

**Proposed PFS and SBX Development
Manchester Road
Rochdale**

Drainage Strategy Report
PI5673-DSR-01 rev A

Client: Euro Garages Ltd

Date: 24 June 2026

Project No: PI5673

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1.0 Introduction

Goodson Associates (Leeds) have been appointed by Euro Garages Ltd to prepare a Drainage Strategy for the proposed redevelopment of an existing petrol filling station (PFS) and Starbucks (SBX) development at Manchester Road, Rochdale. The purpose of this report is to describe, in principle, the design approach of the foul and surface water drainage systems for the development.

2.0 Existing Site

2.1 General Description

The proposed site is located off Manchester Road, Rochdale (Grid Ref: 388829 411974, Post Code: OL11 3PT). Figure 1.0 shows an aerial photograph of the area with the approximate site boundary highlighted in red.

The site currently contains an operating Esso garage and associated Starbucks Drive-Thru coffee shop unit. The site is approximately triangular in shape, and bounded by Manchester Road to the north, Cheltenham Street to the east, and residential properties/gardens and green space to the south and west.

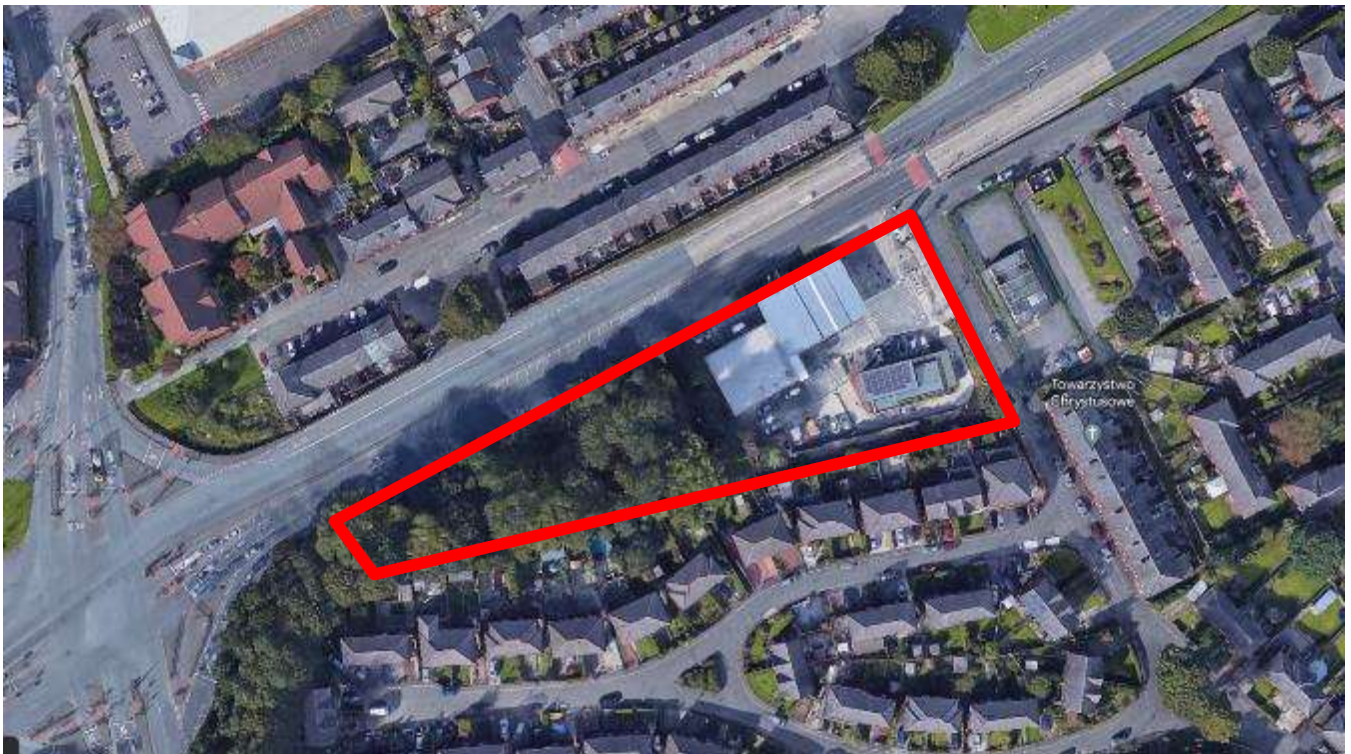


Figure 1.0 - Aerial photograph showing approximate site boundary

2.2 Site Topography

The site is approximately 0.57ha in area, and falls from south to north and east to west; the boundary levels range from 138.62m AOD in the south east corner to 128.94m AOD in the north west corner. The western section of the existing site is largely wooded and typically falls from the southern boundary towards the north, with localised low points in the central wooded area. The existing PFS and coffee shop are located at the eastern end of the site, with boundary levels falling steeply along the south and eastern boundaries; some retention is provided along the southern boundary. This creates a flatter levelled area for the PFS and coffee shop which then falls gently towards the north and western area of the site.

2.3 Existing Natural Drainage Features

There are no recorded water courses on or within close proximity to the site. The Rochdale canal is around 500m to the southeast of the site, and Sudden Brook is around 420m to the southwest.

