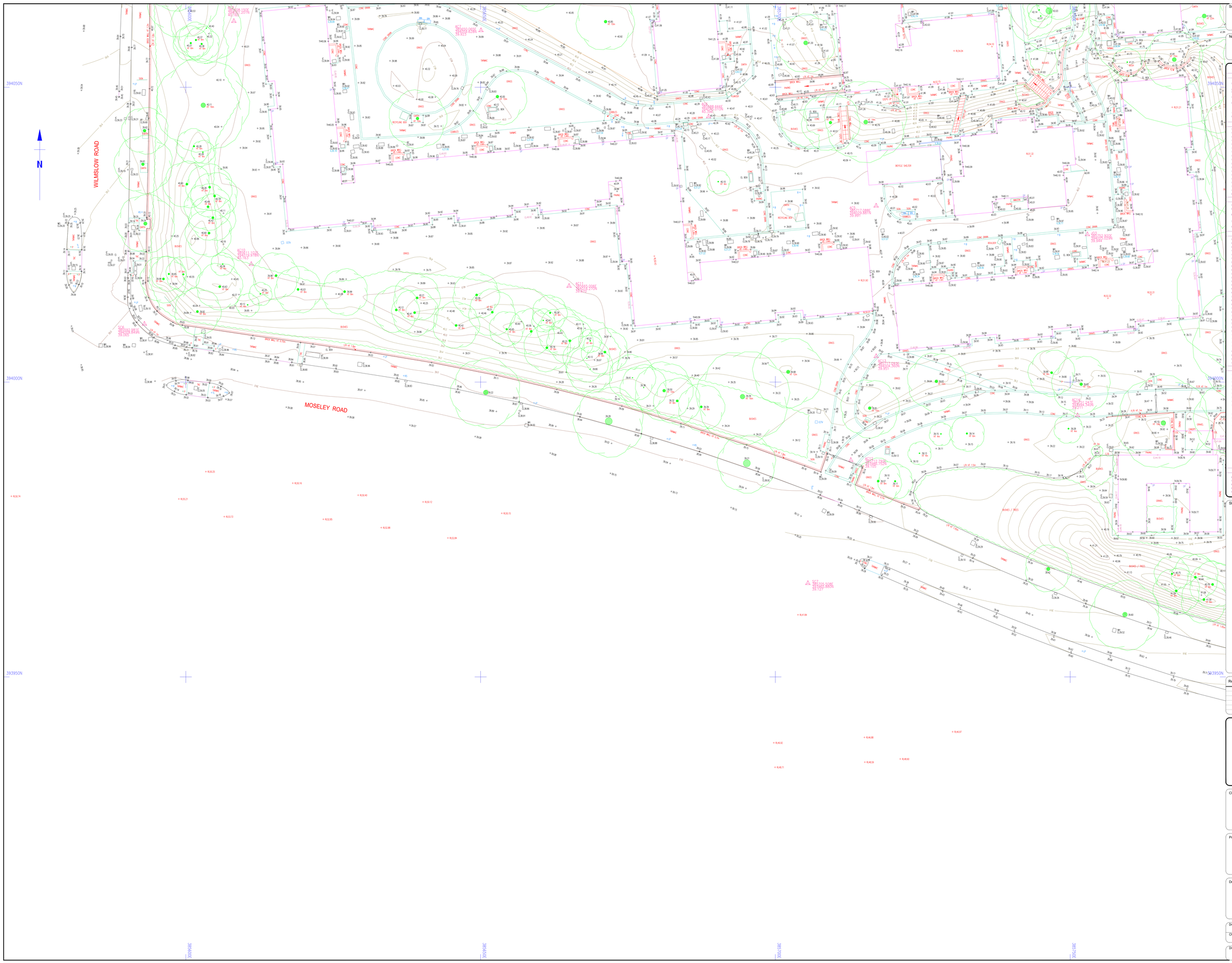
Client
RIDER LEVETT BUCKNALL UK LIMITED
8 PRINCESS PARADE, LIVERPOOL
L3 1DL

Project
UNIVERSITY OF MANCHESTER
FALLOWFIELD

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn By			Survey Date	
	AS	01/12/22		October 2022
Checked by			Scale	
	ED	01/12/22		1 : 200

Drawing No: 59252/5
Revision:



Survey Notes

Grid: Local Plane Metric related to National Grid at survey control SC1

Levels: OS Datum from GNSS positioning converted using the National Geoid Model OSGM15

Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin (RUIN)
Passage
Wall with Height Retaining Wall (RW)

FENCE STYLES AND DESCRIPTIONS

Close Boarded
Corrugated Iron
Chestnut Paling
Chainlink
Handrail
Interwoven
Iron Railings
Lattice
Miscellaneous
Palisade
Post & Chain
Post & Rail
Post & Wire
Post & Barbed Wire
Wire mesh
Wire
Rythe
Stone Wall/style

GENERAL INFORMATION

Petrol Pump
Basement Light
Footbridge
Dish Type Channel
Slot Type Channel
Grate Type Channel
Tactile Paving
Crash Barrier
Column
Stanchion
Car Vacuum
Offset Pit
Air Valve
Trough
Chimney
Telephone Call Box

OVERHEAD FEATURES

Electricity Pylon
Electricity
Telephone

WATER FEATURES

Canal
Stream
Ditch
Weir
Culvert
Grip (Land Drain)
Spring

ROADS

Kerbs
Edge of Surfacing
Pedestrian Crossing
Track
Footpath

STREET FURNITURE

Bollards Bollard
Bus Stop
Cable Box
Coal Chute
Closed Circuit TV
Drain
Electricity Pole
Flood Light
Flag Staff
Lamp Post
Letter Box
Name Plate (street)
Mooring Ring
Mile Post or Mooring Post
Service Marker
Mile Stone
Post
Parking Meter
Reflector Post
Rodding Eye
Road Sign
Speed Camera
Information Sign
Stay
Traffic Light
Telegraph Pole
Traffic Light Push Button Post
Traffic Light Control
Control Box
British Telecom Box
Electricity Box
Gas Box

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

INSPECTION CHAMBERS AND PIPES

Inspection Cover
Inspection Cover (Elec)
Manhole
British Telecom Cover
Inspection Cover (Comms)
Cable TV
Inspection Cover Traffic Signals
Gully
Kerb Outlet
Vent Pipe
Down Pipe
Non Water Pipe
Soil Pipe
Gas Pipe
Unable to lift cover
Stop Tap
Stop Valve
Lamphole
Hydrant
Earth Rod
Gas Valve
Water Meter
Washout
Rodding Eye

LEVEL AND HEIGHT INFORMATION

Standard Spot Height
Precision Spot Height
Bridge Level
Brick Level
Soffit Level
Threshold Level
Cover Level
Invert Level
Pipe Soffit Level
Sump Level
Finished Floor Level
Electricity Box
Eave Level
Ridge Level
Roof Hip Level
Flat Roof Level
Top of Canopy Level
Underside of Canopy Level
Window Sill Level
Window Head Level
Springing Level
Arch Level
Cable Level
Top of Wall Level
Underside of Beam Level
General Height

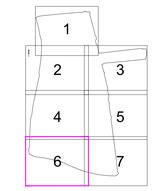
GEOTECHNICAL INFORMATION

Borehole
Trial Pit
Monitor Pin
Probe Hole
Window Sample

SURVEY INFORMATION SIGNS

Permanent Ground Marker
O.S. Trig Station
O.S. Bench Mark

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Checked By			Scale	
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Drawing No	Revision
59252/6	



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Notes

Topographical Survey Legend

BUILDINGS AND WALLS

Building
Building Open Sided
Ruin (RUIN)
Passage
Wall with Height Retaining Wall (WALL 0.6) R/W

FENCE STYLES AND DESCRIPTIONS

Close Boarded C/B
Corrugated Iron C/I
Chestnut Paling C/P
Chainlink C/L
Handrail H/R
Interwoven INT
Iron Railings I/R
Lattice L/T
Miscellaneous Misc
Palisade PAL
Post & Chain P/C
Post & Rail P/R
Post & Wire P/W
Post & Barbed Wire B/W
Wire mesh W/M
Gate
Kerb
Kerb
Edge of Surfacing
Pedestrian Crossing
Track
Footpath

STREET FURNITURE

Bollards
Bus Stop
Cable Box
Cast Chute
Closed Circuit TV
Drain
Electricity Pole
Flood Light
Flag Staff
Lamp Post
Letter Box
Name Plate (street)
Mooring Ring
Mile Post or Mooring Post
Service Marker
Mile Stone
Post
Parking Meter
Reflector Post
Reading Eye
Road Sign
Speed Camera
Information Sign
Stay
Traffic Light
Telegraph Pole
Traffic Light Push Button Post
Traffic Light Control
Control Box
British Telecom Box
Electricity Box
Gas Box

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Inspection Cover (Elec)
Manhole
British Telecom Cover
Inspection Cover (Comms)
Cable TV
Inspection Cover Traffic Signals
Gully
Kerb Outlet
Vent Pipe
Down Pipe
Rain Water Pipe
Soil Pipe
Use Pipe
Unable to lift cover
Stop Tap
Stop Valve
Lamphole
Hydrant
Earth Rod
Gas Valve
Water Meter
Washout
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Probe Hole
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Air Valve
Trough
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Electricity Pylon
Electricity
Telephone

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Canal
Stream
Ditch
Weir
Culvert
Grip (Land Drain)
Spring

ROADS

RELIEF AND VEGETATION

Hedge
Edge of wood/Bushes
Stump
Individual Tree
Slopes with Height Greater than 1m
Cliff Face
Marsh
Reeds

LEVEL AND HEIGHT INFORMATION

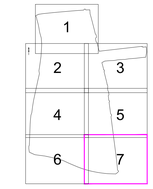
Standard Spot Height
Precision Spot Height
Bridge Soffit
Bridge Level
Soffit Level
Threshold Level
Cover Level
Invert Level
Pipe Soffit Level
Floor Level
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Underside of Canopy Level
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Cable Level
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Underside of Beam Level
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Permanent Ground Marker
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Drawing No: 59252/7
Revision:

Appendix D

Utility survey carried out by Locate Surveys Ltd, drawing no. LSL:12650FG:250:1:2, dated September 2015.

Drawing caveats, please note:

Locate carry out surveys in accordance with site procedures using approved detectors.

Depth data is limited by the accuracy of the detection equipment. Average accuracy is +/- 10% of depth with GPR and +/- 5% of the depth with electromagnetic technologies.

It is Locate's procedure to use statutory undertakers plans prior to and during the survey as a guide for the survey team.

In accordance with British Telecom (BT) national policy, locate are not permitted to raise BT inspection chamber covers.

Drainage routes between manholes, if not able to be traced by Locate's methodologies, are assumed to be direct direct lines between manholes.

Locate advise that excavations in the vicinity of services shown are carried out with due diligence, please refer HSG47.

Topographical Survey Legend

B Bollard
BS Bus Stop
BT Telecommunications IC
CCTV Closed Circuit TV
CTV Cable Television Cover
DP Downpipe
DR Drain
Elec Electrical IC
EP Earth Pit
ER Earth Rod
FP Flagpole
FT Floodlight
G Gully
GP Guard Post
GV Gas Valve

N Height
Hyd Hydrant
IC Inspection Cover
K Kerb Height
KD Kerb Outlet
LB Letter Box
LP Lamp Post
MV Utility Marker
MP Manhole
NP Name Plate
P Post
PM Parking Meter
RE Rodding Eye
RS Road Sign
RTM Retaining Wall

RWP Rain Water Pipe
SP Soil Pipe
SPS Stone Paving Slabs
SV Stop Valve
TCB Telephone Call Box
TL Traffic Light
TP Timber Post
TPS Tactile Paving Slabs
VP Vent Pipe
WM Water Meter
WO Water Outlet
UTL Unable To Lift

Level Prefix Descriptions
AL Arch Level
BL Bed Level
CL Cover Level
EL Eaves Level
FL Floor Level
IL Invert Level
OL Overhead Cable Level
PL Parapet Level
RL Roof/Edge Level
SL Soffit Level
Spr Spring Level
TF Top Of Fence Level
TL Threshold Level
WL Water Level

Fence Annotation:
B/W Barbed Wire
C/B Closed Boarded
C/I Corrugated Iron
C/L Chain Link
H/P Hoarding Panel
H/R Hand Rail
I/R Iron Railings
O/B Open Boarded
P/C Post & Chain
P/R Post & Rail
P/W Post & Wire
W/M Wire Mesh

Fence
Safety Barrier
Gate
Side
Hedge
Limit of Foliage & Tree Canopy

Spot Level 50.00
Survey Control Station (coordinated point) SSL1 50.00
Tree
MT Multi Trunk

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

Drainage/Services Legend

Foul
Surface
Combined
Drainage (unspecified)
British telecom
Telecom
Fibre optics
CATV
CCTV
Electric
Street lighting
Traffic management
Gas
Water
Fuel
Unknown / misc
Ducting
d Service depth (m)
Pipe diameter (mm)
EOT End of trace
UTL Unable to trace
Utility Survey Boundary

Any drainage pipe sizes shown have been gauged from the surface for safety reasons and should be regarded as approximate only.

Survey Station Coordinates

Stn	Easting	Northing	Level
AT01	385082.08	394140.97	41.65
AT02	385616.45	394232.39	43.86
AT03	385637.63	394286.47	44.49
AT04	385708.18	394293.31	44.47
AT05	385786.14	394296.56	44.43
AT06	385809.94	394231.72	44.55
AT07	385881.71	394228.98	44.75
AT08	385970.97	394235.90	45.25
AT09	385982.39	394186.50	45.02
AT10	386069.87	394172.77	44.79
AT11	386067.45	394112.06	44.32
AT12	386046.74	393980.51	42.48
AT13	386035.24	393941.39	42.02
AT14	385993.70	393934.39	41.36
AT15	385896.02	394118.79	42.52
AT16	385845.02	394141.05	42.32
AT17	385862.54	394024.69	40.15
AT18	385871.57	393945.42	40.42
AT19	385780.21	393935.58	39.65
AT20	385594.05	393997.94	39.01
AT21	385721.17	394023.92	39.92
AT22	385697.85	394084.86	41.78
AT23	385703.92	394133.68	42.95
AT24	385762.59	394151.52	43.32
AT25	385763.17	394212.31	44.34
AT1A	385656.59	394235.12	44.44
AT4A	385705.23	394227.08	44.41
AT5A	385786.09	394226.04	44.39
AT6A	385967.96	394267.58	45.46
AT8C	385963.16	394335.17	44.82
AT9D	386004.42	394349.33	44.19
AT9A	385987.97	394196.15	45.34
A14A	385946.56	394131.28	42.37
A15A	385875.14	394124.08	42.54
A15B	385859.36	394129.56	42.30
A15C	385857.95	394141.12	42.28
A15D	385849.68	394139.93	42.48
A15E	385853.00	394151.44	44.37
A20A	385688.73	394124.73	42.66
0010	385984.96	394195.09	45.27
0013	385775.45	394149.78	43.17
0016	385707.41	393982.56	39.02
0017	385705.41	393982.56	39.02
010B	386035.38	394162.83	45.01
010C	385999.13	394202.69	45.26
011A	386127.75	394146.36	45.03
012A	386119.97	393988.63	42.61
012B	386131.35	393993.93	42.41
013A	386006.03	393932.86	42.71
013B	386012.29	393981.89	42.52
013C	386098.50	393939.21	43.30
380Z	386027.85	393928.94	44.40
BEN1	385638.81	394138.59	42.34
BEN2	385762.59	394151.53	43.32
BEN3	385847.45	394023.43	40.14
BEN4	385856.42	393973.54	40.18
BEN5	385824.64	393967.70	40.22
BE2A	385811.72	394146.59	43.28
BE2A	385811.72	394146.59	43.28
BE2B	385779.79	394169.64	44.70
BE2C	385834.48	394207.75	44.09
BE2D	385806.11	394213.26	44.46
BE2E	385795.86	394222.42	44.41
BE5A	385795.87	394012.91	40.17
BE5B	385788.17	394061.09	41.53
BE5C	385778.12	393995.75	39.73
BE5D	385783.13	394112.00	41.96
BE5E	385753.10	394056.38	41.12
BE5F	385840.42	394069.33	41.74
BE5G	385828.92	394114.34	41.59
BE5H	385820.82	394097.53	41.58
BE6A	385783.28	393997.31	39.97
HCS1	385784.27	394146.56	43.09
HCS2	385734.17	393966.10	39.99
HCS4	385881.23	394127.64	42.49
HCS5	385881.23	394127.64	42.41
HCS8	385846.12	394129.67	42.32
HCSC	385844.96	394140.28	42.52
WC01	385699.34	394091.30	41.97
N101	386027.27	394244.76	48.27
N102	386021.36	394244.76	48.58
N103	386004.81	394251.69	48.01
N104	386010.52	394273.90	48.36
N105	386014.19	394304.92	47.62
N201	385811.37	394065.09	41.60
N202	385807.18	394059.57	40.54
N301	385810.69	394115.82	41.52
N302	385800.74	394113.52	41.50
N303	385793.20	394109.12	41.52
N304	385795.17	394095.71	41.54
N305	385777.17	394122.13	42.40
N306	385777.94	394140.08	43.00
N307	385829.01	394187.81	44.01
N308	385827.75	394206.42	44.32
PO03	385882.24	394231.01	44.77
PO25	385940.90	394236.24	44.84
AT3K	385834.31	394339.73	43.30
AT3X	385658.67	394206.61	43.58
AT3Z	385705.29	394202.63	44.42
JB20	386119.00	394187.42	45.24
JB21	386125.20	394174.86	45.16
JB22	386127.43	394141.35	45.01
JB23	386137.70	394125.37	43.69
JB24	386152.00	394126.08	43.54
JB25	386185.19	394126.28	43.62
J21A	386162.87	394174.87	45.16
J21B	386181.96	394173.68	45.15
J22A	386129.41	394096.30	42.50
J22B	386156.10	394141.25	45.10
J22C	386399.74	394004.62	43.52
J22D	386366.58	394107.27	45.23
J22X	386318.31	394082.15	43.05
J22Y	386318.31	394082.15	43.05
JB30	386090.70	394282.32	44.72
JB31	386003.61	394371.29	43.94
JB32	386016.94	394377.72	43.80
JB33	386005.90	394392.60	43.59
JB34	385980.16	394406.05	43.47
JB35	385958.11	394415.47	43.70
JB36	385971.70	394431.76	43.36
JB37	385986.57	394435.57	43.13
JB38	385999.99	394432.46	43.18
J30A	386030.07	394405.46	43.62
J30B	386015.80	394413.77	44.22
J34A	385980.24	394386.81	43.85
J34B	385969.32	394374.55	44.00
J34C	385943.59	394392.52	44.01
J34D	385943.59	394392.52	44.01
JB51	385745.04	394382.20	42.74
JB52	385718.57	394390.37	42.70
JB53	385655.84	394390.72	42.31
JB54	385640.33	394408.20	41.89
J50A	385676.36	394329.01	43.28
J50B	385714.61	394329.82	43.30
J51A	385759.58	394305.71	43.52
J51B	385772.04	394363.39	42.76
J51C	385783.33	394391.26	42.75
J51D	385642.01	394365.11	42.71
J51E	385759.78	394334.46	43.35
J51F	385757.86	394419.07	42.77
SE20	385228.83	394228.83	44.59
RP03	385806.31	394211.50	44.48
RP02	385777.26	394220.69	44.44
RP03	385684.30	394234.46	44.39
RP04	385688.88	394211.19	44.47
RP05	385701.71	394093.55	42.02
RP05	385741.91	394020.45	39.85
RP07	385726.23	394048.56	41.89
RP24	385787.13	394208.80	44.44
RP2B	385779.81	394169.63	44.70
RP2C	385770.75	394262.16	44.62
RP2D	385758.52	394242.46	44.67
RP2E	385748.52	394257.97	44.66
RP2F	385733.50	394257.97	44.66
RP2K	385696.96	394260.21	44.41
RP2L	385731.22	394295.34	44.48
RP21	385689.93	394291.55	44.46
RP22	385669.64	394289.03	44.47
RP2K	385651.82	394288.15	44.45
RP31	385706.39	394275.56	44.44
R202	385671.55	394263.47	44.46
RP34	385650.84	394237.32	44.45
RP38	385638.85	394220.34	44.44
RP3C	385626.70	394256.29	44.32
RP30	385625.63	394206.00	43.93
RP3D	385649.09	394132.53	42.27
RP3F	385637.11	394159.75	43.33
RP3G	385624.24	394159.75	43.33
RP3H	385612.34	394131.29	42.49
RP3I	385617.44	394096.48	41.39
R3D1	385635.46	394125.10	44.39
R3FA	385656.03	394191.82	44.38
R3F8	385706.20	394159.14	43.50
R3G1	385674.41	394093.37	40.95
R3H6	385614.50	394119.77	41.39
RP4A	385728.61	394217.21	44.42
RP4B	385728.62	394182.44	44.45
RP4C	385729.62	394182.44	44.45
R4B1	385699.48	394179.79	43.40
R4CA	385718.24	394198.37	44.45
R4CB	385725.52	394168.95	43.39
R4CC	385716.19	394160.90	43.46
R4CD	385699.19	394160.90	43.46
RP5B	385666.51	394041.25	39.50
RP5C	385610.35	394075.71	41.15
RP5D	385611.17	394047.83	39.34
RP5E	385615.15	394022.24	39.80
RP5F	385643.31	394025.61	39.82
RP5G	385673.19	394008.97	39.86
RP5H	385713.82	393997.85	39.41
R5CA	385623.59	394070.61	41.06
HCSA	385734.17	393965.36	38.99
RP6A	385756.44	394034.24	39.82
RP6B	385753.80	394050.04	40.49
RP6C	385747.27	394083.84	41.98
RP6D	385735.45	394088.31	42.20
RP6E	385751.92	394141.63	43.10
RP6F	385759.59	394158.35	42.01
RP6G	385771.36	394061.48	41.87
RP6H	385779.92	394067.27	40.01
RP6I	385778.77	393971.50	39.96
RP6K	385769.66	393971.85	39.95
RP6L	385757.35	393974.44	39.50
RP6M	385755.66	393962.24	39.58
R6EA	385733.36	394152.71	43.63
RP8A	385687.63	393991.52	39.00
RP8B	385760.29	393961.41	39.65
RP8C	385798.34	393953.13	39.83
RP8D	385862.89	393946.54	40.35
RP8E	385869.28	393969.07	39.99
RP8F	385832.10	394004.59	38.93
SC01	385883.49	394146.52	41.81
SC02	385717.55	394026.95	39.91
SC03	385859.60	394202.44	44.10
SC04	385859.60	394202.44	44.10
SE03	385843.93	394173.73	43.60
SE1A	385826.23	394196.23	45.11
SE2A	385845.61	394186.96	44.64
SE2B	385871.08	394187.37	44.54
SE2C	385910.83	394188.47	44.69
SE2D	385937.61	394188.41	44.75
SE2E	385940.36	394174.62	44.50
SE2F	385907.65	394169.26	44.40
SE2G	385870.49	394169.02	44.27
S201	385920.75	394141.26	44.28
S2A2	385921.37	394155.67	44.36
S2A3	385921.37	394155.67	44.36
SH06	385908.81	394181.48	44.87
TH05	385809.56	394036.63	44.44
TH20	385867.25	394228.83	44.59
TH21	385719.81	394137.26	43.05
TH23	385697.84	394064.82	42.06
TH24	385691.14	394046.63	40.34
G08M	385872.37	394206.72	45.82
J52A	385792.83	394421.98	42.31
J52B	385684.18	394403.84	43.35
J53A	385636.16	394407.68	41.98
J53B	385633.81	394430.19	41.74
J8XX	385760.95	394297.23	44.43
N850	385614.05	394468.43	41.41
N851	385667.62	394456.96	41.69
N852	385665.38	394456.88	42.01
N853	385710.83	394451.86	42.29
N854	385766.14	394464.37	42.76
N855	385780.39	394418.31	42.72
N856	385780.39	394418.31	42.72
N857	385841.04	394303.00	46.50
N858	385896.87	394312.22	45.15
N859	385963.98	394240.26	45.31
N50A	385667.17	394472.10	41.62
N50B	385630.52	394366.82	42.63
N50C	385621.71	394416.05	41.83
N51A	385663.83	394442.40	41.72
N51B	385679.88	394439.06	41.69
N51C	385692.12	394438.12	41.73
N51D	385698.93	394437.57	41.60
N51E	385663.23	394419.21	42.04
N51F	385648.78	394449.34	41.69
N51G	385642.72	394437.87	41.74
N51R	385641.87	394445.56	41.73
N51S	385636.09	394435.56	41.73
N54A	385754.15	394445.72	42.64
N54B	385769.19	394450.22	42.66
N55A	385784.42	394396.74	42.63
N56A	385795.37	394308.81	43.48
N56B	385793.80	394330.88	43.68
N56C	385810.75	394304.87	44.03
N57A	385825.46	394256.10	44.39
N57B	385842.92	394239.51	45.29
N58A	385860.14	394273.51	45.17
N58B	385939.25	394281.56	45.26
N59A	385860.13	394273.51	45.16
N59B	385939.25	394281.56	45.26
N59J	385901.70	394259.43	44.86
SF01	385186.89	394157.15	44.78
SF02	385183.52	394092.29	42.69
SF1A	385186.63	394140.68	44.26
SF2A	385154.85	394093.33	42.57

