White Moss Road, Manchester

Flood Risk Assessment & Drainage Strategy

The Guinness Partnership

January 2023

Notice

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Document history

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1. Introduction

Atkins has been commissioned by The Guinness Partnership to prepare a Flood Risk Assessment and Drainage Strategy to inform a full design package for a proposed residential development (the “Proposed Development”), on the land off White Moss Road, Manchester (the “Site”).

This Flood Risk Assessment and Drainage Strategy has been prepared in accordance with the National Planning Policy Framework (NPPF)[1] and associated Planning Practice Guidance[2]. The scope of this Assessment has been established through consultation with and using documentation provided by United Utilities (UU), Environment Agency (EA) and the Manchester City Council (Lead Local Flood Authority (LLFA)).

[1] National Planning Policy Framework, February 2019, Department for Communities and Local Government
[2] Planning Practice Guidance, March 2014, Department for Communities and Local Government

2. Background Information

2.1. Environment Agency (EA)

An enquiry was submitted to the Environment Agency (EA). The response received is summarised below and included in full in **Appendix A**:

- The site is in Flood Zone 1, very low risk. Their nearest model is in Blackley, which has no impact on this site location.
- The EA do not have any records of flooding affecting the Site.
- The EA have no flood defences in the vicinity of this Site.

2.2. United Utilities (UU)

A Developer Enquiry was submitted to UU. A copy of the response and sewer records are included in **Appendix A** and the key points summarised below:

- UU have no current record of sewer flooding within the vicinity of the Proposed Development.
- UU allow foul flows from the Proposed Development to be discharged into their public combined sewer at an unrestricted rate. Their preferred point of connection is the 225mm diameter public combined sewer to the west of the site.
- In relation to surface water, UU will consider a connection to their 225mm diameter public combined sewer located to the west of the site at discharge rate not exceeding 6l/s, only once evidence is provided that surface water cannot be discharged via methods that are higher in the drainage hierarchy within the National Planning Practice Guidance[2].
- There are public sewers within the Site boundary. UU will require unrestricted access to the sewer for maintenance purposes, a minimum clearance of 3m either side from the centre line of the pipe is required. If this cannot be achieved, then considerations should be given to diverting and or abandoning the public sewer.
- UU assess adoption applications based on the current Design & Construction Guidance and local practices.
- Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines.
- All SuDS should be designed in accordance with the standards within the Design & construction guidance & the CIRIA SuDS manual (C753).
- Sewer Records show that there are combined sewers crossing and surrounding the Site. There is a sewer running along White Moss Road; a sewer crossing the northern area of the Site, eventually connecting into the sewer under White Moss Road. There is a sewer along Lilstock Walk to the west of the site, turning in Woodmere Drive, and a sewer running along the site's south-western boundary, which eventually turns in Dam Head Drive.

2.3. Manchester City Council (MCC)

MCC, as the LLFA, have been consulted regarding requirements specific to the site and the preliminary development proposals. A copy of the full response received is included in **Appendix A** and summarised below:

- The Site is located in the Conurbation Core Critical Drainage Area.
- The nearest flood/drainage incident on record is approximately 30m south of the central part of the Site, dated 16/06/2020, described as "blocked gully or drain".
- The asset register highlights an indicative risk that the Lionfield Brook culverted ordinary watercourse crosses the Site or is in close proximity to the Site. An indicative culvert route is shown crossing Wanley Walk in the central Site; while 3rd party historic OS mapping indicates a 'river' was proximal to the eastern Site boundary. This culvert is an indicative asset and has not been verified with survey.
- The 1984 drainage survey of major assets highlights an indicative culvert asset proximal to the eastern Site boundary.
- A planning application on this site would benefit from site investigation of the indicative culvert risk, which should be presented to support the planning application. Should a culverted ordinary watercourse be identified during site investigations, any planning application's masterplan should take account of the culverted watercourse and any required permissions should be obtained.

3. Site Description

3.1. Location

The Site is located in a residential area approximately 600m south of junction 20 of the M60 (Manchester Outer Ring Road). The Site is bounded to the north by White Moss Road and Wanley Walk, to the west by Lilstock Walk and Woodmere Drive and to the south by Dam Head Drive and a public open space. The site comprises of two parts: a quadrilateral shape to the north-west and an L-shaped part to the south-east. The approximate centre of the Site has easting and northing coordinates of 386432, 403448.

Figure 3-1 Site location plan (not to scale)

3.2. Topography

The Site has an approximate area of 1.11ha. The topographical survey of the Site is shown in **Appendix B**.

Ground levels within the Site slope in a southernly direction from approximately 99.6m AOD at the northern corner of the Site to approximately 89.7m AOD at the southern end of the Site. There is a retaining wall up to 1.3m high along the Lilstock Walk, which is located at a lower level compared to the Site. Ground levels within the Site are relatively steep, approximately 1 in 10, and there is a steep slope of approximately 1 in 4 at the south-eastern end of the Site, falling in a south-easterly direction.

The Site's surrounding area generally falls in a southerly direction.

3.3. Land Use

3.3.1. Historic

An examination of old Ordnance Survey maps dating 1848, shows that the site was occupied by Dam Head Farm and had a pond. More recent mapping, 1980, shows no evidence of the Farm and pond. From 1950s the area surrounding the Site, becomes progressively more developed and by 1975 residential developments, including apartment blocks, had been built within 100m in all directions of the site. Maps from 2000 shows two residential houses located in the southern corner of the Site. These are not shown on maps from 2009.

3.3.2. Current

The Site is currently used as a public landscape area and is entirely covered with grass, with the exception of footpaths, a concrete paved area and an abandoned section of road along the southern boundary. There are sporadic mature trees and smaller vegetation across the Site.

The surrounding area comprises of residential developments, including terraced houses and blocks of flats.

3.4. Ground Conditions

The content of this section has been informed by Geo-Environmental and Geotechnical Reports prepared by Curtins (reference: 077873-CUR-00-XX-RP-GE-041-P01 and 077873-CUR-00-XX-RP-GE-042-P01, date: November 2022) together with information from a number of on-line, public domain data sources.

3.4.1. Soils

According to Soilscapes, the soils on the site are described as *slowly permeable and seasonally wet acid loamy and clayey soils*. No information is currently available regarding the depth of this stratum.

3.4.2. Made Ground

Made ground was encountered up to a depth of 2.6m.

Made Ground soils comprises either soft to firm blackish grey sand clay, grey gravelly slightly sandy cobbles, dark brown slightly silty gravelly clay with occasional cobbles, blackish brown gravelly sand, soft to firm brown gravelly very sandy clay, or grey sandy gravel of fine to coarse subangular of brick, concrete and sandstone.

3.4.3. Geology

3.4.3.1. Superficial Deposits

The Geotechnical Reports have identified that the Site is underlain by Glacial Till, comprising predominantly cohesive deposits, interbedded with granular layers at various depth horizons in the northern area of the site, and described typically as a firm to stiff sandy clay and brown gravelly sand in the southern part of the site.

3.4.3.2. Bedrock

Maps from the British Geological Survey identify the bedrock beneath the site to be Manchester Marls Formation bedrock (majority of site) and Chester Formation bedrock (northwest and southwest corner).

3.4.3.3. Contamination

The Geo-Environmental and Geotechnical Reports have identified the presence of Polycyclic Aromatic Hydrocarbons (PAH), asbestos as loose fibres and board and elevated concentrations of Total Petroleum Hydrocarbon (TPH) (which may be associated with pond infill). Supplementary investigation is recommended. Gas protection measures will be required for the proposed residential development.

3.5. Water Environment

3.5.1. Drainage

3.5.1.1. Land Drainage

There is no evidence indicating that there are any land drainage systems within the site. If any land drainage is encountered during construction, it must be reconnected and/or diverted to ensure ongoing drainage post-development.

3.5.1.2. Private Drainage

There are no records of any private drainage within the Site. However, due to the Site being surrounded by residential developments, it is possible that private drainage is present within the Site.

3.5.1.3. Public Sewerage

UU sewer records for the site and surrounding area have been obtained are provided in **Appendix A**.

There is a 525mm diameter combined sewer of unknown depth running along White Moss Road, which flows in a westerly direction. A combined sewer (525mm diameter, approximately 3.5m deep) runs through the northern area of the Site and connects into the sewer under White Moss Road.

There is a 225mm diameter combined sewer, approximately 3m deep, along Lilstock Walk to the west of the site, flowing in an easterly direction, before turning in Woodmere Drive. A 225mm diameter combined sewer, approximately 3m deep, runs along the site's south-westerly boundary, before turning into Dam Head Drive. This sewer flows in a south-easterly direction.

A site constraints plan (drawing reference 5218589-ATK-WT-XX-DR-D-0501) showing the public sewers location is provided in **Appendix B**.

3.5.2. Watercourses

MCC development enquiry response (section 2.3) highlights the possibility of the presence a section of the Lionfield Brook culverted watercourse crossing the site or is in close proximity to the Site.

The Lionfield Brook, ordinary watercourse, is located approximately 100m to the south of the site, within Bailey's Wood. The Boggart Hole Brook is located approximately 1km to the south of the site.

3.5.3. Waterbodies

There are no waterbodies located within the site. A Boating Lake is located approximately 1km to the south of the site.

3.5.4. Groundwater

According to Environment Agency mapping and the Geo-Environmental and Geotechnical Reports, the Site is not located within any groundwater source protection zones. The superficial deposits are designated as a Secondary Undifferentiated Aquifer. The bedrock underlying the Site is classified as a Secondary B aquifer.

Groundwater was encountered at a minimum depth of 0.9m AOD in a borehole at the southern corner of the Site.

4. Proposed Development

4.1. Description

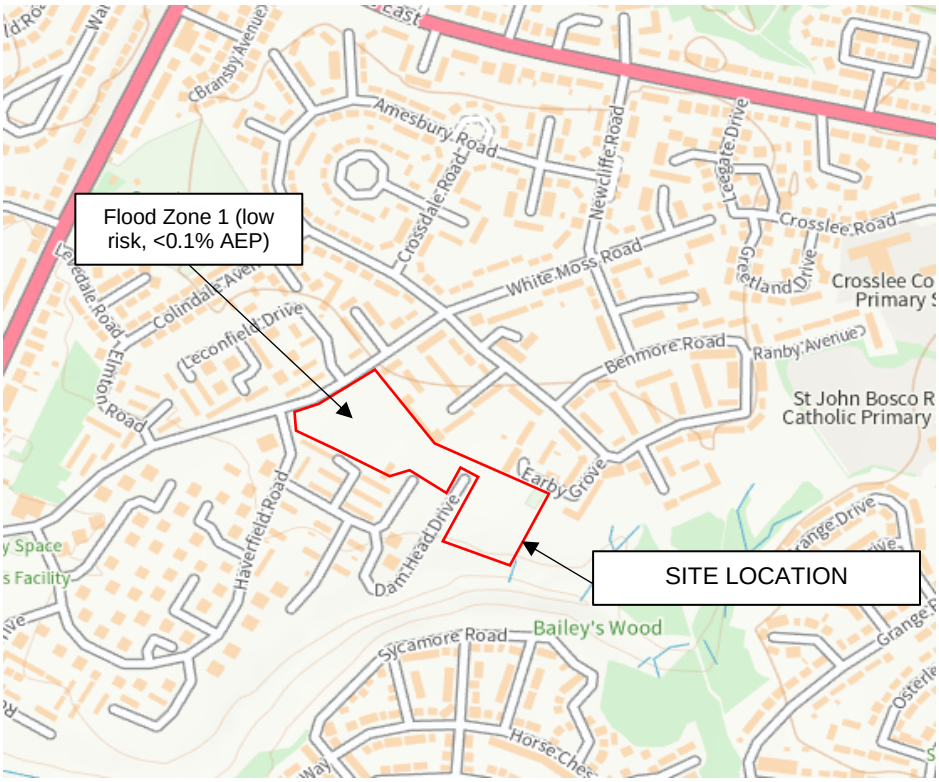
The proposal involves the development of residential housing, comprising of 38 units, a mix of 2 and 3 bedroom properties and a new access road. The new access road will come off White Moss Road and provide access to 25 of the new houses, with the other 13 houses being accessed from Dam Head Drive.

The proposed development layout is included in **Appendix B**.

4.2. Sequential Test

According to the Environment Agency Flood Map, shown in Figure 4-1, the Site is located wholly within Flood Zone 1 (low risk;<0.1% annual exceedance probability (AEP)).

According to the Planning Practice Guidance[2], Table 2, the Proposed Development is classified as *More Vulnerable* as it is a residential development. Planning Practice Guidance, Table 3 shows that *More Vulnerable* development is compatible with Flood Zone 1 hence the Proposed Development is deemed to pass the Sequential Test.



Source: Environment Agency

Figure 4-1 Environment Agency Flood Map

5. Flood Risk Assessment

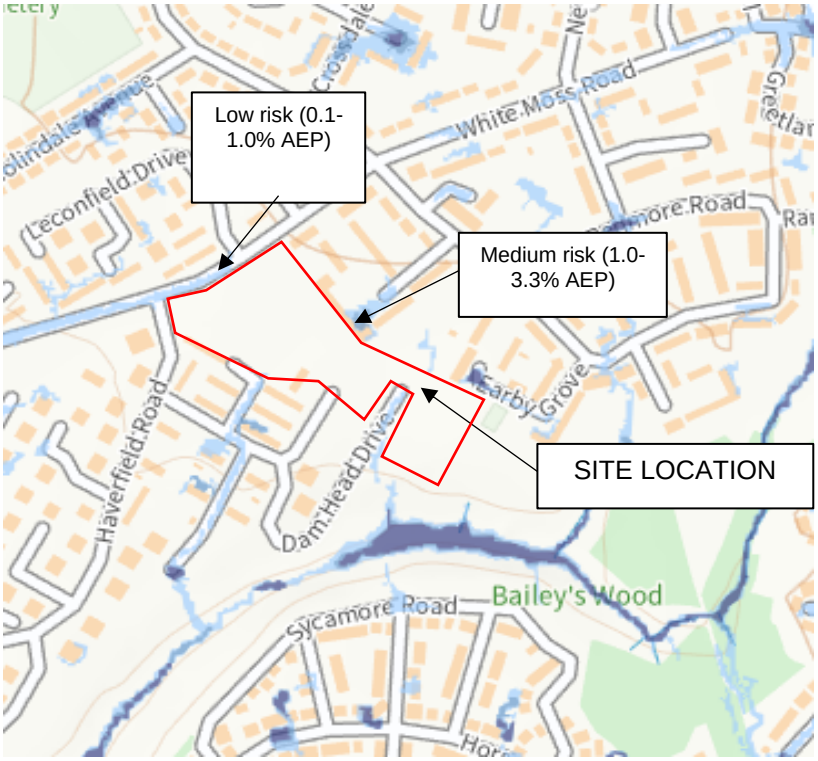
5.1. Flooding History

Consultation with the EA and UU has established that there are no records of flooding at or in the vicinity of the Site. MCC have a flood/drainage incident on record, approximately 30m south of the central part of the Site, dated 2020, associated with blocked gully or drain.

5.2. Identification of Flooding Sources

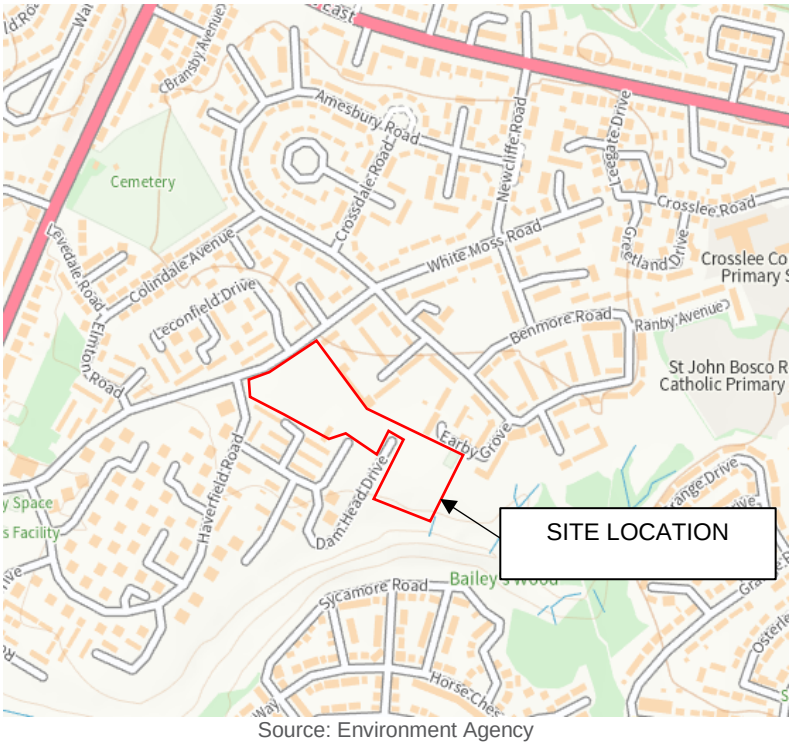
The Planning Practice Guidance[2] requires the risk of flooding from the following sources be considered:

- **Fluvial (river)** – The Environment Agency Flood Map, included in Figure 4-1, shows that the site is entirely located within Flood Zone 1 (low risk, <0.1% AEP), therefore the risk of fluvial flooding is considered low and does not require further consideration.
- **Coastal, tidal and estuarine** – The Site is remote from coastal, tidal and estuarine waters hence the risk associated with this source is negligible.
- **Surface water** – The Environment Agency Surface Water Flood Map, included in Figure 5-1, shows that the Site is not affected by surface water flooding. Minor area in roads surrounding the Site (White Moss Road, Dam Head Drive, Cullen Grove and Earby Road) are affected by low and medium risk of surface water flooding, however their associated flow paths do not encroach the Site area. MCC recorded a blocked gully or drain incident to the south of the Site, where levels are lower than Site levels. Therefore, the risk associated with surface water flooding is negligible.
- **Groundwater** – As described in section 3.5.4, groundwater was encountered in boreholes at a minimum depth of 0.9m AOD. MCC groundwater flooding mapping shows that the site is not located in an area subject to groundwater flooding. Also, as the Site is relatively steep and the area to the south of the Site sits at lower ground levels than the Site; if groundwater was to emerge, it would flow towards the south into the Lionfield Brook. Therefore, the risk of groundwater flooding is considered to be low and does not require further consideration.
- **Sewers** – Consultation with UU has established that are no records of sewer flooding incidents at or in the vicinity of the Site and did not mention any capacity issues. Therefore, the risk of sewer flooding is considered low and does not require further consideration.
- **Artificial sources** – The EA Reservoir Flood Map, included in Figure 5-2, shows that the Site is not located in a flow path of impounded water bodies at an elevation higher than the site, hence the risk from this source is negligible and does not require further assessment.



Source: Environment Agency

Figure 5-1 Environment Agency Surface Water Flood Map



Source: Environment Agency

Figure 5-2 Environment Agency Reservoir Flood Map

5.3. Flood Risk Management

The Proposed Development will incorporate the following flood risk management measures to mitigate flooding risk:

- The finished floor level of all accommodation buildings within each plot will be at least 0.15m above adjacent external ground levels in order to reduce the risk of overland flows entering the property. Where flush thresholds are required, these must be ramped up to the finished floor level to maintain the required level difference.
- Wherever possible, the external ground profile around buildings will ensure that surface water is directed away from the building.
- The Proposed Development will incorporate a positive surface water drainage system, described further in section 6, that will intercept run-off from roofs and paved areas rather than allowing them to flow unchecked through the Proposed Development.

5.4. Residual Risks

Residual risks are those risks that remain once the flood risk management measures described above have been implemented. These are typically associated with extreme events (greater than the 1% AEP plus climate change event) that overwhelm drainage systems and exceed the parameters used to design any mitigation measures.

The principal residual risk that will affect this Site is an extreme rainfall event which exceeds the capacity of the proposed surface water drainage system to both intercept and convey flows. During such an event, water that is unable to enter the formal drainage system, will flow over the ground surface through the Proposed Development, and be directed towards the highway drainage for the northern area of the Site and towards the south into the Lionfield Brook for the southern area of the Site.

6. Surface Water Drainage Strategy

6.1. Existing Drainage Regime

The Site in its current condition drains either via infiltration into the ground or by overland flow into the highway drainage surrounding the Site.

In order to assess the existing run-off flow rates that could be generated by the Site, the current greenfield runoff rates have been calculated using IH124 Flood Estimation for Small Catchments with the ICP SUDS modifications as the Site has an area of less than 50ha. MicroDrainage Source Control was used to undertake the calculations using the following parameters:

- Area 1.11ha
- SAAR (Standard Annual Average Rainfall) 995mm
- SOIL 0.45
- Urban 0.000
- Region 10

The calculation results are shown in Table 6-1.

AEP	Run-off flow (l/s)
100%	6.1
42.9% (QBAR)	7.0
3.3%	11.9
1%	14.6

Table 6-1 - Existing surface water run-off rates

6.2. Proposed Outfall

Surface water run-off from the Proposed Development will be discharged into a local public combined water sewer located to the west of the site at two separate point of connections (UU manhole ref. 4415 and 4305).

As described in section 3.4.3.3, the ground beneath the Site is likely to be contaminated; therefore, infiltration as a means of surface water disposal is not considered viable due to the risk of mobilising contaminants.

6.3. Maximum Permitted Discharge Rate

The maximum total discharge rate from the Proposed Development into the public combined water sewer will be limited to 6l/s. This flow rate has been provided by UU (refer to section 0) and it is lower than the Qbar greenfield runoff rate of 7.0l/s.

As the Site is proposed to discharge surface water into two different point of connections, the maximum total discharge rate has been pro-rated based on catchment areas. The calculation results are shown in Table 6-2.

Catchment	Area (ha)	Discharge Rate (l/s)
Western	0.72	3.9
Eastern	0.39	1.1

Table 6-2 - Catchments discharge rates

6.4. SuDS Selection

The LLFA requires SuDS to be considered for inclusion within the drainage strategy for the Proposed Development. The SuDS techniques suitable for this development have been identified using the selection process defined in CIRIA C697 *The SuDS Manual*[3] and information provided in CIRIA C753 *The SuDS Manual*[4].

The Proposed Development is residential; therefore, according to CIRIA C697[3], Table 5.2 (reproduced in **Appendix C**), all SuDS techniques other than perimeter sand filter are considered acceptable.

