

St Johns Campus, 2 New Quay Street, Manchester, M3 3BE

Detailed Drainage Strategy

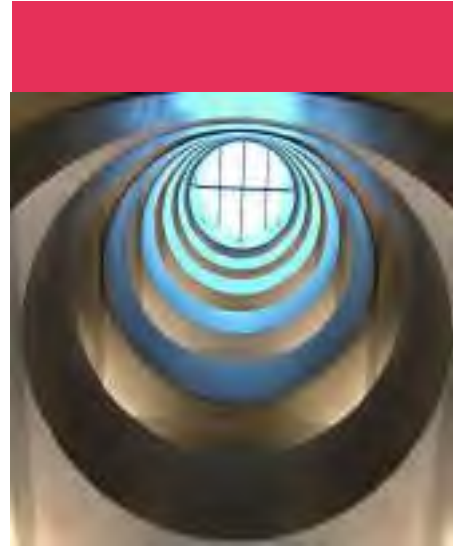
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Control Sheet

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1.0 Introduction

1.1 Project Background

- 1.1.1 Curtins was appointed by St Johns Manchester Ltd, a subsidiary of HBD to provide a Drainage Strategy for the proposed development St Johns Campus, Quay Street, 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 total site area is approximately 0.16 hectares and following scrutiny of the Environment Agency flood maps it has been identified that the site lies within Flood Zone 1. As the site area is smaller than 1ha and the site is within a Flood Zone 1, a Flood Risk Assessment is therefore not required to support a planning application.
- 1.2.3 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.
- 1.2.4 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.
- 1.2.5 The Drainage Strategy report will:
 - Investigate all potential risks of flooding to the site,
 - Consider the impact the development may have elsewhere with regards to flooding,



- Consider proposals to mitigate any potential risk of flooding determined to be present; and
- Consider foul & surface water drainage proposals for the proposed development.

1.2.6 This 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 April 2022.
- Topographical Survey by SEP dated June 2022.
- GPR Survey by SEP dated September 2022.
- CCTV Drainage Survey by SEP dated September 2022.
- Phase I Desk Study by Curtins dated April 2022.
- Interim SI Letter by Curtins dated January 2023.

1.3 Proposed Development

1.3.1 The development is expected to comprise the following:

“Demolition of the existing buildings and structures and the erection of a 16-storey office building (Use Class E(g)), with flexible ground floor uses (Use Class E), rooftop amenity space and works to facilitate public realm improvements.”

1.3.2 The Proposed Landscaping General Arrangement, Proposed Architects Basement and Ground Floor Layouts are enclosed in *Appendix A*.

2.0 Existing Site Details

2.1 History and Current Use

- 2.1.1 The site is located within Manchester City Centre, fronting on to New Quay Street. The site comprises the existing Manchester College building bound by New College Street to the north-east, Gartside Street to the south-east, New Quay Street to the south-west, and the NCP car park to the north-west (see).

Figure 1: Aerial Photograph (© Google 2020)



2.2 Existing Watercourses and Other Waterbodies

- 2.2.1 No above ground watercourses have been identified within the proposed site or immediately adjacent to the site.
- 2.2.2 The nearest watercourse to the site is the River Irwell approximately 105m north-west of the site.
- 2.2.3 The Bridgewater Canal is located approximately 350m south of the site.
- 2.2.4 The nearest 'lost watercourse' is the old canal arm located approximately 135m south-west of the site under the Old Granada Studios building.

2.3 Existing Drainage

2.3.1 The public sewer records have been obtained for the site and are enclosed in *Appendix B*.

2.3.2 An extract from the public sewer records is shown in Figure 2.

Figure 2: United Utilities Public Sewer Record (extract)



2.3.3 The public sewer records indicate that there are no recorded public sewers located within the development site boundary.

2.3.4 The following public sewers are recorded within the vicinity of the site:

- There is a 610 x 900mm combined water sewer flowing south-east along New Quay Street (west of the site).
- There is a 150mm combined sewer in Gartside Street (east of the site) flowing in an easterly direction.

2.3.5 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.

2.3.6 A GPR Survey and CCTV Drainage Survey has been completed to confirm the existing drainage within the site and to confirm the existing outfalls and public sewers surrounding the site.

2.3.7 The GPR and CCTV Surveys confirm that there are a series of 150mm foul sewers (potentially combined) serving the existing building and a 150mm surface water sewer along the north-eastern boundary serving the existing external areas. All existing drainage on site discharges into a 300mm



combined sewer along the north-western boundary of the site which connects into the combined sewer in New Quay Street.

- 2.3.8 The GPR Survey is enclosed in *Appendix C* and the CCTV Drainage Survey is enclosed in *Appendix D*.

2.4 Topography

- 2.4.1 A Topographical Survey has been completed at the site and the survey drawing is enclosed in *Appendix C*.
- 2.4.2 The existing site is relatively flat. The existing building covers a large portion of the existing site with the existing floor level at approximately 28.1m AoD. There is a marginal fall from south-east to north west with existing boundary levels at approximately 28.05m AoD in the south-east, 28.10m AoD in the south-west, 27.8m AoD in the north-east and 27.9m AoD in the north-west.

2.5 Geology

- 2.5.1 The British Geological Survey (BGS) map confirms that no superficial deposits are listed.
- 2.5.2 The bedrock geology is described as Chester Formation – Sandstone, however the boreholes suggest that the primary material identified is fill over clay/silt/sand with sandstone encountered at approximately m below ground.
- 2.5.3 The site is not located within a Groundwater Source Protection Zone.

3.0 Development and Flood Risk

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

- 3.1.1 In July 2021, 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 and updated in August 2021; 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 (River and Sea @), 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 (unless) (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 waterside 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 hospitals.
- Buildings used for dwelling houses (student halls in 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 Zone	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 that involves ramming or rafting 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 D*, and it can be seen that the pre-development site and the surrounding area is located in an area classified as Flood Zone 1 (low probability of flooding from rivers or sea).
- 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).

4.0 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 sea 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.

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

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.

4.3 Tidal Flooding (Coastal or Estuarine)

- 4.3.1 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). Since this is a prediction of a worst-case scenario, it is very low risk that a reservoir flood would be this large.

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



- 4.4.3 The extents of flooding due to reservoir breach in the vicinity of the site is shown in Figure 5. It can be seen that there is the potential for the flood extents to reach the site where there is flooding from rivers at the same time as a reservoir breach.
- 4.4.4 The depths of reservoir flooding extents is unknown, however based on the reservoir breach extents shown and the likely topography in the vicinity, it is not anticipated that the depths of flooding are significant.
- 4.4.5 Since the likelihood of a reservoir breach ever occurring is extremely unlikely, providing that the reservoir asset owners conduct appropriate maintenance and regular inspections, the site is considered to be at low risk of flooding from reservoirs.

4.5 Canal Flooding

- 4.5.1 The nearest canal to the site is the Bridgewater Canal which is located approximately 350m south of the site. However, there is also a 'lost watercourse' which is the old canal arm located approximately 135m south-west of the site under the Old Granada Studios building.

- 4.5.2 The site is not located within a Canal Overtopping or Canal Breach Zone as defined by the SFRA mapping.
- 4.5.3 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.
- 4.5.4 Given the above information, it is considered that there is low risk of canal flooding to the site.

4.6 Groundwater Flooding

- 4.6.1 According to the Manchester, Salford and Trafford SFRA, there are no known reports of groundwater flooding in the Manchester, Trafford and Salford authorities.
- 4.6.2 The site is not shown to be within an area at risk of groundwater flooding according to the groundwater flooding map shown within the Manchester, Salford and Trafford SFRA.
- 4.6.3 The Phase I Desk Study reviews previous site investigation information and confirms no groundwater was encountered during investigation works down to 3.7m below ground level.
- 4.6.4 the site investigation works presented in the Curtins interim Site Investigation letter suggests that no groundwater was encountered during investigation however groundwater was encountered within the sandstone during gas monitoring visits between 1.62m -4.4m below ground level.
- 4.6.5 Based on the current information it is assumed that the proposed basement is at an increased risk of ground water flooding. To that end, as a precaution, mitigation measures are recommended.
- 4.6.6 The groundwater protection measures will generally be applicable to the basement areas only. As the basement will not contain dwellings and is solely used for plant space and some amenity, the level of risk associated with groundwater flooding will therefore affect the users who are accessing this area. We therefore recommend that the structure and basement floor slab is adequately waterproofed to prevent the passage of water through the structure. We also recommend that any vents and services - where proposed, do not allow any conveyance of groundwater into the basement.
- 4.6.7 It is recommended that 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 (and other sources of flooding), the flood water is safely routed away from the buildings on site.
- 4.6.8 Providing the above mitigation measures were imposed, the risk from groundwater flooding would therefore be considered low post development, however it is recommended that ground water levels are monitored.

4.7 Public Sewers or Highway Drainage Flooding (Infrastructure Failure)

- 4.7.1 There are no highway drains recorded within the site.
- 4.7.2 It is likely that there will be localised highway drainage surrounding the site (such as gullies and connections).
- 4.7.3 There are no public sewers recorded within the site. There are public sewers in the surrounding highways to the site.
- 4.7.4 United Utilities and Manchester City Council have not provided any records of flooding to the site or the vicinity.
- 4.7.5 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.

4.8 Surface Water Flooding to the site

- 4.8.1 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.
- 4.8.2 From the UK Government's Flood Risk from Surface Water (extent of flooding) map;
 - Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding, where flooding occurs as a result of rainfall with a greater than 1 in 30 (3.3%) chance in any given year.
 - Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding, where flooding occurs as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
 - 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.
 - 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.
- 4.8.3 The extent of flooding to the site from surface water is indicated in Figure 6 and it can be seen that the majority of the site is identified as being at a 'very low' risk of flooding from surface water. The surrounding highways are generally considered at 'medium' risk of flooding from surface water.

Figure 6: Risk of Flooding from Surface Water - Extent of Flooding



- 4.8.4 It is anticipated that the extent of medium risk areas will be constrained to within the highway below the kerb levels. To further mitigate this risk to the building and entry facades, external ground levels around the perimeter of the site the site should fall away from the proposed building and ensure that the creation of low points is avoided (other than those used intentionally for drainage features) and so any flood water is safely routed away from the building on site.
- 4.8.5 Providing the above measures are implemented the flooding risk to the development site from surface water is therefore considered low post development.

4.9 Surface Water Flooding from the site

- 4.9.1 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.
- 4.9.2 The development has the potential to increase flood risk where additional run-off from proposed roads, paved areas and building roofs are discharged freely into the downstream drainage network. It is



therefore encouraged to propose permeable areas, landscaping areas and incorporate sustainable drainage features utilising infiltration or attenuation where possible.

- 4.9.3 An assessment of the proposed surface flows is carried out within the drainage strategy within section 5 of this report.

4.10 Historical Flooding

- 4.10.1 United Utilities and Manchester City Council have not provided any records of flooding to the site or the vicinity.

5.0 Drainage Strategy

5.1 Existing Drainage

- 5.1.1 The public sewer records indicate that there are no recorded public sewers located within the development site boundary.
- 5.1.2 The following public sewers are recorded within the vicinity of the site:
- There is a 610 x 900mm combined water sewer flowing south-east along New Quay Street (west of the site).
 - There is a 150mm combined sewer in Gartside Street (east of the site) flowing in an easterly direction.
- 5.1.3 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.
- 5.1.4 A GPR Survey and CCTV Drainage Survey has been completed to confirm the existing drainage within the site and to confirm the existing outfalls and public sewers surrounding the site.
- 5.1.5 The GPR and CCTV Surveys confirm that there are a series of 150mm foul sewers (potentially combined) serving the existing building and a 150mm surface water sewer along the north-eastern boundary serving the existing external areas. All existing drainage on site discharges into a 300mm combined sewer along the north-western boundary of the site which connects into the combined sewer in New Quay Street.
- 5.1.6 It is noted that there is an existing offline chamber not currently recorded on the sewer records, but it is within the public highway and therefore a public asset.
- 5.1.7 The GPR Survey is enclosed in *Appendix C* and the CCTV Drainage Survey is enclosed in *Appendix D*.
- 5.1.8 It is proposed that all existing drainage on site will be abandoned due to the construction of a new basement. New outfalls are therefore required.

5.2 Proposed Foul Water Drainage

- 5.2.1 A separate foul and surface water system is proposed.
- 5.2.2 The proposed foul drainage from ground floor level and above will be collected and discharged via suspended pipework and discharged to the surrounding public sewer network by gravity. Currently there is one outfall for foul which is located along the south-western elevation into New Quay Street. The invert level of the connection at the building facade is to be confirmed and requires further coordination with the structure, however it is anticipated to be above an invert level of 25m AoD. A gravity connection

is therefore possible into the offline chamber noted in section 5.1.6, as the current invert level of this manhole is 23.53m AoD (ref: MH 18 on CCTV Survey).

5.2.3 Foul drainage required within the basement area will be required to be drained locally within the basement to pumps which will be connected internally to the gravity foul drainage system noted in section 5.2.2.

5.2.4 The internal pumped discharge based on the discharge unit method is approximated at 2.7 l/s for pump 1 and 1.3 l/s for pump 2, however final flows are to be confirmed with the M&E Engineer.

5.2.5 It will be necessary to provide 24-hour storage for the potential pump outage, pump storage is based on the demand requirements and therefore subject to confirmation of occupancy/usage by the architect.

5.2.6 Based on the British water COP chapter 3, water usage rates, pumped volumes will be based on confirmed occupancy numbers using the basement facilities. However, at this stage the following assumptions have been made:

- shower, toilet and change facility based on cyclist use - 35no. showers per day. cycle storage has a capacity for approx. 23;
- assuming full use and all shower (am only) water use 40l/ use.

volume = 920 litres (0.92m3)

- Toilets: assuming use as per showers (23) water use 10l/ use.

- **volume = 230 litres (0.23m3)**

- Gullies – assume out of use if pump outage.

Total volume = 1150 litres (1.15m3).

5.2.7 The total foul peak flow from the development will be subject to final flows confirmed by the M&E engineer.

5.2.8 United Utilities have confirmed in their pre-development enquiry response that foul water flows from the development can be accommodated within the public combined sewer within New Quay Street at an unrestricted rate. Refer to the United Utilities correspondence enclosed in *Appendix F*.

