



SECTION 73

FLOOD RISK ASSESSMENT

NOVEMBER 2022

This statement was submitted with the original planning application, as revised in December 2017, and was resubmitted as part of the section 73 applications in November 2019 and September 2021. It has not been altered as part of this section 73 application as it remains valid.

Further, a condition was attached to the planning consent (June 2018, as amended) which required further details to be submitted in relation to drainage design and flood prevention. It is expected that this requirement will remain should the Section 73 application be approved.



Jackson's Row Development Ltd

JACKSON'S ROW, MANCHESTER

Flood Risk Assessment





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Flood Risk Assessment

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1 EXECUTIVE SUMMARY

- 1.1.1. WSP is appointed by Jacksons Row Developments Ltd to undertake a Flood Risk Assessment to support the planning application for a proposed mixed-use development off Jackson's Row in Manchester.
- 1.1.2. This report should be read in conjunction with the separate Drainage Strategy Report (WSP, 2017) which provides details on the outline foul and surface water drainage strategies for the proposed development.
- 1.1.3. Based on the findings of this report, the site is considered to be at a low or negligible risk of flooding from all sources.
- 1.1.4. 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 outside of the site boundary along Jackson's Row and Bootle Street in an east to west direction. Careful consideration of levels should mitigate against this risk.
- 1.1.5. Since all roads adjacent to the site are located within Flood Zone 1, access and egress should not be affected during an extreme flooding event.
- 1.1.6. Details of the proposed surface water and foul water drainage strategies, which have been designed in accordance with the requirements of the Environment Agency, Manchester City Council and United Utilities can be found in the accompanying Drainage Strategy Report (WSP, 2017).
- 1.1.7. The drainage strategy will direct surface water run-off away from buildings and into attenuation storage structures that have been sized to retain all excess surface water run-off generated beyond the proposed discharge rate. This design has been based on providing storage up to and including the critical 1 in 100 year event (plus a 40% allowance for climate change), within the confines of the development.

2 PROJECT BACKGROUND

2.1 APPOINTMENT AND BRIEF

- 2.1.1. WSP is appointed by Jacksons Row Developments Ltd to undertake a Flood Risk Assessment to support the planning application for a proposed mixed-use development off Jackson's Row in Manchester.

2.2 OBJECTIVE OF THE STUDY

- 2.2.1. The objective of this study was to undertake a Flood Risk Assessment in accordance with the National Planning Policy Framework (NPPF).

This study assesses:

- Flood risk to the site and the proposed development; and
- Any impact on flood risk to other land because of the development proposals.

- 2.2.2. Where required, flood risk mitigation measures have been proposed.

- 2.2.3. This report should be read in conjunction with the separate Drainage Strategy Report (WSP, 2017) which provides details on the outline foul and surface water drainage strategies for the proposed development.

2.3 PROPOSED DEVELOPMENT

- 2.3.1. The proposed mixed use development comprises a synagogue, two hotels, office, retail, bar/restaurant and residential use.

- 2.3.2. The proposed lower ground/basement floor plan is included in **Appendix A**.

2.4 LIMITATIONS

- 2.4.1. This report is based on the interpretation and assessment of data provided by third parties.

- 2.4.2. 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 therefore the findings of this report may change if the data is amended or updated after the date of consultation.

- 2.4.3. The recommendations made within this report may change upon receipt of any further consultation responses.

3 EXISTING SITE

3.1 SITE LOCATION

- 3.1.1. The site is located off Jackson's Row in Manchester approximately 0.1km west of Manchester Town Hall and Central Library.
- 3.1.2. An approximate postcode is M2 5WD and approximate OS coordinates are 383645, 398030.
- 3.1.3. A site location plan is included in Appendix B of this report.

3.2 SITE DESCRIPTION

- 3.2.1. 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 disused 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.

3.3 EXISTING WATERCOURSES

- 3.3.1. 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.
- 3.3.2. 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 indicates 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.
- 3.3.3. 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. This culvert is 0.3km southwest of the site at its closest point.
- 3.3.4. The Rochdale Canal is located approximately 0.5km to the south of the site.
- 3.3.5. 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 (MST Hybrid SFRA, 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.

- 3.3.6. 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.

3.4 EXISTING FLOOD DEFENCES AND OTHER STRUCTURES

- 3.4.1. The Environment Agency Flood Map for Planning does not identify any flood defences within the vicinity of the site. The consultation response from the Environment Agency confirmed that there are no flood defences in the vicinity of the site.
- 3.4.2. The MST Hybrid SFRA (2011) Flood Risk Management Map indicates that there are no flood storage areas or raised defences in the vicinity of the site.

3.5 EXISTING PUBLIC SEWERS

- 3.5.1. Public sewer records from United Utilities (Appendix D) 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; and
 - A 2,400 mm combined sewer flows south under Deansgate.
- 3.5.2. A CCTV survey is required to confirm the depth, condition and size of the public sewers.

3.6 EXISTING DRAINAGE CHARACTERISTICS OF THE SITE

- 3.6.1. The site is fully developed and occupied by a disused police station, a synagogue and a public house along with car parking.
- 3.6.2. 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.
- 3.6.3. 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 E) indicated three private lateral connections from the existing site.
- 3.6.4. 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).

3.7 GEOLOGY AND HYDROGEOLOGY

- 3.7.1. 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.
- 3.7.2. 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.
- 3.7.3. 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.
- 3.7.4. The Environment Agency website indicates that the site does not lie within a Groundwater Source Protection Zone.

3.8 HISTORICAL LAND USES

- 3.8.1. 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.
- 3.8.2. 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.
- 3.8.3. 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.
- 3.8.4. 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 Abercromby 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.
- 3.8.5. The ruins are replaced by a synagogue between 1951 and 1957.
- 3.8.6. 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.
- 3.8.7. The site has the same usage in present day although buildings have been extended since 1962-1973 mapping.

4 PLANNING POLICY AND CONSULTATION

4.1 PLANNING POLICY DOCUMENTS

4.1.1. The following documents were reviewed for this report and the accompanying Drainage Strategy Report (WSP, 2017):

- Flood And Water Management Act (April 2010);
- National Planning Policy Framework (March 2012) And Planning Practice Guidance (March 2014);
- Sustainable Drainage Systems Written Statement HCWS161 (December 2014);
- Defra Sustainable Drainage Systems Non-Statutory Technical Standards For Sustainable Drainage Systems (March 2015);
- Environment Agency Flood Risk Assessments: Climate Change Allowances (3 February 2017);
- Manchester City Council Core Strategy (2012);
- Strategic Flood Risk Assessment for Greater Manchester – Sub-Regional Assessment (2008);
- Manchester City, Salford City and Trafford Councils' Hybrid Strategic Flood Risk Assessment (2011);
- Manchester City, Salford City and Trafford Councils' Hybrid Strategic Flood Risk Assessment – User Guide (2010);
- Manchester City Council Preliminary Flood Risk Assessment (2011);
- Greater Manchester Surface Water Management Plan Stage 1 – A Strategic Assessment of Surface Water Flood Risk (2012); and
- Manchester City Council Local Flood Risk Management Strategy (March 2014).

4.2 THE SEQUENTIAL TEST

4.2.1. The Sequential Test, within the National Planning Policy Framework, aims to steer all new developments to areas at the lowest risk of flooding and to ensure that the development type proposed is appropriate by reference to the flood risk.

4.2.2. Since the site is located wholly within Flood Zone 1, the Sequential Test is not required.

4.3 THE EXCEPTION TEST

4.3.1. Table 2 of the Flood Risk and Coastal Change Chapter of the Planning Practice Guidance (2014) classes different types of development depending upon their vulnerability.

4.3.2. The development comprises a synagogue, two hotels, office, retail, bar/restaurant and residential use.

4.3.3. The hotel, bar and residential developments are classed as 'more vulnerable' according to Table 2 in the PPG. The rest of the site uses are classed as 'less vulnerable'.

4.3.4. Table 3 of the Flood Risk and Coastal Change Chapter of the Planning Practice Guidance (2014) indicates that all land uses are acceptable in Flood Zone 1.

4.4 CONSULTATION

4.4.1. Alongside the guidance provided by the flood risk policy documents outlined above, the responses of each statutory consultee will also be used in defining the scope and requirements of the study.

4.4.2. The responses from each consultee are summarised below and a full copy is available in Appendix D.

ENVIRONMENT AGENCY

4.4.3. The Environment Agency consultation response received on 13 October 2015 included the following comments:

- The site is located in Flood Zone 1;
- There are no flood defences in the vicinity of the site and no proposals for any future flood alleviation schemes;
- The Environment Agency have no record of flooding affecting the site; and
- The Environment Agency flood map shows that the site is not located in an area at risk of reservoir flooding.

4.4.4. A further response on 18 December 2015 indicated that there were no source protection zones or records of groundwater flooding in the vicinity. Groundwater levels were provided for two monitoring stations within 2 km of the site.

MANCHESTER CITY COUNCIL

The initial consultation response from Manchester City Council was received on 08 October 2015. The response indicated the following:

- There are no watercourses in the vicinity of the site;
- There are no flood defences or man-made structures which affect the site and no proposals for future flood alleviation schemes that could affect the site;
- The council have no record of any previous flooding incidents;
- The site has low susceptibility to groundwater flooding and the council do not have any records of groundwater flooding at the site;
- There is a small area of the site within the existing police station car park which has a low risk of surface water flooding along with parts of Jackson's Row and Bootle Street. The Environment Agency flood maps were referred to for further information;
- The site is located within the Conurbation Core Critical Drainage Area and in accordance with the SFRA and pursuant to policy EN17 of the Core Strategy, new development on Brownfield sites in Critical Drainage Areas should aim for at least a 50% reduction in surface water runoff rates with consideration of climate change;
- Surface water should be managed to ensure there is no increased surface water from the proposed development and runoff from extreme events should be retained within the site such that the adjacent third party land is not affected;
- The Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications which was introduced from 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS). As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems;
- For all major planning proposals the development must consider the use of sustainable drainage systems in accordance with paragraphs 051 and 079 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change. The drainage hierarchy should be followed in accordance with paragraph 080 of the same document;
- Sustainable drainage systems should be designed in line with national Non-Statutory Technical Standards for SuDS and local policies EN08, EN14 and EN17 of the Core Strategy; and
- Hydraulic calculation and drawings to support the design need to be provided along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPPF (PPG).

