BURO HAPPOLD

MMU All Saints Library Transformation Project

Drainage Strategy

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Glossary

Term	Definition
BH	Buro Happold
MMU	Manchester Metropolitan University
MCC	Manchester City Council
EA	Environmental Agency
UU	United Utilities
LLFA	Lead Local Flood Authority
FRA	Flood Risk Assessment
SuDS	Sustainable Drainage Systems
MH	Manhole
m AOD	Metres Above Ordnance Datum.
m bgl	Metres below ground level
Greenfield	Land which has not been previously developed.
Groundwater	Water present within underground strata known as aquifers.
Discharge	The rate of flow of water measured in terms of volume per unit time.
Attenuation	A method to reduce a flood peak to prevent flooding, often utilising temporary storage, but increasing the duration of the flow.

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1 Executive Summary

This Drainage Strategy Report has been prepared in support of a Detailed Planning Application associated with the proposed Manchester Metropolitan University All Saints Library Transformation Project on Oxford Road, All Saints Park, Manchester, M15 6BH.

This report is to be read in conjunction with the Buro Happold Flood Risk Assessment (FRA) and Ground Engineering Desk Study Report also prepared in support of the planning application.

The drainage strategy has been developed in accordance with Manchester's Local Flood Risk Management Strategy, Part H of the Building Regulations and 'The SuDS Manual' (CIRIA C753). Discussions have been held with United Utilities following submission of a pre-development enquiry. A pre-application meeting was held with Drainage Officers from Manchester City Council, in their capacity as the Lead Local Flood Authority (LLFA), on 09 August 2023 and the contents of this drainage strategy reflect the discussions held.

The development will have separate systems for surface and foul water. Foul water will be collected in a dedicated below ground drainage network and discharged to an existing public combined sewer on the western side of the site. Although the existing sewer is at a considerable depth of over 9 metres below ground level, as the existing site currently discharges to this sewer it is intended to reuse existing connections which are located at shallower depth.

The drainage hierarchy for the management and disposal of surface water has been observed in the production of this drainage strategy. Infiltration and discharge to watercourse have been ruled out and, although every effort has been made to identify a practical means of connecting to an existing surface water sewer, this option is not considered viable due to the presence of strategic buried utilities and the significant depth of the sewer within Oxford Road.

Runoff from the proposed development is proposed to be attenuated and released at a controlled rate in order to provide a betterment when compared with the pre-development runoff rate. Due to the extensive constraints across the site, including buried utilities (including fibre-optic cables associated with the MMU Data Centre), tree root protection zones, and constrained external areas, a 20% betterment is targeted. The drainage strategy is designed to ensure on-site flood risk is managed up to the 1 in 100 year storm event, with an appropriate allowance for climate change, and there is no increase in off-site flood risk as a result of the development.

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2 Introduction

2.1 Appointment and Brief

This drainage strategy has been prepared in support of a Detailed Planning Application for the proposed MMU All Saints Library Transformation Project (herein referred to as the proposed development). This report is to be read in conjunction with the Buro Happold Flood Risk Assessment (FRA) and Ground Engineering Desk Study Report also prepared in support of the planning application.

This Report will review and document the following;

- Site constraints
- Existing drainage regime
- Proposed surface and foul water drainage strategy.

2.2 Limitations

This report is based on the interpretation and assessment of data provided by third parties. It should be noted that the detailed design of the drainage and associated Sustainable Drainage Systems (SuDS) features for the site has not been finalised and the assumptions and information presented herein are subject to design development and outcomes from consultation with relative authorities. Operation and maintenance of all SuDS (including proprietary systems) will need to be considered once the proposed development has been finalised with all specific information being presented to those responsible for the maintenance of the facility. Buro Happold cannot be held responsible for the accuracy of third-party data or the conclusions that come from this information or as a result of changes arising from the developing design. The conclusions and findings of this report may change if the proposed development is amended or updated after the date of publishing.

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3 Existing Site

3.1 Site Location and Description

The site is located at the existing All Saints Library at Manchester Metropolitan University (MMU), All Saints Park, Manchester, M15 6BH, centred on SJ 84225 97158. The site is bordered by the elevated Mancunian Way motorway (A635), Oxford Road, All Saints Park and the MMU Business School with educational, commercial and residential properties beyond. The site is approximately 0.65 hectares and is partly within Source Protection Zone 3.

Site uses in the immediate vicinity are as below:

- North - Mancunian Way motorway (A635) with University buildings beyond
- East – Oxford Road with University and commercial buildings beyond
- South – All Saints Park with Cavendish Rd and University buildings beyond
- West – MMU Business School.

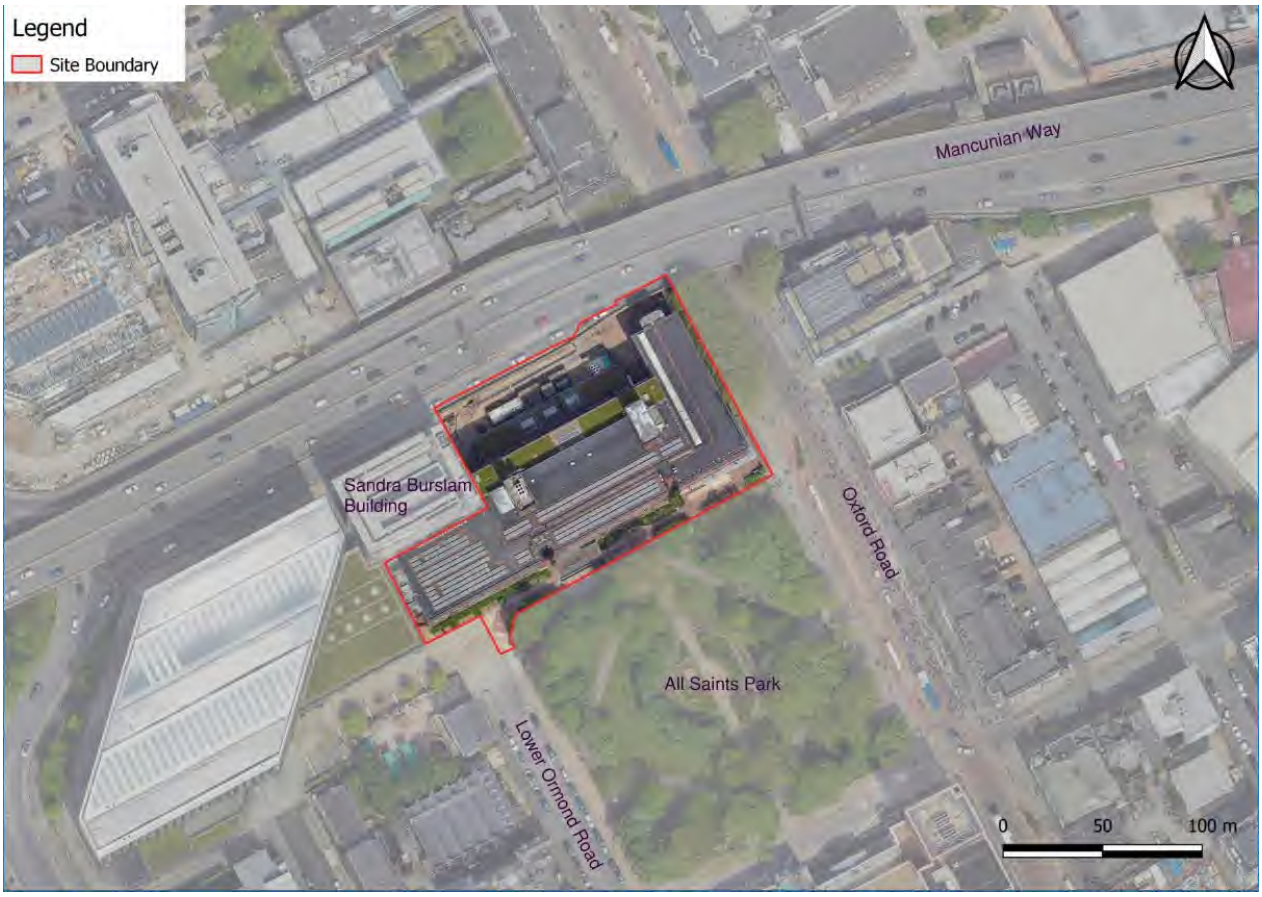

Figure 3.1 Site Boundary

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3.2 Topography and Existing Levels

The site is relatively flat with the highest point southwest of the site near All Saints Park with an approximate elevation of +37.9m AOD. The site generally slopes northwards towards Mancunian Way to a low point of approximately +36.9m AOD with a resultant average gradient of around 1:190.

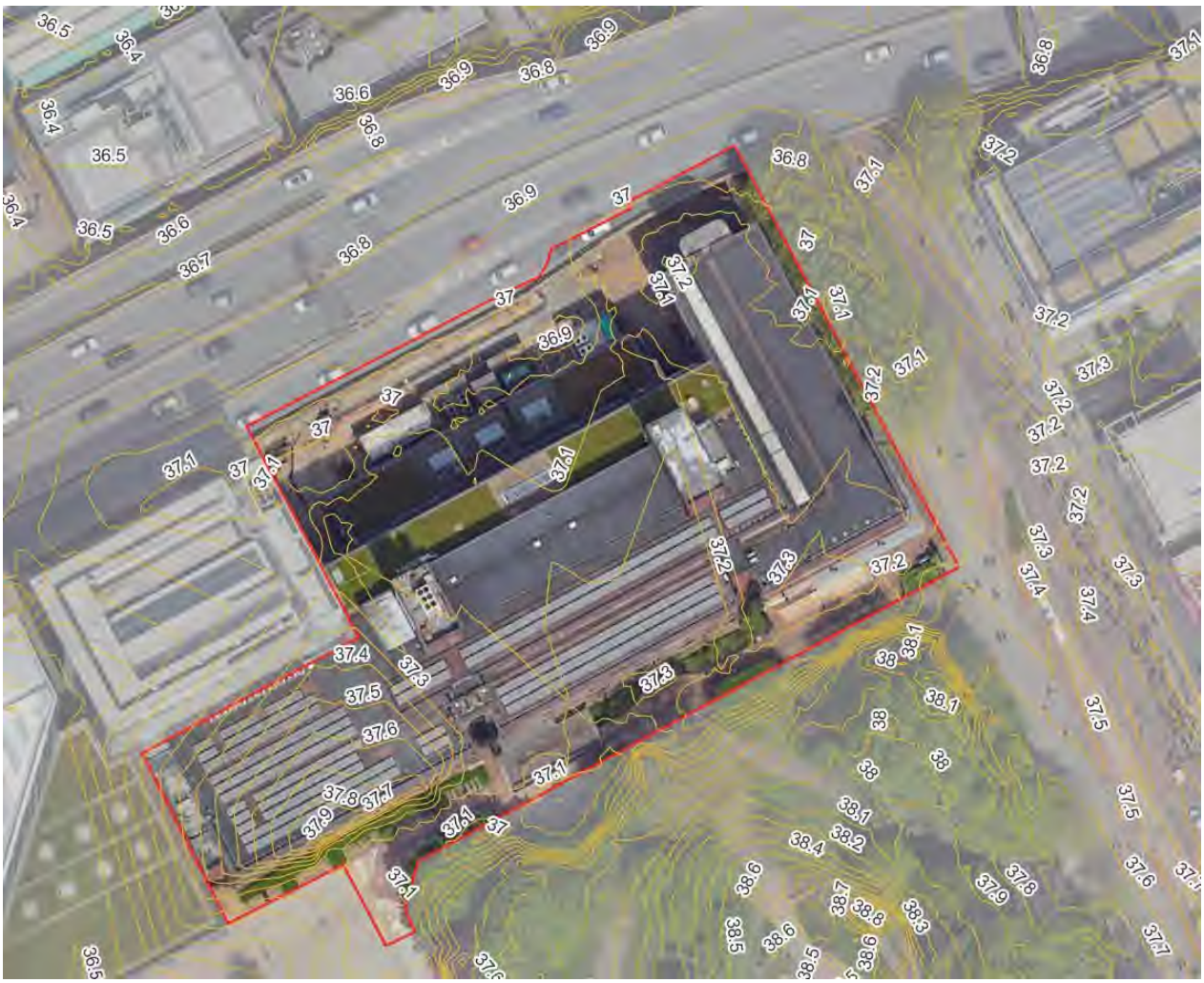

Figure 3.2 Site Topography

3.3 Geology

Ground conditions across the site generally comprise varying depths of Made Ground, underlain by Glaciofluvial Deposits (dense to very dense SAND and/or GRAVEL), underlain by Glacial Till Deposits (firm to stiff sandy gravelly CLAY) which is underlain by bedrock (extremely weak siltstone, sandstone and mudstone) (Manchester Marl Formation). During the GI groundwater strikes were encountered in 5 No. exploratory holes across the site and were recorded to range between 2.30 m bgl (BH01 in glaciofluvial deposits) and 2.90 m bgl (WS04 in Made Ground).

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3.4 Flood Risk

The development site lies within Flood Zone 1, meaning that the risk of flooding is considered to be low, with less than a 1 in 1000-year annual probability of flooding from fluvial or tidal sources. For further details of flood risk at the site please refer to the accompanying Flood Risk Assessment (FRA) which has been produced in support of this project.

