Fallowfield Facilities Unit

Flood Risk Assessment and Drainage Strategy

23/06/2026

FFU-WSP-XXX-XX-RP-CV-000001

Quality Control

Issue/revision	Revision P01	Revision P02	Revision P03
Remarks	First Issue		
Date	23/07/2026		
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Project number	UK0045331.9119		
Report number	FFU-WSP-XXX-XX-RP-CV-000001		

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1. Introduction

1.1 Appointment and brief

1.1.1 This report has been prepared by WSP on behalf of The University of Manchester to support the full planning application for the Fallowfield Facilities Unit.

1.1.2 This report is intended for the sole benefit of the parties named above and shall not be capable of assignment. WSP shall not be liable for any use of the report for any reasons other than that for which the report was originally prepared and provided.

1.2 Proposed development

1.2.1 The proposed development is located at Richmond Car Park, Whitworth Lane, Manchester, M14 6YY and comprises the redevelopment of an approximately 0.43 hectare site.

1.2.2 The proposed development comprises the erection of a single-storey, new-build steel portal frame facilities management services building (sui generis use), incorporating maintenance storage, office accommodation and associated staff welfare facilities, together with associated car parking and landscaping.

1.2.3 A significant proportion of the existing hardstanding across the site will be retained as part of the development. In addition, a new concrete service yard will be constructed to the east of the proposed building to accommodate operational plant and associated equipment.

1.3 Objective of study & methodology

1.3.1 The objective of this study is to provide information and present proposals relating to the following:

- An assessment of flood risk to the site, demonstrating the proposed development will be safe for its lifetime, considering the effects of climate change;
- Flood risk mitigation measures to be included within the development proposals;
- Proposed surface water drainage strategy, with due consideration to the drainage hierarchy and the provision of Sustainable Drainage Systems (SuDS); and
- Arrangements for the discharge of foul water from the development.

2. Planning policy & guidance

2.1 National planning policy and guidance documents

National planning policy framework

2.1.1 The National Planning Policy Framework (NPPF) was first published in March 2012 (last updated in December 2024) with the aim of protecting the environment and to promote sustainable growth. There is an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision.

2.1.2 The following paragraphs/policies within the NPPF are considered relevant to this assessment:

2.1.3 *Paragraph 170 states that, "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.*

2.1.4 Paragraph 175 states that, *"The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk)."*

2.1.5 Paragraph 181: Recommends that *"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

a) Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) The development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) It incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) Any residual risk can be safely managed; and

e) Safe access and escape routes are included where appropriate, as part of an agreed emergency plan."

2.1.6 Paragraph 182: Recommends that *"Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce*

volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

a) take account of advice from the Lead Local Flood Authority;

b) have appropriate proposed minimum operational standards;

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.";

Flood Risk and Coastal Change Planning Practice Guidance (PPG)

2.1.7 The NPPF is supported by the National Planning Practice Guidance (PPG). One of the specific guidance documents comprising the PPG focuses on Flood Risk and Coastal Change, providing information on the flooding risks that should be considered during the planning process.

2.1.8 The Flood Risk and Coastal Change PPG states that an FRA must outline the following:

d) Whether a proposed development is likely to be affected by current or future flooding from any source;

e) Whether it will increase flood risk elsewhere; and

f) Whether the measures proposed to deal with these effects and risks are appropriate.

Defra National Standards for Sustainable Drainage Systems (SuDS) (2025)

2.1.9 This document sets out non-statutory technical standards for sustainable drainage systems. It should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance.

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

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

2.1.12 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30-year rainfall event.

2.1.13 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100-year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g., Pumping Station or Electricity Substation) within the development.

2.1.14 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100-year rainfall event is managed in exceedance routes that minimise the risks to people and property.

2.2 Consideration of climate change

Flood Risk Coastal Change Planning Practice Guidance (PPG)

2.2.1 Increased rainfall affects surface water flood risk and how drainage systems are designed. Climate change allowances have been considered based on the 2070s epoch for developments with a lifetime up to 2125.

2.2.2 The site is located within the Upper Mersey Management Catchment on the EA Climate Change Allowances mapping. The contingency allowances for peak rainfall that are applicable to this site are as follows:

2.2.3 Peak Rainfall (Ribble Management Catchment)

- 3.3% AEP Rainfall Event – 2070s Epoch – upper end allowance – 40%; and
- 1% AEP Rainfall Event – 2070s Epoch – upper end allowance – 45%

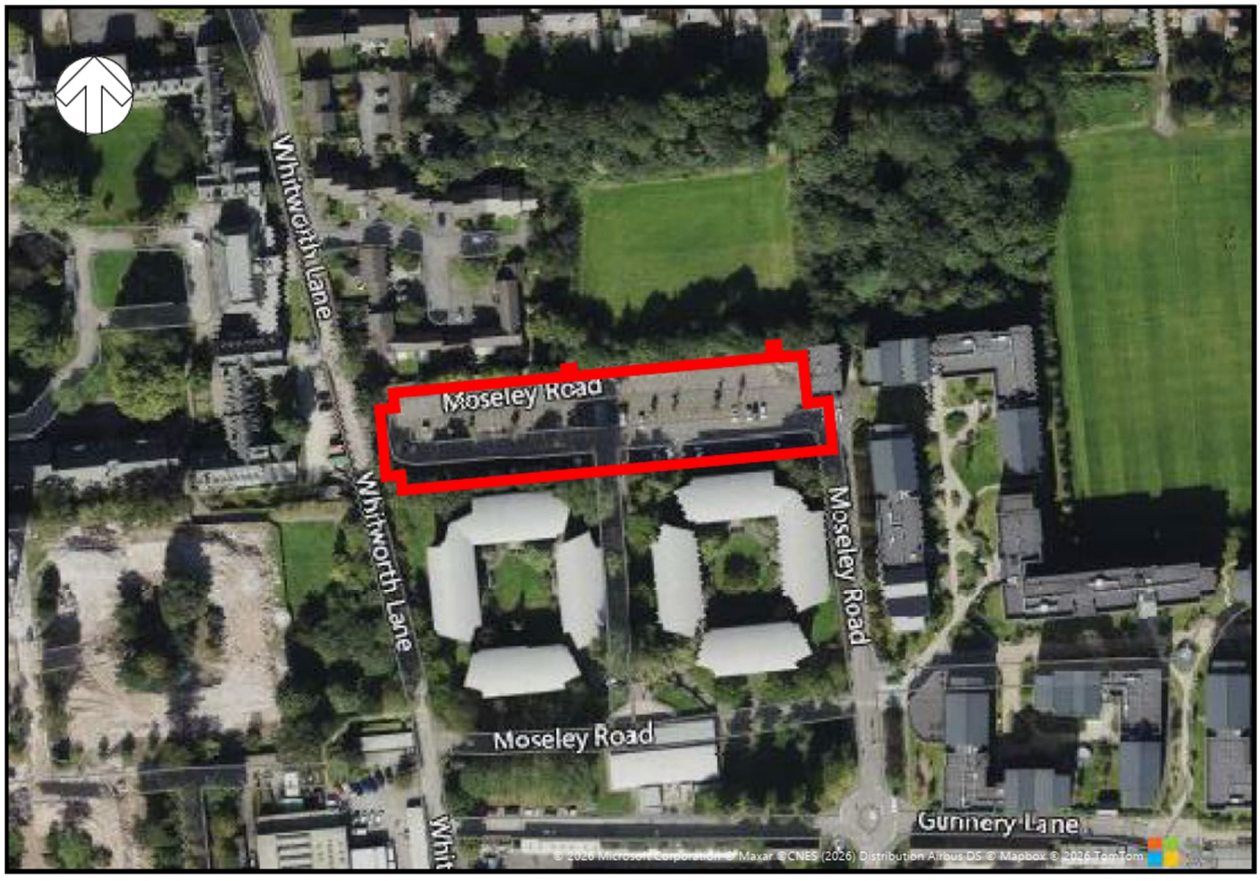
3. Existing site

3.1 Site location

3.1.1 The application site is located at Richmond Car Park, Whitworth Lane, Manchester, M14 6YY, approximately 3.6km south of Manchester City Centre. The site is centred on National Grid Reference 385893, 394340 (Easting, Northing).

3.1.2 The site location and red line boundary is shown in Figure 3-1 below and included in Appendix A.

Figure 3-1 - Indicative site location plan



3.2 Site description

3.2.1 Table 3-1 below describes the general site characteristic:

Table 3-1 - Characteristics of the site

Characteristic	Description
Area	The redline boundary comprises a 0.43 hectare area.
Existing Use	The site is located within the boundary of the existing Richmond Park car park located at the University owned and managed Fallowfield Campus. The car park primarily serves nearby student residences within the Campus, and offers approximately 130 spaces, including disabled car parking bays for neighbouring halls.
Boundaries	The site is bound to the north by an existing residential development and open green space, to the east by Honey Court student accommodation, to the south by Richmond Park student accommodation, and to the west by Whitworth Lane.
Topography	Existing levels across the site fall from south to north, from a level of circa 45.20m AOD to 44.16m AOD
Access	The site is accessed via Chancellors Way, off Mossley Road, Fallowfield.

3.3 Topography

3.3.1 A topographic survey was undertaken by Survey Operations in April 2026.

3.3.2 Existing ground levels across the site generally fall from south to north, from a level of circa 45.20m AOD to 44.16 m AOD. Ground levels also increase towards the north-east corner of the site, where they rise to the threshold level of the electrical substation.

3.3.3 A copy of the topographical survey is included as Appendix B.

3.4 Geology and hydrogeology

3.4.1 Based on the findings of the Ground Investigation Report prepared by Hydrock Consultants Ltd. (Ref. LIMES-HYD-XX-XX-RP-G-2001-P03), ground conditions beneath the site comprise asphalt hardstanding overlying Made Ground, Glacial Till and the Chester Formation bedrock. Made Ground was encountered to depths of approximately 0.4m to 1.65m below ground level (bgl), comprising silty clay and locally granular sandy gravelly fill associated with previous site development. Beneath the Made Ground, Glacial Till extends to depths of approximately 3.65m to 4.70m bgl and comprises soft to firm silty clay near the surface, becoming stiff to very stiff with depth. The underlying Chester Formation was encountered between 3.65m and 4.70m bgl and comprises dense sand.

3.4.2 Groundwater monitoring identified a perched groundwater table at the interface between the Made Ground and Glacial Till, typically between 0.60m and 0.77m bgl. The low permeability nature of the Glacial Till restricts infiltration across the site.

3.4.3 The Glacial Till is classified by the Environment Agency as a Secondary Undifferentiated Aquifer, whilst the underlying Chester Formation is classified as a Principal Aquifer.

3.4.4 The site lies within Groundwater Source Protection Zone (SPZ) 3 (Total Catchment). However, there are no active groundwater abstractions within 1km of the site.

3.5 Existing watercourses, Flood defences and structures

3.5.1 There are no watercourses or waterbodies located within the site boundary. The nearest watercourse is Fallowfield Brook, which is recorded as a brick culverted beneath Moseley Road approximately 400m to the south of the site. The culvert is understood to emerge as an open watercourse approximately 700m south-west of the site.

3.5.2 Additionally, Gore Brook, classified as an ordinary watercourse, is located approximately 400m north of the site, whilst Cringle Black Brook, designated as a Main River, is located approximately 900m to the south.

3.6 Existing drainage

3.6.1 United Utilities public sewer records indicate that there are no public sewers located within the site. The closest public sewers to the site include a 225mm surface water sewer in Whitworth Lane to the west of the site and a 100mm foul water sewer within the residential development to the north of the site. See United Utilities public sewer records in Appendix C.

