

Palgrave Avenue, Manchester

Drainage Strategy

The Guinness Partnership

June 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 Palgrave Avenue in Manchester, North-west of England.

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Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	For Client Review	LG	FL	CB	GC	27/01/23
2.0	LLFA Comments Addressed	LG	FL	CB	GC	05/06/23

Client signoff

Client	The Guinness Partnership
Project	Palgrave Avenue, 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	8
3.1. Location	8
3.2. Topography	8
3.3. Land Use	8
3.4. Ground Conditions	9
3.5. Water Environment	9
3.6. Description	10
4. Surface Water Drainage Strategy	11
4.1. Existing Drainage Regime	11
4.2. Proposed Outfall	11
4.3. Maximum Permitted Discharge Rate	11
4.4. SuDS Selection	11
4.5. Proposed Strategy	13
4.6. Adoption & Maintenance	14
5. Foul Water Drainage Strategy	15
5.1. Foul Water Flow Rates	15
5.2. Proposed Outfall	15
5.3. Strategy	15
5.4. Adoption & Maintenance	15
6. Conclusions & Recommendations	16
6.1. Conclusions	16
6.2. Recommendations	16
Appendices	17
Appendix A. Correspondence	18
Appendix B. Drawings	19
Appendix C. SuDS Selection	20
Appendix D. Surface Water Calculations	22

Tables

Table 4-1 - Existing surface water run-off rates	11
Table 4-2 - Development pollution hazard indices	12
Table 4-3 - % of total run-off treated by each SuDS component	13
Table 4-4 - Pollution mitigation indices for permeable paving	13
Table 4-5 - Potential SuDS configurations	13

Figures

Figure 3-1 - Site location plan (not to scale)	8
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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 development (the “Proposed Development”) on land off Palgrave Avenue 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, 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 located within Flood Zone 1.
- The nearest model is in Moston Brook (2007 Model) which is culverted northwest of the Proposed Development.
- The EA have no flood defences in the vicinity of this Site.
- The EA do not have any records of flooding affecting the 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 allows foul water flow from the Proposed Development to be discharged into their public combined sewer at an unrestricted rate. Their preferred point of discharge is the 675mm diameter public combined sewer located within the site boundary.
- In relation to surface water, UU will consider a connection to their 675mm diameter public combined sewer located within the site boundary at a discharge rate not exceed 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 within and surrounding the Site. There is a sewer running across the site along the public footpath and a combined sewer connecting into it (UU manhole ref. 8307). This sewer eventually discharges into a public combined sewer under Queens Road.

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 response received is included in **Appendix A** and summarised below:

- The Site is located in the Conurbation Core Critical Drainage Area (CDA).
- The nearest flood/drainage incident on record is approximately 30m east of the Site, date 20/04.2012, described as "Grid/gully blocked".
- The asset register does not highlight any culverted watercourses onsite. The nearest "culvert" appears as an annotation in 3rd party historic OS mapping, approximately 80m southwest of the Site.
- The 1984 drainage survey of major assets does not highlight any culvert assets onsite.

The LLFA has provided comments on this Drainage Strategy (P01) on 14th March 2023, a copy of the comments received is included in **Appendix A** and summarised below:

- Objection as the proposed master plan has not considered the public sewer asset onsite (building footprints are shown above the asset and no easement has been provided).
- Increase the surface water discharge rate up to 5l/s in-line with UU allowance to avoid blockages.

- The sustainable drainage system 'must be designed to facilitate maintenance' in line with the NPPF Flood Risk and Coastal Change. Shared attenuation storage located in back garden plots poses a maintenance risk and should be minimised as far as feasible.

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 east by Palgrave Avenue and to the north and south by public footpaths connecting Queens Road to Palgrave Avenue and Tollard Avenue.

The proposed area under consideration for the development is shown below and has an approximated centre point coordinates at Easting: 385853 and Northing: 400310.