2.4 Existing Drainage Infrastructure

Correspondence with United Utilities (UU) indicates existing public combined sewers are present within the site boundary; an extract of the correspondence is provided in the Section 6.0 appendices. UU record plans also indicate an existing public combined sewer at the western end of the site, and an existing highway drain running along the northern site boundary, beneath Manchester Road; an extract of the UU record plan is shown in Figure 2.0 below.



Figure 2.0 – Extract of United Utilities Sewer Record Plan

3.0 Proposed Development

The proposed development will contain a PFS unit, SBX Drive-Thru coffee shop, and associated external hard and soft landscaping areas. The proposed development will intend to retain the existing coffee shop unit but remove and replace the existing PFS with a new unit. A copy of the architect's proposed layout plan is included in the Section 6.0 appendices.

4.0 Flood Risk Assessment

The possible sources of flooding have been considered for the site and figures 3.0 and 4.0 following show the extent of flooding in the site location for fluvial and surface water flooding. Figure 3.0 indicates that the site is within an area classified as Flood Zone 1 i.e. land having less than 0.1% (1 in 1,000) annual probability of river or sea flooding.

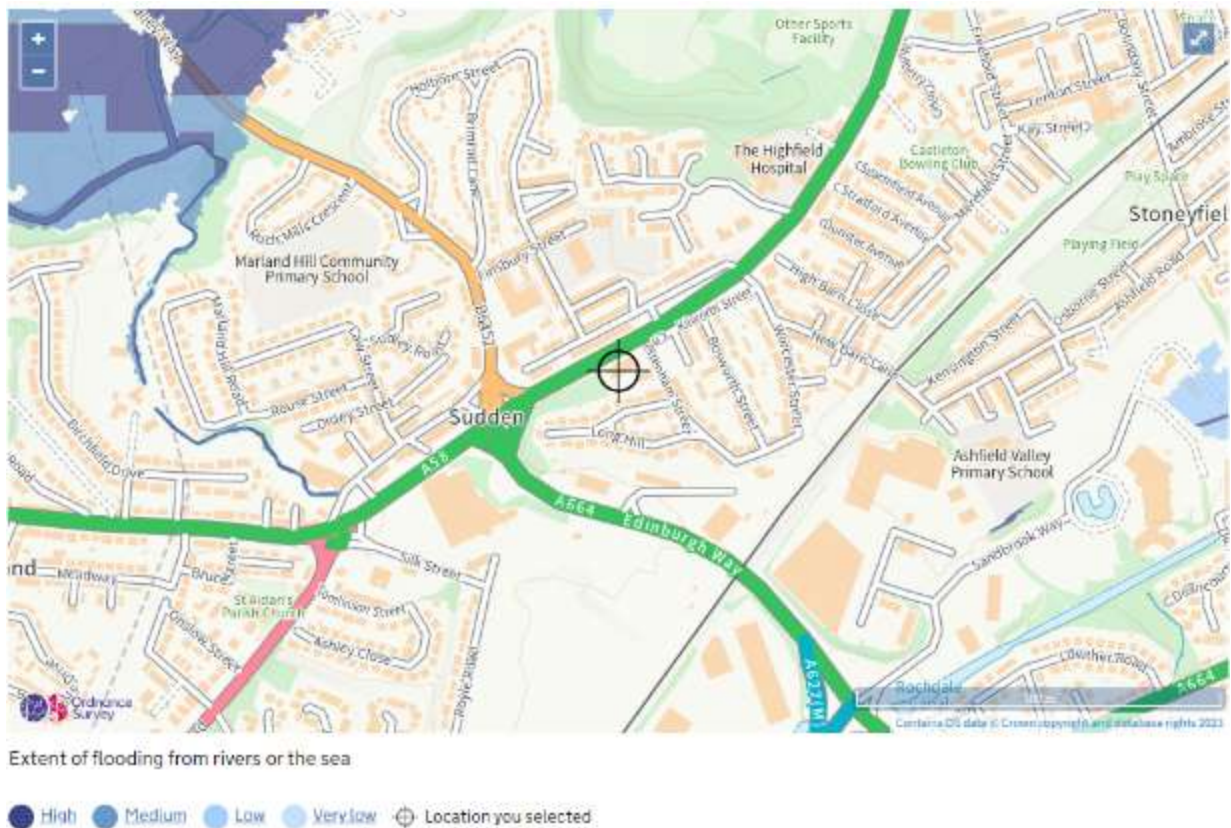


Figure 3.0 Flood Risk from Rivers and the Sea

Figure 4.0 indicates that the site is predominantly an area of very low surface water flood risk, with some areas of low and medium risk at the western end of the site, and adjacent along Manchester Road and Cheltenham Street. The proposed development will be designed to current surface water standards, and the buildings will be set at a slightly higher level to that of the surrounding ground levels, where possible, with external areas generally falling away from the building towards the north and west to minimise surface water flood risk to the new development.