5.2.9 It is assumed that the site will remain under a single ownership, therefore sewers cannot be offered for adoption by United Utilities. Connection(s) to the public sewer network will be subject to a Section 106 Agreement with United Utilities

5.2.10 The proposed basement and ground floor drainage strategy layouts are enclosed in *Appendix G*.

5.3 Proposed Surface Water Drainage

- 5.3.1 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.
- 5.3.2 In May 2022, the Environment Agency released updated climate change allowances by Management Catchment for peak rainfall intensities which should be applied to new Developments. Figure 7 demonstrates the climate change allowances with central and upper end allowances being considered.
- 5.3.3 Based on the nature of the Development, a lifespan of 100 years is anticipated (as defined by the current requirement for residential Development). Therefore, the potential climate change allowance in the Irwell Management Catchment for the 2070s Epoch; 2061-2115 is 45% for the upper end allowance. Proposed design calculations will therefore need to consider +45% climate change allowances.

Figure 7: Irwell Management Catchment peak rainfall allowances



- 5.3.4 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.

Infiltration

- 5.3.5 Based on the sites previous use, it is likely that the development will contain depths of made ground. The superficial deposits is unlisted and the underlying strata is described as comprising Chester Formation, i.e. Sandstone. Boreholes suggest that the primary material identified is fill over clay/silt and sand over sandstone.

- 5.3.6 The existing site is occupied by building across the extents of the development boundary, and proposals are to construct a new building to the extents of the boundary, therefore infiltration would be unviable on the basis that there are no areas within the site to accommodate infiltration with foundations outside of the infiltration zone. Therefore, an infiltration-based discharge is considered unviable.

Watercourse

- 5.3.7 The nearest watercourse to the site is the River Irwell approximately 105m north-west of the site. To drain to this watercourse would not be feasible due to the distance from the site and the requirement to cross third party land.

Surface Water Sewer

- 5.3.8 There are no surface water sewers in the vicinity of the site, therefore discharge to a surface water sewer is unviable.

Combined Water sewer

- 5.3.9 There are various combined sewers in the vicinity of the site and the proposal to discharge to the combined sewer network to the west of the site in New Quay Street subject to agreement with United Utilities.
- 5.3.10 Table 5 summarises the options for surface water disposal.

Table 5: Surface Water Disposal

Surface Water Disposal	Potential	Description
Infiltration	X	It is assumed that the site will not be suitable for infiltration SuDS.
Watercourse	X	The River Irwell is located 105m north-west of the site. A new connection to the watercourse is not considered a viable option as it would have to pass through third-party land.
Surface Water Public Sewer	X	There are no surface water public sewers in the vicinity of the site.
Combined Public Sewer	✓	There are various combined water sewers in the vicinity of the site therefore outfalls are proposed to be connected to the surrounding combined public sewer system.

- 5.3.11 The existing site is currently 100% impermeable, draining to the existing combined public sewer system and therefore considered brownfield. To determine the existing site discharge rates from the site and confirm the existing outfalls to the public sewer system, a Drainage CCTV Survey was undertaken.
- 5.3.12 The survey confirms that there a series of foul and surface water sewers on site which combine to a 300mm pipe along the north-western boundary which outfalls to the public sewer in New Quay Street. Rainwater pipes were not easily identified from general stacks above ground and so the detailed arrangement above ground is unclear in terms of the catchments draining to each downpipe and the outfall this discharged to. Therefore, to approximate the likely existing discharge from the site, we have modelled the 300mm outfall pipes accepting 100% flows from the plot catchment of 0.16 Ha and modelled within Micro-Drainage.
- 5.3.13 The existing flow rates are estimated as:
- 1 Year = 18.9 l/s
 - 30 Year = 46.1 l/s
 - 100 Year = 59.8 l/s
- 5.3.14 We therefore proposed reduce flow by 50% to achieve a maximum of the following flows:
- 1 Year = 9.45 l/s
 - 30 Year = 23.05 l/s
 - 100 Year = 29.9 l/s
- 5.3.15 Manchester Lead Local Flood Authority (LLFA) have been consulted regarding discharge rates (see *Appendix F*). They have confirmed that discharge rates from the existing site should be reduced as a minimum of 50% of existing discharge rates and subject to agreement with United Utilities.
- 5.3.16 United Utilities have been consulted and they have confirmed that the maximum permitted flow from the site is **7 l/s** and that a variable flow is not considered appropriate. United Utilities have also confirmed in their pre-development enquiry response that flows from the development can be accommodated within the public combined sewer within New Quay Street. Refer to the United Utilities correspondence enclosed in *Appendix F*.

- 5.3.17 The surface water is proposed to drain discharge into the public sewer system within New Quay Street at a maximum of **7l/s**.
- 5.3.18 Due to the requirement for flow restriction and attenuation, the proposed surface water drainage is to be collected down to basement level, with an attenuation tank located above the slab at basement level within the designated surface water attenuation tank room. The outfall will therefore require pumping with a rising main, routed to the internal gravity surface water network.
- 5.3.19 Curtins are appointed to complete the below ground Foul and Surface Water Drainage Design for the project. However, all surface water drainage including the attenuation and outlet is positioned above the basement slab level and therefore is detailed as part of the above ground drainage design.
- 5.3.20 Hoare Lea are designing the above ground drainage system, however the criteria that needs to be satisfied is the 100 year +45% climate change event.
- 5.3.21 Curtins are providing a design check on the flows into the attenuation tank and the outflow restriction to satisfy the flow restriction of a maximum 7 l/s as required by United Utilities, which also achieves in excess of the 50% reduction required by Manchester City Council.
- 5.3.22 Estimated volumes required are 110m³, which is to be provided by an above ground tank. We have also recommended that an allowance of 300m freeboard is provided above 110m³ to allow for fluctuations in the flows and for flexibility as the design progresses. The exact configuration of the tank is not yet finalised.
- 5.3.23 The current storage calculations are enclosed in *Appendix H*.
- 5.3.24 Volumes should be reassessed as the design progresses, but the freeboard allowance provide some flexibility to the design.

SUDS

- 5.3.25 In accordance with the National Planning Policy Framework (NPPF) a sustainable drainage system (SuDS) should be provided unless demonstrated to be inappropriate. The following options have been considered for the site:

Infiltration Systems:

- 5.3.26 Systems such as infiltration trenches and soakaways were considered as part of the surface water management strategy however, due to space constraints on site infiltration systems are not considered suitable for the site.

Green/Blue roofs:

- 5.3.27 Green/Blue roofs were considered for the site however, they are not considered viable due to plant requirements at roof level.

SuDS Conclusion

5.3.34 The development is proposing potential options to include:

- Drained Landscaping at roof terrace and balconies
- Rainwater reuse for landscape irrigation (potential)

5.3.35 Surface water run-off from hard paved areas at risk of contamination should receive water quality treatment. Access roads are considered as a low hazard in terms of contamination. Figure 9 illustrates the pollution hazard indices for different land use classifications from The CIRIA SuDS Manual C753 (2015).

Figure 9: Pollution Hazard indices for land use classification (Table 26.2 the CIRIA SuDS manual 2015)

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.3 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg. drive ways, homecomers and general access roads) and non-residential car parking with infrequent change (eg. schools, offices) < 100 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery drive, non-residential car parking with frequent change (eg. hospitals, retail), all roads except low traffic roads and trunk roads (road class 3/4)	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg. housing yards, ferry parks, highly frequented ferry approaches to industrial estates, waste sites, sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured, industrial sites, trunk roads and motorways)	High	0.9	0.8	0.9

5.3.36 Figure 10 illustrates the SuDS Component mitigation indices from The CIRIA SuDS Manual C753 (2015).

Figure 10: Indicative SuDS mitigation indices (Table 26.3 the CIRIA SuDS manual 2015)

Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Grass	0.5	0.5	0.5
Bioretention system	0.5	0.5	0.5
Permeable pavement	0.7	0.6	0.7
Retention pond	0.5	0.5	0.5
Farm	0.7	0.7	0.5
Wetland	0.5	0.5	0.5
Proprietary treatment system ²	These could vary depending on the type of treatment system used. Each of the sub-component indices is calculated based on the (maximum) average discharge rate (m³/s) in a 1 year return period event. For further calculations relevant to the contributing drainage area.		

Notes:

1. SuDS components only deliver their index if they have been designed with regard to hydrocarbon and treatment set out in the relevant CIRIA SuDS manual chapters.
2. For the purpose of this index, the index is based on the design of the system in accordance with the design and maintenance plan.
3. Some and retention ponds are a simple sediment trap, but they also provide a range of other benefits such as reducing the risk of flooding, providing a habitat for wildlife, and providing a place for people to enjoy. Some ponds are designed to provide a range of other benefits, such as providing a place for people to enjoy, providing a habitat for wildlife, and providing a place for people to enjoy.
4. Some ponds are designed to provide a range of other benefits, such as providing a place for people to enjoy, providing a habitat for wildlife, and providing a place for people to enjoy.
5. See CIRIA SuDS manual for more information on the design and maintenance of SuDS systems.
6. Some ponds are designed to provide a range of other benefits, such as providing a place for people to enjoy, providing a habitat for wildlife, and providing a place for people to enjoy.

- 5.3.37 The selection of treatment should ensure that the SuDS mitigation component index (Figure 10) exceeds the pollution hazard index (Figure 9).
- 5.3.38 At this stage, opportunities for SuDS have been broadly assessed, however it is anticipated that risk of pollution from the Development will be low on the basis that the building covers the majority of space, which can be accessed via the surrounding public highways.
- 5.3.39 The proposals for pollution protection should be agreed with The Environment Agency and Salford City Council.
- 5.3.40 It is assumed that the site will remain under a single ownership, therefore sewers cannot be offered for adoption by United Utilities. Connection(s) to the public sewer network will be subject to a Section 106 Agreement with United Utilities.
- 5.3.41 The proposed basement and ground floor drainage strategy layouts are enclosed in *Appendix G*.

5.3.42 The final design of the drainage networks shall be in accordance with the legislation set by the Environment Agency, Manchester City Council and United Utilities.

5.4 Maintenance

5.4.1 A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

5.4.2 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. 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.

5.4.3 A management company may be required for maintenance of attenuation facilities.

5.4.4 For any sustainable drainage systems employed in the development, an appropriate management and maintenance plan for the sustainable drainage system for the lifetime of the development should be submitted which should include:

- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
- Means of access for maintenance and easements where applicable.



Appendix A

Proposed Landscaping General Arrangement

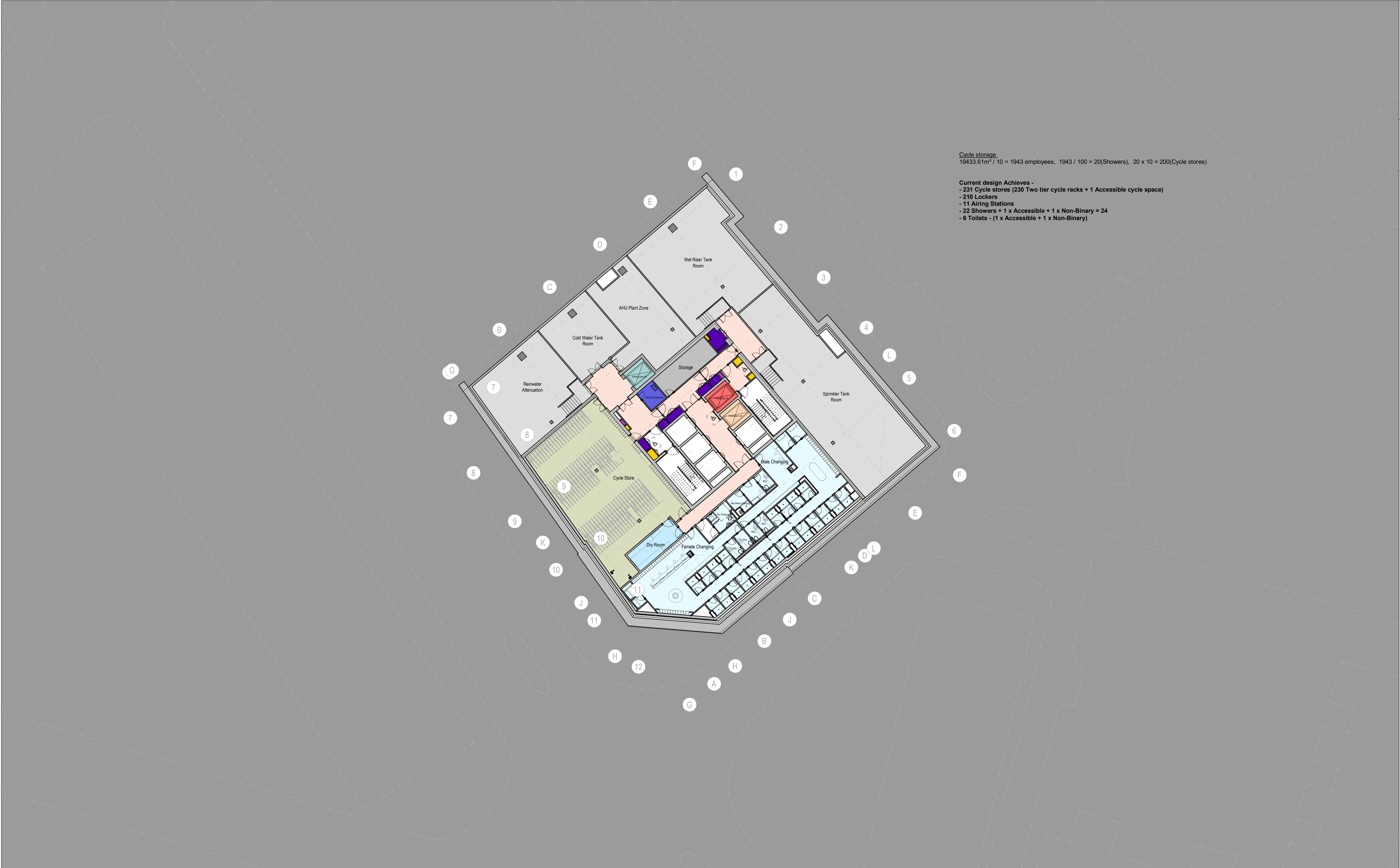
Proposed Basement Floor (GA) Layout

Proposed Ground Floor (GA) Layout

Roof Terrace Landscaping General Arrangement

Balcony Landscaping General Arrangement

Roof Terracing Details (Sections)



Cycle storage.
19433.61m² / 10 = 1943 employees, 1943 / 100 = 20(Showers), 20 x 10 = 200(Cycle stores)

Current design Achieves -
- 231 Cycle stores (230 Two tier cycle racks + 1 Accessible cycle space)
- 210 Lockers
- 11 Airing Stations
- 22 Showers + 1 x Accessible + 1 x Non-Binary = 24
- 6 Toilets - (1 x Accessible + 1 x Non-Binary)

Keyplan

North

Scale bar

SCALE 1: 200

NOTE:

These areas relate to the likely areas of the building at the current stage of design. The areas have been calculated as GEA, GIA & NIA based on the RICS Code of Measuring Practice, 6th Edition. Any decisions to be made on the basis of these predictions, whether as to the project viability, pre-letting, lease agreements or otherwise, should include due allowance for the increases and decreases inherent in the design development and construction. All areas are subject to planning, design development, ROL and daylight/sunlight assessment.