As described in Section 6.2, surface water from the Proposed Development will be discharged into UU's combined sewer. Surface water disposal via infiltration is not considered to be viable as the primary method of surface water discharge, due to the risk of mobilising contaminants.

According to CIRIA C753[4], Table 4.3, the Proposed Development, including the access roads, has a *low* pollution hazard level. For *low* pollution hazard levels, this necessitates the *Simple Index Approach* to assess the water quality management requirements for the proposed development.

According to CIRIA C753[4], Table 26.2, the *low* pollution hazard levels for the Proposed Development translate to the pollution hazard indices set out in Table 6-5.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (<300 movements/day)	Low	0.5	0.4	0.4

Table 6-3 - Development pollution hazard indices

The parameters for the initial selection of SuDS components for this site using CIRIA C697[3] Table 5.4, reproduced in **Appendix C** are as follows:

- Soils: Impermeable
- Area draining to a single SuDS component: 0 – 2ha
- Minimum depth to water table: 0-1m
- Site slope: > 5%
- Available head: 1 – 2m
- Available space: Low

Based on this initial selection process, the following SuDS techniques are identified as being potentially suitable for this site:

- Subsurface storage
- Green roofs
- Rainwater harvesting

Subsurface storage is anticipated to provide the primary surface water storage within the Proposed Development. This will take the form of storage tanks located underneath the private section of the roads for the western catchment and oversized pipes for both the western and eastern catchments.

The Proposed Development does not include green roofs. This is due to uncertainties regarding the ongoing future maintenance that the householder will need to undertake to ensure that they remain operational and effective into the future.

Rainwater harvesting systems for the residential properties on this site are not proposed for this development. This is due to uncertainty regarding the maintenance of such systems when installed in private properties. However, all properties may be fitted with rainwater butts on appropriate downpipes.

[3] C697 The SUDS Manual, CIRIA, 2007
[4] C753 The SUDS Manual, CIRIA, 2016

Although CIRIA C697[3], Table 5.2, rules out permeable paving due to high water table and site slope; hence able provide only limited storage; it is proposed to use permeable paving in the parking areas and private roads to provide water treatment for flows passing through it. The private parking areas are considered to present a higher risk of surface run-off pollution due to substances dripping from parked vehicles and tyre and brake material deposited as vehicles manoeuvre. Permeable paving will need to be lined and constructed above the water table.

Trapped gullies will be used on the public road to separate contaminants and silt from the surface water run-off before it reaches the outfall.

Pocket filter drains are proposed for each residential housing downpipe to provide both interception and water quality benefits for residential roof runoff. Details of pocket filter drains will be established later in the design process.

The percentage of the total Site's run-off treated by each SuDS component is shown in Table 6-4.

SuDS component	Run-off treated by the SuDS component (% of total runoff)
Permeable paving	30
Pocket filter drain	55
Trapped Gully	15

Table 6-4 - % of total run-off treated by each SuDS component

The pollution mitigation indices for pocket filter drain and permeable paving are set out in Table 6-5 as follows (CIRIA C753, Table 26.3).

SuDS component	Total suspended solids (TSS)	Metals	Hydrocarbons
Pocket filter drain	0.4	0.4	0.4
Permeable paving	0.7	0.6	0.7

Source: CIRIA C753, Table 26.3 and 26.4 (extract)

Table 6-5 - Pollution mitigation indices for permeable paving

Table 6-6 demonstrates that the SuDS techniques identified above will achieve the required degree of pollution mitigation for each of the different land uses.

Land use	Pollution hazard indices			SuDS feature	Pollution mitigation indices		
	TSS	Metals	Hydrocarbons		TSS	Metals	Hydrocarbons
Residential roofs	0.2	0.2	0.05	Green roof	0.4	0.4	0.4
Individual property driveways, carparks, low traffic roads (<300 movements/day)	0.5	0.5	0.4	Permeable paving	0.7	0.6	0.7

Table 6-6 - Potential SuDS configurations

6.5. Proposed Strategy

The drainage strategy is illustrated on drawing number 5218589-ATK-WT-XX-DR-D-0502 *Proposed Drainage Strategy*, included in **Appendix B**.

The Proposed Development is divided into two catchments areas (Western and Eastern), each of which is proposed to drain independently to its own outfall. Based on proposed development layout plans, the development has been calculated 60% impermeable. The total impermeable area that the surface water drainage system must achieve is 0.67ha.

It is proposed that the surface water drainage system will comprise a conventional pipe network, alongside SuDS components, draining to cellular storage tanks for the western catchment and oversized pipes for both the western and eastern catchments. Due to high groundwater, floatation checks need to be undertaken on the cellular storage and measures to prevent groundwater ingress into the tank implemented.

Hydro-Brake® flow controls are proposed to be used prior to each outfall into the sewer, limiting the flow to the maximum permitted flow rate for the Site, as detailed in Table 6-2.

The storage has been designed to provide the necessary flow attenuation for all rainfall events up to and including the 1% AEP +45% climate change event.

The required storage volumes have been determined using MicroDrainage Source Control; results are illustrated in Table 6-7. Calculation results in full are provided in **Appendix D**.

Catchment	Total Area (ha)	Imp. Area (ha)	Discharge Rate (l/s)	Required Storage (m^3)
West	0.72	0.43	3.9	280
East	0.39	0.24	1.1	140

Table 6-7 - Storage requirements

6.6. Adoption & Maintenance

It is anticipated that the underground pipework and attenuation storage within the proposed surface water drainage system will be offered to UU for adoption.

7. Foul Water Drainage Strategy

7.1. Foul Water Flow Rates

As described in section 4.1, the Proposed Development comprises 38 accommodation buildings. Based on the Design and Construction Guidance, clause B3.1.1.(b), each dwelling generates 4,000 l/dwelling/day; therefore, the peak foul water flow rate generated by the proposed development will be 1.8l/s (based on 6 dry weather flow (DWF)).

7.2. Proposed Outfall

Correspondence with UU confirmed that there is a suitable point of connection into a 225mm diameter public combined sewer located to the west of the Proposed Development at an unrestricted rate.

Foul water flows from the Proposed Development will be discharged into this public combined sewer at two separate points of connection (UU manhole ref. 4415 and 4305).

7.3. Strategy

It is proposed that foul water flows within the Proposed Development will be conveyed via a gravity pipe network. The pipe network will consist of pipes laid at gradients that enable self-cleansing flow velocities to be achieved in accordance with the Design and Construction Guidance.

7.4. Adoption & Maintenance

It is anticipated that the proposed foul water drainage system will be offered to UU for adoption.

8. Conclusions & Recommendations

8.1. Conclusions

The Site is located within Flood Zone 1 (<0.1% AEP, low risk) for fluvial flooding. Therefore, the risk associated with fluvial flooding is considered low.

Minor areas in roads surrounding the Site are affected by low and medium risk of surface water flooding, but their associated flow paths do not encroach the Site area and therefore are considered negligible.

Risks of flooding from; groundwater, sewers, reservoirs, coastal, tidal, and estuarine are considered to be low or negligible.

The following flood risk management measures will be incorporated into the Proposed Development:

- Finished floor levels shall be at least 0.15m above adjacent external ground levels.
- External ground profiles shall, where possible, fall away from buildings.
- A positive surface water drainage system shall be implemented.

The primary residual risk affecting the Proposed Development relates to an extreme rainfall event exceeding the capacity of the proposed surface water drainage system to intercept and convey flows. This will result in additional overland flows through the Site and potential surface water flooding

Surface water run-off from the Proposed Development will be discharged into a local public combined water sewer located to the west of the site at two separate points of connection (UU manhole ref. 4415 and 4305) at a maximum total discharge rate of 6l/s, prorated based on catchment areas. The ground beneath the Site is likely to be contaminated; therefore, infiltration as a means of surface water disposal is not considered viable.

The proposed surface water drainage system will incorporate SuDS. Subsurface storage is anticipated to provide the primary surface water storage within the Proposed Development, in the form of storage tanks and oversized pipes. The Proposed Development does not include green roofs and rainwater harvesting systems, due to uncertainties regarding the ongoing future maintenance that the householder will need to undertake to ensure that they remain operational and effective. However, all properties may be fitted with rainwater butts on appropriate downpipes.

Permeable pavings are proposed in the parking areas and private roads to provide water treatment for flows passing through it. These will need to be lined and constructed above the water table. Pocket filter drains are proposed for each residential housing downpipe to provide both interception and water quality benefits for residential roof runoff.

The Proposed Development is divided into two catchments areas (Western and Eastern), each of which is proposed to drain independently to its own outfall. It is proposed that the surface water drainage system will primarily comprise a conventional pipe network draining to cellular storage tanks for the western catchment and oversized pipes for both the western and eastern catchments. Due to high groundwater, floating checks need to be undertaken on the cellular storage and measures to prevent groundwater ingress into the tank implemented.

Hydro-Brake® flow controls are proposed to be used prior to each outfall into the sewer, limiting the flow to the maximum permitted flow rate for the Site.

The storage has been designed to provide the necessary flow attenuation for all rainfall events up to and including the 1% AEP +45% climate change event.

The peak foul water flow rate generated by the proposed development will be 1.8l/s. These are proposed to be discharged into the public combined sewer to the west of the site at two separate points of connection (UU manhole ref. 4415 and 4305). The suitability of the connections has been confirmed by UU.

Both the proposed surface and foul water drainage systems will be offered to UU for adoption.

8.2. Recommendations

This Flood Risk Assessment is suitable for submission in support of a full planning application for the Proposed Development.

The design of the Proposed Development and its drainage systems must comply with the principles and parameters defined in this document or a suitable alternative as agreed with the relevant approving authorities.

Appendices

Appendix A. Correspondence

Wilkinson, Ruth

From: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Sent: 19 October 2022 09:23
To: Wilkinson, Ruth
Subject: GMMC281028SW Response attached from the Environment Agency

Dear Ruth,

Thank you for your enquiry which was received on 23/09/22.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The site proposal is located in Flood Zone 1, very low risk. Our nearest model is in Blackley, which has no impact to this site location.

We have no flood defences in the vicinity of this site.

We have no records of flooding affecting the site. However, this does not mean flooding has not occurred in the past or that it will not flood in future. We recommend that you also contact United Utilities and the lead local flood authority who may hold additional information (the former especially in relation to sewer flooding).

For further information on your property's flood risk, visit:
Long term flood risk website: https://flood-warning-information.service.gov.uk/long-term-flood-risk/
Flood Map for Planning: https://flood-map-for-planning.service.gov.uk/

For surface water information please use link: https://check-long-term-flood-risk.service.gov.uk/map?easting=362125.07&northing=388310.97&map=SurfaceWater

Please refer to the Open Government Licence which explains the permitted use of this information.

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

Kind regards,

Sarah

Sarah Walters | Customer and Engagement Officer
Greater Manchester, Merseyside and Cheshire

Direct email: **Inforequests.GMMC@environment-agency.gov.uk**
Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA4 1HT

Creating a better place for people and wildlife

From: Wilkinson, Ruth <Ruth.Wilkinson@atkinsglobal.com>
Sent: 23 September 2022 10:50

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To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: 220929/GA09-Ref: Development enquiry - Former White Moss Day Care Centre, Benmore Road, M9 6DN

> You don't often get email from ruth.wilkinson@atkinsglobal.com. Learn why this is important

Good morning,

I am contacting you in regards to a proposed residential development at former White Moss Day Care Centre near Benmore Road, Manchester. Please find the site location details below and the site location plan attached.

Site location: Adjacent to Benmore Road, M9 6DN

NGR coordinates: 386650, 403521

I am preparing a Drainage Strategy to support a planning application and would be grateful if you could advise on the following:

- Confirm that the site lies within Flood Zone 1
- Whether there are any records of flooding from any source in the vicinity of the site
- Are you aware of any specific flood risk and/or drainage issues that need to be considering within the Drainage Strategy for this site?

Please contact me if you require any clarifications about this enquiry.

Kind Regards,

Ruth Wilkinson *MEng*
Graduate Civil Engineer, Infrastructure
UK & Europe
Engineering, Civil Engineering & Advanced Technology

+(44)1214835888

Two Chamberlain Square, Birmingham, West Midlands, B3 3AX

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Main Banner Image

To help protect your privacy, Microsoft Office prevented automatic download of this picture from the Internet.

Company

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Wilkinson, Ruth

From: Walters, Sarah <Sarah.Walters2@environment-agency.gov.uk>
Sent: 17 January 2023 13:42
To: Wilkinson, Ruth
Subject: GMMC281028SW Response attached from the Environment Agency
Attachments: Ref: 220929/GA10-Development enquiry - White Moss Road, M9 6DA; GMMC281028SW Response attached from the Environment Agency

Dear Ruth,

Thank you for your enquiry.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I have attached the response that was sent on the 19th October 2022. Occationally we get multiple requests for the same sites and to reduce workload with our limited resources, we close these as duplicate emails sent in error. Our team believed both emails submitted were regarding the same site as their postcodes were the same, so the information provided was referring to both enquiries, I apologise for any inconvenience caused.

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

Please refer to the Open Government Licence which explains the permitted use of this information.

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

Kind regards,

Sarah

Sarah Walters | Customer and Engagement Officer
Greater Manchester, Merseyside and Cheshire

Direct email: **Inforequests.GMMC@environment-agency.gov.uk**
Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA4 1HT

Please consider this a "thanks" in advance.
Every email has a carbon footprint. So if you don't hear back from me,
it's not because of you, it's because of the planet.
#WhatWeCanDo

From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 17 January 2023 12:08
To: 'Wilkinson, Ruth' <Ruth.Wilkinson@atkinsglobal.com>
Cc: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Subject: RE: 220929/GA10-Development enquiry - White Moss Road, M9 6DA

Good Afternoon,

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For your information, I have passed your email onto the local Customer and Engagement team who will be able to look into request 220929/GA10.

Kind Regards,

Ian Collier
National Customer Contact Centre
Environment Agency

☎ Tel: 03708 506 506
Web Site: www.gov.uk/environment-agency

From: Wilkinson, Ruth <Ruth.Wilkinson@atkinsglobal.com>
Sent: 09 January 2023 11:00
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: RE: 220929/GA10-Development enquiry - White Moss Road, M9 6DA

Good Morning,

I requested some information for a flood risk assessment on a potential site in Manchester. The reference is 220929/GA10. I do not believe that I ever received an email with the following information that was asked for back on the 29th September 2022.

- Confirm that the site lies within Flood Zone 1
- Whether there are any records of flooding from any source in the vicinity of the site
- Are you aware of any specific flood risk and/or drainage issues that need to be considering within the Flood Risk Assessment and Drainage Strategy for this site?

At the time I put in another request, with reference 220929/GA09, and received an email in response with the relevant information on the 19th October 2022.

Please could you help clarify if this email was every sent out with the information on and if not please could I have that information at the earliest convenience.

Many thanks,

Ruth Wilkinson *MEng*
Graduate Civil Engineer, Infrastructure
UK & Europe
Engineering, Civil Engineering & Advanced Technology

+(44)1214835888

Two Chamberlain Square, Birmingham, West Midlands, B3 3AX

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From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 29 September 2022 11:36
To: Wilkinson, Ruth <Ruth.Wilkinson@atkinsglobal.com>
Subject: Ref: 220929/GA10-Development enquiry - White Moss Road, M9 6DA

Good morning Ruth,

I have passed your e-mail to the local customer team who will deal with your request.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

You can contact our customer team directly on the contact details below, or call the National Customer Contact Centre on 03708 506506 who will transfer you to the area team.

Please quote your enquiry reference 220929/GA10 in any correspondence with us regarding this matter.

Customers and Engagement
Environment Agency
Greater Manchester, Merseyside and Cheshire Area
Richard Fairclough House
Knutsford Road
Latchford
Warrington
WA4 1HT

Kind regards,

Gabriella Alfoldy
Customer Service Advisor
Environment Agency
Tel: 03708 506 506
Web Site: https://www.gov.uk/environment-agency
Click an icon to keep in touch with us:

From: Wilkinson, Ruth <Ruth.Wilkinson@atkinsglobal.com>
Sent: 23 September 2022 10:44
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: Ref: 220929/GA10-Development enquiry - White Moss Road, M9 6DA

> You don't often get email from ruth.wilkinson@atkinsglobal.com. Learn why this is important

Good morning,

I am contacting you in regards to a proposed residential development at White Moss Road, Manchester. Please find the site location details below and the site location plan attached.

Site location: Adjacent to White Moss Road, M9 6DA. Between Lilstock Walk and Wanley Walk.

NGR coordinates: 386427, 403450

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I am preparing a Flood Risk Assessment and Drainage Strategy to support a planning application and would be grateful if you could advise on the following:

- Confirm that the site lies within Flood Zone 1
- Whether there are any records of flooding from any source in the vicinity of the site
- Are you aware of any specific flood risk and/or drainage issues that need to be considering within the Flood Risk Assessment and Drainage Strategy for this site?

Please contact me if you require any clarifications about this enquiry.

Kind Regards,

Ruth Wilkinson *MEng*
Graduate Civil Engineer, Infrastructure
UK & Europe
Engineering, Civil Engineering & Advanced Technology

+(44)1214835888

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Wilkinson, Ruth

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 06 October 2022 16:17
To: Wilkinson, Ruth
Subject: RE: Our reference - 02844365 White Moss Road, Manchester, M9 6DA

Good afternoon Ruth,

Pre Development Enquiry for: Charlestown, Manchester UU Reference Number : 02844365

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

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

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

Foul Water

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

Our preferred point of discharge would be to the 225mm diameter public 4combined sewer located to the West of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

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

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

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For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the culverted/open ordinary watercourselocated 40m Southeast of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

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

Public Sewer

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

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Once evidence is provided as outlined above, United Utilities will consider a connection to the 225mm diameter public combined sewer located West of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 6l/s.

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

Levels

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

Land drainage / Overland flows / track drainage

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

Existing Wastewater Assets Crossing the Site

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

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

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

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

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

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

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

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Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

Sewer Adoptions

You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

SuDS

If your development proposal incorporates any SuDS component(s) which interact with a sewer network you plan on offering for adoption to United Utilities; contact should be made with our technical team at your earliest convenience, please complete the 'Section 104 pre-application form : ' and include as much relevant detail as you can. These discussions can help prevent delays later in the development process.

Section 104 Pre application form (1b)

As per the sewerage sector guidance, all SuDS should be designed in accordance with the standards within the Design & construction guidance & the CIRIA SuDS manual (C753)

Codes For Adoption

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The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/

A free copy of the new Design & Construction Guidance can be downloaded via the link below**:**

https://www.water.org.uk/sewerage-sector-guidance-approved-documents/

Many thanks and kind regards,

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

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CHECKED

United Utilities
Water for the North West

How to contact us:

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

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Your Ref: 115545
Our Ref: UUPS-ORD-452036
Date: 08/12/2022

Atkins - Utility Solutions

The Hub
500 Park Avenue,, Aztec West, Almondsbury
Bristol,
BS32 4RZ

FAO:

Dear Sirs

Location: 1 LINDSIDE WALK, MANCHESTER, M9 6DH

I acknowledge with thanks your request dated 07/12/2022 for information on the location of our services.

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

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

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

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

If you have any queries regarding this matter please contact us .

