Piccadilly Gardens Redevelopment, Manchester

Combined Flood Risk Assessment & Drainage Strategy Report

July 2026

PREPARED FOR

Galliford Try on behalf of Manchester City Council



Combined Flood Risk Assessment & Drainage Strategy Report

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1. Introduction

Civic Engineers Ltd. has been appointed by Prepared for Galliford Try on behalf of Manchester City Council to prepare a Flood Risk Assessment & Drainage Strategy Report in support of a Full Planning application for the proposed development (the 'Site') at Piccadilly Gardens, Manchester.

The Site is one of Manchester's most important public spaces and plays a significant role in the city centre. As the city's primary civic green space, it acts as a major destination for both locals and visitors, while also serving as an important gateway into Manchester. Its location and relationship to surrounding transport infrastructure make it a key part of the city's urban experience.

The gardens are used by a wide range of people across all seasons, making it an important part of the wider regeneration strategy. As a space of civic significance, Piccadilly Gardens requires a carefully considered drainage strategy that enhances safety, supports activity and wellbeing, and reflects its importance within Manchester.

The Site is a large public open space at the heart of Manchester city centre, the site is bound by Piccadilly Road to the north, the commercial unit - One Piccadilly Gardens to the east and the Transport for Greater Manchester (TfGM) tram tracks to the south and west. The site extends west, north of the tram tracks towards Market Street, extending across Tib Street.

In particular, this report shall:

- Provide information on the existing hydrological aspects of the Site and identify any changes to this as a result of the proposed development.
- Provide an assessment of the existing and future risk of flooding to the Site from all sources, accounting for effects of climate change, as well as the impact of proposals on flood risk within its vicinity.
- Outline and summarise the guidance and documentation used to inform the above assessment.
- Propose an outline drainage strategy and further measures to mitigate any residual risks of flooding.

This document is based on currently available information held by Civic Ltd and all comments and conclusions contained within are based upon the assumption that the sourced data is reliable. Civic Ltd accepts no liability for any inaccurate conclusions or assumptions resulting from inaccurate information. Proposals presented in this report represent the design intent and may be subject to alteration or adjustment in finalising the detailed design for this project.

2. Existing Site

2.1. Location and Description

The location of the proposed development is shown in Figure 1

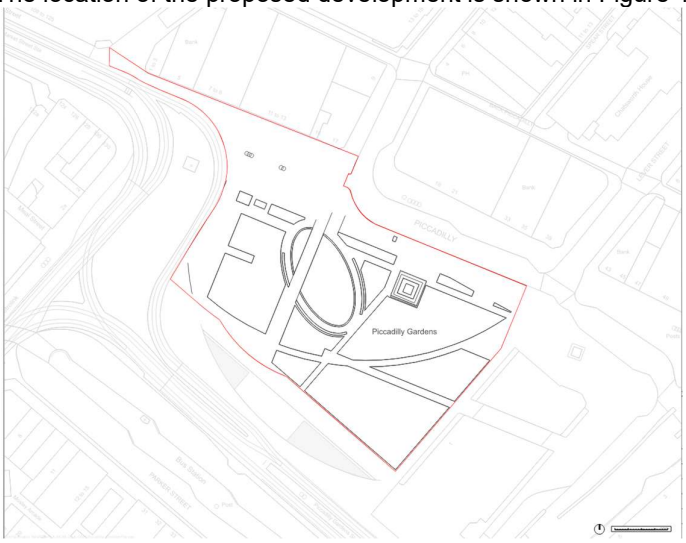


Figure 1: Site Location with an indicative red line boundary

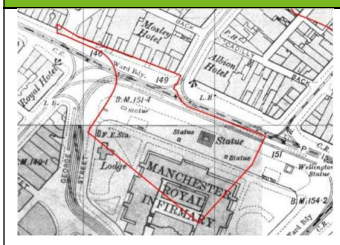
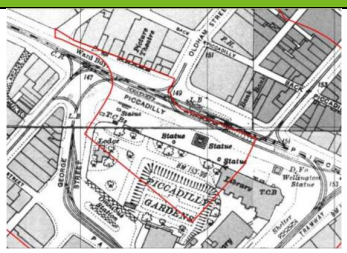
The Site is located approximately 490m to the west of Manchester Piccadilly Station, centred at an approximate National Grid Reference of SJ843982, Easting 384374, Northing 398284. The nearest postcode to the Site is M1 1LU.

The total area encompassed by the red line boundary of the proposed development is c.0.93ha. A site location plan (4004-PLA-XX-XX-DR-L-0007-Site Location Plan) is included in Appendix A of this statement.

2.2. Site Historical and Current Use

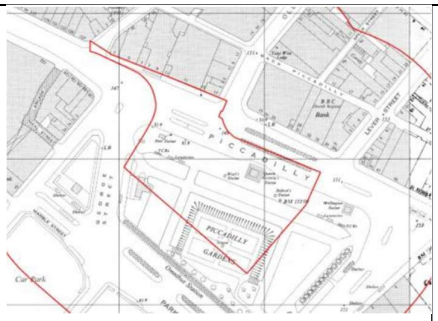
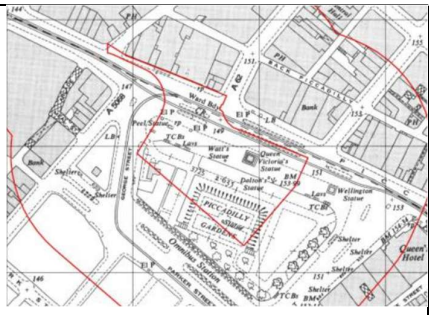
The Site has had various uses over its history since records began with the pertinent history of the site is summarised in Table 1 along with relevant excerpts from historical maps, and aerial photographs. It is noted that prior to the presence of the Infirmary which was built in 1755[1], the site contained Daub Holes (Clay Pits), one of which is considered likely to have been redeveloped into the Canal indicated in the earliest available map records.

Table 1: Summary of Site History

1794 – 1:2, 160	1851 – 1:2,500 (Limited Coverage	1889 to 1893 – 1:2,500
		
Earliest available mapping indicates the site housed an Infirmary and Asylum, with Dilpenfery [Dispensary], Baths, associated gardens and a Canal in the north of the site. The northwest of the site included Levers Row.	The Baths in the west have been extended south beyond the site. Levers Row has been renamed Piccadilly.	The Baths have been demolished with a Lodge now indicated, the Canal has been infilled, and the layout of the Manchester Royal Infirmary has altered. A Tramway is present in the north of the site along Piccadilly.
1908 – 1:2,500	**1922 – 1:2,500**	**1931 to 1933 – 1:2,500**
		
A *Fire Engine* Station is present within the northwestern central site area adjacent to the Lodge.	The main *Infirmary* buildings have been demolished, with one structure and the Lodges remaining south of the site. A Library has been constructed in the east of the site. The Fire Engine Station is no longer indicated. Mapping coverage from 1915 to 1916 indicates that the Infirmary buildings were demolished between 1908 and 1915.	*Piccadilly Gardens*, indicated to be at a sunken level, are indicated in the south of the site. Anecdotal information indicates that this represents a former basement from the demolished Infirmary[2].
1938 – 1:10,560	**1950 to 1954 – 1L2,500**	**1954 to 1955 – 1:2,500**

[1] Glinert, Ed (24 April 2008). The Manchester Compendium: A Street-by-Street History of England's Greatest Industrial City.

[2] https://www.manchestersfinest.com/news/a-lunatic-asylum-the-berlin-wall-spice-what-happened-to-piccadilly-gardens/

		
The Library and remaining Infirmary structures have been demolished, and the *Tramway* is no longer indicated.	No significant changes are noted between 1938 and 1954.	The *Tramway* is present on this map edition, with a reduced number of tracks.
1965 – 1:2,500	1969 to 1970 – 1:2,500	1985 to 1990 – 1:1,250
		
The *Tramway* is no longer indicated.	A *Fountain* has been added to *Piccadilly Gardens.*	An *Electricity Substation* is indicated in the east of the site.
1992 – 1:1,250	2000 – Aerial Imagery	2003 – Aerial Imagery
		
The Tramways have been reinstated along Mosley Street immediately adjacent to the western site boundary.	Aerial imagery dated 2000 indicates that no significant changes have occurred between 1992 and 2000.	The soft landscaping has undergone redevelopment, with the sunken garden infilled and at the same level as the surrounding areas, the fountain relocated and the extent of the gardens extended north. No significant changes were noted between 2003 and 2025.

As per the latest configuration, the site utilises an area of soft landscaping centred around a water fountain. The landscaped areas are dissected by a few impermeable pathways and a concrete wall to the south which was constructed, in part, to act as a noise barrier between the tramway and the surrounding commercial units.

The site is closely surrounded by retail and commercial units and experiences about 500,000 pedestrian movements a week through the site.

Currently, the site has high hoarding around a large proportion of the grass areas which are in place to support safe access to ongoing ground investigations.

2.3. Topography

A topographical survey was carried out by Survey Solutions in April 2024, with full survey data included in Appendix B of this report. The findings indicate that approximately 57% of the site is impermeable, primarily due to areas of existing hardstanding such as tarmac and the central foundations. The survey also provides detailed elevation data

across, which has been used to assess surface water flow and inform drainage and flood risk considerations.

The site generally falls east to west, with the high point in the north east corner at 46.38m AOD and low point in the north west corner at 44.63m AOD. There are localised low sections for existing drainage features and around the fountain perimeter is a localised depression.

2.4. Geology and Hydrogeology

A Phase 1 Desktop Study has been undertaken, also submitted as part of the application, and the preliminary qualitative risk assessment indicates there is a moderate risk to identified receptors from potential contaminants associated with the current and former uses of the site and surrounding area and potential Made Ground associated with the former development of the site. Of note, historical industries identified at the site include clay pits, canal, fire engine house and infirmary. In addition, the assessment has identified potential geotechnical constraints associated with the potential for below ground obstructions, variable thickness of Made Ground, aggressive ground conditions and existing buried services beneath the site. This report can be provided separately upon request.

2.5. Hydrology and Drainage Infrastructure

Survey Solutions undertook a utilities survey in April 2026 (refer to Appendix C) showing several combined sewers across the site. United Utilities public sewer records that have been requested.

A Pre-Development Enquiry (PDE) has been raised with UU (refer to Appendix D), a Site image has been provided which highlights the combined sewers below, generally these are to the north and east of the site. The sewers to the north of the site are positioned directly north of the Queen Victoria statue running east to west and further north and parallel to this run, also taking flows east to west. These pipes appear to combine and translate flows towards Market Street. The combined sewers to the east of the site are beyond the site. There are no surface water sewers in proximity to the site. Sewer records from United Utilities have been requested and will inform the detailed design.

The nearest water bodies are the River Tib which is culverted to the north west of the site, and Rochdale canal is 300m to the east of the site.

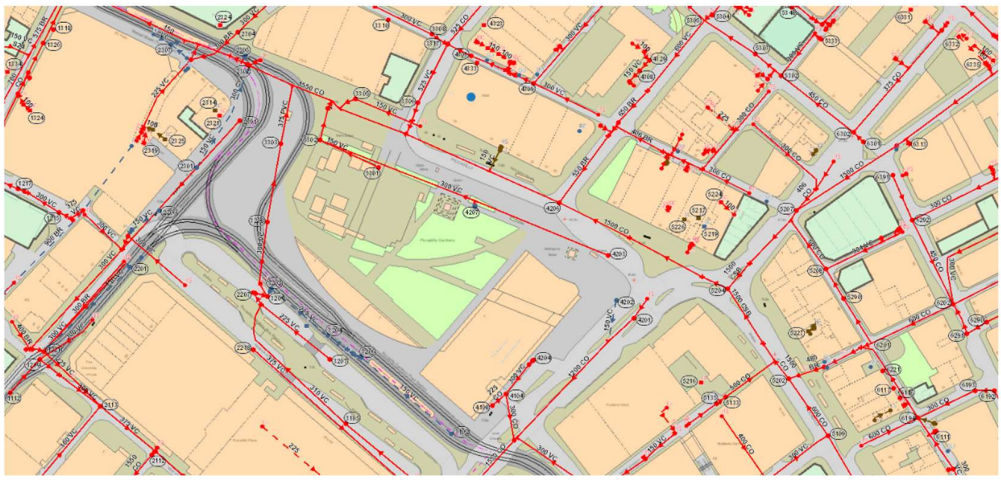


Figure 2: Utility Search - Combined sewers highlighted

3. Proposed Development

Redevelopment and reconfiguration of Piccadilly Gardens comprising works to the public realm including public open space and use of space for events, together with decommissioning and removal of the existing fountain; creation of play space, lawn area, hard and soft landscaping; lighting; and drainage and other associated infrastructure; and a severable plot for a future ancillary structure with associated interim landscaping.



Figure 3: Proposed Site General Arrangement

4. Relevant Legislation, Policy and Guidance

This FRA has been produced in accordance with the requirements of the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG).

4.1. National Planning Policy Framework 2024 & Relevant Planning Practice Guidance

The National Planning Policy Framework (NPPF) 2024 states that a Flood Risk Assessment (FRA) is only required for sites within Flood Zone 1 where one or more of the following points apply:

- The development has a site area of 1 ha or more.
- The site lies within an area with critical drainage problems (areas of critical drainage problems are currently only located within Devon and Cornwall).
- The local planning authority's Strategic Flood Risk Assessment (SFRA) shows it will be at increased flood risk in the future.
- The site is at risk from other sources of flooding and its development would increase its vulnerability classification.

This FRA and DS has been produced following the requirements of the NPPF and Planning Practice Guidance (PPG), as well as complying with or referencing the following regional or local policy and documentation:

- Greater Manchester Combined Authority (GMCA) Level 1 Strategic Flood Risk Assessment (SFRA) 2019
- GMCA Hybrid Level 2 SFRA 2021
- Greater Manchester Surface Water Management Plan 2012
- Manchester Core Strategy Development Plan 2024
- Places for Everyone (PfE) Policy JP-S4 Flood Risk and the Water Environment
- Policy EN8 Adapting to Climate Change

Particularly relevant aspects of these documents and frameworks are presented in the following sections.

Local planning authorities may stipulate individual requirements for FRAs for developments within their administrative area. Policy EN14 (Flood Risk) of the Manchester Core Strategy 2012 requires that developments with an area of greater than 0.5ha residing in Critical Drainage Areas (CDA) identified in the Manchester, Salford, Trafford SFRA 2011 will require submission of an FRA.

As the Site lies within the 'Conurbation Core' CDA, and the area of proposals encompasses 0.93ha an FRA is required as part of this planning application.

Sections of Policy EN14 and Policy EN17 (Water Quality) of the Manchester Core Strategy have been superseded by Places for Everyone (PfE) Policy JP-S4, outlined in the Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan 2022 to 2039, which was adopted by Manchester City Council on 21st March 2024.

The following points detailed in PfE Policy JP-S4 are relevant to this planning application:

- Locating and designing development so as to minimise the impacts of current and future flood risk, including retrofitting or relocating existing developments, infrastructure and places to increase resilience to flooding;
- Expecting developments to manage surface water run-off through sustainable drainage systems and as close to source as possible. Development should achieve greenfield run-off rates unless it is demonstrated to be impracticable. District local plans should consider setting more detailed surface water drainage policies to reflect local circumstances, including alternative surface water discharge rates, such as in areas with critical drainage issues;
- Ensuring that sustainable drainage systems:
  - i. Are designed to provide multifunctional benefits wherever possible, including for water quality, nature conservation and recreation;
  - ii. Avoid adverse impacts on water quality and any possibility of discharging hazardous substances to ground;
  - iii. Are delivered in a holistic and integrated manner, including on larger sites split into different phases; and

iv. Are managed and maintained appropriately to ensure their proper functioning over the lifetime of the development.

This statement has been produced following the requirements of the NPPF and Planning Practice Guidance (PPG), as well as complying with or referencing the following regional or local policy and documentation:

- Greater Manchester Combined Authority (GMCA) Level 1 Strategic Flood Risk Assessment (SFRA) 2019
- GMCA Hybrid Level 2 SFRA 2021
- Greater Manchester Surface Water Management Plan 2012
- Manchester Core Strategy Development Plan 2024
- Places for Everyone (PfE) Policy JP-S4 Flood Risk and the Water Environment
- Policy EN8 Adapting to Climate Change

Particularly relevant aspects of these documents and frameworks are presented in the following sections.

4.2. Sequential Test

A sequential test is one of the primary measures of mitigating flood risk and considers alternative available sites within the vicinity of a proposed development, assessing whether these have a lower risk of flooding than the currently proposed development location with the intention of prioritising development within areas with reduced flood risk.

As the proposed development is located with Flood Zone 1, meaning, the site lies within an area with a low probability of flooding, a sequential test is not required – see Flood Vulnerability Classification below.

4.3. Development Suitability

Where a sequential test has been passed or is not required, a comparison of a site's flood risk probability and vulnerability, informed by the EA's Flood Map for Planning and a classification of vulnerability based on land use, determines the suitability of a development within a given location.

Flood Map for Planning

The EA's Flood Map for Planning divides land into Flood Zones, which represent the susceptibility of an area of land to flooding from rivers and seas ignoring the presence of any flood defences. Definitions of each Flood Zone are provided in Table 2.

Table 2 Reproduction of Table 1 of the Planning Practice Guidance (Flood Risk and Coastal Change), providing definitions of Flood Zones within the Flood Map for Planning

FLOOD ZONE	DEFINITION
ZONE 1 – LOW PROBABILITY	Land assessed as having a less than 1 in 1000 (<0.1%) annual probability of river or sea flooding in any one year.
ZONE 2 – MEDIUM PROBABILITY	Land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.
ZONE 3A – HIGH PROBABILITY	Land assessed as having 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
ZONE 3B – FUNCTIONAL FLOODPLAIN	Land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 1 in 30 (3.3%) or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). 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)

Figure 4**Error! Reference source not found.** displays the extent of Flood Zones within the Site. The Site is shown to lie within Flood Zone 1 and is therefore assessed as having less than a 1 in 1000 (<0.1%) annual probability of flooding from rivers and seas without the presence of flood defences.

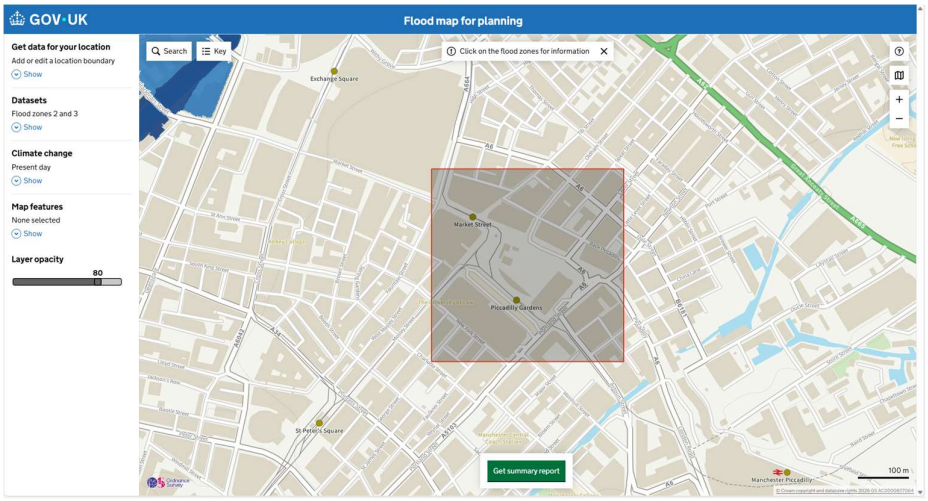


Figure 4: EA Flood Map for Planning

Flood Vulnerability Classification

The Planning Practice Guidance defines five classifications of flood vulnerability based on development usage: 'water compatible', 'less vulnerable', 'more vulnerable', 'highly vulnerable' and 'essential infrastructure'. Descriptions of developments encompassed by the classifications are provided in Table 3. The development is categorised as less vulnerable based on its planned use.