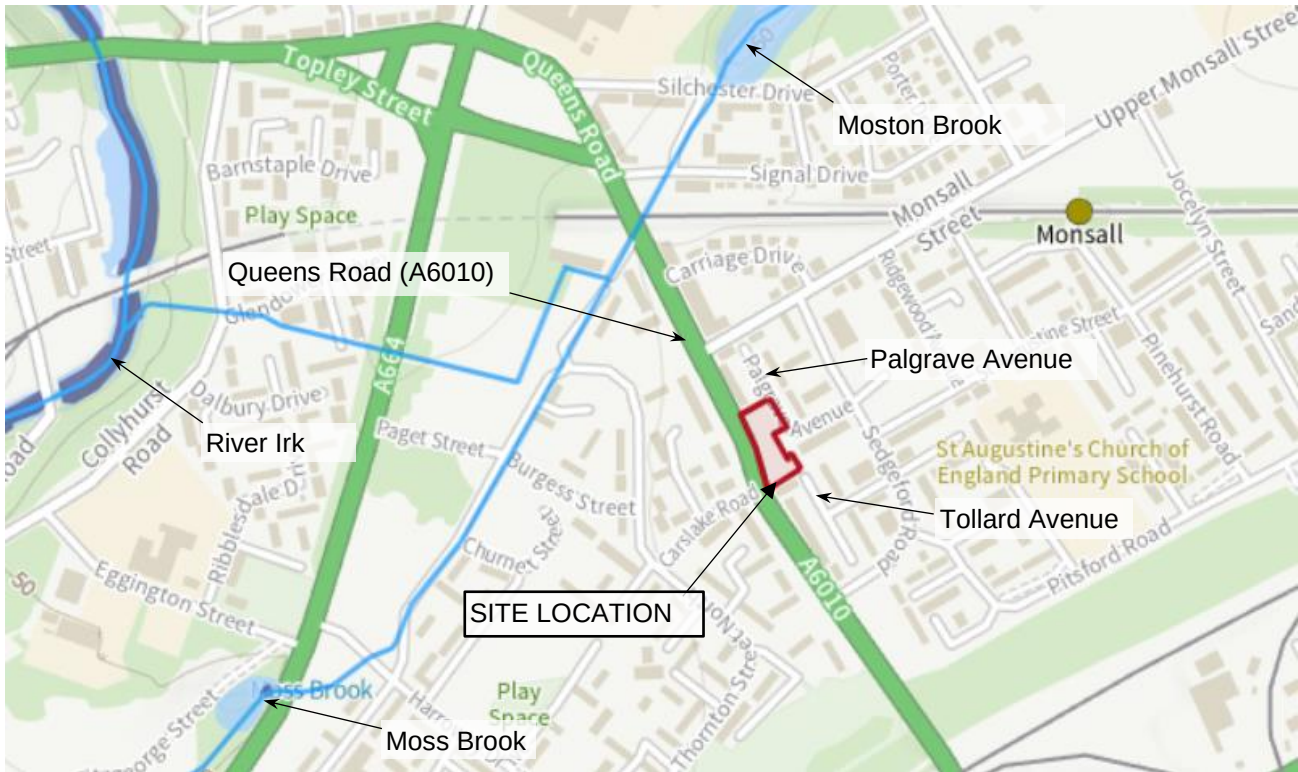


Figure 3-1 - Site location plan (not to scale)

3.2. Topography

The Site has an approximate area of 0.20ha. The topographical survey of the Site is shown on drawing number S21560-T in **Appendix B**.

The topographic survey indicates that the Site generally falls from a high point, of approximately 64.5m AOD, located in the middle of the Site eastern boundary, towards the Site boundary at an approximate gradient of 1 in 20. The lowest level within the Site, of approximately 63.05m AOD, is located in the southern corner of the Site.

The Site's surrounding area falls in a westerly direction.

3.3. Land Use

3.3.1. Historic

The earliest mapping (1845) indicates that the Site was occupied by school buildings (Lamb Lane School) with the surrounding area predominately vacant/agricultural land. A culvert is shown to the east of the Site. Significant residential development was undertaken on-site and the surrounding area in the late 1800s. A railway line is present to the north of the Site.

By the 1960s, the residential properties were demolished, with the Site displayed as public open space in the configuration of the current day. Its local surroundings are generally occupied by residential properties.

3.3.2. Current

The Site is currently occupied as a public open space and is entirely covered with grass, with the exception of two public footpaths dissecting the Site providing access from Palgrave Avenue to Queens Road. There are mature trees scattered around the Site.

The immediate surrounding area is primarily composed of residential developments.

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-044-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 soil*. No information is currently available regarding the depths of this stratum.

3.4.2. Made Ground

The made ground was encountered to depths of between 1 and 2.45m.

Made ground soil comprised of a surface cover of grass which is underlain with dark brown or grey sandy gravel or gravelly sand. The gravel fraction is described as being sandstone, brick, metal, plastic, concrete and glass.

