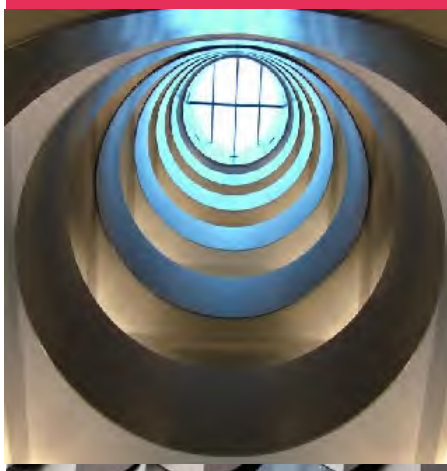








London Road Fire Station

Flood Risk Assessment & Drainage Strategy

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Issue Date: 06 December 2019

Client Name: Allied London Fire Station Ltd

Site Address: London Road Fire Station, London Road, Manchester

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Control Sheet

Rev	Description	Issued by	Checked	Date
V01	DRAFT - Updated to replace Rev A Report – updated proposals and format.	ATL	CG	28/11/2019
V02	Updated to suit Planning Consultant Comments	CG	CG	04/12/2019
V03	Updated to suit Client Comments	CG	CG	05/12/2019
V04	Updated to suit latest drawings	CG	CG	06/12/2019

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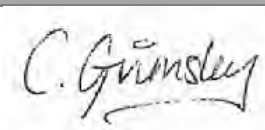
Reviewed	*Signature*	*Date*
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Manchester City Council Correspondence

United Utilities Correspondence

Appendix E

Proposed Drainage Strategy – Basement

Proposed Drainage Strategy – Ground Floor

1.0 Introduction

1.1 Project Background

1.1.1 Curtins was appointed by Allied London to provide a Flood Risk Assessment (FRA) and Detailed Drainage Strategy for the proposed re-development of the former Fire Station at London Road, Manchester Centre.

1.1.2 The report provides information on the nature of flood risk at the site and follows Government guidance with regard to development and flood risk.

1.1.3 The report is based on currently available information and preliminary discussions.

1.1.4 Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.1.5 Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

1.2.1 The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).

1.2.2 The assessment will:

- Investigate all potential risks of flooding to the site.
- Consider the impact the development may have elsewhere with regards to flooding.
- Consider proposals to mitigate any potential risk of flooding determined to be present; and
- Consider proposals for foul and surface water.

1.2.3 The planning application site area is approximately 0.46 hectares and following scrutiny of the Environment Agency flood maps it has been identified that the existing site lies within an area classified as Flood Zone 1 indicating that the risk of flooding from rivers and sea is low. The site is located in the Conurbation Core Critical Drainage Area and may be subject to other sources of flooding. Therefore, a Flood Risk Assessment has been prepared to support a planning application taking into consideration the management of surface water run-off.

1.2.4 In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDs) a material consideration in the determination of planning applications for major developments.

1.2.5 A Detailed Drainage Strategy will therefore be required as part of a full Planning Application as the site is considered to be 'major' development by the Town and Country Planning Order 2015.

1.2.6 The Assessment reviews the following information:

- Environment Agency flood maps for rivers and sea flooding.
- UK Government Flood Warning Information Service maps for surface water flooding and reservoir flooding.
- British Geological Survey (BGS) Infiltration SuDS GeoReport
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2011.
- Curtins Phase 1 Preliminary Site Assessment report (May 2016)
- Curtins Phase 2 Ground Investigation report (December 2016)
- Topographical Survey by CPLS dated September 2008.
- United Utilities Public Sewer Records dated July 2016.
- CCTV Drainage Survey by Survey Systems dated September 2016.

1.3 Proposed Development

1.3.1 The development comprises the internal and external refurbishment and restoration of the Grade II* Listed former London Road Fire Station comprising Hotel (Use Class C1), Workspace/office (Use Class B1), Retail, Restaurants, Cafes and Bars (Use Class A1, A3 and A4), Residential (Use Class C3) and use Class D2.

1.3.2 No increase in the total area of impermeable surface is proposed.

1.3.3 The proposed floor layout is enclosed in *Appendix A.*

2.0 Existing Site Details

2.1 History and Current Use

2.1.1 The site is located within Manchester City, approximately 30 metres west of Manchester Piccadilly train station. The A6 (London Road northbound & southbound) borders the eastern edge of the site, and the A6 (northbound) circumnavigates the northern edge of the site. The B6469 (Fairfield Street) borders the southern edge of the site. Minshull Street South borders the western edge of the site.

2.1.2 The site area is currently entirely brownfield, as is the immediate surrounding area which is mostly business / commercial use to the south, west and north with Manchester Piccadilly Station being immediately to the east. Previous use of the building includes partial use as a fire station, police station, court, and bank; however, the building is currently vacant. The University of Manchester has buildings located approximately 55m to the west of the site. The nearest green spaces are Sackville Gardens (150m west) and Vimto Park (100m south-east).

2.1.3 The wider area is occupied by further commercial, retail and business buildings, with Manchester City Centre being located approximately 700m north-west of the site, and inner city suburbs located approximately 350m to the south (see Figure 1).

Figure 1: Aerial Photograph (© Microsoft)



2.1.4 The site is currently occupied by the Grade II* Listed former London Road Fire Station, which has been vacant for some 30 years and comprises four interconnected buildings with a large central courtyard and basement. The building, although four sided, is generally triangular in shape and is bounded on all four sides by roads. It is located within the Whitworth Street Conservation Area.

2.2 Existing Watercourses

2.2.1 The Rochdale Canal is located approximately 160m north of the site at its nearest point, and runs south-west / north-east.

2.2.2 The Ashton Canal begins approximately 270m north-west of the site, running eastwards.

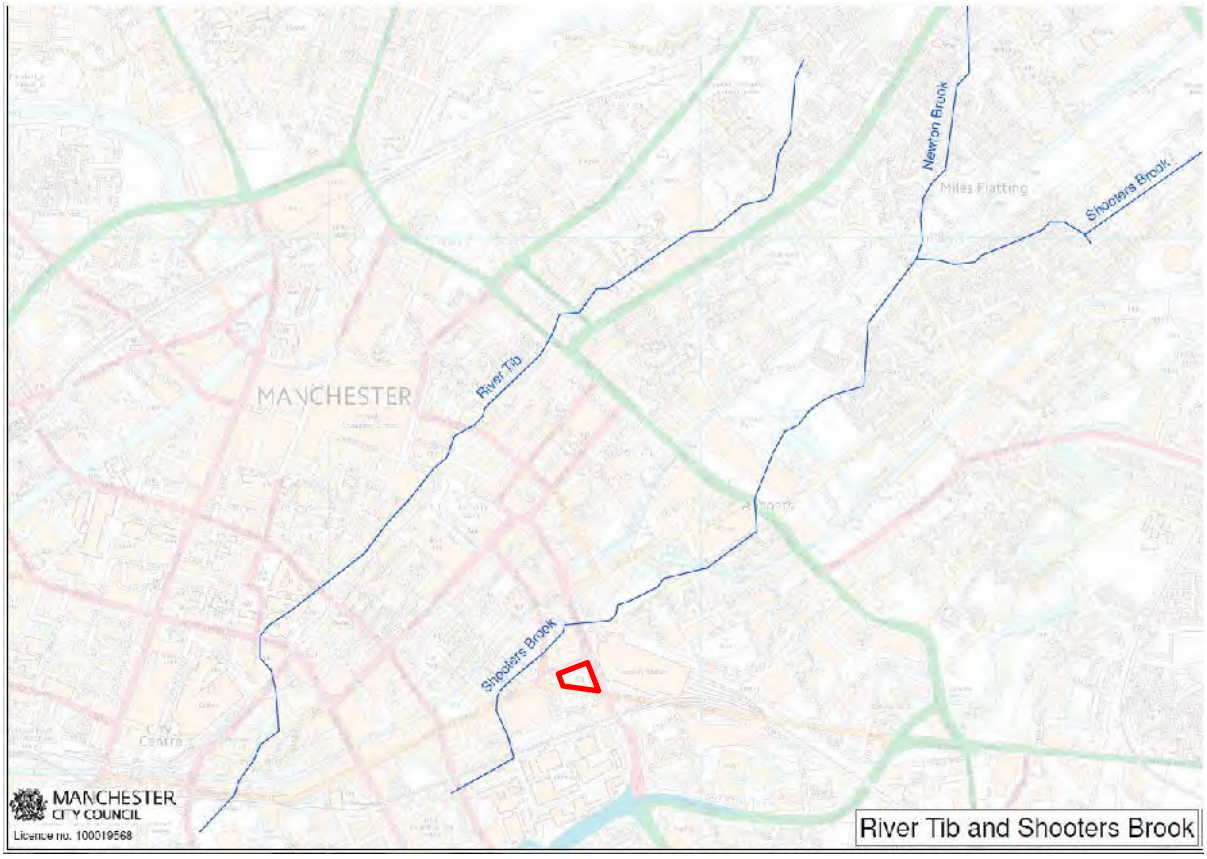
2.2.3 The River Medlock (which is a 'main river') is located approximately 290m south-east of the site, where it is culverted until it re-emerges approximately 497m south-west of the site. The River Medlock continues to meander and flow through a number of culverts along its length both upstream and downstream of the site, until it joins the Bridgewater Canal approximately 1.56km west of the site.

2.2.4 The River Irwell is located approximately 1.26km north-west of the site, and it flows in a south-westerly direction towards the town of Runcorn. Upstream, the River Irwell is a main river from its confluence with the River Irk (also a main river).

2.3 'Hidden' Watercourses

2.3.1 A hidden watercourse has been identified by records obtained from Manchester City Council (see Figure 2). The hidden watercourse is called Shooters Brook and it flows in a westerly direction as a public surface water sewer via a 1560 x 1400 brick culvert underneath Store Street to London Road (approximately 50m north of the site), where it flows into manhole ref: 6808. From manhole 6808, a public surface water sewer flows in a southerly direction, whilst Shooters Brook continues west from manhole 6808 as a public surface water sewer via a 1275mm brick culvert underneath buildings north of the site. Shooters Brook then crosses underneath Aytoun Street to the eastern edge of Manchester Metropolitan University (Aytoun Campus). From this point, Shooters Brook flows in a south-westerly direction via a 600mm clay culvert (as identified on United Utilities sewer map) underneath the university campus and away from the site in a south-westerly direction.

Figure 2: Hidden Watercourse (Courtesy of Manchester City Council)



2.4 Existing Drainage (Public Sewer Network)

2.4.1 The public sewer records have been obtained for the development site. The records indicate that there are no recorded public sewers located within the site.

2.4.2 The public sewer records indicate that the following public sewers are located within the vicinity of the site:

- There is a 1560 x 1400 brick public surface water main sewer (Shooters Brook) flowing in a south-westerly direction along Store Street to manhole ref: 6808 at the junction with London Road. Manhole 6808 has two outlets, one flowing in a westerly direction (Shooters Brook, as described in paragraph 2.3.1), and another outlet flowing in a southerly direction. The latter outlet is a 150mm clay public surface water main sewer and it flows in a southerly direction along London Road to manhole ref: 7801. A 900mm brick public surface water main sewer flows from manhole 7801 in a southerly direction along London Road to manhole ref: 7712, which is situated at the junction with Granby Row. The public surface water main sewer then flows in a westerly direction from manhole 7712 (size and material not identified in the public sewer records) passing through manholes 6713, 6714 and 5604 continuing west along Granby Row. Although the public sewer

records do not extend beyond this point, it is assumed that this public surface water sewer re-joins Shooters Brook at the junction of Granby Street and Sackville Row.

- There is a 1875mm brick public foul sewer running past the northern corner of the site at the junction of Whitworth Street and London Road. This sewer flows past the northern edge of the site along Whitworth Street in a west / south-westerly direction. Approximately half way along the northern edge of the site, this sewer is recorded as being 2175mm brick up to manhole ref: 6802. The public foul sewer then flows away from the site in a south-westerly direction through a 2100mm brick culvert towards manhole ref: 5703.
- There is a 450mm clay public foul sewer flowing in a north-westerly direction along Fairfield Street adjacent to the southern edge of the site. The sewer line starts at the junction of London Road and Fairfield Street, manhole ref: 7708, flowing to manhole ref: 6702 where it is joined by a short branch coming from South Pump Street, through manhole ref: 6710 where it is joined by a foul sewer from Back Acton Street/Ebden Street, continuing along Fairfield street to manhole ref: 6703 where it combines with sewers from Minshull Street South (western edge of the site). The system then flows away from the site in a north-westerly direction until it joins with the system mentioned previously which flows along Whitworth Street.
- A 300mm clay public foul sewer begins with its head of system approximately half way along the eastern edge of the site within London Road. This sewer flows in a southerly direction away from the site within London Road.

2.4.3 The public sewer records are enclosed in *Appendix B.*

2.5 Existing Drainage Within the Site (Private)

2.5.1 A CCTV Drainage Survey was carried out and the findings were reported on 5th September 2016. The purpose of the CCTV survey was to confirm the details of existing drainage within the site and to determine location, routes, depth, condition and connections.

2.5.2 The CCTV survey identified a network of foul, surface, and combined sewers underneath the perimeter of the existing building within the existing courtyard area of the building. The on-site network drains towards the eastern edge of the courtyard where it is assumed to then flow under the courtyard entrance and discharge into the public sewer in London Road.

2.5.3 It is therefore recommended that a further Drainage CCTV Survey is undertaken to confirm the location, route, size, depth, condition, inflows and outflows of **all** drainage within the development site boundary and all drainage which is located along the external facades which connect to the surrounding public sewers including the invert level of the connection point on London Road. It is also recommended that the M&E Engineer and Architect confirm all existing above ground drainage so that existing and proposed flows can be checked for capacity.

2.5.4 The CCTV Survey findings are enclosed in *Appendix B*.

2.6 Topography

2.6.1 A topographical survey has been carried out on the site, and the site is relatively flat. The northern corner of the site at the junction of Whitworth Street / London Road is 39.78m AOD, the north-west corner of the site (Whitworth Street / Minshull Street South) is 40.12m AOD, the south-west corner of the site (Minshull Street South / Fairfield Street) is at 39.96m AOD, and the south-east corner of the site (Fairfield Street / London Road) is approximately 40.03m AOD.

2.6.2 The central courtyard has a high point in the centre which is recorded as 40.06m AOD, and the courtyard falls away from the centre in all directions towards the building edges which are at approximately 39.87m AOD.

2.6.3 The Topographical Survey is enclosed in *Appendix B.*

3.0 Development and Flood Risk

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

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

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

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

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	**This zone comprises land where water has to flow or be stored in times of flood.** Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

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

Essential Infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

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

Water-Compatible Development

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

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

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

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

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

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

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

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

3.2 Site Specific NPPF Flood Risk Categorisation

3.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or seas (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.

3.2.2 From the Environment Agency flooding from rivers and seas map enclosed in *Appendix C*, it can be seen that the entire proposed site and the surrounding area are located within an area classified as Flood Zone 1 (low risk of flooding from rivers or sea).

3.3 Site Specific Flood Zone Compatibility

3.3.1 The proposals for the site are likely to fall within 'buildings used for dwelling houses' / 'drinking establishments' / 'hotels' and would therefore be classified as 'More Vulnerable' development. The site is located within Flood Zone 1, of which is acceptable for any classification of development. Refer to Table 3 for the Flood Zone compatibility table taken from NPPF technical guidance.

3.4 Sequential and Exception Test

3.4.1 As the site is categorised as 'change of use' located within Flood Zone 1 (rivers and sea flooding) with areas classified as 'Less Vulnerable' and 'More Vulnerable' development, the sequential and exception test are not required to be undertaken.

