

CIS Tower, Manchester

Flood Risk Assessment and Drainage Strategy

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Site Address: CIS Tower, Miller Street, Manchester, M60 0AL

Control Sheet

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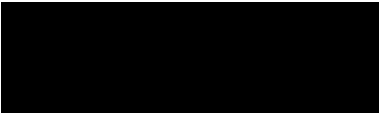
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1 Introduction

1.1 Project Background

- 1.1.1 Curtins was appointed by Devonshire Limited to provide a Flood Risk Assessment (FRA) and Drainage Strategy for the proposed residential site adjacent to Gorton Lane, Manchester.
- 1.1.2 The report provides information on the nature of flood risk at the site and follows Government guidance regarding development and flood risk.
- 1.1.3 The report is based on currently available information and preliminary discussions.
- 1.1.4 Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.
- 1.1.5 Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

- 1.2.1 The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).
- 1.2.2 The assessment will:
 - Investigate all potential risks of flooding to the site,
 - Consider the impact the development may have elsewhere with regards to flooding,
 - Consider design proposals to mitigate any potential risk of flooding determined to be present; and
 - Consider foul & surface water drainage proposals for the proposed development.
- 1.2.3 The total site area is approximately 0.72 hectares. The site is located in Flood Zone 1 and is identified as being in a critical drainage area as per Manchester City Council critical drainage areas map. This Flood Risk Assessment is needed to identify what drainage infrastructure is required to mitigate the risk of flooding from multiple sources.
- 1.2.4 In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments.
- 1.2.5 A Drainage Strategy will therefore be required as part of the Planning Application for the development, as the site is considered to be 'major' development by the Town and Country Planning Order 2015.
- 1.2.6 This Flood Risk Assessment and Drainage Strategy reviews the following information:
 - Environment Agency flood maps for rivers and sea flooding.
 - UK Government Flood Warning Information Service maps for surface water flooding and reservoir flooding.
 - Manchester City, Salford City and Trafford Councils Level 1 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2010.

- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2011.
- Preliminary Flood Risk Assessment (PFRA) for Manchester County Council dated May 2011.
- Manchester City Council SuDS Requirements for New Developments.
- United Utilities Public Sewer Records, dated 2016.
- CCTV Survey by Layer Survey dated 2024.

1.3 Proposed Development

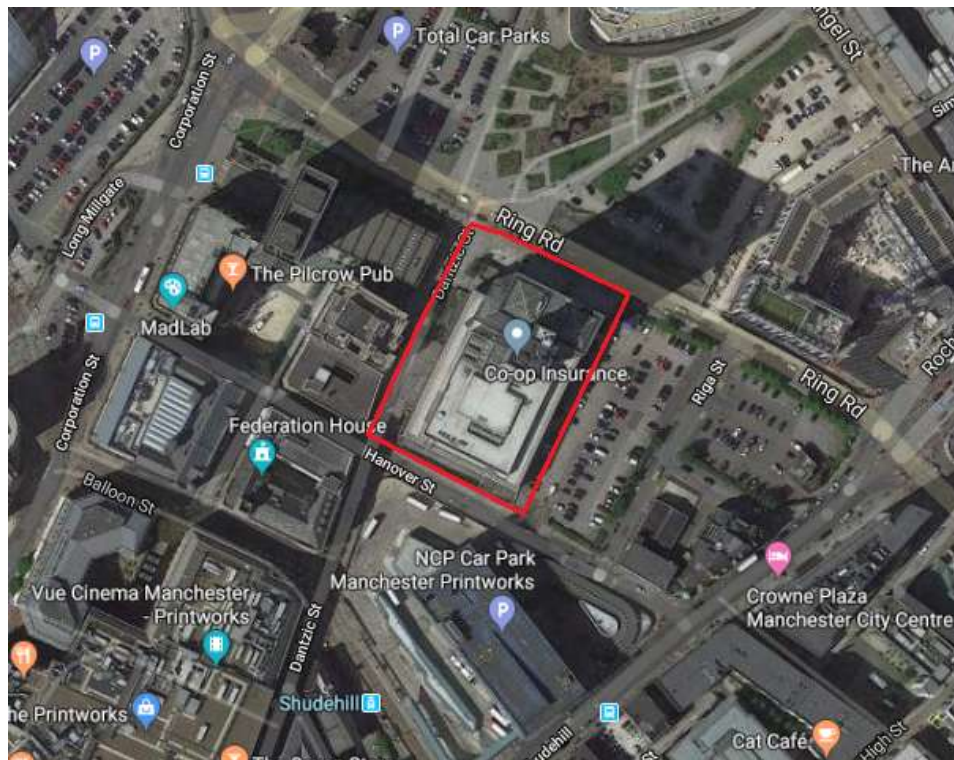
1.3.1 The development is expected to comprise the following:

- The redevelopment of the listed CIS Tower in Manchester city centre. The site layout is enclosed in *Appendix A*.

2 Existing Site Details

- 2.1.1 The site is located within the NOMA area of Manchester city centre opposite to the new Angel Square development.
- 2.1.2 The site is approximately 0.65 ha in size and bound by Miller Street to the north, an existing surface level car park to the east, Hanover Street to the south and Dantzic Street to the west.
- 2.1.3 The site is currently occupied by the CIS Tower building and comprises a tower with 26 storeys (ground floor plus 25), a service tower which extends several storeys above the main tower and a low-level connected podium with 5 storeys (ground plus 4). The building also has three basement levels.

Figure 1: Aerial Photograph (© Google 2019)



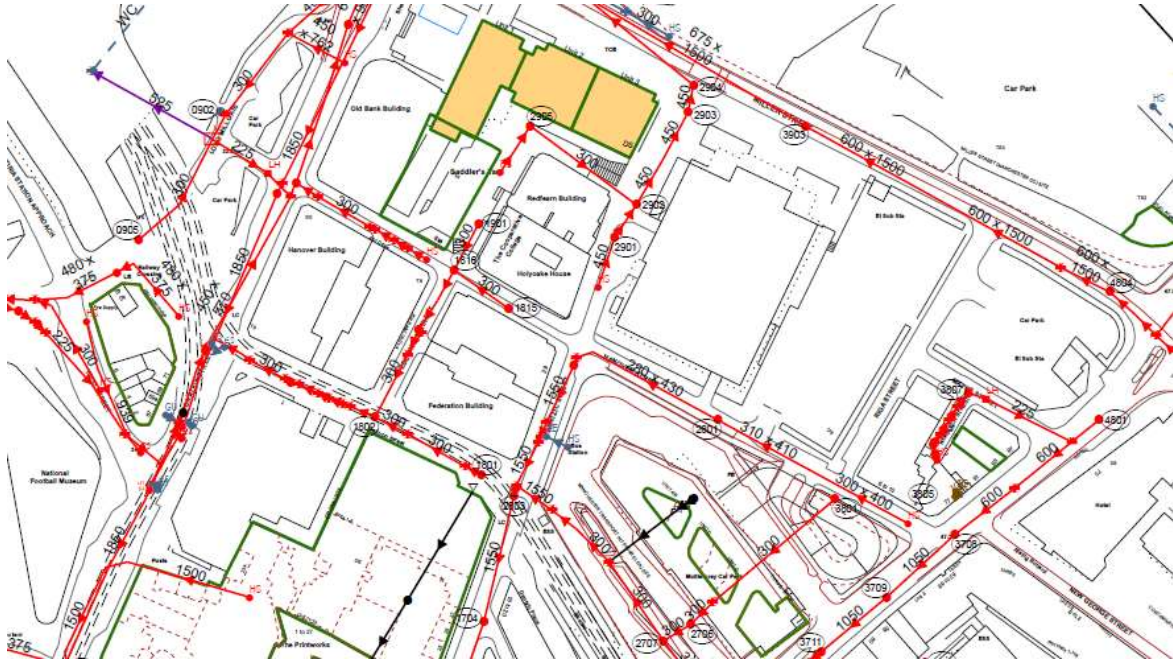
2.2 Existing Watercourses and Other Waterbodies