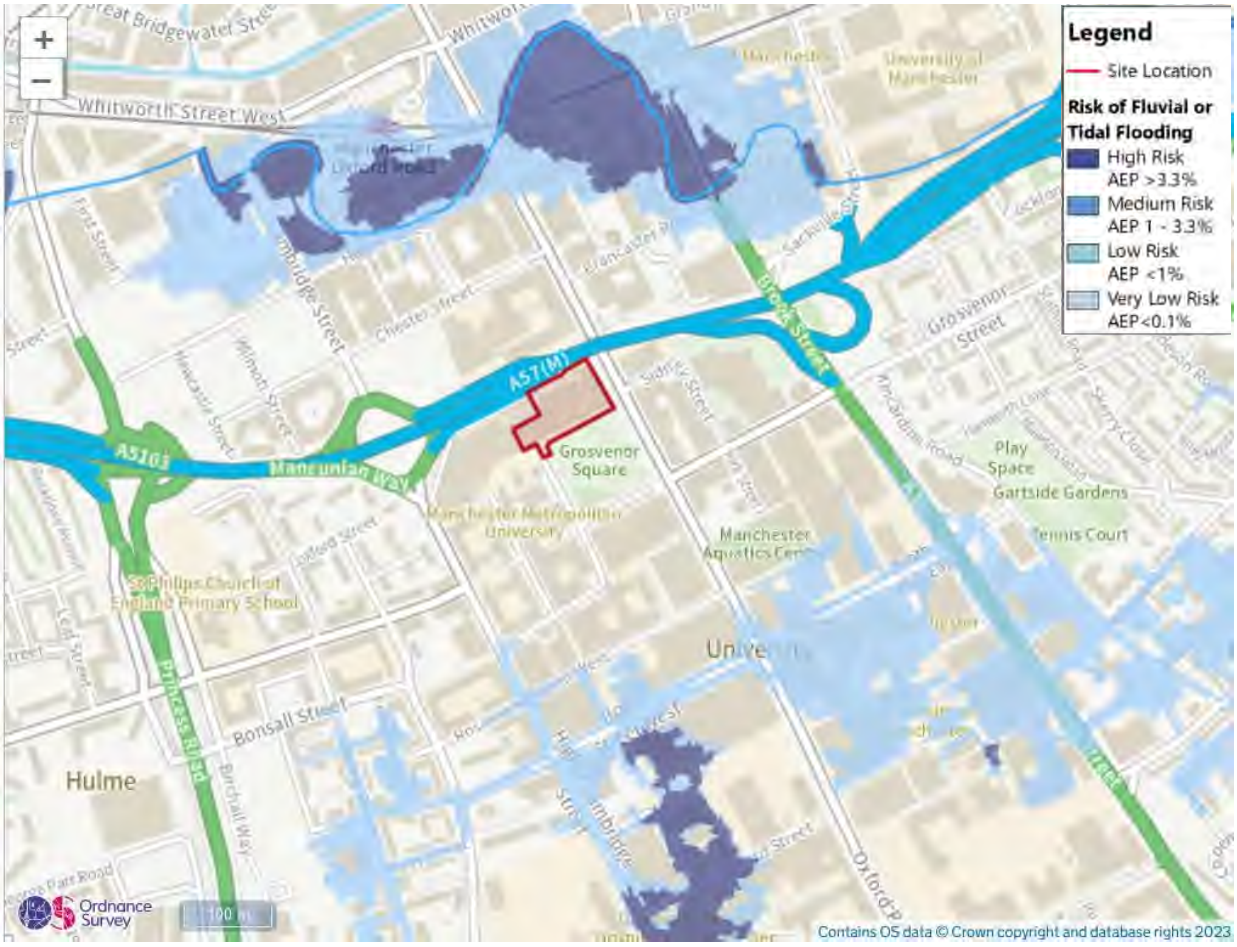

Figure 3.3 Fluvial Flood Risk

3.5 Existing Drainage

This section is to be read in conjunction with the Existing Drainage Plan in Appendix C.

3.5.1 Public Drainage

Record information obtained from United Utilities indicates that an extensive network of public sewers is located within, and immediately adjacent to, the site. The following systems are shown to be present:

- A 600x880mm combined sewer running in a south-easterly direction beneath Lower Ormond Street to the south of the site. The direction of this sewer is unconfirmed but this is not considered to have a bearing on the design. There is a 300mm combined sewer, within the site, which is shown to run in a north-westerly direction and passing beneath the existing MMU Library and Sir Kenneth Green Library building. This sewer then increases to a 580x630mm combined sewer.

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- A 600x900mm combined sewer within Oxford Road to the east of the site, running in a north-westerly direction
- A 830x960mm surface water sewer within Oxford Road to the east of the building running in a north-westerly direction.

A plan of the public sewers in the vicinity of the site is provided in Figure 3.4.

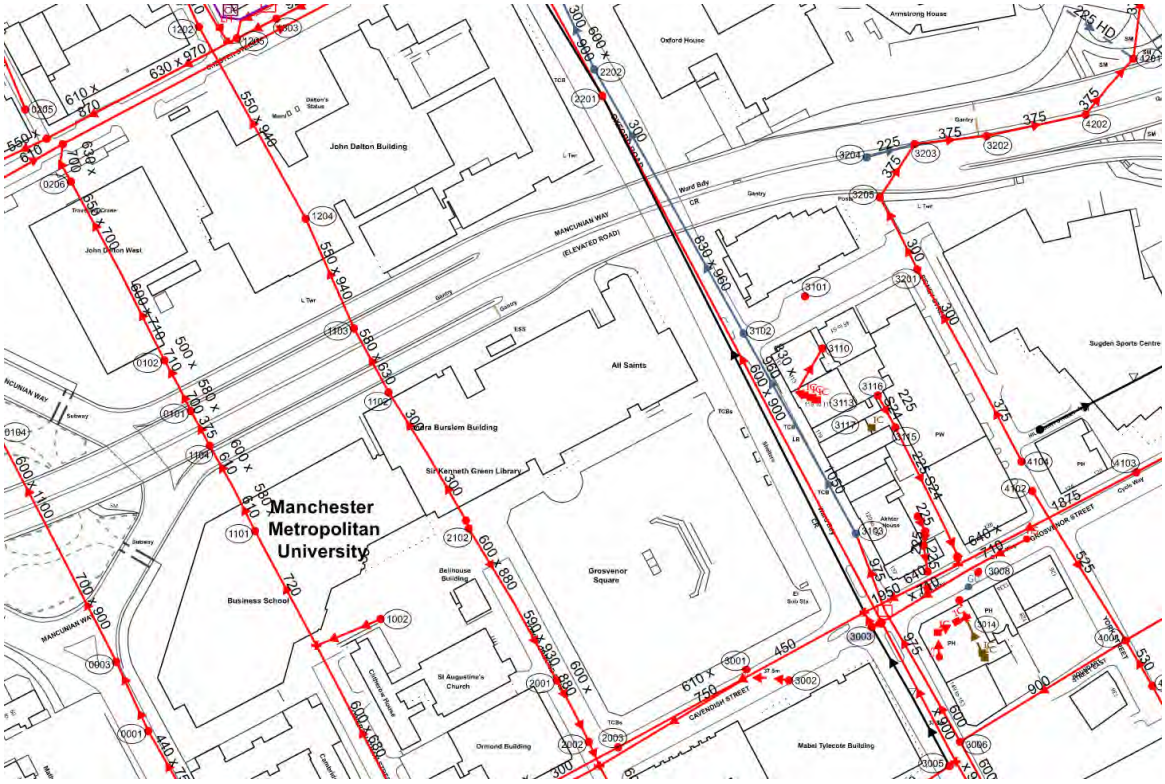

Figure 3.4 Unites Utilities Public Sewer Records

3.5.2 Private Drainage

Topographical and utility survey information gathered at the site indicates the existing library is served by a private network of foul and surface water drains. The identified drainage systems are outlined below and are presented on drawing 1044B-BHE-XX-XX-DR-C-003100 'Existing Drainage Plan';

- A 225mm diameter foul water drain, increasing to 300mm diameter, within the service area to the north of the building which flows in a south-westerly direction. This drain is shown to collect flows from the existing building and discharges into the existing public combined sewer in the vicinity of UU manhole 1102. Although this is identified as a foul water drain on the survey, it is currently assumed this may be a combined drain, due to the increased diameter and positioning of the building downpipes, which may or may not also carry surface water from the existing building.

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- A 150mm diameter foul water drain, increasing to 225mm, within the pedestrianised corridor to the south of the building which flows in a south-westerly direction. This drain is shown to collect flows from the existing building and is assumed to discharge into the existing public combined sewer in the vicinity of UU manhole 2102. Although this is identified as a foul water drain on the survey, it is currently assumed this may actually be a combined drain, due to the increased diameter and positioning of the building downpipes, which may or may not also carry surface water from the existing building.
- Various untraced gullies, rodding eyes and manhole and inspection chamber covers were identified within the southern pedestrianised corridor to the south of the building, along with the presence of rainwater downpipes from the existing building. It is currently assumed all surface water from the southern side of the existing roof area, along with the pedestrian area, discharges to the public combined sewer in the vicinity of UU manhole 2102 either via an unidentified surface water drain, or the aforementioned combined drain.
- A 100mm diameter surface water drain in the south-east corner of the site, flowing in a north-westerly direction along the eastern façade of the existing building, from All Saint's Park in the south-west towards the north-east corner of the library building. Although the survey results were inconclusive, they suggest the drain discharges into a manhole in the northeast corner of the site and turns to head in a north-westerly direction and is assumed to ultimately discharge to the combined sewer network in the west of the site. The CCTV survey suggests this drain may be unused as there is minimal staining and scum markings within the pipe.

All of the drainage systems discussed above have been surveyed to determine connectivity with the existing building and external areas of the site, structural condition, and positive connection points with the United Utilities public sewer network.

3.6 Watercourses

A culvert data screening has been provided by the LLFA which did not confirm the presence of any culverts within the vicinity of the site. The closest watercourse to the site is the River Medlock, a designated Main River, which is partially culverted through the city centre approximately 225m to the north of the site.

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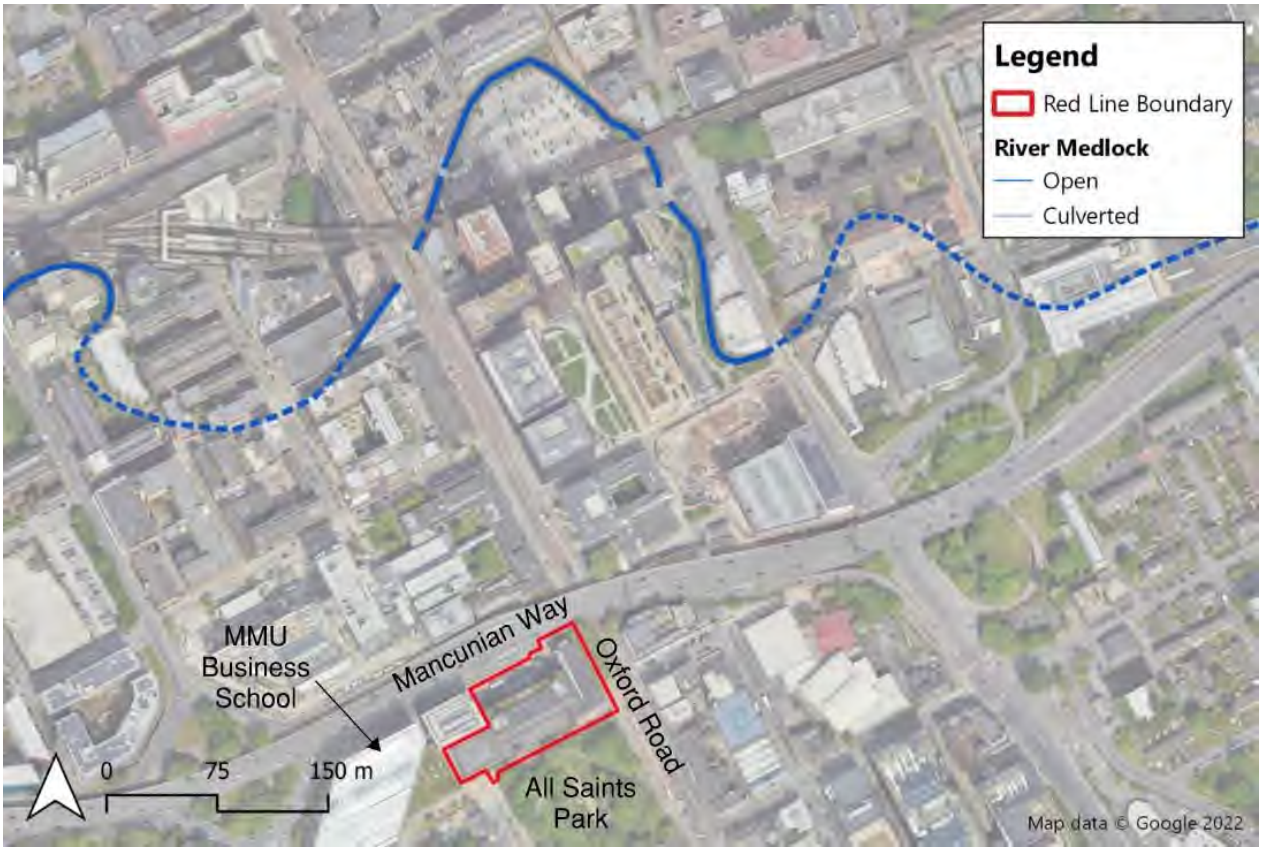

Figure 3.5 Existing Watercourses

3.7 Consultation

Consultation with the relevant authorities has been carried out in order to inform the development of the drainage strategy. A summary of these consultations is provided below and copies of relevant correspondence are provided in Appendix A (United Utilities) and Appendix B (LLFA).

United Utilities (UU)

A Pre-planning enquiry with UU was submitted on 02 December 2022. UU confirmed that foul flows from this site will be allowed to drain into the public foul water/combined sewer system. UU stated that the preferred point of discharge would be to the 600mmx900mm public combined sewer within Oxford Road, however, they would also accept a connection into the western sewer (as per the existing outfall route).

For surface water, UU advised that the development should drain in accordance with the drainage hierarchy, as outlined within National Planning Practice Guidance, ie;

1. into the ground (infiltration);
2. to a surface waterbody;

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3. to a surface water sewer or highway drain;

4. to a combined sewer.

On the understand that the hierarchy is followed, and it is determined that surface water will need to discharge to public sewer, UU highlighted their preferred point of connection would be to the 830x960mm diameter public surface water sewer within Oxford Road. The pass forward flow rate would need to be agreed by the Lead Local Flood Authority, although UU requested the agreed rate should not exceed the greenfield runoff rate.

Manchester City Council (LLFA)

A pre-application enquiry was issued to Manchester City Council, in their capacity as LLFA, on 01 December 2022. A Data Screening request was also issued to the LLFA in June 2023.

A meeting with the LLFA was successfully arranged and carried out on 09 August 2023. The following information was presented;

- Existing site and drainage arrangements;
- Proposed development;
- Existing constraints including site extents, Mancunian Way, existing utilities and tree root protection zones;
- Survey findings including existing buried utilities and public sewer manhole cards;
- UU correspondence held to date (including their aspirations for the Library drainage); and
- Justification for the relaxation to standards being requested.

The LLFA Officers acknowledged the constraints and challenges across the site in the pursuit of a fully compliant surface water drainage strategy. The Officers requested a pack of information to be provided (including topographical, utility and drainage survey data) in order to carry out a detailed review of the site constraints and to inform a formal written pre-application response. The pack of information was issued on 09 August 2023. At the time of producing this Drainage Strategy report a formal response had not been received.

A copy of the slide pack, as presented to the LLFA, is included within Appendix B.