4.0 Hydrological Assessment

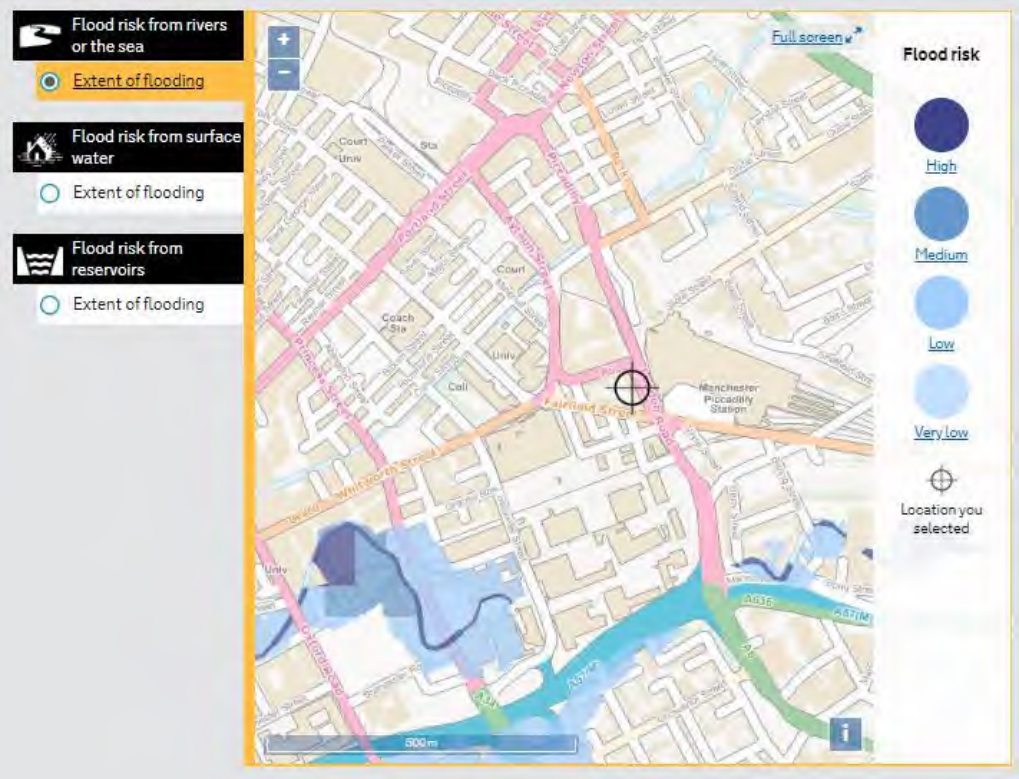
4.1 Sources of Flood Risk

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

4.2 Fluvial Flooding (Rivers and Streams)

4.2.1 Flooding to the site from rivers and seas is indicated below in Figure 2, taken from the UK Government's Long-Term Flood Risk Information.

Figure 2: Long Term Flood Risk Assessment Map – Flood Risk from Rivers or Sea (© Crown Copyright)



4.3 Tidal Flooding (Coastal or Estuarine)

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

4.4 Reservoir Flooding

4.4.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly and essential safety work is carried out.

4.4.2 The Flood Warning Information Service Flood Risk from Reservoirs map shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. Since this is a prediction of a worst-case scenario, it is very low risk that a reservoir flood would be this large.

4.4.3 The site is located outside of an area that could be affected by reservoir flooding and is therefore considered being at very low risk.

4.5 Canal Flooding

4.5.1 The Rochdale Canal is located approximately 160m north of the site at its nearest point and runs south-west/north-east. The Ashton Canal begins approximately 270m north-west of the site, running eastwards. The Bridgewater Canal is approximately 1.56km west of the site and the Manchester Ship Canal (which is privately owned) is situated approximately 2km west of the site where it flows from the River Irwell at Regent Road south-west towards Runcorn.

4.5.2 The SFRA identifies that the Manchester Ship Canal is a canalised watercourse, and hence its flooding mechanisms have more in common with a watercourse than a typical canal. The other canals are identified as ‘broad canals.

4.5.3 The broad canals are identified in the SFRA as not generally posing a direct flood risk as they are a controlled water body. Therefore, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.

4.5.4 A lack of information results in an inability to quantify the risk of canal breach or overtopping but the SFRA describes the areas at potential risk of flooding from all canal sources. The development site, and its vicinity, are not in a canal overtop hazard zone or a canal breach zone. Therefore, the site is regarded as being at low risk from canal flooding.

4.6 Groundwater Flooding

4.6.1 The Level 1 SFRA (Map 2.1) indicates that the site is not in an area at risk of groundwater flooding or groundwater rebound.

4.6.2 The Phase 1 Preliminary Site Assessment identifies that the site is underlain by a principal aquifer situated within the bedrock, and a secondary undifferentiated aquifer within the superficial deposits.

4.6.3 Preliminary information from the Phase 2 Intrusive Site Investigation suggests that groundwater was not encountered until approximately 11.7m BGL and it is therefore concluded that there is a low risk of groundwater flooding.

4.7 Public Sewers or Highway Drainage Flooding (Infrastructure Failure)

4.7.1 There are no public sewers recorded within the site.

4.7.2 The SFRA does not confirm any historical flood events at the development site. A pre-development enquiry has been issued to United Utilities and they have confirmed that they have no records of any hydraulic sewer flooding at the site.

4.7.3 Providing United Utilities and Manchester City Council maintain their drainage assets in the vicinity of the site, the risk of flooding to the proposed development site is considered as low.

4.8 Surface Water Flooding to the site

4.8.1 Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

4.8.2 From the UK Government's Flood Risk from Surface Water (extent of flooding) map;

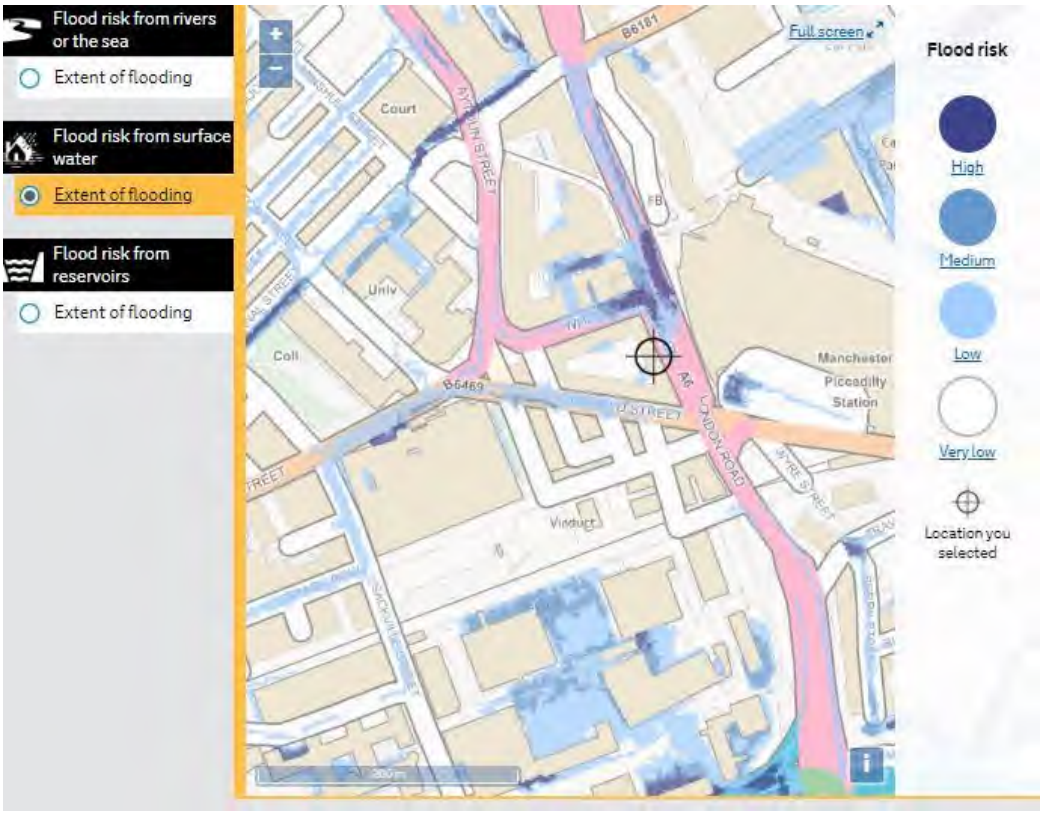
- Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding, where flooding occurs as a result of rainfall with a greater than 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding, where flooding occurs as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a light blue shaded zone, this indicates that the site is at low risk of flooding, where flooding occurs as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year.
- Where a site is located in a clear (unshaded) area; this indicates that the site is at very low risk of flooding, where flooding occurs as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year.

4.8.3 The extent of flooding to the site from surface water is indicated in Figure 4 and it can be seen that the majority of the site is at very low risk of surface water flooding but there is a localised area along the northern edge of the courtyard and at the south-east corner of the courtyard which is at low risk of surface water flooding.

4.8.4 The maximum depth of flooding to the site is below 300mm but there is expected to be a low probability of this occurring.

4.8.5 Outside of the site, the junction of Whitworth Street / London Road is at high risk of flooding from surface water, whilst the building on the north side of Whitworth Street at this junction is surrounded by a localised area ranging from low to high risk of flooding from surface water. Although the cause of this is not known, highway drainage at this point is likely to be the main contributory factor. The same also applies to Fairfield Street along the southern edge of the site, which shows a low risk of flooding from surface water.

Figure 4: Long Term Flood Risk Assessment Map – Flood Risk from Surface Water (© Crown Copyright)



4.8.6 The SFRA places the site within the Conurbation Core Critical Drainage Area (CDA). CDAs generally have local flooding problems associated with drainage, and are particularly sensitive to an increase in the rate of surface water runoff and/or volume from new development. Specific drainage requirements are required in these areas to help reduce local flood risk.

4.8.7 The CDAs provided in the SFRA are identified as being "*extensive*" due to the lack of risk based information for the sewer network and surface water flow paths in the Conurbation Core CDA are largely linked to the natural floodplains of 'hidden' or 'lost' culverted watercourses that run through this area.

4.8.8 Considering the above information, the risk of surface water flooding to the site is considered low. To ensure the risk to the site remains low, mitigation measures are proposed in section 5.

4.9 Surface Water Flooding from the site

4.9.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. This is so as not to cause damage to buildings, essential services or adjoining developments and services.

4.9.2 The proposed surface water drainage network shall be designed to not flood for a 1 in 30-year storm event plus climate change and flood water generated from a 1 in 100-year plus climate change rainfall event shall be constrained within areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

4.9.3 A detailed assessment of the proposed surface flows is carried out within the drainage strategy within section 6 of this report.

4.10 Historical Flooding

4.10.1 The SFRA does not address any specific flood events at the development site or immediately surrounding the area.

4.11 Summary of Flood Risk

4.11.1 From the evidence collated and subsequent negotiations the main types of flooding that may apply to the proposed development site are as follows:

- surface water flooding from the site
- surface water flooding to the site

5.0 Mitigation

5.1 Fluvial/Tidal Flood Mitigation

5.1.1 The development site lies within Flood Zone 1 and therefore there is low risk of fluvial and tidal flooding. No specific measures are required at this location in order to mitigate against fluvial and tidal flooding.

5.2 Groundwater Flood Mitigation

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

5.2.2 Based upon preliminary findings of the Phase 2 Intrusive Site Investigation, where groundwater has not been encountered until approximately 11.7m BGL, the site is considered to be at very low risk of groundwater flooding and no mitigation measures are required.

5.3 Surface Water Flooding to the site Mitigation

5.3.1 The Environment Agency surface water flood maps indicate that the majority of the site is at very low risk of surface water flooding, with localised areas within the existing courtyard identified as being at low risk from surface water flooding. The surrounding highways outside of the site boundary vary from very low risk to high risk.

5.3.2 Existing footway levels along the outside perimeter of the building are determined by the highway authority. It is recommended that these levels should be maintained in order that surface water shall fall away from the building line and into the highway gullies.

5.3.3 Providing the above measures are implemented the flooding risk to the development site from the surface water is therefore considered as low post development.

5.4 Surface Water Flooding from the site Mitigation

5.4.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30 year storm event and flood water generated from up to the critical 1 in 100 year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

5.4.2 It is recommended that proposed courtyard ground levels across the site should be determined such that surface water may drain towards proposed SuDS features via an on-site drainage system and

discharged at a reduced rate into the nearest ordinary watercourse (public surface water sewer). The surface profile of the courtyard should be such that it does not create low points in which water can collect (other than those which are part of the drainage strategy).

5.4.3 For sites which are located within a CDA, the following guidance is provided in the SFRA:

- Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100-year storm event, considering climate change.
- Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event.

5.4.4 The SFRA requires that development proposals should look at opportunities to incorporate SuDS to reduce the risk of surface water flooding, and that surface water should not discharge into the combined sewer system. The risk of groundwater flooding should be considered when assessing suitable SuDS techniques.

5.4.5 In February 2016, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Table 4 demonstrates the climate change allowances with central and upper end allowances being considered.

5.4.6 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, an average allowance of 30% for climate change on peak rainfall intensity will be included in calculations, however the 40% allowance has also been considered.

Table 4: (Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

5.4.7 Additionally, because the site is in a CDA, development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100-year storm event, considering climate change.

5.4.8 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

5.4.9 Owing to the close proximity of building foundations and basements and the preliminary findings of the Phase 2 Intrusive Site Investigations, infiltration is not considered a suitable drainage solution. An alternative method of surface water discharge has been proposed such that the surface water will continue to outfall into the public surface water sewer but at a restricted rate, where practicable, compared to existing.

5.4.10 To minimise localised flooding within the site, the drainage design should ensure that gullies, drainage channels and drains are all suitably sized to accommodate peak storm flows. Also, all inlet features should have suitably sized sumps to catch silts and should be subject to a documented routine maintenance and cleansing regime.

5.4.11 Flood water exceedance routes should be identified, both on and off site.

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

- Any arrangements for adoption by an appropriate public body or statutory undertaker, management and maintenance by a Residents' Management Company
- Arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
- Means of access for maintenance and easements where applicable

5.4.13 Assuming that the proposed drainage system is designed to provide adequate capacity as stated in 5.4.1 and that the private and adopted sewers will be maintained by their adopted authority, it can be assumed risk of flood from blockage or overloading is minimal.

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

6.0 Drainage Strategy

6.1 Existing Drainage

6.1.1 The public sewer records have been obtained for the development site and indicate that there are no public sewers located within the site.

6.1.2 Public sewers located within the vicinity of the site have been discussed in Section 2.4.

6.1.3 The site has a history of commercial and public services use, and a drainage survey has identified existing private drainage (combined surface and foul) within the perimeter of the existing courtyard on the site, assumed to drain towards the eastern edge of the courtyard where it collects at Manhole ref: MH12 and is assumed to then flow east to Manhole ref: MH13. Neither MH12 or MH13 were able to be lifted and surveyed, however it is assumed that the private drainage continues to flow east from MH13, connecting to the 300mm public combined sewer flowing south along London Road. It is also possible that there may be additional connections from the building to the separate public combined sewer along Whitworth Street, Minshull Street South or Fairfield Street, however this is yet to be confirmed.

6.1.4 With only partially conclusive evidence, it is assumed that the downstream combined public sewer is deep enough to provide a fully gravity drainage system, with an outfall into the existing private combined sewer on site at existing MH13. It is also assumed that there are existing connections to the public combined sewer along Fairfield Street and Minshull Street (see public sewer survey for manhole details) receiving flows from external RWPs and these will be re-used where possible.

6.1.5 It is therefore recommended that a further Drainage CCTV Survey is undertaken to confirm the location, route, size, depth, condition, inflows and outflows of **all** drainage within the development site boundary and all drainage which is located along the external facades which connect to the surrounding public sewers including the invert level of the connection point on London Road. It is also recommended that the M&E Engineer and Architect confirm all existing above ground drainage so that existing and proposed flows can be checked for capacity.

6.2 Proposed Foul Water Drainage

6.2.1 The condition of any existing connections should be investigated, and where necessary should be reconstructed. In carrying out the recommended CCTV survey, any existing connections along Fairfield Street, Minshull Street South, and Whitworth Street should be identified. If none exist, it may be necessary to propose new connections at these locations or route all of the foul drainage through MH13 and out to the public combined sewer along London Road.

6.2.2 A Pre-Development Enquiry has been issued to United Utilities (UU) and they have confirmed that foul will be allowed to drain to the public combined sewer network at an unrestricted rate. Correspondence with UU has been included in *Appendix D*.

6.2.3 Any new connections to the public sewer will be subject to a Section 106 Agreement with United Utilities.

6.2.4 The peak flow rate for the development has not currently been calculated as we require confirmation of the above ground proposals, however based upon assessment of current development plans with assumed discharge units taken from Table 2 of BS-EN 12056-2:2000 Gravity Drainage Systems Inside Buildings. The peak foul discharge is therefore estimated as 14.5 l/s (see Figure 3 below).

Figure 3: Estimated Peak Foul Discharge using Assumed Discharge Units

Calculation

Foul Drainage Calculations For
London Road Fire Station

Discharge Unit Method
This method is adopted in BS-EN 752 as the probability method and estimates peak foul discharge flows from appliances. The Following equation is used to define the peak flow: $Q = k\ DU\ \sqrt{\Sigma\ DU}$

Where Q is the wastewater design flow rate, k DU is the frequency factor, DU is the discharge unit

Basement (Total outfall)

Appliance	Number	DU	Total
	Appliances		
WC	210	1.2	252
Kitchen Sink	15	1.05	15.75
Wash Basin	210	0.3	63
Floor Gully	40	1.3	52
Shower	60	0.45	27
Dishwasher	15	0.5	7.5
Washing machine	15	0.65	9.75
Total DU			427
KDU (Frequency)			0.7
Total			**14.5** l/s

6.2.5 The invert level of the connection point on London Road is unknown at this stage, and it is recommended that this should be investigated as part of the CCTV survey.