- 2.2.1 No above ground watercourses have been identified within the proposed site.
- 2.2.2 The River Irk is located approximately 275m to the north-west of the site. The River Irk is identified by the EA as being a main river.
- 2.2.3 The River Irwell is located approximately 390m to the west of the site. The River Irwell is identified by the EA as being a main river.
- 2.2.4 The Rochdale Canal is located approximately 790m to the south-east of the site.
- 2.2.5 There are no other watercourse or waterbodies within the vicinity of the site.

2.3 Existing Drainage

2.3.1 The public sewer records have been obtained for the development site, an extract is illustrated in Figure 2.

Figure 2: Extract from United Utilities Public Sewer Records (© United Utilities 2017)



2.3.2 The public sewer records indicate that there are public sewers located within the current redline boundary:

- A 450mm diameter public combined sewer which is located along the western boundary of the site within Dantzic Street. The sewer flows in a south-west to north-east direction towards Miller Street.

2.3.3 The following public sewers are located within the vicinity of the site:

- A 600mm x 1500mm diameter public combined sewer which runs along Miller Street from south-east to north-west.
- A 280mm x 430mm diameter public combined sewer which runs along Hanover Street from south-east to north-west.

2.3.4 There are further public sewers identified on the public sewer records within the wider vicinity of the site, but these are not considered relevant to the scheme.

2.3.5 Historical drainage records have been provided for the existing building and are enclosed in *Appendix B*.

2.3.6 The Historical drainage records indicate that there is a void below the Ground Floor and the existing building is served by an above ground suspended drainage system. The drainage system comprises:

- A 300mm combined pipe which discharges along the south-east elevation towards the car park.
- A 375mm combined pipe which discharges along the north-west elevation towards Dantzic Street.

- 2.3.7 A CCTV Drainage survey was completed in October 2019 and identified the internal void space below ground floor level. The CCTV survey was to survey the below ground drainage from the building and therefore none of the suspended drainage was included. The M&E Engineer may wish to scope additional surveys to capture the above ground drainage.
- 2.3.8 The CCTV Drainage survey report and layout is enclosed within *Appendix D*.
- 2.3.9 The CCTV Drainage Survey indicates that the following existing drainage features are within the site boundary:
- A 300mm combined pipe from the suspended internal drainage system, which discharges along the south-east elevation towards the car park. The external chamber within the car park could not be located (Ref UC1) however the pipe appeared to discharge north towards Millar Street as a 400mm diameter pipe. The approximate route of this pipe has been illustrated on the survey drawing to another chamber which could not be located (Ref UC2). The survey was terminated at this point; however, it is anticipated that the pipe will connect to the combined public sewer in Miller Street.
 - A 375mm combined pipe from the suspended internal drainage system, which discharges along the north-west elevation towards Dantzic Street. The external chamber is UU Public Sewer manhole (Ref 2901) and appears to discharge north-east as a 400mm pipe through manholes 2902 and 2903 and it is anticipated that the pipe will connect to the combined public sewer in Miller Street.
- 2.3.10 The CCTV Drainage Survey therefore confirms the connections anticipated from the historic drainage layout are correct.
- 2.3.11 There will likely be additional drainage features surrounding the existing building; within the current redline boundary, however at the time of scoping the previous CCTV Drainage Survey, the scope included the building refurbishment works only and additional surveys may therefore be required.

2.4 Topography

- 2.4.1 A Topographical Survey has been undertaken of the site and is enclosed in *Appendix C*.
- 2.4.2 Generally, levels along the northern elevation at the main entrance are at approximately 42.77m AOD, however access included external steps from Miller Street, where bottom of steps are at approximately 41-41.90m AOD.
- 2.4.3 Levels to the car park interface to the east of the building are at approximately 44-46m AOD, with levels generally sloping from south to north to tie into levels along Miller Street at circa 43.20m AOD.
- 2.4.4 There is a service vehicle access along the southern elevation of the building from Dantzic Street at approximately 41.60m AOD. There is a retaining wall separating the service access from Hanover

Street, and levels along Hanover Street are at approximately 44.90m AOD to the south-east, sloping east to west down to 41.60m AOD south-west to tie into Dantzic Street.

- 2.4.5 Levels to the Dantzic Street interface to the west of the building are at approximately 41.70m AOD in the south-west corner of the building sloping up to the north-west corner of the building to 42.90m AOD. There are external steps to tie into levels along Miller Street at circa 40.60m AOD.

2.5 Geology

- 2.5.1 The British Geological Survey maps indicate that no superficial deposits are recorded on the site. However, the bedrock is made up of Chester Formation – Sandstone.
- 2.5.2 A historic borehole shown on the BGS maps shows that an area approximately 100m to the North East of the site is underlain by made ground which consists of sandstone, brick rubble and clay sand. The made ground layer can be found until 1.7m bgl, there is then a concrete slab beneath this layer which is recorded to be 120mm thick. Beneath this is mainly brown sand until 7.4m bgl where the geology turns to Sandstone. It is assumed that the site has a similar geological make up.
- 2.5.3 Boreholes Logs were received for the ground between the existing building and Miller Street. All logs showed a minimum level of made ground of 2.60m bgl of the site. It should also be noted that several of the boreholes recorded a grey concrete slab being present at approximately 3m bgl. Borehole data. See Curtins report 068327-CUR-00-XX-RP-GE-001 for the existing ground conditions.
- 2.5.4 The site is not located within a Groundwater Source Protection Zone.

3 Development and Flood Risk

3.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance

- 3.1.1 In February 2019 the Department of Communities and Local Government published the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance was published in March 2014 which provides guidance on how flood risk should be assessed during the planning and development process.

Table 1: (Extract from Planning Practice Guidance) Flood Zone Classifications

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea !\[\]\(341b5bdc31177a6c7da7dc713da0d169_img.jpg\)](#)), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
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)

Table 2: (Extract from Planning Practice Guidance) Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are **not** required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: (Extract from Planning Practice Guidance) Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

3.2 Site Specific NPPF Flood Risk Categorisation

- 3.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or seas (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.
- 3.2.2 The Flood Map for Planning report is enclosed in *Appendix E*, and it can be seen that whole site is classified as within Flood Zone 1.
- 3.2.3 Further site-specific review of the flood risk to the site is provided in section 4.

3.3 Site Specific Flood Zone Compatibility

- 3.3.1 The proposal for the development site is likely to fall within the following category of 'Less Vulnerable' in accordance with the Flood Risk Vulnerability Classification (Table 2).
- 3.3.2 The site is located within Flood Zone 1 for which a 'Less Vulnerable' development is deemed to be appropriate.