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. The Glacial Till encountered comprises predominantly cohesive deposits, described as firm to stiff, slightly gravelly or gravelly, sandy to very sandy 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 and Polycyclic Aromatic Hydrocarbons (PAH). 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.

3.5.1.2. Private Drainage

There are no records of any private drainage within the Site. However, due to the Site having been developed in the past 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 its surrounding area have been obtained are provided in **Appendix A**.

³ Soilscales, <http://www.landis.org.uk/soilscales/>

⁴ British Geological Survey GeoIndex, <http://mapapps2.bgs.ac.uk/geoindex/home.html>

On the northern edge of the Site, there is a 675mm combined sewer running from southeast to northwest across the Site along the public footpath with a 150mm combined sewer connecting to the 675mm combined sewer at manhole 8307. The depth of these sewers is unknown. These sewers eventually discharge into the 720*1210/660*1140mm public combined sewers (approximately 10m deep) within Queens Road to the west of the Site running in a northerly direction.

A site constraints plan (drawing reference: 5218589-ATK-PG-XX-DR-D-0301) showing the public sewers location is provided in **Appendix B**.

UU is currently being consulted about diverting the 675mm combined sewer running from southeast to northwest across the Site along the public footpath, to avoid clashes with the proposed residential units. The proposed diversion is shown in the Proposed Drainage Layout plan (drawing number 5218589-ATK-PG-XX-DR-C-0302) included in **Appendix B**.

3.5.2. Watercourses

There are no watercourses located within the Site.

The nearest surface water features are the River Irk, located approximately 600m to the west of the Site; the Moston Brook, located approximately 300m to the north of the Site; the Moss Brook, located approximately 800m to the southwest of the Site; and the Rochdale Canal, located approximately 800m to the southeast of the Site.

3.5.3. Waterbodies

There are no water bodies located within the Site. There is a Boating Lake located approx. 2.4km to the north of the Site. There are also ponds which are part of the River Irk, approximately 1.3km 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 as 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. Description

The proposal involves development of residential housing, comprising of 7 new units, a mix of 2 and 3 bedroom properties with private car parking places.

The proposed development layout 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 0.20ha
- 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%	1.0
42.9%(QBAR)	1.2
3.3%	2.0
1%	2.4

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 public combined water sewer located within the site boundary, in a new chamber part of the proposed sewer diversion (refer to drawing 5218589-ATK-PG-XX-DR-D-0302 Drainage Layout).

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 discharged rate from the Proposed Development into the public combined water sewer will be limited to 5l/s because a flow control discharging less than 5l/s would be prone to blockages. This is line with UU correspondence and LLFA comments (dated 14th March 2023).

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 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 4-2.

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 private drives. The permeable paving will primarily provide treatment for flows passing through it. The drives 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	55
Permeable paving	45

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	Pocket filter drain	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-PG-XX-DR-C-0302 *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 60% impermeable area. The total impermeable area that the surface water drainage system must manage is 0.12ha.

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 25m³. 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 will 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 7 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 0.3l/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 a 675mm diameter public combined sewer located within the Site boundary at an unrestricted rate (UU manhole ref. 8307).

It is proposed to discharge foul water flows into this sewer in a new chamber part of the proposed sewer diversion (refer to drawing 5218589-ATK-PG-XX-DR-D-0302 Drainage Layout).

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 within the Site boundary in a new chamber part of the proposed diversion at a maximum total discharge rate of 5/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 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 private drives. 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 required storage volume is 25m³. This 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 0.3l/s. These are proposed to be discharged into the local public combined sewer located within the Site boundary in a new chamber part of the proposed diversion. 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 October 2022 11:11
To: Guo, Zhenglu
Subject: GMMC281144AB Response attached from the Environment Agency
Attachments: Site Location_PalgraveAvenue_M408JW.pdf

Dear Zhenglu,

Re: Development enquiry - Palgrave Avenue (Manchester, M40 8JW)

Thank you for your enquiry which was received on 23/9/22.

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 Moston Brook (2007 Model) which is culverted NW of the proposed location (Non EA maintained Culvert).

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,

Anne Ball

Customer and Engagement Officer

Greater Manchester, Merseyside and Cheshire

Email: inforequests.gmmc@environment-agency.gov.uk

Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA14 4UW

From: Guo, Lucy <Lucy.Guo@atkinsglobal.com>

Sent: 23 September 2022 10:32

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

Subject: Ref: 220929/GA13-Development enquiry - Palgrave Avenue (Manchester, M40 8JW)

Good morning,

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

Site Location: Palgrave Avenue, Manchester, M40 8JW.