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4 Proposed Development

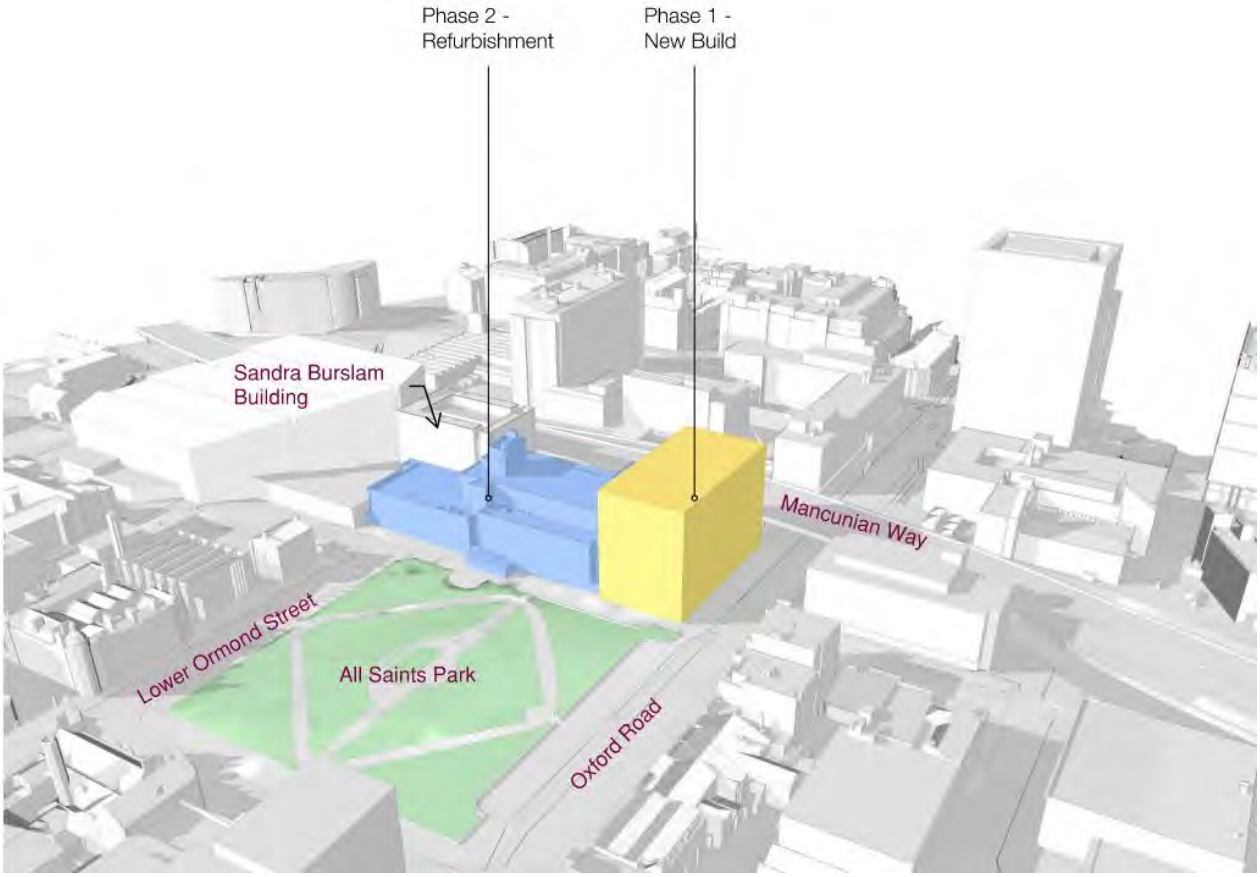

Figure 4.1 Proposed Development Phasing

The proposed development involves two phases, where Phase 1 comprises of the demolition of the All Saints Building adjacent to Oxford Road and replacement with a new 12 storey element. Phase 2 then covers the redevelopment and refurbishment of the adjacent All Saints Library building, which includes adding two additional storeys to the building including a Level 5 roof terrace.

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5 Proposed Surface Water Drainage Strategy

5.1 Existing site Brownfield Drainage rate

The existing impermeable area of the site is approximately 0.654 ha, all of which is positively drained hardstanding and roof space, and the proposed impermeable area is to remain unchanged. Therefore, applying a standard rainfall intensity of 50mm/hr, the existing brownfield surface water runoff from the site to the public sewer is 91 litres per second.

$$Site\ impermeable\ area\ =\ 6536m^2$$

$$Brownfield\ site\ rainfall\ intensity = 50mm/hr$$

$$50mm/hr \times 0.001 = 0.05m/hr$$

$$0.05m/hr \times 6536m^2 = 326.8\ m^3/hr$$

$$326.8\ m^3/hr = 91\ l/s$$

5.2 Drainage Hierarchy

The Building Regulations Approved Document Part H (Drainage and Waste Disposal) and National Planning Practice Guidance specifies a hierarchy for the disposal of surface water which should be adhered to as part of any surface water drainage design. This hierarchy, which is echoed within the Non-Statutory Technical Standards for Sustainable Drainage and the North West SuDS Proforma, states the surface water should be discharged as follows:

1. To an adequate soakaway or some other adequate infiltration system; or, where that is not practicable,
2. A watercourse; or, where that is not practicable,
3. A surface water sewer; or, where that is not practicable,
4. A combined sewer.

Infiltration

It is considered that discharge to the underlying ground via soakaway is not feasible due to ground conditions, the proximity of existing structures and constrained nature of the site. Soakaway testing was inclusive due to the collapse of one of the boreholes, and rapid infiltration of water into two other boreholes. Although the rapid infiltration of water suggests a high infiltration rate, it is considered that the water dissipated into the adjacent made ground. The ground investigation also identified a high water table with strikes at 2.30m below ground level, and post-fieldwork monitoring recording levels at 36mAOD, approximately 1m below ground level.

It is therefore considered that it will not be possible to provide an adequate unsaturated zone beneath any soakaway structure and the discharge of surface water via infiltration is not feasible.

Watercourse

The nearest watercourse to the site is the River Medlock, a Main River managed by the Environment Agency, which is located approximately 250m north of the site. Due to the distance between the river and the proposed development,

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and the significant difficulties in routing a new sewer within the densely developed City Centre district, this option is not considered practical.

Surface Water Sewer

Where infiltration or discharge to watercourse cannot be achieved, UU has expressed their aspiration for all surface water from the development to discharge to the existing surface water sewer on the eastern side of Oxford Road. No other surface water drains or sewers have been identified in the proximity of the development. Although UU state that the discharge rate is to be agreed with the LLFA, they have confirmed their preference for all runoff to be limited the equivalent greenfield rate.

Investigations have been carried out on the existing surface water sewer in Oxford Road in order to determine the feasibility of making a new connection to serve the new development. The following key features have been identified;

- The sewer provides a direct conduit from a combined sewer overflow (CSO), located in the junction of Oxford Road and Grosvenor Street (near to UU manhole ref 3003), to the River Medlock;
- An access chamber (UU manhole ref 3102) is located on the opposite side of Oxford Road from the MMU Library, close to the junction with Sidney Street. A manhole survey has been carried out on manhole 3102 to confirm the following details;
    - Chamber depth: 10.3m
    - Pipe diameter: 1.0m
    - Shaft diameter: 900mm.
- No pre-existing connections from the site to the surface water sewer have been identified.

Due to the significant depth of the existing surface water sewer, it is considered that any connection from the development would need to be made at a high level within manhole 3102 (i.e. up to 3m below ground level), with an internal backdrop arrangement to control the discharge of water to the invert of the chamber. This would avoid exceptionally deep excavations within Oxford Road which would introduce significant costs, hazards and disruption.

Manholes of significant depth require 900mm horizontal clearance between the face of the access ladder and the shaft wall, in order to provide sufficient space for a person to make access with the appropriate PPE necessary for a confined space entry. As the total diameter of the existing shaft is only 900mm, before accounting for the width of the ladder and a new backdrop pipe, it falls significantly below the minimum standard. The chamber also contains step irons rather than the necessary ladder.

Furthermore, internal backdrops are generally not permitted by United Utilities, although this could be challenged in exceptional circumstances.

In order to make a new connection to the surface water sewer, a new outfall pipe would need to be constructed across the eastern footway of Oxford Road, to the centre of the southbound carriageway on the opposite side. A below-ground utility survey has been completed within Oxford Road to verify the presence and location of existing services that would need to be crossed. The following utilities have been identified, generally running parallel with the highway; UU water mains (24" cast iron and 6" spun iron), electricity (33kV and LV) and multiple comms/fibre-optic cable ducts (CityFibre, Gamma, Colt, Zayo Group, Vodafone, Openreach).

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It is clear that a significant number of communication assets are present within the western side of Oxford Road and is expected to represent a strategic corridor within Manchester. A 24" water main is also a substantial asset, with the cast iron material generally considered to be highly susceptible to damage resulting from nearby excavation works. The work required to install a pipe beneath these assets would therefore present numerous risks and hazards, and may also require diversions resulting in significant cost and prolonged disruption.

It is therefore concluded that, due to the presence of multiple strategic utilities, the depth of the surface water sewer and constraints relating to the existing access chamber, it is not feasible to make a new connection to the existing surface water sewer in Oxford Road without introducing significant and disproportionate costs to the development.

Combined Sewer

There are two public combined sewers in the vicinity of the site; a 600x900 located in the centre of Oxford Road and a conduit of varying size on the western side of the site which passes beneath the existing library building. The existing Library has been proven to discharge into the western combined sewer network via connection points on the northern and southern sides of the building (manholes 1102 and 2102 respectively). Although the invert of the sewer is a significant depth of 9.3m, which could present challenges in making a new connection, existing connections are present on the combined system which could be reused to serve the proposed development. This would significantly reduce the hazards and complications associated with deep excavations and works in confined spaces.

Due to the reasons outlined above, it is proposed to discharge surface water from the development to the existing public combined sewer network that serves the existing site. Investigations are to be carried out to determine the precise points of connection from the existing site, and any reuse of existing connections will be agreed with United Utilities.

5.3 Climate Change

Climate change allowances shall be based on the Irwell Management Catchment peak rainfall allowance table for the 1% annual exceedance rainfall event produced by the Environment Agency. As the development is considered to have a design life of between 2061 and 2100, the central allowance for the 2070s epoch (2061 to 2125) should be used.

Table 5—1 Irwell Management Catchment peak rainfall allowances[1]

Allowance category	Central Allowance	Upper End Allowance
2050s	+25%	+40%
2070s	**+30%**	+45%

5.4 SuDS Selection

The Sustainable Drainage Systems (SuDS) approach essentially involves the slowing down of surface water runoff from a development to manage on-site and downstream flood risk, as well as providing water quality improvements. This can generally be achieved by harvesting, infiltrating, slowing, storing and conveying runoff via a variety of techniques, as opposed to the historical and more traditional method of sole reliance on below ground pipework.

[1] Environment Agency. 2022. Flood risk assessments: climate change allowances. [online] Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-rainfall-intensity-allowance [Accessed 5 December 2022].

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The variety of SuDS techniques available are generally not all appropriate for every development, and the selection depends on the characteristics of the site including permeability of the underlying ground, space constraints, land use and topography.

The following Sustainable Drainage Systems (SuDS) have been considered for the MMU Library development, the final selection of which has been determined following a review of the drainage requirements together with structural, building services (MEP) and landscape architecture considerations.

Permeable Paving

Permeable paving provides a pavement suitable for pedestrian and/or vehicular traffic, while allowing rainfall to infiltrate through the surface and into the underlying structural layers. The water is temporarily stored beneath the overlying surface before being discharged downstream. As part of the development, permeable paving will be considered to provide attenuation and water treatment within hardstanding areas north of the development. Due to the relatively flat nature of the site the storage provided within the underlying structure can be used to reduce the required volume of the attenuation tank.

Permeable paving is considered an appropriate option for use within the proposed development.

Attenuation Storage Systems

Attenuation storage systems are used to create a below-ground void space for the temporary storage of surface water before controlled release. Due to the restricted external space within the site, and significant buried utilities including fibre-optic cables associated with the MMU Data Centre, oversized pipes and/or geocellular crates will be the main form of attenuation across the site.

Attenuation storage systems are considered an appropriate solution for use within the proposed development.

Bioretention Systems

Bioretention systems are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution though the use of engineered soils and vegetation. As part of the development, Bioretention systems have been considered for the collection, attenuation and treatment of runoff from for external areas of the site.

Due to operational vehicle requirements in northern areas of the site, and the significant footfall and emergency vehicle access requirements in pedestrian areas to the south and east, bioretention systems are not considered appropriate for the development.

Green and Blue Roofs

Green roofs can be used to treat, attenuate and slow down runoff within their substrate and support root uptake of appropriate planting. Similarly, blue roofs are able to attenuation and slow down runoff within engineered storage atop of the roof.

Although consideration has been given to introducing a blue or green roof system to the development, this is not possible due to the conflicting requirements of the structure, building services and architecture. In the Phase 1 (new build) area the primary constraint relates to the rooftop plant enclosure, while in the larger Phase 2 (refurbishment) area weight limitations associated with the existing retained building structure need to be observed.

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Proprietary Treatment Devices

Proprietary treatment systems are manufactured products that remove specified pollutants from surface water runoff. As part of the development, proprietary treatment devices will provide treatment to the entire site, but in particular the delivery area to capture pollutants before discharging from the site.

SuDs Operation and Maintenance

Regular maintenance of the sustainable drainage system is essential to preserve its performance. An Operation and Maintenance Manual will be prepared in accordance with the CIRIA guidance C753 section 32. This manual will be collated during the detailed design stage and will be included as part of the H&S File and Building Manual for the development. Maintenance will be in accordance with the specific requirements of each feature and the chosen attenuation supplier.

The Operation and Maintenance Manual will set out the location of all SuDS components on-site as well as a brief summary of their design intent, how the SuDS components work, their purpose and performance risks. It will also include a maintenance plan and record pro forma, an explanation of the objectives of the maintenance proposed and the potential implications of not meeting those objectives.

All drainage, including SuDS features, will remain within the ownership and responsibility of the developer.

Table 5—2 SuDS Maintenance Manual

SuDS Technique	Maintenance schedule	Required action	Typical frequency
Tank systems and Over-sized pipes and tanks	Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
		Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
		For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
		Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
	Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
	Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
		Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
Porous pavers / Permeable surfaces	Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas

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SuDS Technique	Maintenance schedule	Required action	Typical frequency
			as this area is most likely to collect the most sediment
	Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate pplied directly into the weeds by an applicator rather than spraying	As required
	Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
	Monitoring	Initial inspection	Monthly for three months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually
Proprietary treatment system	Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
		Change the filter media	As recommended by manufacturer
		Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
	Remedial actions	Replace malfunctioning parts or structures	As required
	Monitoring	Inspect for evidence of poor operation	Six monthly
		Inspect filter media and establish appropriate replacement frequencies	Six monthly
		Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

5.5 Surface Water Drainage Network

As discussed in Section 5.2 the drainage hierarchy for the management and disposal of surface water has been observed in the production of this drainage strategy. Infiltration and discharge to watercourse have been ruled out and, although every effort has been made to identify a practical means of connecting to an existing surface water

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sewer, this option is not considered viable due to the presence of strategic buried utilities and the significant depth and structural condition of the sewer within Oxford Road. It is therefore proposed to discharge all surface water from the proposed development to the existing public combined sewer on the western side of the site, as per the existing regime.