3.4 Sequential Test

- 3.4.1 The site is categorised as a 'Less Vulnerable' development (shown in table 2) and is within Flood Zone 1 therefore the sequential test is not required to be applied (see table 3).

4 Hydrological Assessment

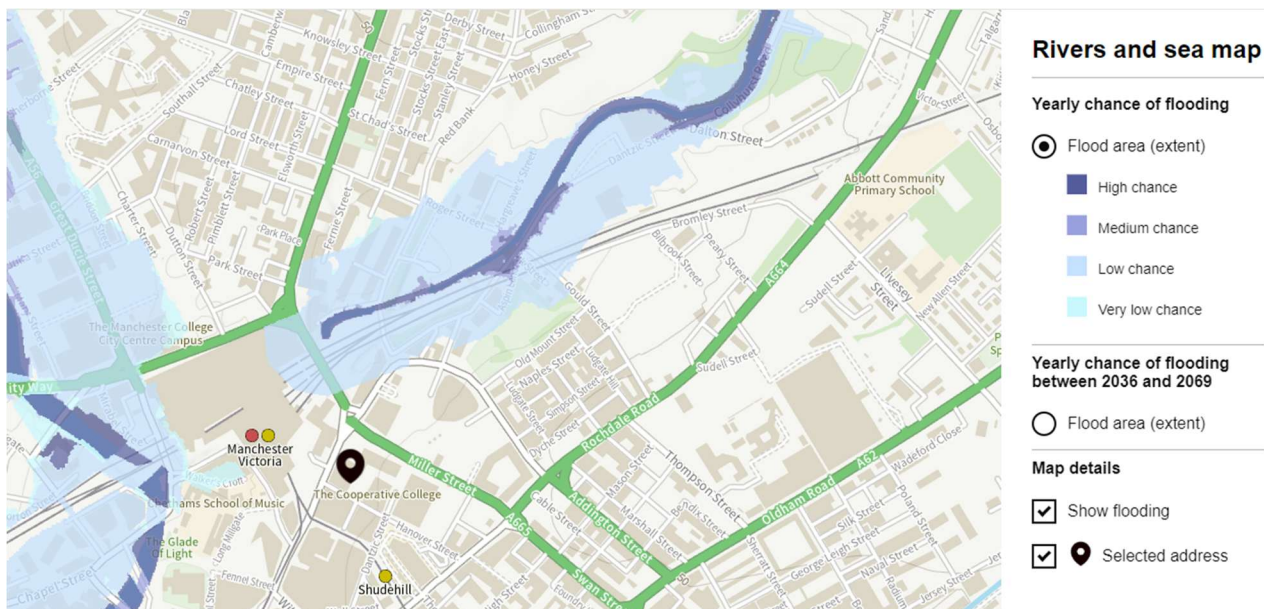
4.1 Sources of Flood Risk

4.1.1 This study assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed. The approach to assessing flood risk at the development site was informed by the requirements of NPPF in conjunction with the client and Environment Agency requirements.

4.2 Fluvial Flooding (Rivers and Streams)

4.2.1 Flooding to the site from rivers and seas is indicated below in Figure 3, taken from the UK Government's Long-Term Flood Risk Information.

Figure 3: Long Term Flood Risk Assessment Map – Flood Risk from Rivers or Sea (© Crown Copyright)



4.2.2 It can be seen that the entire area of the site is at a 'Very Low' risk of fluvial flooding. The site is not shown to be in an area which benefits from flood defences. The site has less than a 0.1% chance of fluvial flooding each year. Therefore, the proposed site is considered to be at a very low residual risk from fluvial flooding.

Flood risk from rivers or the sea

Very low risk means that each year this area has a chance of flooding of less than 0.1%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Figure 4: Long Term Flood Risk Assessment (Detailed Information) – Flood Risk from Rivers or Sea (© Crown Copyright)

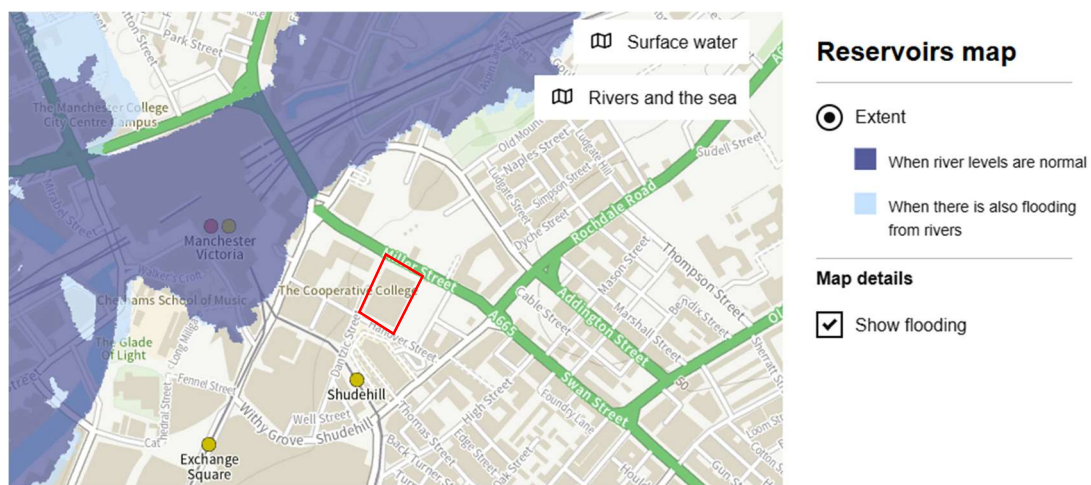
4.3 Tidal Flooding (Coastal or Estuarine)

- 1.1.1 There is currently no flood risk identified on the Environment Agency flood maps for the site and it is therefore regarded to be at low risk from tidal flooding.

4.4 Reservoir Flooding

- 4.4.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.
- 4.4.2 The Long-Term Flood Risk Assessment (Flood Risk from Reservoirs) map shows the largest area that might be flooded if a reservoir were to fail and release the water it holds (see Figure 5).

Figure 5: Long Term Flood Risk Assessment Map – Flood Risk from Reservoirs (© Crown Copyright)



- 4.4.3 The site is not located within the extent of reservoir flood risk according to the online maps. The OS maps show that there are no reservoirs within close proximity of the site. The risk is therefore considered as low.

1.2 Canal Flooding

- 4.4.4 The nearest canal to the site is the Rochdale Canal which is located approximately 790m to the south-east of the site.
- 4.4.5 The canals are identified in the SFRA as not generally posing a direct flood risk as they are a controlled water body. Therefore, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.
- 4.4.6 Given the above information, it is considered that there is low risk of canal flooding to the site.

4.5 Groundwater Flooding

- 4.5.1 According to the SFRA, there are no known reports of groundwater flooding within the Manchester, Trafford and Salford authorities.
- 4.5.2 Although there are three levels of basement to the building, the proposals are for refurbishment works only and therefore the ground levels on the site are to remain the same as existing levels. Therefore, the existing risk of groundwater flooding will not be increased throughout the development.
- 4.5.3 External ground levels across the site currently fall away from the proposed buildings and it is ensured that the creation of low points are not present in order that in the unlikely event of groundwater flooding, the flood water is safely routed away from the buildings on site (over land flow plan included within Drainage Strategy in Appendix F).
- 4.5.4 Providing the above mitigation measures were imposed, the risk from groundwater flooding would therefore be considered low post development.