Assessment

To assess the suitability of a particular development within a given location, Table 3 is used to compare the proposed development's flood risk vulnerability with its Flood Zone and defines whether the development is considered appropriate, as well as outlining whether an Exception Test is required. A Less Vulnerable development is deemed appropriate.

Table 3 Reproduction of Table 2 of the Planning Practice Guidance (Flood Risk and Coastal Change), showing where development is appropriate based on flood risk vulnerability and Flood Zones.

FLOOD RISK VULNERABILITY CLASSIFICATION		ESSENTIAL INFRASTRUCTURE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE	WATER COMPATIBLE
FLOOD ZONE	ZONE 1	√	√	√	√	√
	ZONE 2	√	Exception Test Required	√	√	√
	ZONE 3A	Exception Test Required	×	Exception Test Required	√	√
	ZONE 3B	Exception Test Required	×	×	×	√
√ **Development is appropriate** × **Development should not be permitted.**						

Table 4 Reproduction of Annex 3 of the National Planning Policy Framework, providing information on flood vulnerability classification.

CLASSIFICATION	DESCRIPTION
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 infrastructure for electricity supply including generation, storage, and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms.
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. • Car parks.
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 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.

5. Flood Risk

5.1. Criteria for Assessment

Climate Change Allowances

To account for changes to peak river flow, peak rainfall intensity, sea level rise, offshore wind speed and extreme wave height as a result of climate change, the EA publishes climate change allowances to enable future flood risk to sites to be assessed and to facilitate resilient design of developments. In May 2022, the EA significantly updated guidance on the application of peak rainfall allowances. For England, these are now provided for individual management catchments rather than at a national scale.

The peak river flow and rainfall allowances for the Site are provided in **Error! Reference source not found.** and **Error! Reference source not found.** below, respectively.

Table 5: Peak River Flow allowances

ALLOWANCE CATEGORY	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	24%	43%	75%
Higher	15%	26%	46%
Central	12%	19%	35%

Table 6: Peak Rainfall allowances

ALLOWANCE CATEGORY	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2050S' (UP TO 2060)	TOTAL POTENTIAL CHANGE ANTICIPATED FOR THE '2070S' (2061 TO 2125)
3.3% AEP rainfall event		
Upper end	35%	**40%**
Central	25%	30%
1% AEP rainfall event		
Upper end	40%	**45%**
Central	25%	30%

Environment Agency datasets and mapping contained within the SFRA have been consulted to provide a brief overview of the Site's existing flood risk. The potential sources of flooding to the development have been assessed and are discussed below.

5.2. Historical Flooding

The Environment Agency has not been contacted for evidence on historical flooding. The LLFA has been contacted and there is no anecdotal or publicly available evidence to suggest there has been flooding on site.

5.3. Fluvial and Tidal Flooding

Fluvial (main river) flooding occurs when the capacity of a main river is exceeded, resulting in water overtopping its banks. Heavy or prolonged rainfall, melting of ice and snow and – in rivers subjected to tidal processes – high tides and storm surges are the primary causes of this source of flooding.

The site is remote from tidal influences and any main rivers therefore is at very low risk of tidal flooding.

5.4. Surface Water Flooding

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

Surface water flooding is dependent primarily on topography, which dictates either the flow path of overland flow

which is not contained within public sewers, or areas in which ponding may occur. Surface water flooding is more difficult to predict than the risk of flooding from Rivers or Sea as it is dependent on the amount of rain which will fall in a very localised area, the specific topography of that region and the capacity and functionality of the drainage network within that section.

From the UK Government's Flood Risk from Surface Water (extent of flooding) map the likely depth of surface water flooding (millimetres) is represented on a sliding scale of orange shading. Ranging from less than 150mm to over 2300mm.

The three images depict the AEP of flooding for the 1 in 30 (3.3%), 1 in 100 (1%) and the 1 in 1000 (0.1%) chance of flooding. The EA's Risk of Flooding from Surface Water map (Figure 5) shows that present day chances of surface water flooding at this location could be more than 3.3% (1 in 30) each year. Projected chance of flooding, with no intervention, between 2061 and 2125 has been shown to be between 3.3% (1 in 30) each year.

The depth of the flooding at an annual exceedance probability (AEP) of 1% annual change of flooding varies between 0-300mm localised at the fountains within the site, less than 150mm at the south of the site along a small strip adjacent to Parker Street and at the extents of the site, at the end of Tib Street a 1% chance of 300-600mm.



Figure 5 Surface Water Flooding AEP 3.3%, 1% and 0.1%

5.5. Groundwater Flooding

Ground water flooding occurs when the water table rises above ground level, typically after prolonged periods of heavy rainfall or snowmelt. Unlike surface or river flooding, groundwater flooding develops slowly, can persist for weeks or months, and is often less visible until it affects properties, infrastructure, and ecosystems.

The site is located outside of a groundwater flood alert area, therefore the risk of Groundwater Flooding is Very Low.

5.6. Flooding from Reservoirs

The EA's 'Flood Risk Map from reservoirs', shown in Figure 6, does not identify the Site as an area at risk of flooding from reservoirs in either the dry-day or wet-day scenarios.

Reservoirs may flood in the event of a dam collapse, resulting in the release of a significantly large volume of water, however, reservoirs in the UK have an excellent safety record and the probability of such an event is considered extremely low.

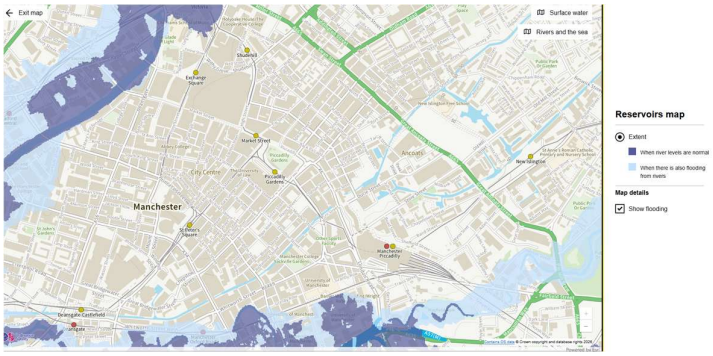


Figure 6: Flood Risk Map from reservoirs

Based on the EA Flood Risk from Reservoirs Map, flooding from reservoirs is unlikely at the Site.

5.7. Canals Flood Risk

In comparison to rivers, canals are generally less susceptible to significant changes in water level due to rainfall. The Rochdale Canal is located approximately 0.3km from the site and based on this distance, the risk of flooding from canals is considered to be extremely low.

5.8. Flooding from Sewers

Sewers may also flood due to exceeded capacity or blockages outside of major storm events. No data on the site's existing flood risk from sewers, including any historic records of sewer flood events, have been found as part of this Flood Risk Assessment.

The surrounding sewers are adopted assets maintained by the statutory undertaker (United Utilities). No recorded incidents of flooding of these assets have been found. It is presumed that the risk of sewer flooding is very low, provided United Utilities carry out their responsibilities to monitor and regularly maintain these assets.

5.9. Summary

The site is located in Flood Zone 1, there is no record of historical flooding in the area but there is a potential for surface water flooding in the two exposed basement areas.

From the evidence the flood risk for the proposed development can be summarised as follows:

- Tidal/Fluvial (Rivers and Sea) – Very low risk
- Pluvial (Surface Water) – Low risk
- Reservoir – Very low risk
- Canals – Extremely low risk
- Public Sewers – To be confirmed by UU, presumed low risk
- Groundwater - Low risk (to be confirmed by site investigation)

The flood risk to the site is low.

6. Drainage Strategy

6.1. Existing Drainage

The site is 0.93ha This is split into 5,341m2 hard landscaping (impermeable and is positively drained hardstanding) and 3,959m2 soft landscaping permeable (planting and lawn). The drainage features are a combination of gulleys, channels, tree pits and soft landscaping areas. Refer to Civic Existing Catchment plan drawing 4475-CIV-XX-ZZ-D-C-10006.

Pre-Development Runoff

Considering the 1in1yr storm event, the total discharge rate from the catchment, in the existing scenario, would be 50.5l /s and for the1in30yr storm event the discharge rate would be 119.32l/s.

Post Development Runoff and Attenuation

In accordance with the requirements of The Places for Everyone Joint Development Plan, it is proposed that the site will be restricted to the existing brownfield rate plus a 50% betterment.

In restricting the flows from the development site, there will be a requirement to provide attenuation to accommodate flows up to the 1 in 100-year event with a climate change allowance of 45%. The purpose of the attenuation is to maintain operation on the system during the 1 in 1-year, 1 in 30-year and the 1 in 100-year (plus climate change) storm events.

For the all post development flood events the proposed discharge rate will be restricted to 25.25 l/s. This restriction will result in the requirement for c.273m3 of attenuation in the 1in30yr event and 618m3 of attenuation in the 1in100yr + 45% climate change

Water quality

Water quality has been considered post development. All drainage catchments within the site are considered low risk of pollution as their primary function will serve the public and not be accommodating to vehicles.

Silt will be prevented from entering the system by the use of silt traps and catch pits where required.

Maintenance

Reference should be made to the Drainage Inspection and Maintenance Schedule in Appendix E, which includes required actions and typical frequencies for all drainage infrastructure service the development. The drainage will be managed and maintained by an appointed Management Company by the Ultimate Client, Manchester City Council.

6.2. Proposed Surface Water Drainage

6.2.1. Drainage Hierarchy Points of Discharge

The NPPF Planning Practice Guidance Paragraph 080 states that:

“Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. *Store rainwater for later use;*
2. *into the ground (infiltration);*
3. *to a surface water body;*
4. *to a surface water sewer, highway drain, or another drainage system;*
5. *to a combined sewer.*”

Store water for later use

There are two 54m^3 tanks that serve the existing fountains. The fountains are being decommissioned and removed, the tanks are being investigated to confirm the capacity to and understand whether they can be re-purposed to collect and store rainwater for reuse, through irrigation, or grey water recycling if a future structure within the Gardens is brough forward with appliances that need grey water. Any future structure will complement the ongoing investment in and refurbishment of the Piccadilly Gardens landscape. The structure does not form part of this application and will be brought forward under a separate full planning application.

Infiltration Potential of Sustainable Drainage Systems (SuDS)

Ground investigation works are being undertaken at the time of writing this strategy document. From initial trial pits on site there appears to be varying depths of made ground underlaid by clay strata which is not anticipated to be suitable for infiltration. The Phase 1 Desktop Study identified a moderate risk to identified receptors for potential contaminants

associated with current and former uses of the site and the surrounding area and potential Made Ground associated with former development of the site. These are opposing factors to utilising infiltration as a method of discharge on site. However for completeness, infiltration testing has been requested to be undertaken as part of further planned site investigations however it is assumed that infiltration is not feasible due to the underlying strata and therefore is not being considered as a viable method for surface water disposal.

Water Body

The nearest water bodies are the River Tib which is culverted to the north west of the site, and Rochdale canal is 300m to the east of the site.

The site layout positions the main surface water network within the heart of piccadilly gardens, discharging to the River Tib has been ruled out due to the potential route requiring crossing third-party assets i.e. avoiding tram tracks and existing services.

Discharging in the Rochdale Canal has also been excluded due to the potential route requiring crossing third-party assets i.e. avoiding tram tracks and existing services.

Surface Water Sewer

There are no known surface water sewers close to the development as per the existing drainage system discussed in Section 2.5. Disposal via surface water sewers is currently deemed to not be feasible.

Combined Sewer

There are several combined water sewers surrounding the development and it is likely this will be the only feasible discharge option for the development based on the results of additional surveys.

The current strategy is designed on the basis that discharge will be to the combined water sewer running east-west across the north of the site.

6.2.2. Surface Water Drainage Design

In order to restrict surface water run-off from the development site to the equivalent brownfield plus 50% betterment run-off rate, on-site storage will be required to accommodate excess run-off. Due to the dense layout of existing services and levels constraints, the use of open SUDS features such as swales and basins is not considered to be feasible.

Within the current design, it is anticipated that storage will be provided by raingardens, permeable paving and a buried attenuation storage tank provided by proprietary geo-cellular systems specified to attenuate stormwater runoff from storms with larger return periods prior to discharging into the existing combined sewer. The tanks will be located beneath the raised lawn area.

Runoff will be restricted to a rate of 25.2l/s upstream of the outfall from site, which allows the system to surcharge and utilise the buried attenuation storage.

Drainage & Exceedance flow routes

The proposed surface water drainage system will be designed in accordance with the drainage strategy set out above. This will ensure that there is no increase in flood risk to the site or elsewhere in the local catchment for all storm events up to and including the 100 year storm plus 45% climate change.

It should be noted that if storm events in excess of the 100 year storm plus 45% climate change or blockages occur, this will result in flood water arising from the drainage system. If the site drainage systems were to flood, it is considered that any surface water arising from the site drainage system would be contained within the raingardens in the northwest of the site; local to the ornamental planting to the west of the site; within the raingardens and permeable paving in the southeast of the site; and local to the channel drain south of the Queen Victoria statue.

To the south of the site where a channel drain is proposed, if this is inundated the catchment is proposed to follow a route beyond the site limits into an existing channel drain. The proposed catchment area for this channel drain is c.0.01ha which is deemed negligible and the likelihood that both channels become inundated is very low, therefore this exceedance flow path is deemed acceptable.

6.3. Proposed Foul Water Drainage

There are no foul flows for the proposed development. Any future structure and associated foul flows will be brough forward under a separate full planning application.

7. Conclusion

Piccadilly Gardens is a 0.93ha previously developed public open space in Manchester City Centre. The proposed redevelopment and reconfiguration of Piccadilly Gardens comprising works to the public realm including public open space and use of space for events, together with decommissioning and removal of the existing fountain; creation of play space, lawn area, hard and soft landscaping; lighting; and drainage and other associated infrastructure; and a severable plot for a future ancillary structure with associated interim landscaping.

This report delivers a combined Flood Risk and Drainage Strategy for the Redevelopment of Piccadilly Gardens and details the impact to the surrounding environment and infrastructure.

Whilst the site is <1ha in size and within Flood Zone 1, as it is within the Conurbation Core Critical Drainage Area (CDA) a Flood Risk Assessment is required. The overall flood risk has been assessed as Low.

A Phase 1 Desktop Study identified a moderate risk to identified receptors for potential contaminants associated with current and former uses of the site and the surrounding area and potential Made Ground associated with former development of the site. These are opposing factors to utilising infiltration as a method of discharge on site. However, for completeness, infiltration testing has been requested to be undertaken as part of further planned site investigations however it is assumed that infiltration is not feasible due to the underlying strata and therefore is not being considered as a viable method for surface water disposal.

Other SuDS have been considered within the strategy for the Site; storing water for later use – utilising existing tanks beneath the lawns subject to whether they can be re-purposed to collect and store rainwater for reuse, through irrigation, or grey water recycling to supply appliances within the pavilion. Implementing raingardens and permeable paving to provide filtration and bioretention before ultimately discharging to combined sewer at a controlled rate.

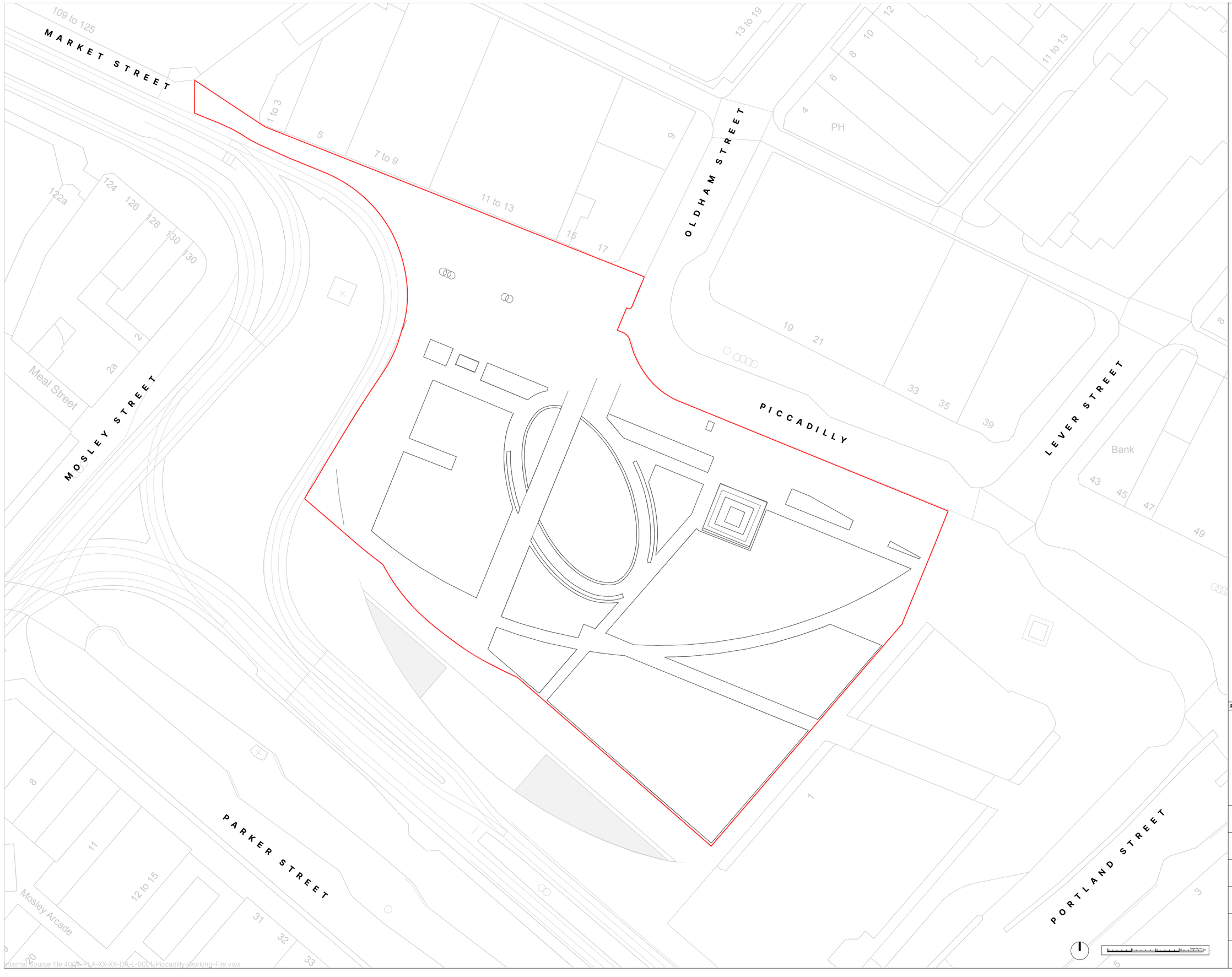
In accordance with Department of Environment, Food & Rural Affairs (DEFRA) Climate Change considerations a 45% allowance has been included within the hydraulic modelling for this site and attenuation storage will be designed to ensure there is no surface water flooding on site for rainfall events up to and including the 1 in 100 + 45% climate change event. The attenuation storage will be designed to ensure that surface water runoff for storm events up to and including the 100 year storm event plus the 45% allowance will not cause risk of flooding to properties or increase the risk outside the site.

There is no foul network within this proposed application.

The drainage strategy is not expected to inhibit the development proposals and similarly the development is not likely to increase the risk of flooding to surrounding properties or public realm. This Flood Risk Assessment and Drainage Strategy conclude the development is appropriate subject to the implementation of the flood mitigation described in this report being carried out.