Yours Faithfully,

Karen McCormack
Property Searches Manager

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

Water for the North West

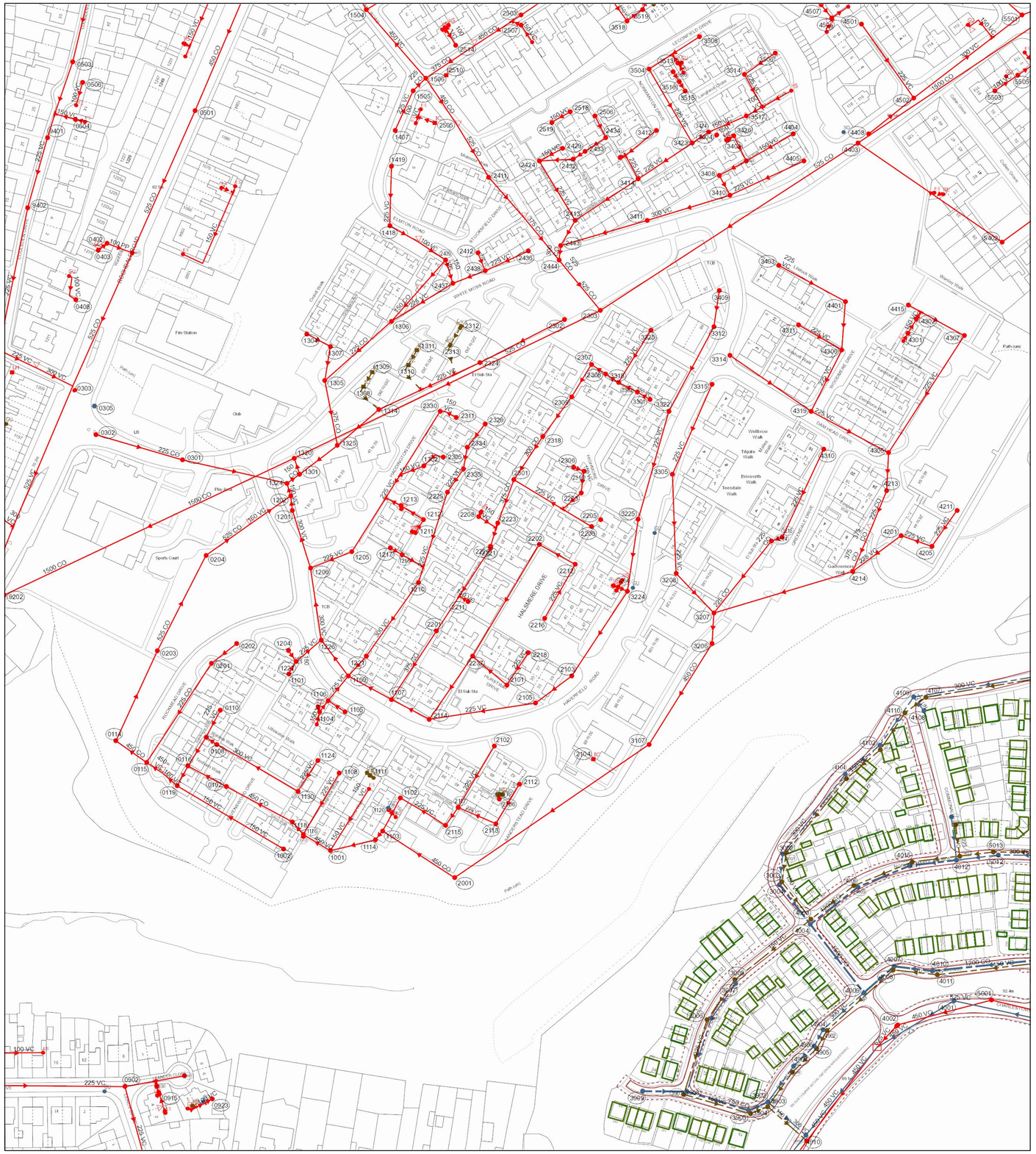
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

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



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4013	94.83	FO	93.41	150			VC	26.4552	1 in 38
4013	94.83	FO	93.41	150			VC	26.4552	1 in 38
4105	94.98	SW	93.28	225			VC	24.01859	1 in 100
4105	94.98	SW	93.28	225			VC	24.01859	1 in 100
5011	96.52	FO	95.17	150			VC	31.94857	1 in 31
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
4211	88.74	CO	82.65	225			VC	24.41311	1 in 32
4211	88.74	CO	82.65	225			VC	24.41311	1 in 32
4213	90.21	CO	84.49	225			CO	23.76973	1 in 21
4319	90.82	CO	88.02	225			VC	48.76474	1 in 163
3403	93.8	CO	90.95	225			VC	42.05948	1 in 76
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
3506	99.17	CO	96.87	225			VC	20.80865	1 in 51
3506	99.17	CO	96.87	225			VC	20.80865	1 in 51
3318	88.19	CO	86.21	225			VC	9.435553	1 in 9.53086076
3315	91.89	CO	89.47	225			VC	54.626	1 in 36
3411	93.29	CO	91.02	300			VC	50	1 in 15
3411	93.29	CO	91.02	300			VC	50	1 in 15
3413	94.81	CO	93.78	150			VC	3.162278	
3413	94.81	CO	93.78	150			VC	3.162278	
3424	97.17	CO	95.32	225			VC	10.81665	1 in 18
3424	97.17	CO	95.32	225			VC	10.81665	1 in 18
3408	95.5	CO	93.72	225			VC	12.52996	1 in 32
3408	95.5	CO	93.72	225			VC	12.52996	1 in 32
3501	100.1	CO	95.23	450			VC	64.07027	1 in 88
3509		CO		150			VC	6.309908	
3509		CO		150			VC	6.309908	
2112	86.06	CO	84.32	150			VC	25.55387	1 in 18
2103	87.78	CO	85.62	225			VC	25	1 in 47
3208	87.85	CO	82.4	225			CO	30.41381	1 in 21
3207	84.5	CO	80.87	450			CO	17.02939	1 in 170
3003	91.71	FO	88.47	150			VC	26.35666	1 in 264
3001	91.78	FO	90.43	150			VC	16.49788	1 in 137
4110	94.65	FO	92.75	150			VC	24.53574	1 in 30
4110	94.65	FO	92.75	150			VC	24.53574	1 in 30
2432	94.98	CO	93.45	225			VC	19.0263	1 in 22
2432	94.98	CO	93.45	225			VC	19.0263	1 in 22
1102	83.05	CO		300			VC	20.87345	
2220	86.66	CO	84.49	375			CO	54.91812	1 in 20
2102	86	CO	84.24	225			VC	39.44617	1 in 20
2113	84.99	CO	82.86	225			VC	22.84732	1 in 34
2438	88.42	CO	86.32	225			VC	19.31321	1 in 18
2436	90.24	CO	88.12	225			VC	26.40076	1 in 15
1325	79.66	CO	75.5	375			CO	26.40076	
2334	83.1	CO	81.61	225			CO	12.16553	1 in 152
2305		CO		150			VC	13.46664	
2309	86.53	CO	84.67	225			VC	27.20294	1 in 35
2311		CO		150			CO	9.888755	
1306	83.53	CO	81.93	225			VC	49.57822	1 in 15
2225	83.83	CO	81.33	225			VC	52.49762	1 in 97
2206	87.65	CO	86.03	225			VC	50.24938	1 in 17
1503	95.55	CO	91.59	225			VC	31.38471	1 in 49
1124	80.88	CO	78.64	225			VC	20.24846	1 in 88
1116	79.77	CO	78.23	150			VC	1	1 in 1
1114	81.55	CO	77.77	450			CO	25.70992	1 in 31
1221	81.45	CO	80.31	300			VC	14.86607	1 in 41
1501	88.33	CO	82.61	450			CO	94.54099	1 in 123
0402		CO		100			PP	14.90917	
0402		CO		100			PP	14.90917	
0506		CO		150			VC	13.29248	
0506		CO		100			VC	13.29248	
1320	78.64	CO	0	1500			CO	178.0365	
1201	78.43	CO	77.05	150			VC	8.062258	1 in 32
1118	78.81	CO	76.26	450			CO	41.54612	
0102	78.52	CO		450			CO	24.21861	
0201	79.14	CO	76.69	225			CO	65.73431	1 in 28
1101		CO		150			VC	7.97622	
3005	90.37	SW	88.64	225			VC	42.94352	1 in 33
4004	91.92	SW	88.07	1500			CO	48.25412	1 in 302
4006	92.96	SW	88.49	1200			CO	33.63239	1 in 280
6503	101.51	CO	97.57	300			VC	82.28001	1 in 187
4012	94.77	SW	88.68	1200			CO	26.01248	1 in 289
4012	94.77	SW	88.68	1200			CO	26.01248	1 in 289
4108	95.2	SW	93.07	225			UN	9.477607	1 in 14
4108	95.2	SW	93.07	225			UN	9.477607	1 in 14
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
4401	93.7	CO	90.37	225			VC	27.07397	1 in 26
3426	97.35	CO	95.13	225			VC	15.65248	1 in 26
3426	97.35	CO	95.13	225			VC	15.65248	1 in 26
4302		CO		150			VC	4.692246	
4302		CO		150			VC	4.692246	
3301		CO		150			VC	8.194279	
3312	90.11	CO	88.79	225			VC	62.36185	1 in 61
3312	93	CO	89.83	225			VC	53.23532	1 in 52
3305	89.56	CO	87.91	225			VC	55.03635	1 in 22
2216	86.94	CO	85.29	225			VC	34.48188	1 in 192
4103	92.54	FO	91.19	150			VC	52.86588	1 in 70
4015	93.98	FO	92.71	150			VC	35.13228	1 in 32
4015	93.98	FO	92.71	150			VC	35.13228	1 in 32
4109	94.97	SW	92.34	300			VC	32.64607	1 in 42
4109	94.97	SW	92.34	300			VC	32.64607	1 in 42
2503	99.43	CO	94.48	450			CO	31.06445	1 in 91
2503	99.43	CO	94.48	450			CO	31.06445	1 in 91
2507		CO		150			VC	5.52704	
2507		CO		150			VC	5.52704	
2424	94.63	CO	92.55	225			VC	38.58756	1 in 16
2424	94.63	CO	92.55	225			VC	38.58756	1 in 16
1103	81.51	CO	78.05	450			CO	6.403124	1 in 29
2001	82.97	CO	78.75	450			CO	47.70744	1 in 70
2114	84.3	CO	82.5	300			VC	23.70654	
2201	84.14	CO	81.65	375			CO	45.48626	
2437	87.33	CO	84.72	225			VC	39.96248	1 in 15
2324	84.04	CO	81.24	225			VC	61.7414	1 in 16
2208		CO		150			VC	11.55016	
2335	83.83	CO	81.51	225			VC	15.81139	1 in 99
1302		CO		150			VC	14.01078	
1504	93.51	CO	90.09	450			VC	18.35756	1 in 97
1504	93.51	CO	90.09	450			VC	18.35756	1 in 97
1506	96.56	CO	0	450			VC	50.32892	
1506	96.56	CO	0	450			VC	50.32892	
1115	79.87	CO	76.58	450			CO	9.219544	1 in 31
1104		CO		150			VC	7.802428	
1109	82.1	CO	79.9	300			VC	25	1 in 24
9401	81.71	CO	79.39	225			VC	40.5216	1 in 156
9401	81.71	CO	79.39	225			VC	40.5216	1 in 156
0401	81.46	CO	76.29	525			CO	81.02469	1 in 71
1324	78.24	CO	76.94	150			CO	8.602325	
1002		CO	0	150			VC	68.60029	
0116	78.11	CO	74.91	450			VC	12.52996	
0106	79	CO		300			VC	7.211102	
0110	79.25	CO	77.46	225			VC	17	1 in 35
0202	79.13	CO	77.23	225			CO	17.80449	1 in 38
9202		CO	0	1500			CO	229.4646	
4001		SW	86.79	525			VC	29.06233	
4001		SW	86.79	525			VC	29.06233	
5001	92.04	CO	88.46	450			VC	53.7785	
5001	92.04	CO	88.46	450			VC	53.7785	
5003	93.55	CO	89.01	450			VC	55.0726	1 in 106
4011	92.9	FO	91.56	150			VC	24.6391	1 in 40
4011	92.9	FO	91.56	150			VC	24.6391	1 in 40
5005	94.12	SW	88.58	1200			CO	64.63892	1 in 294
3907	89.06	SW	86.48	750			CO	35.84104	1 in 299
3006	90.29	FO	88.76	150			VC	43.38728	1 in 41
4904	90.7	FO	89.35	150			VC	11.55378	1 in 40
4902	90.69	SW	87.66	300			VC	10.27068	1 in 114
4007	92.36	SW	88.29	1200			CO	22.29395	1 in 279
4005	92.96	FO	91.6	150			VC	30.13498	1 in 20
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
4106	94.95	FO	93.63	150			VC	17.40154	1 in 79
4106	94.95	FO	93.63	150			VC	17.40154	1 in 79
4107	95.16	FO	93.27	150			VC	14.54713	1 in 28
4107	95.16	FO	93.27	150			VC	14.54713	1 in 28
5105	96.83	SW	94.18	300			VC	82.78629	1 in 45
4201	88.67	CO	81.7	225			VC	33.60059	1 in 168
4205	87.32	CO	81.72	225			VC	18.02776	
4205	87.32	CO	81.72	225			VC	18.02776	
3215	86.94	CO	84.89	225			VC	6.324555	1 in 8
4306	92.19	CO	89.25	225			VC	38.01316	1 in 32
3314	92.75	CO	90.43	225			VC	54.64431	1 in 23
4311	92.35	CO	90.22	225			VC	27.78489	1 in 30
3430	96.46	CO	94.49	225			VC	17	1 in 26
3430	96.46	CO	94.49	225			VC	17	1 in 26
4405	98.04	CO	95.49	225			VC	45.1885	1 in 21
4405	98.04	CO	95.49	225			VC	45.1885	1 in 21
4404	97.49	CO	95.85	150			VC	30.01666	1 in 25
4404	97.49	CO	95.85	150			VC	30.01666	1 in 25
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4507		CO		150			VC	9.524117	
4507		CO		150			VC	9.524117	
3318	88.19	CO	86.21	225			VC	8.592221	1 in 8.67901095
3325	89.35	CO	87.56	225			VC	34.1321	1 in 28
2434	95.54	CO	93.13	225			VC	13.85283	
2434	95.54	CO	93.13	225			VC	13.85283	
3412	96.24	CO	94.54	225			VC	36.78754	1 in 33
3412	96.24	CO	94.54	225			VC	36.78754	1 in 33
3410	95.5	CO	93.22	300			VC	48.08326	1 in 22
3410	95.5	CO	93.22	300			VC	48.08326	1 in 22
3504	97.79	CO	96.37	225			VC	47.50789	1 in 41
3504	97.79	CO	96.37	225			VC	47.50789	1 in 41
3517	98.08	CO	96.98	150			VC	22.84732	1 in 15
3517	98.08	CO	96.98	150			VC	22.84732	1 in 15
3518		CO		150			VC	10.78868	
3518		CO		150			VC	10.78868	
3519		CO		150			VC	7.723894	
3519		CO		150			VC	7.723894	
3508	98.32	CO	97.02	225			VC	33.28663	1 in 53
3508	98.32	CO	97.02	225			VC	33.28663	1 in 53
3513		CO		100			VC	5.833395	
3513		CO		100			VC	5.833395	
3224	89.08	CO	87.07	225			VC	56.30275	1 in 40
3204		CO		100			VC	5.580275	
4214	86.99	CO	81.46	450			CO	80.36168	1 in 144
3002	91.73	SW	89.93	300			VC	17.24258	1 in 37
4104	92.6	SW	90.8	300			VC	56.21508	1 in 65

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4101	93.28	FO	91.93	150			VC	24.80941	1 in 34
1419	93.14	CO	90.64	225			VC	33.01515	1 in 12
1419	93.14	CO	90.64	225			VC	33.01515	1 in 12
2411	92.55	CO	87.51	525			CO	30.4795	1 in 8
2411	92.55	CO	87.51	525			CO	30.4795	1 in 8
1407	94.9	CO	92.98	225			VC	24.16609	1 in 81
1407	94.9	CO	92.98	225			VC	24.16609	1 in 81
2518		CO		150			VC	11.77129	
2518		CO		150			VC	11.77129	
1210	83.31	CO	80.69	300			VC	50.21952	1 in 139
1120		CO		150			VC	5.459459	
2115	83.24	CO	81.25	225			VC	29.40652	
2105	87.09	CO	85.04	225			VC	59.6825	1 in 25
2237	85.33	CO	83.43	225			VC	42.43819	1 in 50
2101	86.62	CO	84.35	225			VC	24.83949	1 in 28
2444	90.34	CO	79.61	525			CO	36.23534	
2412	88.36	CO	0	225			VC	10.77033	
2413	92.54	CO	90.04	225			VC	16.12452	1 in 7
2413	92.54	CO	90.04	225			VC	16.12452	1 in 7
1418	89.99	CO	87.65	225			VC	18.35756	1 in 13
1418	89.99	CO	87.65	225			VC	18.35756	1 in 13
2318	85.95	CO	83.82	300			CO	14.4222	1 in 34
1305	80.7	CO	78.55	375			CO	36.67424	1 in 12
2307	87.15	CO	85.15	225			VC	21.09502	1 in 49
1307	81.76	CO	79.76	225			CO	19.23538	1 in 19
2302	87.36	CO	85.34	225			VC	52.7731	1 in 13
1304	82.57	CO	80.77	225			CO	14.76482	1 in 16
2212	87.44	CO	85.06	225			VC	22.82542	1 in 88
1217		CO		150			VC	7.601641	
2330	82.92	CO	80.83	225			VC	92.11406	1 in 29
2223	85.13	CO	82.31	375			CO	13.60147	1 in 45
2301	85.43	CO	82.88	375			CO	25.63201	1 in 52
2203		CO		150			VC	13.69867	
1108		CO	0	225			VC	39.44617	
1001	80.33	CO	76.93	450			CO	17.49286	1 in 53
0501	84.99	CO	79.7	525			CO	86.40602	1 in 60
0501	84.99	CO	79.7	525			CO	86.40602	1 in 60
0302	77.61	CO	76.41	225			CO	60	
0928		CO		100			VC	3.057589	
0915		CO		100			VC	4.5577	
0115	78.13	CO	74.18	450			CO	20.80865	1 in 32
5901	93.47	SW	88.93	525			VC	70.7922	1 in 33
3908	89.05	FO	87.69	150			VC	38.51841	1 in 133
3904	89.44	SW	86.36	750			CO	11.67858	1 in 389
4908	89.96	FO		150			VC	23.4357	
4907	90.04	SW	87.44	300			VC	24.48978	1 in 122
3909	88.82	SW	86.57	750			CO	24.54757	1 in 273
4906	90.41	FO	89.06	150			VC	18.87132	1 in 42
4905	90.44	SW	87.57	300			VC	16.09513	1 in 124
4008	92.29	FO	90.94	150			VC	49.83525	1 in 31
4002		CO	0	450			CO	4.137034	
3008	90.85	FO	89.5	150			VC	27.04511	1 in 37
4003	91.9	FO	90.15	150			VC	54.03538	1 in 89
0902	83.62	CO	80.86	225			VC	38.32754	1 in 65
3903	89.55	FO	87.32	150			VC	28.92654	1 in 80
5012	95.52	SW	93.72	300			CO	23.35398	1 in 31
5012	95.52	SW	93.72	300			VC	23.35398	1 in 31
5013	95.43	FO	94.13	150			VC	18.9196	1 in 26
5013	95.43	FO	94.13	150			VC	18.9196	1 in 26
5010	96.48	SW	94.68	300			VC	31.2879	1 in 33
5107	96.86	FO	94.59	150			VC	74.11088	1 in 56
6605		CO	0	1500			CO	273.5814	
4310	90.27	CO	87.31	225			VC	54.12947	1 in 23
4305	91.6	CO	87.64	225			VC	21.0238	1 in 17
4307	96.05	CO	92.61	225			VC	77.38863	1 in 16
4307	96.05	CO	92.61	225			VC	77.38863	1 in 16
4301		CO		150			VC	9.114041	
4301		CO		150			VC	9.114041	
3514	98.33	CO	96.43	225			VC	20.59126	
3514	98.33	CO	96.43	225			VC	20.59126	
4415	95	CO	93.15	225			VC	35.35534	1 in 68
4415	95	CO	93.15	225			VC	35.35534	1 in 68
3502		CO		150			VC	11.77347	
3225	89.34	CO	87.74	225			VC	40.4475	1 in 62
3414	94.96	CO	93.35	225			VC	41.88078	1 in 13
3414	94.96	CO	93.35	225			VC	41.88078	1 in 13
2506	96.21	CO	93.81	225			VC	13.41641	1 in 20
2506	96.21	CO	93.81	225			VC	13.41641	1 in 20
4403	98.86	CO	0	525			CO	170.5814	
4403	98.86	CO	0	525			CO	170.5814	
3423	97.01	CO	94.02	225			VC	36.05551	1 in 56
3423	97.01	CO	94.02	225			VC	36.05551	1 in 56
3409	93.99	CO	92.07	225			VC	20.22375	1 in 9
3516		CO		150			VC	6.238936	
3516		CO		150			VC	6.238936	
3107	84.39	CO	80.56	450			CO	130.9198	1 in 73
2218	86.78	CO	85.16	225			VC	21.83331	1 in 28
3206	84.26	CO	80.71	450			CO	66.03786	1 in 508
3214	86.51	CO	82.99	225			CO	51.22499	1 in 26
4102	93.36	SW	91.56	300			VC	25.09649	1 in 33
4014	93.95	SW	88.59	1200			CO	31.19089	1 in 312
4014	93.95	SW	88.59	1200			CO	31.19089	1 in 312
1505	95.82	CO	92.68	225			CO	9.899495	
1505	95.82	CO	92.68	225			CO	9.899495	
2429	94.74	CO	93.15	150			VC	14.76482	
2429	94.74	CO	93.15	150			VC	14.76482	
2433	95.26	CO		225			VC	7.780479	
2433	95.26	CO		225			VC	7.780479	
2117	83.82	CO	82.17	225			VC	12.20656	1 in 14
2211		CO		150			VC	5.795321	
2202	86.7	CO	84.78	225			VC	72.20111	1 in 55
2439	86.96	CO	0	225			CO	22.67157	
2439	86.96	CO	84.88	150			VC	6.324555	1 in 126
2443	90.89	CO	87.7	300			CO	8.062258	1 in 1
2443	90.89	CO	87.7	300			CO	8.062258	1 in 1
2303	88.62	CO	0	525			CO	188.7432	
2329	83.28	CO	81.84	225			VC	16.40122	1 in 78
1314	80.84	CO	77.34	225			VC	30.4795	1 in 19
1206	78.9	CO	76.81	300			VC	33.52611	
1205	79.89	CO	77.64	225			VC	24.69818	1 in 40
1218		CO		150			VC	13.74952	
2221	85.23	CO	83.39	150			CO	1	
2310		CO		150			VC	12.09426	
2306		CO		150			VC	6.02287	
1227	80.29	CO	79.08	225			VC	18.43909	1 in 97
1226	80.39	CO	78.8	300			VC	40.4475	1 in 21
1106		CO		225			VC	17.66848	
1105		CO		150			VC	11.27404	
1107	83.19	CO	0	300			VC	27.29469	
0502	86.09	CO	82.69	225			VC	47.29694	1 in 62
0509		CO		150			VC	44.75237	
9402	80.69	CO	78.14	225			VC	80.60397	1 in 102
9402	80.69	CO	78.14	225			VC	80.60397	1 in 102
0503	83.93	CO	80.76	225			VC	44.27669	1 in 89
0503	83.93	CO	80.76	225			VC	44.27669	1 in 89
0504		CO		150			VC	11.75158	
0504		CO		150			VC	11.75158	
0203	77.98	CO	70.65	525			CO	59.48109	1 in 108
0303	78.3	CO	72.85	525			VC	106.2342	1 in 59
0204	78.21	CO	70.06	525			CO	29.41088	
1202	78.49	CO	76.69	150			VC	7.28011	
0301	78.62	CO	76.44	225			CO	59.43904	
1301		CO	0	375			CO	8.486833	
0901	84.07	CO	82.28	225			VC	33.54102	1 in 66
1130	78.97	CO	78.3	300			VC	51.97459	
0119	78.31	CO	0	100			VC	10.63015	
0107	79.02	CO	76.75	300			VC	18.86796	1 in 28
0114	78.11	CO	70.94	525			CO	55.03635	1 in 204
1204		CO		150			VC	7.537457	
5006	94.05	FO	92.7	150			VC	64.48949	1 in 57
4010	92.85	SW	88.36	1200			CO	21.32987	1 in 305
4010	92.85	SW	88.36	1200			CO	21.32987	1 in 305
3905	89.42	FO	87.4	150			VC	10.35729	1 in 129
3007	90.38	SW	89.16	225			VC	23.51065	1 in 45
3004	91.69	SW	88.47	1200			CO	27.89712	1 in 279

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined | blue - surface water
brown - foul | purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