- 4.4.5. A further response on 30 October 2015 provided information on the hidden watercourses in the site vicinity. The council confirmed that one, the River Tib, was now incorporated into the combined sewer system. The other is a canal tunnel for which the council did not hold any information.

UNITED UTILITIES

- 4.4.6. The initial response from United Utilities indicated on 22 October 2015 that United Utilities had no records of hydraulic sewer flooding in the area.
- 4.4.7. A further response on 28 October 2015 stipulated that foul and surface water will be allowed to drain to the public combined sewer network at an unrestricted rate at a convenient connection point.
- 4.4.8. On 29 October 2015, United Utilities confirmed that multiple connections could be made to the combined sewer network but that a connection application would need to be made for each proposed connection.

4.5 COMPLIANCE

- 4.5.1. Based on the information contained within this Flood Risk Assessment and the separate Drainage Strategy Report (WSP, 2017), the proposed development complies with the above policy documents.

5 DEFINITION OF FLOOD RISK

5.1 INTRODUCTION

- 5.1.1. This chapter assesses the risk of flooding to the site from all current and future potential sources of flooding.
- 5.1.2. Table 2 summarises the findings of the assessment. A more detailed explanation of the flood risk issues on the site and determination of flood risk ratings are presented in sections 5.2 to 5.8 below.

Table 2 – Degree of risk from each source of flooding

Source		Risk
Fluvial		Low
Tidal / Coastal		Negligible
Groundwater		Low
Surface Water		Low
Sewer		Low
Other	Reservoir	Negligible
	Canals	Low
	Culverts	Low
	Pump Failure	Low

5.2 FLUVIAL FLOOD RISK

- 5.2.1. NPPF categorises flood risk as follows:
- Zone 1 (low probability) is assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%);
 - Zone 2 (medium probability) is assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year; and
 - Zone 3 (high probability) is assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- 5.2.2. The Environment Agency Flood Map for Planning indicates that the site lies within Flood Zone 1 and has less than a 1 in 1000 chance of flooding occurring in any given year.
- 5.2.3. The Environment Agency consultation response states that they have no records of flooding affecting the site.
- 5.2.4. The MST Hybrid SFRA (2011) contains mapping which indicates modelled flood depths, extents and hazards within the study area for the 1 in 100 and 1 in 1000 year storms with and without climate change allowances. The mapping indicates that the site does not flood in any of these events.
- 5.2.5. Based on the available information, the risk of flooding from fluvial sources is considered to be low.

5.3 TIDAL / COASTAL FLOOD RISK

- 5.3.1. The site is located at an elevation of around 35 mAOD and located away from the coast.
- 5.3.2. Therefore, the risk from tidal and coastal flooding is considered to be negligible.

5.4 GROUNDWATER FLOODING

- 5.4.1. The MST Hybrid SFRA (2011) Groundwater Flooding Map indicates that the site is not in an area at risk from groundwater flooding, in an area of shallow groundwater, or in an area at risk of groundwater rebound.
- 5.4.2. The consultation response from the Environment Agency included details of two groundwater level monitoring stations within a 2km radius of the site. The first station, labelled Dial House, is situated off Chapel Street on the western side of the River Irwell, close to the river bank 0.65km north of the site. The groundwater levels in this area are less than 1m below ground level. The other monitoring station is situated in Sackville Gardens 0.83km to the southeast of the site. The monitoring station in this area, labelled High School, has recorded a minimum depth below ground level of 10.95m. Since there are no monitoring stations within the vicinity of the site it can only be assumed that groundwater levels underneath the site would be within this range.
- 5.4.3. The Manchester City Council Local Flood Risk Management Strategy (LFRMS, 2014) includes a map showing areas at risk of groundwater flooding which indicates that the site is at risk. The map is described in the LFRMS as displaying the results of the MST Hybrid SFRA; data from the Environment Agency website; cross-boundary geological features including aquifers linked to groundwater; and Areas Susceptible to Groundwater Flooding.
- 5.4.4. Based on the available information, the risk from groundwater flooding is considered to be low.

5.5 SURFACE WATER FLOODING

- 5.5.1. The Environment Agency Risk of Flooding from Surface Water Map indicates that the majority of the site has a very low risk of flooding from surface water. The map shows a strip of low surface water risk across the site in a north to south direction in the eastern section. However, the Surface Water Depth and Surface Water Velocity Maps show that the water has a depth below 300mm and does not flow in any direction. The area shown is therefore assumed to be localised ponding. The Environment Agency consultation response stated that they hold no records of flooding of the site.
- 5.5.2. The Risk of Flooding from Surface Water Map indicates some areas of low and medium surface water flooding on Jackson's Row outside of the site boundary. The Surface Water Velocity Map indicates that flood water flows to the west away from the site.
- 5.5.3. The site lies within the Conurbation Core Critical Drainage Area according to the Critical Drainage Areas Map in the MST Hybrid SFRA (2011).
- 5.5.4. The MST Hybrid SFRA (2011) Susceptibility to Surface Water Flooding Maps indicate that in both the current and future scenario the site is not susceptible to surface water flooding.
- 5.5.5. The Manchester City Council Local Flood Risk Management Strategy (2014) includes a map taken from the Greater Manchester Surface Water Management Plan showing the predicted depth of surface water runoff from a 1:200 year storm. The map indicates that the site is not flooded in this event although an area close to the northwest of the site is affected by 0.3m of surface water flooding.
- 5.5.6. Based on the available information, the flood risk from surface water is considered to be low.

5.6 SURCHARGED SEWER FLOODING

- 5.6.1. The United Utilities consultation response indicated that there are no DG5 flood records at the site.
- 5.6.2. Based on the available information, flood risk from sewers is considered to be low.

5.7 FLOODING FROM OTHER SOURCES

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

RESERVOIRS

- 5.7.2. Following the June 2007 floods and the incident at Ulley reservoir, Sir Michael Pitt was asked by the government to carry out a review of the emergency services' response. He called for reservoir flood maps to be made available to the public and to local emergency planners to allow them to respond quickly to a reservoir flood.
- 5.7.3. As a result reservoir flood maps have been created for 2007 reservoirs in England and Wales. These maps indicate the possibility of flooding from large raised reservoirs that hold at least 25,000 cubic meters of water above natural ground level. The maps released by the Environment Agency show the largest area that might flood if a reservoir were to fail in a credible worst case scenario.

- 5.7.4. The Environment Agency Reservoir Flood Map indicates that the site lies outside the maximum extent of reservoir flooding and therefore the risk of reservoir flooding is assessed as negligible.

CANALS

- 5.7.5. The Rochdale Canal is approximately 0.5km south of the site. Additionally, the disused Manchester and Salford Junction Canal lies 0.3km south west of the site at the closest point.
- 5.7.6. The MST Hybrid SFRA (2011) Canal Hazard Zones Map indicates that the site lies outside of a canal breach zone or canal overtop hazard zone.
- 5.7.7. Additionally, the Hydraulic Interaction Map in the MST Hybrid SFRA indicates that the site does not lie within any hydraulic interaction zones between nearby canals and rivers.
- 5.7.8. The Manchester and Salford Junction Canal is mostly in culvert, the risk relating to all known culverts is discussed in the section below.
- 5.7.9. Based on the available information, flood risk to the site from canals is considered to be low.

CULVERTS

- 5.7.10. The Manchester City Council consultation response indicated that there are no watercourses or culverted watercourses in the immediate vicinity of the site.
- 5.7.11. As detailed in Section 3.3 the Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008) indicates two culverts in the area of the site although not in the immediate vicinity.
- 5.7.12. The first culvert flows within 0.1km of the east of the site under Mount Street. The Manchester City Council consultation response indicates that this watercourse was historically known as the River Tib and has now been incorporated into the public combined sewer network in the vicinity of the site. The topography in the area suggests that in the event of a culvert blockage water would not flow westwards towards the site.
- 5.7.13. The second culvert which is the Manchester and Salford Junction Canal does not appear to have any nodes in the vicinity of the site. The condition of this culvert is unknown and no information was available from Manchester City Council (Appendix D). Ground levels to the southwest of the site around the culvert are lower than those on site and so any floodwater from a culvert collapse or blockage would not flow towards the site.
- 5.7.14. Based on the available information, the risk of culvert flooding is considered to be low.

PUMP FAILURE

- 5.7.15. 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. In addition, a gravity piped overflow will be provided to ensure that in extreme events any rainfall in excess of the volume which can be accommodated in storage will overflow along a safe route to the adjacent roads rather than towards areas in the lower floors of the building.

5.8 CLIMATE CHANGE

- 5.8.1. New Environment Agency guidance "Flood Risk Assessments: Climate Change Allowances" issued on the 19th February 2016 and revised on 3rd February 2017 provides up to date information on expected changes in rainfall, river flows and sea level rise as a consequence of climate change.
- 5.8.2. Based on a typical lifespan of 100 years for the proposed development, the contingency allowances for climate change are:
- Peak River flows (North West) – 30% increase up to 2115;
 - Peak Rainfall Intensity – 40% increase up to 2115; and
 - Sea Level Rise - 1.02 m by 2115.
- 5.8.3. Based on the available information, an increase in peak river flows and sea level rise will not have an impact on the proposed development.
- 5.8.4. The accompanying Drainage Strategy Report (WSP, 2017) indicates how surface water runoff will be managed to include the predicted 40% increase in peak rainfall intensity.