P05

Stage 3 Issue

04.04.23

HW

JAJ

P04

Draft Stage 3 Issue

10.03.23

RW

JAJ

P03

Frozen Design

27.02.23

HW

JAJ

P02

Stage 2 Submission

14.06.22

HW

JAJ

P01

Preliminary Issue

11.03.22

JAJ

DS

No.

Revision

Date

Initial

Chk'd

EPR ARCHITECTS

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www.epr.co.uk

St John's Campus

New Quay St, Manchester M3 3BE

Proposed Basement Floor

Scale @A1

Status

Suitability

Revision

1 : 200

For Approval

S4

- P05

Project Code

Originator

Zone

Level

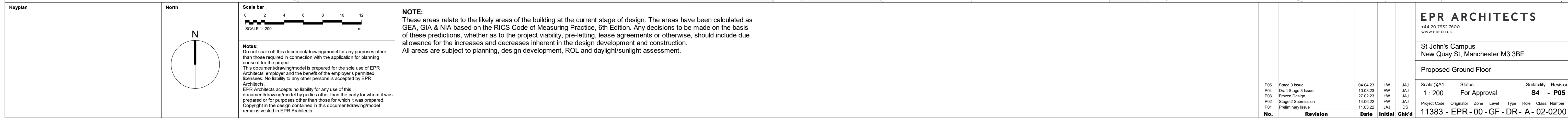
Type

Rate

Class

Number

11383 - EPR - 00 - B1 - DR - A - 02-0199



3 m high acoustic barrier/screen

outdoor lounge with water feature

mound for tree planting

building canopy

gravelled maintenance area

event area

raised metal planter

integrated bar

gravelled maintenance area

raised metal planter

mound for tree planting

outdoor working area

600 mm high raised planter

3 m high acoustic barrier/screen

KEY

LEVELS & CONSTRAINTS

+000mm

SPOT LEVEL - Proposed (above FFL)



100 mm Contours

HARDWORKS



Terrace Decking

- Composite decking boards installed on pedestal system
- Size: W176 x D3600 x H32mm Spacings: 6 mm
- Product: 'Smoked Oak' Enhanced Grain Millboard Composite Decking. Or equal approved.



Gravel Paving

- Material: Granite aggregate
- Colour: Silver grey
- Size: 14 mm Depth: 80 mm



Drainage Channel

- Material: Steel
- Size: D: tbc (shallow)
- Product: Tbc



Raised Metal Planter

- Product: Logic STAPEL Raised Planter Edging with integrated lighting (VELOX Rapid Edge™ system by Logic Manufactured Bespoke™)
- Product Code: P212
- Material: Powder-coated Steel
- Colour and finish: Tbc



Steel Edge

- Material: Mild Steel
- Size: W: 6 Mm X D: Vaires X L: Varies
- Finish: Untreated

SOFTWORKS



Proposed Multi-stem Tree

- Size: +300
- With automatic irrigation



Mixed Planting

- Drought- and wind-tolerant shrubs, perennials and ornamental grasses planting - With automatic irrigation
- Size: 3L pots @ 7m2
- 70 mm gravel mulch of 14 mm granite aggregates
- High-quality intensive greenroof topsoil - Depth: 600-850 mm
- Supplier: Street Design Ltd. or equal & approved.

FURNITURE



Integrated Seating

- Product: Logic SQUARED inset planter seating with backrest and armrests
- Product Code: S136
- Material: Class 2 UK Grown Sustainable Timber (or Accoya wood)
- Colour: Tbc
- Please refer to details drawings



Integrated Bar

- Material: Class 2 UK Grown Sustainable Timber (or Accoya wood)
- Mounted on the balustrade - Please refer to details drawings



Solid acoustic barrier

- Product: Equitone Linea panels - linear texture
- Material: Fibre cement
- Size: Tbc
- Installed on galvanised posts with invisible fixings



Loose furniture

- Please refer to interior design plans and specifications



Pots with Feature Shrubs

- Product: Urbis Crucible planter
- Planter size: W: 810 x H: 920 Mm (one size, 75kg)
- Shrub size: +250
- Colour: Tbc (grey or sandstone)



Water Feature

- Size: W: 1000 H: 450 Mm
- Material: Steel
- Colour: Tbc (grey or sandstone)

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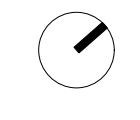
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5. The dimensions of all materials must be checked on site before being laid out.
6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.

P-04	24/03/23	Levels update, drainage, edges	VS	RM
P-03	16/03/23	New layout	VS	RM
P-02	14/03/23	Layout amendments - maintenance	VS	RM
P-01	10/03/23	First issue	VS	RM
Revision	Date	Description	Drawn	Apprvd.



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Client Henry Boot Developments

Project St. Johns Campus
Manchester

Drg Title Level 16 - Roof Terrace Landscape GA
A1 Landscape

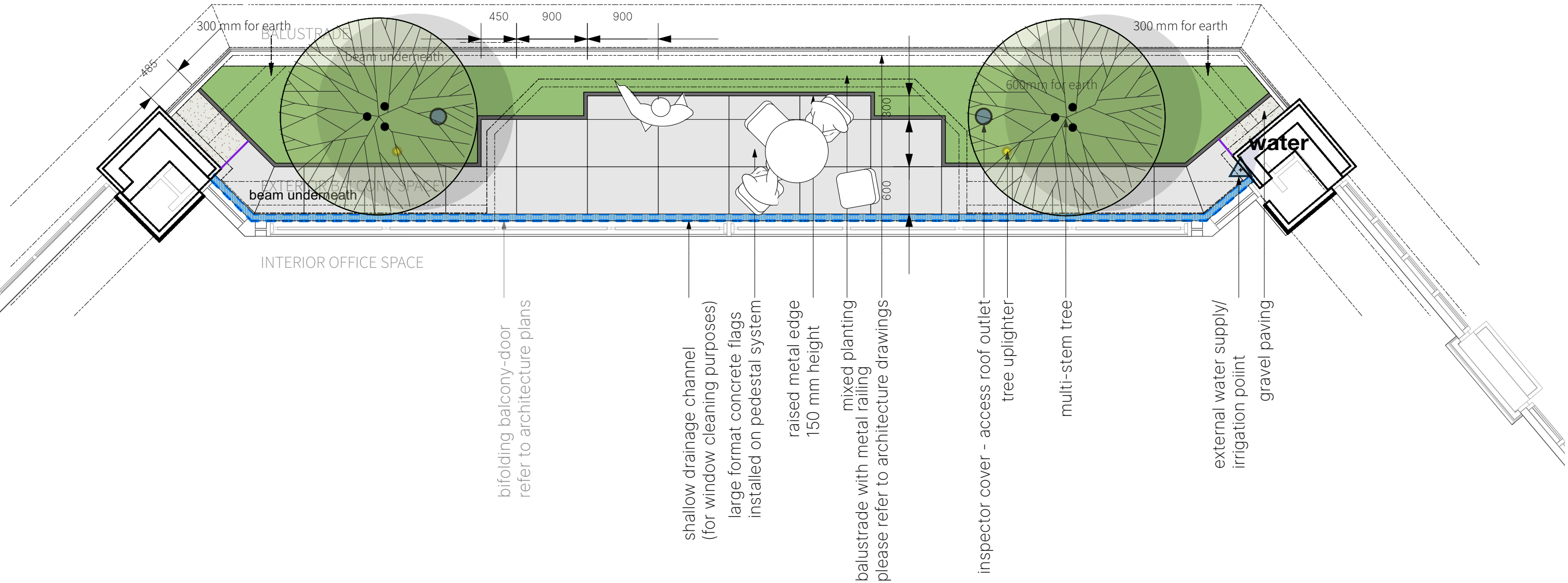
Created on 24/03/2023 Created by VS Approved by RM

Scale 1:75 Size A1 Workstage Stage 03 Status Stage Approval

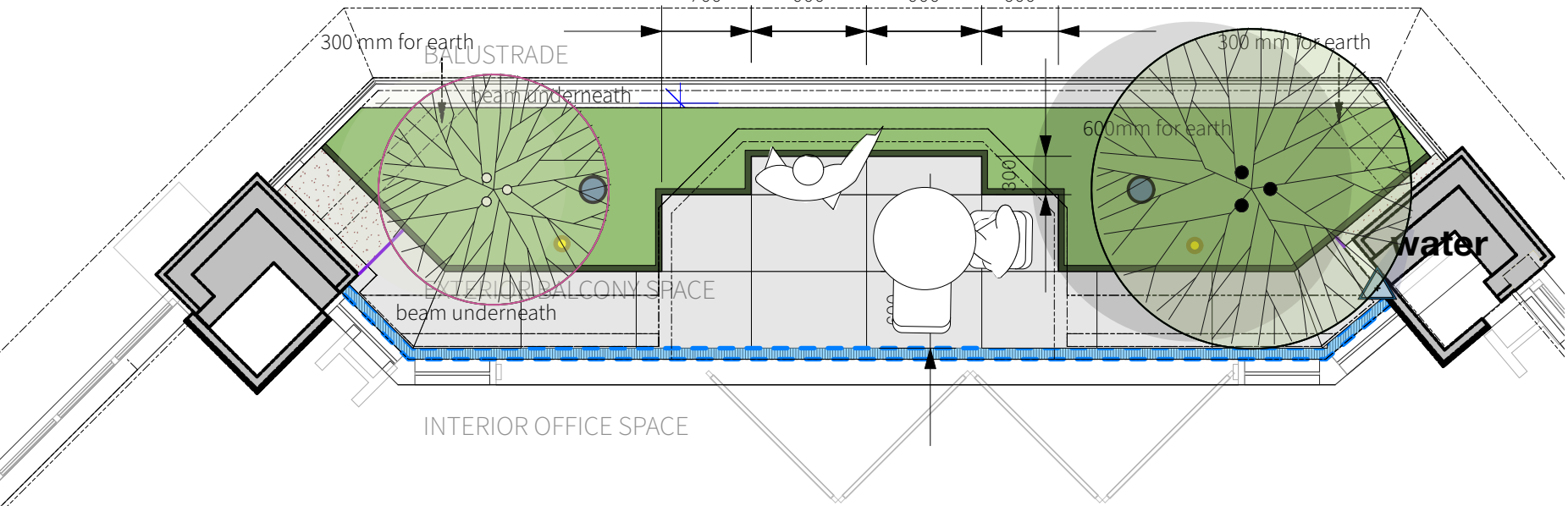
Drg No. 2875-PLA-00-16-DR-L-0001 Suitability Revision S4 P-04

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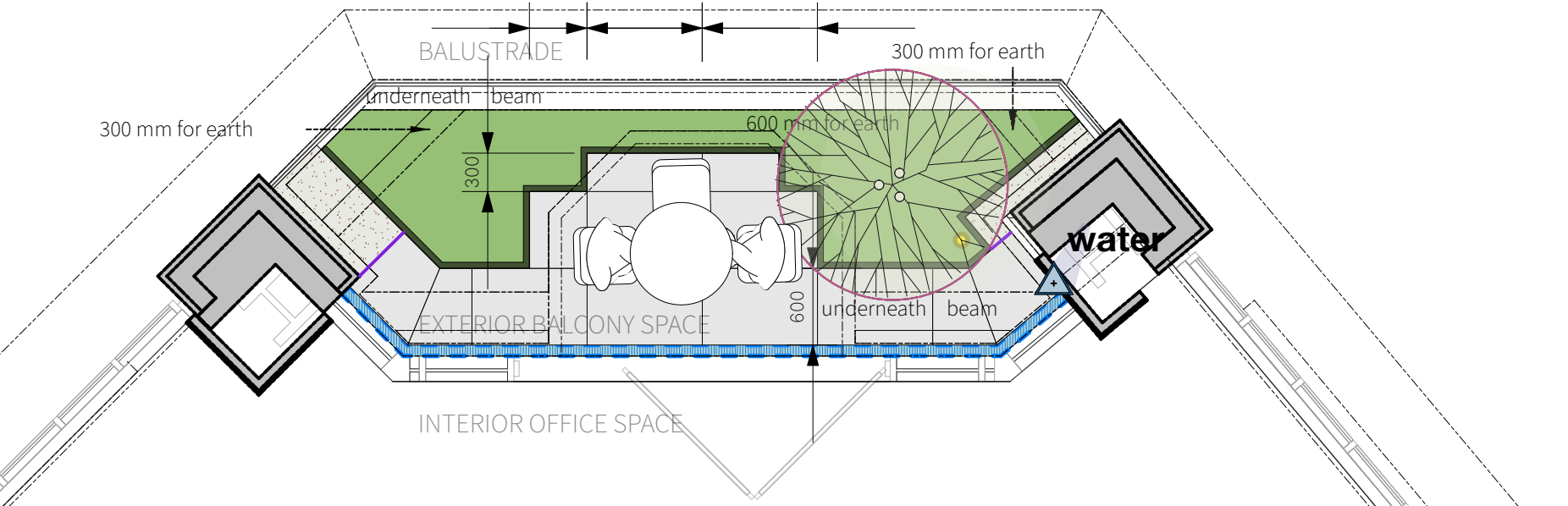
2nd FLOOR



6th FLOOR



9th FLOOR



KEY

HARDWORKS



Concrete Flags Paving

- Installed on pedestal system
- Product: Shelbourne Flag
- Material: Concrete
- Colour: Silver Granite / Profile: Square Edge
- Size: W: 900 X L: 600 X D: 63 Mm
- Bond: Stack - Supplier: Hardscapes
- Pedestal system: RYNO RPA self-levelling adjustable paving pedestal supports



Gravel Paving

- Material: Granite aggregate
- Colour: Silver grey
- Size: 14 mm Thickness: 80 mm



Metal Raised Planting Edge

- Material: Steel/Aluminium (tbc)
- Finish: Powder-coated (RAL) - Colour: Tbc
- Size: W: 6 Mm D-L: Varies



Steel Edge

- Material: Mild Steel
- Size: W: 6 Mm X D: Varies X L: Varies
- Finish: Untreated

DRAINAGE



Drainage Channel

- Material: Steel
- Size: W: 85 Mm D: Tbc (Shallow) L: Varies



Inspection Cover and Access to Roof Outlet

- Product: Tbc



Exterior Water Supply Point

- Product: Tbc

SOFTWORKS



MULTI-STEM TREE - Proposed

- Refer to planting schedule.
- 2m high, 3 or 5 stems
- With automatic irrigation



MIXED ORNAMENTAL PLANTING

- Drought- and wind-tolerant shrubs, perennials and ornamental grasses planting - With automatic irrigation
- Size: 3L pots @ 7m2
- 70 mm gravel mulch of 14 mm granite aggregates
- High-quality intensive greenroof topsoil - Depth: 300-700 mm
- Supplier: Street Design Ltd. or equal & approved.
- With automatic irrigation

FURNITURE & LIGHTING



FREE STANDING TABLES & CHAIRS

Please refer to Interior Design report



UPLIGHTER TO TREES

- Product: Type: HUBBLE COB LED Spotlight
- Code: AD11-11W8M3QUZ5
- Accessories: Spike attachment
- Spike Code: 50 x NA x 235

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5. The dimensions of all materials must be checked on site before being laid out.
6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.