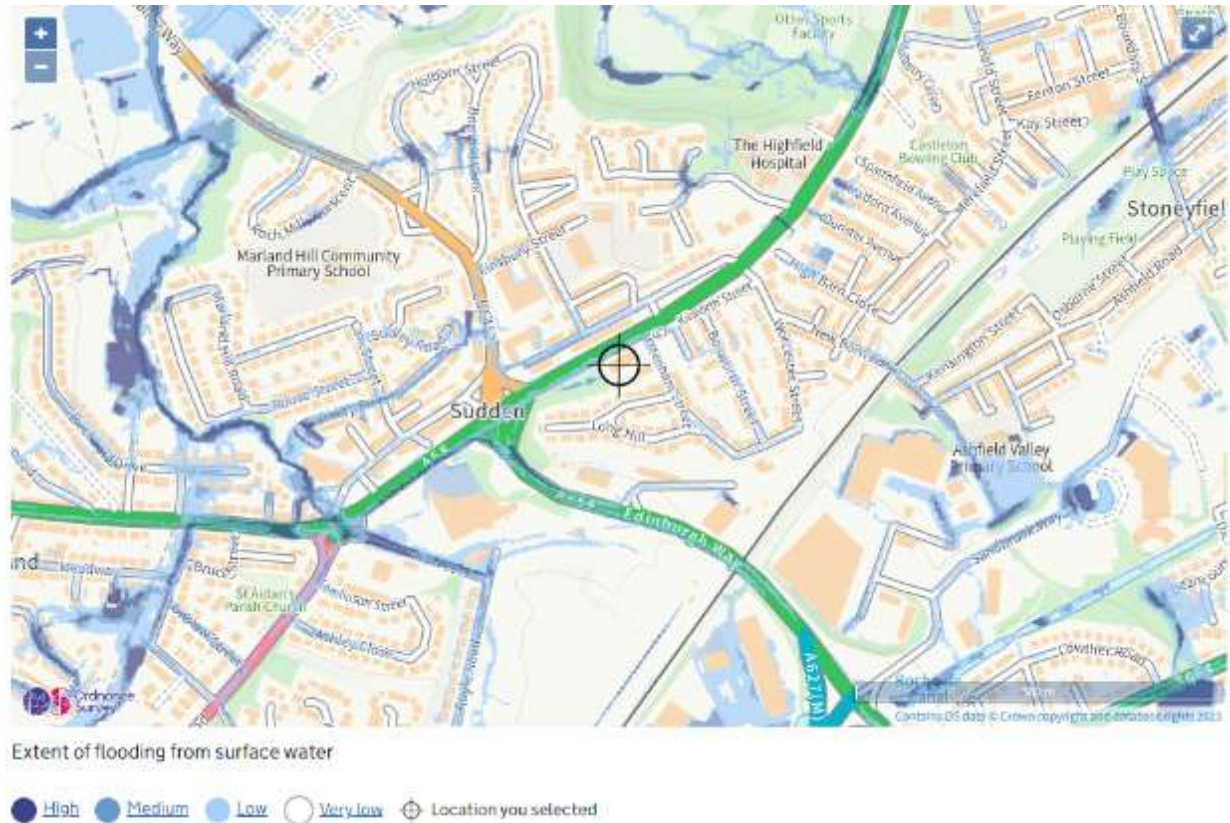


Figure 4.0 Flood Risk from Surface Water

5.0 Site Drainage

- A CCTV survey of the existing drainage network on site has highlighted that foul water from the existing development discharges into an existing combined sewer that runs along the northern site boundary before crossing Manchester Road. It also highlights that surface water from the existing development discharges into the existing highway drain beneath Manchester Road. A copy of the CCTV survey plan is included in the Section 6.0 appendices for reference.
- The proposed development will have separate foul and surface water drainage systems. Foul water will be directed towards the existing public combined sewer, and surface water will discharge to the existing highway drain beneath Manchester Road. These are detailed further in the below and in the drainage layout proposals contained in the Section 6.0 appendices.

5.1 Foul Drainage

- It is proposed to drain foul water flows using a similar approach as the current site. Foul water will be directed towards the western end of the site, before connecting into the existing public combined sewer which crosses Manchester Road. Foul water from the PFS and SBX units will be connected directly into the existing public combined system, and foul run-off from the fuel refill area will be directed through a full retention separator first. Some areas of the existing site foul system will be removed or diverted to suit the proposed foul drainage layout.

5.2 Surface Water System

- SuDS hierarchy has been used for the surface water design.
- Surface water design flows have been calculated for the proposed new development impermeable area of 0.445ha and a design storm intensity of a 100-year return period plus 45% climate change allowance, in accordance with the latest EA guidance.
- From publicly available historical borehole logs, the site is likely to consist of made ground/topsoil, overlying interbedded layers of sand, clay and silt. Additionally, with the current use of the site as a petrol filling station there is a risk of unknown hotspot contamination present in the subsoil which could be spread further through the attempted use of soakaway drainage. Soakaway or infiltration drainage solutions are therefore not considered to be feasible or appropriate options for this site.
- There are no locally accessible watercourses that can be practicably reached to serve this development without travelling a considerable distance and crossing 3rd party land.
- It is therefore proposed that surface water from the PFS unit and SBX roofs, PFS canopy and hardstanding areas will be collected and directed towards attenuation at the western end of the site, before being pumped to connect into the existing highway drain beneath Manchester Road. The existing connection into the highway drain will be reused, and a new manhole will be installed directly upstream of the last site manhole to ensure surface water drains to the highway sewer under gravity. Some areas of the existing site surface system will be removed or diverted to suit the proposed surface drainage layout.
- It is proposed to discharge storm water, via the existing drainage connection serving the site, at a reduced rate from existing to reduce downstream flood risk. A maximum discharge rate of 5 litres / second has been agreed with UU; appropriate correspondence is provided in the Section 6.0 appendices.