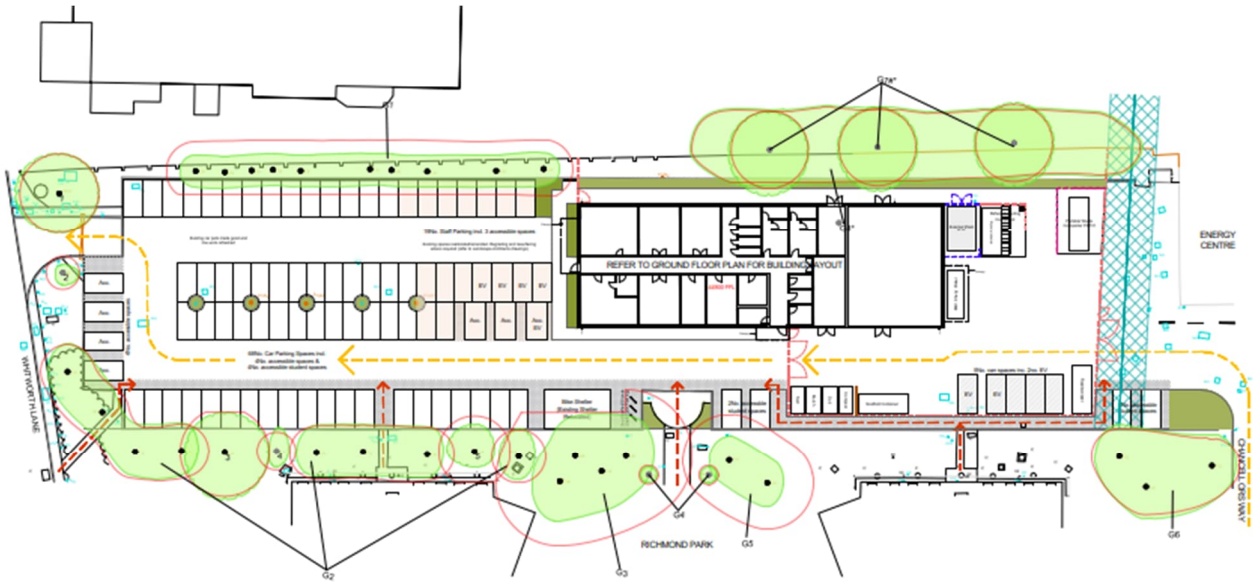
3.6.2 Existing private drainage infrastructure is present to the east of the site and forms part of the wider drainage network serving the adjacent halls of residence development (planning application ref. 110184/FO/2015/S1). The foul water network comprises a 150mm diameter sewer, which currently receives a connection from the electrical substation. The surface water network comprises a 375mm diameter sewer, receiving flows from the electrical substation and an existing channel drain located along the northern boundary of the site. Both networks discharge into the approved drainage system serving the adjacent halls of residence development. See Layer Surveys Ltd utilities survey in Appendix D.

4. The proposed development

4.1 Summary

4.1.1 The proposed development comprises the erection of a single-storey, new-build steel portal frame facilities management services building (sui generis use), incorporating maintenance storage, office accommodation and associated staff welfare facilities, together with associated car parking and landscaping. See the proposed site plan in Figure 4-1.

Figure 4-1 - Architect proposed site plan



5. Flood hazard

5.1 Flood risk

5.1.1 The potential risk of flooding to the site from all current and future sources of flooding has been assessed in accordance with the National Planning Policy Framework.

5.1.2 A detailed assessment the flood risk and associated flood risk ratings are presented in Section 5.2 to 5.6. Table 5-1 below summarises the findings of the assessment. It should be noted that the designation of risk outlined in Table 5-1 is prior to the inclusion of any mitigation measures, which may subsequently act to reduce the risk.

Table 5-1 - Summary of flood risk

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

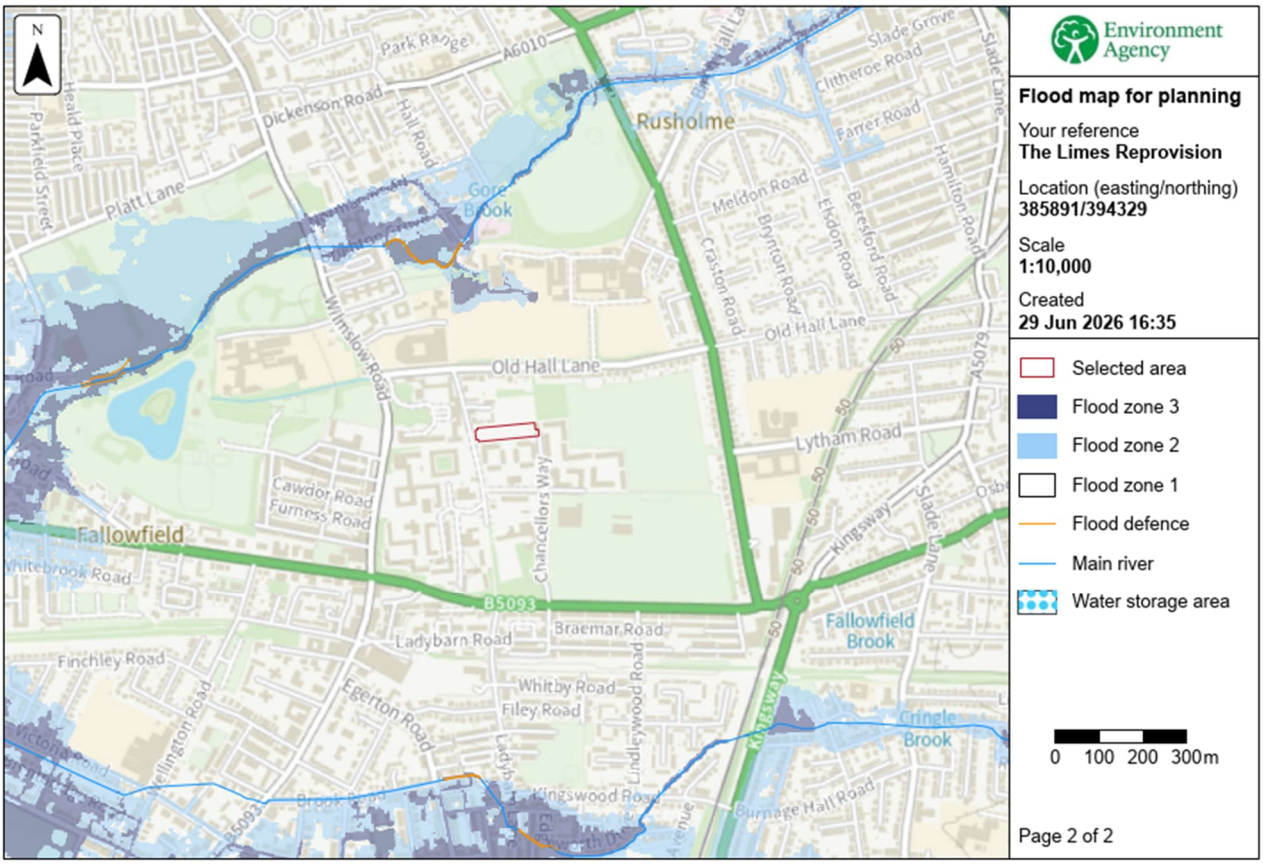
5.2 Fluvial flood risk

5.2.1 The National Planning Policy Framework (NPPF) categorises flood risk as follows:

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

5.2.2 The EA Flood Map for Planning show in Figure 5-1 shows that the Plot 3 development site is located within Flood Zone 1, with less than 1 in 1,000 annual probability of flooding from the rivers of the sea (<0.1% Annual Exceedance Probability (AEP)). This classifies the area at a low risk of flooding from fluvial and tidal sources.

Figure 5-1 - Environment agency flood map for planning



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5.2.3 Based on the above, the risk to the development from fluvial flooding is considered to be low.

5.3 Groundwater flooding

5.3.1 The Ground Investigation Report (Ref. LIMES-HYD-XX-XX-RP-G-2001-P03) identifies a moderate risk of groundwater flooding, which is attributed to the potential for shallow perched groundwater to develop above the cohesive Glacial Till deposits, particularly during periods of prolonged rainfall and seasonal groundwater fluctuation. Groundwater monitoring undertaken as part of the site investigation recorded perched groundwater at the interface between the Made Ground and the Glacial Till at depths of approximately 0.60m to 0.77m below ground level.

5.4 Surface water flooding

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

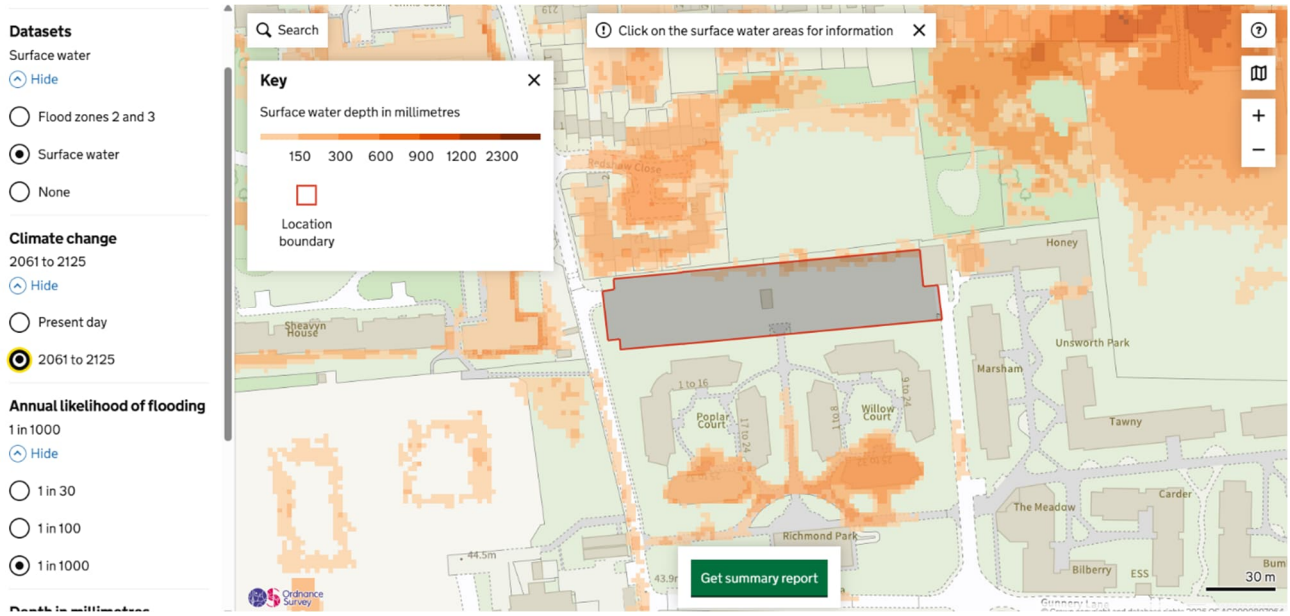
- High risk – that each year this area has a chance of flooding of greater than 3.3%;
- Medium risk – that each year this area has a chance of flooding of between 1% and 3.3%;
- Low risk – that each year this area has a chance of flooding of between 0.1% and 1%; and
- Very Low risk – that each year this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

5.4.2 Given the proposed design life of the development, the Environment Agency's future climate change surface water flood mapping (2061–2125) has been used to assess surface water flood risk. This dataset incorporates allowances for projected changes in rainfall intensity and provides a more representative indication of potential flood risk over the lifetime of the development.

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

5.4.4 The Environment Agency surface water flood map is shown in Figure 5-2. The map indicates that the risk of surface water flooding is generally very low within the site. Along the northern boundary of the site there are some areas of low flood risk, meaning that between 2061 and 2125 the chance of surface water location could be 0.1% (1 in 1000) each year.

Figure 5-2 - Environment agency surface water flood map for planning



5.5 Sewer flooding

5.5.1 There are no public sewers currently within the site area and hence sewer flooding is not anticipated to affect the site. The risk of sewer flooding is therefore considered to be low.

5.6 Artificial sources of flooding

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

5.6.2 The closest canal to the site is the Rochdale Cana; located approximately 3.9m to the north of the site. The site is therefore not considered to be at risk of flooding from canals.

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

Figure 5-3 - Environment agency reservoir flood Map



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

6. Surface water drainage strategy

6.1 Overview

6.1.1 This section sets out the outline surface water drainage strategy for the site. Reference should be made to the WSP Proposed Drainage Layout FFU-WSP-XX-XX-DR-C-3100 included in Appendix E, which includes the proposed points of connection, and the corresponding drainage model results included in Appendix F.

