

Queens Road, Manchester

Drainage Strategy

The Guinness Partnership

January 2023

Notice

This document and its contents have been prepared and are intended solely as information for The Guinness Partnership and use in relation to a full planning application for a residential development on Queens Road in Manchester, North-west of England.

Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	For Client Review	LG	FL	CB	GC	25/01/23
1.1	Drainage layout updated	LG	FL	CB	GC	25/01/23

Client signoff

Client	The Guinness Partnership
Project	Queens Road, Manchester
Job number	5218589
Client signature / date	

Contents

Chapter	Page
1. Introduction	5
2. Background Information	6
2.1. Environment Agency (EA)	6
2.2. United Utilities (UU)	6
2.3. Manchester City Council (MCC)	6
3. Site Description	7
3.1. Location	7
3.2. Topography	7
3.3. Land Use	7
3.4. Ground Conditions	8
3.5. Water Environment	8
3.6. Proposed Development	9
4. Surface Water Drainage Strategy	10
4.1. Existing Drainage Regime	10
4.2. Proposed Outfall	10
4.3. Maximum Permitted Discharge Rate	10
4.4. SuDS Selection	10
4.5. Proposed Strategy	12
4.6. Adoption & Maintenance	13
5. Foul Water Drainage Strategy	14
5.1. Foul Water Flow Rates	14
5.2. Proposed Outfall	14
5.3. Strategy	14
5.4. Adoption & Maintenance	14
6. Conclusions & Recommendations	15
6.1. Conclusions	15
6.2. Recommendations	15
Appendices	16
Appendix A. Correspondence	17
Appendix B. Drawings	18
Appendix C. SuDS Selection	19
Appendix D. Surface Water Calculations	21

Tables

Table 4-1 - Existing surface water run-off rates	10
Table 4-2 - Development pollution hazard indices	11
Table 4-3 - % of total run-off treated by each SuDS component	12
Table 4-4 - Pollution mitigation indices for permeable paving	12
Table 4-5 - Potential SuDS configurations	12

Figures

Figure 3-1 - Site location plan (not to scale)	7
--	---

1. Introduction

Atkins has been commissioned by The Guinness Partnership to prepare a Drainage Strategy to inform a full design package for a proposed residential site development (the “Proposed Development”) on land off Queens Road in Manchester, North-west of England (the “Site”).

This Drainage Strategy has been prepared in accordance with the National Planning Policy Framework (NPPF)¹ and associated Planning Practice Guidance². This Drainage Strategy has been established through consultation with and using documentation provided by United Utilities (UU), Environment Agency (EA) and the Manchester City Council (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 located within Flood Zone 1.
- The Site is remote from any designated 'Main River'.
- The EA do not have any records of flooding affecting the Site.
- The EA do not consider the Site to be at risk from fluvial flooding.

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 allows foul water flow from the Proposed Development to be discharged into their public combined sewer at an unrestricted rate. Their preferred point of connection is the 760*1120mm public combined sewer within Queens Road Located to the West of the Site.
- In relation to surface water, UU will consider a connection to their 760*1120mm public combined sewer within Queens Road located west of the Site at discharge rate not exceeding 5l/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 Guidance².
- 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 surrounding the Site. There is a sewer running along the Queens Road; a sewer along the Trimley Avenue from the east to the west, eventually connecting into the sewer under the Queens Road. There is also a sewer along the eastern area of the Site running from the northwest to the southeast.

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 in the Conurbation Core Critical Drainage Area (CDA).
- The nearest flood/drainage incident on record is approximately onsite, dated 09/07/21 and two incidents on Trimley Avenue, dated 09/07/2021 and 11/08/2021. All these incidents are also described as "Loose/rattling gully/grid or manhole cover"
- The asset register highlights an indicative risk that the Newton Brook culverted ordinary watercourse crosses the Site. An indicative culvert route is shown crossing the southern part of the Site. This culvert is an indicative asset and has not been verified with survey.
- The 1984 drainage survey of major assets (enclosed) does not highlight the indicative culvert asset.
- 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 in the northeast of Manchester City Centre. The Site is bounded to the west by Queens Road (A6010), to the north by Sedgford Road, to the east by residential buildings and to the south by a strip of woodland area and a railway. The proposed area under consideration for the development is an 'L' shape. The Site approximated centre point coordinates are Easting: 385859 and Northing: 400314.