NGR coordinates: 385859 , 400314

We are preparing a Drainage Strategy to support a planning application and would be gratefully 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?

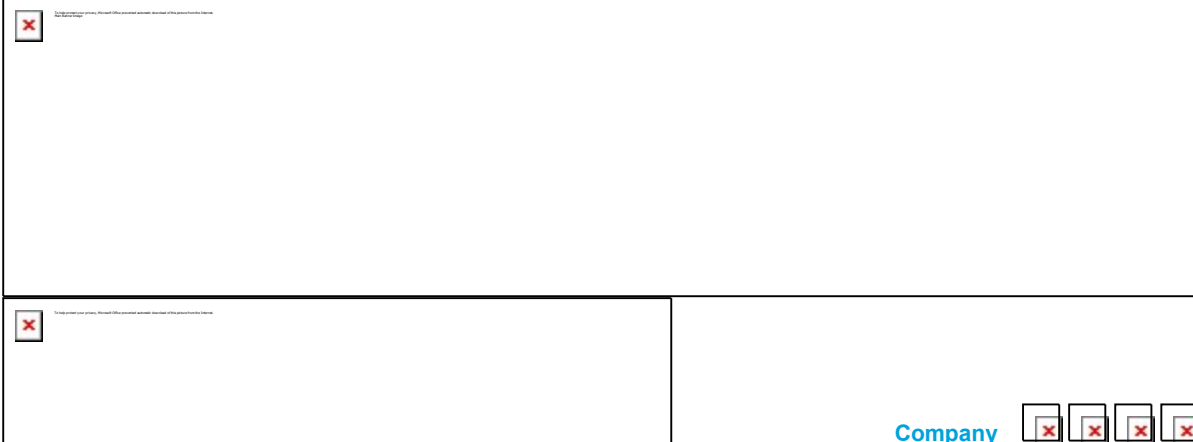
Please contact me if you require any clarifications about this enquiry.

Kind Regards,

Zhenglu Guo *MEng*
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Company



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Lazzarin, Filippo

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 28 September 2022 09:53
To: Guo, Zhenglu
Subject: Pre Development Enquiry for: Palgrave Avenue Manchester M40 8JW UU Reference Number : 02844185

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning, Lucy

Pre Development Enquiry for: Palgrave Avenue Manchester M40 8JW UU Reference Number : 02844185

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 375mm diameter public combined sewer located within the site boundary 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.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

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.

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 675mm diameter public combined sewer located within the site boundary 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/>

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.

If we can be of any further assistance please don't hesitate to contact us further.

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:

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

Many thanks and kind regards,



Gary Jaundrell

Assistant Developer Engineer
Developer Services & Metering
Customer Services

T: 07388 715 589

unitedutilities.com

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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

Coronavirus

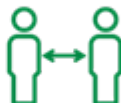
Prevent the spread



Wash your
hands



Disinfect
common surfaces



Practise social
distancing



FEVER +
COUGH

Stay home if you
have symptoms

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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,



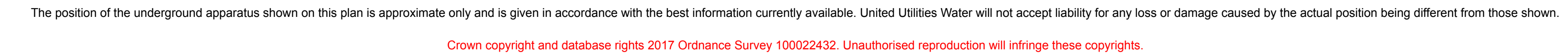
Karen McCormack
Property Searches Manager

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  United Utilities

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)

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<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*

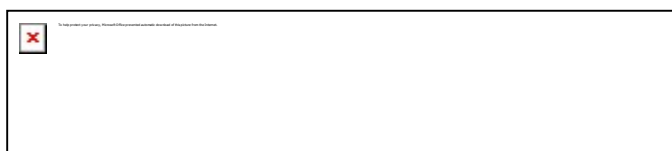
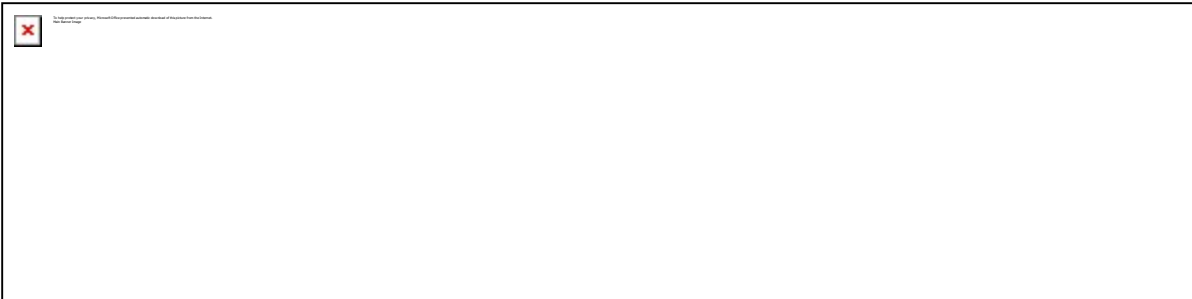
Graduate Civil Engineer, Infrastructure

