

Sharston Industrial Estate: Drainage Strategy

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Executive Summary

The Site comprises land and buildings on Sharston Road, within Sharston Industrial Estate, outlined in red on the submitted Site Location Plan. It measures approximately 1.6ha and is predominantly flat and broadly rectangular in shape.

The Site was until recently occupied by Electrium Sales Ltd (a subsidiary of Siemens) and comprises a collection of industrial buildings developed over time for the purposes of manufacturing and distribution (Class B2/ B8). Buildings occupy almost the entirety of the Site, with limited areas of parking and landscaping provided to the northern, western and southern borders. Access to the Site is made from two principal access points from Sharston Road and Harper Road.

The Site is bound by Harper Road, to the south, Sharston Road to the west, Longley Lane to the north and existing industrial buildings to the east. To the south, east and west of the Site are predominantly commercial uses within Sharston Industrial Estate. To the north, across Longley Lane, lies residential uses, a nursery, medical centre and primary school.

The proposed foul and surface water drainage networks will combine on site to form a single combined system. This combined drain will discharge via a single point of connection into the existing 750mm combined sewer within Sharston Road, which is operated by United Utilities. An agreement in principle for this connection has been provided by United Utilities, with surface water discharge restricted to 3.6 l/s, equivalent to the calculated greenfield runoff rate. Formal agreement will be secured through submission of a Section 106 application.

All drainage elements will be regularly maintained by a nominated management company on behalf of the client/occupier.



1 Chapter 1

1.1 Introduction

This report has been prepared by Stantec on behalf of Kier Sharston Limited to support the planning application. The proposed development seeks full planning permission for the development of industrial and logistic units. The proposed development site plan is included in Appendix A.

The site measures approximately 1.6ha and is predominantly flat and broadly rectangular in shape. The site was occupied by Electrium Sales Ltd (a subsidiary of Siemens) and comprises a collection of industrial buildings developed over time for the purpose of manufacturing and distribution (Class B2/B8).

This document sets out the proposed strategy for surface water and foul drainage for the development.



2 Development Description and Location

2.1 Site Location

The site is referenced in Table 1, and a location plan is provided in Figure 1.

Table 1 - Site Referencing Information

Site Referencing Information	
Site Name	Sharston Industrial Estate
Site Address & Location	Former Electrium Sales Ltd SAITE, 1934 Sharston Road, Wythenshawe
Local Planning Authority	Manchester City Council
Approximate Grid Reference	E 383253 N 389328
Site Area	1.6 hectares
Topography	The site is generally level with no significant slopes. See Appendix B for full topographical survey.
Description of development	Erection of two storey warehouse units (Use Class B2/B8), including ancillary office and trade counters, with all associated works including landscaping, car parking and alterations to access arrangements.
Proposed use	Nine industrial warehouse units (Class B2/B8) including provision for ancillary offices
Boundaries and Surrounding Land	The site is bound by Harper Road, to the south, Sharston Road to the west, Longley Lane to the north and existing industrial buildings to the east. To the south, east and west of the site are predominantly commercial uses within Sharston Industrial Estate. To the north, across Longley Lane, lies residential uses, a nursery, medical centre and primary school.



Sharston Industrial Estate - Drainage Strategy



Figure 1 - Site Location



3 Drainage Strategy

3.1 Existing Site Drainage

The total site area is 1.6 hectares, which will all be developed area. The site was previously occupied by Electrium Sales Ltd (a subsidiary of Siemens) and comprises a collection of industrial buildings developed over time for the purpose of manufacturing and distribution (Class B2/B8) therefore the existing site is considered as brownfield.

The GPR survey (Appendix C) and the Existing Drainage layout drawing (Appendix D), shows the arrangement of the existing drainage network.

Review of United Utilities sewer records (refer to Figure 2 below) indicates the presence of a 750 mm diameter combined sewer within Sharston Road and a 900 mm diameter combined sewer within Longley Lane. The sewer records also identify a 600 mm diameter culverted watercourse within Sharston Road. The full United Utilities sewer records can be found in Appendix E.

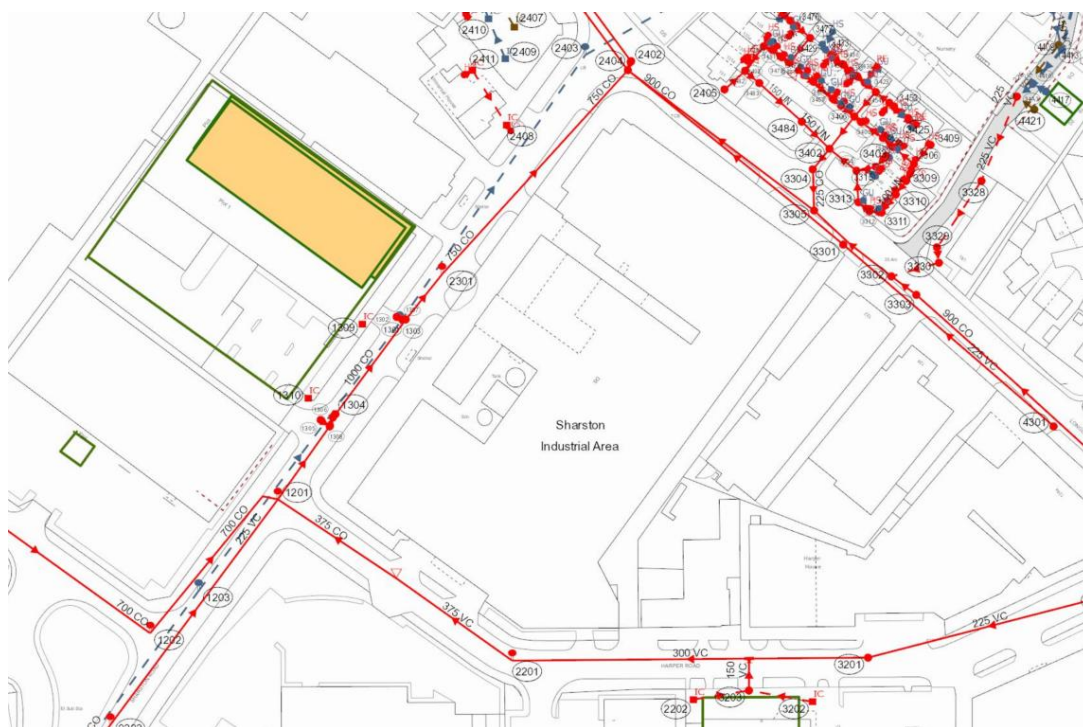


Figure 2 – Extract from United Utilities Sewer Records

Existing foul and surface water flows from the site are understood to discharge to the 900 mm diameter combined sewer within Longley Lane, operated by United Utilities.



3.2 Infiltration

A ground investigation was conducted by Hydrock (now Stantec) document reference 35838-HYD-XX-XX-RP-GE-0001. The report states that *'The post fieldwork monitoring between those boreholes where levels were obtained appear to show the shallow groundwater in the Glaciofluvial Sheet Deposits, is flowing towards the northeast from 33.26m AOD to 32.84m AOD.'* Therefore, infiltration into the ground is not considered feasible due to the high groundwater levels.

3.3 Sustainable Drainage Systems (SuDS)

Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed to manage both the environmental risks resulting from the urban runoff and to contribute, wherever possible, to environmental enhancement. Therefore, SuDS objectives are to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

SuDS help to mimic the natural flow of water ensuring that both the quantity and quality of the surface water is dealt with before feeding it into the drainage network. SuDS features usually come with added maintenance; however, the benefits they reap are considered to outweigh this. The selection of the most appropriate SuDS features should consider constraints, requirements and maintenance of the site. It should be remembered that Local Planning Authorities expect SuDS to be investigated on construction projects. The implementation of SuDS features can assist in achieving the drainage requirements set out in the National Planning Policy Framework.

A strong design theme is essential if maximum aesthetic benefits are to be gained from the SuDS approach. At a more local scale SuDS should be linked with the individual plot structure, planting and amenity areas, gaining multiple benefits from a limited area of land.

The 'Management Train Approach' should be central to the surface water drainage strategy of a proposed site. The main objective is the treatment and control of runoff as near to source as possible, thus protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

- » Prevention - The use of good site design and housekeeping measures to prevent runoff and pollution (e.g. rainwater re-use).
- » Source Control - Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
- » Site Control - Management of water in a local area (e.g. ground storage/attenuation, detention ponds/basins).
- » Regional Control - Management of water from a site or various sites (e.g. wetlands, balancing ponds).

The SuDS philosophy for a development site is the promotion of Pollution Prevention and Site Control Techniques. The following design philosophy is proposed:



- » Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance.
- » Surface water discharge into the United Utilities combined sewer network located within Sharston Road
- » Site Control features (attenuation) to accommodate the additional surface water runoff generated by the development site before discharging into the private surface water network.
- » Provision of suitable oil separators in line with Pollution Prevention Guidance 3 criteria (where applicable).
- » Aim to limit, where possible, the impermeable fraction of development.

A review of the possible SuDS solutions that are feasible include:

- » Permeable Paving
- » Attenuation Tanks

3.4 Prevention and Source Control – Principles and Objectives

The main objective of prevention and source control is the treatment and control of runoff as near to source as possible. Application of these techniques will require reduction of impermeable areas and techniques to restrict the runoff rates.

Prevention measures to be considered, where possible, as part of the overall approach to the management train at this site include rainwater harvesting. Typical examples are given in the SuDS Manual (Ciria C697) and are briefly described in Table 2 below. It must be noted that the effectiveness of each system is dependent on the final design as well as the actual site conditions.



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Table 2 - SuDS Consideration

SuDS Group	Technique	Image	Description	Advantages	Disadvantages	Suitable for use on site?
Retention	Balancing Pond/Swale		Provides both storm water attenuation and treatment. Run-off from each rain event is detained and treated in the pool. The retention time promotes pollutant removal through sedimentation.	Good removal of pollutants, can be used where groundwater is vulnerable, good community acceptability, high ecological, and amenity benefits.	No reduction in run-off volume, land take may limit use in high density sites.	Unsuitable due to lack of available land.
	Sub-Surface Attenuation		Oversized pipes, tank systems and modular geo-cellular systems that can be used to create a below ground storage structure.	Modular and flexible, dual usage (infiltration/storage, high void ratios), can be installed beneath trafficked and soft landscaped areas.	No water quality treatment.	Sub-surface storage can be used.
Infiltration	Infiltration Trench		Surface water run-off can be discharged directly to ground for infiltration by soakaways,	Reduces the volume of run-off, effective at pollutant removal,	Requires appropriate pre-treatment, basins require a	Infiltration is not considered to be feasible due to
	Infiltration Basin					



Sharston Industrial Estate - Drainage Strategy

	Soakaway		basins, or trenches. A prerequisite is that both groundwater and ground conditions are appropriate to receive the quality and quantity of water generated.	contributes to groundwater recharge, simple and cost effective, easy performance observation.	large flat area, offset from foundations.	shallow groundwater
	Porous Paving		Block or porous paving allows run-off to infiltrate through to sub base layer. Water can then be infiltrated into ground or conveyed into storage or drainage systems.	Reduces the volume of run-off and if designed for infiltration contributes towards groundwater recharge. Easy to install and retrofit. Simple to manage. If lined can be used where groundwater is sensitive.	Not suitable for heavily trafficked areas or adoptable roads. Requires regular sweeping to prevent clogging with dirt.	Permeable paving with a liner may be used which will be conveyed into the proposed drainage system.
	Permeable Paving					
Detention	Detention Basin		Surface storage basins that provide flow control through attenuation. Normally dry and in certain situations the land may also function as a recreational facility.	Cater for a wide range of rainfall events, can be used where groundwater is vulnerable, potential for dual land use, easy to maintain.	Land take, little reduction in run-off volume, detention depths constrained by levels.	Unsuitable due to lack of available land.



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	Enhanced Dry Swale		Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate.	Incorporate into landscaping, good removal of pollutants, reduces run-off rates and volumes, low cost.	Not suitable for steep areas, significant land take, not suitable in areas with roadside parking.	Unsuitable due to lack of available land.
	Enhanced Wet Swale					
Source Control	Green/Brown Roof		Multi-layered system that covers the roof of a building with vegetation cover/landscaping over a drainage layer. Designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.	Mimics greenfield state of building footprint for high density developments, good removal of pollutants, ecological benefits, insulates buildings, sound absorption.	Additional weight, not appropriate for steep roofs, maintenance of roof vegetation.	Unsuitable due to the additional weight on the large span structure.
	Rainwater Harvesting		Like the use of water butts this prevention method stores rainwater runoff from roofs and external areas in below ground tanks. The water can then be used for irrigation purposes to the soft landscaping areas or alternatively pumped to an internal storage tank where the 'Grey' water can be used for WC's and washing machines.	Harvested grey water will collect and automatically be used for various systems, such as toilet flushing, outside taps etc. The result will be less water usage and cheaper bills and a greener building or commercial premises.	Rainfall is hard to predict and sometimes little or no rainfall can limit the supply of rainwater. It also should have a "mains water" top up to ensure that you don't run out of water.	Unsuitable due to lack of available land.
Filtration	Surface Sand Filter		Structures designed to treat surface water run-off through	Flexibility of design, efficient in removing	Not for high sediment content,	There is no requirement for



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	Sub-surface Sand Filter		filtration using a sand bed filter medium. The filters can be designed with or without infiltration. Temporary storage of run-off is achieved through ponding above the filter layer. They are used where particularly high pollutant removal is required.	pollutants, suitable for retrofits and in tightly constrained urban locations.	detention times can support algae growth, minimum hydraulic head of 1.2m required, possible odour problems, high capital and maintenance cost.	high pollution reduction at this site.
	Perimeter Sand Filter					
	Bioretention/ filter swale		Vegetated strips of land designed to accept run-off as overland sheet flow between a hard-surfaced area and a receiving system.	Landscaping features, effective in removing pollutants, flexible layout to fit into landscape, suited for highly impervious areas, good retrofit, capability, effective pre-treatment option.	Requires landscaping and management, large land required, not suitable for steep sites; no significant attenuation or reduction of flows.	No requirement for high pollution reduction; large land areas not available.
	Filter trench/drain		Shallow excavations filled with rubble or stone that create temporary subsurface storage for filtration of storm water run-off. Receive lateral inflow from an adjacent impermeable surface.	Hydraulic benefits achieved with filter trenches; trenches can be incorporated into site landscaping and fit well beside roads and car parks.	High clogging potential without effective pre-treatment, limited to small catchments, high cost of replacing filter material.	Filter drains can be used.