8. Lighting design intent only. Lighting to be specified in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011.
9. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.
10. Safety or security lighting to comply with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes

P-02 24/03/23 Layout amendments - structural beams VS RM

P-01 17/02/23 First issue VS RM

Revision	Date	Description	Drawn	Appr'd.
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Client Henry Boot Development Ltd

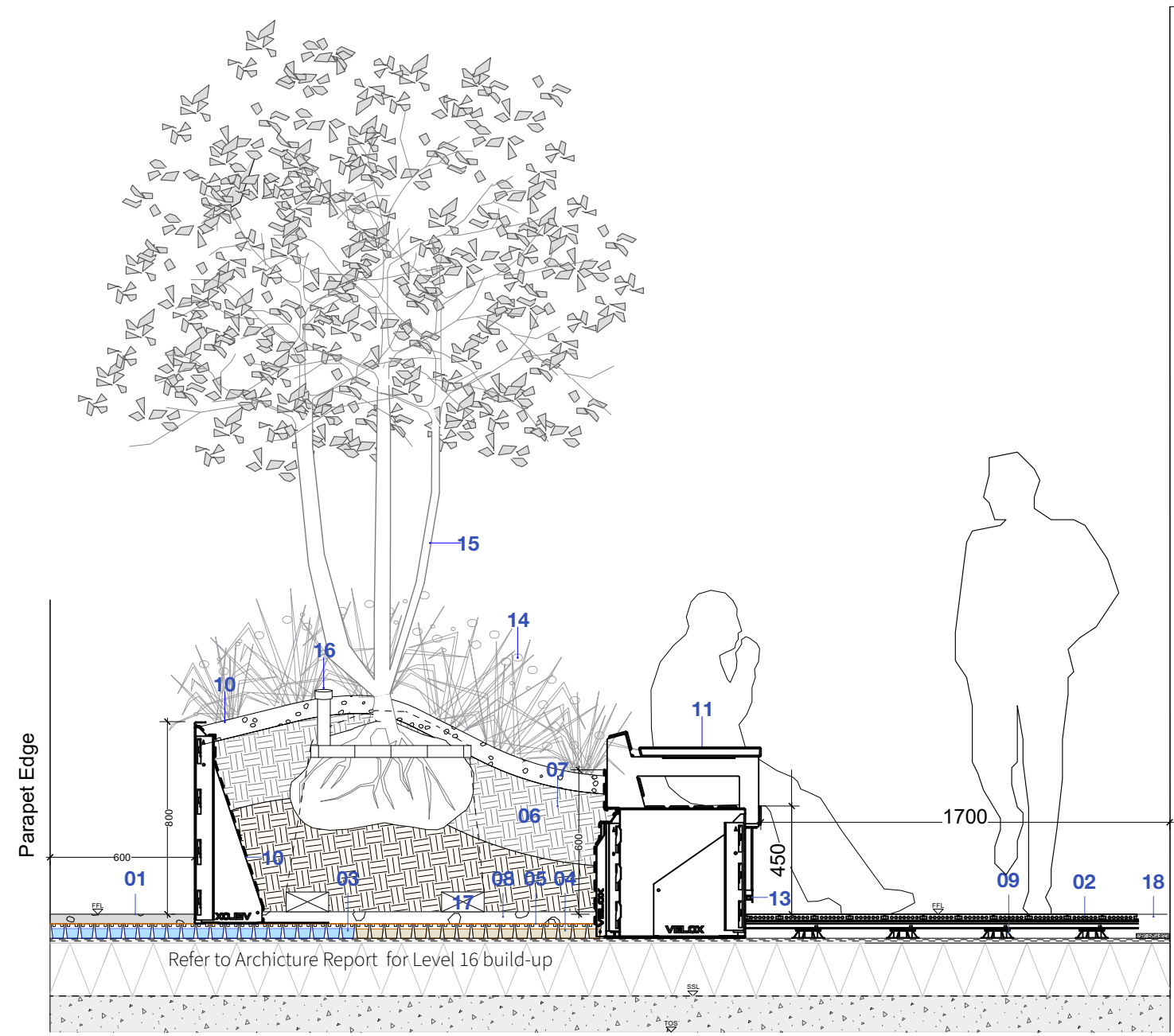
Project St. Johns Campus
Manchester

Drg Title Balconies GA
A2 Landscape

Created on 24/03/2023 **Created by** VS **Approved by** RM

Scale 1:75 **Size** A2 **Workstage** Stage 03 **Status** Stage Approval

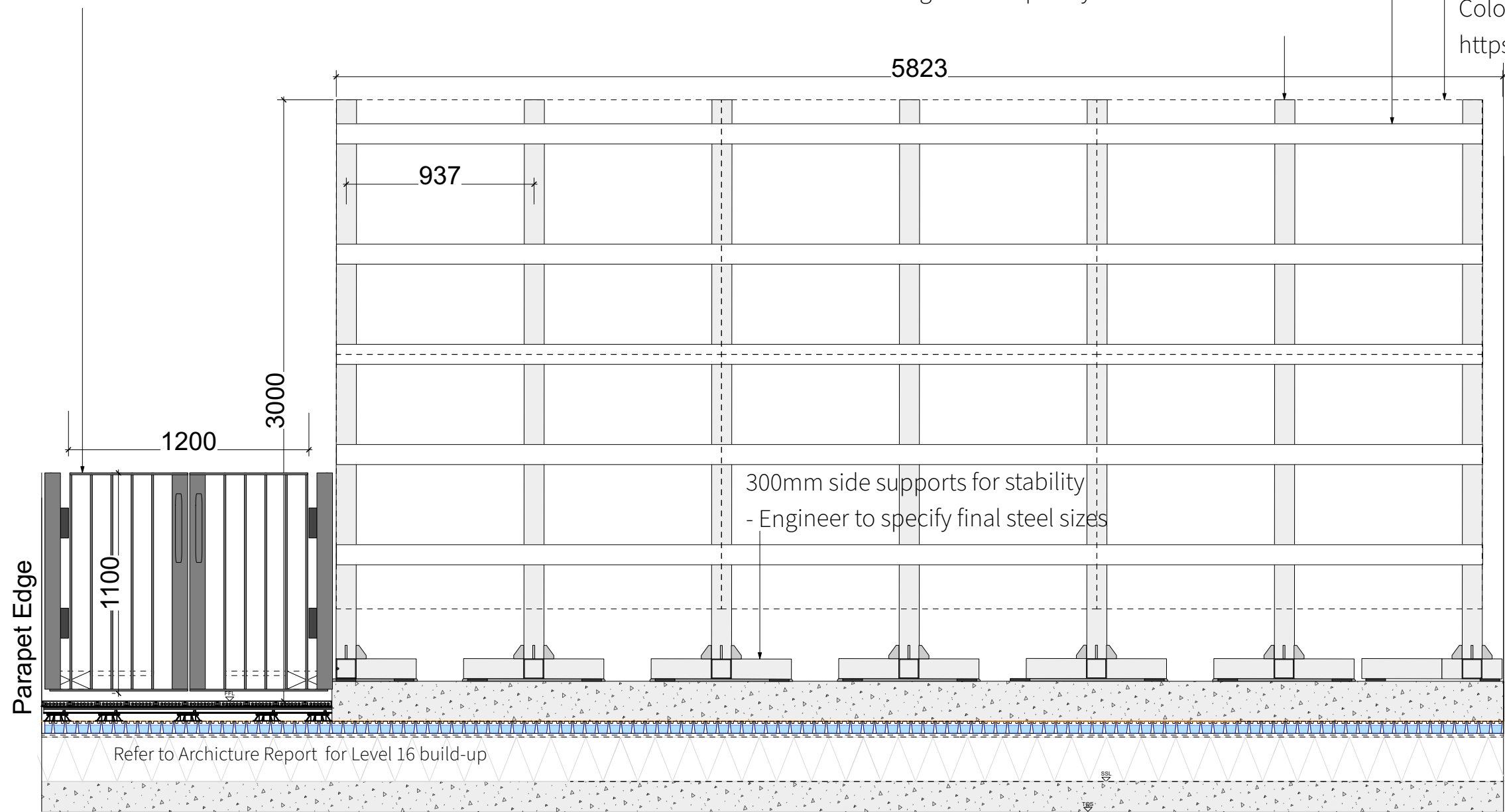
Drg No. 2875-PLA-00-ZZ-DR-L-0001 **Suitability Revision** S4 P-02



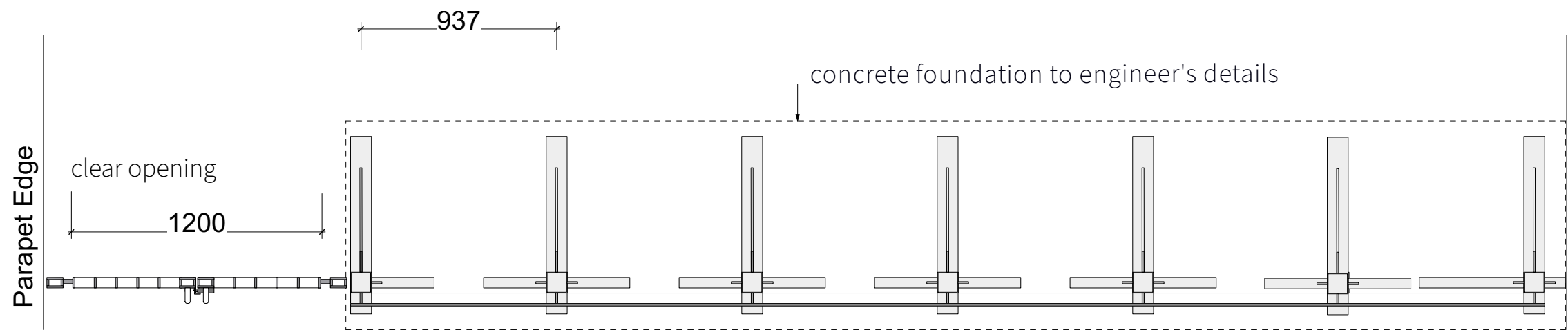
5002 01 (above) Section: Paving & Planter Edge Detail
Scale: 1:25

Flatbar steel Gate. Height TBC x 1.25m clear opening. 50mm x 10mm steel uprights, welded to 50mm x 10mm flat bar steel frame.
Finish: Hot dip galvanised. RAL colour TBA (30% gloss level).
To include a solid panel, 3mm welded to frame. All edges smooth, grounded to appear solid.

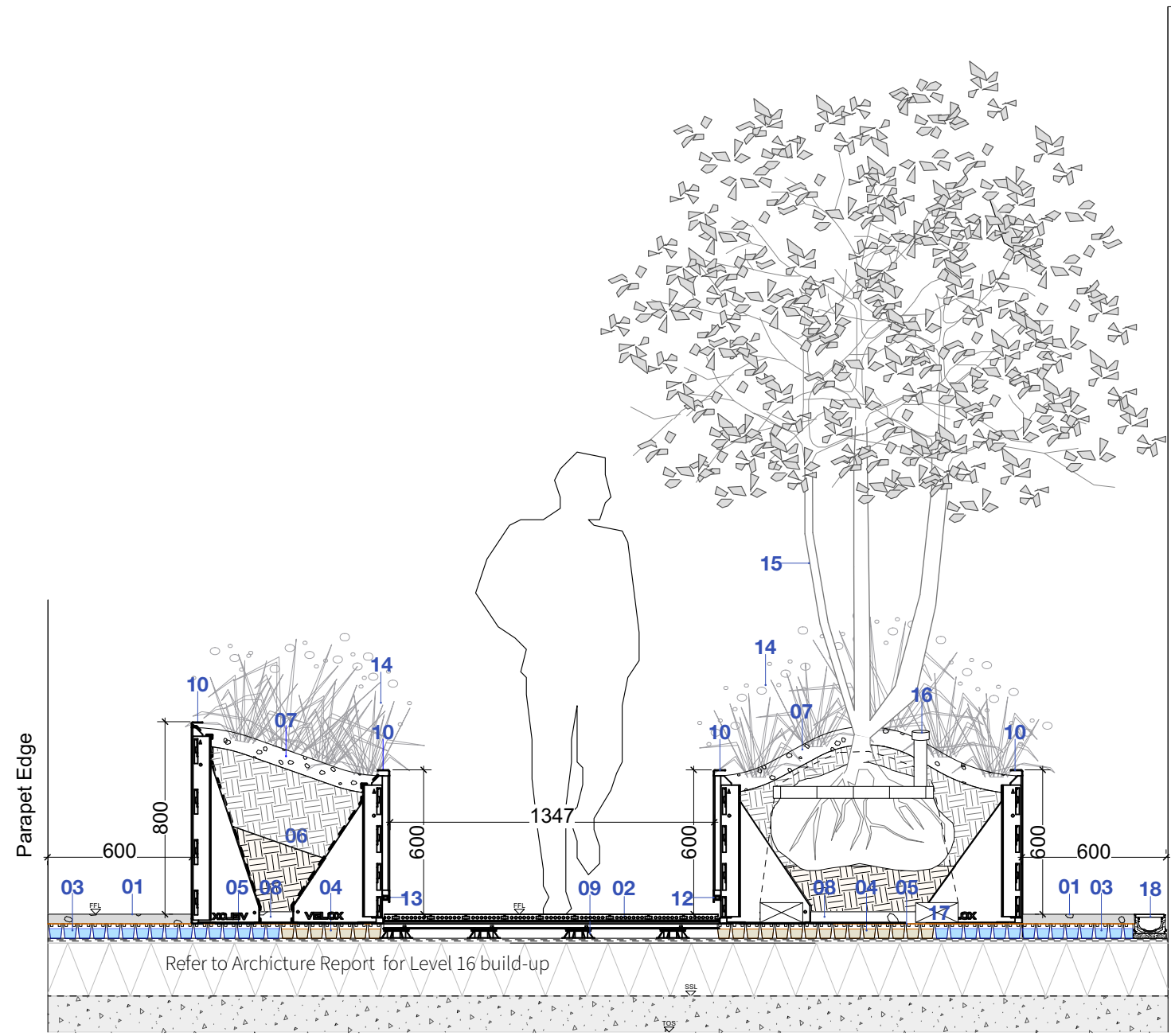
Stainless steel hinges fixed to parapet wall and Acoustic fence post.
Locking system TBA (with manual emergency push bar)
Potential Fabricator Lang+Fulton Tel: 0131 441 1255