6 MANAGEMENT OF FLOOD RISK

6.1 SITE LOCATION AND LAYOUT

- 6.1.1. The Environment Agency Flood Map for Planning indicates that the site is located in Flood Zone 1. All proposed site uses are acceptable in Flood Zone 1.

SITE LEVELS

- 6.1.2. 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.
- 6.1.3. 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.

ACCESS AND EGRESS

- 6.1.4. All of the roads adjacent to the site are located within Flood Zone 1. Therefore, access and egress should not be affected during an extreme flooding event.

MANAGEMENT OF SURFACE WATER RUN-OFF

- 6.1.5. Details of the proposed surface water drainage strategy, which has been designed in accordance with the requirements of the Environment Agency, Manchester City Council and United Utilities can be found in the accompanying Drainage Strategy Report (WSP, 2017).
- 6.1.6. The drainage strategy will ensure surface water run-off is directed away from buildings and into attenuation storage structures that have been sized to retain all excess surface water run-off generated, beyond the proposed discharge rate, by the development, for up to the critical 1 in 100 year (plus a 40% allowance for climate change), within the confines of the development.
- 6.1.7. The vehicular entrance to the basement should be provided with a strip drain to intercept surface water flows.

FOUL WATER DRAINAGE STRATEGY

- 6.1.8. Details of the proposed foul water drainage strategy, which has been designed in accordance with the Environment Agency, Manchester City Council and United Utilities, can be found in the separate Drainage Strategy Report (WSP, 2017).

7 CONCLUSIONS

- 7.1.1. Based on the findings of this report, the site is considered to be at a low or negligible risk of flooding from all sources.
- 7.1.2. 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 outside of the site boundary along Jackson's Row and Bootle Street in an east to west direction. Careful consideration of levels should mitigate against this risk.
- 7.1.3. Since all roads adjacent to the site are located within Flood Zone 1, access and egress should not be affected during an extreme flooding event.
- 7.1.4. Details of the proposed surface water and foul water drainage strategies, which have been designed in accordance with the requirements of the Environment Agency, Manchester City Council and United Utilities can be found in the accompanying Drainage Strategy Report (WSP, 2017).
- 7.1.5. The drainage strategy will ensure surface water run-off is directed away from buildings and into attenuation storage structures that have been sized to retain all excess surface water run-off generated beyond the proposed discharge rate. This design has been based on providing storage up to and including the critical 1 in 100 year event (plus a 40% allowance for climate change), within the confines of the development.

Appendix A

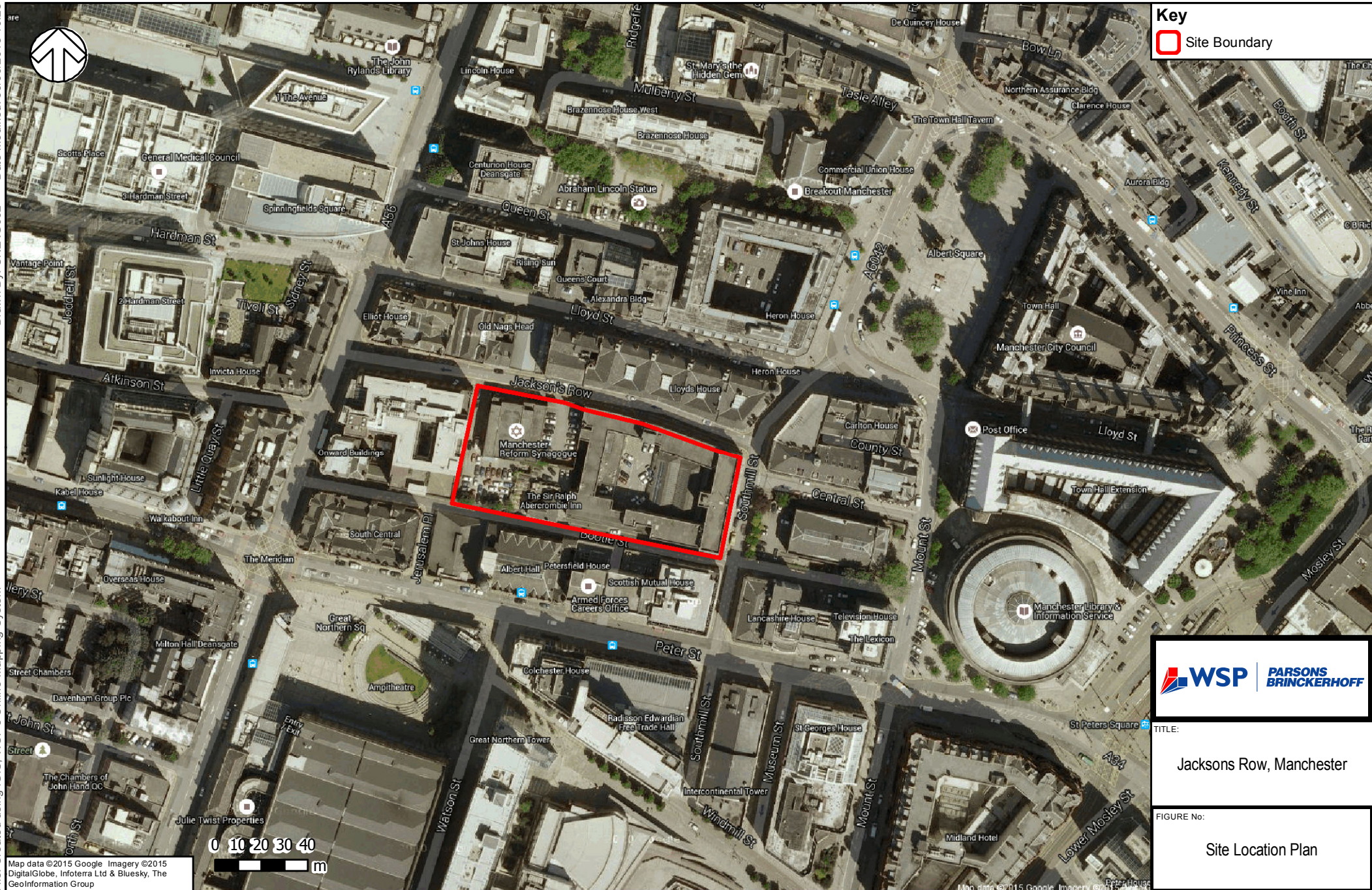
BASEMENT FLOOR PLAN



Appendix B

SITE LOCATION PLAN

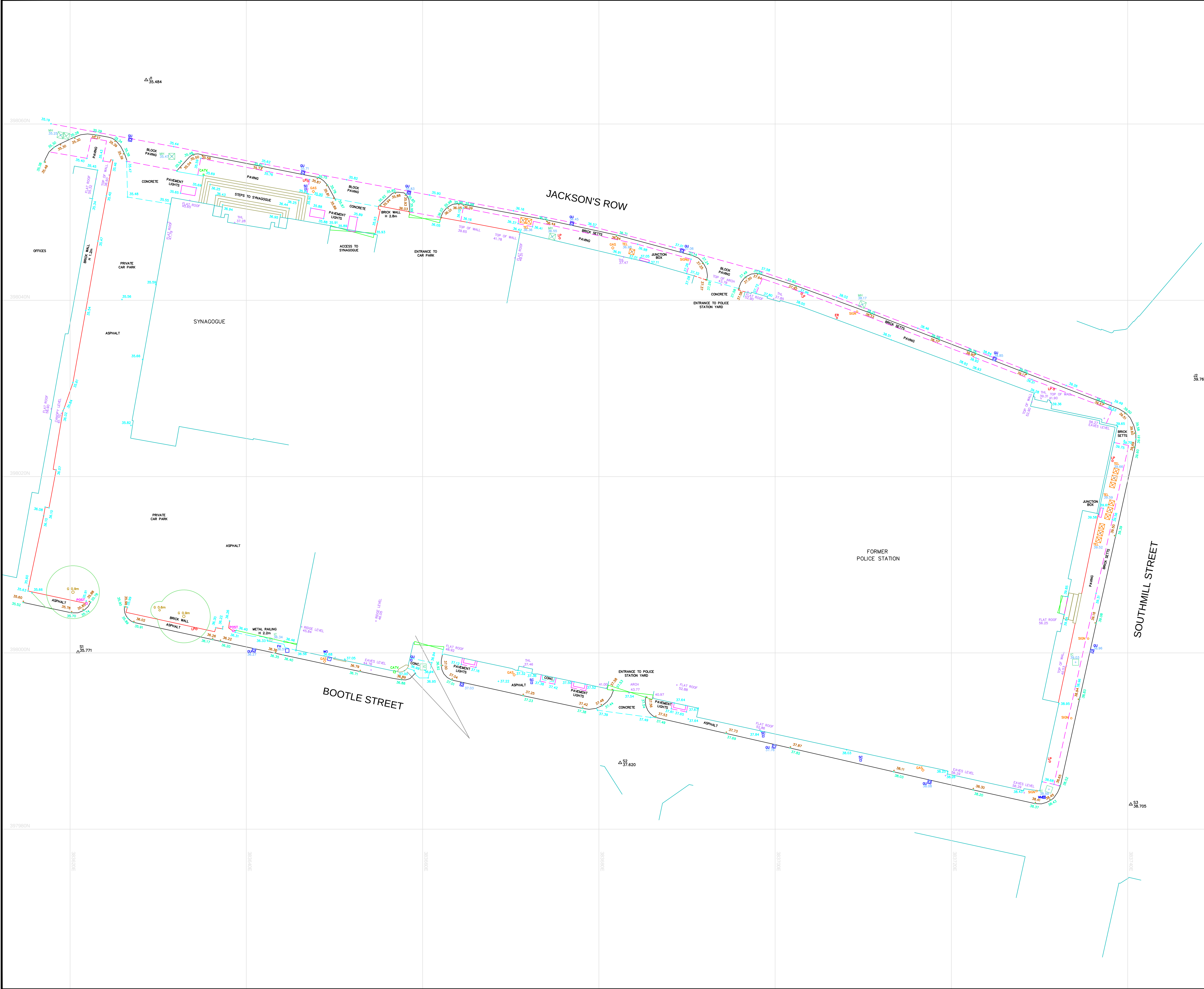




Appendix C

TOPOGRAPHIC SURVEY





Notes

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Direction of North

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 = 35.896 m A.O.D

Station	Easting	Northing	Level
J1	383628.638	398064.997	35.484
J2	383749.307	398030.264	39.763
S1	383620.896	398000.082	35.771
S2	383682.410	397987.528	37.620
S3	383740.354	397982.823	38.705