6.2.6 It is currently unknown where existing drainage is present a basement and ground floor levels and It is also unclear whether any existing basement drainage is currently drained by gravity or pumped up to ground floor level. It is recommended that the M&E Engineer confirms all existing above ground drainage so that existing and proposed flows can be checked for capacity.

6.2.7 Where existing drainage is present, we propose to utilise this where suitable, however there appears to be a significant increase in the requirement for drainage outlet points – particularly at basement level and therefore we anticipate that there will be increased internal drainage requirements.

6.2.8 Further co-ordination is required with the M&E Engineer to determine whether basement drainage is to be pumped to ground floor level or if drainage should be installed below basement level. If the latter, further co-ordination will be required with the Structural Engineer to determine the impact on the existing slab and foundations.

6.2.9 The proposed foul drainage strategy is enclosed in *Appendix E.*

6.3 Proposed Surface Water Drainage

6.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30 year storm event and flood water generated for up to the critical 1 in 100 year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

6.3.2 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

6.3.3 The Phase 1 Preliminary Site Assessment identifies that the site has low permeability drift deposits occurring at the surface, overlying head, clay-with-flints, brickenearth, peat, river terrace deposits and marine and estuarine deposits.

6.3.4 BGS Borehole data from the area identifies the geological succession as follows: Made Ground to a depth of between 3.35m and 8.84m overlying Devensian Till (absent in some locations). The bedrock is sandstone encountered at depths of between 8.84m and 10.06m.

6.3.5 Owing to the close proximity of building foundations and basements and the preliminary findings of the Phase 2 Intrusive Site Investigations, infiltration is not considered a suitable drainage solution. An alternative method of surface water discharge has been proposed such that the surface water will continue to outfall into the public surface water sewer but at a restricted rate, where practicable, compared to existing.

6.3.6 The existing site is currently developed and would be considered Brownfield with a 100% impermeable ratio. he Brownfield run-off rate has therefore been calculated using Micro-Drainage modelling software.

6.3.7 A Pre-Development Enquiry has been issued to United Utilities and they have confirmed that as the site is a refurbishment of an existing property, they will not impose any restrictions on the rate of discharge to the public surface water sewer network. Correspondence with United Utilities has been included in *Appendix D.*

6.3.8 Based on the Manchester SFRA recommendations for brownfield development in a Critical Drainage area; proposed flow rates should be restricted by 50% of existing flow rates as a minimum. We would therefore propose to incorporate this as the strategy, however where the existing roofs are drained via rwp's along the perimeter facades and connect directly to the public sewer network and due to the listed nature of the building it will be difficult to reroute and discharge via an on-site restriction. We therefore propose to restrict to 50% where possible, but this will be based on restricting newly constructed internal areas only.

6.3.9 Correspondence has also been entered into with Manchester City Council (MCC), also included in *Appendix D*. They have requested that a reduction in flow rate ‘as much as practicable’ should be

obtained in the proposals. MCC have also indicated that owing to the presence of basements, they will be looking for us to provide calculations for the 1 in 100 year plus climate change event.

6.3.10 The impermeable area on the proposed site will be as existing i.e. 100%; equating to approximately 0.46 hectares. Of this, 0.15 hectares is believed to discharge from road facing roof direct to the adjacent public sewers. A further 0.16 hectares forms the existing courtyard and 0.15 hectares comprises the internal facing roof.

6.3.11 Given the listed nature of the existing building and that the external roof area has existing direct connections to the public sewer and will not be affected by the proposals, it is not considered practicable to introduce attenuation for these discharges.

6.3.12 However, within the courtyard area there may be opportunity to incorporate some form of attenuation either via a tank or permeable paving. However, the existing courtyard houses existing services and therefore it may be difficult to maintain utilities where providing permeable paving and therefore a tank may be more suitable.

6.3.13 The proposed restriction should be assessed with the flows from the existing building discharging towards the courtyard, however restriction proposals should not increase flood risk to the building and if connecting the building rwp's increases risk, only flows from the courtyards should be restricted.

6.3.14 The above should be confirmed following further co-ordination with the Architect to understand the current above ground arrangement and an assessment of further CCTV survey information.

6.3.15 The existing Brownfield flow rate for the internal courtyard and roof area assumed to drain towards the existing courtyard elevations, has been calculated as 41.3 l/s for the 1 in 100-year event based on a site area of 0.31 Ha using the modified rational method, however it is recommended that flows are confirmed following receipt of existing drainage information.

6.3.16 Based upon a 50% reduction in discharge rate to 20.7 l/s, for the 1:100 year plus 30% climate change event, the required storage volume is estimated as 111m^3. Attenuation volumes should be modelled and confirmed following receipt of existing drainage information.

6.3.17 Connection to the public sewer will be subject to a Section 106 Agreement with United Utilities.

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

6.3.19 The proposed surface water drainage strategy is enclosed in *Appendix E.*

6.4 Maintenance

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

6.4.2 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event. Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

Appendix A

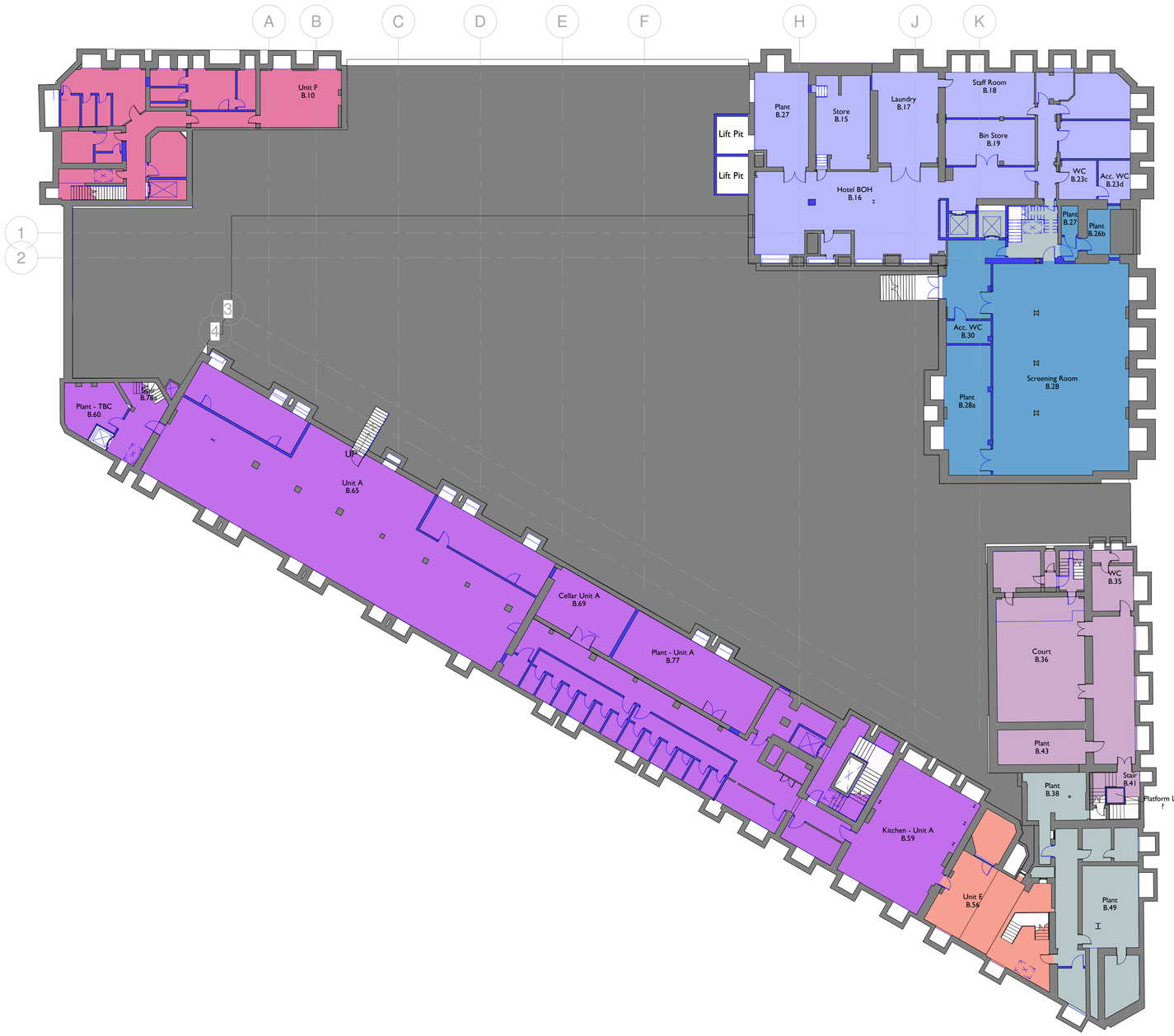
Basement Layout

Ground Floor Layout

First Floor Layout

Second Floor Layout

Third Floor Layout



1 / 2002 **-01 Basement GA**

1 : 200

0 2m 4m 6m 8m 10m 20m

N

Notes:

Drawings are based on survey data and may not accurately represent what is physically present.

Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.

All dimensions are in millimeters unless noted otherwise.

Purcell shall be notified in writing of any discrepancies.

Key Plan
not to scale

- Coroner's Court (Sui generis)
- Hotel (C1)
- Screening Room (B1, A3, A4, D2, C1)
- Unit A (A1, A3, A4)
- Unit E (A1, A3, A4)
- Unit F (A1, A3, A4, D2)
- Landlord Areas

All furniture is shown indicatively

Coroner's Court (Sui generis)	178 m²
Hotel (C1)	340 m²
Landlord Areas	157 m²
Screening Room (B1, A3, A4, D2, C1)	266 m²
Unit A (A1, A3, A4)	694 m²
Unit E (A1, A3, A4)	74 m²
Unit F (A1, A3, A4, D2)	141 m²
Grand total: 94	1851 m²

Existing

Proposed

REV	DATE	DESCRIPTION
1	02/12/19	For planning
2	03/12/19	For Planning
3	06/12/19	For Planning

CLIENT
Allied London

PROJECT
London Road Fire Station

JOB NUMBER
240242

PURCELL

TITLE
Proposed Basement Plan

SIZE	SCALE	LAST REVISED	DRAWN	CHECKED
A1L	As indicated	06/12/2019 11:39:07	SA	

REV **3**
SUITABILITY/REASON FOR ISSUE **S2 FOR PLANNING**

DRAWING NUMBER
240242-PUR-FS-B1-DR-A-2002

St James', 79 Oxford Street, Manchester, M1 6FQ

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I 2003 **00 Ground Floor GA**

1 : 200

0 2m 4m 6m 8m 10m 20m

N

Notes:

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Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.

All dimensions are in millimeters unless noted otherwise.

Purcell shall be notified in writing of any discrepancies.

Key Plan

not to scale

- Coroner's Court (Sui generis)
- Hotel (C1)
- Unit A (A1, A3, A4)
- Unit D (B1, A3, A4, D2, C1)
- Unit E (A1, A3, A4)
- Unit F (A1, A3, A4, D2)
- Unit G (A1, A3, A4)
- Unit H (A1, A3, A4)
- Courtyard (A1, A3, A4, D2)
- Courtyard External (A1, A3, A4, D2)
- Landlord Areas

All furniture is shown indicatively

Hotel (C1)	598 m²
Landlord Areas	127 m²
Live & Work (B1, C3)	827 m²
Live & Work External (B1, C3)	85 m²
Unit L (B1, A3, A4)	149 m²
Workspace (B1)	576 m²
Workspace External (B1)	69 m²
Grand total: 92	2430 m²

Existing

Proposed

REV	DATE	DESCRIPTION
1	02/12/19	For planning
2	03/12/19	For Planning
3	06/12/19	For Planning

CLIENT

Allied London

PROJECT

London Road Fire Station

JOB NUMBER

240242

PURCELL

TITLE

Proposed Ground Floor Plan

SIZE	SCALE	LAST REVISED	DRAWN	CHECKED
A1L	As indicated	06/12/2019 11:39:09	SA	

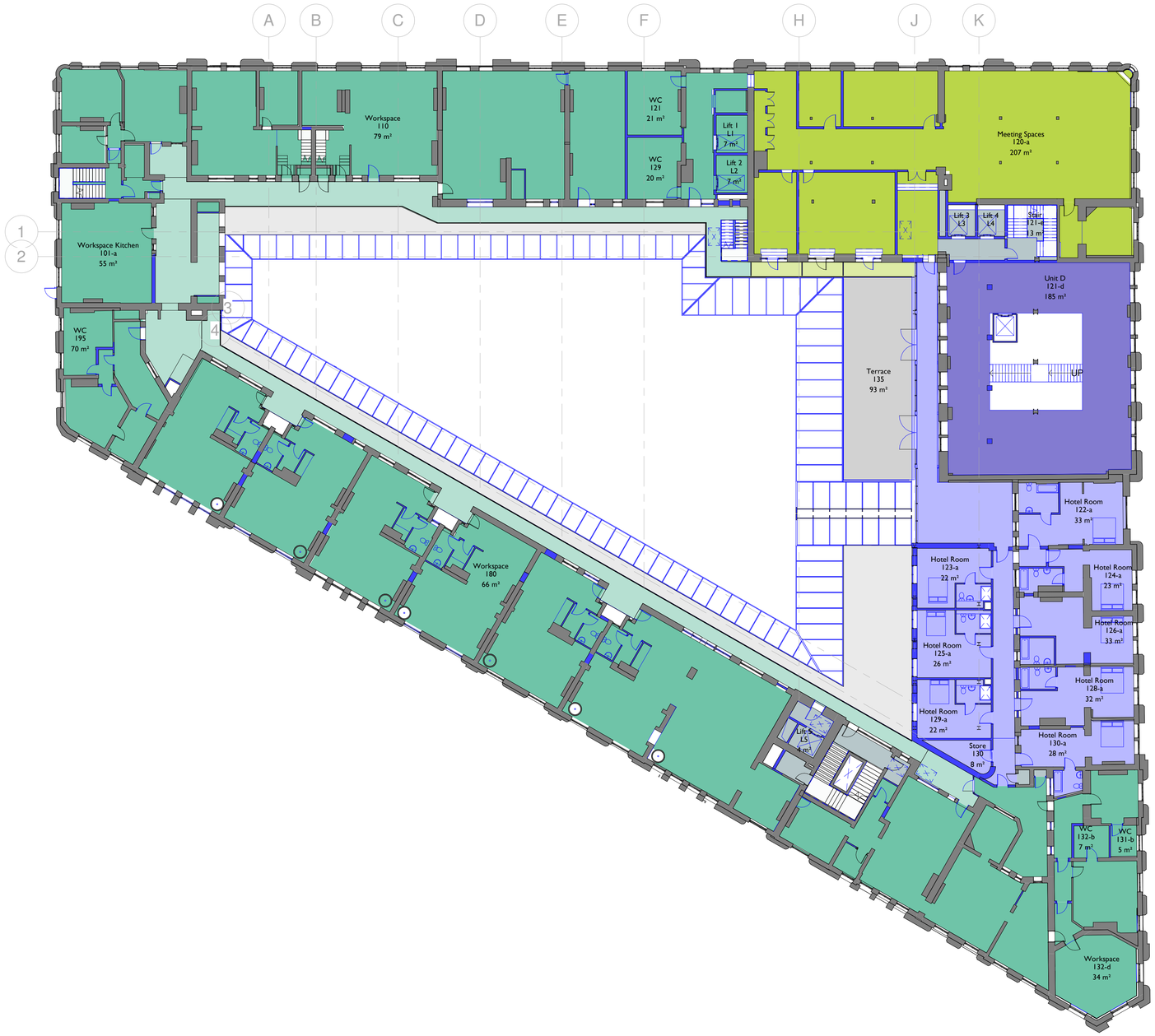
REV 3 **SUITABILITY/REASON FOR ISSUE** **S2 FOR PLANNING**

DRAWING NUMBER

240242-PUR-FS-00-DR-A-2003

St James', 79 Oxford Street, Manchester, M1 6FQ

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01 First Floor GA
1 : 200

0 2m 4m 6m 8m 10m 20m

Notes:

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Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.

All dimensions are in millimeters unless noted otherwise.

Purcell shall be notified in writing of any discrepancies.