This discharge rate represents an 85% reduction on the calculated 1:1 year storm event for the existing site.

- Causeway Flow calculations provided in Section 6.0 determine that a minimum 259.7m³ of storage will be required to achieve the desired total discharge rate of 5 l/s to manage flood risk up to the 1 in 100 year + 45% climate change storm event. An attenuation tank has therefore been designed to provide 265m³ of attenuation, with the discharge to be controlled by a suitable package pump station.
- From the drainage modelling and site topography, should extreme storms exceed the design allowance or there be a malfunction of the drainage system, exceedance routing would direct storm water away from the buildings towards the site low point at the western corner of the site on Manchester Road. The indicative flood exceedance route is shown on the drainage layout plan in the Section 6.0 appendices.

5.3 Maintenance

- Regular inspection and maintenance of the drainage network is important to identify areas which may be blocked or reduced in capacity and not function correctly, and therefore increase the level of flood risk to the development and wider area. A suitable maintenance strategy should be adopted by the facility operating management team to ensure the drainage network is inspected regularly and cleaned when required, with the routine maintenance and cleansing regime formally documented. An operation and maintenance schedule is provided on the drainage layout plan, a copy of which should be included in the O&M manual for ease of reference.
- The drainage system should be inspected at least twice a year, with the system also being inspected after any major storm event. Sediment deposition is likely in catch pits, silt traps and attenuation tanks / ponds, etc. When required a clean-up operation should be carried out to remove all silt, litter, vegetation, sewerage debris and larger objects, and to repair any damaged part of the network. Inspection of the surface water package pump station should also be in accordance with the guidance and recommendations of the specialist manufacturer.
- The maintenance regime should incorporate all components within the drainage network, including gullies, drainage channels, manholes, pipes, flow control units (e.g. Hydrobrake manholes), attenuation tanks, permeable paved areas, forecourt separators, and storage / attenuation ponds. The maintenance regime for the surface water package pump station should also be in accordance with the guidance and recommendations of the specialist manufacturer.
- Appropriate health and safety procedures and equipment should be used when accessing manholes, and work carried out by trained and competent operators. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

6.0 Drawings and Calculations

Site Layout Proposals (ADS Design Ltd)

Topographic Survey (RJP Surveying Consultants Ltd)

CCTV Drainage Survey Plan (Survey Solutions)