6.1.2 The proposed surface water drainage system will be designed for no surcharge during a 2-year rainfall event and no flooding during a 30-year rainfall event. In addition, and in accordance with the requirements of the National Planning Policy Framework (NPPF) and the National standards for sustainable drainage systems (SuDS). The surface water drainage design for the site will demonstrate that all rainfall events up to and including the 100-year rainfall event plus an allowance for climate change can be contained within the site without causing a risk of flooding to property on the site and not increasing flood risk elsewhere in the catchment.

6.1.3 Climate change allowances are based on the Environment Agency's Upper Mersey Management Catchment Peak Rainfall Allowance table for the 100-year rainfall event. For the proposed development, the design life is considered to be greater than 50 years, and the design has been assessed using the Upper End climate change scenario. Therefore, a 45% allowance for climate change has been applied.

6.2 Disposal of surface water

6.2.1 The method for removal of surface water from the site has been selected in accordance with the hierarchy outlined in the ‘National standards for sustainable drainage systems (SuDS)’ guidance which was updated in June 2025.

6.2.2 Standard 1 from the design guidance states:

6.2.3 Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- Priority 1: collected for non-potable use;
- Priority 2: infiltrated to ground;
- Priority 3: discharged to an above ground surface water body;
- Priority 4: discharged to a surface water sewer, or another piped surface water drainage system; and
- Priority 5: discharged to a combined sewer.

Priority 1: Collected for non-potable use

6.2.4 Rainwater harvesting has been considered in accordance with the drainage hierarchy. However, the proposed development does not include a suitable non-potable water demand that would justify the installation of a rainwater harvesting system. Given the limited benefits that would be achieved and the absence of a demand for harvested rainwater, rainwater harvesting has not been incorporated into the proposed drainage strategy.

Priority 2: Infiltrated to ground

6.2.5 Site investigations confirmed that the site is underlain by low-permeability Glacial Till and that shallow perched groundwater is present beneath the site. The Ground Investigation Report concludes that soakaway drainage is unsuitable due to the low infiltration potential of the underlying soils and the potential for perched groundwater.

Priority 3: Discharged to an above ground surface water body

6.2.6 There are no known above ground watercourses or water bodies in close proximity to the site. Consequently, discharge to a watercourse is not considered a feasible for the proposed development.

Priority 4: Discharged to a surface water sewer, or another piped surface water drainage system

6.2.7 Surface water runoff from the proposed development will discharge to the existing 375mm private surface water drainage network located to the east of the site, which forms part of the wider drainage infrastructure serving the adjacent halls of residence development. The drainage strategy for the adjacent halls of residence development, approved under planning application 110184/FO/2015/S1, includes attenuation storage to accommodate runoff from the application site.

6.2.8 Refer to Drawing P00_00_(SK)_Z0_C_002, Flood Risk Assessment & Drainage Strategy – Proposed Catchment Areas, included in Appendix G, extracted from the Owens Park Campus Redevelopment Drainage Strategy. The drawing identifies the site within the wider drainage catchment strategy and confirms that it was included within the attenuation and surface water management proposals developed for the adjacent Owens Park scheme.

6.2.9 Accordingly, the proposed development will connect to the existing as-constructed drainage system in accordance with the approved strategy. The combined development will continue to discharge at or below the agreed runoff rate of 74 l/s.

Priority 5: Discharged to a combined sewer

6.2.10 There are no known combined sewers in close proximity to the site.

6.3 Sustainable Drainage Systems (SuDS)

6.3.1 The provision of Sustainable Urban Drainage Systems (SuDS) has been considered in detail and SuDS features will be included within the surface water drainage proposals wherever possible.

6.3.2 The suitability of the full suite of SuDS features has been considered, and SuDS features that are considered to be feasible have been listed in Table 6-1.

Table 6-1 - Suitability of SuDS features

SuDS Feature	Water Quality	Volume Control	Space Required	Storage Provided	Cost	Amenity Value	Overall Suitability
Below Ground Attenuation Storage	MEDIUM	HIGH	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH
Permeable Pavements	MEDIUM	HIGH	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH
Proprietary Separators	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Rainwater Harvesting	MEDIUM	MEDIUM	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
Filter Drains	MEDIUM	MEDIUM	LOW	LOW	LOW	LOW	MEDIUM
Rain Gardens	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	HIGH	MEDIUM
Swales	MEDIUM	MEDIUM	HIGH	HIGH	LOW	MEDIUM	MEDIUM
Tree Pits	MEDIUM	MEDIUM	LOW	LOW	MEDIUM	HIGH	MEDIUM

6.3.3 Whilst a number of SuDS measures are deemed technically feasible for the site, the proposed development seeks to retain the majority of the existing asphalt hardstanding and utilise the existing drainage infrastructure wherever practicable. Furthermore, the approved drainage strategy for the adjacent halls of residence development (planning application ref. 110184/FO/2015/S1) incorporates attenuation storage for runoff from the application site.

6.4 Water quality

6.4.1 It is intended that water quality treatment will be provided to meet the requirements of the Simple Index Approach as set out in the CIRIA C753 SuDS Manual Chapter 26.

6.4.2 The pollution hazard level for the site is medium due to the use as a commercial yard and non-residential car park. Runoff from this area will pass through a ‘SPEL ESR Bypass Treatment System’ unit or similar. This alone would provide sufficient water quality treatment to meet the requirements of the simple index approach as shown in Table 6-2 and Table 6-3.

Table 6-2 - SuDS mitigation indices

Type	TSS	Metals	Hydrocarbons
SPEL ESR Bypass Treatment System	0.8	0.6	0.9

Table 6-3 - Pollution hazard indices within the proposed development

Area	Pollution Hazard Level	TSS	Metals	Hydrocarbons	Proposed Mitigation Measure	Adequacy
Commercial yard and non-residential car park	Medium	0.7	0.6	0.7	SPEL ESR Bypass Treatment System	Yes

6.5 Maintenance

6.5.1 Reference should be made to the Drainage Inspection and Maintenance Schedule, which is included as Appendix H of this report.

6.5.2 Responsibilities for the future maintenance of private drainage systems has not been confirmed at this stage. It is expected that full details of ownership and maintenance will be available at discharge of planning condition stage.

7. Foul water drainage strategy

7.1 Overview

7.1.1 This section sets out the outline foul water drainage strategy for the site. Reference should be made to the WSP Proposed Drainage Layout FFU-WSP-XX-XX-DR-C-3100 included in Appendix E, which includes the proposed points of connection.

7.1.2 Foul flows generated by the proposed development will discharge to the existing 150mm diameter private foul drainage network located to the east of the site, which forms part of the wider drainage infrastructure serving the adjacent halls of residence development. The drainage strategy for the adjacent halls of residence development, approved under planning application 110184/FO/2015/S1.

8. Conclusion

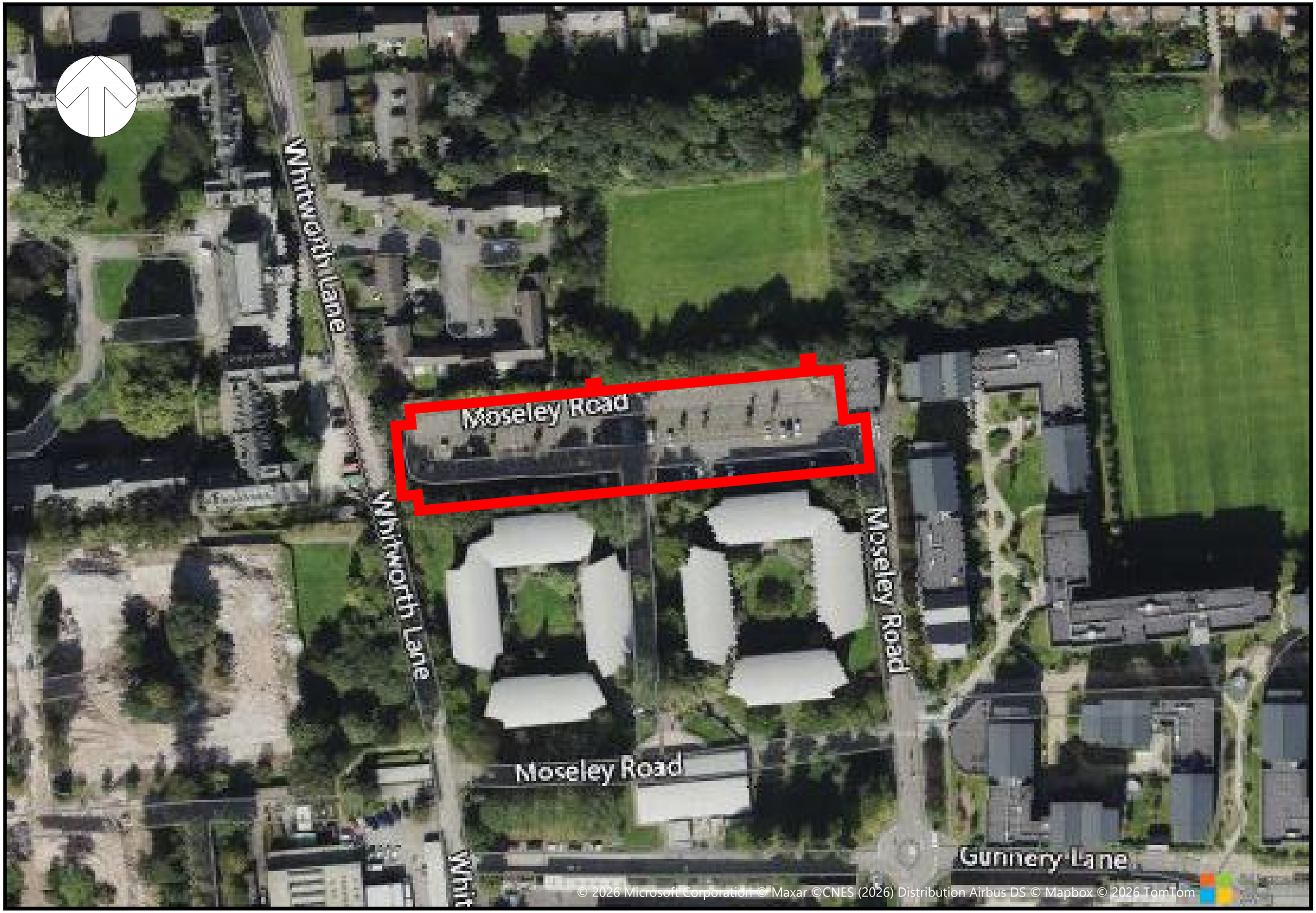
8.1.1 WSP has undertaken a Flood Risk Assessment and Drainage Strategy on behalf of The University of Manchester to support the full planning application for the Fallowfield Facility Unit.

8.1.2 The assessment has considered the risk of flooding from all potential sources, including fluvial, surface water, groundwater, sewer and artificial sources. The site is located entirely within Flood Zone 1 and is therefore at low risk of flooding from rivers and the sea. Surface water flood risk is generally very low across the site, with only isolated areas of low risk identified along the northern boundary. The site is also considered to be at low risk from sewer, reservoir and other artificial sources of flooding. Whilst the site is considered to have a moderate groundwater flood risk associated with shallow perched groundwater, this can be adequately managed by the proposed drainage strategy.