Appendix A

Site Location Plan



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

KEY

Red Line Boundary

Revision	Date	Description	Drawn	Apprvd.
P01	15/07/26	Draft Planning	CB	SPL

PLANIT

Manchester | London | Liverpool | Leeds | Standish

Manchester
2 Back Grafton Street,
Altrincham,
Cheshire,
WA14 1DY

W: planit-ie.com
E: info@planit-ie.com
T: 0161 928 9281

Client	Manchester City Council
Project	Piccadilly Gardens
Drg Title	Site Location Plan

Created on	Created by	Approved by
13-04-2026	CB	LH

Scale	Size	Workstage
1:500	A2	Planning

Drg No.	Suitability	Revision
4004-PLA-XX-XX-DR-L-0007	S2	P01

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Internal Source file:4004-PLA-XX-XX-DR-L-0001-Piccadilly-Working-File.vwx

Appendix B

Topographical Survey

SHEET LAYOUT

Levels are related to **OSGB15**
Value **N/A**

Coordinates are related to **National Grid** (GPS)

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.



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Original Sheet Size A0H

Topographical Survey Legend

B	Bollard	h	Height	RWP	Rain Water Pipe
BS	Bus Stop	Hyd	Hydrant	SP	Soil Pipe
BT	Telecommunications IC	IC	Inspection Cover	SPS	Stone Paving Slabs
CPS	Concrete Paving Slabs	JB	Junction Box	ST	Stop Tap
CTV	Cable Television Cover	KO	Kerb Outlet	Stay	Cable Stay
DP	Downpipe	LB	Letter Box	SV	Stop Valve
DR	Drain	LP	Lamp Post	TCB	Telephone Call Box
Elec	Electrical IC	Mkr	Utility Marker	TL	Traffic Light
EP	Elec. Pole	MP	Mile Post	TP	Telegraph Pole
ER	Earth Rod	NP	Name Plate	TPS	Tactile Paving Slabs
FP	Flagpole	P	Post	VP	Vent Pipe
FT	Floodlight	PM	Parking Meter	WM	Water Meter
G	Gully	RE	Rodding Eye	WO	Water Outlet
GP	Gate Post	RS	Road Sign	UTL	Unable To Lift
GV	Gas Valve	RTW	Retaining Wall		

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

Level Prefix Descriptions

AL	Arch Level	RL	Roof/ridge Level
BL	Bed Level	SL	Soffit Level
CL	Cover Level	Spr	Arch Springing Level
EL	Eaves Level	TF	Top Of Fence Level
FL	Floor Level	TW	Top Of Wall Level
IL	Invert Level	Thr	Threshold Level
OL	Overhead Cable Level	WL	Water Level
PL	Parapet Level		

50.00 + Spot Level

SSL1 50.00 Survey Control Station (coordinated point)

Tree Multi Trunk

Fence
Safety Barrier
Gate
Stile
Hedge
Limit of Foliage & Tree Canopy

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

DRAWING NOTES

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

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Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

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Do not scale from this drawing.

Drainage/Services Legend

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

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

PAS128 Quality Levels

Please refer to PAS128:2014 Table 1 - "Quality level of survey outputs (normative)" for in anticipated accuracy of quality levels.

All utilities are located to PAS128 QL-B2 unless otherwise stated.

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Trench scar, street furniture, visual note/reference to utility	PAS128 QL-C
Assumed route	PAS128 QL-B4
Unable to obtain depth	PAS128 QL-B3
QL-B1	PAS128 QL-B1
QL-B3P	PAS128 QL-B3P
QL-B2P	PAS128 QL-B2P
QL-B1P	PAS128 QL-B1P

Quality levels ending with a "P" refer to a utility that has been located with post processed Ground Penetrating Radar (GPR).

Drawing caveats, please note:

LSS 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.

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Drainage routes between manholes, if not able to be traced by LSS survey methodologies, are assumed to be direct lines between manholes.

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

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL
GPS1	384353.923	398318.078	45.413
GPS2	384335.985	398269.355	45.263
AL01	384327.471	398331.634	44.976
AL02	384403.269	398296.404	45.953
AL03	384437.487	398279.189	46.398
AL04	384390.859	398263.428	45.966
GPS1A	384355.344	398299.228	45.541
RL01X	384328.519	398303.263	45.642
AT01	384309.063	398279.777	45.306
AL33	384442.786	398303.157	46.276
AL44	384415.788	398245.325	46.083
FE01	384287.399	398278.392	45.072
FEBA	384302.646	398358.108	44.689
FEBB	384293.920	398332.413	44.856
FEBC	384263.711	398304.877	44.832
FEBC1	384258.989	398274.661	44.836
FEBC2	384263.230	398258.911	45.355
FEBC3	384270.826	398229.288	45.380
FEBC4	384304.821	398204.976	45.270
FEBC5	384370.144	398145.486	45.297
FEBC6	384357.882	398177.942	45.371
FEBC7	384347.295	3398203.653	45.400
FEBC9	384303.034	398224.158	45.400
FEBC10	384291.677	398235.937	45.363
FEBD	384237.397	398260.168	44.877
FEBE	384186.172	398226.585	44.875
GS01	384421.508	398317.516	46.095
GS02	384363.440	398330.219	45.378
KC01	384388.563	398220.780	45.610
RL01	384478.599	398258.080	46.575
RL02	384458.938	398225.634	46.351
RL03	384430.174	398191.461	46.059
RL04	384411.085	398157.323	45.772
RL05	384379.927	398156.455	45.458
RL1A	384522.110	398259.570	46.902
RL1C	384473.114	398285.180	46.482
RL2A	384483.068	398215.642	46.244
RL3A	384443.301	398179.366	45.922
RL4B	384373.299	398184.342	45.551
RL4C	384313.161	398238.777	45.485
TT01	384374.084	398203.905	45.627
TT1A	384403.268	398177.463	45.659
RL1B	384544.399	398258.148	47.087
RL4A	384389.878	398132.949	45.495
TT1B	384426.854	398157.261	45.632
RL4D	384292.848	398234.727	45.369
RL4E	384344.855	398228.042	45.407
FEBE1	384224.964	398272.356	44.864
GS2A	384345.174	398341.825	45.003

REV	DESCRIPTION	DRAWN	APPR	DATE
1	Detail Added	RD	SR	14/5/24

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE: Piccadilly Gardens, Manchester M60 1AY				
DRAWING DETAIL: TOPOGRAPHICAL SURVEY Sheet 1 of 4				
CLIENT: Manchester City Council				SCALE: 1:200
SURVEYOR: JL SO GS JB	SURVEY DATE: Apr 24	CHECKED BY: NAD	APPROVED BY: SR	DWG STATUS: FINAL
DRAWING NUMBER: 65277MCLS-01			REVISION: 1	ISSUE DATE: 19/04/24

RICS
chartered ices
THE SURVEY ASSOCIATION
ISO 9001 REGISTERED FIRM
QMS ISO 14001 : 2015 REGISTERED

SHEET LAYOUT



Levels are related to **OSGB15**
Value **N/A**

Coordinates are related to **National Grid** (GPS)

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C/P	Concrete Panel	FL	Floor Level
H/R	Hand Rail	IL	Invert Level
R/B	Rail & Bridge	OL	Overhead Cable Level
R/C	Rail & Chain	PL	Parapet Level
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P/W	Post & Wire		
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Level Profile Descriptions

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TW	Top Of Wall Level
Thr	Threshold Level
WL	Water Level

50.00 Spot Level

SSL1 50.00 Survey Control Station *=coordinated point)

Tree
Multi Trunk

Fence
Safety Barrier
Gate
Slab
Hedge
Limit of Foliage & Tree Canopy

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Telecom	W	Water	Service depth (m)
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CATV	Unknown / misc		End of trace
Utility Survey Boundary	Ducting		Unable to trace

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QL-B1P	PAS128 QL-B1P

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STATIONS	EASTINGS	NORTHINGS	LEVEL
GPS1	384353.923	398318.078	45.413
GPS2	384327.471	398330.634	44.979
ALC2	384327.471	398330.634	44.979
ALC0	384403.069	398296.404	45.953
ALC3	384437.487	398279.189	46.398
ALC4	384390.859	398263.428	45.946
ALC5	384368.669	398253.322	45.672
RLD1E	384358.518	398503.953	45.642
A101	384309.063	398279.777	45.306
ALC2	384442.786	398503.157	46.276
ALC1	384467.399	398479.322	46.072
ALC4	384453.308	398275.503	45.950
FEBA	384302.646	398308.108	44.689
FEBB	384293.920	398332.413	44.856
FEBC	384258.889	398214.641	44.838
FEBC1	384258.889	398214.641	44.838
FEBC2	384263.230	398258.911	45.355
FEBC3	384270.826	398229.288	45.360
FEBC4	384304.821	398204.978	45.270
FEBC5	384316.872	398177.942	45.371
FEBC6	384307.882	398177.942	45.371
FEBC7	384347.295	3398203.653	45.400
FEBC8	384303.034	398224.158	45.400
FEBC10	384291.677	398255.937	45.363
FEB1	384358.518	398503.953	45.642
FEB2	384189.172	398226.568	44.870
GS01	384421.508	398317.516	46.095
GS02	384388.560	398330.718	45.973
RL00	384478.599	398258.080	46.575
RL01	384458.938	398225.524	46.391
RL03	384430.174	398191.461	46.059
RL04	384419.827	398156.405	45.458
RL05	384419.827	398156.405	45.458
RL1A	384522.110	398259.570	46.902
RL1C	384473.114	398285.180	46.482
RL3A	384483.068	398215.642	46.244
RL3B	384473.299	398184.342	45.555
RL4B	384473.299	398184.342	45.555
RL4C	384313.181	398238.777	45.485
TT01	384474.084	398203.805	45.622
TT02	384464.269	398256.148	45.587
R1B	384464.269	398256.148	45.587
RL4A	384389.878	398132.949	45.495
TT1B	384435.854	398157.261	45.632
RL4C	384313.181	398238.777	45.485
RL4D	384344.855	398228.542	45.467
FEB01	384224.964	398272.356	44.864
GS2A	384345.174	398341.825	45.003

1	Detail Added	RD	SR	14/3/24
REV	DESCRIPTION	DRAWN	APPR	DATE

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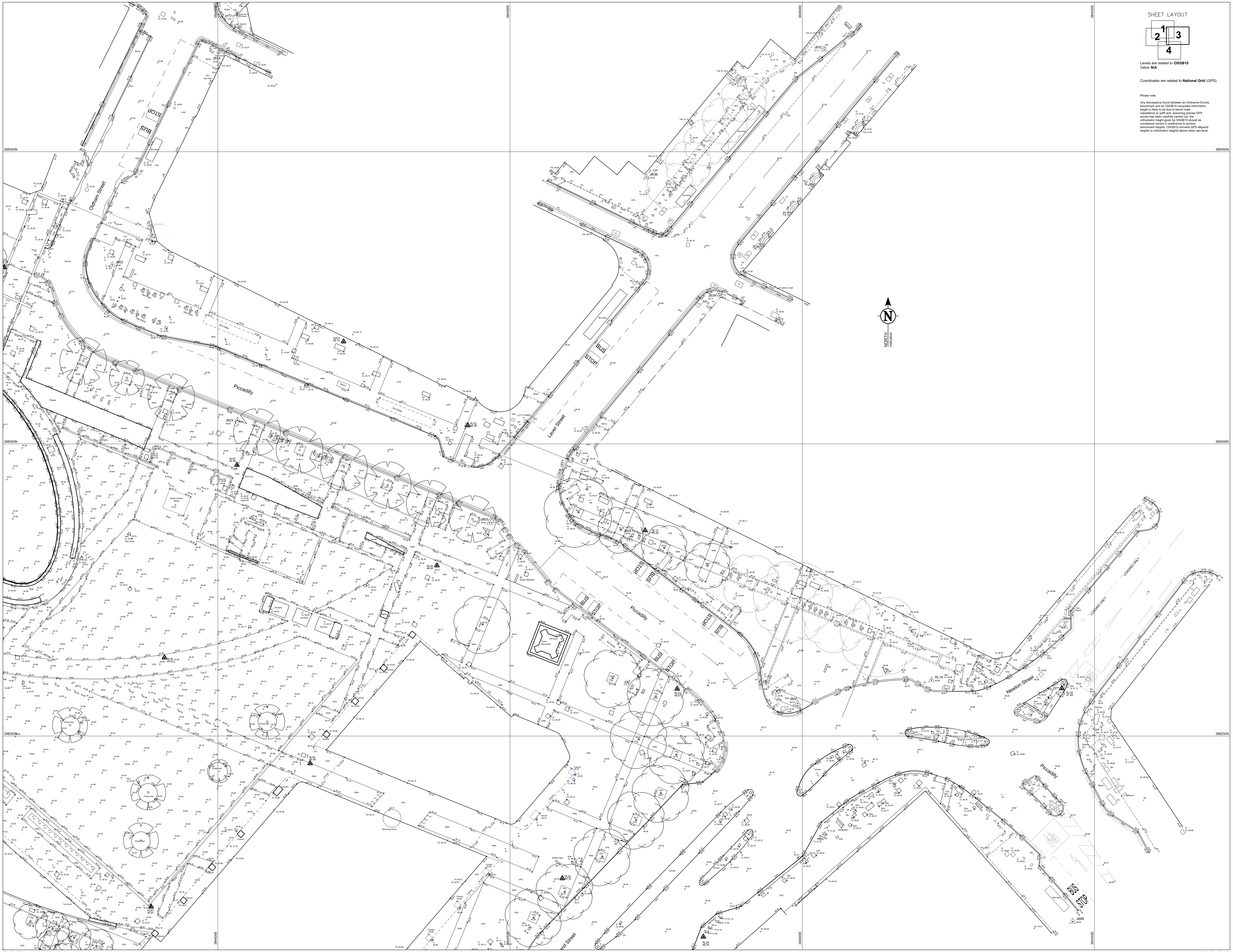
PROJECT TITLE	Piccadilly Gardens, Manchester M60 1AY
DRAWING DETAIL	TOPOGRAPHICAL SURVEY Sheet 2 of 4
CLIENT	Manchester City Council
SCALE	1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
JL SO GS JB	Apr 24	NAD	SR	FINAL

DRAWING NUMBER	REVISION	ISSUE DATE
65277MCLS-01	1	19/04/24

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Original Sheet Size A0H



SHEET LAYOUT

Levels are related to **OSGB15**
Value **N/A**

Coordinates are related to **National Grid** (GPS)

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.

Topographical Survey Legend

B	Bollard	h	Height	RWP	Rain Water Pipe
BS	Bus Stop	Hyd	Hydrant	SP	Soil Pipe
BT	Telecommunications IC	IC	Inspection Cover	SPS	Stone Paving Slabs
CPS	Concrete Paving Slabs	JB	Junction Box	ST	Stop Tap
CTV	Cable Television Cover	KO	Kerb Outlet	Stay	Cable Stay
DP	Downpipe	LB	Letter Box	SV	Stop Valve
DR	Drain	LP	Lamp Post	TCB	Telephone Call Box
Elec	Electrical IC	Mkr	Utility Marker	TL	Traffic Light
EP	Elec. Pole	MP	Mile Post	TP	Telegraph Pole
ER	Earth Rod	NP	Name Plate	TPS	Tactile Paving Slabs
FP	Flagpole	P	Post	VP	Vent Pipe
FT	Floodlight	PM	Parking Meter	WM	Water Meter
G	Gully	RE	Rodding Eye	WO	Water Outlet
GP	Gate Post	RS	Road Sign	UTL	Unable To Lift
GV	Gas Valve	RTW	Retaining Wall		

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

Level Prefix Descriptions

AL	Arch Level	RL	Roof/ridge Level
BL	Bed Level	SL	Soffit Level
CL	Cover Level	Spr	Arch Springing Level
EL	Eaves Level	TF	Top Of Fence Level
FL	Floor Level	TW	Top Of Wall Level
IL	Invert Level	Thr	Threshold Level
OL	Overhead Cable Level	WL	Water Level
PL	Parapet Level		

50.00 Spot Level
SSL1 50.00 Survey Control Station (coordinated point)
Tree Multi Trunk
C/L Fence
Safety Barrier
Gate
Stile
Hedge
Limit of Foliage & Tree Canopy

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

DRAWING NOTES

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

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Do not scale from this drawing.

Drainage/Services Legend

Foul		CATV	CCTV
Surface		E	Electric
Combined		SL	Street lighting
Drainage (unspecified)		TM	Traffic management
BT	British telecom	GAS	Gas
T	Telecom	W	Water
FO	Fibre optics	F	Fuel
CATV	CATV	UK	Unknown / misc
	Utility Survey Boundary		Ducting

d Service depth (m)
ø Pipe diameter (mm)
EOT End of trace
UTT Unable to trace

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

PAS128 Quality Levels

Please refer to PAS128:2014 Table 1 - "Quality level of survey outputs (normative)" for in anticipated accuracy of quality levels.

All utilities are located to PAS128 QL-B2 unless otherwise stated.

The following table identifies the PAS128 quality level based on the text notes shown on the drawing:

Annotation found on drawing	PAS128 Quality Level
Added from records	PAS128 QL-D
Trench scar, street furniture, visual note/reference to utility	PAS128 QL-C
Assumed route	PAS128 QL-B4
Unable to obtain depth	PAS128 QL-B3
QL-B1	PAS128 QL-B1
QL-B3P	PAS128 QL-B3P
QL-B2P	PAS128 QL-B2P
QL-B1P	PAS128 QL-B1P

Quality levels ending with a "P" refer to a utility that has been located with post processed Ground Penetrating Radar (GPR).

Drawing caveats, please note:

LSS 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 LSS 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.

Drainage routes between manholes, if not able to be traced by LSS survey methodologies, are assumed to be direct lines between manholes.