4.6 Public Sewers or Highway Drainage Flooding (Infrastructure Failure)

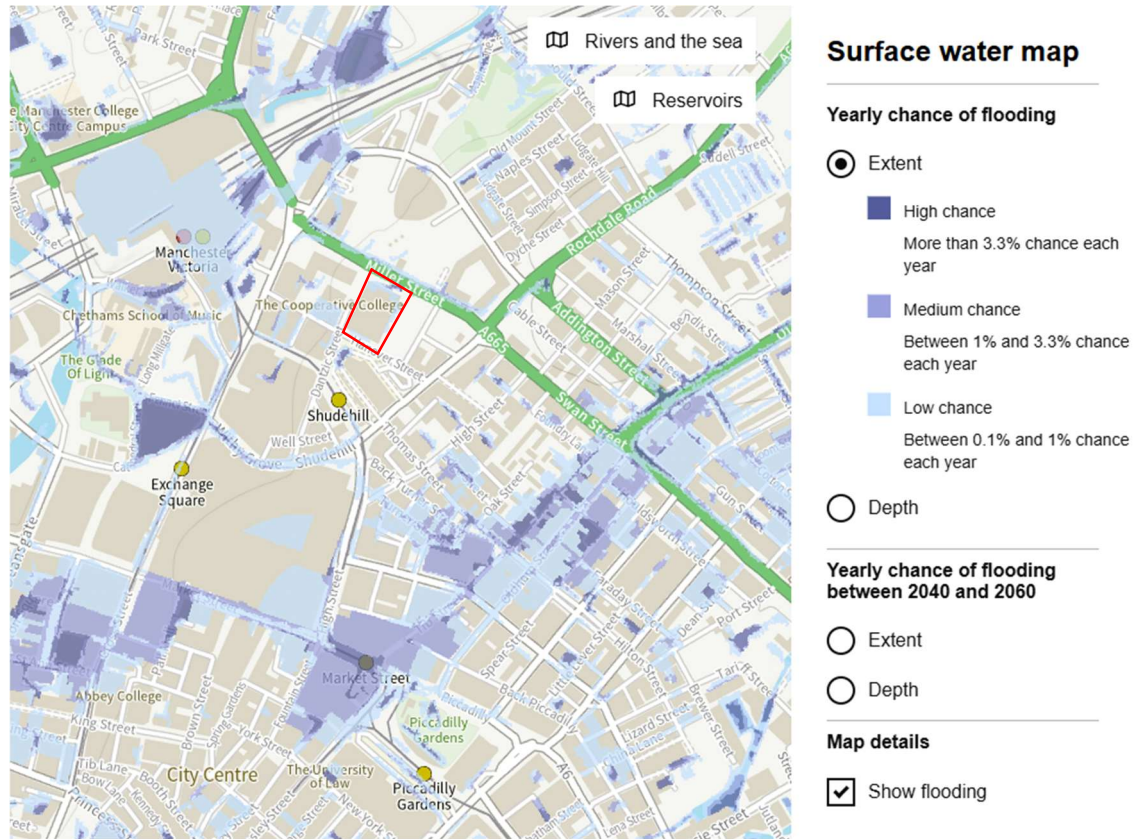
- 4.6.1 There are no highway drains recorded within the site.
- 4.6.2 It is assumed that the surface water drainage outside of the site boundary will be subject to the relevant landowner's regular drainage maintenance schedule.
- 4.6.3 Providing United Utilities and Manchester City Council maintain their drainage assets within and in the vicinity of the site, the risk of flooding to the proposed development site from public sewers or highway drainage is considered as low.

4.7 Surface Water Flooding to the site

- 4.7.1 Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally

from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

Figure 6: Long Term Flood Risk Assessment Map – Flood Risk from Reservoirs (© Crown Copyright)



4.7.2 Figure 6 highlights that the site is identified as being at a 'very low' risk of flooding from surface water. However, there is a region of 'low risk' which is situated along the northern boundary of the site, within

Miller Street which is likely to be due to the localised low points and potential defects with the existing drainage system.

- 4.7.3 The mapping indicates the following:
- 4.7.4 Where a site is located in a light blue shaded zone, this indicates that the site is at low risk of flooding, where flooding occurs as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year.
- 4.7.5 Where a site is located in a clear (unshaded) area; this indicates that the site is at very low risk of flooding, where flooding occurs as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year.
- 4.7.6 To mitigate this risk external ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points is avoided (other than those used intentionally for drainage features) and so the flood water is safely routed away from the buildings on site.
- 4.7.7 Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.

4.8 Surface Water Flooding from the site

- 4.8.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. Where new development is proposed, the proposed surface water drainage network shall be designed to not flood for the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.
- 4.8.2 The proposed impermeable area is not expected to be greater than the existing therefore the development is unlikely to increase surface water flooding to nearby areas.

4.9 Historical Flooding

- 4.9.1 United Utilities and Manchester City Council have not provided any records of flooding to the site or within the vicinity at the time this report was written.

5 Development and Flood Risk

5.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance

- 5.1.1 In February 2019 the Department of Communities and Local Government published the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance was published in March 2014 which provides guidance on how flood risk should be assessed during the planning and development process.

Table 4: (Extract from Planning Practice Guidance) Flood Zone Classifications

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea !\[\]\(ef62519991500c3a77af2e8766280b93_img.jpg\)](#)), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
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)

Table 5: (Extract from Planning Practice Guidance) Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are **not** required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 6: (Extract from Planning Practice Guidance) Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

5.2 Site Specific NPPF Flood Risk Categorisation

- 5.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or seas (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.
- 5.2.2 The Flood Map for Planning report is enclosed in *Appendix E*, and it can be seen that whole site is classified as within Flood Zone 1.
- 5.2.3 Further site-specific review of the flood risk to the site is provided in section 4.

1.3 Site Specific Flood Zone Compatibility

- 5.2.4 The proposal for the development site is likely to fall within the following category of 'Less Vulnerable' in accordance with the Flood Risk Vulnerability Classification (Table 2).
- 5.2.5 The site is located within Flood Zone 1 for which a 'Less Vulnerable' development is deemed to be appropriate.

5.3 Sequential Test

- 5.3.1 The site is categorised as a 'Less Vulnerable' development (shown in table 2) and is within Flood Zone 1 therefore the sequential test is not required to be applied (see table 3).

Mitigation

5.4 Fluvial Flood Mitigation

5.4.1 Not required as site is classified as Flood Zone 1.

5.5 Reservoir Flood Mitigation

5.5.1 Manchester City Council is responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared. The building occupiers should have an emergency procedure in the unlikely event that the reservoir fails. This would include considering where you would go to safety and be ready to follow the advice of emergency services.

5.5.2 Providing maintenance is carried out by United Utilities, the risk from reservoir flooding would therefore be considered low risk.

5.6 Ground Water Flood Mitigation

5.6.1 Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significant risk to life due to the slow rate at which the water level rises; however, it can cause significant risk to property.

5.6.2 The development proposals do not include any below ground basement areas and generally, floor levels are at or above existing ground levels therefore the risk of groundwater flooding to the area is considered low.