Please note:

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Levels are related to **OSGM02**
Value **n/a**

Coordinates are related to **National Grid (GPS)**

Scale **1:250**
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 metres

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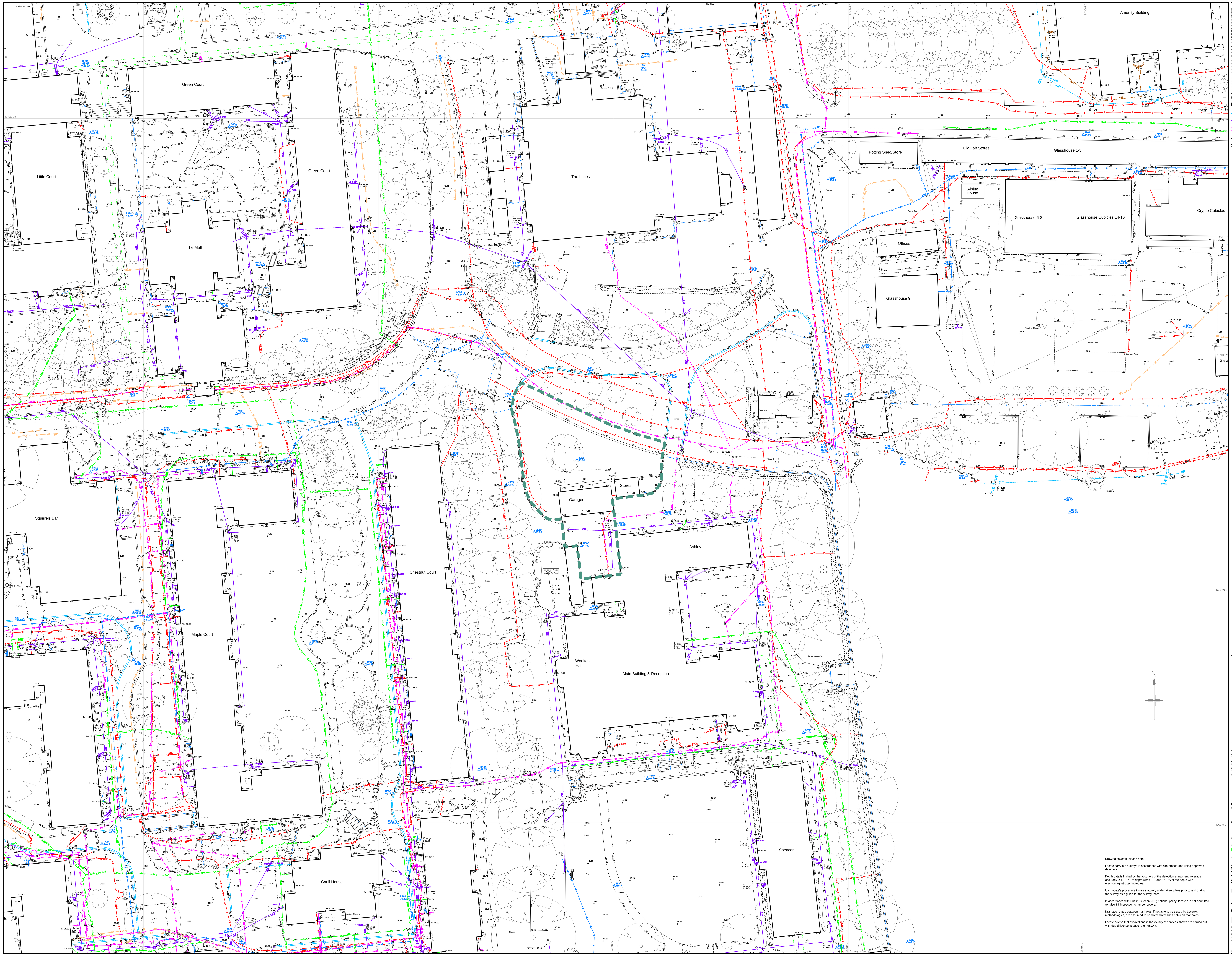
Client B D P

Title
Utility Survey
Additional Area 1
Owens Park
Fallowfield

Surveyed	LOC8	Drawn	PG AH JDS
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Locate Surveys Ltd
Loc8



Topographical Survey Legend

B Bollard
BS Bus Stop
BT Telecommunications IC
CPS Concrete Paving Slabs
CTV Cable Television Cover
DP Downpipe
DR Drain
Elec Electrical IC
EP Elec. Pole
ER Earth Rod
FP Flagpole
FT Floodlight
G Gully
GP Gate Post
GV Gas Valve

h Height
Hyd Hydrant
IC Inspection Cover
JB Junction Box
KO Kerb Outlet
LB Letter Box
LP Lamp Post
Mkr Utility Marker
MP Mile Post
NP Name Plate
P Post
PM Parking Meter
RE Rodding Eye
RS Road Sign
RTW Retaining Wall

RWP Rain Water Pipe
SP Soil Pipe
SPS Stone Paving Slabs
ST Stop Tap
Stay Cable Stay
SV Stop Valve
TCB Telephone Call Box
TL Traffic Light
TP Telegraph Pole
TPS Tactile Paving Slabs
VP Vent Pipe
WM Water Meter
WO Water Outlet
UTL Unable To Lift

Level Prefix Descriptions
AL Arch Level
BL Bed Level
CL Cover Level
EL Eaves Level
FL Floor Level
IL Invert Level
OL Overhead Cable Level
PL Parapet Level
RL Roof/ridge Level
SL Soffit Level
Spr Arch Springing Level
TF Top Of Fence Level
TW Top Of Wall Level
Thr Threshold Level
WL Water Level

Fence Annotation
B/W Barbed Wire
C/B Closed Boarded
C/I Corrugated Iron
C/L Chain Link
C/P Concrete Panel
H/R Hand Rail
I/R Iron Railings
O/B Open Boarded
P/C Post & Chain
P/R Post & Rail
P/W Post & Wire
W/M Wire Mesh

C/L Fence
Safety Barrier
Gate
Stile
Hedge
Limit of Foliage & Tree Canopy
50.00 Spot Level
SSL1 50.00 Survey Control Station (coordinated point)
Tree
MT Multi Trunk

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

Drainage/Services Legend

Foul
Surface
Combined
Drainage (unspecified)
BT British telecom
T Telecom
FO Fibre optics
CATV CATV

CCTV CCTV
E Electric
SL Street lighting
TM Traffic management
GAS Gas
W Water
F Fuel
UK Unknown / misc

Ducting
d Service depth (m)
ø Pipe diameter (mm)
EOT End of trace
UTT Unable to trace
Utility Survey Boundary

Any drainage pipe sizes shown have been gauged from the surface for safety reasons and should be regarded as approximate only.

Survey Station Coordinates

Stn	Easting	Northing	Level
AT01	385582.08	394140.97	41.65
AT02	385616.45	394232.39	43.86
AT03	385637.63	394286.47	44.49
AT04	385708.18	394293.31	44.47
AT05	385786.14	394298.50	44.43
AT06	385809.94	394231.72	44.55
AT07	385881.71	394228.98	44.75
AT08	385970.97	394235.90	45.25
AT09	385982.39	394186.50	45.02
AT10	386069.87	394172.77	44.79
AT11	386067.45	394112.06	44.32
AT12	386046.74	393980.51	42.48
AT13	385976.75	393981.98	41.86
AT14	385983.08	394134.39	43.36
AT15	385896.02	394118.79	42.52
AT16	385845.02	394131.03	42.32
AT17	385862.54	394024.69	40.15
AT18	385871.57	393945.42	40.42
AT19	385780.21	393935.58	39.65
AT20	385594.69	393997.94	39.01
AT21	385721.17	394023.92	39.92
AT22	385697.85	394084.85	41.78
AT23	385703.92	394133.68	42.95
AT24	385762.59	394151.52	43.32
AT25	385763.17	394212.31	44.34
AT2A	385656.59	394235.12	44.44
AT4A	385705.23	394227.08	44.41
AT8A	385960.06	394249.84	45.96
AT8B	385967.95	394287.08	45.48
AT8C	385963.16	394335.17	44.82
AT8D	386004.42	394349.33	44.19
AT9A	385987.97	394196.15	45.34
A14A	385946.56	394131.28	42.57
A15A	385875.14	394124.08	42.54
A15B	385859.36	394129.56	42.30
A15C	385857.95	394141.12	42.28
A15D	385849.68	394139.93	42.48
A15E	385853.00	394151.44	44.37
A23A	385688.73	394124.73	42.66
0010	385984.96	394195.09	45.27
0013	385775.45	394149.78	43.17
0016	385707.41	393982.56	39.02
010A	386072.44	394196.48	45.16
010B	386035.38	394182.83	45.01
010C	385999.13	394202.69	45.26
011A	386127.75	394146.36	45.03
012A	386119.97	393988.63	42.61
012B	386131.35	394093.93	42.41
013A	386006.03	393932.86	42.71
013B	386012.29	393981.89	42.52
013C	386098.50	393939.21	43.30
013D	386207.85	393928.93	44.40
BEN1	385638.81	394138.59	42.34
BEN2	385762.59	394151.53	43.32
BEN3	385847.45	394023.43	40.14
BEN4	385856.42	393973.54	40.18
BEN5	385824.64	393967.70	40.22
BEN6	385789.19	393965.35	40.08
BE2A	385811.72	394145.03	43.22
BE2B	385779.79	394169.64	44.70
BE2C	385834.48	394207.79	44.09
BE2D	385806.11	394213.26	44.46
BE2E	385793.86	394222.42	44.41
BE5A	385795.87	394012.91	40.17
BE5B	385788.17	394061.09	41.53
BE5C	385778.12	393995.75	39.73
BE5D	385783.13	394112.00	41.96
BE5E	385753.10	394056.38	41.12
BE5F	385840.42	394069.33	41.74
BE5G	385828.82	394114.34	41.59
BE5H	385830.82	394069.57	41.58
BE6A	385783.28	393997.31	39.97
GC07	385768.27	394162.69	43.44
HC3A	385734.17	393995.36	38.99
HC4B	385897.06	394116.22	42.49
HC5A	385861.23	394127.64	42.41
HC5B	385846.12	394129.67	42.32
HC5C	385844.96	394140.26	42.52
MC01	385699.34	394091.30	41.97
N101	386027.27	394219.74	48.27
N102	386021.36	394244.76	48.58
N103	386004.81	394251.69	48.01
N104	386010.52	394273.90	48.36
N105	386014.19	394304.92	47.62
N201	385811.37	394065.09	41.60
N202	385807.18	394059.57	40.54
N301	385810.69	394115.82	41.52
N302	385800.74	394113.52	41.50
N303	385793.20	394109.12	41.52
N304	385795.17	394095.71	41.54
N305	385777.17	394122.12	42.40
N306	385777.94	394140.08	43.00
N307	385829.01	394167.81	44.01
N308	385827.75	394206.42	44.32
PC03	385882.24	394231.01	44.77
PC05	385940.90	394236.24	44.84
AT3W	385634.31	394319.73	43.30
AT3X	385658.67	394296.52	43.52
AT3Y	385706.41	394302.61	43.58
AT3Z	385703.29	394292.63	44.42
JB20	386119.00	394187.42	45.24
JB21	386125.20	394174.86	45.16
JB22	386127.43	394141.35	45.01
JB23	386137.70	394125.37	43.69
JB24	386152.00	394126.08	43.54
JB25	386185.19	394126.28	43.62
J21A	386162.87	394174.87	45.16
J21B	386181.96	394173.68	45.15
J22A	386129.41	394096.30	42.50
J22B	386158.10	394141.25	45.10
J22C	386399.74	394004.62	43.52
J22D	386366.58	394107.27	45.23
J22X	386318.31	394082.15	43.05
J24A	386148.63	394121.13	43.84
JB30	386090.70	394282.32	44.72
JB31	386033.61	394371.29	43.94
JB32	386016.94	394377.72	43.80
JB33	386005.90	394392.60	43.59
JB34	385980.16	394406.66	43.47
JB35	385958.11	394415.47	43.70
JB36	385971.70	394431.76	43.36
JB37	385986.57	394435.57	43.13
JB38	385999.99	394432.46	43.18
J30A	386030.07	394405.46	43.62
J30B	386015.80	394413.77	44.22
J34A	385980.24	394386.81	43.85
J34B	385969.32	394374.55	44.00
J34C	385943.59	394382.52	44.01
JB50	385643.87	394341.11	43.14
JB51	385745.04	394362.20	42.74
JB52	385718.57	394390.57	42.70
JB53	385655.84	394390.72	42.31
JB54	385640.33	394408.20	41.89
J50A	385676.36	394329.01	43.28
J50B	385714.61	394329.82	43.30
J51A	385759.58	394305.71	43.52
J51B	385772.04	394363.39	42.76
J51C	385763.33	394391.26	42.75
J51D	385642.01	394365.11	42.71
J51E	385759.78	394334.46	43.35
J51F	385757.86	394419.07	42.77

Stn	Easting	Northing	Level
PC1D	385867.25	394228.83	44.59
RP01	385806.31	394211.50	44.48
RP02	385777.26	394220.69	44.44
RP03	385684.30	394234.46	44.39
RP04	385686.88	394211.19	44.47
RP05	385741.91	394093.55	42.02
RP06	385741.91	394020.45	39.85
RP07	385726.23	394048.56	41.89
RP2A	385787.13	394208.80	44.44
RP2B	385779.81	394169.63	44.70
RP2C	385770.75	394262.16	44.66
RP2D	385738.52	394242.46	44.67
RP2E	385768.62	394298.14	44.50
RP2F	385733.50	394257.97	44.66
RP2G	385696.96	394260.21	44.41
RP2H	385731.22	394295.34	44.48
RP2I	385689.93	394291.55	44.46
RP2J	385669.64	394289.03	44.47
RP2K	385651.82	394288.15	44.45
R2G1	385706.39	394275.56	44.44
R2G2	385671.55	394263.47	44.46
RP3A	385655.84	394237.32	44.45
RP3B	385638.83	394220.34	44.44
RP3C	385626.70	394266.29	44.32
RP3D	385625.63	394206.00	43.93
RP3E	385649.09	394132.33	42.27
RP3F	385657.11	394159.75	43.33
RP3G	385638.78	394085.39	41.03
RP3H	385612.34	394131.25	42.49
RP3I	385617.44	394096.48	41.39
R3D1	385635.62	394175.19	43.70
R3FA	385656.03	394191.82	44.38
R3FB	385706.20	394159.14	43.50
R3G1	385674.41	394093.37	40.95
R3HA	385614.50	394119.77	41.39
RP4A	385728.61	394217.21	44.42
RP4B	385688.72	394196.95	43.36
RP4C	385729.62	394182.44	44.45
R4B1	385698.48	394179.79	43.40
R4CA	385718.24	394198.37	44.45
R4CB	385725.52	394168.95	43.39
R4CC	385716.19	394160.90	43.46
RP5A	385694.07	394049.21	40.50
RP5B	385656.51	394041.05	39.85
RP5C	385610.35	394075.71	41.15
RP5D	385611.17	394047.83	39.94
RP5E	385615.15	394022.24	39.80
RP5F	385643.91	394025.61	39.82
RP5G	385673.19	394008.97	39.86
RP5H	385713.82	393997.85	39.41
R5CA	385623.59	394070.61	41.06
HC3A	385734.17	393995.36	38.99
RP6A	385756.44	394034.24	39.82
RP6B	385753.80	394050.04	40.49
RP6C	385747.27	394083.84	41.98
RP6D	385735.45	394088.31	42.20
RP6E	385751.92	394141.63	43.10
RP6F	385765.59	394128.35	42.01
RP6G	385771.36	394061.48	41.85
RP6H	385775.52	394003.87	39.67
RP6I	385779.92	393987.27	40.01
RP6J	385778.77	393971.50	39.96
RP6K	385769.66	393971.85	39.85
RP6L	385757.35	393974.44	39.50
RP6M	385755.66	393982.24	39.58
R6EA	385733.36	394152.71	43.63
RP8A	385687.63	393991.52	39.00
RP8B	385760.29	393961.41	39.65
RP8C	385798.94	393953.13	39.83
RP8D	385862.89	393946.54	40.35
RP8E	385900.28	393969.07	39.99
RP8F	385632.10	394004.59	38.93
RP8G	385583.49	394146.52	41.81
SC02	385717.35	394026.95	39.91
SE01	385899.89	394196.61	44.99
SE02	385835.60	394202.44	44.10
SE03	385843.93	394173.73	43.60
SE1A	385915.27	394196.23	45.11
SE2A	385845.61	394186.96	44.64
SE2B	385871.08	394187.37	44.54
SE2C	385910.83	394188.47	44.69
SE2D	385937.61	394188.81	44.73
SE2E	385940.36	394174.62	44.50
SE2F	385907.65	394169.26	44.40
SE2G	385870.49	394169.02	44.27
S2G1	385930.75	394141.26	44.28
S2G2	385921.37	394155.67	44.36
SEXY	385800.15	394036.69	40.17
SH06	385998.81	394181.48	44.87
TC05	385800.59	394298.63	44.44
TH20	385698.57	394141.37	43.14
TH21	385719.81	394137.26	43.05
TH22	385697.84	394094.82	42.06
TH24	385691.14	394045.63	40.34
OSBM	385872.37	393946.72	40.82
J52A	385732.83	394421.98	42.31
J52B	385684.18	394403.64	43.35
J53A	385636.16	394407.68	41.98
J53B	385633.81	394430.19	41.74
JBXX	385760.95	394297.23	44.43
NB50	385614.05	394468.43	41.41
NB51	385657.62	394456.96	41.69
NB52	385685.38	394458.68	42.01
NB53	385710.83	394451.86	42.29
NB54	385766.14	394464.37	42.76
NB55	385780.39	394418.31	42.72
NB56	385796.05	394352.59	43.80
NB57	385841.04	394303.00	46.53
NB58	385896.87	394312.22	45.15
NB59	385903.98	394240.26	45.51
N50A	385657.17	394472.10	41.62
N50B	385630.52	394366.82	42.63
N50C	385621.71	394416.05	41.83
N51A	385663.83	394442.40	41.72
N51B	385679.88	394439.06	41.69
N51C	385692.74	394438.12	41.73
N51D	385698.93	394437.57	41.60
N51E	385663.23	394419.21	42.04
N51N	385648.78	394449.34	41.69
N510	385642.72	394437.87	41.74
N51P	385641.87	394445.56	41.73
N51Q	385638.79	394448.13	41.86
N53A	385754.15	394445.72	42.64
N54A	385769.19	394450.22	42.66
N55A	385784.62	394396.74	42.63
N56A	385795.37	394308.81	43.48
N56B	385793.80	394330.88	43.68
N56C	385810.75	394304.87	44.03
N57A	385825.46	394256.10	44.39
N57B	385842.92	394239.51	46.29
N58A	385860.14	394273.51	45.17
N58B	385939.25	394281.56	45.26
N59A	385860.13	394273.51	45.16
N59B	385939.25	394281.56	45.26
N59J	385901.70	394259.43	44.86
SF01	386186.89	394157.15	44.78
SF02	386183.52	394092.29	42.69
SF1A	386186.63	394140.68	44.26
SF2A	386154.85	394093.33	42.57

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGM02 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGM02 should be considered correct in preference to archive benchmark heights. OSGM02 converts GPS ellipsoid heights to orthometric heights above mean sea level.

Drawing caveats, please note:

Locate carry out surveys in accordance with site procedures using approved detectors.

Depth data is limited by the accuracy of the detection equipment. Average accuracy is +/- 10% of depth with GPR and +/- 5% of the depth with electromagnetic technologies.

It is Locate's procedure to use statutory undertakers plans prior to and during the survey as a guide for the survey team.

In accordance with British Telecom (BT) national policy, locate are not permitted to raise BT inspection chamber covers.

Drainage routes between manholes, if not able to be traced by Locate's methodologies, are assumed to be direct direct lines between manholes.

Locate advise that excavations in the vicinity of services shown are carried out with due diligence, please refer HSG47.