Key Plan
not to scale

- Hotel (C1)
- Unit D (B1, A3, A4, D2, C1)
- Workspace (B1)
- Workspace External (B1)
- Workspace (B1, D1)
- Workspace External (B1, D1)
- Landlord Areas

All furniture is shown indicatively

Hotel (C1)	463 m²
Landlord Areas	79 m²
Unit D (B1, A3, A4, D2, C1)	185 m²
Workspace (B1)	1353 m²
Workspace (B1, D1)	374 m²
Workspace External (B1)	256 m²
Workspace External (B1, D1)	17 m²
Grand total: 90	2726 m²

Existing
Proposed

REV	DATE	DESCRIPTION
1	02/12/19	For planning
2	03/12/19	For Planning
3	06/12/19	For Planning

CLIENT
Allied London

PROJECT
London Road Fire Station

JOB NUMBER
240242

PURCELL

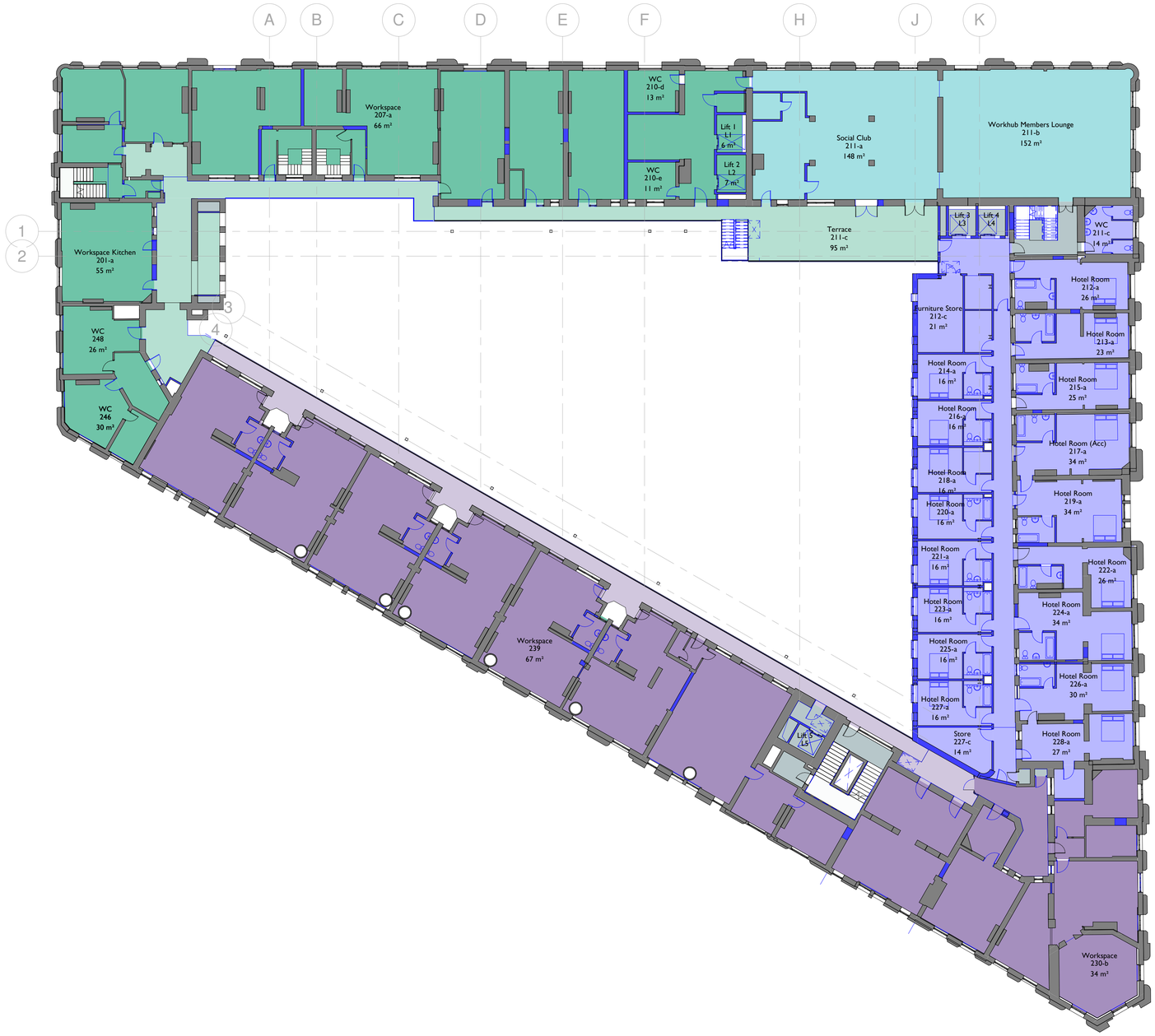
TITLE
Proposed First Floor Plan

SIZE	SCALE	LAST REVISED	DRAWN	CHECKED
A1L	As indicated	06/12/2019 11:46:00	SA	

REV 3
SUITABILITY/REASON FOR ISSUE S2 FOR PLANNING

DRAWING NUMBER
240242-PUR-FS-01-DR-A-2004

St James', 79 Oxford Street, Manchester, M1 6FQ
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1 / **2005** **02 Second Floor GA**

1 : 200

0 2m 4m 6m 8m 10m 20m

N

Notes:

Drawings are based on survey data and may not accurately represent what is physically present.

Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.

All dimensions are in millimeters unless noted otherwise.

Purcell shall be notified in writing of any discrepancies.

Key Plan

not to scale

- Hotel (C1)
- Live & Work (B1, C3)
- Live & Work External (B1, C3)
- Workspace (B1)
- Workspace External (B1)
- Unit K (B1, A3, A4)
- Landlord Areas

All furniture is shown indicatively

Hotel (C1)	616 m²
Landlord Areas	72 m²
Live & Work (B1, C3)	783 m²
Live & Work External (B1, C3)	107 m²
Unit K (B1, A3, A4)	300 m²
Workspace (B1)	572 m²
Workspace External (B1)	197 m²
Grand total: 98	2646 m²

Existing

Proposed

REV	DATE	DESCRIPTION
1	02/12/19	For planning
2	03/12/19	For Planning
3	06/12/19	For Planning

CLIENT

Allied London

PROJECT

London Road Fire Station

JOB NUMBER

240242

PURCELL

TITLE

Proposed Second Floor Plan

SIZE	SCALE	LAST REVISED	DRAWN	CHECKED
A1L	As indicated	06/12/2019 11:39:15	SA	

REV 3

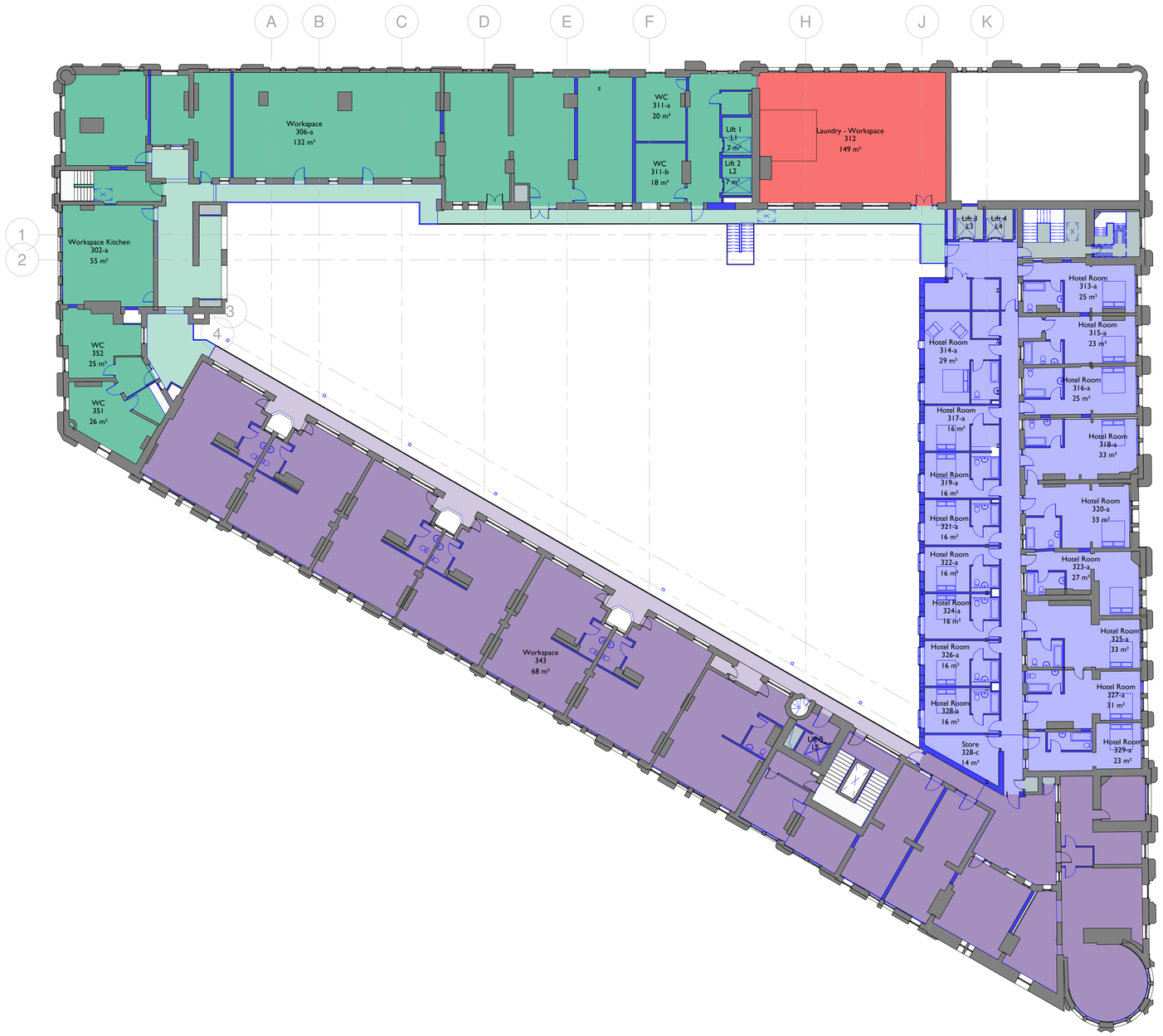
SUITABILITY/REASON FOR ISSUE S2 FOR PLANNING

DRAWING NUMBER

240242-PUR-FS-02-DR-A-2005

St James', 79 Oxford Street, Manchester, M1 6FQ

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I 2006 **03 Third Floor GA**

1 : 200

0 2m 4m 6m 8m 10m 20m

N

Notes:

Drawings are based on survey data and may not accurately represent what is physically present.

Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.

All dimensions are in millimeters unless noted otherwise.

Purcell shall be notified in writing of any discrepancies.

Key Plan
not to scale

- Hotel (C1)
- Live & Work (B1, C3)
- Live & Work External (B1, C3)
- Workspace (B1)
- Workspace External (B1)
- Unit L (B1, A3, A4)
- Landlord Areas

All furniture is shown indicatively

Hotel (C1)	598 m²
Landlord Areas	127 m²
Live & Work (B1, C3)	827 m²
Live & Work External (B1, C3)	85 m²
Unit L (B1, A3, A4)	149 m²
Workspace (B1)	576 m²
Workspace External (B1)	69 m²
Grand total: 92	2430 m²

Existing

Proposed

REV	DATE	DESCRIPTION
1	02/12/19	For planning
2	03/12/19	For Planning
3	06/12/19	For Planning

CLIENT
Allied London

PROJECT
London Road Fire Station

JOB NUMBER
240242

PURCELL

TITLE
Proposed Third Floor Plan

SIZE	SCALE	LAST REVISED	DRAWN	CHECKED
A1L	As indicated	06/12/2019 11:39:17	SA	

REV 3 **SUITABILITY/REASON FOR ISSUE** S2 FOR PLANNING

DRAWING NUMBER
240242-PUR-FS-03-DR-A-2006

St James', 79 Oxford Street, Manchester, M1 6FQ

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Appendix B

Public Sewer Records

Topographical Survey

CCTV Drainage Survey

United Utilites 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: B060270 - LONDON ROAD
Our Ref: 16/ 1220760
Date: 27/7/2016

Curtins Consulting Engineers
1st Floor Merchant Exchange
17-19 Whitworth Street West
Bishopsgate
Manchester
M1 5WG

FAO:

Dear Sirs

Location: 2 Fairfield Street Manchester M1 3GF

I acknowledge with thanks your request dated 26/07/16 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.

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

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

I trust the above meets with you 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,

Amanda Simmonds
Property Searches Manager

UUWaterLimited 2014

United Utilities Water Limited
Registered in England & Wales No. 2366678
Registered Office: Haweswater House,
Lingley Mere Business Park, Lingley Green Avenue,
Great Sankey, Warrington, WA5 3LP

TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

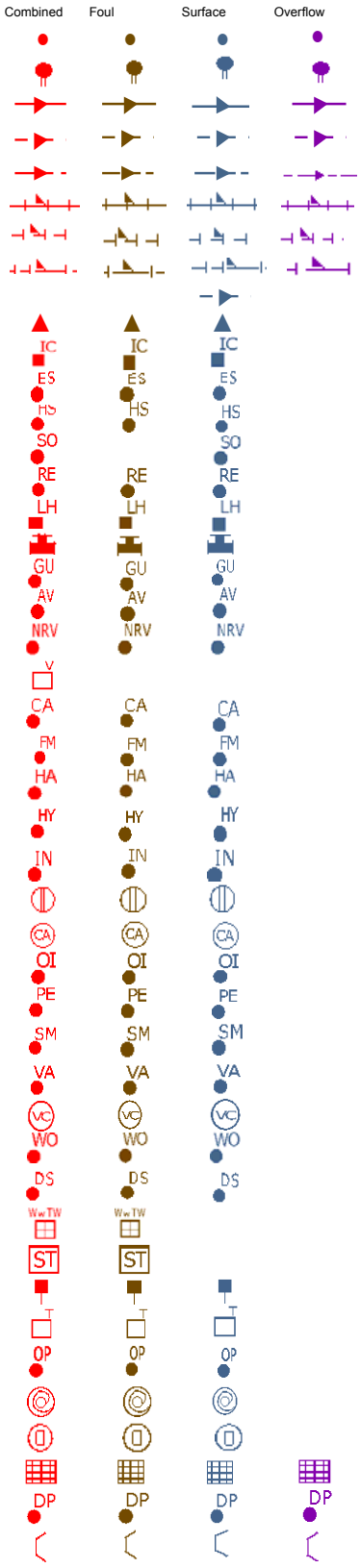
These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self-construction of water mains) (UUWL apparatus) 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 and given in accordance with the best information available. The nature of the relevant system and/or its actual position may be different from that shown on the plan and UUWL is not liable for any damage caused by incorrect information provided save as stated in section 199 of the Water Industry Act 1991. 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.