United Utilities PDE Response

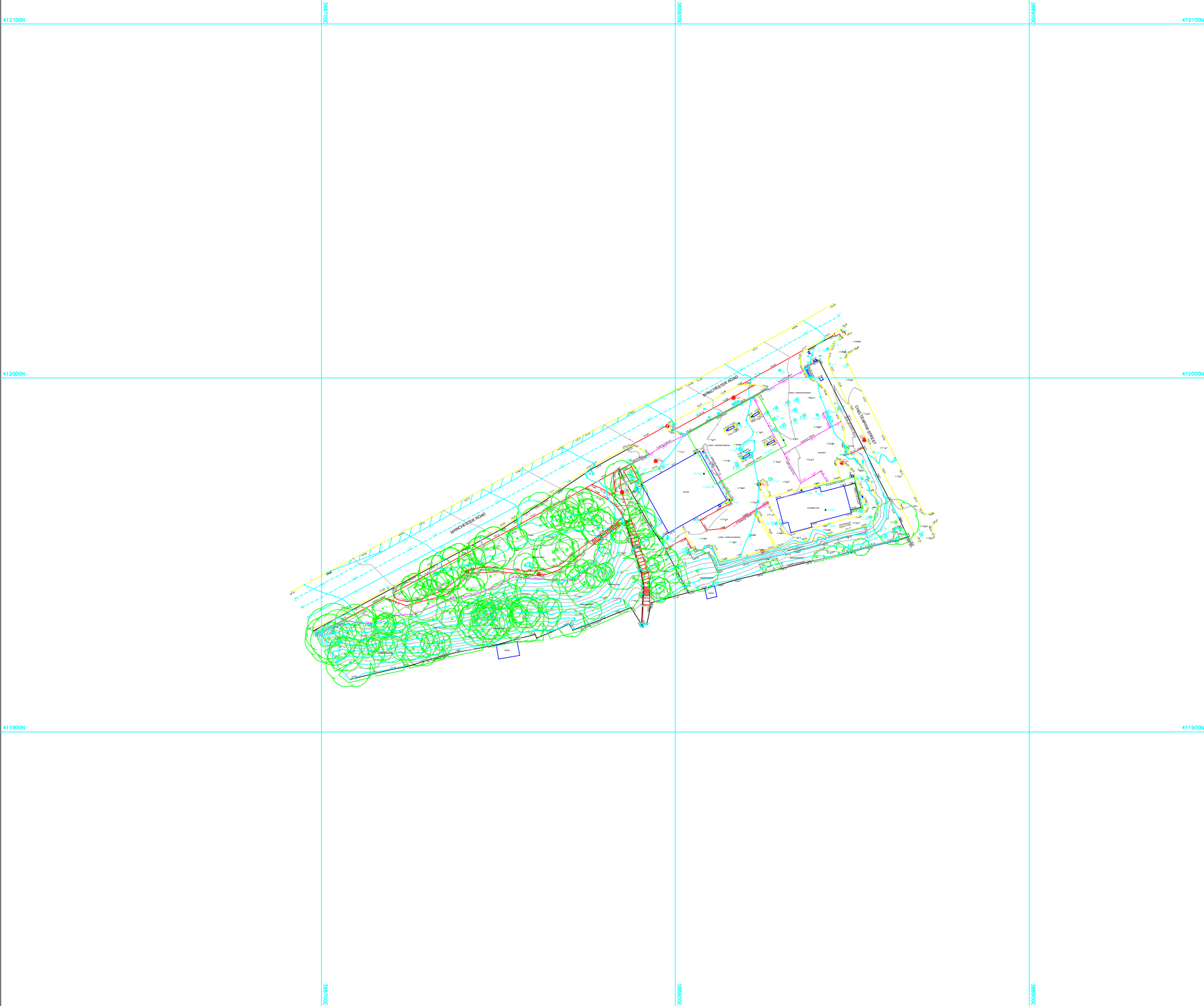
United Utilities Sewer Records

PI5673-500(A) Drainage Layout Plan (Goodson Associates)

PI5673-501 Impermeable Area Plan (Goodson Associates)

PI5673 Causeway Flow Network Modelling Calculations (Goodson Associates)





COORDINATED STATIONS			
STATION	EASTING	NORTHING	LEVEL (m)
A	388847.098	411975.959	134.923
B	388823.635	411969.950	134.211
C	388824.596	411951.034	134.326
D	388794.467	411976.494	132.834
E	388797.785	411986.328	133.013
1	388833.404	411982.427	135.890
2	388816.448	411994.348	133.810

ABBREVIATIONS

AV	AIR VALVE/VENT	IC	INSPECT CHAMBER
BOL	BOLLARD	IL	INVERT LEVEL
BB	BELISHA BEACON	JKW	JAPANESE KNOTT WEED
BM	BENCH MARK	LH	LAMP HOLE
BL	BED LEVEL	LP	LAMP POST
BS	BUS STOP	NP	NAME PLATE
BT	BRITISH TELECOM	MH	MANHOLE
CL	COVER LEVEL	PS	POST/SIGN POST
DI	DILAPIDATED	PB	POST BOX
DN	DRIVEN	PK	UNKNOWN SERVICE
EL	EAVES LEVEL	RE	ROOFSIDE EYE
ELE	ELEC JUNCT. BOX	RL	RIDGE LEVEL
EP	ELECTRICITY POLE	RS	ROAD SIGN
PH	FIRE HYDRANT	ST	STOP TAP
FL	FLOOR LEVEL	TH	TRIAL HOLE
FOS	FULL OF SEDIMENT	TL	TRAFFIC LIGHT
FP	FLAG POLE	TP	TELEGRAPH POLE
G	GALLY	TV	CABLE TV BOX
GM	GAS METER	ULI	UNABLE TO LIFT
GV	GAS VALVE	WM	WATER METER

SYMBOLS

	SURVEY STATION		TREE
	O/H ELEC CABLE		BENCH MARK
	O/H PHONE LINE		TRIAL PIT
	CANOPY/HEDGE		BOREHOLE

NOTES

- A) ONLY MANHOLES AND SERVICES VISIBLE AT TIME OF SURVEY SHOWN
- B) O/S USED AND ORIENTATED TO TRUE NORTH
- C) LEVELS IN METRES RELATED TO G.P.S.
- D) DRAINAGE INFORMATION TAKEN FROM LOCAL AUTHORITY RECORDS. INFORMATION MUST BE CHECKED PRIOR TO WORK COMMENCING

Rev	Description	Date
PROPOSED DEVELOPMENT AT MANCHESTER ROAD, ROCHDALE		
EURO GARAGES LTD.		
TOPOGRAPHICAL SURVEY		
EG328/T00	Surveyed	A. BAYBUTT
	Drawn	I. GREEN
	Date	JANUARY 2022
	Scale	1:500 @ A1

RJP Surveying Consultants Ltd
LAND SURVEYORS & SITE ENGINEERS
AYREFIELD COTTAGE
AYREFIELD ROAD
ROBY MILLS
UPHOLLAND
LANCASHIRE
WN8 0GP
TEL: 01257 251554
MOBILE: 07710 308709
WEBSITE: www.rjsurveyors.co.uk
E-MAIL: mail@rjsurveyors.co.uk

Subject:

Pre Development Enquiry for: Manchester Road Rochdale OL11 3PT UU Reference Number : 03547509

Good afternoon Phillip,

Pre Development Enquiry for: Manchester Road Rochdale OL11 3PT UU Reference Number : 03547509

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

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

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

Foul Water

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

Our preferred point of discharge would be to the 225mm diameter public combined sewer 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.