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Tel. 0845 225 045
Fax 01625 526815
Email: mail@locate-surveys.com
Web: www.locate-surveys.com

Levels are related to **OSGM02**
Value **n/a**

Coordinates are related to **National Grid (GPS)**

Scale **1:250**
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5
metres

The accuracy of this survey is commensurate with the drawing scale specified within the title block. Copyright in this drawing remains with Locate Surveys Ltd. Do not scale from this drawing, work to figured dimensions. Check all dimensions on-site. In the event of any discrepancy, please refer query to Locate Surveys Ltd.

Client B D P

Title
Utility Survey Additional Area 2 Owens Park Fallowfield

Surveyed LOC8 | Drawn PG AH JDS
Date September 2015 | Checked MT
CAD file name 12650G | Revision No. | Sheet size A0
Drawing No. **LSL:12650G:250:2:2**

Locate Surveys Ltd

© Registered in England No.08162040

Loc8

Appendix E

Proposed Landscape GA by Landscape projects, drawing no. UMRF-LAP-XX-00-DR-L-00002 Rev P5.

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(1) Do not scale from this drawing - use written dimensions only. (2) All dimensions are in millimeters unless noted. (3) All dimensions shall be verified on site before proceeding with the work. (4) Contractor to report and discreoancies or errors before proceeding on site. (5)Landscape Projects shall be notified of any discrepancies. (6) Engineer to specify all sub-bases. Any below ground construction is indicative.

LANDSCAPE KEY

HARD LANDSCAPE
See drawing UMRF-LAP-XX-00-DR-L-00008

STREET FURNITURE
Seating and benches. See drawing UMRF-LAP-00-DR-L-00012

Cycle stores.

Cycle racks. See drawing UMRF-LAP-XX-00-DR-L-00022

LIGHTING
Feature lighting columns to Concourse
Other lighting fittings. See drawing UMRF-LAP-XX-00-DR-L-00011

BOUNDARIES
See drawing UMRF-LAP-XX-00-DR-L-00014

SIGNAGE AND WAYFINDING
See drawing UMRF-LAP-XX-00-DR-L-00019

SOFT LANDSCAPING

TREES
Existing trees retained. See drawing UMRF-LAP-XX-00-DR-L-00003 for removals

Proposed trees. See drawing UMRF-LAP-XX-00-DR-L-00016

PLANTING
See soft landscaping drawings UMRF-LAP-XX-00-DR-L-10001-60001
Ornamental planting beds

Mixed scrub

Grass, mown and wildflower lawn

REV P5	RD	2025-02-19	Landscape layout updates.
REV P4	RD	2025-02-12	Entrance 6 updated
REV P3	RD	2025-02-06	Final GA updates, key added
REV P2	RD	2025-02-04	Building GA plans updated
REV P1	RD	2025-01-20	Draft planning issue

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JOB TITLE	UoM Residences DBFO
CLIENT	University of Manchester
TITLE	Proposed Landscape GA
SCALE	1:600 @ A1
DATE	2025-01-20
STATUS	S3
PURPOSE	Planning
DRAWN	RCD
CHECKED	NS
REFERENCE	UMRF-LAP-XX-00-DR-L-00002
REV	P5

Appendix F

Proposed drainage layout sheet 1 & 2, drawing no. UMRF-KRD-XX-XX-DR-C-00501 & 00502.



SHEET LAYOUT
(SCALE 1:2000)

DRAINAGE LAYOUT
(SCALE 1:250)

KEY

- EXISTING COMBINED WATER SEWER
- EXISTING COMBINED WATER DRAIN
- PROPOSED SURFACE WATER DRAIN
- PROPOSED FOUL WATER DRAIN
- PROPOSED SUMP MANHOLE
- PROPOSED FLOW CONTROL
- PROPOSED POLYPROPYLENE INSPECTION CHAMBER
- PROPOSED POROUS PAVING
- PROPOSED GEOCELLULAR ATTENUATION TANK
- PROPOSED LANDSCAPED ATTENUATION DRY BASIN
- PROPOSED GREEN ROOF LOCATION
- PROPOSED BACKDROP
- PROPOSED PITCHED STONE HEADWALL

NOTES

1. THIS DRAWING IS PRELIMINARY AND IS SUBJECT TO CHANGE DEPENDING ON FURTHER DEVELOPMENT OF THE G.A., SITE LAYOUT, RWP AND POP-UP LAYOUT.
2. SHOULD THIS DRAWING BE NEEDED FOR COSTING YOU MUST CONTACT KENNEDY REDFORD IN THE FIRST INSTANCE TO DISCUSS UNKNOWNS AND ASSUMPTIONS MADE AT THIS STAGE.
3. THIS DRAWING IS BASED ON THE LANDSCAPE ARCHITECTS PROPOSED LANDSCAPE GA, DRAWING NO. UMRF-LAP-XX-00-DR-L-00002, REV P5.
4. TO BE READ IN CONJUNCTION WITH ALL RELEVANT KENNEDY REDFORD DRAWINGS.
5. THIS PRELIMINARY LAYOUT ASSUMES THE FLOWS FROM THE ROOF AREAS CAN BE RESTRICTED TO GREENFIELD RUNOFF AT ROOF LEVEL.
6. EXISTING SEWER LOCATIONS AND LEVELS TO BE CONFIRMED BY CONTRACTOR ON SITE, PRIOR TO WORK COMMENCING.
7. ANY PART OF THE EXISTING DRAINAGE SYSTEM TO BE RETAINED AS PART OF THE NEW SCHEME SHALL BE CLEANED AND INSPECTED. ANY STRUCTURAL DEFECTS SHALL BE REPAIRED USING APPROPRIATE AND APPROVED MEANS.
8. ALL REDUNDANT EXISTING DRAINAGE TO BE GRUBBED UP OR GROUTED, ANY EXISTING LIVE DRAINAGE SHOULD BE REPORTED TO THE ENGINEER AND RECONNECTED.
9. PRIVATE DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH BUILDING REGULATIONS.
10. NO CONNECTION TO BE MADE TO THE PUBLIC SEWER OR WATERCOURSE UNTIL APPROVAL HAS BEEN RECEIVED FROM UNITED UTILITIES AND MANCHESTER CITY COUNCIL.
11. ALL MANHOLE LEVELS ARE INDICATIVE ONLY.
12. ALL MANHOLE AND PIPE POSITIONS ARE APPROXIMATE.
13. UNLESS INDICATED OTHERWISE ALL PIPES TO BE LAID SOFFIT TO SOFFIT.
14. WHERE PROPOSED DRAINS ARE IN PROXIMITY TO PROPOSED FOUNDATIONS, THE FOUNDATIONS SHALL BE TAKEN DEEPER TO BELOW THE DRAINS OR THE DRAIN SHOULD BE PROTECTED WITH A FULL CONCRETE SURROUND.
15. SETTING OUT OF RAINWATER PIPES, WASTEWATER CONNECTIONS AND POPUP POSITIONS OF ABOVE GROUND DRAINAGE BY OTHERS.
16. RAINWATER PIPES AND WASTEWATER CONNECTION LOCATIONS NOT SHOWN AT THIS STAGE.
17. LINEAR DRAIN AND GULLY LOCATIONS NOT SHOWN AT THIS STAGE.
18. ALL CHANNEL DRAINAGE TO HAVE SILT BUCKETS ON OUTLETS.
19. ALL ROAD GULLIES ARE TO BE 150mm DIAMETER.
20. ALL GULLY LEADS TO BE 150mm DIAMETER.
21. PROPOSED DRAINAGE IS SUBJECT TO CONFIRMATION (BY CONTRACTOR) OF LEVELS OF EXISTING DRAINAGE AT PROPOSED CONNECTION POINTS.
22. DISCHARGE RATE INTO CULVERT SUBJECT TO FINAL AGREEMENT WITH UNITED UTILITIES AND MANCHESTER CITY COUNCIL.

NOTE

THE FOLLOWING INFORMATION WILL BE REQUIRED IN ORDER TO COMPLETE A DETAILED DRAINAGE DESIGN:

1. FIXED SITE LAYOUT INCLUDING THE HARDSTANDING EXTENTS.
2. RAINWATER PIPE LOCATIONS.
3. INTERNAL FOUL CONNECTION LOCATIONS.
4. FINALISED SITE LEVELS.

THE VOLUME OF ATTENUATION SHOWN IS SUBJECT TO CHANGE BASED ON THE FOLLOWING:

1. FIXED SITE LAYOUT INCLUDING THE HARDSTANDING EXTENTS.
2. FINALISED SITE LEVELS.

REV	DATE	DESCRIPTION	ORN	CHK	APR
P08	19.02.25	PLANNING ISSUE (LAYOUT UPDATE)	N.R	J.H	P.V
P07	13.02.25	PLANNING SUBMISSION ISSUE	N.R	J.H	P.V
P06	24.01.24	PLANNING SUBMISSION ISSUE	N.R	J.H	P.V
P05	13.12.24	WIP ISSUE	N.R	J.H	P.V
P04	05.11.24	DRAWING NUMBER AMENDED (PREVIOUS NUMBER - 0501)	A.W	J.H	P.V
P03	24.05.24	AMENDED TO SUIT LAYOUT	R.B	P.V	D.B
P02	26.04.24	DRY BASINS ADDED	R.B	P.V	D.B
P01	13.03.24	FIRST ISSUE	R.B	P.V	D.B

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Kennedy Redford MANAGING VISION

CLIENT

GRAHAM

PROJECT NAME
UoM STUDENT RESIDENCES FALLOWFIELD

DRAWING TITLE
PROPOSED DRAINAGE LAYOUT SHEET 1 OF 2

DATE	SCALE	SHEET SIZE	REV
08.03.24	1:250	A0	P08

DRAWING STATUS
S3 - FOR REVIEW / COMMENT

DRAWING NUMBER
UMRF - KRD - XX - XX - DR - C - 00501



SHEET LAYOUT
(SCALE 1:2000)

DRAINAGE LAYOUT
(SCALE 1:250)

KEY

- EXISTING COMBINED WATER SEWER
- EXISTING COMBINED WATER DRAIN
- PROPOSED SURFACE WATER DRAIN
- PROPOSED FOUL WATER DRAIN
- PROPOSED SUMP MANHOLE
- PROPOSED FLOW CONTROL
- PROPOSED POLYPROPYLENE INSPECTION CHAMBER
- PROPOSED POROUS PAVING
- PROPOSED GEOCELLULAR ATTENUATION TANK
- PROPOSED LANDSCAPED ATTENUATION DRY BASIN
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NOTES

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19. ALL ROAD GULLIES ARE TO BE TRAPPED AND RODDABLE.
20. ALL GULLY LEADS TO BE 150mm DIAMETER.
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2. FINALISED SITE LEVELS.

REV	DATE	DESCRIPTION	DRN	CHK	APP
P08	19.02.25	PLANNING ISSUE (LAYOUT UPDATE)	N.R	J.H	P.V
P07	13.02.25	PLANNING SUBMISSION ISSUE	N.R	J.H	P.V
P06	24.01.24	PLANNING SUBMISSION ISSUE	N.R	J.H	P.V
P05	13.12.24	WIP ISSUE	N.R	J.H	P.V
P04	05.11.24	DRAWING NUMBER AMENDED (PREVIOUS NUMBER - 0502)	A.W	J.H	P.V
P03	24.05.24	AMENDED TO SUIT LAYOUT	R.B	P.V	D.B
P02	26.04.24	DRY BASINS ADDED	R.B	P.V	D.B
P01	13.03.24	FIRST ISSUE	R.B	P.V	D.B

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Kennedy Redford MANAGING VISION

CLIENT

GRAHAM

PROJECT NAME
UoM STUDENT RESIDENCES FALLOWFIELD

DRAWING TITLE
PROPOSED DRAINAGE LAYOUT SHEET 2 OF 2

DATE	SCALE	SHEET SIZE	REV
08.03.24	1:250	A0	P08

DRAWING STATUS
S3 - FOR REVIEW / COMMENT

DRAWING NUMBER
UMRF - KRD - XX - XX - DR - C - 00502

Appendix G

Calculations using InfoDrainage.

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		



Porous Paving (4)

Type : Porous Paving

Dimensions

Exceedance Level (m)	44.500
Depth (m)	0.620
Base Level (m)	43.880
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	20
Length (m)	47.895
Long. Slope (1:X)	10000.00
Width (m)	11.130
Total Volume (m³)	52.243

Advanced

Base Infiltration Rate (m/hr)	0.0
Safety Factor	2.0
Conductivity (m/hr)	50.0



Porous Paving (3)

Type : Porous Paving

Dimensions

Exceedance Level (m)	44.500
Depth (m)	0.620
Base Level (m)	43.880
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	20
Length (m)	53.686
Long. Slope (1:X)	10000.00
Width (m)	13.740
Total Volume (m³)	72.288

Advanced

Base Infiltration Rate (m/hr)	0.0
Safety Factor	2.0
Conductivity (m/hr)	50.0

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		



Porous Paving (2)

Type : Porous Paving

Dimensions

Exceedance Level (m)	44.450
Depth (m)	0.620
Base Level (m)	43.830
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	20
Length (m)	46.266
Long. Slope (1:X)	10000.00
Width (m)	13.659
Total Volume (m³)	61.930

Advanced

Base Infiltration Rate (m/hr)	0.0
Safety Factor	2.0
Conductivity (m/hr)	50.0



Porous Paving (1)

Type : Porous Paving

Dimensions

Exceedance Level (m)	44.450
Depth (m)	0.620
Base Level (m)	43.830
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	3.0
Porosity (%)	20
Length (m)	27.504
Long. Slope (1:X)	180.00
Width (m)	7.533
Total Volume (m³)	20.305

Advanced

Base Infiltration Rate (m/hr)	0.0
Safety Factor	2.0
Conductivity (m/hr)	50.0

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		



Swale (3)

Type : Swale

Swale

Exceedance Level (m)	40.000
Depth (m)	0.500
Base Level (m)	39.500
Top Width (m)	9.600
Side Slope (1:X)	4.00
Base Width (m)	5.600
Freeboard (mm)	0
Length (m)	15.000
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.035
Total Volume (m³)	57.000

Advanced

Swale

Porosity (%)	100



Swale (4)

Type : Swale

Swale

Exceedance Level (m)	40.000
Depth (m)	0.500
Base Level (m)	39.500
Top Width (m)	6.000
Side Slope (1:X)	4.00
Base Width (m)	2.000
Freeboard (mm)	0
Length (m)	25.000
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.035
Total Volume (m³)	50.000

Advanced

Swale

Porosity (%)	100

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		



Swale (1)

Type : Swale

Swale

Exceedance Level (m)	42.900
Depth (m)	0.500
Base Level (m)	42.400
Top Width (m)	8.000
Side Slope (1:X)	4.00
Base Width (m)	4.000
Freeboard (mm)	0
Length (m)	10.000
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.035
Total Volume (m³)	30.000

Advanced

Swale

Porosity (%)	100



Swale (2)

Type : Swale

Swale

Exceedance Level (m)	43.100
Depth (m)	0.700
Base Level (m)	42.400
Top Width (m)	7.600
Side Slope (1:X)	4.00
Base Width (m)	2.000
Freeboard (mm)	0
Length (m)	20.000
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.035
Total Volume (m³)	67.200

Advanced

Swale

Porosity (%)	100

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		



Swale (5)

Type : Swale

Swale

Exceedance Level (m)	39.600
Depth (m)	0.670
Base Level (m)	38.930
Top Width (m)	14.020
Side Slope (1:X)	3.00
Base Width (m)	10.000
Freeboard (mm)	0
Length (m)	28.340
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.035
Total Volume (m³)	228.043

Advanced

Swale

Porosity (%)	100



Tank 5

Type : Cellular Storage

Dimensions

Exceedance Level (m)	40.000
Depth (m)	1.000
Base Level (m)	38.476
Number of Crates Long	12
Number of Crates Wide	48
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	274.124



Tank 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.100
Depth (m)	1.000
Base Level (m)	41.203
Number of Crates Long	44
Number of Crates Wide	13
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	272.597



Tank 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	44.500
Depth (m)	1.500
Base Level (m)	41.980
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	257.520



Tank 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	44.500
Depth (m)	1.000
Base Level (m)	42.280
Number of Crates Long	10
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	48.720



Tank 6

Type : Cellular Storage

Dimensions

Exceedance Level (m)	39.600
Depth (m)	1.000
Base Level (m)	37.851
Number of Crates Long	40
Number of Crates Wide	14
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	266.749



Tank 4

Type : Cellular Storage

Dimensions

Exceedance Level (m)	40.100
Depth (m)	1.000
Base Level (m)	38.522
Number of Crates Long	21
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	100.328

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Outfall Details Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Manhole (29)	Free Discharge			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH 2022

Type: FEH

Site Location	GB 385550 394000 SJ 85550 94000
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	40.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole (1a)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.570	43.480	43.525	0.045	3.9	0.051	0.000	3.8	1.802	OK
Manhole (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.640	43.285	43.337	0.052	5.0	0.058	0.000	4.7	2.820	OK
Manhole (2)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.620	43.116	43.173	0.057	5.4	0.064	0.000	5.2	3.115	OK
Manhole (3)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.650	43.034	43.091	0.057	6.0	0.065	0.000	5.7	3.984	OK
Manhole (4)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.630	42.843	42.903	0.059	5.9	0.067	0.000	5.4	4.018	OK
Manhole (5)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.730	42.597	42.668	0.071	9.2	0.080	0.000	8.9	6.252	OK
Manhole (6)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.580	42.519	42.602	0.083	13.0	0.094	0.000	11.4	8.236	OK
Manhole (7)	FEH 2022: 2 years: +0 %: 960 mins: Winter	44.500	42.204	42.571	0.367	4.0	0.415	0.000	3.8	99.099	Surcharged
Manhole (8)	FEH 2022: 2 years: +0 %: 960 mins: Winter	44.500	41.978	42.571	0.593	4.5	0.671	0.000	3.6	199.204	Surcharged
Manhole (9)	FEH 2022: 2 years: +0 %: 240 mins: Winter	44.450	41.749	41.801	0.052	4.4	0.059	0.000	4.4	61.205	OK
Manhole (10)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.500	41.689	41.746	0.057	5.9	0.065	0.000	5.9	9.759	OK
Manhole (11)	FEH 2022: 2 years: +0 %: 1440 mins: Winter	43.790	41.395	41.676	0.281	6.1	0.318	0.000	6.1	273.171	Surcharged
Manhole (12)	FEH 2022: 2 years: +0 %: 1440 mins: Winter	43.380	41.203	41.675	0.472	6.6	0.534	0.000	3.9	380.915	Surcharged
Manhole (13)	FEH 2022: 2 years: +0 %: 1440 mins: Winter	43.020	41.118	41.673	0.555	3.9	0.628	0.000	3.9	320.966	Surcharged
Manhole (14)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.700	40.694	40.787	0.093	14.7	0.105	0.000	13.8	10.590	OK
Manhole (15)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.240	40.250	40.314	0.064	24.8	0.073	0.000	24.4	17.780	OK
Manhole (16)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.360	38.965	39.088	0.123	35.5	0.139	0.000	34.6	26.252	OK
Manhole (17)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.150	38.735	38.917	0.182	42.5	0.206	0.000	40.0	30.043	OK
Manhole (18)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.980	38.354	38.893	0.539	53.2	0.609	0.000	46.4	39.919	Surcharged
Manhole (19)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.340	38.315	38.888	0.573	55.1	0.648	0.000	35.3	43.950	Surcharged
Manhole (20)	FEH 2022: 2 years: +0 %: 15 mins: Winter	39.980	38.243	38.884	0.641	38.3	0.725	0.000	30.8	34.272	Surcharged
Manhole (21)	FEH 2022: 2 years: +0 %: 30 mins: Winter	39.750	38.177	38.334	0.157	41.7	0.178	0.000	41.6	67.822	OK
Manhole (22)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.310	38.101	38.314	0.213	25.5	0.241	0.000	25.2	276.887	OK
Manhole (23)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.260	38.064	38.310	0.247	25.6	0.279	0.000	25.3	279.743	OK
Manhole (24)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.320	38.009	38.307	0.298	26.1	0.337	0.000	25.6	285.095	OK
Manhole (25)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.200	37.957	38.305	0.348	26.2	0.394	0.000	25.7	289.962	OK
Manhole (26)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.210	37.913	38.304	0.391	52.3	0.442	0.000	51.7	464.027	OK
Manhole (27)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.100	37.851	38.299	0.448	54.4	0.507	0.000	53.7	480.754	OK
Manhole (28)	FEH 2022: 2 years: +0 %: 240 mins: Winter	39.600	37.824	38.290	0.466	42.5	0.527	0.000	42.5	455.149	Surcharged
Manhole (29)	FEH 2022: 2 years: +0 %: 240 mins: Winter	39.580	37.640	37.788	0.148	42.5	0.000	0.000	42.5	455.043	OK
Manhole (30)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.780	43.350	43.376	0.026	2.5	0.029	0.000	2.4	1.167	OK
Manhole (31)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.540	42.970	43.012	0.042	3.2	0.048	0.000	3.0	1.472	OK