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)

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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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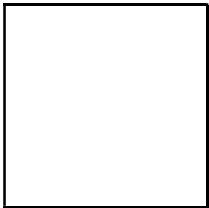
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**MANCHESTER
CITY COUNCIL**

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: MCC004D/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.
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- 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.
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- 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

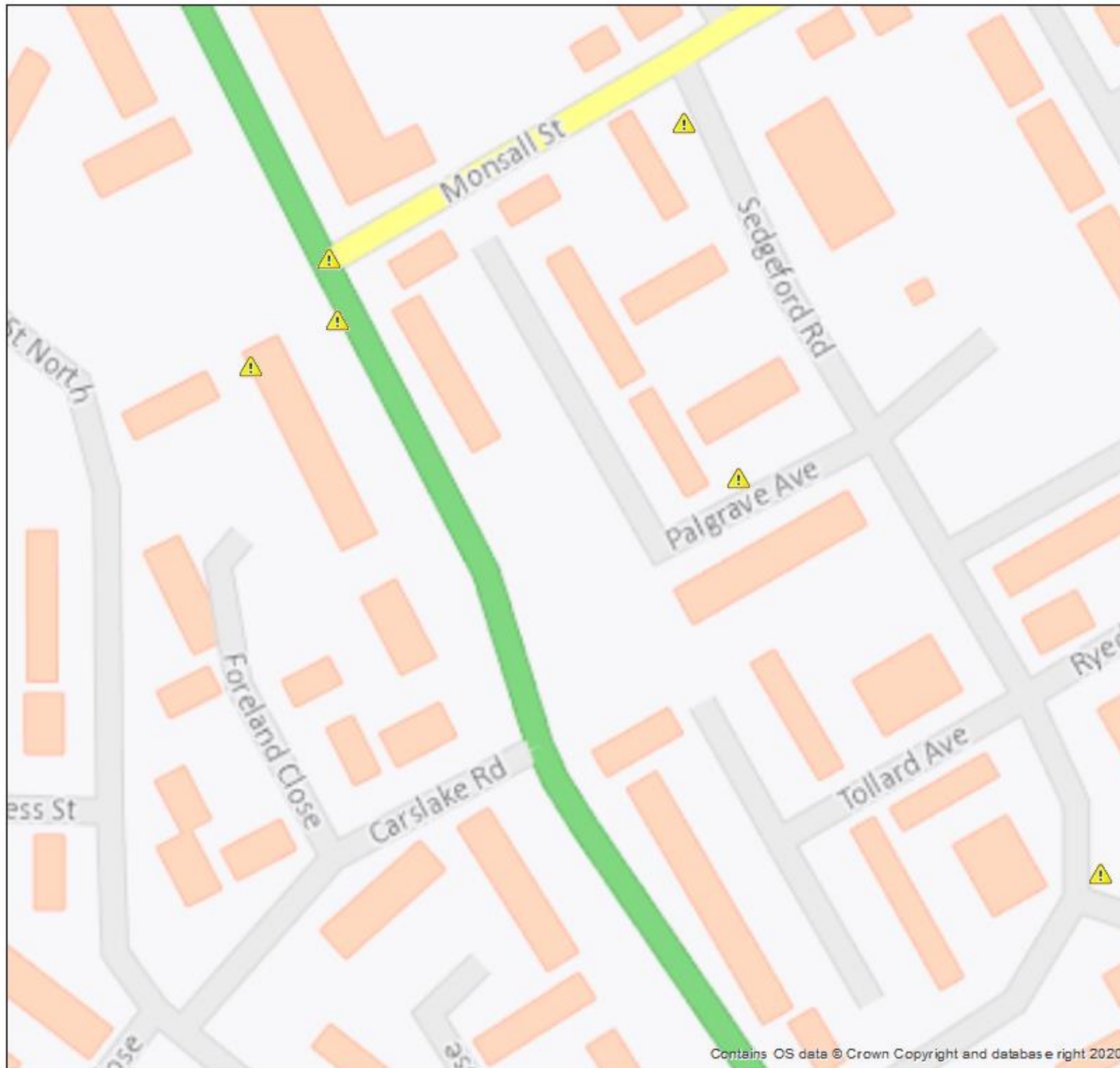
Supplementary Information where available:

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

Flood Incidents - The nearest flood/drainage incident on record is approximately 30m east of the Site, dated 20/04/2012, described as “Grid / gully blocked”.

Culvert Conduits – The asset register does not highlight any culverted watercourses onsite. The nearest “culvert” (in information available to the LLFA) appears as an annotation in 3rd party historic OS mapping, approximately 80m southwest of the Site.

Survey and Design Archive – The 1984 drainage survey of major assets (enclosed) does not highlight any culvert assets onsite.



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**MANCHESTER
CITY COUNCIL**

LLFA DATA SCREEN

Address/Site Ref:
Palgrave Avenue, M40 8JW

Our Ref: **MCC004D/01/2023**

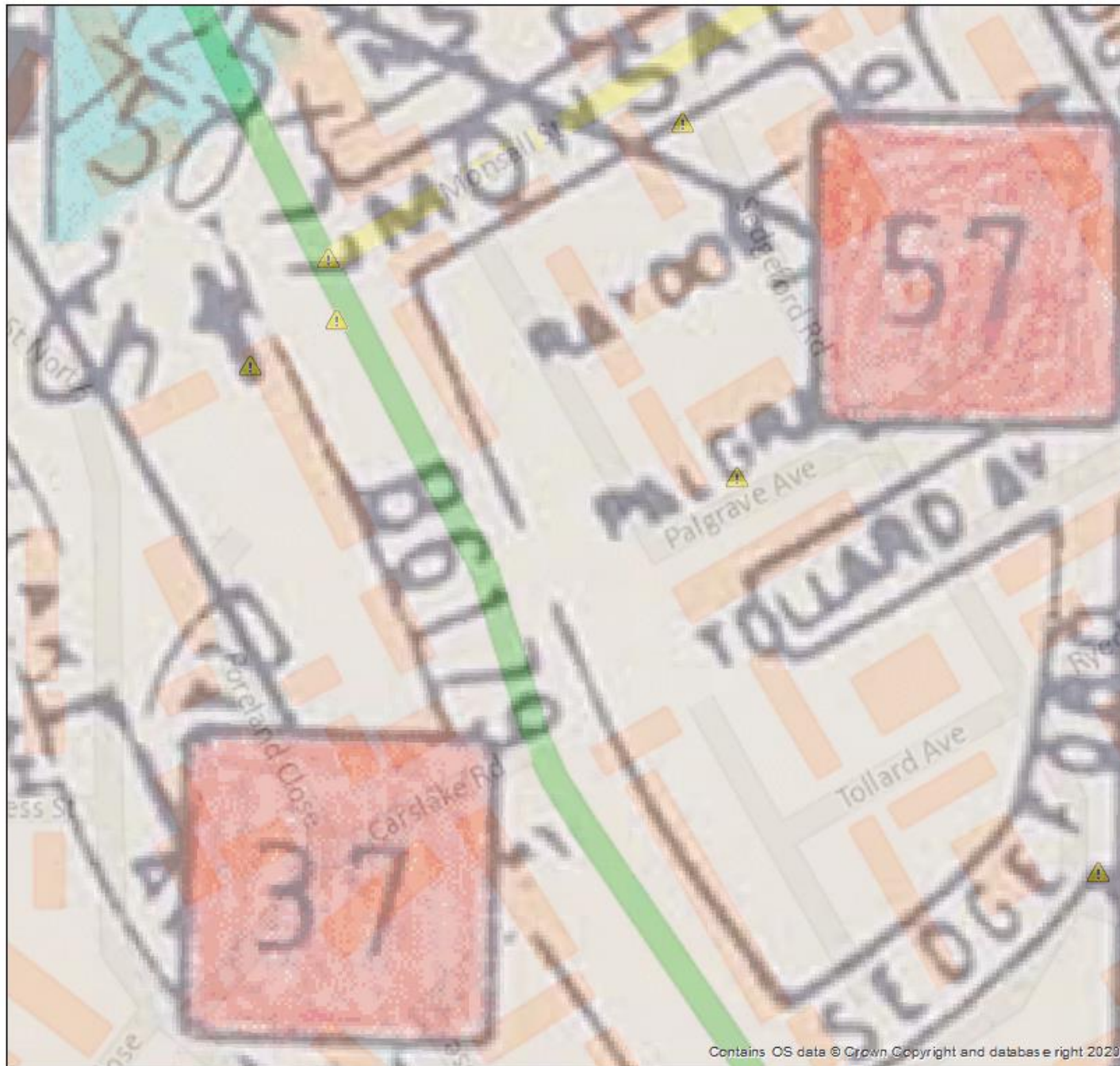
Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,280