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Conveyance	Conveyance Swales		Formal linear drainage features in which surface water can be stored or conveyed. They can be incorporated with water features such as ponds or waterfalls where appropriate.	Negate the need for underground pipework. Can provide some attenuation. Possible reduction in run-off volume via plant uptake and infiltration.	Potential trip/wheel hazard, disabled access issues.	Could be used where conveyance is required but the lack of formal outside spaces at the site makes the aesthetic aspects unnecessary.
	Rills					
Wetland	Shallow Wetland		Wetlands provide storm water attenuation and treatment. They comprise shallow ponds and marshy areas, covered in aquatic vegetation. Wetlands detain flows for an extended period to allow sediments to settle and to remove contaminants. They can provide significant ecological benefits.	Good pollutant removal and if lined can be used where groundwater is vulnerable. Good community acceptability, ecological and amenity benefits.	Land take is high, requires base flow, little reduction in run-off volume, not suitable for steep sites.	Unsuitable due to lack of available land.
	Extended Detention Wetland					
	Pond Wetland					
	Pocket Wetland					
	Submerged Gravel Wetland					
	Wetland Channel					



3.5 Surface Water Drainage Strategy

The site was previously used occupied by Electrium Sales Ltd (a subsidiary of Siemens) and comprises a collection of industrial buildings developed over time for the purpose of manufacturing and distribution (Class B2/B8) therefore the existing site is considered as brownfield. However, in accordance with the DEFRA non-statutory guidance for SuDS (2015) the surface water drainage discharge rate shall mimic the natural greenfield characteristics of the site as it is a new connection into the culverted watercourse.

1.3.7 Non-statutory guidance for SuDS

The non-statutory guidance⁶ for SuDS published by DeFRA (2015), sets out the technical Standards for SuDS systems in England. For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year and 1 in 100-year rainfall event should never exceed the peak greenfield runoff rate for the same event. For developments which were previously developed, the peak runoff rate from the development must be as close as reasonably practicable to the equivalent greenfield runoff rate over the same area; never exceeding the rate of discharge from the development prior to redevelopment for any event.

The total greenfield runoff rate for the proposed developed area is 3.6l/s based on Qbar (see Appendix F). The greenfield runoff rate has been produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com.

Surface Water Drainage Strategies must follow the hierarchy of surface water disposal as set out in Building Regulations – Approved Document H, as listed below.

- » Option 1 - Into the ground (infiltration)
- » Option 2 - To a watercourse
- » Option 3 - To a public/private sewer

Due the presence of shallow groundwater infiltration into the ground is not considered feasible.

A 600 mm diameter culverted watercourse is understood to be present within Sharston Road, with its outfall to the River Mersey initially identified through onsite dye testing. This asset was subsequently considered as a potential point of discharge for the proposed development.

Following consultation, Manchester City Council, acting as the Lead Local Flood Authority (LLFA) advised that a condition survey of the culvert would be required to support any proposed connection. The feasibility of undertaking a CCTV survey was therefore assessed; however, due to limited access points, the potential for the culvert to pass beneath third-party land, and its likely extent, it was concluded that such a survey would not be practicable.

In the absence of a condition survey, Manchester City Council have not approved a connection to the culverted watercourse.



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As Manchester City Council, acting as the Lead Local Flood Authority (LLFA), have not approved a connection to the culverted watercourse, discharge to a public sewer (Option 3) has been identified as the preferred drainage strategy. Accordingly, surface water from the development will discharge into the existing 750mm combined sewer within Sharston Road, operated by United Utilities.

United Utilities have provided an agreement in principle for this connection, subject to a restricted discharge rate of 3.6 l/s (refer to Appendix G). An application under Section 106 will be submitted to secure formal approval for the connection to the combined sewer network.

Surface water run-off from roof and external areas will be directed to the below ground gravity network, run-off from car parks will pass through an oil interceptor before joining the wider private drainage network of carrier drains and will be attenuated prior to outfall, where it will discharge at a restricted rate of 3.6l/s into the United Utilities combined sewer. (See Appendix H for Proposed Drainage drawing).

A hydraulic model has been created using drainage software as part of the preliminary drainage design, which defines pipe sizes and attenuation volumes. Hydraulic calculations have been provided in Appendix I. It is noted that these rates and volumes are preliminary and may change at detailed design stage when more specific information is available.

An allowance for 45% climate change is to be incorporated into the surface water drainage design for the 1 in 100 year storm event in accordance with local and national planning policy as seen in Figure 3 below.

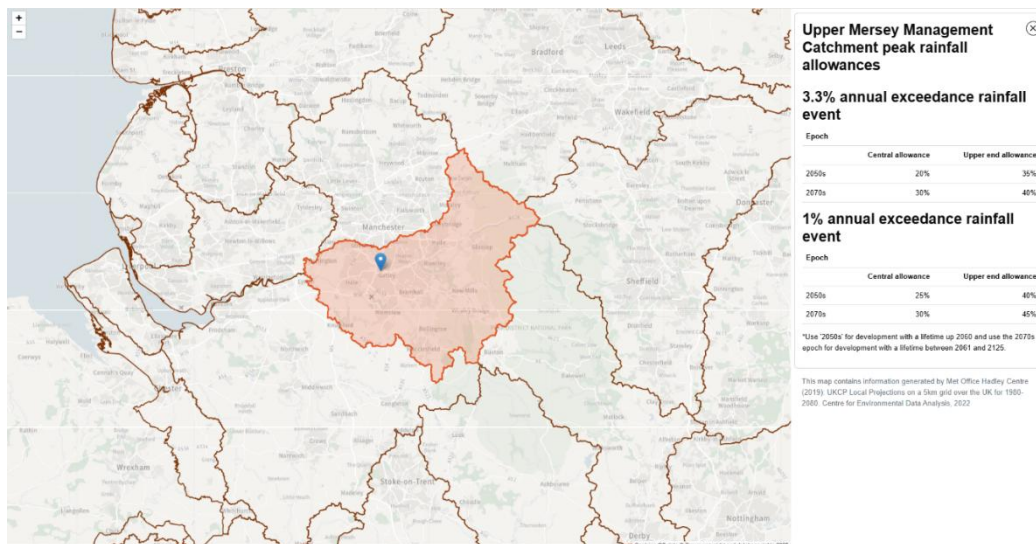


Figure 3 – Climate Change Allowance

The proposed drainage layout is designed in accordance with Design and Construction Guidance. No above ground flooding should occur for the 1 in 30-year storm event and the 1 in 100-year + 45% climate change events. There is no exceedance for 100 years + 45%. An overland flow plan has been produced to show the outcome in the event of a major blockage at the outfall. (Appendix J).



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The surface water below ground gravity drainage system is to provide connections from all new rainwater pipes, channels, gullies and road gullies at ground floor level. The locations of the drainage components are to be fully coordinated with all relevant architectural, landscaping and services drawings.

HGV yards are considered to have a high pollution hazard level. To mitigate this, the use of suitable oil separators has been considered.

Gullies and drainage channels will be specified with silt traps and catch pits will be incorporated in the drainage system to reduce the risk of silt getting into the surface water network.

The drainage system should be designed so that flooding does not occur during the 1 in 100-year rainfall event in any part of the building.

3.6 Water Quality

The primary pollution control measure for the infrastructure elements will be in the form of an oil interceptor. Additionally, SuDS features (filter drain and permeable paving) have been integrated into the design to manage pollution for a portion of the site. Further pollution control will be provided in the form of trapped gullies.

The site mainly comprises of commercial/industry roof, commercial yard, access roads, and parking, which have pollution hazard levels ranging from low to high in accordance with CIRIA C753 table 26.2 as below.

Table 3 - CIRIA C753 Table 26.2

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²



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Appropriate SuDS mitigation indices will be provided for each area of the development in accordance with CIRIA C753 table 26.3, as below

Table 4 - CIRIA C753 table 26.3

Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 5 - SPEL Oil Interceptor SuDS mitigation

SPEL ESR Full Flow Treatment System	
Certified Mitigation Index	
TSS	0.8
Metals	0.6
Hydrocarbons	0.9*
*H R Wallingford test results to BS EN 858: tested to it's maximum designed flow rate	



In line with C753 where two or more components in series, the total SuDS mitigation index can be calculated as:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

Where:

$\text{mitigation Index}_n$ = mitigation index for component n

A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

Figure 4 - Total SuDS mitigation index

Therefore, following the calculation for Total SuDS mitigation index in CIRIA C753, the carpark has sufficient mitigation from the permeable paving, and the yard will have petrol interceptors to ensure there is sufficient mitigation.

3.7 Foul Drainage Strategy

The proposed foul and surface water drainage networks will combine on site to form a single combined system.

This combined drain will discharge via a single point of connection into the existing 750mm combined sewer within Sharston Road, which is operated by United Utilities.

An agreement in principle for this connection has been provided by United Utilities (see Appendix G), and a formal agreement will be secured through submission of a Section 106 application.

3.8 Management, Maintenance and Residual Risk

The proposed drainage layout will be designed in accordance with building regulations. SuDS guidance will be taken from Ciria C753.

Run-off from roofs is generally clean with limited contamination and will be discharged directly to SuDS planters before entering the proposed drainage infrastructure. Silt is to be prevented from entering the drainage system using trapped gullies, interceptors or using sustainable drainage techniques.

Run-off from car park and other external areas will be treated via proprietary treatment system of a full-retention oil interceptor.

Flood risk to people and property can be managed but it can never be completely removed. Residual risk remains after flood management or mitigation measures have been put in place. This relates to a rainfall event beyond what can be fully quantified.



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A private management company will maintain the drainage infrastructure as part of a site-wide management and maintenance schedule as shown in Table 6 - 9.

Table 6 - Below ground drainage (pipe works, manholes, catchpits etc.)

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	Inspection and identification of any areas that are not operating correctly. remedial action should be taken if required.	Monthly for the first 3 months and then annually
	Where it may cause risks to performance the removal of debris from the catchment surface is required.	Monthly
	Removal of sediments	Annually, As required
REMEDIATION ACTIONS	Rehabilitation/repair/replace of gratings/covers, inlets, outlets, overflows and vents.	As required
MONITORING	Inspection of inlets, outlets, vents and overflows for the insurance of good condition and operation according to design.	Annually



Table 7 - Flow Control Chamber

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Remove sediment, oil, grease and floatable	As necessary - indicated by system inspections or immediately following significant rainfall event
REMEDIAL ACTIONS	Replace malfunctioning parts or structures	As required
MONITORING	Inspect for evidence of poor operation	Every six months
	Inspect device and establish appropriate replacement frequencies	Every six months
	Inspect sediment accumulation rates in sump and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months



Table 8 - Permeable pavements

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency As required, based on site-specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
	Stabilise and mow contributing and adjacent areas	As required
OCCASIONAL MAINTENANCE	Removal of weeds or management using glyphosate applied directly into the weeds by an application rather than spraying	As required - once per year on less frequently used pavements.
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
REMEDIAL ACTIONS	Remediate work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an application rather than spraying	Every 10 to 15 years or As required (if infiltration performance is reduced due to significant clogging)
MONITORING	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three Monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually



Sharston Industrial Estate - Drainage Strategy

Table 9 - Below Ground Attenuation Tank

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	Inspection and identification of any areas that are not operating correctly. remedial action should be taken if required.	Monthly for the first 3 months and then annually
	Where it may cause risks to performance the removal of debris from the catchment surface is required.	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Removal of sediments from pre-treatment structures and/or internal forebays.	Annually, As required
REMEDIAL ACTIONS	Rehabilitation/repair of inlets, outlets, overflows and vents.	As required
MONITORING	Inspection of inlets, outlets, vents and overflows for the insurance of good condition and operation according to design.	Annually
	Structural and sediment survey to be conducted in the interior of the tank for structural condition and sediment build-up and remedial action, silt removal if necessary.	Every 5 years or As required



Appendix A – Site Plan





Parking Schedule		Bicycle Provision	
Description	Count		Count
Unit 1		Unit 1	
Standard car parking bay	25		18
Standard car sharing parking bay	2		Unit 2-5
Standard electric vehicle charging parking bay	4		20
Accessible car parking bay	2		Unit 6
Motorcycle bay	4		8
	37		Unit 7
Unit 2			6
Standard car parking bay	4		Unit 8
Standard car sharing parking bay	1		6
Standard electric vehicle charging parking bay	1		Unit 9
Accessible car parking bay	1		4
Accessible electric vehicle parking bay	1		58
	8		
Unit 3			
Standard car parking bay	2		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible electric vehicle parking bay	1		
	5		
Unit 4			
Standard car parking bay	2		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible electric vehicle parking bay	1		
	5		
Unit 5			
Standard car parking bay	5		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible car parking bay	1		
Accessible electric vehicle parking bay	1		
	9		
Unit 6			
Standard car parking bay	6		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible electric vehicle parking bay	1		
	9		
Unit 7			
Standard car parking bay	1		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible electric vehicle parking bay	1		
	4		
Unit 8			
Standard car parking bay	4		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible car parking bay	1		
Accessible electric vehicle parking bay	1		
	8		
Unit 9			
Standard car parking bay	2		
Standard car sharing parking bay	1		
Standard electric vehicle charging parking bay	1		
Accessible electric vehicle parking bay	1		
	5		
Total: 90	90		

09	Issued in support of full Planning Application	AD	19.11.25	BB
08	Issued in support of full Planning Application	AD	11.11.25	BB
07	Issued in support of full Planning - Existing Trees 702.03.04, 12 proposed to be retained Block 3 location amended, drawing number amended	AD	20.10.25	BB
06	Issued in support of full Planning Application	PM	30.07.25	BB
05	Final draft issue for approval prior to final Planning issue	PM	25.07.25	BB
04	Partial revision and designation of spaces updated. Existing trees to be removed omitted for this issue.	PM	13.05.25	ME
03	Dock ramp retaining wall reduced. Unit 2 moved to increase Unit 3 yard depth and incorporate safe pedestrian route. Trees to be removed included	PM	06.05.25	ME
02	Updated to incorporate comments received. Unit 2 location moved to increase Unit 3 yard depth. General updates to finishes	PM	25.04.25	ME
01	Issue for information purposes	PM	16.04.25	ME
Rev	Revision Details	Drawn	Draw Date	Checked

