



SECTION 73

DRAINAGE STRATEGY 2022

DECEMBER 2022

The Drainage Strategy 2022 should be read in conjunction with the Drainage Strategies from 2021 and 2019. These are appended to this statement.



Jackson's Row Developments

ST MICHAEL'S, JACKSON'S ROW

Drainage Strategy Report - Addendum



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Drainage Strategy Report - Addendum

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EXECUTIVE SUMMARY

Jackson's Row Developments Ltd (hereinafter referred to as 'the Applicant') is seeking to construct a major development proposal known as St Michael's, Jackson's Row, Manchester, UK.

The planning application for the development was originally registered in January 2017. Following feedback, the decision was taken to revise the scheme. Revised plans and documents were submitted in November 2017 and the development was granted planning permission on 20 June 2018 (reference: 114664/FO/2016). It was subsequently amended under Section 73¹ on 26 June 2020 (reference: 125549/JO/2019) and under Section 96a² on 1 December 2020 (reference: 125549/JO/2019). For the purposes of this Drainage Strategy, the approved development will be referred to as the 'Approved Development'.

Following discharge of the relevant pre-commencement conditions, works to implement the Approved Development were undertaken in April 2021 and completed on 12th of that month. The works comprised the demolition of the kitchen of the Sir Ralph Abercromby and making good remaining external walls. These works represented Phase 1 of the Approved Development. The lawful implementation of the consent was confirmed in a Lawful Development Certificate issued by Manchester City Council on 21 May 2021.

The remainder of the development works are split into Phase 2 and Phase 3. Phase 2 concerns the eastern redevelopment of the plot with the construction of an office block on the former police station site. Phase 2 was submitted for detailed planning on the 9th September 2021. (131612/JO/2021). The WSP Drainage Strategy Addendum (2021) submitted to support this application states that Phase 2 development will have discrete systems for foul and surface water drainage and connection points to the public sewerage system. This is a departure from the 2019 WSP drainage strategy which included a drainage solution for the full site (including Phase 3). The solution for the Phase 3 development (western half of the site) was not detailed in the 2021 addendum and is the subject of this report.

Further changes to the Approved Development are now sought by way of a Section 73 application. The changes relate solely to the Phase 3 development and include:-

¹ Section 73 of the Town and Country Planning Act 1990 (as amended)

² Section 96(a) of the Town and Country Planning Act 1990 (as amended)

- From the original layout proposed in the Flood Risk Assessment (2016) various parts of the buildings internal layout and purpose have been reconfigured for Phase 3.
- Originally the first floor was dedicated to a synagogue currently occupying the site; However, this has now been removed and replaced with office space.
- A proposed leisure centre for the ground floor has been relocated to basement level 2.
- A further change to the ground floor layout includes the ramp down to the basement being repositioned towards the back centre of the building.
- The original architectural designs in 2016 depicted the design of two adjacent towers labelled towers A and B. The building initially was 4 floors high with two basement levels before ascending into two towers, with Towers A and B being 19 and 34 floors high respectively. This has now been changed to one multi storey building which is 42 stories high with 3 basement levels.
- A proposed ballroom on the third floor from the 2016 architectural drawings has been removed in favour of a restaurant.
- The footprint available for the attenuation tank has been decreased and has been moved from basement level 2 to basement level 1.

The changes proposed will be referred to as the 'Proposed Amendments'. For the avoidance of doubt, references to the 'Proposed Development' refer to the 'Approved Development' as well as the 'Proposed Amendments', i.e. the entirety of the development as now proposed.

The updates to the Drainage Strategy in this addendum relate to the Proposed Amendments. The amended floor plans have been reviewed together with the information from the public health engineers showing above ground drainage. The review identified no overall changes to the impermeable areas, discharge rates and surface water attenuation storage requirements for the Proposed Development and this drainage strategy has been set up to assess Phase 3 of the site separately. The public health drawings identified revised locations of proposed foul and surface water drainage connections to the existing public sewers. These comply with the requirements of United Utilities and are also amended in the report accordingly.

This Drainage Strategy Addendum should be read in conjunction with the separate Drainage Strategy Report and Flood Risk Assessment Report which provides details on the outline flood risk strategy for the Proposed Development.

SURFACE WATER DRAINAGE STRATEGY

Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with three level basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.

There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.

Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.

The United Utilities consultation response available in appendix H.2, indicated that surface water may discharge into their public sewer network at the rates agreed with Manchester City Council as Lead Local Flood Authority. United Utilities requested that, as a preference discharges should go to highway surface water drainage systems as a preference to the combined sewer, however Manchester City Council have confirmed that no such systems are available local to the site with sufficient capacity to accept the discharge. Therefore, surface water will discharge to the combined sewerage system in Bootle Street as originally intended.

Manchester City Council have reaffirmed their original consultation response from 2016 that flows from the development will have to be restricted to 50% of the existing flow rate associated with the pre-development brownfield site. The resulting allowable flow is calculated to be 39.8 l/s for the Phase 2 and Phase 3 development areas. A restricted discharge rate of 23.4 l/s was apportioned for Phase 2 based on the prorate of impermeable areas across the full development. This results in the restricted discharge rate for the Phase 3 areas being 16.4 l/s.

The volume of on-site attenuation required for the Phase 3 development has been calculated as 52.8 m³ to cater for the critical 1 in 100 year storm with a 40% allowance for climate change applied. The storage is currently proposed to be located in the upper basement level B1 and thus it is unlikely that a gravity solution will be possible for discharge to adjacent United Utilities combined sewers. The solution assumes that a sump and pump set will be installed integral to the attenuation tank. A rising main from the tank will convey flows through to the United Utilities combined sewer in Bootle Street.

The building rainwater collection system, attenuation tank and pumping facility will be located within and the confines of the building therefore will be privately maintained.

FOUL WATER DRAINAGE STRATEGY

It is proposed to discharge the foul water flows from the new development into the public combined sewer network.

The United Utilities pre-development enquiry response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network with a preference to discharge to the combined sewer in Jackson Row.

Consultation with the Building MEP designer has indicated that the majority of foul drainage from floors above ground level will be collected and routed through to a single point of discharge on the northern and southern faces of the building. From here a single lateral connection will be provided to the combined sewers in Jackson Row and Bootle Street respectively. Wastewater drainage from a proportion of the upper floors, along with the three basement levels however will be routed to the lower basement level (B3). Here a below slab gravity foul water drainage system will collect drainage and route it through to a pumping station. Flows will be transferred from the pumping station via rising main discharging to the United Utilities Combined Sewer on Jackson Row via the aforementioned gravity lateral connection. Emergency Storage will be provided for the Pumping Station in accordance with Building Regulations Document H requirements. The foul water drainage system including the pumping station will be privately owned and maintained.



A trade discharge consent will be required for the discharge of backwash waters associated with the swimming pool and leisure centre. The consultation response from United Utilities in regard to this is still awaited to determine any restrictions on the trade discharge flow rate and the timing of discharges. It has however been confirmed that the trade discharge can be via the same discharge point as the domestic sewerage to the Jackson Row combined sewer.

1. INTRODUCTION

1.1. APPOINTMENT AND BRIEF

- 1.1.1. WSP was appointed by Jackson's Row Developments Ltd to undertake a Drainage Strategy (including an update on Flood Risk) for Phase 3 of the development plan. For phase 2 of the development, refer to the WSP Drainage Strategy Addendum (2021). In this document an update on the flood risk relative to the site will be provide; Furthermore, a detailed drainage strategy for Phase 3 is outlined in sections 3 to 6 5.
- 1.1.2. A site location plan is included in Appendix A.

1.2. DEVELOPMENT STATUS

- 1.2.1. This development will be delivered in three phases. Starting off with the demolition of certain existing structures on the site (Phase 1), followed by the acquisition of planning permission and the development of Block B in the eastern half of the site (offices and the former police station) (Phase 2). Then finally the plan and development of Block A (hotel, residential and offices) (Phase 3) in the western half of the site.
- 1.2.2. Phase 1 – Demolition
 - Phase 1 entailed the demolition of certain pre-existing structures on the site.
- 1.2.3. Phase 2 – Plan and layout of block B
 - In Phase 2 state planning permission for the development was obtained in 2021. The original planning permission was obtained on 20 June 2018 (reference: 114664/FO/2016). Following the initial planning permission two subsequent amendments occurred, under Section 73¹ on 26 June 2020 (reference: 125549/JO/2019) and under Section 96a² on 1 December 2020 (reference: 125549/JO/2019).
 - Detailed proposals for the development of Block B (offices) on the former police station site was provided.
 - A drainage strategy for foul and surface water was devised and assessed in to two initial separate reports Drainage Strategy Report (WSP 2019) and Flood Risk Assessment (WSP 2017). Subsequently the specific drainage proposals for Phase 2 were detailed in the WSP Drainage Strategy Addendum (2021)
- 1.2.4. Phase 3 – Plan and layout of Block A
 - A 42 story (plus 3 basement levels) plan and development of Block A (hotel, residential and offices) to be submitted for approval.
 - Plot details of Block B.
 - A drainage strategy for foul and surface water to be devised concerning Block A.
 - This report provides an update on the Flood Risk Assessment (WSP, 2017) and Drainage Strategy (WSP 2019) in respect to possible changes to information provided by governing bodies or other 3rd party members and to reflect the current development proposals.

³ Section 73 of the Town and Country Planning Act 1990 (as amended)

¹ Section 73 of the Town and Country Planning Act 1990 (as amended)

² Section 96(a) of the Town and Country Planning Act 1990 (as amended)

1.3. PREVIOUS DOCUMENTATION

1.3.1. The original Flood Risk Assessment (FRA) (WSP 2016) and Drainage Strategy (DSR) (WSP 2016) looked at the foul and surface water situation for the entire site as well as the level of flood risk. An updated version of the Drainage Strategy was produced in 2019 (WSP 2019). It adopted the new site layout and tweaked the drainage strategy. In 2021 a Drainage Strategy Addendum was produced which focused on Phase 2 of the site delivering an updated Drainage strategy and Flood Risk Assessment. It must be noted that since the 2016 reports no re-consultation was undertaken with United Utilities, Manchester City Council and the Environment Agency in the writing of the subsequent reports.

1.3.2. The previous documentation is listed in the table 1 below:

Table 1 – List of WSP Documentation

Document name	Date produced	Acronym	Reference	Report Reference number
Flood Risk Assessment 2016	10/2016	FRA	(WSP 2016)	10278-FRA-001
Drainage Strategy 2016	10/2016	DSR	(WSP 2016)	10278-DSR-001
Drainage Strategy 2019	11/2019	DSR	(WSP 2019)	70101665-DSR001
Drainage Strategy Addendum 2021	09/2021	DSA	(WSP 2021)	70088013-DSR-001

1.4. DESIGN DEVELOPMENT

- 1.4.1. The changes to the Phase 3 development proposals from the original drainage strategies are summarised below;
- 1.4.2. The original ground floor (Level 00) design proposed in the Flood Risk Assessment (WSP 2016) has changed.
- 1.4.3. A Synagogue was initially proposed however the space has been repurposed into an entrance lounge for the office complex as shown in Appendix B; Furthermore, the Leisure facility has been relocated into the basement level (B2). The ramp has also been moved from the side to the back of the ground floor.

- 1.4.4. A further change reported is that the Phase 2 foul and surface water solutions proposed in the Drainage Addendum (WSP 2021) will not interface with that of Phase 3.
- 1.4.5. The previous architectural drawings proposed in 2016 have changed due to the number of floors proposed. Originally the design included four shared floors and two basement levels followed by two towers. Towers A and B being 16 and 31 stories high respectively; However, the new design includes one tower that is 42 stories high with three basements.
- 1.4.6. The original design had a ballroom on the third floor. This has now been changed to a restaurant.
- 1.4.7. The space allocated for the attenuation tank has been reduced and moved from basement level 2 to basement level 1. There has been no alteration to the proposed site impermeable area since the 2019 Drainage Strategy. (WSP 2019)

2. EXISTING SITE

2.1. PREVIOUS REPORT

- 2.1.1. This document is an addendum to capture updates on the Flood Risk Assessment (WSP 2016) previously undertaken. For full details of flood risk relevant to the development site reference should be made to the original report. This section of the report provides an update on flood risk status based on currently available information.

2.2. SITE CHARACTERISTICS

- 2.2.1. The Site characteristics of both Phases 2 & 3 of the development have been detailed in tables 2 & 3 below. Phase 2 details have been provided to provide direct comparison with the 2016 Flood Risk Assessment which covered both Phase 2 and 3:

Table 2 - Characteristics of the Site (Phase 2)

Area		The Site Area is Approximately 0.33 Ha.
Site Use		The site is currently occupied by a police station.
General Topography		The topographical survey (Appendix C) includes levels for external areas around the perimeter of the site only. The survey indicates that site levels fall from east to west. Site levels in the Northeast corner peak at 39.75m AOD whereas in the southeast corner the maximum level is 38.68m AOD. Levels on the western boundary of the site vary between 36m AOD and 37m AOD.
Boundaries	North	Jackson's Row, drinking establishments, a restaurant, and a hair salon.
	South	Bootle Street and commercial property which appears to be disused.
	East	Southmill Street and commercial development.
	West	The location of Phase 3.
Access		Access to eastern half of the site may be gained via Jackson's Row. Syers Court off Bootle Street allows access to the west of the site through Phase 3.

Table 3 - Characteristics of the Site (Phase 3)

Area		The Site Area is Approximately 0.23 Ha.
Site Use		The site is currently occupied by a Synagogue and pub.
General Topography		The topographical survey (Appendix C) includes levels for external areas around the perimeter of the site only. The survey indicates that site levels fall from east to west. Site levels in the Southeast corner peak at 37.05m AOD whereas in the Southwest corner the maximum level is 36.42m AOD. Levels on the western boundary of the site vary between 35m AOD and 36m AOD.
Boundaries	North	Jackson's Row, drinking establishments, a restaurant and a hair salon.
	South	Bootle Street and commercial property which appears to be disused.
	East	Location of Phase 2.
	West	A multi-storey office building beyond which is the A56/Deansgate.
Access		Access to eastern half of the site may be gained via Jackson's Row through Phase 2. Syers Court off Bootle Street allows access to the west of the site.

2.3. FLUVIAL FLOOD RISK

- 2.3.1. The flood map provided by the Environmental agency (EA), in figure 1 below, indicates that the site falls within Flood Zone 1 has a 'low' chance of flooding from rivers and seas. The current risk level has not changed from the one provided in the Flood Risk Assessment (WSP 2016).



Figure 1 - Extract from the Environmental Agency (EA) online fluvial flood risk maps.

2.4. SURFACE WATER FLOOD RISK

- 2.4.1. The flood map detailed in figure 2 below indicates that the North of the site has a 'medium' chance of flooding from surface water; However, in the Northwest of the site the risk is low. The risk level has changed from being only a 'low' chance stated in the Flood Risk Assessment. (WSP 2016)
- 2.4.2. It must be stated that the site is located in Flood Zone 1. Hence, it has a low overland flood risk as stated in the Flood Risk Assessment (WSP 2016).
- 2.4.3. The EA surface Water Flooding Map does not take into account the presence of positive surface water drainage systems on Jackson Row and Bootle Street which would capture and convey flows to below ground drainage systems during typical rainfall events. However, there is a potential for ponding / overland flows on these highways should the drainage system capacity be exceeded.
- 2.4.4. The Environment Agency Risk of Flooding from Surface Water Velocity Map indicates that during storm events with a low chance of occurring there is surface water flow along Jackson's Row and Bootle Street in an east to west direction.
- 2.4.5. Site levels on the northern and southern boundary should be engineered to ensure that any flow would be retained within the highway rather than towards building entrances as in the current situation.



Figure 2 - Extract from the Environmental Agency (EA) online Surface Water flood risk maps.

2.5. SEWER FLOOD RISK

- 2.5.1. The Hybrid Strategic Flood Risk Assessment (2011) supplied by Manchester, Salford and Trafford Council has not changed since the previous Flood Risk Assessment (WSP 2016) undertaken for the site. The site was not originally identified as being at risk from sewer flooding, and recent consultations with United Utilities and Manchester City Council confirm no historical sewer flooding within the vicinity of the site.

2.6. FLOOD RISK FROM RESERVOIRS AND CANALS

- 2.6.1. The ground water flooding map from the Environmental Agency (EA) present in figure 3, suggests that the risk of flooding from reservoirs and canals is low due to the closest canals being 0.3km Southwest of the site. The risk level of 'low' is unchanged since the previous Flood Risk Assessment (WSP 2016).



Figure 3 - Extract from the Environmental Agency (EA) online reservoirs and canals flood risk maps.

2.7. GROUND WATER FLOOD RISK

The documentation used in the Strategic Flood Assessment (WSP 2016) has not changed. The MST Hybrid SFRA (2011) Groundwater Flooding Map and the Manchester City Council Local Flood Risk Management Strategy (LFRMS, 2014) are yet to be updated. Therefore, the assessed risk of groundwater flooding remains Low.

2.8. CLIMATE CHANGE

- 2.8.1. The advice provided on Climate change by the Environment Agency has not been updated since the 'Flood Risk Assessments: Climate Change Allowances' released in 2016. This documentation was used in the Strategic Flood Assessment (WSP 2016). A 40% climate change allowance for attenuation sizing has been adopted in this updated drainage strategy based on the current guidance.
- 2.8.2. The surface water drainage calculations consider climate change with a factor of 40% following the information provided by Manchester City Council (present in Appendix H.1). The 40% value is between the central and upper end allowance for a structure with a lifetime between 2061–2125.

2.9. CONSULTATIONS

2.9.1. Consultation was undertaken with the following organisations in relation to this work:

Table 4 – Table of Consultation in Phase 3.

Organisation	Re-Consulted	Date
Environment Agency	N	-
Manchester City Council	Y	08/11/2022
United Utilities	Y	08/11/2022

2.10. SEQUENCE AND EXEMPTION TEST

A Sequential and Exemption test will not be required due to the site being located in Flood Zone 1 and not at significant risk of flooding from other sources.

2.11. SURFACE WATER MANAGEMENT

- 2.11.1. The restrictions implemented for run-off on site include restricted discharge, due to this being a brownfield site, discharge must be reduced by a minimum of 50% in line with the Manchester City Council pre-application consultation response received on 08 November 2022). Another requirement being that volumes associated surface water run-off above the restricted rate, should be contained on-plot for the 1 in 100-year storm return period + 40% climate change event.
- 2.11.2. The restricted rates from the 2019 Drainage Strategy (WSP 2019) have been prorated to determine the permitted rate for Phase 3 taking into account flow has been allocated for Phase 2 as displayed in the table 5 below:

Table 5 – Table of restricted rates in Phases 2 & 3.

Restricted Rate	Flow Rate (L/s)
Original	39.8
Phase 2	23.4
Phase 3	16.4

2.12. CONCLUSION

The table 6 below summarises the findings of the assessment.

Table 6 – Degree of risk from each source of flooding.

Source	Risk
Fluvial	Low
Surface Water	Low to the Northwest Medium to the North
Sewer	Low
Reservoirs and Canals	Low
Ground Water	Low

4. SURFACE WATER DRAINAGE STRATEGY

4.1. PROPOSED DISCHARGE POINT

- 4.1.1. In accordance with requirement H3 of Building Regulations 2015, a hierarchical approach has been used to determine the suitable discharge point for the surface water run-off generated by the Proposed Development.

DISPOSAL OF SURFACE WATER BY INFILTRATION METHODS

- 4.1.2. Wallingford WRAP Class Maps indicated that the ground beneath the site is classed as clayey, or loamy over clayey soils with an impermeable area at shallow depths indicating that infiltration may not be suitable for the site.
- 4.1.3. The site has limited space and sits within a city centre context. The proposals include a main external walkway between Phases 2 and 3 linking Jackson's Row to Bootle Street as shown in the site plan (Appendix B.1). However both Phase 2 and Phase 3 have basement levels, preventing the use of infiltration in this area.
- 4.1.4. Therefore, infiltration is not considered to be viable for this site.

DISCHARGE TO A SUITABLE WATERCOURSE

- 4.1.5. There are two watercourses shown within the vicinity of the site on the Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008).
- 4.1.6. The closest, which was previously known as the River Tib, is now advised by Manchester City Council on 30 October 2015 to be incorporated into the combined public sewer network and so discharge to this watercourse would not be in accordance with the drainage hierarchy.
- 4.1.7. The other 'hidden river' is the Manchester and Salford Junction Canal which is a distance of 0.3 km southwest of the site at the closest point. The condition and capacity of this watercourses to accept new flow is unknown, no information was available from Manchester City Council as of 30 October 2015. Therefore, it is considered that this watercourse would be unsuitable for discharge.
- 4.1.8. The other watercourses in the vicinity of the site are the Rochdale Canal, River Medlock and River Irwell. However, each of these watercourses is a minimum distance of at least 0.5 km and therefore a connection to the watercourses would need a sewer requisition of considerable length.
- 4.1.9. Whilst the distances to watercourses are not prohibitive the routing of a new surface water sewer to the nearest watercourse via city centre streets is not considered feasible due to the impact on traffic, commercial operations, and the high likelihood of encountering engineering restrictions.
- 4.1.10. Therefore, a connection to a watercourse for discharge of surface water from the site is considered to be unfeasible.

DISCHARGE TO SEWER

- 4.1.11. There are no MCC Highway drains or United Utilities Surface Water Drains in vicinity of the site which indirectly drain to a watercourse.

- 4.1.12. There is a network of public combined sewers around the site as shown in the United Utilities sewer plan in Appendix E.
- 4.1.13. The United Utilities pre-development enquiry response received on 08 November 2022 available in appendix H.2, indicated a preference for surface water to drain via highway drainage systems where available. Should this not be feasible discharge into the combined sewers would be accepted at a restricted rate of 16.4 l/s for Phase 3. MCC have subsequently confirmed that no highway drains are present in the vicinity of the site and therefore it is proposed that surface water be discharged to the United Utilities combined sewerage system.
- 4.1.14. The proposed connection point, subject to confirmation following CCTV results, is to the public sewers under Bootle Street.

4.2. PROPOSED DISCHARGE RATE

- 4.2.1. The Manchester City Council pre-application consultation response received on 08 November 2022 indicated flows from the site should be restricted to 50% of the existing pre-development peak flow rate. The response is in line with council policy which restricts discharge to this level for sites proposed in critical drainage areas; the site lies within the Conurbation Core Critical Drainage Area.
- 4.2.2. The existing flow rate for the Proposed Development was determined based on a 140 l/s/ha allowance which is commonly presented by local authorities for calculations involving brownfield sites. All of the 0.56 ha of site area is considered to be impermeable following a review of site aerial photography and the topographical survey (Appendix C) on which no significant permeable areas are indicated. The existing flow rate determined by this method for the site is 79.6 l/s, which applying the restrictions imposed by Manchester City Council infers that the allowable flow rate from the site should be restricted to a value of 39.8 l/s. The allowable flow rate from the Proposed Amendments (Phase 3) has been calculated as 16.4 l/s based on an impermeable area of 0.23ha.
- 4.2.3. For the purpose of this report the entirety of the site is also considered to be impermeable. The lower ground floor plan indicates external areas to be paved and fully impermeable. It is possible that planters at installed at roof levels may have potential to capture water which could be incorporated at the detailed design stage.
- 4.2.4. The Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) guidance indicates that as a minimum surface water discharge from brownfield sites should not exceed the existing rate. However, development should achieve a greenfield runoff rate where reasonably practicable.
- 4.2.5. The site is space constrained and therefore it is considered that there would be insufficient space to provide attenuation storage in order to reduce the flow rate from the site to greenfield rates.
- 4.2.6. Therefore, flow from the site is proposed to be restricted to 50% of existing flows, which meets the underlying Defra criteria for flow control.
- 4.2.7. For the Proposed Amendments, a pumping station will be required to discharge water into the combined sewer network (at a maximum rate of 16.4 l/s) since the attenuation storage is located at basement level B1 and thus likely to be lower than the public sewers in the vicinity. It is envisaged pumps will be required and these will be housed integral to the attenuation tank.

4.3. SUDS CONSIDERATION

- 4.3.1. The November 2022 response from Manchester City Council (MCC) requested the consideration of SuDS in the drainage strategy to provide attenuation, allow reduction in the volume of the basement attenuation tank and to slow down the run-off from the development.
- 4.3.2. The prospect of a blue-green roof was considered; However, it was deemed impractical due to there being no suitable location for a grass roof (green roof). Space is available for a blue roof on the sixth floor; However, this has been designated for plant and would be difficult to integrate. Provision of a blue roof would have negligible benefits over the attenuation tank located in basement level 1.
- 4.3.3. Therefore, it has been concluded that SuDS cannot be incorporated into the buildings design. Most appropriately attenuation will be provided in a single tank on floor B1.

4.4. ATTENUATION STORAGE

- 4.4.1. The attenuation storage volume for the Proposed Amendments has been based on an impermeable area of 0.23 ha and achieving a discharge rate of 16.4 l/s during the critical 1 in 100 year (plus a 40% allowance for climate change) storm event, whilst ensuring there was no flooding of the development during the storm event in accordance with the requirements within Design and Construction Guidance(DCG) and MCC requirements.
- 4.4.2. The Block A (Phase 3) required attenuation volume calculated using the Source Control Function in Microdrainage is 46.8m³. The pumping rate assumed was 16.4l/s. It is proposed that an 'L' shaped free-standing tank can be provided in the 'tank' room at B1 level. Based on a plan area of 33m² and a height of 1.6m this would provide a storage volume of 52.8m³ providing some allowance for exceedance events.
- 4.4.3. The Drainage Strategy Plan included within Appendix F shows the proposed points of discharge for surface water to the combined sewer network on Bootle Street. This location is indicative only, as results of a CCTV survey will allow for confirmation of the most feasible and convenient connection point.
- 4.4.4. The proposed point of discharge for the Proposed Development will be subject to review during subsequent stages of the design, when inputs from the MEP consultant are available. The drainage strategy will be updated to reflect this; it should be noted that the attenuation and disposal concept is unlikely to change.
- 4.4.5. Coordination between disciplines on the arrangement of drainage is ongoing and likely to continue into the detailed design stage. Proposals currently include for a single surface water connection between the site and the public combined sewer network. If additional connection points are used for the surface water discharge, then the sum of the surface water flows leaving the Block A site must not exceed 16.4 l/s and the attenuation storage may be reconfigured to facilitate this.
- 4.4.6. The attenuation storage for the Proposed Amendments will incorporate a sump to house duty / standby pump which will discharge surface water at the proposed rate of 16.4 l/s.
- 4.4.7. The drainage strategy for the site includes discharge of surface and foul water using gravity systems where possible. However, in both the foul and surface water networks, pumps will be required as part of the strategy. There is a risk that failure of these pumps could lead to overflow in the storage

tanks and flood part of the site. In order to mitigate against this risk the pumps will be provided with a primary and secondary power supply to ensure they can continuously operate.

4.5. ADOPTION AND MAINTENANCE

- 4.5.1. Any drainage runs, pumping stations and attenuation provided for the building will be privately maintained.
- 4.5.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance and routine de-silting of the attenuation storage.

4.6. CONSIDERATION OF CLIMATE CHANGE

- 4.6.1. Calculations in Appendix G demonstrate that the maximum storage volume required for the 1 in 100year +40% storm event is 46.8m³; Therefore, the attenuation storage has sufficient space to accommodate flows. In this event the storage has approximately 100mm of 'freeboard' above the top water level suggesting a good contingency which could be used for exceedance storms.
- 4.6.2. Therefore, the design incorporates the higher allowance for increases in peak rainfall due to climate change according to the Environment Agency Climate Change Allowances (February 2016).). This value is between the central and upper end allowance for a structure with a lifetime between 2061–2125 as specified by Manchester City Council in appendix H.1.
- 4.6.3. The site lies within Flood Zone 1 and is not at risk of flooding from tidal/coastal sources. Therefore, increases in peak river flow or sea level rise are not considered to impact upon the site during the development lifetime.

5. FOUL WATER DRAINAGE STRATEGY

5.1. PROPOSED DISCHARGE POINTS

- 5.1.1. It is proposed to discharge the foul water flows from the Proposed Development into the existing public combined sewer network surrounding the site.
- 5.1.2. The United Utilities pre-development enquiry response, received on 8 November 2022, indicated that foul water drainage from the site may discharge into the public combined sewer network on either Jackson Row (UU's preferred option) or Bootle Street (UU's least preferred option).
- 5.1.3. The proposed connection points, subject to confirmation following CCTV results, are to the public sewers under the adjoining streets of Jackson's Row and Bootle Street, as shown in the drainage strategy layout in Appendix F.
- 5.1.4. Where practicable upper level foul water discharge will drain via proposed gravity lateral sewer connections. Any foul water drainage from the basement (serving back of house areas; refuse areas and plant areas) will drain via a pumped solution which can be sized to accommodate flows from upper levels which cannot drain to the United Utilities combined sewers by gravity. The extent of foul drainage discharging to the basement pumping station will be subject to the internal drainage coordination at the detailed design stage.
- 5.1.5. It has been confirmed by United Utilities on 17 November 2022 that both trade effluent discharge and foul water can discharge via the same lateral connection to the combined sewer on Jackson Row..
- 5.1.6. Any discharges from kitchen / food preparation areas shall pass through a grease separator compliant to BS EN 1825-1:2004.
- 5.1.7. As the building exceeds 20 stories in height ground and first floor appliances should discharge into separate stacks independent of those used by upper floors.

5.2. PROPOSED DISCHARGE RATES

- 5.2.1. The proposed rates of discharge for each of the connection points for Phase 3 are detailed below in table 7 based on figures provided to WSP for all site uses. The Drainage Strategy Plan (Appendix F) indicates the location of these discharge points. The flow rates are estimated based on apportion of building foul discharges to either sewer and need to be confirmed at detailed design stage.
- 5.2.2. There is provision in the Drainage Strategy Plan for collection and pumping of foul water from car parking, plant rooms, cycle store and bin storage areas. These flow rates are likely to be minimal.

Table 7 – Details of sewer outfall pipes

Sewer Outfall	Peak Foul Water Flow Rate (L/s)
01 (Jackson Row)	23.92
02 (Bootle Street)	14.67

- 5.2.3. The total foul water flow from the site is therefore 38.61 l/s.
- 5.2.4. The estimated peak daily foul discharge volume is 247m³.
- 5.2.5. Building Regulations Document H (2010) requires emergency storage to be provided for privately owned foul pumping stations equivalent to the 24 hour volume. We estimate that the emergency storage volume will be between 10-20m³ based on assumed areas of the building draining to the lower basement (B3) level.
- 5.2.6. At detailed design stage the actual emergency storage volume should be confirmed once the internal building drainage design has been finalised. It is imperative to minimise the extent of foul drainage routed to the pumping station is minimised where feasible with preference for gravity discharge. It is proposed that the emergency storage tank will be situated below slab at Basement B3 level immediately upstream of the pump station wet well.
- 5.2.7. The pumping station wetwell should be equipped with a pump failure and high water level alarm to notify the maintenance company responsible for the pump station.
- 5.2.8. The trade effluent discharge consent application needs to be submitted to United Utilities at the detailed design stage when the characteristics of the system are known. The response from United Utilities regarding any restriction on the trade effluent discharge (flow rate or time of discharge) is currently awaited. United Utilities however have confirmed the trade effluent can discharge to the combined sewer on Jackson Row via the same discharge point to be used for domestic sewerage.

5.3. ADOPTION AND MAINTENANCE

- 5.3.1. The foul water collection system is confined to the building of the Proposed Development; and therefore will be privately maintained.
- 5.3.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance.

6. CONCLUSIONS

6.1. SURFACE WATER DRAINAGE STRATEGY

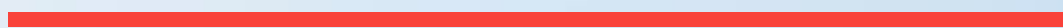
- 6.1.1. Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.
- 6.1.2. There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.
- 6.1.3. Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.
- 6.1.4. Manchester City Council have reaffirmed their policy in their latest consultation response, that flows post development should be restricted to 50% of the pre-development brownfield peak flow rate. The resulting allowable flow for the Proposed Amendments (phase 3) is calculated to be 16.4 l/s. This is also the rate of discharge accepted by United Utilities to discharge to their combined sewerage system.
- 6.1.5. On-site storage with a total volume of up to 46.8m³ is required in order to attenuate flows to the allowable rate in a 1 in 100 year storm with a 40% allowance for climate change. The storage is currently proposed to be located at basement level B1 and thus it is likely that a gravity solution will not be possible for discharge. The storage tank will therefore include a sump and duty / standby pump sets.
- 6.1.6. The arrangement of site drainage and attenuation may involve multiple off-site connections, which will be confirmed following receipt of CCTV results of the public sewer network. A single discharge point is currently proposed to Bootle Street.
- 6.1.7. The majority of the sewers as well as the pumping station and attenuation storage are located within or below the basement and so will be privately maintained.