KEY

AIR VALVE	AV	KERB OUTLET	KO
BENCH MARK	BM	LAMP POST	LP
BIN	BN	MANHOLE (CIRCULAR)	MH
BOLLARD	BOL	MANHOLE (RECTANGULAR)	MH
BORE HOLE	BH	MANHOLE (TRIANGULAR)	MH
BRITISH TELECOM COVER	BT	MARKER POST	MP
BUS STOP	BUS	GULLY	GU
CABLE TV COVER	CA	RODDING EYE	RE
CABLE TV SUPPLY	CA	SIGN POST	SP
COLUMN	COL	TELECOM COVER	TEL
EARTHING POINT	ER	TELEGRAPH POLE	TP
ELECTRICITY COVER	ELEC	THRESHOLD LEVEL	THL
ELECTRICITY POLE	EP	TRAFFIC LIGHT	TL
FIRE HYDRANT	FH	TRIAL PIT	TP
GAS VALVE	GV	WASH OUT	WO
GATE	G	WATER METER	WM
INSPECTION COVER (CIRCULAR)	IC	WATER STOP COCK	SC
INSPECTION COVER (RECTANGULAR)	IC	WATER STOP VALVE	SV
COVER LEVEL	CL	CHAMBER BASE LEVEL	Ch.L
INVERT LEVEL	IL	WATER SURFACE LEVEL	WL
UNABLE TO RAISE	UTR	UNABLE TO MEASURE	UTM
GIRTH OF TREE TRUNK	G	DIAMETER OF TREE TRUNK	D
HEIGHT TO TOP OF TREE CANOPY	H	MULTI BOLE TREE	MB

Rev	Date	Drawn	Description	Check
-	--/------	--	--	--

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T: +44 [0] 1132 008 900
F: +44 [0] 1132 008 901
E: admin@metgeoenvironmental.com
W: www.metgeoenvironmental.com

Client

ZERUM CONSULT LTD

Site

JACKSON'S ROW
MANCHESTER M25WD

Title

TOPOGRAPHICAL SURVEY
2D

Surveyed	SJ/MC/MT	Drawn	SJ
Chk.	DA	Date	01/04/2015
Scale	[A1 Sheet] 1/200	DWG Ref	13643-100_2DT
Job No	13643-100	Status	FINAL
Rev	Ø		

Appendix D

CONSULTATION RESPONSES



Barlow, Laura

From: GMMC Info Requests <Inforequests.gmmc@environment-agency.gov.uk>
Sent: 18 December 2015 11:01
To: Barlow, Laura
Cc: GMMC Info Requests
Subject: GMMC 5706 Jackson's Row, Manchester
Attachments: 17-11-15 Dial House.xlsx; 17-11-15 High School.xlsx; GW Monitoring Stations.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

Please find attached final information you requested around Groundwater. Please note the Standard Notice conditions of use sent to you previously.

Groundwater Levels

Two groundwater level monitoring stations have been identified within a 2km radius of the subject site, Details of these are provided on the GW monitoring station attachment and the groundwater levels are on a separate Dial House and High School attachments.

Groundwater Source Protection Zone

No source protection zones have been identified in the vicinity of the site.

Groundwater flooding

The groundwater team do not hold records on groundwater flooding; groundwater flooding is the responsibility of the lead local flood authority. The Lead Local Flood Authority for your area is Manchester Council.

Local authorities search

<https://www.gov.uk/find-your-local-council>

Local authorities – new roles and responsibilities

<http://www.defra.gov.uk/environment/flooding/legislation/la-roles/>

Jane Sansbury

Customers and Engagement Specialist

(Greater Manchester, Merseyside and Cheshire Area)

Environment Agency, Richard Fairclough House, Knutsford Road, Warrington, WA4 1HT

Telephone: 020302 50651 / 07990 841 920

Out of hours: 0800 028 1989

E-mail : jane.sansbury@environment-agency.gov.uk

Follow us on www.twitter.com/envagencynw

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From: GMMC Info Requests <Inforequests.gmmc@environment-agency.gov.uk>
Sent: 13 October 2015 10:15
To: Barlow, Laura
Cc: GMMC Info Requests
Subject: GMMC 5706/JS - Flood Risk Assessment - Jackson's Row, Manchester
Attachments: Standard_Notice[1].pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Laura,

We can confirm that the site (Jackson's Row, Manchester) is located within Flood Zone 1. Please see response to your enquiry below. Please read the Standard Notice which sets out conditions of use of this data.

Watercourses

- Details of any watercourses / culverted watercourses in the vicinity and who is responsible for their maintenance; The responsibility for the repair and condition of the watercourse, its channel, banks and adjacent structures, lies ultimately with the riparian owner.
- Minimum set back distances from any watercourse and governing statute / byelaw. Under the terms of the Water Resources Act 1991, and the Land Drainage Byelaws, the prior written consent of the Environment Agency is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of watercourses which are designated 'main river'. We utilise the land drainage byelaws to control development within 8 metres of the bank top of the watercourse to ensure that our access arrangements to the watercourse are maintained.

Hydraulic Modelling

- Hydraulic modelling results of any watercourse that could potentially cause flooding at the site; N/A
- Whether or not any hydraulic modelling of any surrounding watercourses would be required to accompany a FRA and if so, provide some guidance on the level of modelling required (e.g. 1D or 2D); Please refer to the guidance in the National Planning Policy Framework (NPPF) or the flooding risk standing advice on the GOV.UK website <https://www.gov.uk/planning-applications-assessing-flood-risk>.
- Whether or not any hydraulic modelling of any blockage scenarios / breach analysis would be required to be undertaken as part of the FRA; Please refer to the guidance in the NPPF or the flooding risk standing advice on the GOV.UK website <https://www.gov.uk/planning-applications-assessing-flood-risk>
- Does modelling or any other evidence indicate that flood waters can come out of bank upstream / downstream from the site and flood the site by overland flow? The site is located in Flood Zone 1 with a less than 1 in 1000 chance of flooding occurring in any given year.
- Whether or not hydraulic modelling / Flood Zones will be updated in the near future. The site is located in Flood Zone 1.

Flood Defences / Other Structures

- Details of any flood defences in the area including standard of protection, condition, type, who is responsible for maintenance; There are no flood defences in the vicinity of the site.
- If the EA are responsible for maintenance, will be they maintained to include climate change allowances; There are no flood defences in the vicinity of the site.
- Details of any proposals for any future flood alleviation scheme that could affect the site and if so, provide details and timescales; There currently no proposals in this area.
- Details of any other man-made structures / sources of flood risk that could affect the site. The Environment Agency holds information on flood risk from rivers and the sea and reservoirs. For

information on Surface water flood risk please contact the Lead Local Flood Authority and for information on Sewer Flooding please contact United Utilities.

Previous flooding records

- Any previous flooding records and if so dates, source, depth, extent and any further detail. We have no records of flooding affecting the site. However, this does not mean flooding has not occurred in the past or that it will not flood in future. We recommend that you also contact United Utilities and Manchester Council who may hold additional information (the former especially in relation to sewer flooding).

Groundwater

- Details of any groundwater levels in the vicinity of the site;
- Whether or not the site lies within a Groundwater Source Protection Zone;
- Details of any groundwater flooding issues in the area.

Reservoir Flood Risk

- Whether or not the site is located within an area susceptible to reservoir flooding, and provide a copy of the Reservoir Flood Map to confirm this. The Environment Agency Flood map shows that the site is not located in an area at risk of reservoir flooding.

Surface Water

- Whether or not the site is located within an area susceptible to flooding from surface water and provide a copy of the relevant surface water flooding map; The Local Authority is responsible for issues relating to surface water and hold information on surface water flooding.
- Details of any restrictions associated with the drainage of surface water from the site; The Local Authority is responsible for issues relating to surface water and hold information on surface water flooding. We recommend that you contact the local planning authority who will be able to discuss their requirements.
- Whether or not the site is located within a critical drainage area. This can be found by consulting the local authority Strategic Flood Risk Assessment.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Jane Sansbury

Customers and Engagement Specialist

(Greater Manchester, Merseyside and Cheshire Area)

Environment Agency, Richard Fairclough House, Knutsford Road, Warrington, WA4 1HT

Telephone: 01925 54 2200 / 07990 841 920

Out of hours: 0800 028 1989

E-mail : jane.sansbury@environment-agency.gov.uk

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Barlow, Laura

From: e.ainsworth@manchester.gov.uk on behalf of
floodriskmanagement@manchester.gov.uk
Sent: 30 October 2015 11:21
To: Barlow, Laura
Subject: Re: FW: Flood risk enquiry - Jackson's Row
Attachments: Jacksons Row, Manchester - Site Location Plan.pdf

Laura,

The River Tib which historically flowed within the vicinity of the Town Hall has recently been confirmed to be largely obsolete in the vicinity of your site having been incorporated into the combined sewer system. I can confirm that the tunnel to the south of the site is the Canal tunnel but we do not hold any information on this structure.