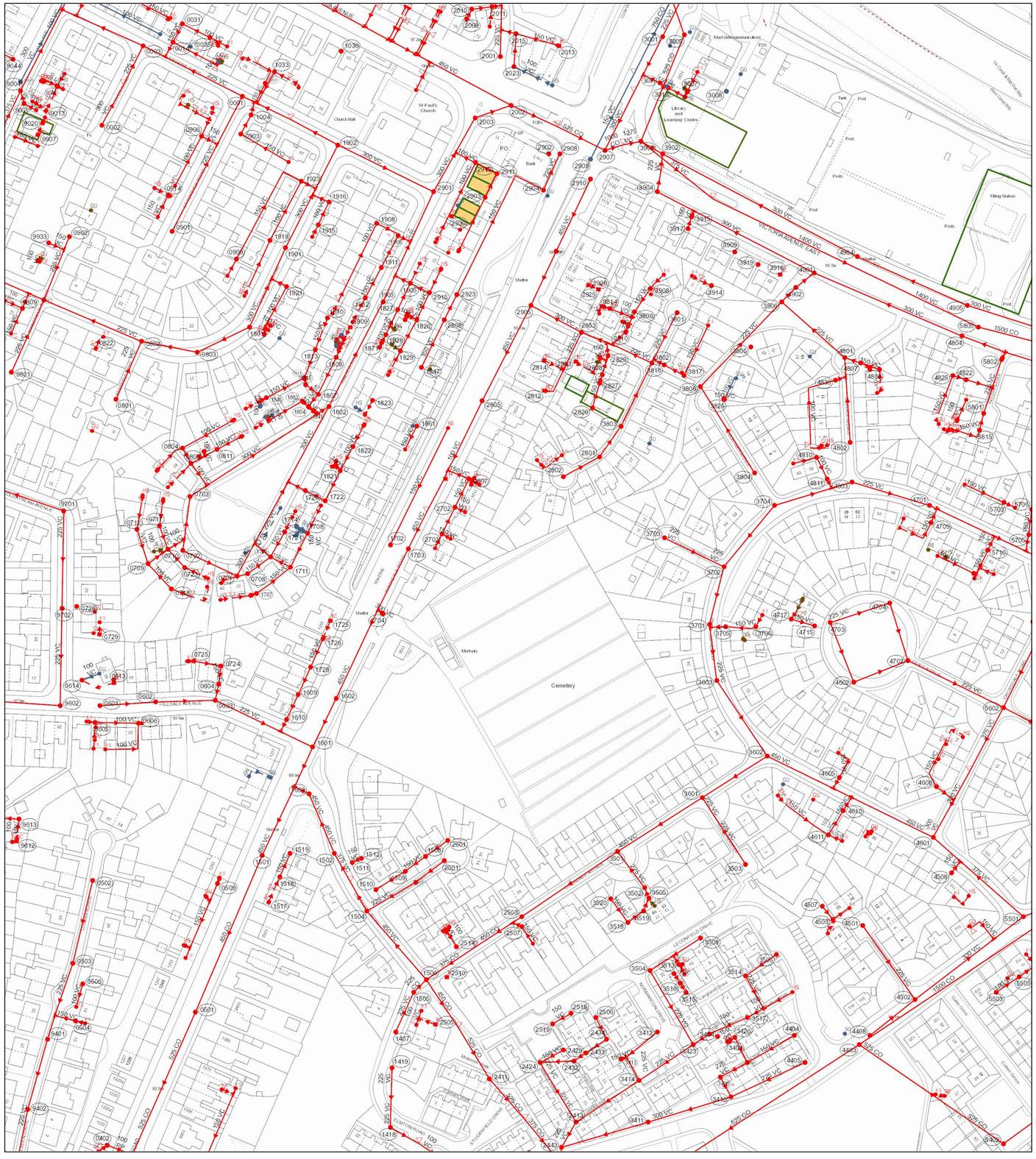
1 LINDSIDE WALK,
MANCHESTER,
M9 6DH

OS sheet Number: SD8603SW
Scale: 1:1250 **Date:** 08/12/2022
Nodes: 346
Sheet: 1 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
5601	101.27	CO	99.75	225			VC	32.64965	1 in 251
4701	102.29	CO	100.49	225			VC	86.33076	1 in 93
4701	102.29	CO	100.49	225			VC	86.33076	1 in 93
5705		CO		150			VC	9.284122	
5705		CO		150			VC	9.284122	
3430	96.46	CO	94.49	225			VC	17	1 in 26
3430	96.46	CO	94.49	225			VC	17	1 in 26
4405	98.04	CO	95.49	225			VC	45.1885	1 in 21
4405	98.04	CO	95.49	225			VC	45.1885	1 in 21
4404	97.49	CO	95.85	150			VC	30.01666	1 in 25
4404	97.49	CO	95.85	150			VC	30.01666	1 in 25
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
4610		CO		150			VC	8.598775	
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4507		CO		150			VC	9.524117	
4507		CO		150			VC	9.524117	
4508		CO		150			VC	8.061387	
4508		CO		150			VC	8.061387	
3503	100.49	CO	98.99	225			VC	44.10215	1 in 48
4704	103.62	CO	101.58	225			VC	33.52611	1 in 129
2434	95.54	CO	93.13	225			VC	13.85283	
2434	95.54	CO	93.13	225			VC	13.85283	
3412	96.24	CO	94.54	225			VC	36.78754	1 in 33
3412	96.24	CO	94.54	225			VC	36.78754	1 in 33
3410	95.5	CO	93.22	300			VC	48.08326	1 in 22
3410	95.5	CO	93.22	300			VC	48.08326	1 in 22
3504	97.79	CO	96.37	225			VC	47.50789	1 in 41
3504	97.79	CO	96.37	225			VC	47.50789	1 in 41
3517	98.08	CO	96.98	150			VC	22.84732	1 in 15
3517	98.08	CO	96.98	150			VC	22.84732	1 in 15
3518		CO		150			VC	10.78868	
3518		CO		150			VC	10.78868	
3519		CO		150			VC	7.723894	
3519		CO		150			VC	7.723894	
3508	98.32	CO	97.02	225			VC	33.28663	1 in 53
3508	98.32	CO	97.02	225			VC	33.28663	1 in 53
3513		CO		150			VC	5.833395	
3513		CO		150			VC	5.833395	
1419	93.14	CO	90.64	225			VC	33.01515	1 in 12
1419	93.14	CO	90.64	225			VC	33.01515	1 in 12
2411	92.55	CO	87.51	525			CO	30.4795	1 in 8
2411	92.55	CO	87.51	525			CO	30.4795	1 in 8
1407	94.9	CO	92.98	225			VC	24.16609	1 in 81
1407	94.9	CO	92.98	225			VC	24.16609	1 in 81
1506	96.56	CO	92.42	450			CO	32.44996	1 in 74
1506	96.56	CO	92.42	450			CO	32.44996	1 in 74
2518		CO		150			VC	11.77129	
2518		CO		150			VC	11.77129	
2413	92.54	CO	90.04	225			VC	16.12452	1 in 7
2413	92.54	CO	90.04	225			VC	16.12452	1 in 7
1418	89.99	CO	87.65	225			VC	18.35756	1 in 13
1418	89.99	CO	87.65	225			VC	18.35756	1 in 13
2702		CO		150			VC	17.6431	
1722		CO		100			VC	12.46453	
5805		CO	0	1500			CO	200.3397	
5805		CO	0	1500			CO	200.3397	
5801	98.32	CO	95.93	225			VC	31.62278	1 in 31
5801	98.32	CO	95.93	225			VC	31.62278	1 in 31
4811		CO		100			VC	5.662676	
4830		CO		100			VC	5.958196	
4806		CO		150			VC	11.05924	
5815		CO		150			VC	9.49207	
5815		CO		150			VC	9.49207	
3801	98.99	CO	97.67	225			VC	31.30495	1 in 14
3804	100.72	CO	100.24	225			VC	56.60389	1 in 32
4905	96.59	CO	93.29	300			VC	66.70832	1 in 39
4905	96.59	CO	93.29	300			VC	66.70832	1 in 39
3907	94.4	CO	0	375			VC	51.22499	
3007		CO		150			VC	3.817585	
2905	95.59		86.41	450			VC	59.48109	1 in 991
2901	98.92	CO	94.09	300			VC	47.01064	1 in 261
2911		CO		100			VC	13.29007	
2803	95.66	CO	93.34	300			VC	31.76476	1 in 151
2910		CO	0	450			VC	44.28318	
3908		CO		150			VC	15.79386	
3902	94.48	CO	90.37	375			VC	13.89244	
1861		CO		150			VC	14.47788	
1803		CO	0	150			VC	4.494277	
1815		CO	0	150			VC	8.63084	
1814		CO	0	150			VC	3.971177	
1829				100			VC	19.63894	
1923		CO		150			VC	8.980028	
1916		CO		150			VC	9.887456	
1810		CO		150			VC	8.187227	1 in
1903	100.55	CO	95.98	300			VC	67.11929	1 in 258
2002	96.23	CO	88.89	450			VC	28.63564	1 in 95
2023		CO		0			UN	18.19305	
2013		CO	0	150			VC	3.25115	
2011		CO	0	150			VC	5.435385	
1919		CO		100			VC	37.08021	
1033		CO		150			VC	20.02287	
0001	100.12	CO	96.8	225			VC	61.71714	1 in 123
0002	99.59	CO	96.85	300			VC	25.05993	1 in 109
0902	98.15	CO	95.04	225			VC	37.69616	1 in 41
5710		CO		150			VC	8.479527	
5710		CO		150			VC	8.479527	
5703		CO		150			VC	6.803391	
5703		CO		150			VC	6.803391	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
4406	99.14	CO	97.91	225			VC	32.01562	1 in 100
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4601	102.7	CO	96.8	450			VC	102.4158	1 in 201
4601	102.7	CO	96.8	450			VC	102.4158	1 in 201
3603	103.02	CO	100.28	225			VC	50.47772	1 in 89
3506	99.17	CO	96.87	225			VC	20.80865	1 in 51
3506	99.17	CO	96.87	225			VC	20.80865	1 in 51
4611		CO		150			VC	15.86365	
4702	103.52	CO	101.25	225			VC	59.03389	1 in 54
4702	103.52	CO	101.25	225			VC	59.03389	1 in 54
4703	103.72	CO	101.94	225			VC	35.4683	1 in 87
3706		CO		150			VC	16.92572	
3703	102.8	CO	101.1	225			VC	36.67424	1 in 147
3411	93.29	CO	91.02	300			VC	50	1 in 15
3411	93.29	CO	91.02	300			VC	50	1 in 15
3413	94.81	CO	93.78	150			VC	3.162278	
3413	94.81	CO	93.78	150			VC	3.162278	
3424	97.17	CO	95.32	225			VC	10.81665	1 in 18
3424	97.17	CO	95.32	225			VC	10.81665	1 in 18
3408	95.5	CO	93.72	225			VC	12.52996	1 in 32
3408	95.5	CO	93.72	225			VC	12.52996	1 in 32
3501	100.1	CO	95.23	450			VC	64.07027	1 in 88
3502	100.26	CO	98.71	225			VC	25	1 in 32
3509		CO		150			VC	6.309908	
3509		CO		150			VC	6.309908	
2601		CO		150			VC	15.28905	
2432	94.98	CO	93.45	225			VC	19.0263	1 in 22
2432	94.98	CO	93.45	225			VC	19.0263	1 in 22
2703		CO		150			VC	16.46383	
1714		SW		0				2.888854	1 in
2807		CO		150			VC	12.73403	
1822		CO		100			VC	15.07347	
5803	97.47	CO	0	225			VC	64.84597	
3704	103.63	CO	101.99	225			VC	44.92215	1 in 43
4810		CO		100			VC	13.33024	
4802	102.35	CO	100.19	225			VC	47.09621	1 in 34
4807		CO		150			VC	9.315366	
3816		CO		150			VC	6.668663	
4902	99.3	CO	94.61	225			VC	12.80625	1 in 23
4901	95.71	CO	93.01	300			VC	97.94897	1 in 113
3915		CO		150			VC	3.556029	
3904	94.76	CO	91.91	300			VC	11.18034	1 in 20
3010		CO		150			VC	10.29405	
2802	99.1	CO	96.36	225			VC	22.82542	1 in 56
2826		CO		150			VC	14.17604	
3810		CO		225			VC	10.46401	
2923		CO		150			VC	90.98305	
2903		CO		100			VC	14.59848	
3809		CO		225			VC	7.40496	
2001	96.18	CO	94.46	225			VC	157.1882	1 in 52
1847		CO		150			VC	29.22897	
1901	100.77	CO	97.82	300			VC	63.95311	1 in 136
1912		CO		100			VC	18.80462	
1905		CO		100			VC	9.430775	
1827		CO		100			VC	16.22158	
2909	94.94	SW	94	150			VC	52.7731	1 in 12
3001	93.01	CO	87.29	225			VC	34.88553	1 in 205
2009		CO	0	150			VC	5.834126	
0914		CO		150			VC	1.141903	
1004		CO		150			VC	7.346786	
0014		CO		150			VC	9.347383	
0031		CO		150			VC	11.36628	
9901	98.91	CO	95.93	225			VC	60.00833	1 in 56
1503	95.55	CO	91.59	225			VC	31.38471	1 in 49
1508		CO		150			VC	13.83184	
0702	100.35	CO	97.44	300			VC	33.10589	1 in 144
1707		CO		150			VC	23.97274	
1501	88.33	CO	82.61	450			CO	94.54099	1 in 123
6503	102.14	CO	97.57	300			VC	82.28001	1 in 187
5602	102.14	CO	98.06	375			VC	40.70626	1 in 83
5602	102.14	CO	98.06	375			VC	40.70626	1 in 83
5706		CO		150			VC	13.94907	
5706		CO		150			VC	13.94907	
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
3426	97.35	CO	95.13	225			VC	15.65248	1 in 26
3426	97.35	CO	95.13	225			VC	15.65248	1 in 26
3602	102.63	CO	96.25	450			VC	42.72002	1 in 104
4605		CO		150			VC	6.900367	
3701	103.32	CO	100.52	225			VC	31.257	1 in 142
3705		CO		150			VC	8.762109	
4717		CO		150			VC	13.52242	
4703	103.72	CO	102.03	225			VC	34.78505	1 in 83
3702	103.55	CO	100.82	225			VC	32.98484	1 in 118
3704	103.63	CO	101.99	225			VC	44.04543	1 in 80
2503	99.43	CO	94.48	450			CO	31.06445	1 in 91
2503	99.43	CO	94.48	450			CO	31.06445	1 in 91

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
2507		CO		150			VC	5.52704	
2507		CO		150			VC	5.52704	
2424	94.63	CO	92.55	225			VC	38.58756	1 in 16
2424	94.63	CO	92.55	225			VC	38.58756	1 in 16
1708		CO		150			VC	21.03563	
5802	96.81	CO	94.37	225			VC	4.472136	
5802	96.81	CO	94.37	225			VC	4.472136	
5804	97.44	CO	94.29	300			VC	92.34717	1 in 95
4804	96.59	CO	93.99	300			VC	89.15717	1 in 110
4804	96.59	CO	93.99	300			VC	89.15717	1 in 110
4822		CO		150			VC	15.19679	
4822		CO		150			VC	15.19679	
3817		CO		150			VC	12.38656	
3825		CO		150			VC	0.6371598	
3906	99.95	CO	97.46	225			VC	11.31371	1 in 60
4801	100.73	CO	98.77	225			VC	46.75468	1 in 37
4904	95.75	CO	91.53	300			VC	122.1188	
3013		CO		150			VC	5.460033	
2827		CO		150			VC	5.006031	
2828		CO		150			VC	11.01766	
2829		CO		150			VC	7.296511	
3803	97.3	CO	94.56	225			VC	38.91015	1 in 85
2906		CO	0	450			VC	33.10589	
2907	94.49	CO	86.98	1000			CO	10.44031	
2805	95.72	CO	86.32	100			VC	69.34499	1 in 17
1841		CO	0	300			VC	2.717144	
1804		CO		100			VC	3.705891	
1808		CO	0	150			VC	15.08382	
1915		CO		100			VC	14.05475	
1908		CO		100			VC	14.54599	
1828		CO		100			VC	15.44248	
1826		CO		100			VC	16.24288	
2808		CO		150			VC	15.72933	
1902	100.2	CO	97.33	300			VC	29.52965	1 in 95
2903	96.79	CO	93.84	300			VC	21.18862	1 in 64
3011		CO		150			VC	10.4942	
2010		CO	0	150			VC	11.31037	
0803	100.33	CO	98.58	225			VC	31.57531	1 in 54
1801	100.9	CO	99.25	225			VC	32.20248	1 in 50
1801	100.9	CO	98.17	300			VC	48.33219	1 in 131
1921		CO		150			VC	9.435148	
0903		CO		150			VC	12.07601	
1031		CO		150			VC	11.97617	
0035		CO		150			VC	17.09918	
0801	99.17	CO	97.17	225			VC	34.9285	1 in 94
0802	99.77	CO	96.77	225			VC	58.69412	1 in 74
9044		CO		150			VC	18.87795	
9004	99.24	CO	0	100			VC	50.53711	
9005	99.33	CO	96.15	300			VC	46.76474	1 in 139
1601	90.83	CO	85.07	450			VC	24.16609	
1504	93.51	CO	90.09	450			VC	18.35756	1 in 97
1504	93.51	CO	90.09	450			VC	18.35756	1 in 97
1512		CO		150			VC	5.570956	
0725		CO		150			VC	15.29751	
0701	99.94	CO	96.57	300			VC	106.9439	1 in 972
6605		CO	0	1500			CO	273.5814	
3514	98.33	CO	96.43	225			VC	20.59126	
3514	98.33	CO	96.43	225			VC	20.59126	
4608		CO		150			VC	12.25576	
4608		CO		150			VC	12.25576	
4602	103.59	CO	101.49	225			VC	32.31099	1 in 249
5717		CO		100			VC	1.533907	
5717		CO		100			VC	1.533907	
4709		CO		150			VC	8.167535	
4709		CO		150			VC	8.167535	
3414	94.96	CO	93.35	225			VC	41.88078	1 in 13
3414	94.96	CO	93.35	225			VC	41.88078	1 in 13
2506	96.21	CO	93.81	225			VC	13.41641	1 in 20
2506	96.21	CO	93.81	225			VC	13.41641	1 in 20
4403	98.86	CO	0	525			CO	170.5814	
4403	98.86	CO	0	525			CO	170.5814	
3423	97.01	CO	94.02	225			VC	36.05551	1 in 56
3423	97.01	CO	94.02	225			VC	36.05551	1 in 56
3601	100.55	CO	95.8	450			VC	55.75841	1 in 101
3505		CO		150			VC	6.203548	
3516		CO		150			VC	6.238936	
3516		CO		150			VC	6.238936	
1505	95.82	CO	92.68	225			CO	9.899495	
1505	95.82	CO	92.68	225			CO	9.899495	
2501	96.85	CO	94.68	225			VC	20	1 in 36
2429	94.74	CO	93.15	150			VC	14.76482	
2429	94.74	CO	93.15	150			VC	14.76482	
2433	95.26	CO	0	525			VC	7.780479	
2433	95.26	CO	0	525			VC	7.780479	
2443	90.89	CO	87.7	300			CO	8.062258	1 in 1
2443	90.89	CO	87.7	300			CO	8.062258	1 in 1
1821		CO		100			VC	18.61349	
4803	102.98	CO	100.93	225			VC	44.92215	1 in 107
4825		CO		150			VC	7.727024	
4825		CO		150			VC	7.727024	
3806	100.35	CO	97.96	225			VC	65.09019	1 in 159
3917		CO		150			VC	6.860689	
3005	93.01	CO	0	525			CO	63.69458	
2601	96.16	CO	94.89	225			VC	20.80865	1 in 67
3802	97.48	CO	94.07	225			VC	21.0238	1 in 60
2912		CO		100			VC	12.44765	
2904	95.35	CO	94.21	225			VC	21.93171	1 in 35
1823		CO	0	150				8.945894	
1807		CO	0	150			VC	8.874681	
1802	100.63	CO	96.44	300			VC	65.29931	1 in 148
1813		CO	0	150			VC	16.72548	
1811		CO		100			VC	4.987584	
1902	100.2	CO	96.95	300			VC	59.03389	1 in 76
1911		CO		100			VC	20.03493	
1909		CO		100			VC	7.709434	
2915		CO		100			VC	11.88028	
2015		CO	0	150			VC	8.707931	
0909		CO		150			VC	65.97488	
0901	100.37	CO	97.7	225			VC	84.53402	1 in 134
0906		CO		150			VC	9.824132	
9003	99.06	CO	98.04	150			VC	7.28011	
9016		CO		150			VC	3.897566	
9933		CO		150			VC	9.369792	
9801	99.83	CO	98.27	225			VC	43.86343	1 in 32
1603		CO	0	450			VC	8.944272	
1502	91.72	CO	88.2	450			VC	35.8469	
1726		CO		150			VC	17.16769	
1703	94.44	CO	85.73	450			VC	92.14263	1 in 181
1704	93.56	CO	91.42	300			VC	3.605551	
0804		CO		100			VC	9.783896	
0805		CO		100			VC	15.08382	
0724		CO		150			VC	10.12331	
0708		CO		150			VC	15.65495	
1706		CO		150			VC	3.366609	
1709		CO		150			VC	11.57108	
1721		CO		150			VC	15.88712	
1711		CO		150			VC	12.50051	
1723		CO		100			VC	10.72927	
0502	86.09	CO	82.69	225			VC	47.29694	1 in 62
0509		CO		150			VC	44.75237	
9702	98.17	CO	95.7	225			VC	54.00926	1 in 65
9701	99.76	CO	96.56	225			VC	54.00926	1 in 64
0709		CO		100			VC	13.6506	
0602	93.82	CO	90.91	225			VC	33.01515	1 in 54
9402	80.69	CO	78.14	225			VC	80.60397	1 in 102
9402	80.69	CO	78.14	225			VC	80.60397	1 in 102
0605		CO		100			VC	24.04364	
0503	83.93	CO	80.76	225			VC	44.27669	1 in 89
0503	83.93	CO	80.76	225			VC	44.27669	1 in 89
0504		CO		150			VC	11.75158	
0504		CO		150			VC	11.75158	
9809		CO		150			VC	9.070807	
9701	99.76	CO	98.34	225			VC	55.97321	1 in 122
0003	99.88	CO	96.28	225			VC	49.24429	
1728		CO		150			VC	16.7081	
1602	91.91	CO	85.19	450			VC	29.96665	1 in 300
1509		CO		150			VC	19.0729	
0703	100.53	CO	99.03	300			VC	84.14294	1 in 33
0811		CO		100			VC	16.40411	
0904		CO		150			VC	9.088585	
0712		CO		100			VC	20.1005	
0723		CO		100			VC	13.80133	
0501	84.99	CO	79.7	525			CO	86.40602	1 in 60
0501	84.99	CO	79.7	525			CO	86.40602	1 in 60
9613		CO		100			UN	11.30114	
1610		CO		150			VC	7.476566	
0606		CO		100			VC	1.850584	
1518		CO		150			VC	14.19427	
0718		CO		100			VC	18.88387	
0717		CO		100			VC	13.54993	
0710		CO		100			VC	10.65574	
0402		CO		100			PP	14.90917	
0402		CO		100			PP	14.90917	
0506		CO		100			VC	13.29248	
0506		CO		100			VC	13.29248	
1609		CO		150			VC	15.21964	
0601	95.31	CO	92.27	225			VC	31.06445	1 in 62
9401	81.71	CO	79.39	225			VC	40.5216	1 in 156
9401	81.71	CO	79.39	225			VC	40.5216	1 in 156
0603	92.19	CO	89.65	225			VC	59.9333	1 in 58
9602	96.49	CO	94.86	225			VC	102.2399	1 in 48