6.2. FOUL WATER DRAINAGE STRATEGY

- 6.2.1. It is proposed to discharge the foul water flows from the new development into the public combined sewer network.
- 6.2.2. The United Utilities consultation response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network at a single location or multiple locations. United Utilities preference is for the majority of foul drainage to discharge to Jackson Row.
- 6.2.3. Multiple discharge points are currently proposed for foul water from the site to maximise the potential for gravity drainage discharge.
- 6.2.4. A foul pumping station will be required at lower basement level (B3) to collect foul drainage from basement levels and a proportion of upper floors. The pumping station shall be provided with an emergency storage tank to provide 24 hours storage in the event of pump failure. The required storage volume will be determined at detailed design stage once the areas served by the pumping station have been confirmed. It is currently envisaged the storage volume will be in the order of 10-20m³ based on the assumed areas of the building routed to the B3 level.

- 6.2.5. The majority of the site drainage infrastructure is proposed to be located within the building footprint and so will be privately maintained.

Appendix A



SITE LOCATION PLAN

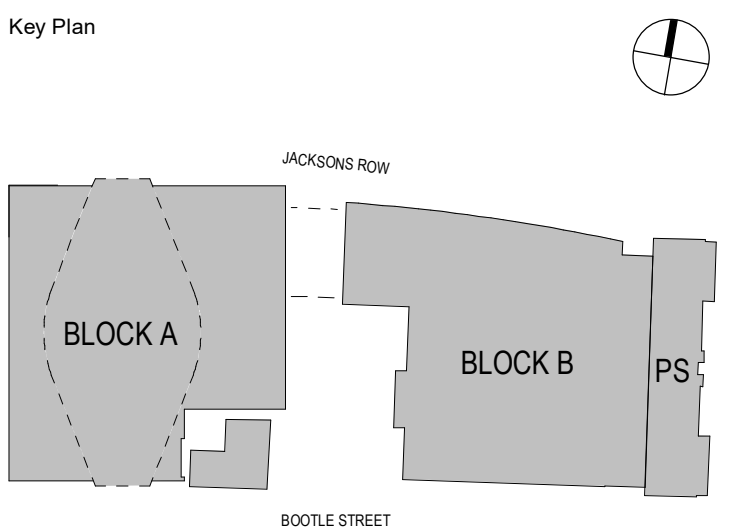
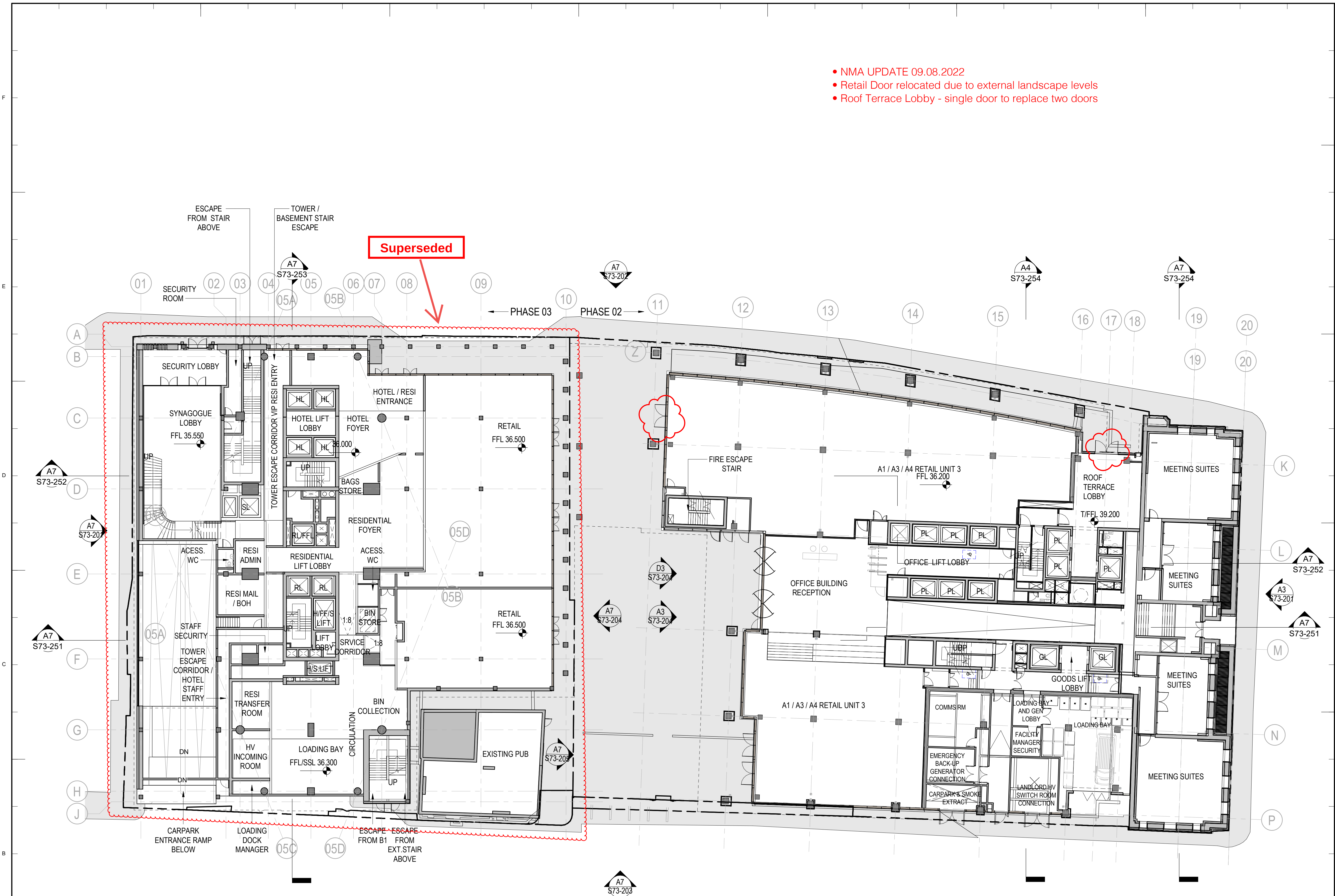


Appendix B.1



SITE PLANS – BLOCK A & B OFFICE
GROUND LEVEL GA PLAN (SOM
DRAWING NO. S73-103)

- NMA UPDATE 09.08.2022
- Retail Door relocated due to external landscape levels
- Roof Terrace Lobby - single door to replace two doors



General Notes

NO:	DATE:	ISSUE:
P06	09/08/22	Non Material Amendment
P05	18/03/22	S96A - Retail Update
P04	04/03/22	S96A Planning Update
P03	06/09/21	S73 Submission
P02	20/08/21	S73 Submission DRAFT
P01	15/11/19	S73 Submission

Status

FOR INFORMATION

Interior Designer	Synagogue Consultant	Design Consultant
BOWLER JAMES BRINDLEY	FDG	hoddler+partners
Civil Engineer	Services Engineer	Fire Engineer
McCurtains	HOARE LEA (H)	DESIGN FIRE
Client	Landscaped Designer	Project Manager
ST!M	p-10	zerum

Architect
SOM
Skidmore, Owings & Merrill, Inc.
The Broadgate Tower, 20 Primrose Street
London EC2A 2EW, UK
Tel: +44 (0)20 7798 1000 Fax: +44 (0)20 7798 1100

Project Name
**ST. MICHAELS DEVELOPMENT,
MANCHESTER**

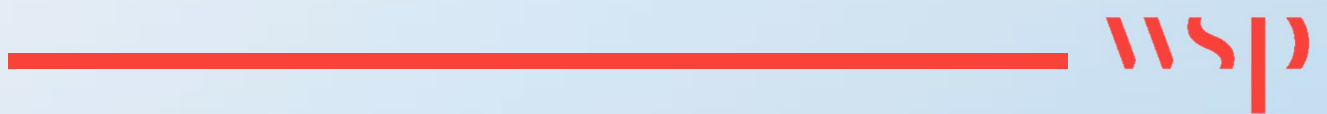
Drawing Title

GROUND LEVEL GA PLAN

Project No	Drawing No	Revision
0601	S73-103	P06
Scale @ A0	As indicated	

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Appendix B.2



SITE PLANS – BLOCK A OFFICE
LEVEL 00 PLAN (HODDER +
PARTNER DRAWING NO. 20200)

DO NOT SCALE
Work to annotated dimensions only. Read drawings in conjunction with relevant specification, Structural Engineers' and Services Engineers' drawings. Confirm all dimensions before commencement of any work on site or fabrication.

Department Legend

- Ancillary
- Hotel
- Hotel (BOH)
- Office
- Residential

P1 Stage 2 Issue. 06.09.22
Rev: Details: Date:

client:
S.T.M.
project:
St Michaels, Phase 03
job number:
0643
status:
Stage 2/3

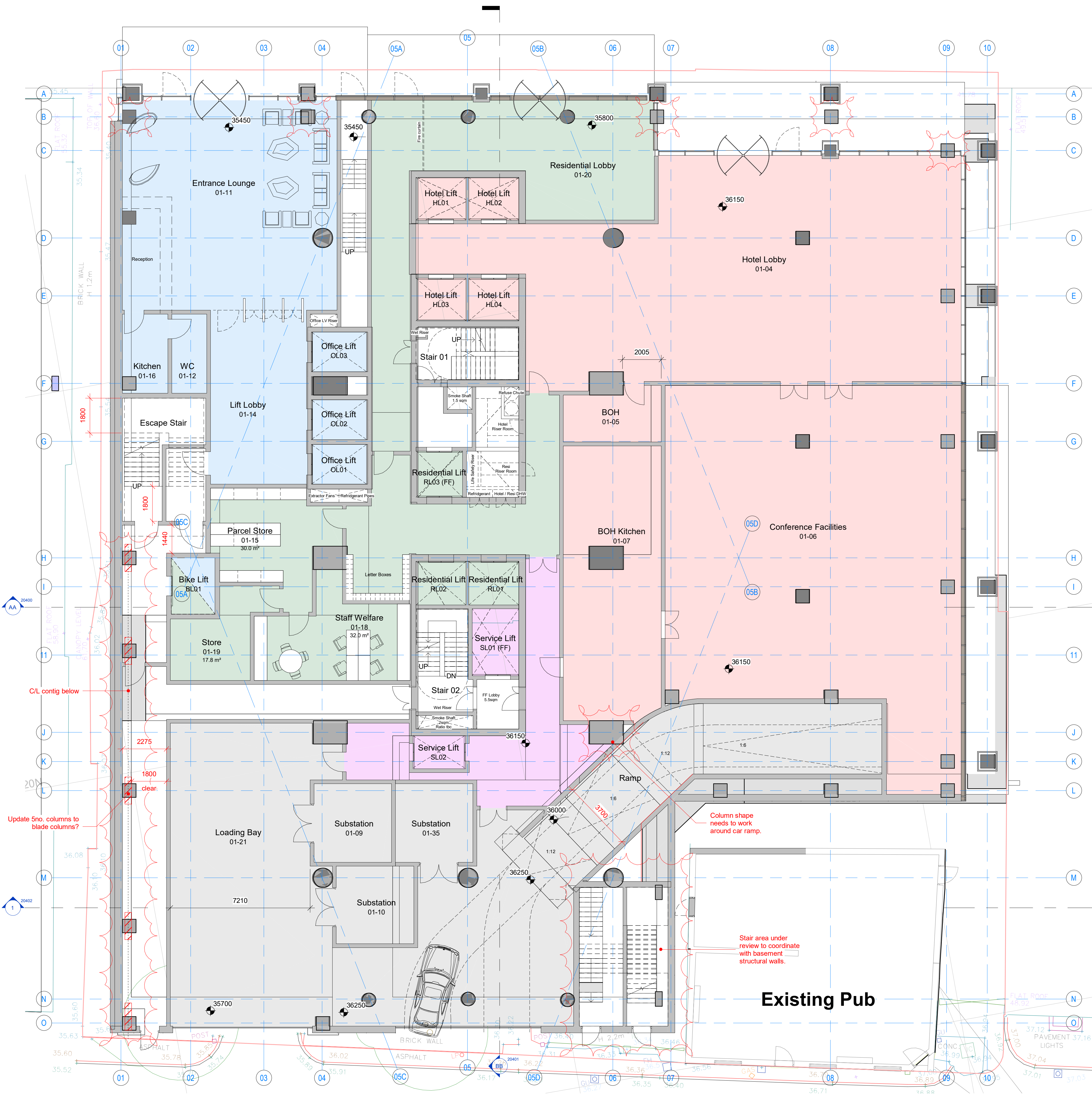
title:
Level 00 Plan

scale: 1 : 100
@ A1
drawing number:
20200

current revision date: 06.09.22
revision: P1

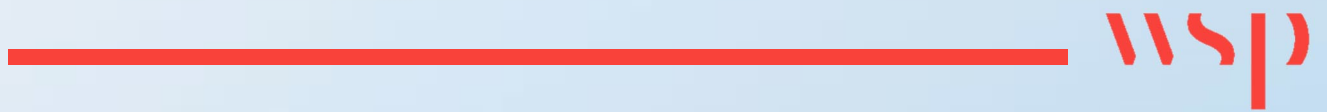
SGI Studios
t: +44(0)161 832 9842
e: mail@hodderandpartners.com
w: www.hodderandpartners.com

hodder+partners



GA Plan - Level 00 - Ground Floor
1 : 100

Appendix B.3



SITE PLANS – BLOCK A OFFICE
LEVEL B1 PLAN (HODDER +
PARTNERS DRAWING NO. 20244)

DO NOT SCALE
Work to annotated dimensions only. Read drawings in conjunction with relevant specification, Structural Engineers' and Services Engineers' drawings. Confirm all dimensions before commencement of any work on site or fabrication.

Notes

Structural coordination in progress. Columns in structural model shown in red and subject to further coordination.

Occupancy Legend

- Ancillary
- BOH
- Hotel
- Office
- Plant
- Residential

P1 Stage 2 Issue.
Rev: Details:

06.09.22
Date:

client:



project:
St Michaels, Phase 03
job number:
0643
status:
Stage 2/3

title:
Level B1 Plan

scale:
As indicated
@ A1

drawing number:
20244

current revision date:
06.09.22

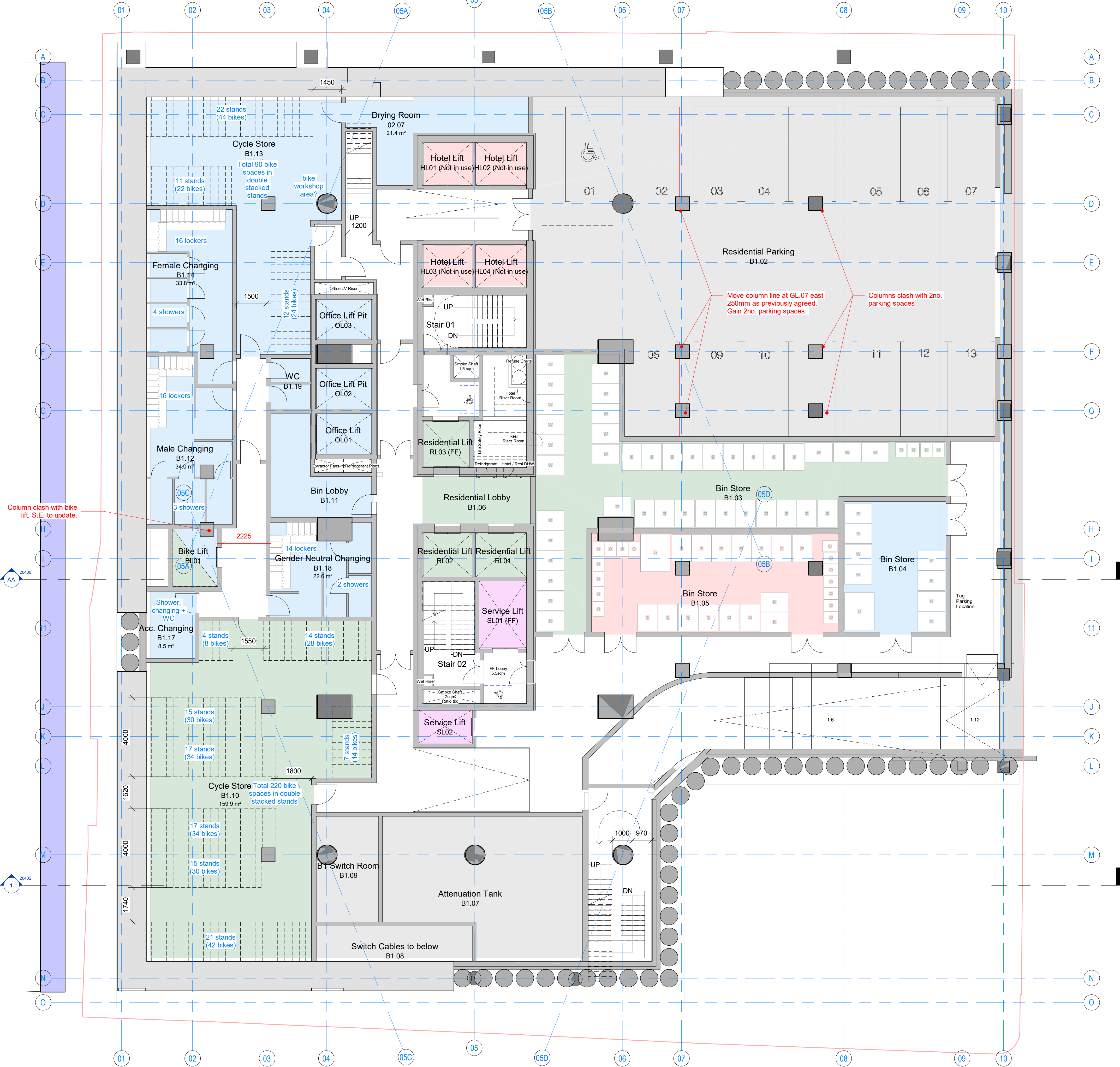
revision:
P1

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GA Plan - Level B1 - Basement

1: 100



Appendix C



TOPOGRAPHICAL SURVEY (SURVEY
SOLUTIONS DRAWING NO.
44705MCLS-01)

Appendix D

wsp
UTILITY SURVEY (LAYER SURVEY
LTD DRAWING NO. 1418_U)

Appendix E

wsp
UNITED UTILITIES SEWER PLANS

**WSP Civils
3 White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL**

FAO: Laura Garner

United Utilities Water Limited
Property Searches
Ground Floor Grasmere House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP
DX 715568 Warrington
Telephone 0370 751 0101

Property.searches@uuplc.co.uk

Your Ref: 70010278
Our Ref: 14/ 1119358
Date: 30/06/2015

Dear Sirs

Location: Police Station/Synagogue Jacksons Row Manchester M2 5GU

I acknowledge with thanks your request dated 30/06/15 for information on the location of our services.

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

I attach General Condition Information sheets, which details contact numbers for additional services (i.e. new supplies, connections, diversions) which we are unable to deal with at this office. In addition you should ensure they are made available to anyone carrying out any works which may affect our apparatus.

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 telephone us on 0370 7510101.

Yours Faithfully,



Sue McManus
Operations Manager
Property Searches

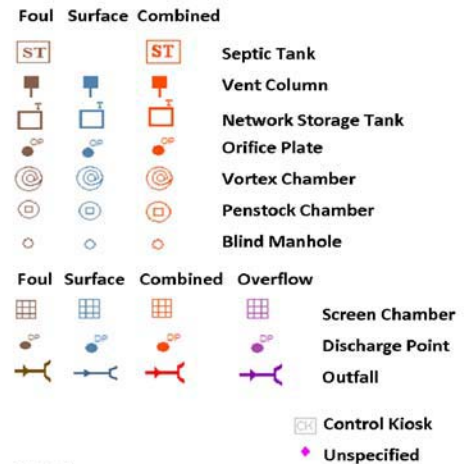
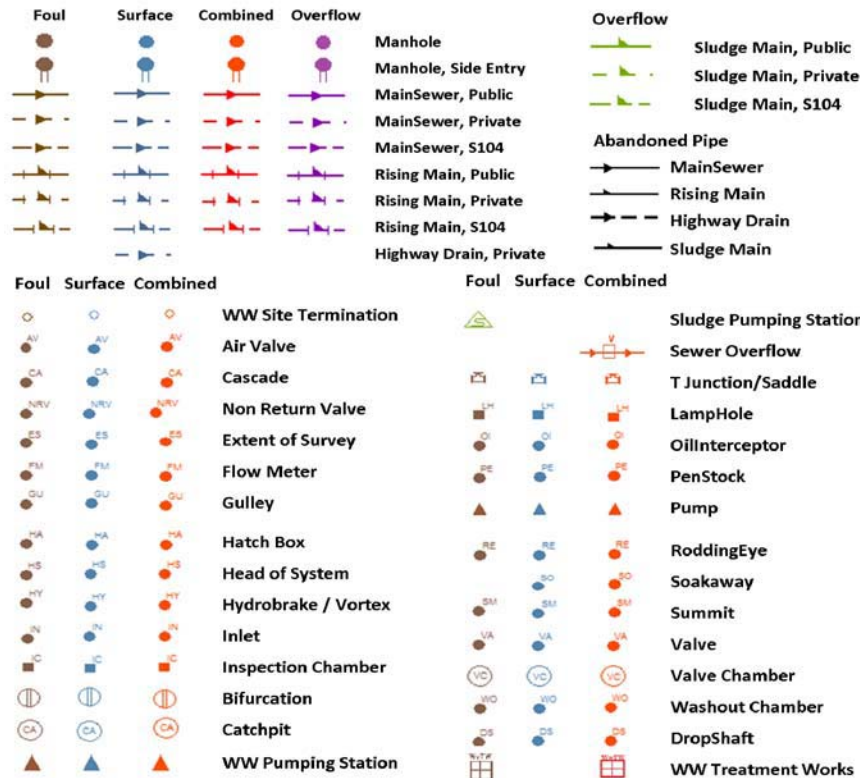
TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

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:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

WASTE WATER SYMBOLOGY



Legend			
MANHOLE FUNCTION		SEWER SHAPE	
FO	Foul	CI	Circular
SW	Surface Water	EO	Egg
CO	Combined	OV	Oval
OV	Overflow	FT	Flat Top
		RE	Rectangular
		SQ	Square
		TR	Trapezoidal
		AR	Arch
		BA	Barrel
		HO	HorseShoe
		UN	Unspecified
SEWER MATERIAL			
AC	Asbestos Cement	DI	Ductile Iron
BR	Brick	VC	Vitrified Clay
CO	Concrete	PP	Polypropylene
CSB	Concrete Segment	PF	Pitched Fibre
CSU	Concrete Segment	MA	Masonry, Coursed
CC	Concrete Box Culverted	MA	Masonry, Random
PSC	Plastic / Steel	RP	Reinforced Plastic
GR	Glass Reinforced	CI	Cast Iron
GRP	Glass Reinforced	SI	Spun Iron
PVC	Polyvinyl Chloride	ST	Steel
PE	Polyethylene	U	Unspecified

CLEAN WATER SYMBOLOGY

PIPE WORK



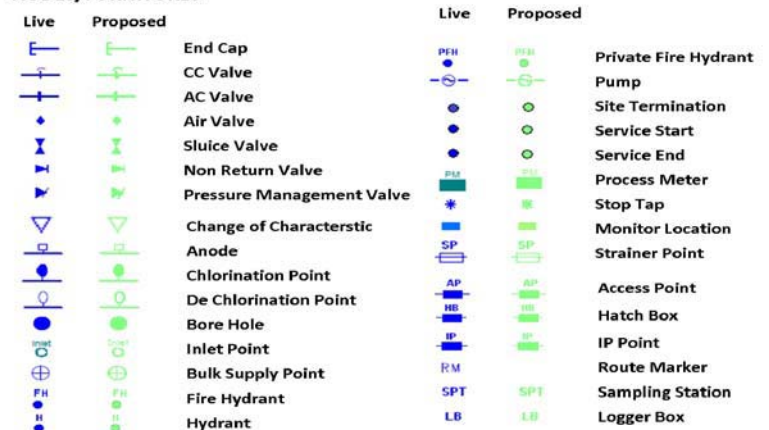
ABANDONED PIPE



PROPERTY TYPES



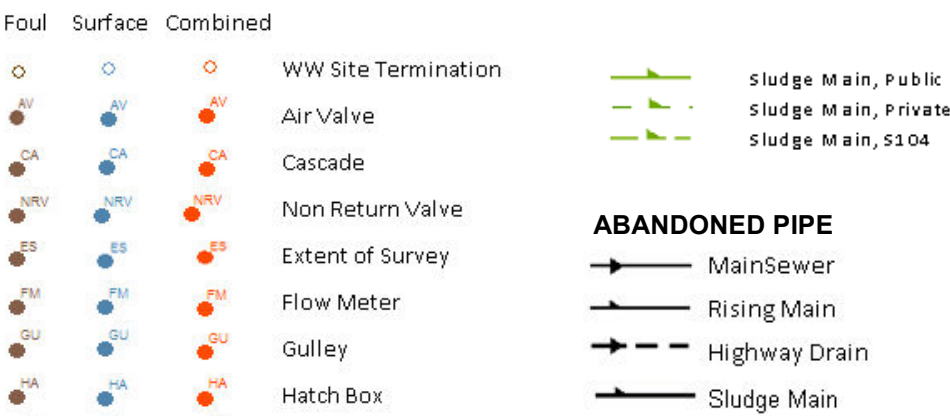
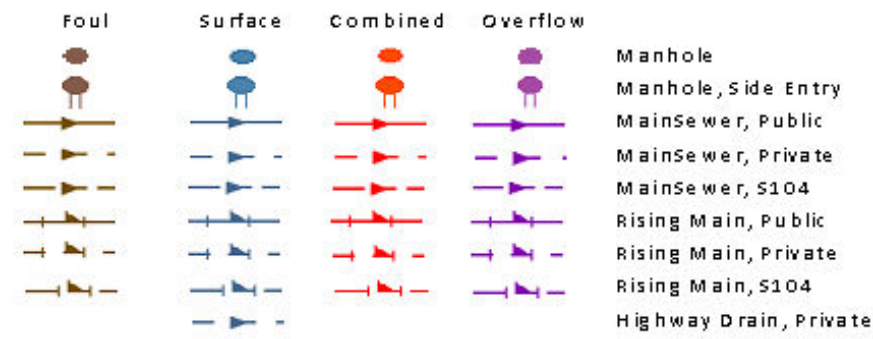
NODES/FURNITURES



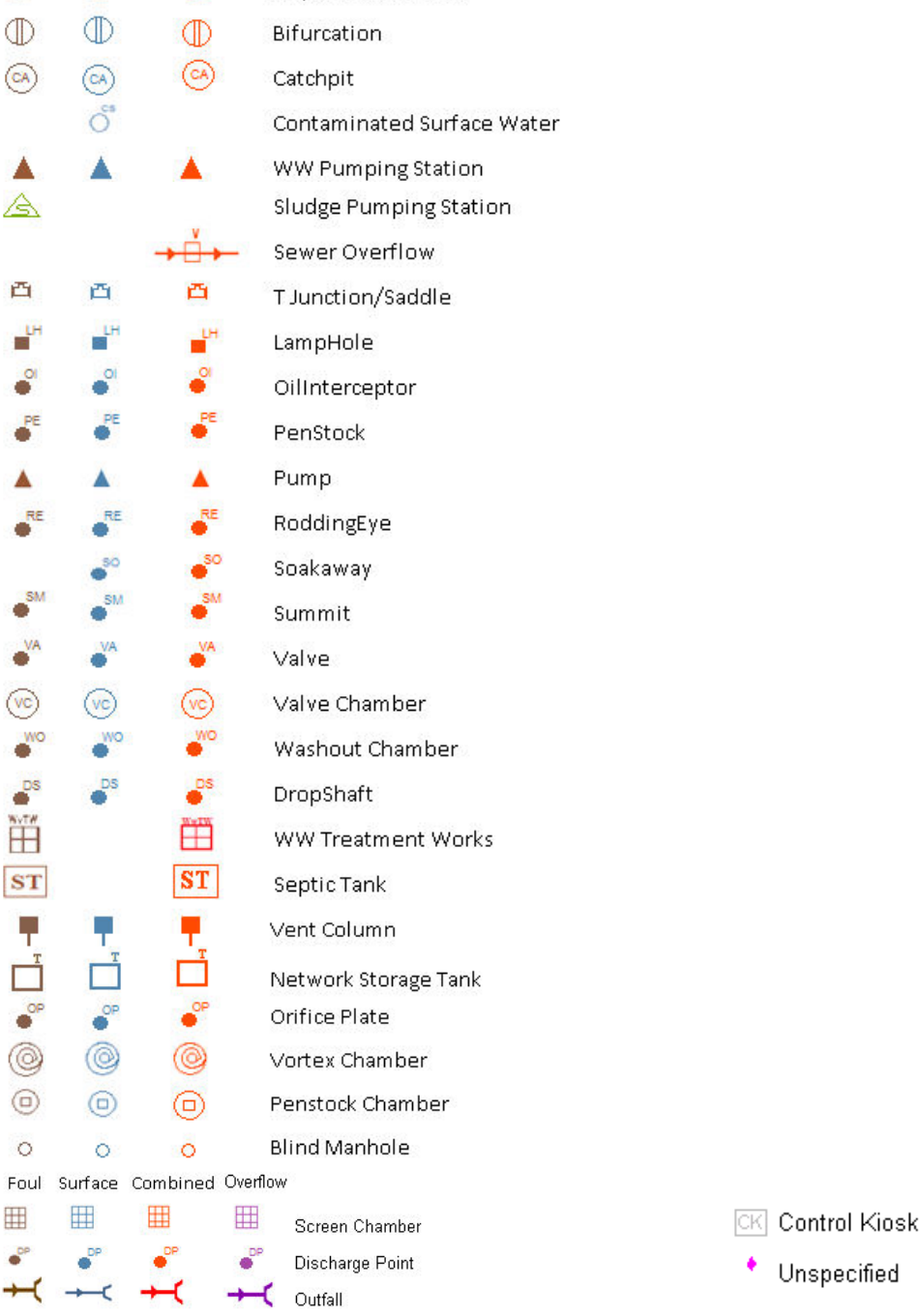
Legend	
MATERIAL TYPES	LINING TYPES
AC ASBESTOS CEMENT	CL CEMENT LINING
CI CAST IRON	TB TAR OR BITUMEN
CU COPPER	ERL EPOXY RESIN
CO CONCRETE	
DI DUCTILE IRON	INSERTION TYPES
GI GALVANISED IRON	DD DIE DRAWN
GR GREY IRON	DR DIRECTIONAL DRILLING
OT OTHERS	MO MOLING
PB LEAD	PI PIPELINE
PV UPVC	SL SLIP LINED
SI SPUN IRON	
ST STEEL	
UN UNKNOWN	
PE POLYETHYLENE	

Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad	Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad
4091	CO		0	220	380	EG	BR	12.04											
4115	CO		0	220	380	EG	BR	10											
4122	CO																		
4123	CO																		
4205	CO		0	500	330	EG	BR	32.25											
4206	CO		0	525		CI	CO	24.33											
4207	CO		0	500	330	EG	VC	21.21											
4305	CO		0	530	830	EG	BR	20.62											
5018	CO		0	300		CI	VC	43.66											
5090	CO																		
5091	CO																		
5108	CO		0	2300		CI	BR	81.36											
5207	CO																		
5210	CO																		
5309	CO																		
5312	CO																		
5314	CO																		
5315	CO																		
6005	CO																		
6017	CO																		
6209	CO		0	830	430	EG	BR	44.92											
6210	CO		0	500		CI	CO	36.4											
6211	CO		0	430	700	EG	BR	10.3											
6216	CO																		
6219	CO																		
6261	CO		0	430	830	UN	BR	7.07											
6292	CO																		
6313	CO																		
6314	CO																		
6315	CO																		
6390	CO																		
7014	CO																		
7107	CO																		
7210	CO																		
7215	CO																		
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7329	CO																		
7390	CO																		
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8010	CO																		
8012	CO																		
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8110	CO																		
8112	CO																		
8190	CO		0	610	510	EG	VC	5											
8207	CO																		
8212	CO																		
8290	CO																		
8291	CO		0	320	400	EG	VC	20.4											
8301	CO																		
8302	CO																		
8303	CO																		
8305	CO																		
8108	CO																		
9214	CO																		
9215	CO																		
8707	SW																		
8709	CO																		
8811	CO																		
8902	CO																		
8115	CO																		
4701	CO		31	330	630	550	UN	BR	24.72										
336	CO		0	870	630	EG	BR	37.93											

WASTE WATER SYMBOLOGY



ABANDONED PIPE



LEGEND

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available.

The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

OS Sheet No:

Scale: 1: 1250 Date: 30/06/2015

372 Nodes

Sheet 2 of 2



SEWER RECORDS

OS Sheet No:

Approximately Scale: 1: 1250 Date: 30/06/2015

Printed By: Property Searches

Conditions and Information regarding wastewater network

These general conditions and precautions apply to the wastewater network of United Utilities

Please ensure that a copy of these conditions is passed to your representative and contractor on site.