Manhole (32)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.520	42.774	42.825	0.051	4.5	0.057	0.000	4.1	2.118	OK
Manhole (33)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.760	43.410	43.455	0.045	3.8	0.051	0.000	3.6	1.742	OK
Manhole (34)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.780	43.251	43.299	0.049	4.5	0.055	0.000	4.3	2.751	OK
Manhole (35)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.740	43.094	43.156	0.062	6.1	0.070	0.000	5.8	3.542	OK
Manhole (36)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.800	43.033	43.093	0.060	6.4	0.068	0.000	6.2	4.151	OK
Manhole (37)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.800	42.872	42.937	0.066	7.4	0.074	0.000	7.0	4.672	OK
Manhole (38)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.720	42.736	42.796	0.060	7.0	0.068	0.000	6.7	4.626	OK
Manhole (39)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.560	42.535	42.629	0.094	12.7	0.107	0.000	11.8	8.337	OK
Manhole (40)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.800	43.750	43.785	0.035	4.5	0.039	0.000	4.4	2.488	OK
Manhole (41)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.710	43.097	43.131	0.034	4.4	0.038	0.000	4.2	2.471	OK
Manhole (42)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.550	43.500	43.525	0.025	1.3	0.028	0.000	1.2	0.591	OK
Manhole (43)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.520	43.270	43.311	0.041	3.4	0.046	0.000	3.2	1.600	OK
Manhole (44)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.630	43.108	43.162	0.054	5.6	0.062	0.000	5.3	2.704	OK
Manhole (45)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.650	42.911	42.974	0.063	6.2	0.071	0.000	5.9	3.702	OK
Manhole (46)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.640	42.850	42.914	0.065	7.5	0.073	0.000	7.2	4.397	OK
Manhole (47)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.640	42.641	42.713	0.073	9.2	0.082	0.000	8.7	5.288	OK
Manhole (48)	FEH 2022: 2 years: +0 %: 960 mins: Winter	44.520	42.427	42.571	0.144	2.6	0.163	0.000	2.6	59.534	OK
Manhole (49)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.690	43.630	43.662	0.032	2.9	0.036	0.000	2.9	1.353	OK
Manhole (50)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.690	43.304	43.342	0.038	4.1	0.044	0.000	4.0	2.402	OK
Manhole (51)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.710	42.991	43.035	0.044	4.0	0.050	0.000	3.8	2.380	OK
Manhole (52)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.700	42.905	42.949	0.044	3.8	0.050	0.000	3.7	2.355	OK
Manhole (53)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.620	42.608	42.674	0.066	7.2	0.074	0.000	6.8	4.580	OK
Manhole (54)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.500	43.450	43.471	0.021	0.8	0.024	0.000	0.8	1.308	OK
Manhole (55)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.550	43.319	43.343	0.024	1.1	0.027	0.000	1.0	0.868	OK
Manhole (56)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.470	43.281	43.304	0.023	1.0	0.026	0.000	1.0	1.454	OK
Manhole (57)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.470	43.107	43.140	0.034	2.2	0.038	0.000	2.2	3.652	OK
Manhole (58)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.490	42.942	42.980	0.038	3.6	0.043	0.000	3.4	2.799	OK
Manhole (59)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.400	42.687	42.726	0.039	3.3	0.044	0.000	3.2	4.634	OK
Manhole (60)	FEH 2022: 2 years: +0 %: 960 mins: Winter	44.500	42.329	42.571	0.242	1.8	0.274	0.000	1.7	42.221	Surcharged
Manhole (61)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.700	43.350	43.374	0.024	1.1	0.027	0.000	1.1	1.958	OK
Manhole (62)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.680	43.239	43.277	0.038	2.8	0.043	0.000	2.6	2.263	OK
Manhole (63)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.700	43.117	43.161	0.044	3.4	0.050	0.000	3.2	2.579	OK
Manhole (64)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.540	42.936	42.984	0.048	3.7	0.054	0.000	3.5	2.775	OK
Manhole (65)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.540	42.855	42.895	0.040	4.4	0.045	0.000	4.4	6.481	OK
Manhole (66)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.460	43.410	43.455	0.045	3.4	0.050	0.000	3.3	1.939	OK
Manhole (67)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.450	43.356	43.399	0.043	3.3	0.049	0.000	3.2	1.920	OK
Manhole (68)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.275	43.315	0.040	3.2	0.045	0.000	3.0	1.896	OK

Manhole (69)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.089	43.147	0.058	5.5	0.065	0.000	5.2	3.010	OK
Manhole (70)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.430	42.946	43.007	0.061	5.7	0.069	0.000	5.4	3.240	OK
Manhole (71)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.470	42.847	42.918	0.071	7.7	0.080	0.000	7.2	4.970	OK
Manhole (72)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.590	42.530	42.561	0.031	1.9	0.035	0.000	1.8	1.365	OK
Manhole (73)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.500	42.357	42.404	0.047	4.2	0.054	0.000	4.0	2.469	OK
Manhole (74)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.500	42.200	42.251	0.051	4.7	0.058	0.000	4.5	3.215	OK
Manhole (75)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.440	42.093	42.154	0.061	6.8	0.069	0.000	6.5	4.228	OK
Manhole (76)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.080	41.872	41.926	0.055	7.9	0.062	0.000	7.6	4.874	OK
Manhole (77)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.900	41.644	41.699	0.055	7.6	0.062	0.000	7.4	4.837	OK
Manhole (78)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.500	43.536	0.036	2.5	0.041	0.000	2.4	1.662	OK
Manhole (79)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.393	43.434	0.042	2.9	0.047	0.000	2.8	1.895	OK
Manhole (80)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.480	43.294	43.344	0.050	4.9	0.056	0.000	4.7	2.853	OK
Manhole (81)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.110	42.972	43.025	0.053	6.5	0.060	0.000	6.2	3.688	OK
Manhole (82)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.000	42.832	42.927	0.095	17.2	0.108	0.000	16.4	10.239	OK
Manhole (83)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.880	42.677	42.744	0.067	16.4	0.076	0.000	16.0	10.218	OK
Manhole (84)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.360	43.400	0.040	3.2	0.045	0.000	3.1	1.472	OK
Manhole (85)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.221	43.286	0.065	6.5	0.073	0.000	6.3	3.040	OK
Manhole (86)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.160	43.223	0.064	6.6	0.072	0.000	6.4	3.455	OK
Manhole (87)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.500	43.028	43.118	0.090	11.1	0.102	0.000	10.4	6.010	OK
Manhole (89)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.480	41.430	41.480	0.050	6.8	0.056	0.000	6.6	3.562	OK
Manhole (90)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.200	41.146	41.219	0.073	8.0	0.083	0.000	7.7	4.152	OK
Manhole (91)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.750	41.085	41.157	0.072	7.7	0.082	0.000	7.4	4.127	OK
Manhole (92)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.690	40.970	41.047	0.077	8.7	0.087	0.000	8.3	4.702	OK
Manhole (93)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.110	40.852	40.925	0.073	8.3	0.083	0.000	7.8	4.672	OK
Manhole (94)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.650	41.193	41.222	0.029	2.6	0.033	0.000	2.5	1.201	OK
Manhole (95)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.200	41.030	41.059	0.029	1.7	0.033	0.000	1.7	0.798	OK
Manhole (96)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.200	40.881	40.919	0.038	2.7	0.043	0.000	2.5	1.255	OK
Manhole (97)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.180	40.725	40.778	0.053	4.3	0.060	0.000	4.1	2.450	OK
Manhole (98)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.200	40.675	40.724	0.049	4.1	0.056	0.000	3.9	2.427	OK
Manhole (99)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.190	40.549	40.614	0.066	6.7	0.074	0.000	6.3	4.263	OK
Manhole (100)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.260	40.423	40.500	0.077	8.9	0.087	0.000	8.2	5.978	OK
Manhole (101)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.100	40.790	40.812	0.022	0.9	0.025	0.000	0.9	0.639	OK
Manhole (102)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.100	40.674	40.705	0.031	1.8	0.035	0.000	1.7	1.373	OK
Manhole (103)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.100	40.572	40.608	0.036	2.7	0.041	0.000	2.6	1.793	OK
Manhole (104)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.200	40.150	40.172	0.022	1.0	0.025	0.000	1.0	1.730	OK
Manhole (105)	FEH 2022: 2 years: +0 %: 30 mins: Winter	42.480	39.886	39.923	0.037	2.2	0.042	0.000	2.1	3.492	OK
Manhole (106)	FEH 2022: 2 years: +0 %: 30 mins: Winter	42.600	39.852	39.891	0.039	3.0	0.044	0.000	2.9	4.653	OK

Manhole (107)	FEH 2022: 2 years: +0 %: 30 mins: Winter	42.700	39.620	39.672	0.052	4.7	0.059	0.000	4.6	7.298	OK
Manhole (108)	FEH 2022: 2 years: +0 %: 30 mins: Winter	42.650	39.469	39.509	0.040	5.7	0.046	0.000	5.7	8.754	OK
Manhole (109)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.200	40.150	40.168	0.018	0.6	0.020	0.000	0.6	1.042	OK
Manhole (110)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.200	40.008	40.039	0.031	1.9	0.035	0.000	1.7	1.610	OK
Manhole (111)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.200	39.768	39.800	0.032	1.8	0.036	0.000	1.7	2.743	OK
Manhole (112)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.190	39.713	39.756	0.043	3.2	0.048	0.000	3.0	2.295	OK
Manhole (113)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.200	39.465	39.493	0.029	3.0	0.032	0.000	2.9	2.265	OK
Manhole (114)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.190	40.140	40.158	0.018	0.6	0.020	0.000	0.6	1.043	OK
Manhole (115)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.200	40.040	40.064	0.024	1.1	0.027	0.000	1.1	1.933	OK
Manhole (116)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.440	40.390	40.427	0.037	2.7	0.042	0.000	2.6	1.235	OK
Manhole (117)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.180	40.243	40.286	0.043	3.1	0.048	0.000	2.9	1.454	OK
Manhole (118)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.120	40.134	40.175	0.041	2.9	0.046	0.000	2.7	1.449	OK
Manhole (119)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.120	40.009	40.052	0.043	2.7	0.049	0.000	2.6	1.443	OK
Manhole (120)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.080	39.979	40.024	0.045	3.5	0.051	0.000	3.3	1.879	OK
Manhole (121)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.080	39.827	39.876	0.049	4.2	0.056	0.000	3.9	2.267	OK
Manhole (122)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.940	39.675	39.730	0.056	5.1	0.063	0.000	4.7	3.188	OK
Manhole (123)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.970	39.467	39.508	0.042	6.0	0.047	0.000	5.7	4.432	OK
Manhole (124)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.130	39.100	39.164	0.064	6.5	0.072	0.000	6.4	7.424	OK
Manhole (125)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.020	38.750	38.918	0.168	12.9	0.190	0.000	14.8	9.193	OK
Manhole (126)	FEH 2022: 2 years: +0 %: 60 mins: Winter	41.040	39.660	39.674	0.014	0.5	0.016	0.000	0.5	1.361	OK
Manhole (127)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.150	39.310	39.349	0.039	2.6	0.044	0.000	2.5	1.835	OK
Manhole (128)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.150	39.201	39.245	0.044	3.3	0.050	0.000	3.2	2.198	OK
Manhole (129)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.150	39.100	39.153	0.053	4.5	0.060	0.000	4.3	2.769	OK
Manhole (130)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.150	39.011	39.062	0.051	4.3	0.057	0.000	4.0	2.737	OK
Manhole (131)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.040	38.894	38.943	0.049	4.0	0.056	0.000	3.8	2.693	OK
Manhole (132)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.500	39.450	39.474	0.024	1.2	0.027	0.000	1.1	0.889	OK
Manhole (133)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.490	39.349	39.397	0.048	4.3	0.055	0.000	4.1	2.340	OK
Manhole (134)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.480	39.219	39.269	0.050	4.1	0.057	0.000	3.9	2.315	OK
Manhole (135)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.490	39.112	39.169	0.057	5.3	0.065	0.000	5.0	2.926	OK
Manhole (136)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.480	38.995	39.059	0.064	6.6	0.072	0.000	6.3	3.983	OK
Manhole (137)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.760	38.836	38.933	0.097	9.6	0.110	0.000	8.7	6.110	OK
Manhole (138)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.980	40.980	40.991	0.011	0.5	0.013	0.000	0.5	0.937	OK
Manhole (139)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.780	39.703	39.718	0.015	1.2	0.017	0.000	1.2	2.172	OK
Manhole (140)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.000	38.930	38.964	0.034	2.0	0.038	0.000	1.9	1.294	OK
Manhole (141)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.000	38.807	38.944	0.137	2.9	0.155	0.000	2.8	2.120	OK
Manhole (142)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.000	38.737	38.941	0.204	3.2	0.231	0.000	3.9	2.754	Surcharged
Manhole (143)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.000	38.622	38.934	0.312	4.4	0.353	0.000	5.2	3.639	Surcharged

Manhole (144)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.000	38.429	38.912	0.483	6.2	0.546	0.000	6.9	4.968	Surcharged
Manhole (145)	FEH 2022: 2 years: +0 %: 15 mins: Summer	40.560	39.510	39.510	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (146)	FEH 2022: 2 years: +0 %: 15 mins: Summer	40.580	39.417	39.417	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (147)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.500	39.193	39.209	0.016	0.5	0.018	0.000	0.5	0.875	OK
Manhole (148)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.310	38.960	38.977	0.017	0.5	0.019	0.000	0.5	0.860	OK
Manhole (149)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.460	43.320	43.335	0.015	0.4	0.017	0.000	0.4	0.185	OK
Manhole (150)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.520	43.142	43.155	0.013	0.4	0.014	0.000	0.3	0.180	OK
Manhole (151)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.490	42.930	42.974	0.044	3.9	0.050	0.000	3.7	2.621	OK
Manhole (152)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.370	42.639	42.687	0.048	4.7	0.055	0.000	4.4	3.776	OK
Manhole (153)	FEH 2022: 2 years: +0 %: 30 mins: Winter	44.270	42.395	42.464	0.069	10.5	0.078	0.000	10.4	15.353	OK
Manhole (154)	FEH 2022: 2 years: +0 %: 15 mins: Winter	43.130	41.910	41.977	0.067	15.9	0.076	0.000	14.9	11.719	OK
Manhole (155)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.620	40.240	40.340	0.100	22.0	0.113	0.000	21.1	16.037	OK
Manhole (156)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.650	39.900	40.050	0.150	36.5	0.169	0.000	33.6	26.004	OK
Manhole (157)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.570	39.743	39.837	0.094	37.0	0.106	0.000	36.3	27.601	OK
Manhole (158)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.000	39.294	39.441	0.147	38.7	0.166	0.000	36.8	28.811	OK
Manhole (159)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.710	39.199	39.341	0.142	38.2	0.161	0.000	37.7	46.800	OK
Manhole (160)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.350	38.903	39.041	0.138	43.3	0.156	0.000	43.1	54.553	OK
Manhole (161)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.240	38.683	38.804	0.121	46.2	0.137	0.000	45.8	57.829	OK
Manhole (162)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.340	38.305	38.435	0.130	49.6	0.147	0.000	49.1	62.112	OK
Manhole (163)	FEH 2022: 2 years: +0 %: 240 mins: Winter	40.290	38.027	38.306	0.278	27.3	0.315	0.000	27.3	172.260	OK
Manhole (164)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.370	43.120	43.164	0.044	3.7	0.050	0.000	3.6	2.958	OK
Manhole (165)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.000	42.852	42.895	0.043	3.6	0.048	0.000	3.3	2.904	OK
Manhole (166)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.320	42.719	42.769	0.050	5.1	0.057	0.000	4.8	4.145	OK
Manhole (167)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.680	40.570	40.612	0.042	3.4	0.047	0.000	3.2	2.100	OK
Manhole (168)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.580	40.393	40.440	0.047	3.9	0.053	0.000	3.7	2.873	OK
Manhole (169)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.110	41.000	41.019	0.019	0.8	0.021	0.000	0.8	0.361	OK
Manhole (170)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.100	40.916	40.962	0.046	4.3	0.052	0.000	4.1	2.240	OK
Manhole (171)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.080	40.691	40.739	0.048	4.4	0.055	0.000	4.1	2.365	OK
Manhole (172)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.040	40.565	40.633	0.068	7.0	0.077	0.000	6.6	4.195	OK
Manhole (173)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.030	40.389	40.460	0.071	10.6	0.080	0.000	10.2	6.391	OK
Manhole (174)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.060	40.218	40.298	0.080	11.8	0.090	0.000	11.3	7.225	OK
Manhole (175)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.080	40.157	40.235	0.078	12.0	0.088	0.000	11.6	7.509	OK
Manhole (176)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.800	40.045	40.120	0.075	13.5	0.085	0.000	13.0	9.197	OK
Manhole (177)	FEH 2022: 2 years: +0 %: 15 mins: Summer	42.100	40.912	40.912	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (178)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.100	40.761	40.773	0.012	0.3	0.014	0.000	0.3	0.148	OK
Manhole (179)	FEH 2022: 2 years: +0 %: 30 mins: Winter	42.070	41.020	41.035	0.015	0.6	0.017	0.000	0.5	0.995	OK
Manhole (180)	FEH 2022: 2 years: +0 %: 60 mins: Winter	42.090	40.695	40.715	0.020	1.4	0.023	0.000	1.4	3.671	OK

Manhole (181)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.700	40.650	40.665	0.015	0.4	0.017	0.000	0.4	0.202	OK
Manhole (182)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.700	40.517	40.535	0.018	0.7	0.021	0.000	0.6	0.322	OK
Manhole (183)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.680	40.374	40.395	0.021	1.2	0.023	0.000	1.1	0.607	OK
Manhole (184)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.680	40.630	40.650	0.020	0.7	0.022	0.000	0.7	1.166	OK
Manhole (185)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.650	40.532	40.554	0.023	0.9	0.026	0.000	0.9	0.763	OK
Manhole (186)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.570	40.496	40.524	0.028	1.6	0.032	0.000	1.5	1.092	OK
Manhole (187)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.470	40.356	40.390	0.034	2.1	0.038	0.000	2.0	3.000	OK
Manhole (188)	FEH 2022: 2 years: +0 %: 15 mins: Winter	41.190	40.202	40.231	0.030	2.9	0.033	0.000	2.8	2.171	OK
Manhole (189)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.980	39.910	39.940	0.030	3.8	0.034	0.000	3.8	5.702	OK
Manhole (190)	FEH 2022: 2 years: +0 %: 30 mins: Winter	41.120	40.100	40.119	0.019	0.6	0.021	0.000	0.6	1.046	OK
Manhole (191)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.620	39.300	39.337	0.037	2.8	0.041	0.000	2.6	1.934	OK
Manhole (192)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.530	39.480	39.508	0.028	1.6	0.032	0.000	1.5	1.079	OK
Manhole (193)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.520	39.348	39.389	0.041	3.5	0.047	0.000	3.3	2.313	OK
Manhole (194)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.530	39.100	39.154	0.054	5.2	0.061	0.000	4.9	3.519	OK
Manhole (195)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.360	38.954	38.999	0.045	5.4	0.051	0.000	5.1	4.076	OK
Manhole (196)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.310	39.260	39.289	0.029	2.3	0.033	0.000	2.2	1.432	OK
Manhole (197)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.260	39.210	39.234	0.024	1.1	0.027	0.000	1.1	0.813	OK
Manhole (198)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.290	39.119	39.150	0.031	2.0	0.036	0.000	1.9	1.225	OK
Manhole (199)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.250	38.920	38.958	0.038	2.6	0.043	0.000	2.4	1.520	OK
Manhole (200)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.310	38.761	38.802	0.041	3.0	0.046	0.000	2.8	2.124	OK
Manhole (201)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.340	38.645	38.695	0.050	3.8	0.057	0.000	3.6	2.567	OK
Manhole (202)	FEH 2022: 2 years: +0 %: 15 mins: Winter	40.360	38.607	38.655	0.049	4.0	0.055	0.000	3.8	3.061	OK
Manhole (203)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.360	38.442	38.494	0.052	4.3	0.059	0.000	4.3	5.905	OK
Manhole (204)	FEH 2022: 2 years: +0 %: 30 mins: Winter	40.270	38.296	38.343	0.047	4.7	0.053	0.000	4.7	6.306	OK
Manhole (53a)	FEH 2022: 2 years: +0 %: 15 mins: Winter	44.650	42.754	42.813	0.059	6.2	0.067	0.000	6.0	4.049	OK

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

Kennedy Redford

FEH 2022: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole (1a)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.570	43.480	43.808	0.328	0.7	0.371	0.000	0.7	23.524	Surcharged
Manhole (1)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	43.285	43.808	0.523	1.2	0.591	0.000	1.2	42.260	Surcharged
Manhole (2)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.620	43.116	43.808	0.692	1.4	0.782	0.000	1.4	46.388	Surcharged
Manhole (3)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	43.034	43.807	0.774	1.9	0.875	0.000	1.9	63.969	Surcharged
Manhole (4)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.630	42.843	43.808	0.965	1.9	1.091	0.000	1.9	65.316	Surcharged
Manhole (5)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.730	42.597	43.808	1.211	2.9	1.369	0.000	2.7	100.061	Surcharged
Manhole (6)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.580	42.519	43.807	1.289	3.4	1.457	0.000	3.4	127.705	Surcharged
Manhole (7)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	42.204	43.807	1.603	7.0	1.813	0.000	5.5	296.676	Surcharged
Manhole (8)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	41.978	43.807	1.829	8.1	2.069	0.000	3.8	562.571	Surcharged
Manhole (9)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.450	41.749	42.895	1.146	4.3	1.296	0.000	4.3	476.951	Surcharged
Manhole (10)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	41.689	42.893	1.204	5.0	1.361	0.000	5.0	507.101	Surcharged
Manhole (11)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.790	41.395	42.886	1.491	9.3	1.686	0.000	9.2	680.375	Surcharged
Manhole (12)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.380	41.203	42.884	1.681	10.4	1.901	0.000	4.9	813.152	Surcharged
Manhole (13)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.020	41.118	42.877	1.759	4.9	1.990	0.000	4.9	647.601	Flood Risk
Manhole (14)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.700	40.694	41.100	0.406	28.5	0.459	0.000	26.5	23.734	Surcharged
Manhole (15)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.240	40.250	40.345	0.095	56.1	0.107	0.000	55.9	46.299	OK
Manhole (16)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.360	38.965	39.818	0.853	90.3	0.965	0.000	93.4	73.276	Surcharged
Manhole (17)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.150	38.735	39.713	0.978	102.4	1.106	0.000	105.4	85.728	Surcharged
Manhole (18)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.980	38.354	39.524	1.170	149.6	1.323	0.000	138.1	114.906	Surcharged
Manhole (19)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.340	38.315	39.504	1.189	163.8	1.345	0.000	43.3	122.464	Surcharged
Manhole (20)	FEH 2022: 30 years: +40 %: 15 mins: Winter	39.980	38.243	39.501	1.258	47.3	1.422	0.000	38.4	52.539	Surcharged

Manhole (21)	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.750	38.177	39.163	0.986	33.3	1.115	0.000	32.9	301.232	Surcharged
Manhole (22)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.101	39.163	1.062	34.5	1.201	0.000	33.8	308.238	Surcharged
Manhole (23)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.260	38.064	39.163	1.099	34.4	1.243	0.000	33.1	312.235	Surcharged
Manhole (24)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.320	38.009	39.162	1.154	35.0	1.305	0.000	33.6	321.146	Surcharged
Manhole (25)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.200	37.957	39.162	1.205	34.7	1.363	0.000	33.4	329.384	Surcharged
Manhole (26)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.210	37.913	39.162	1.249	134.1	1.413	0.000	133.8	703.069	Surcharged
Manhole (27)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.100	37.851	39.155	1.304	142.8	1.475	0.000	142.4	736.348	Surcharged
Manhole (28)	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.600	37.824	39.141	1.317	62.9	1.490	0.000	62.8	564.481	Surcharged
Manhole (29)	FEH 2022: 30 years: +40 %: 480 mins: Winter	39.580	37.640	37.830	0.190	63.0	0.000	0.000	63.0	1419.041	OK
Manhole (30)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.780	43.350	43.808	0.458	0.4	0.517	0.000	0.5	15.275	Surcharged
Manhole (31)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.970	43.808	0.838	0.6	0.947	0.000	0.6	19.269	Surcharged
Manhole (32)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	42.774	43.808	1.034	0.8	1.169	0.000	0.8	27.683	Surcharged
Manhole (33)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.760	43.410	43.808	0.398	0.7	0.450	0.000	0.7	22.655	Surcharged
Manhole (34)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.780	43.251	43.808	0.557	1.3	0.630	0.000	1.3	42.893	Surcharged
Manhole (35)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.740	43.094	43.808	0.714	1.6	0.808	0.000	1.6	53.523	Surcharged
Manhole (36)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.800	43.033	43.808	0.775	1.9	0.877	0.000	1.9	66.056	Surcharged
Manhole (37)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.800	42.872	43.807	0.936	2.1	1.058	0.000	2.1	73.374	Surcharged
Manhole (38)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.720	42.736	43.808	1.072	2.1	1.212	0.000	2.0	73.373	Surcharged
Manhole (39)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.560	42.535	43.808	1.273	3.8	1.439	0.000	3.7	133.795	Surcharged
Manhole (40)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.800	43.750	43.814	0.064	13.8	0.073	0.000	13.6	7.716	OK
Manhole (41)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.710	43.097	43.808	0.711	1.1	0.804	0.000	1.1	37.401	Surcharged
Manhole (42)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.550	43.500	43.808	0.308	0.2	0.348	0.000	0.2	7.799	Surcharged
Manhole (43)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	43.270	43.808	0.538	0.6	0.608	0.000	0.6	21.044	Surcharged
Manhole (44)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.630	43.108	43.808	0.700	1.0	0.792	0.000	1.0	35.358	Surcharged
Manhole (45)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	42.911	43.808	0.897	1.6	1.014	0.000	1.6	55.311	Surcharged