**Sharston Industrial Estate
Sharston Road,
Wythenshawe,
Manchester**

HORIZON

fletcher | rae

Appendix B – Topographical Survey



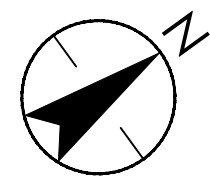


Appendix C – GPR Survey



Appendix D – Existing Drainage Layout





1. THIS DRAWING IS JUST FOR INFORMATION PURPOSES ONLY AND UNDER NO CIRCUMSTANCES SHALL IT BE USED FOR CONSTRUCTION.
2. ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORKS. WORK TO FIGURED DIMENSIONS ONLY. DO NOT SCALE OFF THIS DRAWING. ANY DISCREPANCIES ARE TO BE REPORTED TO STANTEC FOR CLARIFICATION.
3. DRAWING BASED ON GPR SURVEY S26239-U BY SURVEY & ENGINEERING PROJECTS

Legend

- EXISTING UNITED UTILITIES COMBINED SEWER
- EXISTING PRIVATE COMBINED SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING PRIVATE FOUL WATER SEWER
- EXISTING CULVERTED WATERCOURSE

ISSUED/REVISION	JK	NB	02.02.2026
	By	Appd	DD.MM.YYYY
	JK	JK	NB
	Dwn	Dgn	Chk
			02.02.2026
			DD.MM.YYYY

Issue Status

S2 - FOR INFORMATION

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo



Client/Project
KIER SHARSTON Ltd

SHARSTON INDUSTRIAL ESTATE

SHARSTON ROAD
WYTHENSHAW, MANCHESTER

Title
EXISTING DRAINAGE LAYOUT

Project No.
35838

Revision
P01

A0 Scale
1:200

Drawing No.
25006-STN-EX-XX-DR-C-00501

EXISTING UNITED UTILITIES
COMBINED SEWER (2301)
CL 35.110
IL 29.330

EXISTING UNITED UTILITIES
COMBINED SEWER (2404)
CL 35.190
IL 28.750

UNABLE TO SURVEY
BEYOND THIS POINT. PIPE
ROUTE BEYOND THIS
POINT IS ASSUMED AND
INDICATIVE ONLY

UNABLE TO SURVEY
BEYOND THIS POINT. PIPE
ROUTE BEYOND THIS
POINT IS ASSUMED AND
INDICATIVE ONLY

UNABLE TO SURVEY
BEYOND THIS POINT. PIPE
ROUTE BEYOND THIS
POINT IS ASSUMED AND
INDICATIVE ONLY

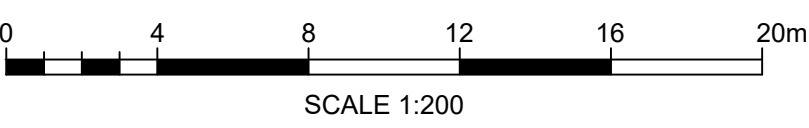
UNABLE TO SURVEY
BEYOND THIS POINT. PIPE
ROUTE BEYOND THIS
POINT IS ASSUMED AND
INDICATIVE ONLY

EXCOM02
CL:35.130
IL:31.63

EXCOM01
CL:34.99
IL:32.47

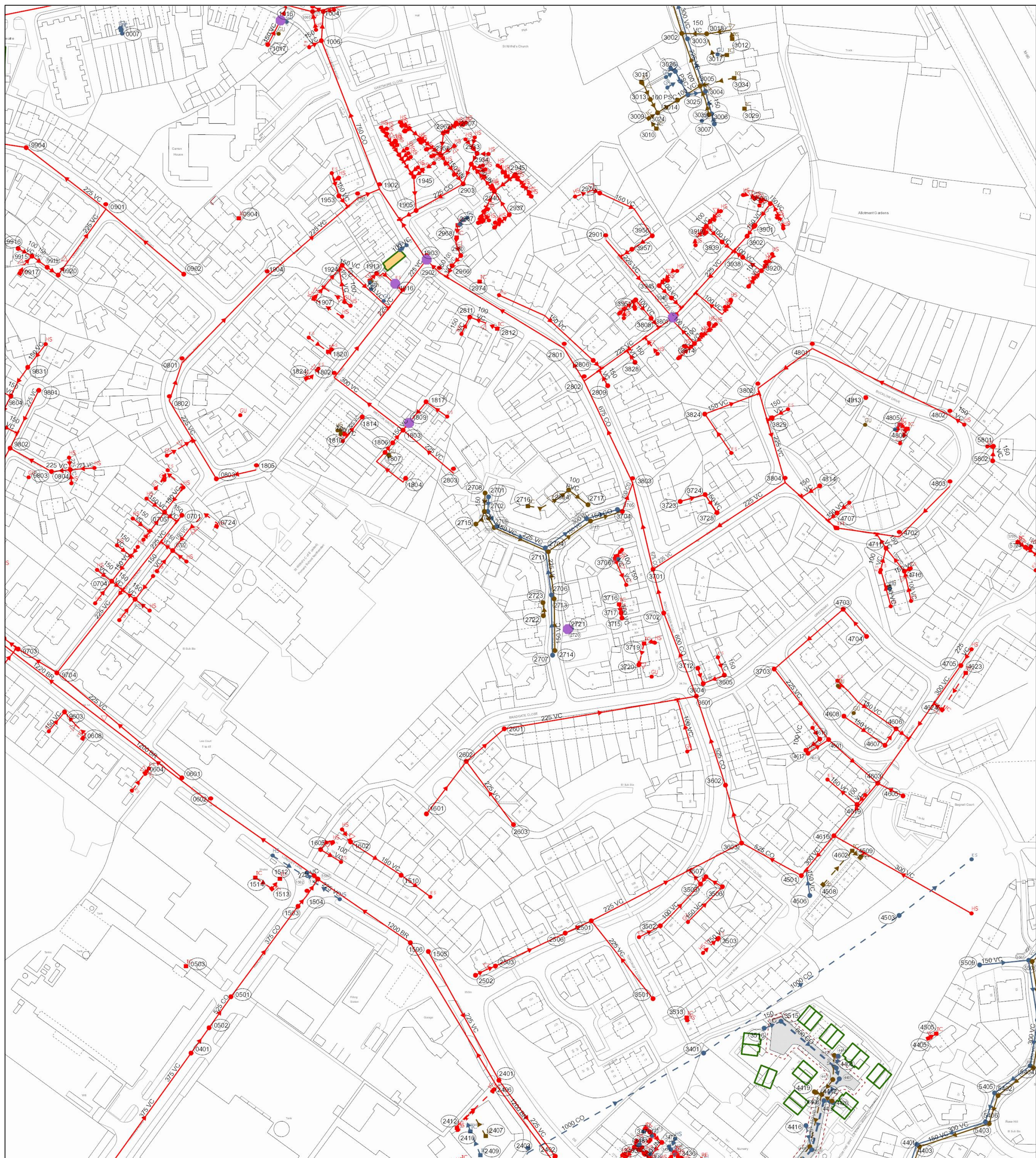
EXISTING UNITED
UTILITIES
COMBINED SEWER
(3301)
CL 35.360
IL 32.200

2250 CONNECTION



Appendix E – United Utilites Sewer Records





Rehno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad	Rehno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
1916	CO	0	31.16	225	225	0	VC	5.44423	1 in 120	1902	CO	0	30.12	525	525	0	VC	20.80865	1 in 63
1809	VC	0	31.96	225	225	0	VC	5.44462	1 in 120	0902	CO	0	30.12	525	525	0	VC	20.80865	1 in 63
0801	VC	0	31.96	225	225	0	VC	6.71886	1 in 80	2705	SW	0	30.12	525	525	0	VC	17.55945	1 in 63
3507	VC	0	31.96	225	225	0	VC	4.91429	1 in 133	1913	CO	0	30.12	525	525	0	VC	16.60112	1 in 63
0601	VC	0	31.96	225	225	0	VC	90.13878	1 in 644	1913	CO	0	30.12	525	525	0	VC	13.84761	1 in 63
3003	VC	0	31.96	225	225	0	VC	37.30308	1 in 133	1913	CO	0	30.12	525	525	0	VC	12.30014	1 in 63
4801	VC	0	31.96	225	225	0	VC	37.20215	1 in 109	4707	CO	0	30.12	525	525	0	VC	6.55411	1 in 63
0903	VC	0	31.96	225	225	0	VC	26.41969	1 in 43	4707	CO	0	30.12	525	525	0	VC	7.397573	1 in 63
3506	VC	0	31.96	225	225	0	VC	10.7517	1 in 43	0704	CO	0	30.12	525	525	0	VC	7.688309	1 in 63
1802	VC	0	31.96	225	225	0	VC	48.01119	1 in 52	3801	CO	0	30.12	525	525	0	VC	3.894033	1 in 63
1810	VC	0	31.96	225	225	0	VC	2.055499	1 in 52	4808	CO	0	30.12	525	525	0	VC	2.75409	1 in 63
5406	SW	0	30.0	300	300	0	VC	39.75471	1 in 150	2203	35.16	CO	32.99	225	225	VC	42.66014	1 in 63	
5406	SW	0	30.0	300	300	0	VC	39.75471	1 in 150	2203	35.16	CO	32.99	225	225	VC	42.66014	1 in 63	
5406	SW	0	30.0	300	300	0	VC	39.75471	1 in 150	3801	CO	0	30.12	525	525	VC	13.2103	1 in 63	
5406	SW	0	30.0	300	300	0	VC	39.75471	1 in 150	4804	CO	0	30.12	525	525	VC	54.48186	1 in 63	
5401	FO	0	30.0	300	300	0	VC	24.62351	1 in 150	2801	34.81	CO	31.8	225	225	VC	107.5174	1 in 229	
5401	FO	0	30.0	300	300	0	VC	24.62351	1 in 150	1804	CO	0	30.12	525	525	VC	16.60112	1 in 63	
5401	FO	0	30.0	300	300	0	VC	24.62351	1 in 150	1510	CO	0	30.12	525	525	VC	19.90558	1 in 63	
5401	FO	0	30.0	300	300	0	VC	24.62351	1 in 150	2712	CO	0	30.12	525	525	VC	18.47819	1 in 63	
3801	CO	0	31.1	600	600	0	VC	49.39635	1 in 150	2202	35.1	CO	33.16	150	150	VC	6.71944	1 in 96	
9831	CO	0	31.1	600	600	0	VC	18.6152	1 in 150	2202	35.1	CO	33.16	150	150	VC	6.71944	1 in 96	
5403	FO	0	30.0	300	300	0	VC	40.61946	1 in 150	4804	CO	0	30.12	525	525	VC	10.37098	1 in 63	
5403	FO	0	30.0	300	300	0	VC	40.61946	1 in 150	2715	FO	0	30.12	525	525	VC	8.852213	1 in 63	
5403	FO	0	30.0	300	300	0	VC	40.61946	1 in 150	1502	34.59	FO	32.12	225	225	VC	34.48186	1 in 144	
5403	FO	0	30.0	300	300	0	VC	40.61946	1 in 150	1502	34.59	FO	32.12	225	225	VC	34.48186	1 in 144	
4615	FO	0	30.0	300	300	0	VC	13.7058	1 in 150	4803	35.28	SW	31.29	225	225	VC	50.60632	1 in 629	
4615	FO	0	30.0	300	300	0	VC	13.7058	1 in 150	4803	35.28	SW	31.29	225	225	VC	50.60632	1 in 629	
2708	FO	0	30.0	300	300	0	VC	8.94958	1 in 150	4703	35.86	CO	33.47	225	225	VC	2.854597	1 in 629	
1804	CO	0	30.0	300	300	0	VC	28.01562	1 in 150	2714	FO	0	30.12	525	525	VC	28.65252	1 in 629	
5403	FO	0	30.0	300	300	0	VC	8.94958	1 in 150	2714	FO	0	30.12	525	525	VC	28.65252	1 in 629	
3025	SW	0	30.0	300	300	0	PSC	9.88689	1 in 150	2714	FO	0	30.12	525	525	VC	28.65252	1 in 629	
4814	CO	0	30.0	300	300	0	VC	12.34842	1 in 150	2714	FO	0	30.12	525	525	VC	28.65252	1 in 629	
0702	CO	0	30.0	300	300	0	VC	8.12602	1 in 150	3005	34.7	FO	32.4	225	225	VC	30.67372	1 in 118	
2402	35.25	CO	31.96	225	225	0	VC	3.124356	1 in 11	2802	33.68	FO	29.84	675	675	VC	9.89495	1 in 118	
3502	35.25	CO	31.96	225	225	0	VC	3.124356	1 in 11	2802	33.68	FO	29.84	675	675	VC	9.89495	1 in 118	
3638	CO	0	30.0	300	300	0	VC	6.092239	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
3018	CO	0	30.0	300	300	0	VC	13.39489	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
3479	CO	0	30.0	300	300	0	VC	3.886238	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
3479	CO	0	30.0	300	300	0	VC	3.886238	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
1905	CO	0	30.0	300	300	0	VC	10.36412	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
2404	CO	0	30.0	300	300	0	VC	14.65953	1 in 150	5402	FO	0	30.12	525	525	VC	16.2029	1 in 118	
2711	CO	0	30.0	300	300	0	VC	28.71566	1 in 150	3703	34.82	CO	33.38	225	225	VC	49.20388	1 in 214	
3004	34.7	SW	31.91	375	375	0	VC	30.7572	1 in 110	4401	FO	0	30.12	525	525	VC	33.49485	1 in 110	
0501	CO	0	30.0	300	300	0	VC	62.20129	1 in 150	4401	FO	0	30.12	525	525	VC	33.49485	1 in 110	
3808	CO	0	30.0	300	300	0	VC	6.86323	1 in 150	4401	FO	0	30.12	525	525	VC	33.49485	1 in 110	
1016	CO	0	30.0	300	300	0	VC	9.38618	1 in 150	0902	34.14	CO	32.63	225	225	VC	56.0803	1 in 110	
1303	CO	0	30.0	300	300	0	VC	10.91125	1 in 150	1092	34.58	CO	32.63	225	225	VC	7.688309	1 in 110	
5508	SW	0	30.0	300	300	0	VC	25.49573	1 in 150	1503	CO	0	30.12	525	525	VC	0.768924	1 in 110	
5508	SW	0	30.0	300	300	0	VC	25.49573	1 in 150	1503	CO	0	30.12	525	525	VC	0.768924	1 in 110	
5508	SW	0	30.0	300	300	0	VC	25.49573	1 in 150	1503	CO	0	30.12	525	525	VC	0.768924	1 in 110	
5508	SW	0	30.0	300	300	0	VC	25.49573	1 in 150	1503	CO	0	30.12	525	525	VC	0.768924	1 in 110	
2501	35.33	SW	32.25	225	225	0	VC	93.47727	1 in 156	4418	35.27	SW	33.83	150	150	VC	13.62353	1 in 80	
2501	35.33	SW	32.25	225	225	0	VC	93.47727	1 in 156	4418	35.27	SW	33.83	150	150	VC	13.62353	1 in 80	
2806	CO	0	30.0	300	300	0	VC	6.386981	1 in 150	4418	35.27	SW	33.83	150	150	VC	13.62353	1 in 80	
0402	34.42	CO	30.76	375	375	0	VC	87.41853	1 in 250	4419	35.51	FO	33.49	150	150	VC	4.21772	1 in 23	
0803	34.32	CO	30.76	375	375	0	VC	50.34038	1 in 144	4419	35.51	FO	33.49	150	150	VC	4.21772	1 in 23	
1902	33.63	CO	28.6	750	750	0	VC	88.92273	1 in 326	4705	36.9	CO	33.55	300	300	VC	79.63039	1 in 119	
3480	CO	0	30.0	300	300	0	VC	3.442052	1 in 150	4705	36.9	CO	33.55	300	300	VC	79.63039	1 in 119	
4605	35.72	CO	33.08	225	225	0	VC	15.62448	1 in 87	4413	35.01	FO	32.4	225	225	VC	21.60227	1 in 57	
2809	CO	0	30.0	300	300	0	VC	8.734385	1 in 150	4413	35.01	FO	32.4	225	225	VC	21.60227	1 in 57	
2809	CO	0	30.0	300	300	0	VC	8.734385	1 in 150	4413	35.01	FO	32.4	225	225	VC	21.60227	1 in 57	
2803	CO	0	30.0	300	300	0	VC	43.60046	1 in 150	4819	CO	0	30.12	525	525	VC	21.38827	1 in 961	
1504	34.45	CO	28.13	450	450	0	VC	10.81665	1 in 150	0703	34.02	CO	30.72	225	225	VC	5.11076	1 in 961	
1924	CO	0	30.0	300	300	0	VC	34.99861	1 in 150	0901	24.24	CO	32.1	225	225	VC	55.6075	1 in 139	
5504	CO	0	30.0	300	300	0	VC	34.99861	1 in 150	3476	CO	0	30.12	525	525	VC	5.11076	1 in 139	
5504	CO	0	30.0	300	300	0	VC	34.99861	1 in 150	3476	CO	0	30.12	525	525	VC	5.11076	1 in 139	
5504	CO	0	30.0	300	300	0	VC	34.99861	1 in 150	3476	CO	0	30.12	525	525	VC	5.11076	1 in 139	
0802	34.14	CO	32.14	225	225	0	VC	22.13594	1 in 138	3516	35.47	SW	34.29	150	150	VC	10.00335	1 in 29	
2704	CO	0	30.0	300	300	0	VC	28.01959	1 in 150	3516	35.47	SW	34.29	150	150	VC	10.00335	1 in 29	
4603	35.59	CO	32.86	300	300	0	VC	37.43306	1 in 157	4414	35.72	SW	34.13	150	150	VC	6.72995	1 in 35	
3505	CO	0	30.0	300	300	0	VC	14.49526	1 in 150	4414	35.72	SW	34.13	150	150	VC	6.72995	1 in 35	
4606	CO	0	30.0	300	300	0	VC	9.638245	1 in 150	3515	35.43	SW	33.01	600	600	VC	39.98976	1 in 400	
1017	CO	0	30.0	300	300	0	VC	9.020158	1 in 150	3515	35.43	SW	33.01	600	600	VC	39.98976	1 in 400	



Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
5504	FO	0	150				VC	27.55526	
5504	FO	0	150				VC	27.55526	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
4503	35.28	SW	1000				CO	50.60632	
4503	35.28	SW	1000				CO	50.60632	
4403	SW	0	300				VC	32.55935	
4403	SW	0	300				VC	32.55935	
4403	SW	0	300				VC	32.55935	
4403	SW	0	300				VC	32.55935	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5703	CO	0	150				VC	7.424601	
5503	FO	0	150				VC	32.33073	
5503	FO	0	150				VC	32.33073	
5503	FO	0	150				VC	32.33073	
5501	FO	0	150				VC	32.5839	
5501	FO	0	150				VC	32.5839	
5508	SW	0	300				VC	25.49573	
5508	SW	0	300				VC	25.49573	
5402	FO	0	150				VC	16.2029	
5402	FO	0	150				VC	16.2029	
5402	FO	0	150				VC	16.2029	
5402	FO	0	150				VC	16.2029	
4802	37.14	CO	35.48	225			VC	84.5281	1 in 53
4802	37.14	CO	35.48	225			VC	84.5281	1 in 53
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5510	FO	0	100				PVC	2.257099	
5510	FO	0	100				PVC	2.257099	
5401	FO	0	150				VC	24.92351	
5401	FO	0	150				VC	24.92351	
5401	FO	0	150				VC	24.92351	
5401	FO	0	150				VC	24.92351	
5508	SW	0	225				VC	22.13688	
5508	SW	0	225				VC	22.13688	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5507	SW	0	225				VC	33.46882	
5507	SW	0	225				VC	33.46882	
5507	SW	0	225				VC	33.46882	
5505	SW	0	225				VC	34.53074	
5505	SW	0	225				VC	34.53074	
5704	CO	0	150				VC	1.200034	
5704	CO	0	150				VC	1.200034	
5509	SW	0	150				VC	27.21098	
5509	SW	0	150				VC	27.21098	
5509	SW	0	150				VC	27.21098	
5511	FO	0	100				PVC	9.071838	
5511	FO	0	100				PVC	9.071838	
4803	37.22	CO	35.68	225			VC	39.59798	1 in 78
4803	37.22	CO	35.68	225			VC	39.59798	1 in 78
5512	FO	0	100				PVC	2.254166	
5512	FO	0	100				PVC	2.254166	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
5502	FO	0	150				VC	20.44271	
5502	FO	0	150				VC	20.44271	
5802	CO	0	150				VC	8.056728	
5802	CO	0	150				VC	8.056728	
5801	CO	0	150				VC	3.338461	
5801	CO	0	150				VC	3.338461	
4705	36.9	CO	33.55	300			VC	79.63039	1 in 119
4705	36.9	CO	33.55	300			VC	79.63039	1 in 119

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

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

- Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate
- Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Septic Tank

Control Kiosk

DNM Network Monitoring Point

Change of Characteristic

MANHOLE FUNCTION

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

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

Sharston Industrial Estate,

OS sheet SJ8389NE
Number:
Scale: 1:1250
Nodes: 77
Sheet: 2 of 4
Date: 07/01/2026

Printed by: Property Searches

SEWER RECORDS

United Utilities

Water for the North West

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

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad	Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4011	34.45	CO	30.28	525			VC	17.20465			3203	CO	150				VC	10.46445	
4012	34.45	CO	30.28	525			VC	17.20465			4415	SW	33.1				VC	5.11876	1 in 85
4013	34.45	CO	0	300			VC	57.31492			4415	SW	33.1				VC	5.11876	1 in 85
4014	34.45	CO	0	300			VC	57.31492			4415	SW	33.1				VC	5.11876	1 in 85
9903	39.78	CO	36.84	225			VC	10.77033	1 in 51		4417	SW	34.8	SW	33.8		VC	5.06318	1 in 72
5003		FO	0	150			VC	32.32073			3301	35.36	CO	32.2	225		VC	11.11681	1 in 29
5004		SW	0	150			VC	32.32073			3330	35.65	CO	31.98	225		VC	11.19027	1 in 81
5005		FO	0	150			VC	32.32073			4413	35.01	FO	39.24	225		VC	21.66227	1 in 80
5006		SW	0	150			VC	32.32073			4413	35.01	FO	39.24	225		VC	21.66227	1 in 80
2201	35.35	CO	30.43	375			VC	46.61545	1 in 291		4408	35.33	SW	32.85	600		CO	27.86565	1 in 349
3011	35.35	CO	33.6	600			CO	28.11522	1 in 64		4408	35.33	SW	32.85	600		CO	27.86565	1 in 349
3113		CO	0	100			UN	10.27431			3425	CO	100				UN	2.809392	
3422		CO	0	100			UN	10.27431			3425	CO	100				UN	11.77043	1 in 111
3423	35.73	CO	33.57	525			VC	87.55171	1 in 396		4410	35.1	SW	31.5	300		VC	0.786477	
4406	SW	0	300				VC	39.75471			3409	CO	0				UN	8.127333	
4407	SW	0	300				VC	39.75471			3309	CO	100				UN	5.662398	
4408	SW	0	300				VC	39.75471			4406	35.5	SW	32.91	600		CO	6.147098	1 in 307
4409	SW	0	300				VC	39.75471			4406	35.61	SW	32.91	600		CO	6.147098	1 in 307
4411	FO	0	150				VC	24.92581			3437	CO	100				UN	2.622932	
4412	FO	0	150				VC	24.92581			3302	35.39	CO	28.8	900		CO	33.47628	
4413	FO	0	150				VC	24.92581			3312	CO	100				UN	4.684785	
4414	FO	0	150				VC	24.92581			4420	35.47	FO	34.11	150		VC	7.728104	1 in 26
3115	39.24	CO	35.58	100			VC	6.468133	1 in 2		4420	35.47	FO	34.11	150		VC	7.728104	1 in 26
3403	FO	0	150				VC	40.61946			4412	35.34	FO	33.31	150		VC	26.62528	
3404	FO	0	150				VC	40.61946			4412	35.34	FO	33.31	150		VC	26.62528	
3405	FO	0	150				VC	40.61946			4407	35.52	SW	32.89	600		CO	14.7397	1 in 368
3406	FO	0	150				VC	40.61946			4407	35.52	SW	32.89	600		CO	14.7397	1 in 368
3407	CO	0	100				UN	13.41675			3476	CO	100				UN	5.92941	
3408	CO	0	100				UN	9.05007			3476	CO	100				UN	5.92941	
3409	CO	0	100				UN	4.69665			3470	CO	100				UN	6.608585	
3454		CO	0	100			UN	5.717759			4409	35.03	SW	32.77	600		CO	14.57307	1 in 291
3501	35.96	SW	31.28	100			CO	135.2075	1 in 13021		4409	35.03	SW	32.77	600		CO	14.57307	1 in 291
4313	35.91	SW	0	375			VC	40.67313											
4314	35.91	SW	0	375			VC	41.87198											
3501	35.11	CO	33.25	225			VC	54.81788	1 in 79										
2402	35.25	CO	31.96	225			VC	3.124356	1 in 1										
2402	35.25	CO	31.96	225			VC	3.124356	1 in 1										
2201	35.11	CO	29.33	750			UN	50.69026	1 in 238										
3436		CO	0	100			UN	3.52647											
3475		CO	0	100			UN	2.673246											
4303	FO	0	150				VC	34.23367											
4303	FO	0	150				VC	34.23367											
4343	CO	0	150				UN	18.83635											
4349	CO	0	100				UN	3.689228											
4349	CO	0	100				UN	3.689228											
5404	SW	0	300				VC	24.72137											
5404	SW	0	300				VC	24.72137											
5404	SW	0	300				VC	24.72137											
5404	SW	0	300				VC	24.72137											
2404	35.19	CO	28.75	1200			BR	144.6663											
3011	38.6	CO	33.41	225			VC	90.44335	1 in 63										
0501		CO	0.15	375			CO	62.20129											
3110		CO	0.15	375			CO	62.20129											
3110		CO	0.15	375			UN	7.468607											
1303	35.02	SW	31.1	1000			CO	107.1125	1 in 428										
0011	35.24	CO	36.58	225			VC	3.605501	1 in 2										
3484		CO	0	100			UN	12.67461											
0011	34.56	CO	30.4	100			CO	92.41753	1 in 237										
5008	SW	0	300				VC	25.49573											
5008	SW	0	300				VC	25.49573											
501	35.33	CO	32.55	225			VC	83.47772	1 in 156										
2501	35.33	CO	32.55	225			VC	93.47727	1 in 156										
002	35.75	CO	31.95	225			VC	92.20007	1 in 42										
002	34.42	CO	30.76	375			VC	87.41853	1 in 250										
3480	CO	0	100				UN	3.440262											
3480	CO	0	100				UN	3.440262											
4203	CO	0	900				CO	87.58718											
4203	CO	0	900				CO	87.58718											
4304	SW	0	375				CO	17.88038											
0902	39.16	CO	32.78	600			VC	8											
1407		CO	0	750			CO	19.20307											
5506	SW	0	225				VC	33.46862											
5506	SW	0	225				VC	33.46862											
5507	SW	0	225				VC	33.46862											
5507	SW	0	225				VC	33.46862											
4310	SW	0	375				VC	34.12045											
5009	SW	0	150				VC	27.21098											
5009	SW	0	150				VC	27.21098											
5009	SW	0	150				VC	27.21098											
5009	SW	0	150				VC	27.21098											
1303	35.02	SW	30.13	1000			VC	3.605501											
3314	CO	0	150				UN	11.46878											
3405	CO	0	150				UN	2.294827											
3481	CO	0	100				UN	10.11255											
3481	CO	0	100				UN	10.11255											
4312	SW	0	225				VC	24.74211											
1304	35.02	SW	29.84	1000			CO	38.60002											
3482	CO	0	150				UN	6.22488											
5502	CO	0	150				UN	20.44271											
5502	CO	0	150				UN	20.44271											
3499	CO	0	100				UN	3.632023											
5004	CO	0	150				VC	27.05528											
5004	CO	0	150				VC	27.05528											
1201	35.26	SW	31.25	1000			CO	110	1 in 846										
1201	35.19	CO	29.78	750			CO	29.41088											
4403	SW	0	300				VC	32.59325											
4403	SW	0	300				VC	32.59325											
4403	SW	0	300				VC	32.59325											
2403	35.11	CO	30.82	1000			VC	111.4662	1 in 5573										
2403	35.11	CO	30.82	1000			VC	111.4662	1 in 5573					</					

LEGEND

The diagram illustrates the flow of water from various sources into a public sewer system. The sources are categorized into four groups: Abandoned, Foul, Surface Water, and Combined. The flow paths are represented by colored lines: brown for Abandoned, green for Foul, blue for Surface Water, and red for Combined. The flow paths lead to a public sewer system, which is shown as a series of lines branching out to different locations: Public Sewer, Private Sewer, Section 104, Rising Main, Sludge Main, Overflow, Water Course, and Highway Drain.