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WASTE WATER SYMBOLOGY

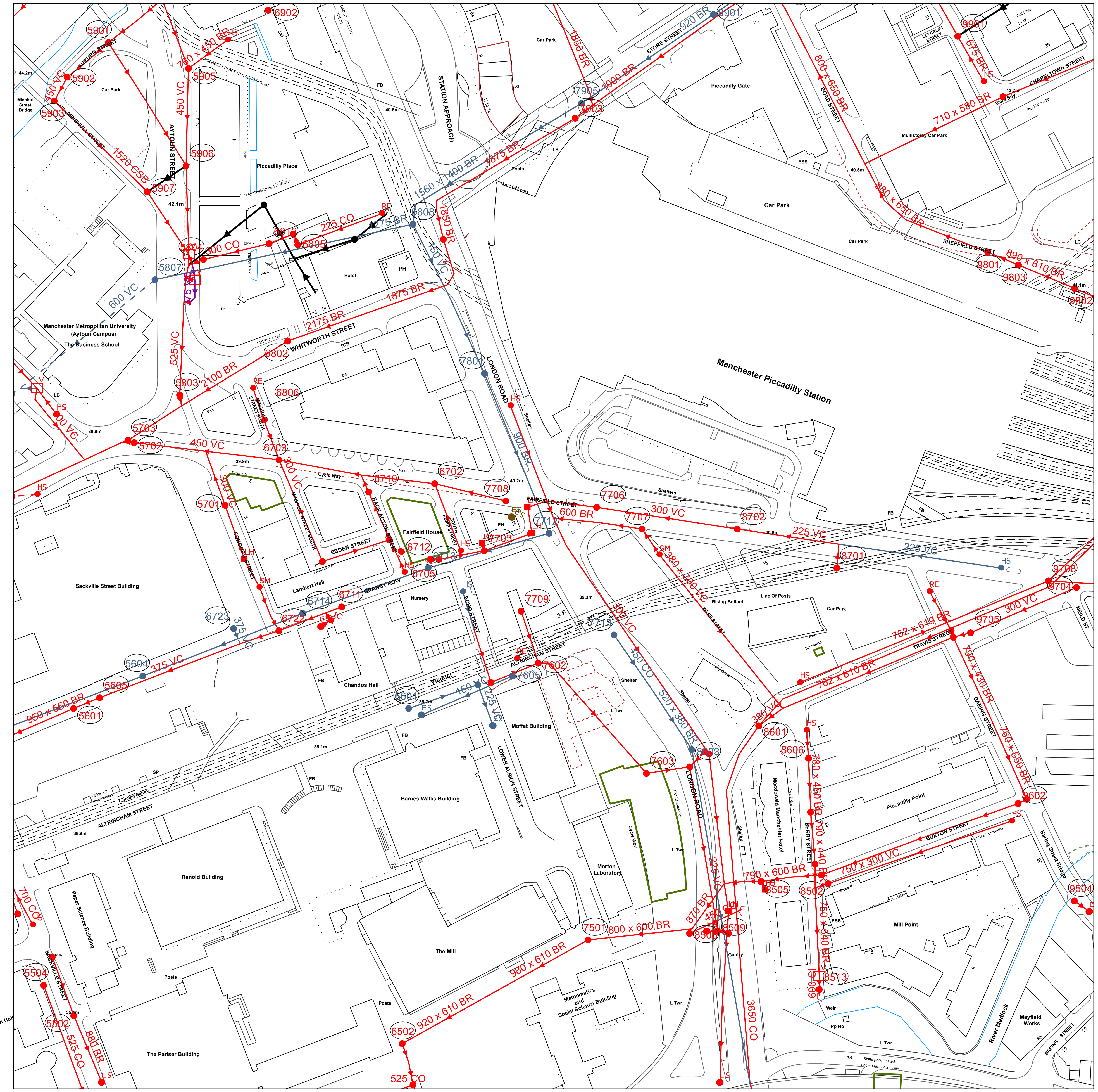


MANHOLE FUNCTION		SEWER SHAPE			
FO	Foul	CI	Circular	SQ	Square
SW	Surface Water	EG	Egg	TR	Trapezoidal
CO	Combined	OV	Oval	AR	Arch
OV	Overflow	FT	Flat Top	BA	Barrel
		RE	Rectangular	HO	Horse Shoe
SEWER MATERIAL				U	Unspecified
AC	Asbestos Cement	DI	Ductile Iron		
BR	Brick	VC	Vitrified Clay		
CO	Concrete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



ABANDONED PIPE





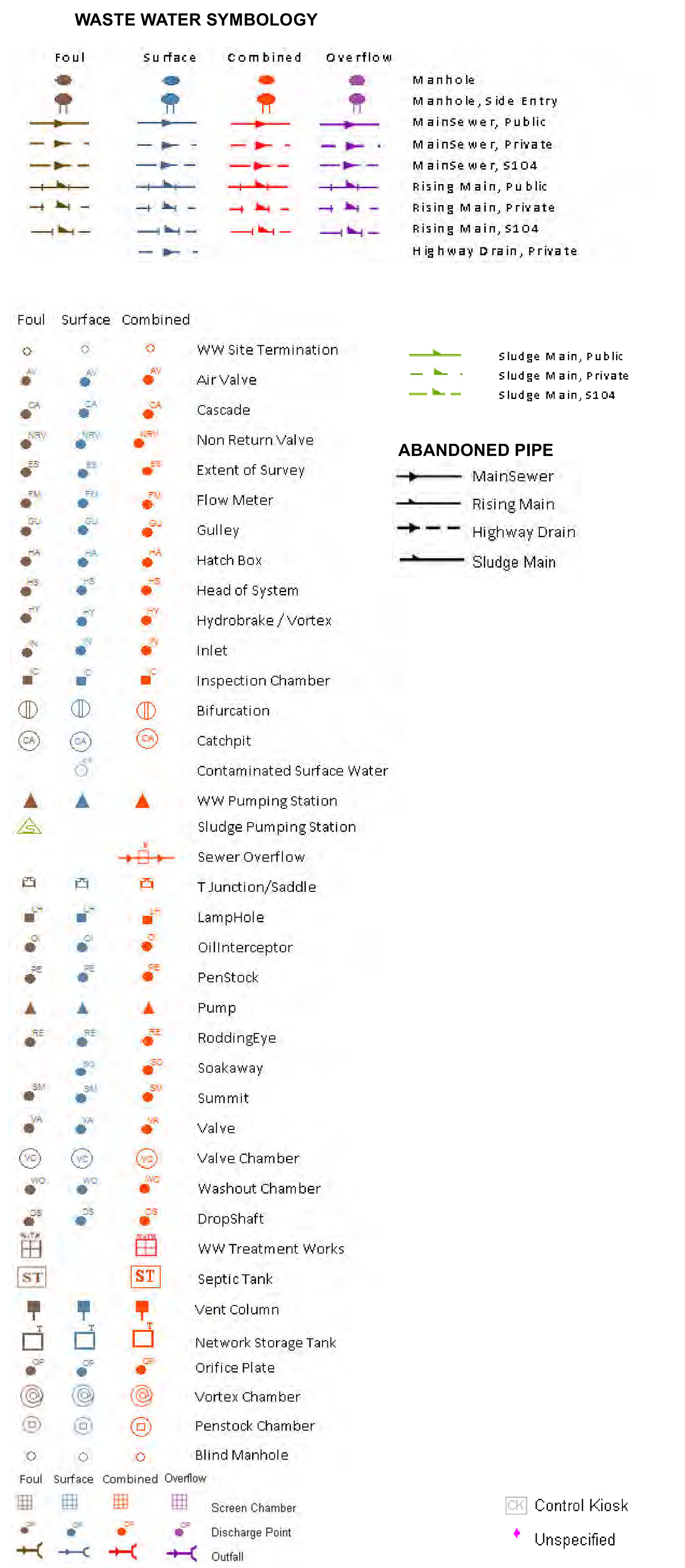
OS Sheet No: SJ8497NE

Scale: 1: 1250 Date: 27/07/2016

Printed By: Property Searches

Refno	Cover	Func	Invert	Size.x	Size.y	Shape	Matl	Length	Grad
5501	35.75	CO	31.79	880	580	EG	BR	28.79	10
5502	35.23	CO							
5503		CO							
5504		CO	0	525		CI	CO	103.46	
5601	38.65	CO	0	950	550	EG	BR	55.54	
5604	40.27	SW	27.99	900		CI	BR	84.5	352
5605	39.89	CO	35.27	950	550	EG	BR	13	
5701	39.98	CO							
5702	39.97	CO							
5703	39.99	CO	30.46	2100		CI	BR	132.02	
5803	40.47	CO	31.63	525		CI	VC	5.1	
5804	33.25	CO							
5807	41.18	SW							
5901	43.76	CO	39	320		CI	CI	12.04	241
5902	43.51	CO	37.55	450		CI	VC	12.53	45
5903	43.62	CO	36.7	1520		CI	CSB	60.11	118
5905	43.72	CO							
5906	42.37	CO							
5907	42.2	CO	35.78	1520		CI	CSB	34.75	29
6501		CO	0	525		CI	CO	36.4	
6502	33.79	CO	27.8	920	630	EG	BR	9.49	
6601	38.42	SW	36.88	225		CI	VC	33.84	113
6702	40.11	CO	32.69	450		CI	VC	72.87	
6703	40.03	CO	36.24	450		CI	VC	67.48	17
6705	40.96	CO	38.14	300		CI	VC	8.94	2
6706	40.88	CO	33.28	300		CI	VC	51.08	
6707	40.67	CO							
6710		CO							
6711		CO	0	375		CI	VC	31.02	
6712	41	CO	38.02	939		CI	CO	4	
6713	40.85	SW	28.46	900		CI	BR	61.68	411
6714	41.23	SW	28.31	900		CI	BR	79.48	248
6722	41.18	CO							
6723	41.09	SW	36.07	375		CI	VC	7.62	
6728	40.96	CO	38.41	300		CI	CO	21.38	5
6801	39.58	CO							
6802	40	CO	38.08	2100		CI	BR	87.14	11
6805	33.93	CO							
6806	40.2	CO							
6808	39.59	SW							
6809	33.25	CO							
6812	33.25	CO							
6902		CO							
7501	33.92	CO							
7601	38.99	CO							
7602	39.03	CO							
7603	37.18	CO	29.21	225		CI	VC	20.22	144
7605	38.94	SW	33.91	150		CI	VC	45.69	
7606	38.91	SW	36.58	225		CI	VC	20.25	
7703	40.45	CO							
7706	40.38	CO							
7707	40.54	CO	37.69	590	510	FT	BR	20.22	
7708	40.02	CO	32.88	450		CI	VC	33.96	179
7709	39.81	CO	35.3	225		CI	VC	25.3	7
7712	40.01	SW							
7713	38.95	SW	34.32	450		CI	CO	31.62	34
7801	39.93	SW	29	900		CI	BR	79.85	
7903	38.9	CO							
7905	38.95	SW	31.17	1330	1430	EG	BR	44.42	
8502	36.06	CO							
8505	36.03	CO							
8506	36.07	CO	31.29	760	470	FT	BR	14.04	10
8508	34.72	CO	28.31	450		CI	CO	26.4	
8509	35.45	CO	28.37	930	600	EG	BR	5	
8513	35.32	CO							
8519	35.51	CO	31.51	300		CI	CO	2.24	1
8601		CO							
8603	37.44	SW	32.42	520	380	EG	BR	157.33	
8606	38.34	CO	37.17	780	460	EG	BR	25.02	6
8607	37.43	CO							
8608	36.26	CO	31.5	740	450	FT	BR	11	
8609	37.27	CO	29.05	225		CI	VC	77.1	203
8610	37.29	CO		300		CI	VC	9.9	
8612	37.1	CO	0	300		CI	VC	60.41	
8701	40.81	CO	36.62	225		CI	VC	11.05	
8702	40.77	CO	36.51	300		CI	VC	65.76	120
8901	38.41	SW							
9504	35.39	CO	32.18	225		CI	VC	8.6	
9601	37.07	CO	32.81	225		CI	VC	2.24	1
9602	37.01	CO	28.78	790	610	EG	BR	32.89	
9702	39.84	CO	34.18	780	510	FT	BR	1.41	
9703	39.84	CO	34.21	790	430	FT	BR	40.72	59
9704	40.88	CO	35.04	300		CI	VC	53.31	
9705		CO							
9708	40.85	CO							
9801	40.8	CO	36.49	890	650	EG	BR	40.85	
9802		CO							
9803	41.09	CO	36.97	890	610	EG	BR	15.25	32
9901	42.06	CO							
9902	42.3	CO	36.35	710	580	EG	BR	71.11	
5505		CO							
5506		CO	0	700		CI	CO	27.29	
5706		CO		300		CI	VC	23.09	
5808		CO							
5810		CO	0	225		CI	VC	14.97	
5818		OV							
5904		CO	0	760	450	EG	BR	22.56	
5909		CO							
5910		CO							
5911		CO							
6503		CO							
6709		CO							
6724		CO	0	300		CI	VC	13.93	
6732		CO	0	300		CI	VC	7.62	
6803		CO							
6906		CO							
7502		CO							
7609		SW							
7701		CO	0	600		CI	BR	35.41	
7702		CO							
7711		CO	0	300		CI	VC	116.5	
7717		CO	0	300		CI	VC	33.24	
7719		CO	0	600	530	EG	BR	7.21	
7720		SW	0	760	500	EG	BR	17.72	
7804		CO	0	300		CI	VC	47.17	
7805		SW							
7901		SW							
7906		CO	0	1875		CI	BR	5.1	
8503		CO	0	800	600	EG	BR	48.26	
8512		CO							
8514		CO							
8516		CO							
8611		CO	0	762	619	EG	BR	124.23	
8613		CO	0	150		CI	VC	13.04	
8614		CO							
9603		CO	0	750	300	EG	VC	89.81	
9605		CO							
9606		CO							
9607		CO							
9706		CO							
9707		CO							
9709		SW	0	225		CI	VC	75.8	
9903		CO	0	675		CI	BR	24.19	
9905		CO	0	880	650	EG	BR	32.69	
9906		CO							
5705		CO							
5707		CO							
5708		CO							
5806		CO							
5809		CO							
5811		CO							
5812		CO							
5817		SW							
6708		CO							
6721		CO							
6726		CO							
6730		CO							
6731		CO							
6734		CO	0	375		CI	VC	69.64	
6736		CO							

Refno	Cover	Func	Invert	Size.x	Size.y	Shape	Matl	Length	Grad
7704		CO							
7705		CO							
7710		CO							
7716		CO	0	760	500	EG	BR	26.25	
7718		CO							
7907		CO							
8501		CO	0	750	540	EG	BR	41	
8504		CO							
8507		CO							
8510		CO							
8525		CO	0	300		CI	VC	57.26	
8528		CO							
8535		CO							
8605		CO	0	380		CI	VC	13.6	
8703		CO							
8903		CO	0	800	650	EG	BR	90.95	
8904		CO	0	1900		CI	BR	77.42	
9604		CO							
6807	33.99	CO							
6810		CO							
6811		CO							
6904	36.93	CO							
6910		SW							
5801		CO							
5802		CO							
5805		CO	40.14	225		CI	VC	8.05	
8515		CO							



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	Vitrified 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	MAR	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.

United Utilities Water Limited 2014. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown and United Utilities copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

OS Sheet No: SJ8497NE

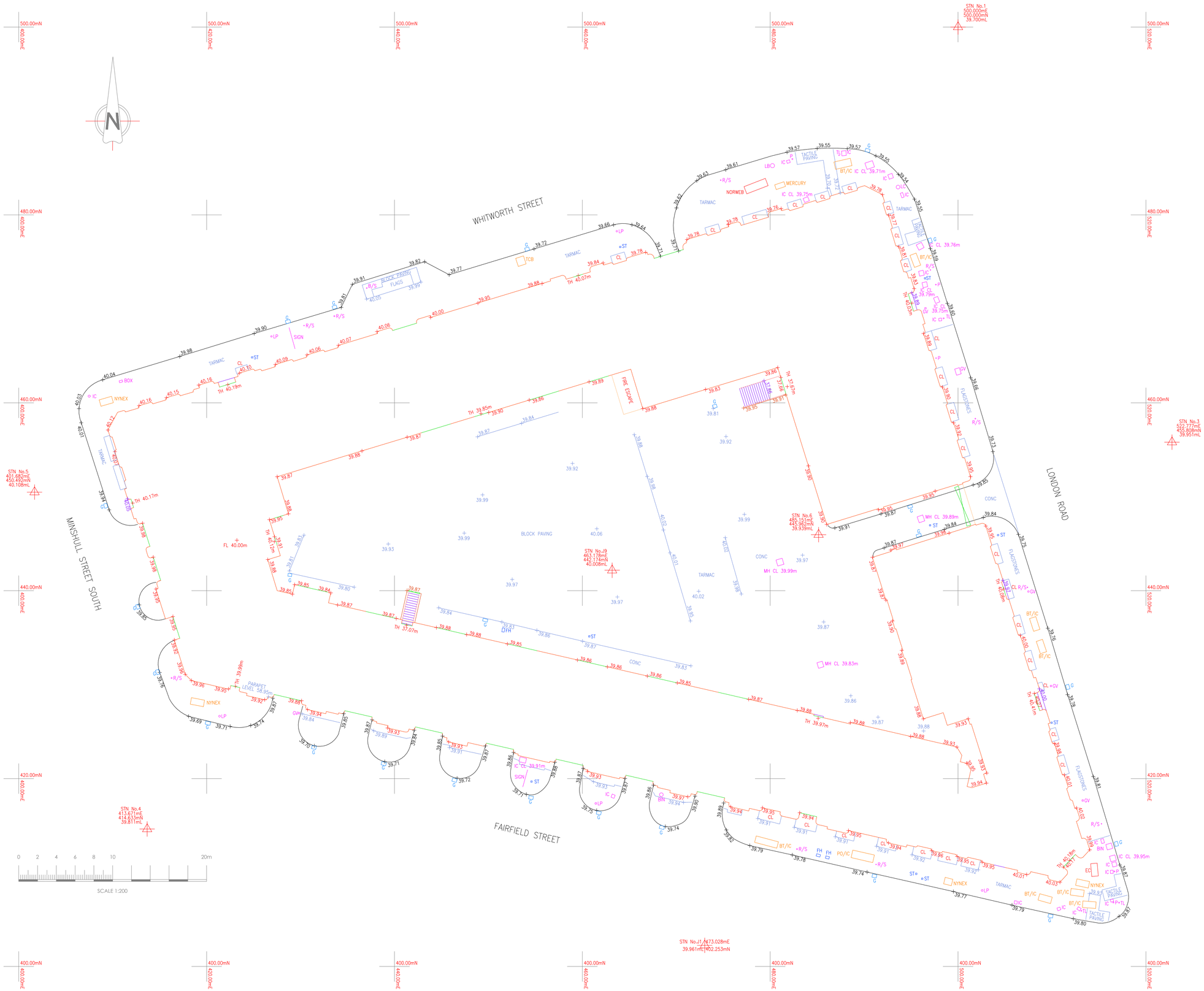
Scale: 1: 1250 Date: 27/07/2016

177 Nodes

Sheet 1 of 1

United Utilities — helping life flow smoothly

SEWER RECORDS



Abbreviations/Symbols (Measured Building Surveys):