Manhole (46)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	42.850	43.808	0.958	1.9	1.083	0.000	1.8	64.790	Surcharged
Manhole (47)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	42.641	43.808	1.167	2.2	1.320	0.000	2.1	76.861	Surcharged
Manhole (48)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	42.427	43.808	1.381	4.6	1.562	0.000	4.6	169.231	Surcharged
Manhole (49)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.690	43.630	43.808	0.178	0.5	0.201	0.000	0.5	17.605	Surcharged
Manhole (50)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.690	43.304	43.808	0.504	1.1	0.570	0.000	1.1	36.762	Surcharged
Manhole (51)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.710	42.991	43.808	0.817	1.1	0.924	0.000	1.1	36.769	Surcharged
Manhole (52)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	42.905	43.808	0.903	1.1	1.021	0.000	1.1	36.776	Surcharged
Manhole (53)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.620	42.608	43.808	1.200	2.0	1.357	0.000	2.0	72.628	Surcharged
Manhole (54)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	43.450	43.807	0.357	0.4	0.404	0.000	0.4	14.193	Surcharged
Manhole (55)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.550	43.319	43.807	0.488	0.5	0.552	0.000	0.5	15.966	Surcharged
Manhole (56)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.470	43.281	43.807	0.526	0.5	0.595	0.000	0.5	16.129	Surcharged
Manhole (57)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.470	43.107	43.807	0.700	1.2	0.792	0.000	1.2	40.446	Surcharged
Manhole (58)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.490	42.942	43.807	0.865	1.5	0.979	0.000	1.5	50.391	Surcharged
Manhole (59)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.400	42.687	43.807	1.120	1.5	1.267	0.000	1.4	50.494	Surcharged
Manhole (60)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	42.329	43.807	1.478	3.3	1.672	0.000	3.2	118.629	Surcharged
Manhole (61)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	43.350	43.808	0.458	0.6	0.517	0.000	0.6	21.552	Surcharged
Manhole (62)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.680	43.239	43.807	0.569	1.2	0.643	0.000	1.2	41.152	Surcharged
Manhole (63)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	43.117	43.807	0.690	1.3	0.781	0.000	1.3	45.841	Surcharged
Manhole (64)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.936	43.807	0.871	1.4	0.986	0.000	1.4	49.051	Surcharged
Manhole (65)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.855	43.807	0.952	2.0	1.077	0.000	2.0	70.356	Surcharged
Manhole (66)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.460	43.410	43.498	0.088	10.4	0.100	0.000	10.2	6.005	OK
Manhole (67)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.450	43.356	43.439	0.083	10.2	0.094	0.000	9.9	5.971	OK
Manhole (68)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.275	43.349	0.074	9.9	0.083	0.000	9.7	5.923	OK
Manhole (69)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.089	43.230	0.141	17.3	0.160	0.000	13.7	9.382	OK
Manhole (70)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.430	42.946	43.136	0.190	15.4	0.215	0.000	14.4	10.139	Surcharged

Manhole (71)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.470	42.847	43.059	0.212	21.6	0.240	0.000	20.5	15.566	Surcharged
Manhole (72)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.590	42.530	42.886	0.356	0.7	0.402	0.000	0.7	23.701	Surcharged
Manhole (73)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.500	42.357	42.886	0.529	1.1	0.598	0.000	1.1	38.605	Surcharged
Manhole (74)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.500	42.200	42.886	0.686	1.6	0.776	0.000	1.6	54.149	Surcharged
Manhole (75)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.440	42.093	42.885	0.793	2.0	0.897	0.000	2.0	68.161	Surcharged
Manhole (76)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.080	41.872	42.885	1.014	4.0	1.146	0.000	2.2	118.191	Surcharged
Manhole (77)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.900	41.644	42.885	1.242	2.8	1.404	0.000	2.2	102.874	Surcharged
Manhole (78)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.500	43.569	0.069	7.6	0.078	0.000	7.4	5.139	OK
Manhole (79)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.393	43.474	0.082	9.1	0.092	0.000	8.8	5.905	OK
Manhole (80)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.480	43.294	43.394	0.100	15.4	0.113	0.000	14.7	8.896	OK
Manhole (81)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.110	42.972	43.071	0.099	20.5	0.112	0.000	19.7	11.506	OK
Manhole (82)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.000	42.832	43.014	0.182	47.5	0.206	0.000	46.1	31.881	OK
Manhole (83)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.880	42.677	42.883	0.207	4.5	0.234	0.000	4.5	153.781	OK
Manhole (84)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.360	43.552	0.192	9.8	0.217	0.000	7.0	4.552	Surcharged
Manhole (85)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.221	43.528	0.307	17.5	0.347	0.000	14.8	9.392	Surcharged
Manhole (86)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.160	43.475	0.316	16.0	0.357	0.000	14.6	10.697	Surcharged
Manhole (87)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.028	43.383	0.355	28.1	0.401	0.000	26.2	18.617	Surcharged
Manhole (89)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.480	41.430	41.625	0.195	15.1	0.220	0.000	14.1	15.943	Surcharged
Manhole (90)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	41.146	41.565	0.419	20.6	0.474	0.000	17.9	12.852	Surcharged
Manhole (91)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.750	41.085	41.528	0.443	17.9	0.501	0.000	15.5	12.802	Surcharged
Manhole (92)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.690	40.970	41.436	0.467	19.5	0.528	0.000	17.5	14.613	Surcharged
Manhole (93)	FEH 2022: 30 years: +40 %: 15 mins: Winter	43.110	40.852	41.304	0.452	17.5	0.511	0.000	18.9	14.561	Surcharged
Manhole (94)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.650	41.193	41.247	0.054	8.0	0.061	0.000	7.9	3.687	OK
Manhole (95)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	41.030	41.084	0.054	5.3	0.061	0.000	5.2	2.462	OK
Manhole (96)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	40.881	40.951	0.070	8.3	0.080	0.000	7.9	3.879	OK

Manhole (97)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.180	40.725	40.844	0.120	13.6	0.135	0.000	11.8	7.574	OK
Manhole (98)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.200	40.675	40.823	0.148	9.7	0.167	0.000	9.4	11.072	OK
Manhole (99)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.190	40.549	40.782	0.233	16.4	0.264	0.000	16.2	20.229	Surcharged
Manhole (100)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.260	40.423	40.661	0.238	22.8	0.269	0.000	22.6	29.064	Surcharged
Manhole (101)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.790	40.829	0.039	2.9	0.044	0.000	2.8	1.991	OK
Manhole (102)	FEH 2022: 30 years: +40 %: 15 mins: Summer	42.100	40.674	40.729	0.055	5.3	0.063	0.000	5.2	3.826	OK
Manhole (103)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.100	40.572	40.679	0.107	7.1	0.122	0.000	6.7	8.925	OK
Manhole (104)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.150	40.189	0.039	3.1	0.044	0.000	3.0	5.436	OK
Manhole (105)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.480	39.886	40.052	0.166	6.7	0.188	0.000	7.9	6.254	Surcharged
Manhole (106)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.600	39.852	40.042	0.190	9.6	0.215	0.000	11.3	8.471	Surcharged
Manhole (107)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.700	39.620	39.955	0.335	15.3	0.379	0.000	17.3	13.260	Surcharged
Manhole (108)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.650	39.469	39.838	0.369	19.4	0.418	0.000	22.0	16.061	Surcharged
Manhole (109)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.150	40.181	0.031	1.8	0.035	0.000	1.8	3.275	OK
Manhole (110)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.008	40.063	0.055	5.6	0.062	0.000	5.5	8.685	OK
Manhole (111)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.200	39.768	39.876	0.108	5.5	0.123	0.000	8.7	5.003	OK
Manhole (112)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.190	39.713	39.861	0.148	10.1	0.167	0.000	12.7	7.305	OK
Manhole (113)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.200	39.465	39.810	0.345	12.7	0.391	0.000	15.3	7.313	Surcharged
Manhole (114)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.190	40.140	40.171	0.031	1.8	0.035	0.000	1.8	3.287	OK
Manhole (115)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.040	40.083	0.043	3.4	0.048	0.000	3.3	6.091	OK
Manhole (116)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.440	40.390	40.461	0.071	8.3	0.080	0.000	8.0	3.821	OK
Manhole (117)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.180	40.243	40.325	0.082	9.5	0.093	0.000	9.1	4.503	OK
Manhole (118)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.120	40.134	40.214	0.080	9.1	0.091	0.000	8.7	4.498	OK
Manhole (119)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.120	40.009	40.099	0.090	8.7	0.102	0.000	8.3	4.491	OK
Manhole (120)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.080	39.979	40.088	0.109	11.3	0.123	0.000	10.8	5.843	OK
Manhole (121)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.080	39.827	40.059	0.232	13.5	0.262	0.000	12.8	7.063	Surcharged

Manhole (122)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.940	39.675	40.009	0.335	16.6	0.379	0.000	12.9	9.951	Surcharged
Manhole (123)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.970	39.467	39.896	0.430	16.8	0.486	0.000	17.9	13.997	Surcharged
Manhole (124)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.130	39.100	39.773	0.673	18.8	0.762	0.000	20.3	15.272	Surcharged
Manhole (125)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.020	38.750	39.545	0.795	40.5	0.900	0.000	42.9	30.316	Surcharged
Manhole (126)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.040	39.660	39.900	0.240	1.9	0.271	0.000	2.5	1.790	Surcharged
Manhole (127)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.310	39.668	0.358	8.0	0.405	0.000	6.4	5.725	Surcharged
Manhole (128)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.201	39.651	0.450	7.5	0.509	0.000	9.1	6.953	Surcharged
Manhole (129)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.100	39.619	0.519	10.2	0.587	0.000	12.2	8.841	Surcharged
Manhole (130)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.011	39.567	0.556	12.2	0.629	0.000	14.2	9.215	Surcharged
Manhole (131)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.040	38.894	39.528	0.634	14.2	0.717	0.000	16.4	10.189	Surcharged
Manhole (132)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.500	39.450	39.844	0.394	7.4	0.445	0.000	3.7	2.845	Surcharged
Manhole (133)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.490	39.349	39.838	0.489	9.8	0.554	0.000	8.1	7.341	Surcharged
Manhole (134)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.480	39.219	39.813	0.594	8.1	0.672	0.000	9.7	7.235	Surcharged
Manhole (135)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.490	39.112	39.775	0.663	10.8	0.750	0.000	12.5	9.165	Surcharged
Manhole (136)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.480	38.995	39.708	0.713	15.1	0.807	0.000	16.9	12.478	Surcharged
Manhole (137)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.760	38.836	39.573	0.737	22.2	0.833	0.000	24.4	19.273	Surcharged
Manhole (138)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.980	40.980	40.999	0.019	1.6	0.021	0.000	1.6	2.920	OK
Manhole (139)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.780	39.703	39.729	0.026	3.8	0.030	0.000	3.8	6.800	OK
Manhole (140)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.930	39.588	0.658	6.2	0.744	0.000	4.8	4.099	Surcharged
Manhole (141)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.807	39.577	0.771	6.7	0.872	0.000	8.5	6.960	Surcharged
Manhole (142)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.737	39.557	0.820	9.8	0.927	0.000	11.6	9.411	Surcharged
Manhole (143)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.622	39.502	0.880	13.3	0.995	0.000	15.2	12.311	Surcharged
Manhole (144)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.429	39.493	1.064	18.3	1.203	0.000	20.6	16.368	Surcharged
Manhole (145)	FEH 2022: 30 years: +40 %: 15 mins: Summer	40.560	39.510	39.510	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (146)	FEH 2022: 30 years: +40 %: 15 mins: Summer	40.580	39.417	39.417	0.000	0.0	0.000	0.000	0.0	0.000	OK

Manhole (147)	FEH 2022: 30 years: +40 %: 30 mins: Winter	40.500	39.193	39.221	0.028	1.6	0.032	0.000	1.5	2.756	OK
Manhole (148)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.960	39.163	0.203	2.4	0.229	0.000	1.2	4.999	Surcharged
Manhole (149)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.460	43.320	43.346	0.026	1.2	0.029	0.000	1.2	0.578	OK
Manhole (150)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.520	43.142	43.165	0.023	1.2	0.026	0.000	1.1	0.573	OK
Manhole (151)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.490	42.930	43.075	0.145	12.3	0.164	0.000	11.8	8.119	OK
Manhole (152)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.370	42.639	43.025	0.386	15.0	0.437	0.000	11.9	11.778	Surcharged
Manhole (153)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.270	42.395	42.928	0.533	27.8	0.603	0.000	28.9	28.585	Surcharged
Manhole (154)	FEH 2022: 30 years: +40 %: 30 mins: Winter	43.130	41.910	42.358	0.448	38.0	0.506	0.000	36.7	59.611	Surcharged
Manhole (155)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.620	40.240	40.801	0.561	53.2	0.634	0.000	52.6	80.616	Surcharged
Manhole (156)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.650	39.900	40.419	0.519	91.9	0.587	0.000	91.6	129.284	Surcharged
Manhole (157)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.570	39.743	39.919	0.176	99.2	0.199	0.000	98.0	136.206	OK
Manhole (158)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.000	39.294	39.784	0.490	103.6	0.554	0.000	103.2	142.532	Surcharged
Manhole (159)	FEH 2022: 30 years: +40 %: 30 mins: Winter	40.710	39.199	39.613	0.414	107.5	0.469	0.000	107.1	147.548	Surcharged
Manhole (160)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.350	38.903	39.205	0.302	80.8	0.341	0.000	80.9	289.123	OK
Manhole (161)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.240	38.683	39.192	0.510	85.9	0.576	0.000	86.0	306.792	Surcharged
Manhole (162)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.340	38.305	39.180	0.875	92.4	0.989	0.000	91.4	328.005	Surcharged
Manhole (163)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.290	38.027	39.169	1.141	104.4	1.291	0.000	104.0	372.832	Surcharged
Manhole (164)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.370	43.120	43.204	0.084	11.5	0.095	0.000	11.1	9.165	OK
Manhole (165)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.000	42.852	43.097	0.245	11.1	0.277	0.000	10.5	9.072	Surcharged
Manhole (166)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.320	42.719	43.067	0.348	15.9	0.393	0.000	12.6	12.960	Surcharged
Manhole (167)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.680	40.570	40.855	0.285	8.2	0.323	0.000	7.5	10.110	Surcharged
Manhole (168)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.580	40.393	40.825	0.432	10.1	0.488	0.000	9.7	14.568	Surcharged
Manhole (169)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.110	41.000	41.033	0.033	2.4	0.037	0.000	2.4	1.113	OK
Manhole (170)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.916	41.006	0.090	13.2	0.101	0.000	12.8	6.932	OK
Manhole (171)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.080	40.691	40.788	0.097	13.3	0.110	0.000	11.5	7.399	OK

Manhole (172)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.040	40.565	40.757	0.192	20.3	0.217	0.000	19.5	13.006	Surcharged
Manhole (173)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.030	40.389	40.623	0.234	25.6	0.265	0.000	24.7	29.876	Surcharged
Manhole (174)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.060	40.218	40.575	0.357	28.3	0.404	0.000	27.8	33.881	Surcharged
Manhole (175)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.080	40.157	40.546	0.389	29.3	0.440	0.000	28.9	35.185	Surcharged
Manhole (176)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.800	40.045	40.498	0.453	34.9	0.513	0.000	34.6	44.586	Surcharged
Manhole (177)	FEH 2022: 30 years: +40 %: 15 mins: Summer	42.100	40.912	40.912	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (178)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.761	40.787	0.026	1.0	0.029	0.000	0.6	0.507	OK
Manhole (179)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.070	41.020	41.045	0.025	1.8	0.029	0.000	1.7	3.122	OK
Manhole (180)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.090	40.695	40.729	0.034	4.5	0.039	0.000	4.5	8.078	OK
Manhole (181)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.700	40.650	40.676	0.026	1.3	0.029	0.000	1.3	0.619	OK
Manhole (182)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.700	40.517	40.549	0.033	2.1	0.037	0.000	2.0	1.006	OK
Manhole (183)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.680	40.374	40.411	0.037	3.9	0.042	0.000	3.7	1.867	OK
Manhole (184)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.680	40.630	40.665	0.035	2.3	0.040	0.000	2.3	3.667	OK
Manhole (185)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.650	40.532	40.576	0.044	2.9	0.050	0.000	2.8	2.397	OK
Manhole (186)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.570	40.496	40.549	0.053	5.1	0.060	0.000	4.9	3.446	OK
Manhole (187)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.470	40.356	40.419	0.063	6.8	0.071	0.000	6.6	5.598	OK
Manhole (188)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.190	40.202	40.257	0.055	9.3	0.063	0.000	9.1	6.842	OK
Manhole (189)	FEH 2022: 30 years: +40 %: 30 mins: Winter	40.980	39.910	39.965	0.056	12.1	0.063	0.000	12.0	18.004	OK
Manhole (190)	FEH 2022: 30 years: +40 %: 60 mins: Winter	41.120	40.100	40.132	0.032	1.8	0.036	0.000	1.8	4.714	OK
Manhole (191)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.620	39.300	39.374	0.074	8.6	0.084	0.000	8.1	6.022	OK
Manhole (192)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.530	39.480	39.531	0.051	5.0	0.058	0.000	4.8	3.345	OK
Manhole (193)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.520	39.348	39.428	0.080	10.9	0.090	0.000	10.4	7.181	OK
Manhole (194)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.530	39.100	39.208	0.108	16.2	0.123	0.000	15.4	10.971	OK
Manhole (195)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.954	39.178	0.224	9.5	0.254	0.000	9.6	35.118	Surcharged
Manhole (196)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.310	39.260	39.312	0.052	7.1	0.059	0.000	6.9	4.456	OK

Manhole (197)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.260	39.210	39.254	0.044	3.5	0.050	0.000	3.4	2.545	OK
Manhole (198)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.290	39.119	39.180	0.061	2.9	0.069	0.000	2.8	9.885	OK
Manhole (199)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.250	38.920	39.179	0.259	4.1	0.293	0.000	3.5	12.075	Surcharged
Manhole (200)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.761	39.178	0.417	5.0	0.472	0.000	5.0	18.401	Surcharged
Manhole (201)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.340	38.645	39.176	0.531	6.0	0.600	0.000	6.0	21.555	Surcharged
Manhole (202)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.607	39.174	0.568	7.3	0.642	0.000	7.3	26.827	Surcharged
Manhole (203)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.442	39.169	0.727	8.5	0.822	0.000	7.7	32.043	Surcharged
Manhole (204)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.270	38.296	39.161	0.865	8.4	0.978	0.000	7.8	33.815	Surcharged
Manhole (53a)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	42.754	43.808	1.054	1.9	1.192	0.000	1.8	65.106	Surcharged

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

FEH 2022: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole (1a)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.570	43.480	44.366	0.886	1.2	1.002	0.000	1.2	27.884	Flood Risk
Manhole (1)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.640	43.285	44.366	1.080	2.2	1.222	0.000	2.2	49.996	Flood Risk
Manhole (2)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.620	43.116	44.365	1.249	2.4	1.412	0.000	2.4	54.818	Flood Risk
Manhole (3)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.650	43.034	44.364	1.330	3.3	1.505	0.000	3.1	75.318	Flood Risk
Manhole (4)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.630	42.843	44.363	1.520	3.2	1.719	0.000	3.0	76.077	Flood Risk
Manhole (5)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.730	42.597	44.361	1.764	4.7	1.995	0.000	4.6	115.981	Surcharged
Manhole (6)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.580	42.519	44.361	1.842	9.7	2.083	0.000	5.7	236.011	Flood Risk
Manhole (7)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.500	42.204	44.367	2.163	11.8	2.446	0.000	10.7	327.440	Flood Risk
Manhole (8)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.500	41.978	44.367	2.389	13.4	2.702	0.000	4.2	519.582	Flood Risk
Manhole (9)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.450	41.749	43.130	1.381	4.7	1.562	0.000	4.7	510.235	Surcharged
Manhole (10)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.500	41.689	43.127	1.438	5.8	1.626	0.000	5.7	550.338	Surcharged
Manhole (11)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.790	41.395	43.116	1.721	11.8	1.947	0.000	11.7	780.357	Surcharged
Manhole (12)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.380	41.203	43.114	1.911	13.3	2.161	0.000	11.4	942.271	Flood Risk
Manhole (13)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.020	41.118	43.105	1.988	11.9	88.023	85.872	5.2	762.807	Flood
Manhole (14)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.700	40.694	41.358	0.664	30.9	0.751	0.000	32.0	29.961	Surcharged
Manhole (15)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.240	40.250	40.355	0.105	66.3	0.119	0.000	66.1	59.588	OK
Manhole (16)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.360	38.965	40.059	1.094	107.2	1.237	0.000	110.6	95.305	Surcharged
Manhole (17)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.150	38.735	39.925	1.190	122.3	1.346	0.000	126.0	110.688	Surcharged
Manhole (18)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.980	38.354	39.781	1.427	72.5	1.614	0.000	60.9	646.948	Surcharged
Manhole (19)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.340	38.315	39.780	1.465	89.2	1.657	0.000	37.1	915.669	Surcharged
Manhole (20)	FEH 2022: 100 years: +45 %: 240 mins: Winter	39.980	38.243	39.779	1.536	37.8	1.737	0.000	37.9	735.603	Flood Risk