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 5 10 20
Meters



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**MANCHESTER
CITY COUNCIL**

LLFA DATA SCREEN

Address/Site Ref:
Palgrave Avenue, M40 8JW

Our Ref: **MCC004D/01/2023**

Author: Manchester City Council LLFA
Date: 04/01/2023
Scale: 1:1,280

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.

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Meters

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Application number: 135795/FO/2022

Proposal: Erection of 7, two storey dwellinghouses (Use Class C3a) with associated, car parking, landscaping and boundary treatment and other associated works

Location: Palgrave Avenue, Manchester, M40 8QN

LLFA Comments 14 March 2023

The following information has been considered:

- Uploads to the Planning Portal 19 December 2022 to 30 January 2023

We recommend OBJECTION for the following reasons:

- The proposed masterplan has not considered the public sewer asset onsite (building footprints are shown above the asset and no easement has been provided). United Utilities require consideration of the public sewer asset to provide 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.”

The following is required as a minimum to lift our objection:

- A revised masterplan with proposed arrangements for the public sewer in-line with United Utilities requirements, with surveyed levels to justify viability of the drainage proposal.

We also require the following to progress the scheme:

- A drainage layout which demonstrates it can be accessed and maintained for the lifetime of the development, including:
 - o A layout compatible with the proposed public sewer design.
 - o Restriction up to 5 l/s in-line with UU allowance. A blockage risk assessment undertaken as part of the drainage strategy to support proposed flows less than 5 l/s. If the risk cannot be adequately managed, a higher minimum discharge rate should be considered / agreed with relevant parties.
 - o The sustainable drainage system “must be designed to facilitate maintenance” in-line with Paragraph 059 of the NPPF Flood Risk and Coastal Change. Shared attenuation storage located in back garden plots poses a maintenance risk and should be minimised as far as feasible. Where this is not possible to avoid, a strategy must be devised that considers access, maintenance and clashes with fences/infrastructure.

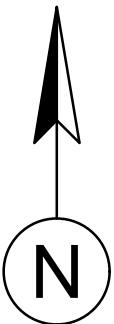
Appendix B. Drawings

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. TOPOGRAPHICAL SURVEY DATA TAKEN FROM DRAWING REFERENCE S21560-T, PROVIDED BY SURVEY & ENGINEERING PROJECTS. DATED APRIL 21.
3. SITE UTILITIES ALIGNMENT TRACED OVER PDF VERSION OF UTILITY REPORT (REF. 077873.002, Palgrave Avenue - Utilities Search, PROVIDED BY CORNERSTONE PROJECT LTD. RECIVED 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. SITE LAYOUT PROVIDED BY JOHN MCCALL ARCHITECTS (REF. PL.003, RECEIVED IN NOVEMBER 22).

KEY:

- SITE BOUNDARY
- ELECTRICITY SERVICES
- UU COMBINED
- UU FOUL WATER
- UU SURFACE WATER
- CLEAN WATER DISTRIBUTION MAIN
- BT CABLE
- VIRGIN MEDIA CABLE
- GAS MAIN
- LIVE BT BOX
- UU EASEMENT - 6m WIDE STRIP

P01	27/01/23	FIRST ISSUE	LG	FL	CB
Rev.	Date	Description	By	Chk'd	App'd

Drawing Status	S2
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Client

the guinness partnership

Project Title

PROJECT 500 MANCHESTER

Drawing Title

PALGRAVE AVENUE
CONSTRAINTS PLAN

Scale	Designed	Drawn	Checked	Authorised
1:150	LG	LG	FL	CB
Original Size	Date	Date	Date	Date
A1	19/01/23	19/01/23	23/01/23	27/01/23