- 1 United Utilities provides the approximate locations of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer culvert or drain, private connections from properties to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual positions and/or depths being different from those indicated. The records do indicate the position of the nearest known public sewer from which the likely length of private connections can be estimated together with the need for any off site drainage rights or easements.
- 2 Special requirements relative to our sewers may be indicated. United Utilities employees or its contractors will visit any site at reasonable notice to assist in the location of its underground sewers and advise any precautions that may be required to obviate any damage. To arrange a visit or for further information regarding new supplies, connections, diversions, costing, or any notification required under these General Conditions, please call us on **0345 602 0406**.
- 3 Where public sewers are within a site which is to be developed and do not take any drainage from outside the area, they are from an operational viewpoint redundant. The developer must identify all redundant sewers affected by the development and apply to United Utilities in writing for these sewers to be formally closed. The developer shall bear all related costs of the physical abandonment work.
- 4 Public sewers within the site that are still live outside the area will be subject to a "Restricted Building zone". This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to public sewers must be maintained at all times and no interference to manholes will be permitted during construction work.
5. Where there is a public sewer along the line of a proposed development/building, arrangements shall be made by the developer at his cost to divert the sewer around the development. Where this is not possible and as a last resort, a "Building Over Agreement" will need to be completed under section 18 of the Building Act 1984. The developer shall design building foundations to ensure that no additional loading is transferred to the sewer and submit such details both to the Local Authority's Building Control Officer and to United Utilities for approval/acceptance. United Utilities on a rechargeable basis would normally undertake all aspects of design work associated with the diversion of any part of the operational wastewater network. For further advice please email wastewaterdeveloperservices@uuplc.co.uk
6. Where there is a non-main river watercourse/culvert passing through the site, the landowner has the responsibility of a riparian owner for the watercourse/culvert and is responsible for the maintenance of the fabric of the culvert and for all works involved in maintaining the unrestricted flow through it. Building over the watercourse/culvert is not recommended. The developer must contact the local authority before any works are carried out on the watercourse/culvert. Where it is necessary to discharge surface water from the site into the watercourse/culvert the developer shall make an assessment of the available capacity of the watercourse/culvert (based on a 1 in 50 year event) and ensure that the additional flow to be discharged into the watercourse/culvert will not cause any flooding. In appropriate cases, flooding may be prevented by on-site storage. The developer shall submit the relevant details required to substantiate his development proposals. Details of any outfall proposed shall also be submitted to the Environment Agency, PO Box 12, Richard Fairclough House, Knutsford Road, Warrington, Cheshire, WA4 1HT for their approval.
7. Where there is a main river watercourse/culvert passing through the site, the developer shall submit all proposals affecting the river to the Environment Agency at the address stated in paragraph 6 for approval/acceptance.

8. Your attention is drawn also to the following:

Private drains or sewers which may be within the site.

On 1 October 2011 all privately owned sewers and lateral drains which communicate with (that is drain to) an existing public sewer as at 1 July 2011 will become the responsibility of the sewerage undertaker. This includes private sewers upstream of pumping stations that have yet to transfer, but excludes lengths of sewer or drain that are the subject of an on-going appeal or which have been excluded from transfer as a result of an appeal or which are on or under land opted-out by a Crown body. The transfer specifically excludes sewers and lateral drains owned by a railway undertaker. Sewers upstream of such assets, however, are transferred. Such assets may not be recorded on the public sewer record currently as it was not a requirement to keep records of previously private sewers and drains.

Applications to make connections to the public sewer.

The developer must write to United Utilities requesting an application form that must be duly completed and returned. No works on the public sewer shall be carried out until a letter of consent is received from United Utilities.

Sewers for adoption If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with "Sewers for Adoption", Seventh Edition, published by the Water Research Centre (2001) Plc, Henley Road, Medmenham, PO Box 16, Marlow, Buckinghamshire, SL7 2HD will be required, taking into consideration any departures from the general guide stipulated by United Utilities.

Further consultation with United Utilities.

Developers wishing to seek advice or clarification regarding sewer record information provided should contact United Utilities to arrange an appointment. A consultation fee may be charged, details of which will be made available at the time of making an appointment.

9. Combined sewers, foul sewers, surface water sewers, and pumped mains. These are shown separately in a range of colours or markings to distinguish them on our drawings, which are extracts from the statutory regional sewer map. A legend and key is provided on each extract for general use, although not all types of sewer will be shown on every extract.

Combined sewers shown coloured red carries both surface water and foul sewage, especially in areas where there is no separate surface water sewerage system.

Foul sewers coloured brown may also carry surface water and there may be no separate surface water system indicated in the immediate area. Both combined and foul sewers carry wastewater to our treatment works before it can safely be returned to the environment.

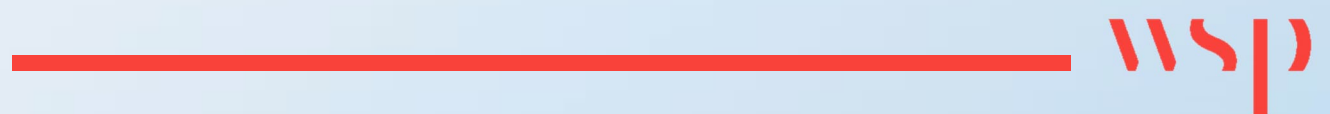
Surface water sewers coloured blue on our drawings are intended only to carry uncontaminated surface water (e.g. rainfall from roofs, etc) and they usually discharge into local watercourses. It is important for the protection of the environment and water quality that only uncontaminated surface water is connected to the surface water sewers. Improper connections to surface water sewers from sink wastes, washing machines and other domestic use of water can cause significant pollution of watercourses.

Pumped mains, rising mains and sludge mains will all be subject to pumping pressures and are neither suitable nor available for making new connections.

Highway drains, when included, show as blue and black dashed lines. Highway drains are not assets belonging to United Utilities and are the responsibility of local authorities.

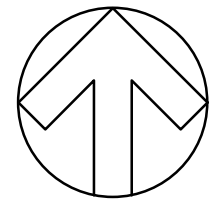
1. For information regarding future proposals for construction of company apparatus please write to United Utilities, PO Box 453, Warrington, WA5 3QN.
2. For information regarding easements, deeds, grants or wayleaves please write to United Utilities Property Solutions, Coniston Buildings, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3UU
Tel: 01925 731 365

Appendix F



DRAINAGE LAYOUT BLOCK A
(BASEMENT) (HODDER + PARTNERS
NO. STMJR-WSP-B1-XX-DR-D-P03)
AND (HODDER + PARTNERS
NO. STMJR-WSP-B1-XX-DR-D-000002)

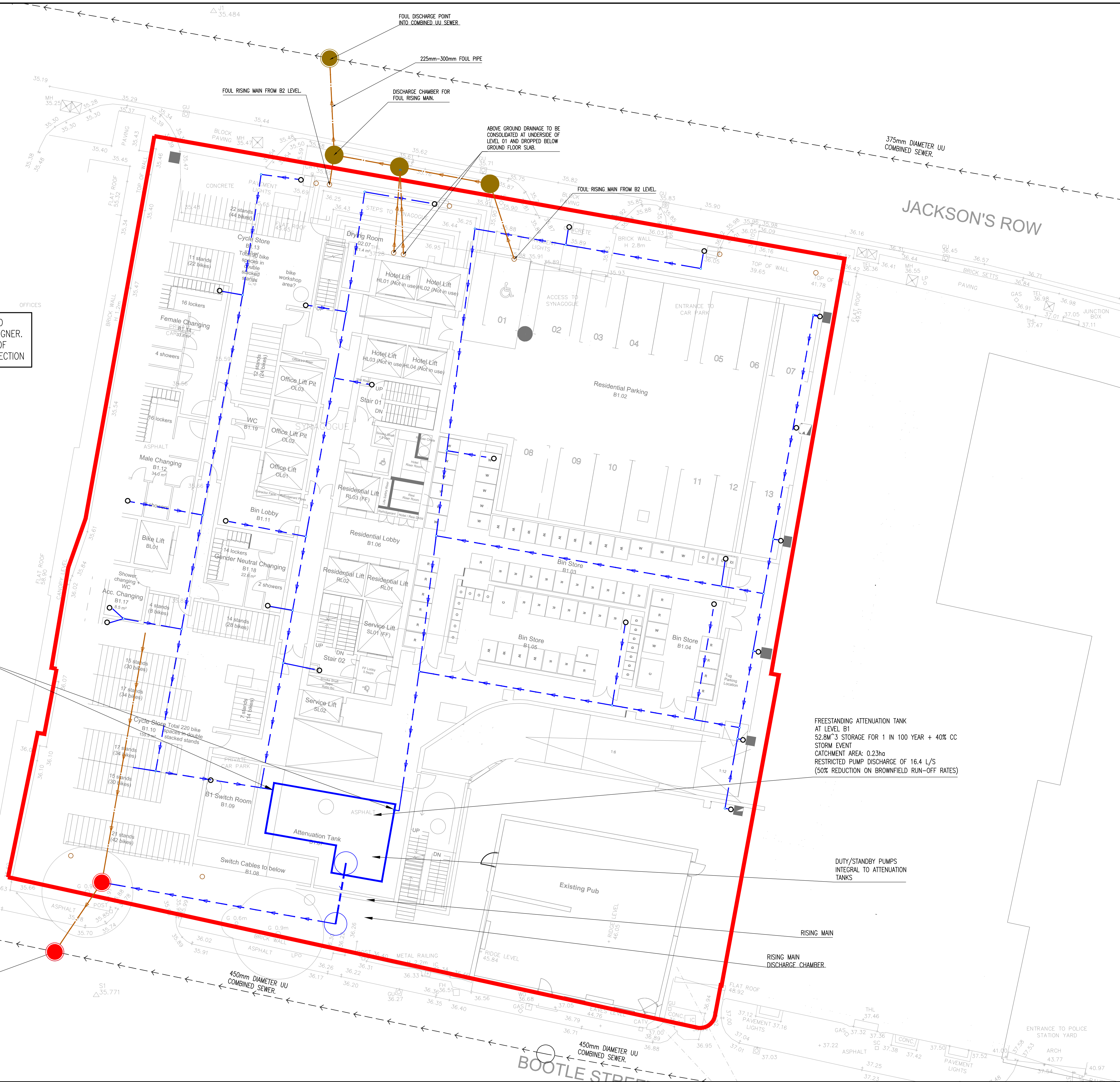
File name: \\UK.VS\GROUP\CONCENTRAL\DATA\PROJECTS\701000007010665-ST MICHAELS_S2-MODIFICATIONS_20203.WPD\DRAWINGS\STRATEGY\DRAINAGE STRATEGY\B1-XX-DR-D-P01.DWG, printed on 25 November 2022 10:51:38, by Abood, James



INDICATIVE DRAINAGE LAYOUT SUBJECT TO
DETAILED DESIGN BY BUILDING MEP DESIGNER.
THIS DRAWING SHOWS THE PRINCIPALS OF
SURFACE WATER AND FOUL WATER COLLECTION

ABOVE FLOOR
RAINWATER COLLECTION
PIPES VERTICAL DROP
INTO TANK

CONNECTION TO
UU COMBINED SEWER
WITH PROPOSED COMBINED
MANHOLE.



DO NOT SCALE	
KEY	
	FOUL DRAIN
	SURFACE WATER DRAIN (ABOVE GROUND)
	COMBINED SEWER (UNITED UTILITIES)
	FOUL WATER MANHOLE
	SURFACE WATER MANHOLE
	COMBINED SEWER MANHOLE (UNITED UTILITIES)
	ATTENUATION TANK
	FOUL DRAIN (VERTICAL)
	SURFACE WATER DRAIN (VERTICAL)

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

P03	25/11/2022	JPA	ADJUSTED BOTH FOUL AND SURFACE WATER MAINS TO BOOTH STREET. RE-ROUTED FOUL RISING MAIN TO JACKSON ROW.	N5	N5
P02	11/11/2022	JPA	RE-ROUTED THE FOUL RISING MAIN TO JACKSON ROW. RE-SIZED EXISTING UU SEWERS.	N5	N5
P01	26/10/2022	JPA	FIRST ISSUE	N5	N5
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S2 - FOR INFORMATION

3 Wellington Place, Leeds, LS1 4AP, UK
T+ 44 (0) 113 395 6200, F+ 44 (0) 113 395 6201
wsp.com

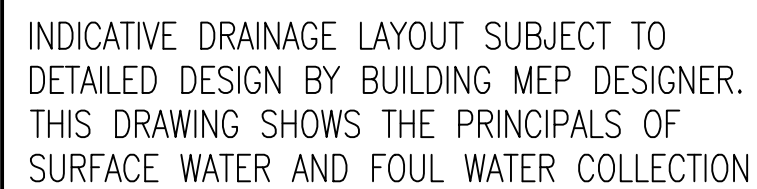
CLIENT: ST.M

ARCHITECT: HODDER + PARTNERS

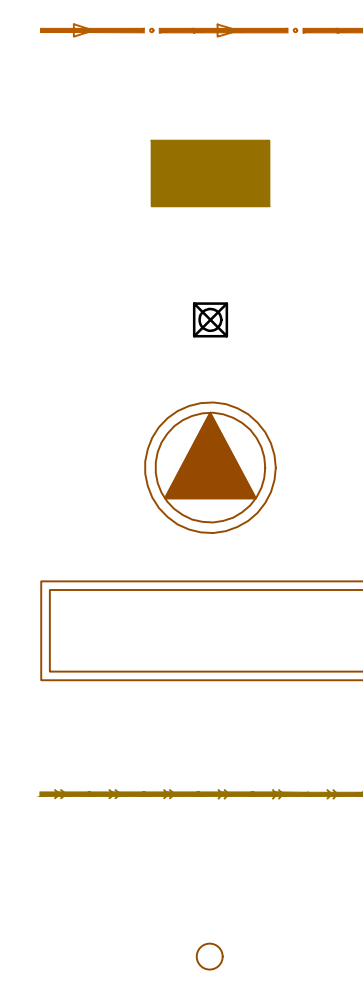
SITE/PROJECT: ST MICHAELS, JACKSON ROW
PHASE 3

TITLE: DRAINAGE STRATEGY
B1 AND GROUND LEVEL

SCALE @ A1:	1:125	CHECKED:	NS	APPROVED:	NS
PROJECT NO:	70101665	DESIGNED:	JPA	DRAWN:	JPA
DRAWING NO:	STMJR-WSP-B1-XX-DR-D-P03	DATE:	November 22	REV:	P02
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KEY



FOUL DRAIN
FOUL WATER MANHOLE
FOUL GULLEY
FOUL PUMP STATION
FOUL EMERGENCY STORAGE TANK
FOUL WATER RISING MAIN
FOUL WATER DRAIN (VERTICAL)

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

P03	23/11/2022	JPA	RELOCATED PUMP AND FOUL EMERGENCY STORAGE TANK. ALTERED FOUL SYSTEM TO FACILITATE THE NEW PUMP LOCATION.	N5	N5
P02	11/11/2022	JPA	RE-ROUTED THE FOUL RISING MAIN TO JACKSON ROW.	N5	N5
P01	26/10/2022	JPA	FIRST ISSUE	N5	N5
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S2 - FOR INFORMATION



CLIENT: ST.M

ARCHITECT: HODDER + PARTNERS

SITE/PROJECT:

ST MICHAELS, JACKSON ROW
PHASE 3

TITLE: DRAINAGE STRATEGY
B3 (LOWER BASEMENT)

SCALE @ A1: 1:125	CHECKED: NS		APPROVED: NS
PROJECT NO: 70101665	DESIGNED: JPA	DRAWN: JPA	DATE: November 22

DRAWING No:	STMJR-WSP-B3-XX-DR-D-P03	REV:	P02
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Appendix G

DRAINAGE CALCULATIONS



WSP Group Ltd				Page 1	
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Date 20/10/2022 09:17		Designed by UKNLS001			
File Phase 3 - 1 in 100 yr +...		Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	33.848	1.048	16.4	34.6	O K
30 min Summer	33.983	1.183	16.4	39.0	O K
60 min Summer	34.001	1.201	16.4	39.6	O K
120 min Summer	33.862	1.062	16.4	35.0	O K
180 min Summer	33.660	0.860	16.4	28.4	O K
240 min Summer	33.464	0.664	16.4	21.9	O K
360 min Summer	33.138	0.338	16.4	11.2	O K
480 min Summer	32.920	0.120	16.4	4.0	O K
600 min Summer	32.817	0.017	16.4	0.5	O K
720 min Summer	32.807	0.007	16.4	0.3	O K
960 min Summer	32.801	0.001	16.4	0.3	O K
1440 min Summer	32.801	0.001	12.3	0.3	O K
2160 min Summer	32.800	0.000	6.3	0.5	O K
2880 min Summer	32.800	0.000	5.1	0.4	O K
4320 min Summer	32.800	0.000	3.7	0.0	O K
5760 min Summer	32.800	0.000	2.9	0.0	O K
7200 min Summer	32.800	0.000	2.4	0.0	O K
8640 min Summer	32.800	0.000	2.1	0.0	O K
10080 min Summer	32.800	0.000	1.9	0.0	O K
15 min Winter	34.029	1.229	16.4	40.5	O K
30 min Winter	34.213	1.413	16.4	46.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	118.613	0.0	49.8	16	
30 min Summer	79.413	0.0	66.4	27	
60 min Summer	50.812	0.0	84.8	44	
120 min Summer	31.468	0.0	103.8	78	
180 min Summer	23.466	0.0	117.5	112	
240 min Summer	18.940	0.0	127.6	142	
360 min Summer	13.882	0.0	139.2	202	
480 min Summer	11.143	0.0	148.4	256	
600 min Summer	9.389	0.0	154.8	308	
720 min Summer	8.158	0.0	162.7	460	
960 min Summer	6.531	0.0	172.7	522	
1440 min Summer	4.764	0.0	185.4	646	
2160 min Summer	3.468	0.0	200.8	996	
2880 min Summer	2.766	0.0	219.1	1392	
4320 min Summer	2.007	0.0	242.7	0	
5760 min Summer	1.596	0.0	257.4	0	
7200 min Summer	1.336	0.0	269.3	0	
8640 min Summer	1.154	0.0	279.2	0	
10080 min Summer	1.020	0.0	287.9	0	
15 min Winter	118.613	0.0	55.7	16	
30 min Winter	79.413	0.0	74.7	29	
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WSP Group Ltd				Page 2	
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Date 20/10/2022 09:17		Designed by UKNLS001			
File Phase 3 - 1 in 100 yr +...		Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	34.218	1.418	16.4	46.8	O K
120 min Winter	33.965	1.165	16.4	38.5	O K
180 min Winter	33.638	0.838	16.4	27.7	O K
240 min Winter	33.325	0.525	16.4	17.3	O K
360 min Winter	32.889	0.089	16.4	3.0	O K
480 min Winter	32.809	0.009	16.4	0.3	O K
600 min Winter	32.801	0.001	12.3	0.3	O K
720 min Winter	32.801	0.001	16.4	0.3	O K
960 min Winter	32.801	0.001	16.4	0.3	O K
1440 min Winter	32.800	0.000	6.3	0.3	O K
2160 min Winter	32.800	0.000	4.6	0.5	O K
2880 min Winter	32.800	0.000	3.7	0.0	O K
4320 min Winter	32.800	0.000	2.7	0.0	O K
5760 min Winter	32.800	0.000	2.1	0.0	O K
7200 min Winter	32.800	0.000	1.8	0.0	O K
8640 min Winter	32.800	0.000	1.5	0.0	O K
10080 min Winter	32.800	0.000	1.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	50.812	0.0	96.0	48	
120 min Winter	31.468	0.0	119.2	84	
180 min Winter	23.466	0.0	130.9	120	
240 min Winter	18.940	0.0	141.4	150	
360 min Winter	13.882	0.0	155.0	200	
480 min Winter	11.143	0.0	166.5	242	
600 min Winter	9.389	0.0	173.8	372	
720 min Winter	8.158	0.0	181.1	492	
960 min Winter	6.531	0.0	191.1	462	
1440 min Winter	4.764	0.0	200.3	842	
2160 min Winter	3.468	0.0	231.8	1072	
2880 min Winter	2.766	0.0	249.8	0	
4320 min Winter	2.007	0.0	271.9	0	
5760 min Winter	1.596	0.0	288.3	0	
7200 min Winter	1.336	0.0	301.6	0	
8640 min Winter	1.154	0.0	312.8	0	
10080 min Winter	1.020	0.0	322.4	0	
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WSP Group Ltd		Page 3																																	
. . .																																			
Date 20/10/2022 09:17	Designed by UKNLS001																																		
File Phase 3 - 1 in 100 yr +...	Checked by																																		
XP Solutions		Source Control 2019.1																																	
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.360</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.224 <table> <thead> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4</td> <td>0.224</td> </tr> </tbody> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	18.000	Shortest Storm (mins)	15	Ratio R	0.360	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)		Area	From:	To:	(ha)	0	4	0.224
Rainfall Model	FSR	Winter Storms	Yes																																
Return Period (years)	100	Cv (Summer)	0.750																																
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From:	To:	(ha)																																	
0	4	0.224																																	
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WSP Group Ltd		Page 4																				
		Micro Drainage																				
Date 20/10/2022 09:17 File Phase 3 - 1 in 100 yr +...	Designed by UKNLS001 Checked by																					
XP SolutionsSource Control 2019.1																						
Model Details Storage is Online Cover Level (m) 34.800 Tank or Pond Structure Invert Level (m) 32.800 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>33.0</td><td>1.600</td><td>33.0</td><td>1.601</td><td>0.0</td></tr></tbody></table> Pump Outflow Control Invert Level (m) 32.800 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.001</td><td>16.4000</td><td>2.000</td><td>16.4000</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	33.0	1.600	33.0	1.601	0.0	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.001	16.4000	2.000	16.4000
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																	
0.000	33.0	1.600	33.0	1.601	0.0																	
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																			
0.001	16.4000	2.000	16.4000																			
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Appendix H.1

wsp
CORRESPONDENCE – MANCHESTER
CITY COUNCIL

From: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Sent: 16 November 2022 14:31
To: Abbott, James
Subject: RE: St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

Follow Up Flag: Follow up
Flag Status: Flagged

Hi James,

I hope you're well. Thank you for providing this information.

This site has been reviewed internally. The LLFA would not permit discharge to a highway drain from this development.

We have no records of the highway drains in this area, their condition or their capacity tolerances. As a result, the highway drainage network is reserved for highway drainage only.

Please refer to our SuDS Guidance for Developers which we recommend is reviewed to guide your drainage strategy. We promote the use of Sustainable Drainage infrastructure and would welcome early discussion with regards to the drainage layout.

Kind regards
Talha Esmail
Flood Risk Engineer – Lead Local Flood Authority
E: talha.esmail@manchester.gov.uk 

From: Abbott, James <James.Abbott@wsp.com>
Sent: 11 November 2022 11:04
To: Talha Esmail <Talha.Esmail@manchester.gov.uk>
Subject: FW: St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

You don't often get email from james.abbott@wsp.com. [Learn why this is important](#)

From: Abbott, James
Sent: 09 November 2022 10:26
To: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Subject: RE: St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

Good Morning Talha,

Thank you for your response.

After consultation with United Utilities, their hierarchy of disposal requires consideration of discharge of surface water into highway drains; Therefore, I am requesting the email address of Manchester City Council's Highways department.

If you require any further information, please feel free to reach out to me.

Kind regards,
James Abbott



James Abbott
Graduate Engineer

First Floor
3 Wellington Place
Leeds
LS1 4AP

wsp.com

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From: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Sent: 08 November 2022 13:43
To: Abbott, James <James.Abbott@wsp.com>
Subject: RE: St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

Hi James,

Thank you for your email. I hope you're well.

As stated in the National Planning Practice Guidance, the aim should be to discharge surface water run-off as high up the drainage hierarchy, as reasonably practicable:

1. Into the ground (infiltration);
2. To a surface water body;
3. To a surface water sewer
4. To a combined sewer

The LLFA only comment on Surface Water related queries.

What is the design life of this development?

Please note there are new updates for peak rainfall climate change allowances in Flood risk assessments. For further details on climate change allowances please visit - [Flood risk assessments: climate change allowances - GOV.UK \(www.gov.uk\)](#)

Type in your postcode to determine the % cc - [Climate change allowances for peak river flow in England \(data.gov.uk\)](#)

Any proposed surface water drainage will need to be restricted to greenfield rates or by at least 50% from the existing rates where appropriate.

MCC offer a Data Screening Service. Please find attached letter detailing our Service. If you would like to instruct a data screening, please submit a request at the following link: <https://manchester.civicapayforms.co.uk/Sales/LaunchInternet.aspx?saleform=llfa>

Please also find attached our SuDS Guidance for Developers which we recommend is reviewed to guide your drainage strategy. We promote the use of Sustainable Drainage infrastructure and would welcome early discussion with regards to the drainage layout. Please note surface water from the development must not drain onto the highway or any third-party land.

Should you have further queries about your proposal, please do not hesitate to contact us.

Kind regards
Talha Esmail
Flood Risk Engineer – Lead Local Flood Authority
E: talha.esmail@manchester.gov.uk 

From: Abbott, James <James.Abbott@wsp.com>
Sent: 26 October 2022 09:37
To: Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Subject: St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

You don't often get email from james.abbott@wsp.com. [Learn why this is important](#)

Dear Sir/Madam,

Good Afternoon,

St Michaels Phase 3, Jackson Row, Manchester, M2 5ND

I am emailing in regards to the proposed development of St Michaels street, Jackson row, highlighted in the site location document attached.

WSP previously submitted a pre-planning enquiry in 2016 for the whole site (phase 2 and 3). Subsequently Phase 2 (125549/JO/2019) has been granted planning and has a discrete foul and surface water drainage system. Therefore this enquiry is for the Phase 3 area only.

The last consultation undertaken with Manchester city council was in 2015. In the last consultation it was stated that the surface water run-off rates should be subject to a 50% reduction of brownfield run-off rates, as depicted in the attached document.

WSP would like to Request if there is any change to the above policy.

Our current proposed drainage strategy is outlined below. This assumes the 50% reduction in brownfield run-off rates still apply.

Surface Water

On floor B1 (Upper basement level) there is a surface water pipe network that will flow underneath the slabs. All of the Surface Water flow from the floors above will traverse down via a gravity pipe network to this level where it will be collected in an attenuation tank of 52.8M³ capacity. The proposed Surface Water flow for the full site(Phase 2 and 3) is 39.8 l/s with 16.4 l/s being the available flow rate for Phase 3 (23.4 l/s already allocated for Phase 2). A pump will be located in the attenuation tank and using a rising main will transfer the surface water to the UU combined sewer on Bootle street. A rising main discharge chamber will also be present.

Foul Water

Foul pipe networks are also present to transfer the foul collected to the adjacent United Utilities combined sewers. It is intended that the majority of foul drainage will discharge by gravity to the United Utilities combined sewers through various lateral connections (peak rate circa 24.47 l/s). It is envisaged that wastewater from the basement levels and a proportion of upper floors will be conveyed to a below slab drainage collection system at lower basement level (B3) discharging to a foul pumping station. Flows will be pumped through to the United Utilities combined sewer in Bootle Street at a peak rate of circa 14.2 Litres per second. An emergency Foul storage tank is proposed at B3 level to provide storage for a period of 24 hours (volume to be confirmed).

The Surface Water and Foul pipes will connect to the existing Combined Sewer with saddle connections.

We would like to know if the above drainage proposal is acceptable.

WSP would also like to request Council Highway Flooding records in vicinity of the site; Furthermore, we would like to request any further details pertaining to flood risk.

If you require any further information, please feel free to reach out to me.

Kind regards,
James Abbott

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[L AEmH4HdLJ2BTW6A4pg7pUKI](#)

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Appendix H.2

CORRESPONDENCE – UNITED
UTILITIES

wsp

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 14 November 2022 16:19
To: Abbott, James
Subject: RE: PDE for: ST MICHAEL'S, JACKSON'S ROW UU Ref : 02998443
Attachments: 1.jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon James,

Please find below the updated assessment of your application, I attached a screenshot of the proposed site to show the location of the sewer crossing the site.

Pre Development Enquiry for: ST MICHAEL'S, JACKSON'S ROW UU Reference Number : 02998443

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

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

I can confirm that we have no current record of sewer flooding on our DG5 register within the vicinity of the proposed development. The DG5 register is a register of properties that have flooded as a result of hydraulic inadequacy of the public sewer network.

Please note that United Utilities Water Limited (U UW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the register.

Our response does not include:

- any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which U UW has no control and not a facet of sewer capacity; or
- any historical sewer flooding events that have been removed from the register as a result of investment in our infrastructure.

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 375mm diameter public combined sewer within Jacksons Row located to the North of your proposed development at an unrestricted rate. Or to the 450mm diameter public combined sewer within Bootle Street located to the South 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

According to the site layout, we are satisfied that infiltration is not feasible as there is no enough space for boreholes, we accept the provided sufficient evidence to discount infiltration.

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 450mm diameter public combined sewer within Bootle Street located South 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 23.4 l/s for phase 2 and 16.4 l/s for phase 3.

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

levels

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

[Land drainage / Overland flows / track drainage](#)

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network [under any circumstances](#)

[Existing Wastewater Assets Crossing the Site](#)

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Please refer to the link below to obtain full details of the processes involved with sewer closure:

<https://www.unitedutilities.com/builders-developers/wastewater-services/close-a-sewer/sewer-closures/>

[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.

Many thanks and kind regards,



United Utilities
Water for the North West

Mohamed Aljafarawi (He/Him)
Developer Engineer
Developer Services & Metering
Customer Services
M: 07950474499
unitedutilities.com

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----- Original Message -----
From: Abbott, James [james.abbott@wsp.com]
Sent: 09/11/2022 10:25
To: wastewaterdeveloperservices@uuplc.co.uk
Subject: RE: PDE for: ST MICHAEL'S, JACKSON'S ROW UU Ref : 02998443

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Good Morning Mohamed,

Thank you for your response,

I am emailing regarding the reference to United Utilities sewers crossing the site. From our previous correspondence in 2015, the maps we obtained had no record of this; Therefore, I am requesting a map or screenshot showing these sewers crossing the site.

I would also like to inform you that the Surface Water Discharge rates for phase 2 and phase 3 are the wrong way round. Phase 2 has a discharge rate of 23.4 l/s, and Phase 3 has a discharge rate of 16.4 l/s. Would it possible for you to correct these rates in your response below.

If you require any further information, please feel free to reach out to me.

Kind regards,
James Abbott



James Abbott
Graduate Engineer

First Floor
3 Wellington Place
Leeds
LS1 4AP

[wsp.com](https://www.wsp.com)

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From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>
Sent: 08 November 2022 15:49
To: Abbott, James <James.Abbott@wsp.com>
Subject: PDE for: ST MICHAEL'S, JACKSON'S ROW UU Ref : 02998443

Good afternoon James,

Pre Development Enquiry for: ST MICHAEL'S, JACKSON'S ROW UU Reference Number : 02998443

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Levels

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Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Please refer to the link below to obtain full details of the processes involved with sewer closure:

<https://www.unitedutilities.com/builders-developers/wastewater-services/close-a-sewer/sewer-closures/>

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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@uuplco.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.

Many thanks and kind regards,



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8 First Street
Manchester
M15 4RP

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APPENDIX A

DRAINAGE STRATEGY

ADDENDUM 2021



Jackson's Row Developments Ltd

ST MICHAEL'S, JACKSON'S ROW
Drainage Strategy Report - Addendum



Jackson's Row Developments Ltd

ST MICHAEL'S, JACKSON'S ROW

Drainage Strategy Report - Addendum

PUBLIC

PROJECT NO. 70088013

OUR REF. NO. 70088013-DSR-001

DATE: SEPTEMBER 2021

WSP

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WSP.com



QUALITY CONTROL

Issue/revision	First Issue		
Remarks	Issue		
Date	08 September 2021		
Prepared by	D. Valla		
Checked by	K. Tweedie		
Authorised by	C. Cozens		
Project number	70088013		
Report number	70088013-DSR-001		
File reference	\\uk.wspgroup.com\Central Data\Projects\70088xxx\70088013 - St Michaels Jacksons Row\03 WIP\Drainage Strategy		

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APPENDICES

APPENDIX A

SITE LOCATION PLAN

APPENDIX B .1

SITE PLANS – BLOCK B OFFICE GROUND LEVEL GA PLAN
(SOM DRAWING NO. A-102)

APPENDIX B.2

SITE PLANS – BLOCK B OFFICE BASEMENT 1 PLAN (SOM
DRAWING NO. A-101)

APPENDIX C

TOPOGRAPHICAL SURVEY (DRAWING NO. 13643-100_2DT)

APPENDIX D

UTILITY SURVEY (DRAWING NO. S11741-U)

APPENDIX E

UNITED UTILITIES SEWER PLANS

APPENDIX F

DRAINAGE LAYOUT BLOCK B (BASEMENT) (CURTINS
DRAWING NO. 078847-CUR-XX-XX-DR-C-92500-P01) AND
ALTERNATIVE OPTION 2

APPENDIX G

DRAINAGE CALCULATIONS



EXECUTIVE SUMMARY

Jackson's Row Developments Ltd (hereinafter referred to as 'the Applicant') is seeking to construct a major development proposal known as St Michael's, Jackson's Row, Manchester, UK.