Manhole (21)	FEH 2022: 100 years: +45 %: 120 mins: Winter	39.750	38.177	39.666	1.490	38.3	1.685	0.000	38.4	360.950	Flood Risk
Manhole (22)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.310	38.101	39.666	1.565	38.4	1.770	0.000	38.5	366.337	Surcharged
Manhole (23)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.260	38.064	39.666	1.602	38.6	1.812	0.000	38.7	368.446	Surcharged
Manhole (24)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.320	38.009	39.665	1.657	38.7	1.874	0.000	38.8	376.759	Surcharged
Manhole (25)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.200	37.957	39.666	1.709	39.1	1.932	0.000	39.3	386.649	Surcharged
Manhole (26)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.210	37.913	39.666	1.753	161.4	1.982	0.000	160.9	855.997	Surcharged
Manhole (27)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.100	37.851	39.649	1.798	171.9	2.033	0.000	171.3	884.408	Surcharged
Manhole (28)	FEH 2022: 100 years: +45 %: 120 mins: Winter	39.600	37.824	39.622	1.798	83.0	23.569	21.560	62.3	614.711	Flood
Manhole (29)	FEH 2022: 100 years: +45 %: 1440 mins: Summer	39.580	37.640	37.830	0.190	63.0	0.000	0.000	63.0	2757.996	OK
Manhole (30)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.780	43.350	44.361	1.011	0.8	1.144	0.000	0.8	18.068	Surcharged
Manhole (31)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.540	42.970	44.361	1.391	1.0	1.574	0.000	0.9	22.448	Flood Risk
Manhole (32)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.520	42.774	44.361	1.587	1.3	1.795	0.000	1.2	31.689	Flood Risk
Manhole (33)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.760	43.410	44.377	0.967	1.2	1.093	0.000	1.2	26.946	Surcharged
Manhole (34)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.780	43.251	44.376	1.125	2.2	1.273	0.000	2.2	50.940	Surcharged
Manhole (35)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.740	43.094	44.376	1.282	2.8	1.450	0.000	2.7	63.367	Surcharged
Manhole (36)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.800	43.033	44.375	1.342	3.3	1.518	0.000	3.2	77.924	Surcharged
Manhole (37)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.800	42.872	44.373	1.502	3.6	1.699	0.000	3.5	86.005	Surcharged
Manhole (38)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.720	42.736	44.373	1.637	3.5	1.851	0.000	3.3	85.267	Surcharged
Manhole (39)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.560	42.535	44.371	1.836	6.3	2.076	0.000	6.2	155.395	Flood Risk
Manhole (40)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.800	43.750	44.372	0.622	1.9	0.703	0.000	1.9	44.293	Surcharged
Manhole (41)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.710	43.097	44.371	1.274	1.9	1.441	0.000	1.9	44.102	Surcharged
Manhole (42)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.550	43.500	44.378	0.878	0.9	0.993	0.000	0.4	9.333	Flood Risk
Manhole (43)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.520	43.270	44.378	1.108	1.1	1.253	0.000	1.1	25.084	Flood Risk
Manhole (44)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.630	43.108	44.378	1.270	1.8	1.436	0.000	1.8	41.806	Flood Risk
Manhole (45)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.650	42.911	44.377	1.466	2.8	1.658	0.000	2.6	64.792	Flood Risk

Manhole (46)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.640	42.850	44.376	1.527	3.1	1.727	0.000	3.0	75.452	Flood Risk
Manhole (47)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.640	42.641	44.375	1.734	3.6	1.961	0.000	3.5	88.883	Flood Risk
Manhole (48)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.520	42.427	44.373	1.946	7.7	2.201	0.000	7.6	194.607	Flood Risk
Manhole (49)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.690	43.630	44.377	0.747	0.9	0.845	0.000	0.9	20.874	Surcharged
Manhole (50)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.690	43.304	44.377	1.073	1.9	1.214	0.000	1.9	43.482	Surcharged
Manhole (51)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.710	42.991	44.377	1.386	1.9	1.567	0.000	1.8	43.110	Surcharged
Manhole (52)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.700	42.905	44.376	1.472	1.8	1.664	0.000	1.7	42.823	Surcharged
Manhole (53)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.620	42.608	44.375	1.767	3.4	1.998	0.000	3.3	83.471	Flood Risk
Manhole (54)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.500	43.450	44.369	0.919	0.7	1.040	0.000	0.7	16.876	Flood Risk
Manhole (55)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.550	43.319	44.369	1.050	0.8	1.188	0.000	0.8	19.193	Flood Risk
Manhole (56)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.470	43.281	44.369	1.088	0.8	1.231	0.000	0.8	19.900	Flood Risk
Manhole (57)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.470	43.107	44.369	1.262	2.1	1.427	0.000	2.0	48.418	Flood Risk
Manhole (58)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.490	42.942	44.368	1.426	2.5	1.613	0.000	2.4	59.422	Flood Risk
Manhole (59)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.400	42.687	44.368	1.681	4.1	1.901	0.000	2.3	74.562	Flood Risk
Manhole (60)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.500	42.329	44.367	2.039	5.5	2.306	0.000	5.4	137.034	Flood Risk
Manhole (61)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.700	43.350	44.372	1.022	1.1	1.155	0.000	1.1	25.548	Surcharged
Manhole (62)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.680	43.239	44.371	1.133	2.1	1.281	0.000	2.1	48.771	Surcharged
Manhole (63)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.700	43.117	44.371	1.254	2.4	1.418	0.000	2.3	54.189	Surcharged
Manhole (64)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.540	42.936	44.370	1.434	2.5	1.622	0.000	2.3	57.372	Flood Risk
Manhole (65)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.540	42.855	44.369	1.514	3.3	1.713	0.000	3.2	82.148	Flood Risk
Manhole (66)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.460	43.410	43.518	0.108	13.6	0.123	0.000	13.2	7.857	OK
Manhole (67)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.450	43.356	43.461	0.105	13.2	0.119	0.000	12.3	7.820	OK
Manhole (68)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.500	43.275	43.441	0.166	9.7	0.187	0.000	9.3	11.885	Surcharged
Manhole (69)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.500	43.089	43.394	0.305	16.1	0.345	0.000	15.8	18.130	Surcharged
Manhole (70)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.430	42.946	43.263	0.317	17.3	0.358	0.000	17.0	19.527	Surcharged

Manhole (71)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.470	42.847	43.151	0.304	25.4	0.344	0.000	25.2	31.518	Surcharged
Manhole (72)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.590	42.530	43.117	0.587	0.9	0.664	0.000	0.9	31.808	Surcharged
Manhole (73)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.500	42.357	43.117	0.760	1.5	0.859	0.000	1.5	51.237	Surcharged
Manhole (74)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.500	42.200	43.117	0.917	2.1	1.037	0.000	2.1	71.470	Surcharged
Manhole (75)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.440	42.093	43.116	1.024	2.7	1.158	0.000	2.6	89.512	Surcharged
Manhole (76)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.080	41.872	43.116	1.245	7.0	1.408	0.000	2.9	167.082	Surcharged
Manhole (77)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.900	41.644	43.116	1.472	4.7	1.665	0.000	2.8	142.852	Surcharged
Manhole (78)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.500	43.500	43.583	0.083	9.9	0.094	0.000	9.6	6.742	OK
Manhole (79)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.500	43.393	43.490	0.098	11.9	0.111	0.000	11.5	7.745	OK
Manhole (80)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.480	43.294	43.419	0.125	20.1	0.142	0.000	19.1	11.653	OK
Manhole (81)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.110	42.972	43.114	0.142	2.2	0.160	0.000	2.2	74.335	OK
Manhole (82)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.000	42.832	43.114	0.282	6.0	0.319	0.000	6.0	206.211	Surcharged
Manhole (83)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.880	42.677	43.113	0.437	6.0	0.494	0.000	6.0	206.160	Surcharged
Manhole (84)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.500	43.360	43.803	0.443	12.9	0.501	0.000	8.8	5.957	Surcharged
Manhole (85)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.500	43.221	43.769	0.548	22.5	0.620	0.000	18.5	12.292	Surcharged
Manhole (86)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.500	43.160	43.699	0.539	18.9	0.610	0.000	18.4	19.958	Surcharged
Manhole (87)	FEH 2022: 100 years: +45 %: 15 mins: Winter	44.500	43.028	43.561	0.533	35.5	0.603	0.000	32.2	24.386	Surcharged
Manhole (89)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.480	41.430	42.098	0.668	20.0	0.756	0.000	18.4	21.062	Surcharged
Manhole (90)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.200	41.146	41.985	0.839	26.8	0.949	0.000	21.8	16.845	Flood Risk
Manhole (91)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.750	41.085	41.932	0.847	21.8	0.958	0.000	18.0	16.788	Surcharged
Manhole (92)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.690	40.970	41.804	0.835	22.6	0.944	0.000	21.0	19.164	Surcharged
Manhole (93)	FEH 2022: 100 years: +45 %: 15 mins: Winter	43.110	40.852	41.625	0.773	21.0	0.874	0.000	22.2	19.106	Surcharged
Manhole (94)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.650	41.193	41.368	0.175	10.5	0.198	0.000	8.2	4.828	Surcharged
Manhole (95)	FEH 2022: 100 years: +45 %: 15 mins: Summer	42.200	41.030	41.092	0.062	6.6	0.070	0.000	6.4	2.879	OK
Manhole (96)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.200	40.881	41.069	0.188	7.4	0.213	0.000	7.1	6.954	Surcharged

Manhole (97)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.180	40.725	41.044	0.319	12.6	0.361	0.000	11.9	14.694	Surcharged
Manhole (98)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.200	40.675	41.011	0.336	11.9	0.380	0.000	11.3	14.664	Surcharged
Manhole (99)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.190	40.549	40.950	0.401	20.6	0.454	0.000	20.0	26.764	Surcharged
Manhole (100)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.260	40.423	40.766	0.343	27.2	0.388	0.000	27.8	24.563	Surcharged
Manhole (101)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.790	40.834	0.044	3.8	0.050	0.000	3.8	2.612	OK
Manhole (102)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.674	40.809	0.135	7.5	0.153	0.000	6.3	5.620	OK
Manhole (103)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.572	40.797	0.225	9.0	0.255	0.000	8.2	7.375	Surcharged
Manhole (104)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.200	40.150	40.440	0.290	3.5	0.328	0.000	4.2	4.008	Surcharged
Manhole (105)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.480	39.886	40.424	0.538	8.8	0.608	0.000	8.7	8.296	Surcharged
Manhole (106)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.600	39.852	40.411	0.559	10.9	0.633	0.000	12.0	11.127	Surcharged
Manhole (107)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.700	39.620	40.315	0.695	17.3	0.787	0.000	19.1	17.406	Surcharged
Manhole (108)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.650	39.469	40.156	0.687	21.9	0.777	0.000	24.7	21.082	Surcharged
Manhole (109)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.200	40.150	40.276	0.126	2.1	0.143	0.000	3.5	2.426	OK
Manhole (110)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.200	40.008	40.269	0.261	7.5	0.296	0.000	8.1	6.675	Surcharged
Manhole (111)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.200	39.768	40.220	0.452	8.1	0.511	0.000	9.9	6.722	Surcharged
Manhole (112)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.190	39.713	40.198	0.485	11.7	0.549	0.000	13.7	9.820	Surcharged
Manhole (113)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.200	39.465	40.065	0.600	13.7	0.679	0.000	16.6	9.999	Surcharged
Manhole (114)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.190	40.140	40.176	0.036	2.4	0.041	0.000	2.4	4.350	OK
Manhole (115)	FEH 2022: 100 years: +45 %: 60 mins: Winter	41.200	40.040	40.090	0.050	4.5	0.057	0.000	4.5	11.683	OK
Manhole (116)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.440	40.390	40.474	0.084	10.8	0.095	0.000	10.5	5.003	OK
Manhole (117)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.180	40.243	40.375	0.132	12.5	0.150	0.000	12.0	5.893	OK
Manhole (118)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.120	40.134	40.365	0.231	12.0	0.262	0.000	11.5	5.886	Surcharged
Manhole (119)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.120	40.009	40.350	0.341	11.5	0.386	0.000	10.5	5.888	Surcharged
Manhole (120)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.080	39.979	40.343	0.365	14.3	0.412	0.000	10.3	7.665	Surcharged
Manhole (121)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.080	39.827	40.309	0.482	13.8	0.545	0.000	11.4	9.269	Surcharged

Manhole (122)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.940	39.675	40.260	0.585	16.3	0.662	0.000	14.0	13.057	Surcharged
Manhole (123)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.970	39.467	40.138	0.672	19.1	0.760	0.000	20.8	18.422	Surcharged
Manhole (124)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.130	39.100	40.000	0.900	20.9	1.018	0.000	22.4	19.979	Flood Risk
Manhole (125)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.020	38.750	39.791	1.041	18.2	1.178	0.000	17.4	117.040	Flood Risk
Manhole (126)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.040	39.660	40.142	0.482	3.8	0.545	0.000	3.6	2.404	Surcharged
Manhole (127)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.150	39.310	39.918	0.608	10.4	0.688	0.000	7.7	7.481	Flood Risk
Manhole (128)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.150	39.201	39.894	0.693	9.1	0.784	0.000	10.7	9.083	Flood Risk
Manhole (129)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.150	39.100	39.852	0.752	12.1	0.850	0.000	14.1	11.563	Flood Risk
Manhole (130)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.150	39.011	39.797	0.786	5.5	0.889	0.000	5.6	35.139	Surcharged
Manhole (131)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.040	38.894	39.793	0.899	6.0	1.017	0.000	5.3	35.482	Flood Risk
Manhole (132)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.500	39.450	40.177	0.727	4.7	0.822	0.000	4.8	3.754	Surcharged
Manhole (133)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.490	39.349	40.171	0.822	12.9	0.929	0.000	9.2	9.641	Surcharged
Manhole (134)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.480	39.219	40.139	0.920	9.2	1.041	0.000	10.6	9.526	Surcharged
Manhole (135)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.490	39.112	40.096	0.984	12.1	1.113	0.000	13.6	12.104	Surcharged
Manhole (136)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.480	38.995	40.022	1.027	16.9	1.161	0.000	18.5	16.404	Surcharged
Manhole (137)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.760	38.836	39.846	1.010	28.2	1.143	0.000	30.0	25.209	Surcharged
Manhole (138)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.980	40.980	41.002	0.022	2.2	0.024	0.000	2.1	3.857	OK
Manhole (139)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.780	39.703	39.868	0.166	4.9	0.187	0.000	7.1	5.013	Surcharged
Manhole (140)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.000	38.930	39.818	0.888	8.1	1.004	0.000	5.6	5.341	Flood Risk
Manhole (141)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.000	38.807	39.810	1.004	5.8	1.135	0.000	5.3	22.496	Flood Risk
Manhole (142)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.000	38.737	39.808	1.072	6.8	1.212	0.000	6.3	28.032	Flood Risk
Manhole (143)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.000	38.622	39.804	1.182	8.3	1.336	0.000	7.9	35.144	Flood Risk
Manhole (144)	FEH 2022: 100 years: +45 %: 240 mins: Winter	40.000	38.429	39.792	1.363	8.3	1.542	0.000	8.1	61.078	Flood Risk
Manhole (145)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.560	39.510	39.666	0.156	1.1	0.177	0.000	0.1	0.309	Surcharged
Manhole (146)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.580	39.417	39.666	0.250	2.1	0.282	0.000	1.8	1.145	Surcharged

Manhole (147)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.500	39.193	39.667	0.474	2.8	0.536	0.000	2.9	8.227	Surcharged
Manhole (148)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.310	38.960	39.667	0.707	2.9	0.799	0.000	3.6	9.346	Surcharged
Manhole (149)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.460	43.320	43.711	0.391	3.9	0.442	0.000	1.2	1.287	Surcharged
Manhole (150)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.520	43.142	43.710	0.568	4.0	0.643	0.000	4.4	2.283	Surcharged
Manhole (151)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.490	42.930	43.709	0.779	12.3	0.881	0.000	11.0	18.049	Surcharged
Manhole (152)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.370	42.639	43.662	1.023	14.4	1.157	0.000	15.0	25.936	Surcharged
Manhole (153)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.270	42.395	43.562	1.167	33.4	1.320	0.000	34.6	63.892	Surcharged
Manhole (154)	FEH 2022: 100 years: +45 %: 30 mins: Winter	43.130	41.910	42.845	0.935	41.9	1.057	0.000	39.8	78.947	Flood Risk
Manhole (155)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.620	40.240	41.130	0.890	60.7	1.006	0.000	59.4	106.722	Surcharged
Manhole (156)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.650	39.900	40.667	0.767	103.0	0.868	0.000	102.0	171.092	Surcharged
Manhole (157)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.570	39.743	40.224	0.481	112.1	0.544	0.000	110.9	180.275	Surcharged
Manhole (158)	FEH 2022: 100 years: +45 %: 60 mins: Winter	41.000	39.294	40.096	0.802	107.2	0.908	0.000	105.6	260.137	Surcharged
Manhole (159)	FEH 2022: 100 years: +45 %: 60 mins: Winter	40.710	39.199	40.025	0.826	110.4	0.935	0.000	108.5	268.522	Surcharged
Manhole (160)	FEH 2022: 100 years: +45 %: 60 mins: Winter	40.350	38.903	39.880	0.977	128.7	1.105	0.000	125.7	315.725	Surcharged
Manhole (161)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.240	38.683	39.818	1.135	110.1	1.284	0.000	106.2	401.155	Surcharged
Manhole (162)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.340	38.305	39.753	1.448	114.6	1.638	0.000	114.0	427.475	Surcharged
Manhole (163)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.290	38.027	39.696	1.669	131.0	1.887	0.000	129.9	486.250	Surcharged
Manhole (164)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.370	43.120	43.849	0.729	13.9	0.824	0.000	11.3	20.313	Surcharged
Manhole (165)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.000	42.852	43.775	0.923	11.3	1.044	0.000	10.6	20.260	Flood Risk
Manhole (166)	FEH 2022: 100 years: +45 %: 30 mins: Winter	44.320	42.719	43.734	1.015	15.3	1.148	0.000	15.1	28.882	Surcharged
Manhole (167)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.680	40.570	41.209	0.639	10.9	0.723	0.000	9.5	13.360	Surcharged
Manhole (168)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.580	40.393	41.164	0.771	12.8	0.872	0.000	12.3	19.257	Surcharged
Manhole (169)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.110	41.000	41.142	0.142	3.2	0.160	0.000	3.1	1.459	OK
Manhole (170)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.916	41.140	0.224	17.4	0.253	0.000	15.4	9.060	Surcharged
Manhole (171)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.080	40.691	41.101	0.410	15.4	0.463	0.000	11.8	10.274	Surcharged

Manhole (172)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.040	40.565	41.046	0.481	19.5	0.543	0.000	18.6	17.107	Surcharged
Manhole (173)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.030	40.389	40.913	0.524	32.4	0.593	0.000	29.3	26.052	Surcharged
Manhole (174)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.060	40.218	40.861	0.643	35.7	0.727	0.000	32.7	29.514	Surcharged
Manhole (175)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.080	40.157	40.828	0.671	35.6	0.758	0.000	32.7	30.739	Surcharged
Manhole (176)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.800	40.045	40.771	0.726	40.6	0.821	0.000	41.9	37.762	Surcharged
Manhole (177)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.912	41.104	0.192	0.0	0.218	0.000	1.0	0.344	Surcharged
Manhole (178)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.100	40.761	41.103	0.342	5.4	0.387	0.000	2.4	1.571	Surcharged
Manhole (179)	FEH 2022: 100 years: +45 %: 30 mins: Winter	42.070	41.020	41.049	0.029	2.3	0.033	0.000	2.3	4.130	OK
Manhole (180)	FEH 2022: 100 years: +45 %: 15 mins: Winter	42.090	40.695	40.800	0.105	5.1	0.119	0.000	7.7	5.813	OK
Manhole (181)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.700	40.650	40.680	0.030	1.8	0.034	0.000	1.7	0.817	OK
Manhole (182)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.700	40.517	40.555	0.038	2.8	0.043	0.000	2.6	1.324	OK
Manhole (183)	FEH 2022: 100 years: +45 %: 15 mins: Summer	41.680	40.374	40.415	0.041	4.9	0.047	0.000	4.8	2.176	OK
Manhole (184)	FEH 2022: 100 years: +45 %: 30 mins: Winter	41.680	40.630	40.671	0.041	3.0	0.046	0.000	3.0	4.856	OK
Manhole (185)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.650	40.532	40.583	0.052	3.8	0.059	0.000	3.6	3.151	OK
Manhole (186)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.570	40.496	40.558	0.062	6.7	0.070	0.000	6.5	4.531	OK
Manhole (187)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.470	40.356	40.430	0.074	9.0	0.084	0.000	8.6	7.355	OK
Manhole (188)	FEH 2022: 100 years: +45 %: 15 mins: Winter	41.190	40.202	40.267	0.065	12.3	0.074	0.000	12.0	8.989	OK
Manhole (189)	FEH 2022: 100 years: +45 %: 15 mins: Winter	40.980	39.910	39.975	0.065	16.2	0.074	0.000	15.8	13.833	OK
Manhole (190)	FEH 2022: 100 years: +45 %: 60 mins: Winter	41.120	40.100	40.137	0.037	2.4	0.042	0.000	2.4	6.305	OK
Manhole (191)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.620	39.300	39.860	0.560	5.9	0.633	0.000	5.9	21.446	Surcharged
Manhole (192)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.530	39.480	39.778	0.298	3.2	0.337	0.000	3.2	11.737	Surcharged
Manhole (193)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.520	39.348	39.775	0.427	7.0	0.483	0.000	7.0	24.992	Surcharged
Manhole (194)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.530	39.100	39.759	0.659	10.7	0.745	0.000	10.7	38.432	Surcharged
Manhole (195)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.360	38.954	39.735	0.781	12.5	0.884	0.000	12.5	46.082	Surcharged
Manhole (196)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.310	39.260	39.700	0.440	4.3	0.498	0.000	4.3	15.133	Surcharged

Manhole (197)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.260	39.210	39.740	0.530	2.5	0.599	0.000	2.5	9.336	Surcharged
Manhole (198)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.290	39.119	39.738	0.620	3.7	0.701	0.000	3.7	13.487	Surcharged
Manhole (199)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.250	38.920	39.736	0.816	5.8	0.922	0.000	4.6	17.047	Surcharged
Manhole (200)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.310	38.761	39.731	0.970	7.0	1.097	0.000	6.0	25.746	Surcharged
Manhole (201)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.340	38.645	39.723	1.078	7.5	1.219	0.000	7.3	29.980	Surcharged
Manhole (202)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.360	38.607	39.718	1.112	8.8	1.257	0.000	8.7	36.937	Surcharged
Manhole (203)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.360	38.442	39.696	1.254	10.2	1.418	0.000	9.2	43.595	Surcharged
Manhole (204)	FEH 2022: 100 years: +45 %: 120 mins: Winter	40.270	38.296	39.666	1.370	10.2	1.550	0.000	9.5	46.167	Surcharged
Manhole (53a)	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.650	42.754	44.376	1.622	3.1	1.835	0.000	3.0	75.639	Flood Risk