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

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL
GPS1	384353.923	398318.078	45.413
GPS2	384335.985	398269.355	45.263
AL01	384327.471	398331.634	44.976
AL02	384403.269	398296.404	45.953
AL03	384437.487	398279.189	46.398
AL04	384390.859	398263.428	45.966
GPS1A	384355.344	398299.228	45.541
RL01X	384328.519	398303.263	45.642
AT01	384309.063	398279.777	45.306
AL33	384442.786	398303.157	46.276
AL44	384415.788	398245.325	46.083
FE01	384287.399	398278.392	45.072
FEBA	384302.646	398358.108	44.689
FEBB	384293.920	398332.413	44.856
FEBC	384263.711	398304.877	44.832
FEBC1	384258.989	398274.661	44.836
FEBC2	384263.230	398258.911	45.355
FEBC3	384270.826	398229.288	45.380
FEBC4	384304.821	398204.976	45.270
FEBC5	384370.144	398145.486	45.297
FEBC6	384357.882	398177.942	45.371
FEBC7	384347.295	3398203.653	45.400
FEBC9	384303.034	398224.158	45.400
FEBC10	384291.677	398235.937	45.363
FEBD	384237.397	398260.168	44.877
FEBE	384186.172	398226.585	44.875
GS01	384421.508	398317.516	46.095
GS02	384363.440	398330.219	45.378
KC01	384388.585	398220.780	45.610
RL01	384478.599	398258.080	46.575
RL02	384458.938	398225.634	46.351
RL03	384430.174	398191.461	46.059
RL04	384411.085	398157.323	45.772
RL05	384379.927	398156.455	45.458
RL1A	384522.110	398259.570	46.902
RL1C	384473.114	398285.180	46.482
RL2A	384483.068	398215.642	46.244
RL3A	384443.301	398179.366	45.922
RL4B	384373.299	398184.342	45.551
RL4C	384313.161	398238.777	45.485
TT01	384374.084	398203.905	45.627
TT1A	384403.268	398177.463	45.659
RL1B	384544.399	398258.148	47.087
RL4A	384389.878	398132.949	45.495
TT1B	384426.854	398157.261	45.632
RL4D	384292.848	398234.727	45.369
RL4E	384344.855	398228.042	45.407
FEBE1	384224.964	398272.356	44.864
GS2A	384345.174	398341.825	45.003

REV	DESCRIPTION	DRAWN	APPR	DATE
1	Detail Added	RD	SR	14/5/24

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PROJECT TITLE
Piccadilly Gardens, Manchester M60 1AY

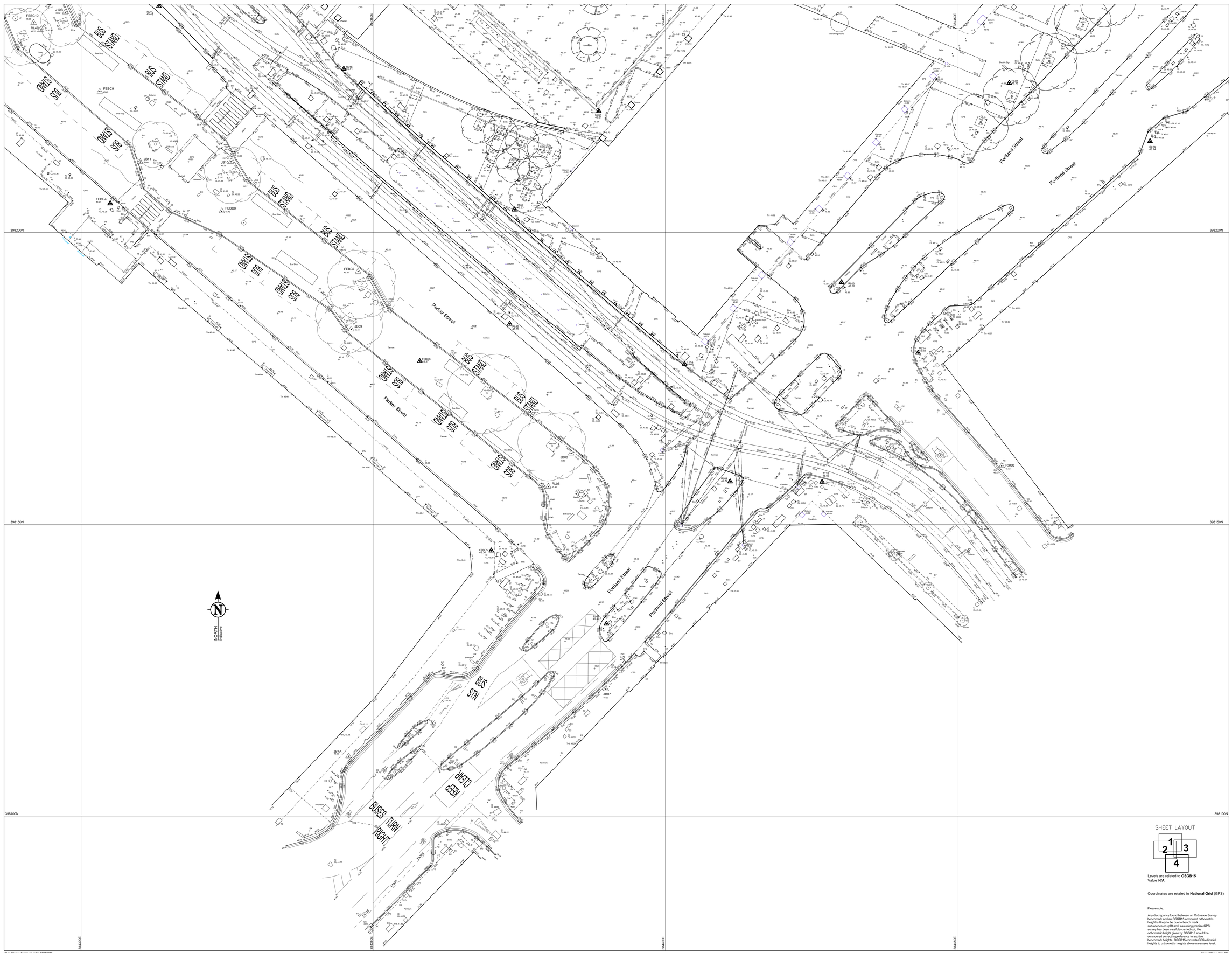
DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 3 of 4

CLIENT				SCALE
Manchester City Council				1:200
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
JL SO GS JB	Apr 24	NAD	SR	FINAL
DRAWING NUMBER			REVISION	ISSUE DATE
65277MCLS-01			1	19/04/24

RICS
chartered ices
THE SURVEY ASSOCIATION
ISO 9001 REGISTERED FIRM
QMS ISO 14001 : 2015 REGISTERED

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Topographical Survey Legend

BL	Bollard	Ht	Height	RWP	Rain Water Pipe
BT	Boundary Marker	HYD	Hydrant	SP	Soil Pipe
BTT	Telecommunications IC	IC	Inspection Cover	SPS	Stone Paving Slabs
CPS	Concrete Paving Slabs	JB	Junction Box	ST	Stop Tap
CTV	Cable Television Cover	KO	Kerb Outlet	SVay	Cable Stay
DC	Drainage	LP	Lamp Post	TC	Tree Canopy
DR	Drain	LT	Lamp Post	TCB	Telephone Cell Box
Elec	Electrical IC	Mkr	Utility Marker	TL	Traffic Light
EP	Elec. Pole	MP	Mile Post	TP	Telegraph Pole
ER	Earth Rod	NP	Name Plate	TPS	Tactile Paving Slabs
FB	Flowerbed	PC	Post	VC	Vent Column
FL	Floodlight	PM	Parking Meter	WM	Water Meter
G	Gully	RE	Rodding Eye	WO	Water Outlet
GP	Gate Post	RS	Road Sign	UTL	Unable To Lift
GV	Gas Valve	RTW	Retaining Wall		

Fence Annotation

B/W	Barbed Wire	AL	Arch Level
C/B	Closed Boarded	BL	Bed Level
C/I	Corrugated Iron	CL	Cover Level
C/P	Close Pale	EL	Eave Level
C/P	Concrete Panel	FL	Floor Level
H/R	Hand Rail	IL	Invert Level
R/R	Run Railings	OL	Overhead Cable Level
S/B	Stone Boundary	PL	Parapet Level
T/C	Steel & Chain		
P/	Post & Rail		
P/W	Post & Wire		
W/M	Wire Mesh		

Level Profile Descriptions

RL	Roofridge Level		
SL	Soffit Level		
SpF	Arch Springing Level		
TF	Top Of Fence Level		
TW	Top Of Wall Level		
Thr	Threshold Level		
WL	Water Level		

Spot Level: 50.00

SSL1 50.00 Survey Control Station (coordinated point)

Tree: Multi Trunk

Fence, Safety Barrier, Gate, Stile, Hedge, Limit of Foliage & Tree Canopy

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

DRAWING NOTES

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

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Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

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Do not scale from this drawing.

Drainage/Services Legend

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

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.

PAS128 Quality Levels

Please refer to PAS128:2014 Table 1 - "Quality level of survey outputs (normative)"

for in anticipated accuracy of quality levels.

All utilities are located to PAS128 QL-B2 unless otherwise stated.

The following table identifies the PAS128 quality level based on the text notes shown on the drawing.

Annotation found on drawing	PAS128 Quality Level
Added from records	PAS128 QL-D
Trench scar, street furniture, visual note/reference to utility	PAS128 QL-C
Assumed route	PAS128 QL-B4
Unable to obtain depth	PAS128 QL-B3
QL-B1	PAS128 QL-B1
QL-B3P	PAS128 QL-B3P
QL-B2P	PAS128 QL-B2P
QL-B1P	PAS128 QL-B1P

Quality levels ending with a "P" refer to a utility that has been located with post processed Ground Penetrating Radar (GPR).

Drawing caveats, please note:

LSS 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 LSS 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.

Drainage routes between manholes, if not able to be traced by LSS survey methodologies, are assumed to be direct lines between manholes.

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

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL
GPS1	384353.923	398318.078	45.413
GPS2	384330.985	398369.155	45.263
ALO1	384327.471	398331.634	44.976
ALO2	384403.289	398296.404	45.953
ALO3	384437.487	398279.189	46.398
ALO4	384455.344	398289.228	45.541
GPS1A	384355.344	398289.228	45.541
RL01X	384328.919	398301.263	45.642
ATO1	384309.063	398279.777	45.306
AL53	384442.786	398303.157	46.276
AL52	384437.399	398278.302	46.072
FE01	384287.399	398278.302	45.072
FEBA	384302.646	398338.108	44.699
FEBB	384263.910	398332.413	44.852
FEBC	384263.330	398332.413	44.852
FEBC1	384258.989	398274.661	44.836
FEBC2	384263.230	398258.911	45.355
FEBC3	384270.828	398229.288	45.380
FEBC4	384370.144	398145.496	45.297
FEBC5	384370.144	398145.496	45.297
FEBC6	384357.882	398177.942	45.371
FEBC7	384347.295	398203.653	45.400
FEBC9	384303.034	398224.158	45.400
FEBC8	384303.034	398224.158	45.400
FEBD	384237.397	398060.168	44.877
FEBE	384186.172	398226.585	44.875
GS01	384421.508	398317.516	46.095
GS02	384383.440	398330.219	45.376
RL01	384478.599	398258.680	45.575
RL01	384478.599	398258.680	45.575
RL02	384458.938	398225.634	46.351
RL03	384441.084	398197.323	45.773
RL04	384441.084	398197.323	45.773
RL05	384379.927	398156.455	45.458
RL1A	384322.110	398209.570	46.902
RL1C	384473.314	398285.562	46.482
RL1D	384473.314	398285.562	46.482
RL3A	384443.301	398176.366	45.822
RL4B	384373.299	398184.342	45.551
RL4C	384313.161	398238.777	45.465
TT01	384374.084	398303.905	45.627
RL10	384344.399	398258.146	47.087
RL10	384344.399	398258.146	47.087
RL4A	384389.878	398132.949	45.495
RL1B	384400.844	398134.701	45.520
RL1E	384400.844	398134.701	45.520
RL4E	384344.853	398228.042	45.407
FEBE1	384224.964	398272.356	44.864
GS2A	384345.174	398341.825	45.003

REV	DESCRIPTION	DRAWN	APPR	DATE
1	Detail Added	RD	SR	14/5/24

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SHEET LAYOUT

Levels are related to **OSGB15** Value **N/A**

Coordinates are related to **National Grid** (GPS)

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.

PROJECT TITLE
Piccadilly Gardens, Manchester M60 1AY

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 4 of 4

CLIENT
Manchester City Council

SCALE
1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
JL SO GS JB	Apr 24	NAD	SR	FINAL

DRAWING NUMBER
65277MCLS-01

REVISION
1

ISSUE DATE
19/04/24

RICS REGULATED FIRMS · ICES · THE SURVEY ASSOCIATION · ISO 14001:2015 REGISTERED

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Original Sheet Size A0H

Appendix C

Ground Penetration Radar (Utilities Survey)

PAS 128: 2014 QUALITY LEVEL GUIDE

QL-LEVEL	DESCRIPTION	ACC.	QL-LEVEL	DESCRIPTION
QL-D	Terrain evidence below from records.	metres	QL-B2	Inspection & location of utility using only non destructive techniques
QL-C	Visual evidence of surface & below ground supplemented by geophysical technology	metres	QL-B1	Inspection & location of utility using multiple geophysical techniques
QL-B4	Trial hole data providing a point vision of an underlying utility	0.1	QL-A	Inspection & location of utility using non destructive excavation to obtain accurate, detailed, and comprehensive data
QL-B3	Utilities made 'fit for the purpose of' follow trial hole data and verification			

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV &
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optics
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
GM/GS and/or VM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm.C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (GL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

SURVEY RECOMMENDATIONS

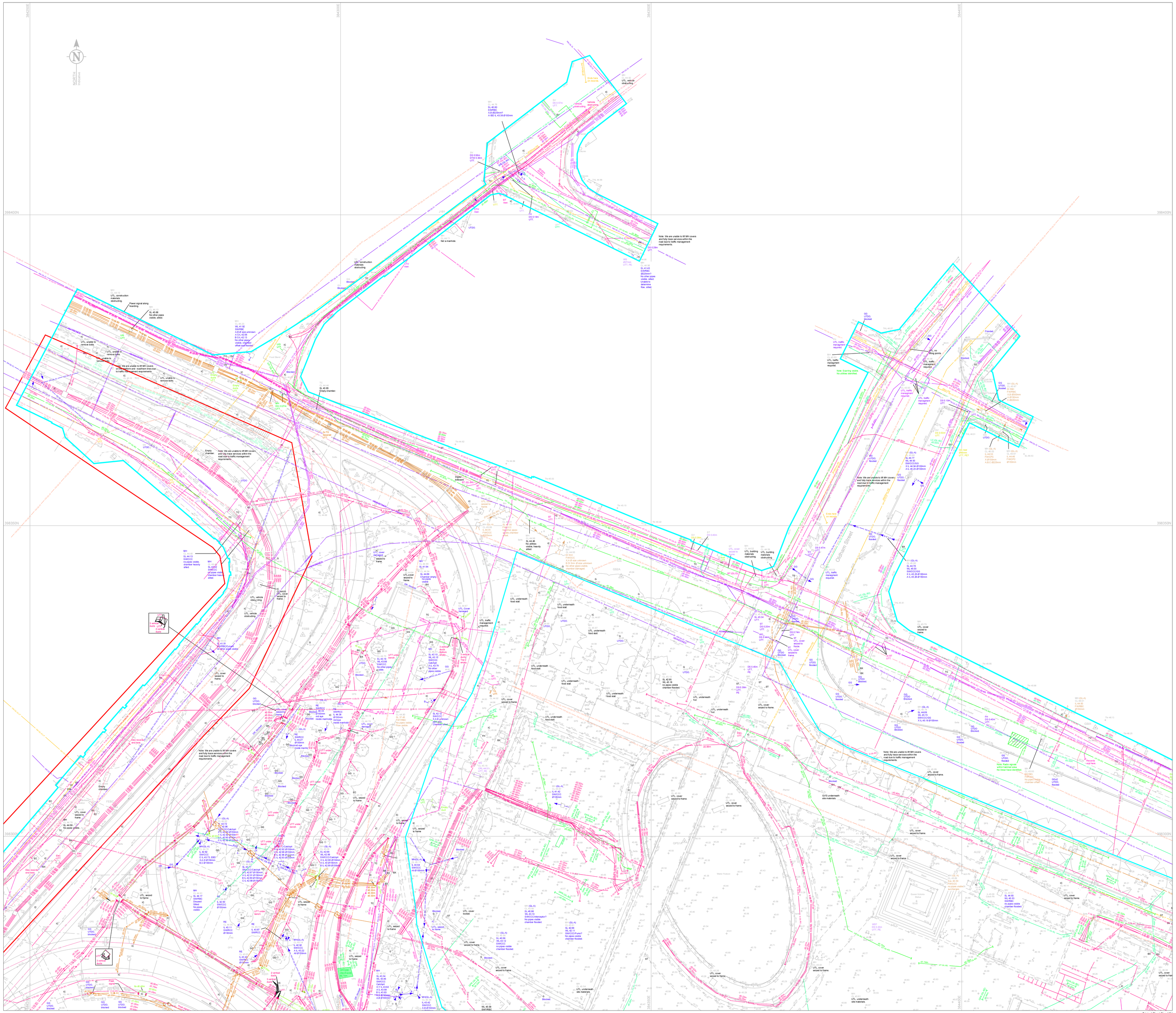
An up to date topographical survey drawing to overlay PAS utility information onto.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

Note: Covers not lifted within the carriageway or tramway require traffic management.
Covers on the tram platforms couldn't be lifted due to obscure lifting points.

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UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

1D 3C	1 Duct 3 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Bale Level	DTS	Depth To Surcharge	SuL	Surcharge Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace →	UTC	Unable To CCTV
CCC	Circular Conc Chamber	IBD	Internal Backdrop	UTDO	Unable To Determine Outlet
CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CrL	Crown Level	PD	Pole Dept Response	UTT	Unable To Trace
CU	Camera Under Water →	RSB	Rod Bend	WL	Water Level

BT CABLE(S)
DUCT(S) (HELD BY CABLE(S))
COMMUNICATIONS CABLE(S)
CABLE TV CABLE(S)
EMPTY DUCT
ELECTRIC CABLE(S)
OVERHEAD ELECTRIC CABLE(S)
FIBREOPTIC CABLE(S)
FUEL PIPE(S)
GAS MAIN
GAS SERVICE
GROUND PENETRATING RADAR (GPR) TRACE
HOT WATER PIPE
LIGHTING CIRCUIT
OIL PIPE(S)
SCANNED SCARRING
SECURITY CABLING
TELECOM CABLE(S)
TRAFFIC CABLE(S)
UNIDENTIFIED SERVICE
UNIDENTIFIED TRACE
WATER MAIN
WATER SERVICE
COMBINED WATER
COMBINED WATER RISING MAIN
EFFLUENT WATER
FOUL SEWER
FOUL WATER RISING MAIN
SURFACE WATER SEWER
SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note: UTILITIES COMMENT BOX (GENERAL NOTES)
DEPTH TO SERVICE

AUDIBLE CONNECTION
SERVICE ABOVE GROUND
CAMERA UNDER WATER
SERVICE OVERHEAD

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to invents, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 65277 from MANCHESTER CITY COUNCIL. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL DWG DRAWING INFORMATION
TOPOGRAPHICAL SURVEY DATE 19/04/2024

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	LSS supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS
AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: YES

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	YES	UNITED UTILITIES
WATER MAIN	YES	UNITED UTILITIES
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	BT-WCOS-CITY FIBRE
CABLE TV	YES	BT-SKY-VIRGIN MEDIA
ELECTRICITY	YES	ELECTRICITY NORTH WEST
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
A	ADDITIONAL AREA SURVEYED.	DT	PI	RDN	15/06/2024

SURVEY SOLUTIONS
LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING
0845 040 5969
survey-solutions.co.uk
IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
PICCADILLY GARDENS
MANCHESTER. M60 1AY

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 1 OF 5

CLIENT
MANCHESTER CITY COUNCIL

SCALE
1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
TH OB OS	15/06/2024	DWR/DCB	DWR	PRELIM

DRAWING NUMBER	REVISION	ISSUE DATE
65277MCUG-01	A	27/06/2024

PAS 128: 2014 QUALITY LEVEL GUIDE

QL-LEVEL	DESCRIPTION	ACC.	QL-LEVEL	DESCRIPTION
QL-D	Terrain positions below from records.	useless	QL-B0	Inspection & surface location using only one geophysical technique
QL-C	Initial location & physical information from a combination of geophysical techniques	useless	QL-B3	Inspection & surface location using multiple geophysical techniques
QL-B4	Trial trenching and vacuum excavation to mark the position, confirm depth and validate the survey	1/2"	QL-A	Excavation, trial trenching and vacuum excavation to expose, characterise, validate and record utilities
QL-B3	Utilities shown by the geophysical technique but will require trial trenching/digging			

DETECTION METHOD

IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, chamber sizes/type and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lamp holes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity

Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV &

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optics

FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables

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Gas & Water Inc, Fuel Pipes and Hot Water Pipes

GM/GS and/or VM/VS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar

GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm,Ø63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces

All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (GL-C)

Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (GL-B4/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

SURVEY RECOMMENDATIONS

An up to date topographical survey drawing to overlay PAS utility information onto.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

Note: Covers not lifted within the carriageway or tramway require traffic management.
Covers on the tram platforms couldn't be lifted due to obscure lifting points.