Please note there is a highway drain north of your proposed site boundary.

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 225mm diameter public combined sewer 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 in line with HR Wallingford IH124.

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.

Many thanks and kind regards,

 Water for the North West	Ashleigh Bellerby Assistant Developer Engineer Developer Services & Metering Customer Services T: 07826891650 unitedutilities.com
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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: P15673 Manchester Road, Rochdale
Our Ref: UUPS-ORD-465058
Date: 17/02/2023**

FAO:

Dear Sirs

Location: EURO GARAGES MANCHESTER ROAD, ROCHDALE, OL11 3PT

I acknowledge with thanks your request dated 16/02/2023 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,

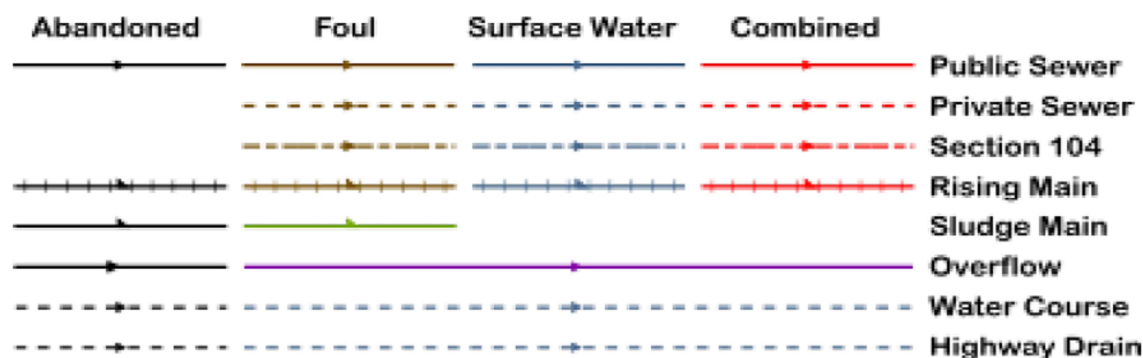
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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:

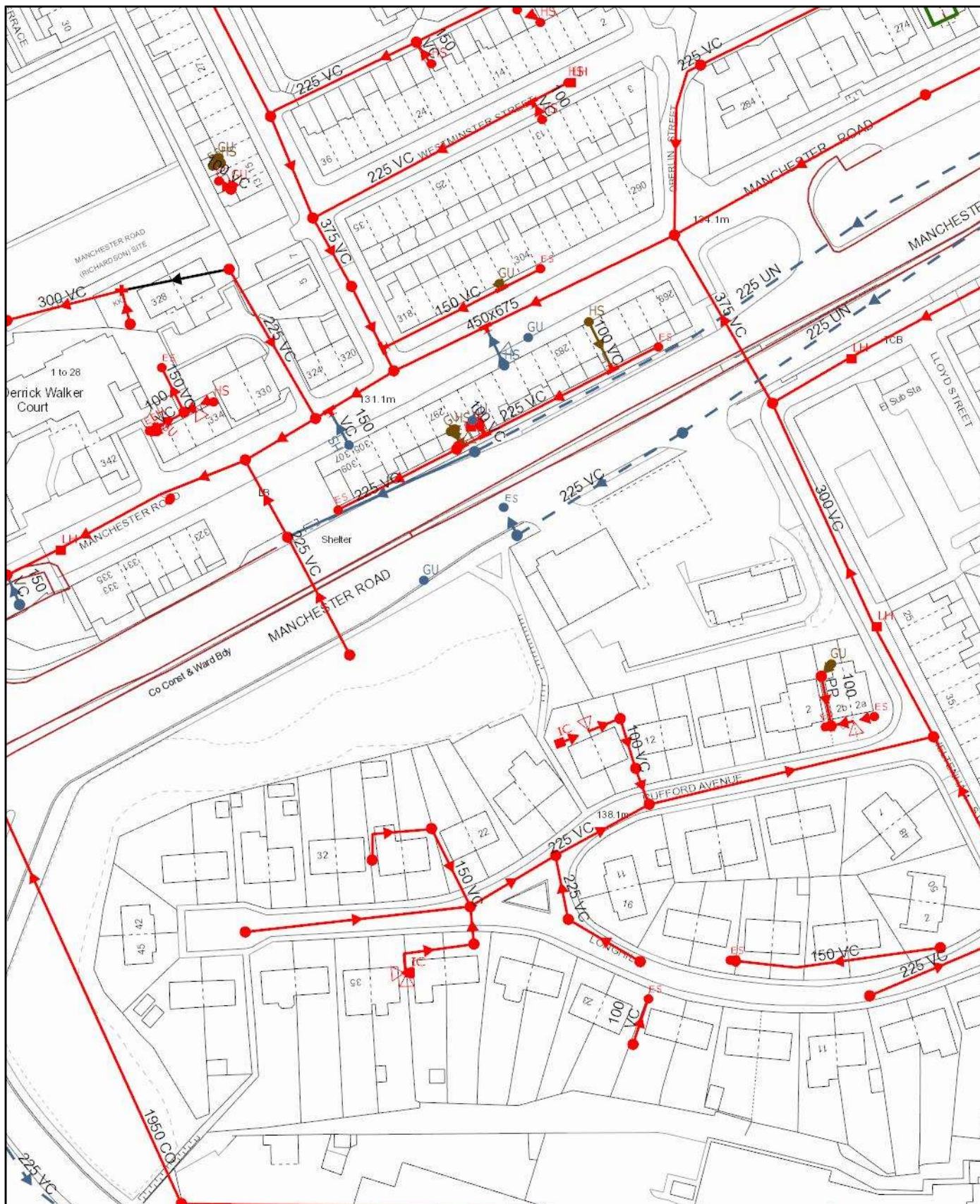
- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out 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.