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined | blue - surface water
brown - foul | purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

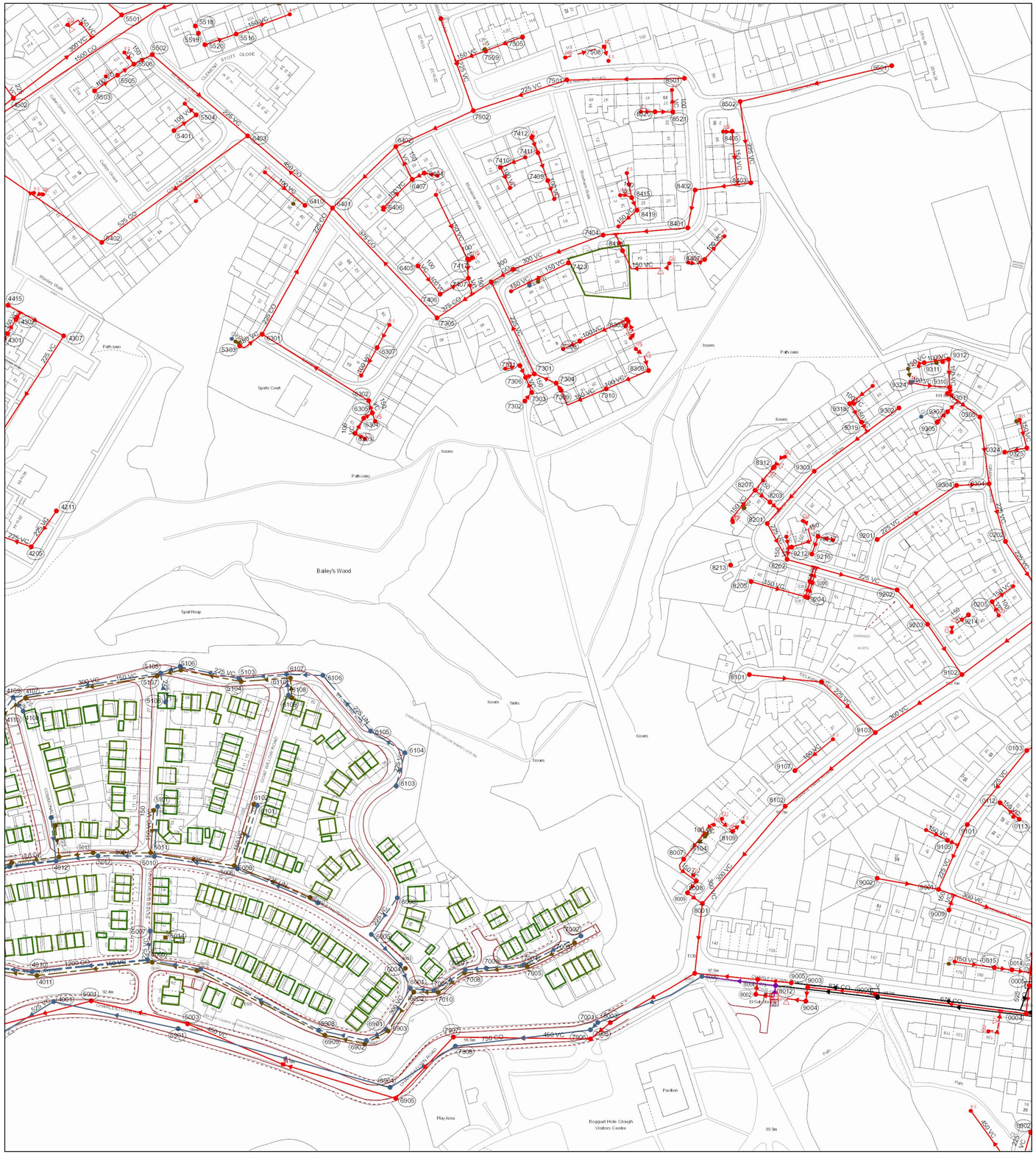
1 LINDSIDE WALK,
MANCHESTER,
M9 6DH

OS sheet Number: SD8603NW
Scale: 1:1250 **Date:** 08/12/2022
Nodes: 372
Sheet: 2 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
7503	100.95	CO	99.06	225			VC	54.08327	1 in 61
7503	100.95	CO	99.06	225			VC	54.08327	1 in 61
8501	100.86	CO	98.96	225			VC	65.00769	1 in 155
8501	100.86	CO	98.96	225			VC	65.00769	1 in 155
8521		CO		100			VC	12.20286	
8521		CO		100			VC	12.20286	
8401	99.95	CO	95.62	225			VC	47.16991	1 in 197
8401	99.95	CO	95.62	225			VC	47.16991	1 in 197
8419		CO		150			VC	13.55874	
8419		CO		150			VC	13.55874	
7410		CO		100			VC	12.53881	
7410		CO		100			VC	12.53881	
7411		CO		100			VC	16.46323	
7411		CO		100			VC	16.46323	
7407		CO		150			VC	9.340865	
7306		CO		150			VC	5.32906	
7310		CO		150			VC	32.11576	
8502	99.39	CO	96.33	225			VC	45.39824	
8502	99.39	CO	96.33	225			VC	45.39824	
0305	102.19	CO	99.04	225			VC	37.33631	1 in 162
8203		CO		100			VC	6.629276	
9212		CO		150			VC	1.748377	
9318		CO		150			VC	12.15961	
9319		CO		150			VC	6.135215	
8101	100.34	CO	98.74	225			VC	40.1995	1 in 74
8202	101.36	CO	98.55	225			VC	63.32852	1 in 90
9205		CO		150			VC	8.494842	
0202	102.68	CO	98.51	225			VC	44.65423	1 in 93
9203	102.3	CO	0	225			VC	33.83785	
0103	101.67	CO	98.96	225			VC	52.63079	1 in 170
9103	101.88	CO	96.51	300			VC	64.66065	1 in 67
7005	97.69	FO	95.38	150			VC	34.92458	1 in 109
8007	97.26	FO	0	150			VC	17.31303	
0004	99.7	CO	94.68	675			CO	84.43276	1 in 384
6406		CO		100			VC	22.21425	
6406		CO		100			VC	22.21425	
6407		CO		150			VC	20.41142	
6407		CO		150			VC	20.41142	
7502	100.3	CO	98.15	225			VC	47.42362	1 in 139
7502	100.3	CO	98.15	225			VC	47.42362	1 in 139
6303		CO		100			VC	9.759541	
5303		CO		150			VC	15.1608	
4013	94.83	FO	93.41	150			VC	26.4552	1 in 38
4013	94.83	FO	93.41	150			VC	26.4552	1 in 38
4105	94.98	SW	93.28	225			VC	24.01859	1 in 100
4105	94.98	SW	93.28	225			VC	24.01859	1 in 100
5101	97.17	SW	95.44	225			VC	27.6055	1 in 41
5011	96.52	FO	95.17	150			VC	31.94857	1 in 31
5102	97.11	FO	95.55	150			VC	23.63441	1 in 62
6104	98.35	SW	96.63	225			UN	22.50688	1 in 102
5201	96.6	SW	94.25	300			VC	11.33377	1 in 162
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
4211	88.74	CO	82.65	225			VC	24.41311	1 in 32
4211	88.74	CO	82.65	225			VC	24.41311	1 in 32
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4110	94.65	FO	92.75	150			VC	24.53574	1 in 30
4110	94.65	FO	92.75	150			VC	24.53574	1 in 30
7607	96.64	CO	93.23	450			VC	46.69047	1 in 467
6904	96.3	SW	91.86	750			CO	121.9622	1 in 35
6901	97.21	SW	94.15	300			VC	12.45122	1 in 138
6902	97.08	SW	94.06	300			VC	27.00791	1 in 135
6002	97.4	FO	94.83	150			VC	25.84607	1 in 136
6003	97.62	SW	95.89	225			VC	14.51794	1 in 104
5004	94.7	FO	93.36	150			VC	25.22019	1 in 38
5002	94.72	SW	92.93	300			VC	29.74408	1 in 73
6005	97.81	SW	96.17	225			VC	23.1041	1 in 83
6006	98.12	SW	96.4	225			VC	24.74664	1 in 108
6007	98.17	SW	96.45	225			UN	48.4753	1 in 81
7505		CO		150			VC	21.788	
7505		CO		150			VC	21.788	
8402	100.26	CO	95.8	225			VC	21.37756	1 in 126
8402	100.26	CO	95.8	225			VC	21.37756	1 in 126
8403		CO	0	225			VC	31.257	
8403		CO	0	225			VC	31.257	
8407		CO		100			VC	16.98481	
8410		CO		150			VC	9.983336	
8415		CO		150			VC	7.554543	
8415		CO		150			VC	7.554543	
8520		CO		100			VC	9.935346	
8520		CO		100			VC	9.935346	
7409		CO		100			VC	10.87592	
7409		CO		100			VC	10.87592	
7406		CO		150			VC	17.97115	
7309		CO		150			VC	4.820855	
7308		CO		100			VC	10.27675	
9311		CO		100			VC	13.72915	
9307		CO		150			VC	8.219264	
9207		CO		150			VC	8.712391	
7008	97.86	FO	95.06	150			VC	18.16098	1 in 140
7905	97.6	SW	92.46	750			CO	75.53807	1 in 216
7006	97.86	SW	94.86	300			VC	11.64263	1 in 129
8006	97.61	SW	92.7	750			CO	63.44416	1 in 1269
8004	97.63	CO	94.43	450			VC	35.0201	1 in 168
8012		OV	93.96	750			CO	41.14534	1 in 37
8002	97.34	CO	94.3	375			CO	8.320986	1 in 139
0005		CO	94.82	525			CO	15.85146	
6402	100.78	CO	97.8	225			CO	48.79549	1 in 17
6402	100.78	CO	97.8	225			CO	48.79549	1 in 17
7305	98.16	CO	94.91	375			CO	84.17244	1 in 443
6307		CO		100			VC	17.6909	
5502	101.8	CO	99.62	225			VC	69.52783	1 in 82
5502	101.8	CO	99.62	225			VC	69.52783	1 in 82
5401	93.45	CO		100			VC	15.00425	
5401	93.45	CO		100			VC	15.00425	
5520		CO		150			VC	18.40527	
5520		CO		150			VC	18.40527	
6101	98.29	SW	96.48	225			VC	36.93183	1 in 59
5012	95.52	SW	93.72	300			VC	23.35398	1 in 31
5012	95.52	SW	93.72	300			VC	23.35398	1 in 31
5013	95.43	FO	94.13	150			VC	18.9196	1 in 26
5013	95.43	FO	94.13	150			VC	18.9196	1 in 26
5010	96.48	SW	94.68	300			VC	31.2879	1 in 33
6105	98.14	SW	96.41	225			UN	40.55909	1 in 68
5108	97.08	SW	94.81	225			VC	16.39001	1 in 29
5107	96.86	FO	94.59	150			VC	74.11088	1 in 56
6109	97.6	FO	95.85	150			VC	11.05889	1 in 79
6108	97.59	SW	95.47	225			VC	11.64977	1 in 97
6110	97.53	FO	95.72	150			VC	27.45913	1 in 45
6107	97.48	SW	95.35	225			VC	26.54256	1 in 41
5103	96.97	SW	94.7	225			VC	33.31285	1 in 88
6605		CO	0	1500			CO	273.5814	
5506		CO		100			VC	11.40675	
5506		CO		100			VC	11.40675	
4307	96.05	CO	92.61	225			VC	77.38863	1 in 16
4307	96.05	CO	92.61	225			VC	77.38863	1 in 16
4301		CO		150			VC	9.114041	
4301		CO		150			VC	9.114041	
4415	95	CO	93.15	225			VC	35.35534	1 in 68
4415	95	CO	93.15	225			VC	35.35534	1 in 68
4014	93.95	SW	88.59	1200			CO	31.19089	1 in 312
4014	93.95	SW	88.59	1200			CO	31.19089	1 in 312
0902	100.23	CO	97.61	225			VC	25	1 in 125
6905	96.33	CO	92.57	450			VC	122.6986	1 in 44
7908	96.64	SW	92.16	750			CO	42.72002	1 in 171
6903	97.18	FO	94.64	150			VC	14.7616	1 in 134
6908	96.71	SW	93.86	300			VC	73.72286	1 in 79
7010	97.6	FO	94.93	150			VC	13.49169	1 in 135
7007	97.84	SW	94.77	300			VC	20.73881	1 in 138
7009	97.56	SW	94.62	300			VC	13.28559	1 in 133
5006	94.05	FO	92.7	150			VC	64.48949	1 in 57
4010	92.85	SW	88.36	1200			CO	21.32987	1 in 305
4010	92.85	SW	88.36	1200			CO	21.32987	1 in 305
6008	98.17	FO	96.85	150			VC	45.40752	1 in 70
8405		CO		150			VC	29.5629	
8405		CO		150			VC	29.5629	
7402	99.2	CO	95.18	300			CO	13.89244	1 in 232
7401	98.76	CO	95.02	375			CO	36.05551	1 in 400.616808
7301	96.45	CO	95.39	225			VC	56.36488	1 in 282
7302		CO		150			VC	6.185668	
7303		CO		150			VC	8.783695	
7304		CO		150			VC	13.07121	
9301	101.66	CO	99.36	225			VC	22.2036	1 in 85
9312		CO		150			VC	15.58287	
9201	102.17	CO	100.41	225			VC	53.25411	1 in 118
8312		CO		150			VC	3.706493	
9217		CO		150			VC	10.36651	
9302	101.24	CO	99.82	225			VC	58.60034	1 in 120
9204		CO		150			VC	8.713991	
8205		CO		150			VC	31.30603	
9208		CO		150			VC	8.700858	
0113		CO		150			VC	14.04936	
9102	102.17	CO	97.2	300			VC	57.68862	1 in 85
9202	102.52	CO	97.79	225			VC	25.4951	1 in 88
9105		CO		150			VC	6.506974	
0205		CO		150			VC	14.43913	
9004	97.34	CO	94.38	825			CO	10.66257	1 in 1066
9003	97.49	CO	94.4	825			CO	7.758256	1 in 388
9006	98.26	CO	94.46	825			CO	37.69028	1 in 628
7004	97.67	SW	95.01	300			VC	20.86746	1 in 139
7003	97.39	FO	95.74	150			VC	29.2675	1 in 81
8001	97.41	CO	94.74	300			VC	38.80578	1 in 75
8102	99.68	CO	95.53	300			VC	70.93659	1 in 95
9002	101.1	CO	99.31	225			VC	34.52535	1 in 69
9101	100.95	CO	98.63	225			VC	39.39571	1 in 127
0015		CO		150			VC	9.876177	
6405		CO		100			VC	19.98461	
6304		CO		100			VC	5.641041	
6503	101.51	CO	97.57	300			VC	82.28001	1 in 187
6301	97.93	CO	95.62	225			CO	80.13114	1 in 116
5008	97.52	SW	95.85	225			VC	46.49523	1 in 43
4012	94.77	SW	88.68	1200			CO	26.01248	1 in 289
4012	94.77	SW	88.68	1200			CO	26.01248	1 in 289
5009	97.45	FO	96.2	150			VC	46.97147	1 in 46
6102	98.3	FO	96.65	150			VC	35.7537	1 in 79
4108	95.2	SW	93.07	225			UN	9.477607	1 in 14
4108	95.2	SW	93.07	225			UN	9.477607	1 in 14
5104	97	FO	95.11	150			VC	34.00753	1 in 81
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
4302		CO		150			VC	4.692246	
4302		CO		150			VC	4.692246	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4015	93.98	FO	92.71	150			VC	35.13228	1 in 32
4015	93.98	FO	92.71	150			VC	35.13228	1 in 32
4109	94.97	SW	92.34	300			VC	32.64607	1 in 42
4109	94.97	SW	92.34	300			VC	32.64607	1 in 42
4001		SW	86.79	525			VC	29.06233	
4001		SW	86.79	525			VC	29.06233	
5001	92.04	CO	88.46	450			VC	53.7785	
5001	92.04	CO	88.46	450			VC	53.7785	
5003	93.55	CO	89.01	450			VC	55.0726	1 in 106
4011	92.9	FO	91.56	150			VC	24.6391	1 in 40
4011	92.9	FO	91.56	150			VC	24.6391	1 in 40
5005	94.12	SW	88.58	1200			CO	64.63882	1 in 294
5007	94.92	SW	93.33	225			VC	16.02258	1 in 22
7509		CO		150			VC	17.56493	
7509		CO		150			VC	17.56493	
7501	101.24	CO	98.51	225			VC	54.70832	1 in 166
7501	101.24	CO	98.51	225			VC	54.70832	1 in 166
7404	100.19	CO	95.37	300			VC	53.48832	1 in 297
7404	100.19	CO	95.37	300			VC	53.48832	1 in 297
8303		CO		100			VC	28.68926	
8308		CO		100			VC	25.70632	
9501	101.24	CO	99.35	225			VC	86.34813	1 in 29
9501	101.24	CO	99.35	225			VC	86.34813	1 in 29
9310		CO		150			VC	5.1038	
9304	102.37	CO	99.94	225			VC	18.02776	1 in 139
0304	102.46	CO	98.79	225			VC	33.24154	1 in 128
8207		CO		150			VC	10.69763	
9303	100.93	CO	99.32	225			VC	38.94868	1 in 73
8201	100.74	CO	98.74	225			VC	22.82542	1 in 163
9104	101.77	CO	98.19	225			VC	41.03657	1 in 95
9005		CO	94.43	450			VC	18.68521	1 in 168
7906	97.54	CO	93.88	450			VC	76.00658	1 in 123
7002	97.3	SW	95.27	300			VC	35.70357	1 in 137
7001	97.51	SW	92.6	750			CO	5.656854	1 in 26
6003	97.46	CO	93.36	450			VC	14.21267	1 in 25
8005	97.62	CO	94.05	450			VC	54.32558	1 in 84
8008	97.66	CO	0	300			VC	6.190775	
8009	97.53	CO	0	300			VC	10.27011	
9001	100.59	CO	98.31	300			VC	57.58472	1 in 180
9009				150			VC	8.693988	
0014		CO		150			VC	10.23413	
6404		CO		100			VC	7.551493	
6404		CO		100			VC	7.551493	
5504		CO		100			VC	8.943911	
5504		CO		100			VC	8.943911	
5516		CO		150			VC	31.64024	
5516		CO		150			VC	31.64024	
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6401	100.39	CO	94.7	450			CO	61.7171	1 in 363
6401	100.39	CO	94.7	450			CO	61.7171	1 in 363
6302	97.74	CO	96.07	225			CO	69.64194	1 in 170
4106	94.95	FO	93.63	150			VC	17.40154	1 in 79
4106	94.95	FO	93.63	150			VC	17.40154	1 in 79
6103	98.55	SW	96.82	225			VC	19.13797	1 in 101
4107	95.16	FO	93.27	150			VC	14.54713	1 in 28
4107	95.16	FO	93.27	150			VC	14.54713	1 in 28
5105	96.83	SW	94.18	300			VC	82.78629	1 in 45
5106	96.59	FO	94.69	150			VC	13.40705	1 in 134
6106	97.72	SW	95.81	225			UN	20.25471	1 in 44
4205	87.32	CO	81.72	225			VC	18.02776	
4205	87.32	CO	81.72	225			VC	18.02776	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
6907	97.04	FO	94.53	150			VC	22.89256	1 in 135
6909	96.76	FO	94.36	150			VC	79.26721	1 in 79
6001	97.47	SW	94.35	300			VC	26.37988	1 in 132
5901	93.47	SW	88.93	525			VC	70.7922	1 in 33

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined | blue - surface water
brown - foul | purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