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UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

10 SC	1 Duct 5 Cables	DCr	Depth To Crown	RSC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Bare Level	DTS	Depth To Surcharge	SUL	Surcharge Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace →●	UTC	Unable To CCTV
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CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CL	Crown Level	PR	Pole Depth Response	UTT	Unable To Trace
CU	Camera Under Water →●	RSB	Rod Bend	WL	Water Level

BT CABLES
CHANNELED BT CABLES
COMMUNICATIONS CABLES
CABLE TV CABLE(S)
EMPTY DUCT
ELECTRIC CABLE(S)
OVERHEAD ELECTRIC CABLE(S)
FIBEROPTIC CABLE(S)
FUEL PIPE(S)
GAS MAIN
GAS SERVICE
GROUND PENETRATING RADAR (GPR) TRACE
HOT WATER PIPE
LIGHTING CIRCUIT
OIL PIPE(S)
SECURITY SCARRING
SECURITY CABLING
TELECOM CABLE(S)
TRAFFIC CABLE
UNIDENTIFIED SERVICE
UNIDENTIFIED TRACE
WATER MAIN
WATER SERVICE
WATER TANK/TOWER
COMBINED WATER RISING MAIN
EFFLUENT WATER
FOUL SEWER
FOUL WATER RISING MAIN
SURFACE WATER SEWER
SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note: UTILITIES COMMENT BOX (GENERAL NOTES)
DEPTH TO SERVICE

AUDIBLE CONNECTION
SERVICE ABOVE GROUND
CAMERA UNDER WATER
SERVICE OVERHEAD

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to invents, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

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Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

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© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 65277 from MANCHESTER CITY COUNCIL. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/ DWG DRAWING INFORMATION

TOPOGRAPHICAL SURVEY DATE 19/04/2024

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	LSS supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS

AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: YES

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	YES	UNITED UTILITIES
WATER MAIN	YES	UNITED UTILITIES
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	BT-KECS-CITY FIBRE
CABLE TV	YES	BT-SKY-VIRGIN MEDIA
ELECTRICITY	YES	ELECTRICITY NORTH WEST
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV.	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
A	ADDITIONAL AREA SURVEYED.	DT	PI	RON	15/06/2026

SURVEY SOLUTIONS
LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING
0845 040 5969
survey-solutions.co.uk
IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
PICCADILLY GARDENS
MANCHESTER, M60 1AY

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 2 OF 5

CLIENT
MANCHESTER CITY COUNCIL

SCALE
1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
TH OB CG	16/05/2024	DWR/DCB	DWR	FINAL

DRAWING NUMBER	REVISION	ISSUE DATE
65277MCUG-02	A	27/06/2024

Original Sheet Size A0H1

PAS 128: 2014 QUALITY LEVEL GUIDE

QL-LEVEL	DESCRIPTION
QL-D	Service positions below from records.
QL-C	Service positions of surface fixed fittings, underground by geophysical techniques
QL-B	Service positions by detection and correlation of surface fixed fittings
QL-A	Service positions by trial excavation and subsequent measurement

QC	QL-LEVEL	DESCRIPTION
QC-1	QL-B2	Inspection & surface location using only one geophysical technique
QC-2	QL-B3	Inspection & surface location using two or more geophysical techniques
TT	QL-A	Inspection, surface location and trial excavation to expose

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lamp holes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
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Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

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Ground Penetrating Radar
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Unidentified Traces
All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scanning (QL-C)
Scanning has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between those points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

SURVEY RECOMMENDATIONS

An up to date topographical survey drawing to overlay PAS utility information onto.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

Note: Covers not lifted within the carriageway or tramway require traffic management.
Covers on the tram platforms couldn't be lifted due to obscure lifting points.

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UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

10 SC	1 Duct 5 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Bass Level	DTS	Depth To Surcharge	SuL	Surcharge Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace →	UTC	Unable To CCTV
CCC	Circular Conc Chamber	IBD	Internal Backdrop	UTDO	Unable To Determine Outlet
CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CrL	Crown Level	PD	Pole Depth Response	UTT	Unable To Trace
CU	Camera Under Water →	RB	Rod Bend	WL	Water Level

BT CABLES
DUCT(S)
OVERHEAD BT CABLE(S)
COMMUNICATIONS CABLE(S)
CABLE TV CABLE(S)
EMPTY DUCT
ELECTRIC CABLE(S)
OVERHEAD ELECTRIC CABLE(S)
FIBREOPTIC CABLE(S)
FUEL PIPE(S)
GAS MAIN
GAS SERVICE
GROUND PENETRATING RADAR (GPR) TRACE
HOT WATER PIPE
LIGHTING CIRCUIT
OIL PIPE(S)
SECURITY CABLING
SECURITY CABLING
TELECOM CABLE(S)
TRAFFIC CABLE
UNIDENTIFIED SERVICE
UNIDENTIFIED TRACE
WATER MAIN
WATER SERVICE
WATER TANK/TOWER
COMBINED WATER RISING MAIN
EFFLUENT WATER
FOUL SEWER
FOUL WATER RISING MAIN
SEWER MAIN
SURFACE WATER SEWER
SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note: UTILITIES COMMENT BOX (GENERAL NOTES)
DEPTH TO SERVICE

AUDIBLE CONNECTION
SERVICE ABOVE GROUND
CAMERA UNDER WATER
SERVICE OVERHEAD

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature. GPR depths to the top of a feature and drainage depth shown to invents, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 65277 from MANCHESTER CITY COUNCIL. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/ DWG DRAWING INFORMATION
TOPOGRAPHICAL SURVEY DATE 19/04/2024

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	LSS supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS
AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: YES

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	YES	UNITED UTILITIES
WATER MAIN	YES	UNITED UTILITIES
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	BT-NEOS-CITY FIBRE
CABLE TV	YES	BT-SKY-VIRGIN MEDIA
ELECTRICITY	YES	ELECTRICITY NORTH WEST
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
A	ADDITIONAL AREA SURVEYED	DF	PI	RGN	15/06/2026

SURVEY SOLUTIONS
LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING
0845 040 5969
survey-solutions.co.uk
IPSWICH KEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE	PICCADILLY GARDENS MANCHESTER, M60 1AY
DRAWING DETAIL	UTILITIES AND DRAINAGE SURVEY. SHEET 3 OF 5
CLIENT	MANCHESTER CITY COUNCIL
SCALE	1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
TH OB CG	16/05/2024	DWR/DCB	DWR	FINAL

DRAWING NUMBER	REVISION	ISSUE DATE
65277MCUG-03	A	27/06/2024

PAS 128: 2014 QUALITY LEVEL GUIDE

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Undefined	QL-B2	Horizontal & vertical location using only one geophysical technique.
QL-C	Visual evidence of service existence but undetectable by geophysical technology.	Undefined	QL-B1	Horizontal & vertical location using multiple geophysical techniques.
QL-B4	Undetectable service present shown as an assumed route. (AR)	H: +/- 500mm V: N/A	QL-A	Horizontal & vertical position verification by open excavation, manholes and/or inspection chambers.
QL-B3	Horizontal location by one geophysical technique but with none or poor depth information.			

DETECTION METHOD

IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV drainage and will be shown as indicative only.

Electricity

Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic

FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables

LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar

GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm,C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces

All UIT's will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)

Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

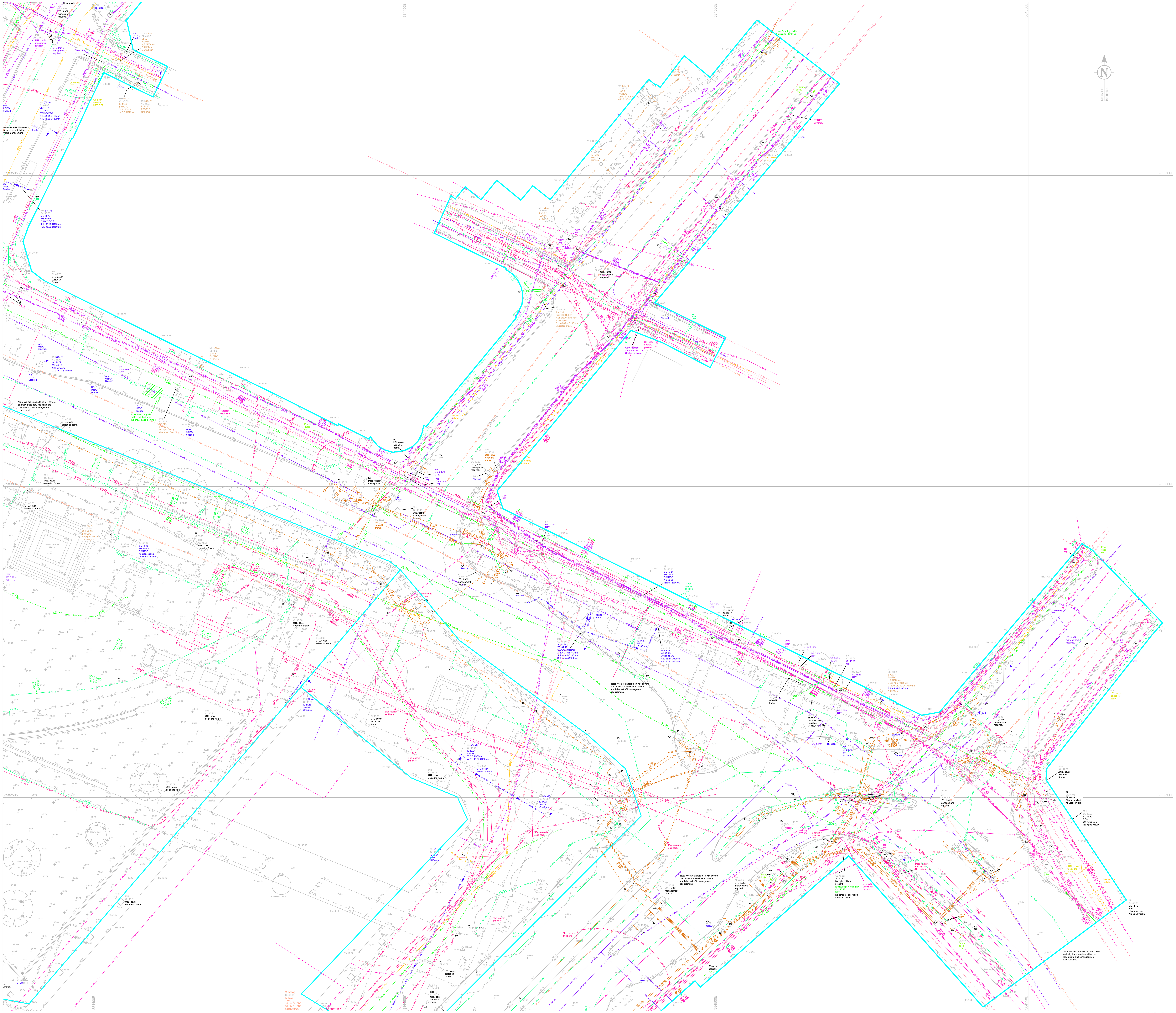
SURVEY RECOMMENDATIONS

An up to date topographical survey drawing to overlay PAS utility information onto.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

Note: Covers not lifted within the carriageway or tramway require traffic management.
Covers on the tram platforms couldn't be lifted due to obscure lifting points.



UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

1D 5C	1 Duct 5 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Base Level	DTS	Depth To Surcharge	SuL	Surcharge Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace	UTC	Unable To CCTV
CCC	Circular Conc Chamber	IBD	Internal Backdrop	UTDO	Unable To Determine Outfall
CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CrL	Crown Level	PDR	Poor Depth Response	UTT	Unable To Trace
CU	Camera Under Water	RB ●	Rest Bend	WL	Water Level

BT — BT CABLE(S)
O/BT — OVERHEAD BT CABLE(S)
COM — COMMUNICATIONS CABLE(S)
CTV — CABLE TV CABLE(S)
DUCT — EMPTY DUCT
E — ELECTRIC CABLE(S)
O/E — OVERHEAD ELECTRIC CABLE(S)
FO — FIBREOPTIC CABLE(S)
FUEL — FUEL PIPE(S)
GM — GAS MAIN
GS — GAS SERVICE
GPR — GROUND PENETRATING RADAR (GPR) TRACE
HW — HOT WATER PIPE
LC — LIGHTING CIRCUIT
OIL — OIL PIPE(S)
SCAR — VISIBLE SCARRING
SEC — SECURITY CABLING
TC — TELECOM CABLE(S)
TS — TRAFFIC SIGNAL
UIS — UNIDENTIFIED SERVICE
UIT — UNIDENTIFIED TRACE
WM — WATER MAIN
WS — WATER SERVICE
CW — COMBINED SEWER
CW RM — COMBINED WATER RISING MAIN
EW — EFFLUENT WATER
FOUL SEWER
FW RM — FOUL WATER RISING MAIN
RM — RISING MAIN
SURFACE WATER SEWER
SW RM — SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note: .... — UTILITIES COMMENT BOX (GENERAL NOTES)
d0.37m — DEPTH TO SERVICE

??-AC — AUDIBLE CONNECTION
??-AG — SERVICE ABOVE GROUND
??-CU — CAMERA UNDER WATER
??-OH — SERVICE OVERHEAD

NORTH Indicative

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 65277 from MANCHESTER CITY COUNCIL. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/ DWG DRAWING INFORMATION
TOPOGRAPHICAL SURVEY DATE 19/04/2024

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	LSS supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS
AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D) PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B COMMISSIONED: YES

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	YES	UNITED UTILITIES
WATER MAIN	YES	UNITED UTILITIES
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	BT-NEOS-CITY FIBRE
CABLE TV	YES	BT-SKY-VIRGIN MEDIA
ELECTRICITY	YES	ELECTRICITY NORTH WEST
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
A	ADDITIONAL AREA SURVEYED.	DT	PI	RDN	15/06/2026

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE: PICCADILLY GARDENS MANCHESTER, M60 1AY			
DRAWING DETAIL: UTILITIES AND DRAINAGE SURVEY. SHEET 4 OF 5			
CLIENT: MANCHESTER CITY COUNCIL			SCALE: 1:200
SURVEYOR: TH OB CG	SURVEY DATE: 16/05/2024	CHECKED BY: DWR/DCB	APPROVED BY: DWR
DWG STATUS: FINAL			
DRAWING NUMBER: 65277MCUG-04		REVISION: A	ISSUE DATE: 27/06/2024

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Original Sheet Size A0H

PAS 128: 2014 QUALITY LEVEL GUIDE

QL-LEVEL	DESCRIPTION	QCC	QL-LEVEL	DESCRIPTION
QL-D	Tertiary positions taken from records.	QL-B2	Detected & surface evident using only a non-electronic technique.	
QL-C	Visible & surface evidence & evidence by engineering & geophysical technique.	confirm	QL-B3	Detected & surface evident using multiple geophysical techniques.
QL-B4	Trace, depth, material & precise position of service proven by an excavation.	QL-A	Detected, surveyed, verified and trace completed to invert.	
QL-B3	Detected location by one geophysical technique but confirmed by another technique.			

DETECTION METHOD

IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lamp/poles have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity

Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, duct sealing can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV &

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optics

FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. Where this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables

LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GM/GS and/or VM/VS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar

GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm.C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces

All UiTs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scanning (QL-C)

Scanning has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cis/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

SURVEY RECOMMENDATIONS

An up to date topographical survey drawing to overlay PAS utility information onto.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

Note: Covers not lifted within the carriageway or tramway require traffic management.
Covers on the tram platforms couldn't be lifted due to obscure lifting points.

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UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

10 SC	1 Out 5 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Base Level	DTS	Depth To Surcharge	SUL	Surcharges Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Concrete Brick Chamber	EOT	End Of Trace →	UTC	Unable To CCTV
CCC	Concrete Conc Chamber	IBD	Internal Backdrop	UTDO	Unable To Determine Outlet
CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CL	Crown Level	PD	Pole Depth Response	UTT	Unable To Trace
CU	Camera Under Water →	RB ●	Red Bend	WL	Water Level

BT CABLES
DARK/HEAD BT CABLE(S)
COMMUNICATIONS CABLE(S)
CABLE TV CABLE(S)
EMPTY DUCT
ELECTRIC CABLE(S)
OVERHEAD ELECTRIC CABLE(S)
FIBREOPTIC CABLE(S)
FUEL PIPE(S)
GAS MAIN
GAS SERVICE
GROUND PENETRATING RADAR (GPR) TRACE
HOT WATER PIPE
LIGHTING CIRCUIT
OIL PIPE(S)
RAILWAY SCARRING
SECURITY CABLING
TELECOM CABLE(S)
TRAFFIC CABLE
UNIDENTIFIED SERVICE
UNIDENTIFIED TRACE
WATER MAIN
WATER SERVICE
WATER TANK/TOWER
COMBINED WATER RISING MAIN
EFFLUENT WATER
FOUL SEWER
FOUL WATER RISING MAIN
SEWER MAIN
SURFACE WATER SEWER
SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note: UTILITIES COMMENT BOX (GENERAL NOTES)
DEPTH TO SERVICE

AUDIBLE CONNECTION
SERVICE ABOVE GROUND
CAMERA UNDER WATER
SERVICE OVERHEAD

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

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Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature. GPR depths to the top of a feature and drainage depth shown to invents, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

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All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 65277 from MANCHESTER CITY COUNCIL. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/ DWG DRAWING INFORMATION
TOPOGRAPHICAL SURVEY DATE 19/04/2024

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	LSS supplied	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS
AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: YES

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	YES	UNITED UTILITIES
WATER MAIN	YES	UNITED UTILITIES
GAS MAIN	PUBLIC	CADENT GAS
TELECOM	PUBLIC	BT-NEOS-CITY FIBRE
CABLE TV	YES	BT-SKY-VIRGIN MEDIA
ELECTRICITY	YES	ELECTRICITY NORTH WEST
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
A	ADDITIONAL AREA SURVEYED.	DT	FH	RDN	15/06/2025

SURVEY SOLUTIONS
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LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE	PICCADILLY GARDENS MANCHESTER. M60 1AY
DRAWING DETAIL	UTILITIES AND DRAINAGE SURVEY. SHEET 5 OF 5
CLIENT	MANCHESTER CITY COUNCIL
SCALE	1:200

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
TH OB CG	16/05/2024	DWR/DCB	DWR	FINAL

DRAWING NUMBER	REVISION	ISSUE DATE
65277MCUG-05	A	27/06/2024

Original Sheet Size A0H

Appendix D

United Utilities Pre Development Enquiry

WASTEWATER PRE-DEVELOPMENT ENQUIRY

United Utilities
Water for the North West

United Utilities Grasmere House, 2nd Floor
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

07.07.26

Dear Paul,

Pre-Development Enquiry for Piccadilly Gardens, Manchester, M1 1AF. UU Reference Number: 09661200

We have assessed your application based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your strategy will need review by other authorities as part of the planning process. We advise conducting necessary site investigations to confirm viability of your proposals.

Modelled Flood Risk

Please see the image on **page 3** for details

I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

Please see **comment 2** of the attached guidance sheet

Asset Protection

1. According to our public sewer records, there are public sewers located within your site boundary. This requires an easement of 3m. If you cannot achieve the required clearance, you may wish to consider diverting and or abandoning the public sewer.

Please see **comment 3** of the attached guidance sheet and **Working Near Our Pipelines Guidance document**

Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer system.

Our preferred point of discharge would be to the North of your proposed development at an unrestricted rate.