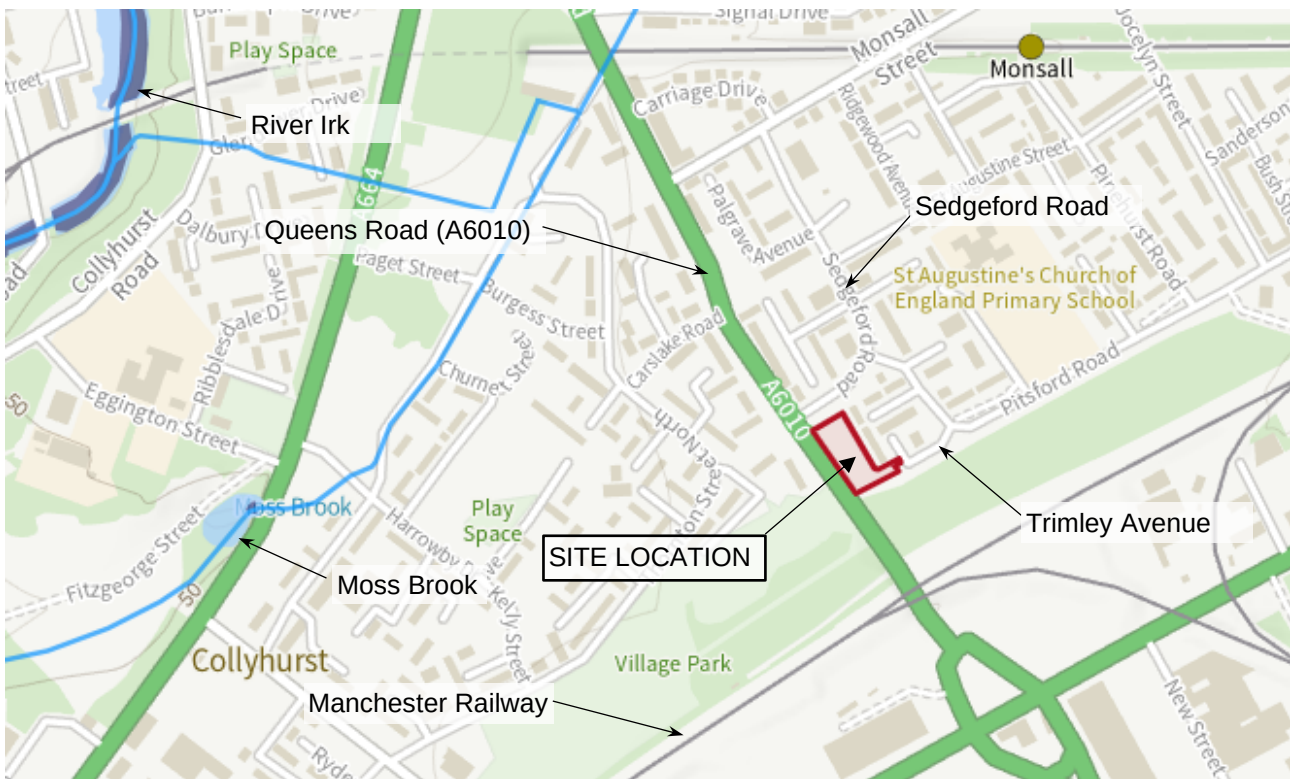


Figure 3-1 - Site location plan (not to scale)

3.2. Topography

The Site has an approximate area of 0.22ha. The topographical survey of the Site is shown on drawing number S21559-T in **Appendix B**.

There is a ridge in the middle of the Site at approximately 64.1m AOD, parallel to Queens Road. This ridge falls towards the boundary of the Site at gradients between 1 in 10 and 1 in 20. The lowest point of the Site, 61.6m AOD is located in the southern corner of the Site.

The Site's surrounding area falls in a westerly direction. The strip of woodland to the south of the Site, falls towards the Site at an approximate gradient of 1 in 3.

3.3. Land Use

3.3.1. Historic

The earliest mapping (1845) indicates that the Site was occupied by the Collyhurst Lodge. By the early 1900s, the lodge was replaced with a residential housing development and the area to the south of the Site occupied by railway sidings.

By the 1970s, the residential buildings were demolished, with the Site displayed as public open space in the configuration of the current day. Railway sidings to the south of the Site are no longer mapped by the 1990s with areas now comprised of densely vegetated woodland.

3.3.2. Current

The Site is currently used as a public open space and is entirely covered with grass, with the exception of a footpath in the northern area of the Site. There are mature trees scattered around the Site.

The immediate surrounding area is primarily composed of residential developments with the exception of land to the south of the Site, which comprises of densely vegetated vacant woodland.

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-043-P01; date: November 2022) together with information from a number of on-line, public domain data sources.

3.4.1. Soils

According to Soilscales³, the soils on the Site are described as *slowly permeable seasonally wet acid loamy and clayey soils*. No information is currently available regarding the depths of this stratum.

3.4.2. Made Ground

Made ground was encountered to depths of between 0.6 and 2.3m.

Made ground soil comprised of a surface cover of grass which is underlain with loose slightly gravelly sand, loose dark brown gravelly sand with rootlets and rare cobbles, or soft to firm slightly gravelly sandy clay. The gravel fraction of the granular soil includes angular and subangular fine to coarse of brick, concrete, glass and mudstone, cobbles are angular to subangular of concrete and angular to subangular fine to medium of brick.

3.4.3. Geology

3.4.3.1. Superficial Deposits

According to the Geotechnical Report, the superficial deposits underlying the Site are classified as Glacial Till Deposits (interbedded granular and cohesive soils) and Pennine Middle Coal Measures Formation bedrock. The Glacial Till encountered comprises predominantly cohesive deposits, described as typically firm to very stiff slightly sandy slightly gravelly clay.

3.4.3.2. Bedrock

According to the British Geological Survey (BGS) GeoIndex⁴, the bedrock underlying the Site is interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.

3.4.3.3. Contamination

The Geo-Environmental and Geotechnical Reports have identified the presence of Metals, Polycyclic Aromatic Hydrocarbons (PAH) and Total Petroleum Hydrocarbon (TPH). No suspected asbestos containing materials were identified.

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 Soilscales, <http://www.landis.org.uk/soilscales/>

⁴ British Geological Survey GeoIndex 1:50000 mapping records for Manchester dated 2010, <http://mapapps2.bgs.ac.uk/geoindex/home.html>

3.5.1.2. Private Drainage

There are no records of any private drainage within the Site. However, due to the Site being developed in the past surrounded and 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**.

To the east of the Site, there is a 150mm diameter public combined sewer of unknown depth running northwest to the southeast. A 300mm diameter public combined sewer of unknown depth crosses the south of the site from east to west. This sewer connects into the public combined sewer, 760*1120mm and 620*900m, to the west of the Site, in Queens Road near Manhole 9102.

The sewer in Queens Road is running in a northerly direction and is 620*900m (changing to 760*1120mm) in size; and is approximately 10m deep.

A site constraints plan (drawing reference: 5218589-ATK-PG-XX-DR-D-0401) 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 Newton Brook culverted ordinary watercourse crossing the site. An indicative culvert route is shown crossing the southern part of the Site but has not been verified with survey.

The River Irk is located approximately 700m to the west of the Site and the nearest surface water features are the Moston Brook located 500m to the north of the Site and Moss Brook located 800m to the west of the Site. The Rochdale Canal is located 650m to the southeast of the Site.

3.5.3. Waterbodies

There are no waterbodies located within the Site. There is a Boating Lake located approx. 2.5km to the north of the Site. There are also ponds which are a part of the River Irk, approx. 1.5km to the North of the Site.

3.5.4. Groundwater

According to the Environmental Agency mapping and the Geo-Environmental and Geotechnical Reports, the Site is not located within any groundwater Source Protection Zone. The superficial deposits underlying the site are designated a Secondary Undifferentiated aquifer. The bedrock underlying the Site is classified as a Secondary A aquifer.

There were no groundwater strikes recorded during the intrusive works.

3.6. Proposed Development

The proposal involves development of residential housing, comprising of 8 new units, a mix of 2 and 3 bedroom properties with private car parking places.

The proposed indicative development layout (drawing reference: 5218589-ATK-PG-XX-M2-D-5403; date: Dec 2023) is included in **Appendix B**.

4. Surface Water Drainage Strategy

4.1. 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 green field 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 0.22ha
- SAAR (Standard Annual Average Rainfall) 896mm
- SOIL 0.450
- Urban 0.000
- Region 10

The calculation results are shown in Table 4-1.