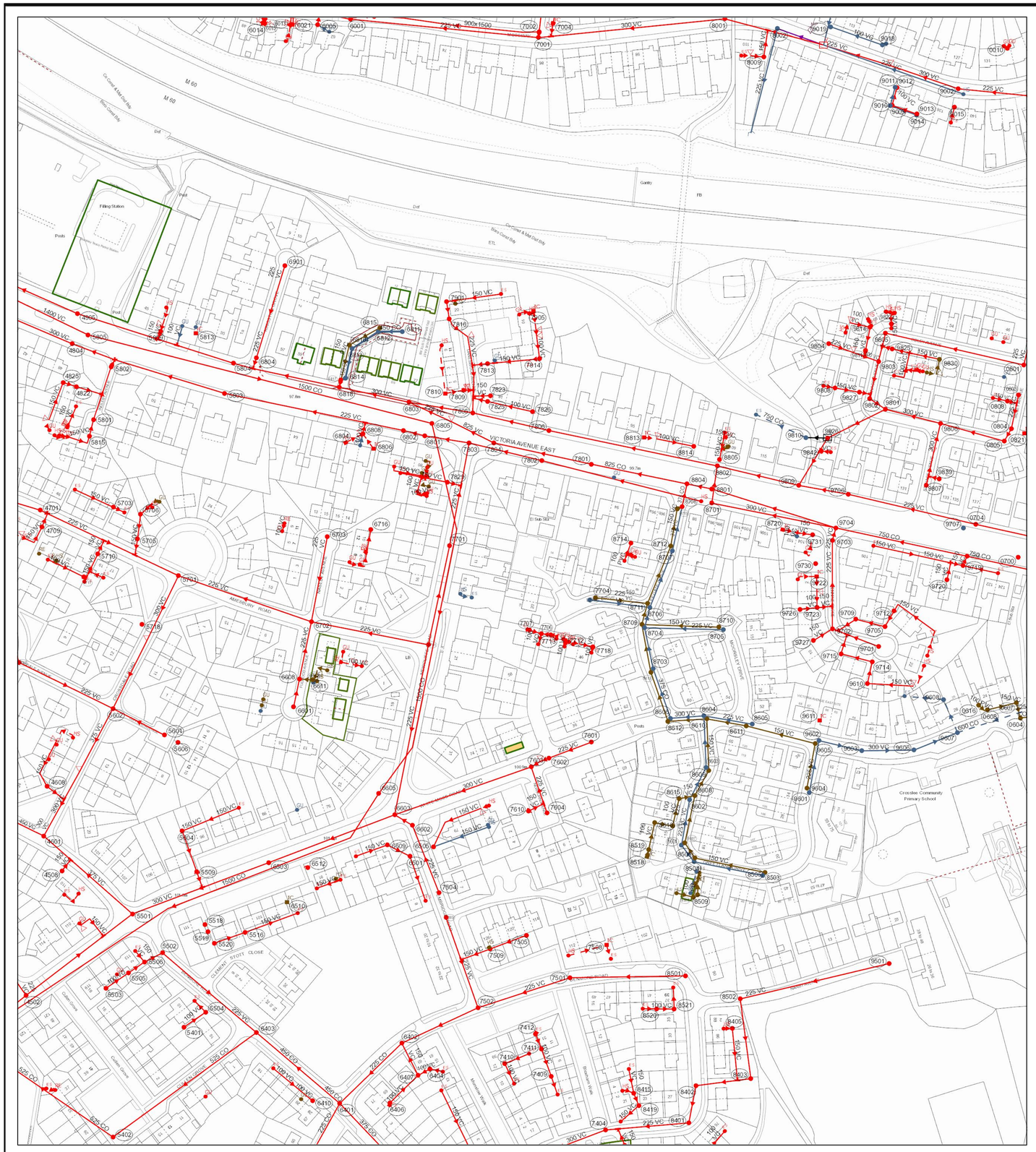
1 LINDSIDE WALK,
MANCHESTER,
M9 6DH

OS sheet Number: SD8603SE
Scale: 1:1250 **Date:** 08/12/2022
Nodes: 273
Sheet: 3 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
7002	98.3	CO	96.63	225			VC	3.296615	
9805	99.73	CO	98.06	300			VC	16.49242	1 in 412
9803	99.7	CO	98.02	300			VC	21.58703	1 in 166
9806	99.67	CO	97.94	300			VC	32.01562	1 in 246
9807	99.65	CO	98.22	225			VC	18.43955	1 in 142
7801	99.44	CO	95.21	825			VC	56.29387	1 in 217
7802	99.25	CO	96.61	225			VC	42.2019	1 in 90
7823		CO		150			VC	9.816127	
7814		CO		100			VC	5.749976	
9704	99.69	CO	95.83	300			VC	71.39628	1 in 1428
8713	100.61	FO	96.53	150			VC	3.022747	1 in 13
8801	99.99	CO	95.43	825			CO	14.30475	
9808		CO		150			VC	14.00795	
8711	100.68	FO	97.06	150			VC	34.93707	1 in 103
9701	99.4	CO	97.94	225			VC	27.55078	1 in 71
9712		CO		150			VC	10.27394	
9720		CO		150			VC	9.840399	
9727		CO		150			VC	12.57234	
8705	100.39	SW	98.17	225			VC	44.42126	1 in 91
9702	98.83	CO	97.43	225			VC	50	1 in 86
9723		CO		150			VC	8.693803	
8606	99.92	SW	97.76	375			CO	29.82026	1 in 229
7712		CO		100			VC	2.200838	
0616		FO		100			PVC	6.201232	
8610	99.7	FO	97.71	150			VC	21.96215	1 in 169
8604	99.72	SW	97.83	300			VC	18.89047	1 in 270
7602	100.69	CO	98.4	225			VC	5.385165	1 in 539
8612	99.94	FO	97.58	150			VC	29.26386	1 in 139
8506	100.64	FO	98.19	150			VC	10.25674	1 in 128
8508		FO		100			PE	14.33085	
7503	100.95	CO	99.06	225			VC	54.08327	1 in 61
7503	100.95	CO	99.06	225			VC	54.08327	1 in 61
8501	100.86	CO	98.96	225			VC	65.00769	1 in 155
8501	100.86	CO	98.96	225			VC	65.00769	1 in 155
8521		CO		100			VC	12.20286	
8521		CO		100			VC	12.20286	
8401	99.95	CO	95.62	225			VC	47.16991	1 in 197
8401	99.95	CO	95.62	225			VC	47.16991	1 in 197
8419		CO		150			VC	13.55874	
8419		CO		150			VC	13.55874	
7410		CO		100			VC	12.53881	
7410		CO		100			VC	12.53881	
7411		CO		100			VC	16.46323	
7411		CO		100			VC	16.46323	
8502	99.39	CO	96.33	225			VC	45.39824	
8502	99.39	CO	96.33	225			VC	45.39824	
6801	98.55	CO	95.95	225			VC	12.36932	1 in 155
6602	101.16	CO	98.79	225			VC	11.6619	1 in 78
7603	100.92	CO	98.37	300			VC	81.59657	1 in 204
6406		CO		100			VC	22.21425	
6406		CO		100			VC	22.21425	
6407		CO		150			VC	20.41142	
6407		CO		150			VC	20.41142	
7502	100.3	CO	98.15	225			VC	47.42362	1 in 139
7502	100.3	CO	98.15	225			VC	47.42362	1 in 139
6603	101.28	CO	97.93	300			VC	75.96052	1 in 230
6703	101.21	CO	99.88	225			VC	48.83646	1 in 119
5710		CO		150			VC	8.479527	
5710		CO		150			VC	8.479527	
5703		CO		150			VC	6.803391	
5703		CO		150			VC	6.803391	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
5505		CO		100			VC	10.9223	
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4408	99.14	CO	97.91	225			VC	32.01562	1 in 100
4601	102.7	CO	96.8	450			VC	102.4158	1 in 201
4601	102.7	CO	96.8	450			VC	102.4158	1 in 201
4702	103.52	CO	101.25	225			VC	59.03389	1 in 54
4702	103.52	CO	101.25	225			VC	59.03389	1 in 54
6005		CO		150			VC	6.641957	
5803	97.47	CO	0	225			VC	64.84597	
6817	98	CO	3	225			PVC	4.195181	1 in 28
6813	98.4	SW	96.24	150			CO	17.05548	1 in 426
6812	98.74	SW	96.29	450			CO	17.70284	1 in 354
6811	98.93	SW	96.32	450			CO	13.47404	1 in 449
9002	101	CO	99.2	300			VC	40.16217	1 in 115
9018		SW		100			VC	30.93165	
9009		SW		100			VC	10.78834	
9814		CO		150			VC	13.23962	
9825		CO		100			VC	5.773371	
9822		CO		150			VC	2.676366	
8802	100.02	CO	95.66	300			VC	97.08244	1 in 237
7804	98.89	CO	94.94	825			VC	26.83282	
7825		CO		100			VC	8.370474	
0804	100.35	CO	98.28	300			VC	8.062258	1 in 115
0803	100.31	CO	98.53	225			VC	19.41649	1 in 324
8707	101	SW	97.32	375			VC	25.54382	1 in 32
8712	101.01	FO	96.72	150			VC	21.42799	1 in 113
9810		SW		150			CO	30.8707	
8706	100.74	SW	97.46	375			CO	34.45211	1 in 246
7703	101.31	SW	99.38	225			VC	34.17654	1 in 19
9705		CO		150			VC	16.94014	
9703	99.58	CO	96.84	225			VC	7.28011	1 in 23
8709	100.84	FO	97.15	150			VC	12.30162	1 in 137
9608		SW		600			CO	22.09066	
0607		FO		150			VC	8.891009	
0604		FO	0	225			CO	38.04004	
8609	99.91	CO	97.88	150			VC	29.14039	1 in 194
9605	99.3	FO	98.22	150			VC	40.13573	1 in 118
9604	99.55	FO	98.36	150			VC	25.63526	1 in 183
9601	99.54	SW	98.12	225			VC	29.76395	1 in 39
9602	99.31	SW	97.36	225			VC	24.84735	1 in 311
9714		CO		150			VC	18.19345	
7601	100.21	CO	98.62	225			VC	25.63201	1 in 117
8614		FO		100			VC	15.83312	
8615		FO		150			VC	9.098629	
8601	100.58	SW	98.41	225			VC	25.97802	1 in 200
8607	100.57	FO	98.11	150			VC	27.33399	1 in 210
8503	100.21	SW	98.7	225			VC	39.44288	1 in 179
7505		CO		150			VC	21.788	
7505		CO		150			VC	21.788	
8402	100.26	CO	95.8	225			VC	21.37756	1 in 126
8402	100.26	CO	95.8	225			VC	21.37756	1 in 126
8403		CO	0	225			VC	31.257	
8403		CO	0	225			VC	31.257	
8407		CO		100			VC	16.98481	
8410		CO		150			VC	9.983336	
8415		CO		150			VC	7.554543	
8415		CO		150			VC	7.554543	
8520		CO		100			VC	9.935346	
8520		CO		100			VC	9.935346	
7409		CO		100			VC	10.87592	
7409		CO		100			VC	10.87592	
7805	98.69	CO	95	300			VC	36.49657	1 in 192
6701	102.37	CO	99.78	225			VC	57.27129	1 in 62
6609		CO		150			VC	14.29379	
6402	100.78	CO	97.8	225			CO	48.79549	1 in 17
6402	100.78	CO	97.8	225			CO	48.79549	1 in 17
7305	98.16	CO	94.91	375			CO	84.17244	1 in 443
6501		CO		150			VC	26.60517	
6701	102.37	CO	100.45	225			VC	67.28812	1 in 67
5604		CO		150			VC	24.41815	
5502	101.8	CO	99.62	225			VC	69.52783	1 in 82
5502	101.8	CO	99.62	225			VC	69.52783	1 in 82
5401	93.45	CO		100			VC	15.00425	
5401	93.45	CO		100			VC	15.00425	
5520		CO		150			VC	18.40527	
5520		CO		150			VC	18.40527	
5701	102.02	CO	98.68	300			VC	41.14608	1 in 114
6605		CO	0	1500			CO	273.5814	
5506		CO		100			VC	11.40675	
5506		CO		100			VC	11.40675	
4608		CO		150			VC	12.25576	
4608		CO		150			VC	12.25576	
4602	103.59	CO	101.49	225			VC	32.31099	1 in 249
5717		CO		100			VC	1.533907	
5717		CO		100			VC	1.533907	
4709		CO		150			VC	8.167535	
4709		CO		150			VC	8.167535	
6802	98.45	CO	95.8	225			VC	103.1601	
6814	98.05	SW	96.2	225			PVC	2.756702	1 in 2
4803	102.98	CO	100.93	225			VC	44.92215	1 in 107
4825		CO		150			VC	7.727024	
4825		CO		150			VC	7.727024	
8002		SW	0	225			VC	60.87693	
9010		CO		100			VC	10.35077	
9830		CO		150			VC	17.34974	
9804	99.54	CO	98.24	225			VC	14.86607	1 in 149
9801	99.59	CO	97.8	300			VC	36.54834	1 in 183
9827		CO		150			VC	6.441765	
9802	99.59	CO	97.86	300			VC	10.81665	1 in 216
0805	100.36	CO	98.19	300			VC	37.36308	1 in 162
7813		CO		150			VC	8.571057	
8708	100.63	CO	96.3	375			CO	13.12221	1 in 131
9706	99.78	CO	97.94	225			VC	28.44292	
9826		CO	97.6	300			VC	31.32238	
9809		CO	0	300			VC	47.29694	
0702	99.46	CO	96.43	750			CO	75.70998	1 in 344
8710	100.44	FO	98.61	150			VC	43.60546	1 in 30
8703	100.79	SW	97.61	375			CO	23.38992	1 in 292
7713		CO		100			VC	5.428893	
7707		CO		100			VC	6.935621	
8704	100.9	SW	97.53	375			CO	11.89454	1 in 170
9606		SW	0	300			VC	26.41179	
0608		FO		150			VC	16.78935	
8605	99.45	SW	98.27	225			VC	27.66732	1 in 106
8603	99.91	SW	97.96	300			VC	29.1955	
8616		FO		100			VC	10.27036	
7604	100.97	CO	99.07	225			VC	27.51368	1 in 42
8504	100.64	SW	98.48	225			VC	11.70205	1 in 167
8608	100.23	FO	97.98	150			VC	16.17386	1 in 162
8405		CO		150			VC	29.5629	
8405		CO		150			VC	29.5629	
7803	98.73	CO	96.14	225			VC	25.31798	1 in 158
7829		CO		150			VC	7.971866	
6701	102.37	CO	0	225			VC	97.86214	
7504	101.04	CO	99.28	225			VC	40.8534	1 in 91
6601	102.12	CO	100.4	225			CO	16.0269	
6611		FO		100			VC	7.529234	
6601	102.12	CO		225			VC	33.0037	
6503	101.51	CO	97.57	300			VC	82.28001	1 in 187
5602	102.14	CO	98.06	375			VC	40.70626	1 in 83
5602	102.14	CO	98.06	375			VC	40.70626	1 in 83
6301	97.93	CO	95.62	225			CO	80.13114	1 in 116
6702	102.08	CO	99.43	225			VC	79.37884	1 in 112
5706		CO		150			VC	13.94907	
5706		CO		150			VC	13.94907	
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154
4502	99.92	CO	97.57	300			VC	75.60423	1 in 154

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
5501	101.71	CO	97.07	375			VC	66.60332	1 in 416
6901	98.21	CO	96	225			VC	54.40588	1 in 101
7816		CO		150			VC	14.78748	
7001	98.97	CO	96.66	225			VC	106.7001	1 in 130
6803	98.38	CO	94.81	300			VC	40.20981	
6816	98.4	FO	95.94	150			PVC	20.21651	1 in 22
6804	97.54	CO	94.61	225			VC	6.324555	
5802	96.81	CO	94.37	225			VC	4.472136	
5802	96.81	CO	94.37	225			VC	4.472136	
5804	97.44	CO	94.29	300			VC	92.34717	1 in 95
6815	98.75	FO	96.8	150			PVC	19.79689	1 in 23
5809		CO		150			VC	4.753512	
4804	96.59	CO	93.99	300			VC	89.15717	1 in 110
4804	96.59	CO	93.99	300			VC	89.15717	1 in 110
4822		CO		150			VC	15.19679	
4822		CO		150			VC	15.19679	
8001		CO	98.52	300			VC	105.6775	1 in 106
8009		CO		150			VC	15.33628	
0801	100.21	CO	98.61	300			VC	80.04999	1 in 148
9811		CO		150			VC	3.558741	
0704	99.5	CO	97.72	225			VC	73.97973	
9839		CO		150			VC	6.293564	
8804	100.46	CO	95.43	825			CO	55.12156	1 in 290
7806	99.24	CO	95.24	300			VC	44.14748	1 in 184
7926		CO		100			VC	26.00236	
0808		CO		150			VC	5.356706	
8701	100.05	CO	95.86	300			VC	21.2132	1 in 133
9842		CO		150			VC	0.9578412	
7704	101.26	FO	99.38	150			VC	29.65087	1 in 13
9719		CO		150			VC	5.780854	
9715		CO		150			VC	11.43629	
9709		CO		150			VC	12.11765	
9726		CO		100			VC	9.691854	
8613	100.78	FO	97.37	150			VC	27.52233	1 in 125
7718		CO		100			VC	3.432941	
7706		CO		100			VC	6.15064	
9603	99.57	SW	0	300			VC	29.49459	
9607		SW		600			CO	20.20811	
8611	99.46	FO	97.88	150			VC	22.59456	1 in 133
9610		CO		150			VC	12.54187	
8519		FO		100			VC	15.47445	
7610		CO		150			VC	9.652183	
8602	100.25	SW	98.25	300			VC	20.56788	1 in 71
8505	100.19	FO	98.45	150			VC	40.45533	1 in 156
7509		CO		150			VC	17.56493	
7509		CO		150			VC	17.56493	
7501	101.24	CO	98.51	225			VC	54.70832	1 in 166
7501	101.24	CO	98.51	225			VC	54.70832	1 in 166
7404	100.19	CO	95.37	300			VC	53.48832	1 in 297
7404	100.19	CO	95.37	300			VC	53.48832	1 in 297
9501	101.24	CO	99.35	225			VC	86.34813	1 in 29
9501	101.24	CO	99.35	225			VC	86.34813	1 in 29
7701	100.77	CO	97.68	225			VC	59.03389	1 in 87
6805		CO	0	1500			CO	219.3291	
6404		CO		100			VC	7.551493	
6404		CO		100			VC	7.551493	
5504		CO		100			VC	8.943911	
5504		CO		100			VC	8.943911	
5509		CO		150			VC	9.504189	
5516		CO		150			VC	31.64024	
5516		CO		150			VC	31.64024	
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6403	100.52	CO	94.51	525			CO	100.2098	1 in 1432
6401	100.39	CO	94.7	450			CO	61.7171	1 in 363
6401	100.39	CO	94.7	450			CO	61.7171	1 in 363
5601	101.27	CO	99.75	225			VC	32.64965	1 in 251
4701	102.29	CO	100.49	225			VC	86.33076	1 in 93
4701	102.29	CO	100.49	225			VC	86.33076	1 in 93
5705		CO		150			VC	9.284122	
5705		CO		150			VC	9.284122	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
5402	98.4	CO	94.43	525			CO	97.08244	
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4501	100.14	CO	98.21	225			VC	50.21952	1 in 173
4508		CO		150			VC	8.061387	
4508		CO		150			VC	8.061387	
4704	103.62	CO	101.58	225			VC	33.52811	
7901		CO		150			VC	9.898611	
6001	97.76	CO	95.84	225			VC	39.72459	1 in 107
5805		CO	0	1500			CO	200.3397	
5805		CO	0	1500			CO	200.3397	
5801	98.32	CO	95.93	225			VC	31.62278	1 in 31
5801	98.32	CO	95.93	225			VC	31.62278	1 in 31
6818	97.9	CO		150			VC	61.21972	
5815		CO		150			VC	9.49207	
5815		CO		150			VC	9.49207	
4905	96.59	CO	93.29	300			VC	66.70832	1 in 39
4905	96.59	CO	93.29	300			VC	66.70832	1 in 39

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined, blue - surface water, brown - foul, purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

1 LINDSIDE WALK,
MANCHESTER,
M9 6DH

OS sheet Number: SD8603NE
Scale: 1:1250 **Date:** 08/12/2022
Nodes: 294
Sheet: 4 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities
Water for the North West

Lazzarin, Filippo

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 17 January 2023 11:01
To: Wilkinson, Ruth
Cc: Lazzarin, Filippo
Subject: DG5 Register for Manchester area

Good Morning Ruth,

Thank you for your email and the additional information.

The following information applies to all five addresses:

I can confirm that we have no current record of sewer flooding within the vicinity of the proposed development.

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

Our response does not include:

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

As with all development sites, we recommend you liaise with our water and wastewater engineers by contacting our Developer Services team so the details of your development proposal can be considered further. Details can be found at the following link.

https://www.unitedutilities.com/services/builders-developers/

Should you require any further information please do not hesitate to contact me.

Kind regards

United Utilities
Water for the North West

Louise Dack
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 01925 233063 (33063 internal)
unitedutilities.com

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry https://www.unitedutilities.com/builders-developers/ or you can email us at WastewaterDeveloperServices@uuplc.co.uk

---------- Original Message ----------
From: Wilkinson, Ruth [ruth.wilkinson@atkinsglobal.com]
Sent: 16/01/2023 10:16
To: wastewaterdeveloperservices@uuplc.co.uk
Cc: filippo.lazzarin@atkinsglobal.com
Subject: FW: DG5 Register for Manchester area

EXTERNAL EMAIL This email originated outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Morning Louise,

The addresses and postcode for the 5 sites are as follows:

1. Benmore Road, M9 6DN
2. White Moss Road, M9 6DA
3. Canberra Street, M11 4NL
4. Queens Road, M40 8TQ
5. Palgrave Avenue, M40 8JW

If you could perform a search on our system, that would be greatly appreciated. If you need any more information please just let me know.

Kind Regards,

Ruth Wilkinson *MEng*
Graduate Civil Engineer, Infrastructure
UK & Europe
Engineering, Civil Engineering & Advanced Technology

T +(44)1214835888

Two Chamberlain Square, Birmingham, West Midlands, B3 3AX

Company

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>
Sent: 16 January 2023 10:07
To: Lazzarin, Filippo <Filippo.Lazzarin@atkinsglobal.com>
Subject: DG5 Register for Manchester area

Good Morning Filippo,

Thank you for contacting United Utilities.

Unfortunately, we cannot provide a copy of the DG5 register and we cannot provide information regarding specific properties.

We can provide an overview of the area if you can supply the five property addresses.

Our response does not include:

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

If you can provide the full addresses and post codes, we can perform a search on our system.

Kind Regards,

Louise Dack
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 01925 233063 (33063 internal)
unitedutilities.com

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry https://www.unitedutilities.com/builders-developers/ or you can email us at WastewaterDeveloperServices@uuplc.co.uk

---

From: Lazzarin, Filippo <Filippo.Lazzarin@atkinsglobal.com>
Sent: 12 January 2023 11:06
To: propertysearches@uuplc.co.uk
Subject: DG5 Register for Manchester area

EXTERNAL EMAIL This email originated outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Morning,

I am working on Flood Risk Assessments for 5 no. sites in the Manchester area.

In order to assess the risk of flooding from sewers, could you please provide me with a copy of the DG5 register for the Manchester area?