Manhole reference SD3301, **Grid reference** 384357, 398312

WASTEWATER PRE-DEVELOPMENT ENQUIRY

Please see the images on **page 3** for clarification

Surface Water

Follow the National Planning Policy Guidance drainage hierarchy and Provide evidence for discounting higher options before considering public sewer discharge. Consult the Lead Local Flood Authority regarding surface water concerns.

Please see comment **4** within the guidance sheet

Infiltration

Please see comment **4** within the guidance sheet

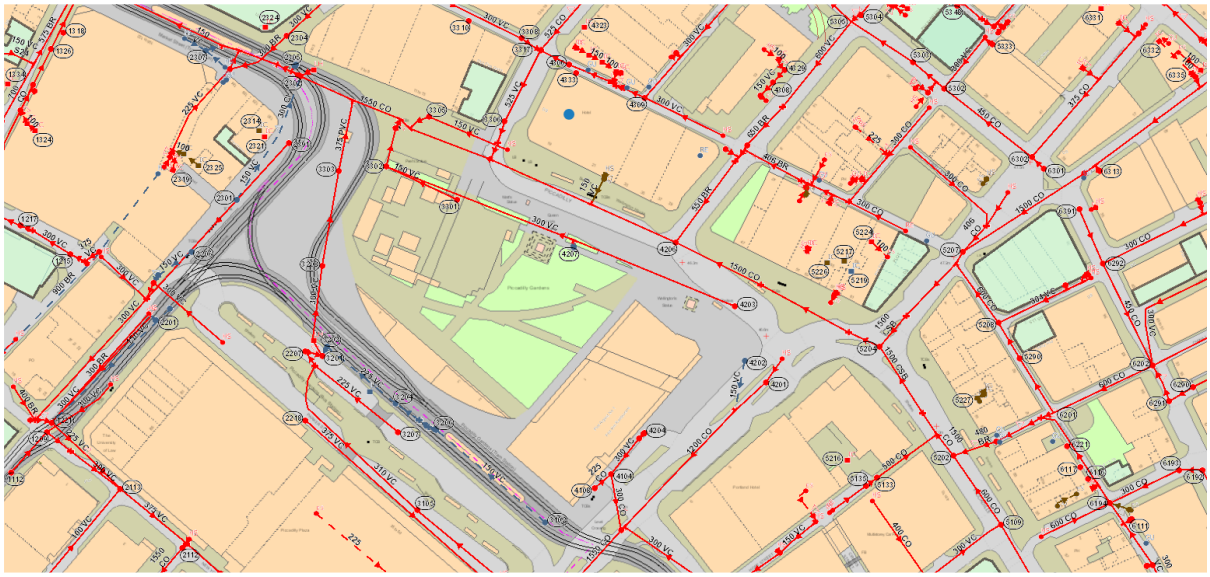
Public Sewer

United Utilities will consider a connection to the 300mm diameter public combined sewer within the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities requests that any agreed rate does not exceed 5 l/s.

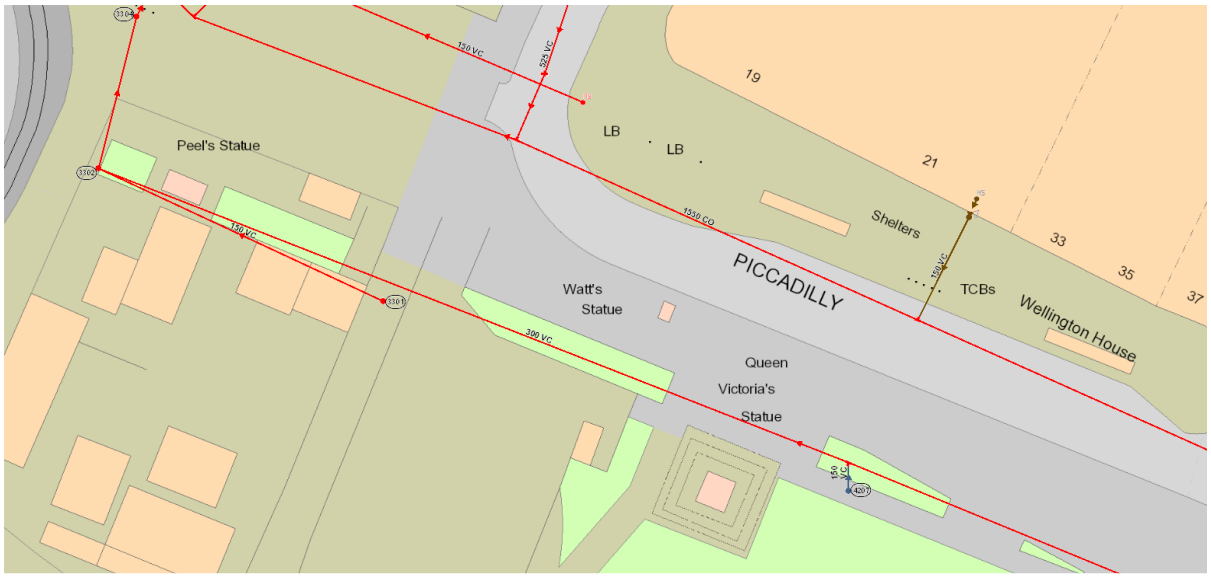
Grid reference 384375, 398305

Please see images on **page 3** for clarification

Site Images



WASTEWATER PRE-DEVELOPMENT ENQUIRY



Appendix E

Drainage Inspection and Maintenance Schedule

Piccadilly Gardens Redevelopment, Manchester

Drainage Inspection & Maintenance Schedule

Augst 2026

PREPARED FOR

Galliford Try on behalf of Manchester City Council



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Piccadilly Gardens Redevelopment, Manchester Drainage Inspection & Maintenance Schedule

Prepared By	Jack Lee, MEng, CEng		
Reviewed By	Jack Lee, MEng, CEng		
Report Reference	4475-CIV-XX-XX-T-C-00001		
Issued	07.08.2026		
Revisions			
Date	**Rev**	**Reason**	**Name**
August 26	P01	For Approval	Jack Lee, MEng, CEng

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1. Maintenance

The following document outlines the maintenance requirements for the project site. The responsibility of the required maintenance falls to the ultimate Client, Manchester City Council. The Client is expected to hire a Management Company to take ownership for the responsibility proposals for the various maintenance regimes.

The on-plot drainage network will be managed by a private company, the off plot drainage is proposed to be adopted by the Statutory Undertaker, Severn Trent Water, under a separate S106 agreement. STW have their own maintenance procedures and frequency.

1.1. General

This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where propriety products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

The existing combined water network has been retained with additional SuDS features added to provide attenuation. It may be that the exceedance flows above the 1 in 30-year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, or other space. As the flows are being attenuated on site there will be a period after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48 hours appropriate action should be taken as noted in this section.

1.2. Components

The following components have been included within the drainage design for the proposed development:

- Inspection and manhole chambers
- Catchpits
- Pipes
- Drainage channels and gullies
- Vortex Flow Control
- Cellular Attenuation Tank
- Bioretention System (Rain Garden)

The proposed locations of the components are indicated on Civic Engineers drawings:

- 4475-CIV-XX-ZZ-D-C-30001

Table 1 below shows the maintenance responsibilities of the various components.

Table 1 - Maintenance Responsibility

Component	Maintenance responsibility
Inspection chambers and manholes	Maintenance company
Pipes	Maintenance company
Drainage channels and plot gullies	Maintenance company
Vortex Flow Control	Maintenance company
Cellular Attenuation Tank	Maintenance company
Bioretention System (Rain Garden)	Maintenance company

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.

A copy of the final construction drainage layout should be provided in the final operations and maintenance manual.

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, and should be disposed of appropriately.

Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system. Sand and silt must not be disposed of into the drainage network.

During the winter months, drainage features such as channels should be cleared of ice, snow, debris, or litter.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the upstream/downstream catchpits.

1.3. Inspection and Manhole Chambers

Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with building Regulations Part H.

The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the maintenance manager prior to any access. Double locked and sealed manholes must be sealed and locked correctly post maintenance operation.

1.4. Pipes

Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture’s recommendations should be followed. Regardless of the product used the pipes will be fully compliant with Civic Engineers drainage specification.

Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the drainage rate. They are intended to be dry except for during rainfall events. Pipes which are proposed simply to convey water around the site have been designed such that they are considered to be self-cleansing. Where the primary function of the pipe/tank is to provide attenuation and the pipes are therefore oversized the velocity of water in the pipe may drop below 0.75m/s, which is considered to be self-cleansing. For larger diameter pipes

the risk is reduced due to the overall pipe size, however these pipes should be inspected for sediment build up.

Access for maintenance is provided through access chambers and manholes.

Regular inspection and maintenance are important to identify areas which may have been obstructed/clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Table 2 below shows the maintenance schedule for pipes, the actions required and the frequency of which these actions need to be undertaken.

Table 2 - Maintenance Schedule for Pipes

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

1.5. Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned using high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers can move within their frame, this may cause damage to the frame or seating.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Below, Table 3 shows the maintenance schedule for drainage channels and gullies, the actions required and the frequency of which these actions need to be undertaken.

Table 3 - Maintenance Schedule for Drainage Channels and Gullies

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

1.6. Vortex Flow Control

The proposed proprietary Vortex Flow Control should be inspected and cleaned in accordance with the manufacturer's recommendations.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers can move within their frame, this may cause damage to the frame or seating.

Sediment/material removal should be undertaken in accordance with the manufacturers recommended protocols.

Below, Table 4 shows the maintenance schedule for drainage Hydrodynamic Vortex Separator, the actions required and the frequency of which these actions need to be undertaken.

Table 4 - Maintenance Schedule for Vortex Flow Control

Maintenance schedule	Required action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial inspection of chamber.	Half yearly and after large storms.
Regular maintenance/inspection	Litter and debris removal	Monthly or as required.
Remedial action	Inspect chamber and rod through outlets as initial remediation. Manufacturers advice to be sought if blockage issues persist	As required.

1.7. Cellular Attenuation Tank

The proposed proprietary Cellular Attenuation Tank should be inspected and cleaned in accordance with the manufacturer's recommendations.

Maintenance requirements include Regular inspection of silt traps, and air vents and connected chambers with removal of sediment and debris as required.

Below, Table 5 shows the maintenance schedule for drainage Cellular Attenuation Tanks, the actions required and the frequency of which these actions need to be undertaken.

Table 5 - Maintenance Schedule for Cellular Attenuation Tank

Maintenance schedule	Required action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial inspection of chambers connected to tank.	Half yearly and after large storms.
Regular maintenance/inspection	Litter and debris removal	Monthly or as required.
Remedial action	Inspect chamber and rod through as initial remediation. Manufacturers advice to be sought if blockage issues persist	As required.

1.8. Bioretention System (Rain Garden)

The proposed raingardens for the bioretention systems at the proposed development site.

Table 6 below shows the maintenance required for the proposed raingardens.

Table 6 - Maintenance Schedule for Bioretention System (Rain Garden)

Activity/maintenance schedule	Required action	Frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockages	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter, and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

Appendix F

Drainage Strategy

STANDARD NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
4. ALL DISCREPANCIES SHOULD BE REPORTED TO C.A./E.A. PRIOR TO THE COMMENCEMENT OF WORKS.

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KEY

- SITE BOUNDARY
- PROPOSED SW MANHOLE & SEWER
- PROPOSED FW MANHOLE & SEWER
- PROPOSED RAIN GARDEN
- PROPOSED PERFORATED PIPE
- EXISTING UU COMBINED SEWER
- PROPOSED PPIC
- PROPOSED GULLY
- PROPOSED SW ATTENUATION TANK
- PROPOSED CHANNEL DRAIN
- PROPOSED PERMEABLE SURFACE
- PREDICTED UU ASSET NO BUILD ZONE (DETAILED IN PDE RESPONSE REF NUMBER 09661299)

1. TOPOGRAPHICAL SURVEY INFORMATION PROVIDED BY SURVEY SOLUTIONS, DATED: APRIL 2024, DRAWING NUMBER: 65277MCLS-01 SHEETS 1 TO 4
2. SITE BOUNDARY INFORMATION TAKEN FROM PLANIT SITE PLAN DRAWING TITLED: '4004-PLA-XX-XX-DR-L-0001-General Arrangement'.

0 6 12 Meters

Proposed Rain Garden. Storage: Approximately 12m³. Subject to detail design.
Proposed Planit Tree Pit removed as acceptance over the existing uu combined sewer network is extremely unlikely
Proposed Rain Garden Storage Approximately: 6m³ Subject to detail design
Proposed Rain Garden. Storage: Approximately 40m³. Subject to detail design.
Proposed Rain Garden. Storage: Approximately 18m³. Subject to detail design.
PREDICTED 3m UU EASEMENT OVER COMBINED WATER ASSET
Proposed Rain Garden. Storage: Approximately 30m³. Subject to detail design.
Proposed new Manhole on Existing United Utilities Combined Sewer. Subject to S104 approval with United utilities
Predicted 3m UU easement over combined water asset
Proposed softworks on accordance with landscape architect layout
Proposed Hydrobrake Flow Control Manhole. Restricting flows to 50% betterment Brownfield runoff requirement: 25.2 l/s
Proposed geocellular Attenuation Tank. Storage: Approximately 90m³. 1m deep Subject to detail design.
Extent of plant room taken from Civic point cloud file "Piccadilly Gardens Plant Room Manchester"
Overflow details of existing tank to be confirmed at next stage of design
Initial surveys state volume of tanks are 54m³, total 108m³
Proposed Rain Garden. Storage approximately:35m³ Subject to detailed design
Permeable Sub base and adjacent rain gardens Area:874m² Predicted Storage:129m³

RG01 CL: 45.572 IL: 44.372
RG02 CL: 45.273 IL: 44.073
RG03 CL: 45.00 IL: 44.00
RG04 CL: 45.269 IL: 44.069
RG05 CL: 45.015 IL: 44.015
RG06 CL: 46.112 IL: 45.000
RG07 CL: 45.876 IL: 44.900
RG08 CL: 45.28 IL: 44.500

MH 01 CL: 45.196 IL: 43.96
MH 01a CL: 45.146 IL: 43.697
MH 02 CL: 45.029 IL: 43.753
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MH 04 CL: 45.634 IL: 43.267
CMH 01 CL: 45.382 IL: tbc
MH 05 CL: 46.087 IL: 44.55
MH 06 CL: 46.205 IL: 44.900
MH 07 CL: 45.622 IL: 44.460
MH 08 CL: 46.180 IL: TBC WITH EXISTING TANK DETAIL
MH 08a CL: 46.069 IL: TBC WITH EXISTING TANK DETAIL
MH 09 CL: 46.048 IL: 44.109
MH 10 CL: 45.519 IL: TBC WITH EXISTING TANK DETAIL
MH 11 CL: 45.634 IL: 43.267

IL: 43.730
IL: 43.730

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Ø150 @ 1:150
Ø150 @ 1:150
Ø225@ 1:1000
Ø225 @ TBC
Ø225 @ 1:100

Oldham Street
Parker Street
Piccadilly

11.08.26	P04	AMENDED TO SUIT REVISED DISCHARGE RATE	MM / JDL
10.08.26	P03	UPDATED TO SUIT PLANIT LAYOUT	MM / JDL
15.07.26	P02	FOR PLANNING	FJH / JL
26.06.26	P01	FOR INFORMATION	MM / PM
DATE	REV	DESCRIPTION	DRAWN / CHKD

CIVIC

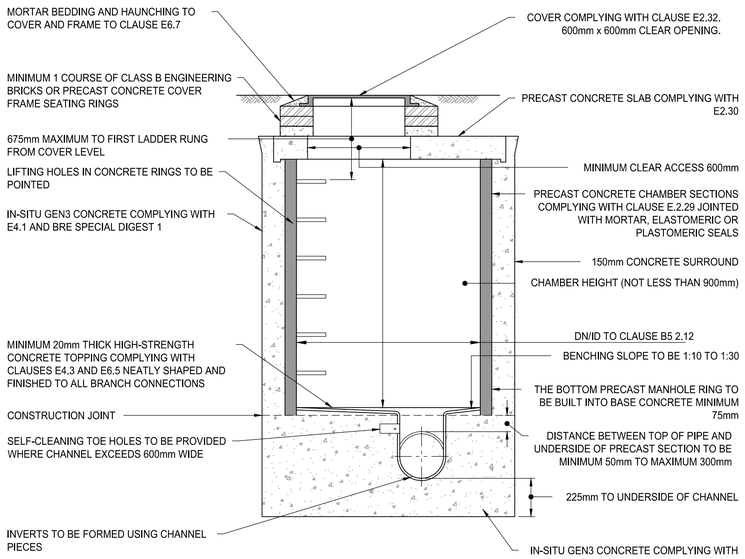
team-civic.com

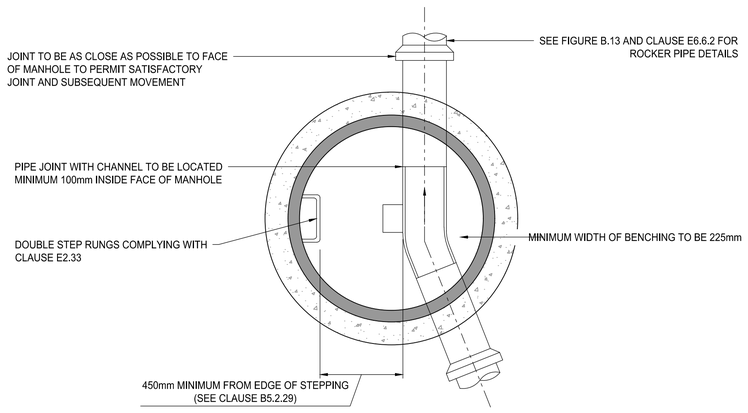
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PICCADILLY GARDENS

TITLE
INDICATIVE DRAINAGE STRATEGY

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DRAWING No.				REV
4475-CIV-XX-ZZ-D-C-30001				P04

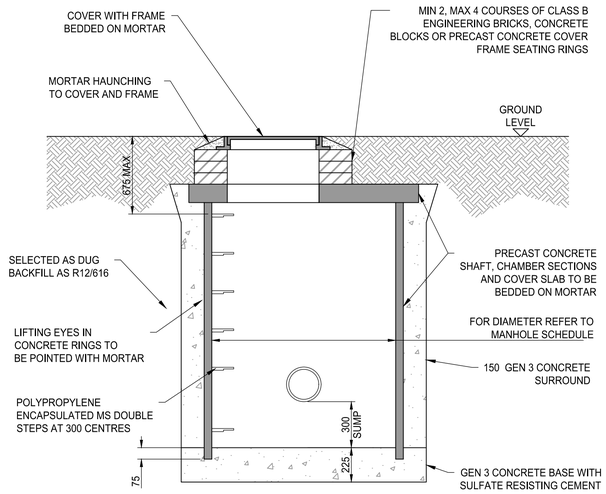
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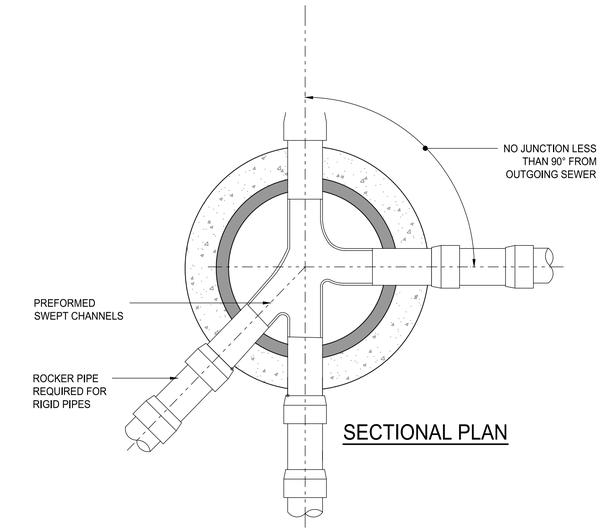