Runoff from the proposed development is to be attenuated and released at a controlled rate in order to provide a betterment when compared with the pre-development rate. Due to the extensive constraints across the site, including buried utilities (including fibre-optic cables associated with the MMU Data Centre), tree root protection zones, and constrained external areas, a 20% betterment is targeted. The drainage strategy is designed to ensure on-site flood risk is managed up to the 1 in 100 year storm event, with a 30% allowance for climate change, and there is no increase in off-site flood risk as a result of the development.

Following a review of site constraints, and coordination with the Landscape Architect, permeable paving and below ground attenuation have been assessed as being the most appropriate SuDS feature for use within the development. Proprietary treatment devices will also be used, where necessary, to ensure appropriate treatment is provided.

Refer to the Proposed Drainage Plan in Appendix C.

5.6 Proposed Discharge Rate and Attenuation Volume

By reducing the rate of runoff from the proposed development by 20%, the total rate of runoff from the whole site would reduce from 91 to 73 litres per second and would require an attenuation volume of approximately 150m^3 to prevent flooding up to the 1 in 100-year critical storm event (including climate change). As outlined above, this is considered to be the most appropriate solution for the proposed development.

In the event that it is necessary to reduce runoff from the whole site by 50%, i.e. from 91 litres per second to 45.5 litres per second, a total attenuation volume of approximately 287m^3 would be required to prevent flooding up to the 1 in 100-year critical storm event (including climate change). This is not considered feasible at the site without significant utility diversions.

In the event that it is necessary to limit runoff from the entire site to the equivalent greenfield runoff rate, assumed to be 5 litres per second as a practical minimum, a total attenuation volume of approximately 550m^3 would be required to prevent flooding up to the 1 in 100-year critical storm event (including climate change). This is not considered feasible at the site without significant utility diversions.

5.7 Pollution Control

It is widely recognised that diffuse pollution from urban surface water runoff is a significant factor which compromises receiving waterbodies including watercourses and groundwater. As such there is a requirement to identify and mitigate the impact of poor water quality originating from new developments.

The SuDS Manual (CIRIA C753) provides various methodologies for identifying potential sources of pollution within developments and a means of determining the treatment potential the various SuDS techniques can offer. The Simple Index Approach allocates pollution hazard indices against the proposed land use, along with pollution mitigation indices for each SuDS component. To ensure adequate treatment is being provided, the selected SuDS components must have a total pollution mitigation index equal to or greater than the pollution hazard index associated with the land use of the contributing drainage area. Two components or more will be required if the mitigation index of an

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individual component is insufficient. As there will be a reduced inflow concentrations for secondary or tertiary components a factor of 0.5 is used to account for this.

$$\underset{(for\ each\ contaminant\ type)}{Total\ SuDS\ mitigation\ index} \geq \underset{(for\ each\ contaminant\ type)}{pollution\ hazard\ index}$$

$$Total\ SuDS\ mitigation\ index = mitigation\ index_1 + 0.5(mitigation\ index_2)$$

Where;

$$mitigation\ index_{\ n} = mitigation\ index\ for\ component\ n$$

The pollution hazard indices for the proposed land use within the development are as follows, based on Table 26.2 of the SuDS Manual.

Table 5—3 Pollution Hazard Indices (based on Table 26.2 of the SuDS Manual)

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Commercial Roofs	Low	0.3	0.2	0.05
Pedestrian areas and low trafficked roads	Low	0.5	0.4	0.4
Commercial yard and delivery areas	Medium	0.7	0.6	0.7

Following an initial screening exercise (see Sustainable Drainage Systems section below) the following table presents the mitigation indices for a range of SuDS components which may be appropriate for the proposed development.

Table 5—4 Indicative SuDS Mitigation Indices (based on Table 26.3 of the SuDS Manual and product literature)

SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
SPEL Stormceptor	0.8	0.6	0.9

The proposed site is deemed to have low pollution risks from its roof and pedestrian areas, and a medium pollution risk from its delivery areas. As existing hardstanding non-permeable pavement is retained for the delivery area, and other SuDS components are not deemed practical for this area, a proprietary system is proposed. A SPEL Stormceptor, or similar product, is proposed in order to mitigate all pollution hazards to acceptable levels. Since the mitigation index exceeds the pollution hazard index, this method of hazard mitigation is deemed sufficient.

5.8 Designing for Exceedance

Although the surface water drainage system will be designed to accommodate flows up to the 1 in 100-year storm event, including additional allowances for climate change, there is always a possibility of a storm event occurring

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which exceeds this design standard. In such an event, potential risks include the exceedance of the surface water network and attenuation system and flooding of the site.

It is proposed to design external pedestrian areas and the service yard to shed water away from the building during such exceedance events and direct overland flood flows through the site towards off-site areas following the natural topography. It is anticipated that the local adopted highway network will act as the wider overland flow network.

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6 Proposed Foul Water Drainage Strategy

6.1 General

The foul water network that will serve the new development is to be designed in accordance with Building Regulations Approved Document Part H (Drainage and Waste Disposal). This document sets requirements for the design and construction of underground foul water drains to the point of connection to an existing sewer.

6.2 Consultation

A Wastewater Development Enquiry has been issued to United Utilities (UU) with regard to discharging foul water to the public combined sewer network to the west of the site, which would follow the existing drainage regime of the site. UU has accepted this strategy.

6.3 Proposed Strategy

For both the Phase 1 (new build) and Phase 2 (refurbishment) elements of the scheme all new sanitary downpipes will be collected at slab level and routed, below the new slab, to external yard areas to the south of the building. From here, foul water flows will be routed to the existing public combined sewer located at the western end of the site, utilising the existing private foul water network, subject to capacity and condition checks, where possible.

The intention is to reuse existing connections to the public sewer network wherever possible to avoid physical works to UU assets. Where this cannot be avoided, any physical connection works to the public sewer network will be constructed under a Section 106 Agreement with UU.

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Appendix A United Utilities Correspondence

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Andrew Durber

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 04 January 2023 12:57
To: Andrew Durber
Subject: RE: UU Reference: 03196370- All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)

****External Email. This email originated from outside Buro Happold.****

Good afternoon, Andrew and Yvonne

All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)
UU Reference: 03196370

Following our review of the recent submission, we accept in principle that a foul water connection to the combined sewer under the western side of the proposed development.

Currently we have not had any survey information on the manhole references: 3102, 3013 and 2202 in our department. However, the applicant's responsibility to demonstrate the exact relationship on site between any wastewater assets that may cross/ near to the site and any proposed development.

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/

Connection Application
Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:
https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

Many thanks and kind regards,

Josephine

---------- Original Message ----------
From: Andrew Durber [andrew.durber@burohappold.com]
Sent: 03/01/2023 13:50
To: wastewaterdeveloperservices@uuplc.co.uk
Cc: yvonne.lai@burohappold.com
Subject: RE: RE: UU Reference: 03196370- All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)

EXTERNAL EMAIL This email originated outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Dear Sir/Madam,

Further to the enquiry below relating to FW from the proposed MMU Library development, may I please add a request for information to this thread, this time relating to surface water?

With the UU Developer Enquiry Response, it has been suggested the UU public SW sewer within Oxford Road is the preferred point of connection (should infiltration and discharge to watercourse be deemed impractical). The only information we currently have available on this SW sewer is from the UU records. The records suggest it is 830x960 brick conduit, approximately 10m deep and acts as an overflow from a nearby CSO (although this last point is not clear from the records).

Does UU have any survey information on the sewer, such as an STC25 manhole card on node 3102 (3013 and 2202 would also be useful)? I am keen to obtain any existing information before instructing a new survey on a very deep sewer within a busy road.

Thank you in advance for any assistance you are able to offer.

Kind regards,

Andrew Durber CEng MICE
Associate Director – Civil Infrastructure
Buro Happold | Cities
www.burohappold.com | @burohappold.com

From: Yvonne Lai <Yvonne.Lai@BuroHappold.com>
Sent: 23 December 2022 10:04
To: WastewaterDeveloperServices@uuplc.co.uk
Cc: Andrew Durber <Andrew.Durber@BuroHappold.com>
Subject: RE: UU Reference: 03196370- All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)

Dear Sir/Madam,

All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)
UU Reference: 03196370

Many thanks for your email. We acknowledge your requirement for connection to the public surface water sewer within Oxford Road, and are working towards building evidence for the proforma as suggested.

We are also in the process of exploring options for the foul water drainage and we kindly ask United Utilities to consider a foul water connection to the 550mm x 940mm combined sewer under the western side of the proposed development. According to survey information we believe all foul and surface water from the existing building currently discharges to this public sewer. Despite the increase in foul discharge from the proposed development, the reduction in discharge by rerouting surface water discharge to the public surface water sewer within Oxford Road will result in a net decrease in discharge rate to the western combined sewer.

The combined sewer in the west of the site is also considered to be a more suitable connection, as it will have existing connections that we can hopefully reuse, limiting the impact to the existing sewer. It is also located within our site boundary and will avoid the more onerous works required to make a new connection to the Oxford Road sewer.

Should you require any further information please do not hesitate to contact me, and I look forward to receiving your response.

Kind regards,

Yvonne Lai GMICE | She/her
Graduate Infrastructure Engineer
Buro Happold | Cities - Infrastructure
www.burohappold.com | Twitter | Instagram

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---------- Original Message ----------
From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]
Sent: 16/12/2022 12:44
To: andrew.durber@burohappold.com
Subject: UU Reference: 03196370- All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)

Good afternoon, Andrew

All Saint's Library, MMU, Oxford Rd, Manchester M15 6BW (Grid ref: 384255, 397172)
UU Reference: 03196370

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:
https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water
Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.
Our preferred point of discharge would be to the 600mmx900mm public foul water/combined sewer within Oxford Road located to the east of your proposed development.
If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water
All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

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

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration
Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.
A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.
Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:
https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody
If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the River Medlock/culverted/open ordinary watercourse/main river//canal/waterbody/pond (with onward flow) located to the north of the proposed site.
We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

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

Public Sewer
In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 830x960mm diameter public surface water sewer within Oxford Road located to the east of the development at a pass forward flow to be

agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed greenfield runoff rate.
Please note the given discharge rate is based on the full site area as the specifics of the area being developed are not yet clear. If there are significant areas of the site that will not be developed, the discharge rate should be reduced accordingly.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

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

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

Existing Wastewater Assets Crossing the Site
We have significant assets crossing this site that cannot realistically be diverted. We would ask that you obtain a copy of our asset data records from your provider and plan your development around them ensuring that all legal easements are observed. If any work is required that may impart vibration into the ground we would ask that you contact us for further advice.
According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 8m which is measured 4m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply.

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

Connection Application
Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:
https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Many thanks and kind regards,

Appendix B LLFA Correspondence and Pre-app Slide Pack

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MANCHESTER
CITY COUNCIL

Lead Local Flood Authority
Highways Service
Growth and Neighbourhoods Directorate
Manchester City Council
PO Box 532
Town Hall
Manchester
M60 2LA
Email: floodriskmanagement@manchester.gov.uk

DATE 10/07/2023

Dear Sir or Madam,

RE: Our Ref: MCC010/07/2023

We acknowledge with thanks your payment received on 19/06/2023 for our LLFA data screen service.

Please find enclosed plan showing the results of the data screen. The position of features shown on this plan is approximate only and is given in accordance with the best information currently available.

The enclosed plan cannot be used to substitute a competent site investigation.

The enclosed plan is being provided to you subject to Manchester City Council's terms and conditions which are shown attached.

I trust the above meets your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter, please do not hesitate to contact us.

Yours Faithfully,

T.Esmail

Talha Esmail, Flood Risk Engineer, Lead Local Flood Authority

MANCHESTER
CITY COUNCIL

TERMS AND CONDITIONS – LLFA DATA SCREEN

These provisions apply to LLFA data supplied by Manchester City Council ("MCC").

TERMS AND CONDITIONS:

- This data Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- MCC has taken all reasonable care to compile this data Map. This data Map and any information supplied with it is provided for general guidance only and MCC makes no representation, undertaking or warranty of any kind as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position of any culverted assets shown on the data Map are approximate only. MCC strongly recommends that a comprehensive site investigation is undertaken in addition to reviewing this data Map to determine and ensure the precise location of any assets. The exact location, positions and depths should be obtained by an appropriate survey which may include but shall not be limited to GPR and CCTV.
- The data screened may be modified over time without notice and therefore this data Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the data Map have been made subsequent to issue and prior to any works being carried out.
- This data Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) or for the purpose of determining the suitability of a point of connection to discharge.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising from damages of any kind caused to assets by reason of the actual position and/or existence of assets being different from those shown on the data Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent MCC from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

MANCHESTER
CITY COUNCIL

DATA SCREEN SYMBOLOGY

Bridge

- Good
- Fair
- Poor
- Very Poor
- Unknown

Trash Screen

- Good
- Fair
- Poor
- Very Poor
- Unknown

Culvert Orifice

- Very Good
- Good
- Fair
- Poor
- Very Poor
- Unknown

Culvert Conduit

- CCTV surveyed
- Not CCTV surveyed
- Ordinary Watercourse Conduit
- MCC SuDS
- MCC Flood Incident Points
- MCC Section 19 Report
- MCC Flood Incident Polygons
- MCC Local Authority Boundary

Supplementary Information where available:

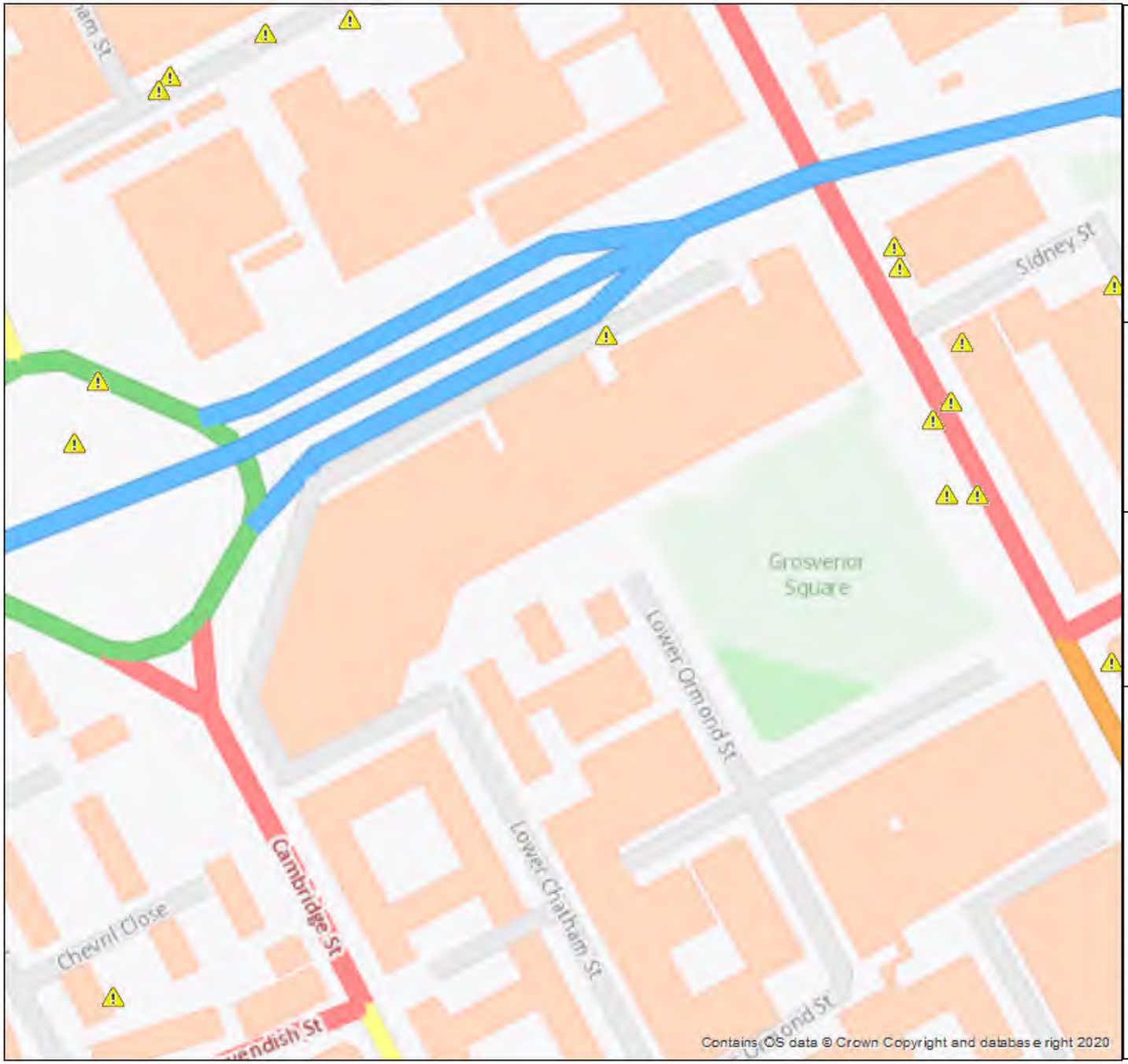
Critical Drainage Area *– The site is within the Conurbation Core Critical Drainage Area (CDA)*

Flood Incidents *- The nearest incident was recorded 02/03/2022, 30m north-west of All Saints Campus, Oxford Road, Manchester, described as blocked gully or drain*

Culvert Conduits *– There are no culverted ordinary watercourse conduits on-record in the LLFA asset register within the vicinity of the Site.*

Survey and Design Archive *– A copy of the 1984 major drainage survey is included, which does not record any culverted ordinary watercourses within vicinity of the Site.*

Any other information *– The Site is >0.5 Ha and located within a Critical Drainage Area, therefore the planning application would benefit from a Flood Risk Assessment and SuDS Strategy.*



MANCHESTER CITY COUNCIL

LLFA DATA SCREEN

Address/Site Ref:
MMU Library

Our Ref: **MCC010/07/2023**

Author: Manchester City Council LLFA
Date: 10/07/2023
Scale: 1:1,750

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

0 12.5 25 50 Meters

N

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MANCHESTER CITY COUNCIL

LLFA DATA SCREEN

Address/Site Ref:
MMU Library

Our Ref: **MCC010/07/2023**

Author: Manchester City Council LLFA
Date: 10/07/2023
Scale: 1:1,750

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

0 12.5 25 50 Meters

N

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BURO HAPPOLD

MMU Library Transformation

LLFA Consultation

09 August 2023

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UU Sewer Records

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
1101	36.31	CO	32.68	580	610	EG	BR	17.89	1
1102		CO	0	580	630	RE	BR	27.29	
1103		CO	0	550	940	EG	BR	44.78	
1104		CO	0	375		CI	CO	14.76	
1202	34.41	CO	26.82	550	910	RE	BR	28.64	102
1204		CO							
1205		CO							
1302	32.28	CO	27.34	225		CI	VC	54.98	
1303	35.2	CO							
1308		CO							
1309		CO							
1310		CO							
1311		CO							
1312		CO							
1313		CO							
1314		CO							
1316		CO							
1319		CO							
1403	32.74	CO	29.22	300		CI	VC	23.77	77
1404	33.56	CO							
1405	33.36	CO							
1406	33.31	CO							
1408	33.46	CO							
1409	33.11	CO	26.65	225		CI	CI	14.56	
1410	33.07	CO							
1414		CO							
1416		CO							
1418		CO							
1430		CO							
1435		CO							
1436		CO		150		CI	VC	5.63	
2001	36.98	CO							
2002	37.05	CO							
2003	37.16	CO							
2101	37.14	CO	28.5	300		CI	CI	27.78	1
2102	37.04	CO							
2201	36.47	CO							
2202	36.37	SW							
2305	34.81	CO							
2306	35.22	SW							
2401	30.86	CO	0	150		CI	VC	14.42	
2404	31.57	CO	27.71	600		CI	CO	8.94	9
2406	31.64	CO	25.6	300		CI	BR	26.47	
2407		FO							
2409	31.34	CO							
2411	31.13	CO							
2412		CO	0	630	940	RE	BR	69.29	
2413	31.46	CO							
2414	31.65	FO							
3000		CO	0	600	900	EG	VC	223.27	
3001	37.38	CO	32.16	610	750	EG	BR	64.14	
3002	37.57	CO	32.44	510	580	FT	BR	8.06	0
3003	37.73	CO							
3005	37.9	CO							
3006	37.88	CO							
3007	37.67	CO	24.65	1950		CI	BR	23.29	
3008	37.79	CO	33.52	640	710	EG	BR	38.95	
3010		CO							
3012		CO							
3014		CO							
3015		CO							
3017		CO							
3020		FO							
3021		FO							
3101	37.17	CO							
3102	37.09	SW	28.85	830	960	RE	BR	57.31	249
3103		SW	0	1050		CI	BR	43.42	

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Summary of communication

- UU communication received (16/12/2022)
  - UU approved FW connection
  - Oxford Road combined sewer preferred point of discharge
- UU data request (03/01/2023)
  - Request for information on Node 3102, 3103, and 2202.
- UU communication received (04/01/2023)
  - UU confirmed there is no information available, and for applicant to confirm.

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Drainage Hierarchy

1. Infiltration

- Considered unfeasible due to;
  - ground conditions
  - high groundwater (2.65m bgl)
  - proximity of existing structures
  - constrained nature of the site.
- Testing to be carried out

2. Watercourses

- River Medlock, Main River, 250m north of the site.
- Connection not considered practical.

3. Surface water sewer

- Surface water sewer located on opposite side of Oxford Road
- UU's preferred (sewer) discharge point
- Significant challenges including depth and existing utilities

4. Combined sewer

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Summary of CCTV Survey

- Objectives:
  - Locate UU surface water sewer and combined sewer within Oxford Road
  - Locate combined sewer connection west of site

- Results:
  - Existing combined sewer connections proven in west
  - SW sewer in Oxford Road 10m deep with 900mm shaft
  - No connectivity identified between site and existing SW sewer
  - Combined sewer in Oxford Road, suspect 8m depth

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UU Sewer Records

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
1101	36.31	CO	32.68	580	610	EG	BR	17.89	1
1102		CO	0	580	630	RE	BR	27.29	
1103		CO	0	550	940	EG	BR	44.78	
1104		CO	0	375		CI	CO	14.76	
1202	34.41	CO	26.82	550	910	RE	BR	28.64	102
1204		CO							
1205		CO							
1302	32.28	CO	27.34	225		CI	VC	54.98	
1303	35.2	CO							
1308		CO							
1309		CO							
1310		CO							
1311		CO							
1312		CO							
1313		CO							
1314		CO							
1316		CO							
1319		CO							
1403	32.74	CO	29.22	300		CI	VC	23.77	77
1404	33.56	CO							
1405	33.36	CO							
1406	33.31	CO							
1408	33.46	CO							
1409	33.11	CO	26.65	225		CI	CI	14.56	
1410	33.07	CO							
1414		CO							
1416		CO							
1418		CO							
1430		CO							
1435		CO							
1436		CO		150		CI	VC	5.63	
2001	36.98	CO							
2002	37.05	CO							
2003	37.16	CO							
2101	37.14	CO	28.5	300		CI	CI	27.78	1
2102	37.04	CO							
2201	36.47	CO							
2202	36.37	SW							
2305	34.81	CO							
2306	35.22	SW							
2401	30.86	CO	0	150		CI	VC	14.42	
2404	31.57	CO	27.71	600		CI	CO	8.94	9
2406	31.64	CO	25.6	300		CI	BR	26.47	
2407		FO							
2409	31.34	CO							
2411	31.13	CO							
2412		CO	0	630	940	RE	BR	69.29	
2413	31.46	CO							
2414	31.65	FO							
3000		CO	0	600	900	EG	VC	223.27	
3001	37.38	CO	32.16	610	750	EG	BR	64.14	
3002	37.57	CO	32.44	510	580	FT	BR	8.06	0
3003	37.73	CO							
3005	37.9	CO							
3006	37.88	CO							
3007	37.67	CO	24.65	1950		CI	BR	23.29	
3008	37.79	CO	33.52	640	710	EG	BR	38.95	
3010		CO							
3012		CO							
3014		CO							
3015		CO							
3017		CO							
3020		FO							
3021		FO							
3101	37.17	CO							
3102	37.09	SW	28.85	830	960	RE	BR	57.31	249
3103		SW	0	1050		CI	BR	43.42	

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MANHOLE RECORD CHART

REFERENCE: UU3102 DATE: [illegible]

LOCATION: MMU Oxford Road All Saints Library

CARRIAGEWAY [ ] FOOTPATH [ ] VERGE [ ] OUTSIDE BOUNDARY [ ]

COVER SHAPE ○ [ ] △ [ ] ○ [ ] OTHER

HEAVY DUTY [ ] MEDIUM DUTY [ ] LIGHT DUTY [ ] SIZE WIDTH 610 LENGTH 610

COVER CONDITION OK [ ] ATTENTION REQUIRED [ ]

CHAMBER

REGULATING COURSE	OK		ATTENTION REQ				
SHAFT	OK		ATTENTION REQ		WIDTH 3000	LENGTH	
CHAMBER	OK		ATTENTION REQ		WIDTH 1000	LENGTH 2000	
BENCHING	OK		ATTENTION REQ		WIDTH	LENGTH	
CHANNEL	OK		ATTENTION REQ				
STEP IRONS	OK		ATTENTION REQ				
LADDER	OK		ATTENTION REQ				

CHAMBER CONSTRUCTION

BRICK [ ] PRECAST CONC [ ] INSITU CONC [ ] BOLTED SECT [ ] OTHER

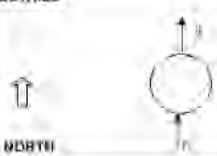
FOUL [ ] SURFACE WATER [ ] COMBINED [X] WATERCOURSE [ ] T/EFFLUENT [ ]

SHAFT CONSTRUCTION

BRICK [ ] PRECAST CONC [ ] INSITU CONC [ ] BOLTED SECT [ ] OTHER

FOUL [ ] SURFACE WATER [ ] COMBINED [ ] WATERCOURSE [ ] T/EFFLUENT [ ]

CHAMBER CONTENT	INCOMING PIPES					OUTGOING PIPES		
(I) PIPE	A	B	C	D	E	X	Y	Z
(II) DEPTH TO INV (mm)	10380					10300		
(III) SIZE (∅ mm)	1000					1000		
(IV) SHAPE	C					C		
(V) BACKDROP (∅ mm)								
Total depth from cover								

DETAILS	LOCATION DETAILS	COMMENTS
 NORTH		Missing steps Infiltration seeping into shaft & manhole.