The planning application for the development was originally registered in January 2017. Following feedback, the decision was taken to revise the scheme. Revised plans and documents were submitted in November 2017 and the development was granted planning permission on 20 June 2018 (reference: 114664/FO/2016). It was subsequently amended under Section 73¹ on 26 June 2020 (reference: 125549/JO/2019) and under Section 96a² on 1 December 2020 (reference: 125549/JO/2019). For the purposes of this Drainage Strategy, the approved development will be referred to as the 'Approved Development'.

Following discharge of the relevant pre-commencement conditions, works to implement the Approved Development were undertaken in April 2021 and completed on 12th of that month. The works comprised the demolition of the kitchen of the Sir Ralph Abercromby and making good remaining external walls. These works represented Phase 1 of the Approved Development. The lawful implementation of the consent was confirmed in a Lawful Development Certificate issued by Manchester City Council on 21 May 2021.

Further changes to the Approved Development are now sought by way of a Section 73 application. The main changes are:-

- Changing the project phasing to allow Block B (offices) and the former police station to form Phase 2, with Block A (hotel, residential and synagogue) forming Phase 3;
- Reduction in size of Basement -2 level, reduction of car parking numbers and increasing cycle parking;
- The use of the former Police Station is proposed to change from boutique hotel use to offices and will integrate into the new build offices;
- Change to the rooftop extension to the former Police Station to remove the plant from the roof of this area and extend the office terrace at this level, adjust the height and reconfigure the

¹ Section 73 of the Town and Country Planning Act 1990 (as amended)

² Section 96(a) of the Town and Country Planning Act 1990 (as amended)

proposed extension internally to align the floors with the new build office behind (the previous maximum height to the top of the plant screen was 65.03m AOD, the new maximum height of the rooftop extension will be 64.65m AOD) (0.38m decrease));

- Reconfiguration of office core and internal layouts in response to the integration of former Police Station and to allow the phase to be constructed and operated independently of Phase 3;
- Improved sustainability ratings for the proposed offices and removal of proposed plant from the former Police Station roof has required an increased size of plant deck on top of the offices. The footprint of the plant deck is proposed to extend 4m to the north and south, the height is also proposed to increase by 1.87m, the deck will be enclosed beneath to accommodate the leisure use;
- The glass balustrade around the rooftop terrace will be increased from 1.5m to 3m to improve comfort on the terrace and increase safety;
- Internal reconfiguration and alterations to align floorplates from the new build office into the retained former Police Station building; and
- Change to the access arrangements to the retained Police Station building at ground floor to create a lobby and allow a through connection to the offices.

The changes proposed will be referred to as the 'Proposed Amendments'. For the avoidance of doubt, references to the 'Proposed Development' refer to the 'Approved Development' as well as the 'Proposed Amendments', i.e. the entirety of the development as now proposed.

The updates to the Drainage Strategy in this addendum relate to the Proposed Amendments. The amended floor plans have been reviewed together with the information from the public health engineers showing above ground drainage. The review identified no overall changes to the impermeable areas, discharge rates and surface water attenuation storage requirements for the Proposed Development and this addendum has been updated to assess Block B amendments separately. The public health drawings identified revised locations of proposed foul and surface water drainage connections to the existing public sewers. These comply with the requirements of United Utilities and are also amended in the report accordingly.

This Drainage Strategy Addendum should be read in conjunction with the separate Drainage Strategy Report and Flood Risk Assessment Report which provides details on the outline flood risk strategy for the Proposed Development.

SURFACE WATER DRAINAGE STRATEGY

Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.

There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.

Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.

The United Utilities consultation response indicated that surface water may discharge at an unrestricted rate into the public combined sewer network.

However, in line with Manchester City Council policy and their consultation response, flows will be restricted to 50% of the existing flow rate following development. The resulting allowable flow is calculated to be 39.8 l/s for the Proposed Development and 23.4 l/s for the Proposed Amendments.

On-site storage for the Proposed Amendments with a total volume of up to 125 m³ is required in order to attenuate flows to the allowable rate in a 1 in 100 year storm with a 40% allowance for climate change. The storage is currently proposed to be located at basement level B1 and thus it is likely that a gravity solution will not be possible for discharge. The storage therefore includes a sump and pumping station.

The arrangement of site drainage and attenuation may currently involve multiple off-site connections, which will be confirmed following receipt of CCTV results of the public sewer network.

The majority of the sewers as well as the proposed pumping station and attenuation storage are to be located within or below the basement and so will be privately maintained.

FOUL WATER DRAINAGE STRATEGY

It is proposed to discharge the foul water flows from the new development into the public combined sewer network.

The United Utilities pre-development enquiry response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network at a single location or multiple locations.

A single discharge point is currently proposed for foul water from the Proposed Amendments to the public sewers. Following CCTV results for the site, the exact discharge points and rates can be confirmed.

The majority of the proposed site drainage infrastructure is located within the basement and so will be privately maintained.

1. INTRODUCTION

1.1. APPOINTMENT AND BRIEF

- 1.1.1. WSP was appointed by Jackson's Row Developments Ltd to undertake a Drainage Strategy to support the Section 73³ application for amendments to the Approved Development. The amendments now proposed will be referred to as the 'Proposed Amendments'. For the avoidance of doubt, references to the 'Proposed Development' refer to the 'Approved Development' as well as the 'Proposed Amendments', i.e. the entirety of the development as now proposed.
- 1.1.2. A site location plan is included in Appendix A.

1.2. PROPOSED DEVELOPMENT

- 1.2.1. The Proposed Development comprises a synagogue, two hotels and space for office, retail, bar/restaurant and residential use.
- 1.2.2. The Proposed Amendments are summarised as follows:
- Changing the project phasing to allow Block B (offices) and the former police station to form Phase 2, with Block A (hotel, residential and synagogue) forming Phase 3;
 - Reduction in size of Basement -2 level, reduction of car parking numbers and increasing cycle parking;
 - The use of the former Police Station is proposed to change from boutique hotel use to offices and will integrate into the new build offices;
 - Change to the rooftop extension to the former Police Station to remove the plant from the roof of this area and extend the office terrace at this level, adjust the height and reconfigure the proposed extension internally to align the floors with the new build office behind (the previous maximum height to the top of the plant screen was 65.03m AOD, the new maximum height of the rooftop extension will be 64.65m AOD) (0.38m decrease));
 - Reconfiguration of office core and internal layouts in response to the integration of former Police Station and to allow the phase to be constructed and operated independently of Phase 3;
 - Improved sustainability ratings for the proposed offices and removal of proposed plant from the former Police Station roof has required an increased size of plant deck on top of the offices. The footprint of the plant deck is proposed to extend 4m to the north and south, the height is also proposed to increase by 1.87m, the deck will be enclosed beneath to accommodate the leisure use;
 - The glass balustrade around the rooftop terrace will be increased from 1.5m to 3m to improve comfort on the terrace and increase safety;
 - Internal reconfiguration and alterations to align floorplates from the new build office into the retained former Police Station building; and
 - Change to the access arrangements to the retained Police Station building at ground floor to create a lobby and allow a through connection to the offices.

³ Section 73 of the Town and Country Planning Act 1990 (as amended)

- 1.2.3. Proposed site plans and elevations for the Proposed Amendments can be found within the centralised plans section and Appendix B.

1.3. OBJECTIVE OF THE STUDY

- 1.3.1. The objective of this addendum is to provide details of how the Proposed Amendment's foul and surface water drainage strategies are incorporated in that of the Proposed Development. The report will support the separate Drainage Strategy Report (WSP 2019) and Flood Risk Assessment (WSP 2017) that has been undertaken in accordance with the National Planning Policy Framework.
- 1.3.2. This report provides details on the following:
- The existing drainage characteristics of the site;
 - The design requirements of the relevant statutory consultees;
 - The discharge points offsite for the new foul and surface water drainage networks;
 - The discharge rates and attenuation storage requirements;
 - An assessment of the requirement for on-site pumping station(s);
 - The suitability and incorporation of SuDS within the development; and
 - A strategy for the adoption and maintenance of drainage features.

1.4. PLANNING POLICY & DESIGN GUIDANCE REQUIREMENTS

- 1.4.1. A detailed review of the relevant national and local planning policies as well as relevant design guidance is included in the separate Flood Risk Assessment (WSP 2017). The 2019 update of the National Planning Policy Framework has no effect on drainage and flood risk.
- 1.4.2. The surface and foul water drainage strategy has been designed in accordance with the following national and local policy documents and relevant design guidance:
- Flood and Water Management Act (2010);
 - National Planning Policy Framework (2019) and Planning Practice Guidance (2014);
 - Building Regulations Part H [Drainage and Waste Disposal] (2015);
 - Sewers for Adoption 7th Edition;
 - Sustainable Drainage Systems Written Statement HCWS161 (December 2014);
 - Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015);
 - British Standard 8533:2011, Assessing and Managing Flood Risk in Development;
 - British Standard 8582:2013 Code of Practice for Surface Water Management for Development Sites; and
 - Manchester, Salford and Trafford Councils' Level 1 and 2 Hybrid Strategic Flood Risk Assessment (2011).

1.5. LIMITATIONS

- 1.5.1. This report is based on the interpretation and assessment of data provided by third parties.
- 1.5.2. Whilst every care has been taken to ensure this information is accurate and up-to-date, WSP cannot guarantee the accuracy of third party data and the findings of this report may change if the data is amended or updated after the date of consultation.
- 1.5.3. The recommendations made within this report have been based on available information and may be subject to change upon receipt of further consultation responses.

2. EXISTING SITE

2.1. SITE LOCATION

- 2.1.1. The site is located off Jackson's Row in Manchester approximately 0.1 km west of Manchester Town Hall and Central Library.
- 2.1.2. An approximate postcode is M2 5WD and OS coordinates are 383645, 398030.
- 2.1.3. A site location plan can be found in Appendix A.

2.2. SITE DESCRIPTION

- 2.2.1. Table 1 describes the general site characteristics.

Table 1 - Characteristics of the Site

Area		The Site Area is Approximately 0.56 Ha.
Site Use		The site is currently occupied by a police station, synagogue and pub.
General Topography		The topographical survey (Appendix C) includes levels for external areas around the perimeter of the site only. The survey indicates that site levels fall from east to west. Site levels in the north east corner peak at 39.75m AOD whereas in the south east corner the maximum level is 38.68m AOD. Levels on the western boundary of the site vary between 35m AOD and 36m AOD.
Boundaries	North	Jackson's Row, drinking establishments, a restaurant and a hair salon.
	South	Bootle Street and commercial property which appears to be disused.
	East	Southmill Street and commercial development.
	West	A multi-storey office building beyond which is the A56/Deansgate.
Access		Access to eastern half of the site may be gained via Jackson's Row. Syers Court off Bootle Street allows access to the west of the site.

2.3. EXISTING WATERCOURSES

- 2.3.1. The Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008) does not show the route of any watercourse under the site. However, two watercourses are shown in vicinity of the site on this map.
- 2.3.2. The first is an underground 'lost watercourse' which runs in a northeast - southwest orientation, although the direction of flow is not confirmed. The Manchester City Council response received on 30 October 2015 indicated that historically this watercourse was known as the River Tib and now the watercourse is incorporated into the combined sewer system in the vicinity of the site. The closest point of this watercourse to the site is 0.1km to the east where it flows under land near to Mount Street.

- 2.3.3. A second underground 'lost watercourse', confirmed by the Manchester City Council consultation response on 30 October 2015 as the Manchester and Salford Junction Canal, connects the River Irwell (between Princess Bridge and New Quay Street) to the Rochdale Canal near to Bridgewater Hall on Great Bridgewater Street. The Manchester and Salford Junction Canal is 0.3km southwest of the site at its closest point. It appears that the Canal and the other unnamed watercourse connect shortly before the southern end of the Canal.
- 2.3.4. The Rochdale Canal is located approximately 0.5km to the south of the site.
- 2.3.5. Beyond the canal at approximately 0.6km south of the site the River Medlock flows generally in an east to west direction. The River is partially in culvert around this location and the Manchester, Salford and Trafford Council Hybrid Strategic Flood Risk Assessment (2011) Flood Risk Management Map indicates that the 'Medlock Tunnels' flow northwest from under Deansgate before emerging at Potato Wharf at a distance of approximately 0.6km from the site. The River is classified as a main river upstream of the entrance into the tunnel at Deansgate and as an ordinary watercourse from this point downstream.
- 2.3.6. A section of the River Irwell known as the Grey Irwell flows in the vicinity of the site. The river which is classed as an ordinary watercourse in this section flows northeast to southwest approximately 0.5km northwest of the site at the closest point.

2.4. EXISTING PUBLIC SEWERS

- 2.4.1. Public sewer records from United Utilities (Appendix E) indicate that there are no public sewers within the site boundary. The following sewers are located within the vicinity of the site under the adjacent roads:
 - A combined sewer manhole is indicated in the north east corner of the site which forms the head of two combined sewer runs: one which runs south under Southmill Street to a junction with a sewer flowing along Bootle Street; and another combined sewer of unknown size runs west under Jackson's Row adjacent to the northern boundary of the site.
 - From the crossing of sewers at the junction of Southmill Street and Bootle Street a combined sewer flows west along Bootle Street past the southern boundary of the site. At manhole 6906 to the south of the site, the sewer size is marked as 450 mm.
 - A 2,400 mm combined sewer flows south under Deansgate.
- 2.4.2. A CCTV survey is required to confirm the depth, condition and size of the public sewers.

2.5. EXISTING DRAINAGE CHARACTERISTICS OF THE SITE

- 2.5.1. The site is fully developed and occupied by a police station, a synagogue and a public house along with car parking.
- 2.5.2. The site is therefore covered in hardstanding and surface water runoff is not infiltrated. Instead the runoff is directed towards gullies and into the underground drainage system.
- 2.5.3. There is evidence of separate foul and surface water drainage networks serving the site. A topographical survey (Appendix C) indicates multiple chambers around the perimeter of the site. Additionally, a utility survey of the site in February 2016 (Appendix D) indicated three private lateral connections from the existing site.

- 2.5.4. Surface water runoff from external areas around the perimeter of the site appears to flow into the surrounding highways, based on a site visit and assessment of the topographical survey (Appendix C).

2.6. GEOLOGY AND HYDROGEOLOGY

- 2.6.1. The British Geological Survey Geology of Britain Viewer shows that the site is underlain by sandstone known as the Chester Pebble Beds Formation. There are superficial deposits of Devensian till on the west and centre of the site. The east of the site is shown to have no superficial deposits.
- 2.6.2. The Environment Agency website designates the bedrock under the site as a principal aquifer. The designation is used for rocks which usually provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.
- 2.6.3. The superficial deposits are classed as a Secondary A Aquifer meaning that the deposits are permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers.
- 2.6.4. The Environment Agency website shows that the site does not lie within a Groundwater Source Protection Zone.

2.7. HISTORICAL LAND USES

- 2.7.1. On the earliest available map from 1848, the area around the site is indicated to be developed but the map is broad scale and so it is not possible to determine the use of the site at that time.
- 2.7.2. In 1851 the majority of site is shown to be covered with smaller buildings. There is a larger building at the eastern boundary of the site.
- 2.7.3. Jackson's Row and Bootle Street are visible in 1891 mapping. The road now known as Southmill Street is shown as South Street on this map. Numerous buildings are shown across the site of different sizes. A small road separates a plot in the east of the site which is split into three adjoining sections.
- 2.7.4. In 1948 the road in the east of the site has disappeared and the eastern section of the site is occupied by a police station. A public house is marked in the centre of the site near the southern boundary where the Sir Ralph Abercrombie public house is located in the present day. The northwest of the site is marked as ruins. Other unmarked buildings are also present on the site.
- 2.7.5. The ruins are replaced by a synagogue between 1951 and 1957.
- 2.7.6. An OS plan from 1962-1973 shows the building layout changing but the site usage remaining as a synagogue, public house and police station. The street on the eastern boundary of the site is now marked as Southmill Street.
- 2.7.7. The site has the same usage in present day although buildings have been extended since 1962-1973 mapping.

3. SURFACE WATER DRAINAGE STRATEGY

3.1. PROPOSED DISCHARGE POINT

- 3.1.1. In accordance with requirement H3 of Building Regulations 2015, a hierarchical approach has been used to determine the suitable discharge point for the surface water run-off generated by the Proposed Development.

DISPOSAL OF SURFACE WATER BY INFILTRATION METHODS

- 3.1.2. Wallingford WRAP Class Maps indicated that the ground beneath the site is classed as clayey, or loamy over clayey soils with an impermeable area at shallow depths indicating that infiltration may not be suitable for the site.
- 3.1.3. The site has limited space and sits within a city centre context. The proposals include a main external walkway between Jackson's Row and Bootle Street shown in the site plan (Appendix B) which has further storeys of development beneath, preventing their use for infiltration.
- 3.1.4. Therefore, infiltration is not considered to be viable for this site.

DISCHARGE TO A SUITABLE WATERCOURSE

- 3.1.5. There are two watercourses shown within the vicinity of the site on the Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008).
- 3.1.6. The closest, which was previously known as the River Tib, is now advised by Manchester City Council on 30 October 2015 to be incorporated into the combined public sewer network and so discharge to this watercourse would not be in accordance with the drainage hierarchy.
- 3.1.7. The other 'hidden river' is the Manchester and Salford Junction Canal which is a distance of 0.3 km southwest of the site at the closest point. The condition and capacity of this watercourses to accept new flow is unknown, no information was available from Manchester City Council as of 30 October 2015. Therefore, it is considered that this watercourse would be unsuitable for discharge.
- 3.1.8. The other watercourses in the vicinity of the site are the Rochdale Canal, River Medlock and River Irwell. However, each of these watercourses is a minimum distance of at least 0.5 km and therefore a connection to the watercourses would need a sewer requisition of considerable length.
- 3.1.9. Therefore, a connection to a watercourse for discharge of surface water from the site is considered to be unfeasible.

DISCHARGE TO SEWER

- 3.1.10. There is a network of public combined sewers around the site as shown in the United Utilities sewer plan in Appendix E.
- 3.1.11. The United Utilities pre-development enquiry response received on 28 and 29 October 2015 indicated that surface water could discharge into the public combined sewer network at a convenient connection point or points.
- 3.1.12. The proposed connection point, subject to confirmation following CCTV results, is to the public sewers under Bootle Street.

3.2. PROPOSED DISCHARGE RATE

- 3.2.1. The Manchester City Council pre-application consultation response received on 08 October 2015 indicated flows from the site should be restricted to 50% of the existing flow rate. The response is in line with council policy which restricts discharge to this level for sites proposed in critical drainage areas; the site lies within the Conurbation Core Critical Drainage Area.
- 3.2.2. The United Utilities pre-development enquiry response received on 28 October 2015 indicated that surface water could discharge at an unrestricted rate into the public combined sewer network.
- 3.2.3. The existing flow rate for the Proposed Development was determined based on a 140 l/s/ha allowance which is commonly presented by local authorities for calculations involving brownfield sites. All of the 0.56 ha of site area is considered to be impermeable following a review of site aerial photography and the topographical survey (Appendix C) on which no significant permeable areas are indicated. The existing flow rate determined by this method for the site is 79.6 l/s, which applying the restrictions imposed by Manchester City Council infers that the allowable flow rate from the site should be restricted to a value of 39.8 l/s. The allowable flow rate from the Proposed Amendments has been calculated as 23.4 l/s based on an impermeable area of 0.337 ha.
- 3.2.4. For the purpose of this report the entirety of the site is also considered to be impermeable. The lower ground floor plan indicates impermeable development across the site area. It is possible that planters at higher levels may capture water which could be incorporated at the detailed design stage.
- 3.2.5. The Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) guidance indicates that as a minimum surface water discharge from brownfield sites should not exceed the existing rate. However, development should achieve a greenfield runoff rate where reasonably practicable.
- 3.2.6. The site is space constrained and therefore it is considered that there would be insufficient space to provide attenuation storage in order to reduce the flow rate from the site to greenfield rates.
- 3.2.7. Therefore, flow from the site is proposed to be restricted to 50% of existing flows, which meets the underlying Defra criteria for flow control.
- 3.2.8. For the Proposed Amendments, a pumping station will be required to discharge water into the combined sewer network (at a maximum rate of 23.4 l/s) since the attenuation storage is located at basement level B1 and thus likely to be lower than the public sewers in the vicinity. The need for pumping will be confirmed following CCTV results, however, space has been accommodated in the development for any required sump and pumps.
- 3.2.9. The network is proposed to have a gravity piped overflow installed to minimise the risk of surcharging the tank in extreme events. The tank is fitted with a high level alarm which should allow for automatic diversion of excessive flows from higher levels into an overflow pipe. The pipe will route flows safely off-site although the exact location is still to be determined. Owing to the potential for surcharged sewers in extreme events, utilisation of a safe overflow route along the surrounding road network may be considered.
- 3.2.10. It should be noted that this overflow system is only intended to be used in extreme events in excess of the 1 in 100 year plus 40% climate change event. The location for the overflow should be chosen to minimise the impact outside of the site boundary.

3.3. ATTENUATION STORAGE

- 3.3.1. The attenuation storage volume for the Proposed Amendments has been based on an impermeable area of 0.337 ha and achieving a discharge rate of 23.4 l/s during the critical 1 in 100 year (plus a 40% allowance for climate change) storm event, whilst ensuring there was no flooding of the development during the storm event (in accordance with the requirements within Sewers for Adoption).
- 3.3.2. The Block B attenuation volume calculated using the Source Control Function in Microdrainage depends on the rate of pumping for the pumps selected and varies from approximately 110 m³ to 125m³. The calculations are included in Appendix G.
- 3.3.3. The Drainage Strategy Plan included within Appendix F shows the proposed points of discharge for surface water to the combined sewer network on Bootle Street. This location is indicative only, as results of a CCTV survey will allow for confirmation of the most feasible and convenient connection point.
- 3.3.4. The proposed point of discharge for the Proposed Development will be subject to review during subsequent stages of the design, when inputs from the MEP consultant are available. The drainage strategy will be updated to reflect this; it should be noted that the strategy is unlikely to change.
- 3.3.5. Coordination between disciplines on the arrangement of drainage is ongoing and likely to continue into the detailed design stage. Proposals currently include a connection each for foul water and surface water between the site and the public combined sewer network. If additional connection points are used for the surface water discharge, then the sum of the surface water flows leaving the Block B site must not exceed 23.4 l/s and the attenuation storage may be reconfigured to facilitate this.
- 3.3.6. The attenuation storage for the Proposed Amendments will incorporate a sump to house pumps which will discharge surface water at the proposed rate of 23.4 l/s.

3.4. ADOPTION AND MAINTENANCE

- 3.4.1. Any below ground drainage sewer runs, pumping stations and attenuation provided for the building will be privately maintained.
- 3.4.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance and routine de-silting of the attenuation storage.

3.5. CONSIDERATION OF CLIMATE CHANGE

- 3.5.1. Calculations in Appendix G demonstrate that the attenuation storage has sufficient space to accommodate flows from the 1 in 100 year storm including a 40% allowance for climate change. In this event the storage has approximately 200mm of 'freeboard' above the top water level suggesting a good contingency.
- 3.5.2. Therefore, the design incorporates the higher allowance for increases in peak rainfall due to climate change according to the Environment Agency Climate Change Allowances (February 2016).
- 3.5.3. The site lies within Flood Zone 1 and is not at risk of flooding from tidal/coastal sources. Therefore, increases in peak river flow or sea level rise are not considered to impact upon the site during the development lifetime.

4. FOUL WATER DRAINAGE STRATEGY

4.1. PROPOSED DISCHARGE POINTS

- 4.1.1. It is proposed to discharge the foul water flows from the Proposed Development into the existing public combined sewer network surrounding the site.
- 4.1.2. The United Utilities pre-development enquiry response, received on 28 October 2015, indicated that foul water drainage from the site may discharge into the public combined sewer network at a convenient connection point or points.
- 4.1.3. The proposed connection points, subject to confirmation following CCTV results, are to the public sewers under the adjoining streets of Jackson's Row and Bootle Street, as shown in the drainage strategy layout in Appendix F.
- 4.1.4. Where practicable upper level foul water discharge will drain via proposed gravity lateral sewer connections. Any foul water drainage from the basement (serving back of house areas; refuse areas and plant areas) will drain via a pumped solution which can be sized to accommodate flows from upper levels which may be needed depending on the internal drainage coordination at the detailed design stage.

4.2. PROPOSED DISCHARGE RATES

- 4.2.1. The United Utilities pre-development enquiry response indicated that at present foul water may discharge at an unrestricted rate into the public combined sewer network.
- 4.2.2. Foul water rates from the Proposed Development will be subject to review during subsequent stages of the design, when further detailed inputs from the MEP consultant are available. The Drainage Strategy Plan (Appendix F) indicates the location of the Block B discharge point.
- 4.2.3. There is provision in the Drainage Strategy Plan for collection and pumping of foul water from car parking, plant rooms, cycle store and bin storage areas. These flow rates are likely to be minimal.

4.3. ADOPTION AND MAINTENANCE

- 4.3.1. A number of foul water drainage features are proposed in the basement of the Proposed Development; these features will be privately maintained.
- 4.3.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance.

5. CONCLUSIONS

5.1. SURFACE WATER DRAINAGE STRATEGY

- 5.1.1. Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.
- 5.1.2. There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.
- 5.1.3. Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.
- 5.1.4. The United Utilities consultation response indicated that surface water may at present discharge at an unrestricted rate into the public combined sewer network.
- 5.1.5. However, in line with Manchester City Council policy and their consultation response, flows following development will be restricted to 50% of the existing flow rate. The resulting allowable flow for the Proposed Amendments is calculated to be 23.4 l/s.
- 5.1.6. On-site storage with a total volume of up to 125 m³ is required in order to attenuate flows to the allowable rate in a 1 in 100 year storm with a 40% allowance for climate change. The storage is currently proposed to be located at basement level B1 and thus it is likely that a gravity solution will not be possible for discharge. The storage will therefore include a sump and pumping station.
- 5.1.7. The arrangement of site drainage and attenuation may involve multiple off-site connections, which will be confirmed following receipt of CCTV results of the public sewer network. A single discharge point is currently proposed to Bootle Street.
- 5.1.8. The majority of the sewers as well as the pumping station and attenuation storage are located within or below the basement and so will be privately maintained.

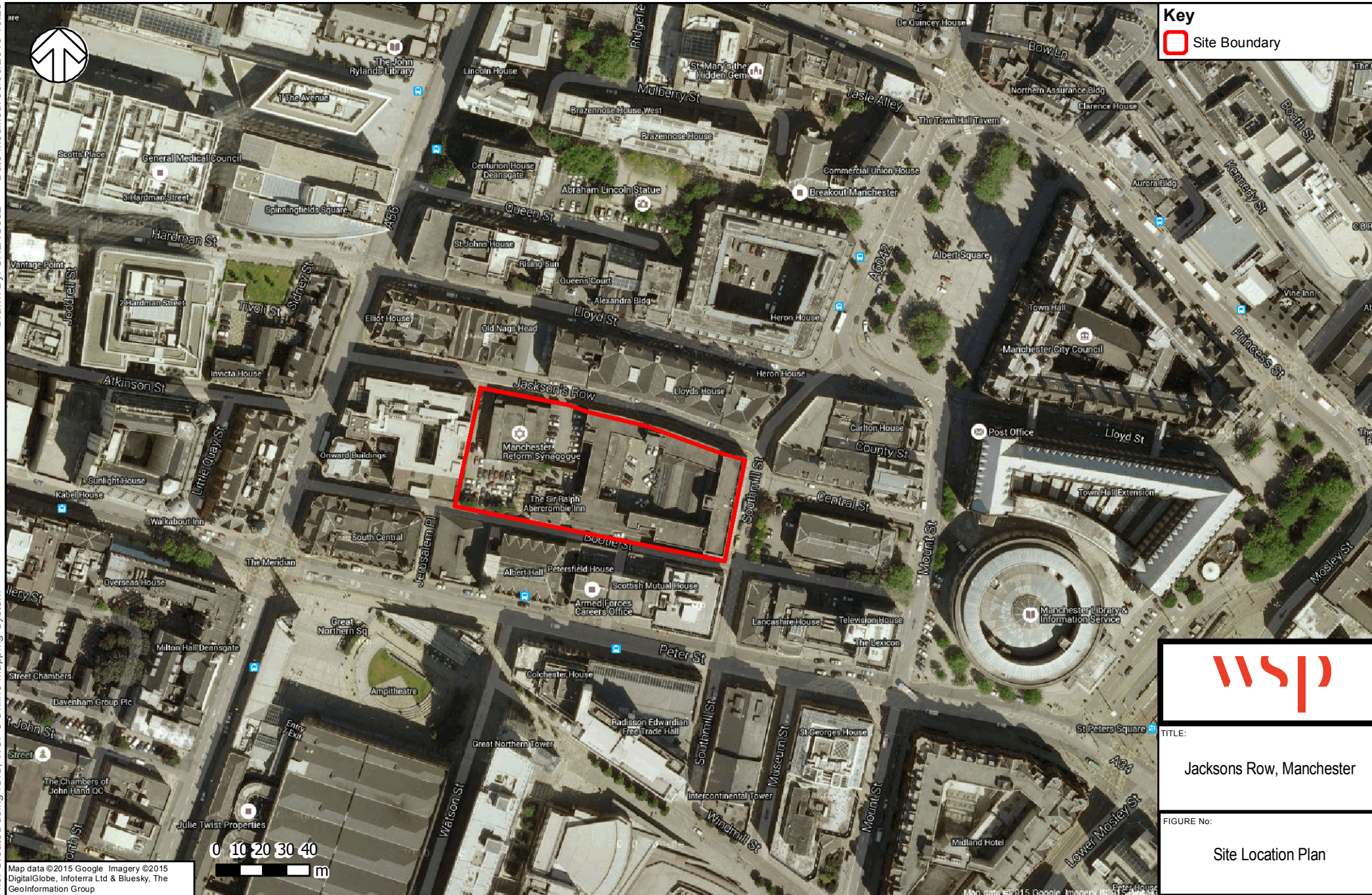
5.2. FOUL WATER DRAINAGE STRATEGY

- 5.2.1. It is proposed to discharge the foul water flows from the new development into the public combined sewer network.
- 5.2.2. The United Utilities consultation response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network at a single location or multiple locations.
- 5.2.3. A single discharge point is currently proposed for foul water from the site. Following CCTV results for the site the exact discharge points and rates can be confirmed.
- 5.2.4. The majority of the site drainage infrastructure is proposed to be located within the basement and so will be privately maintained.