AEP	Run-off flow (l/s)
100%	1.1
42.9%(QBAR)	1.3
3.3%	2.2
1%	2.7

Table 4-1 - Existing surface water run-off rates

4.2. Proposed Outfall

Surface water run-off from the Proposed Development will be discharged into the local public combined water sewer located to the West of the Site within the Queens Road (UU manhole ref. 9101).

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.

4.3. Maximum Permitted Discharge Rate

The maximum total discharge rate from the Proposed Development into the public combined water sewer will be limited to the QBAR greenfield runoff rate of 1.3l/s.

This flow rate is lower than the maximum discharge rate provided by UU of 5l/s (section 2.2).

4.4. 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*⁴ and information provided in CIRIA C753 *The SuDS Manual*⁵.

The Proposed Development is residential; therefore, according to CIRIA C697⁴, Table 5.2 (reproduced in **Appendix C**), all SuDS techniques, with the exception of perimeter sand filter are considered acceptable.

As described in Section 4.2, 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 C753⁵, Table 4.3, the Proposed Development, including the road serving the car park, 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.

⁴ C697 The SUDS Manual, CIRIA, 2007

⁵ C753 The SUDS Manual, CIRIA, 2016

According to CIRIA C753⁵, Table 26.2, the *low* pollution hazard levels for the Proposed Development translate to the pollution hazard indices set out in Table 4-4.

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 4-2 - Development pollution hazard indices

The parameters for the initial selection of SuDS components for this site using CIRIA C697⁴ 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: >1m
- Site slope: 0 – 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
- Pocket wetland
- Sub-surface sand filter
- Filter trench
- Green roofs
- Rainwater harvesting
- Permeable paving

Subsurface storage is anticipated to provide the primary surface water storage within the Proposed Development. This will take the form of oversized pipes.

Wetlands require either a continuous through-flow of water or consistently high groundwater levels. Neither of these are present on the Site hence wetlands are not considered to be a viable SuDS technique for the Proposed Development.

Subsurface sand filter is potentially suitable; however, at this stage a decision regarding the use of these systems has not been made.

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 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 are not proposed on this site. 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.

Permeable paving is proposed on the parking bays and the road serving the car parking. The permeable paving will primarily provide treatment for flows passing through it. The car parking areas are considered to present the higher risk of surface run-off pollution due to substances dripping from parked vehicles and tyre and brake material deposited as vehicles manoeuvre.

The percentage of the total Site's run-off treated by each SuDS component is shown in Table 4-3.

SuDS component	Run-off treated by the SuDS component (% of total runoff)
Pocket filter drain	45
Permeable paving	55

Table 4-3 - % 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 4-4 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 4-4 - Pollution mitigation indices for permeable paving

Table 4-5 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 4-5 - Potential SuDS configurations

4.5. Proposed Strategy

The drainage strategy is illustrated on drawing number 5218589-ATK-QN-XX-DR-C-0402 *Proposed Drainage Strategy*; a copy is included in **Appendix B**.

Based on the proposed development layout plans, the Proposed Development has been calculated as having a 70% impermeable area. The total impermeable area that the surface water drainage system must manage is 0.16ha.

It is proposed that the surface water drainage system will comprise a conventional pipe network, alongside SuDS components, draining to oversized pipes.

A Hydro-Brake® flow control is proposed to be used prior to the outfall into the sewer, limiting the flow to the maximum permitted flow rate for the Site, as detailed in section 4.3.

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 volume is 95m³. This has been determined using MicroDrainage Source Control; the results are provided in **Appendix D**.

4.6. Adoption & Maintenance

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

5. Foul Water Drainage Strategy

5.1. Foul Water Flow Rates

As described in section 4.1, the Proposed Development comprises 8 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 0.4/s (based on 6 dry weather flow (DWF)).

5.2. Proposed Outfall

Correspondence with UU confirmed that there is a suitable point of connection into the 760*1120mm public combined sewer within Queens Road located to the west of the Site at an unrestricted rate (UU manhole ref. 9101).

5.3. 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.

5.4. Adoption & Maintenance

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

6. Conclusions & Recommendations

6.1. Conclusions

Surface water runoff from the Proposed Development will be discharged into a local public combined water sewer located to the west of the site (UU manhole ref. 9101) at a maximum total discharge rate of 1.3l/s. The ground beneath the Site is likely to be contaminated, hence infiltration as a means of surface water disposal is not considered viable.

The Proposed Development will incorporate SuDS features. Subsurface storage is anticipated to provide the primary surface water storage within the Proposed Development, in the form of the 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 paving is proposed on the parking bays and the road serving the car parking. Subsurface sand filters are potentially suitable and should be considered during future design stages.

Pocket filter drains are proposed for each residential housing downpipe to provide both interception and water quality benefits for residential roof runoff.

A Hydro-Brake® flow control is proposed to be used prior to the 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 0.4l/s. These are proposed to be discharged into the public combined sewer to the west of the site (UU manhole ref. 9101). The suitability of the connection has been confirmed by UU.

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

6.2. Recommendations

This Drainage Strategy 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

Guo, Zhenglu

From: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Sent: 19 January 2023 15:35
To: Guo, Zhenglu
Subject: GMMC295448SW Response attached from the Environment Agency

Dear Lucy,

Thank you for your enquiry which was received on 09/01/23, please accept my sincere apology for the delay.

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

Please find your questions followed by my colleague's response in red, below;

- The site lies within Flood Zone 1. Please could you confirm this and advise whether there are any records of flooding from any source in the vicinity of the site. - **From the grid ref provided (SD 85961 00146) the site appears to be within flood zone 1 from the published [flood map for planning](#). The site/property is remote from any designated "Main River". The EA has no records of flooding to the site and it is not considered to be at risk from fluvial flooding. However, there can be other sources of flooding such as surface water run-off problems, highway drainage and burst water mains which, the EA does not keep records of. If you have not already done so, we recommend you contact the Lead Local Flood Authority who might have information on surface water risks and records of flood events from highways etc.**
- Are you aware of any specific flood risk and/or drainage issues that we should take into account within the Drainage Strategy for this site? - **From April 2015 Lead Local Flood Authorities became the statutory consultee for surface water flood risk in relation to planning applications. The LLFA is now the appropriate body to assess applicants/developers drainage proposals.**

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: Guo, Zhenglu <Zhenglu.Guo@atkinsglobal.com>

Sent: 09 January 2023 15:12

To: Enquiries, Unit <enquiries@environment-agency.gov.uk>

Subject: RE: Ref: 220929/GA11-Development Enquiry - Queens Road (Manchester, M40 8TQ)

You don't often get email from zhenglu.guo@atkinsglobal.com. [Learn why this is important](#)

Good afternoon,

Hope you are well.