Regards

Flood Risk Management Team

=====



Capital Programmes & Property, Growth and Neighbourhoods Directorate

Manchester City Council

Postal address:
PO Box 532, Town Hall, Manchester, M60 2LA

Office Location:
Level 8, Town Hall Extension, Mount Street, Manchester, M2 5NS

Email: floodriskmanagement@manchester.gov.uk

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



Please consider the environment before printing this email.

"Barlow, Laura" <Laura.Barlow@wspgroup.com>

29/10/2015 10:17

To "floodriskmanagement@manchester.gov.uk"
<floodriskmanagement@manchester.gov.uk>

cc

Subject FW: Flood risk enquiry - Jackson's Row

Dear Flood Risk Management,

Thank you for your response.

Upon reviewing the Hidden Rivers Map in the Greater Manchester Strategic Flood Risk Assessment (2008) it appears that there are two hidden watercourses which are not shown in the immediate vicinity of the site but at a distance that may have an impact upon flood risk to the site.

Please could you provide any information you have on these watercourses? We understand that one is the Manchester and Salford Junction Canal and the other flows under Mount Street to the east of the site.

This project is to be treated as confidential at the moment, please could you keep information we have provided for the enquiry confidential.

Kind regards,

Laura

Laura Barlow
Graduate Engineer

Three White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL

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If possible, please consider saving paper by not printing your e-mail.

From: Barlow, Laura

Sent: 27 October 2015 15:08

To: 'floodriskmanagement@manchester.gov.uk'

Subject: RE: Flood risk enquiry - Jackson's Row

Dear Flood Risk Management,

Thank you for your response. I have been made aware and so I am writing to advise that this is a confidential scheme and so the details we have provided and the information given in response to the enquiry should remain confidential at this stage.

Regards,

Laura

Laura Barlow
Graduate Engineer

Three White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL
Tel: +44(0) 113 395 6326
Fax: +44(0) 113 395 6201

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From: e.ainsworth@manchester.gov.uk [<mailto:e.ainsworth@manchester.gov.uk>] On Behalf Of
floodriskmanagement@manchester.gov.uk
Sent: 08 October 2015 13:51
To: Barlow, Laura
Subject: Re: Flood risk enquiry - Jackson's Row

Laura,

Please find attached response to your queries

Regards

Flood Risk Management Team

=====



Capital Programmes & Property, Growth and Neighbourhoods Directorate

Manchester City Council

Postal address:
PO Box 532, Town Hall, Manchester, M60 2LA

Office Location:
Level 8, Town Hall Extension, Mount Street, Manchester, M2 5NS

Email: floodriskmanagement@manchester.gov.uk



"Garner, Laura" <Laura.Garner@wspgroup.com>

02/10/2015 17:04

To "floodriskmanagement@manchester.gov.uk"
<floodriskmanagement@manchester.gov.uk>

cc

Subject Flood risk enquiry - Jackson's Row

Dear Flood Risk Management

WSP | Parsons Brinckerhoff are currently undertaking a Flood Risk Assessment and Drainage Strategy for a site known as Jackson's Row. An approximate postcode is M2 5WD and a site location plan is attached.

I would be grateful if you could provide the following information (if available):

- Details of any watercourses / culverted watercourses in the vicinity for which Manchester City Council is responsible (the available maps in the SFRA show no watercourses in the immediate vicinity but culverted sections of the Medlock 0.5km to the south of the site);
- Minimum set back distances from any watercourse and governing statute / byelaw;
- Details of any flood defences in the area including standard of protection, condition, type, who is responsible for maintenance;
- Details of any proposals for any future flood alleviation scheme that could affect the site and if so, provide details and timescales;
- Details of any other man-made structures / sources of flood risk that could affect the site;
- Any previous flooding records or known issues at or near the site and if so dates, source, depth, extent and any further detail;
- Details of any groundwater flooding issues in the area;
- Whether or not the site is located within an area susceptible to flooding from surface water (appears not to be from mapping in the SFRA);
- Details of any restrictions associated with the drainage of surface water from the site (the early indication is that discharge by infiltration or to a watercourse may not be suitable and so a connection to the United Utilities sewer network will be pursued) ;
- Confirmation that the site lies within the Conurbation Core Critical Drainage Area as shown in the SFRA (has there been any update since this document?).

Please let me know if you require anything further from me at this stage.

Kind regards,

Laura

Laura Garner
Graduate Engineer

Three White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL
Tel: +44(0) 113 395 6326
Fax: +44(0) 113 395 6201

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Jackson's Row

(Flood Risk Management Response 08/10/2015)

Please find responses in blue below to your requests

- Details of any watercourses / culverted watercourses in the vicinity for which Manchester City Council is responsible (the available maps in the SFRA show no watercourses in the immediate vicinity but culverted sections of the Medlock 0.5km to the south of the site);

There are no watercourses within the vicinity of the site

- Minimum set back distances from any watercourse and governing statute / byelaw;

Not applicable as development will not affect any watercourse

- Details of any flood defences in the area including standard of protection, condition, type, who is responsible for maintenance;

There are no flood defences which affect the site

- Details of any proposals for any future flood alleviation scheme that could affect the site and if so, provide details and timescales;

There are no proposals for any future flood alleviation scheme that could affect the site

- Details of any other man-made structures / sources of flood risk that could affect the site;

There are no man-made structures that could affect the site

- Any previous flooding records or known issues at or near the site and if so dates, source, depth, extent and any further detail;

We have no record of any previous flooding incidents

- Details of any groundwater flooding issues in the area;

The site has low susceptibility to groundwater flooding. We do not have any records of groundwater flooding at the site.

- Whether or not the site is located within an area susceptible to flooding from surface water (appears not to be from mapping in the SFRA);

There is a small area of the site within the existing police station car park which has a low risk of surface water flooding along with parts of Jackson's Row and Bootle Street. Further details can be found at <http://watermaps.environment-agency.gov.uk/>

- Details of any restrictions associated with the drainage of surface water from the site (the early indication is that discharge by infiltration or to a watercourse may not be suitable and so a connection to the United Utilities sewer network will be pursued) ;

The site is located within the Conurbation Core Critical Drainage Area and in accordance with the SFRA and pursuant to policy EN17 of the Core Strategy, new development on Brownfield sites in Critical Drainage Areas should aim for at least a 50% reduction in surface water runoff rates with consideration of climate change.

Surface water should be managed to ensure there is no increased surface water from the proposed development and runoff from extreme events should be retained within the site such that the adjacent third party land is not affected.

The Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications which was introduced from 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS). As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems.

For all major planning proposals the development must consider the use of sustainable drainage systems in accordance with paragraphs 051 and 079 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change. The drainage hierarchy should be followed in accordance with paragraph 080 of the same document.

Sustainable drainage systems should be designed in line with national Non-Statutory Technical Standards for SuDS and local policies EN08, EN14 and EN17 of the Core Strategy.

Hydraulic calculation and drawings to support the design need to be provided along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPPF (PPG).

- Confirmation that the site lies within the Conurbation Core Critical Drainage Area as shown in the SFRA (has there been any update since this document?).

The site lies within the Conurbation Core Critical Drainage Area and there are no updates to the Manchester SFRA document

Barlow, Laura

From: O'Brien, Neil <Neil.O'Brien@uuplc.co.uk>
Sent: 29 October 2015 15:40
To: Wilson-Wright, Matthew
Subject: RE: DE1532 Pre-Development and Flood Risk Enquiry - DE1532R

Mathew,

Multiple connections can be made but a connection application will need to be made for each sewer connection.

You will need an access certificate to work on the public sewer. Please call 0345 6723 723 and ask the call Centre to pass your details to the District Engineer for the area.

Regards

Neil

From: Wilson-Wright, Matthew [mailto:matthew.wilson-wright@wspgroup.com]
Sent: 29 October 2015 12:10
To: O'Brien, Neil
Cc: Barlow, Laura
Subject: RE: DE1532 Pre-Development and Flood Risk Enquiry - DE1532R

Neil

In respect to your comments on the allowance to drain foul and surface water to the combined network, I was wondering if there would be any objection to multiple points of connection being made from both the foul and surface water site networks to the combined system?

In addition, we would like to commission a CCTV and level survey of the combined sewer network around the site and I was wondering if you could advise on who this needs to be discussed with within United Utilities?

Thanks

Matthew



Matthew Wilson-Wright
Associate

Three White Rose Business Park, Millshaw Park Lane, Leeds LS11 0DL
Tel: +44(0) 113 3956274

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From: O'Brien, Neil [mailto:Neil.O'Brien@uuplc.co.uk]
Sent: 28 October 2015 10:52
To: Wastewater Developer Services; Barlow, Laura
Subject: RE: DE1532 Pre-Development and Flood Risk Enquiry - DE1532R

Dear Customer

We have carried out an assessment of your application which is based on the information provided; this pre development advice will be valid for 12 months

Foul will be allowed to drain to the public combined sewer network at an unrestricted rate. The connection to the public sewer can be at a point convenient to yourself

Surface water will be allowed to drain to the public combined sewer network at an unrestricted rate. The connection to the public sewer can be at a point convenient to yourself

Connection Application

Although we may discuss and agree discharge points & 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

<http://www.unitedutilities.com/connecting-public-sewer.aspx>

Please be aware that on site drainage must be designed in accordance with Building Regulations, National Planning Policy, Planning Conditions and local flood authority guidelines, we would recommend that you liaise and make suitable agreements with the relevant statutory bodies.