Appendix A

SITE LOCATION PLAN

wsp



Key
[Red Outline] Site Boundary



TITLE:
Jacksons Row, Manchester

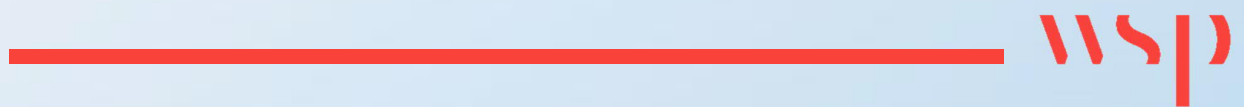
FIGURE No:
Site Location Plan

Appendix B.1

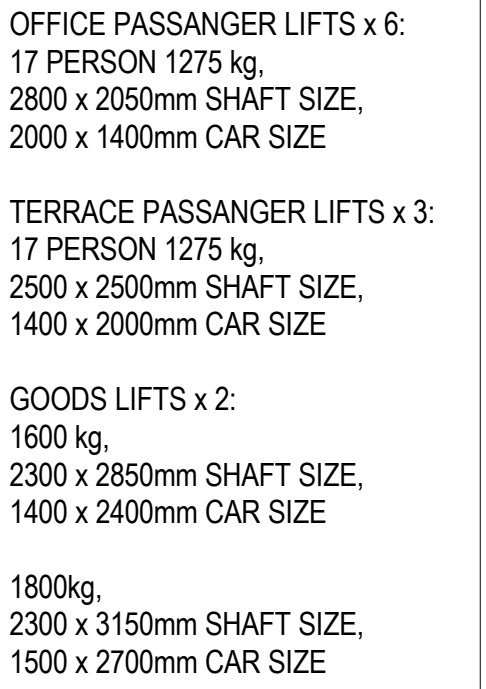


SITE PLANS – BLOCK B OFFICE
GROUND LEVEL GA PLAN (SOM
DRAWING NO. A-102)

Appendix B.2



SITE PLANS – BLOCK B OFFICE
BASEMENT 1 PLAN (SOM DRAWING
NO. A-101)

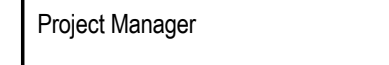


1. FOR ABBREVIATIONS, SYMBOLS, LEGENDS, GENERAL NOTES AND MATERIAL CODE LIST, REFER TO A-0-002

IN PROGRESS

[illegible]

FOR INFORMATION

	Design Consultant	hodder+partners
Civil Engineer		
Services Engineer		
HOARE LEA 		
Fire Engineer		
Client	Landscapist Designer	
	Project Manager	
		

Architect / Structural Engineer

SOM

Skidmore, Owings & Merrill (Europe) LLP
The Broadgate Tower, 20 Primrose Street
London EC2A 2EW, UK
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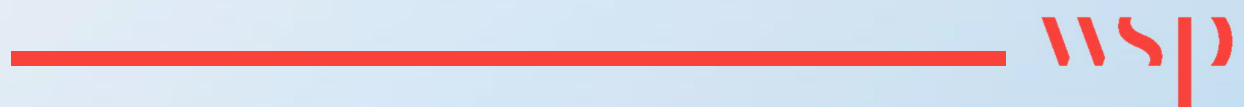
ST. MICHAELS DEVELOPMENT,
MANCHESTER

BLOCK B OFFICE - BASEMENT 1

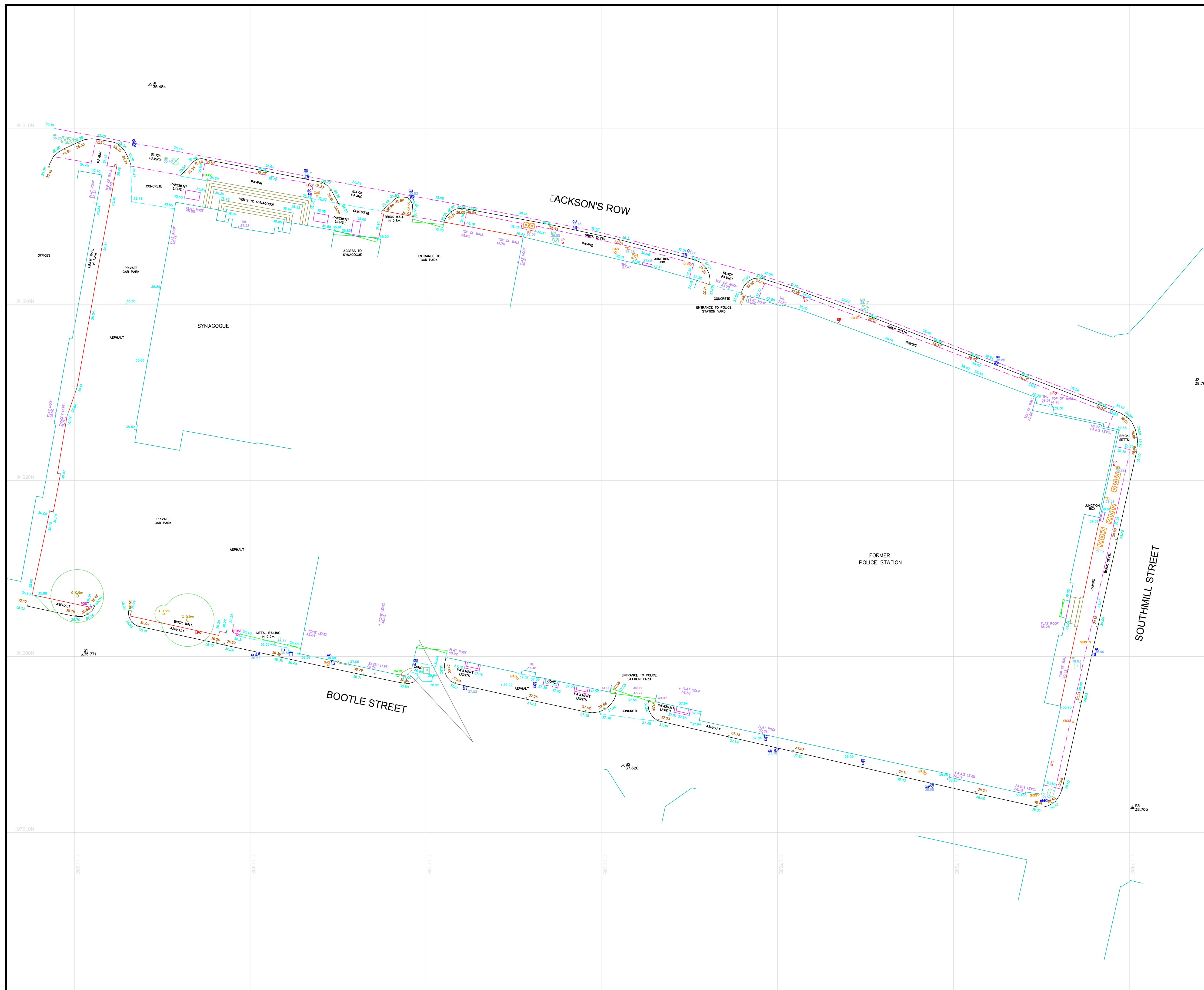
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Protocol Drawing No							
STM-SOM-ZZ-ZZ-DR-A-0101							
Project No		SOM Drawing No				Revision	
218739		A-101					
Scale @ A0							
1 : 100							

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Appendix C

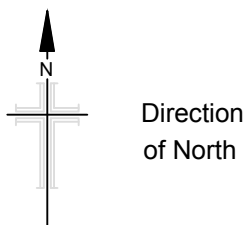


TOPOGRAPHICAL SURVEY
(DRAWING NO. 13643-100_2DT)



Notes

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Grid : OS National Grid ☐ Approximate ☐
Derived by fitting surveyed points to
coordinates from OS digital information.

Datum : Related to Ordnance Survey benchmark
Located on Elliot House, Deansgate.
☐ value ☐ 5.19 m A.O.D

Station Listing

Station	Easting	Northing	Level
1	2	9004.997	5.4
2	749.07	9000.24	9.7
S1	20.9	9000.02	5.77
S2	2.410	9797.52	7.2
S	740.54	9797.22	7.70

KEY

ARC VALVE	A/V	KERO OUTLET	KO
BENCH MARK	B/M	LAMP POST	LP
BIN	BIN	LAMP STOP	LN
BOLLARD	BOL	MANHOLE (CIRCULAR)	BM
BORE HOLE	BH	MANHOLE (RECTANGULAR)	BM
BRITISH TELECOM COVER	BT	MANHOLE (TRIANGULAR)	BM
BUS STOP	BUS	MARKER POST	MKP
CABLE TV COVER	CAT	GULLY	GU
CABLE TV SUPPLY	CA	ROOOFING EYE	RE
COLUMN	COL	CA SIGN POST	CSN
EARTHING POINT	COL	TELECOM COVER	TEL
ELECTRICITY COVER	ELEC	TELEGRAPH POLE	TP
ELECTRICITY POLE	EP	THRESHOLD LEVEL	TL
FIRE HYDRANT	PH	TRAFFIC LIGHT	TL
GAS VALVE	GAS	TRIAL PIT	TPIT
GATE		WASH OUT	WO
INSPECTION COVER (CIRCULAR)	IC	WATER METER	WM
INSPECTION COVER (RECTANGULAR)	IC	WATER STOP COCK	SC
CONVEYOR COVER	CL	WATER STOP VALVE	SV
CORNER LEVEL	CL	CHAMBER BASE LEVEL	CHL
INVERT LEVEL	IL	WATER SURFACE LEVEL	WL
UNABLE TO RAISE	UTR	UNABLE TO MEASURE	UM
GIRTH OF TREE TRUNK	G	DIAMETER OF TREE TRUNK	D
HIGHT OF TREE TO TOP CANOPY	H	MINI BOLE TREE	MB

☐	☐	☐	☐	☐
Rev	Date	Drawn	Description	



Southgate House
Pontefracr Road T: 044 0112 00900
Stourton F: 044 0112 00901
Leeds E: admin@metgeoenvironmental.com
West Yorkshire W: www.metgeoenvironmental.com
LS10 1SW

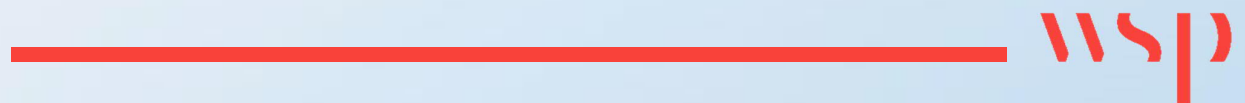
Client ☐ ERUM CONSULT LTD

Site ☐ JACKSON'S ROW
MANCHESTER M25WD

Title TOPOGRAPHICAL SURVEY
2D

Surveyed	S / MC/MT	Drawn	S
chk.	DA	Date	01/04/2015
scale	A1 Sheet	DWG Ref	Status
1/200		1 4 100 2DT	FINAL
Job No	1 4 100		Rev
			Ø

Appendix D



UTILITY SURVEY (DRAWING NO.
S11741-U)

Appendix E

wsp
UNITED UTILITIES SEWER PLANS

**WSP Civils
3 White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL**

FAO: Laura Garner

United Utilities Water Limited
Property Searches
Ground Floor Grasmere House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP
DX 715568 Warrington
Telephone 0370 751 0101

Property.searches@uuplc.co.uk

Your Ref: 70010278
Our Ref: 14/ 1119358
Date: 30/06/2015

Dear Sirs

Location: Police Station/Synagogue Jacksons Row Manchester M2 5GU

I acknowledge with thanks your request dated 30/06/15 for information on the location of our services.

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

I attach General Condition Information sheets, which details contact numbers for additional services (i.e. new supplies, connections, diversions) which we are unable to deal with at this office. In addition you should ensure they are made available to anyone carrying out any works which may affect our apparatus.

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 telephone us on 0370 7510101.

Yours Faithfully,



Sue McManus
Operations Manager
Property Searches

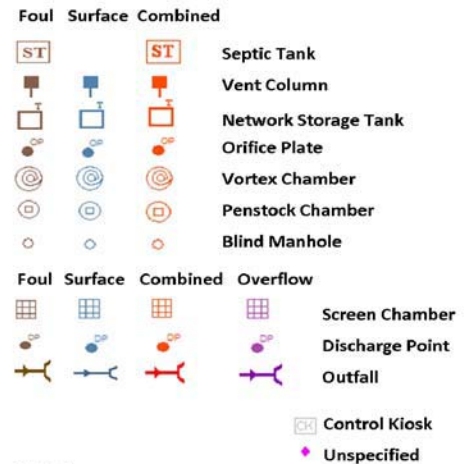
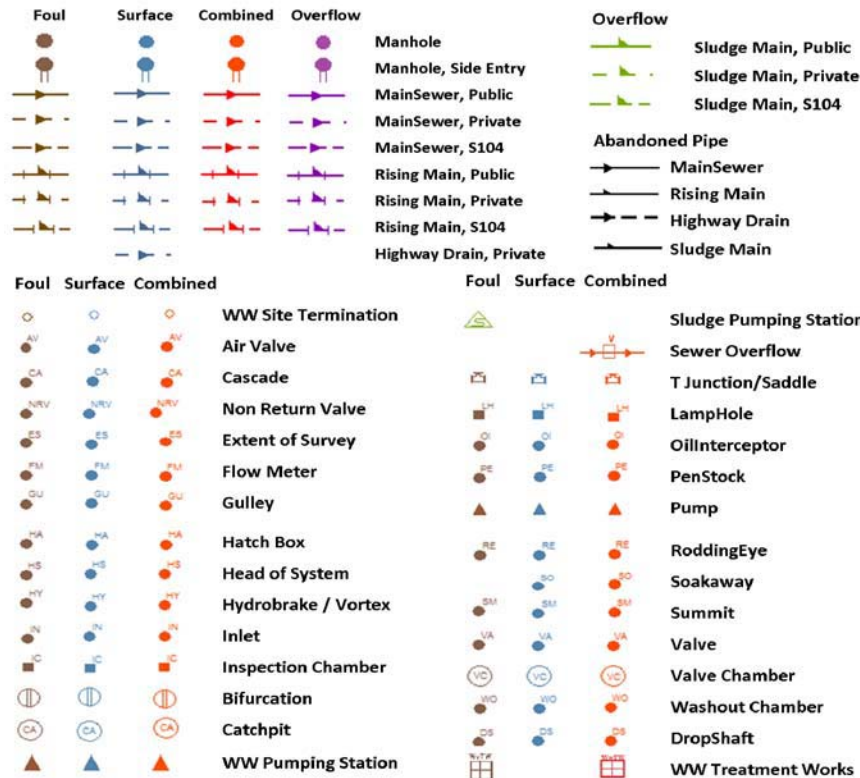
TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

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:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

WASTE WATER SYMBOLOGY



Legend			
MANHOLE FUNCTION		SEWER SHAPE	
FO	Foul	CI	Circular
SW	Surface Water	EO	Egg
CO	Combined	OV	Oval
OV	Overflow	FT	Flat Top
		RE	Rectangular
		SQ	Square
		TR	Trapezoidal
		AR	Arch
		BA	Barrel
		HO	HorseShoe
		UN	Unspecified
SEWER MATERIAL			
AC	Asbestos Cement	DI	Ductile Iron
BR	Brick	VC	Vitrified Clay
CO	Concrete	PP	Polypropylene
CSB	Concrete Segment	PF	Pitched Fibre
CSU	Concrete Segment	MA	Masonry, Coursed
CC	Concrete Box Culverted	MA	Masonry, Random
PSC	Plastic / Steel	RP	Reinforced Plastic
GR	Glass Reinforced	CI	Cast Iron
GRP	Glass Reinforced	SI	Spun Iron
PVC	Polyvinyl Chloride	ST	Steel
PE	Polyethylene	U	Unspecified

CLEAN WATER SYMBOLOGY

PIPE WORK



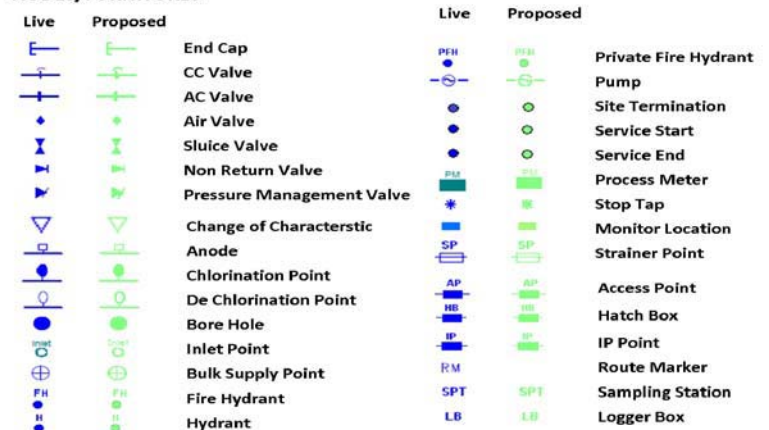
ABANDONED PIPE



PROPERTY TYPES



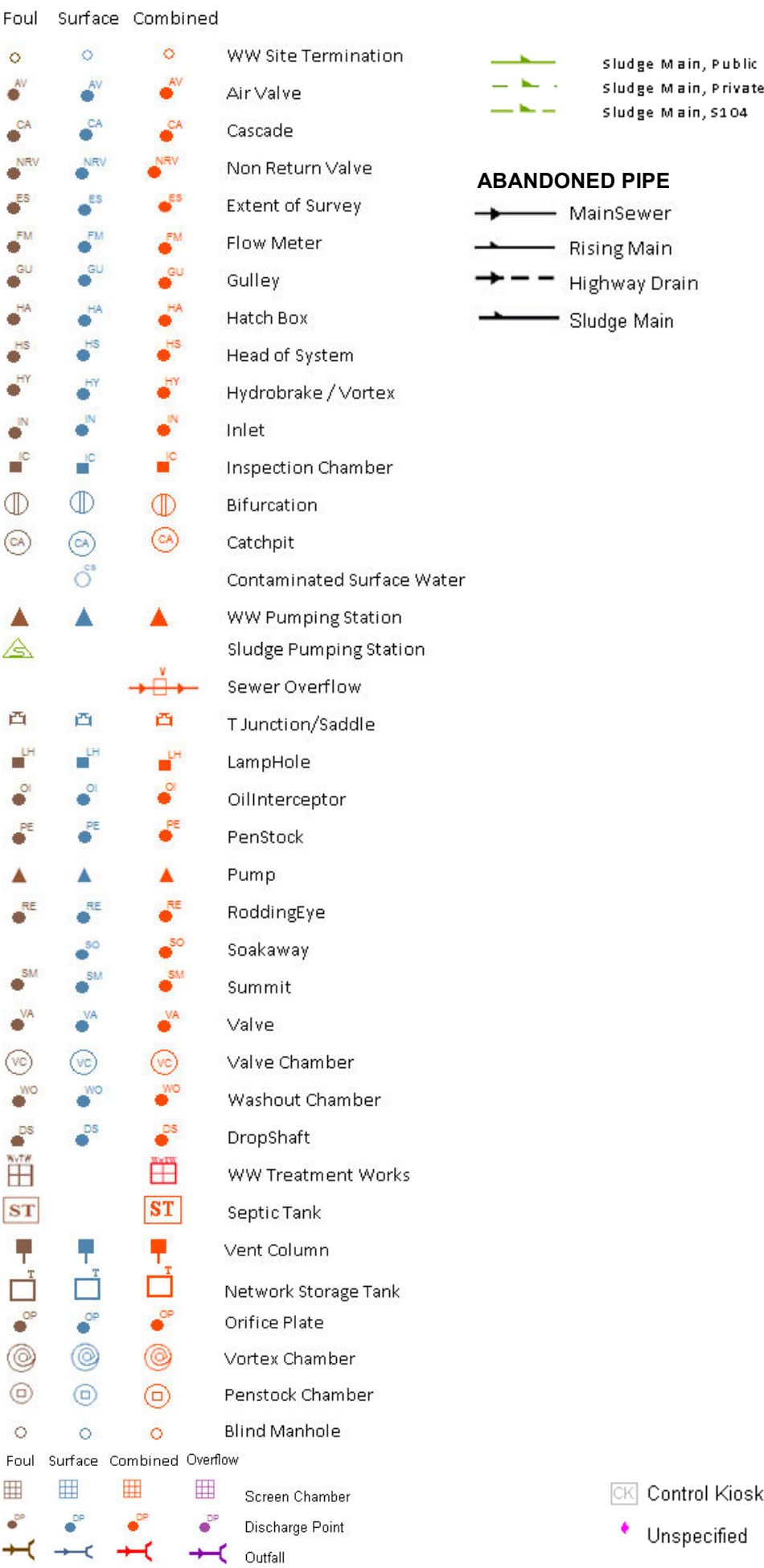
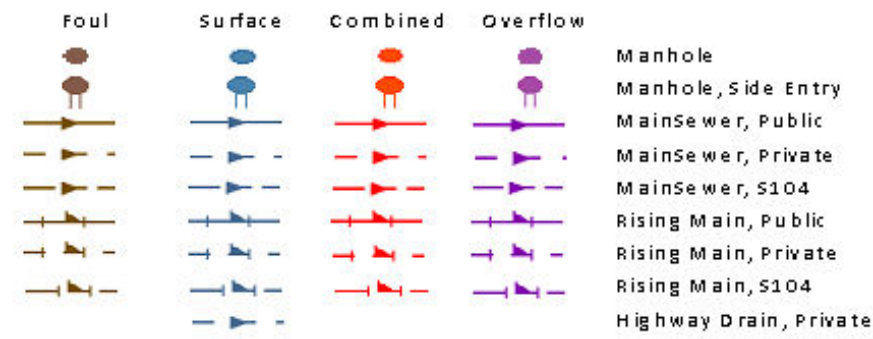
NODES/FURNITURES



Legend	
MATERIAL TYPES	LINING TYPES
AC	ASBESTOS CEMENT
CI	CAST IRON
CU	COPPER
CO	CONCRETE
DI	DUCTILE IRON
GI	GALVANISED IRON
GR	GREY IRON
OT	OTHERS
PB	LEAD
PV	UPVC
SI	SPUN IRON
ST	STEEL
UN	UNKNOWN
PE	POLYETHYLENE
CL	CEMENT LINING
TB	TAR OR BITUMEN
ERL	EPOXY RESIN
INSERTION TYPES	
DD	DIE DRAWN
DR	DIRECTIONAL DRILLING
MO	MOLING
PI	PIPELINE
SL	SLIP LINED

Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad	Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad
4091	CO		0	220	380	EG	BR	12.04											
4115	CO		0	220	380	EG	BR	10											
4122	CO																		
4123	CO																		
4205	CO		0	500	330	EG	BR	32.25											
4206	CO		0	525		CI	CO	24.33											
4207	CO		0	500	330	EG	VC	21.21											
4305	CO		0	530	830	EG	BR	20.62											
5018	CO		0	300		CI	VC	43.66											
5090	CO																		
5091	CO																		
5108	CO		0	2300		CI	BR	81.36											
5207	CO																		
5210	CO																		
5309	CO																		
5312	CO																		
5314	CO																		
5315	CO																		
6005	CO																		
6017	CO																		
6209	CO		0	830	430	EG	BR	44.92											
6210	CO		0	500		CI	CO	36.4											
6211	CO		0	430	700	EG	BR	10.3											
6216	CO																		
6219	CO																		
6261	CO		0	430	830	UN	BR	7.07											
6292	CO																		
6313	CO																		
6314	CO																		
6315	CO																		
6390	CO																		
7014	CO																		
7107	CO																		
7210	CO																		
7215	CO																		
7216	CO																		
7218	CO																		
7220	CO																		
7222	CO																		
7290	CO		0	410	720	EG	BR	1.41											
7312	CO																		
7321	CO																		
7325	CO																		
7329	CO																		
7390	CO																		
8004	CO																		
8010	CO																		
8012	CO																		
8015	CO		0	450		CI	CO	1											
8103	CO																		
8109	CO		0	410	310	EG	VC	9.43											
8110	CO																		
8112	CO																		
8190	CO		0	610	510	EG	VC	5											
8207	CO																		
8212	CO																		
8290	CO																		
8291	CO		0	320	400	EG	VC	20.4											
8301	CO																		
8302	CO																		
8303	CO																		
8305	CO																		
8108	CO																		
9214	CO																		
9215	CO																		
8707	SW																		
8709	CO																		
8811	CO																		
8902	CO																		
8115	CO																		
4701	CO		31	330	630	550	UN	BR	24.72										
336	CO		0	870	630	EG	BR	37.93											

WASTE WATER SYMBOLOGY



LEGEND

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available.

The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

OS Sheet No:

Scale: 1: 1250 Date: 30/06/2015

372 Nodes

Sheet 2 of 2



SEWER RECORDS

OS Sheet No:

Approximately Scale: 1: 1250 Date: 30/06/2015

Printed By: Property Searches

Conditions and Information regarding wastewater network

These general conditions and precautions apply to the wastewater network of United Utilities

Please ensure that a copy of these conditions is passed to your representative and contractor on site.

- 1 United Utilities provides the approximate locations of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer culvert or drain, private connections from properties to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual positions and/or depths being different from those indicated. The records do indicate the position of the nearest known public sewer from which the likely length of private connections can be estimated together with the need for any off site drainage rights or easements.
- 2 Special requirements relative to our sewers may be indicated. United Utilities employees or its contractors will visit any site at reasonable notice to assist in the location of its underground sewers and advise any precautions that may be required to obviate any damage. To arrange a visit or for further information regarding new supplies, connections, diversions, costing, or any notification required under these General Conditions, please call us on **0345 602 0406**.
- 3 Where public sewers are within a site which is to be developed and do not take any drainage from outside the area, they are from an operational viewpoint redundant. The developer must identify all redundant sewers affected by the development and apply to United Utilities in writing for these sewers to be formally closed. The developer shall bear all related costs of the physical abandonment work.
- 4 Public sewers within the site that are still live outside the area will be subject to a "Restricted Building zone". This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to public sewers must be maintained at all times and no interference to manholes will be permitted during construction work.
5. Where there is a public sewer along the line of a proposed development/building, arrangements shall be made by the developer at his cost to divert the sewer around the development. Where this is not possible and as a last resort, a "Building Over Agreement" will need to be completed under section 18 of the Building Act 1984. The developer shall design building foundations to ensure that no additional loading is transferred to the sewer and submit such details both to the Local Authority's Building Control Officer and to United Utilities for approval/acceptance. United Utilities on a rechargeable basis would normally undertake all aspects of design work associated with the diversion of any part of the operational wastewater network. For further advice please email wastewaterdeveloperservices@uuplc.co.uk
6. Where there is a non-main river watercourse/culvert passing through the site, the landowner has the responsibility of a riparian owner for the watercourse/culvert and is responsible for the maintenance of the fabric of the culvert and for all works involved in maintaining the unrestricted flow through it. Building over the watercourse/culvert is not recommended. The developer must contact the local authority before any works are carried out on the watercourse/culvert. Where it is necessary to discharge surface water from the site into the watercourse/culvert the developer shall make an assessment of the available capacity of the watercourse/culvert (based on a 1 in 50 year event) and ensure that the additional flow to be discharged into the watercourse/culvert will not cause any flooding. In appropriate cases, flooding may be prevented by on-site storage. The developer shall submit the relevant details required to substantiate his development proposals. Details of any outfall proposed shall also be submitted to the Environment Agency, PO Box 12, Richard Fairclough House, Knutsford Road, Warrington, Cheshire, WA4 1HT for their approval.
7. Where there is a main river watercourse/culvert passing through the site, the developer shall submit all proposals affecting the river to the Environment Agency at the address stated in paragraph 6 for approval/acceptance.

8. Your attention is drawn also to the following:

Private drains or sewers which may be within the site.

On 1 October 2011 all privately owned sewers and lateral drains which communicate with (that is drain to) an existing public sewer as at 1 July 2011 will become the responsibility of the sewerage undertaker. This includes private sewers upstream of pumping stations that have yet to transfer, but excludes lengths of sewer or drain that are the subject of an on-going appeal or which have been excluded from transfer as a result of an appeal or which are on or under land opted-out by a Crown body. The transfer specifically excludes sewers and lateral drains owned by a railway undertaker. Sewers upstream of such assets, however, are transferred. Such assets may not be recorded on the public sewer record currently as it was not a requirement to keep records of previously private sewers and drains.

Applications to make connections to the public sewer.

The developer must write to United Utilities requesting an application form that must be duly completed and returned. No works on the public sewer shall be carried out until a letter of consent is received from United Utilities.

Sewers for adoption If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with "Sewers for Adoption", Seventh Edition, published by the Water Research Centre (2001) Plc, Henley Road, Medmenham, PO Box 16, Marlow, Buckinghamshire, SL7 2HD will be required, taking into consideration any departures from the general guide stipulated by United Utilities.

Further consultation with United Utilities.

Developers wishing to seek advice or clarification regarding sewer record information provided should contact United Utilities to arrange an appointment. A consultation fee may be charged, details of which will be made available at the time of making an appointment.

9. Combined sewers, foul sewers, surface water sewers, and pumped mains. These are shown separately in a range of colours or markings to distinguish them on our drawings, which are extracts from the statutory regional sewer map. A legend and key is provided on each extract for general use, although not all types of sewer will be shown on every extract.

Combined sewers shown coloured red carries both surface water and foul sewage, especially in areas where there is no separate surface water sewerage system.

Foul sewers coloured brown may also carry surface water and there may be no separate surface water system indicated in the immediate area. Both combined and foul sewers carry wastewater to our treatment works before it can safely be returned to the environment.

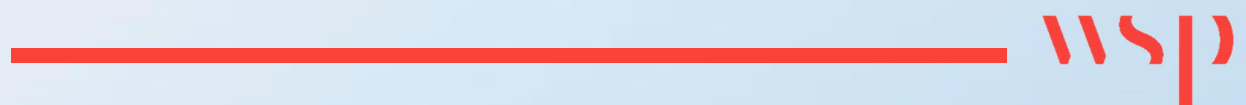
Surface water sewers coloured blue on our drawings are intended only to carry uncontaminated surface water (e.g. rainfall from roofs, etc) and they usually discharge into local watercourses. It is important for the protection of the environment and water quality that only uncontaminated surface water is connected to the surface water sewers. Improper connections to surface water sewers from sink wastes, washing machines and other domestic use of water can cause significant pollution of watercourses.

Pumped mains, rising mains and sludge mains will all be subject to pumping pressures and are neither suitable nor available for making new connections.

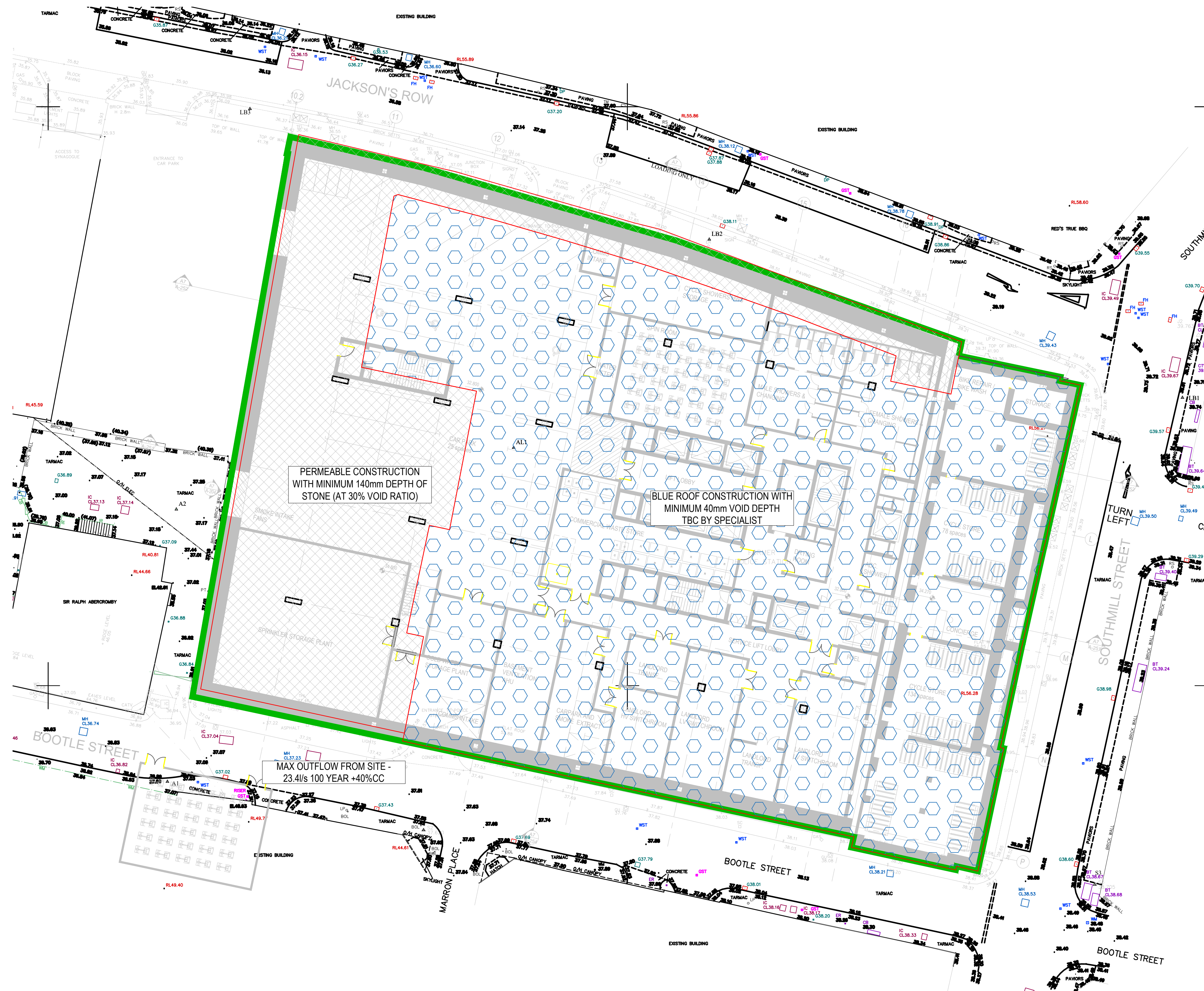
Highway drains, when included, show as blue and black dashed lines. Highway drains are not assets belonging to United Utilities and are the responsibility of local authorities.

1. For information regarding future proposals for construction of company apparatus please write to United Utilities, PO Box 453, Warrington, WA5 3QN.
2. For information regarding easements, deeds, grants or wayleaves please write to United Utilities Property Solutions, Coniston Buildings, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3UU
Tel: 01925 731 365

Appendix F



DRAINAGE LAYOUT BLOCK B
(BASEMENT) (CURTINS DRAWING
NO. 078847-CUR-XX-XX-DR-C-92500-
P01) AND ALTERNATIVE OPTION 2



ALTERNATIVE ATTENUATION STRATEGY
BLUE ROOF AND PERMEABLE CONSTRUCTION

Phase Area = 3265m²
External Area = 875m²
Roof Area = 2390m²

Therefore requires approximately 40mm void depth across
blue roof area of 3265m² and 140mm depth of permeable
sub base (at 30% void ratio) of external area of 875m².