I am reaching out on one of the Development site we had in Manchester:

Location: Queens Road, M40 8TQ

NGR coordinates: 385961 , 400146

Enquiry Reference: 220929/GA11.

We have submitted the development enquiry on 23rd September 2022 and receive an email back on 29th September 2022, where stated our enquiry has been passed onto the local customer team, however, we have not received anything since.

I am wondering would it be possible to have the following to support us on preparing a Drainage Strategy for planning application?

- The site lies within Flood Zone 1. Please could you confirm this and advise 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 we should take into account within the Drainage Strategy for this site?

Please contact me if you require any clarifications about this enquiry and I look forward to hearing from you.

Sincerely,

Lucy Guo *MEng*

Graduate Civil Engineer, Infrastructure

UK & Europe

Engineering, Civil Engineering & Advanced Technology

 +(44)1214835862

Atkins, member of the SNC-Lavalin Group

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



ATKINS

Member of the SNC-Lavalin Group

Company



From: Enquiries, Unit <enquiries@environment-agency.gov.uk>

Sent: 29 September 2022 11:58

To: Guo, Zhenglu <Zhenglu.Guo@atkinsglobal.com>

Subject: Ref: 220929/GA11-Development Enquiry - Queens Road (Manchester, M40 8TQ)

Good morning Zhenglu,

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/GA11 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: Guo, Lucy <Lucy.Guo@atkinsglobal.com>

Sent: 23 September 2022 10:39

To: Enquiries, Unit <enquiries@environment-agency.gov.uk>

Subject: Ref: 220929/GA11-Development Enquiry - Queens Road (Manchester, M40 8TQ)

You don't often get email from lucy.guo@atkinsglobal.com. [Learn why this is important](#)

Good morning,

We are contacting you with reference to a proposed residential development in Queens Road, Manchester. Please see the site location details below and the site location plane attached.

Site Location: Queens Road, Manchester, M40 8TQ.

NGR coordinates: 385961 , 400146

We are preparing a Drainage Strategy to support a planning application and would be grateful if you could confirm the following:

- The site lies within Flood Zone 1. Please could you confirm this and advise 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 we should take into account within the Drainage Strategy for this site?

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

Kind Regards,

Zhenglu Guo *MEng*

Graduate Civil Engineer, Infrastructure

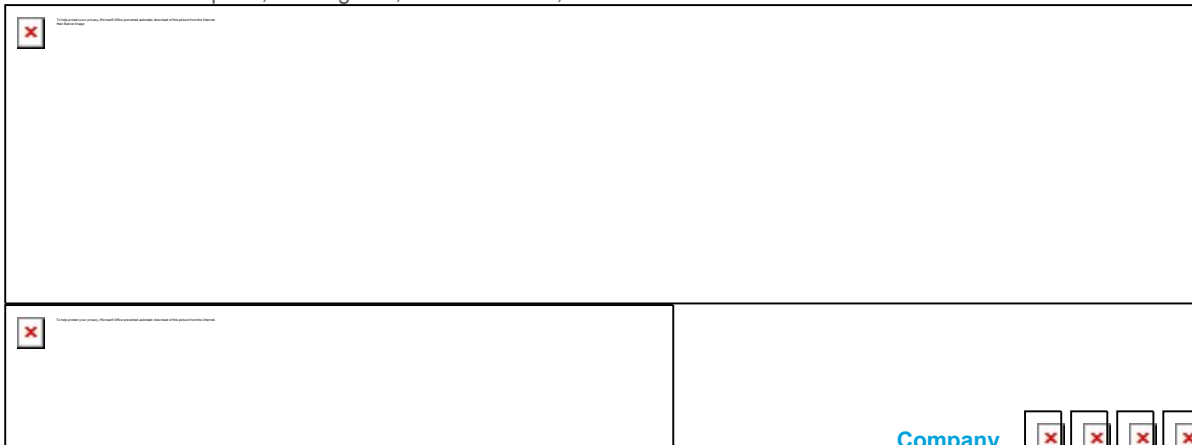
UK & Europe

Engineering, Civil Engineering & Advanced Technology



+ (44) 1214835862

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



Company



At Atkins - member of the SNC-Lavalin Group, we work flexible hours around the world. Although I have sent this email at a time convenient for me, I don't expect you to respond until it works for you.

NOTICE – This email message and any attachments may contain information or material that is confidential, privileged, and/or subject to copyright or other rights. Any unauthorized viewing, disclosure, retransmission, dissemination, or other use of or reliance on this message or anything contained therein is strictly prohibited and may be unlawful. If you believe you may have received this message in error, kindly inform the sender by return email and delete this message from your system. Thank you.

Information in this message may be confidential and may be legally privileged. If you have received this message by mistake, please notify the sender immediately, delete it and do not copy it to anyone else. We have checked this email and its attachments for viruses. But you should still check any attachment before opening it. We may have to make this message and any reply to it public if asked to under the Freedom of Information Act, Data Protection Act or for litigation. Email messages and attachments sent to or from any Environment Agency address may also be accessed by someone other than the sender or recipient, for business purposes.

Information in this message may be confidential and may be legally privileged. If you have received this message by mistake, please notify the sender immediately, delete it and do not copy it to anyone else. We have checked this email and its attachments for viruses. But you should still check any attachment before opening it. We may have to make this message and any reply to it public if asked to under the Freedom of Information Act, Data Protection Act or for litigation. Email messages and attachments sent to or from any Environment Agency address may also be accessed by someone other than the sender or recipient, for business purposes.

Guo, Zhenglu

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 06 October 2022 14:50
To: Guo, Zhenglu
Subject: PDE for: Queens Road UU Ref : 02845156

Good afternoon Zhenglu,

Pre Development Enquiry for: Queens Road UU Reference Number : 02845156

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 760*1120mm public combined sewer within Queens Road 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.**

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

United Utilities acknowledge that the nearest watercourse is a significant distance off-site.

Highway Drainage

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

Public Sewer

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

Once evidence is provided as outlined above, United Utilities will consider a connection to the 760*1120mm public combined sewer within Queens Road 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 5l/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 public sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

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

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

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

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

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

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

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

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

Connection Application

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

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

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

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

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:

Many thanks and kind regards,



Mohammed Aljafarawi (He/Him)

Developer Engineer
Developer Services & Metering
Customer Services
M: 07950474499
unitedutilities.com

If you have received a great service today why not tell us?