All point assets follow the standard colour convention:

red - combined blue - surface water
brown - foul 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 | DNNI Network Monitoring Point |
| Drop Shaft | Change of Characteristic |
| Orifice Plate | |

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

Circular	TR	Trapezoidal
Egg	AR	Arch
Oval	BA	Barrel
Flat Top	HO	HorseShoe
Rectangular	UN	Unspecified
Square		

SEWER MATERIAL

- Asbestos Cement
- Brick
- Polyethylene
- Reinforced Plastic Matrix
- Concrete
- Concrete Segment Bolted
- Concrete Segment Unbolted
- Concrete Box Culverted
- Plastic / Steel Composite
- Glass Reinforced Plastic
- Ductile Iron
- Polyvinyl Chloride
- Cast Iron
- Spun Iron
- Steel
- Vitrified Clay
- Polypropylene
- Pitch Fibre
- Masonry, Coursed
- Masonry, Random
- Unspecified

Address or Site Reference:

Sharston Industrial Estate,

OS sheet SJ8389SW

Number:

Date: 07/01/2026

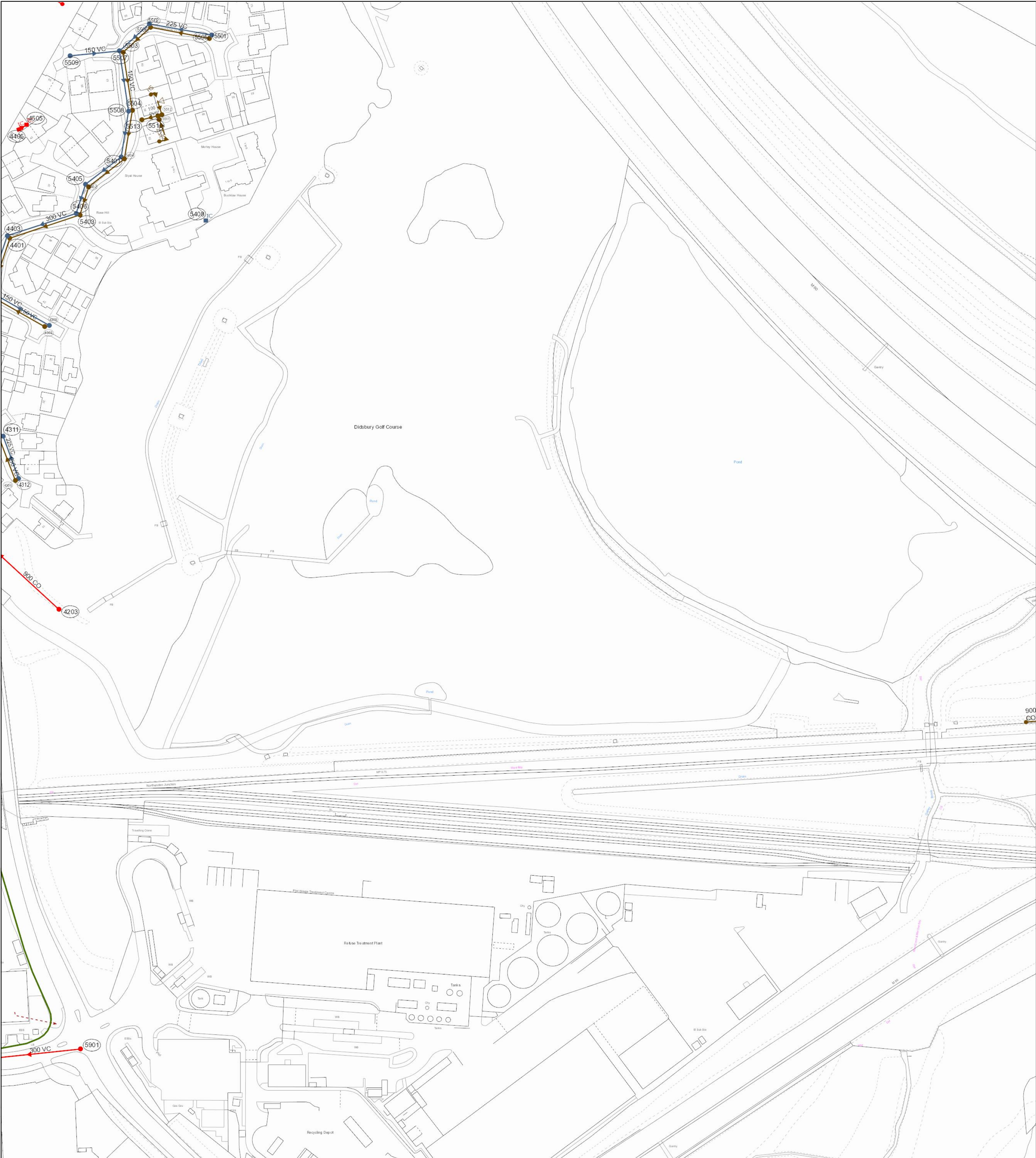
Nodes: 233

Sheet: 3 of 4

Printed by: Property Searches

SEWER RECORDS





Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
5504	FO	0	150				VC	17.05526	
5504	FO	0	150				VC	27.05526	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
5404	SW	0	300				VC	24.72137	
4403	SW	0	300				VC	32.05935	
4403	SW	0	300				VC	32.05935	
4403	SW	0	300				VC	32.05935	
4403	SW	0	300				VC	32.05935	
5901	CO	0	300				VC	17.31492	
5901	CO	0	300				VC	57.31492	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5405	SW	0	300				VC	16.91249	
5503	FO	0	150				VC	32.33073	
5503	FO	0	150				VC	32.33073	
5503	FO	0	150				VC	32.33073	
5501	FO	0	150				VC	32.38339	
5501	FO	0	150				VC	32.38339	
5508	SW	0	300				VC	25.49573	
5508	SW	0	300				VC	25.49573	
4311	SW	0	225				VC	26.39258	
4311	SW	0	225				VC	26.39258	
4203	CO	0	900				CO	87.08718	
4203	CO	0	900				CO	87.08718	
5402	FO	0	150				VC	16.2029	
5402	FO	0	150				VC	16.2029	
5402	FO	0	150				VC	16.2029	
4308	SW	0	150				VC	38.421	
4308	SW	0	150				VC	38.421	
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5406	SW	0	300				VC	39.75471	
5510	FO	0	100				PVC	2.267099	
5510	FO	0	100				PVC	2.267099	
5401	FO	0	150				VC	24.92351	
5401	FO	0	150				VC	24.92351	
5401	FO	0	150				VC	24.92351	
5506	SW	0	225				VC	22.13988	
5506	SW	0	225				VC	22.13988	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5403	FO	0	150				VC	40.61946	
5507	SW	0	225				VC	33.46882	
5507	SW	0	225				VC	33.46882	
5507	SW	0	225				VC	33.46882	
5507	SW	0	225				VC	33.46882	
5505	SW	0	225				VC	34.93074	
5505	SW	0	225				VC	34.93074	
4306	FO	0	150				VC	25.26428	
4306	FO	0	150				VC	25.26428	
5509	SW	0	150				VC	27.21098	
5509	SW	0	150				VC	27.21098	
5509	SW	0	150				VC	27.21098	
5509	SW	0	150				VC	27.21098	
5511	FO	0	100				PVC	9.071838	
5511	FO	0	100				PVC	9.071838	
5512	FO	0	100				PVC	2.264166	
5512	FO	0	100				PVC	2.264166	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
4401	FO	0	150				VC	33.49485	
4312	SW	0	225				VC	24.74211	
4312	SW	0	225				VC	24.74211	
4303	FO	0	150				VC	34.22367	
4303	FO	0	150				VC	34.22367	
5502	FO	0	150				VC	20.44271	
5502	FO	0	150				VC	20.44271	

Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
------	-------	------	--------	--------	--------	-------	------	--------	------

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

All point assets follow the standard colour convention:

red - combined

blue - surface water

brown - foul

purple - overflow

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Ww Pumping Station

Septic Tank

Control Kiosk

DNM Network Monitoring Point

Change of Characteristic

MANHOLE FUNCTION

FO Foul

SW Surface Water

CO Combined

OV Overflow

SEWER SHAPE

CI Circular

TR Trapezoidal

EG Egg

AR Arch

OV Oval

BA Barrel

FT Flat Top

HO HorseShoe

RE Rectangular

UN Unspecified

SQ Square

SEWER MATERIAL

AC Asbestos Cement

BR Brick

PE Polyethylene

RP Reinforced Plastic Matrix

CO Concrete

CSB Concrete Segment Bolted

CSU Concrete Segment Unbolted

CC Concrete Box Culvert

PSC Plastic / Steel Composite

GRC Glass Reinforced Plastic

DI Ductile Iron

PVC Polyvinyl Chloride

CI Cast Iron

SI Spun Iron

ST Steel

VC Vitrified Clay

PP Polypropylene

PF Pitch Fibre

MAC Masonry, Coursed

MAR Masonry, Random

U Unspecified

Address or Site Reference:

Sharston Industrial Estate,

OS sheet Number:

Scale: 1:1250

Nodes: 76

Sheet: 4 of 4

SJ8389SE

Date: 07/01/2026

Printed by: Property Searches

SEWER RECORDS

United Utilities

Water for the North West

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Appendix F – HR Wallingford Greenfield Rate Calculations



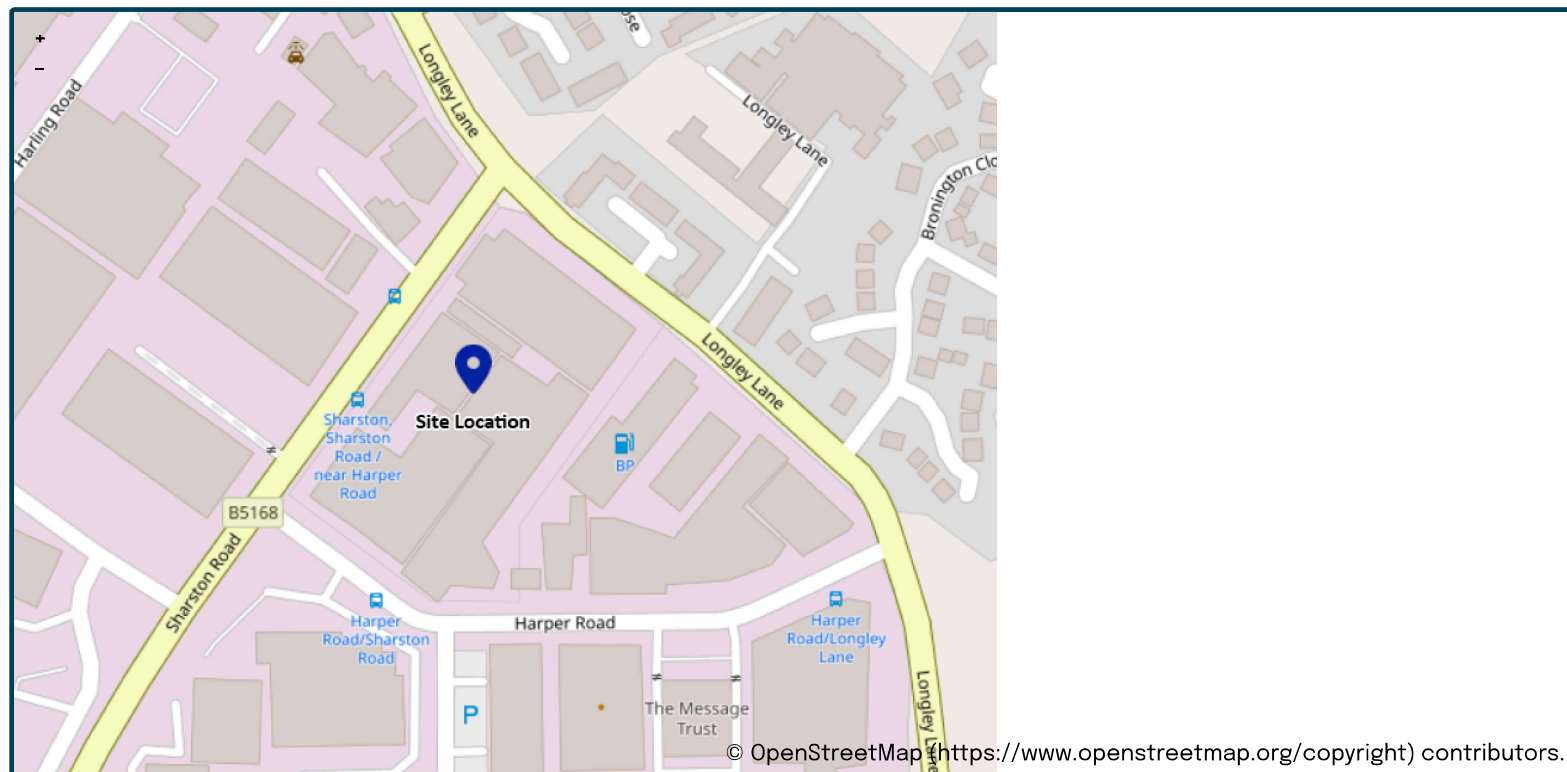
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	<input type="text" value="08/07/2025"/>
Calculated by	<input type="text" value="Natasha Mehmood"/>
Reference	<input type="text" value="Sharston"/>
Model version	<input type="text" value="2.0.1"/>

Location

Site name	<input type="text" value="Trade City Sharston"/>
Site location	<input type="text" value="Former Electrium Sales Ltd SAITE, 1934 Sharston Road, Wythenshawe"/>



Site easting	<input type="text" value="383250"/>
Site northing	<input type="text" value="389331"/>

Site details

Total site area (ha)	<input type="text" value="1.6"/>	ha
----------------------	----------------------------------	----

Greenfield runoff

Method

Method	IH124		
		<u>My value</u>	<u>Map value</u>
SAAR (mm)	830	mm	☐ 830
How should SPR be derived?	WRAP soil type		
WRAP soil type	2	☐	2
SPR	0.3		
QBar (IH124) (l/s)	3.6	l/s	

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	10	☐ 10
1 year growth factor	0.87	
2 year growth factor	0.93	
10 year growth factor	1.38	
30 year growth factor	1.7	
100 year growth factor	2.08	
200 year growth factor	2.37	

Results

Method	IH124	
Flow rate 1 year (l/s)	3.1	l/s
Flow rate 2 year (l/s)	3.3	l/s
Flow rate 10 years (l/s)	4.9	l/s
Flow rate 30 years (l/s)	6.1	l/s
Flow rate 100 years (l/s)	7.4	l/s
Flow rate 200 years (l/s)	8.4	l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.0.1) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix G – United Utilites Correspondence



Kara, Jay

From: Checkley, Victoria
Sent: 24 March 2026 17:09
To: Vallipuram Suresh; Hannah Hogan; Flood Risk Management
Cc: Brad Wiseman; Butler, Oliver; Byrne, Neil; Kara, Jay
Subject: RE: Sharston - UU REF: 07867880 - Sharston Industrial Estate, M22 4RA

Hi Vkey,

It is common practice that acceptance of connection from UU is done via email, so whilst, as requested, we will ask UU for a formal letter, we trust this will not hold up the approval process once we submit the updated drainage strategy?