Wastewater Symbolology



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

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



Scale: 1:1250
Date: 17/02/2023

SEWER RECORDS



Address or Site Reference: EURO GARAGES MANCHESTER ROAD,
ROCHDALE, OL11 3PT
Printed by: Property Searches

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

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OPERATION AND MAINTENANCE REQUIREMENTS FOR ATTENUATION STORAGE TANKS		
MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	INSPECT A IDENTIFY ANY AREAS THAT ARE NOT OPERATING CORRECTLY, IF REQUIRED, TAKE REMEDIAL ACTION REMOVE DEBRIS FROM THE CATCHMENT SURFACE (WHERE IT MAY CAUSE BUILT UP TO PERFORMANCE) REMOVE SEDIMENT FROM PRE-TREATMENT ROAD GULLIES & SILT TRAP MANHOLE	MONTHLY FOR 3 MONTHS THEN ANNUALLY MONTHLY MONTHLY FOR 3 MONTHS THEN ANNUALLY OR AS REQUIRED
REMEDIAL ACTIONS	REPAIR/REHABILITATE INLETS, OUTLETS, OVERFLOWS & VENTS	AS REQUIRED
MONITORING	INSPECT/CHECK ALL INLETS, OUTLETS, VENTS & OVERFLOWS TO ENSURE THAT THEY ARE IN GOOD CONDITION & OPERATING AS DESIGNED CUT SURVEY RIDGE OF TANK FOR SEDIMENT BUILD-UP & REMOVE IF NECESSARY	ANNUALLY AFTER CONSTRUCTION, 1 YEAR & THEN EVERY 5 YEARS OR AS REQUIRED

DO NOT SCALE - IF IN DOUBT ASK. DO NOT INTERROGATE CAD BASE

DRAINAGE NOTES:

1. THIS DRAWING HAS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S & ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DRAINAGE DETAILS ARE LEFT TO DRAINING SPECIALIST.
3. DRAINAGE OF ALL ROOF & PAVEMENT INTERNAL TURNS-UP FOR ARCHITECTS DRAINAGE RUN-PIPS MUST BE FITTED WITH ACCESS HANDLES AS FOLLOWS FOR OR EQUIVALENT:
4. GULLY CONNECTIONS TO BE 1000 UNITS A.L.S.V.P. CONNECTIONS TO BE MINIMUM 1000 OR TO MATCH S.V.P. DOWNPIPE IF GREATER, A.L.S.V.P. CONNECTIONS TO BE 1000 OR TO MATCH R.V.P. DOWNPIPE.
5. DOWNPIPE TO 4000 TO BE U.PVC PIPES, PIPES GREATER THAN 4000 TO BE CONCRETE.
6. DOWNPIPE RUNS HAVING 120mm OR LESS COVER ARE TO BE ENCASED IN CONCRETE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
7. ALL DOWNPIPE RUNS TO BE PROTECTED AND SHOULD BE SET TO SUIT FINISHED ROAD LEVEL AND CAMBER.
8. ALL DOWNPIPS & MANHOLE COVERS ARE TO BE FITTED WITH LOADCLASS D4 COVERED UNITS A.L.S.V.P. EXTERNAL MANHOLES TO BE FITTED WITH LOADCLASS D4 UNITS WITH LOADCLASS B125 COVERS UNITS A.L.S.V.P. IN ACCORDANCE WITH BS EN 12400 (ALL PARTS).
9. INVERT LEVELS OF EXISTING DRAINS AND MANHOLES TO BE CONFIRMED ON SITE AND ALL MANHOLES TO BE OPENED UP. EXISTING LEVER MANHOLE TO BE OPENED OR ENTERED WITHOUT THE PERMISSION OF THE LOCAL AUTHORITY DRAINAGE DEPARTMENT AND THE ATTENDANCE OF SENIOR PERSON AS REQUIRED.
10. DRAINAGE DESIGN AND INSTALLATION TO BE TO THE SATISFACTION OF THE LOCAL AUTHORITY CONTROL ENGINEER. ALL DRAINS TO BE IN BS EN 752:2017, BS EN H10:2015, BS EN 12056-1:2000, BS EN 12056-2:2000 AND BS EN 12056-3:2000.
11. ALL DRAINAGE ELEMENTS TO BE MAINTAINED IN ACCORDANCE WITH THE LATEST EDITION OF "SEWERS FOR ADOPTION".
12. ALL DRAINAGE ELEMENTS TO BE MAINTAINED IN ACCORDANCE WITH CLAS C178 SURFACE WATER ATTENUATION GRATES TO BE WALVIN AQUACRE PLUS OR SIMILAR APPROVED TO BE INSTALLED IN LINE WITH MANUFACTURERS SPECIFICATIONS.