TYPICAL MANHOLE DETAIL

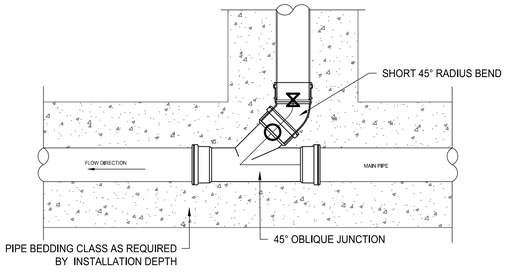
DEPTH FROM COVER TO SOFFIT OF PIPE 1.5m TO 3m
ALTERNATIVE RIGID MATERIAL CONSTRUCTION WITH CONCRETE SURROUND
(TO SEWER SECTOR GUIDANCE APPENDIX C)



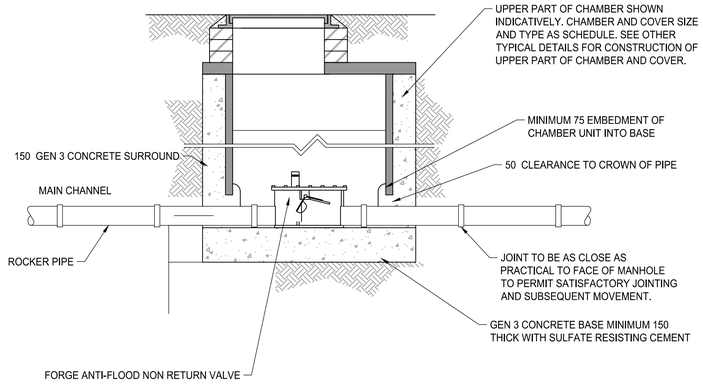
PRECAST CONCRETE CATCHPIT DETAIL



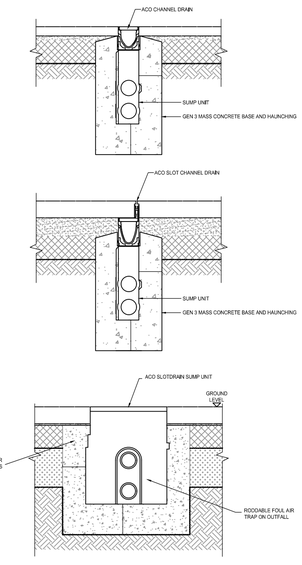
SECTIONAL PLAN



TYPICAL 45° PIPE JUNCTION CONNECTION DETAIL



NON-RETURN SEWER VALVE



SUMP UNIT CHANNEL/SLOT DRAIN DETAILS

ACO MULTIDRAIN SUMP UNIT OR SIMILAR APPROVED

STANDARD NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
4. ALL DISCREPANCIES SHOULD BE REPORTED TO C.A./E.A. PRIOR TO THE COMMENCEMENT OF WORKS.

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NOTES:

1. ALL DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH BS EN 852 AND BUILDING REGULATIONS APPROVED DOCUMENT H
2. ALL MATERIALS INCLUDING PIPES, CHAMBERS AND ALL ACCESSORIES SHALL CONFORM TO SECTION E2 OF THE SEWER SECTOR GUIDANCE APPENDIX C DCG.
3. MANHOLE COVERS TO BE ORIENTED PARALLEL TO ALIGN WITH PAVING, KERB LINES AND/OR BUILDINGS
4. ALL INTERNAL MANHOLE COVERS ARE TO BE DOUBLE SEALED AND LOCKABLE
5. PIPE CONNECTIONS NOT IN INSPECTION CHAMBERS OR MANHOLES SHALL BE MADE VIA PREFORMED OBLIQUE JUNCTIONS SWEPT IN THE DIRECTION OF FLOW

DATE	REV	DESCRIPTION	DRAWN	CHKD
10.08.26	P01	FOR INFORMATION	MM	JDL

CIVIC ENGINEERS
civicengineers.com

PROJECT
BROTHERTON HOUSE

TITLE
DRAINAGE STANDARD DETAILS
SHEET 1 OF 2

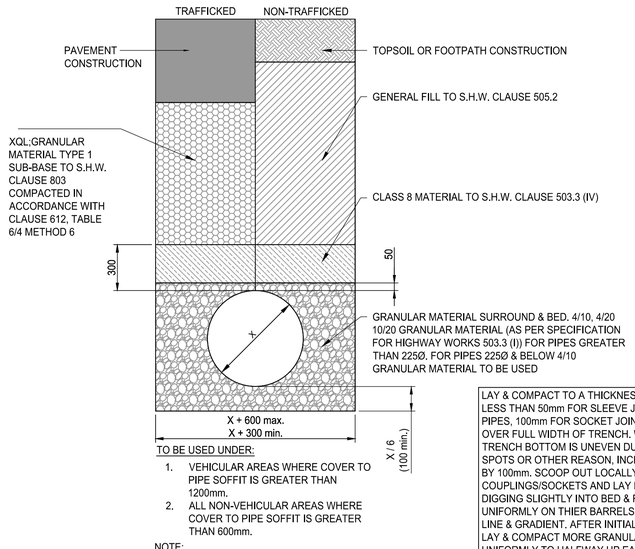
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INFORMATION	-

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DRAWING No.
4475-CIV-XX-XX-D-C-31001

REV
P01

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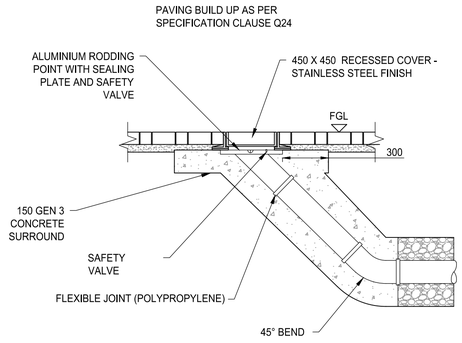
TO BE USED UNDER:

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2. ALL NON-VEHICULAR AREAS WHERE COVER TO PIPE SOFFIT IS GREATER THAN 600mm.

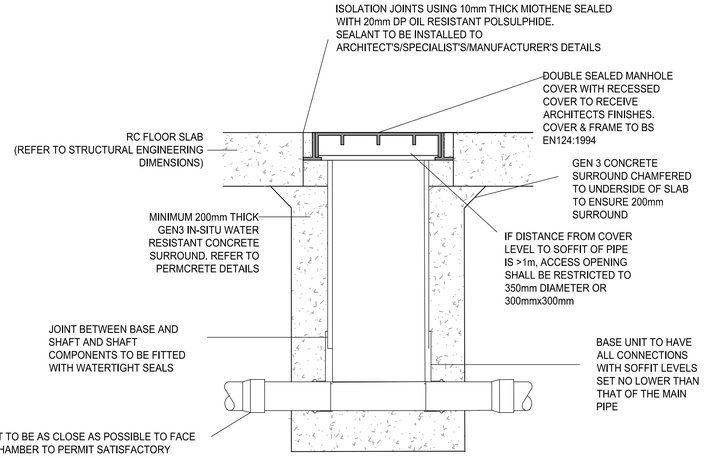
NOTE:
ALL PIPEWORK SHALL HAVE FLEXIBLE COUPLINGS

LAY & COMPACT TO A THICKNESS OF NOT LESS THAN 50mm FOR SLEEVE JOINTED PIPES, 100mm FOR SOCKET JOINTED PIPES, OVER FULL WIDTH OF TRENCH. WHERE TRENCH BOTTOM IS UNEVEN DUE TO HARD SPOTS OR OTHER REASON, INCREASE DEPTH BY 100mm. SCOOP OUT LOCALLY AT COUPLINGS/SOCKETS AND LAY PIPES DIGGING SLIGHTLY INTO BED & RESTING UNIFORMLY ON THIER BARRELS. ADJUST TO LINE & GRADIENT. AFTER INITIAL TESTING, LAY & COMPACT MORE GRANULAR MATERIAL UNIFORMLY TO HALFWAY UP EACH SIDE OF PIPE. BACKFILL (250mm FOR ADOPTABLE SEWERS) ABOVE CROWN OF PIPE WITH PROTECTIVE CUSHION OF MOT TYPE 1 OR SELECTED FILL, FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL & MATERIAL RETAINED ON A 40mm SIEVE. COMPACT BY HAND (OR LIGHT MECHANICAL RAMMER) IN 100mm LAYERS.

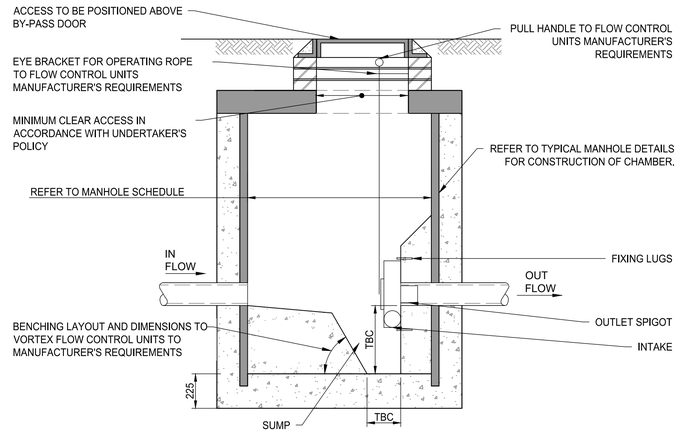
CLASS S PIPE BEDDING & SURROUND



RECESSED RODDING EYE

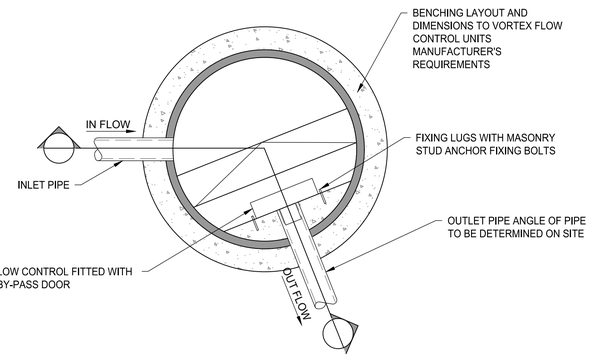


TYPICAL INTERNAL INSPECTION CHAMBER

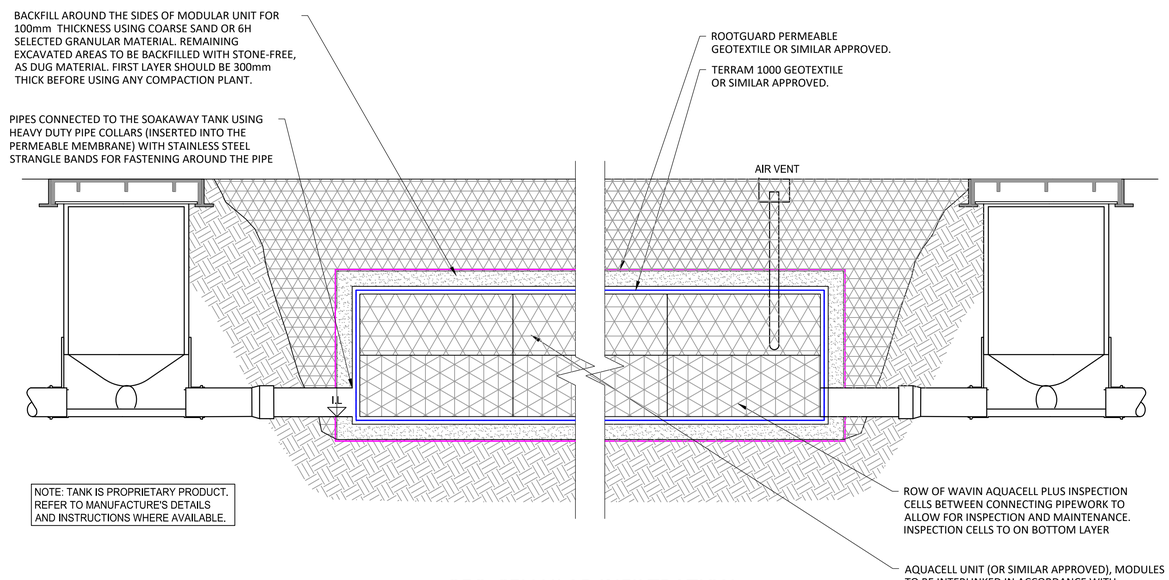


VORTEX FLOW CONTROL CHAMBER - SECTION A-A

TO MANUFACTURER'S REQUIREMENTS



VORTEX FLOW CONTROL CHAMBER PLAN VIEW



NOTE: TANK IS PROPRIETARY PRODUCT. REFER TO MANUFACTURE'S DETAILS AND INSTRUCTIONS WHERE AVAILABLE.

GEO-CELLULAR INFILTRATION TANK DETAIL

STANDARD NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
4. ALL DISCREPANCIES SHOULD BE REPORTED TO C.A./E.A. PRIOR TO THE COMMENCEMENT OF WORKS.

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NOTES:

1. ALL DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH BS EN 852 AND BUILDING REGULATIONS APPROVED DOCUMENT H
2. ALL MATERIALS INCLUDING PIPES, CHAMBERS AND ALL ACCESSORIES SHALL CONFORM TO SECTION E2 OF THE SEWER SECTOR GUIDANCE APPENDIX C DCG.
3. MANHOLE COVERS TO BE ORIENTED PARALLEL TO ALIGN WITH PAVING, KERB LINES AND/OR BUILDINGS
4. ALL INTERNAL MANHOLE COVERS ARE TO BE DOUBLE SEALED AND LOCKABLE
5. PIPE CONNECTIONS NOT IN INSPECTION CHAMBERS OR MANHOLES SHALL BE MADE VIA PREFORMED OBLIQUE JUNCTIONS SWEPT IN THE DIRECTION OF FLOW

DATE	REV	DESCRIPTION	DRAWN	CHKD
10.08.26	P01	FOR INFORMATION	MM	JDL

CIVIC ENGINEERS
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PROJECT
BROTHERTON HOUSE

TITLE
DRAINAGE STANDARD DETAILS
SHEET 2 OF 2

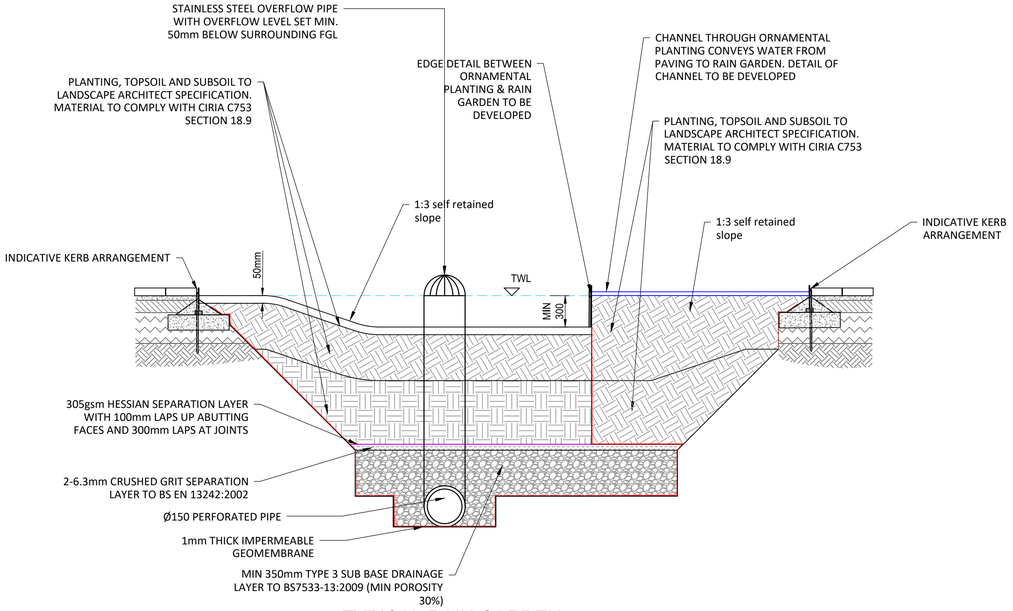
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INFORMATION	-

CE PROJECT No.	SCALE @ A1	DATE CREATED	DRAWN	CHECKED
4475	NTS	AUG'26	MM	JDL

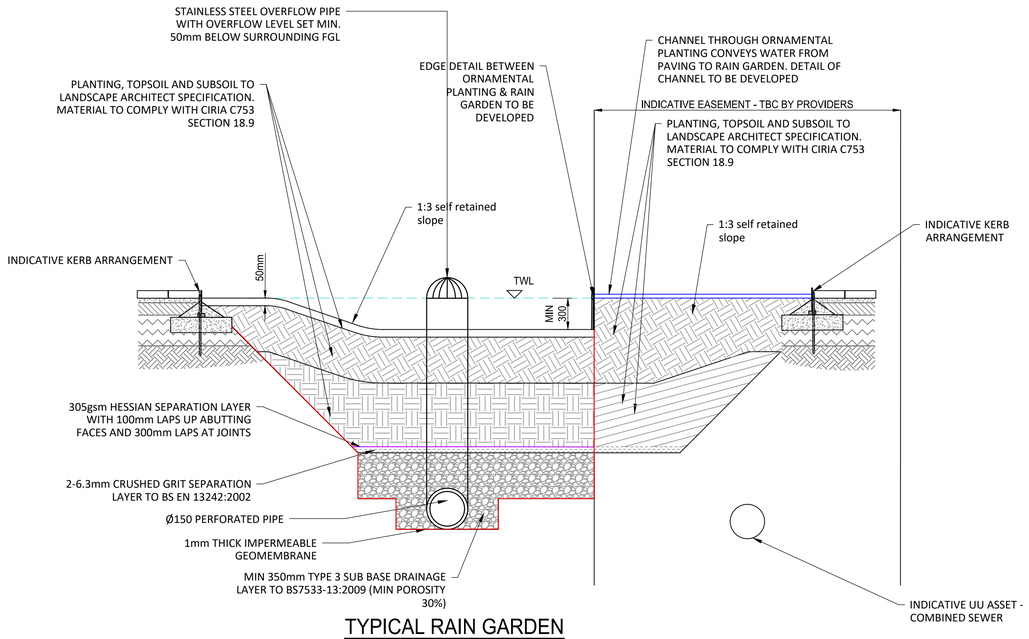
DRAWING No.
4475-CIV-XX-XX-D-C-31002

REV
P01

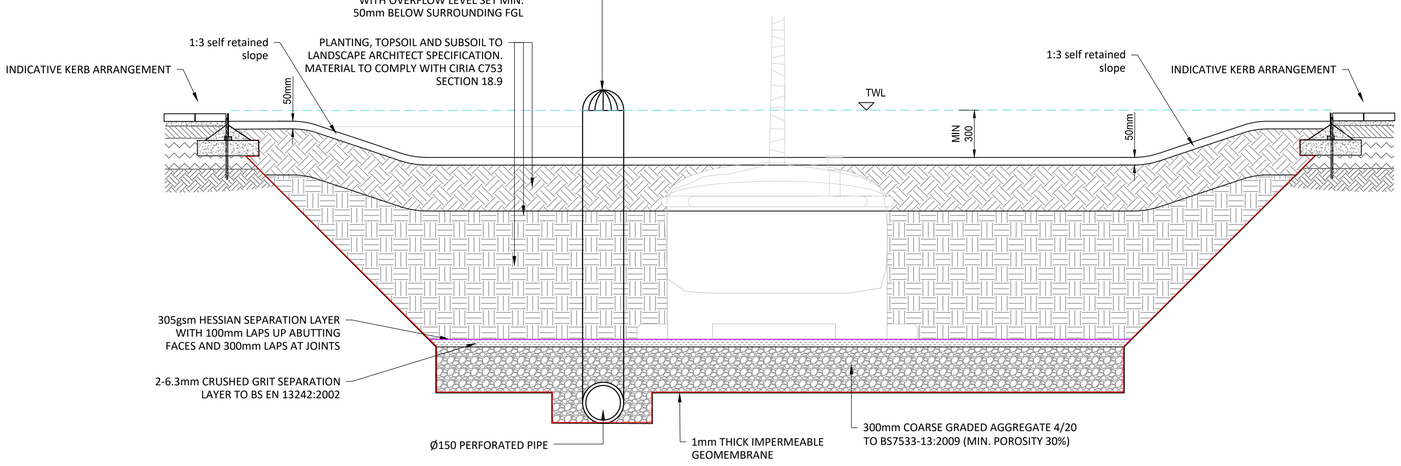
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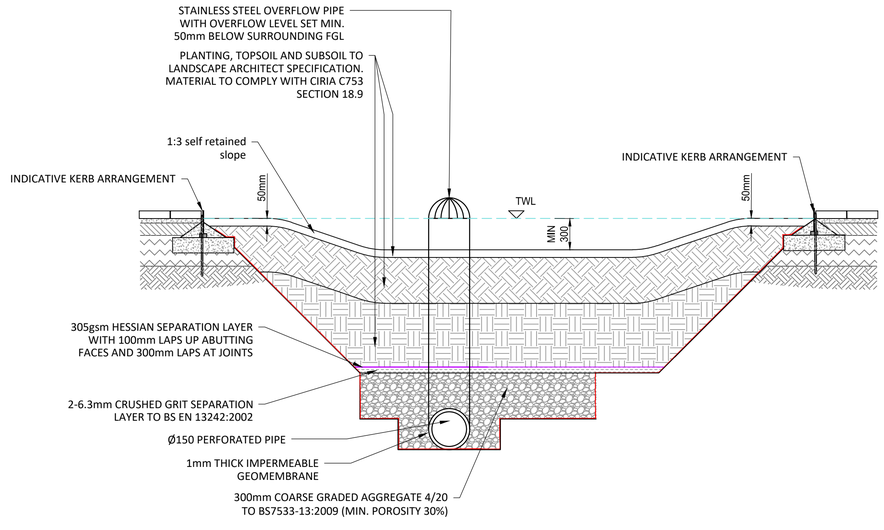
TYPICAL RAIN GARDEN WITH ORNAMENTAL PLANTING