Kind Regards,

Filippo Lazzarin *MEng*
Civil Engineer, Infrastructure
CE&AT MIDLANDS, SW & WALES
Engineering, Design & Project Management

+441214835583

Two Chamberlain Square, Birmingham, B3 3AX

Company

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www.unitedutilities.com/subsidiaries

MANCHESTER
CITY COUNCIL

Lead Local Flood Authority
Highways Service
Growth and Neighbourhoods Directorate
Manchester City Council
PO Box 532
Town Hall
Manchester
M60 2LA
Email: floodriskmanagement@manchester.gov.uk

DATE 04/01/2022

Dear Sir or Madam,

RE: Our Ref: MCC004A/01/2023

We acknowledge with thanks your payment received on 15/12/2022 for our LLFA data screen service.

Please find enclosed plan showing the results of the data screen. The position of features shown on this plan is approximate only and is given in accordance with the best information currently available.

The enclosed plan cannot be used to substitute a competent site investigation.

The enclosed plan is being provided to you subject to Manchester City Council's terms and conditions which are shown attached.

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

If you have any queries regarding this matter, please do not hesitate to contact us.

Yours Faithfully,

Neil Bayliss-Rowe, Highways Development Control & Flood Risk Manager, Lead Local Flood Authority

MANCHESTER
CITY COUNCIL

TERMS AND CONDITIONS – LLFA DATA SCREEN

These provisions apply to LLFA data supplied by Manchester City Council ("MCC").

TERMS AND CONDITIONS:

- This data Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- MCC has taken all reasonable care to compile this data Map. This data Map and any information supplied with it is provided for general guidance only and MCC makes no representation, undertaking or warranty of any kind as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position of any culverted assets shown on the data Map are approximate only. MCC strongly recommends that a comprehensive site investigation is undertaken in addition to reviewing this data Map to determine and ensure the precise location of any assets. The exact location, positions and depths should be obtained by an appropriate survey which may include but shall not be limited to GPR and CCTV.
- The data screened may be modified over time without notice and therefore this data Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the data Map have been made subsequent to issue and prior to any works being carried out.
- This data Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) or for the purpose of determining the suitability of a point of connection to discharge.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising from damages of any kind caused to assets by reason of the actual position and/or existence of assets being different from those shown on the data Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent MCC from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

MANCHESTER
CITY COUNCIL

DATA SCREEN SYMBOLOGY

Bridge

- Good
- Fair
- Poor
- Very Poor
- Unknown

Trash Screen

- Good
- Fair
- Poor
- Very Poor
- Unknown

Culvert Orifice

- Very Good
- Good
- Fair
- Poor
- Very Poor
- Unknown

Culvert Conduit

- CCTV surveyed
- Not CCTV surveyed
- Ordinary Watercourse Conduit
- MCC SuDS
- MCC Flood Incident Points
- MCC Section 19 Report
- MCC Flood Incident Polygons
- MCC Local Authority Boundary

Supplementary Information where available:

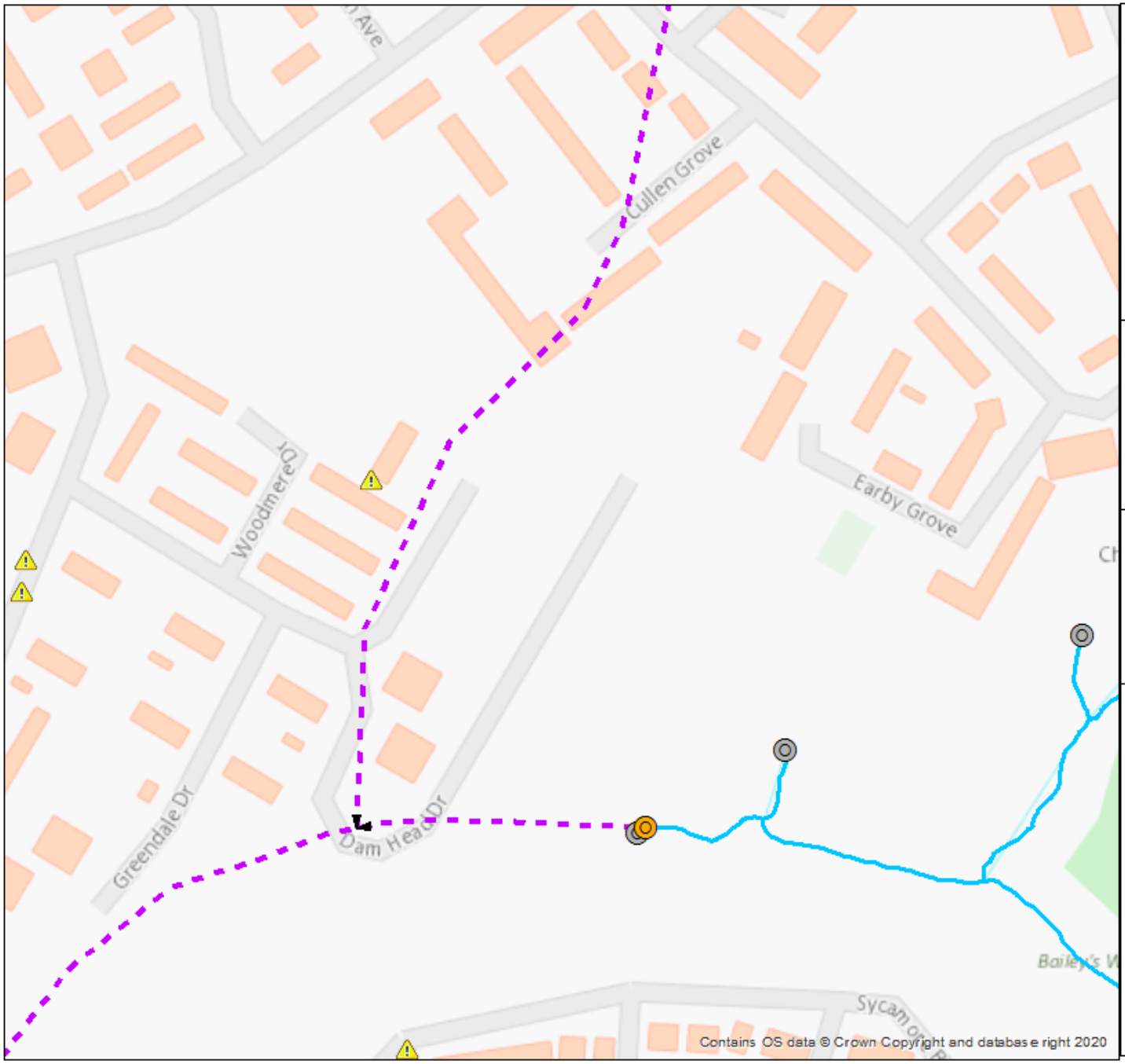
Critical Drainage Area – The Site is in the Conurbation Core CDA

Flood Incidents – The nearest flood/drainage incident on record is approximately 30m south of the central part of the Site, dated 16/06/2020, described as "blocked gully or drain".

Culvert Conduits – The asset register highlights an indicative risk that the Lionfield Brook culverted ordinary watercourse crosses the Site or is in close proximity to the Site. An indicative culvert route is shown crossing Wanley Walk in the central Site; while 3rd party historic OS mapping indicates a 'river' was proximal to the eastern Site boundary. This culvert is an indicative asset and has not been verified with survey.

Survey and Design Archive – The 1984 drainage survey of major assets (enclosed) highlights an indicative culvert asset proximal to the eastern Site boundary (dash-dot-dot line).

Any other information identified by LLFA officer during screening – A planning application on this site would benefit from site investigation of the indicative culvert risk, which should be presented to support the planning application. Inadequate site investigations to prove or disprove the asset's presence could result in an objection to the application from the LLFA. Should a culverted ordinary watercourse be identified during site investigations, any planning application's masterplan should take account of the culverted watercourse and any required permissions should be obtained.



MANCHESTER CITY COUNCIL

LLFA DATA SCREEN

Address/Site Ref:
White Moss Road, M9 6DA

Our Ref: **MCC004A/01/2023**

Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,778

The position of features shown on this plan is approximate only and is given in accordance with the best information currently available. Manchester City Council will not accept liability for any loss or damage caused by the actual position being different from those shown.

0 12.5 25 50 Meters

N

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White Moss Road, M9 6DA

Our Ref: **MCC004A/01/2023**

Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,778

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0 12.5 25 50 Meters

N

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Appendix B. Drawings

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PLAN GRID NORTH

File Name: 521436-T_3D.dwg

LEGEND

AV	AIR VALVE	LBY	LITTERBUOY
BB	BELOW BEACON	MH	MANHOLE
BH	BORE HOLE	MS	MILE STONE
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BM	BENCH MARK	OP	OUTFALL PIPE
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CB	CATCH BASIN	PO	POST
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAINAGE	RE	RE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CABLE PHONE STATION	RL	ROAD LEVEL
CTV	CABLE TV COVER	RL	ROAD LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DI	DRAIN INTE	SAP	SAMPLING PIPE
DR	DRAIN	SAP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EL	ELECTRIC	SP	SIGN POST
ELB	ELECTRIC BOX	SOF	SOFFIT LEVEL
ER	EARTH ROD	TV	STOP VALVE
FB	FIBRE OPTIC BOLT	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE	TL	TRAFFIC LIGHT
FV	FIRE VALVE	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
G.L	GROUND LEVEL	TP	TARGET POLE
GP	GATE POST	TP	TELEGRAPH POLE
GR	GRATE	TP	TELEGRAPH POLE
GSV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WT	WATER TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	CO.M	TREE GIRTH (Dia.)
LD	LAND DRAIN	WC	TREE MULTI-GIRTH
LP	LAMP POST		
PAL	PALISADE		DRIP LINE
R/W	WALL WITCH		ROCK COARSE
C/W	CONC. WITCH WIRE		ASHE
C/P	CONC PANEL		GRASS
P/W	POST AND WIRE		SURFACE CHANGE
P/R	POST AND RAIL		TOP
L/S	IRON RAIL		TOP BANK
C/L	CONC. LANDRED		BOTTOM BANK
CLL	CHAIN LINK		BUILDING
[34.28]	TOP OF FEATURE		BUILDING CANOPY
[34.28]	TOP		SURVEY BOUNDARY
ST	STATION		OVER HEAD TELECOM VERTICAL
BH	BOREHOLE		OVER HEAD TELECOM
	BATTER		HEDGE

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

SURVEY STATIONS:

Name	Easting	Northing	Height
SEP3	386500.047	403380.274	96.137
SEP4	386412.400	403438.372	97.885

SHEET LAYOUT

0 2m 4m 8m 12m 16m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Curtins Consulting Limited
Rose Wharf
78-80 East Street
Leeds
LS9 8EE

Project Title
Topographical Survey of Land at:
Whitemoss Haverfield
White Moss Road
Manchester
M9 6DG

Surveyed	Drawn	Checked
S.Howard	M.Charlton	D.Balmer

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Mar' 21	521436-T	01	A0	--

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N

PLAN GRID NORTH

File Name: 521435-T_30.dwg

LEGEND

AV	AIR VALVE	LBY	LITTERBUOY
BB	BELOWA BEACON	MH	MANHOLE
BH	BORE HOLE	MS	MILE STONE
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BM	BENCH MARK	NP	NOTICE BOARD
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CB	CATCH BASIN	PH	PHONE
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAINAGE	PS	PSS
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CABLE PILLAR STATION	RL	ROOF LEVEL
CTV	CABLE TV COVER	RL	ROOF LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DI	DRAIN INTE	SAP	SAMPLING PIPE
DR	DRAIN	SAP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EL	ELECTRIC	SOF	SOFFIT LEVEL
ELB	ELECTRIC BOX	SOF	SOFFIT LEVEL
EB	EARTH BOD	SV	STOP VALVE
FL	FLOOR LEVEL	TB	TELEGRAPH BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FIRE PUMP	TL	TRAFFIC LIGHT
FV	FLAG POLE	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
G.L	GROUND LEVEL	TP	TARGET POSTER
GP	GATE POST	TP	TELEGRAPH POLE
GP	GATE POST	TP	TELEGRAPH POLE
GSV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WT	WATER TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	DD.BM	TREE GIRTH (Dia.)
LD	LAND DRAIN	WC	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
W.W	WIRE WATCH		HEDGE COARSE
CLF	CHAIN LINK FENCE		HEDGE
C.P.P	CONC PANEL		FENCE
C.P.W	CONC PANEL WALL		SURFACE CHANGE
P.W	POST AND RAIL		TOP
I.R	IRON RAIL		TOP BANK
W.P.F	WOOD PLANKED		BOTTOM BANK
CLL	CHAIN LINK		BUILDING
[34.28]	TOP OF FEATURE		BUILDING CANOPY
[34.28]	TOP		SURVEY BOUNDARY
ST	STATION		OVER HEAD TELE/POL
BH	BOREHOLE		OVER HEAD TELE/COM
	BATTER		HEDGE

NOTES:

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

SURVEY STATIONS			
Name	Easting	Northing	Height
SEP1	385485.574	403324.420	92.787
SEP2	385510.306	403375.438	95.953
SEP3	385505.090	403380.277	95.152

SHEET LAYOUT

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Curtins Consulting Limited
Rose Wharf
78-80 East Street
Leeds
LS9 8EE

Project Title
Topographical Survey of Land at:
Dam Head Drive
Manchester
M9 6LX

Surveyed	Drawn	Checked
S.Howard	M.Charlton	D.Balmer

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Mar' 21	521435-T	01	A0	--

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N

PLAN GRID NORTH

File name: S22526-T_3D.dwg

LEGEND

AV	AIR VALVE	LBY	LITTERBUOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BORE HOLE	MOL	MOORING
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BM	BENCH MARK	NP	NOTICE BOARD
BS	BUS STOP	OP	SUTRALL PIER
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CB	CATCH BASIN	PM	PM
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAINAGE	RE	RE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CATHODIC PROTECTION	RL	ROOF LEVEL
CTV	CABLE TV COVER	RL	RAIL LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DI	DRAIN INTE	SAP	SAMPLING PIPE
DR	DRAIN	SAP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EL	ELEVATION	SOF	SOFFIT LEVEL
ELB	ELECTRIC BOX	SOF	SOFFIT LEVEL
EB	EARTH BOD	SV	STOP VALVE
FL	FLOOR LEVEL	TB	TELEPHONE BILLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FIRE PUMP	TL	TRAFFIC LIGHT
FP	FLAG POLE	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
G.L	GROUND LEVEL	TP	TARGET POLE
GP	GATE POST	TP	TELEGRAPH POLE
GRP	GRP	TP	TELEGRAPH
GSV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
KO	KERB OUTLET	WSP	WATER TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	CO.Bd	TREE GIRTH (Dia.)
LD	LAND DRAIN	WS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
R/W	RAIL WITCH		ROUGH GRASS
R/W	RAILWAY WIRE		ASTRO
C/P	CONC PANEL		GRASS
P/W	POST AND WIRE		SURFACE CHANGE
P/R	POST AND RAIL		TOP
L/B	IRON RAL		TOP BANK
C/L	CHAIN LINK SCARFED		BOTTOM BANK
CL/L	CHAIN LINK		BUILDING
(34.28)	TOP OF FEATURE		BUILDING CANOPY
ST	STATION		OVER HEAD ELECTRICAL
ST	STATION		OVER HEAD TELECOM
	BOREHOLE		HEDGE
	BATTER		

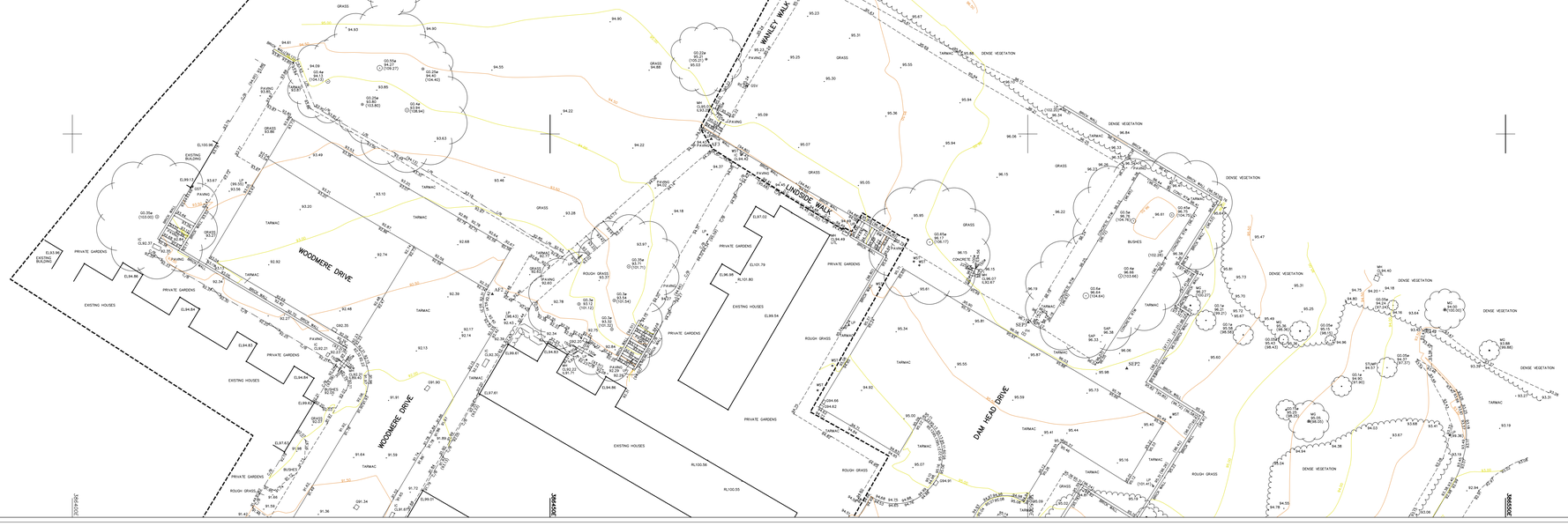
NOTES:

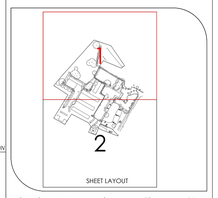
All levels relate to O.S (Newlyn) Datum. Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

Detail displayed within bold dashed line surveyed May 2021 and added to an existing drawing 121435-T.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	386480.575	403324.032	92.797
SEP2	386428.629	403353.744	91.221
AF1	386428.628	403353.745	91.221
AF2	386443.982	403383.224	92.479
AF3	386468.882	403359.458	94.447





SHEET LAYOUT

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION

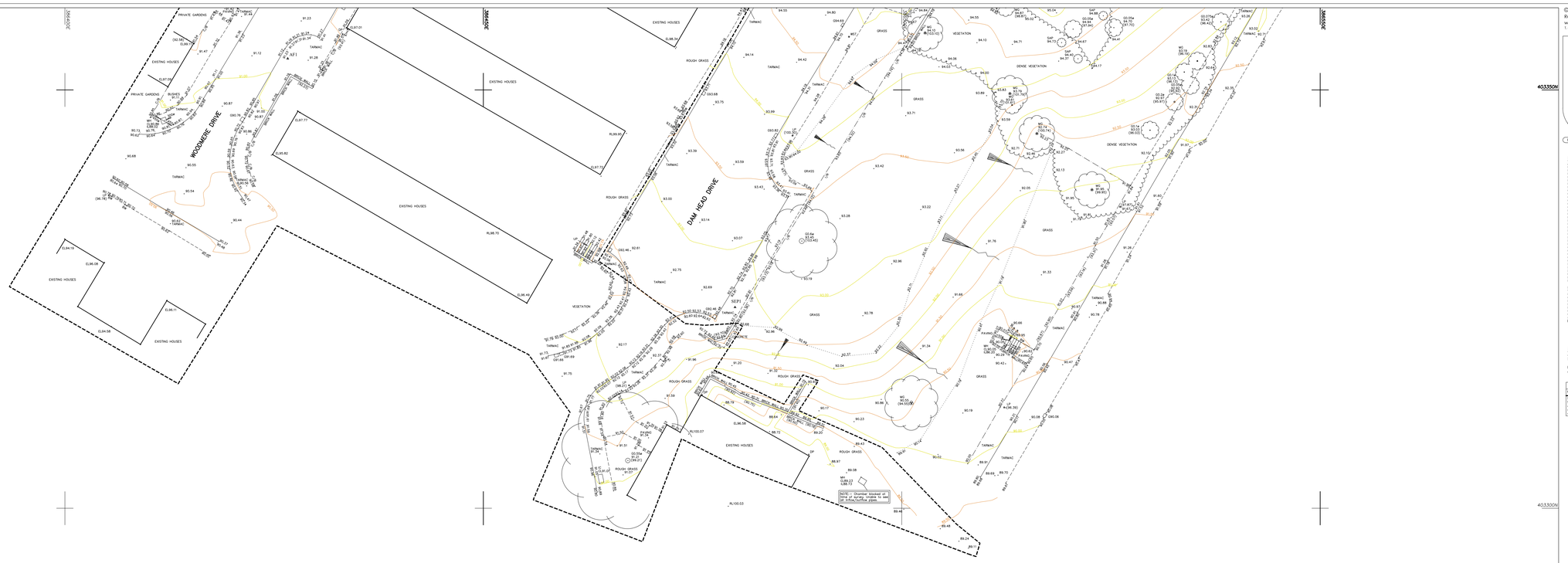
SURVEY & ENGINEERING PROJECTS

Client
Curtins Consulting Limited
Rose Wharf
78-80 East Street
Leeds
LS9 8EE

Project Title
Topographical Survey of Land at:
Dam Head Drive
Manchester
M9 6LX

Surveyed	Drawn	Checked
A.Fellowes	M.Charlton	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	May 21	S22526-T	01	A0	--



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N

PLAN GRID NORTH

File name: 522326-T_30.dwg

LEGEND

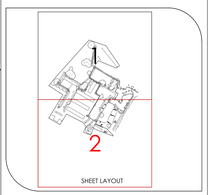
AV	AIR VALVE	LBY	LITTERBUOY
BB	BELOWA BEACON	MH	MANHOLE
BH	BORE HOLE	MS	MILE STONE
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BM	BENCH MARK	NP	NOTICE BOARD POST
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CB	CATCH BASIN	PI	PIPE INVERT
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAINAGE	RE	RE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CAR PARKING STATION	RL	ROOF LEVEL
CTV	CABLE TV COVER	RL	ROOF LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DP	DOWN PIPE	SAP	SAMPLING PIPE
DR	DRAIN	SAP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
ELB	ELECTRIC BOX	SP	SIGN POST
ELB	ELECTRIC BOX	SpP	SUPPLY LEVEL
EP	EARTH POST	SV	STOP VALVE
FL	FINISHED FLOOR LEVEL	TB	TELEPHONE BILLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FIRE PUMP	TL	TRAFFIC LIGHT
FV	FLAG POLE	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
G.L	GROUND LEVEL	TP	TARGET POLE
GP	GATE POST	TP	TELEGRAPH POLE
GP	GATE POST	TP	TELEGRAPH POLE
GSV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WSP	WATER STOP TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	DD.84	TREE GIRTH (Dia.)
LD	LAND DRAIN	WS	TREE MULTI-GIRTH
LP	LAMP POST		
PAL	PALISADE		DRIP LINE
W.W	WIRE WATCH		ROUGH GRASSE
CLF	CHAIN LINK FENCE		ASPHALT
CVP	CONC PANEL		TARMAC
CVP	CONC PANEL		SURFACE CHANGE
P.W	POST AND WIRE		KERB
P.W	POST AND RAIL		TOP BANK
I.W	IRON RAIL		BOTTOM BANK
C.L	CHAIN LINK		BUILDING
(C.L)	CHAIN LINK		BUILDING CANOPY
(84.28)	TOP OF FEATURE		OVER HEAD ELECTRICAL
(84.28)	TOP		OVER HEAD TELECOM
	STATION		
	BOREHOLE		HEDGE
	BATTER		

NOTES:

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

Detail displayed within bold dashed line surveyed May 2021 and added to an existing drawing 521435-T.