Regards

Victoria

Victoria Checkley, BEng (Hons), CEng MStructE
Director



From: Vallipuram Suresh <Vallipuram.Suresh@manchester.gov.uk>
Sent: 24 March 2026 16:54
To: Checkley, Victoria <Victoria.Checkley@stantec.com>; Hannah Hogan <Hannah.Hogan@manchester.gov.uk>; Flood Risk Management <floodriskmanagement@manchester.gov.uk>
Cc: Brad Wiseman <brwiseman@savills.com>; Butler, Oliver <oliver.butler@kier.co.uk>; Byrne, Neil <Neil.Byrne@stantec.com>
Subject: RE: Sharston - UU REF: 07867880 - Sharston Industrial Estate, M22 4RA

Hi Victoria,

Thank you for confirming this via email. However, we kindly request a formal letter of confirmation from the United Utilities for our record.

We are looking forward to receiving a copy of your revised drainage strategy for our review.

Kind Regards,
Vkey

Vallipuram Suresh
Flood Risk Team (LLFA) Flood Risk Engineer
Email: vallipuram.suresh@manchester.gov.uk

Highways Service
Neighbourhoods Directorate
Manchester City Council
PO Box 532
Town Hall
Manchester
M60 2LA
Web: <http://www.manchester.gov.uk>

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From: Checkley, Victoria <Victoria.Checkley@stantec.com>

Sent: 24 March 2026 16:44

To: Hannah Hogan <Hannah.Hogan@manchester.gov.uk>; Flood Risk Management <floodriskmanagement@manchester.gov.uk>; Vallipuram Suresh <Vallipuram.Suresh@manchester.gov.uk>

Cc: Brad Wiseman <brwiseman@savills.com>; Butler, Oliver <oliver.butler@kier.co.uk>; Byrne, Neil <Neil.Byrne@stantec.com>

Subject: FW: Sharston - UU REF: 07867880 - Sharston Industrial Estate, M22 4RA

ALERT This message originated outside of the Manchester City Council network. **BE CAUTIOUS** before clicking any links or opening any attachments. Please remember your Cyber Training and report anything suspicious.

Hi,

Just as an updated, UU have confirmed they will accept a surface water connection onto their combined sewer for our Sharston site – see email below.

We will be issuing the updated drainage strategy to the planners to allow this planning condition to be signed off.

Regards

Victoria

Victoria Checkley, BEng (Hons), CEng MStructE
Director



From: McDermott, Daniel <Daniel.McDermott@uuplc.co.uk>

Sent: 24 March 2026 16:04

To: Butler, Oliver <Oliver.Butler@kier.co.uk>; Byrne, Neil <Neil.Byrne@stantec.com>

Cc: Checkley, Victoria <Victoria.Checkley@stantec.com>

Subject: RE: Sharston - UU REF: 07867880 - Sharston Industrial Estate, M22 4RA

Hi all,

As the combined network has no CSO United Utilities would agree to permit a connection to it.

If I can be of any further assistance please don't hesitate to contact me.

Regards,



Daniel McDermott
Customer Area Manager WW
Developer Services & Metering
Customer Services
M: 07795046445
unitedutilities.com

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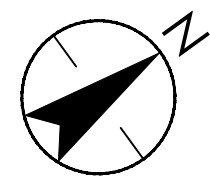
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Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Appendix H – Proposed Drainage Plan





1. THIS DRAWING IS JUST FOR INFORMATION PURPOSES ONLY AND UNDER NO CIRCUMSTANCES SHALL IT BE USED FOR CONSTRUCTION.
2. ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORKS. WORK TO FIGURED DIMENSIONS ONLY. DO NOT SCALE OFF THIS DRAWING. ANY DISCREPANCIES ARE TO BE REPORTED TO STANTEC FOR CLARIFICATION.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT STANTEC DRAWINGS AND SPECIFICATIONS.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND M&E SERVICES DRAWINGS AND SPECIFICATIONS.
5. ALL SURFACE WATER DRAINAGE PIPES TO BE LAID SOFFIT TO SOFFIT UNLESS STATED OTHERWISE.
6. REFER TO DRAINAGE NOTES DRAWING FOR FURTHER REQUIREMENTS.

- Legend**
- PLANNING BOUNDARY
 - PROPOSED SURFACE WATER PIPE
 - PROPOSED SURFACE WATER MANHOLE
 - PROPOSED LINEAR DRAIN (CHANNEL/SLOT)
 - PROPOSED KERB DRAIN
 - PROPOSED PERMEABLE PAVING (REFER TO STANDARD DETAILS DRAWING 25006-STN-EX-XX-DR-C-01100-01104)
 - PROPOSED FOUL PIPE
 - PROPOSED FOUL MANHOLE
 - PROPOSED INTERCEPTOR
 - PROPOSED PERFORATED PIPE
 - PROPOSED ATTENUATION TANK
 - PROPOSED COMBINED SEWER
 - PROPOSED GULLY
 - PROPOSED FILTER DRAIN
 - EXISTING SW DRAIN (FROM GPR)
 - EXISTING UIU COMBINED SEWER (FROM GPR AND UIU SEWER RECORDS)
 - EXISTING PRIVATE COMBINED SEWER (FROM GPR SURVEY)
 - PROPOSED RAINWATER PIPE
 - ROOT PROTECTION AREAS (REFER TO DRAWING 25006-HFR-AV-XXDR-A0101 PRODUCED BY ARBTECH)

PO4 DRAINAGE UPDATES, NEW DISCHARGE POINT FOR SURFACE AND FOUL WATER DRAINAGE	JK	NB	05.03.26	
PO5 DRAINAGE UPDATES	NM	NB	28.11.25	
PO4 LAYOUT AND DRAINAGE UPDATES	NM	NB	25.11.25	
PO3 LAYOUT AND DRAINAGE UPDATES	TF	NB	17.10.25	
PO2 LAYOUT UPDATED	JM	CF	07.08.25	
PO1 PLANNING ISSUE	NM	NB	31.07.25	
Issued/Revision	By	Appd	DD.MM.YYYY	
	NM	NB	25.11.25	
	Dwn	Dsgn	Chkd	DD.MM.YYYY

Issue Status

S4 - SUITABLE FOR STAGE APPROVAL

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo



Client/Project
KIER SHARSTON Ltd

SHARSTON INDUSTRIAL ESTATE

SHARSTON ROAD
WYTHENSHAW, MANCHESTER

Title
PROPOSED DRAINAGE LAYOUT

EXISTING UNITED UTILITIES
COMBINED SEWER (3301)
CL 35.110
IL 29.330

SHARSTON ROAD

EXISTING UNITED UTILITIES
COMBINED SEWER (2404)
CL 35.190
IL 28.750

LONGLEY LANE

Units 2, 3, 4, 5
FFL 35.530m

Units 6, 7, 8, 9
FFL 35.665m

Unit 1
FFL 35.450m

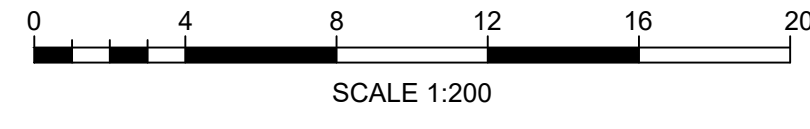
DN300 CONCRETE PIPE,
WITH CONCRETE BED AND
SURROUND (FULL TRENCH)
TO PASS UNDER BUILDING
AND AVOID FOUNDATIONS

SPEL FULL RETENTION
SEPARATOR
MODEL: P085 10/SC OR
SIMILAR APPROVED,
HEAVY TANK

SPEL FULL RETENTION
SEPARATOR
MODEL: P085 10/SC OR
SIMILAR APPROVED,
HEAVY TANK

SPEL BYPASS SEPARATOR
MODEL: 103 CL/SC OR
SIMILAR APPROVED,
HEAVY TANK

HARPER



Appendix I – Hydraulic Calculations



Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Tank Unit 1

Type : Tank

Dimensions

Exceedance Level (m)	34.942
Depth (m)	3.187
Base Level (m)	31.755
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	660.393

Depth (m)	Area (m²)	Volume (m³)
0.000	462.25	86.000
1.500	462.25	86.000

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	SW1.005
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (22)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

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

Outlets

Outlet

Outgoing Connection	Pipe (6)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	21.500

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Tank Unit 2 and 3

Type : Tank

Dimensions

Exceedance Level (m)	35.327
Depth (m)	1.965
Base Level (m)	33.362
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	559.565

Depth (m)	Area (m²)	Volume (m³)
0.000	588.00	0.000
1.000	588.00	558.600

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	SW11.000
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	SW9.007
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	SW7.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (11)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	28.000

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Porous Paving

Type : Porous Paving

Dimensions

Exceedance Level (m)	35.220
Depth (m)	0.500
Base Level (m)	34.720
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	1.0
Porosity (%)	30
Length (m)	42.624
Long. Slope (1:X)	10000.00
Width (m)	5.119
Total Volume (m³)	24.747

Under Drain

Height Above Base (m)	0.100
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Car Park 6
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (13)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	216.0
---------------------	-------

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Connections Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
SW1.001	7.828	Pipe	7.420		0.6	225	35.480	34.355
SW4.000	20.755	Pipe	20.651		0.6	225	35.358	34.000
SW8.000	22.719	Pipe	49.933		0.6	150	35.438	34.360
SW1.004	8.647	Pipe	78.605		0.6	300	35.483	33.105
SW5.001	9.043	Pipe	226.086		0.6	300	34.829	33.145
SW6.001	33.888	Pipe	99.671		0.6	225	35.244	34.115
Pipe (1)	16.492	Pipe	149.929		0.6	225	35.336	34.200
SW1.000	8.441	Pipe	153.479		0.6	225	35.103	33.975
Pipe (5)	28.133	Pipe	21.232		0.6	150	35.483	34.430
Pipe (10)	26.869	Pipe	46.892		0.6	300	35.614	34.123
Pipe (4)	30.987	Pipe	99.959		0.6	225	35.132	33.920
Pipe (12)	9.462	Pipe	30.521		0.6	225	34.998	33.610
Pipe (13)	3.737	Pipe	3.088		0.6	150	35.224	34.820
Pipe (14)	90.441	Pipe	155.932		0.6	750	35.110	29.330
SW1.008	13.631	Pipe	143.480		0.6	225	35.471	31.660
Pipe (15)	59.149	Pipe	149.745		0.6	225	35.428	34.300
Pipe (16)	36.239	Pipe	37.867		0.6	225	35.557	34.507
Pipe (17)	45.711	Pipe	69.260		0.6	225	35.556	34.210
Pipe (18)	46.077	Pipe	122.871		0.6	225	35.614	34.498
Pipe (8)	35.507	Pipe	97.013		0.6	225	35.614	34.489
Pipe (9)	11.342	Pipe	5.075		0.6	150	35.400	31.565
Pipe (19)	29.739	Pipe	21.242		0.6	225	35.365	32.965
SW11.000	10.211	Pipe	72.938		0.6	300	35.244	33.840
Pipe (20)	47.911	Pipe	245.699		0.6	300	35.480	33.300
Pipe (6)	2.911	Pipe	194.083		0.6	300	34.942	31.755
Pipe (7)	18.823	Pipe	121.437		0.6	300	34.829	33.105
Pipe (21)	6.080	Pipe	243.211		0.6	300	35.377	32.950
Pipe (23)	3.768	Pipe	94.200		0.6	150	35.064	31.740
Pipe (24)	5.819	Pipe	145.464		0.6	225	35.117	31.700
Pipe (11)	5.165	Pipe	109.897		0.6	300	35.327	33.362
Pipe (25)	6.220	Pipe	20.733		0.6	150	35.291	33.315
Pipe (26)	7.384	Pipe	147.688		0.6	225	35.289	33.015
Pipe (2)	47.350	Pipe	59.937		0.6	225	35.384	34.090
SW9.007	6.868	Pipe	137.350		0.6	300	35.557	33.550
SW7.002	6.342	Pipe	97.562		0.6	225	35.432	33.905
SW1.005	4.448	Pipe	22.809		0.6	375	35.352	32.995
Pipe (22)	2.410	Pipe	13.389		0.6	300	35.377	32.980
Pipe	12.719	Pipe	14.132		0.6	225	34.913	33.775