Appendix G

DRAINAGE CALCULATIONS

wsp

WSP Group Ltd				Page 1	
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Date 03/09/2021 01:18		Designed by UKDXV006			
File 210902 St Michaels Block B.SRCX		Checked by			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	98.324	1.324	12.4	66.2	0 K
30 min Summer	98.671	1.671	15.6	83.6	0 K
60 min Summer	98.904	1.904	17.8	95.2	0 K
120 min Summer	99.020	2.020	18.9	101.0	0 K
180 min Summer	99.007	2.007	18.8	100.4	0 K
240 min Summer	98.952	1.952	18.3	97.6	0 K
360 min Summer	98.807	1.807	16.9	90.3	0 K
480 min Summer	98.675	1.675	15.7	83.7	0 K
600 min Summer	98.559	1.559	14.6	77.9	0 K
720 min Summer	98.458	1.458	13.6	72.9	0 K
960 min Summer	98.295	1.295	12.1	64.8	0 K
1440 min Summer	98.065	1.065	10.0	53.3	0 K
2160 min Summer	97.850	0.850	8.0	42.5	0 K
2880 min Summer	97.714	0.714	6.7	35.7	0 K
4320 min Summer	97.546	0.546	5.1	27.3	0 K
5760 min Summer	97.447	0.447	4.2	22.4	0 K
7200 min Summer	97.381	0.381	3.6	19.0	0 K
8640 min Summer	97.332	0.332	3.1	16.6	0 K
10080 min Summer	97.296	0.296	2.8	14.8	0 K
15 min Winter	98.484	1.484	13.9	74.2	0 K
30 min Winter	98.875	1.875	17.6	93.8	0 K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	118.613	0.0	74.9	23	
30 min Summer	79.413	0.0	100.4	34	
60 min Summer	50.812	0.0	128.4	54	
120 min Summer	31.468	0.0	159.1	86	
180 min Summer	23.466	0.0	177.9	120	
240 min Summer	18.940	0.0	191.5	154	
360 min Summer	13.882	0.0	210.5	220	
480 min Summer	11.143	0.0	225.3	284	
600 min Summer	9.389	0.0	237.3	348	
720 min Summer	8.158	0.0	247.4	410	
960 min Summer	6.531	0.0	264.1	532	
1440 min Summer	4.764	0.0	289.0	778	
2160 min Summer	3.468	0.0	315.6	1144	
2880 min Summer	2.766	0.0	335.5	1504	
4320 min Summer	2.007	0.0	365.1	2216	
5760 min Summer	1.596	0.0	387.3	2944	
7200 min Summer	1.336	0.0	405.1	3680	
8640 min Summer	1.154	0.0	420.1	4408	
10080 min Summer	1.020	0.0	433.1	5144	
15 min Winter	118.613	0.0	83.9	23	
30 min Winter	79.413	0.0	112.4	34	
©1982-2019 Innovyze					

WSP Group Ltd

Page 2

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Date 03/09/2021 01:18
File 210902 St Michaels Block B.SRCX
XP Solutions

Designed by UKDXV006
Checked by
Source Control 2019.1



Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	99.134	2.134	20.0	106.7	0 K
120 min Winter	99.217	2.217	20.8	110.9	0 K
180 min Winter	99.154	2.154	20.2	107.7	0 K
240 min Winter	99.050	2.050	19.2	102.5	0 K
360 min Winter	98.831	1.831	17.1	91.6	0 K
480 min Winter	98.649	1.649	15.4	82.4	0 K
600 min Winter	98.497	1.497	14.0	74.9	0 K
720 min Winter	98.371	1.371	12.8	68.5	0 K
960 min Winter	98.174	1.174	11.0	58.7	0 K
1440 min Winter	97.917	0.917	8.6	45.9	0 K
2160 min Winter	97.697	0.697	6.5	34.9	0 K
2880 min Winter	97.567	0.567	5.3	28.4	0 K
4320 min Winter	97.419	0.419	3.9	20.9	0 K
5760 min Winter	97.336	0.336	3.1	16.8	0 K
7200 min Winter	97.282	0.282	2.6	14.1	0 K
8640 min Winter	97.244	0.244	2.3	12.2	0 K
10080 min Winter	97.216	0.216	2.0	10.8	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	50.812	0.0	143.8	56
120 min Winter	31.468	0.0	178.2	92
180 min Winter	23.466	0.0	199.3	128
240 min Winter	18.940	0.0	214.5	164
360 min Winter	13.882	0.0	235.8	232
480 min Winter	11.143	0.0	252.3	298
600 min Winter	9.389	0.0	265.8	362
720 min Winter	8.158	0.0	277.1	426
960 min Winter	6.531	0.0	295.8	550
1440 min Winter	4.764	0.0	323.6	796
2160 min Winter	3.468	0.0	353.4	1156
2880 min Winter	2.766	0.0	375.8	1528
4320 min Winter	2.007	0.0	409.0	2248
5760 min Winter	1.596	0.0	433.8	2952
7200 min Winter	1.336	0.0	453.7	3680
8640 min Winter	1.154	0.0	470.5	4408
10080 min Winter	1.020	0.0	485.0	5144

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Date 03/09/2021 01:18	Designed by UKDXV006															
File 210902 St Michaels Block B.SRCX	Checked by															
XP Solutions	Source Control 2019.1															
<u>Model Details</u> Storage is Online Cover Level (m) 100.000 <u>Tank or Pond Structure</u> Invert Level (m) 97.000 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>50.0</td><td>2.500</td><td>50.0</td><td>2.501</td><td>0.0</td></tr></table> <u>Pump Outflow Control</u> Invert Level (m) 97.000 Depth (m) Flow (l/s) <table><tr><td>2.500</td><td>23.4000</td></tr></table>			Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	50.0	2.500	50.0	2.501	0.0	2.500	23.4000
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)											
0.000	50.0	2.500	50.0	2.501	0.0											
2.500	23.4000															
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APPENDIX B

DRAINAGE STRATEGY 2019



Jackson's Row Developments Ltd

ST MICHAEL'S, JACKSON'S ROW

Drainage Strategy Report

(To be read in conjunction with the Drainage Strategy Addendum Report 2021)





Jackson's Row Developments Ltd

ST MICHAEL'S, JACKSON'S ROW

Drainage Strategy Report

PUBLIC

PROJECT NO. 70061860

OUR REF. NO. 70061860-DSR001

DATE: NOVEMBER 2019

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QUALITY CONTROL

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DRAINAGE CALCULATIONS

EXECUTIVE SUMMARY

Jackson's Row Developments Ltd (hereinafter referred to as 'the Applicant') is seeking to construct a major development proposal known as St Michael's, Jackson's Row, Manchester, UK.

The planning application for the development was originally registered in January 2017. Following feedback, the decision was taken to revise the scheme. Revised plans and documents were submitted in November 2017 and the development was granted planning permission in June 2018. For the purposes of this Drainage Strategy Report, the approved development will be referred to as the 'Approved Development'.

Through the detailed design process, a number of relatively minor improvements to the original scheme have been identified; these will also provide technical and functional improvements through the next stage design process. The Applicant wishes to progress these proposed changes, which are considered to require amendments to the original scheme, through a Section 73¹ application. It is important to stress from the outset that the fundamental scheme principles, such as the layout, uses, and height of the tower are unaltered, and viewed in the context of the overall scheme, the Proposed Amendments are considered to be minor. In addition, further minor amendments to the Approved Development are desired to address the particular brand standards and specifications of the operator for the proposed hotel. The amendments now proposed will be referred to as the 'Proposed Amendments'. For the avoidance of doubt, references to the 'Proposed Development' refer to the 'Approved Development' as well as the 'Proposed Amendments', i.e. the entirety of the development as now proposed.

The changes to the Drainage Strategy Report relate to the Proposed Amendments. The amended floor plans have been reviewed together with the information from the public health engineers showing above ground drainage. The review identified no changes to the impermeable areas, discharge rates and surface water attenuation storage requirements and the Proposed Development drawings have been updated in the appendices. The public health drawings identified revised locations of proposed foul and surface water drainage connections to the existing public sewers. These comply with the requirements of United Utilities and are also amended in the report accordingly.

¹ Section 73 of the Town and Country Planning Act 1990 (as amended)

This Drainage Strategy Report should be read in conjunction with the separate Flood Risk Assessment Report which provides details on the outline flood risk strategy for the Proposed Development.

SURFACE WATER DRAINAGE STRATEGY

Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.

There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.

Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.

The United Utilities consultation response indicated that surface water may discharge at an unrestricted rate into the public combined sewer network.

However, in line with Manchester City Council policy and their consultation response, flows will be restricted to 50% of the existing flow rate following development. The resulting allowable flow is calculated to be 39.8 l/s.

On-site storage with a total volume of approximately 149 m³ is required in order to attenuate flows to the allowable rate in a 1 in 100 year storm with a 40% allowance for climate change. The storage is currently proposed to be located at basement level B2 and thus it is likely that a gravity solution will not be possible for discharge. The storage therefore includes a sump and pumping station.

The arrangement of site drainage and attenuation may currently involve multiple off-site connections, which will be confirmed following receipt of CCTV results of the public sewer network.

The majority of the sewers as well as the proposed pumping station and attenuation storage are to be located within or below the basement and so will be privately maintained.

FOUL WATER DRAINAGE STRATEGY

It is proposed to discharge the foul water flows from the new development into the public combined sewer network.

The United Utilities pre-development enquiry response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network at a single location or multiple locations.

Two discharge points are currently proposed for foul water from the site to the public sewers. Following CCTV results for the site, the exact discharge points and rates can be confirmed.

The majority of the proposed site drainage infrastructure is located within the basement and so will be privately maintained.

1. INTRODUCTION

1.1. APPOINTMENT AND BRIEF

- 1.1.1. WSP was appointed by Jackson's Row Developments Ltd to undertake a Drainage Strategy to support the Section 73² application for minor amendments to the Approved Development. For the avoidance of doubt, references to the 'Proposed Development' refer to the 'Approved Development' as well as the 'Proposed Amendments', i.e. the entirety of the development as now proposed.
- 1.1.2. A site location plan is included in Appendix A.

1.2. PROPOSED DEVELOPMENT

- 1.2.1. The Proposed Development comprises a synagogue, two hotels and space for office, retail, bar/restaurant and residential use.
- 1.2.2. Proposed site plans and elevations can be found within the centralised plans section and Appendix B.

1.3. OBJECTIVE OF THE STUDY

- 1.3.1. The objective of this report is to provide details of the Proposed Development's foul and surface water drainage strategies to support the separate Flood Risk Assessment (WSP 2017) that has been undertaken in accordance with the National Planning Policy Framework.
- 1.3.2. This report provides details on the following:
- The existing drainage characteristics of the site;
 - The design requirements of the relevant statutory consultees;
 - The discharge points offsite for the new foul and surface water drainage networks;
 - The discharge rates and attenuation storage requirements;
 - An assessment of the requirement for on-site pumping station(s);
 - The suitability and incorporation of SuDS within the development; and
 - A strategy for the adoption and maintenance of drainage features.

1.4. PLANNING POLICY & DESIGN GUIDANCE REQUIREMENTS

- 1.4.1. A detailed review of the relevant national and local planning policies as well as relevant design guidance is included in the separate Flood Risk Assessment (WSP 2017). The 2019 update of the National Planning Policy Framework has no effect on drainage and flood risk.
- 1.4.2. The surface and foul water drainage strategy has been designed in accordance with the following national and local policy documents and relevant design guidance:
- Flood and Water Management Act (2010);
 - National Planning Policy Framework (2019) and Planning Practice Guidance (2014);

² Section 73 of the Town and Country Planning Act 1990 (as amended)

- Building Regulations Part H [Drainage and Waste Disposal] (2013);
- Sewers for Adoption 7th Edition;
- Sustainable Drainage Systems Written Statement HCWS161 (December 2014);
- Defra Sustainable Drainage Systems Non-Statutory Technical Standards For Sustainable Drainage Systems (March 2015);
- British Standard 8533:2011, Assessing and Managing Flood Risk in Development;
- British Standard 8582:2013 Code of Practice for Surface Water Management for Development Sites; and
- Manchester, Salford and Trafford Councils' Level 1 and 2 Hybrid Strategic Flood Risk Assessment (2011).

1.5. LIMITATIONS

- 1.5.1. This report is based on the interpretation and assessment of data provided by third parties.
- 1.5.2. Whilst every care has been taken to ensure this information is accurate and up-to-date, WSP cannot guarantee the accuracy of third party data and the findings of this report may change if the data is amended or updated after the date of consultation.
- 1.5.3. The recommendations made within this report have been based on available information and may be subject to change upon receipt of further consultation responses response.

2. EXISTING SITE

2.1. SITE LOCATION

- 2.1.1. The site is located off Jackson's Row in Manchester approximately 0.1 km west of Manchester Town Hall and Central Library.
- 2.1.2. An approximate postcode is M2 5WD and approximate OS coordinates are 383645, 398030.
- 2.1.3. A site location plan can be found in Appendix A.

2.2. SITE DESCRIPTION

- 2.2.1. Table 1 describes the general site characteristics.

Table 1 - Characteristics of the Site

Area		The Site Area is Approximately 0.56 Ha.
Site Use		The site is currently occupied by a police station, synagogue and pub.
General Topography		The topographical survey (Appendix C) includes levels for external areas around the perimeter of the site only. The survey indicates that site levels fall from east to west. Site levels in the north east corner peak at 39.75 mAOD whereas in the south east corner the maximum level is 38.68 mAOD. Levels on the western boundary of the site vary between 35 mAOD and 36 mAOD.
Boundaries	North	Jackson's Row, drinking establishments, a restaurant and a hair salon.
	South	Bootle Street and commercial property which appears to be disused.
	East	Southmill Street and commercial development.
	West	A multi-storey office building beyond which is the A56/Deansgate.
Access		Access to eastern half of the site may be gained via Jackson's Row. Syers Court off Bootle Street allows access to the west of the site.

2.3. EXISTING WATERCOURSES

- 2.3.1. The Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008) does not show the route of any watercourse under the site. However, two watercourses are shown in vicinity of the site on this map.
- 2.3.2. The first is an underground 'lost watercourse' which flows in a northeast - southwest orientation, although the direction of flow is not confirmed. The Manchester City Council response received on 30 October 2015 indicated that historically this watercourse was known as the River Tib and now the watercourse is incorporated into the combined sewer system in the vicinity of the site. The closest point of this watercourse to the site is 0.1km to the east where it flows under land near to Mount Street.

- 2.3.3. A second underground 'lost watercourse', confirmed by the Manchester City Council consultation response on 30 October 2015 as the Manchester and Salford Junction Canal, connects the River Irwell (between Princess Bridge and New Quay Street) to the Rochdale Canal near to Bridgewater Hall on Great Bridgewater Street. The canal is 0.3km southwest of the site at its closest point. It appears that the Canal and the other unnamed watercourse connect shortly before the southern end of the Canal.
- 2.3.4. The Rochdale Canal is located approximately 0.5km to the south of the site.
- 2.3.5. Beyond the canal at approximately 0.6km south of the site the River Medlock flows generally in an east to west direction. The River is partially in culvert around this location and the Manchester, Salford and Trafford Council Hybrid Strategic Flood Risk Assessment (2011) Flood Risk Management Map indicates that the 'Medlock Tunnels' flow northwest from under Deansgate before emerging at Potato Wharf at a distance of approximately 0.6km from the site. The River is classified as a main river upstream of the entrance into the tunnel at Deansgate and as an ordinary watercourse from this point downstream.
- 2.3.6. A section of the River Irwell known as the Grey Irwell flows in the vicinity of the site. The river which is classed as an ordinary watercourse in this section flows northeast to southwest approximately 0.5km northwest of the site at the closest point.

2.4. EXISTING PUBLIC SEWERS

- 2.4.1. Public sewer records from United Utilities (Appendix E) indicate that there are no public sewers within the site boundary. The following sewers are located within the vicinity of the site under the adjacent roads:
- A combined sewer manhole is indicated in the north east corner of the site which forms the head of two combined sewer runs: one which runs south under Southmill Street to a junction with a sewer flowing along Bootle Street; and another combined sewer of unknown size runs west under Jackson's Row adjacent to the northern boundary of the site.
 - From the crossing of sewers at the junction of Southmill Street and Bootle Street a combined sewer flows west along Bootle Street past the southern boundary of the site. At manhole 6906 to the south of the site, the sewer size is marked as 450 mm.
 - A 2,400 mm combined sewer flows south under Deansgate.
- 2.4.2. A CCTV survey is required to confirm the depth, condition and size of the public sewers.

2.5. EXISTING DRAINAGE CHARACTERISTICS OF THE SITE

- 2.5.1. The site is fully developed and occupied by a police station, a synagogue and a public house along with car parking.
- 2.5.2. The site is therefore covered in hardstanding and surface water runoff is not infiltrated. Instead the runoff is directed towards gullies and into the underground drainage system.
- 2.5.3. There is evidence of separate foul and surface water drainage networks serving the site. A topographical survey (Appendix C) indicates multiple chambers around the perimeter of the site. Additionally, a utility survey of the site in February 2016 (Appendix D) indicated three private lateral connections from the existing site.

- 2.5.4. Surface water runoff from external areas around the perimeter of the site appears to flow into the surrounding highways, based on a site visit and assessment of the topographical survey (Appendix C).

2.6. GEOLOGY AND HYDROGEOLOGY

- 2.6.1. The British Geological Survey Geology of Britain Viewer shows that the site is underlain by sandstone known as the Chester Pebble Beds Formation. There are superficial deposits of Devensian till on the west and centre of the site. The east of the site is shown to have no superficial deposits.
- 2.6.2. The Environment Agency website designates the bedrock under the site as a principal aquifer. The designation is used for rocks which usually provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.
- 2.6.3. The superficial deposits are classed as a Secondary A Aquifer meaning that the deposits are permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers.
- 2.6.4. The Environment Agency website shows that the site does not lie within a Groundwater Source Protection Zone.

2.7. HISTORICAL LAND USES

- 2.7.1. On the earliest available map from 1848, the area around the site is indicated to be developed but the map is broad scale and so it is not possible to determine the use of the site at that time.
- 2.7.2. In 1851 the majority of site is shown to be covered with smaller buildings. There is a larger building at the eastern boundary of the site.
- 2.7.3. Jackson's Row and Bootle Street are visible in 1891 mapping. The road now known as Southmill Street is shown as South Street on this map. Numerous buildings are shown across the site of different sizes. A small road separates a plot in the east of the site which is split into three adjoining sections.
- 2.7.4. In 1948 the road in the east of the site has disappeared and the eastern section of the site is occupied by a police station. A public house is marked in the centre of the site near the southern boundary where the Sir Ralph Abercrombie public house is located in the present day. The northwest of the site is marked as ruins. Other unmarked buildings are also present on the site.
- 2.7.5. The ruins are replaced by a synagogue between 1951 and 1957.
- 2.7.6. An OS plan from 1962-1973 shows the building layout changing but the site usage remaining as a synagogue, public house and police station. The street on the eastern boundary of the site is now marked as Southmill Street.
- 2.7.7. The site has the same usage in present day although buildings have been extended since 1962-1973 mapping.

3. SURFACE WATER DRAINAGE STRATEGY

3.1. PROPOSED DISCHARGE POINT

- 3.1.1. In accordance with requirement H3 of Building Regulations 2003, a hierarchical approach has been used to determine the suitable discharge point for the surface water run-off generated by the Proposed Development.

DISPOSAL OF SURFACE WATER BY INFILTRATION METHODS

- 3.1.2. Wallingford WRAP Class Maps indicated that the ground beneath the site is classed as clayey, or loamy over clayey soils with an impermeable area at shallow depths indicating that infiltration may not be suitable for the site.
- 3.1.3. The site has limited space and sits within a city centre context. The proposals include a main external walkway between Jackson's Row and Bootle Street shown in the site plan (Appendix B) which has further storeys of development beneath, preventing their use for infiltration.
- 3.1.4. Therefore, infiltration is not considered to be viable for this site.

DISCHARGE TO A SUITABLE WATERCOURSE

- 3.1.5. There are two watercourses shown within the vicinity of the site on the Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008).
- 3.1.6. The closest, which was previously known as the River Tib, is now advised by Manchester City Council on 30 October 2015 to be incorporated into the combined public sewer network and so discharge to this watercourse would not be in accordance with the drainage hierarchy.
- 3.1.7. The other 'hidden river' is the Manchester and Salford Junction Canal which is a distance of 0.3 km southwest of the site at the closest point. The condition and capacity of this watercourses to accept new flow is unknown, no information was available from Manchester City Council as of 30 October 2015. Therefore, it is considered that this watercourse would be unsuitable for discharge.
- 3.1.8. The other watercourses in the vicinity of the site are the Rochdale Canal, River Medlock and River Irwell. However, each of these watercourses is a minimum distance of at least 0.5 km and therefore a connection to the watercourses would need a sewer requisition of considerable length.
- 3.1.9. Therefore, a connection to a watercourse for discharge of surface water from the site is considered to be unfeasible.

DISCHARGE TO SEWER

- 3.1.10. There is a network of public combined sewers around the site as shown in the United Utilities sewer plan in Appendix E.
- 3.1.11. The United Utilities pre-development enquiry response received on 28 and 29 October 2015 indicated that surface water could discharge into the public combined sewer network at a convenient connection point or points.
- 3.1.12. The proposed connection point, subject to confirmation following CCTV results, is to the public sewers under Bootle Street.

3.2. PROPOSED DISCHARGE RATE

- 3.2.1. The Manchester City Council pre-application consultation response received on 08 October 2015 indicated flows from the site should be restricted to 50% of the existing flow rate. The response is in line with council policy which restricts discharge to this level for sites proposed in critical drainage areas; the site lies within the Conurbation Core Critical Drainage Area.
- 3.2.2. The United Utilities pre-development enquiry response received on 28 October 2015 indicated that surface water could discharge at an unrestricted rate into the public combined sewer network.
- 3.2.3. The existing flow rate for the site was determined based on a 140 l/s/ha allowance which is commonly presented by local authorities for calculations involving brownfield sites. All of the 0.56 ha of site area is considered to be impermeable following a review of site aerial photography and the topographical survey (Appendix C) on which no significant permeable areas are indicated. The existing flow rate determined by this method for the site is 79.6 l/s, which applying the restrictions imposed by Manchester City Council infers that the allowable flow rate from the site should be restricted to a value of 39.8 l/s.
- 3.2.4. For the purpose of this report the entirety of the site is also considered to be impermeable. The lower ground floor plan indicates impermeable development across the site area. It is possible that planters at higher levels may capture water which could be incorporated at the detailed design stage. However, for the purpose of this report the strategy will be designed assuming that the site is entirely impermeable.
- 3.2.5. The Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) guidance indicates that as a minimum surface water discharge from brownfield sites should not exceed the existing rate. However, development should achieve a greenfield runoff rate where reasonably practicable.
- 3.2.6. The site is space constrained and therefore it is considered that there would be insufficient space to provide attenuation storage in order to reduce the flow rate from the site to greenfield rates.
- 3.2.7. Therefore, flow from the site is proposed to be restricted to 50% of existing flows, which meets the underlying Defra criteria for flow control.
- 3.2.8. A pumping station will be required to discharge water into the combined sewer network (at a maximum rate of 39.8 l/s) since the attenuation storage is located at basement level B2 and thus likely to be lower than the public sewers in the vicinity. The need for pumping will be confirmed following CCTV results, however, space has been accommodated in the development for any required sump and pumps.
- 3.2.9. The network is proposed to have a gravity piped overflow installed to minimise the risk of surcharging the tank in extreme events. The tank is fitted with a high level alarm which should allow for automatic diversion of excessive flows from higher levels into an overflow pipe. The pipe will route flows safely off-site although the exact location is still to be determined. Owing to the potential for surcharged sewers in extreme events, utilisation of a safe overflow route along the surrounding road network may be considered.
- 3.2.10. It should be noted that this overflow system is only intended to be used in extreme events in excess of the 1 in 100 year plus 40% climate change event. The location for the overflow should be chosen to minimise the impact outside of the site boundary.

3.3. ATTENUATION STORAGE

- 3.3.1. The attenuation storage volume has been based on an impermeable area of 0.56ha and achieving a discharge rate of 39.8 l/s during the critical 1 in 100 year (plus a 40% allowance for climate change) storm event, whilst ensuring there was no flooding of the development during the storm event (in accordance with the requirements within Sewers for Adoption).
- 3.3.2. The total attenuation volume calculated using the Source Control Function in Microdrainage is approximately 149 m³. The calculations are included in Appendix G.
- 3.3.3. The Drainage Strategy Plan included within Appendix F shows the proposed points of discharge for surface water to the combined sewer network on Bootle Street. This location is indicative only, as results of a CCTV survey are awaited which will allow for confirmation of the most feasible and convenient connection point.
- 3.3.4. The proposed point of discharge for the Proposed Development will be subject to review during subsequent stages of the design, when inputs from the MEP consultant are available. The drainage strategy will be updated to reflect this; it should be noted that the strategy is unlikely to change.
- 3.3.5. Coordination between disciplines on the arrangement of drainage is ongoing and likely to continue into the detailed design stage. Proposals currently include two connections each for foul water and surface water between the site and the public combined sewer network. If additional connection points are used for the surface water discharge, then the sum of the surface water flows leaving the site must not exceed 39.8 l/s and the attenuation storage may be reconfigured to facilitate this.
- 3.3.6. The attenuation storage will incorporate a sump to house pumps which will discharge surface water at the proposed rate of 39.8 l/s.

3.4. ADOPTION AND MAINTENANCE

- 3.4.1. Any below ground drainage sewer runs, pumping stations and attenuation provided for the building will be privately maintained.
- 3.4.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance and routine de-silting of the attenuation storage.

3.5. CONSIDERATION OF CLIMATE CHANGE

- 3.5.1. Calculations in Appendix G demonstrate that the attenuation storage has sufficient space to accommodate flows from the 1 in 100 year storm including a 40% allowance for climate change. In this event the storage has approximately 200mm of 'freeboard' above the top water level suggesting a good contingency.
- 3.5.2. Therefore, the design incorporates the higher allowance for increases in peak rainfall due to climate change according to the Environment Agency Climate Change Allowances (February 2016).
- 3.5.3. The site lies within Flood Zone 1 and is not at risk of flooding from tidal/coastal sources. Therefore, increases in peak river flow or sea level rise are not considered to impact upon the site during the development lifetime.

4. FOUL WATER DRAINAGE STRATEGY

4.1. PROPOSED DISCHARGE POINTS

- 4.1.1. It is proposed to discharge the foul water flows from the Proposed Development into the existing public combined sewer network surrounding the site.
- 4.1.2. The United Utilities pre-development enquiry response, received on 28 October 2015, indicated that foul water drainage from the site may discharge into the public combined sewer network at a convenient connection point or points.
- 4.1.3. The proposed connection points, subject to confirmation following CCTV results, are to the public sewers under the adjoining streets of Jackson's Row and Bootle Street, as shown in the drainage strategy layout in Appendix F.
- 4.1.4. Where practicable upper level foul water discharge will drain via proposed gravity lateral sewer connections. Any foul water drainage from the basement (serving back of house areas; refuse areas and plant areas) will drain via a pumped solution which can be sized to accommodate flows from upper levels which may be needed depending on the internal drainage coordination at the detailed design stage.

4.2. PROPOSED DISCHARGE RATES

- 4.2.1. The United Utilities pre-development enquiry response indicated that at present foul water may discharge at an unrestricted rate into the public combined sewer network.
- 4.2.2. The proposed rates of discharge for each of the connection points are detailed below in Table 2 based on figures provided to WSP for all site uses. The Drainage Strategy Plan (Appendix F) indicates the location of these discharge points.
- 4.2.3. Foul water rates from the Proposed Development will be subject to review during subsequent stages of the design, when further detailed inputs from the MEP consultant are available.

Table 2 - Proposed Foul Water Connection Points

Sewer Outfall	Area Served	Foul Water Flow Rate (L/S)
01 (Jackson's Row)	Synagogue	6.4
02 (Jackson's Row)	Block A (Hotel / Residential)	30.5
03 (Bootle Street)	General Basement / Podium	7.0
04 (Bootle Street)	Block B (Office / Boutique Hotel)	12.1

- 4.2.4. The total foul water flow from the site is therefore 56.0 l/s. There is provision in the Drainage Strategy Plan for collection and pumping of foul water from car parking and bin storage areas. As these flow rates are likely to be minimal they have not been included in the estimated rates above.

4.3. ADOPTION AND MAINTENANCE

- 4.3.1. A number of foul water drainage features are proposed in basement of the Proposed Development; these features will be privately maintained.
- 4.3.2. The location of access chambers will be coordinated with the architectural and structural layouts and above ground drainage proposals to ensure that these are located in positions that provide sufficient access for maintenance.

5. CONCLUSIONS

5.1. SURFACE WATER DRAINAGE STRATEGY

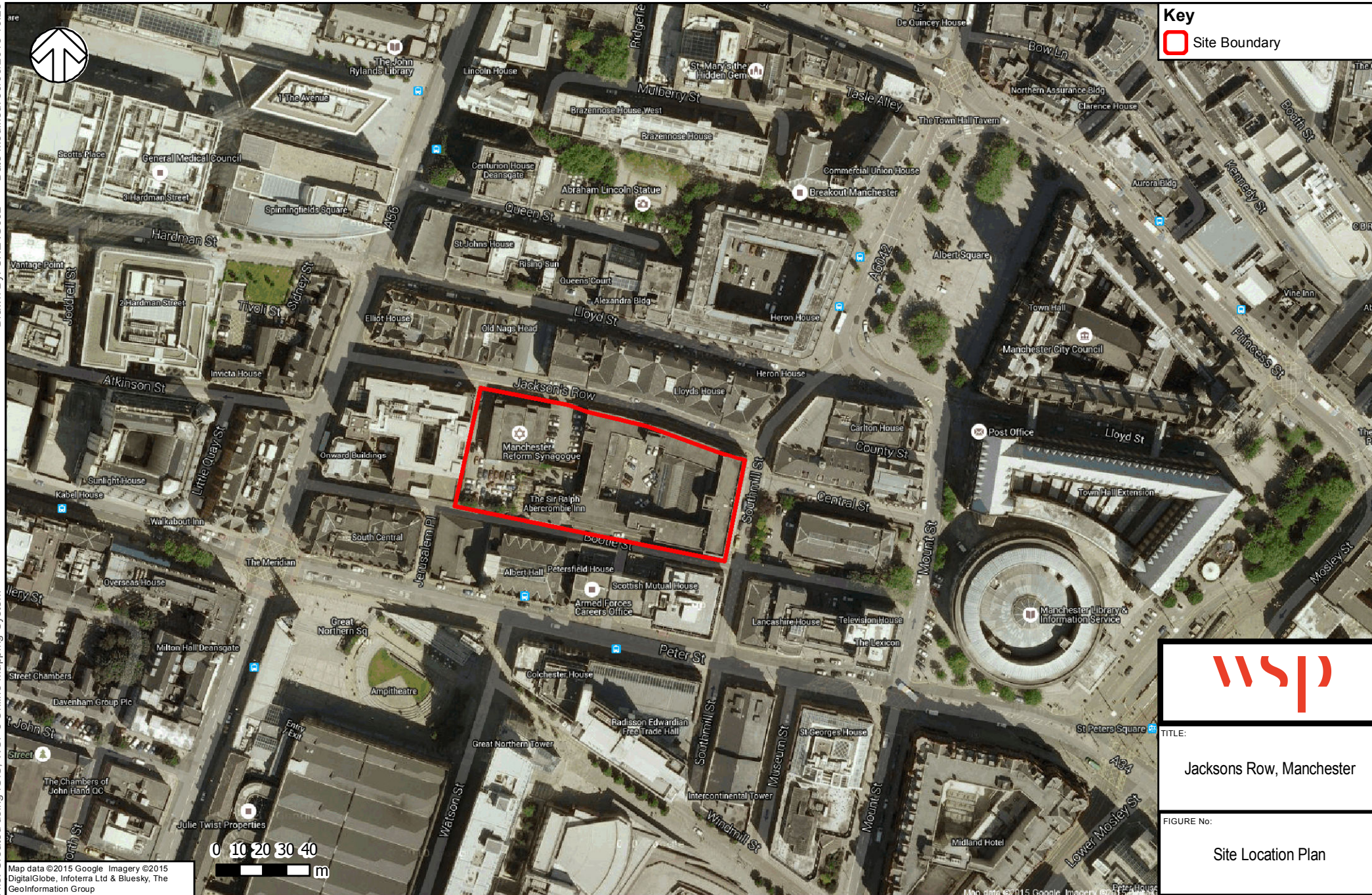
- 5.1.1. Wallingford WRAP Class Maps indicate that the site has limited potential for infiltration. Additionally, the site is space constrained in a city centre context with basement construction. Therefore, infiltration is considered an unsuitable method for discharge of surface water.
- 5.1.2. There are no suitable watercourses in the vicinity of the site for surface water discharge. If a connection was to be made to a suitable watercourse then a sewer requisition of a minimum of 0.5 km would be required which is considered to be unfeasible.
- 5.1.3. Therefore, the current proposal is to discharge surface water into the local sewer network which comprises combined sewers only.
- 5.1.4. The United Utilities consultation response indicated that surface water may at present discharge at an unrestricted rate into the public combined sewer network.
- 5.1.5. However, in line with Manchester City Council policy and their consultation response, flows following development will be restricted to 50% of the existing flow rate. The resulting allowable flow is calculated to be 39.8 l/s.
- 5.1.6. On-site storage with a total volume of approximately 149 m³ is required in order to attenuate flows to the allowable rate in a 1 in 100 year storm with a 40% allowance for climate change. The storage is currently proposed to be located at basement level B2 and thus it is likely that a gravity solution will not be possible for discharge. The storage will therefore include a sump and pumping station.
- 5.1.7. The arrangement of site drainage and attenuation may involve multiple off-site connections, which will be confirmed following receipt of CCTV results of the public sewer network.
- 5.1.8. The majority of the sewers as well as the pumping station and attenuation storage are located within or below the basement and so will be privately maintained.