SURFACE WATER ATTENUATION

PROPOSED IMPERMEABLE AREA: 4530m² (0.445 HA)

EXISTING IMPERMEABLE AREA: 2500m² (0.25 HA)

TOTAL SITE AREA: 5140m² (0.574 HA)

EXISTING SW RUN-OFF: 2.78 + 0.28 = 3.06 m³/s @ 33.2/45

DISCHARGE RATE: 33.2/45 - 85% = 5.01 L/S²
(AS AGREED WITH UNITED LISTINGS)

CELLULAR TANK DIMENSIONS: 31m x 5m x 1m @ 30m x 20m

STORM EVENT: 1m + 100% + CRITICAL CHANGE

RAINFALL DATA: FH:22

CDM NOTES

1. ACCESS AND EGRESS TO THE SITE FROM BUSY ROAD.
2. POTENTIAL, GROUND INSTABILITY IN DEEP EXCAVATIONS
NO HEAVY PLANT OR STORAGE POINTS OVER OR WITHIN 3m OF THE CONSTRUCTED TANK
3. TANKS TO BE FULLY PROTECTED FROM SILT AND DEBRIS ARISING DURING CONSTRUCTION AND TO BE INSPECTED AND MAINTAINED DURING OPERATION AS DETAILED ABOVE
4. TANKS NOT DESIGNED TO RESIST UPLIFT. UPLIFT FULLY BACKFILLED
5. EXISTING SERVICES IDENTIFIED ON SITE
6. ADEQUATE SEGREGATION OF TRAFFIC REQUIRED TO SEPARATE PUBLIC FROM THE CONSTRUCTION SITE.
7. ADEQUATE MEASURES REQUIRED TO CONTROL NOISE, DUST, VIBRATION
8. POTENTIAL HOT SPOT CONTAMINATION DUE TO PREVIOUS SITE USE.

REV.	DATE	REVISION	BY	CHK
-		FIRST ISSUE	PH	NB
A	24.06.26	SW ATTENUATION TANK AMENDED TO SUIT CAUSEWAY FLOW CALCULATIONS - F19573 RICHDALE FLOW/SW ATTENUATION CALC.	PH	SJ

Euro Garages Ltd

Proposed PFS Redevelopment at
Manchester Road, Rochdale

Drainage Layout Plan

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PLANNING		
DATE CREATED: May, '23	SCALE: 1:250	@ A1
CONTRACT No: P15673	DRAWING No: 500	REV: A

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.223	5.00	2.590	1200	1200	388734.267	411933.300	2.400
S2	0.222	5.00	2.590	1200	1200	388765.862	411950.556	2.490
OUTFALL			2.400	1200	1200	388774.639	411955.349	1.200

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
S1.000	S1	S2	36.000	0.600	0.190	0.100	0.090	400.0	300	5.77	132.2
S1.001	S2	OUTFALL	10.000	0.600	0.100	1.200	-1.100	-9.1	150	5.94	131.0

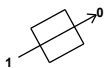
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1.000	0.780	55.1	79.9	2.100	2.190	0.223	0.0	300	0.790
S1.001	1.000	17.7	158.0	2.340	1.050	0.445	0.0	150	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S1.000	36.000	400.0	300	Circular	2.590	0.190	2.100	2.590	0.100	2.190
S1.001	10.000	-9.1	150	Circular	2.590	0.100	2.340	2.400	1.200	1.050

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
S1.000	S1	1200	1200	Manhole	Adoptable	S2	1200	1200	Manhole	Adoptable
S1.001	S2	1200	1200	Manhole	Adoptable	OUTFALL	1200	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
S1	388734.267	411933.300	2.590	2.400	1200	1200				
							0	S1.000	0.190	300
S2	388765.862	411950.556	2.590	2.490	1200	1200				
							1	S1.000	0.100	300
							0	S1.001	0.100	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
OUTFALL	388774.639	411955.349	2.400	1.200	1200	1200	1	S1.001	1.200	150



Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node S2 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	0.100	Design Flow (l/s)	5.0
Replaces Downstream Link	✓	Design Depth (m)	2.490		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	5.000	2.490	5.000

Node S1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.190
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	232.5	232.5	1.200	232.5	297.4	1.201	0.0	297.4	2.400	0.0	297.4

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.73%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	S1	352	1.349	1.159	37.4	259.7393	0.0000	SURCHARGED
360 minute winter	S2	352	1.348	1.248	21.4	4.0233	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	1.200	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	S1	S1.000	S2	-15.9	0.498	-0.288	2.5351	
360 minute winter	S2	Depth/Flow	OUTFALL	5.0				174.7