5002 03 (above) Elevation: Fence & Gate
Scale: 1:25



5002 04 (above) Plan: Fence & Gate
Scale: 1:25

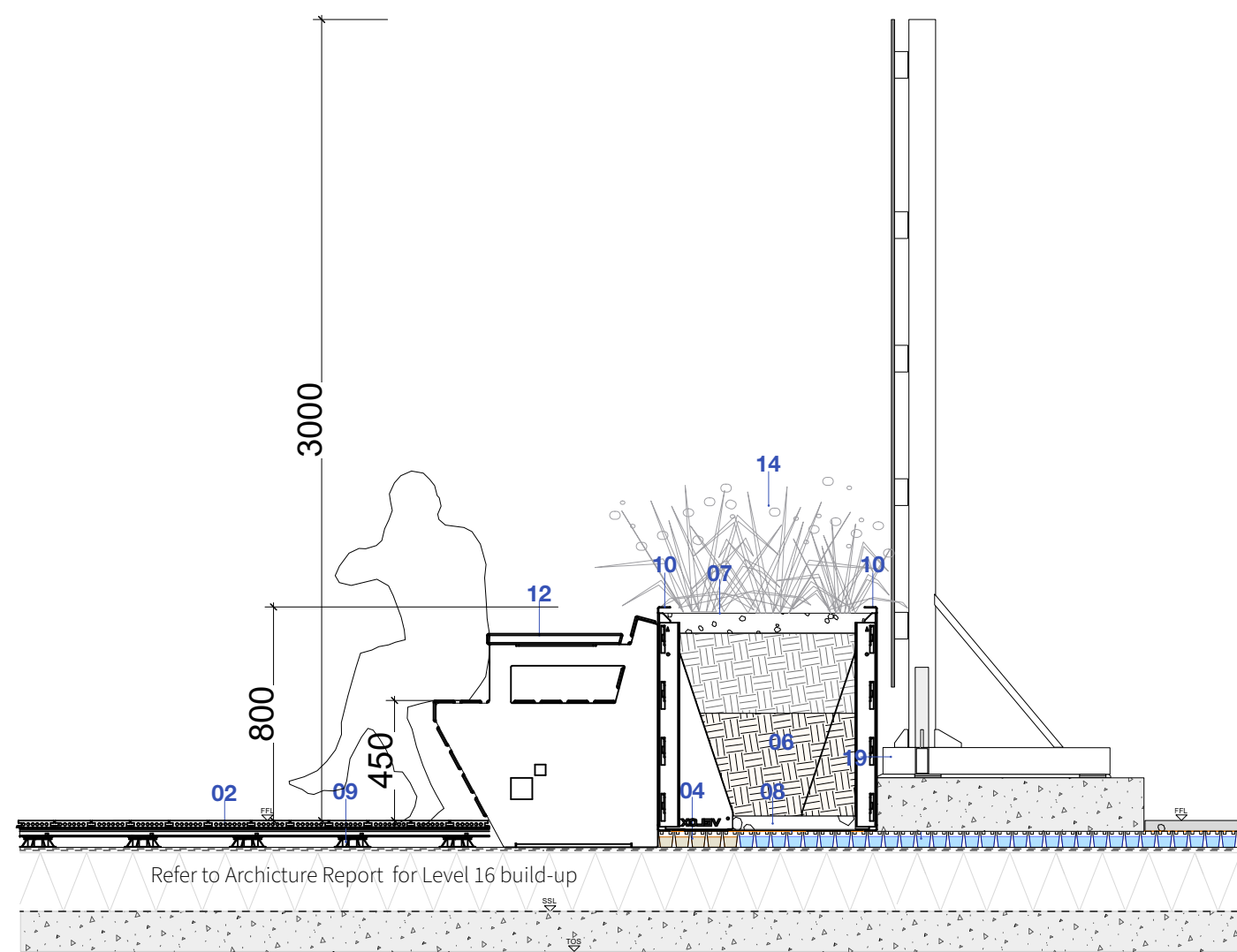


5002 02 (above) Section: Paving & Planter Edge Detail
Scale: 1:25

Fence Posts:
Galvanised Steel box section frame used to form a support for the fence cladding screen.
- 3000mm high
- To include 300mm side supports for stability where shown
- Strengthening flange to internal angle
- 100 x 100mm box section.
- Engineer to specify final steel sizes

Fence Rail:
Galvanised Steel box section frame used to form a support for the fence cladding screen.
- 50 x 100mm box section.
- Engineer to specify final steel sizes

Fence cladding:
Fibre cement panels to be:
Equitone Linea textured panels:
Colour Ref: LT 20 - Fixed Vertically
<https://www.equitone.com/en-gb/materials/linea/>



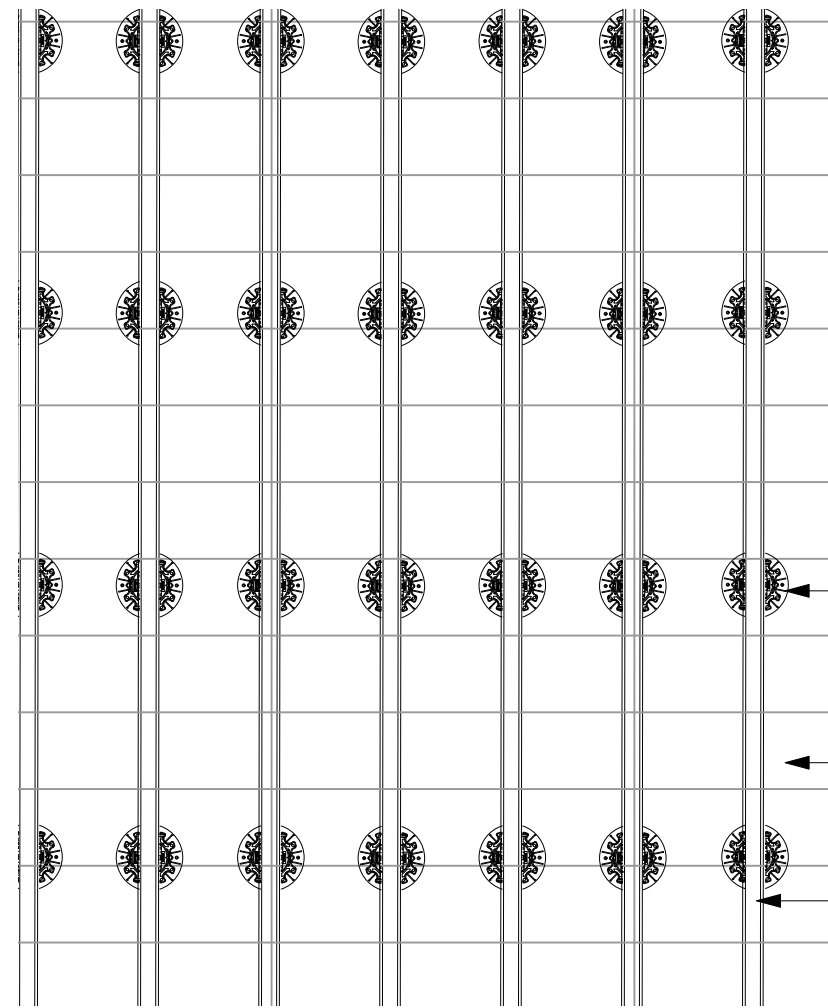
5002 05 (above) Section: Planter & Fence Post
Scale: 1:25



Equitone Linea textured panels



Fibre cement panels to be:
Equitone Linea textured panels:
Colour Ref: LT 20 - Fixed Vertically
<https://www.equitone.com/en-gb/materials/linea/>



Adjustable pedestals to manufacturer's recommendations.
Number, product and spacings to manufacturer's recommendations.
Terraflora Excel Plain deck, D21 x W146 mm x L3m.
Aluminium Joisting to decking manufacturer's recommendations with clips and accessories as necessary.

LEGEND 5002/1

- Loose gravel - Size: 14mm granite aggregate angular gravel,
- Composite Timber Decking, laid on decking pedestals.
Product: Smoked Oak' Enhanced Grain Millboard Composite, W176 x D3600 x H32mm Spacings: 6 mm
Aluminium Joisting to decking manufacturer's recommendations with clips and accessories as necessary.
- Bauder DSE60 Drainage Board or similar
- Bauder DSE60 Drainage Board with Bauder Mineral Drain or MOT type 1- Refer to Bauder for further details
- Bauder Filter Fleece or similar.
- High-quality intensive greenroof topsoil.
Depth 600-850 mm
Supplier; Street Design Ltd. or equal & approved.
- Gravel mulch_Min 75mm of 14mm granite aggregate mulch to all planting beds.
To sit 30mm below Planter edge.
- Pea shingle layer_50mm Pea shingle layer to improve drainage. No fines.
- Ryno RD-FR Non-Combustible Joist Support Pedestal
- Powder-coated steel planter wall - 'Stapel' VELOX Rapid Edge™ system by Logic Manufactured Bespoke™. Product code: P212
Colour and finish tbc.
- Planter edge integrated seating - S136 - SquareD Integrated Seat
with backrest & Arms by Logic Manufactured Bespoke™. Or equal approved.
- Bespoke widened lounge seating - Squares Seat with backrest & Arms by Logic Manufactured Bespoke™. Non-integrated seating.
Or equal approved.
- Inset Light detail. To Logic Manufactured Bespoke™ recommendation/specification.
- Mixed Planting
- Multi-stem tree
- Single inlet irrigation/aeration system.
- Traditional deadman anchoring system to avoid penetration through podium water proofing layer.
- Shallow drainage channel (for window-cleaning water)
- 3m high solid acoustic barrier fence.

THIS DRAWING IS COPYRIGHT PROTECTED AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN AUTHORITY FROM THE OWNER.

NOTES:

- Do not scale from this drawing.
- Always work to noted dimensions.
- All dimensions are in millimetres unless otherwise stated.
- All setting out, levels and dimensions to be agreed on site.
- The dimensions of all materials must be checked on site before being laid out.
- This drawing must be read with the relevant specification clauses and detail drawings.
- Order of construction and setting out to be agreed on site.

DESIGN INTENT ONLY
Structural engineer's input required.
Loadings to be agreed.

P02	24/03/23	Screening fence elevation added	VE/VS	RM
P01	16/03/23	First issue	VE	RM
Revision	Date	Description	Drawn	Approval



Plant I.E. Limited
Manchester | London | Liverpool | Leeds | Standish
E: info@plant-ie.com W: plant-ie.com

MANCHESTER
2 Back Grafton St.,
Altrincham,
W14 1DY
T: 0161 928 9281

Client	Henry Boot Developments Ltd			
Project	St. John's Campus			
Drg Title	Level 16 Roof Terrace Details A1 Landscape			
Created on	24/03/2023	Created by	VE/VS	Approved by RM
Scale	1:25	Size	A1	Workstage Stage 03
Status	Stage Approval			
Drg No.	2875-PLA-00-16-DR-L-5002			Suitability S4
Revision				P02



Appendix B

United Utilities Public Sewer Records

Curtins Consulting Ltd

51-55
Tithebarn Street,
Liverpool,
L2 2SB

FAO:

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Your Ref: 074458 - CSMA826
Our Ref: UUPS-ORD-387049
Date: 20/04/2022

Dear Sirs

Location: Saint Johns Campus

I acknowledge with thanks your request dated 19/04/2022 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