Visit: unitedutilities.com/wow



The information contained in this e-mail is intended only for the individual to whom it is addressed. It may contain legally privileged or confidential information or otherwise be exempt from disclosure. If you have received this Message in error or there are any problems, please notify the sender immediately and delete the message from your computer. You must not use, disclose, copy or alter this message for any unauthorised purpose. Neither United Utilities Group PLC nor any of its subsidiaries will be liable for any direct, special, indirect or consequential damages as a result of any virus being passed on, or arising from the alteration of the contents of this message by a third party.

United Utilities Group PLC, Haweswater House, Lingley Mere
Business Park, Lingley Green Avenue, Great Sankey,
Warrington, WA5 3LP
Registered in England and Wales. Registered No 6559020

www.unitedutilities.com

www.unitedutilities.com/subsidiaries

Atkins - Utility Solutions

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

FAO:

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: 115544
Our Ref: UUPS-ORD-452031
Date: 08/12/2022

Dear Sirs

Location: 555 QUEENS ROAD, MANCHESTER, M40 8TQ

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,



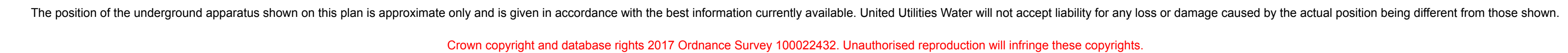
Karen McCormack
Property Searches Manager

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.



**SEWER
RECORDS**

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

Our response does not include:

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

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



Louise Dack
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 01925 233063 (33063 internal)
[unitedutilities.com](https://www.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*

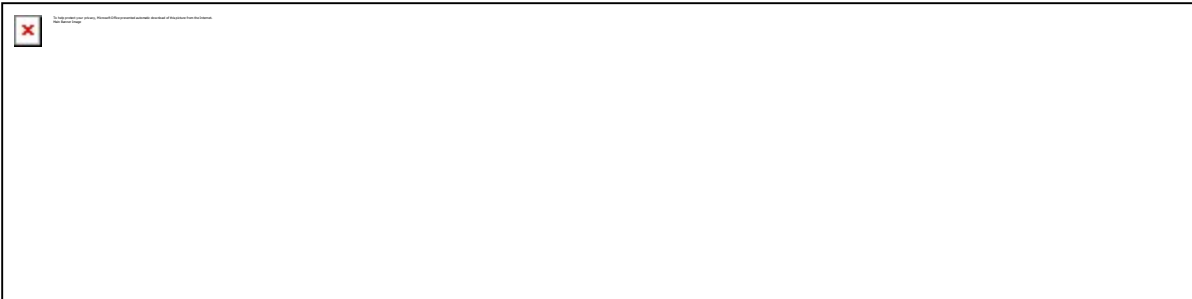
Graduate Civil Engineer, Infrastructure

UK & Europe

Engineering, Civil Engineering & Advanced Technology

 +(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 U UW 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](https://www.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

☐ ☐ ☐ ☐

At Atkins - member of the SNC-Lavalin Group, we work flexible hours around the world. Although I have sent this email at a time convenient for me, I don't expect you to respond until it works for you.

NOTICE – This email message and any attachments may contain information or material that is confidential, privileged, and/or subject to copyright or other rights. Any unauthorized viewing, disclosure, retransmission, dissemination, or other use of or reliance on this message or anything contained

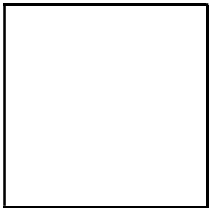
therein is strictly prohibited and may be unlawful. If you believe you may have received this message in error, kindly inform the sender by return email and delete this message from your system. Thank you.

The information contained in this e-mail is intended only for the individual to whom it is addressed. It may contain legally privileged or confidential information or otherwise be exempt from disclosure. If you have received this Message in error or there are any problems, please notify the sender immediately and delete the message from your computer. You must not use, disclose, copy or alter this message for any unauthorised purpose. Neither United Utilities Group PLC nor any of its subsidiaries will be liable for any direct, special, indirect or consequential damages as a result of any virus being passed on, or arising from the alteration of the contents of this message by a third party.

United Utilities Group PLC, Haweswater House, Lingley Mere
Business Park, Lingley Green Avenue, Great Sankey,
Warrington, WA5 3LP
Registered in England and Wales. Registered No 6559020

www.unitedutilities.com

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 04/01/2023

Dear Sir or Madam,

RE: Our Ref: MCC004C/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,

A handwritten signature in black ink, appearing to be 'NB' or similar initials.

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

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.

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:

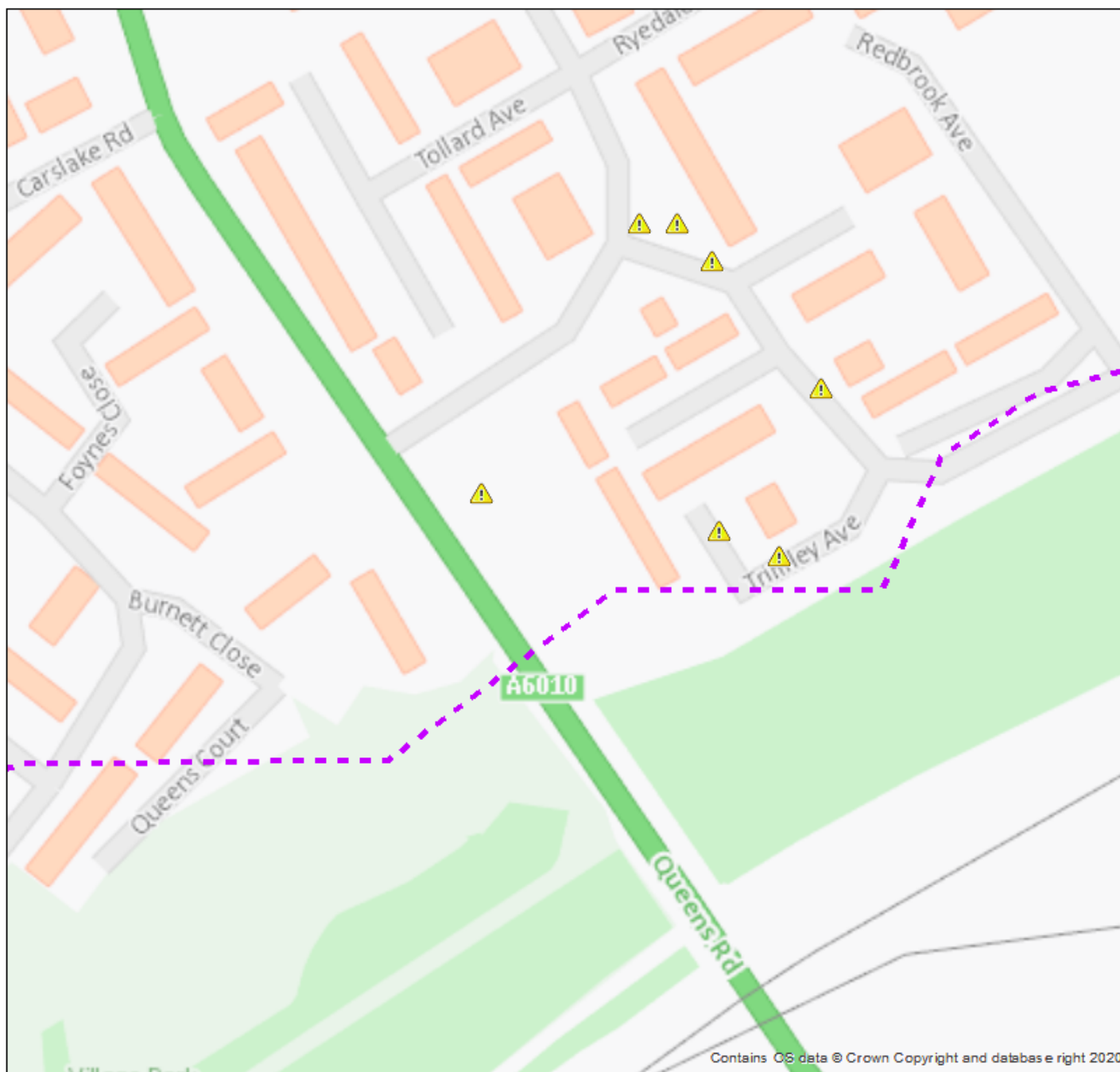
Critical Drainage Area – The Site is in the Conurbation Core CDA.