Regards

Neil O'Brien

Developer Engineer
Developer Services and Planning

From: Barlow, Laura [mailto:Laura.Barlow@wspgroup.com]
Sent: 22 October 2015 14:44
To: O'Brien, Neil
Subject: RE: DE1532 Pre-Development and Flood Risk Enquiry - DE1532

Neil,

Thank you for your response.

Please could you also comment on whether United Utilities would accept flow from the site into the surrounding combined sewers and detail any restrictions on flow rate for foul and surface water from the site? We have also sought a response from Manchester City Council and the Environment Agency on this matter.

I have attached the pre development enquiry for clarity but please let me know if you require anything else.

Regards,

Laura

From: O'Brien, Neil [mailto:Neil.O'Brien@uuplc.co.uk]
Sent: 22 October 2015 14:34
To: Wastewater Developer Services; Barlow, Laura
Subject: RE: DE1532 Pre-Development and Flood Risk Enquiry - DE1532

Laura

United Utilities have no records of hydraulic sewer flooding in the area

Regards

Neil

From: Wastewater Developer Services
Sent: 06 October 2015 10:48
To: O'Brien, Neil
Subject: DE1532 Pre-Development and Flood Risk Enquiry - Jackson's Row, Manchester

FYI due date 26/10/2015

Jacki Cherry

Developer Services Assistant
Developer Services and Planning
Operational Services
United Utilities

T: 01925 679367
unitedutilities.com

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United Utilities Water PLC - Developer Services and Planning
Warrington North Wastewater Treatment Works
Barnard Street Off Old Liverpool Road
Gatewarth Industrial Estate
Warrington
WA5 1DS

From: Barlow, Laura [mailto:Laura.Barlow@wspgroup.com]
Sent: 05 October 2015 09:39

To: Wastewater Developer Services
Subject: Pre-Development and Flood Risk Enquiry - Jackson's Row, Manchester

To Wastewater Developer Services,

Please find attached our pre-planning drainage enquiry for a proposed development known as Jackson's Row, Manchester. The development is mixed-use including a place of worship alongside residential, office, hotel and retail space. An approximate postcode is M2 5WD. A site location plan including the site boundary is attached.

Please could you also provide details of any DG5 sewer flooding records in the area?

Please let me know if you require any further information.

Kind regards,

Laura



Laura Barlow
Graduate Engineer

Three White Rose Office Park, Millshaw Park Lane, Leeds, LS11 0DL
Tel: +44(0) 113 395 6326
Fax: +44(0) 113 395 6201

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EMGateway3.uuplc.co.uk made the following annotations

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United Utilities Group PLC, Haweswater House, Lingley Mere

**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

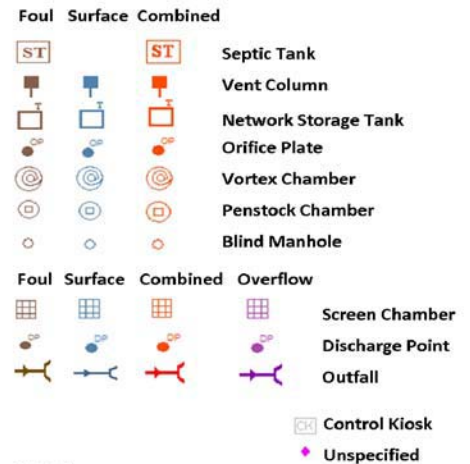
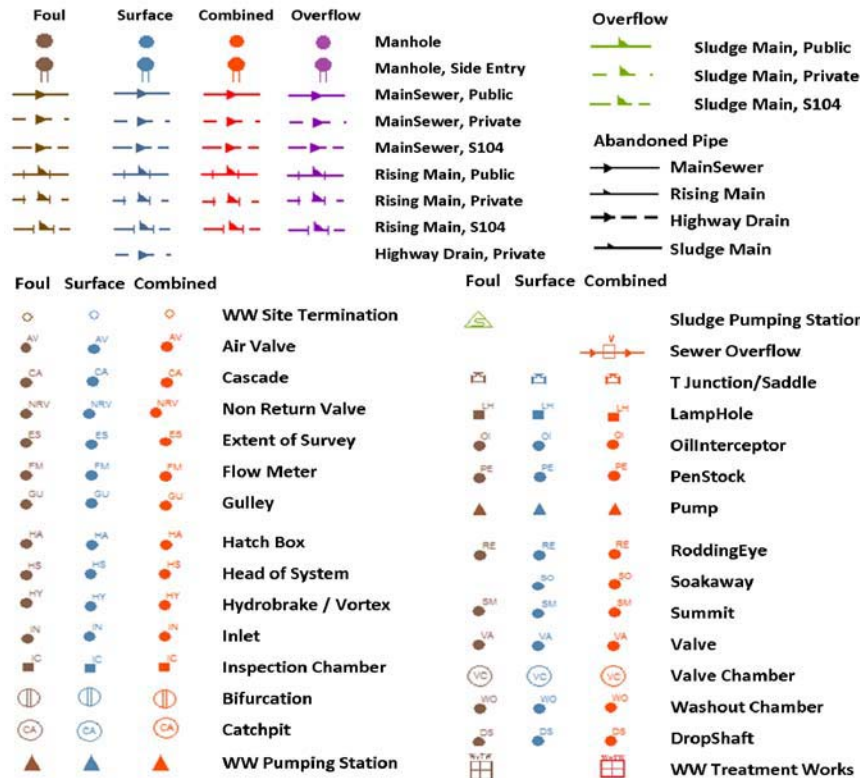
TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