5.6.3 External ground levels across the site should fall away from the proposed buildings and ensure that the creation of low points is avoided (other than those used intentionally for drainage features) in order that in the unlikely event of groundwater flooding, the flood water is safely routed away from the buildings on site.

5.6.4 Providing the above mitigation measures were imposed, the risk from groundwater flooding would therefore be considered low post development.

5.7 Surface Water Flooding to the site Mitigation

5.7.1 The UK Government Long Term Flood Risk Assessment surface water flood maps indicate that the site is at very low risk to low of surface water flooding.

5.7.2 The surface water flood maps do not identify any surface water entering the site from outside of the site boundary. It is recommended that these levels should be maintained, in order that the surface water flood risk to the site shall not be increased. It is assumed that the surface water drainage outside of the site boundary will be subject to the relevant landowner's regular drainage maintenance schedule.

5.7.3 It is recommended that proposed external ground levels across the site should fall away from the proposed buildings in a manner which does not create low points where water might collect unintentionally. This will ensure that any surface water will not flow towards the proposed buildings. The proposed surface water drainage network shall be designed to accommodate flows generated from within the site.

- 5.7.4 Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.
- 5.7.5 A detailed assessment of the proposed surface flows is carried out within the drainage strategy within section 6 of this report.

6 Drainage Strategy

6.1 Existing Drainage

6.1.1 The public sewer records (Figure 2) indicate that there are public sewers located within the current redline boundary:

- A 450mm diameter public combined sewer which is located along the western boundary of the site within Dantzic Street. The sewer flows in a south-west to north-east direction towards Miller Street.

6.1.2 The following public sewers are located within the vicinity of the site:

- A 600mm x 1500mm diameter public combined sewer which runs along Miller Street from south-east to north-west.
- A 280mm x 430mm diameter public combined sewer which runs along Hanover Street from south-east to north-west.

6.1.3 The Historical drainage records indicate that there is a void below the Ground Floor and the existing building is served by an above ground suspended drainage system. The drainage system comprises:

- A 300mm combined pipe which discharges along the south-east elevation towards the car park.
- A 375mm combined pipe which discharges along the north-west elevation towards Dantzic Street.

6.1.4 The CCTV Drainage Survey indicates that the following existing drainage features are within the site boundary:

- A 300mm combined pipe from the suspended internal drainage system, which discharges along the south-east elevation towards the car park. The external chamber within the car park could not be located (Ref UC1) however the pipe appeared to discharge north towards Millar Street as a 400mm diameter pipe. The approximate route of this pipe has been illustrated on the survey drawing to another chamber which could not be located (Ref UC2). The survey was terminated at this point; however, it is anticipated that the pipe will connect to the combined public sewer in Miller Street.
- A 375mm combined pipe from the suspended internal drainage system, which discharges along the north-west elevation towards Dantzic Street. The external chamber is UU Public Sewer manhole (Ref 2901) and appears to discharge north-east as a 400mm pipe through manholes 2902 and 2903 and it is anticipated that the pipe will connect to the combined public sewer in Miller Street.

- 6.1.5 The CCTV Drainage Survey therefore confirms the connections anticipated from the historic drainage layout are correct.
- 6.1.6 The CCTV survey was to survey the below ground drainage from the building and therefore none of the suspended drainage was included.
- 6.1.7 It is not clear if there are any additional drainage points from lower basement levels or any existing pumped drainage. The M&E Engineer should confirm this prior to detailed design.
- 6.1.8 The M&E Engineer may wish to scope additional surveys to capture the above ground drainage.
- 6.1.9 There will likely be additional external drainage features surrounding the existing building; within the current redline boundary, however at the time of scoping the previous CCTV Drainage Survey, the scope included the building refurbishment works only and additional surveys may therefore be required.
- 6.1.10 It is anticipated that the majority of the existing drainage will be reused as part of the new development. However existing drainage may require repairing and additional drainage points will be required as part of the works.

6.2 Proposed Foul Water Drainage

- 6.2.1 It is likely that additional connections will be necessary from new appliances to suit new refurbished layouts, however all drainage should be routed to tie into the existing above ground drainage system. The M&E Engineer should confirm the internal drainage has sufficient capacity to accept the post development flows. Any additional connections required (where additional capacity is required) should be directed towards the existing external drainage system towards the car park or towards Dantzic Street.
- 6.2.2 The peak foul flow rate should be confirmed once the final internal layouts and number of appliances are confirmed.
- 6.2.3 The existing drainage appears to connect to a wider sewer network and therefore approval will be required from United Utilities for the redevelopment works to ensure the use and flows are acceptable to United Utilities.
- 6.2.4 The proposed drainage strategy is enclosed in *Appendix F*.

6.3 Proposed Surface Water Drainage

- 6.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.
- 6.3.2 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration. However, the proposals are for refurbishment works and therefore the existing drainage system is proposed to be reused where possible. It should be noted that the external areas cannot be infiltrated due to the existing ground conditions identified by the borehole logs. A CCTV survey (see Appendix D) highlights how

there is existing drainage within the external areas of the site therefore proposed drainage within these areas should be minimised.

- 6.3.3 It is anticipated that the proposed system will utilise the existing drainage connections and outfall to the existing combined sewer network. Flow restriction will not be suitable as this could pose as an increased flood risk to the system and building. It is recommended that pipes are sufficiently upgraded to accommodate flows and increase due to climate change where possible. It is also recommended that the existing system is checked to understand if it has adequate capacity.
- 6.3.4 The existing impermeable area of the site is not expected to increase. Additional vegetational areas have been proposed to help reduce the existing run-off rates.
- 6.3.5 The Proposed Drainage Strategy is enclosed in *Appendix F*.
- 6.3.6 The final design of the drainage networks shall be in accordance with the legislation set by the Manchester City Council and United Utilities.
- 6.3.7 SUDs features are considered not to be feasible due to the limited space on the site, the current ground conditions and the existing services within the site boundary.

7 Maintenance

- 7.1.1 This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 7.1.2 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

7.2 Components

- 7.2.1 The following components have been included within the drainage design for the proposed development:
- Inspection, Manhole and Catchpit Chambers
 - Pipes
 - Gullies & Channels
 - Attenuation Tank
 - Flow Control Unit
 - Permeable pavement
- 7.2.2 The maintenance strategy should be implemented to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.
- 7.2.3 The maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.
- 7.2.4 Maintenance of the drainage network will be the responsibility of an on-site facilities management team.
- 7.2.5 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- 7.2.6 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.
- 7.2.7 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.
- 7.2.8 During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris, or litter.
- 7.2.9 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

7.3 Inspection, Manhole and Catchpit Chambers

- 7.3.1 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.
- 7.3.2 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

7.4 Pipes

- 7.4.1 Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.
- 7.4.2 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 7.4.3 Access for maintenance is provided through access chambers and manholes.
- 7.4.4 Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