Flood Incidents - The nearest flood/drainage incident on record is approximately onsite, dated 09/07/2021, described as “Loose/rattling gully/grid or manhole cover”. Two incidents on Trimley Avenue are also described as “Loose/rattling gully/grid or manhole cover” dated 09/07/2021 and 11/08/2021.

Culvert Conduits – The asset register highlights an indicative risk that the Newton Brook culverted ordinary watercourse crosses the Site. An indicative culvert route is shown crossing the southern part of the Site. 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) does not highlight the indicative culvert asset.

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:
Queens Road, Manchester, M40 8TQ

Our Ref: **MCC004C/01/2023**

Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,506

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 10 20 40
Meters



Contains OS data © Crown Copyright
and database right 2022.



**MANCHESTER
CITY COUNCIL**

LLFA DATA SCREEN

Address/Site Ref:
Queens Road, Manchester, M40 8TQ

Our Ref: **MCC004C/01/2023**

Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,506

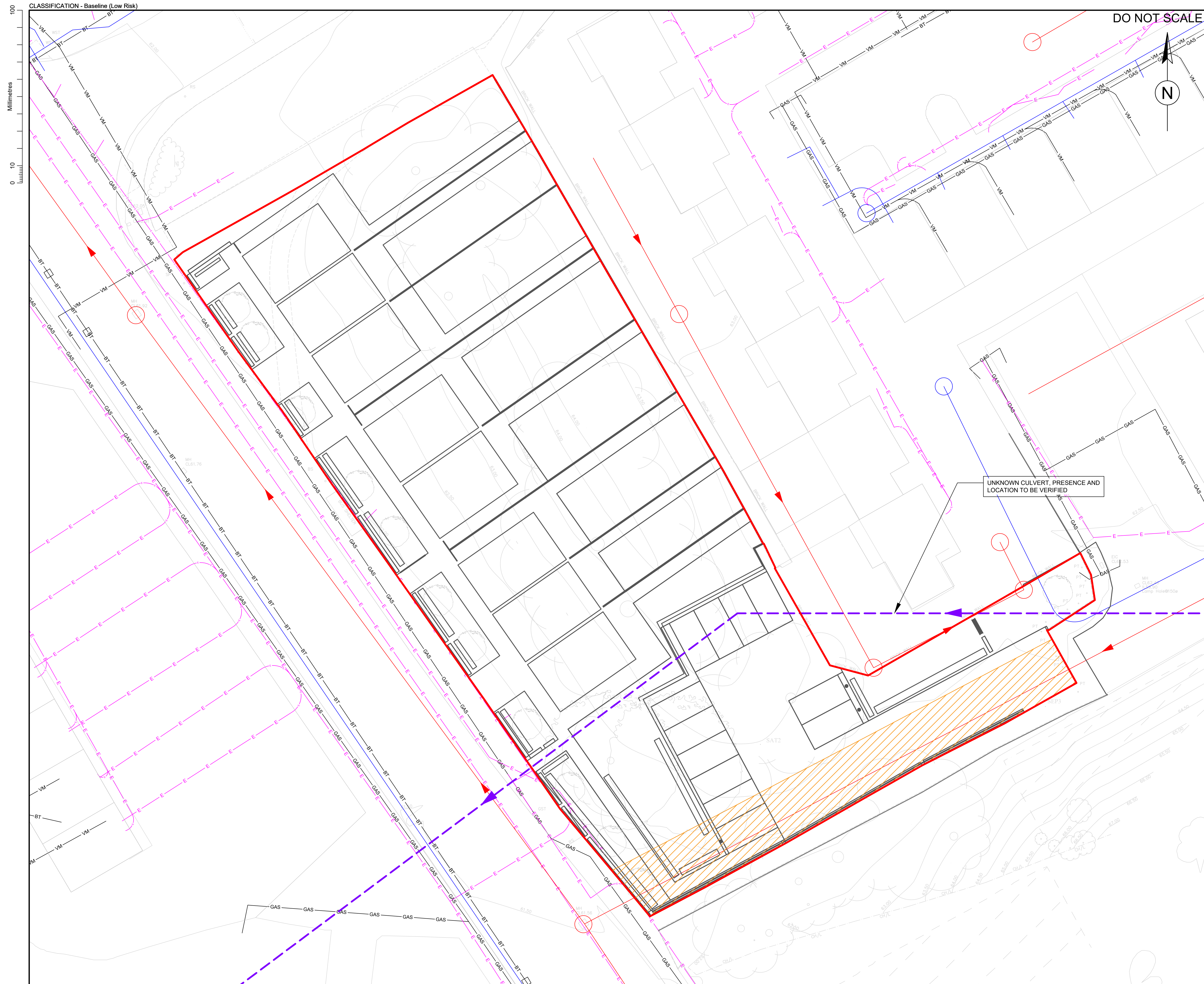
The position of features shown on this plan is approximate only and is given in accordance with the best information currently available. Manchester City Council will not accept liability for any loss or damage caused by the actual position being different from those shown.