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

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen Mc Cormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This 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.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this 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 Map have been made subsequent to issue and prior to any works being carried out.
- This 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) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the 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 UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Reho	Cover	Func	Invert	Size x	Size y	Shape	Mat	Length	Grad
4103	30.8	CO	28.29	525			VC	6.89542	1 in 127
2401	28.33	CO	22.83	600			CO	2.53458	
2019		VC		100			VC	7.78829	
4904		CO		150			VC	2.75273	
9808	27.56	FO	22.37	150			BR	14.52178	
0303	26.4	CO	23.75	450			PVC	8.648161	1 in 216
1906		VC		375			VC	39.10408	1 in 81
2021	30.9	FO	26.19	100			VC	5.741253	
4204		CO		525			CO	48.45558	
2022		FO		100			VC	13.96354	1 in 147
9813	26.82	CO	22.82	300			CO	2.769395	1 in 6
1108		CO		650			CO	43.60446	
3302	29.15	CO	23.35	620			BR	18.16771	1 in 606
4303		BR		330			VC	29.37442	
2906		CO		225			VC	38.33615	
2905		VC		225			VC	9.42084	
2103		CO		150			VC	25.4521	
2602		CO		875			VC	66.70077	
4008		CO		225			VC	4.896239	
2305		CO		225			VC	10.62254	
1305		VC		150			VC	10.53051	
2413		CO		150			PF	26.13279	
1303		FO		150			VC	16.52098	
4812		CO		225			VC	4.046647	
0302	26.89	CO	24.24	450			PVC	7.642538	1 in 16
3011	30.86	CO	27.65	675			CO	6.388345	
1901	28.85	CO	25	450			BR	8.544033	1 in 85
2005	26.13	CO	23.27	375			CO	13.67288	
2006	26.55	CO	26.22	150			VC	4	
4114		SW		525			CO	10.53554	
0003	25.85	CO	23.9	375			CO	40.6	1 in 226
2301		VC		150			VC	51.22489	
0204	26.91	CO	23.21	525			CO	30.50144	1 in 66
0205	26.84	CO	23.74	525			CO	43.04339	1 in 110
3006	30.86	CO	27.65	300			VC	37.10785	1 in 161
4021		CO		450			VC	8.062258	
4803	34.44	BR	31.43	450			BR	43.9505	1 in 92
0403	26.15	CO	22.09	700			PVC	8.634386	1 in 13
3106	30.8	CO	26.86	525			CO	18.97688	1 in 80
3804	34.07	CO	33.04	225			VC	33.52811	1 in 17
0404	27.43	CO	24.74	1350			CO	150.3595	1 in 367
1104	27.31	CO	23.02	680			VC	7.21102	
9201	26.67	CO	23.73	525			CO	36.53424	1 in 70
2203	26.65	CO	22.95	520			BR	12.05956	
9901	26.17	CO	23.16	300			VC	48.98489	1 in 179
0303	26.21	CO	23.71	1350			CO	98.01497	
3303	26.28	CO	23.33	600			BR	17.46286	
2202	27.41	CO	23.07	600			CO	74.20702	
9403	26.1	CO	26.46	600			CO	50.41628	1 in 187
4190	33	CO	28.29	600			VC	71.96215	1 in 78
3005		VC		150			VC	2.839202	
4003	30.83	CO	26.11	450			VC	8.062258	
1100	26.63	CO	23.32	600			VC	37.11605	1 in 371
2001	27.9	CO	0	900			VC	6.324555	
2400	26.37	BR	16.64	2280			BR	36.23297	
3807	33.44	CO	30.27	375			VC	48.00018	
0101	26.65	CO	23.45	600			CO	40.15522	1 in 365
2003	26.3	CO	26.97	675			CO	34.48188	
4106		CO		225			VC	47.43575	
3011		VC		100			VC	3.23371	
1102	26.26	CO	23.34	600			CO	9.879443	1 in 454
0100		VC		450			VC	2.434991	
2102	26.41	CO	25.48	450			BR	8.246211	
0206	27.2	CO	22.35	625			CO	4.472785	1 in 1
3806	33.49	CO	30.46	440			BR	12.52996	
4013		CO		375			CO	89.73851	
1301	27.47	CO	0	2100			VC	62.51952	
4009		VC		150			VC	2.155489	
0001	26.17	CO	23.61	300			VC	7.434013	
2007		BR		610			BR	5	
4808	35.16	CO	31.85	450			BR	25	
3105	30.9	CO	26.97	525			BR	22.526	1 in 78
4302	32.79	CO	26.99	525			CO	108.3846	1 in 254
2806	33.42	CO	31.38	225			VC	32.68855	
3012	31.73	CO	27.84	300			CO	25.08815	
9101	27.03	CO	24.03	2110			BR	80.68468	
9401	26.87	CO	26.48	900			CO	43.63966	1 in 74
4301	33.01	CO	27.17	525			CO	26.85333	1 in 167
2300	27.47	CO	16.82	2100			CO	56.23946	
3009	30.93	CO	23.25	450			VC	11.7047	
2302		VC		525			VC	20.86965	
2403	28.1	CO	23.34	450			GRP	13.86244	1 in 139
9408		CO		1350			CO	19.01028	
4112		SW		525			CO	16.22967	
0201	27.49	CO	0	2100			CO	6.76204	
4905		CO		150			VC	1.887158	
4303	33.01	CO	26.94	450			CO	1.414214	
0202	27.36	CO	140.8285	2110			BR	140.8285	
0109	25.65	CO	26.01	225			VC	9.336599	
0809		CO		300			VC	45.65947	
3091	30.2	CO	27.02	675			CO	45.35416	
0109	25.65	CO	24.01	225			VC	9.236111	
0406		CO		1350			CO	50.59098	
4802		CO		450			CO	102.8635	
9407	29.07	CO	25.8	600			CO	7.998854	
3001	33.28	CO	26.88	540			BR	48.27007	
0002	26.65	CO	23.81	300			VC	47.20398	
1106	27.68	CO	22.82	610			BR	57.98276	
4805	35.27	CO	21.7	2300			BR	113.3019	1 in 872
3301	30.19	CO	24.27	525			CO	9.50098	1 in 48
1004	25.65	CO	22.97	675			CO	40.34903	1 in 38
2004	29.38	CO	22.66	610			BR	66.48308	
9903	26.37	CO	23.46	300			VC	18.61098	
3007	30.83	CO	27.38	300			VC	8.062258	1 in 17
4102	30.9	CO	27.43	550			BR	77.98453	
3004	30.09	CO	23.01	300			VC	2.55520	
2903	32.21	CO	29.18	520			BR	77.7946	1 in 37
9805	27.41	CO	23.01	300			VC	6.831584	
4104	30.8	CO	26.47	525			CO	9.598722	1 in 53
3805	33.63	CO	31.01	225			VC	9.21844	1 in 33
4205	30.9	CO	9.446328	1 in 189			BR	8.446328	
3008	30.99	CO	22.48	610			BR	15.29706	
2402	26.08	CO	23.24	600			CO	39.61036	1 in 97
0400	29.16	CO	26.53	1350			CO	48.70533	
1101	27.48	CO	23.22	610			BR	50.52983	1 in 132
4107	30.9	CO	26.97	525			BR	15.04418	1 in 84
2201	27.65	CO	23.59	620			BR	44.89781	1 in 89
2002	26.04	CO	22.74	610			BR	84.11897	1 in 1402
4304	31.63	CO	25.29	510			BR	38.78756	1 in 59
3003	29	CO	23.4	500			VC	41.97618	
0901	26.68	SW	23.4	400			VC	5	1 in 26
3005	30.09	CO	26.86	225			VC	2	
4201	30.66	CO	25.74	600			CO	63.97901	1 in 213

Reho	Cover	Func	Invert	Size x	Size y	Shape	Mat	Length	Grad
4103	30.8	CO	28.29	525			VC	6.89542	1 in 127
2401	28.33	CO	22.83	600			CO	2.53458	
2019		VC		100			VC	7.78829	
4904		CO		150			VC	2.75273	
9808	27.56	FO	22.37	150			BR	14.52178	
0303	26.4	CO	23.75	450			PVC	8.648161	1 in 216
1906		VC		375			VC	39.10408	1 in 81
2021	30.9	FO	26.19	100			VC	5.741253	
4204		CO		525			CO	48.45558	
2022		FO		100			VC	13.96354	1 in 147
9813	26.82	CO	22.82	300			CO	2.769395	1 in 6
1108		CO		650			CO	43.60446	
3302	29.15	CO	23.35	620			BR	18.16771	1 in 606
4303		BR		330			VC	29.37442	
2906		CO		225			VC	38.33615	
2905		VC		225			VC	9.42084	
2103		CO		150			VC	25.4521	
2602		CO		875			VC	66.70077	
4008		CO		225			VC	4.896239	
2305		CO		225			VC	10.62254	
1305		VC		150			VC	10.53051	
2413		CO		150			PF	26.13279	
1303		FO		150			VC	16.52098	
4812		CO		225			VC	4.046647	
0302	26.89	CO	24.24	450			PVC	7.642538	1 in 16
3011	30.86	CO	27.65	675			CO	6.388345	
1901	28.85	CO	25	450			BR	8.544033	1 in 85
2005	26.13	CO	23.27	375			CO	13.67288	
2006	26.55	CO	26.22	150			VC	4	
4114		SW		525			CO	10.53554	
0003	25.85	CO	23.9	375			CO	40.6	1 in 226
2301		VC		150			VC	51.22489	
0204	26.91	CO	23.21	525			CO	30.50144	1 in 66
0205	26.84	CO	23.74	525			CO	43.04339	1 in 110
3006	30.86	CO	27.65	300			VC	37.10785	1 in 161
4021		CO		450			VC	8.062258	



Appendix C

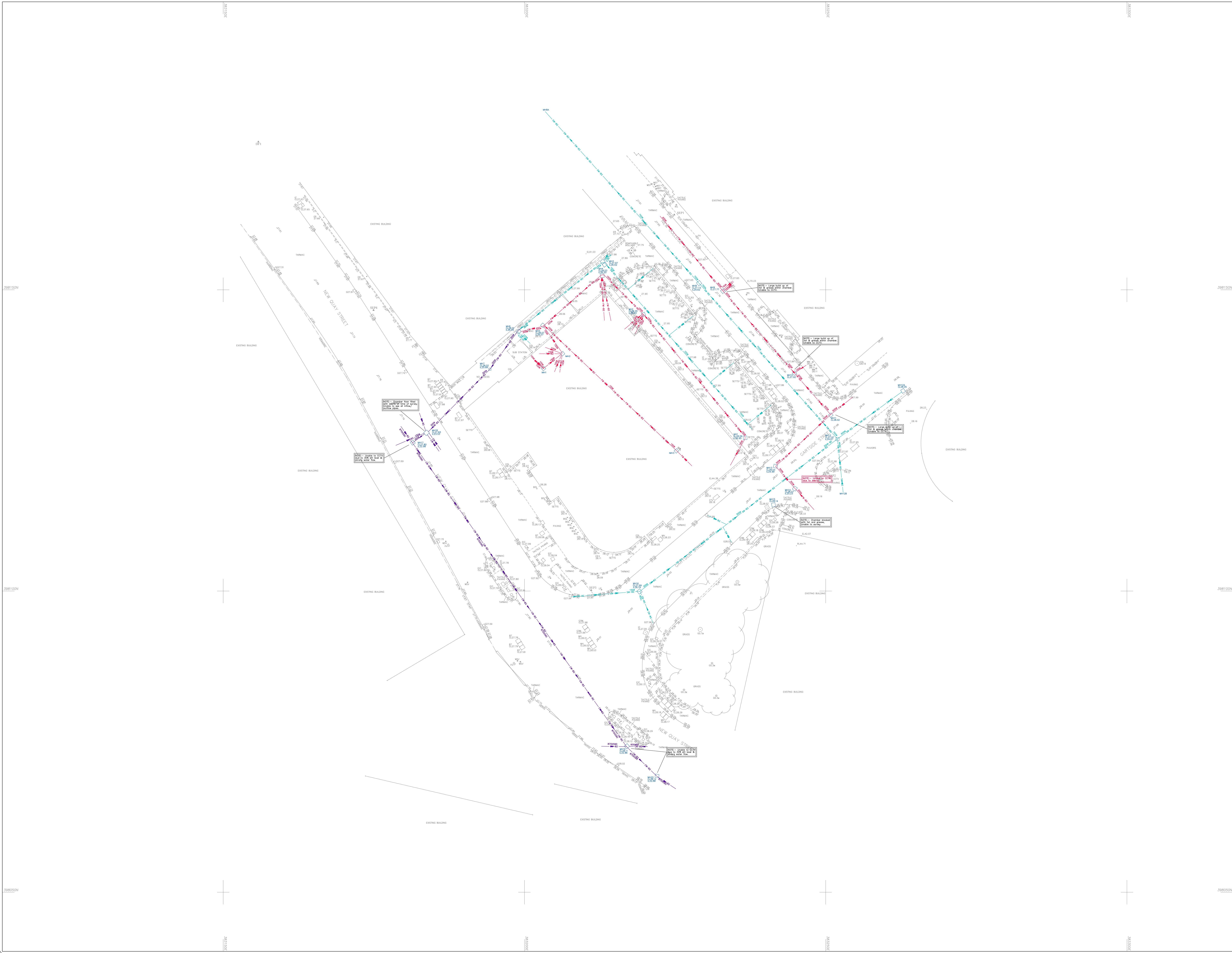
Topographical Survey

GPR Survey



Appendix D

CCTV Drainage Survey



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1. Planning (2022) 1.11.2022. 10. www.surveyandengineering.co.uk

N

PLAN GRID NORTH

File Name: 523744-CCTV.dwg

LEGEND

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

NOTES

1. All data is to O.S. (Newlyn) Datum. Elevation using network RTK. Survey carried out at a point not yet identified as a service area.

2. This underground utility survey was conducted in accordance with the BS 5801:2014 standard.

3. Service boundaries shown are for information only. The quality level to which the service was located is given in the Quality level to which the service was located (see BS 5801:2014 standard).

4. For information on quality levels, please consult the BS 5801:2014 standard document.

5. Unless indicated as GPR, all services are shown as approximate locations. Located using the Ground Penetrating Radar method and should be considered as Quality Level 2. The nature of these services could not be determined by non-invasive means. GPR data that uses correlation as a service area shown as their respective service.

DISCLAIMER

At SEP we are a professional and experienced staff, modern up to date techniques and use of the range of electromagnetic and radar technology to locate and trace underground utilities. However, the performance of the equipment employed in non-invasive survey can be adversely affected by factors outside the control of SEP. Therefore SEP cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult registered utility records and undertake their own service area.

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

Successful tracing of non-conductive materials may be limited. Drainage gullies are often located where possible to provide connectivity but it is not always possible to introduce the service due to narrow pipe size and/or accumulated silt.

Depth information of underground services is generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to 1.700m) but this cannot be guaranteed. Depth given should refer to the top of the service. Drains, sewers and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. If it is not possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, cables, debris and/or rougher ground.

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

Excavation in the vicinity of services shown should be carried out with due diligence. Best Practice.

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client

Arcadis LLP

4 Piccadilly Place

Manchester

M1 3BN

Project Title

CCTV Survey of Land at:

The Manchester College

St Johns Centre

Quay Street

Manchester

M3 3BE

Surveyed	Drawn	Checked
SEP	K.Donaghy	D.Shipton

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Sep 22	523744-CCTV	01	A0	--



Appendix E

Environment Agency Flood Map for Planning

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
383215/398131

Created
4 Apr 2023 20:05

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

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

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.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

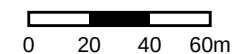
Your reference
<Unspecified>

Location (easting/northing)
383215/398131

Scale
1:2500

Created
4 Apr 2023 20:05

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area





Appendix F

Lead Local Flood Authority Correspondence

United Utilities Correspondence

Chloé Grimsley

From: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Sent: 31 May 2022 13:01
To: Charlie Smith
Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE

Hi Charlie,

We would need to see further evidence that the drainage hierarchy has been followed before agreeing to discharge rates into the UU sewer system.

However that said, if you provide this additional evidence, then in principle, we would have no objection to you calculating the existing discharge rates (based on the existing on site network model) and reducing this figure by at least 50% to calculate the proposed flow rates, as the site is classed as brownfield. I would also recommend that you discuss the proposal with United Utilities as well.

We would also expect to see SuDS incorporated into the scheme wherever possible to help further reduce surface water flows.

Kind Regards,

Oliver

Oliver Timmins
Engineer (Flood Risk Management)
Mobile: 07814082200
Email: oliver.timmins@manchester.gov.uk

Lead Local Flood Authority
Highways
Growth & Development and Neighbourhoods Directorate
Manchester City Council
PO Box 532 Town Hall
Manchester
M60 2LA

Web: <http://www.manchester.gov.uk>

From: Charlie Smith <Charlie.Smith@curtins.com>
Sent: 19 May 2022 14:00
To: Oliver Timmins <oliver.timmins@manchester.gov.uk>
Subject: Manchester College, New Quay Street, Manchester, M3 3BE

You don't often get email from charlie.smith@curtins.com. [Learn why this is important](#)

Good afternoon,

We are currently producing a drainage strategy for a site located off New Quay Street, Manchester, M3 3BE (NGR – X:383206, Y:398127) – Please see attached location plan.