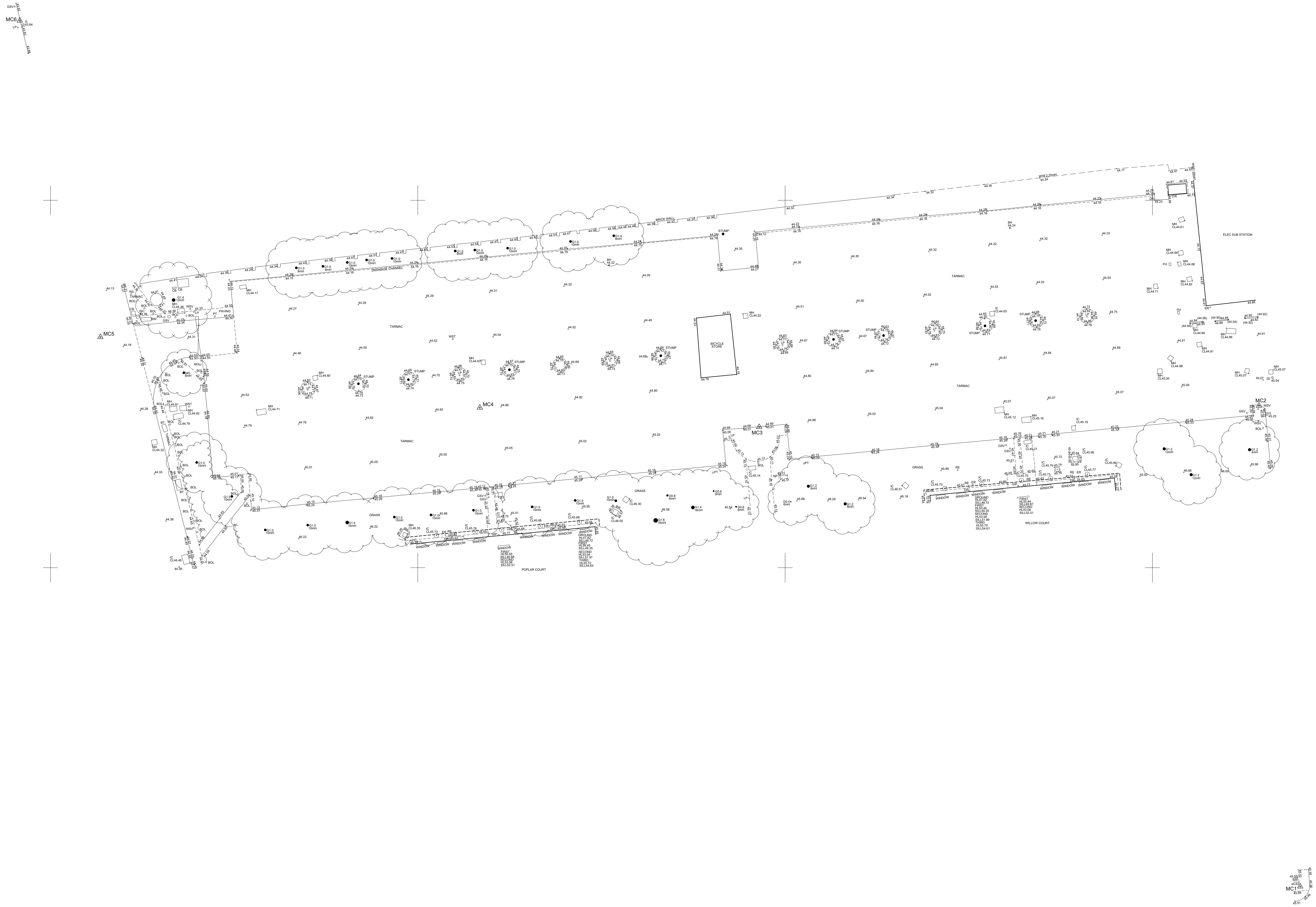
8.1.3 It is proposed that the development will discharge surface and foul water will discharge to the private surface water drainage network located to the east of the site, which forms part of the wider drainage infrastructure serving the adjacent halls of residence development. The drainage strategy for the adjacent halls of residence development, approved under planning application 110184/FO/2015/S1, includes attenuation storage to accommodate runoff from the application site.

8.1.4 The proposed drainage system has been designed in accordance with current national guidance and will accommodate rainfall events up to and including the 1 in 100-year event plus a 45% allowance for climate change. Surface water quality treatment will be provided through proprietary treatment measures in accordance with CIRIA SuDS guidance, ensuring that runoff from operational and parking areas receives an appropriate level of treatment prior to discharge.

Appendix A – Site location plan


Whitworth Lane
Moseley Road
Moseley Road
Moseley Road
Gunnery Lane
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Appendix B – Topographical survey



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Note:
The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.
Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS

Name	Easting	Northing	Height
MC1	385970.11	394256.61	45.62
MC2	385964.50	394322.04	45.30
MC3	385896.47	394319.15	45.02
MC4	385858.44	394321.78	44.87
MC5	385806.80	394331.39	44.14
MC6	385795.82	394374.46	43.94

STANDARD REFERENCE & ABBREVIATIONS

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

SurveY OPERATIONS
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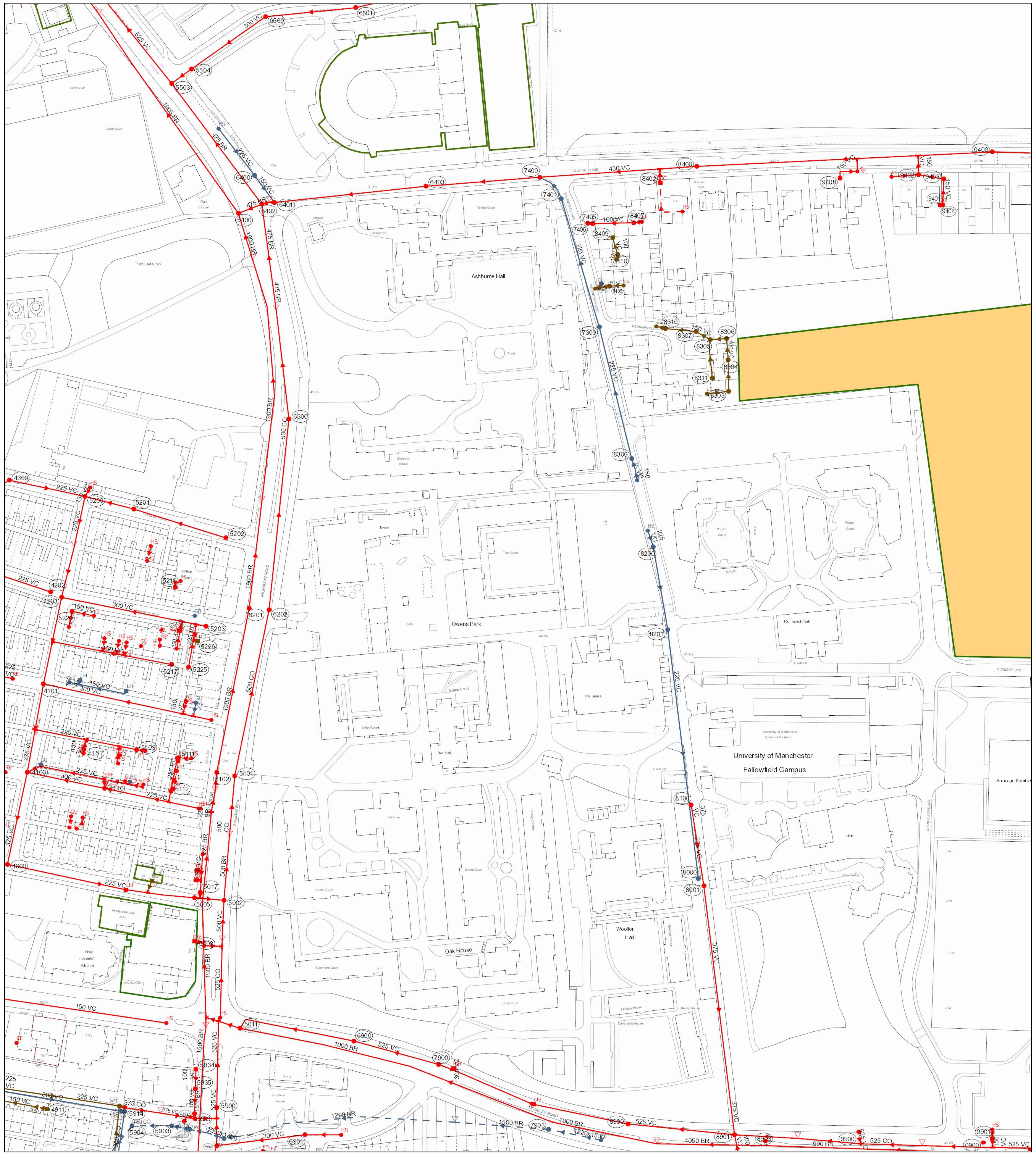
Client
Halliday Meecham Architects

Drawing Title
Topographical Survey of Land at:
The Limes, Fallowfield Campus
University of Manchester
Manchester