Disclaimer: Condition Survey - to be used as a guide only

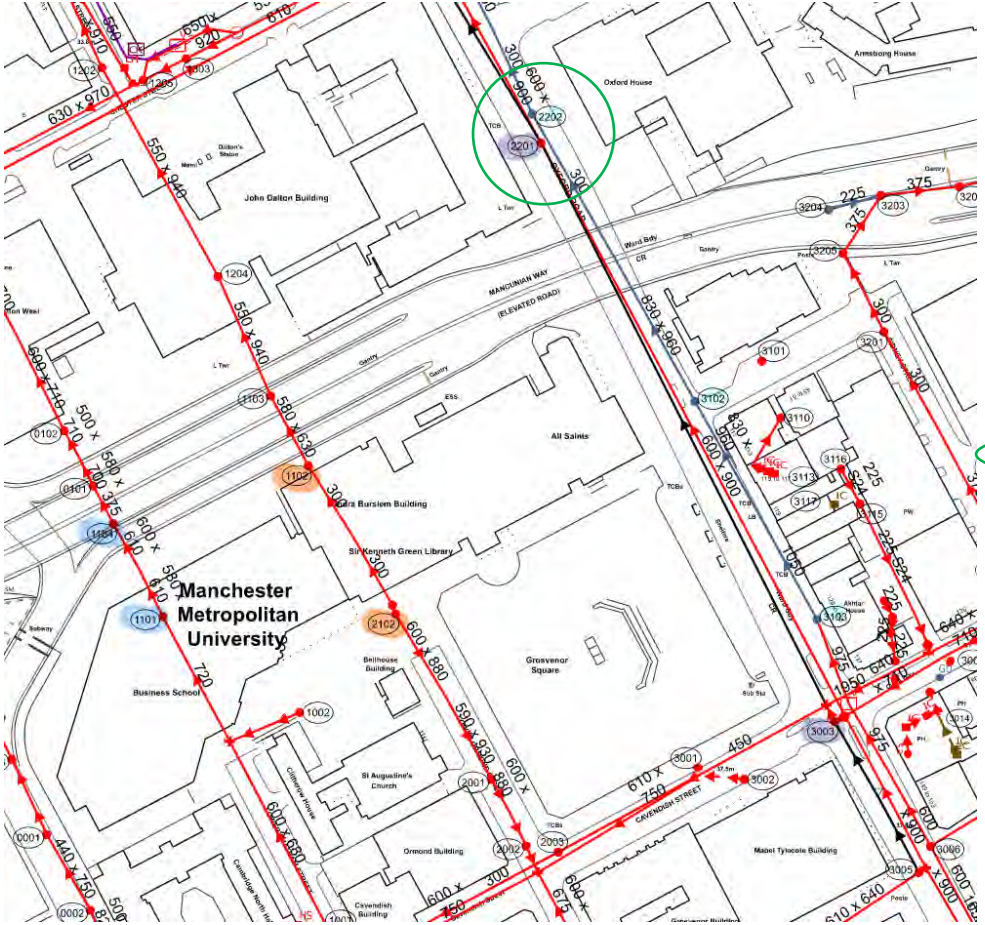
SHEET No.	JOB No.	SURVEYOR
		KD

MANHOLE RECORD CHART

Location Photo	Cover photo
Chamber Photo	**Additional photo (if required)**

STC25 MH card for UU3102

UU Sewer Records



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1103		CO	0	550	940	EG	BR	44.78	
1104		CO	0	375		CI	CO	14.76	
1202	34.41	CO	26.82	550	910	RE	BR	28.64	102
1204		CO							
1205		CO							
1302	32.28	CO	27.34	225		CI	VC	54.98	
1303	35.2	CO							
1308		CO							
1309		CO							
1310		CO							
1311		CO							
1312		CO							
1313		CO							
1314		CO							
1316		CO							
1319		CO							
1403	32.74	CO	29.22	300		CI	VC	23.77	77
1404	33.56	CO							
1405	33.36	CO							
1406	33.31	CO							
1408	33.46	CO							
1409	33.11	CO	26.65	225		CI	CI	14.56	
1410	33.07	CO							
1414		CO							
1416		CO							
1418		CO							
1430		CO							
1435		CO							
1436		CO		150		CI	VC	5.63	
2001	36.98	CO							
2002	37.05	CO							
2003	37.16	CO							
2101	37.14	CO	28.5	300		CI	CI	27.78	1
2102	37.84	CO							
2201	36.47	CO							
2202	36.37	SW							
2305	34.81	CO							
2306	35.22	SW							
2401	30.86	CO	0	150		CI	VC	14.42	
2404	31.57	CO	27.71	600		CI	CO	8.94	9
2406	31.64	CO	25.8	300		CI	BR	26.47	
2407		FO							
2409	31.34	CO							
2411	31.13	CO							
2412		CO	0	630	940	RE	BR	69.29	
2413	31.46	CO							
2414	31.65	FO							
3000		CO	0	600	900	EG	VC	223.27	
3001	37.38	CO	32.16	610	750	EG	BR	64.14	
3002	37.57	CO	32.44	510	580	FT	BR	8.06	0
3003	37.73	CO							
3005	37.9	CO							
3006	37.88	CO							
3007	37.67	CO	24.65	1950		CI	BR	23.29	
3008	37.79	CO	33.52	640	710	EG	BR	38.95	
3010		CO							
3012		CO							
3014		CO							
3015		CO							
3017		CO							
3020		FO							
3021		FO							
3101	37.17	CO							
3102	37.09	SW	28.85	830	960	RE	BR	57.31	249
3103		SW	0	1050		CI	BR	43.42	

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MANHOLE RECORD CHART

REFERENCE [illegible] DATE [illegible]

LOCATION [illegible] Sample Library

CARRIAGEWAY [ ] FOOTPATH [ ] VERGE [ ] OUTSIDE BOUNDARY [ ]

COVER SHAPE ○ □ △ ▭ ⬡ ⬭ OTHER

HEAVY DUTY [ ] MEDIUM DUTY [ ] LIGHT DUTY [ ] SIZE WIDTH 650 LENGTH 650

COVER CONDITION OK [ ] ATTENTION REQUIRED [ ]

CHAMBER

REGULATING COURSE	OK [ ]	ATTENTION REQ [ ]				
SHAFT	OK [ ]	ATTENTION REQ [ ]	WIDTH		LENGTH	
CHAMBER	OK [ ]	ATTENTION REQ [ ]	WIDTH	2800	LENGTH	
BENCHING	OK [ ]	ATTENTION REQ [ ]	WIDTH		LENGTH	
CHANNEL	OK [ ]	ATTENTION REQ [ ]				
STEP IRONS	OK [ ]	ATTENTION REQ [ ]				
LADDER	OK [ ]	ATTENTION REQ [ ]				

CHAMBER CONSTRUCTION

BRICK [ ] PRECAST CONC [ ] INSITU CONC [ ] BOLTED SECT [ ] OTHER

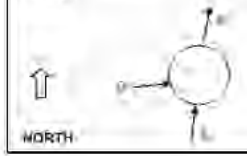
FOUL [ ] SURFACE WATER [ ] COMBINED [ ] WATERCOURSE [ ] EFFLUENT [ ]

SHAFT CONSTRUCTION

BRICK [ ] PRECAST CONC [ ] INSITU CONC [ ] BOLTED SECT [ ] OTHER

FOUL [ ] SURFACE WATER [ ] COMBINED [ ] WATERCOURSE [ ] EFFLUENT [ ]

CHAMBER CONTENT	INCOMING PIPES					OUTGOING PIPES		
(i) PIPE	A	B	C	D	E	X	Y	Z
(ii) DEPTH TO INV. (mm)	3850	3900				3850		
(iii) SIZE (mm)	900X6 SU	675				900x6 SU		
(iv) SHAPE	U	C				U		
(v) BACKDROP (mm)		375						
Total depth from cover	4700							

DETAILS	LOCATION DETAILS	COMMENTS
		Landing depth = 4.4m

SHEET No	JOB No	SURVEYOR

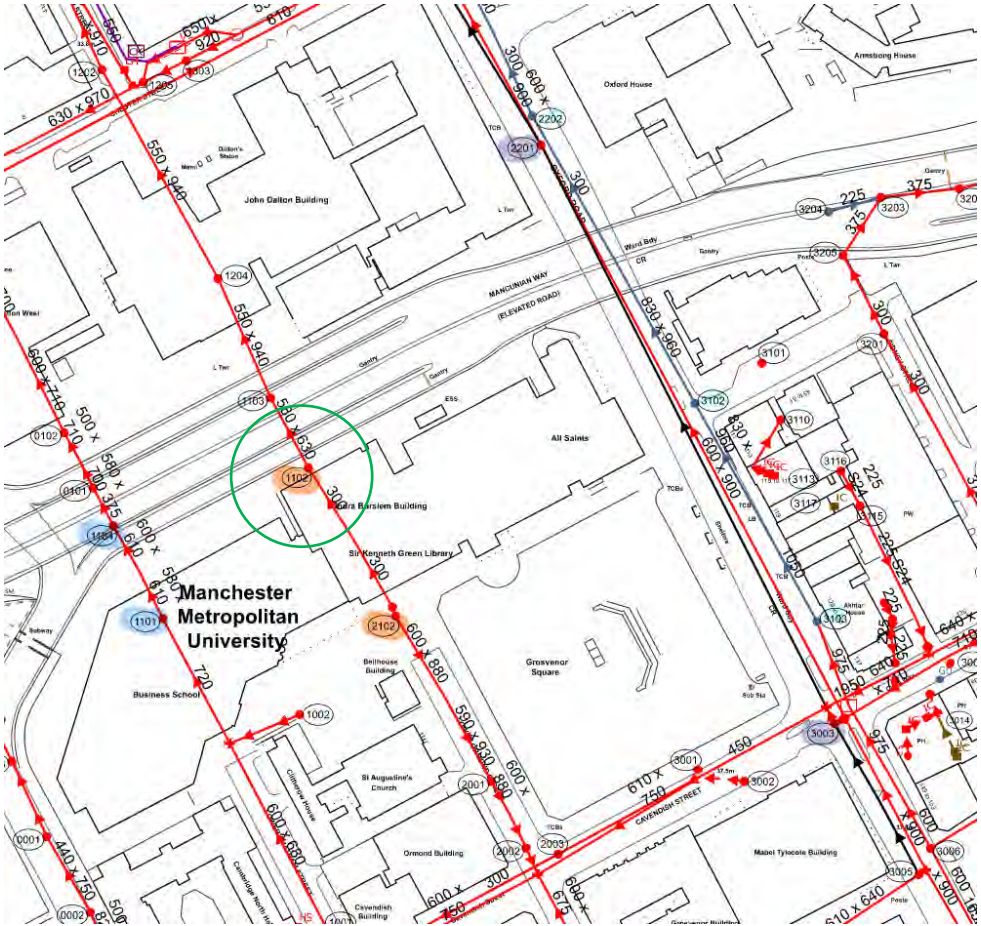
MANHOLE RECORD CHART

Disclaimer: Condition Survey - to be used as a guide only

Location Photo	Cover photo
Chamber Photo	**Additional photo (if required)**

STC25 MH card for UU2201/2202 (TBC)

UU Sewer Records



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
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1102		CO	0	580	630	RE	BR	27.29	
1103		CO	0	550	940	EG	BR	44.78	
1104		CO	0	375		CI	CO	14.76	
1202	34.41	CO	26.82	550	910	RE	BR	28.64	102
1204		CO							
1205		CO							
1302	32.28	CO	27.34	225		CI	VC	54.98	
1303	35.2	CO							
1308		CO							
1309		CO							
1310		CO							
1311		CO							
1312		CO							
1313		CO							
1314		CO							
1316		CO							
1319		CO							
1403	32.74	CO	29.22	300		CI	VC	23.77	77
1404	33.56	CO							
1405	33.36	CO							
1406	33.31	CO							
1408	33.46	CO							
1409	33.11	CO	26.65	225		CI	CI	14.56	
1410	33.07	CO							
1414		CO							
1416		CO							
1418		CO							
1430		CO							
1435		CO							
1436		CO		150		CI	VC	5.63	
2001	36.98	CO							
2002	37.05	CO							
2003	37.16	CO							
2101	37.14	CO	28.5	300		CI	CI	27.78	1
2102	37.04	CO							
2201	36.47	CO							
2202	36.37	SW							
2305	34.81	CO							
2306	35.22	SW							
2401	30.86	CO	0	150		CI	VC	14.42	
2404	31.57	CO	27.71	600		CI	CO	8.94	9
2406	31.64	CO	25.8	300		CI	BR	26.47	
2407		FO							
2409	31.34	CO							
2411	31.13	CO							
2412		CO	0	630	940	RE	BR	69.29	
2413	31.46	CO							
2414	31.65	FO							
3000		CO	0	600	900	EG	VC	223.27	
3001	37.38	CO	32.16	610	750	EG	BR	64.14	
3002	37.57	CO	32.44	510	580	FT	BR	8.06	0
3003	37.73	CO							
3005	37.9	CO							
3006	37.88	CO							
3007	37.67	CO	24.65	1950		CI	BR	23.29	
3008	37.79	CO	33.52	640	710	EG	BR	38.95	
3010		CO							
3012		CO							
3014		CO							
3015		CO							
3017		CO							
3020		FO							
3021		FO							
3101	37.17	CO							
3102	37.09	SW	28.85	830	960	RE	BR	57.31	249
3103		SW	0	1050		CI	BR	43.42	

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MANHOLE RECORD CHART

REFERENCE: MH1 DATE: [illegible]

LOCATION: All Saints Library

CARRIAGEWAY [ ] FOOTPATH [x] VERGE [ ] OUTSIDE BOUNDARY [ ]

COVER SHAPE ○ [x] △ [ ] ○ ○ OTHER

HEAVY DUTY [x] MEDIUM DUTY [ ] LIGHT DUTY [ ] SIZE WIDTH 650 LENGTH 650

COVER CONDITION OK [x] ATTENTION REQUIRED [ ] Recessed

CHAMBER

REGULATING COURSE	OK		ATTENTION REQ				
SHAFT	OK		ATTENTION REQ		WIDTH		LENGTH
CHAMBER	OK		ATTENTION REQ		WIDTH	1900Ø	LENGTH
BENCHING	OK		ATTENTION REQ		WIDTH		LENGTH
CHANNEL	OK		ATTENTION REQ	x			
STEP IRONS	OK		ATTENTION REQ				
LADDER	OK		ATTENTION REQ				

CHAMBER CONSTRUCTION

BRICK [ ] PRECAST CONC [x] INSITU CONC [ ] BOLTED SECT [ ] OTHER

FOUL [ ] SURFACE WATER [ ] COMBINED [x] WATERCOURSE [ ] TIEFFLUENT [ ]

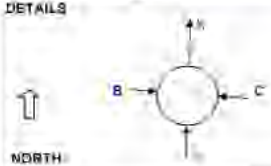
SHAFT CONSTRUCTION

BRICK [ ] PRECAST CONC [ ] INSITU CONC [ ] BOLTED SECT [ ] OTHER

FOUL [ ] SURFACE WATER [ ] COMBINED [x] WATERCOURSE [ ] TIEFFLUENT [ ]

CHAMBER CONTENT	INCOMING PIPES					OUTGOING PIPES		
(I) PIPE	A	B	C	D	E	X	Y	Z
(II) DEPTH TO INV (mm)	3300	3500	2800			3930		
(III) SIZE (Ø mm)	225	225	300			750x6 00		
(IV) SHAPE	C	C	C			C		
(V) BACKDROP (Ø mm)		225	300					
Total depth from cover		6600	6600					