C:	Window Cill Height
H:	Window Head Height
BH:	Beam Height
DH:	Door Height
COL:	Column
SVP:	Soil Vent Pipe
FL:	Floor Level
TH:	Threshold Level
2.50	Floor to Ceiling Height
	Vaulted Ceiling

Line types

	Hedge Lines
	Drainage Runs
	Overhead Electricity Cables
	Overhead Telephone Cables

Symbols

	Tree/Bush		Glass House
	Control Station		Osbm
	Borehole		
	Trial Hole		

Abbreviations (Topographic Survey):

AH:	Arch Height
AV:	Air Valve
BB:	Belisha Beacon
BOX:	Electricity Box, Cables Box, Etc.
BOL:	Bollard
BT/IC:	British Telecom Inspection Chamber
BS:	Bus Stop
BS/LP:	Bus Stop / Lamp Post
CATV:	CATV Inspection Chamber
CCTV:	Closed Circuit Television
CL:	Cellar Light
C.PIT:	Catch Pit
ER:	Earth Rod
EC:	Electricity Inspection Chamber
EP:	Electricity Pole
FH:	Fire Hydrant
FP:	Flag Pole
GV:	Gas Valve
G:	Gully
IC:	Inspection Chamber
KO:	Kerb Outlet
LP:	Lamp Post
LB:	Letter Box
LC:	Lighting Column
MKR:	Marker
MH:	Manhole
MP:	Mooring Point
MS:	Mile Stone
NYNEX:	Nynex Inspection Chamber
O/H:	Over Hang
P:	Post
PO/IC:	Post Office Inspection Chamber
R/S:	Road Sign
RE:	Rodding Eye
RTW:	Retaining Wall
S/P:	Sign Post
SNP:	Street Name Plate
ST:	Stop Tap
SV:	Stop Valve
TCB:	Telephone Call Box
TH:	Threshold Level
TL:	Traffic Light
TP:	Telegraph Pole
TROUGH:	Trough
WO:	Water Outlet
WM:	Water Meter

Fence Descriptions:

B/W:	Barbed Wire
C/B:	Close Boarded
C/BARRIER:	Crash Barrier
C/L:	Chain Link
C/P:	Chestnut Paling
C/I:	Corrugated Iron
I/R:	Iron Railing
MISC:	Miscellaneous
P/R:	Post & Rail
P/W:	Post & Wire
P/C:	Post & Chain
S/PAL:	Steel Palisade
W/M:	Wire Mesh

Survey Notes:

Levels related to Ordnance Survey Datum - GPS OSGB36

Revision	Date	Description

CPLS
ices
Chris Partington Land Surveyors
56b Carrington Lane
Sale
Cheshire
M33 5NR
t: 0161 976 1194 f: 0161 962 8644
www.cpls.co.uk e:survey@cpls.co.uk

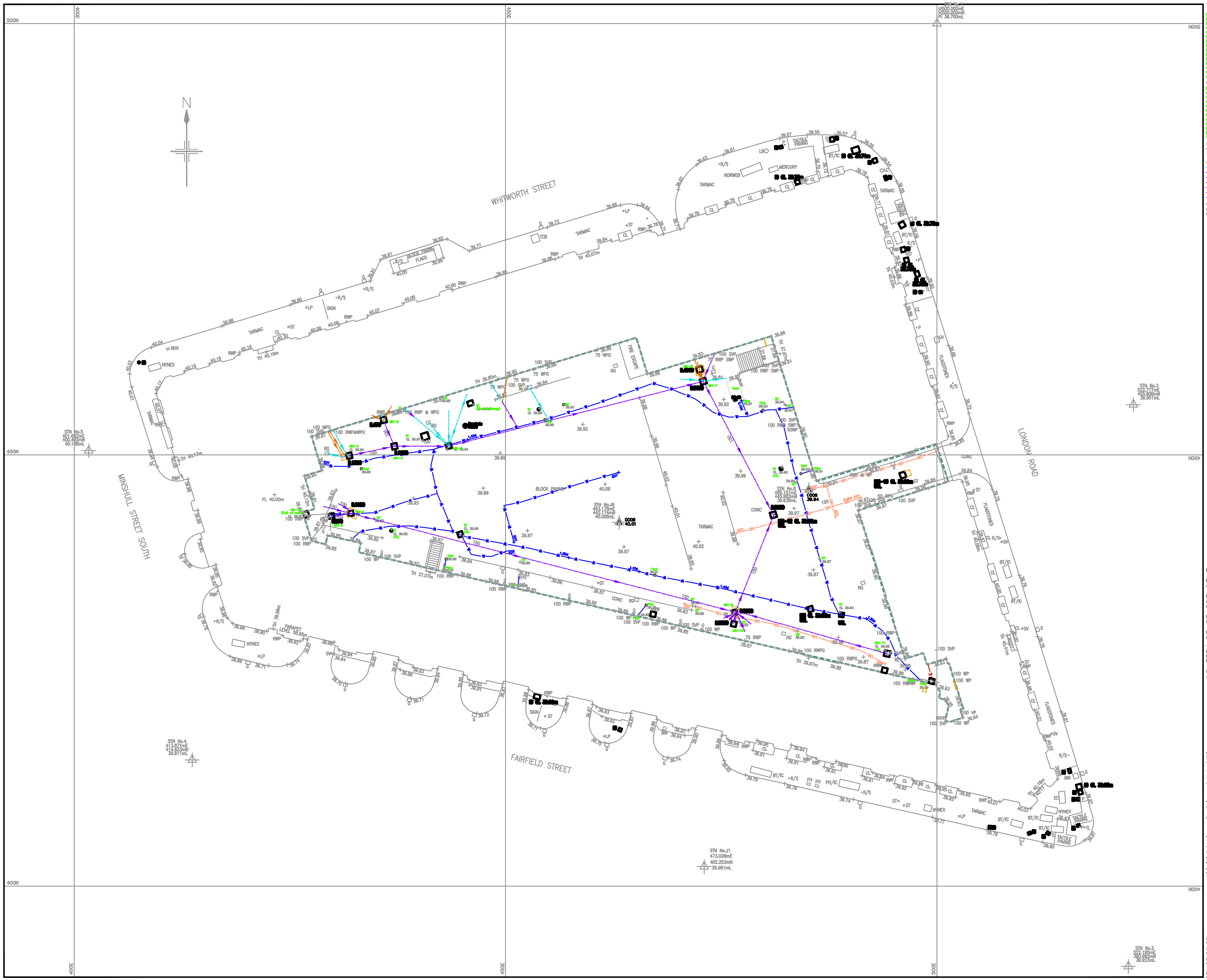
Client

Britannia Hotels
Halecroft, 253 Hale Road, Hale, Altrincham,
Cheshire, WA15 8RE.
T: 0161 904 5322 F: 0161 904 5331

Project

Former London Road Fire Station, Manchester.
Site Survey

Scale	1:200	Surveyed By	JC/TA
		Date	Sep 08
Drawing No.	0910jc-02	Checked By	CPLS
		Date	01/10/08
		Drawn By	CPT
		Date	01/10/08



Topographical Survey Legend

B	Bollard	h	Height	SP	Soil pipe		Level prefix descriptions
BS	Bus stop	Hyd	Hydrant	ST	Stop tap	AL	Arch level
BT	British telecom ic	IC	Inspection cover	Stay	Cable stay	BL	Bed level
CPS	Concrete paving slabs	JB	Junction box	SV	Stop valve	CL	Cover level
CTV	Cable television cover	KO	Kerb outlet	TCB	Telephone call box	EL	Eaves level
DP	Downpipe	LB	Letter box	TL	Traffic light	FL	Floor level
DR	Drain	LP	Lamp post	TP	Telegraph pole	IL	Invert level
Elec	Electrical ic	Mkr	Utility marker	TPS	Tactile paving slabs	PL	Parapet level
EP	Elec. pole	MP	Mile post	VP	Vent pipe	RL	Roof/ridge level
ER	Earth rod	NP	Name plate	WM	Water meter	SL	Soffit level
FP	Flagpole	P	Post	WO	Water outlet	Spr	Arch springing level
FT	Floodlight	PM	Parking meter	UTL	Unable to lift	TF	Top of fence level
G	Gully	RE	Rodding eye			TW	Top of wall level
GP	Gate post	RS	Road sign			Thr	Threshold level
GV	Gas valve	rwp	Rain water pipe			WL	Water level

Fence annotation

B/W	Barbed wire
C/B	Closed boarded
C/I	Corrugated iron
C/L	Chain link
C/P	Concrete panel
H/R	Hand rail
I/R	Iron railings
O/B	Open boarded
P/C	Post & chain
P/R	Post & rail
P/W	Post & wire
W/M	Wire mesh

C/L Fence
Safety barrier
Gate
Stile
Hedge
Limit of foliage & tree canopy
50.00 Spot level
SSL1 50.00 Survey control station (Coordinated point)
Tree
MT Multi trunk

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

Drainage/Services Legend

Foul	CCTV — CCTV	Ducting
Surface	E — Electric	d — Service depth (m)
Combined	SL — Street lighting	ø — Pipe diameter (mm)
Drainage (unspecified)	TM — Traffic management	EOT — End of trace
BT — British telecom	GAS — Gas	UTT — Unable to trace
T — Telecom	W — Water	Utility Survey Boundary
FO — Fibre optics	F — Fuel	
CATV — CATV	UK — Unknown / misc	

Drainage pipe size data has been determined from the surface, in order to comply with confined spaces health and safety legislation. Please regard this data as approximate.

Drawing caveats, please note:

Locate Surveys carry out surveys in accordance with site procedures using approved detectors.

Depth data is limited by the accuracy of the detection equipment. Average accuracy is +/- 10% of depth with GPR and +/- 5% of the depth with electromagnetic technologies.

It is Locate's procedure to use statutory undertakers plans prior to and during the survey as a guide for the survey team.

In accordance with British Telecom's national policy survey companies are not permitted to raise BT inspection chamber covers.

The connections between manholes have been proved but not traced or mapped. Drainage routes are assumed to be direct, straight lines and are shown as such for illustration purposes.
Refer to the accompanying CCTV report and DVD for further information.

Locate advise that excavations in the vicinity of services are carried out with due diligence, please refer to HSG47.

Head and Registered Office
Willow Bank House
Old Road
Handforth • Wilmslow
Cheshire SK9 3AZ
Tel. 0845 225 0405
Fax 01625 526815
Email: mail@locate-surveys.com
Web: www.locate-surveys.com

Levels are related to **Existing Site Datum**
Value **n/a**
Survey tied to an Existing Topographical Survey.
Survey Stations No's 6 & 9 found. Supplied by client.
Coordinates are related to **Existing Site Grid**

Scale **1:200**

0 2 4 6 8 10 12 14 16 18
metres

The accuracy of this survey is commensurate with the drawing scale specified within the title block. Copyright in this drawing remains with Locate Surveys Ltd. Do not scale from this drawing, work to figured dimensions. Check all dimensions on-site. In the event of any discrepancy, please refer query to Locate Surveys Ltd.

Client OBI Property

Title

Utility Survey
London Road Fire Station
Fairfield Street
Manchester M1 6FQ

Surveyed GO NB | Drawn AG
Date | Checked
CAD file name | Revision No. | Sheet size A1
Drawing No. **LSL:17499:200:1:1**

Locate Surveys Ltd

© Registered in England No.08162040

Our Ref: SS / S49950 / J17499 – CCTV SUMMARY – Rev A

Monday 5th September 2016

OBI Property
80 Mosley Street
Manchester
M2 3FX

For the attention of Joe Weilding

Dear Sirs

RE: CCTV survey – London Road Fire Station, Fairfield Street, Manchester, M1 6FQ

Following our receipt of your order and as requested our engineers have attended the above mentioned site. The purpose of the visit was to carryout a CCTV survey of the drainage lines as instructed in order to establish the condition, location and connectivity.

The below highlights the findings on site, and where necessary recommendations have been put forward for repairs to be carried out on the drainage system. We would strongly recommend that all repairs that have been identified as necessary are completed to prevent further defects arising. The drainage system has been designed to work in a particular way – the defects identified are preventing the drainage system from performing as it should.

Please find below our summary of the survey, along with the detailed survey log sheets, indicative plan of the drains and the DVD footage (to follow).

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

Regards,



Simon Scragg | Operations Director

FINDINGS & RECCOMENDATIONS

- **Manhole-1 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Obstruction (30%)

0.2m – The survey was abandoned (Camera unable to pass the obstruction).

We recommend the below work:

Carryout High Pressure Water Flailing in an attempt to clear the obstruction from the drain and afterwards undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

- **Manhole-1 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.4m – Drain deviates up (90°)

0.4m – The survey finished at the vertical section of drain.

The above drainage line does not appear to exhibit any evident defects at this present time.

- **Manhole-1 Branch-2 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.1m – Multiple fractures (collapsing, 12 to 12 o'clock)

0.4m – The survey was abandoned (Camera unable to pass the collapsing section).

We recommend the below work:

Undertake an excavation to a maximum depth of 2.0m over the collapsing section located from 0.1m and replace with new 150mm diameter pipe work
Backfill the excavation and re-instate to match the existing surface finish (Brick paving)
Re-survey the drain once repaired to establish its full condition.

The total cost for this is £2,190.00 plus VAT allowing up to 3.0m of pipe work to be replaced.

- **Manhole-1 downstream to Discharge**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Circumferential fracture at the joint (08 to 01 o'clock)
1.0m – Displaced joint (medium)
2.1m – Displaced joint (medium)
5.6m – Large displaced joint
5.6m – Multiple fractures to 6.2m (12 to 12 o'clock)
5.8m – Defective incoming connection (multiple fractures, 03 o'clock)
10.0m – Longitudinal crack to 10.5m (01 o'clock)
10.2m – Defective incoming connection (fractured, 03 o'clock)
12.0m – Displaced joint (medium)
13.0m – Displaced joint (medium)
13.7m – Multiple fractures to 14.6m (12 to 12 o'clock)
14.0m – Defective incoming connection (fractured, 03 o'clock)
14.6m – Large displaced joint
16.5m – Obstruction (30%)
20.0m – Longitudinal fracture to 20.3m (08 o'clock)
26.0m – Large displaced joint

33.5m – The survey was abandoned (Unable to continue pushing the camera).

We recommend the below work:

Supply and install 1 x 150mm diameter patch liner over the defective section located from 0.3m to 1.0m.
The cost for this is £480.00 plus VAT.

Trace the drain to 5.8m
Undertake an excavation to a maximum depth of 2.2m over the defective section located from 5.6m to 5.8m and replace with new 150mm diameter pipe work including incoming connection
Backfill the excavation and re-instate to match the existing surface finish (Concrete / Brick paving).

The total cost for this is £2,190.00 plus VAT allowing up to 3.0m of pipe work to be replaced.

Trace the drain to 14.6m
Undertake an excavation to a maximum depth of 3.0m over the defective section located from 10.0m to 14.6m and replace with new 150mm diameter pipe work including 2x incoming connections
Backfill the excavation and re-instate to match the existing surface finish (Concrete / Brick paving).

The total cost for this is £5,620.00 plus VAT allowing up to 7.0m of pipe work to be replaced.

Carryout High Pressure Water Jetting in an attempt to clear the obstruction from the drain and afterwards undertake a re-survey to establish its full condition as further work is required.
See costs at the bottom of the summary.

- **Manhole-3 downstream to Discharge**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.9m – Large displaced joint

4.8m – The survey finished inside Manhole-4.

We recommend the below work:

Supply and install 1 x 150mm diameter patch liner over the displaced joint at 0.9m.
The cost for this is £480.00 plus VAT.

- **Manhole-3 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Top of the drop shaft

0.3m – The survey was abandoned (Camera unable to pass the drop shaft).

We recommend the below work:

Undertake an excavation to a maximum depth of 0.5m over the drain (after the drop shaft) in order to gain access for a CCTV survey to be undertaken
Repair the pipe work, backfill the excavation and re-instate to match the existing surface finish (Block paving).

The total cost for this (including CCTV survey) is £580.00 plus VAT.