Scale(s)	1:200	Surveyor	MC
Date	Apr 26	Drawn	DIF
Job Number	26B287	Checked	MG

Sheet Size & Drg Number & Revision
A0 26B287/001

Appendix C – Public sewer records



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
8304		FO		100			VC	11.89919	
8306		FO		100			VC	9.127561	
6300	42.93	CO	0	500			CO	60.40695	
6501	41.61	CO	38.4	300			VC	50.24938	1 in 239
6501	41.61	CO	38.4	300			VC	50.24938	1 in 239
5220		CO		150			VC	8.860958	
5220		CO		150			VC	8.860958	
0401	43.88	CO	38.82	450			VC	74.02702	1 in 285
0401	43.88	CO	38.82	450			VC	74.02702	1 in 285
5140	40.35	CO	37.33	300			VC	43.77243	1 in 84
5140	40.35	CO	37.33	300			VC	43.77243	1 in 84
8400	42.9	CO	37.56	450			VC	87.20665	1 in 67
8400	42.9	CO	37.56	450			VC	87.20665	1 in 67
5217		CO		150			VC	67.32286	
9900	41.46	CO	33.01	525			VC	4.123106	
9900	41.46	CO	33.01	525			VC	4.123106	
7300	43.79	SW	41.45	225			VC	74.04053	1 in 103
8902	40.41	CO	37.2	300			VC	14.31782	1 in 102
6201	43.68	CO	0	1900			BR	59.4138	
5914	37.97	SW	34.69	375			CO	2	1 in 4
5914	37.97	SW	34.69	375			CO	2	1 in 4
5914	37.97	SW	34.69	375			CO	2	1 in 4
5914	37.97	SW	34.69	375			CO	2	1 in 4
8305		FO		150			VC	9.104059	
5005		CO	33.48	225			VC	16.4179	1 in 15
8300	44.29	SW	42.26	225			VC	75.18643	1 in 98
4300	41.49	CO	39.12	225			VC	67.11929	1 in 43
4300	41.49	CO	39.12	225			VC	67.11929	1 in 43
5913	37.96	CO	32.71	375			CO	20.22375	1 in 72
5913	37.96	CO	32.71	375			CO	20.22375	1 in 72
5913	37.96	CO	32.71	375			CO	20.22375	1 in 72
5913	37.96	CO	32.71	375			CO	20.22375	1 in 72
7900	38.97	CO	32.91	525			VC	48.76474	1 in 128
7900	38.97	CO	32.91	525			VC	48.76474	1 in 128
5400	41.32	CO	0	1905			BR	134.2832	
5400	41.32	CO	0	1905			BR	134.2832	
5933		CO		100			VC	8.315703	
5933		CO		100			VC	8.315703	
5225		CO		225			VC	24.21125	
5017		CO		150			VC	3.343338	
8201	44.28	SW	41.99	225			VC	139.0432	1 in 83
5504	41.24	CO	35	300			VC	13.60147	1 in 151
5504	41.24	CO	35	300			VC	13.60147	1 in 151
5908	38.48	CO	31.91	525			VC	21	
5908	38.48	CO	31.91	525			VC	21	
6403	41.74	CO	36.25	450			VC	84.48077	1 in 217
6403	41.74	CO	36.25	450			VC	84.48077	1 in 217
8100	42.2	CO	37.05	375			VC	45.54119	1 in 77
9403		CO		150			VC	14.17256	
9403		CO		150			VC	14.17256	
9403		CO		150			VC	14.17256	
9403		CO		150			VC	14.17256	
8310		FO		150			VC	4.998927	
7400	41.74	CO	36.21	450			VC	63.1981	
7400	41.74	CO	36.21	450			VC	63.1981	
8311		FO		100			VC	21.44718	
0901	42.46	CO	38.88	150			VC	5	
0901	42.46	CO	38.88	150			VC	5	
0901	42.46	CO	38.88	150			VC	5	
0901	42.46	CO	38.88	150			VC	5	
0902	42.66	CO	41.48	990			BR	147.085	1 in 14
0902	42.66	CO	41.48	990			BR	147.085	1 in 14
5902	38.61	SW	36.49	1200			BR	5.09902	1 in 85
5902	38.61	SW	36.49	1200			BR	5.09902	1 in 85
5935		CO		100			VC	13.68916	
5935		CO		100			VC	13.68916	
4103	39.94	CO	36.79	375			VC	52.17279	1 in 23
4103	39.94	CO	36.79	375			VC	52.17279	1 in 23
6402	41.45	CO	0	475			BR	83.60024	
6402	41.45	CO	0	475			BR	83.60024	
4000	38.55	CO	33.48	225			VC	105.418	1 in 94
4000	38.55	CO	33.48	225			VC	105.418	1 in 94
5934		CO		100			VC	10.92771	
5934		CO		100			VC	10.92771	
7401	42.6	SW	40.68	225			VC	17.75022	1 in 21
7401	42.6	SW	40.68	225			VC	17.75022	1 in 21
5901	38.65	CO	32.15	375			VC	12	
5901	38.65	CO	32.15	375			VC	12	
4202	41.88	CO	38.73	225			VC	75.89466	
4202	41.88	CO	38.73	225			VC	75.89466	
4203	42	CO	38.65	300			VC	49.0306	1 in 52
4203	42	CO	38.65	300			VC	49.0306	1 in 52
9408		CO		150			VC	20.4327	
9408		CO		150			VC	20.4327	
5102	41.65	CO	0	1905			BR	92.76314	
0903	43.05	CO	36.23	525			VC	63.00862	1 in 115
0903	43.05	CO	36.23	525			VC	63.00862	1 in 115
7500	41.63	CO	38.65	300			VC	56.51548	1 in 235
5200	42.37	CO	39.42	225			VC	28.63564	1 in 75
5200	42.37	CO	39.42	225			VC	28.63564	1 in 75
6400	41.28	SW	39.35	150			VC	18.60108	
6400	41.28	SW	39.35	150			VC	18.60108	
8001	41.18	CO	36.44	375			VC	139.0432	1 in 68
6900	38.88	CO	32.5	525			VC	67.01919	
6900	38.88	CO	32.5	525			VC	67.01919	
5903	38.57	SW	36.36	1050			CO	22	1 in 275
5903	38.57	SW	36.36	1050			CO	22	1 in 275
6500	41.41	CO	38.17	300			VC	50.21952	1 in 173
6500	41.41	CO	38.17	300			VC	50.21952	1 in 173
5201	42.88	CO	39.85	225			VC	27.89265	1 in 75
5203	43.29	CO	36.52	300			VC	81.58431	1 in 35
4901	37.45	SW	35.32	300			VC	77.10383	
4901	37.45	SW	35.32	300			VC	77.10383	
5906	37.89	SW	35.11	300			CO	26.30589	1 in 64
5906	37.89	SW	35.11	300			CO	26.30589	1 in 64
8307		FO		150			VC	17.05704	
8200	44.38	SW	42.72	225			VC	46.69047	1 in 65
5900	38.44	CO	0	525			VC	48.01041	
5900	38.44	CO	0	525			VC	48.01041	
8407		CO		100			VC	22.63418	
8407		CO		100			VC	22.63418	
8405		FO		150			VC	5.528187	
5909	37.87	FO	34.63	225			VC	30.14963	1 in 59
5909	37.87	FO	34.63	225			VC	30.14963	1 in 59
0400	43.69	CO	38.54	450			VC	164.195	1 in 169
0400	43.69	CO	38.54	450			VC	164.195	1 in 169
0400	43.69	CO	38.54	450			VC	164.195	1 in 169
0400	43.69	CO	38.54	450			VC	164.195	1 in 169
5803	89.4	CO	79.73	1500			BR	161.9783	
4300	41.49	CO	39.12	225			VC	42.95346	
4300	41.49	CO	39.12	225			VC	42.95346	
7405		CO		100			VC	2.786955	
7405		CO		100			VC	2.786955	
5111		CO		225			VC	24.83061	
3101	37.43	CO	34.34	450			VC	126.3022	1 in 152
8900	39.84	CO	34.08	525			VC	110.6005	1 in 98
8900	39.84	CO	34.08	525			VC	110.6005	1 in 98
5202	43.91	CO	41.71	225			VC	53.45091	1 in 51
8303		FO		100			VC	17.44142	
7903	39.32	SW	36.79	1500			BR	52.15362	
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5231		CO		150			VC	5.333312	
6901	38.53	CO	34.99	300			VC	49.36598	1 in 20
6901	38.53	CO	34.99	300			VC	49.36598	1 in 20
5101	41.65	CO	31.63	500			CO	93.94147	1 in 626
8901	40.35	CO	34.37	525			VC	59.3043	1 in 220
8901	40.35	CO	34.37	525			VC	59.3043	1 in 220
5011	38.83	CO	0	1000			BR	12.64911	
5011	38.83	CO	0	1000			BR	12.64911	
5503	41.41	CO	30.9	525			VC	76.83749	1 in 452
5503	41.41	CO	30.9	525			VC	76.83749	1 in 452
0900	42.43	CO	35.67	525			VC	34.0147	
0900	42.43	CO	35.67	525			VC	34.0147	
0900	42.43	CO	35.67	525			VC	34.0147	
0900	42.43	CO	35.67	525			VC	34.0147	
9402		CO		150			VC	10.53487	
9402		CO		150			VC	10.53487	
9402		CO		150			VC	10.53487	
9402		CO		150			VC	10.53487	
5907	38.5	SW	36.82	1050			VC	9.486833	1 in 59
5907	38.5	SW	36.82	1050			VC	9.486833	1 in 59
4900	37.45	FO	34.57	225			VC	73.82411	1 in 164
4900	37.45	FO	34.57	225			VC	73.82411	1 in 164
6402	41.45	CO	30.82	475			BR	13.92839	
6402	41.45	CO	30.82	475			BR	13.92839	
5911	38.2	FO	34.1	300			VC	3.162278	1 in 105
5911	38.2	FO	34.1	300			VC	3.162278	1 in 105
5911	38.2	FO	34.1	300			VC	3.162278	1 in 105
5911	38.2	FO	34.1	300			VC	3.162278	1 in 105
6202	43.7	CO	31.47	500			CO	106.5692	
5002	39.74	CO	32.32	500			BR	35.12834	
5904	38.08	SW	36.27	1050			CO	24.20744	1 in 346
5904	38.08	SW	36.27	1050			CO	24.20744	1 in 346
6401	41.49	CO	35.85	450			VC	3	1 in 1
6401	41.49	CO	35.85	450			VC	3	1 in 1
8903	40.62	CO	30.77	1050			BR	60.00833	
8903	40.62	CO	30.77	1050			BR	60.00833	
7403		FO		150			VC	2.304651	
5802		CO	32.18	525			VC	86.02325	1 in 344
5109		CO		225			VC	57.36808	
9401		CO		150			VC	14.41813	
9401		CO		150			VC	14.41813	
9401		CO		150			VC	14.41813	
9401		CO		150			VC	14.41813	
8410		FO		100			VC	9.52614	
5151		CO		150			VC	5.438822	
5151		CO		150			VC	5.438822	
4101	40.84	CO	37.66	375			VC	49.81968	1 in 59
4101	40.84	CO	37.66	375			VC	49.81968	1 in 59

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

	Abandoned	Foul	Surface Water	Combined
Public Sewer				
Private Sewer				
Section 104				
Rising Main				
Sludge Main				
Overflow				
Water Course				
Highway Drain				

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

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

MANHOLE FUNCTION

FO Foul
SW Surface Water
CO Combined
OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

LS5311A,

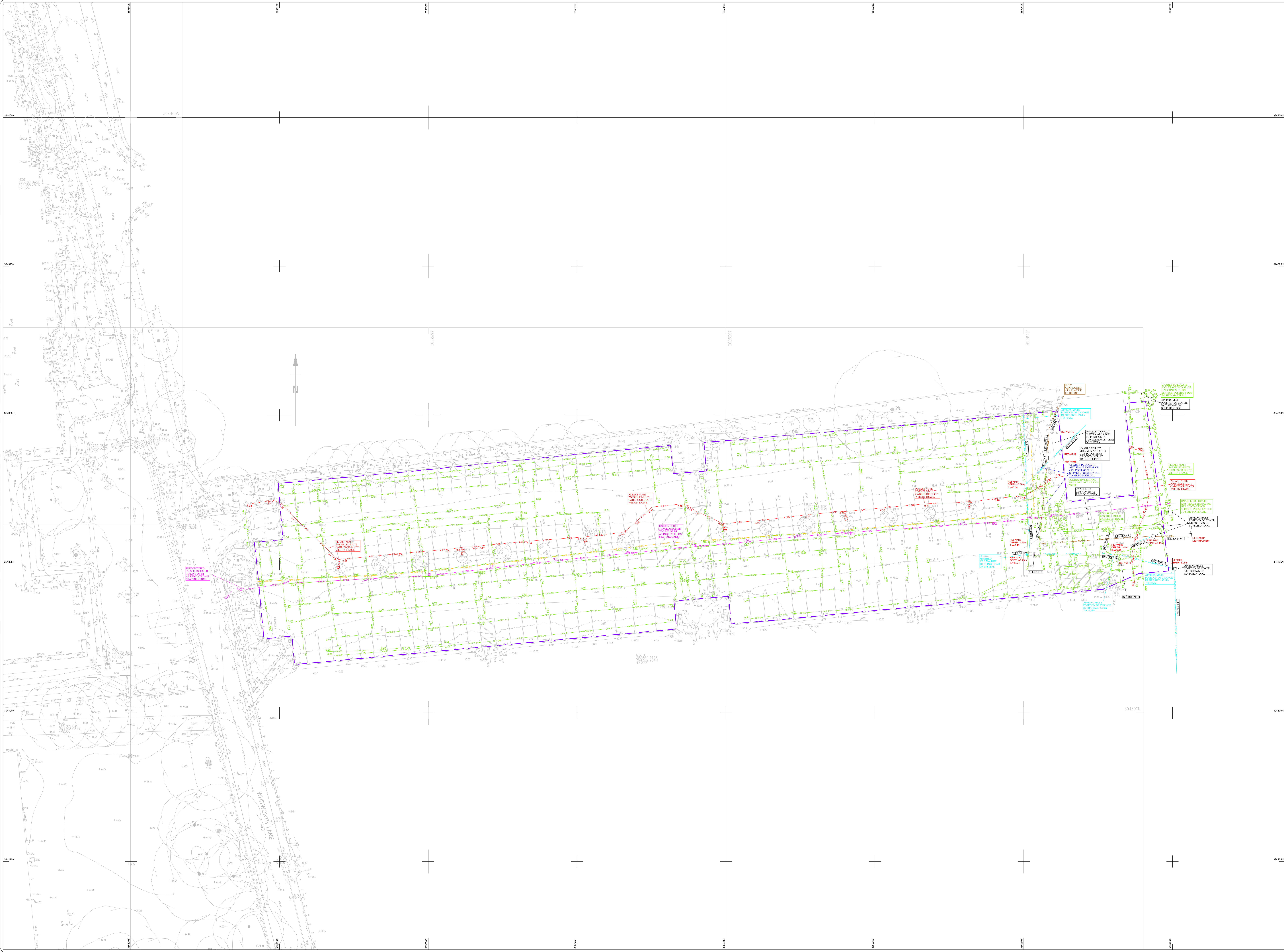
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Scale: 1:1250   **Date:** 10/04/2024
Nodes: 179
Sheet: 7 of 12

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West

Appendix D – Utilities survey



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N W E S
PLAN GRID NORTH

File Name: LS5311.dwg

NOTES:

All levels relate to OS (Newlyn) Datum. Established using Network RTK. Survey plotted on a plane Local Grid. Orientated to National Grid.

Services shown as "From Statutory Authority Plans" line styles are taken from Statutory Records plans supplied by the relevant regional authority. These services were not located and are shown for indicative purposes only.