Project: University of Manchester Campus	Date: 13/02/2025		
	Designed by: Nour Rashdan	Checked by: Johnny Hunt	Approved By: Pedro Vicente
Report Details: Type: Stormwater Controls Summary Storm Phase: Full Site	Company Address: 20 Market Street Altrincham WA14 1PF		

FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank 5	FEH 2022: 2 years: +0 %: 120 mins: Winter	38.560	38.560	0.084	0.084	15.7	22.942	0.000	0.000	5.6	18.189	91.631	OK
Swale (3)	FEH 2022: 2 years: +0 %: 15 mins: Summer	39.515	39.500	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Swale (4)	FEH 2022: 2 years: +0 %: 15 mins: Summer	39.525	39.500	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Swale (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	42.410	42.400	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Tank 3	FEH 2022: 2 years: +0 %: 1440 mins: Winter	41.675	41.675	0.472	0.472	5.0	128.339	0.000	0.000	3.7	92.023	52.920	OK
Swale (2)	FEH 2022: 2 years: +0 %: 15 mins: Winter	42.447	42.420	0.027	0.020	5.3	0.985	0.000	0.000	3.5	2.579	98.534	OK
Tank 1	FEH 2022: 2 years: +0 %: 960 mins: Winter	42.571	42.571	0.591	0.591	5.6	101.080	0.000	0.000	3.5	94.997	60.749	OK
Tank 2	FEH 2022: 2 years: +0 %: 960 mins: Winter	42.571	42.571	0.291	0.291	3.5	13.830	0.000	0.000	0.4	6.398	71.613	OK
Tank 6	FEH 2022: 2 years: +0 %: 240 mins: Winter	38.293	38.293	0.442	0.442	53.7	117.641	0.000	0.000	42.5	455.419	55.898	OK
Swale (5)	FEH 2022: 2 years: +0 %: 15 mins: Summer	38.958	38.930	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (4)	FEH 2022: 2 years: +0 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (3)	FEH 2022: 2 years: +0 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (2)	FEH 2022: 2 years: +0 %: 15 mins: Summer	43.835	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	43.983	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Tank 4	FEH 2022: 2 years: +0 %: 120 mins: Winter	38.567	38.567	0.045	0.045	3.7	4.448	0.000	0.000	1.0	3.416	95.567	OK

Project: University of Manchester Campus	Date: 13/02/2025		
	Designed by: Nour Rashdan	Checked by: Johnny Hunt	Approved By: Pedro Vicente
Report Details: Type: Stormwater Controls Summary Storm Phase: Full Site	Company Address: 20 Market Street Altrincham WA14 1PF		

FEH 2022: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank 5	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.211	39.211	0.735	0.735	78.6	200.995	0.000	0.000	21.0	112.471	26.677	OK
Swale (3)	FEH 2022: 30 years: +40 %: 15 mins: Summer	39.515	39.500	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Swale (4)	FEH 2022: 30 years: +40 %: 15 mins: Winter	39.525	39.508	0.000	0.008	0.0	0.132	0.000	0.000	0.4	0.189	99.736	OK
Swale (1)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.886	42.886	0.476	0.486	3.9	28.473	0.000	0.000	0.7	28.460	5.090	OK
Tank 3	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.884	42.884	1.681	1.681	12.4	272.442	0.000	0.000	3.2	82.257	0.057	OK
Swale (2)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.884	42.884	0.464	0.484	3.9	36.896	0.000	0.000	1.2	66.741	45.096	OK
Tank 1	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.807	43.807	1.827	1.827	9.2	256.872	0.000	0.000	3.0	264.171	0.252	OK
Tank 2	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.807	43.807	1.527	1.527	6.6	48.018	0.000	0.000	0.7	36.674	1.440	OK
Tank 6	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.145	39.145	1.294	1.294	142.4	266.373	0.000	0.000	62.9	572.230	0.141	OK
Swale (5)	FEH 2022: 30 years: +40 %: 120 mins: Winter	38.966	38.966	0.008	0.036	3.9	6.224	0.000	0.000	2.6	5.798	97.271	OK
Porous Paving (4)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (3)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (2)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.835	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (1)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.983	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Tank 4	FEH 2022: 30 years: +40 %: 240 mins: Winter	39.140	39.140	0.618	0.618	10.5	61.656	0.000	0.000	6.3	59.543	38.546	OK

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Stormwater Controls Summary Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

FEH 2022: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank 5	FEH 2022: 100 years: +45 %: 240 mins: Winter	39.780	39.780	1.304	1.304	88.8	273.985	0.000	0.000	23.7	266.153	0.051	OK
Swale (3)	FEH 2022: 100 years: +45 %: 240 mins: Winter	39.677	39.677	0.162	0.177	7.0	15.908	0.000	0.000	6.2	15.857	72.092	OK
Swale (4)	FEH 2022: 100 years: +45 %: 120 mins: Winter	39.766	39.766	0.241	0.266	17.3	19.152	0.000	0.000	15.1	19.134	61.696	OK
Swale (1)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.117	43.117	0.707	0.717	6.9	48.720	18.717	0.000	1.1	41.955	-62.400	Flood
Tank 3	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.114	43.114	1.911	1.911	16.5	276.163	3.516	0.000	5.8	96.270	-1.308	Flood
Swale (2)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.114	43.114	0.694	0.714	7.6	67.762	0.875	0.000	1.6	94.376	-0.836	Flood
Tank 1	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.367	44.367	2.387	2.387	18.9	257.403	0.000	0.000	4.3	179.512	0.045	OK
Tank 2	FEH 2022: 100 years: +45 %: 960 mins: Winter	44.367	44.367	2.087	2.087	9.2	48.550	0.000	0.000	0.5	5.765	0.349	OK
Tank 6	FEH 2022: 100 years: +45 %: 120 mins: Winter	39.628	39.628	1.777	1.777	171.3	274.060	7.255	0.000	83.0	649.824	-2.741	Flood
Swale (5)	FEH 2022: 100 years: +45 %: 240 mins: Winter	39.095	39.095	0.137	0.165	8.4	44.683	0.000	0.000	5.5	43.829	80.406	OK
Porous Paving (4)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.892	44.363	0.008	0.483	3.1	16.824	0.000	0.000	0.6	10.864	67.796	OK
Porous Paving (3)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	43.887	44.362	0.002	0.482	3.5	21.514	0.000	0.000	0.8	14.289	70.238	OK
Porous Paving (2)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.048	44.473	0.214	0.643	3.8	42.147	4.799	0.000	0.9	21.183	31.944	Flood
Porous Paving (1)	FEH 2022: 100 years: +45 %: 1440 mins: Winter	44.665	44.665	0.682	0.835	5.5	49.027	28.718	0.000	4.1	42.569	-141.452	Flood
Tank 4	FEH 2022: 100 years: +45 %: 240 mins: Winter	39.676	39.676	1.154	1.154	20.2	99.932	0.000	0.000	7.0	83.435	0.394	OK

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Outfall Details Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

Kennedy Redford

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Manhole (29)	Fixed Surcharged Level	☑	38.540	
FEH 2022 : 2 years: +0 %: 15 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 15 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 15 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 15 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 15 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 15 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 30 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 30 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 30 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 30 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 30 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 30 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 60 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 60 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 60 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 60 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 60 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 60 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 120 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 120 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 120 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 120 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 120 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 120 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 240 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 240 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 240 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 240 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 240 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 240 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 360 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 360 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 360 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 360 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 360 mins: Summer			38.540	

FEH 2022 : 100 years: +45 %: 360 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 480 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 480 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 480 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 480 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 480 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 480 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 960 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 960 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 960 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 960 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 960 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 960 mins: Winter			38.540	
FEH 2022 : 2 years: +0 %: 1440 mins: Summer			38.540	
FEH 2022 : 2 years: +0 %: 1440 mins: Winter			38.540	
FEH 2022 : 30 years: +40 %: 1440 mins: Summer			38.540	
FEH 2022 : 30 years: +40 %: 1440 mins: Winter			38.540	
FEH 2022 : 100 years: +45 %: 1440 mins: Summer			38.540	
FEH 2022 : 100 years: +45 %: 1440 mins: Winter			38.540	

Project:	Date:		
University of Manchester Campus	13/02/2025		
	Designed by:	Checked by:	Approved By:
	Nour Rashdan	Johnny Hunt	Pedro Vicente
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Full Site	20 Market Street Altrincham WA14 1PF		

FEH 2022: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole (1a)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.570	43.480	43.808	0.328	0.7	0.371	0.000	0.7	23.524	Surcharged
Manhole (1)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	43.285	43.808	0.523	1.2	0.591	0.000	1.2	42.261	Surcharged
Manhole (2)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.620	43.116	43.808	0.692	1.4	0.783	0.000	1.4	46.391	Surcharged
Manhole (3)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	43.034	43.807	0.774	1.9	0.875	0.000	1.9	63.973	Surcharged
Manhole (4)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.630	42.843	43.808	0.965	1.9	1.091	0.000	1.9	65.321	Surcharged
Manhole (5)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.730	42.597	43.808	1.211	2.9	1.369	0.000	2.7	100.066	Surcharged
Manhole (6)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.580	42.519	43.807	1.289	3.4	1.457	0.000	3.4	127.709	Surcharged
Manhole (7)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	42.204	43.808	1.604	7.0	1.814	0.000	5.5	296.688	Surcharged
Manhole (8)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	41.978	43.807	1.829	8.1	2.069	0.000	3.8	562.528	Surcharged
Manhole (9)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.450	41.749	42.895	1.146	4.3	1.296	0.000	4.3	476.917	Surcharged
Manhole (10)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	41.689	42.893	1.204	5.0	1.361	0.000	5.0	507.068	Surcharged
Manhole (11)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.790	41.395	42.886	1.491	9.3	1.686	0.000	9.2	680.343	Surcharged
Manhole (12)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.380	41.203	42.884	1.681	10.4	1.901	0.000	4.9	813.174	Surcharged
Manhole (13)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.020	41.118	42.877	1.759	4.9	1.990	0.000	4.9	647.605	Flood Risk
Manhole (14)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.700	40.694	41.100	0.406	28.5	0.459	0.000	26.5	23.733	Surcharged
Manhole (15)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.240	40.250	40.345	0.095	56.1	0.107	0.000	55.9	46.299	OK
Manhole (16)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.360	38.965	39.818	0.853	90.2	0.965	0.000	93.4	73.275	Surcharged
Manhole (17)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.150	38.735	39.713	0.978	102.3	1.106	0.000	105.4	85.727	Surcharged
Manhole (18)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.980	38.354	39.524	1.170	149.5	1.323	0.000	138.1	114.799	Surcharged
Manhole (19)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.340	38.315	39.504	1.189	163.8	1.345	0.000	43.3	119.622	Surcharged
Manhole (20)	FEH 2022: 30 years: +40 %: 15 mins: Winter	39.980	38.243	39.501	1.258	47.3	1.422	0.000	38.4	48.748	Surcharged

Manhole (21)	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.750	38.177	39.494	1.317	33.3	1.490	0.000	33.5	300.211	Flood Risk
Manhole (22)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.101	39.496	1.395	34.5	1.577	0.000	33.7	301.675	Surcharged
Manhole (23)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.260	38.064	39.496	1.433	34.0	1.620	0.000	34.1	301.145	Surcharged
Manhole (24)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.320	38.009	39.497	1.488	34.4	1.683	0.000	34.5	305.024	Surcharged
Manhole (25)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.200	37.957	39.498	1.541	35.3	1.743	0.000	35.4	309.144	Surcharged
Manhole (26)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.210	37.913	39.499	1.586	116.4	1.793	0.000	116.1	654.385	Surcharged
Manhole (27)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.100	37.851	39.493	1.642	124.1	1.857	0.000	123.6	664.311	Surcharged
Manhole (28)	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.600	37.824	39.481	1.657	60.2	1.874	0.000	60.6	415.314	Flood Risk
Manhole (29)	FEH 2022: 30 years: +40 %: 15 mins: Summer	39.580	37.640	38.540	0.900	0.0	0.000	0.000	0.0	0.000	OK
Manhole (30)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.780	43.350	43.808	0.458	0.4	0.518	0.000	0.5	15.274	Surcharged
Manhole (31)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.970	43.808	0.838	0.6	0.947	0.000	0.6	19.269	Surcharged
Manhole (32)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	42.774	43.808	1.034	0.8	1.169	0.000	0.8	27.683	Surcharged
Manhole (33)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.760	43.410	43.808	0.398	0.7	0.450	0.000	0.7	22.656	Surcharged
Manhole (34)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.780	43.251	43.808	0.557	1.3	0.630	0.000	1.3	42.896	Surcharged
Manhole (35)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.740	43.094	43.808	0.714	1.6	0.808	0.000	1.6	53.528	Surcharged
Manhole (36)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.800	43.033	43.808	0.775	1.9	0.877	0.000	1.9	66.062	Surcharged
Manhole (37)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.800	42.872	43.808	0.936	2.1	1.059	0.000	2.1	73.381	Surcharged
Manhole (38)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.720	42.736	43.808	1.072	2.1	1.212	0.000	2.0	73.380	Surcharged
Manhole (39)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.560	42.535	43.808	1.273	3.8	1.440	0.000	3.7	133.802	Surcharged
Manhole (40)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.800	43.750	43.814	0.064	13.8	0.073	0.000	13.6	7.716	OK
Manhole (41)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.710	43.097	43.808	0.711	1.1	0.804	0.000	1.1	37.401	Surcharged
Manhole (42)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.550	43.500	43.808	0.308	0.2	0.349	0.000	0.2	7.799	Surcharged
Manhole (43)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	43.270	43.808	0.538	0.6	0.609	0.000	0.6	21.043	Surcharged
Manhole (44)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.630	43.108	43.808	0.700	1.0	0.792	0.000	1.0	35.357	Surcharged
Manhole (45)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	42.911	43.808	0.897	1.6	1.015	0.000	1.6	55.312	Surcharged

Manhole (46)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	42.850	43.808	0.958	1.9	1.084	0.000	1.8	64.791	Surcharged
Manhole (47)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.640	42.641	43.808	1.167	2.2	1.320	0.000	2.1	76.851	Surcharged
Manhole (48)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.520	42.427	43.808	1.381	4.6	1.562	0.000	4.6	169.394	Surcharged
Manhole (49)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.690	43.630	43.808	0.178	0.5	0.201	0.000	0.5	17.605	Surcharged
Manhole (50)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.690	43.304	43.808	0.504	1.1	0.570	0.000	1.1	36.763	Surcharged
Manhole (51)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.710	42.991	43.808	0.817	1.1	0.924	0.000	1.1	36.770	Surcharged
Manhole (52)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	42.905	43.808	0.903	1.1	1.021	0.000	1.1	36.776	Surcharged
Manhole (53)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.620	42.608	43.808	1.200	2.0	1.357	0.000	2.0	72.618	Surcharged
Manhole (54)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	43.450	43.807	0.357	0.4	0.404	0.000	0.4	14.192	Surcharged
Manhole (55)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.550	43.319	43.807	0.488	0.5	0.552	0.000	0.5	15.964	Surcharged
Manhole (56)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.470	43.281	43.807	0.526	0.5	0.595	0.000	0.5	16.128	Surcharged
Manhole (57)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.470	43.107	43.807	0.700	1.2	0.792	0.000	1.2	40.445	Surcharged
Manhole (58)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.490	42.942	43.807	0.865	1.5	0.979	0.000	1.5	50.399	Surcharged
Manhole (59)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.400	42.687	43.807	1.120	1.5	1.267	0.000	1.4	50.420	Surcharged
Manhole (60)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.500	42.329	43.807	1.478	3.3	1.672	0.000	3.2	119.708	Surcharged
Manhole (61)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	43.350	43.808	0.458	0.6	0.518	0.000	0.6	21.552	Surcharged
Manhole (62)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.680	43.239	43.808	0.569	1.2	0.643	0.000	1.2	41.152	Surcharged
Manhole (63)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.700	43.117	43.808	0.691	1.3	0.781	0.000	1.3	45.840	Surcharged
Manhole (64)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.936	43.808	0.872	1.4	0.986	0.000	1.4	49.060	Surcharged
Manhole (65)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.540	42.855	43.808	0.953	2.0	1.077	0.000	2.0	70.284	Surcharged
Manhole (66)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.460	43.410	43.498	0.088	10.4	0.100	0.000	10.2	6.005	OK
Manhole (67)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.450	43.356	43.439	0.083	10.2	0.094	0.000	9.9	5.971	OK
Manhole (68)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.275	43.349	0.074	9.9	0.083	0.000	9.7	5.923	OK
Manhole (69)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.089	43.230	0.141	17.3	0.160	0.000	13.7	9.382	OK
Manhole (70)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.430	42.946	43.136	0.190	15.4	0.215	0.000	14.4	10.140	Surcharged

Manhole (71)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.470	42.847	43.059	0.212	21.6	0.240	0.000	20.5	15.566	Surcharged
Manhole (72)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.590	42.530	42.886	0.356	0.7	0.402	0.000	0.7	23.701	Surcharged
Manhole (73)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.500	42.357	42.886	0.529	1.1	0.598	0.000	1.1	38.604	Surcharged
Manhole (74)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.500	42.200	42.886	0.686	1.6	0.776	0.000	1.6	54.147	Surcharged
Manhole (75)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.440	42.093	42.885	0.793	2.0	0.897	0.000	2.0	68.159	Surcharged
Manhole (76)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.080	41.872	42.885	1.014	4.0	1.147	0.000	2.2	118.195	Surcharged
Manhole (77)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.900	41.644	42.886	1.242	2.8	1.404	0.000	2.2	102.878	Surcharged
Manhole (78)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.500	43.569	0.069	7.6	0.078	0.000	7.4	5.139	OK
Manhole (79)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.393	43.474	0.082	9.1	0.092	0.000	8.8	5.905	OK
Manhole (80)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.480	43.294	43.394	0.100	15.4	0.113	0.000	14.7	8.896	OK
Manhole (81)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.110	42.972	43.071	0.099	20.5	0.112	0.000	19.7	11.506	OK
Manhole (82)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.000	42.832	43.014	0.182	47.5	0.206	0.000	46.1	31.881	OK
Manhole (83)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.880	42.677	42.883	0.207	4.5	0.234	0.000	4.5	153.782	OK
Manhole (84)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.360	43.552	0.192	9.8	0.217	0.000	7.0	4.552	Surcharged
Manhole (85)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.221	43.528	0.307	17.5	0.347	0.000	14.8	9.392	Surcharged
Manhole (86)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.160	43.475	0.316	16.0	0.357	0.000	14.6	10.697	Surcharged
Manhole (87)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.500	43.028	43.383	0.355	28.1	0.401	0.000	26.2	18.617	Surcharged
Manhole (89)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.480	41.430	41.625	0.195	15.1	0.220	0.000	14.1	15.943	Surcharged
Manhole (90)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	41.146	41.565	0.419	20.6	0.474	0.000	17.9	12.852	Surcharged
Manhole (91)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.750	41.085	41.528	0.443	17.9	0.501	0.000	15.5	12.802	Surcharged
Manhole (92)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.690	40.970	41.436	0.467	19.5	0.528	0.000	17.5	14.613	Surcharged
Manhole (93)	FEH 2022: 30 years: +40 %: 15 mins: Winter	43.110	40.852	41.304	0.452	17.5	0.511	0.000	18.9	14.561	Surcharged
Manhole (94)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.650	41.193	41.247	0.054	8.0	0.061	0.000	7.9	3.687	OK
Manhole (95)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	41.030	41.084	0.054	5.3	0.061	0.000	5.2	2.462	OK
Manhole (96)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.200	40.881	40.951	0.070	8.3	0.080	0.000	7.9	3.879	OK

Manhole (97)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.180	40.725	40.844	0.120	13.6	0.135	0.000	11.8	7.574	OK
Manhole (98)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.200	40.675	40.823	0.148	9.7	0.167	0.000	9.4	11.072	OK
Manhole (99)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.190	40.549	40.782	0.233	16.4	0.264	0.000	16.2	20.229	Surcharged
Manhole (100)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.260	40.423	40.661	0.238	22.8	0.269	0.000	22.6	29.064	Surcharged
Manhole (101)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.790	40.829	0.039	2.9	0.044	0.000	2.8	1.991	OK
Manhole (102)	FEH 2022: 30 years: +40 %: 15 mins: Summer	42.100	40.674	40.729	0.055	5.3	0.063	0.000	5.2	3.826	OK
Manhole (103)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.100	40.572	40.679	0.107	7.1	0.122	0.000	6.7	8.925	OK
Manhole (104)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.150	40.189	0.039	3.1	0.044	0.000	3.0	5.436	OK
Manhole (105)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.480	39.886	40.053	0.167	6.7	0.188	0.000	7.9	6.254	Surcharged
Manhole (106)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.600	39.852	40.042	0.190	9.6	0.215	0.000	11.3	8.471	Surcharged
Manhole (107)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.700	39.620	39.955	0.335	15.3	0.379	0.000	17.3	13.261	Surcharged
Manhole (108)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.650	39.469	39.838	0.369	19.4	0.418	0.000	22.0	16.062	Surcharged
Manhole (109)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.150	40.181	0.031	1.8	0.035	0.000	1.8	3.275	OK
Manhole (110)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.008	40.063	0.055	5.6	0.062	0.000	5.5	8.685	OK
Manhole (111)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.200	39.768	39.876	0.108	5.5	0.123	0.000	8.7	5.003	OK
Manhole (112)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.190	39.713	39.861	0.148	10.1	0.167	0.000	12.7	7.305	OK
Manhole (113)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.200	39.465	39.810	0.345	12.7	0.391	0.000	15.3	7.313	Surcharged
Manhole (114)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.190	40.140	40.171	0.031	1.8	0.035	0.000	1.8	3.287	OK
Manhole (115)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.200	40.040	40.083	0.043	3.4	0.048	0.000	3.3	6.091	OK
Manhole (116)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.440	40.390	40.461	0.071	8.3	0.080	0.000	8.0	3.821	OK
Manhole (117)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.180	40.243	40.325	0.082	9.5	0.093	0.000	9.1	4.503	OK
Manhole (118)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.120	40.134	40.214	0.080	9.1	0.091	0.000	8.7	4.498	OK
Manhole (119)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.120	40.009	40.099	0.090	8.7	0.102	0.000	8.3	4.491	OK
Manhole (120)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.080	39.979	40.088	0.109	11.3	0.123	0.000	10.8	5.843	OK
Manhole (121)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.080	39.827	40.059	0.232	13.5	0.262	0.000	12.8	7.063	Surcharged