DETAILS



LOCATION DETAILS

COMMENTS

SHEET No.	JOB No.	SURVEYOR

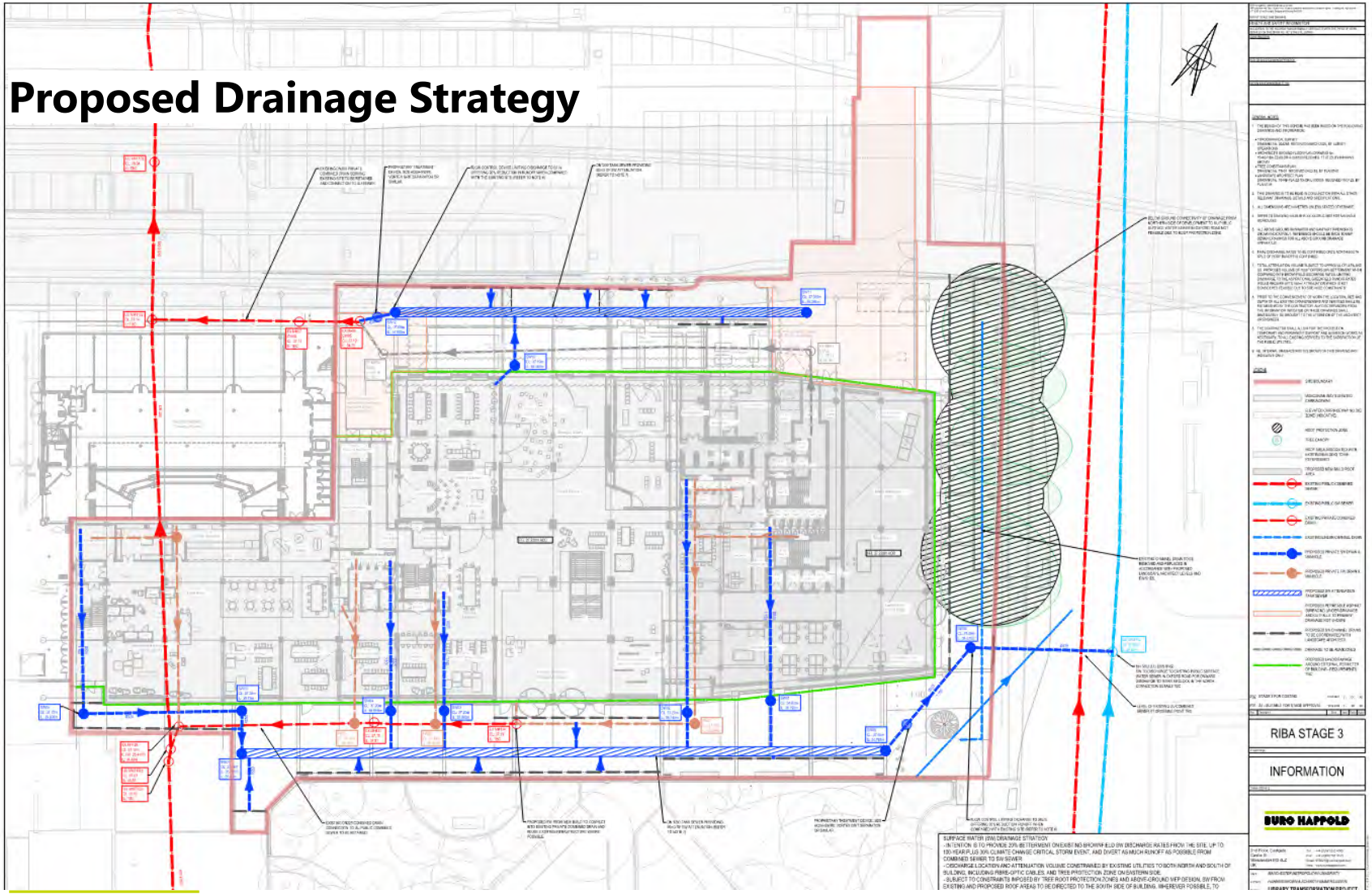
MANHOLE RECORD CHART

Disclaimer: Condition Survey - to be used as a guide only

Location Photo	Cover photo
Chamber Photo	**Additional photo (if required)**

STC25 MH card for UU1102

Proposed Drainage Strategy



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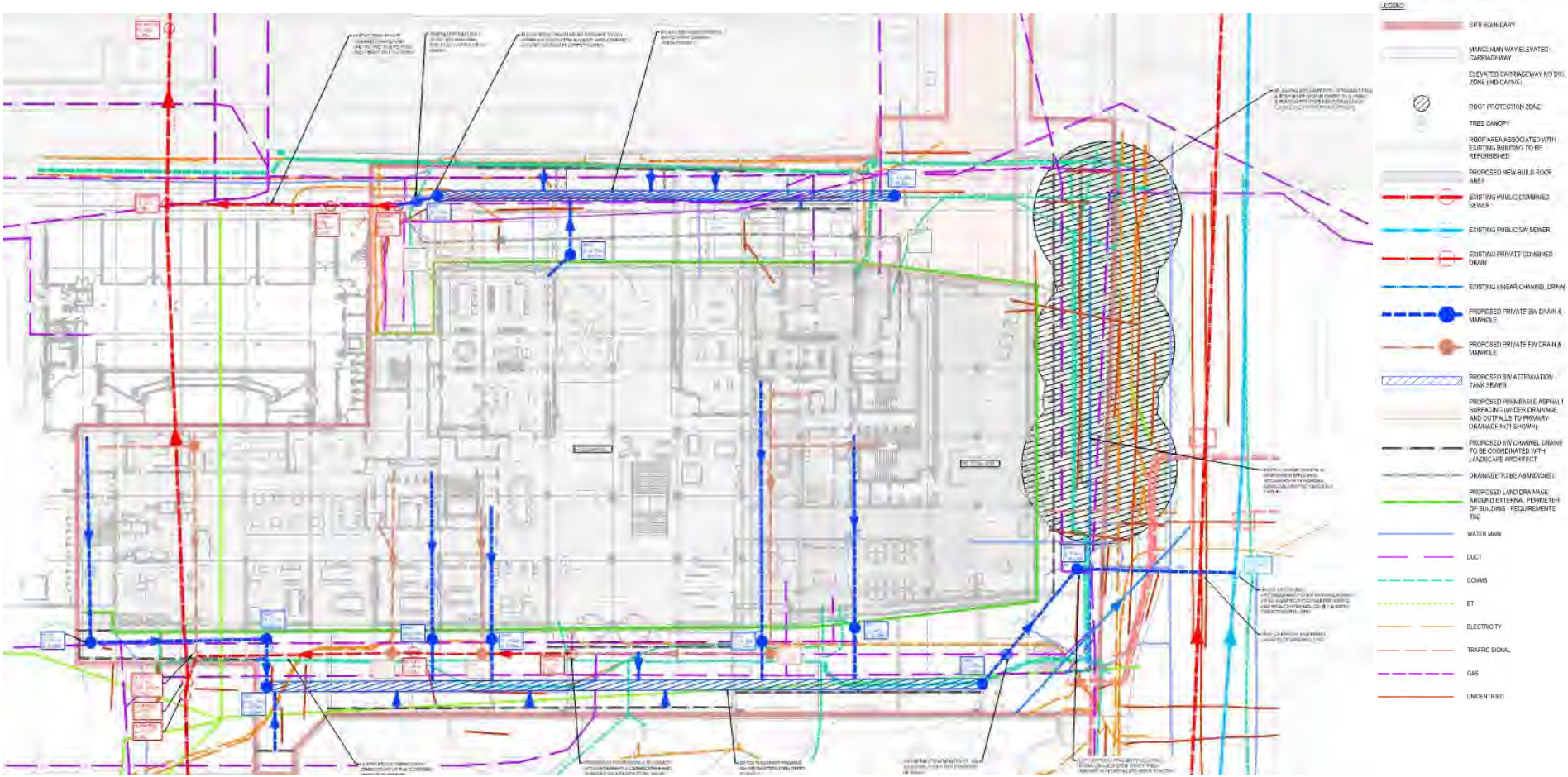
Existing Utilities and Proposed Drainage Strategy



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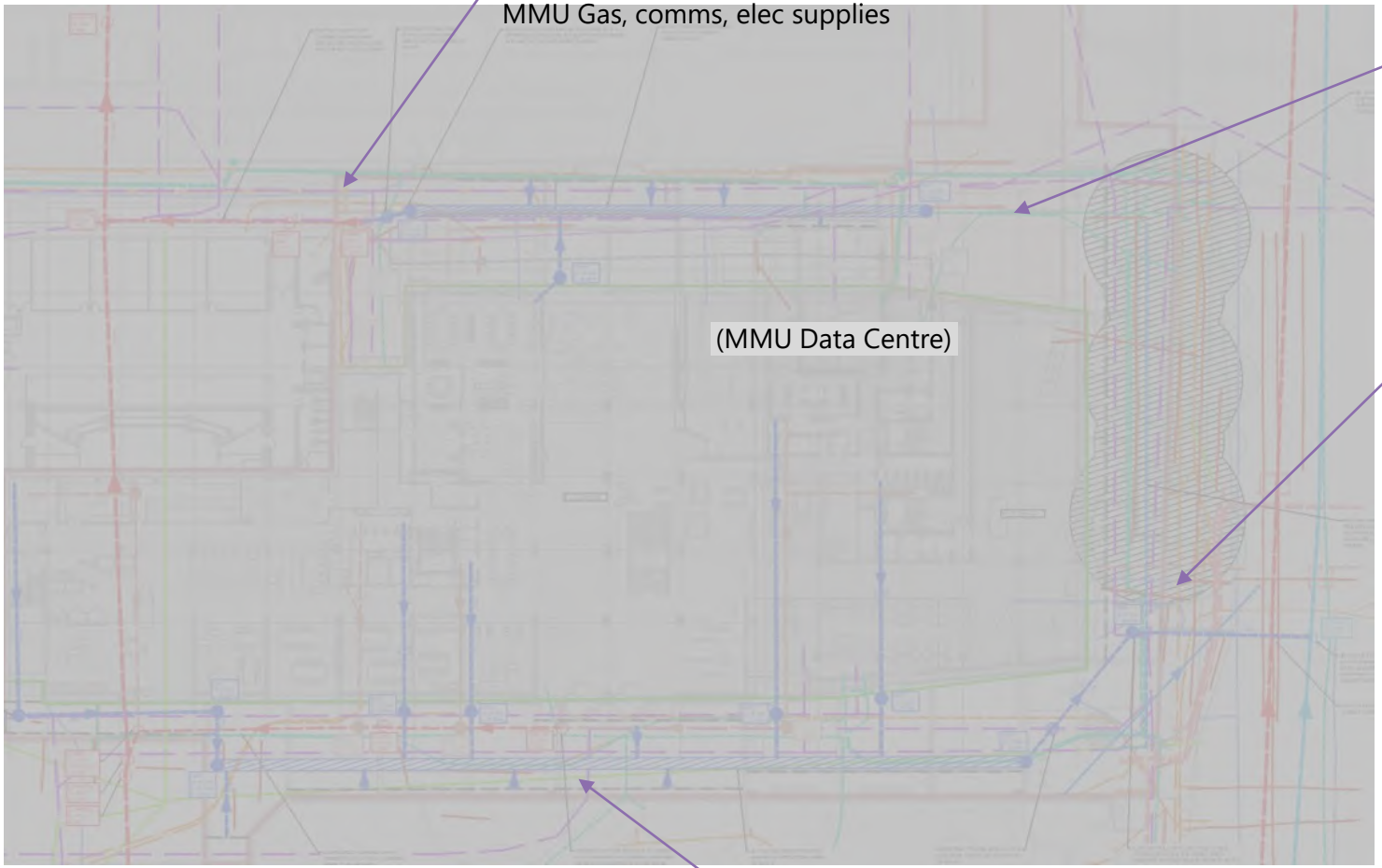

Water (36" CI)
MMU Gas, comms, elec supplies

MMU supplies
Virgin Media
City Fibre
Vodafone
Gamma
Gas (LP)

<u>Fibre Optics</u>
CityFibre
Gamma
Colt
Zayo Group
Vodafone
Openreach

Water (24" CI)
Water (6" SI)

Elec 33kV & LV

Openreach
MMU Supplies

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Drainage Strategy

- Discharge SW to UU combined sewer in west
- Provide betterment to existing flow rates;
  - Trial trenches to be completed – utility identification
  - 20% betterment realistic aspiration
- MCC requirement for SuDS Proforma (?)

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BURO HAPPOLD

JUMP ON BOARD!

We'd love to hear from you

Yvonne Lai
yvonne.lai@burohappold.com

www.burohappold.com

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Appendix C Drawings

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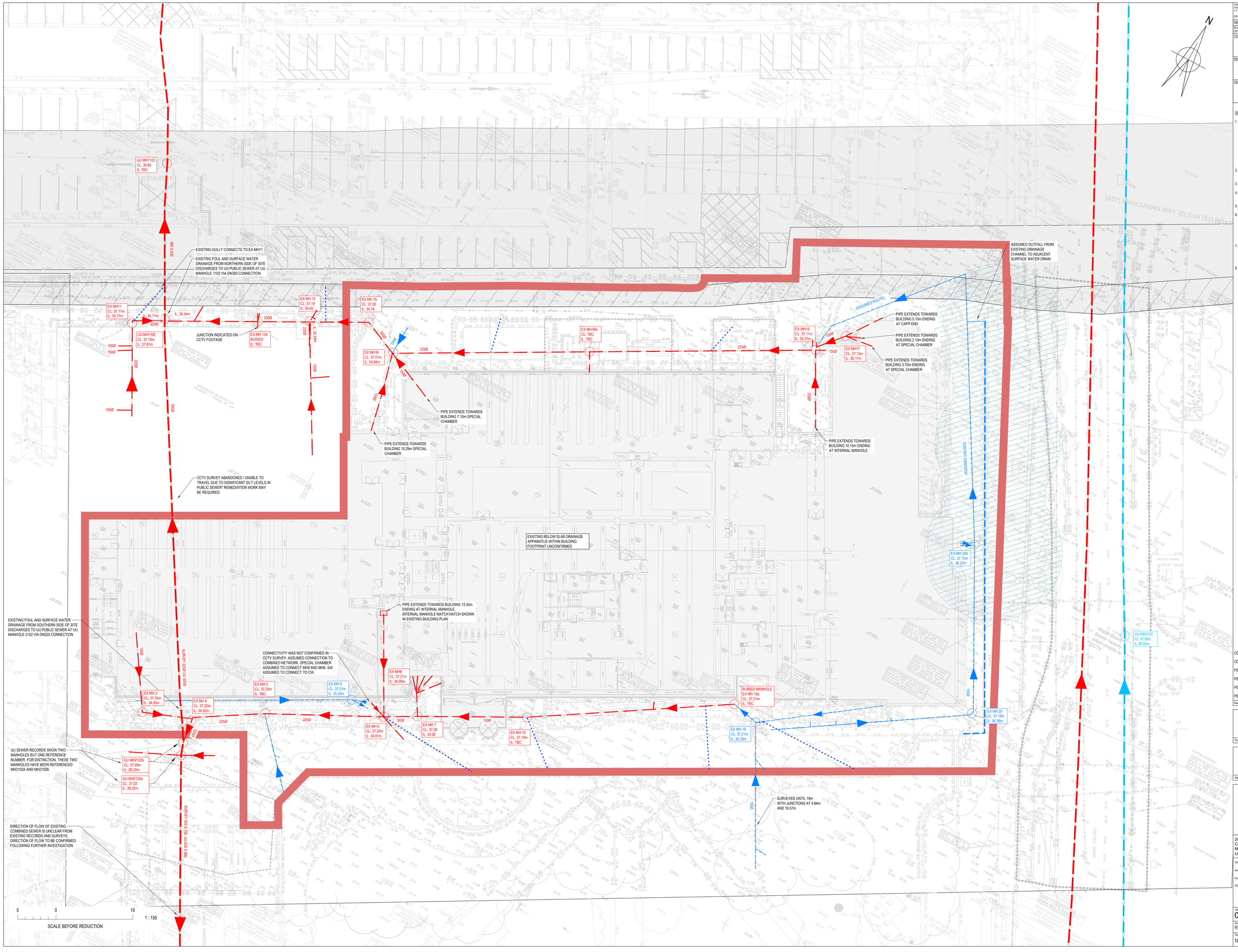

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DO NOT SCALE THIS DRAWING.