Please note survey control established for mapping only. Control shouldn't be used by third parties without confirmation from Layer Surveys.

Utility and CCTV surveys added to supplied topographical survey provided by client.

Only manholes and services visible at time of survey shown.

Drainage information must be checked and verified with local authority records prior to work commencing.

Please note all drainage information and chamber position have be taken from CCTV condition survey.

LEGEND:

AV	AIR VALVE	PIPE	PIPE
BENCH	BENCH	POST	POST
BIN	BIN	RWP	RAIN WATER PIPE
BOL	BOLLARD	RISER	SERVICE RISER
BT	BT INSPECTION COVER	SAP	SAPLING
BST	BUS STOP POST	SIGN	STREET SIGN
CTV	CABLE TV COVER	STUMP	TREE STUMP
CCTV	CCTV CAMERA POST	TP	TELEGRAPH POLE
CB	CONTROL BOX	TIE	TIE WIRE
DP	DRAIN PIPE	TL	TRAFFIC LIGHT
DR	DRAIN	WO	WASH OUT VALVE
ER	EARTH ROD	WST	WATER STOP TAP
ELB	ELECTRIC BOX	WSV	WATER STOP VALVE
EIC	ELECTRIC INSPECTION COVER		BORE HOLE
ELP	ELECTRICITY POLE		EOT SYMBOL
FH	FIRE HYDRANT		GATE
GST	GAS STOP TAP		GPR EOT SYMBOL
GSV	GAS STOP VALVE		SURVEY STATION
G	GULLEY		BENCHMARK
IC	INSPECTION COVER		
KO	KERB OUTLET		
LP	LAMP POST		
MH	MANHOLE		
NAME PLATE	NAME PLATE		

BT	BT (B2)
UNIDENTIFIED CABLE	UCAB (B2)
CCTV CABLE	CCTV (B2)
CABLE TV	CATV
CABLE DUCT	DUCT (B2)
ELECTRIC	E (B2)
FIBRE-OPTICS	FO (B2)
GAS	GAS (B2)
UNIDENTIFIED FEATURE	UNID (B2)
UNIDENTIFIED PIPE	UP (B2)
WATER SERVICE	W (B2)
TRAFFIC SENSOR CABLE	TRAFFIC (B2)
GROUND PENETRATING RADAR FEATURE	GPR (B2)
REINSTATEMENT SCAR	SCAR
DISTRICT HEATING	DH (B2)
COMBINED HEATING AND POWER	CHP (B2)
OIL - FUEL PIPELINE	OFP (B2)
SURFACE WATER SEWER / FLOW DIRECTION	>> SW (B2) >>
FOUL WATER SEWER / FLOW DIRECTION	>> FW (B2) >>
COMBINED SEWER / FLOW DIRECTION	>> CS (B2) >>
UNIDENTIFIED SEWER / FLOW DIRECTION	>> UW (B2) >>

QUALITY LEVEL

A - VERIFIED BY TRIAL PIT, EXCAVATION OR CHAMBER.

B1 - POSITION AND DEPTH DETECTED BY GPR (GROUND PENETRATING RADAR) AND EML (ELECTRIC MAGNETIC LOCATOR).

B2 - POSITION AND DEPTH DETECTED BY ONE OF GPR (GROUND PENETRATING RADAR) OR EML (ELECTRIC MAGNETIC LOCATOR).

B3 - LOCATED BY GPR (GROUND PENETRATING RADAR) OR EML (ELECTRIC MAGNETIC LOCATOR) PLEASE NOTE, NO DEPTH RECORDED DUE TO POOR SIGNAL.

B4 - FEATURE ROUTE IS ASSUMED.

C - STAT RECORD DATA LOCATED AND POSITIONED TO STREET FURNITURE (NOT DETECTED).

D - STAT RECORD DATA ADDED (NOT DETECTED).

P - POST PROCESSED

DISCLAIMER:

At Layer Surveys we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of Layer Surveys. Therefore Layer Surveys cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, annotated line. The displayed depth will refer to the shallowest detected utility.

Successful tracing of non-conductive materials may be limited. Drainage gulleys are dye tested where possible to prove connectivity but it is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to Layer Surveys by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).

TYPICAL FEATURE DEPTH ANNOTATION

ELECTRO-MAGNETIC DETECTION (RD)	DRAINAGE (VISUAL OBSERVATION)	GROUND PENETRATING RADAR
APPROX DEPTH TO CENTRE — CABLE/FIBRE OPTIC	APPROX DEPTH TO INVERT	APPROX DEPTH

SHEET LAYOUT

0 2 4 6 8 10
Scale Bar (m)

LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

REV	DATE	DESCRIPTION
#	##/##/####	-------------------------------

CLIENT
Hydrock
Northern Assurance Buildings
9-21 Princess Street
Albert Square
Manchester M2 4DN

PROJECT TITLE
Utility Survey of Land at:
The Limes Building
University of Manchester
Old Hall Lane
Fallowfield, M14 6HP

Drawing Ref.	Surveyed	Drawn	Checked
LS5311	J.B	I.T	L.S.L

Scale	Date	No.	Size	Rev
1:200	April 2024	01	A0	

Appendix E – Proposed drainage layout

EXISTING SURFACE WATER DRAINAGE CHANNEL TO BE RETAINED SUBJECT TO CONDITION AND CONFIRMATION OF HYDRAULIC CAPACITY.

NEW CONNECTION FROM SURFACE WATER DRAINAGE CHANNEL SUBJECT TO CONFIRMATION OF EXISTING OUTLETS BY DRAINAGE SURVEY AND HYDRAULIC CAPACITY OF EXISTING CHANNEL

EXISTING SURFACE WATER DRAINAGE CHANNEL TO BE RETAINED SUBJECT TO CONDITION AND CONFIRMATION OF HYDRAULIC CAPACITY.

EX FW01
CL: 44.630
IL: 43.708 (ASSUMED)

EX FW02
CL: 44.740
IL: 43.631 (ASSUMED)

EX SW04
EXISTING INTERCEPTOR
CL: 45.110
IL: 43.397

FW07
CL: 45.020
IL: 42.924

EX FW04
CL:45.020
IL: 42.910 (ASSUMED)

EX SW01
CL: 44.730
IL: 43.830

EX FW03
CL: 45.010
IL: 43.470

EX FW05
CL: 45.170
IL: 42.560

EX SW05
CL: 45.366
IL: 43.350

EX SW02
CL: 45.030
IL: 43.730

EX SW03
CL: 45.110
IL: 43.710

FW01
CL: 44.822
IL: 43.783

FW02
CL: 44.823
IL: 43.546

FW03
CL: 44.845
IL: 43.351

FW04
CL: 44.854
IL: 43.325

FW05
CL: 44.867
IL: 43.293

SW04
CL: 44.893
IL: 43.503

FW06
CL: 44.938
IL: 43.059

SW05
CL: 44.917
IL: 43.477

SW02
CL: 44.983
IL: 43.465

SW01
CL: 44.921
IL: 43.698

SW03
CL: 44.874
IL: 43.642

SPEL ESR BYPASS TREATMENT SYSTEM 320C1/ESR (OR SIMILAR APPROVED). DRAINAGE AREA APPROX. 2600m².

100ø / 1:40
150ø / 1:150
375ø / 1:310

DO NOT SCALE

NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS SPECIFIED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELATED DOCUMENTATION AND STANDARD DETAILS.
3. THIS DRAWING IS BASED ON THE FOLLOWING DRAWINGS AND INFORMATION:
   – TOPOGRAPHICAL SURVEY (REF: 26B287) PRODUCED BY SURVEY OPERATIONS DATED APRIL 2026.
   – BELOW GROUND UTILITIES SURVEY (REF: LS5311) PRODUCED BY LAYER SURVEYS LTD DATED APRIL 2024.
   – ARCHITECT GENERAL ARRANGEMENT PLAN 5938-HMA-LIM-00-DR-A-00110 P1 PRODUCED BY HALLIDAY MEECHAM DATED 21/07/2026.
   – ARCHITECT GROUND FLOOR PLAN 5938-HMA-LIM-GF-DR-A-00200 P04 PRODUCED BY HALLIDAY MEECHAM DATED 03/07/2026.
   – LANDSCAPE ARCHITECT GENERAL ARRANGEMENT PLAN 440-LYR-LXX-ZZ-DWG-L-1001 P01 PRODUCED BY LAYER STUDIO DATED 15/07/2026.
4. PRIOR TO THE COMMENCEMENT OF WORK THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINAGE AND SERVICED SHALL BE ESTABLISHED BY THE CONTRACTOR. ANY DISCREPANCIES FROM THE INFORMATION SHOWN ON THESE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER.
5. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY TO ALL EXISTING SERVICED TO THE SATISFACTION OF THE PROJECT MANAGER.

KEY:

- SITE BOUNDARY
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER 1200mmø MANHOLE
- PROPOSED OIL SEPERATOR
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED FOUL WATER 600mmø INSPECTION CHAMBER
- EXISTING DRAINAGE
- EXISTING MANHOLE
- PROPOSED LINEAR CHANNEL DRAIN
- EXISTING LINEAR CHANNEL DRAIN TO BE RETAINED
- PROPOSED RAINWATER PIPE

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

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	23/07/2026	AM	FIRST ISSUE	DC	RV

DRAWING STATUS: S2 - FOR INFORMATION

wsp
8 First Street, Manchester, M15 4GU, UK
T+ 44 (0) 161 200 5000
wsp.com

CLIENT: THE UNIVERSITY OF MANCHESTER

ARCHITECT: HALLIDAY MEECHAM

SITE/PROJECT: FALLOWFIELD FACILITIES UNIT

TITLE: PROPOSED DRAINAGE LAYOUT

SCALE @ A1:	CHECKED:		APPROVED:
1:250	DC		RV
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
UK0045331.9119	AM	AM	July 26

DRAWING No: FFU-WSP-XX-XX-DR-C-3100 REV: P01

© WSP UK Ltd

File name:C:\SERS\GBDC100822\WSP OSS\UK0045331.9119 - UK UNIVERSITY OF MANCHESTER CPU REPROVISION - DOCUMENTS\03 WIP\CIVIL S\02 DRAWINGS & MODELS\FFU\WSP-XX-XX-DR-C-3100.DWG, plotted on 22 July 2026 09:11:12, by Carroll, Daniel

Appendix F – Drainage model results

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Junctions Storm Phase: Phase	WSP		

Name	Junction Type	Easting (m)	Northing (m)	Cover Elevation (m)	Depth (m)	Invert Elevation (m)	Chamber Shape	Diameter (m)
SW02	Manhole	385939.608	394326.096	44.983	1.518	43.465	Circular	1.200
SW01	Manhole	385883.261	394320.751	44.921	1.223	43.698	Circular	1.200
SW03	Manhole	385885.120	394322.292	44.874	1.232	43.642	Circular	1.200
SW04	Manhole	385928.080	394326.367	44.934	1.431	43.503	Circular	1.200
SW05	Manhole	385936.061	394327.124	44.917	1.440	43.477	Circular	1.200
OWI	Manhole	385925.434	394324.741	44.980	1.469	43.511	Circular	1.200
Simple Junction	Simple Junction	385875.856	394343.603					
EX SW01	Manhole	385950.465	394337.978	44.730	0.900	43.830	Circular	1.200
EX SW02	Manhole	385951.051	394326.647	45.030	1.300	43.730	Circular	1.200
EX SW03	Manhole	385962.912	394326.779	45.110	1.400	43.710	Circular	1.200
EX SW04	Manhole	385966.038	394326.570	45.110	1.713	43.397	Circular	1.200
EX SW05	Manhole	385975.268	394324.255	45.366	2.016	43.350	Circular	1.200
EX SW06	Manhole	385977.337	394304.643	45.366	2.077	43.289	Circular	1.200
Simple Junction (2)	Simple Junction	385949.937	394350.404					
Simple Junction (3)	Simple Junction	385957.615	394348.628					

Name	Lock
SW02	None
SW01	None
SW03	None
SW04	None
SW05	None
OWI	None
Simple Junction	
EX SW01	None
EX SW02	None
EX SW03	None
EX SW04	None
EX SW05	None
EX SW06	None
Simple Junction (2)	
Simple Junction (3)	