The scheme is to redevelop Manchester college. The building is to be demolished and a new structure to be built for commercial end use.

Infiltration testing has been undertaken within the site and a review of the ground conditions, infiltration is considered unsuitable for this site.

There are no watercourses near to the site, therefore discharging to a water course is not feasible.

There are no surface water sewers near to the site, therefore discharging to a surface water sewer is not feasible.

Following SuDs hierarchy the next best option is to discharge surface water flows to the public combined water sewer within New Quay Street.

A CCTV survey is to be commissioned within the next few weeks to determine the current outfall of the existing site.

The existing network is yet to be modelled as we have not yet received the CCTV survey. However, once the network has been modelled and a discharge rate calculated we are proposing to reduce the maximum discharge rate to 50% of the existing 1:100 year rates. Please can you confirm this method is acceptable and we will issue the calculations to support our proposal once the CCTV survey is complete.

In order to achieve the flow restrictions, a flow control device would be located within the last chamber prior to discharging to the public combined sewer.

We have also issued the above proposal to UU for their approval.

Attenuation within our site will be provided using appropriate SuDs features.

Foul water flows are assumed to connect into the public sewer within New Quay Street where we aim to use an existing connection dependant on the results of the CCTV survey.

If you have any further questions, please do not hesitate to get in contact.

Kind regards,

Charlie Smith
Civil Engineer
T. 0161 236 2394
charlie.smith@curtins.com

Merchant Exchange
17-19 Whitworth Street West
Manchester M1 5WG



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This footnote also confirms that this email message has been swept for the presence of computer viruses.

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 15 June 2022 14:55
To: Charlie Smith
Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE - UU Ref. 02169098

Good afternoon Charlie ,

Pre Development Enquiry for: Manchester College, New Quay Street UU Reference Number : 02169098

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 3723223 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 610*900mm public combined sewer within New Quay Street located to the West of your proposed development at an unrestricted rate.

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.

Please ensure all proposed manhole chambers cover levels and finished floor levels are higher than the receiving public sewer.

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

United Utilities acknowledge that the nearest watercourse is a significant distance off-site.

Highway Drainage

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

Public Sewer

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

Once evidence is provided as outlined above, United Utilities will consider a connection to the 610*900mm public combined sewer within New Quay Street located West of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 7l/s.

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 public sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

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.

Kind regards,



Mohammed Aljafarawi
Developer Engineer
Developer Services & Metering
Customer Services
unitedutilities.com

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----- Original Message -----

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]

Sent: 15/06/2022 13:27

To: charlie.smith@curtins.com

Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE - UU Ref. 02169098

Good afternoon Charlie,

I am sorry for the delayed response. I did not receive your email that was sent on 23/05/2022 due to a system error. I phoned your office this afternoon, they mention that the only way to reach you is by email.

Regarding your PDE application, I will do my best to respond today or by the end of tomorrow.

Kind regards,



Mohammed Aljafarawi
Developer Engineer
Developer Services & Metering
Customer Services
M: 07950474499
unitedutilities.com

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----- Original Message -----

From: Charlie Smith [charlie.smith@curtins.com]

Sent: 15/06/2022 09:18

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE - UU Ref. 02169098

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.

Good morning,

Please can you confirm when we will receive a response to our PDE.

Kind regards,

Charlie Smith Civil Engineer
Curtins
T. 0161 236 2394 | charlie.smith@curtins.com

From: Charlie Smith
Sent: 23 May 2022 11:51
To: wastewaterdeveloperservices@uuplc.co.uk
Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE - UU Ref. 02169098

Good morning Mohammed,

I sent my original email to this email so I'm not sure why you haven't received the attachments but I am happy to reissue.

Please can you confirm you have received the attachments when you receive this email.

Kind regards,

Charlie Smith Civil Engineer
Curtins
T. 0161 236 2394 | charlie.smith@curtins.com

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>
Sent: 23 May 2022 10:42
To: Charlie Smith <Charlie.Smith@curtins.com>
Subject: RE: Manchester College, New Quay Street, Manchester, M3 3BE - UU Ref. 02169098

Good morning Charlie,

Thanks for your email, due to an *email thread*, this is a wastewater pre-development enquiry.
Could you please submit the followings directly to our wastewater email box
WastewaterDeveloperServices@uuplc.co.uk for our assessment?

1. Wastewater pre-development application, <https://www.unitedutilities.com/builders-developers/wastewater-services/wastewater-planning/wastewater-pre-dev/>
2. The site location plan with site boundary and street names (or grid references)
3. The planning reference (if available)

We will be able to agree on the drainage strategy to the site before the application is submitted to the local planning authority.

If the planning application is already submitted, an agreement through the pre-dev enquiry process will support your application.

Kind regards,



Mohammed Aljafarawi
Developer Engineer
Developer Services & Metering
Customer Services
[unitedutilities.com](https://www.unitedutilities.com)

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----- Original Message -----

From: Charlie Smith [charlie.smith@curtins.com]

Sent: 19/05/2022 13:59

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: Manchester College, New Quay Street, Manchester, M3 3BE

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.

Good afternoon,

We are currently producing a drainage strategy for a site located off New Quay Street, Manchester, M3 3BE (NGR – X:383206, Y:398127) – Please see attached location plan.

The scheme is to redevelop Manchester college. The building is to be demolished and a new structure to be built for commercial end use.

Infiltration testing has been undertaken within the site and a review of the ground conditions, infiltration is considered unsuitable for this site.

There are no watercourses near to the site, therefore discharging to a water course is not feasible.

There are no surface water sewers near to the site, therefore discharging to a surface water sewer is not feasible.

Following SuDs hierarchy the next best option is to discharge surface water flows to the public combined water sewer within New Quay Street.

A CCTV survey is to be commissioned within the next few weeks to determine the current outfall of the existing site.

The existing network is yet to be modelled as we have not yet received the CCTV survey. However, once the network has been modelled and a discharge rate calculated we are proposing to reduce the maximum discharge rate to 50% of the existing 1:100 year rates. Please can you confirm this method is acceptable and we will issue the calculations to support our proposal once the CCTV survey is complete.

In order to achieve the flow restrictions, a flow control device would be located within the last chamber prior to discharging to the public combined sewer.

We have also issued the above proposal to the LLFA for their approval.

Attenuation within our site will be provided using appropriate SuDs features.

Foul water flows are assumed to connect into the public sewer within New Quay Street where we aim to use an existing connection dependant on the results of the CCTV survey.

If you have any further questions, please do not hesitate to get in contact.

Kind regards,

Charlie Smith
Civil Engineer
T. 0161 236 2394
charlie.smith@curtins.com



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Manchester M1 5WG

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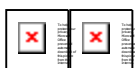
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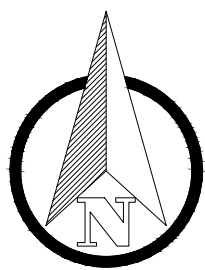




Appendix G

Proposed Drainage Layout – Basement

Proposed Drainage Layout – Ground Floor



DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 45% CLIMATE CHANGE EVENT.
SW FLOW RATE: 7US TBC WITH UULLFA
APPROXIMATE STORAGE REQUIREMENT: 110m³
OUTFALL: TO BE AGREED WITH UU (S106)
IT IS ASSUMED THAT GIVEN THE VARIOUS OPTIONS FOR DISCHARGE LOCATIONS AND THAT THERE IS A BASEMENT THAT PUMPING WILL BE REQUIRED. TBC FOLLOWING FURTHER DESIGN AND SURVEY WORK.
POLLUTION TREATMENT: NOT REQUIRED.
SUSTAINABLE DRAINAGE: POTENTIAL GREEN/BLUE ROOF COMBINATIONS.
INFILTRATION IS (NOT) CONSIDERED APPROPRIATE FOR THIS SCHEME DUE TO SPACE CONSTRAINTS.

FOUL WATER DESIGN
FW PEAK FLOW RATE: TBC
OUTFALL: TO BE AGREED WITH UU (S106)
GIVEN THE VARIOUS OPTIONS FOR DISCHARGE LOCATIONS AND THAT THERE IS A BASEMENT THAT PUMPING WILL BE REQUIRED.

DRAINAGE KEY

- APPLICATION BOUNDARY (2875-PLA-00-GF-DR-L-0002-S3-P03-GF LEVELS)
- EXISTING OWNERSHIP BOUNDARY (2875-PLA-00-GF-DR-L-0002-S3-P03-GF LEVELS)
- PROPOSED OWNERSHIP TO BE CONFIRMED
- HIGHWAY TO BE OFFERED FOR ADOPTION
- EXISTING PUBLIC COMBINED SEWER TAKEN FROM UU SEWER PLANS
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL DRAINAGE (BELOW GROUND)
- INDICATIVE FW PUMPED MAIN (BY OTHERS)
- INDICATIVE SW PUMPED MAIN (BY OTHERS)
- PROPOSED ATTENUATION TANK (BY OTHERS)
- PROPOSED FOUL MANHOLE
- DRAINAGE TO BE CAST IN FOUNDATION
- DRAINAGE TO PASS ABOVE FOUNDATION

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- 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.
- STRATEGY BASED ON NEW OUTFALLS BEING INSTALLED AND ANY REUSE OF EXISTING OUTFALLS WILL BE DETERMINED FOLLOWING COMPLETION OF CCTV SURVEY.
- STRATEGY IS BASED ON TOPOGRAPHICAL SURVEY AND UTILITIES SURVEY. NO CCTV SURVEY AVAILABLE AT THE TIME OF DESIGN.
- PROPOSED ATTENUATION TANK LOCATION INDICATIVE AND THE PREFERRED LOCATION TO BE AGREED.
- INTERNAL MANHOLES WILL BE REQUIRED - THE LOCATIONS WILL BE SUBJECT TO CONFIRMED POP UP LOCATIONS AND CO-ORDINATION WITH FOUNDATIONS.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

DRAWING BASED ON:

- GROUND FLOOR LAYOUT: 11383-EPR-00-GF-DR-A-02-0200 RECEIVED 08.03.23
- BASEMENT LAYOUT: 11383-EPR-00-B1-DR-A-02-0199 RECEIVED 13.05.23
- UNITED UTILITIES SEWER PLANS
- TOPOGRAPHICAL SURVEY RECEIVED 17.06.22
- UTILITY SURVEY RECEIVED 17.06.22
- CCTV SURVEY RECEIVED 02.12.22
- M&E DRAWING 0406075-HLEA-ZZ-B1-GA-P-500-1000-P01 RECEIVED 09.03.23

FOUL PUMPING & STORAGE- PUMP 1

FLows TAKEN FROM BRITISH WATER COP CHAPTER 3

PUMPED VOLUMES WILL BE BASED ON OCCUPANCY NUMBERS USING THE BASEMENT FACILITIES - TO BE CONFIRMED BY THE ARCHITECT/CLIENT.

SHOWERS:

APPROX. 23 SHOWERS;
ASSUMING FULL USE AND ALL SHOWER (AM ONLY)
WATER USE 40L/USE
VOLUME = 920 LITRES (0.92m³)

TOILETS:

ASSUMING USE AS PER SHOWERS (23)
WATER USE 10L/USE
VOLUME = 230 LITRES (0.23m³)

NO ALLOWANCE MADE FOR FLOOR GULLIES - IT IS ASSUMED THAT ANY WASHDOWN WOULD BE TEMPORARILY SUSPENDED DURING A PERIOD OF PUMP OUTAGE.

NOTE:

THE ASSUMPTIONS ABOVE HAVE BEEN USED AS CONFIRMED INFORMATION HAS NOT BEEN PROVIDED TO CURTINS. THE CONTRACTOR/CLIENT AND PUMP DESIGNER SHOULD SATISFY THEMSELVES THAT THE ASSUMPTIONS ARE SUFFICIENTLY ROBUST.

FOUL PUMPING & STORAGE- PUMP 2

FLows TAKEN FROM BRITISH WATER COP CHAPTER 3

PUMPED VOLUMES WILL BE BASED ON OCCUPANCY NUMBERS USING THE BASEMENT FACILITIES - TO BE CONFIRMED BY THE ARCHITECT/CLIENT.

ALLOWANCE MADE FOR FLOOR GULLIES - PUMP CHAMBER IS SERVING ONLY FLOOR GULLIES. FLOWS TO BE NEGLIGIBLE.

IT IS ASSUMED THAT ANY WASHDOWN WOULD BE TEMPORARILY SUSPENDED DURING A PERIOD OF PUMP OUTAGE.

NOTE:

THE ASSUMPTIONS ABOVE HAVE BEEN USED AS CONFIRMED INFORMATION HAS NOT BEEN PROVIDED TO CURTINS. THE CONTRACTOR/CLIENT AND PUMP DESIGNER SHOULD SATISFY THEMSELVES THAT THE ASSUMPTIONS ARE SUFFICIENTLY ROBUST.

FOUL

THE DESIGN RESPONSIBILITIES FOR THE FOUL PUMP SYSTEM ARE AS STATED BELOW:-

- PUMPING STATION DESIGN AND SPECIFICATION - **MANUFACTURER/SUPPLIER.**
- PUMPING STATION CIVIL WORKS - **MAIN CONTRACTOR.**
- SITE LAYOUT AND PUMPING STATION LOCATION - **MAIN CONTRACTOR.**
- PUMPING STATION INSTALLATION - **MANUFACTURER/SUPPLIER.**
- RIISING MAIN, BREAK CHAMBER AND OUTFALL DESIGN AND SPECIFICATION - **MANUFACTURER/SUPPLIER.**
- RIISING MAIN, BREAK CHAMBER AND INSTALLATION - **MAIN CONTRACTOR.**
- FABRICATION AND CONSTRUCTION DRAWINGS - **MANUFACTURE/SUPPLIER.**
- REVIEW OF LAYOUT AND LEVELS TO COMPLY WITH DRAINAGE DESIGN - **MAIN CONTRACTOR'S DESIGN (CURTINS).**
- REQUIREMENTS FOR APPROVAL OF PUMP STATIONS - **MANUFACTURE/SUPPLIER.**
- ACCEPTANCE AND APPROVAL FROM CONSTRUCTION - **MAIN CONTRACTOR.**
- APPROVAL OF TESTING REGIME - **MAIN CONTRACTOR.**

ATTENUATION TANK - DESIGNED BY ABOVE GROUND DESIGNER. CURTINS HAVE COMPLETED A DESIGN CHECK ON VOLUMES TO ACCOMMODATE UP TO 100 YEAR +45%CC EVENT. ATTENUATION TANK SIZE BASED ON PROVISION OF 110m³ PLUS AN ALLOWANCE OF 300mm FREEBOARD TO ALLOW FOR FLUCTUATIONS IN THE WATER LEVEL/DESIGN. SURFACE WATER TANK TO BE DETAILED BY M&E. OVERFLOW BY M&E
ABOVE GROUND DESIGNER TO CONFIRM SPATIAL REQUIREMENTS AROUND THE TANK AND MAINTENANCE ACCESS REQUIREMENTS.