SURVEY STATIONS			
Name	Easting	Northing	Height
AF1	385450.215	403367.025	91.000
SEP1	385450.372	403350.777	90.152
AF1	385426.828	403353.748	91.220
AF2	385443.362	403383.224	92.478
AF3	385468.804	403399.484	94.441



SHEET LAYOUT

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Curtins Consulting Limited
Rose Wharf
78-80 East Street
Leeds
LS9 8EE

Project Title
Topographical Survey of Land at:
Dam Head Drive
Manchester
M9 6LX

Surveyed	Drawn	Checked
A.Fellowes	M.Charlton	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	May 21	522326-T	02	A0	--

Millimetres 0 10 100

DO NOT SCALE

N

WHITEMOSS ROAD

Cullen Grove

CULLEN GROVE

UNKNOWN CULVERT, PRESENCE AND LOCATION TO BE VERIFIED

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

MAINTENANCE/CLEANING

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

DECOMMISSIONING/DEMOLITION

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

NOTES:

1. ALL DIMENSIONS ARE IN METRES (m) UNLESS OTHERWISE STATED.
2. SITE UTILITIES ALIGNMENT TRACED OVER PDF VERSION OF UTILITY REPORT (REF. 077873.006, White Moss Road - Utilities Search, PROVIDED BY CORNERSTONE PROJECT LTD. RECIEVED 22/11/2021).
3. SEWER RECORDS TRACED OVER PDF VERSION OF UNITED UTILITES REPORT (REF. Single Utility Report - 115545 - Whitemoss Road & Benmore, RECEIVED 12/12/2022).
4. CULVERTED WATERCOURSE TRACED OVER PDF VERSION OF MANCHESTER CITY COUNCIL LLFA DATA SCREEN (REF. DataScreen_WhiteMossRoad, RECEIVED 05/01/2023).
5. SITE LAYOUT PROVIDED BY JOHN MCCALL ARCHITECTS (REF. PL.003A, RECEIVED IN NOVEMBER 22).

KEY:

- SITE BOUNDARY
- E — ELECTRICITY SERVICES
- UU COMBINED SEWER
- CLEAN WATER DISTRIBUTION MAIN
- BT — BT CABLE
- VM — VIRGIN MEDIA CABLE
- GAS — GAS MAIN
- LIVE BT BOX
- UU EASEMENT - 6m WIDE STRIP
- CULVERTED WATERCOURSE

Rev.	Date	Description	By	Chk'd	App'd
P01	20/01/23	FIRST ISSUE	RW	FL	CB

Drawing Status: FOR INFORMATION

Suitability: S2

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Client: the guinness partnership

Project Title: PROJECT 500 MANCHESTER

Drawing Title: CONSTRAINTS PLAN

Scale	Designed	Drawn	Checked	Authorised
SCALE	RW	RW	FL	CB
Original Size: A1	Date: 05/12/22	Date: 05/12/22	Date: 17/01/23	Date: 17/01/23

Drawing Number: 5218589-ATK-WT-XX-DR-D-0501

Revision: P01

USER: PANG8291 Date: 20/1/23 10:51:03
Filename: \\wsatkins.com\projects\GBEMCWGE\Projects\Cities\321858\Guinness Partnership Sites, Manchester, P5007 WP\DD\CAD\DR\0218589-ATK-WT-XX-DR-D-0501 Constraints Drawing
Internal Project Number: 5218589

Dimensions are to be checked on site. Do not scale from drawings. Report discrepancies to the Architect.

PROPOSED PLAN

1 **Proposed Site Plan** 1:1000

N

SITE BOUNDARY

SITE AREA : 11,091m^2

EXISTING TREES

EXISTING TREES TO BE REMOVED

PROPOSED SOFT LANDSCAPING (Subject to a detailed landscaping strategy)

PROPOSED TREES (Subject to a detailed landscaping strategy)

PROPOSED STREET TREES (Subject to a detailed landscaping strategy)

EV 7kW Charge Point

DUAL ASPECT UNITS TO ADDRESS EACH CORNER

POTENTIAL PARTY WALL DISCUSSIONS NEEDED

	House Type	Total
	2B4P House Type 1 @ 79m^2	12
	2B4P House Type 2 @ 79m^2	14
	3B5P House Type 1 @ 93m^2	12
		38

PROPOSED MASSING

the guinness partnership

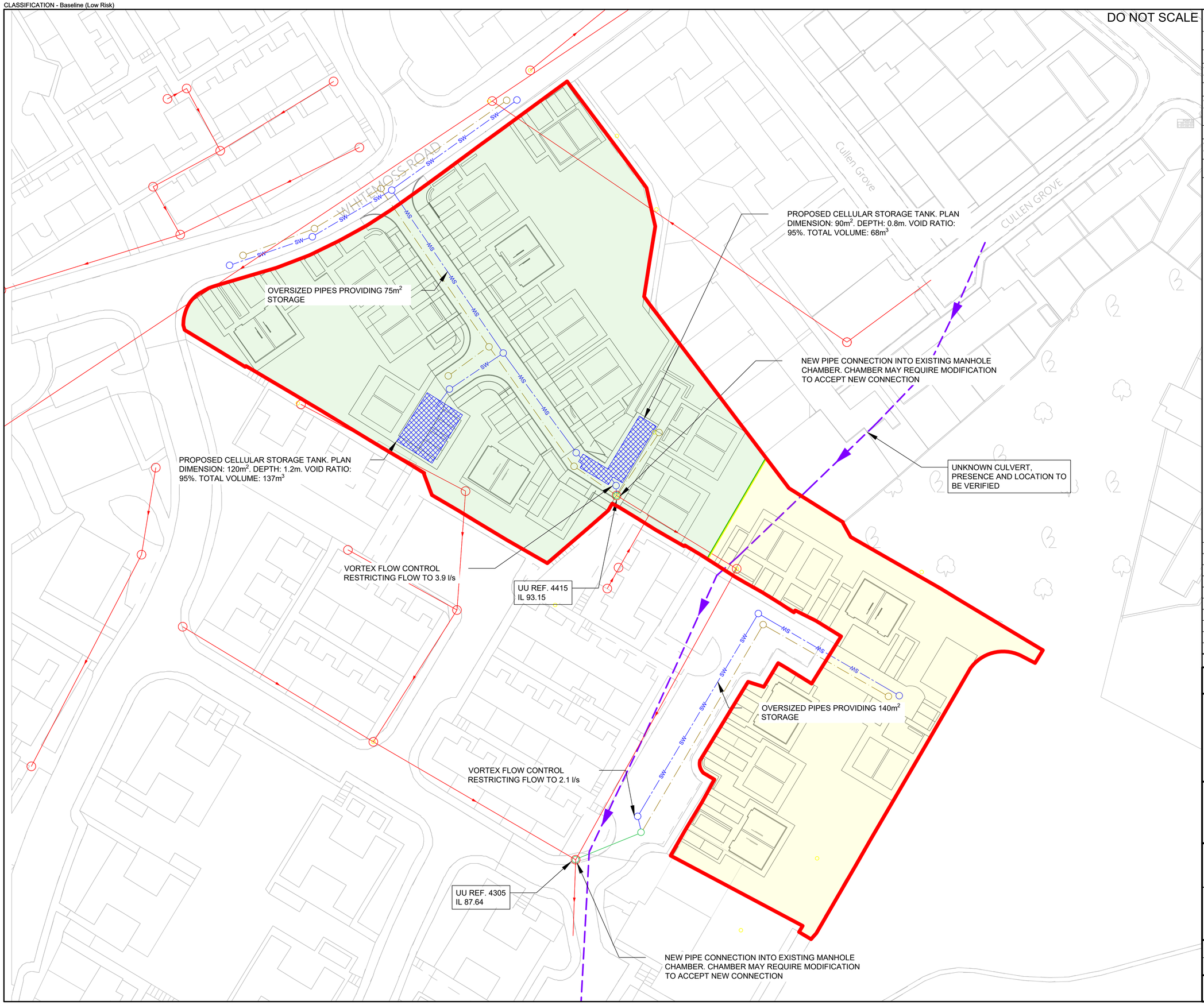
1785

PL.003A

Charlestown Phase 2 **Site 1 - Proposed Plan and Massing**

JOHN McCALL ARCHITECTS

DO NOT SCALE



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

MAINTENANCE/CLEANING

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

DECOMMISSIONING/DEMOLITION

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

NOTES:

1. ALL DIMENSIONS ARE IN METRES (m) UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE SHOWN IN METRES ABOVE ORDNANCE DATUM (mAOD) UNLESS OTHERWISE STATED.
3. ACCESS FOR MAINTENANCE OF CELLULAR STORAGE IS REQUIRED.
4. TOPOGRAPHICAL SURVEY DATA TAKEN FROM DRAWING REFERENCE "5218589-ATK-WT-XX-M2-D-5501-TOPOGRAPHICAL SURVEY".
5. SEWER RECORDS TRACED OVER PDF VERSION OF UNITED UTILITES REPORT (REF. Single Utility Report - 115545 - Whitemoss Road & Benmore, RECEIVED 12/12/2022).
6. CULVERTED WATERCOURSE TRACED OVER PDF VERSION OF MANCHESTER CITY COUNCIL LLFA DATA SCREEN (REF. DataScreen_WhiteMossRoad, RECEIVED 05/01/2023).
7. SITE LAYOUT PROVIDED BY JOHN MCCALL ARCHITECTS (REF. PL.003A, RECEIVED IN NOVEMBER 22).

KEY:

- SITE BOUNDARY
- SW — PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED COMBINED SEWER
- EXISTING UU COMBINED SEWER
- PROPOSED CELLULAR STORAGE TANK
- CULVERTED WATERCOURSE
- EAST CATCHMENT AREA
- WEST CATCHMENT AREA

Rev.	Date	Description	By	Chk'd	App'd
P01	20/01/23	FIRST ISSUE	RW	FL	CB

Drawing Status: FOR INFORMATION

Suitability: S2

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Client: the guinness partnership

Project Title: PROJECT 500 MANCHESTER

Drawing Title: DRAINAGE LAYOUT

Scale	Designed	Drawn	Checked	Authorised
SCALE	RW	RW	FL	CB
Original Size: A1	Date: 18/01/23	Date: 18/01/23	Date: 20/01/23	Date: 20/01/23

Drawing Number: 5218589-ATK-WT-XX-DR-D-0502

Revision: P01

Internal Project Number: XXXXXXX

USER: PANG8291 Date: 20/1/23 10:57:09
Filename: \\wsatkins.com\projects\CBEM\CWCE\Projects\Cities\5218589 Guinness Partnership Site, Manchester, P5007 WP\DD\CAD\DR\5218589-ATK-WT-XX-DR-D-0502 Drainage Layout.dwg

Appendix C. SuDS Selection

The following tables are taken from CIRIA C697 The SuDS Manual (2007).

CIRIA C697, Table 5.2 Land Use Selection Matrix

SuDS group	Technique	Low density	Residential	Local roads	Commercial	Hotspots	Construction site	Brownfield	Contaminated land
Retention	Retention pond	Y	Y	Y[1]	Y[2]	Y[2]	Y[3]	Y	Y[2]
	Subsurface storage	Y	Y	Y	Y	Y	Y[3]	Y	Y
Wetland	Shallow wetland	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Extended detention wetland	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Pond/wetland	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Pocket wetland	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Submerged gravel wetland	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Wetland channel	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
Infiltration	Infiltration trench	Y	Y	Y[1]	Y[2]	N	N	Y	Y[4]
	Infiltration basin	Y	Y	Y[1]	Y[2]	N	N	Y	Y[4]
	Soakaway	Y	Y	Y[1]	Y[2]	N	N	Y	Y[4]
Filtration	Surface sand filter	N	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Sub-surface sand filter	N	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Perimeter sand filter	N	N	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Bioretention/filter strip	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
	Filter trench	Y	Y	Y[1]	Y[2]	Y[2]	N	Y	Y[2]
Detention	Detention basin	Y	Y	Y[1]	Y[2]	Y[1,2]	Y[3]	Y	Y[2]
Open channels	Conveyance swale	Y	Y	Y[1]	Y[2]	Y[2]	Y[3]	Y	Y[2]
	Enhanced dry swale	Y	Y	Y[1]	Y[2]	Y[2]	Y[3]	Y	Y[2]
	Enhanced wet swale	Y	Y	Y[1]	Y[2]	Y[1]	Y[3]	Y	Y[2]
Source control	Green roof	Y	Y	N	Y[2]	Y	N	Y	Y
	Rainwater harvesting	Y	Y	N	Y[2]	N	N	Y	Y
	Permeable paving	Y	Y	N	Y[2]	Y[1]	N	Y	Y[2]

Y: Yes N: No

[1] May require two treatment train stages, depending on type and intensity of road use and receiving water sensitivity.
[2] May require three treatment train stages, depending on receiving watercourse sensitivity.
[3] Will require draw-down and rehabilitation following construction activities, prior to use as a permanent drainage system.
[4] Providing designs prevent mobilisation of contamination.

CIRIA C697, Table 5.4 Site Characteristics Selection Matrix

SuDS group	Technique	Soils		Area draining to a single SuDS component		Minimum depth to water table		Site slope		Available head		Available space	
		Impermeable	Permeable	0 - 2ha	>2ha	0 - 1m	>1m	0 - 5%	>5%	0 - 1m	1 - 2m	Low	High
Retention	Retention pond	Y	Y[1]	Y	Y[5]	Y	Y	Y	Y	Y	Y	**N**	Y
	Subsurface storage	Y	Y	Y	Y[5]	Y	Y	Y	Y	Y	Y	Y	Y
Wetland	Shallow wetland	Y[2]	Y[4]	Y[4]	Y[6]	Y[2]	Y[2]	Y	**N**	Y	Y	**N**	Y
	Extended detention wetland	Y[2]	Y[4]	Y[4]	Y[6]	Y[2]	Y[2]	Y	**N**	Y	Y	**N**	Y
	Pond/wetland	Y[2]	Y[4]	Y[4]	Y[6]	Y[2]	Y[2]	Y	**N**	Y	Y	**N**	Y
	Pocket wetland	Y[2]	Y[4]	Y[4]	N	Y[2]	Y[2]	Y	**N**	Y	Y	Y	Y
	Submerged gravel wetland	Y[2]	Y[4]	Y[4]	Y[6]	Y[2]	Y[2]	Y	**N**	Y	Y	**N**	Y
	Wetland channel	Y[2]	Y[4]	Y[4]	Y[6]	Y[2]	Y[2]	Y	**N**	Y	Y	**N**	Y
Infiltration	Infiltration trench	**N**	Y	Y	N	**N**	Y	Y	Y	Y	**N**	Y	Y
	Infiltration basin	**N**	Y	Y	Y[5]	**N**	Y	Y	Y	Y	**N**	**N**	Y
	Soakaway	**N**	Y	Y	N	**N**	Y	Y	Y	Y	**N**	Y	Y
Filtration	Surface sand filter	Y	Y	Y	Y[5]	**N**	Y	Y	**N**	N	Y	**N**	Y
	Sub-surface sand filter	Y	Y	Y	N	**N**	Y	Y	**N**	N	Y	Y	Y
	Perimeter sand filter	Y	Y	Y	N	**N**	Y	Y	**N**	Y	Y	Y	Y
	Bio-retention/filter strip	Y	Y	Y	N	**N**	Y	Y	N	Y	Y	**N**	Y
	Filter trench	Y	Y[1]	Y	N	**N**	Y	Y	**N**	Y	Y	Y	Y
Detention	Detention basin	Y	Y[1]	Y	Y[5]	**N**	Y	Y	Y	N	Y	**N**	Y
Open channels	Conveyance swale	Y	Y	Y	N	**N**	Y	Y	**N[3]**	Y	N	**N**	Y
	Enhanced dry swale	Y	Y	Y	N	**N**	Y	Y	**N[3]**	Y	N	**N**	Y
	Enhanced wet swale	Y[2]	Y[4]	Y	N	Y	Y	Y	**N[3]**	Y	N	**N**	Y
Source control	Green roof	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
	Rainwater harvesting	Y	Y	Y	N	Y	Y	Y	Y	Y			
	Permeable paving	Y	Y	Y	Y	**N**	Y	Y	**N**	Y	Y	Y	Y

Y: Yes N: No

[1] With liner
[2] With surface baseflow
[3] Unless follows contours
[4] With liner and constant surface baseflow, or high ground water table
[5] Possible, but not recommended (implies appropriate management train not in place)
[6] Where high flows are diverted around SuDS component.

Appendix D. Surface Water Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm north

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.500	Add Flow / Climate Change (%)	0
Ratio R	0.331	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm north

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.331
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.500 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2160, 2880
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	480 Winter	100	+45%	100/240 Winter				94.473
S2.000	S2	480 Winter	100	+45%	100/360 Winter				94.472
S2.001	S3	480 Winter	100	+45%	100/240 Winter				94.472
S1.001	S1	480 Winter	100	+45%	100/240 Winter				94.473
S3.000	S5	480 Winter	100	+45%	100/240 Winter				94.460
S1.002	S2	480 Winter	100	+45%	100/240 Winter				94.479
S1.003	S7	480 Winter	100	+45%	100/120 Winter				94.509
S4.000	S8	480 Winter	100	+45%	100/15 Summer				94.511
S1.004	S4	480 Winter	100	+45%	100/15 Summer				94.511

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.128	0.000	0.01			3.7	SURCHARGED	
S2.000	S2	0.085	0.000	0.01			4.2	SURCHARGED	
S2.001	S3	0.125	0.000	0.03			14.2	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm north

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.001	S1	0.204	0.000	0.03			13.8	SURCHARGED	
S3.000	S5	0.251	0.000	0.16		640	34.6	SURCHARGED	
S1.002	S2	0.294	0.000	0.06			29.1	SURCHARGED	
S1.003	S7	0.390	0.000	0.07			16.4	SURCHARGED	
S4.000	S8	0.819	0.000	0.13			5.8	SURCHARGED	
S1.004	S4	1.011	0.000	0.32		994	3.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm north

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 386560 403466 SD 86560 03466
Data Type Point
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2160, 2880
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	480 Winter	100	+45%	100/240 Winter				94.947
S2.000	S2	480 Winter	100	+45%	100/240 Winter				94.947
S2.001	S3	480 Winter	100	+45%	100/240 Winter				94.947
S1.001	S1	480 Winter	100	+45%	100/120 Winter				94.947
S3.000	S5	480 Winter	100	+45%	100/120 Winter				94.947
S1.002	S2	480 Winter	100	+45%	100/120 Winter				94.947
S1.003	S7	480 Winter	100	+45%	100/60 Winter				94.947
S4.000	S8	480 Winter	100	+45%	100/15 Summer				94.947
S1.004	S4	480 Winter	100	+45%	100/15 Summer				94.947

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm north

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.602	0.000	0.01			5.5	SURCHARGED	
S2.000	S2	0.560	0.000	0.02			6.2	SURCHARGED	
S2.001	S3	0.600	0.000	0.03			15.0	SURCHARGED	
S1.001	S1	0.678	0.000	0.04			16.4	SURCHARGED	
S3.000	S5	0.738	0.000	0.16		643	34.9	SURCHARGED	
S1.002	S2	0.762	0.000	0.07			30.2	SURCHARGED	
S1.003	S7	0.828	0.000	0.08			17.6	FLOOD RISK	
S4.000	S8	1.255	0.000	0.17			7.7	FLOOD RISK	
S1.004	S4	1.447	0.000	0.36		1164	3.9	FLOOD RISK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm south

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.500	Add Flow / Climate Change (%)	0
Ratio R	0.331	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm south

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.331
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.500 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2160, 2880
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S2.000	S4	480 Winter	100	+45%					91.414
S2.001	S4	480 Winter	100	+45%					91.414
S2.002	S3	480 Winter	100	+45%	100/360 Winter				91.412
S2.003	S3	480 Winter	100	+45%	100/15 Summer				91.412

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S2.000	S4	-0.086	0.000	0.00			5.5	OK	
S2.001	S4	-0.012	0.000	0.00			8.1	OK	
S2.002	S3	0.093	0.000	0.00			1.8	SURCHARGED	
S2.003	S3	1.451	0.000	0.12			1.6	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm south

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 386560 403466 SD 86560 03466
Data Type Point
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2160, 2880
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S2.000	S4	480 Winter	100	+45%	100/240 Winter				92.172
S2.001	S4	480 Winter	100	+45%	100/240 Winter				92.172
S2.002	S3	480 Winter	100	+45%	100/240 Winter				92.172
S2.003	S3	480 Winter	100	+45%	100/15 Summer				92.172

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S2.000	S4	0.672	0.000	0.00			6.1	SURCHARGED	
S2.001	S4	0.746	0.000	0.00			8.8	SURCHARGED	
S2.002	S3	0.853	0.000	0.00			1.7	SURCHARGED	
S2.003	S3	2.211	0.000	0.15			2.0	SURCHARGED	

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