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Junctions Storm Phase: Phase	WSP		

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SW02	Inlet	S2.002 S1.002	(None)	No Restriction
SW01	Inlet	S1.000 Catchment Area Catchment Area (4)	(None)	No Restriction
SW03	Inlet	Catchment Area (1)	(None)	No Restriction
	Inlet (1)	Catchment Area (6)	(None)	No Restriction
SW04	Inlet	S2.000 Catchment Area (5)	(None)	No Restriction
	Inlet (1)	Catchment Area (7)	(None)	No Restriction
SW05	Inlet	S2.001	(None)	No Restriction
OWI	Inlet	S1.001	(None)	No Restriction
EX SW01	Inlet	EX S4.000 EX S5.000 Catchment Area (3)	(None)	No Restriction
EX SW02	Inlet	EX S4.001	(None)	No Restriction
EX SW03	Inlet	EX S4.002	(None)	No Restriction
EX SW04	Inlet	EX S4.003	(None)	No Restriction
EX SW05	Inlet	EX S4.004 S1.003	(None)	No Restriction
EX SW06	Inlet	EX S1.004	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW02	Outlet	S1.003	Free Discharge
SW01	Outlet	S1.001	Free Discharge
SW03	Outlet	S2.000	Free Discharge
SW04	Outlet	S2.001	Free Discharge
SW05	Outlet	S2.002	Free Discharge
OWI	Outlet	S1.002	Free Discharge
Simple Junction	Outlet	S1.000	Free Discharge
EX SW01	Outlet	EX S4.001	Free Discharge
EX SW02	Outlet	EX S4.002	Free Discharge
EX SW03	Outlet	EX S4.003	Free Discharge
EX SW04	Outlet	EX S4.004	Free Discharge
EX SW05	Outlet	EX S1.004	Free Discharge
Simple Junction (2)	Outlet	EX S4.000	Free Discharge
Simple Junction (3)	Outlet	EX S5.000	Free Discharge

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Connections Storm Phase: Phase	WSP		

Name	From	To	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	No. of Barrels
S2.000	SW03	SW04	43.153	Pipe	310.000		0.6	1
S2.001	SW04	SW05	8.017	Pipe	310.000		0.6	1
S2.002	SW05	SW02	3.693	Pipe	307.775		0.6	1
S1.001	SW01	OWI	42.361	Pipe	310.000		0.6	1
S1.002	OWI	SW02	14.239	Pipe	309.549		0.6	1
S1.000	Simple Junction	SW01	24.021	Pipe	99.262		0.6	1
EX S4.000	Simple Junction (2)	EX SW01	12.437	Pipe	101.111		0.6	1
EX S5.000	Simple Junction (3)	EX SW01	12.827	Pipe	145.766		0.6	1
EX S4.001	EX SW01	EX SW02	11.346	Pipe	113.463		0.6	1
EX S4.002	EX SW02	EX SW03	11.861	Pipe	593.062		0.6	1
EX S4.003	EX SW03	EX SW04	3.134	Pipe	10.011		0.6	1
EX S4.004	EX SW04	EX SW05	9.516	Pipe	202.461		0.6	1
S1.003	SW02	EX SW05	35.707	Pipe	310.498		0.6	1
EX S1.004	EX SW05	EX SW06	19.720	Pipe	325.000		0.6	1

Name	Diameter / Base Width (mm)	Height (mm)	Corner Splay (mm)	Side Slope (1:x)	Curved	Curve Easting (m)	Curve Northing (m)	Upstream Cover Elevation (m)
S2.000	375				☐			44.874
S2.001	375				☐			44.934
S2.002	375				☐			44.917
S1.001	375				☐			44.921
S1.002	375				☐			44.980
S1.000	150				☐			44.165
EX S4.000	150				☐			44.178
EX S5.000	150				☐			44.643
EX S4.001	375				☐			44.730
EX S4.002	375				☐			45.030
EX S4.003	375				☐			45.110
EX S4.004	375				☐			45.110
S1.003	375				☐			44.983
EX S1.004	375				☐			45.366

Name	Upstream Invert Elevation (m)	Downstream Cover Elevation (m)	Downstream Invert Elevation (m)	Part Family	Lock	Entry Loss	Exit Loss	Average Loss
S2.000	43.642	44.934	43.503		None	0.5	0	0
S2.001	43.503	44.917	43.477		None	0.5	0	0
S2.002	43.477	44.983	43.465		Elevations	0.5	0	0
S1.001	43.698	44.980	43.561		Elevations	0.5	0	0
S1.002	43.511	44.983	43.465		None	0.5	0	0
S1.000	44.165	44.921	43.923		Elevations	0.5	0	0
EX S4.000	44.178	44.730	44.055		Elevations	0.5	0	0
EX S5.000	44.143	44.730	44.055		Elevations	0.5	0	0
EX S4.001	43.830	45.030	43.730		None	0.5	0	0
EX S4.002	43.730	45.110	43.710		None	0.5	0	0
EX S4.003	43.710	45.110	43.397		None	0.5	0	0
EX S4.004	43.397	45.366	43.350		None	0.5	0	0
S1.003	43.465	45.366	43.350		None	0.5	0	0
EX S1.004	43.350	45.366	43.289		None	0.5	0	0

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Connections Storm Phase: Phase	WSP		

Name	Min. Cover Depth (m)	Min. Downstream Invert Elevation (m)	Flow Restriction (L/s)	Velocity (m/s)	Time Of Travel (mins)	Culvert Type	Culvert Shape	Culvert Entrance
S2.000	0.000	0.000				(None)		(None)
S2.001	0.000	0.000				(None)		(None)
S2.002	0.000	0.000				(None)		(None)
S1.001	0.000	0.000				(None)		(None)
S1.002	0.000	0.000				(None)		(None)
S1.000	0.000	0.000				(None)		(None)
EX S4.000	0.000	0.000				(None)		(None)
EX S5.000	0.000	0.000				(None)		(None)
EX S4.001	0.000	0.000				(None)		(None)
EX S4.002	0.000	0.000				(None)		(None)
EX S4.003	0.000	0.000				(None)		(None)
EX S4.004	0.000	0.000				(None)		(None)
S1.003	0.000	0.000				(None)		(None)
EX S1.004	0.000	0.000				(None)		(None)

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Inflow Summary Storm Phase: Phase	WSP		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area	SW01		Time of Concentration	0.192	100	0	100	0.192
Catchment Area (1)	SW03		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)			Time of Concentration	0.015	100	0	100	0.015
Catchment Area (3)	EX SW01		Time of Concentration	0.140	100	0	100	0.140
Catchment Area (4)	SW01		Time of Concentration	0.059	100	0	100	0.059
Catchment Area (5)	SW04		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (6)	SW03		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (7)	SW04		Time of Concentration	0.018	100	0	100	0.018
TOTAL		**0.0**		**0.476**				**0.476**

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Network Design Criteria Storm Phase: Phase	WSP		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.367

Pipe Options

Lock Slope Options	None
Design Options	Minimize Excavation
Design Level	Level Crowns
Min. Cover Depth (m)	1.200
Min. Slope (1:x)	500.00
Max. Slope (1:x)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:x)	Max. Slope (1:x)
100	0.00	0.00
150	0.00	0.00

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Network Design Criteria Storm Phase: Phase	WSP		

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Outfall Details Storm Phase: Phase	WSP		

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Elevation (m)	Elevation Curve
EX SW06	Free Discharge			

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Title:	Company Address:		
Rainfall Analysis Criteria	WSP		

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	☐

Project: University of University of Manchester - The Limes	Date: 22-07-2026		
	Designed by: AM	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
SW02	FSR: 2 years: +0 %: 15 mins: Winter	44.983	43.465	43.618	0.153	40.4	0.174	0.000	36.8	23.059	OK
SW01	FSR: 2 years: +0 %: 15 mins: Winter	44.921	43.698	43.851	0.153	39.7	0.173	0.000	35.9	18.346	OK
SW03	FSR: 2 years: +0 %: 15 mins: Winter	44.874	43.642	43.694	0.052	5.4	0.058	0.000	4.9	2.487	OK
SW04	FSR: 2 years: +0 %: 30 mins: Summer	44.934	43.503	43.610	0.107	7.1	0.121	0.000	7.0	6.098	OK
SW05	FSR: 2 years: +0 %: 15 mins: Winter	44.917	43.477	43.619	0.142	6.7	0.161	0.000	7.3	4.763	OK
OWI	FSR: 2 years: +0 %: 15 mins: Winter	44.980	43.511	43.669	0.158	35.9	0.179	0.000	34.8	18.339	OK
Simple Junction	FSR: 2 years: +0 %: 15 mins: Summer		44.165	44.165	0.000	0.0			0.0	0.000	OK
EX SW01	FSR: 2 years: +0 %: 15 mins: Winter	44.730	43.830	43.926	0.096	22.1	0.108	0.000	21.7	10.246	OK
EX SW02	FSR: 2 years: +0 %: 15 mins: Winter	45.030	43.730	43.839	0.109	21.7	0.123	0.000	21.1	10.225	OK
EX SW03	FSR: 2 years: +0 %: 15 mins: Winter	45.110	43.710	43.761	0.051	21.1	0.057	0.000	21.0	10.219	OK
EX SW04	FSR: 2 years: +0 %: 15 mins: Winter	45.110	43.397	43.553	0.156	21.0	0.177	0.000	19.5	10.228	OK
EX SW05	FSR: 2 years: +0 %: 15 mins: Winter	45.366	43.350	43.544	0.194	56.3	0.219	0.000	50.5	33.169	OK
EX SW06	FSR: 2 years: +0 %: 15 mins: Winter	45.366	43.289	43.466	0.176	50.5	0.000	0.000	50.7	33.169	OK
Simple Junction (2)	FSR: 2 years: +0 %: 15 mins: Summer		44.178	44.178	0.000	0.0			0.0	0.000	OK
Simple Junction (3)	FSR: 2 years: +0 %: 15 mins: Summer		44.143	44.143	0.000	0.0			0.0	0.000	OK

Project: University of University of Manchester - The Limes	Date: 22-07-2026		
	Designed by: AM	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		

FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
SW02	FSR: 30 years: +0 %: 15 mins: Winter	44.983	43.465	43.709	0.244	74.7	0.276	0.000	68.7	43.492	OK
SW01	FSR: 30 years: +0 %: 15 mins: Winter	44.921	43.698	43.926	0.228	75.1	0.258	0.000	69.7	33.820	OK
SW03	FSR: 30 years: +0 %: 15 mins: Summer	44.874	43.642	43.713	0.071	10.2	0.081	0.000	8.7	4.425	OK
SW04	FSR: 30 years: +0 %: 15 mins: Winter	44.934	43.503	43.710	0.208	17.1	0.235	0.000	14.4	9.018	OK
SW05	FSR: 30 years: +0 %: 15 mins: Winter	44.917	43.477	43.709	0.232	14.4	0.263	0.000	16.5	9.011	OK
OWI	FSR: 30 years: +0 %: 15 mins: Winter	44.980	43.511	43.753	0.242	69.7	0.274	0.000	65.6	34.528	OK
Simple Junction	FSR: 30 years: +0 %: 15 mins: Summer		44.165	44.165	0.000	0.0			0.0	0.000	OK
EX SW01	FSR: 30 years: +0 %: 15 mins: Winter	44.730	43.830	43.967	0.137	41.9	0.155	0.000	41.2	19.373	OK
EX SW02	FSR: 30 years: +0 %: 15 mins: Winter	45.030	43.730	43.876	0.146	41.2	0.165	0.000	40.3	19.325	OK
EX SW03	FSR: 30 years: +0 %: 15 mins: Winter	45.110	43.710	43.772	0.062	40.3	0.070	0.000	40.1	19.339	OK
EX SW04	FSR: 30 years: +0 %: 15 mins: Winter	45.110	43.397	43.662	0.265	40.1	0.300	0.000	37.8	19.349	OK
EX SW05	FSR: 30 years: +0 %: 15 mins: Winter	45.366	43.350	43.653	0.303	106.5	0.343	0.000	97.9	62.701	OK
EX SW06	FSR: 30 years: +0 %: 15 mins: Winter	45.366	43.289	43.561	0.271	97.9	0.000	0.000	98.1	62.701	OK
Simple Junction (2)	FSR: 30 years: +0 %: 15 mins: Summer		44.178	44.178	0.000	0.0			0.0	0.000	OK
Simple Junction (3)	FSR: 30 years: +0 %: 15 mins: Summer		44.143	44.143	0.000	0.0			0.0	0.000	OK