0 10 20 40
Meters



Contains OS data © Crown Copyright and database right 2022.

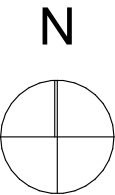
Appendix B. Drawings



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. TOPOGRAPHICAL SURVEY DATA TAKEN FROM DRAWING REFERENCE S21559-T, PROVIDED BY SURVEY & ENGINEERING PROJECTS, DATED APRIL 21.					
3. SITE UTILITIES ALIGNMENT TRACED OVER PDF VERSION OF UTILITY REPORT (REF. 077873.003, Queens Road - Utilities Search, PROVIDED BY CORNERSTONE PROJECT LTD. RECEIVED 22/11/2021).					
4. SEWER RECORDS TRACED OVER PDF VERSION OF UNITED UTILITIES REPORT (REF. Single Utility Report - 115544 - Palgrave Avenue & Queens Road, RECIEVED 12/12/2022).					
5. CULVERTED WATERCOURSE TRACED OVER PDF VERSION OF MANCHESTER CITY COUNCIL LLFA DATA SCREEN (REF. DataScreen_QueensRoad, RECEIVED 05/01/2023).					
6. SITE LAYOUT PROVIDED BY JOHN MCCALL ARCHITECTS (REF. PL.003, RECEIVED IN NOVEMBER 22).					
KEY:					
SITE BOUNDARY E E ELECTRICITY SERVICES UU COMBINED CLEAN WATER DISTRIBUTION MAIN BT BT BT CABLE VM VM VIRGIN MEDIA CABLE GAS GAS GAS MAIN LIVE BT BOX UU EASEMENT - 6m WIDE STRIP CULVERTED WATERCOURSE (INDICATIVE)					

P01	25/01/23	FIRST ISSUE	LG	FL	CB
Rev.	Date	Description	By	Chk'd	App'd
Drawing Status				Suitability	
FOR INFORMATION				S2	
SNC • LAVALIN ATKINS Member of the SNC-Lavalin Group Two Chamberlain Square Birmingham West Midlands B3 3AX Tel: +44 (0)121 483 5757 Fax: www.atkinsglobal.com © SNC-Lavalin (2022)					
Client					
the guinness partnership					
Project Title					
PROJECT 500 MANCHESTER					
Drawing Title					
QUEENS ROAD CONSTRAINTS PLAN					
Scale	Designed LG	Drawn LG	Checked FL	Authorised CB	
Original Size A1	Date 19/01/23	Date 19/01/23	Date 23/01/23	Date 25/01/23	
Drawing Number				Revision	
5218589-ATK-QN-XX-DR-D-0401				P01	

PROPOSED PLAN



SITE BOUNDARY

SITE AREA : 2170.5m²



EXISTING TREES



EXISTING TREES TO BE REMOVED



PROPOSED TREES TO BE PLANTED
(Subject to a detailed landscaping strategy)



PROPOSED SOFT LANDSCAPING
(Subject to a detailed landscaping strategy)



EV 7kW Charge Point (min 25% of spaces)

	House Type	Total
	2B4P House @ 79m ²	6
	3B5P House @ 93m ²	2
		8



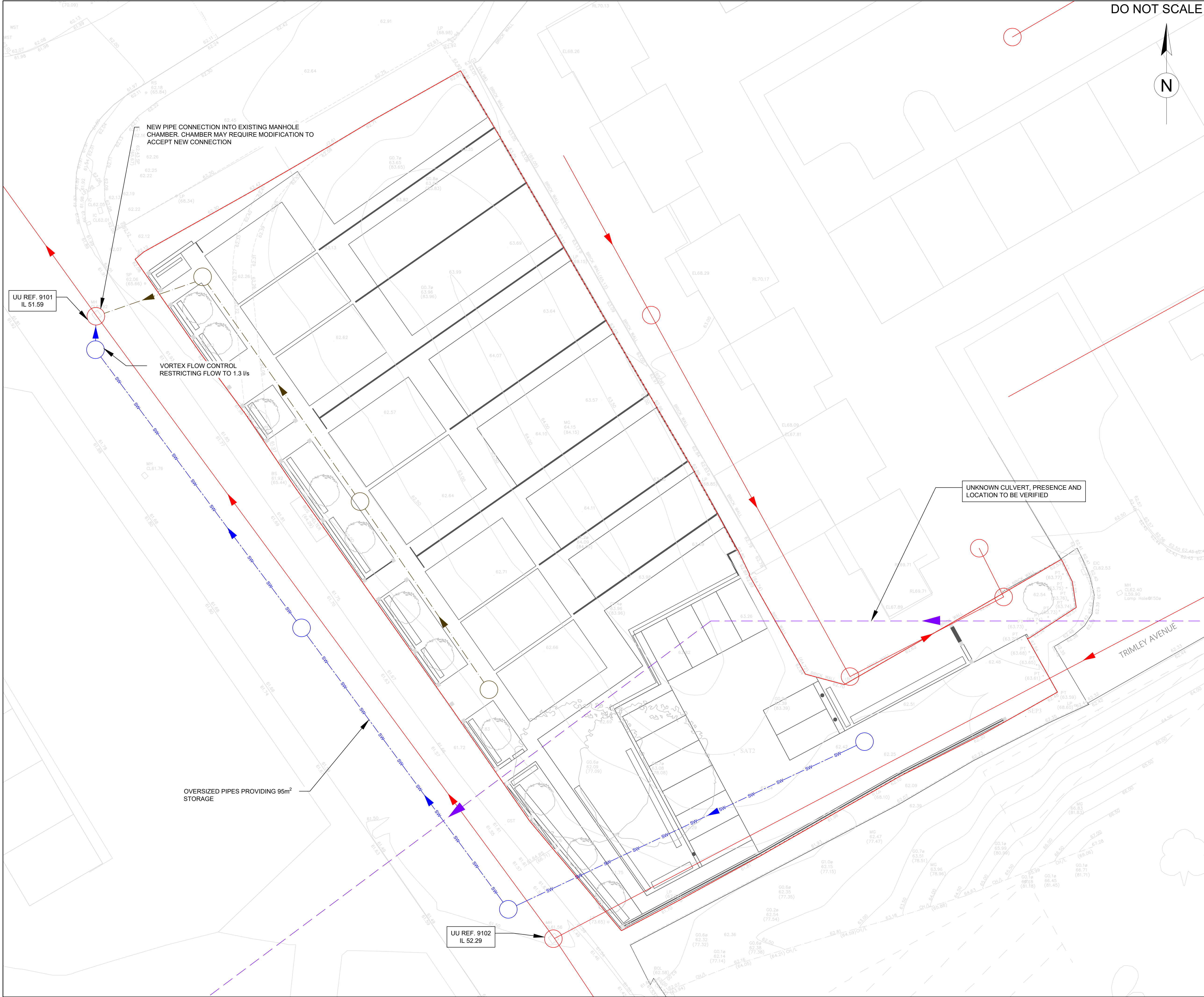
PROPOSED MASSING



DUAL ASPECT UNITS TO ADDRESS EACH CORNER

100
0 10
Millimetres

CLASSIFICATION - Baseline (Low Risk)