- **Manhole-3 Branch-2 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting foul waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Top of the drop shaft
0.0m – Multiple fractures (12 to 12 o'clock, bottom of the drop shaft, rest bend)
0.7m – Large displaced joint
1.7m – Defective incoming connection (fractured, 03 o'clock)
1.8m – Multiple fractures (12 to 12 o'clock)
2.1m – Large displaced joint
2.2m – Drain deviates up (90°)

2.2m – The survey finished at the vertical section of drain.

We recommend the below work:

Trace the drain to 2.2m
Undertake an excavation to a maximum depth of 1.4m (majority at 0.5m) over the defective section of drain located from 0.0m (including the whole drop shaft and rest bend) to 2.1m and replace with new 100mm diameter pipe work
Backfill the excavation and re-instate to match the existing surface finish (Block paving).

The total cost for this is £1,660.00 plus VAT allowing up to 4.0m of pipe work to be replaced.

- **Manhole-3 Branch-3 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting foul waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.4m – Debris build up (100%, possible collapse)

0.4m – The survey was abandoned (Camera unable to pass the debris).

We recommend the below work:

Trace the drain to 0.4m
Undertake an excavation to a maximum depth of 0.5m over the defective section located at 0.4m and replace with new 100mm diameter pipe work
Backfill the excavation and re-instate to match the existing surface finish (Block paving)
Re-survey the drain to establish its full condition (if found to be in use).

The total cost for this is £580.00 plus VAT allowing up to 3.0m of pipe work to be replaced.

- **Manhole-3 Branch-4 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.1m – Top of the drop shaft
0.4m – Debris / silt build up (10%)
1.2m – Debris / silt build up (25%)

2.3m – The survey was abandoned (Camera unable to pass the debris / silt).

We recommend the below work:

Carryout High Pressure Water Jetting in an attempt to clear the drain through and afterwards undertake a re-survey to establish its full condition. See costs at the bottom of the summary.

- **Manhole-4 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Top of the drop shaft
0.0m – Circumferential fracture (at the drop shaft, 12 to 12 o'clock)
1.3m – Circumferential crack at the joint (12 to 12 o'clock)
1.4m – Large displaced joint

2.2m – The survey finished inside Manhole-5.

We recommend the below work:

Trace the drain to 1.4m
Undertake an excavation to a maximum depth of 0.6m over the defective section located from 0.0m to 1.4m and replace with new 100mm diameter pipe work
Backfill the excavation and re-instate to match the existing surface finish (Brick paving).

The total cost for this is £580.00 plus VAT allowing up to 2.0m of pipe work to be replaced.

- **Manhole-4 Branch-2 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.5m – Drain deviates up (90°)

0.6m – The survey was abandoned (Camera unable to progress beyond the bend).

We recommend the below work:

Undertake an excavation to a maximum depth of 1.0m over the vertical section of drain at 0.5m in order to gain access for a CCTV survey to be undertaken
Repair the pipe work, backfill the excavation and re-instate to match the existing surface finish (Brick paving).

The total cost for this (including CCTV survey) is £580.00 plus VAT.

- **Manhole-4 downstream to Discharge**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Debris build up (10%)
1.4m – Circumferential crack at the joint (10 to 02 o'clock)

3.4m – The survey finished inside Manhole-6.

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through.
See costs at the bottom of the summary.

Supply and install 1 x 150mm diameter patch liner over the cracked joint located at 1.4m.
The cost for this is £480.00 plus VAT.

- **Manhole-5 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.5m – Circumferential crack at the joint (04 to 08 o'clock)
1.5m – Drain deviates left (45°)
1.7m – Drain deviates up (90°)

1.7m – The survey finished at the vertical section of drain.

We recommend the below work:

Supply and install 1 x 100mm diameter patch liner over the cracked joint located at 0.5m.
The cost for this is £450.00 plus VAT.

- **Manhole-5 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting foul waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Large displaced joint
0.4m – Drain deviates up (90°)

0.4m – The survey was abandoned (Camera unable to progress beyond the bend).

We recommend the below work:

Undertake an excavation to a maximum depth of 0.5m over the vertical section of drain at 0.4m in order to gain access for a CCTV survey to be undertaken
Repair the pipe work, backfill the excavation and re-instate to match the existing surface finish (Concrete).

The total cost for this (including CCTV survey) is £580.00 plus VAT.

- **Manhole-6 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Top of the drop shaft
0.8m – Surface damage to the pipe work
1.1m – Large displaced joint

3.2m – The survey finished at a trap (gully).

We recommend the below work:

Supply and install 1 x 100mm diameter patch liner over the defective section located from 0.8m to 1.1m.
The cost for this is £450.00 plus VAT.

- **Manhole-6 Branch-2 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Large displaced joint
0.3m – Drain deviates up (90°)

0.5m – The survey finished at the vertical section of drain.

We do not recommend any further work at this present time (head of line in close proximity, gully).

- **Manhole-6 Branch-3 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Large displaced joint
0.3m – Drain deviates up (slight)
5.7m – Large displaced joint
6.3m – Circumferential crack at the joint (10 to 03 o'clock)

7.1m – The survey finished at a trap (gully).

We recommend the below work:

Supply and install 2 x 100mm diameter patch liners over the defective sections located at 0.3m and 5.7-6.3m.
The cost per patch liner is £450.00 plus VAT (total cost is £900.00 plus VAT).

- **Manhole-6 Branch-4 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.4m – Debris build up (50-100%)

0.4m – The survey was abandoned (Camera unable to pass the debris).

We recommend the below work:

Carryout High Pressure Water Jetting in an attempt to clear the drain through and afterwards undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

- **Manhole-6 downstream to Discharge**

The drain surveyed is a circular 225mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Longitudinal crack (10 o'clock)
1.0m – Debris / silt build up to 4.5m (15%)

31.5m – The survey finished inside Manhole-7.

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through.
See costs at the bottom of the summary.

Supply and install 1 x 225mm diameter patch liner over the cracked section located at 0.3m.
The cost for this is £760.00 plus VAT.

- **Manhole-7 downstream to Discharge**

The drain surveyed is a circular 225mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.4m – Debris / silt build up to 5.0m (10-15%)
10.8m – Longitudinal crack (03 o'clock)
15.8m – Debris / silt build up (15%)

16.0m – The survey finished inside Manhole-12 (Unable to lift).

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through.
See costs at the bottom of the summary.

Re-survey the drain in 3 months time to determine if the condition of the cracked section located at 10.8m has deteriorated.
The cost for this is £120.00 plus VAT.

- **Manhole-7 Branch-2 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
2.2m – Debris / silt build up (15%)
3.0m – Drain deviates up (90°)

3.0m – The survey finished at the vertical section of drain.

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through.
See costs at the bottom of the summary.

- **Manhole-7 Branch-5 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.5m – Large displaced joint
1.0m – Large displaced joint
6.5m – Drain deviates up (90°)

6.5m – The survey finished at the vertical section of drain.

We recommend the below work:

Supply and install 1 x 150mm diameter patch liner over the large displaced joints located at 0.5-1.0m.
The cost for this is £480.00 plus VAT.

- **Manhole-7 Branch-3 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting foul waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Large displaced joint
0.3m – Trap (from Manhole-8)

0.3m – The survey was abandoned (Camera unable to pass the trap).

Due to the depth of Manhole-7 (5.38m) we cannot recommend any work at this present time. However if you would like a quotation to repair the large displaced joint please contact our office as a site visit would be required to gather additional details.

- **Manhole-7 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting surface water.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Debris / silt build up (10%)
0.5m – Drain deviates up (90°)
0.5m – Broken section (at the rest bend, 04 to 08 o'clock)

0.5m – The survey was abandoned (Camera unable to pass the broken section).

We recommend the below work:

Attempt to install 1 x 150mm diameter radial patch liner over the broken rest bend and afterwards re-survey the drain to establish its full condition (due to the unknown condition of the pipe work beyond 0.5m this may not be possible).
The cost for this is £900.00 plus VAT.

- **Manhole-7 Branch-4 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.2m – Debris / silt build up (20%)
0.6m – Large displaced joint
3.0m – Drain deviates up (90°)

3.0m – The survey finished at the vertical section of drain.

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through.
See costs at the bottom of the summary.

Supply and install 1 x 150mm diameter patch liner over the large displaced joint located at 0.6m.
The cost for this is £480.00 plus VAT.

- **Manhole-8 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting foul waste.

The below observations have been made:

0.0m – Water level (0-5%)
2.1m – Displaced joint (medium)
2.3m – Displaced joint (medium)
2.8m – Large displaced joint
3.3m – Drain deviates right
6.1m – Debris build up (20%)
6.1m – Displaced joint (medium)
6.1m – Camera lens is covered (loss of picture)

7.7m – The survey was abandoned (Unable to continue pushing the camera).

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through and afterwards undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

Supply and install 1 x 150mm diameter patch liner over the displaced joints located from 2.1-2.8m.
The cost for this is £480.00 plus VAT.

- **Manhole-9 Branch-3 upstream to Head of Line**

The drain surveyed is a circular 225mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Camera lens is partially covered (view restricted)
25.7m – Longitudinal fracture to 26.0m (04 o'clock)

26.5m – The survey was abandoned (Unable to continue pushing the camera).

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through and undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

Supply and install 1 x 225mm diameter patch liner over the fractured section located from 25.7-26.0m.
The cost for this is £760.00 plus VAT.

- **Manhole-9 Branch-4 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
3.8m – Multiple fractures at the joint (09 to 03 o'clock)
3.8m – Large displaced joint
4.6m – Displaced joint (medium)
5.1m – Large displaced joint
6.0m – Displaced joint (medium)
8.3m – Multiple cracks at the joint (10 to 12 o'clock)
9.0m – Multiple cracks at the joint (09 to 01 o'clock)
11.4m – Multiple cracks at the joint (09 to 01 o'clock)
15.8m – Large displaced joint

16.5m – The survey finished inside Manhole-11 (Unable to lift).

We recommend the below work:

Supply and install up to 17.0m of 150mm diameter flexi liner throughout the drain from Manhole-9 to Manhole-11
Re-open 4 x incoming connections located at 4.0m, 4.4m, 5.3m and 6.2m.
The total cost for this is £5,320.00 plus VAT.

Please note the liner cannot be installed until access into Manhole-11 has been made available. Please see the bottom of the summary for recommendations. Also any further incoming connections located pre-installation will require further costs (£290.00 plus VAT per connection).

- **Manhole-9 Branch-5 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Large displaced joint
0.3m – Multiple fractures (12 to 12 o'clock)
0.4m – Drain deviates up (90°)

0.4m – The survey was abandoned (Camera unable to progress beyond the bend).

We recommend the below work:

Attempt to install 1 x 150mm diameter radial patch liner over the fractured rest bend and afterwards re-survey the drain to establish its full condition (due to the unknown condition of the pipe work beyond 0.4m this may not be possible).
The cost for this is £900.00 plus VAT.

- **Manhole-9 upstream to Head of Line**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Camera lens is partially covered (view restricted)
0.5m – Trap (from Manhole-10)

0.5m – The survey was abandoned (Camera unable to pass the trap).

We cannot recommend any further work at this present time.

- **Manhole-9 downstream to Discharge**

The drain surveyed is a circular 150mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.0m – Debris / silt build up (10%)
6.7m – Water level (15%)
7.0m – Camera submerges underwater (loss of picture)

11.8m – The survey was abandoned (Unable to continue pushing the camera).

We recommend the below work:

Carryout High Pressure Water Jetting in order to clear the drain through and afterwards undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

- **Manhole-9 Branch-1 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.8m – Obstruction (50%)

0.8m – The survey was abandoned (Camera unable to pas the obstruction).

We recommend the below work:

Carryout High Pressure Water Flailing in an attempt to remove the obstruction from the drain and afterwards undertake a re-survey to establish its full condition.
See costs at the bottom of the summary.

- **Manhole-9 Branch-6 upstream to Head of Line**

The drain surveyed is a circular 100mm diameter vitrified clay pipe transporting combined waste.

The below observations have been made:

0.0m – Water level (0-5%)
0.3m – Debris build up (10%)
0.3m – Circumferential crack (12 to 12 o'clock)
0.6m – Debris build up (100%, suspected collapse)

0.6m – The survey was abandoned (Camera unable to pass the debris build up).

We recommend the below work:

Trace the drain to 0.6m
Undertake an excavation to a maximum depth of 1.5m over the suspected collapse located at 0.6m and replace with new 100mm diameter pipe work (if collapsed)
Backfill the excavation and re-instate to match the existing surface finish (Concrete)
Re-survey the drain once repaired to establish its full condition.

The total cost for this is £1,690.00 plus VAT allowing up to 3.0m of pipe work to be replaced.

DRAINAGE LINES REQUIRING HPW JETTING / FLAILING:

Manhole-1 upstream to Head of Line*
Manhole-3 Branch-4 upstream to Head of Line*
Manhole-6 Branch-4 upstream to Head of Line*
Manhole-7 downstream to Discharge
Manhole-7 Branch-4 upstream to Head of Line
Manhole-9 Branch-3 upstream to Head of Line*
Manhole-9 Branch-1 upstream to Head of Line*
Manhole-1 downstream to Discharge*
Manhole-4 downstream to Discharge
Manhole-6 downstream to Discharge
Manhole-7 Branch-2 upstream to Head of Line
Manhole-8 upstream to Head of Line*
Manhole-9 downstream to Discharge*

*Re-survey required.

The cost for a High Volume Tanker is £960.00 plus VAT per shift on site (including re-survey as indicated above). We estimate 2x shifts on site.

The below manholes could not be accessed:

Manhole-11 (Unable to lift, 650x650mm, concrete re-instatement)
Manhole-12 (Unable to lift, 650x650mm, concrete re-instatement)
Manhole-13 (Unable to lift, 650x650mm, concrete re-instatement)
Manhole-15 (Unable to lift, 650x650mm, concrete re-instatement)
Manhole-16 (Unable to lift, 650x650mm, concrete re-instatement)
Manhole-17 (Unable to lift, 650x650mm, concrete re-instatement)

The cost to excavate out the existing cover and frames, replace with new, HPW Jetting and a CCTV survey to all previously un-surveyed drains is £560.00 plus VAT (per manhole).

The below manholes could not be surveyed:

Manhole-2: (Full of debris, large pieces of wood, soil)
Manhole-14: (Full of water, debris, bricks)

The cost to carry out a clean of Manhole-2 and Manhole-4 (including CCTV survey afterwards) is £120.00 plus VAT per hour on site.

Manhole-10:

The cost to carry out a CCTV survey of Manhole-10 with man entry and confined spaces equipment is £460.00 plus VAT.

Manhole-9: Branch-2 could not be surveyed due to access restrictions.

All work has been priced as external. If any work is found to be located internally, further costs may be required.

Appendix C

Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
LRFS	**384673/397812**	**28 Nov 2019 9:42**

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

This means:

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

Notes

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

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

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



Environment Agency

Flood map for planning

Your reference
LRFS

Location (easting/northing)
384673/397812

Scale
1:2500

Created
28 Nov 2019 9:42

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

0 20 40 60m

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Appendix D

Manchester City Council Correspondence

United Utilities Correspondence

Chloé Grimsley

From: z.todorovic@manchester.gov.uk on behalf of floodriskmanagement@manchester.gov.uk
Sent: 22 August 2016 13:56
To: Chloé Grimsley
Cc: floodriskmanagement@manchester.gov.uk
Subject: Re: London Road, Fire Station
Attachments: London Road, Site Location Plan.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Chloe

Thank you for the email.

With regards to the proposed development, please note that we have already sent information about the location of the culverted watercourse (Shooters Brook) to your colleague Lawrence Lee.
We do not hold record of any flooding on site or in an immediate vicinity of the site. However, the surface water flooding maps indicate that the corner of Withworth Street and London Road is prone to surface water flooding.

With regards to the required flow reduction, we are looking for reduction as much as practicable on site so your proposal needs to detail the limitations of site (if any) to achieve required restrictions.

Please also note that, having in mind that your development comprises basement areas, we will be looking at your assessment of how the proposed drainage system would perform during 100 year storm with allowance for climate change. The proposed flows should not affect property including basement areas. Also please note that the EA has issued (February 2016) new guidance with regards to climate change uplift and we are looking for compliance with these new recommendations.

If you need further clarifications, please let us know.

Regards

Zorica

Zorica Todorovic
Flood Risk Management
The Neighbourhoods Service
Growth and Neighbourhoods
Manchester City Council

Tel: 0161 219 6295
Email: floodriskmanagement@manchester.gov.uk
Web: http://www.manchester.gov.uk/

POSTAL ADDRESS: Manchester City Council, Public Realm, The Neighbourhood Service, PO Box 532, Town Hall, Manchester M60 2LA

Chloé Grimsley <Chloe.Grimsley@curtins.com>
12/08/2016 09:13

To "floodriskmanagement@manchester.gov.uk" <floodriskmanagement@manchester.gov.uk>
cc
Subject London Road, Fire Station

Dear Sir/Madam,

We are currently preparing a Flood Risk Assessment and Drainage Strategy to support a planning application for the above development.