HEALTH AND SAFETY INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING

CONSTRUCTION:

MAINTENANCE/CLEANING/OPERATION:

DECOMMISSIONING/DEMOLITION:

GENERAL NOTES:

1. THE DESIGN OF THIS SCHEME HAS BEEN BASED ON THE FOLLOWING DRAWINGS AND INFORMATION:
   - TOPOGRAPHICAL SURVEY: DRAWING No. 20A265 RECEIVED MARCH 2020, BY SURVEY OPERATIONS
   - EXISTING GROUND FLOOR PLANDRAWING No. S23565-GF RECEIVED JUN 2022, BY SURVEY & ENGINEERING PROJECTS
   - TREE CONSTRAINS PLAN: DRAWING No. TR-01 RECEIVED 04.02.19, BY PLANIT-IE
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, DETAILS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, DETAILS AND SPECIFICATIONS.
5. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
6. PRIOR TO THE COMMENCEMENT OF WORK THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/SEWERS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER.
7. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES.
8. ALL INTERNAL DRAINAGE ROUTES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY.

LEGEND

- SITE BOUNDARY
- MANCUNIAN WAY ELEVATED CARRIAGEWAY
- ELEVATED CARRIAGEWAY NO DIG ZONE (INDICATIVE)
- ROOT PROTECTION ZONE
- TREE CANOPY
- ROOF AREA ASSOCIATED WITH EXISTING BUILDING
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC SW SEWER
- EXISTING PRIVATE COMBINED DRAIN
- EXISTING PRIVATE SW DRAIN
- EXISTING LINEAR CHANNEL DRAIN
- EXISTING GULLY CONNECTIONS (SHOWN INDICATIVELY)

Rev	Description	Date	Iss'd	Rev'd	App'd
C02	UPDATED RED LINE BOUNDARY	26.10.2023	YL	NC	AD
C01	FINAL ISSUE STAGE 3	17.10.2023	NC	NC	AD
P04	STAGE 3 ISSUE	27.09.2023	YL	NC	AD
P03	UPDATED STAGE 3	08.09.2023	YL	NC	FR
P02	STAGE 3 FOR COSTING	01.08.2023	YL	DC	AD
P01	S4 - SUITABLE FOR STAGE APPROVAL	10.02.2023	YL	AD	AD

RIBA STAGE 3

Project Stage

A3 - AUTHORISED AND ACCEPTED

Status of Drawing

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Architect: HAWKINS\BROWN & SCHMIDT\HAMMER\LASSEN/

Project: **LIBRARY TRANSFORMATION PROJECT**

Drg Title: EXISTING DRAINAGE PLAN

Job No.	Scale@A0
053621	1:150

Drawn/Designed By:	Checked By:	Approved By:
YL	AD	AD

Drawing No.	Revision
1044B-BHE-XX-XX-DR-C-003100	C02

Filename: 1044B-BHE-XX-XX-DR-C-003100_Existing Drainage Plan.dwg

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DO NOT SCALE THIS DRAWING.

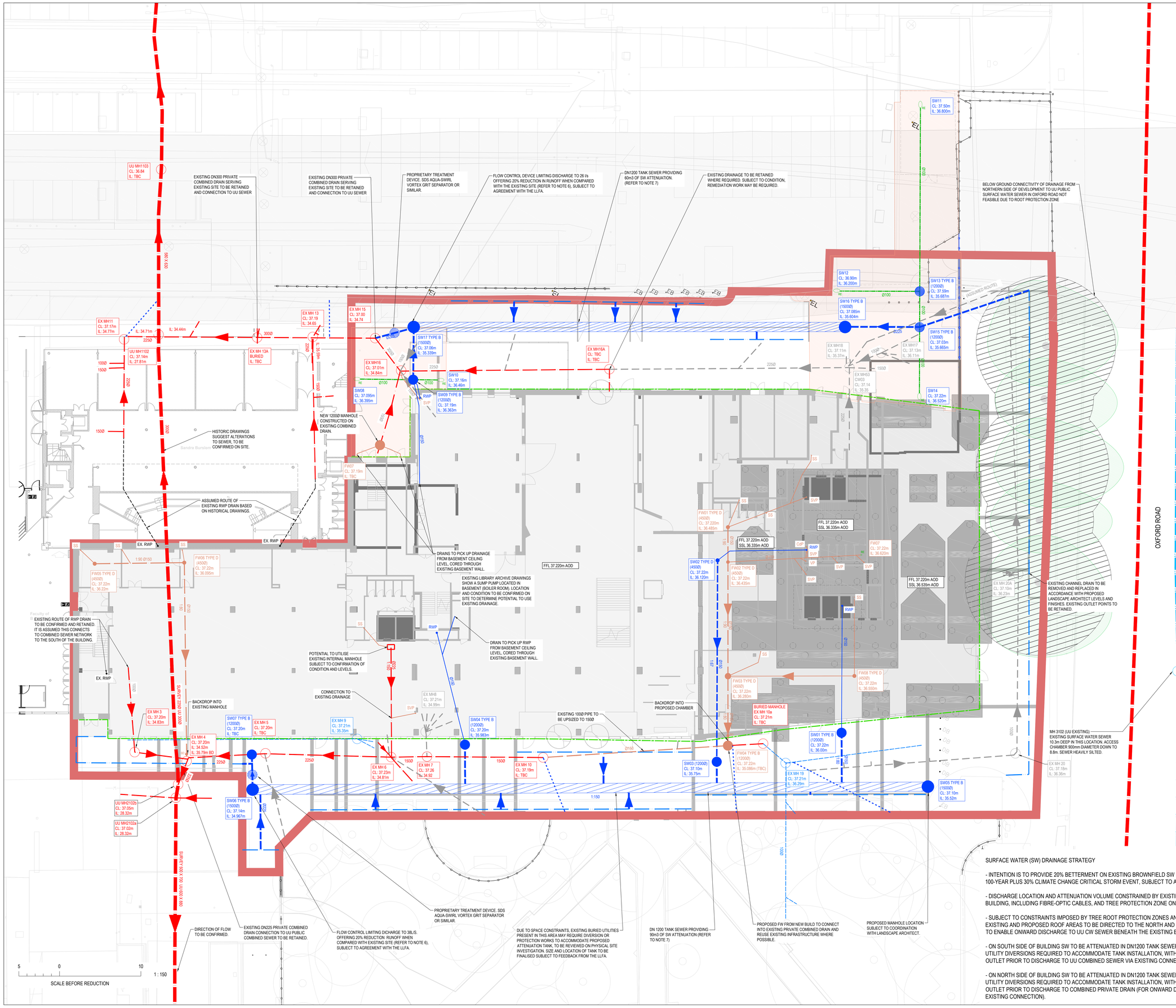
HEALTH AND SAFETY INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING :

CONSTRUCTION:
- WORKS WITHIN POTENTIAL CONFINED SPACE CONDITIONS
- WORKS IN PROXIMITY TO LIVE SERVICES
- WORKS INTERFACE WITH THE PUBLIC ON OXFORD ROAD

MAINTENANCE/CLEANING/OPERATION:
- DRAINAGE AND ATTENUATION TANK TO BE REGULARLY MAINTAINED TO ENSURE PROPER FUNCTIONALITY OF NETWORK.
- MANUFACTURER GUIDANCE MUST BE FOLLOWED FOR PROPRIETARY PRODUCTS USED IN DRAINAGE NETWORK.

DECOMMISSIONING/DEMOLITION:
- WORKS TO EXISTING DRAINAGE
- WORKS TO EXISTING UTILITIES



LEGEND

- SITE BOUNDARY
- MANCUNIAN WAY ELEVATED CARRIAGEWAY
- ELEVATED CARRIAGEWAY NO DIG ZONE (INDICATIVE)
- ROOT PROTECTION ZONE
- TREE CANOPY
- ROOF AREA ASSOCIATED WITH EXISTING BUILDING TO BE REFURBISHED
- PROPOSED NEW-BUILD ROOF AREA
- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC SW SEWER
- EXISTING PRIVATE COMBINED DRAIN
- EXISTING LINEAR CHANNEL DRAIN
- PROPOSED PRIVATE SW DRAIN & MANHOLE
- RWP — PROPOSED RAINWATER PIPE & DRAIN
- BACKDROP — SVP — PROPOSED PRIVATE FW DRAIN & MANHOLE
- PROPOSED SVP/SS & DRAIN
- PROPOSED SW ATTENUATION TANK SEWER
- PROPOSED PERMEABLE ASPHALT SURFACING (UNDER-DRAINAGE AND OUTFALLS TO PRIMARY DRAINAGE NOT SHOWN)
- PERFORATED DRAIN
- RE — RODDING EYE
- PROPOSED SW CHANNEL DRAINS TO BE COORDINATED WITH LANDSCAPE ARCHITECT
- DRAINAGE TO BE ABANDONED
- PROPOSED LAND DRAINAGE AROUND EXTERNAL PERIMETER OF BUILDING - REQUIREMENTS TBC
- PROPOSED FOUNDATIONS

GENERAL NOTES:

1. THE DESIGN OF THIS SCHEME HAS BEEN BASED ON THE FOLLOWING DRAWINGS AND INFORMATION:
   - TOPOGRAPHICAL SURVEY: DRAWING No. 20A265 RECEIVED MARCH 2020, BY SURVEY OPERATIONS
   - ARCHITECT'S GROUND FLOOR PLAN DRAWING No. 1044B-HBA-ZZ-00-DR-A-20X100 RECEIVED 17.07.23, BY HAWKINS BROWN
   - TREE CONSTRAINS PLAN: DRAWING No. TR-01 RECEIVED 04.02.19, BY PLANIT-IE
   - LANDSCAPE ARCHITECT PLAN: DRAWING No. 1044B-PLA-ZZ-XX-DR-L-000003 RECEIVED 18.07.23, BY PLANIT-IE
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, DETAILS AND SPECIFICATIONS.
3. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
4. ALL ABOVE GROUND RAINWATER AND SANITARY PIPEWORK IS SHOWN INDICATIVELY. REFERENCE SHOULD BE MADE TO MEP DESIGN DRAWINGS FOR ALL ABOVE GROUND DRAINAGE APPARATUS.
5. FINAL DISCHARGE RATES TO BE CONFIRMED WITH UU AND THE LLFA, ONCE NORTH-SOUTH SPLIT OF ROOF RUNOFF IS CONFIRMED.
6. TOTAL ATTENUATION VOLUME SUBJECT TO APPROVAL OF LLFA AND UU. PROPOSED VOLUME OF $150m^3$ OFFERS 20% BETTERMENT WHEN COMPARED WITH BROWNFIELD DISCHARGE RATES. LIMITING DISCHARGE TO THE ASPIRATIONAL GREENFIELD RUNOFF RATES WOULD REQUIRE UPTO $550m^3$ ATTENUATION WHICH IS NOT CONSIDERED FEASIBLE DUE TO SITE-WIDE CONSTRAINTS.
7. PRIOR TO THE COMMENCEMENT OF WORK THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/SEWERS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER.
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SURFACE WATER (SW) DRAINAGE STRATEGY

- INTENTION IS TO PROVIDE 20% BETTERMENT ON EXISTING BROWNFIELD SW DISCHARGE RATES FROM THE SITE, UP TO 100-YEAR PLUS 30% CLIMATE CHANGE CRITICAL STORM EVENT, SUBJECT TO AGREEMENT WITH THE LLFA.

- DISCHARGE LOCATION AND ATTENUATION VOLUME CONSTRAINED BY EXISTING UTILITIES TO BOTH NORTH AND SOUTH OF BUILDING, INCLUDING FIBRE-OPTIC CABLES, AND TREE PROTECTION ZONE ON EASTERN SIDE.

- SUBJECT TO CONSTRAINTS IMPOSED BY TREE ROOT PROTECTION ZONES AND ABOVE-GROUND MEP DESIGN, SW FROM EXISTING AND PROPOSED ROOF AREAS TO BE DIRECTED TO THE NORTH AND SOUTH SIDE OF BUILDING, WHEREVER POSSIBLE, TO ENABLE ONWARD DISCHARGE TO UU CW SEWER BENEATH THE EXISTING BUILDING TO THE WEST OF THE SITE.

- ON SOUTH SIDE OF BUILDING SW TO BE ATTENUATED IN DN1200 TANK SEWER (OR SIMILAR), SUBJECT TO ASSESSMENT OF UTILITY DIVERSIONS REQUIRED TO ACCOMMODATE TANK INSTALLATION, WITH CORRESPONDING FLOW CONTROL ON OUTLET PRIOR TO DISCHARGE TO UU COMBINED SEWER VIA EXISTING CONNECTION.

- ON NORTH SIDE OF BUILDING SW TO BE ATTENUATED IN DN1200 TANK SEWER (OR SIMILAR), SUBJECT TO ASSESSMENT OF UTILITY DIVERSIONS REQUIRED TO ACCOMMODATE TANK INSTALLATION, WITH CORRESPONDING FLOW CONTROL ON OUTLET PRIOR TO DISCHARGE TO COMBINED PRIVATE DRAIN (FOR ONWARD DISCHARGE TO UU COMBINED SEWER VIA EXISTING CONNECTION).

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RIBA STAGE 3

Project Stage

A3 - AUTHORISED AND ACCEPTED

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Architect: HAWKINS\BROWN & SCHMIDT\HAMMER\LASSEN/

Project: **LIBRARY TRANSFORMATION PROJECT**

Drg Title: PROPOSED DRAINAGE PLAN

Job No.	Scale@A0
053621	1:150

Drawn/Designed By	Checked By	Approved By
YL	AD	AD

Drawing No. 1044B-BHE-XX-XX-DR-C-003101

Revision C02

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