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



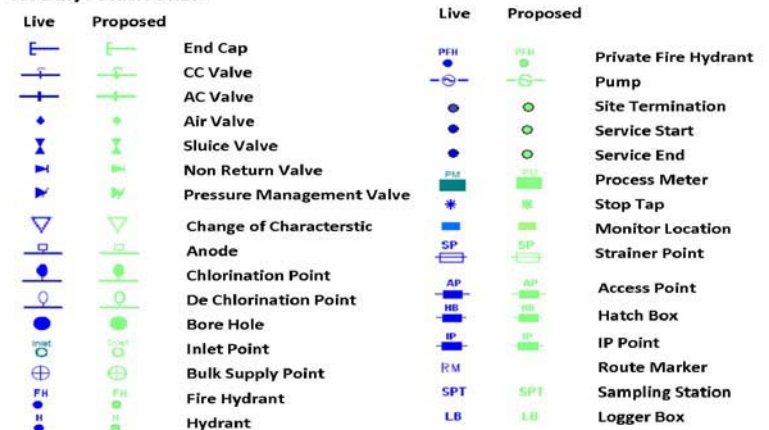
ABANDONED PIPE



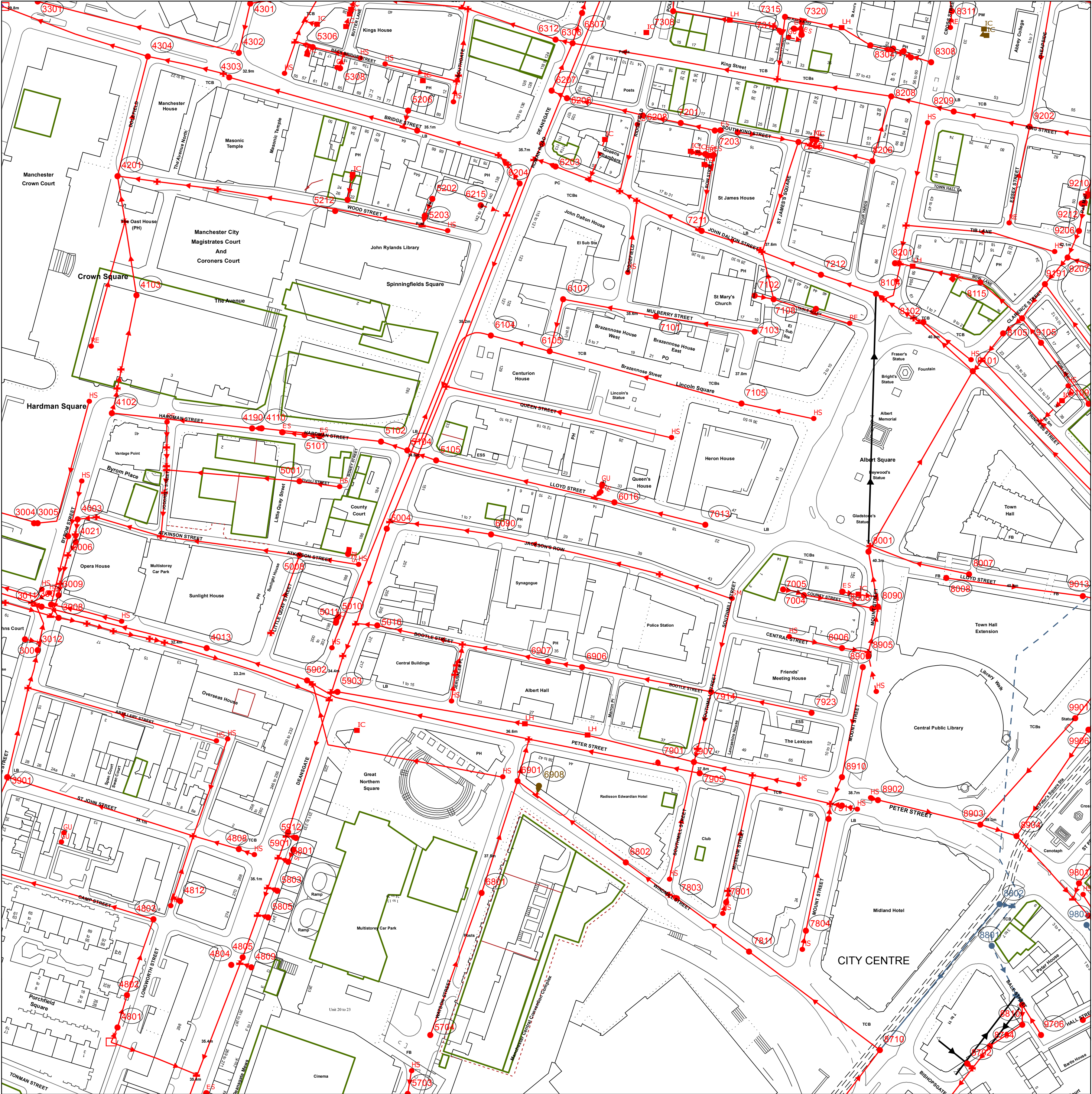
PROPERTY TYPES



NODES/FURNITURES



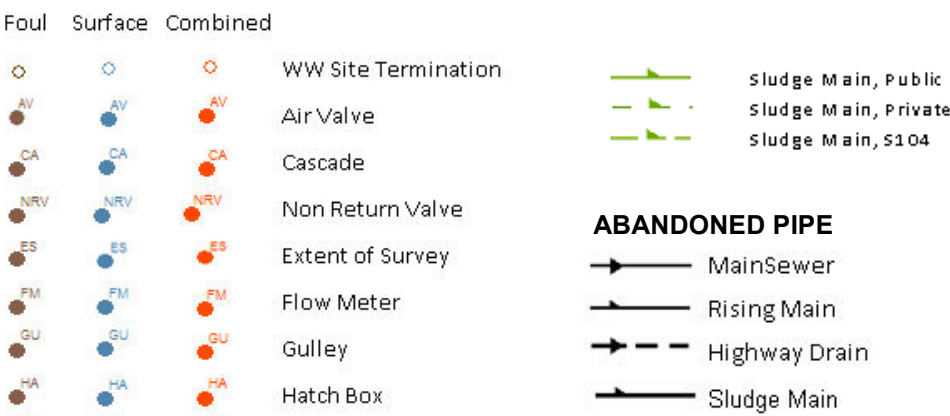
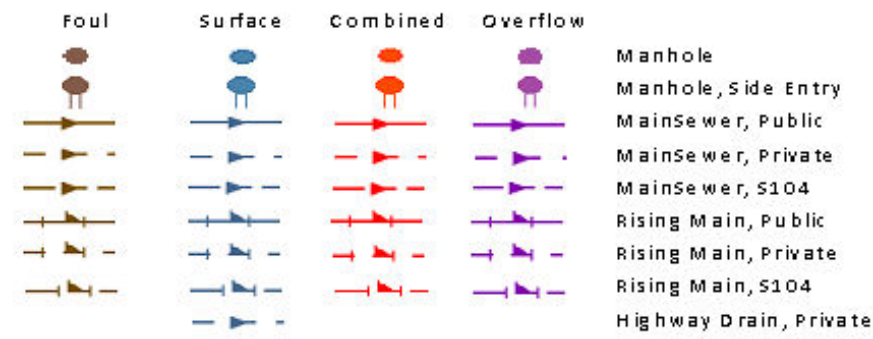
Legend	
MATERIAL TYPES	LINING TYPES
AC ASBESTOS CEMENT	CL CEMENT LINING
CI CAST IRON	TB TAR OR BITUMEN
CU COPPER	ERL EPOXY RESIN
CO CONCRETE	
DI DUCTILE IRON	INSERTION TYPES
GI GALVANISED IRON	DD DIE DRAWN
GR GREY IRON	DR DIRECTIONAL DRILLING
OT OTHERS	MO MOLING
PB LEAD	PI PIPELINE
PV UPVC	SL SLIP LINED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



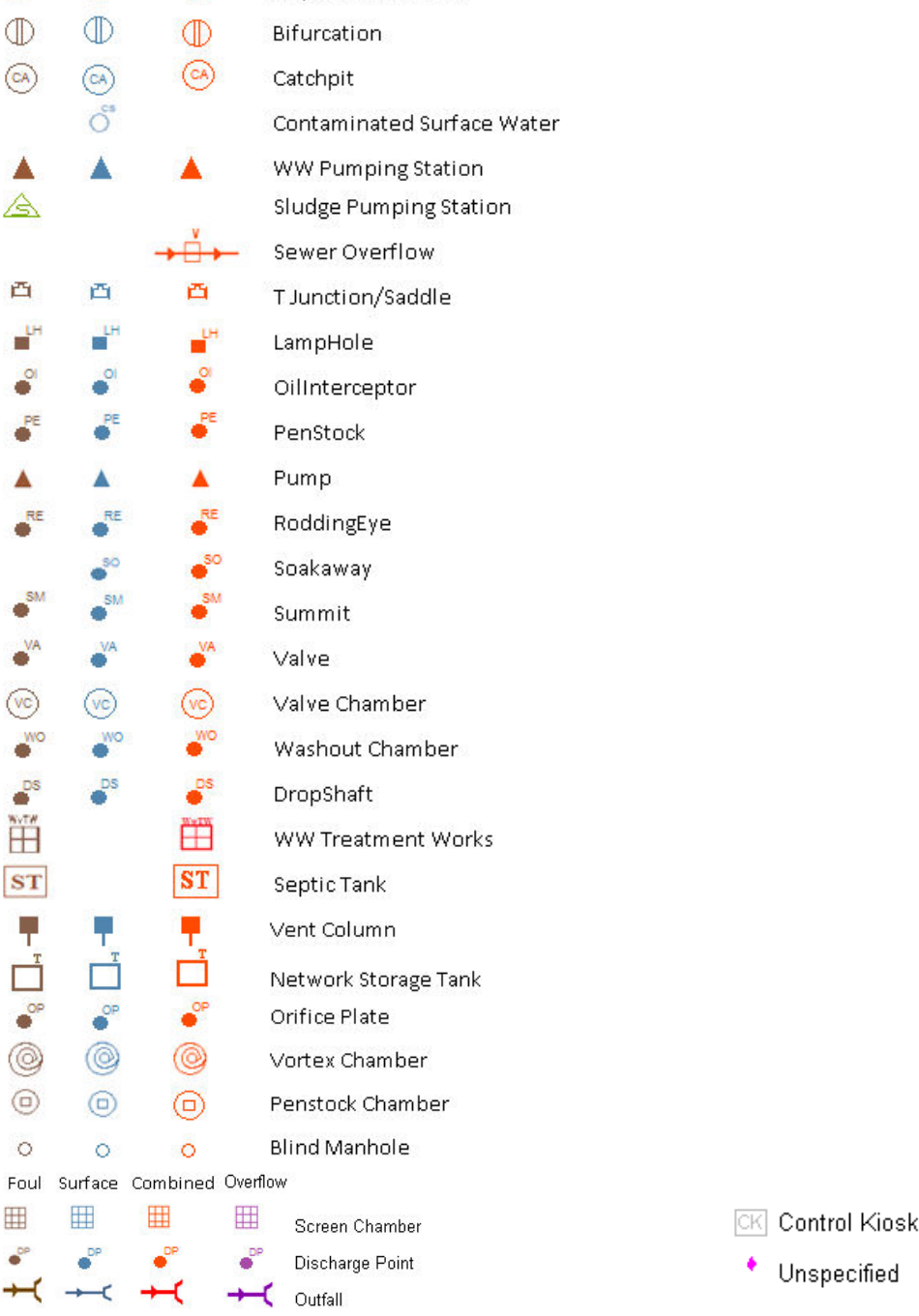
Refno	Cover	Func	Invert	Size	x	y	Shape	Mat	Length	Grad
3901	33.28	CO	29.58	650	540	FT	BR	48.27		
4801	34.39	CO								
4802	34.21	CO								
4803	34.44	CO								
4804	35.23	CO								
4805	35.27	CO								
4806	35.15	CO								
4809		CO								
4812		CO								
5703	17.87	CO	0	450			CI	VC	6.15	
5704		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	18.25	
5901	36.94	CO					CI	VC	18.25	
5905	18.09	CO					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	
7810	39.43	CO	0	450			CI	VC	86.4	
7811	39.34	CO					CI	VC	86.4	
7812	39.34	CO					CI	VC	86.4	
7813	39.34	CO					CI	VC	86.4	
7814	39.34	CO					CI	VC	86.4	
7815	39.34	CO					CI	VC	86.4	
7816	39.34	CO					CI	VC	86.4	
7817	39.34	CO					CI	VC	86.4	
7818	39.34	CO					CI	VC	86.4	
7819	39.34	CO					CI	VC	86.4	
7820	39.34	CO					CI	VC	86.4	
7821	39.34	CO					CI	VC	86.4	
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7823	39.34	CO					CI	VC	86.4	
7824	39.34	CO					CI	VC	86.4	
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7828	39.34	CO					CI	VC	86.4	
7829	39.34	CO					CI	VC	86.4	
7830	39.34	CO					CI	VC	86.4	
7831	39.34	CO					CI	VC	86.4	
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7866	39.34	CO					CI	VC	86.4	
7867	39.34	CO					CI	VC	86.4	
7868	39.34	CO					CI	VC	86.4	
7869	39.34	CO					CI	VC	86.4	
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7952	39.34	CO					CI	VC	86.4	
7953	39.34	CO					CI	VC	86.4	
7954	39.34	CO		</						

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
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.