Manhole (122)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.940	39.675	40.010	0.335	16.6	0.379	0.000	12.9	9.951	Surcharged
Manhole (123)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.970	39.467	39.896	0.430	16.8	0.486	0.000	17.9	13.999	Surcharged
Manhole (124)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.130	39.100	39.773	0.673	18.8	0.762	0.000	20.3	15.273	Surcharged
Manhole (125)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.020	38.750	39.545	0.795	40.5	0.900	0.000	42.9	30.306	Surcharged
Manhole (126)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.040	39.660	39.900	0.240	1.9	0.271	0.000	2.5	1.790	Surcharged
Manhole (127)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.310	39.668	0.358	8.0	0.405	0.000	6.4	5.725	Surcharged
Manhole (128)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.201	39.651	0.450	7.5	0.509	0.000	9.1	6.953	Surcharged
Manhole (129)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.100	39.619	0.519	10.2	0.587	0.000	12.2	8.841	Surcharged
Manhole (130)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.150	39.011	39.567	0.556	12.2	0.629	0.000	14.2	9.215	Surcharged
Manhole (131)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.040	38.894	39.528	0.634	14.2	0.717	0.000	16.4	10.189	Surcharged
Manhole (132)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.500	39.450	39.844	0.394	7.4	0.445	0.000	3.8	2.845	Surcharged
Manhole (133)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.490	39.349	39.838	0.489	9.8	0.553	0.000	8.0	7.342	Surcharged
Manhole (134)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.480	39.219	39.813	0.594	8.0	0.672	0.000	9.7	7.235	Surcharged
Manhole (135)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.490	39.112	39.775	0.663	10.8	0.750	0.000	12.5	9.164	Surcharged
Manhole (136)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.480	38.995	39.708	0.713	15.1	0.807	0.000	16.9	12.477	Surcharged
Manhole (137)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.760	38.836	39.573	0.737	22.2	0.833	0.000	24.4	19.272	Surcharged
Manhole (138)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.980	40.980	40.999	0.019	1.6	0.021	0.000	1.6	2.920	OK
Manhole (139)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.780	39.703	39.729	0.026	3.8	0.030	0.000	3.8	6.803	OK
Manhole (140)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.930	39.588	0.658	6.2	0.744	0.000	4.8	4.099	Surcharged
Manhole (141)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.807	39.577	0.771	6.7	0.872	0.000	8.5	6.961	Surcharged
Manhole (142)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.737	39.557	0.820	9.8	0.928	0.000	11.6	9.382	Surcharged
Manhole (143)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.622	39.502	0.880	13.3	0.995	0.000	15.2	12.259	Surcharged
Manhole (144)	FEH 2022: 30 years: +40 %: 15 mins: Winter	40.000	38.429	39.493	1.064	18.3	1.203	0.000	20.6	16.299	Surcharged
Manhole (145)	FEH 2022: 30 years: +40 %: 15 mins: Summer	40.560	39.510	39.510	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (146)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.580	39.417	39.500	0.083	0.1	0.094	0.000	0.2	0.197	OK

Manhole (147)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.500	39.193	39.500	0.307	1.2	0.347	0.000	1.3	5.391	Surcharged
Manhole (148)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.960	39.499	0.539	5.5	0.609	0.000	1.3	6.129	Surcharged
Manhole (149)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.460	43.320	43.346	0.026	1.2	0.029	0.000	1.2	0.578	OK
Manhole (150)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.520	43.142	43.165	0.023	1.2	0.026	0.000	1.1	0.573	OK
Manhole (151)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.490	42.930	43.075	0.145	12.3	0.164	0.000	11.8	8.119	OK
Manhole (152)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.370	42.639	43.025	0.386	15.0	0.437	0.000	11.9	11.778	Surcharged
Manhole (153)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.270	42.395	42.928	0.533	27.8	0.603	0.000	28.9	28.585	Surcharged
Manhole (154)	FEH 2022: 30 years: +40 %: 30 mins: Winter	43.130	41.910	42.358	0.448	38.0	0.506	0.000	36.7	59.611	Surcharged
Manhole (155)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.620	40.240	40.801	0.561	53.2	0.634	0.000	52.6	80.617	Surcharged
Manhole (156)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.650	39.900	40.419	0.519	91.9	0.587	0.000	91.6	129.285	Surcharged
Manhole (157)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.570	39.743	39.919	0.176	99.2	0.199	0.000	98.0	136.207	OK
Manhole (158)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.000	39.294	39.784	0.490	103.6	0.554	0.000	103.2	142.533	Surcharged
Manhole (159)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.710	39.199	39.663	0.464	69.8	0.524	0.000	69.6	246.135	Surcharged
Manhole (160)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.350	38.903	39.593	0.690	80.8	0.781	0.000	80.9	289.111	Surcharged
Manhole (161)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.240	38.683	39.562	0.879	85.9	0.994	0.000	82.9	306.006	Surcharged
Manhole (162)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.340	38.305	39.532	1.227	89.3	1.387	0.000	88.8	325.173	Surcharged
Manhole (163)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.290	38.027	39.511	1.483	101.8	1.677	0.000	101.2	369.194	Surcharged
Manhole (164)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.370	43.120	43.204	0.084	11.5	0.095	0.000	11.1	9.165	OK
Manhole (165)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.000	42.852	43.097	0.245	11.1	0.277	0.000	10.5	9.071	Surcharged
Manhole (166)	FEH 2022: 30 years: +40 %: 15 mins: Winter	44.320	42.719	43.067	0.348	15.9	0.393	0.000	12.6	12.961	Surcharged
Manhole (167)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.680	40.570	40.855	0.285	8.2	0.323	0.000	7.5	10.110	Surcharged
Manhole (168)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.580	40.393	40.825	0.432	10.1	0.488	0.000	9.7	14.568	Surcharged
Manhole (169)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.110	41.000	41.033	0.033	2.4	0.037	0.000	2.4	1.113	OK
Manhole (170)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.916	41.006	0.090	13.2	0.101	0.000	12.8	6.932	OK
Manhole (171)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.080	40.691	40.788	0.097	13.3	0.110	0.000	11.5	7.400	OK

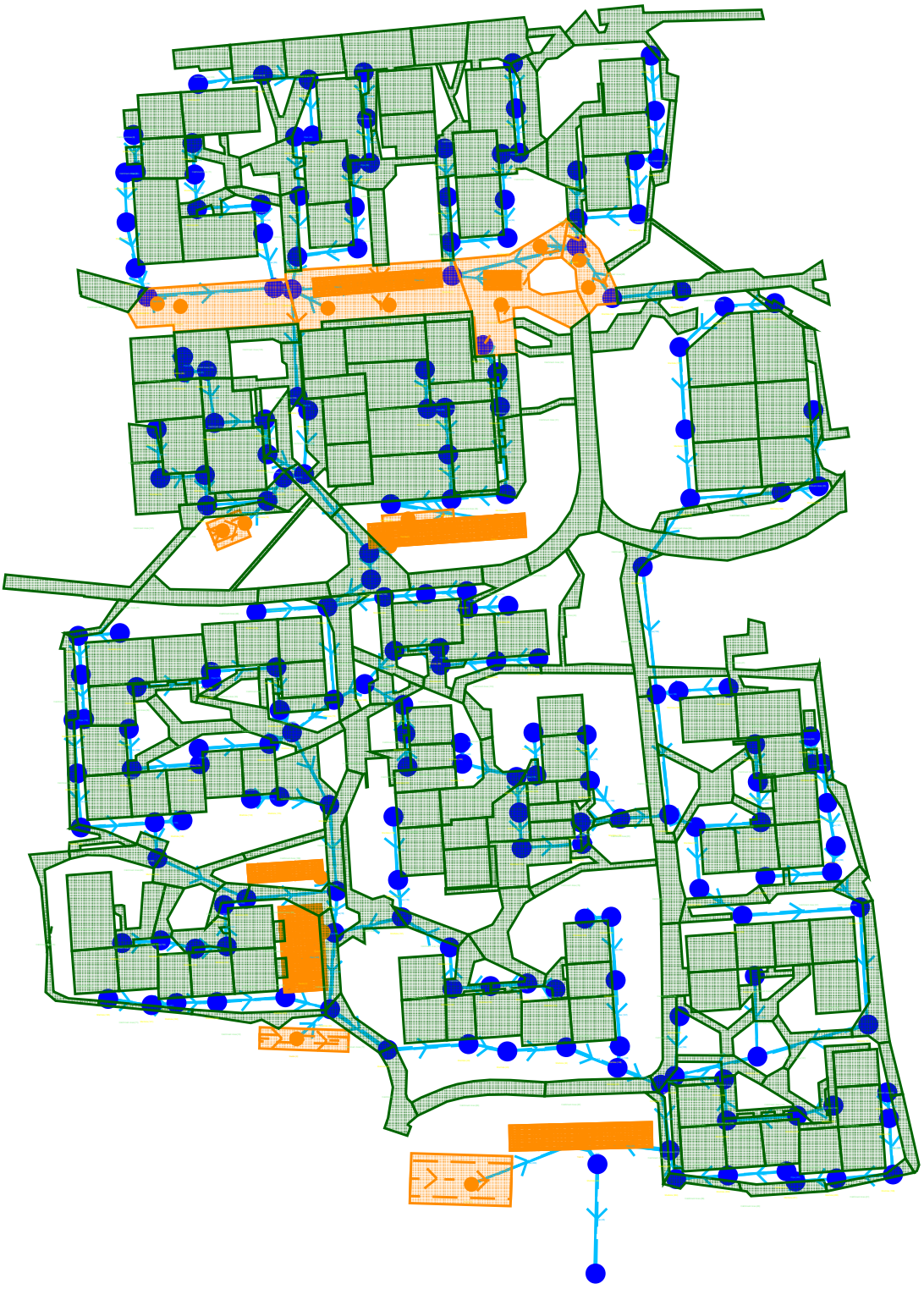
Manhole (172)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.040	40.565	40.757	0.192	20.3	0.217	0.000	19.5	13.006	Surcharged
Manhole (173)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.030	40.389	40.623	0.234	25.6	0.265	0.000	24.7	29.876	Surcharged
Manhole (174)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.060	40.218	40.575	0.357	28.3	0.404	0.000	27.8	33.881	Surcharged
Manhole (175)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.080	40.157	40.546	0.389	29.3	0.440	0.000	28.9	35.185	Surcharged
Manhole (176)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.800	40.045	40.498	0.453	34.9	0.513	0.000	34.6	44.586	Surcharged
Manhole (177)	FEH 2022: 30 years: +40 %: 15 mins: Summer	42.100	40.912	40.912	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (178)	FEH 2022: 30 years: +40 %: 15 mins: Winter	42.100	40.761	40.787	0.026	1.0	0.029	0.000	0.6	0.507	OK
Manhole (179)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.070	41.020	41.045	0.025	1.8	0.029	0.000	1.7	3.122	OK
Manhole (180)	FEH 2022: 30 years: +40 %: 30 mins: Winter	42.090	40.695	40.729	0.034	4.5	0.039	0.000	4.5	8.078	OK
Manhole (181)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.700	40.650	40.676	0.026	1.3	0.029	0.000	1.3	0.619	OK
Manhole (182)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.700	40.517	40.549	0.033	2.1	0.037	0.000	2.0	1.006	OK
Manhole (183)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.680	40.374	40.411	0.037	3.9	0.042	0.000	3.7	1.867	OK
Manhole (184)	FEH 2022: 30 years: +40 %: 30 mins: Winter	41.680	40.630	40.665	0.035	2.3	0.040	0.000	2.3	3.667	OK
Manhole (185)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.650	40.532	40.576	0.044	2.9	0.050	0.000	2.8	2.397	OK
Manhole (186)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.570	40.496	40.549	0.053	5.1	0.060	0.000	4.9	3.446	OK
Manhole (187)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.470	40.356	40.419	0.063	6.8	0.071	0.000	6.6	5.598	OK
Manhole (188)	FEH 2022: 30 years: +40 %: 15 mins: Winter	41.190	40.202	40.257	0.055	9.3	0.063	0.000	9.1	6.842	OK
Manhole (189)	FEH 2022: 30 years: +40 %: 30 mins: Winter	40.980	39.910	39.965	0.056	12.1	0.063	0.000	12.0	18.004	OK
Manhole (190)	FEH 2022: 30 years: +40 %: 60 mins: Winter	41.120	40.100	40.132	0.032	1.8	0.036	0.000	1.8	4.714	OK
Manhole (191)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.620	39.300	39.584	0.284	4.5	0.321	0.000	4.5	16.358	Surcharged
Manhole (192)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.530	39.480	39.549	0.069	2.5	0.078	0.000	2.5	8.937	OK
Manhole (193)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.520	39.348	39.548	0.200	5.3	0.226	0.000	5.3	19.056	Surcharged
Manhole (194)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.530	39.100	39.540	0.440	8.2	0.497	0.000	8.1	29.301	Surcharged
Manhole (195)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.954	39.529	0.575	9.5	0.650	0.000	9.5	35.117	Surcharged
Manhole (196)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	39.260	39.512	0.252	3.3	0.285	0.000	3.3	11.522	Surcharged

Manhole (197)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.260	39.210	39.539	0.329	2.2	0.372	0.000	1.9	7.122	Surcharged
Manhole (198)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.290	39.119	39.538	0.419	2.9	0.474	0.000	2.8	10.107	Surcharged
Manhole (199)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.250	38.920	39.537	0.617	3.5	0.697	0.000	3.5	12.509	Surcharged
Manhole (200)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.310	38.761	39.534	0.774	5.0	0.875	0.000	5.0	18.898	Surcharged
Manhole (201)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.340	38.645	39.530	0.886	6.1	1.002	0.000	5.6	21.890	Surcharged
Manhole (202)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.607	39.528	0.921	7.0	1.042	0.000	6.6	26.973	Surcharged
Manhole (203)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.360	38.442	39.518	1.076	7.8	1.216	0.000	6.5	31.640	Surcharged
Manhole (204)	FEH 2022: 30 years: +40 %: 120 mins: Winter	40.270	38.296	39.503	1.207	7.2	1.365	0.000	6.6	33.221	Surcharged
Manhole (53a)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	44.650	42.754	43.808	1.054	1.9	1.192	0.000	1.8	65.107	Surcharged

Project: University of Manchester Campus	Date: 13/02/2025		
	Designed by: Nour Rashdan	Checked by: Johnny Hunt	Approved By: Pedro Vicente
Report Details: Type: Stormwater Controls Summary Storm Phase: Full Site	Company Address: 20 Market Street Altrincham WA14 1PF		

FEH 2022: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank 5	FEH 2022: 30 years: +40 %: 240 mins: Winter	39.474	39.474	0.998	0.998	68.5	273.032	0.000	0.000	20.1	186.901	0.398	OK
Swale (3)	FEH 2022: 30 years: +40 %: 15 mins: Summer	39.515	39.500	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Swale (4)	FEH 2022: 30 years: +40 %: 15 mins: Winter	39.525	39.508	0.000	0.008	0.0	0.132	0.000	0.000	0.4	0.189	99.736	OK
Swale (1)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.886	42.886	0.476	0.486	3.9	28.476	0.000	0.000	0.7	28.463	5.079	OK
Tank 3	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.884	42.884	1.681	1.681	12.4	272.442	0.000	0.000	3.2	82.312	0.057	OK
Swale (2)	FEH 2022: 30 years: +40 %: 1440 mins: Winter	42.884	42.884	0.464	0.484	3.9	36.901	0.000	0.000	1.2	66.745	45.088	OK
Tank 1	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.807	43.807	1.827	1.827	9.2	256.872	0.000	0.000	3.0	264.348	0.252	OK
Tank 2	FEH 2022: 30 years: +40 %: 1440 mins: Winter	43.808	43.808	1.528	1.528	6.6	48.019	0.000	0.000	0.6	36.675	1.440	OK
Tank 6	FEH 2022: 30 years: +40 %: 120 mins: Winter	39.484	39.484	1.633	1.633	123.6	266.695	0.000	0.000	60.2	436.279	0.020	OK
Swale (5)	FEH 2022: 30 years: +40 %: 240 mins: Winter	39.042	39.041	0.083	0.111	7.2	28.362	0.000	0.000	4.3	28.024	87.563	OK
Porous Paving (4)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (3)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.885	43.880	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (2)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.835	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Porous Paving (1)	FEH 2022: 30 years: +40 %: 15 mins: Summer	43.983	43.830	0.000	0.000	0.0	0.000	0.000	0.000	0.0	0.000	100.000	OK
Tank 4	FEH 2022: 30 years: +40 %: 240 mins: Winter	39.379	39.379	0.857	0.857	14.7	85.486	0.000	0.000	6.1	58.252	14.794	OK



Kennedy Redford

Date: 13/02/2025 00:00:00

Designed by: Nour Rashdan

Checked by: Johnny Hunt

File: SW FEH 2022.iddx

Plot Scale: 1:1800

University of Manchester Campus

InfoDrainage 2025.3.2

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Appendix H

United Utilities correspondence.

Johnny Hunt

Subject: FW: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>
Sent: 17 April 2024 12:42
To: Richard Brown <r.brown@kennedyredford.com>
Subject: RE: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester

Hi Richard,

Thank you for your email, please see below:

UU REF 05526688 – WW PDE – Fallowfield Campus, Manchester

Whilst the surface water culvert is mapped on the public sewer records it is classified as a private asset and therefore the LLFA / LPA will be responsible for accepting flow rates and connections.

Regards

Anthony

United Utilities
Water for the North West

Anthony Laithwaite
Ww Engineer
Developer Services & Metering
Customer Services

M: 07880 298897
unitedutilities.com

---------- Original Message ----------
From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 16/04/2024 15:57
To: r.brown@kennedyredford.com
Subject: RE: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester

Hello Richard

Thank you for requesting a further response I have let Anthony Laithwaite know and he will respond by the 30th April.

Regards

Samantha

---------- Original Message ----------
From: Richard Brown [r.brown@kennedyredford.com]

Sent: 16/04/2024 09:29
To: seweradoptions@uuplc.co.uk
Subject: RE: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester

Morning Anthony,

Thank you for the response. Just to confirm regarding the proposed flow rate, as we are discharging into a culverted water course marked as a UU asset, once we have approval from the LLFA, does UU ultimately approve the flow rate? If so, is UU happy with the proposed flow rate of 309.9 l/s into the culvert?

Regards,

Richard Brown
Principal Engineer | Kennedy Redford

Mobile: +44 (0) 7749 341 564
Email: r.brown@kennedyredford.com
Web: www.kennedyredford.com
Office: 20 Market Street, Altrincham, WA14 1PF

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From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>
Sent: Tuesday, April 2, 2024 1:58 PM
To: Richard Brown <r.brown@kennedyredford.com>
Subject: UU REF 05517107 – WW PDE – Parkhill Avenue, Manchester

Good Afternoon,

Thank you for your WW PDE, please see our response below.

UU REF 05526688 – WW PDE – Fallowfield Campus, Manchester

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 combined sewer system, however I would appreciate

you providing one plan showing the 6 foul proposed points of connection only for our comment

Surface Water

I can see the effort applied here and can confirm we have no objections to the temporary connection with an agreement of turning the flow into the culverted watercourse thus ensuring the whole site is ultimately drained to the watercourse and falls inline with your phasing plan

Please do contact me should you wish to discuss any matters

Regards

Anthony

United Utilities
Water for the North West

Anthony Laithwaite
Ww Engineer
Developer Services & Metering
Customer Services

M: 07880 298897
unitedutilities.com

---------- Original Message ----------
From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 02/04/2024 09:34
To: r.brown@kennedyredford.com
Subject: REF - 05526688 - UoM Fallowfield Pre-development Enquiry

Good Morning

PRE DEVELOPMENT APPLICATION AT: Fallowfield Campus – UU Ref 05526688

Please accept this email as receipt of your application received on 28 March 2024 for the above development. This has now been logged on our system and the job reference is 05526688 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 on or before 11 April 2024.

Kind regards

Jayne Guest
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 0345 072 6067 option 4
unitedutilities.com

---------- Original Message ----------
From: Richard Brown [r.brown@kennedyredford.com]
Sent: 28/03/2024 14:42
To: seweradoptions@uuplc.co.uk
Subject: UoM Fallowfield Pre-development Enquiry

Good afternoon,

Please find attached a pre-development enquiry form for the proposed re-development of the University of Manchester Fallowfield Campus. The supporting documents for this application can be downloaded here: [Image is no longer available] 240328 - Pre-development Enquiry

You have been previously contacted regarding this site by Buro Happold. These emails have been included in the supporting documentation. It was agreed in this correspondence that UU would only comment once a more detailed drainage proposal was available.

The existing site contains University of Manchester student accommodation and supporting facility buildings. Existing foul and surface water from site is discharged via. 6No. combined water connections into UU combined water sewers. These locations can be seen on the Existing Drainage Summary PDF.

The existing roof and external hardstanding areas discharged to the combined sewers. The existing site hardstanding has an area of approximately 4.459 ha. A drawing showing these areas is included in the supporting information. Applying the modified rational method to the existing hardstanding area, with a rainfall intensity of 50mm/hr, generates a peak flow rate of 2.78 x 4.459 x 50 = 619.8 l/s.

A previous site investigation found the presence of made ground across the site to depths of approximately 2.6m. This made ground was found to contain elevated levels of contaminates, meaning infiltration will not be a viable means to dispose of surface water. A summary of the site investigation can be found in the Phase 1 Desk Study within the supporting documents.

A proposed drainage layout has now been developed and is included in the supporting documents. It is proposed that foul water will continue to discharge to 5 No. of the existing combined water connection locations. The peak foul flow rate calculations will be provided once detailed building layouts have been completed.

It is proposed that all surface water will be discharged to the culverted Fallowfield Brook to the south of the site. This is shown as being a UU asset on the sewer map. In line with Manchester City Council requirements, it is proposed to apply a 50% betterment to the existing flow rate. Therefore, a peak discharge rate of 309.9 l/s into the existing culvert is proposed.

The development will be constructed in 2 phases, over a period of 1-2 years. The northern blocks will be constructed first, followed by the southern blocks. Due to constraints around existing buildings and root protection zones, a connection to the existing southern culvert can only be made once Phase 2 has commenced. Therefore, it is proposed to construct a temporary surface water connection from chamber SW071 into the existing combined drainage system. It is proposed that this temporary connection will have a peak discharge rate of 100 l/s, representing approximately 1/3rd of the overall peak discharge rate. Once Phase 2 commences, this connection will be removed, and all surface water will discharge via a single flow control into the existing Fallowfield Brook culvert.

Based on the proposals discussed above, could you please comment on the surface water peak flow rate proposals and the phasing/temporary connection proposals.

Regards,

Richard Brown
Principal Engineer | Kennedy Redford

Mobile: +44 (0) 7749 341 564
Email: r.brown@kennedyredford.com
Web: www.kennedyredford.com
O□ice: 20 Market Street, Altrincham, WA14 1PF

[Image is no longer available]

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