Project: University of University of Manchester - The Limes	Date: 22-07-2026		
	Designed by: AM	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		

FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
SW02	FSR: 100 years: +45 %: 15 mins: Winter	44.983	43.465	44.084	0.619	129.9	0.700	0.000	118.3	82.980	Surcharged
SW01	FSR: 100 years: +45 %: 15 mins: Winter	44.921	43.698	44.343	0.645	140.9	0.729	0.000	126.1	64.045	Surcharged
SW03	FSR: 100 years: +45 %: 15 mins: Winter	44.874	43.642	44.094	0.452	18.9	0.511	0.000	16.0	9.410	Surcharged
SW04	FSR: 100 years: +45 %: 15 mins: Summer	44.934	43.503	43.959	0.456	19.3	0.516	0.000	27.6	17.572	Surcharged
SW05	FSR: 100 years: +45 %: 15 mins: Summer	44.917	43.477	43.956	0.479	27.6	0.542	0.000	29.6	17.817	Surcharged
OWI	FSR: 100 years: +45 %: 15 mins: Winter	44.980	43.511	44.142	0.631	126.1	0.714	0.000	115.1	65.024	Surcharged
Simple Junction	FSR: 100 years: +45 %: 15 mins: Winter		44.165	44.245	0.080	7.9			0.0	0.423	OK
EX SW01	FSR: 100 years: +45 %: 15 mins: Winter	44.730	43.830	44.037	0.207	78.5	0.234	0.000	77.1	36.298	OK
EX SW02	FSR: 100 years: +45 %: 15 mins: Winter	45.030	43.730	43.954	0.224	77.1	0.253	0.000	70.8	36.285	OK
EX SW03	FSR: 100 years: +45 %: 15 mins: Summer	45.110	43.710	43.855	0.145	69.1	0.163	0.000	69.5	32.396	OK
EX SW04	FSR: 100 years: +45 %: 15 mins: Summer	45.110	43.397	43.846	0.449	69.5	0.507	0.000	62.7	32.412	Surcharged
EX SW05	FSR: 100 years: +45 %: 15 mins: Winter	45.366	43.350	43.875	0.525	175.9	0.593	0.000	169.1	118.089	Surcharged
EX SW06	FSR: 100 years: +45 %: 15 mins: Winter	45.366	43.289	43.664	0.375	169.1	0.000	0.000	169.4	118.089	OK
Simple Junction (2)	FSR: 100 years: +45 %: 15 mins: Summer		44.178	44.178	0.000	0.0			0.0	0.000	OK
Simple Junction (3)	FSR: 100 years: +45 %: 15 mins: Summer		44.143	44.143	0.000	0.0			0.0	0.000	OK

Project: University of University of Manchester - The Limes	Date: 22-07-2026		
	Designed by: AM	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: WSP		

FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S2.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW03	SW04	44.874	43.694	0.086	2.487	0.3	0.04	4.9	OK
S2.001	FSR: 2 years: +0 %: 30 mins: Summer	Pipe	SW04	SW05	44.934	43.610	0.118	6.098	0.3	0.06	7.0	OK
S2.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW05	SW02	44.917	43.619	0.148	4.757	0.2	0.06	7.3	OK
S1.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW01	OWI	44.921	43.851	0.144	18.346	0.9	0.32	35.9	OK
S1.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	OWI	SW02	44.980	43.669	0.156	18.339	0.8	0.31	34.8	OK
S1.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Simple Junction	SW01	44.165	44.165	0.000	0.000	0.0	0	0.0	OK
EX S4.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Simple Junction (2)	EX SW01	44.178	44.178	0.000	0.000	0.0	0	0.0	OK
EX S5.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Simple Junction (3)	EX SW01	44.643	44.143	0.000	0.000	0.0	0	0.0	OK
EX S4.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EX SW01	EX SW02	44.730	43.926	0.102	10.246	0.9	0.12	21.7	OK
EX S4.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EX SW02	EX SW03	45.030	43.839	0.080	10.225	1.2	0.26	21.1	OK
EX S4.003	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EX SW03	EX SW04	45.110	43.761	0.104	10.219	0.9	0.03	21.0	OK
EX S4.004	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EX SW04	EX SW05	45.110	43.553	0.175	10.228	0.5	0.14	19.5	OK
S1.003	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SW02	EX SW05	44.983	43.618	0.174	23.053	0.7	0.33	36.8	OK
EX S1.004	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	EX SW05	EX SW06	45.366	43.544	0.185	33.169	0.9	0.46	50.5	OK

Project: University of University of Manchester - The Limes	Date: 22-07-2026		
	Designed by: AM	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: WSP		

FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S2.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	SW03	SW04	44.874	43.713	0.135	4.425	0.3	0.08	8.7	OK
S2.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW04	SW05	44.934	43.710	0.220	9.018	0.3	0.13	14.4	OK
S2.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW05	SW02	44.917	43.709	0.238	9.002	0.3	0.15	16.5	OK
S1.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW01	OWI	44.921	43.926	0.210	33.820	1.1	0.62	69.7	OK
S1.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	OWI	SW02	44.980	43.753	0.243	34.528	0.9	0.58	65.6	OK
S1.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Simple Junction	SW01	44.165	44.165	0.000	0.000	0.0	0	0.0	OK
EX S4.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Simple Junction (2)	EX SW01	44.178	44.178	0.000	0.000	0.0	0	0.0	OK
EX S5.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Simple Junction (3)	EX SW01	44.643	44.143	0.000	0.000	0.0	0	0.0	OK
EX S4.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	EX SW01	EX SW02	44.730	43.967	0.142	19.373	1.1	0.22	41.2	OK
EX S4.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	EX SW02	EX SW03	45.030	43.876	0.104	19.325	1.6	0.5	40.3	OK
EX S4.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	EX SW03	EX SW04	45.110	43.772	0.163	19.339	1.1	0.06	40.1	OK
EX S4.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	EX SW04	EX SW05	45.110	43.662	0.284	19.349	0.4	0.27	37.8	OK
S1.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SW02	EX SW05	44.983	43.709	0.273	43.483	0.8	0.61	68.7	OK
EX S1.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	EX SW05	EX SW06	45.366	43.653	0.287	62.701	1.1	0.89	97.9	OK

Project:	Date:		
University of University of Manchester - The Limes	22-07-2026		
	Designed by:	Checked by:	Approved By:
	AM		
Report Details:	Company Address:		
Type: Connections Summary Storm Phase: Phase	WSP		

FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S2.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SW03	SW04	44.874	44.094	0.375	8.803	0.3	0.14	16.0	Surcharged
S2.001	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	SW04	SW05	44.934	43.959	0.375	16.451	0.3	0.24	27.6	Surcharged
S2.002	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	SW05	SW02	44.917	43.956	0.375	16.429	0.3	0.26	29.6	Surcharged
S1.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SW01	OWI	44.921	44.343	0.375	63.643	1.1	1.12	126.1	Surcharged
S1.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	OWI	SW02	44.980	44.142	0.375	65.024	1.0	1.02	115.1	Surcharged
S1.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	Simple Junction	SW01	44.165	44.245	0.150	0.021	0.2	0	0.0	OK
EX S4.000	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	Simple Junction (2)	EX SW01	44.178	44.178	0.000	0.000	0.0	0	0.0	OK
EX S5.000	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	Simple Junction (3)	EX SW01	44.643	44.143	0.000	0.000	0.0	0	0.0	OK
EX S4.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	EX SW01	EX SW02	44.730	44.037	0.215	36.298	1.2	0.41	77.1	OK
EX S4.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	EX SW02	EX SW03	45.030	43.954	0.201	36.285	1.2	0.87	70.8	OK
EX S4.003	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	EX SW03	EX SW04	45.110	43.855	0.297	32.396	1.0	0.11	69.5	OK
EX S4.004	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	EX SW04	EX SW05	45.110	43.846	0.375	32.412	0.6	0.45	62.7	Surcharged
S1.003	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SW02	EX SW05	44.983	44.084	0.375	81.963	1.1	1.05	118.3	Surcharged
EX S1.004	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	EX SW05	EX SW06	45.366	43.875	0.375	118.089	1.5	1.53	169.1	Surcharged

Appendix G – Owens Park Drainage Strategy Catchment Areas Plan

Proposed Catchment Areas				
Phase	Building (m²)	Hardstanding (m²)	Soft Landscaping (m²)	Total (m²)
1A	9022	10253	9292	28567
1A+	2188	3215	2578	7981
1B	9359	7182	12361	28902
2	7494	6220	13009	26723
Total (m²)	28063	26870	37240	92173

Key

- Planning Boundary
- Phase 1A Boundary
  1.93ha Impermeable
  0.93ha Permeable
- Phase 1A+ Boundary
  0.54ha Impermeable
  0.26ha Permeable
- Phase 1B Boundary
  1.65ha Impermeable
  1.24ha Permeable
- Phase 2 Boundary
  1.37ha Impermeable
  1.30ha Permeable
- Proposed Soft Landscaping Area
- Proposed Hardstanding Area
- Proposed Building Area

Existing car park area outside of boundary to be drained into Phase 1A drainage network. Additional catchment area therefore included in table figures above.

1A

1A+

2

1B

OLD HALL LANE
REDSHAW CLOSE
LANGLEY ROAD
WILMSLOW ROAD
MOSELEY ROAD
CARILL DRIVE

BUILDING DESIGN PARTNERSHIP SHALL HAVE NO RESPONSIBILITY FOR ANY USE MADE OF THIS DOCUMENT OTHER THAN FOR THAT WHICH IT WAS PREPARED AND ISSUED.

ALL DIMENSIONS SHOULD BE CHECKED ON SITE.

DO NOT SCALE FROM THIS DRAWING.

ANY DRAWING ERRORS OR DIVERGENCES SHOULD BE BROUGHT TO THE ATTENTION OF BUILDING DESIGN PARTNERSHIP AT THE ADDRESS SHOWN BELOW.

NOTES

REVISION - DESCRIPTION	DRAWN	CHECKED	DATE
P01 ISSUED FOR PLANNING	CS	AJ	22/09/15
FIRST ISSUE	CS	AJ	20/03/15

KEY PLAN

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PROJECT TITLE
Owens Park, Fallowfield
Campus Redevelopment

PROJECT NUMBER
P2006665

DRAWING TITLE
Flood Risk Assessment &
Drainage Strategy
Proposed Catchment Areas

SCALE @ A1
1:1000

DATE
Mar '15

DRAWING No.
P00_00_(SK)_Z0_C_002

REVISION
P01

Appendix H - Drainage inspection and maintenance schedule

Fallowfield Facilities Unit – Drainage Inspection and Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Below Ground Drainage Pipes, Manholes, etc		
Regular maintenance	Lift covers and inspect manholes for evidence of debris and silt deposits and evidence of blockages (standing water). Carry out CCTV survey if required	Quarterly
Remedial actions	High pressure jetting and/or remove minor blockages and silt build up	As required – 20% loss of pipe cross-section
	Replace broken access covers, remove major blockages, repair structurally defective pipework	As required
Linear Channel Drains and Gullies		
Regular maintenance	Lift access covers and inspect for silt/debris accumulation	Quarterly
Remedial actions	High pressure jetting and or remove minor blockages and silt build up	As required
	Replace broken access covers, gratings	As required
Rainwater Pipes		
Regular maintenance	Inspect rainwater goods for evidence of leaking pipework	Quarterly
Occasional maintenance	Remove rodding eyes and carry out high pressure jetting to remove any debris	Annually
Remedial actions	Replace cracked/leaking pipework	As required

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