5.2. FOUL WATER DRAINAGE STRATEGY

- 5.2.1. It is proposed to discharge the foul water flows from the new development into the public combined sewer network.
- 5.2.2. The United Utilities consultation response indicated that foul water may discharge at an unrestricted rate into the public combined sewer network at a single location or multiple locations.
- 5.2.3. Two discharge points are currently proposed for foul water from the site. Following CCTV results for the site the exact discharge points and rates can be confirmed.
- 5.2.4. The majority of the site drainage infrastructure is proposed to be located within the basement and so will be privately maintained.

Appendix A

SITE LOCATION PLAN 

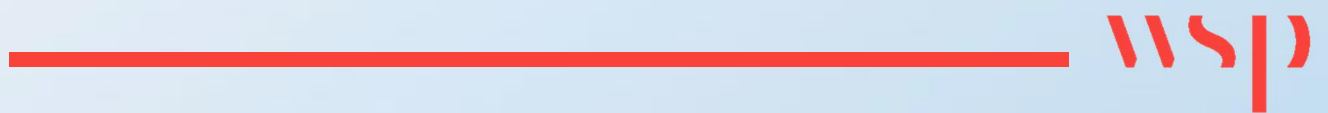


Key
 Site Boundary

TITLE:
Jacksons Row, Manchester

FIGURE No:
Site Location Plan

Appendix B.1

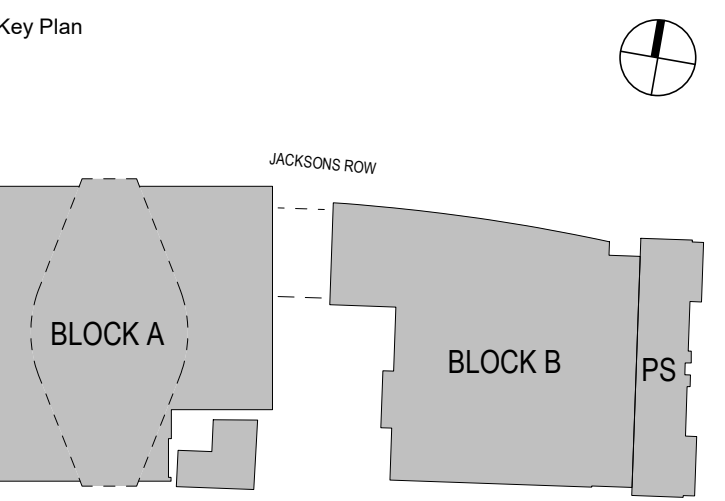
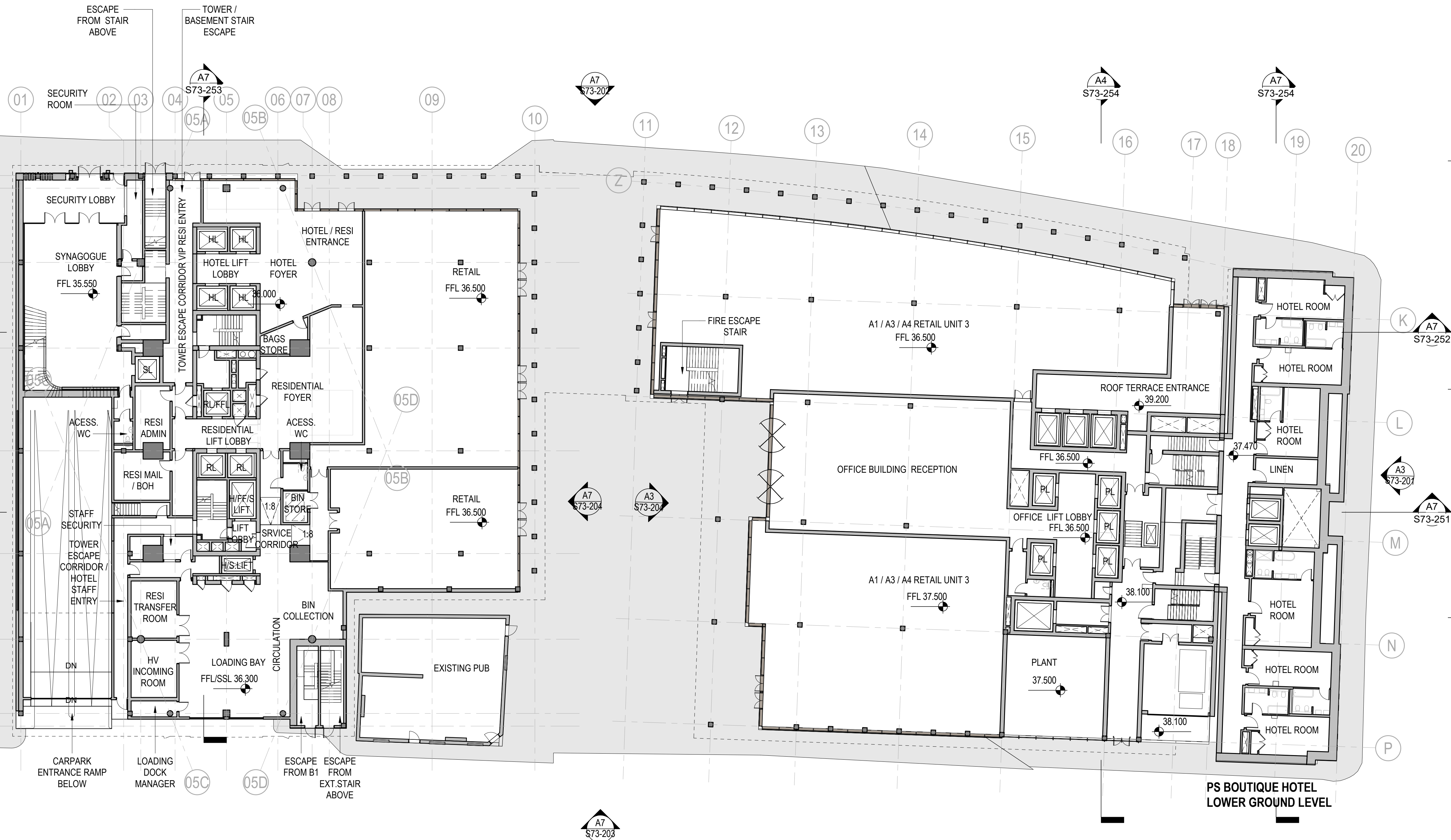


SITE PLANS - GROUND LEVEL GA
PLAN (SOM DRAWING NO. S73-103
REV P01)

A7

GROUND LEVEL PLAN

1 : 200



General Notes

P01	15/11/19	S73 Submission
NO:	DATE:	ISSUE:

Status

FOR INFORMATION

Interior Designer ROWLER JAMES BRINDLEY	Synagogue Consultant FDG fairhursts design group	Design Consultant hodder+partners
Civil Engineer RAMBOLL	Services Engineer HOARE LEA (H)	Fire Engineer OMEGA FIRE
Client ST M	Landscape Designer p-10	Project Manager zerum

Architect
SOM
Skidmore, Owings & Merrill, Inc.
The Broadgate Tower, 20 Primrose Street
London EC2A 2EW, UK
Tel: +44 (0)20 7798 1000 Fax: +44 (0)20 7798 1100

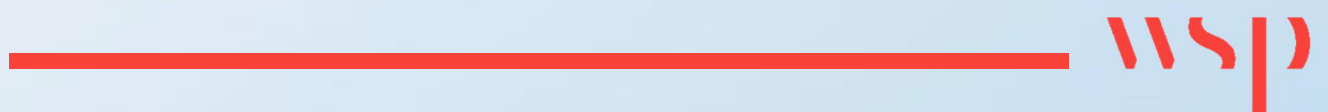
Project Name
**ST. MICHAELS DEVELOPMENT,
MANCHESTER**

Drawing Title

GROUND LEVEL GA PLAN

Project No 218739	Drawing No S73-103	Revision P01
----------------------	------------------------------	------------------------

Appendix B.2



SITE PLANS - BASEMENT B1 PLAN
(SOM DRAWING NO. S73-102 REV
P01) & BASEMENT B2 PLAN (SOM
DRAWING NO. S73-101 REV P01)



1 : 200

Senior Designer DAVID JAMES BRINDLEY FDG fairhursts design group	Design Consultant	hodder+partners
Senior Engineer RAMBOLL		
Services Engineer HOARE LEA (HL)		
Fire Engineer OMEGA FIRE		
Client SITM	Landscape Designer p+ie	
	Project Manager zerum	

architect

SOM

Skidmore, Owings & Merrill, Inc.
The Broadgate Tower, 20 Primrose Street
London EC2A 2EW, UK
Tel: +44 (0)20 7798 1000 Fax: +44 (0)20 7798 1100

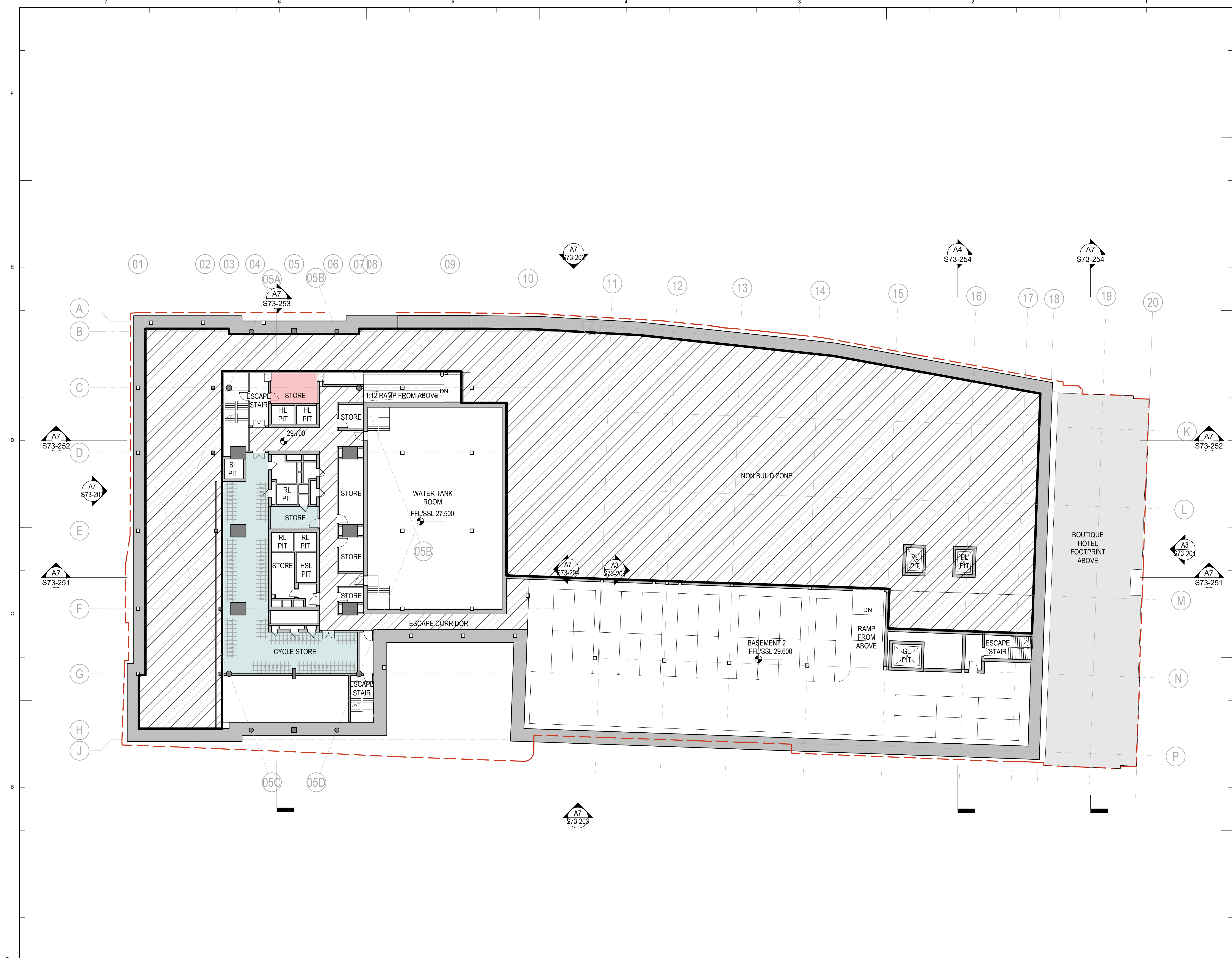
ST. MICHAELS DEVELOPMENT,
MANCHESTER

Drawing Title

BASEMENT B1 PLAN

Project No	Drawing No	Revision
218739	S73-102	P01
Scale @ A0		
As indicated		

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Key Plan

General Notes

P01	15/11/19	S73 Submission
NO:	DATE:	ISSUE:

Status

FOR INFORMATION

Interior Designer BOWLER JAMES BRINDLEY	Synagogue Consultant FDG fairhursts design group	Design Consultant hodder+partners
Civil Engineer RAMBOLL	Services Engineer HOARE LEA (H)	Fire Engineer OMEGA FIRE
Client ST!M	Landscape Designer p-1e	Project Manager zerum
Architect SOM Skidmore, Owings & Merrill, Inc. The Broadgate Tower, 20 Primrose Street London EC2A 2EW, UK Tel: +44 (0)20 7798 1000 Fax: +44 (0)20 7798 1100		

Project Name

**ST. MICHAELS DEVELOPMENT,
MANCHESTER**

Drawing Title

BASEMENT B2 PLAN

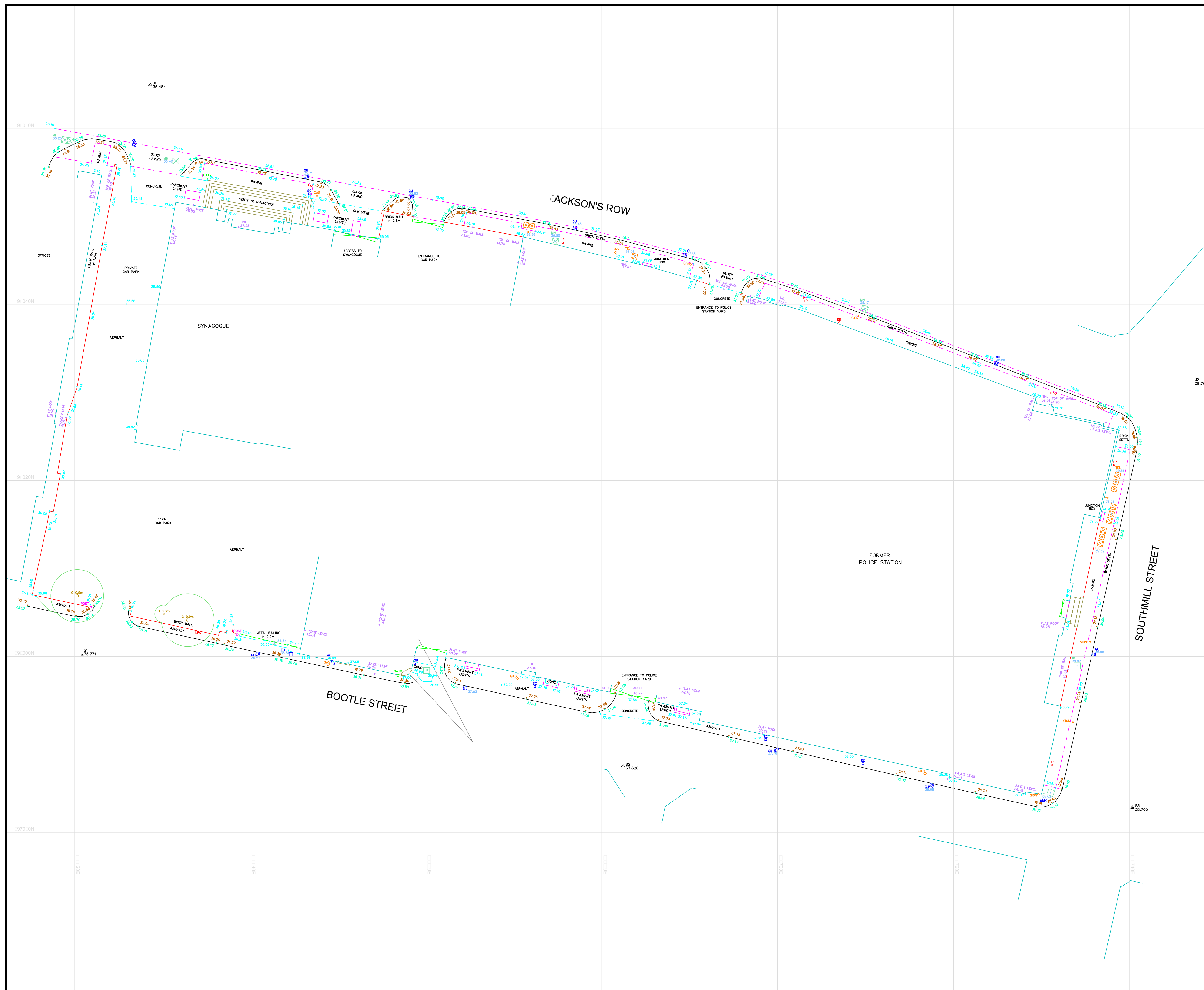
Project No 218739	Drawing No S73-101	Revision P01
Scale @ A0 As indicated		

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Appendix C

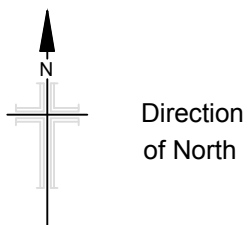
wsp

TOPOGRAPHICAL SURVEY
(DRAWING NO. 13643-100_2DT)



Notes

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Grid : OS National Grid ☐ Approximate ☐
Derived by fitting surveyed points to
coordinates from OS digital information.

Datum : Related to Ordnance Survey benchmark
Located on Elliot House, Deansgate.
☐ value ☐ 5.19 m A.O.D

Station Listing

Station	Easting	Northing	Level
1	2	904.997	5.4
2	749.07	900.24	9.7
S1	20.9	9000.02	5.77
S2	2.410	979.752	7.2
S	740.54	979.2.2	7.70

KEY

ARC VALVE	A AV	KERO OUTLET	KO
BENCH MARK	B BM	LAMP POST	LP
BIN	BIN	LAMP STOP	LN
BOLLARD	BOL	MANHOLE (CIRCULAR)	BM
BORE HOLE	BH	MANHOLE (RECTANGULAR)	BM
BRITISH TELECOM COVER	BT	MANHOLE (TRIANGULAR)	BM
BUS STOP	BUS	MARKER POST	MKP
CABLE TV COVER	CAT	GULLY	GU
CABLE TV SUPPLY	CA	ROOOFING EYE	RE
COLUMN	COL	SGN POST	SGN
EARTHING POINT	COL	TELECOM COVER	TEL
ELECTRICITY COVER	ELEC	TELEGRAPH POLE	TP
ELECTRICITY POLE	EP	THRESHOLD LEVEL	TL
FIRE HYDRANT	PH	TRAFFIC LIGHT	TL
GAS VALVE	GAS	TRIAL PIT	TPIT
GATE		WASH OUT	WO
INSPECTION COVER (CIRCULAR)	IC	WATER METER	WM
INSPECTION COVER (RECTANGULAR)	IC	WATER STOP COCK	SC
	CH	WATER STOP VALVE	SV
CONCRETE COVER	CL	CHAMBER BASE LEVEL	CHL
INVERT LEVEL	IL	WATER SURFACE LEVEL	WL
UNABLE TO RAISE	UTR	UNABLE TO MEASURE	UM
GIRTH OF TREE TRUNK	G	DIAMETER OF TREE TRUNK	D
HIGHEST HEIGHT TO TOP OF CANOPY	H	MINI BOLE TREE	MB

Rev	Date	Drawn	Description	



Southgate House
Pontefracr Road T: 044 0112 00900
Stourton F: 044 0112 00901
Leeds E: admin@metgeoenvironmental.com
West Yorkshire W: www.metgeoenvironmental.com
LS10 1SW

Client ☐ ERUM CONSULT LTD

Site ☐ JACKSON'S ROW
MANCHESTER M25WD

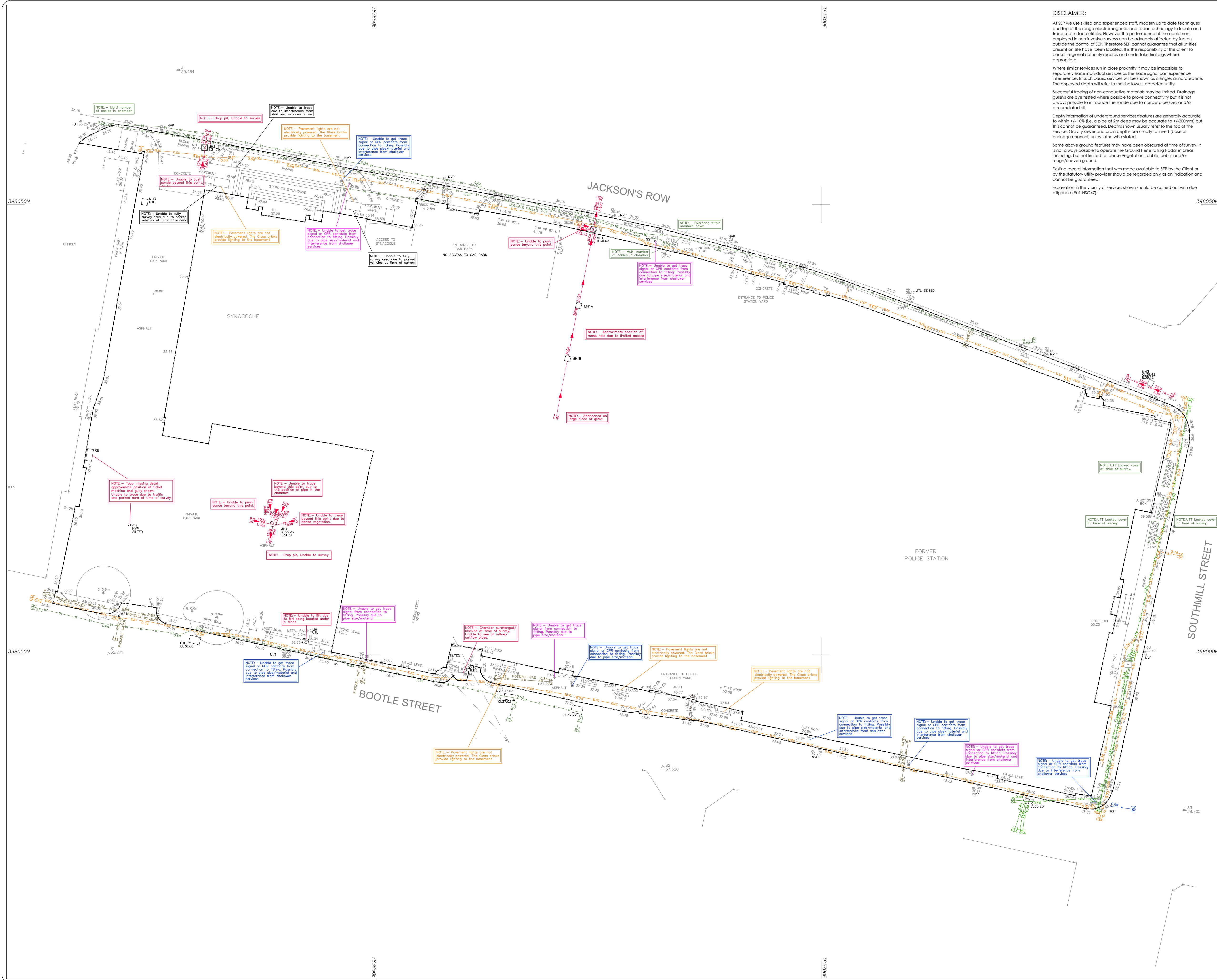
Title TOPOGRAPHICAL SURVEY
2D

Surveyed	S / MC/MT	Drawn	S
chk.	DA	Date	01/04/2015
scale	A1 Sheet	DWG Ref	Status
1/200		1 4 100 2DT	FINAL
Job No	1 4 100		Rev
			Ø

Appendix D

wsp

UTILITY SURVEY (DRAWING NO.
S11741-U)



DISCLAIMER:

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

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

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

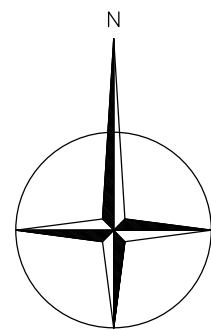
Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to 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 (Ref. HSG47).

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T. (01695) 729835 F. (01695) 725566 W. www.sepltd.com E. info@sepltd.com



PLAN GRID NORTH

File Name: S11741-U.dwg

LEGEND

[illegible]

FROM STATUTORY AUTHORITY PLANS

OP	OUTFALL PIPE	
PN	PYRON	
PP	PETROL PUMP	BT
NE	NEEDLE EYE	
PWP	RAINWATER PIPE	CABLE DUCT
SOP	SIGHT LEVEL	
SV	STOP VALVE	CATV
TL	TELEPHONE CABLE BOX	
TLB	TRAFFIC LIGHT	CCTV
TR	TRAFFIC LIGHT BOX	
TP	TELEPHONE POLE	ELECTRIC
WM	WATER METER	
WO	WATER OUTFALL	MAINS GAS
WMCST	WATER STOP TAP	
WVS	WATER STOP VALVE	MAINS WATER
ET	END OF TRACE	
EDS	END OF SURVEY AREA	SEWER CW
UTL	UNABLE TO LOCATE	SEWER FW
UNL	UNABLE TO SONDE	
UNLTT	UNABLE TO TRACE	SEWER SW

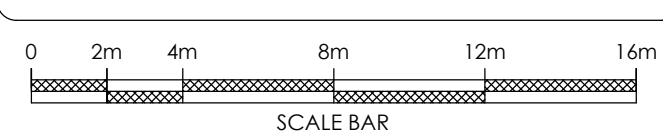
NOTES

All levels relate to O.S. (Newlyn) Datum. Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

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

Utility survey overlaid on topographical survey provided
Drawing reference - 13643-100_3DT

SHEET LAYOUT



REV	DATE	DESCRIPTION
-----	------	-------------

SEP (SITE ENGINEERING PERSONNEL) Ltd



SURVEY & ENGINEERING PROJECTS

Client
Zerum Consult Limited,
4 Jordan Street,
Manchester.
M15 4PY.

Project Title
Utility Survey of Land at:
Jacksons Row,
Manchester.
M2 5WD

Surveyed S.Huyton		Drawn T.English		Checked J.Gardner	
Scale 1:200	Date Feb 16	Drawing Ref. S11741-U		No. 01	Size A1
				Rev.	--

Appendix E

wsp
UNITED UTILITIES SEWER PLANS

**WSP Civils
3 White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL**

FAO: Laura Garner

United Utilities Water Limited
Property Searches
Ground Floor Grasmere House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP
DX 715568 Warrington
Telephone 0370 751 0101

Property.searches@uuplc.co.uk

Your Ref: 70010278
Our Ref: 14/ 1119358
Date: 30/06/2015

Dear Sirs

Location: Police Station/Synagogue Jacksons Row Manchester M2 5GU

I acknowledge with thanks your request dated 30/06/15 for information on the location of our services.

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

I attach General Condition Information sheets, which details contact numbers for additional services (i.e. new supplies, connections, diversions) which we are unable to deal with at this office. In addition you should ensure they are made available to anyone carrying out any works which may affect our apparatus.

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 telephone us on 0370 7510101.

Yours Faithfully,



Sue McManus
Operations Manager
Property Searches

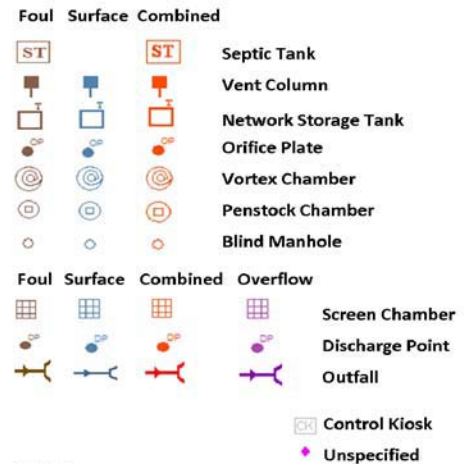
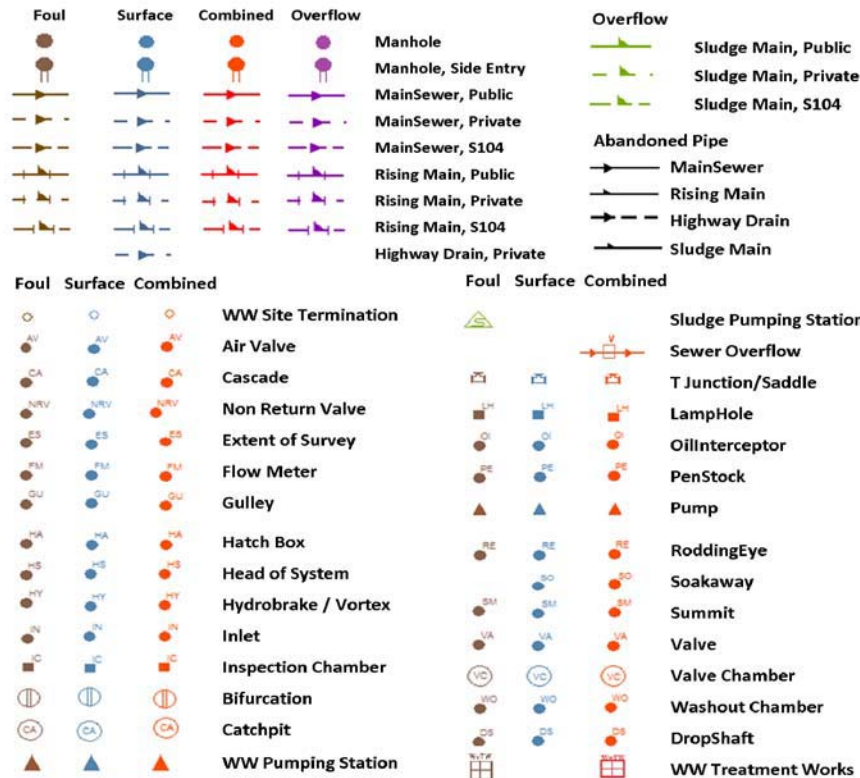
TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

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:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

WASTE WATER SYMBOLOGY



Legend	
MANHOLE FUNCTION	SEWER SHAPE
FO Foul	CI Circular
SW Surface Water	EG Egg
CO Combined	OV Oval
OV Overflow	FT Flat Top
	RE Rectangular
	SQ Square
	TR Trapezoidal
	AR Arch
	BA Barrel
	HO HorseShoe
	UN Unspecified
SEWER MATERIAL	
AC Asbestos Cement	DI Ductile Iron
BR Brick	VC Vitrified Clay
CO Concrete	PP Polypropylene
CSB Concrete Segment	PF Pitched Fibre
CSU Concrete Segment	MA Masonry, Coursed
CC Concrete Box Culverted	MA Masonry, Random
PSC Plastic / Steel	RP Reinforced Plastic
GR Glass Reinforced	CI Cast Iron
GRP Glass Reinforced	SI Spun Iron
PVC Polyvinyl Chloride	ST Steel
PE Polyethylene	U Unspecified