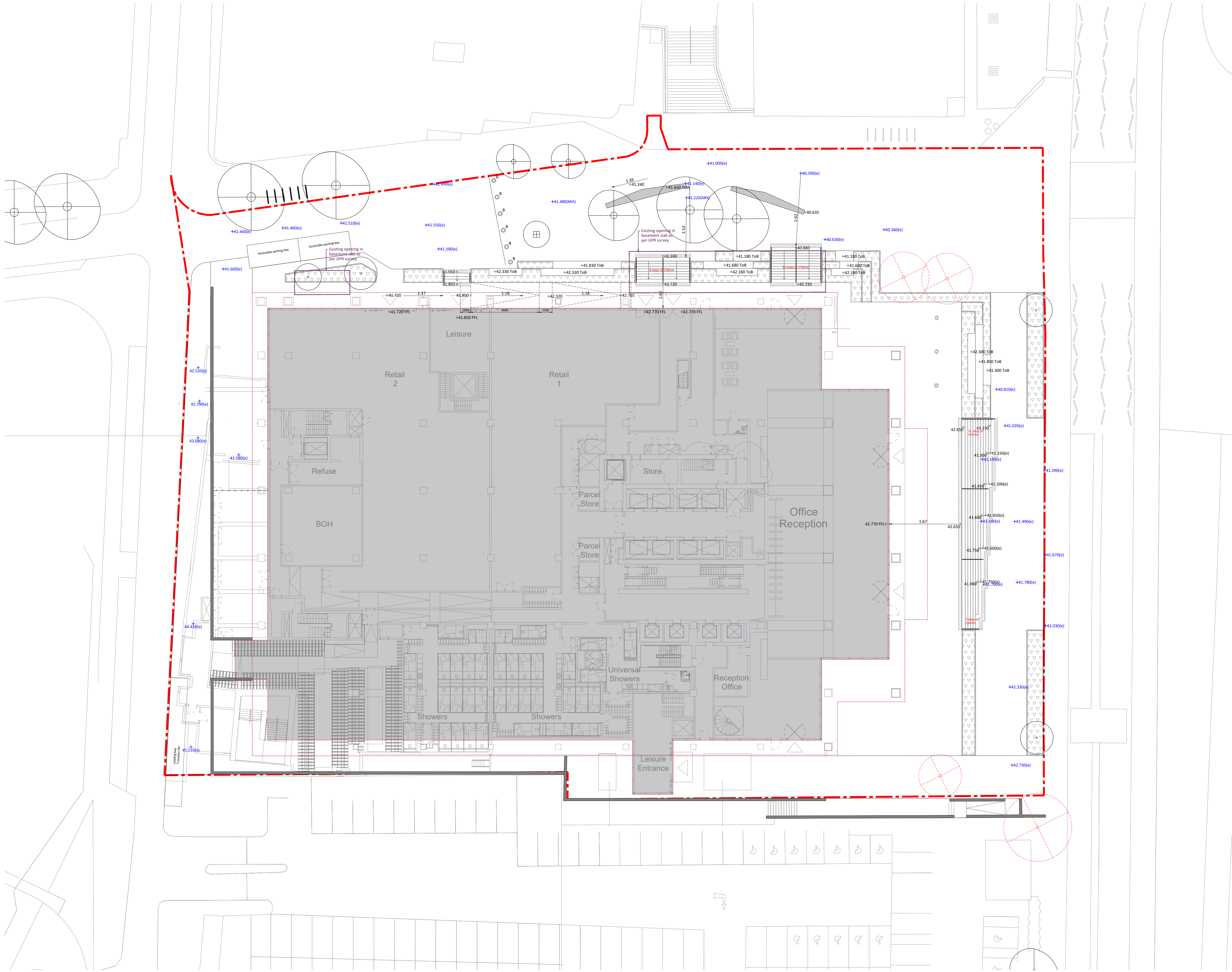
7.5 Gullies & Channels

- 7.5.1 Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.
- 7.5.2 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.
- 7.5.3 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near gully gratings.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Remedial Action	Inspect sumps and outlet pipes and rod through poorly performing channels and outlets as initial remediation.	As required.

Appendix A

Site Layout



- Notes**
- All dimensions in mm, unless otherwise stated.
 - Scaling from drawing if printed incorrectly may lead to errors.
 - All information outside red line boundary shown for contextual purpose only.
 - All hatch patterns are indicative only unless stated otherwise.
 - This drawing is to be read in conjunction with ALL re-form landscape architecture documentation AND all relevant documentation from the design team.
 - Levels information on this drawing illustrates the design intent. The contractor is to check and verify all levels and dimensions against site survey information.
 - Any discrepancies in the design information are to be brought to the attention of re-form landscape architecture, in writing, prior to commencement of construction works.
 - All proprietary products shall be installed in strict accordance with manufacturers written instructions. Refer to other consultants' drawings and specifications for the following design information:
 - Foundation details
 - Base course and/or sub bases design & specification
 - Waterproofing of any element
 - Drainage design and infrastructure
 - Lighting and ducting
 - Existing & proposed utilities
 - Plant quantities are to suit site areas in accordance with scheduled plant densities.
 - Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

- Key**
- Planning application boundary
 - Existing building
 - steps
 - Handrails
 - Bike stands
 - Existing granite bench to be retained
 - Bollards
 - Planting
 - Proposed tree in hard landscape
 - Proposed tree in soft landscape
 - Existing trees to be retained
 - Existing trees to be removed
 - Existing levels
 - Proposed levels
 - Finish floor levels

Scale
0m 5m 10m 15m

15.01.25 For coordination
Date Description of revision JS EB JM P01
Drawn Checked Approved Revision
by by by

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Project
CIS TOWER, MANCHESTER
RF24-1129

Client
DEVONSHIRE LIMITED

Document title
LANDSCAPE GENERAL ARRANGEMENT

Paper size
A1

Status
FOR INFORMATION

Drawing number
1129-RFM-XX-00-DR-L-0001

© re-form landscape architecture

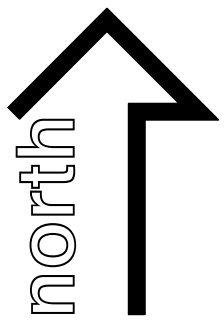
Scale
1:200

S2

Revision
P01

Appendix B

United Utilities Records



The Utility Information on this drawing has been taken from records supplied by each individual affected Utility Company under a C2 request and is given without warranty, the accuracy thereof cannot be guaranteed, nor can we guarantee the accuracy of the transfer of information to this drawing. No Liability of any kind whatsoever is accepted by WDA Ltd for any error or omission.

This drawing is solely for visual guidance.

Safe Digging practices in accordance with HS(G)47 must be used to verify and establish the actual position of each individual service.