Drawing Number	Revision
5218589-ATK-PG-XX-DR-D-0301	P01

CLASSIFICATION - Baseline (Low Risk)

User: PANG201 Date: 20/12/2023 07:54:54 Filename: \\wales.com\projects\GIDEMO\GIDEMO\Project\ChamberlainSquare\Manchester_P001\WIP\GIDEMO\5218589-ATK-PG-XX-DR-D-0301\Constraints Plan.dwg Internal Project Number: 5218589

PROPOSED PLAN



N

— SITE BOUNDARY

SITE AREA : 1,939m²

- EXISTING TREES TO BE REMOVED
- EXISTING TREES
- PROPOSED TREES TO BE PLANTED
(Subject to a detailed landscaping strategy)
- PROPOSED SOFT LANDSCAPING
(Subject to a detailed landscaping strategy)
- EV 7kW Charge Point

	House Type	Total
	2B4P House @ 79m ²	3
	3B5P House @ 93m ²	4
		7



1 Proposed Site Plan 1:500

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

PROPOSED MASSING



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

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

- PROXIMITY TO LIVE TRAFFIC
- BURIED SERVICES

NOTES:

- KEY:

- _____

P02	05/06/23	DRAINAGE STRATEGY UPDATED	LG	FL	CB
P01	27/01/23	FIRST ISSUE	LG	FL	CB
Rev.	Date	Description	By	Chk'd	App'd

FOR INFORMATION

S2

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PROJECT 500 MANCHESTER

PALGRAVE AVENUE EXISTING AND PROPOSED DRAINAGE LAYOUT

Drawing Number	Revision
5218589-ATK-PG-XX-DR-D-0302	P02

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		
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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	0.354	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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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S2, DS/PN: S1.003, Volume (m³): 18.3

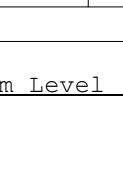
Unit Reference	MD-SHE-0088-5000-2400-5000
Design Head (m)	2.400
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	88
Invert Level (m)	61.303
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	5.0	Kick-Flo®	0.784	3.0
Flush-Flo™	0.381	3.7	Mean Flow over Head Range	-	3.8

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	2.7	1.200	3.6	3.000	5.5	7.000	8.3
0.200	3.5	1.400	3.9	3.500	6.0	7.500	8.5
0.300	3.7	1.600	4.1	4.000	6.4	8.000	8.8
0.400	3.7	1.800	4.4	4.500	6.7	8.500	9.1
0.500	3.7	2.000	4.6	5.000	7.1	9.000	9.3
0.600	3.6	2.200	4.8	5.500	7.4	9.500	9.6
0.800	3.0	2.400	5.0	6.000	7.7		
1.000	3.3	2.600	5.2	6.500	8.0		

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Atkins (Epsom)		Page 3	
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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 * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (1/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	120 Winter	100	+45%	100/30 Winter				63.295
S1.001	S2	120 Winter	100	+45%	100/30 Summer				63.295
S1.002	S3	120 Winter	100	+45%	100/30 Summer				63.295
S1.003	S2	120 Winter	100	+45%	100/15 Summer				63.295
S1.004	S3	120 Winter	100	+45%					61.348

PN	US/MH Name	Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.845	0.000	0.02		12.2	SURCHARGED	
S1.001	S2	0.871	0.000	0.01		6.6	SURCHARGED	

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Surrey, KT18 5BW

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Page 1



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 0.354

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	120 Winter	100	+45%	100/60 Winter				62.589
S1.001	S2	120 Winter	100	+45%	100/60 Winter				62.589
S1.002	S3	120 Winter	100	+45%	100/60 Winter				62.589
S1.003	S2	120 Winter	100	+45%	100/15 Summer				62.589
S1.004	S3	120 Winter	100	+45%					61.342

PN	US/MH Name	Surcharged Flooded			Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow						
S1.000	S1	0.139	0.000	0.01			10.4	SURCHARGED		
S1.001	S2	0.165	0.000	0.01			5.9	SURCHARGED		
S1.002	S3	0.194	0.000	0.00			2.9	SURCHARGED		
S1.003	S2	1.136	0.000	0.35			3.8	SURCHARGED		
S1.004	S3	-0.089	0.000	0.35			3.8	OK		

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