The site is located within Flood Zone 1, within the Conurbation Core Critical Drainage Area.

We are therefore preparing the FRA based on the exceedance of 0.5 Ha site area where the focus will be on the surface water management.

A Drainage Survey is currently underway to confirm the existing discharge points, however it is proposed that existing connections off site are reused where suitable.
Based on the Manchester SFRA recommendations for brownfield development in a Critical Drainage area; proposed flow rates should be restricted by 50% of existing flow rates as a minimum. We would therefore propose this as the strategy, however where the existing roofs are drained via rwp's along the perimeter facades and connect directly to the public sewer network and due to the listed nature of the building it will be difficult to reroute and discharge via an on-site restriction. We therefore propose to restrict to a 50% where possible but this will be based on restricting newly constructed internal areas.

It will also be difficult to specify sustainable drainage features due to the restrictive areas on site and listed building status prevent a new flat roof with green construction, however we will try and incorporate permeable construction within courtyards where suitable.

Please could you confirm if the above is acceptable?

Please could you also confirm if you have any drainage records for the area and whether there have been any historic flood events at the site?

If you require any further information, please let me know.

Kind Regards,
Chloé



Click here to learn more

Chloé Grimsley **Senior Engineer** T. 0161 236 2394 **chloe.grimsley@curtins.com**	curtins
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Chloé Grimsley

From: O'Brien, Neil <Neil.O'Brien@uuplc.co.uk>
Sent: 08 September 2016 10:27
To: Chloé Grimsley
Cc: Wastewater Developer Services
Subject: RE: London Road Fire Station - DE2577

Chloe,

Please see my comments in red below.

Regards

Neil

From: Chloé Grimsley [mailto:Chloe.Grimsley@curtins.com]
Sent: 25 August 2016 11:24
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: London Road Fire Station

Good Morning Sir/Madam,

Please find attached the pre-development enquiry form for the above site. I have attached a site location plan for information.

The proposal is for refurbishment of the listed building for commercial use within the existing basement and all upper floors.
At basement level we are also proposing newly constructed basement within the existing courtyard but at ground level the courtyard will remain as open space.

I have attached the floor plans for your information.

A Drainage Survey is currently underway to confirm the existing discharge points, however it is proposed that existing connections off site are reused where suitable.

It is assumed that the existing drainage will connect to the existing public sewer network, however it is not yet confirmed whether discharge is to the combined sewers in Fairfield Street, London Road, Minshull Street and Whitworth Street or whether there are also connections into the 900mm surface water pubic sewer in London Road.

Please could you confirm if the 900mm surface water public sewer in London Road is the 900mm 'Shooters Brook' the council have on record? It appears to flow in the same location.

The sewer records indicate that the 900mm pipe outside the fire station in London Road is a public surface water sewer. The sewer records indicate that 'Shooters Brook' starts at a location formerly known as Shooters Mill (now known as New Islington) and terminates in the Ashton Canal on Store Street.

Based on the Manchester SFRA recommendations for brownfield development in a Critical Drainage area; proposed flow rates should be restricted by 50% of existing flow rates as a minimum. We would therefore propose this as the

strategy, however where the existing roofs are drained via rwp's along the perimeter facades and connect directly to the public sewer network and due to the listed nature of the building it will be difficult to reroute and discharge via an on-site restriction. We therefore propose to restrict to a 50% **where possible** but this will be based on restricting newly constructed internal areas.

The flow rates will be confirmed once the Drainage Survey has been received and reviewed.

The proposed peak foul flows are expected to be approximately:

- The peak foul discharge for the proposed floor areas based on SFA 1.1l/s/ha. Basement is 0.5ha ground and upper floors 0.34ha, therefore approximately **2.3 l/s.**

Please could you confirm if the above is acceptable and whether any further flow restriction would be imposed on the development. **As this is a refurbishment scheme rather than new build UU will not impose any restrictions on flows**

Please could you also confirm if there have been any historic flood events at the site? United Utilities have no records of hydraulic sewer flooding in the area

If you require any further information, please let me know.

Kind Regards,
Chloé



Click here to lea

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Appendix E

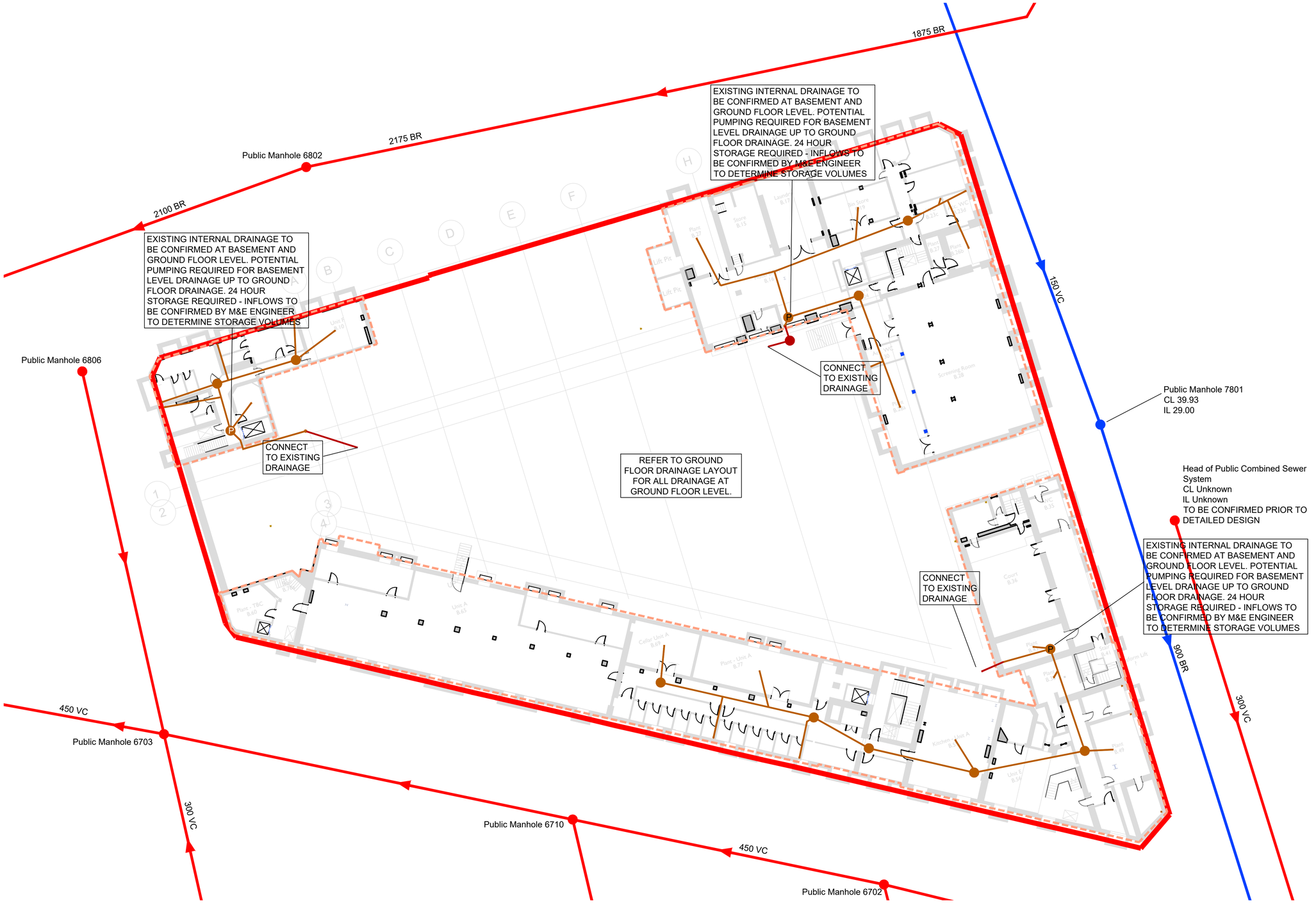
Proposed Drainage Strategy – Basement

Proposed Drainage Strategy – Ground Floor

NB:
- INVERT LEVELS OF PROPOSED FOUL SUBJECT TO AMENDMENT PENDING SURVEY OF DOWNSTREAM CONNECTION TO PUBLIC SEWER.
- IT IS RECOMMENDED THAT THE M&E ENGINEER CONFIRMS ALL EXISTING ABOVE GROUND FOUL DRAINAGE SO THAT EXISTING AND PROPOSED FLOWS CAN BE CHECKED FOR CAPACITY.
- THE ABOVE SHOULD BE CONFIRMED FOLLOWING FURTHER CO-ORDINATION WITH THE ARCHITECT TO UNDERSTAND THE CURRENT ABOVE GROUND ARRANGEMENT AND AN ASSESSMENT OF FURTHER CCTV SURVEY INFORMATION.
- ARCHITECT TO CONFIRM PROPOSED FINISHED FLOOR LEVELS.
- COVER LEVELS SUBJECT TO AMENDMENT ACCORDING TO PROPOSED FINISHED FLOOR LEVELS.

KEY - BASEMENT

- SITE BOUNDARY (APPROXIMATE)
- EXTENT OF BASEMENT
- PUBLIC SURFACE WATER SEWER (APPROXIMATE)
- PUBLIC COMBINED SEWER (APPROXIMATE)
- PROPOSED FOUL WATER DRAINAGE
- P — INDICATIVE PROPOSED PUMPING STATION (24 HR STORAGE REQUIRED)



GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN. ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
3. DO NOT SCALE THIS DRAWING. ALL DETAILS AND DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
4. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
5. WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION.
6. A CCTV SURVEY IS RECOMMENDED TO ASSESS THE CONDITION AND LEVELS OF EXISTING CONNECTIONS TO MH-13 AND ANY EXISTING CONNECTIONS TO THE PUBLIC SEWER.
7. IT IS RECOMMENDED THAT A CCTV SURVEY IS CARRIED OUT TO DETERMINE ANY FURTHER EXISTING CONNECTIONS TO THE PUBLIC SEWER SYSTEM ALONG FAIRFIELD STREET, MINSHULL STREET SOUTH, AND WHITWORTH STREET.
8. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
9. IT IS RECOMMENDED THAT THE M&E ENGINEER CONFIRMS ALL EXISTING ABOVE GROUND FOUL DRAINAGE SO THAT EXISTING AND PROPOSED FLOWS CAN BE CHECKED FOR CAPACITY.
10. THE ABOVE SHOULD BE CONFIRMED FOLLOWING FURTHER CO-ORDINATION WITH THE ARCHITECT TO UNDERSTAND THE CURRENT ABOVE GROUND ARRANGEMENT AND AN ASSESSMENT OF FURTHER CCTV SURVEY INFORMATION.
11. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
12. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

Rev:	Description:	Date:	By:	Chkd:
P01	PLANNING ISSUE	04.12.19	CG	CG

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Status: PRELIMINARY

Project: LONDON ROAD FIRE STATION

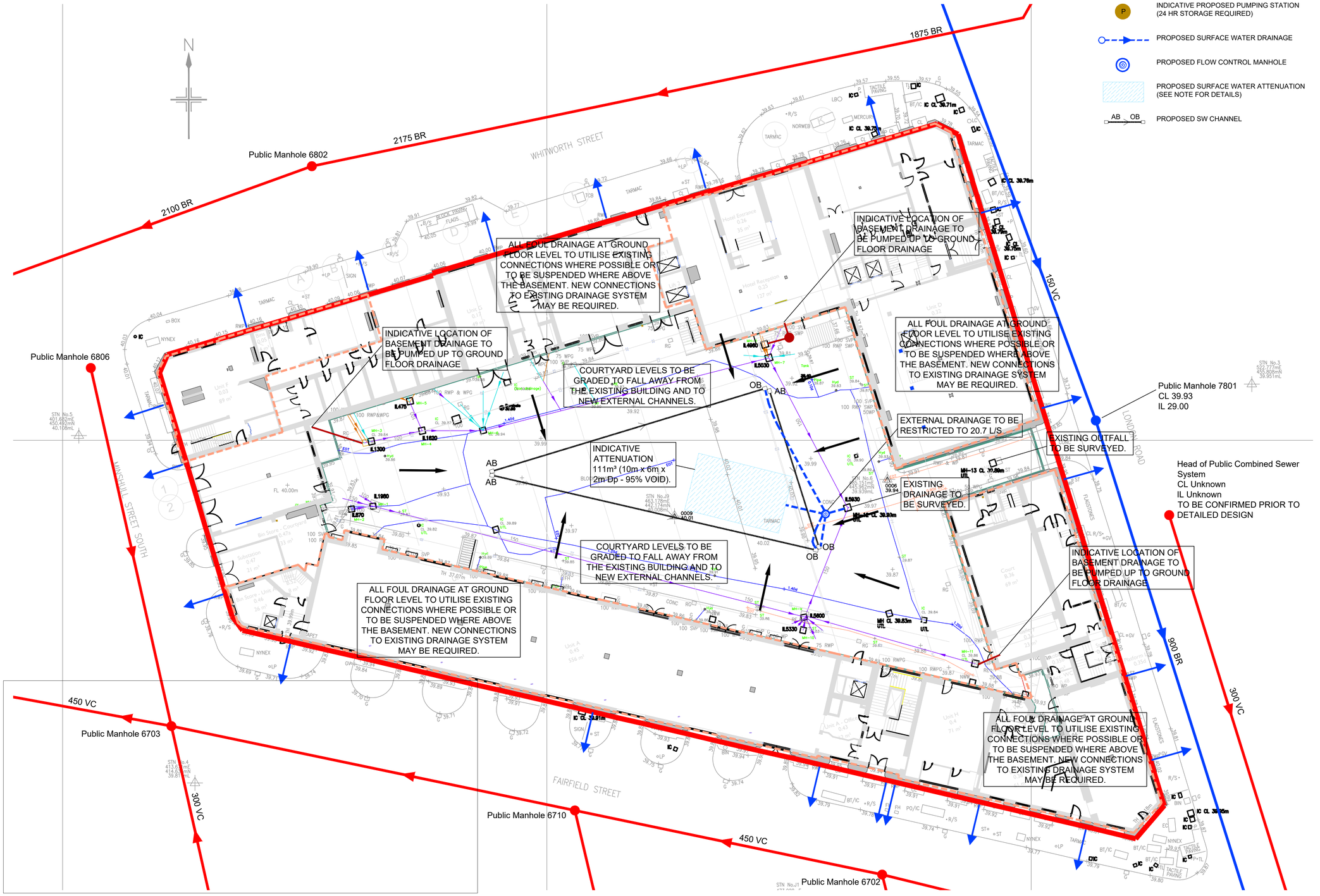
Drg Title: DRAINAGE STRATEGY BASEMENT

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	22/11/19	TM	CG	CG
Scale: 1:200				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
060270	CUR	00	XX	DR	C	92500	P01

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NB:
- INVERT LEVELS OF PROPOSED FOUL SUBJECT TO AMENDMENT PENDING SURVEY OF DOWNSTREAM CONNECTION TO PUBLIC SEWER.
- IT IS RECOMMENDED THAT THE M&E ENGINEER CONFIRMS ALL EXISTING ABOVE GROUND FOUL DRAINAGE SO THAT EXISTING AND PROPOSED FLOWS CAN BE CHECKED FOR CAPACITY.
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- ARCHITECT TO CONFIRM PROPOSED FINISHED FLOOR LEVELS.
- COVER LEVELS SUBJECT TO AMENDMENT ACCORDING TO PROPOSED FINISHED FLOOR LEVELS.



KEY - GROUND FLOOR

- SITE BOUNDARY (APPROXIMATE)
- EXTENT OF BASEMENT
- PUBLIC SURFACE WATER SEWER (APPROXIMATE)
- PUBLIC COMBINED SEWER (APPROXIMATE)
- ASSUMED EXISTING SURFACE WATER CONNECTION TO PUBLIC SEWER (CONTRACTOR TO CONFIRM BY SURVEY)
- PROPOSED FOUL WATER DRAINAGE
- P — INDICATIVE PROPOSED PUMPING STATION (24 HR STORAGE REQUIRED)
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FLOW CONTROL MANHOLE
- PROPOSED SURFACE WATER ATTENUATION (SEE NOTE FOR DETAILS)
- AB OB — PROPOSED SW CHANNEL

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
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Status: PRELIMINARY

Project: LONDON ROAD FIRE STATION

Drg Title: DRAINAGE STRATEGY SURFACE WATER

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	22/11/19	TM	CG	CG

Scale: 1:200

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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