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.
2. TOPOGRAPHICAL SURVEY DATA TAKEN FROM DRAWING REFERENCE S21559-T, PROVIDED BY SURVEY & ENGINEERING PROJECTS, DATED APRIL 21.
3. SEWER RECORDS TRACED OVER PDF VERSION OF UNITED UTILITIES REPORT (REF. Single Utility Report - 115544 - Palgrave Avenue & Queens Road, RECEIVED 12/12/2022).
4. CULVERTED WATERCOURSE TRACED OVER PDF VERSION OF MANCHESTER CITY COUNCIL LLFA DATA SCREEN (REF. DataScreen_QueensRoad, RECEIVED 05/01/2023).
5. SITE LAYOUT PROVIDED BY JOHN MCCALL ARCHITECTS (REF. PL.003, RECEIVED IN NOVEMBER 22).

KEY:

- SITE BOUNDARY
- SW — PROPOSED SURFACE WATER
- PROPOSED FOUL WATER
- EXISTING UU COMBINED
- CULVERTED WATERCOURSE (INDICATIVE)

P02	25/01/23	DRAINAGE STRATEGY UPDATED	TKP	FL	CB
P01	25/01/23	FIRST ISSUE	LG	FL	CB
Rev.	Date	Description	By	Chk'd	App'd

Drawing Status	Suitability
FOR INFORMATION	S2



SNC-LAVALIN



ATKINS

Member of the SNC-Lavalin Group



the **guinness** partnership

Two Chamberlain Square
Birmingham
West Midlands
B3 3AX

Tel: +44 (0)121 483 5757
Fax:
www.atkinsglobal.com
© SNC-Lavalin (2022)

Client

Project Title
PROJECT 500 MANCHESTER

Drawing Title
QUEENS ROAD EXISTING AND PROPOSED DRAINAGE LAYOUT

Scale	Designed	Drawn	Checked	Authorised
1:150	LG	LG	FL	CB
Original Size	Date	Date	Date	Date
A1	20/01/23	20/01/23	23/01/23	25/01/23
Drawing Number				Revision
5218589-ATK-QN-XX-DR-D-0402				P02

CLASSIFICATION - Baseline (Low Risk)

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	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

Atkins (Epsom)		Page 1
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW		
Date 20/01/2023 15:03 File QN_NETWORKS.MDX	Designed by LAZZ4777 Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.100	Add Flow / Climate Change (%)	0
Ratio R	0.355	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

©1982-2020 Innovyze

Atkins (Epsom)		Page 2
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW		
Date 20/01/2023 15:03 File QN_NETWORKS.MDX	Designed by LAZZ4777 Checked by	
Innovyze	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S4, DS/PN: S1.003, Volume (m³): 37.9

Unit Reference	MD-SHE-0042-1300-2700-1300
Design Head (m)	2.700
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	42
Invert Level (m)	59.128
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.700	1.3	Kick-Flo®	0.378	0.5
Flush-Flo™	0.183	0.7	Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	1.200	0.9	3.000	1.4	7.000	2.0
0.200	0.7	1.400	1.0	3.500	1.5	7.500	2.1
0.300	0.6	1.600	1.0	4.000	1.6	8.000	2.1
0.400	0.6	1.800	1.1	4.500	1.6	8.500	2.2
0.500	0.6	2.000	1.1	5.000	1.7	9.000	2.3
0.600	0.7	2.200	1.2	5.500	1.8	9.500	2.3
0.800	0.8	2.400	1.2	6.000	1.9		
1.000	0.8	2.600	1.3	6.500	1.9		

©1982-2020 Innovyze

Atkins (Epsom)		Page 3	
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW			
Date 20/01/2023 15:03			
File QN_NETWORKS.MDX			
Designed by LAZZ4777			
Checked by			
Innovyze		Network 2020.1.3	

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

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.355
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.100 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	S1	1440 Winter	100	+45%	100/1440 Winter				60.718
S1.001	S2	1440 Winter	100	+45%	100/1440 Winter				60.719
S1.002	S3	1440 Winter	100	+45%	100/1440 Winter				60.719
S1.003	S4	1440 Winter	100	+45%	100/15 Summer				60.722
S1.004	S4	1440 Winter	100	+45%					59.139

		Surcharged Flooded			Half Drain		Pipe		
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.218	0.000	0.00			1.1	SURCHARGED	
S1.001	S2	0.275	0.000	0.00			1.0	SURCHARGED	
S1.002	S3	0.337	0.000	0.00			1.4	SURCHARGED	
S1.003	S4	1.444	0.000	0.09			1.0	SURCHARGED	
S1.004	S4	-0.119	0.000	0.09			1.0	OK	

©1982-2020 Innovyze

Atkins (Epsom)		Page 1
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW		
Date 20/01/2023 15:01 File QN_NETWORKS.MDX	Designed by LAZZ4777 Checked by	
Innovyze		Network 2020.1.3

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

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 385873 400281 SD 85873 00281
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS 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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	960 Winter	100	+45%	100/240 Winter				61.159
S1.001	S2	960 Winter	100	+45%	100/240 Winter				61.159
S1.002	S3	960 Winter	100	+45%	100/240 Winter				61.159
S1.003	S4	960 Winter	100	+45%	100/15 Summer				61.159
S1.004	S4	960 Winter	100	+45%					59.141

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.659	0.000	0.00			1.8	SURCHARGED	
S1.001	S2	0.715	0.000	0.00			1.2	SURCHARGED	

©1982-2020 Innovyze

Filippo Lazzarin
Atkins Limited
Two Chamberlain Square
Paradise Circus
Birmingham
B3 3AX

Tel: +44 (0)121 483 5583