CLEAN WATER SYMBOLOGY

PIPE WORK



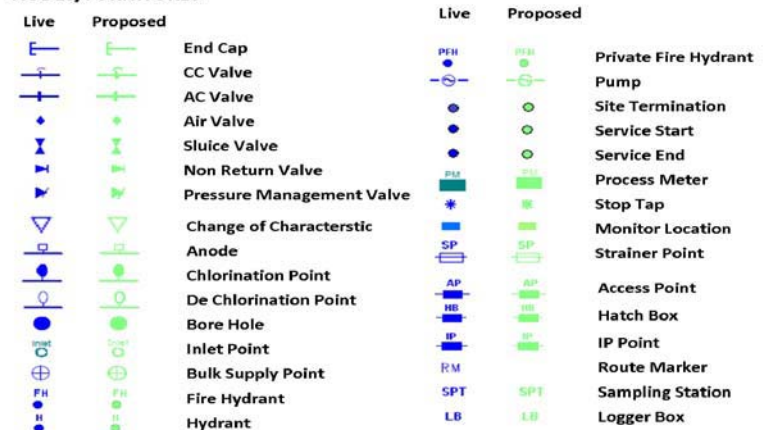
ABANDONED PIPE



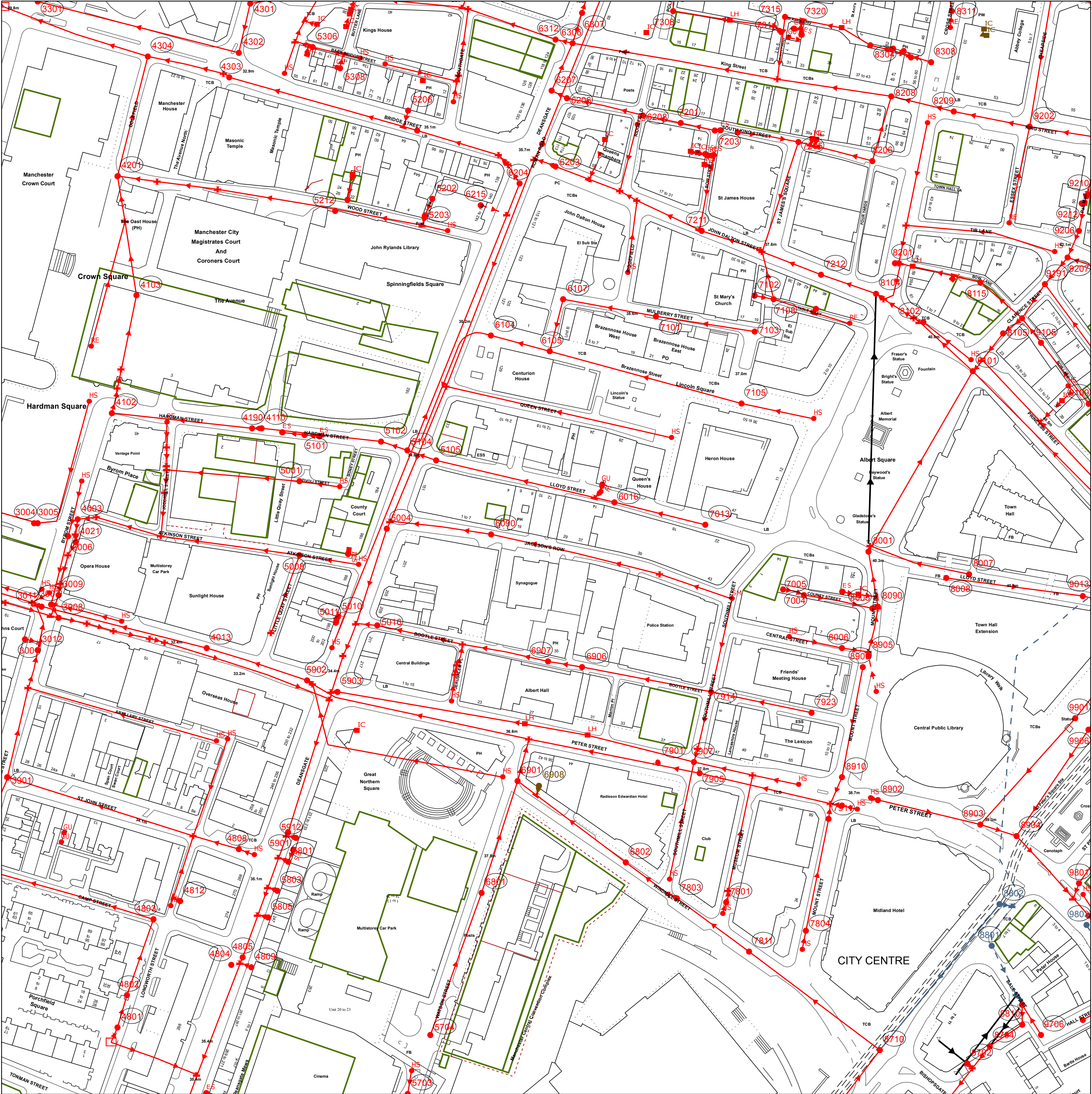
PROPERTY TYPES



NODES/FURNITURES



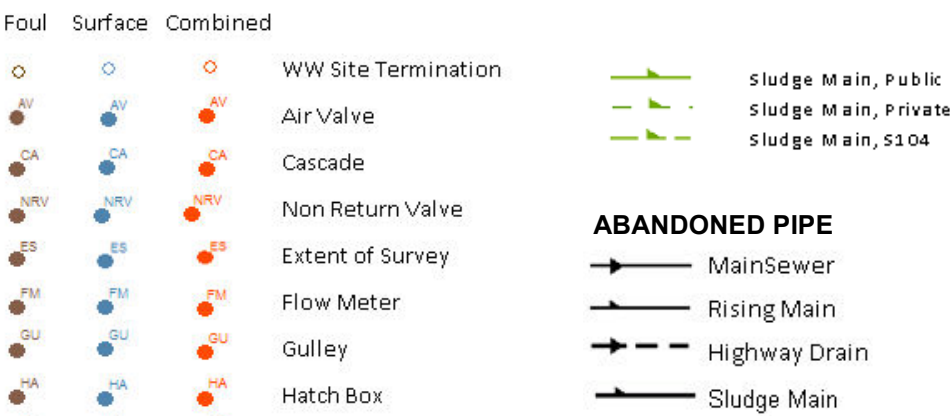
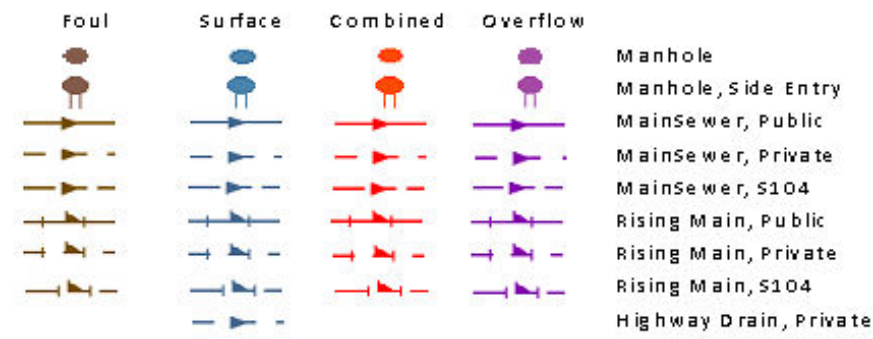
Legend	
MATERIAL TYPES	LINING TYPES
AC ASBESTOS CEMENT	CL CEMENT LINING
CI CAST IRON	TB TAR OR BITUMEN
CU COPPER	ERL EPOXY RESIN
CO CONCRETE	
DI DUCTILE IRON	INSERTION TYPES
GI GALVANISED IRON	DD DIE DRAWN
GR GREY IRON	DR DIRECTIONAL DRILLING
OT OTHERS	MO MOLING
PB LEAD	PI PIPELINE
PV UPVC	SL SLIP LINED
SI SPUN IRON	
ST STEEL	
UN UNKNOWN	
PE POLYETHYLENE	



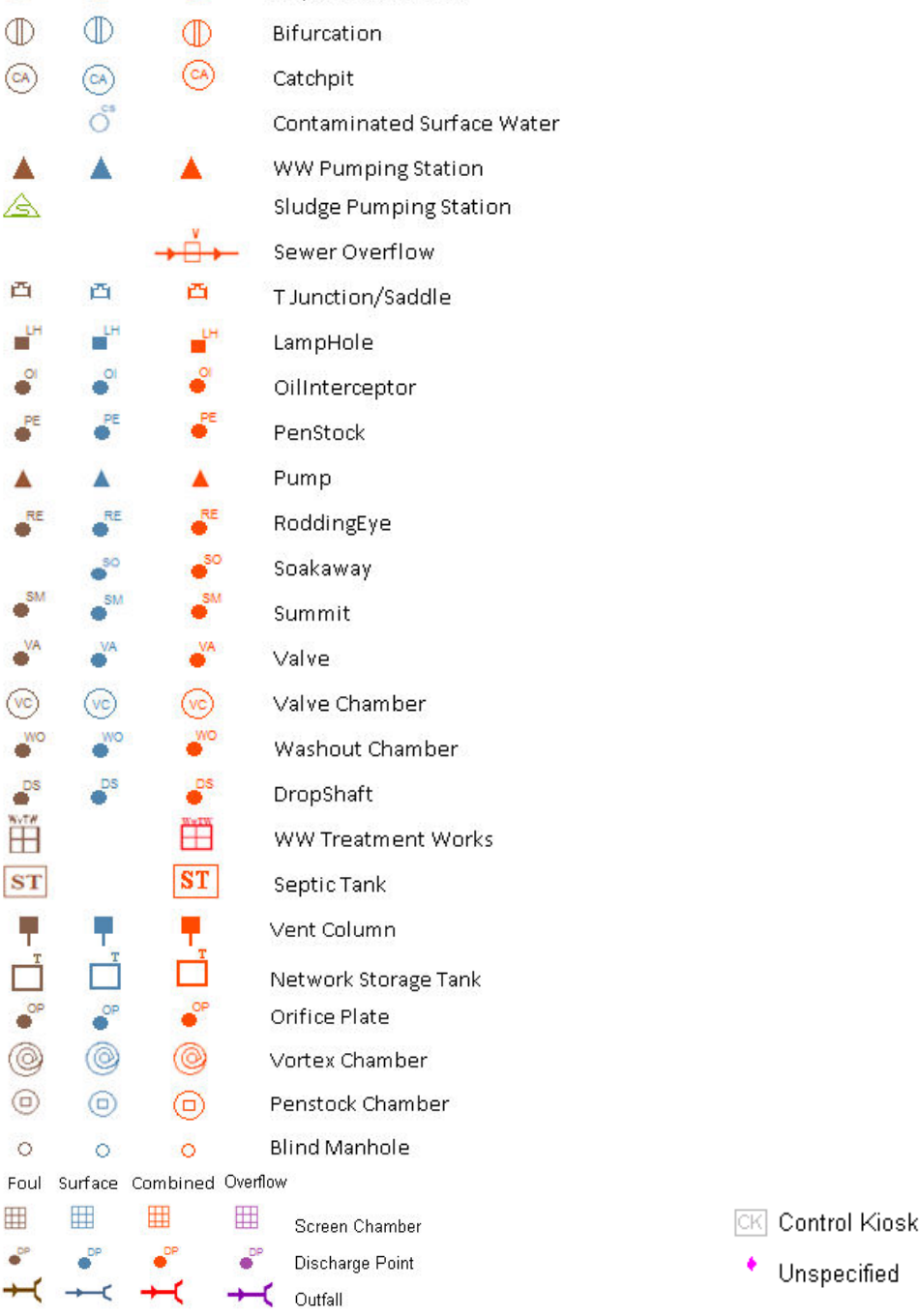
Refno	Cover	Func	Invert	Size	x	y	Shape	Mat	Length	Grad
3901	33.28	CO	29.58	650	540	FT	BR	48.27		
4801	34.39	CO								
4802	34.21	CO								
4803	34.44	CO								
4804	35.23	CO								
4805	35.27	CO								
4806	35.15	CO								
4809		CO								
4812		CO								
5703	17.87	CO	0	450			CI	VC	6.15	
5704		CO	0	450			CI	VC	32.57	
5801		CO					CI	VC	79.71	
5803		CO					CI	VC	5.41	
5805		CO					CI	VC	8.45	
5901	34.79	CO	21.81	2400			CI	BR	70.23	780
5902	34.19	CO	31.03	375			CI	VC	55.07	
5903	34.5	CO					CI	VC	4.98	
5902	18.48	CO					CI	VC	4.98	
5901	36.94	CO					CI	VC	18.25	
5905	18.09	CO	0	450			CI	VC	18.25	
5907	27.13	CO					CI	VC	18.25	
5908	39.53	CO					CI	VC	18.25	
7803	39.37	CO					CI	VC	18.25	
7804	39.52	CO					CI	VC	18.25	
7811		CO					CI	VC	18.25	
7812		CO					CI	VC	18.25	
7813		CO					CI	VC	18.25	
7814	38.51	CO	0	450			CI	VC	54.13	
7823	37.28	CO	34.68	600			CI	VC	3.8	
7824	37.14	CO	33.56	600			CI	VC	8.54	
7814	38.51	CO	0	450			CI	VC	54.13	
8702	37.28	CO	34.68	600			CI	VC	3.8	
8704	37.14	CO	33.56	600			CI	VC	8.54	
8710	39.43	CO	0	450			CI	VC	86.4	
8801	39.34	SW					CI	VC	3.8	
8802	39.51	SW	35.59	600	430	EG	CO	VC	99.49	
8803	37.76	CO	34.2	600			CI	VC	10.51	53
8810	37.8	CO					CI	VC	10.51	
8901	36.88	CO	33.7	300			CI	VC	55.54	40
8902	36.88	CO					CI	VC	55.54	
8903	39.45	CO					CI	VC	55.54	
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8905	39.45	CO					CI	VC	55.54	
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8907	39.45	CO					CI	VC	55.54	
8908	39.45	CO					CI	VC	55.54	
8909	39.45	CO					CI	VC	55.54	
8910	39.45	CO					CI	VC	55.54	
8911	39.45	CO					CI	VC	55.54	
8912	39.45	CO					CI	VC	55.54	
8913	39.45	CO					CI	VC	55.54	
8914	39.45	CO					CI	VC	55.54	
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8923	39.45	CO					CI	VC	55.54	
8924	39.45	CO					CI	VC	55.54	
8925	39.45	CO					CI	VC	55.54	
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8933	39.45	CO					CI	VC	55.54	
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8935	39.45	CO					CI	VC	55.54	
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8937	39.45	CO					CI	VC	55.54	
8938	39.45	CO					CI	VC	55.54	
8939	39.45	CO					CI	VC	55.54	
8940	39.45	CO					CI	VC	55.54	
8941	39.45	CO					CI	VC	55.54	
8942	39.45	CO					CI	VC	55.54	
8943	39.45	CO					CI	VC	55.54	
8944	39.45	CO					CI	VC	55.54	
8945	39.45	CO					CI	VC	55.54	
8946	39.45	CO					CI	VC	55.54	
8947	39.45	CO					CI	VC	55.54	
8948	39.45	CO					CI	VC	55.54	
8949	39.45	CO					CI	VC	55.54	
8950	39.45	CO					CI	VC	55.54	
8951	39.45	CO					CI	VC	55.54	
8952	39.45	CO					CI	VC	55.54	
8953	39.45	CO					CI	VC	55.54	
8954	39.45	CO					CI	VC	55.54	
8955	39.45	CO					CI	VC	55.54	
8956	39.45	CO					CI	VC	55.54	
8957	39.45	CO					CI	VC	55.54	
8958	39.45	CO					CI	VC	55.54	
8959	39.45	CO					CI	VC	55.54	
8960	39.45	CO					CI	VC	55.54	
8961	39.45	CO					CI	VC	55.54	
8962	39.45	CO					CI	VC	55.54	
8963	39.45	CO					CI	VC	55.54	
8964	39.45	CO					CI	VC	55.54	
8965	39.45	CO					CI	VC	55.54	
8966	39.45	CO					CI	VC	55.54	
8967	39.45	CO					CI	VC	55.54	
8968	39.45	CO					CI	VC	55.54	
8969	39.45	CO					CI	VC	55.54	
8970	39.45	CO					CI	VC	55.54	
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8972	39.45	CO					CI	VC	55.54	
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8976	39.45	CO					CI	VC	55.54	
8977	39.45	CO					CI	VC	55.54	
8978	39.45	CO					CI	VC	55.54	
8979	39.45	CO					CI	VC	55.54	
8980	39.45	CO					CI	VC	55.54	
8981	39.45	CO					CI	VC	55.54	
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8986	39.45	CO					CI	VC	55.54	
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8994	39.45	CO					CI	VC	55.54	
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9000	39.45	CO					CI	VC	55.54	
9001	39.45	CO					CI	VC	55.54	
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9003	39.45	CO					CI	VC	55.54	
9004	39.45	CO					CI	VC	55.54	
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9007	39.45	CO					CI	VC	55.54	
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9010	39.45	CO					CI	VC	55.54	
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9012	39.45	CO					CI	VC	55.54	
9013	39.45	CO					CI	VC	55.54	
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9022	39.45	CO					CI	VC	55.54	
9023	39.45	CO					CI	VC	55.54	
9024	39.45	CO					CI	VC	55.54	
9025	39.45	CO					CI	VC	55.54	
9026	39.45	CO					CI	VC	55.54	
9027	39.45	CO					CI	VC	55.54	
9028	39.45	CO					CI	VC	55.54	
9029	39.45	CO					CI	VC	55.54	
9030	39.45	CO					CI	VC	55.54	
9031	39.45	CO					CI	VC	55.54	
9032	39.45	CO					CI	VC	55.54	
9033	39.45	CO					CI	VC	55.54	

Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad	Refno	Cover	Func	Invert	Size	xSize	yShape	Mat	Length	Grad
4091	CO		0	220	380	EG	BR	12.04											
4115	CO		0	220	380	EG	BR	10											
4122	CO																		
4123	CO																		
4205	CO		0	500	330	EG	BR	32.25											
4206	CO		0	525		CI	CO	24.33											
4207	CO		0	500	330	EG	VC	21.21											
4305	CO		0	530	830	EG	BR	20.62											
5018	CO		0	300		CI	VC	43.66											
5090	CO																		
5091	CO																		
5108	CO		0	2300		CI	BR	81.36											
5207	CO																		
5210	CO																		
5309	CO																		
5312	CO																		
5314	CO																		
5315	CO																		
6005	CO																		
6017	CO																		
6209	CO		0	830	430	EG	BR	44.92											
6210	CO		0	500		CI	CO	36.4											
6211	CO		0	430	700	EG	BR	10.3											
6216	CO																		
6219	CO																		
6261	CO		0	430	830	UN	BR	7.07											
6292	CO																		
6313	CO																		
6314	CO																		
6315	CO																		
6390	CO																		
7014	CO																		
7107	CO																		
7210	CO																		
7215	CO																		
7216	CO																		
7218	CO																		
7220	CO																		
7222	CO																		
7290	CO		0	410	720	EG	BR	1.41											
7312	CO																		
7321	CO																		
7325	CO																		
7329	CO																		
7390	CO																		
8004	CO																		
8010	CO																		
8012	CO																		
8015	CO		0	450		CI	CO	1											
8103	CO																		
8109	CO		0	410	310	EG	VC	9.43											
8110	CO																		
8112	CO																		
8190	CO		0	610	510	EG	VC	5											
8207	CO																		
8212	CO																		
8290	CO																		
8291	CO		0	320	400	EG	VC	20.4											
8301	CO																		
8302	CO																		
8303	CO																		
8305	CO																		
8108	CO																		
9214	CO																		
9215	CO																		
8707	SW																		
8709	CO																		
8811	CO																		
8902	CO																		
8115	CO																		
4701	CO		31	330	630	550	UN	BR	24.72										
336	CO		0	870	630	EG	BR	37.93											

WASTE WATER SYMBOLOGY



ABANDONED PIPE



LEGEND

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available.

The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

OS Sheet No:

Scale: 1: 1250 Date: 30/06/2015

372 Nodes

Sheet 2 of 2



SEWER RECORDS

OS Sheet No:

Approximately Scale: 1: 1250 Date: 30/06/2015

Printed By: Property Searches

Conditions and Information regarding wastewater network

These general conditions and precautions apply to the wastewater network of United Utilities

Please ensure that a copy of these conditions is passed to your representative and contractor on site.

- 1 United Utilities provides the approximate locations of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer culvert or drain, private connections from properties to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual positions and/or depths being different from those indicated. The records do indicate the position of the nearest known public sewer from which the likely length of private connections can be estimated together with the need for any off site drainage rights or easements.
- 2 Special requirements relative to our sewers may be indicated. United Utilities employees or its contractors will visit any site at reasonable notice to assist in the location of its underground sewers and advise any precautions that may be required to obviate any damage. To arrange a visit or for further information regarding new supplies, connections, diversions, costing, or any notification required under these General Conditions, please call us on **0345 602 0406**.
- 3 Where public sewers are within a site which is to be developed and do not take any drainage from outside the area, they are from an operational viewpoint redundant. The developer must identify all redundant sewers affected by the development and apply to United Utilities in writing for these sewers to be formally closed. The developer shall bear all related costs of the physical abandonment work.
- 4 Public sewers within the site that are still live outside the area will be subject to a "Restricted Building zone". This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to public sewers must be maintained at all times and no interference to manholes will be permitted during construction work.
5. Where there is a public sewer along the line of a proposed development/building, arrangements shall be made by the developer at his cost to divert the sewer around the development. Where this is not possible and as a last resort, a "Building Over Agreement" will need to be completed under section 18 of the Building Act 1984. The developer shall design building foundations to ensure that no additional loading is transferred to the sewer and submit such details both to the Local Authority's Building Control Officer and to United Utilities for approval/acceptance. United Utilities on a rechargeable basis would normally undertake all aspects of design work associated with the diversion of any part of the operational wastewater network. For further advice please email wastewaterdeveloperservices@uuplc.co.uk
6. Where there is a non-main river watercourse/culvert passing through the site, the landowner has the responsibility of a riparian owner for the watercourse/culvert and is responsible for the maintenance of the fabric of the culvert and for all works involved in maintaining the unrestricted flow through it. Building over the watercourse/culvert is not recommended. The developer must contact the local authority before any works are carried out on the watercourse/culvert. Where it is necessary to discharge surface water from the site into the watercourse/culvert the developer shall make an assessment of the available capacity of the watercourse/culvert (based on a 1 in 50 year event) and ensure that the additional flow to be discharged into the watercourse/culvert will not cause any flooding. In appropriate cases, flooding may be prevented by on-site storage. The developer shall submit the relevant details required to substantiate his development proposals. Details of any outfall proposed shall also be submitted to the Environment Agency, PO Box 12, Richard Fairclough House, Knutsford Road, Warrington, Cheshire, WA4 1HT for their approval.
7. Where there is a main river watercourse/culvert passing through the site, the developer shall submit all proposals affecting the river to the Environment Agency at the address stated in paragraph 6 for approval/acceptance.

8. Your attention is drawn also to the following:

Private drains or sewers which may be within the site.

On 1 October 2011 all privately owned sewers and lateral drains which communicate with (that is drain to) an existing public sewer as at 1 July 2011 will become the responsibility of the sewerage undertaker. This includes private sewers upstream of pumping stations that have yet to transfer, but excludes lengths of sewer or drain that are the subject of an on-going appeal or which have been excluded from transfer as a result of an appeal or which are on or under land opted-out by a Crown body. The transfer specifically excludes sewers and lateral drains owned by a railway undertaker. Sewers upstream of such assets, however, are transferred. Such assets may not be recorded on the public sewer record currently as it was not a requirement to keep records of previously private sewers and drains.

Applications to make connections to the public sewer.

The developer must write to United Utilities requesting an application form that must be duly completed and returned. No works on the public sewer shall be carried out until a letter of consent is received from United Utilities.

Sewers for adoption If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with "Sewers for Adoption", Seventh Edition, published by the Water Research Centre (2001) Plc, Henley Road, Medmenham, PO Box 16, Marlow, Buckinghamshire, SL7 2HD will be required, taking into consideration any departures from the general guide stipulated by United Utilities.

Further consultation with United Utilities.

Developers wishing to seek advice or clarification regarding sewer record information provided should contact United Utilities to arrange an appointment. A consultation fee may be charged, details of which will be made available at the time of making an appointment.

9. Combined sewers, foul sewers, surface water sewers, and pumped mains. These are shown separately in a range of colours or markings to distinguish them on our drawings, which are extracts from the statutory regional sewer map. A legend and key is provided on each extract for general use, although not all types of sewer will be shown on every extract.

Combined sewers shown coloured red carries both surface water and foul sewage, especially in areas where there is no separate surface water sewerage system.

Foul sewers coloured brown may also carry surface water and there may be no separate surface water system indicated in the immediate area. Both combined and foul sewers carry wastewater to our treatment works before it can safely be returned to the environment.

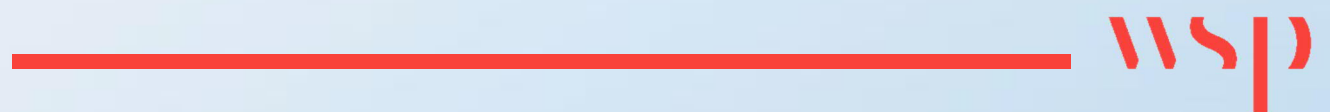
Surface water sewers coloured blue on our drawings are intended only to carry uncontaminated surface water (e.g. rainfall from roofs, etc) and they usually discharge into local watercourses. It is important for the protection of the environment and water quality that only uncontaminated surface water is connected to the surface water sewers. Improper connections to surface water sewers from sink wastes, washing machines and other domestic use of water can cause significant pollution of watercourses.

Pumped mains, rising mains and sludge mains will all be subject to pumping pressures and are neither suitable nor available for making new connections.

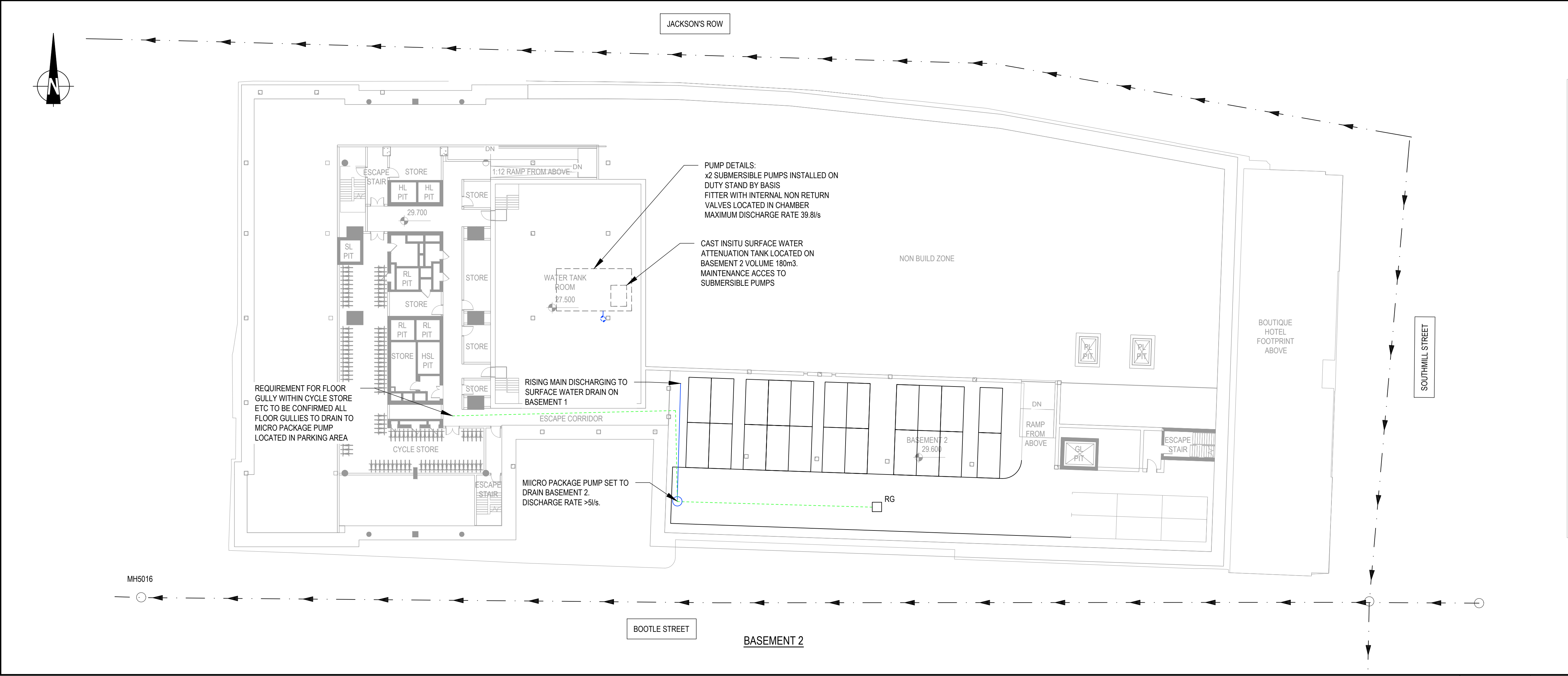
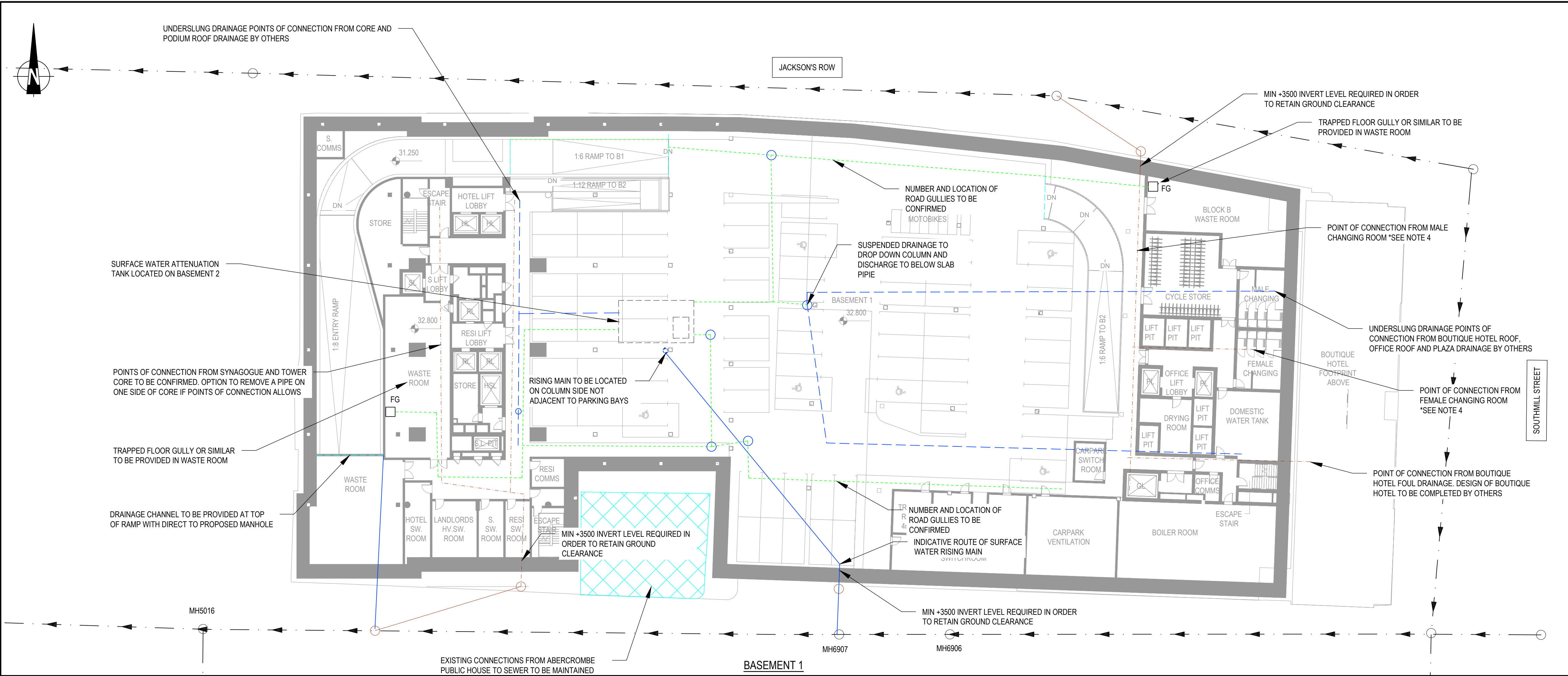
Highway drains, when included, show as blue and black dashed lines. Highway drains are not assets belonging to United Utilities and are the responsibility of local authorities.

1. For information regarding future proposals for construction of company apparatus please write to United Utilities, PO Box 453, Warrington, WA5 3QN.
2. For information regarding easements, deeds, grants or wayleaves please write to United Utilities Property Solutions, Coniston Buildings, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3UU
Tel: 01925 731 365

Appendix F



SURFACE WATER AND FOUL WATER
DRAINAGE STRATEGY (DRAWING
NO. STM-PBA-XX-XX-DR-C-0001 REV
P01)



NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
- DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
- THE SITE PLAN OF THIS DRAWING IS BASED ON SOM LLP, DRAWING NUMBER ASK-0041 RECEIVED ON 28.06.19
- BASEMENT LEVEL MALE AND FEMALE CHANGING ROOMS TO BE DRAINED BY MACERATOR PUMP SYSTEM SUITABLE FOR COMMERCIAL USE

KEY:

- EXISTING COMBINED DRAIN
- EXISTING COMBINED SEWER MANHOLE
- PROPOSED SURFACE WATER DRAIN
- PROPOSED SURFACE WATER DRAIN INSPECTION CHAMBER
- PROPOSED SUSPENDED SURFACE WATER DRAIN
- PROPOSED FOUL WATER
- PROPOSED SUSPENDED FOUL WATER
- PROPOSED SURFACE WATER DRAIN
- PROPOSED LINEAR DRAINAGE CHANNEL
- FG FLOOR GULLY
- RG ROAD GULLY

SCALE REFERENCE:

1:250 0 12.5m 25m

Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

Drawing Issue Status

PRELIMINARY

**ST MICHAEL'S REGENERATION
MANCHESTER
SURFACE WATER AND FOUL WATER
STRATEGY**

Architect

**SKIDMORE, OWINGS
& MERRILL, INC**

Date of 1st Issue

04/07/19

Designed

UB

Drawn

UB

A1 Scale

1:250

Checked

ET

Approved

ET

Drawing Number

STM-PBA-XX-XX-DR-C-0001

Revision

P01

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Appendix G



DRAINAGE CALCULATIONS



8 First Street
Manchester
M15 4RP

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