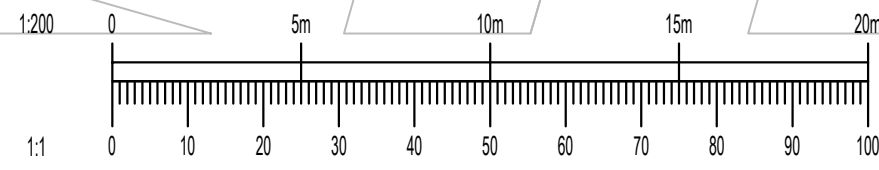
THE FOLLOWING RECOMMENDATIONS ARE MADE:
THE TANK TO BE A SIDE ACCESS, SECTIONAL, FULLY SEALED TANK. THE TANK SHOULD BE VENTED FROM THE TOP.
BASE LEVEL OF TANK TO BE CONSIDERED WITH OUTLET PIPE - STANDING WATER TO BE DISCOUNTED FROM STORAGE VOLUME.

INDICATIVE RISING MAIN LOCATION. RISING MAIN FROM SW TANK TO BE DESIGNED BY OTHERS. RISING MAIN TO CONNECT TO GRAVITY DRAINAGE WITHIN BUILDING.

EXMH 18
INDICATIVE RISING MAIN LOCATION. RISING MAIN FROM FW PC TO BE DESIGNED BY OTHERS. RISING MAIN TO CONNECT TO GRAVITY DRAINAGE WITHIN BUILDING.
PUMPING CHAMBER AND 24 HOUR STORAGE SIZE TO BE DETAILED BY PUMP SUPPLIER/MANUFACTURER.
INDICATIVE SIZE SHOWN - SEE NOTES FOR INDICATIVE USAGE.
PUMP CHAMBER LOCATION TBC
F10 - PUMP 1
CL23.795
IL20.920

INDICATIVE RISING MAIN LOCATION. RISING MAIN FROM FW PC TO BE DESIGNED BY OTHERS. RISING MAIN TO CONNECT TO GRAVITY DRAINAGE WITHIN BUILDING.
PUMPING CHAMBER AND 24 HOUR STORAGE SIZE TO BE DETAILED BY PUMP SUPPLIER/MANUFACTURER.
INDICATIVE SIZE SHOWN - SEE NOTES FOR INDICATIVE USAGE.
PUMP CHAMBER LOCATION TBC
F13 - PUMP 2
CL23.040
IL21.530

EXTENT OF LAND TO BE OFFERED FOR ADOPTION TO BE CONFIRMED BY LANDSCAPE.



P02	STAGE 3 ISSUE	23.03.23	CS	CG
P01	STAGE 2 ISSUE	14.06.22	CS	CG
Rev:	Description:	Date:	By:	Chkd:



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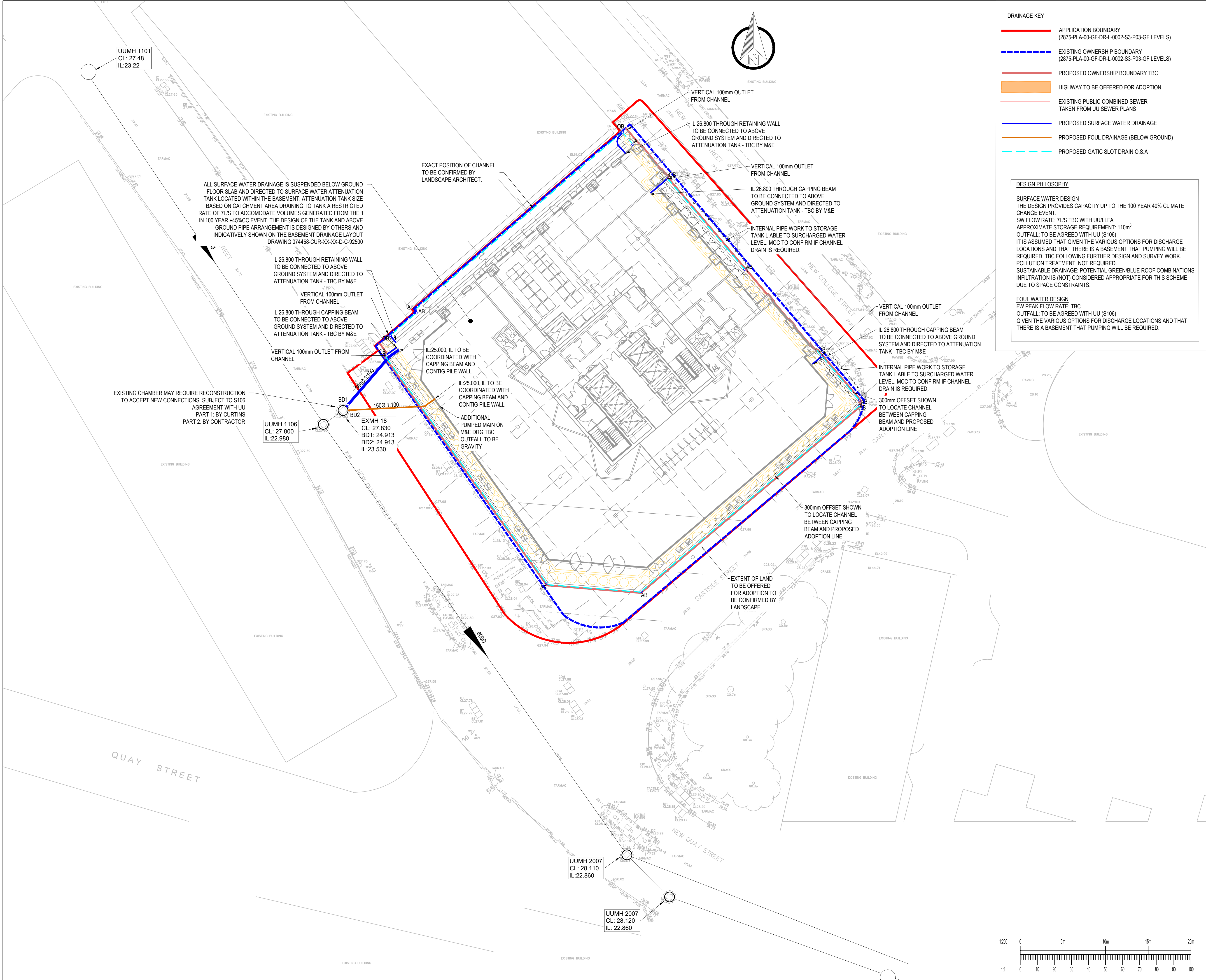
Status: **SUITABLE FOR INFORMATION** **S2**

Project: **ST JOHNS CAMPUS**

Orig Title: **PROPOSED DRAINAGE LAYOUT BASEMENT**

Drawn By	Designed By	Checked By
CS	CS	CG
Date	06/06/22	Scales @ A1
1:200		

Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision
074458 - CUR - XX - XX - D - C - 92500	P02



DRAINAGE KEY

- APPLICATION BOUNDARY (2875-PLA-00-GF-DR-L-0002-S3-P03-GF LEVELS)
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- EXISTING PUBLIC COMBINED SEWER TAKEN FROM UU SEWER PLANS
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL DRAINAGE (BELOW GROUND)
- PROPOSED GATIC SLOT DRAIN O.S.A

DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 40% CLIMATE CHANGE EVENT.
SW FLOW RATE: 7L/S TBC WITH UUI/LFA
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IT IS ASSUMED THAT GIVEN THE VARIOUS OPTIONS FOR DISCHARGE LOCATIONS AND THAT THERE IS A BASEMENT THAT PUMPING WILL BE REQUIRED. TBC FOLLOWING FURTHER DESIGN AND SURVEY WORK.
POLLUTION TREATMENT: NOT REQUIRED.
SUSTAINABLE DRAINAGE: POTENTIAL GREEN/BLUE ROOF COMBINATIONS. INFILTRATION IS (NOT) CONSIDERED APPROPRIATE FOR THIS SCHEME DUE TO SPACE CONSTRAINTS.

FOUL WATER DESIGN
FW PEAK FLOW RATE: TBC
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- 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.
- STRATEGY BASED ON NEW OUTFALLS BEING INSTALLED AND ANY REUSE OF EXISTING OUTFALLS WILL BE DETERMINED FOLLOWING COMPLETION OF CCTV SURVEY.
- STRATEGY IS BASED ON TOPOGRAPHICAL SURVEY AND UTILITIES SURVEY. NO CCTV SURVEY AVAILABLE AT THE TIME OF DESIGN.
- PROPOSED ATTENUATION TANK LOCATION INDICATIVE AND THE PREFERRED LOCATION TO BE AGREED.
- INTERNAL MANHOLES WILL BE REQUIRED , THE LOCATIONS WILL BE SUBJECT TO CONFIRMED POP UP LOCATIONS AND CO-ORDINATION WITH FOUNDATIONS.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

DRAWING BASED ON:

- GROUND FLOOR LAYOUT: 11383-EPR-00-GF-DR-A-02-0200 RECEIVED 08.03.23
- BASEMENT LAYOUT: 11383-EPR-00-B1-DR-A-02-0199 RECEIVED 13.05.23
- UNITED UTILITIES SEWER PLANS
- TOPOGRAPHICAL SURVEY RECEIVED 17.06.22
- UTILITY SURVEY RECEIVED 17.06.22
- CCTV SURVEY RECEIVED 02.12.22
- M&E DRAWING 0406075-HLEA-ZZ-B1-GA-P-300-1000-P01 RECEIVED 09.03.23

Rev:	Description:	Date:	By:	Chkd:
P02	STAGE 3 ISSUE	23.03.23	CS	CG
P01	STAGE 2 ISSUE	14.06.22	CS	CG

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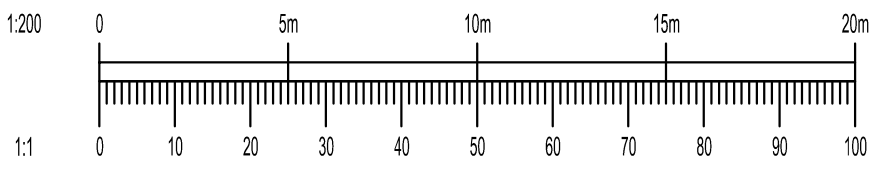
Status: **SUITABLE FOR INFORMATION** **S2**

Project: **ST JOHNS CAMPUS**

Orig Title: **PROPOSED DRAINAGE LAYOUT GROUND FLOOR**

Drawn By	Designed By	Checked By
CS	CS	CG
Date: 06/06/22		Scales @ A1: 1:200
Project No - Originator - Function - Spatial - Form - Discipline - Number		

074458 - CUR - XX - XX - D - C - 92501 P02





Appendix H

Proposed SW Calculations 1 in 100 Year +45%cc

CAUSEWAY



Curtins Consulting Ltd

17-19 WHITWORTH STREET

WEST, MANCHESTER

M1 5WG

File: SW Drainage Calculation 23.03.14.pfd

Network: Storm

Charlie Smith

22/03/2023

Page 1

Design Settings

Rainfall Methodology

FSR

Return Period (years)

1

Additional Flow (%)

0

FSR Region

England and Wales

M5-60 (mm)

18.000

Ratio-R

0.358

CV

0.750

Time of Entry (mins)

5.00

Maximum Time of Concentration (mins)

30.00

Maximum Rainfall (mm/hr)

50.0

Minimum Velocity (m/s)

1.00

Connection Type

Level Soffits

Minimum Backdrop Height (m)

0.200

Preferred Cover Depth (m)

1.200

Include Intermediate Ground

✓

Enforce best practice design rules

x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.282	5.00	36.900	250	329.250	231.750	0.900
TANK			35.000	250	356.250	231.750	2.000
OUTLET			35.000	150	361.250	231.750	2.050

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	TANK	16.000	0.600	36.000	33.850	2.150	7.4	300	5.18	46.0
1.002	TANK	OUTLET	5.000	0.600	33.000	32.950	0.050	100.0	250	5.31	45.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	5.797	409.8	35.2	0.600	0.850	0.282	0.0
1.002	1.399	68.7	34.8	1.750	1.800	0.282	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	16.000	7.4	300	1 STANDARD	36.900	36.000	0.600	35.000	33.850	0.850
1.002	5.000	100.0	250	1 STANDARD	35.000	33.000	1.750	35.000	32.950	1.800

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	250	Manhole	1 STANDARD	TANK	250	Manhole	1 STANDARD
1.002	TANK	250	Manhole	1 STANDARD	OUTLET	150	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	329.250	231.750	36.900	0.900	250				
						0	1.000	36.000	300
TANK	356.250	231.750	35.000	2.000	250		1	1.000	33.850
						0	1.002	33.000	250
OUTLET	361.250	231.750	35.000	2.050	150		1	1.002	32.950
						1			

Simulation Settings

Rainfall Methodology

FSR

FSR Region

England and Wales

M5-60 (mm)

18.000

Ratio-R

0.358

Summer CV

0.750

Winter CV

0.840

Analysis Speed

Normal

Skip Steady State

x

Drain Down Time (mins)

240

Additional Storage (m³/ha)

20.0

Check Discharge Rate(s)

x

Check Discharge Volume

x

Storm Durations

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

Return Period (years)

100

Climate Change (CC %)

45

Additional Area (A %)

0

Additional Flow (Q %)

0

Node TANK Online Depth/Flow Control

Flap Valve

x

Replaces Downstream Link

x

Invert Level (m)

33.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.000	0.300	7.000	0.500	7.000	0.700	7.000	0.900	7.000	1.100	7.000	1.300	7.000	1.500	7.000	1.700	7.000
0.200	7.000	0.400	7.000	0.600	7.000	0.800	7.000	1.000	7.000	1.200	7.000	1.400	7.000	1.600	7.000		

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	36.143	0.143	157.2	0.9035	0.0000	OK
120 minute winter	TANK	118	34.687	1.687	53.5	109.3217	0.0000	SURCHARGED
30 minute winter	OUTLET	10	33.004	0.054	7.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	TANK	156.3	5.081	0.382	0.4924	
30 minute winter	TANK	1.002	OUTLET	7.0	0.857	0.102	0.0410	96.8

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