TYPICAL RAIN GARDEN WITH ORNAMENTAL PLANTING ADJACENT TO SEWER / UTILITIES WITH EASEMENTS



TYPICAL RAIN GARDEN WITH TREE PIT



TYPICAL RAIN GARDEN

STANDARD NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
4. ALL DISCREPANCIES SHOULD BE REPORTED TO C.A./E.A. PRIOR TO THE COMMENCEMENT OF WORKS.

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DATE	REV	DESCRIPTION	DRAWN	CHKD
05.07.26	P01	ISSUED FOR INFORMATION	MM	JDL

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PROJECT

PICCADILLY GARDENS

TITLE

RAIN GARDEN DETAIL

DRAWING STATUS	STATUS CODE
FOR INFORMATION	S2

CE PROJECT No.	SCALE @ A1	DATE CREATED	DRAWN	CHECKED
4475	1:10	JUL 26	MM	JDL

DRAWING No.	REV
4475-CIV-XX-XX-D-C-31011	P01

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Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		



RG 05

Type : Bioretention

Ponding Area

Exceedance Level (m)	45.015
Depth (m)	0.100
Base Level (m)	44.915
Top Area (m²)	108.18
Side Slope (1:X)	3.00
Base Area (m²)	91.83
Freeboard (mm)	0
Porosity (%)	100
Length (m)	27.239
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	5.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	36.633

Filter Area

Base Level (m)	44.015

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	700	30	5.0	Soil Type
	Storage	200	40	50.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Pipe (27)
Outlet Type	Orifice
Diameter (m)	0.100
Coefficient of Discharge	0.600
Invert Level (m)	44.915

Outlet

Outgoing Connection	Pipe
Outlet Type	Free Discharge

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Advanced

Ponding Area

Base Perimeter (m)	61.222
Top Perimeter (m)	62.422



RG 03

Type : Bioretention

Ponding Area

Exceedance Level (m)	45.000
Depth (m)	0.100
Base Level (m)	44.900
Top Area (m²)	36.51
Side Slope (1:X)	3.00
Base Area (m²)	24.95
Freeboard (mm)	0
Porosity (%)	100
Length (m)	19.279
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	10.761

Filter Area

Base Level (m)	44.000

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Friction Scheme	Manning's n
n	0.015
Release Height (m)	0.000

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	600	30	10.0	Soil Type
	Storage	300	40	50.0	

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (14)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Outlets

Outlet

Outgoing Connection	Pipe (4)
Outlet Type	Under Drain

Outlet (1)

Outgoing Connection	Pipe (29)
Outlet Type	Weir
Width (m)	0.150
Coefficient of Discharge	0.544
Crest Level (m)	44.800

Advanced

Ponding Area

Base Perimeter (m)	41.147
Top Perimeter (m)	42.347



RG 04

Type : Bioretention

Ponding Area

Exceedance Level (m)	45.269
Depth (m)	0.150
Base Level (m)	45.119
Top Area (m²)	11.99
Side Slope (1:X)	3.00
Base Area (m²)	3.21
Freeboard (mm)	0
Porosity (%)	100
Length (m)	9.765
Long. Slope (1:X)	1000.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	2.326

Filter Area

Base Level (m)	44.019

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	700	30	15.0	Soil Type
	Storage	400	40	50.0	

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (11)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (5)
Outlet Type	Free Discharge

Outlet (1)

Outgoing Connection	Pipe (26)
Outlet Type	Orifice

Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	45.000

Advanced

Ponding Area

Base Perimeter (m)	20.186
Top Perimeter (m)	21.986



RG 02

Type : Bioretention

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Ponding Area

Exceedance Level (m)	45.273
Depth (m)	0.100
Base Level (m)	45.173
Top Area (m²)	52.05
Side Slope (1:X)	3.00
Base Area (m²)	45.67
Freeboard (mm)	0
Porosity (%)	100
Length (m)	10.641
Long. Slope (1:X)	0.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	23.610

Filter Area

Base Level (m)	43.923

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	900	30	5.0	Soil Type
	Storage	350	40	50.0	

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (15)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (30)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (6)
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	29.865
Top Perimeter (m)	31.065

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		



RG 01

Type : Bioretention

Ponding Area

Exceedance Level (m)	45.524
Depth (m)	0.150
Base Level (m)	45.374
Top Area (m²)	87.61
Side Slope (1:X)	3.00
Base Area (m²)	71.84
Freeboard (mm)	0
Porosity (%)	100
Length (m)	17.522
Long. Slope (1:X)	0.00
Filtration Rate (m/hr)	5.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	41.113

Filter Area

Base Level (m)	44.174

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	225
No. of Barrels	1
Friction Scheme	Manning's n
n	0.015
Release Height (m)	0.000

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	800	30	5.0	Soil Type
	Storage	400	40	50.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (12)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Outlets

Outlet

Outgoing Connection	Pipe (7)
Outlet Type	Free Discharge

Outlet (1)

Outgoing Connection	Pipe (31)
Outlet Type	Orifice
Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	45.300

Outlet (2)

Outgoing Connection	(None)
Outlet Type	Under Drain

Advanced

Ponding Area

Base Perimeter (m)	43.243
Top Perimeter (m)	45.043



RG06

Type : Bioretention

Ponding Area

Exceedance Level (m)	46.112
Depth (m)	0.100
Base Level (m)	46.012
Top Area (m²)	99.19
Side Slope (1:X)	3.00
Base Area (m²)	90.17
Freeboard (mm)	0
Porosity (%)	100
Length (m)	15.028
Long. Slope (1:X)	0.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.15
Total Volume (m³)	38.756

Filter Area

Base Level (m)	45.000

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☑	Soil	800	30	5.0	Soil Type
	Storage	212	40	50.0	

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (9)
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	42.056
Top Perimeter (m)	43.256

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		



Existing Tank

Type : Tank

Dimensions

Exceedance Level (m)	45.759
Depth (m)	1.959
Base Level (m)	43.800
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	-0.005
Total Volume (m³)	105.772

Depth (m)	Area (m²)	Volume (m³)
0.000	67.25	0.000
1.570	67.00	105.383

Inlets

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	12.225

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		

Tank (1) Type : Tank

Dimensions

Exceedance Level (m)	45.719
Depth (m)	2.493
Base Level (m)	43.226
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	90.404

Depth (m)	Area (m²)	Volume (m³)
0.000	93.591	47.464
1.000	93.591	47.464

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (19)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (20)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (21)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	18.737

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: NO TANK	Company Address:		



PLAY AREA

Type : Porous Paving

Dimensions

Exceedance Level (m)	45.205
Depth (m)	0.500
Base Level (m)	44.705
Paving Layer Depth (mm)	10
Membrane Percolation (m/hr)	5.0
Porosity (%)	30
Length (m)	53.767
Long. Slope (1:X)	1000.00
Width (m)	16.276
Total Volume (m³)	129.307

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (4)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (3)

Outgoing Connection	Pipe (15)
Outlet Type	Free Discharge

Outlet

Outgoing Connection	Pipe (12)
Outlet Type	Orifice

Diameter (m)	0.100
Coefficient of Discharge	0.600
Invert Level (m)	45.100

Advanced

Conductivity (m/hr)	250.0

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: NO TANK	Company Address:		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH01	45.195 43.960	Diameter / Length: 1.200	{1} Pipe (28)	Pipe	43.960	Diam/Width:150	Manhole
E:384320.702 N:398300.352	1.235		{a} Pipe (1)	Pipe	43.960	Diam/Width:150	Not Applicable
MH 02	45.071 43.860	Diameter / Length: 1.200	{1} Pipe (1)	Pipe	43.860	Diam/Width:150	Manhole
E:384329.620 N:398314.714	1.211		{a} Pipe (2)	Pipe	43.860	Diam/Width:225	Not Applicable
MH 03	45.315 43.809	Diameter / Length: 1.200	{1} Pipe (24) {2} Pipe (2)	Pipe Pipe	43.809 43.809	Diam/Width:150 Diam/Width:225	Manhole
E:384342.885 N:398314.168	1.506		{a} Pipe (3)	Pipe	43.809	Diam/Width:225	Not Applicable
MH 04	45.459 43.459	Diameter / Length: 1.200	{1} Pipe (3) {2} Pipe (25) {3} Pipe (6)	Pipe Pipe Pipe	43.459 43.459 43.459	Diam/Width:225 Diam/Width:225 Diam/Width:225	Manhole
E:384355.321 N:398309.367	2.000		{a} Pipe (20)	Pipe	43.459	Diam/Width:225	Not Applicable

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: NO TANK	Company Address:		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH 08	45.977 44.077	Diameter / Length: 1.200					Manhole
E:384349.903 N:398297.393	1.900		{a} Pipe (8)	Pipe	44.077	Diam/Width:150	Not Applicable
MH 05	46.080 44.950	Diameter / Length: 1.200	{1} Pipe (9)	Pipe	44.950	Diam/Width:150	Manhole
E:384405.904 N:398279.682	1.130		{a} Pipe (10)	Pipe	44.950	Diam/Width:150	Not Applicable
MH06	46.202 44.897	Diameter / Length: 1.200	{1} Pipe (10)	Pipe	44.897	Diam/Width:150	Manhole
E:384406.444 N:398268.750	1.305		{a} Pipe (11)	Pipe	44.897	Diam/Width:225	Not Applicable
MH 07	45.562 44.460	Diameter / Length: 1.200	{1} Pipe (12) {2} Pipe (15)	Pipe Pipe	44.460 44.460	Diam/Width:150 Diam/Width:100	Manhole
E:384385.156 N:398242.078	1.102		{a} Pipe (14)	Pipe	44.460	Diam/Width:225	Not Applicable
MH 09	46.030 44.109	Diameter / Length: 1.200	{1} Pipe (13)	Pipe	44.109	Diam/Width:225	Manhole
E:384353.955 N:398269.664	1.921		{a} Pipe (18)	Pipe	44.109	Diam/Width:225	Not Applicable

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: NO TANK	Company Address:		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH 10	45.667 43.730	Diameter / Length: 1.200	{1} Pipe (18) {2} Pipe (23)	Pipe Pipe	43.730 43.730	Diam/Width:225 Diam/Width:225	Manhole
E:384353.037 N:398278.599	1.937		{a} Pipe (19)	Pipe	43.730	Diam/Width:225	Not Applicable
MH 11	45.633 43.221	Diameter / Length: 1.200	{1} Pipe (21)	Pipe	43.221	Diam/Width:225	Manhole
E:384363.363 N:398303.794	2.412		{a} Pipe (22)	Pipe	43.221	Diam/Width:150	Not Applicable
CMH 01	45.470 43.000	Diameter / Length: 1.200	{1} Pipe (22)	Pipe	43.000	Diam/Width:150	Manhole
E:384360.151 N:398311.101	2.470						Not Applicable
Simple Junction		Diameter / Length: 1.200	{1} Pipe (5) {2} Pipe (26)	Pipe Pipe	43.832 43.832	Diam/Width:225 Diam/Width:150	Simple Junction
E:384351.984 N:398314.620			{a} Pipe (25)	Pipe	43.832	Diam/Width:225	Not Applicable
Simple Junction (1)		Diameter / Length: 1.200	{1} Pipe {2} Pipe (27)	Pipe Pipe	43.995 43.995	Diam/Width:150 Diam/Width:100	Simple Junction
E:384316.319 N:398302.256			{a} Pipe (28)	Pipe	43.995	Diam/Width:150	Not Applicable

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: NO TANK	Company Address:		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
Simple Junction (2)		Diameter / Length: 1.200	{1} Pipe (4)	Pipe	43.975	Diam/Width:150	Simple Junction
E:384341.809 N:398330.517			{2} Pipe (29)	Pipe	43.729	Diam/Width:100	
			{a} Pipe (24)	Pipe	43.963	Diam/Width:150	Not Applicable
Simple Junction (3)		Diameter / Length: 1.200	{1} Pipe (7)	Pipe	44.131	Diam/Width:225	Simple Junction
E:384365.137 N:398322.777			{2} Pipe (31)	Pipe	44.131	Diam/Width:225	
			{a} Pipe (30)	Pipe	44.131	Diam/Width:225	Not Applicable
MH 8a	46.134 44.285	Diameter / Length: 1.200	{1} Pipe (11)	Pipe	44.285	Diam/Width:225	Manhole
E:384383.652 N:398268.358	1.849		{2} Pipe (14)	Pipe	44.285	Diam/Width:225	
			{a} Pipe (13)	Pipe	44.285	Diam/Width:225	Not Applicable

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: NO TANK	Company Address:		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: NO TANK	Company Address:		

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: NO TANK	Company Address:		

Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH01	FSR: 100 years: +45 %: 180 mins: Winter	45.195	43.960	44.088	0.128	4.9	0.145	0.000	4.9	15.822	OK
MH 02	FSR: 100 years: +45 %: 60 mins: Summer	45.071	43.860	43.957	0.096	11.9	0.109	0.000	11.9	14.951	OK
MH 03	FSR: 100 years: +45 %: 60 mins: Summer	45.315	43.809	43.919	0.110	23.5	0.125	0.000	23.5	34.280	OK
MH 04	FSR: 100 years: +45 %: 60 mins: Summer	45.459	43.459	43.915	0.456	34.6	0.515	0.000	32.9	50.270	Surcharged
MH 08	FSR: 100 years: +45 %: 60 mins: Summer	45.977	44.077	44.134	0.057	6.8	0.064	0.000	6.9	8.568	OK
MH 05	FSR: 100 years: +45 %: 60 mins: Summer	46.080	44.950	45.120	0.171	18.9	0.193	0.000	18.0	25.415	Surcharged
MH06	FSR: 100 years: +45 %: 60 mins: Summer	46.202	44.897	44.967	0.070	18.0	0.079	0.000	17.9	23.946	OK
MH 07	FSR: 100 years: +45 %: 180 mins: Winter	45.562	44.460	44.529	0.069	8.6	0.078	0.000	8.6	93.376	OK
MH 09	FSR: 100 years: +45 %: 60 mins: Summer	46.030	44.109	44.209	0.100	35.4	0.113	0.000	35.3	78.900	OK
MH 10	FSR: 100 years: +45 %: 60 mins: Summer	45.667	43.730	43.919	0.189	44.6	0.214	0.000	44.5	95.434	OK
MH 11	FSR: 100 years: +45 %: 180 mins: Summer	45.633	43.221	43.978	0.757	25.2	0.856	0.000	25.1	230.408	Surcharged
CMH 01	FSR: 100 years: +45 %: 180 mins: Summer	45.470	43.000	43.106	0.105	25.1	0.000	0.000	25.1	230.378	OK
Simple Junction	FSR: 100 years: +45 %: 60 mins: Summer		43.832	43.916	0.084	11.1			11.1	14.980	OK
Simple Junction (1)	FSR: 100 years: +45 %: 180 mins: Winter		43.995	44.088	0.093	4.4			4.4	11.624	OK
Simple Junction (2)	FSR: 100 years: +45 %: 60 mins: Summer		43.729	44.059	0.331	11.8			11.8	19.369	OK
Simple Junction (3)	FSR: 100 years: +45 %: 60 mins: Summer		44.131	44.336	0.206	16.3			0.0	15.232	OK
MH 8a	FSR: 100 years: +45 %: 60 mins: Summer	46.134	44.285	44.421	0.136	25.7	0.154	0.000	25.3	66.349	OK

Project:	Date: 15/07/2026		
	Designed by: MattM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: NO TANK	Company Address:		

Critical Storm Per Item: Rank By: Max. Outflow

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
RG 05	FSR: 100 years: +45 %: 180 mins: Winter	45.008	44.217	0.966	0.202	7.1	25.178	0.000	0.000	4.4	11.626	31.268	OK
RG 03	FSR: 100 years: +45 %: 60 mins: Summer	44.946	44.178	0.927	0.178	16.4	4.400	0.000	0.000	11.8	19.734	59.109	OK
RG 04	FSR: 100 years: +45 %: 60 mins: Summer	45.340	45.266	1.311	1.247	12.5	2.244	0.366	0.000	11.1	15.034	3.536	Flood
RG 02	FSR: 100 years: +45 %: 180 mins: Winter	45.198	44.086	1.275	0.163	8.9	12.834	0.000	0.000	0.7	30.921	45.641	OK
RG 01	FSR: 100 years: +45 %: 60 mins: Summer	44.574	44.317	0.401	0.143	19.7	6.245	0.000	0.000	5.8	18.925	84.811	OK
Existing Tank	FSR: 100 years: +45 %: 60 mins: Summer	43.919	43.919	0.120	0.120	7.4	8.054	0.000	0.000	6.3	10.559	92.386	OK
Tank (1)	FSR: 100 years: +45 %: 60 mins: Summer	43.915	43.915	0.689	0.689	75.2	61.296	0.000	0.000	25.5	110.011	32.198	OK
RG06	FSR: 100 years: +45 %: 60 mins: Summer	46.063	45.121	1.063	0.121	16.3	17.970	0.000	0.000	3.1	1.822	53.633	OK
PLAY AREA	FSR: 100 years: +45 %: 180 mins: Winter	44.965	44.903	0.206	0.199	23.3	55.768	0.000	0.000	8.6	93.456	56.871	OK

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