RELATED DRAWINGS:

ELECTRIC SERVICES: WDA 88_MPS(E)_01
GAS SERVICES: WDA 88_MPS(G)_01
TELECOMS SERVICES: WDA 88_MPS(T)_01
MULTI INFRASTRUCTURE WDA 88_MPS(MI)_01

NOTES

- All C2 utility record mapping received between 23rd May and 30th May 2019
- C2 Utility mapping received for Miller Street (Northern Eastern Footpath), between the stopped up Dantzic Street and the Junction with Rochdale Road are out of date and will be updated once the utility companies revise their current records

WATER SERVICES LEGEND

- Water Main
- Water Main
- Water-Trunk Main
- Surface Water Drain
- Foul Water Sewer
- Foul Water Sewer (Abandoned)
- Trunk Water Main Easement
No Work Permitted over or within 5M (Horizontal) of the asset
- 315mm Water Main Easement
No Work Permitted over or within 5M (Horizontal) of the asset

Client(s) NOMA GP Ltd

Project NOMA, MANCHESTER
MASTERPLAN STUDY

Drg Title RECORD UNDERGROUND UTILITIES
WATER SERVICES

This Drawing No. WDA 88_MPS(W)_01 Rev

Scale	Sheet	Drawn	Checked	Date
1:1000	A1	CP		25/06/2019

Drawing revisions:

Revision	Event	Drawn By	Checked By	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				

Utilities Infrastructure Consultants



Site Appraisals | Masterplanning | Diversions | New Infrastructure

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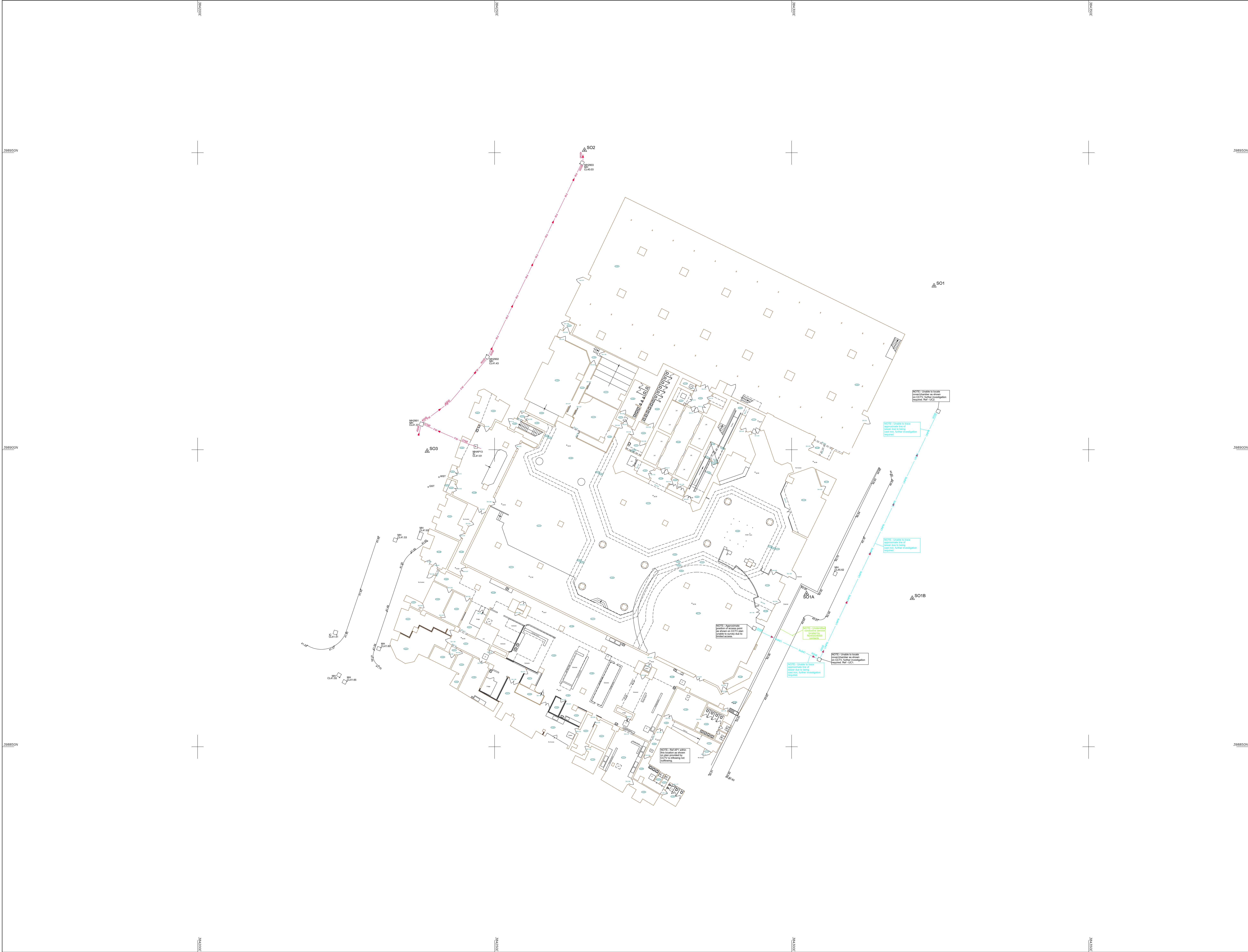
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Appendix C

Topographical Survey

Appendix D

CCTV 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.

Drainage information must be verified with local authority records before use

All information taken from hand drawing drainage plans provided by client.

All information shown as indicated/ requested by CCTV team on site at time of survey.

Additional topographical survey information shown for location of drainage only.

Drawing (27562-CIS-F05A-B1) supplied by client shown faint in background.

— FW — Foul Sewer
— UAPS — Unproven Sewer
— U — Unidentified Trace

Revision - Date - Description
A - 15/10/19 - Dia size added/changed.

Survey
OPERATIONS

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Client
SEP Drainage Surveys Ltd