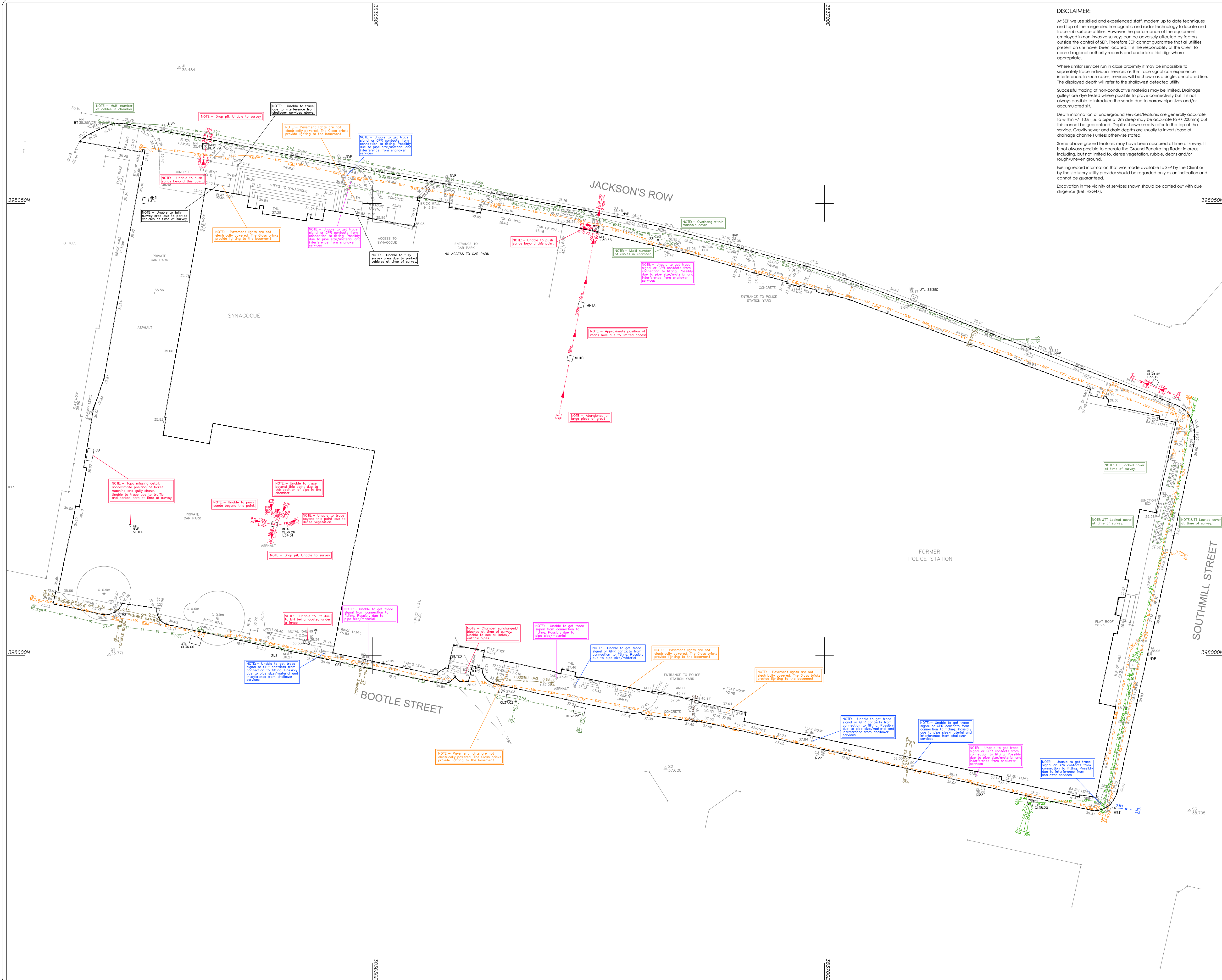
Highway drains, when included, show as blue and black dashed lines. Highway drains are not assets belonging to United Utilities and are the responsibility of local authorities.

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 E

UTILITY SURVEY





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.

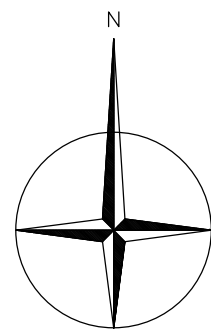
Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage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

File Name: S11741-U.dwg

LEGEND

AB	CONTROL	BT	BT	BT	BT
AC	CONTROL POST	BT	BT	BT	BT
AD	CRV CABLE	BT	BT	BT	BT
AE	CRV CONTROL POST	BT	BT	BT	BT
AF	CRV CABLE	BT	BT	BT	BT
AG	CRV CONTROL POST	BT	BT	BT	BT
AH	CRV CABLE	BT	BT	BT	BT
AI	CRV CONTROL POST	BT	BT	BT	BT
AJ	CRV CABLE	BT	BT	BT	BT
AK	CRV CONTROL POST	BT	BT	BT	BT
AL	CRV CABLE	BT	BT	BT	BT
AM	CRV CONTROL POST	BT	BT	BT	BT
AN	CRV CABLE	BT	BT	BT	BT
AO	CRV CONTROL POST	BT	BT	BT	BT
AP	CRV CABLE	BT	BT	BT	BT
AQ	CRV CONTROL POST	BT	BT	BT	BT
AR	CRV CABLE	BT	BT	BT	BT
AS	CRV CONTROL POST	BT	BT	BT	BT
AT	CRV CABLE	BT	BT	BT	BT
AV	CRV CONTROL POST	BT	BT	BT	BT
AW	CRV CABLE	BT	BT	BT	BT
AX	CRV CONTROL POST	BT	BT	BT	BT
AY	CRV CABLE	BT	BT	BT	BT
AZ	CRV CONTROL POST	BT	BT	BT	BT
BA	CRV CABLE	BT	BT	BT	BT
BB	CRV CONTROL POST	BT	BT	BT	BT
BC	CRV CABLE	BT	BT	BT	BT
BD	CRV CONTROL POST	BT	BT	BT	BT
BE	CRV CABLE	BT	BT	BT	BT
BF	CRV CONTROL POST	BT	BT	BT	BT
BG	CRV CABLE	BT	BT	BT	BT
BH	CRV CONTROL POST	BT	BT	BT	BT
BI	CRV CABLE	BT	BT	BT	BT
BJ	CRV CONTROL POST	BT	BT	BT	BT
BK	CRV CABLE	BT	BT	BT	BT
BL	CRV CONTROL POST	BT	BT	BT	BT
BM	CRV CABLE	BT	BT	BT	BT
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BO	CRV CABLE	BT	BT	BT	BT
BP	CRV CONTROL POST	BT	BT	BT	BT
BQ	CRV CABLE	BT	BT	BT	BT
BR	CRV CONTROL POST	BT	BT	BT	BT
BS	CRV CABLE	BT	BT	BT	BT
BT	CRV CONTROL POST	BT	BT	BT	BT
BU	CRV CABLE	BT	BT	BT	BT
BV	CRV CONTROL POST	BT	BT	BT	BT
BW	CRV CABLE	BT	BT	BT	BT
BX	CRV CONTROL POST	BT	BT	BT	BT
BY	CRV CABLE	BT	BT	BT	BT
BZ	CRV CONTROL POST	BT	BT	BT	BT
CA	CRV CABLE	BT	BT	BT	BT
CB	CRV CONTROL POST	BT	BT	BT	BT
CC	CRV CABLE	BT	BT	BT	BT
CD	CRV CONTROL POST	BT	BT	BT	BT
CE	CRV CABLE	BT	BT	BT	BT
CF	CRV CONTROL POST	BT	BT	BT	BT
CG	CRV CABLE	BT	BT	BT	BT
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CN	CRV CONTROL POST	BT	BT	BT	BT
CO	CRV CABLE	BT	BT	BT	BT
CP	CRV CONTROL POST	BT	BT	BT	BT
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CR	CRV CONTROL POST	BT	BT	BT	BT
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CT	CRV CONTROL POST	BT	BT	BT	BT
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CW	CRV CABLE	BT	BT	BT	BT
CX	CRV CONTROL POST	BT	BT	BT	BT
CY	CRV CABLE	BT	BT	BT	BT
CZ	CRV CONTROL POST	BT	BT	BT	BT
DA	CRV CABLE	BT	BT	BT	BT
DB	CRV CONTROL POST	BT	BT	BT	BT
DC	CRV CABLE	BT	BT	BT	BT
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DE	CRV CABLE	BT	BT	BT	BT
DF	CRV CONTROL POST	BT	BT	BT	BT
DG	CRV CABLE	BT	BT	BT	BT
DH	CRV CONTROL POST	BT	BT	BT	BT
DI	CRV CABLE	BT	BT	BT	BT
DJ	CRV CONTROL POST	BT	BT	BT	BT
DK	CRV CABLE	BT	BT	BT	BT
DL	CRV CONTROL POST	BT	BT	BT	BT
DM	CRV CABLE	BT	BT	BT	BT
DN	CRV CONTROL POST	BT	BT	BT	BT
DO	CRV CABLE	BT	BT	BT	BT

FROM STATUTORY AUTHORITY PLANS

OP	OUTLET PIPE	
PN	PYLON	
PP	PETROL PUMP	BT
RC	ROCKING EYE	
RWF	RAN-WATER PIPE	CABLE DUCT
RF	ROOF LEVEL	
SV	STOP VALVE	CATV
TCB	TELEPHONE CABLE BOX	
TL	TRAFFIC LIGHT	CCTV
TLB	TRAFFIC LIGHT BOX	
TP	TRAFFIC POLE	ELECTRIC
WM	WATER METER	
WM	WATER METER	MANS GAS
WNCST	WATER STOP TAP	
WNSV	WATER STOP VALVE	MANS WATER
WNSV	WATER STOP VALVE	
END	END OF TRACE	SEWER CW
END	END OF SURVEY AREA	
UNABLE TO	UNABLE TO	SEWER FW
UNABLE TO	UNABLE TO	
UNABLE TO	UNABLE TO	
UNABLE TO	UNABLE TO	SEWER SW

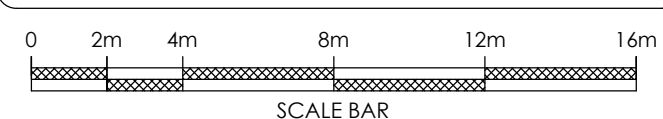
NOTES

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
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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 --



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