Drawing Title
Drainage Survey of Land at:
CIS Tower NOMA
Manchester

Scale(s)	1:200	Surveyor	MB
Date	OCT 19	Drawn	IT
Job Number	19I148	Checked	SO

Sheet Size & Drg Number & Revision
A0 19I148/001 A

Appendix E

Flood Map for Planning

Flood map for planning

Your reference
CIS

Location (easting/northing)
384275/398884

Created
29 Dec 2019 10:46

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

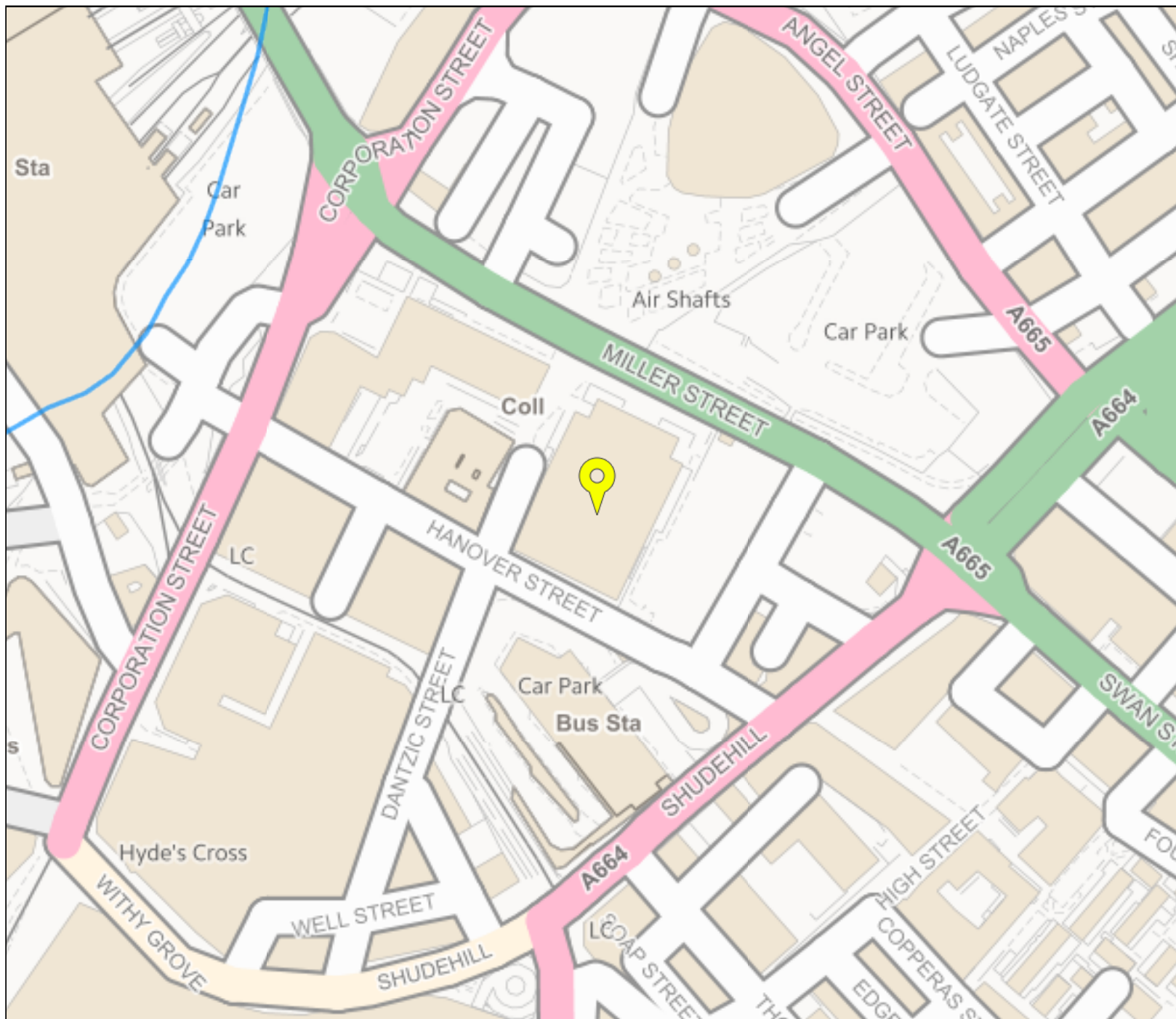
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference

CIS

Location (easting/northing)

384275/398884

Scale

1:2500

Created

29 Dec 2019 10:46

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

Appendix F

Preliminary Drainage Strategy



DRAWING BASED ON:

ARCHITECT'S LAYOUTS

- 10518-SHA-Z1-A-G200-PL-00-001_UNCONTROLLED_250110 RECEIVED 13-01-25

LANDSCAPE ARCHITECT'S LAYOUT

- 2025.02.06-1129-RFM-XX-00-M2-L-0001-Landscape Working Drawing-WIP RECEIVED 07-02-25

CCTV SURVEY

- LS5761- LAYER SURVEY CCTV RECEIVED 03-02-25
- 191148/001 - SURVEY OPERATIONS RECEIVED OCTOBER 2019

M&E

- Z3D-FUT-G581-PL-B1-001 REVISION P06
- Z3D-FUT-G581-PL-B1-002 REVISION P06

- LEGEND
- PLANNING BOUNDARY
 - OVERLAND FLOW ARROWS
 - PROPOSED LANDSCAPED AREAS
 - FW PW EXISTING FOUL DRAIN TAKEN FROM SURVEY OPERATIONS DATED OCTOBER 2019
 - CW(SD) CW(SD) EXISTING COMBINED WATER DRAIN TAKEN FROM LAYER SURVEY DATED JANUARY 2024
 - SW(SD) SW(SD) EXISTING SURFACE WATER DRAIN TAKEN FROM LAYER SURVEY DATED JANUARY 2024

- GENERAL NOTES:
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
 - ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
 - WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
 - ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
 - COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
 - ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
 - OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

DESIGN PHILOSOPHY

SURFACE WATER

IT IS ANTICIPATED THAT THE PROPOSED SYSTEM WILL UTILISE THE EXISTING DRAINAGE CONNECTIONS AND OUTFALL TO THE EXISTING COMBINED SEWER NETWORK. FLOW RESTRICTION WILL NOT BE SUITABLE AS THIS COULD POSE AS AN INCREASED FLOOD RISK TO THE SYSTEM AND BUILDING. IT IS RECOMMENDED THAT PIPES ARE SUFFICIENTLY UPGRADED TO ACCOMMODATE FLOWS AND INCREASE DUE TO CLIMATE CHANGE WHERE POSSIBLE.

THE EXISTING DRAINAGE SYSTEM IN THE EXTERNAL AREAS WILL BE USED TO CONTROL THE EXISTING EXTERNAL RUN-OFF RATES.

FURTHER SURVEYS MAY BE REQUIRED TO IDENTIFY THE EXISTING DRAINAGE INFRASTRUCTURE TO THE EXTERNAL SPACES ON SITE AND ITS CONDITION. ONCE THIS HAS BEEN COMPLETED A MORE DETAILED ANALYSIS WILL BE CARRIED OUT TO IDENTIFY IF THE EXISTING DRAINAGE SYSTEM HAS SUFFICIENT CAPACITY.

FOUL WATER DESIGN

IT IS LIKELY THAT ADDITIONAL CONNECTIONS WILL BE NECESSARY FROM NEW APPLIANCES TO SUIT NEW REFURBISHED LAYOUTS, HOWEVER ALL DRAINAGE SHOULD BE ROUTED TO THE INTO THE EXISTING ABOVE GROUND DRAINAGE SYSTEM.

THE M&E ENGINEER SHOULD CONFIRM THE INTERNAL DRAINAGE HAS SUFFICIENT CAPACITY TO ACCEPT THE POST DEVELOPMENT FLOWS. ANY ADDITIONAL CONNECTIONS REQUIRED (WHERE ADDITIONAL CAPACITY IS REQUIRED) SHOULD BE DIRECTED TOWARDS THE EXISTING EXTERNAL DRAINAGE SYSTEM TOWARDS THE CAR PARK OR TOWARDS DANTZIG STREET.

THE PEAK FOUL FLOW RATE SHOULD BE CONFIRMED ONCE THE FINAL INTERNAL LAYOUTS AND NUMBER OF APPLIANCES ARE CONFIRMED.

THE EXISTING DRAINAGE APPEARS TO CONNECT TO A WIDER SEWER NETWORK AND THEREFORE APPROVAL WILL BE REQUIRED FROM UNITED UTILITIES FOR THE REDEVELOPMENT WORKS TO ENSURE THE USE AND FLOWS ARE ACCEPTABLE TO UNITED UTILITIES.

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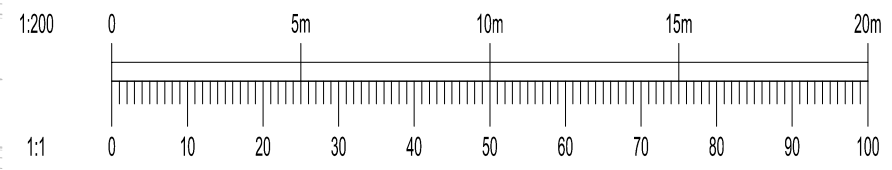
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Project: **PROJECT SAM**

Dwg Title: **PRELIMINARY DRAINAGE STRATEGY**

Drawn By	Designed By	Checked By
CS	CS	CG
Date		Scales @ A1
26/02/25		1:200
Project No - Originator - Function - Spatial - Form - Discipline - Number		
Revision		

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