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Connections Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
SW1.001	35.480	33.300	None		(None)	(None)
SW4.000	35.352	32.995	None		(None)	(None)
SW8.000	35.432	33.905	None		(None)	(None)
SW1.004	35.352	32.995	None		(None)	(None)
SW5.001	34.829	33.105	None		(None)	(None)
SW6.001	34.913	33.775	None		(None)	(None)
Pipe (1)	35.384	34.090	None		(None)	(None)
SW1.000	35.132	33.920	None		(None)	(None)
Pipe (5)	35.483	33.105	None		(None)	(None)
Pipe (10)	35.557	33.550	None		(None)	(None)
Pipe (4)	34.998	33.610	None		(None)	(None)
Pipe (12)	35.480	33.300	None		(None)	(None)
Pipe (13)	34.998	33.610	None	0.0	(None)	(None)
Pipe (14)	35.190	28.750	None		(None)	(None)
SW1.008	35.400	31.565	None		(None)	(None)
Pipe (15)	35.432	33.905	None		(None)	(None)
Pipe (16)	35.557	33.550	None		(None)	(None)
Pipe (17)	35.557	33.550	None		(None)	(None)
Pipe (18)	35.614	34.123	None		(None)	(None)
Pipe (8)	35.614	34.123	None		(None)	(None)
Pipe (9)	35.110	29.330	None		(None)	(None)
Pipe (19)	35.400	31.565	None		(None)	(None)
SW11.000	35.327	33.700	All		(None)	(None)
Pipe (20)	35.483	33.105	None		(None)	(None)
Pipe (6)	35.064	31.740	None		(None)	(None)
Pipe (7)	35.377	32.950	None		(None)	(None)
Pipe (21)	35.377	32.925	None		(None)	(None)
Pipe (23)	35.117	31.700	None	2.0	(None)	(None)
Pipe (24)	35.471	31.660	None		(None)	(None)
Pipe (11)	35.291	33.315	None		(None)	(None)
Pipe (25)	35.289	33.015	None	2.0	(None)	(None)
Pipe (26)	35.365	32.965	None		(None)	(None)
Pipe (2)	35.480	33.300	None		(None)	(None)
SW9.007	35.327	33.500	All		(None)	(None)
SW7.002	35.327	33.840	All		(None)	(None)
SW1.005	34.942	32.800	All		(None)	(None)
Pipe (22)	34.942	32.800	All		(None)	(None)
Pipe	34.942	32.875	All		(None)	(None)

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Car Park 1	SWMH16		Time of Concentration	0.026	100	0	100	0.026
Car Park 2	SWMH01		Time of Concentration	0.058	100	0	100	0.058
Car Park 3	SWMH02		Time of Concentration	0.016	100	0	100	0.016
Car Park 4	SWMH17		Time of Concentration	0.014	100	0	100	0.014
Car Park 5	SWMH02		Time of Concentration	0.017	100	0	100	0.017
Car Park 6	Porous Paving		Time of Concentration	0.022	100	0	100	0.022
Main Yard 1	SWMH28		Time of Concentration	0.087	100	0	100	0.087
Main Yard 2	SWMH28		Time of Concentration	0.089	100	0	100	0.089
Main Yard 3	SWMH28		Time of Concentration	0.094	100	0	100	0.094
Main Yard 4	SWMH28		Time of Concentration	0.079	100	0	100	0.079
Unit 1 Roof 1	SWMH08		Time of Concentration	0.075	100	0	100	0.075
Unit 1 Roof 2	SWMH07		Time of Concentration	0.079	100	0	100	0.079
Unit 1 Roof 3	SWMH04		Time of Concentration	0.079	100	0	100	0.079
Unit 1 Roof 4	SWMH15		Time of Concentration	0.075	100	0	100	0.075
Unit 1 Yard 1	SWMH10		Time of Concentration	0.078	100	0	100	0.078
Unit 1 Yard 2	SWMH10		Time of Concentration	0.045	100	0	100	0.045
Unit 1 Yard 3	SWMH10		Time of Concentration	0.112	100	0	100	0.112
Unit 2 Roof 1	SWMH19		Time of Concentration	0.037	100	0	100	0.037
Unit 2 Roof 2	SWMH14		Time of Concentration	0.037	100	0	100	0.037
Unit 3 Roof 1	SWMH20		Time of Concentration	0.029	100	0	100	0.029
Unit 3 Roof 2	SWMH14		Time of Concentration	0.029	100	0	100	0.029
Unit 4 Roof 1	SWMH21		Time of Concentration	0.025	100	0	100	0.025
Unit 4 Roof 2	SWMH04		Time of Concentration	0.025	100	0	100	0.025
Unit 5 Roof 1	SWMH21		Time of Concentration	0.046	100	0	100	0.046
Unit 5 Roof 2	SWMH17		Time of Concentration	0.046	100	0	100	0.046
Unit 6 Roof 1	SWMH22		Time of Concentration	0.040	100	0	100	0.040
Unit 6 Roof 2	SWMH27		Time of Concentration	0.034	100	0	100	0.034
Unit 7 Roof 1	SWMH22		Time of Concentration	0.022	100	0	100	0.022
Unit 7 Roof 2	SWMH26		Time of Concentration	0.018	100	0	100	0.018
Unit 8 Roof 1	SWMH24		Time of Concentration	0.032	100	0	100	0.032
Unit 8 Roof 2	SWMH25		Time of Concentration	0.027	100	0	100	0.027
Unit 9 Roof 1	SWMH24		Time of Concentration	0.029	100	0	100	0.029

Trade City Sharston:				Date: 25/03/2026											
				Designed by:		Checked by:				Approved By:					
				NM											
Report Details: Type: Inflow Summary Storm Phase: Phase				100 Barbirolli Square : Manchester United Kingdom M2 3PW											
Unit 9 Roof 2		SWMH25		Time of Concentration		0.025				100		0		100	
TOTAL		0.0				1.545								1.545	

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



Flow Options

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

Pipe Options

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

Manhole Options

Apply Offset	☐
--------------	--------------------------

Trade City Sharston:	Date: 25/03/2026			
	Designed by: NM	Checked by:	Approved By:	
Report Details:	100 Barbirolli Square :			
Type: Outfall Details	Manchester			
Storm Phase: Phase	United Kingdom			
	M2 3PW			

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
UU 2404	Free Discharge			

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



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

Rainfall

FSR	Type: FSR
-----	-----------

Region	England And Wales
M5-60 (mm)	18.0
Ratio R	0.385
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
100.0	0.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 2 years: +0 %: 15 mins: Winter	35.10 3	33.97 5	34.054	0.079	9.4	0.089	0.000	9.1	4.327	OK
SWMH17	FSR: 2 years: +0 %: 15 mins: Winter	35.48 0	34.35 5	34.387	0.032	9.6	0.009	0.000	9.6	4.461	OK
SWMH04	FSR: 2 years: +0 %: 15 mins: Winter	35.48 0	33.30 0	33.497	0.197	55.2	0.223	0.000	49.6	26.488	OK
COMMH33	FSR: 2 years: +0 %: 1440 mins: Winter	35.47 1	31.66 0	31.686	0.026	1.0	0.029	0.000	1.0	150.372	OK
COMMH31	FSR: 2 years: +0 %: 960 mins: Winter	35.36 5	32.96 5	32.984	0.019	1.7	0.022	0.000	1.7	161.885	OK
SWMH22	FSR: 2 years: +0 %: 15 mins: Winter	35.61 4	34.49 8	34.568	0.070	9.9	0.020	0.000	9.4	4.575	OK
SWMH27	FSR: 2 years: +0 %: 15 mins: Winter	35.55 6	34.21 0	34.252	0.042	5.5	0.048	0.000	5.2	2.557	OK
SWMH26	FSR: 2 years: +0 %: 15 mins: Winter	35.55 7	33.55 0	33.680	0.130	33.9	0.147	0.000	30.1	16.776	OK
SWMH21	FSR: 2 years: +0 %: 15 mins: Winter	35.42 8	34.30 0	34.377	0.077	11.4	0.087	0.000	10.6	5.274	OK
SWMH28	FSR: 2 years: +0 %: 15 mins: Winter	35.24 4	33.84 0	33.996	0.156	56.5	0.176	0.000	55.4	26.070	OK
SWMH23	FSR: 2 years: +0 %: 15 mins: Winter	35.61 4	34.12 3	34.189	0.066	18.8	0.075	0.000	17.6	9.072	OK
SWMH20	FSR: 2 years: +0 %: 15 mins: Winter	35.43 2	33.90 5	34.010	0.105	21.1	0.119	0.000	19.1	10.154	OK
SWMH25	FSR: 2 years: +0 %: 15 mins: Winter	35.55 7	34.50 7	34.553	0.046	8.3	0.013	0.000	8.1	3.853	OK
SWMH05	FSR: 2 years: +0 %: 15 mins: Winter	35.48 3	33.10 5	33.265	0.160	60.1	0.181	0.000	56.9	31.353	OK
SWMH08	FSR: 2 years: +0 %: 15 mins: Winter	35.24 4	34.11 5	34.194	0.079	12.1	0.089	0.000	11.6	5.589	OK
SWMH10	FSR: 2 years: +0 %: 15 mins: Winter	34.82 9	33.14 5	33.305	0.160	37.8	0.181	0.000	37.2	17.456	OK
SWMH07	FSR: 2 years: +0 %: 15 mins: Winter	35.35 8	34.00 0	34.050	0.050	12.7	0.057	0.000	12.5	5.868	OK
SWMH06	FSR: 2 years: +0 %: 15 mins: Winter	35.35 2	32.99 5	33.120	0.125	69.4	0.141	0.000	68.0	37.195	OK
SWMH15	FSR: 2 years: +0 %: 15 mins: Winter	35.33 6	34.20 0	34.286	0.086	12.1	0.024	0.000	11.9	5.605	OK
SWMH19	FSR: 2 years: +0 %: 15 mins: Winter	35.43 8	34.36 0	34.409	0.049	5.9	0.055	0.000	5.8	2.744	OK
SWMH24	FSR: 2 years: +0 %: 15 mins: Winter	35.61 4	34.48 9	34.555	0.066	9.8	0.019	0.000	9.4	4.520	OK
SWMH09	FSR: 2 years: +0 %: 15 mins: Winter	34.91 3	33.77 5	33.820	0.045	11.6	0.050	0.000	11.2	5.581	OK
SWMH11	FSR: 2 years: +0 %: 15 mins: Winter	34.82 9	33.10 5	33.242	0.137	37.2	0.155	0.000	36.0	17.457	OK
SWMH16	FSR: 2 years: +0 %: 15 mins: Winter	35.38 4	34.09 0	34.162	0.072	16.1	0.020	0.000	15.4	7.566	OK
SWMH02	FSR: 2 years: +0 %: 15 mins: Winter	35.13 2	33.92 0	34.005	0.085	14.5	0.097	0.000	13.9	6.826	OK
SWMH14	FSR: 2 years: +0 %: 15 mins: Winter	35.48 3	34.43 0	34.483	0.053	10.7	0.015	0.000	10.5	4.934	OK
FC SWMH18	FSR: 2 years: +0 %: 1440 mins: Winter	35.06 4	31.74 0	32.154	0.414	1.0	0.468	0.000	1.0	150.492	Surcharged
SWMH03	FSR: 2 years: +0 %: 15 mins: Winter	34.99 8	33.61 0	33.665	0.055	13.9	0.063	0.000	13.5	6.815	OK
UU 2310	FSR: 2 years: +0 %: 360 mins: Winter	35.11 0	29.33 0	29.358	0.028	2.7	0.072	0.000	2.7	98.869	OK

Trade City Sharston:		Date: 25/03/2026			
		Designed by: NM	Checked by:	Approved By:	
Report Details: Type: Junctions Summary Storm Phase: Phase		100 Barbirolli Square : Manchester United Kingdom M2 3PW			

UU 2404	FSR: 2 years: +0 %: 360 mins: Winter	35.19 0	28.75 0	28.779	0.029	2.7	0.000	0.000	2.7	98.869	OK
COMMH34	FSR: 2 years: +0 %: 360 mins: Winter	35.40 0	31.56 5	31.584	0.019	2.7	0.021	0.000	2.7	99.180	OK
SWMH12	FSR: 2 years: +0 %: 15 mins: Winter	35.37 7	32.95 0	33.112	0.162	36.0	0.183	0.000	35.0	17.358	OK
SWMH13	FSR: 2 years: +0 %: 15 mins: Winter	35.37 7	32.92 5	33.065	0.140	35.0	0.159	0.000	34.7	17.258	OK
COMMH32	FSR: 2 years: +0 %: 1440 mins: Winter	35.11 7	31.70 0	31.725	0.025	1.0	0.028	0.000	1.0	150.425	OK
FC SWMH29	FSR: 2 years: +0 %: 480 mins: Winter	35.29 1	33.31 5	33.579	0.264	1.7	0.299	0.000	1.7	83.417	Surcharged
COMMH30	FSR: 2 years: +0 %: 360 mins: Winter	35.28 9	33.01 5	33.047	0.032	1.7	0.036	0.000	1.7	62.279	OK

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Report Details: Type: Junctions Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		





FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 30 years: +0 %: 15 mins: Winter	35.10 3	33.97 5	34.092	0.117	17.7	0.132	0.000	17.4	8.187	OK
SWMH17	FSR: 30 years: +0 %: 15 mins: Winter	35.48 0	34.35 5	34.400	0.045	18.2	0.013	0.000	18.2	8.429	OK
SWMH04	FSR: 30 years: +0 %: 15 mins: Winter	35.48 0	33.30 0	33.728	0.428	96.3	0.484	0.000	89.7	50.154	Surcharged
COMMH33	FSR: 30 years: +0 %: 1440 mins: Winter	35.47 1	31.66 0	31.685	0.025	1.1	0.029	0.000	1.1	157.874	OK
COMMH31	FSR: 30 years: +0 %: 1440 mins: Winter	35.36 5	32.96 5	32.984	0.019	1.7	0.022	0.000	1.7	261.291	OK
SWMH22	FSR: 30 years: +0 %: 15 mins: Winter	35.61 4	34.49 8	34.598	0.100	18.7	0.028	0.000	17.9	8.645	OK
SWMH27	FSR: 30 years: +0 %: 15 mins: Winter	35.55 6	34.21 0	34.269	0.059	10.4	0.066	0.000	10.0	4.830	OK
SWMH26	FSR: 30 years: +0 %: 960 mins: Winter	35.55 7	33.55 0	33.816	0.266	4.7	0.301	0.000	4.6	104.953	OK
SWMH21	FSR: 30 years: +0 %: 15 mins: Winter	35.42 8	34.30 0	34.410	0.110	21.6	0.124	0.000	20.3	9.969	OK
SWMH28	FSR: 30 years: +0 %: 15 mins: Winter	35.24 4	33.84 0	34.084	0.244	106.8	0.276	0.000	104.9	49.322	OK
SWMH23	FSR: 30 years: +0 %: 15 mins: Winter	35.61 4	34.12 3	34.216	0.093	35.8	0.105	0.000	34.0	17.158	OK
SWMH20	FSR: 30 years: +0 %: 15 mins: Winter	35.43 2	33.90 5	34.066	0.161	40.1	0.182	0.000	37.0	19.226	OK
SWMH25	FSR: 30 years: +0 %: 15 mins: Winter	35.55 7	34.50 7	34.570	0.063	15.7	0.018	0.000	15.4	7.287	OK
SWMH05	FSR: 30 years: +0 %: 15 mins: Winter	35.48 3	33.10 5	33.351	0.246	109.7	0.278	0.000	106.9	59.403	OK
SWMH08	FSR: 30 years: +0 %: 15 mins: Winter	35.24 4	34.11 5	34.227	0.112	22.9	0.126	0.000	22.1	10.574	OK
SWMH10	FSR: 30 years: +0 %: 15 mins: Winter	34.82 9	33.14 5	33.400	0.255	71.5	0.288	0.000	70.3	33.030	OK
SWMH07	FSR: 30 years: +0 %: 15 mins: Winter	35.35 8	34.00 0	34.069	0.069	24.0	0.078	0.000	23.7	11.098	OK
SWMH06	FSR: 30 years: +0 %: 15 mins: Winter	35.35 2	32.99 5	33.180	0.185	130.6	0.209	0.000	129.2	70.470	OK
SWMH15	FSR: 30 years: +0 %: 15 mins: Winter	35.33 6	34.20 0	34.324	0.124	23.0	0.035	0.000	22.6	10.608	OK
SWMH19	FSR: 30 years: +0 %: 15 mins: Winter	35.43 8	34.36 0	34.429	0.069	11.2	0.078	0.000	11.0	5.191	OK
SWMH24	FSR: 30 years: +0 %: 15 mins: Winter	35.61 4	34.48 9	34.583	0.094	18.5	0.027	0.000	17.9	8.545	OK
SWMH09	FSR: 30 years: +0 %: 15 mins: Winter	34.91 3	33.77 5	33.838	0.063	22.1	0.071	0.000	21.5	10.563	OK
SWMH11	FSR: 30 years: +0 %: 15 mins: Winter	34.82 9	33.10 5	33.316	0.211	70.3	0.239	0.000	68.3	33.030	OK
SWMH16	FSR: 30 years: +0 %: 15 mins: Winter	35.38 4	34.09 0	34.195	0.105	30.6	0.030	0.000	29.7	14.286	OK
SWMH02	FSR: 30 years: +0 %: 15 mins: Winter	35.13 2	33.92 0	34.042	0.122	27.6	0.137	0.000	27.2	12.918	OK
SWMH14	FSR: 30 years: +0 %: 15 mins: Winter	35.48 3	34.43 0	34.507	0.077	20.2	0.022	0.000	20.0	9.320	OK
FC SWMH18	FSR: 30 years: +0 %: 1440 mins: Winter	35.06 4	31.74 0	32.544	0.804	1.1	0.910	0.000	1.1	157.987	Surcharged
SWMH03	FSR: 30 years: +0 %: 15 mins: Winter	34.99 8	33.61 0	33.741	0.131	27.2	0.148	0.000	16.9	12.906	OK

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UU 2310	FSR: 30 years: +0 %: 30 mins: Winter	35.11 0	29.33 0	29.358	0.028	2.7	0.072	0.000	2.7	7.154	OK
UU 2404	FSR: 30 years: +0 %: 30 mins: Winter	35.19 0	28.75 0	28.779	0.029	2.7	0.000	0.000	2.7	7.154	OK
COMMH34	FSR: 30 years: +0 %: 120 mins: Winter	35.40 0	31.56 5	31.584	0.019	2.7	0.021	0.000	2.7	32.216	OK
SWMH12	FSR: 30 years: +0 %: 15 mins: Winter	35.37 7	32.95 0	33.176	0.226	68.3	0.255	0.000	66.8	32.927	OK
SWMH13	FSR: 30 years: +0 %: 15 mins: Winter	35.37 7	32.92 5	33.107	0.182	66.8	0.206	0.000	66.3	32.825	OK
COMMH32	FSR: 30 years: +0 %: 1440 mins: Winter	35.11 7	31.70 0	31.725	0.025	1.1	0.028	0.000	1.1	157.922	OK
FC SWMH29	FSR: 30 years: +0 %: 960 mins: Winter	35.29 1	33.31 5	33.816	0.501	1.7	0.567	0.000	1.7	173.156	Surcharged
COMMH30	FSR: 30 years: +0 %: 60 mins: Summer	35.28 9	33.01 5	33.047	0.032	1.7	0.036	0.000	1.7	10.149	OK

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Report Details: Type: Junctions Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 100 years: +0 %: 15 mins: Winter	35.103	33.975	34.118	0.143	22.9	0.161	0.000	18.7	10.575	OK
SWMH17	FSR: 100 years: +0 %: 15 mins: Winter	35.480	34.355	34.406	0.051	23.6	0.014	0.000	23.5	10.894	OK
SWMH04	FSR: 100 years: +0 %: 15 mins: Winter	35.480	33.300	34.041	0.741	117.6	0.838	0.000	115.8	64.817	Surcharged
COMMH33	FSR: 100 years: +0 %: 1440 mins: Winter	35.471	31.660	31.687	0.027	1.2	0.031	0.000	1.2	177.389	OK
COMMH31	FSR: 100 years: +0 %: 1440 mins: Summer	35.365	32.965	32.984	0.019	1.7	0.022	0.000	1.7	250.326	OK
SWMH22	FSR: 100 years: +0 %: 15 mins: Winter	35.614	34.498	34.615	0.117	24.2	0.033	0.000	23.2	11.165	OK
SWMH27	FSR: 100 years: +0 %: 15 mins: Winter	35.556	34.210	34.277	0.067	13.5	0.076	0.000	12.9	6.237	OK
SWMH26	FSR: 100 years: +0 %: 1440 mins: Winter	35.557	33.550	33.985	0.435	4.3	0.492	0.000	4.0	145.573	Surcharged
SWMH21	FSR: 100 years: +0 %: 15 mins: Winter	35.428	34.300	34.428	0.128	27.9	0.145	0.000	26.3	12.874	OK
SWMH28	FSR: 100 years: +0 %: 15 mins: Winter	35.244	33.840	34.236	0.396	138.0	0.447	0.000	134.0	63.736	Surcharged
SWMH23	FSR: 100 years: +0 %: 15 mins: Winter	35.614	34.123	34.229	0.106	46.3	0.120	0.000	44.2	22.173	OK
SWMH20	FSR: 100 years: +0 %: 15 mins: Winter	35.432	33.905	34.104	0.199	52.0	0.225	0.000	47.8	24.841	OK
SWMH25	FSR: 100 years: +0 %: 15 mins: Winter	35.557	34.507	34.579	0.072	20.3	0.020	0.000	20.0	9.408	OK
SWMH05	FSR: 100 years: +0 %: 15 mins: Winter	35.483	33.105	33.463	0.358	141.7	0.404	0.000	137.0	76.792	Surcharged
SWMH08	FSR: 100 years: +0 %: 15 mins: Winter	35.244	34.115	34.245	0.130	29.6	0.147	0.000	28.6	13.663	OK
SWMH10	FSR: 100 years: +0 %: 15 mins: Winter	34.829	33.145	33.487	0.342	92.4	0.387	0.000	90.0	42.667	Surcharged
SWMH07	FSR: 100 years: +0 %: 15 mins: Winter	35.358	34.000	34.079	0.079	31.0	0.090	0.000	30.7	14.337	OK
SWMH06	FSR: 100 years: +0 %: 15 mins: Winter	35.352	32.995	33.214	0.219	167.7	0.248	0.000	167.8	91.094	OK
SWMH15	FSR: 100 years: +0 %: 15 mins: Winter	35.336	34.200	34.348	0.148	29.7	0.042	0.000	28.9	13.707	OK
SWMH19	FSR: 100 years: +0 %: 15 mins: Winter	35.438	34.360	34.440	0.080	14.5	0.091	0.000	14.2	6.701	OK
SWMH24	FSR: 100 years: +0 %: 15 mins: Winter	35.614	34.489	34.598	0.109	23.9	0.031	0.000	23.2	11.041	OK
SWMH09	FSR: 100 years: +0 %: 15 mins: Winter	34.913	33.775	33.848	0.073	28.6	0.082	0.000	27.8	13.651	OK
SWMH11	FSR: 100 years: +0 %: 15 mins: Winter	34.829	33.105	33.370	0.265	90.0	0.300	0.000	87.7	42.667	OK
SWMH16	FSR: 100 years: +0 %: 15 mins: Winter	35.384	34.090	34.225	0.135	39.3	0.038	0.000	33.5	18.448	OK
SWMH02	FSR: 100 years: +0 %: 15 mins: Winter	35.132	33.920	34.116	0.196	31.9	0.221	0.000	21.3	16.700	OK
SWMH14	FSR: 100 years: +0 %: 15 mins: Winter	35.483	34.430	34.521	0.091	26.1	0.026	0.000	25.9	12.037	OK
FC SWMH18	FSR: 100 years: +0 %: 1440 mins: Winter	35.064	31.740	32.794	1.054	1.2	1.192	0.000	1.2	177.511	Surcharged

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SWMH03	FSR: 100 years: +0 %: 15 mins: Winter	34.99 8	33.61 0	34.061	0.451	21.3	0.510	0.000	19.9	16.674	Surcharged
UU 2310	FSR: 100 years: +0 %: 1440 mins: Winter	35.11 0	29.33 0	29.358	0.028	2.7	0.072	0.000	2.7	421.303	OK
UU 2404	FSR: 100 years: +0 %: 1440 mins: Winter	35.19 0	28.75 0	28.779	0.029	2.7	0.000	0.000	2.7	421.303	OK
COMMH34	FSR: 100 years: +0 %: 1440 mins: Winter	35.40 0	31.56 5	31.584	0.019	2.7	0.021	0.000	2.7	421.620	OK
SWMH12	FSR: 100 years: +0 %: 15 mins: Winter	35.37 7	32.95 0	33.218	0.268	87.7	0.303	0.000	86.0	42.564	OK
SWMH13	FSR: 100 years: +0 %: 15 mins: Winter	35.37 7	32.92 5	33.129	0.204	86.0	0.231	0.000	85.3	42.462	OK
COMMH32	FSR: 100 years: +0 %: 1440 mins: Winter	35.11 7	31.70 0	31.727	0.027	1.2	0.030	0.000	1.2	177.441	OK
FC SWMH29	FSR: 100 years: +0 %: 1440 mins: Winter	35.29 1	33.31 5	33.985	0.670	1.7	0.758	0.000	1.7	244.426	Surcharged
COMMH30	FSR: 100 years: +0 %: 30 mins: Winter	35.28 9	33.01 5	33.047	0.032	1.7	0.036	0.000	1.7	4.943	OK

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Report Details: Type: Junctions Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		





FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH01	FSR: 100 years: +45 %: 15 mins: Winter	35.103	33.975	34.853	0.878	33.2	0.993	0.000	25.4	15.370	Flood Risk
SWMH17	FSR: 100 years: +45 %: 15 mins: Winter	35.480	34.355	34.643	0.288	34.2	0.081	0.000	26.6	15.798	Surcharged
SWMH04	FSR: 100 years: +45 %: 15 mins: Winter	35.480	33.300	34.609	1.309	155.9	1.481	0.000	147.8	93.921	Surcharged
COMMH33	FSR: 100 years: +45 %: 1440 mins: Winter	35.471	31.660	31.693	0.033	1.8	0.037	0.000	1.8	214.841	OK
COMMH31	FSR: 100 years: +45 %: 1440 mins: Winter	35.365	32.965	32.985	0.020	1.8	0.022	0.000	1.8	272.683	OK
SWMH22	FSR: 100 years: +45 %: 15 mins: Winter	35.614	34.498	34.648	0.150	35.0	0.042	0.000	33.6	16.186	OK
SWMH27	FSR: 100 years: +45 %: 1440 mins: Winter	35.556	34.210	34.326	0.116	0.9	0.131	0.000	0.9	32.516	OK
SWMH26	FSR: 100 years: +45 %: 1440 mins: Winter	35.557	33.550	34.326	0.776	6.3	0.878	0.000	6.0	210.060	Surcharged
SWMH21	FSR: 100 years: +45 %: 15 mins: Winter	35.428	34.300	34.508	0.208	40.4	0.235	0.000	34.2	18.649	OK
SWMH28	FSR: 100 years: +45 %: 15 mins: Winter	35.244	33.840	34.507	0.667	200.1	0.754	0.000	197.1	92.412	Surcharged
SWMH23	FSR: 100 years: +45 %: 1440 mins: Winter	35.614	34.123	34.326	0.203	3.4	0.230	0.000	3.4	115.823	OK
SWMH20	FSR: 100 years: +45 %: 1440 mins: Winter	35.432	33.905	34.326	0.421	3.8	0.476	0.000	3.8	128.478	Surcharged
SWMH25	FSR: 100 years: +45 %: 15 mins: Winter	35.557	34.507	34.597	0.090	29.5	0.026	0.000	29.2	13.636	OK
SWMH05	FSR: 100 years: +45 %: 1440 mins: Winter	35.483	33.105	34.153	1.048	11.9	1.185	0.000	11.9	413.642	Surcharged
SWMH08	FSR: 100 years: +45 %: 15 mins: Winter	35.244	34.115	34.282	0.167	42.9	0.189	0.000	41.4	19.812	OK
SWMH10	FSR: 100 years: +45 %: 1440 mins: Winter	34.829	33.145	34.152	1.007	6.5	1.138	0.000	6.5	222.937	Surcharged
SWMH07	FSR: 100 years: +45 %: 1440 mins: Winter	35.358	34.000	34.151	0.151	2.2	0.171	0.000	2.2	74.835	OK
SWMH06	FSR: 100 years: +45 %: 1440 mins: Winter	35.352	32.995	34.152	1.157	14.1	1.309	0.000	14.1	487.373	Surcharged
SWMH15	FSR: 100 years: +45 %: 15 mins: Winter	35.336	34.200	35.005	0.805	43.0	0.228	0.000	34.2	19.877	Surcharged

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SWMH19	FSR: 100 years: +45 %: 15 mins: Winter	35.43 8	34.36 0	34.497	0.137	21.0	0.155	0.000	18.3	9.712	OK
SWMH24	FSR: 100 years: +45 %: 15 mins: Winter	35.61 4	34.48 9	34.628	0.139	34.6	0.039	0.000	33.7	16.011	OK
SWMH09	FSR: 100 years: +45 %: 1440 mins: Winter	34.91 3	33.77 5	34.152	0.377	2.1	0.426	0.000	2.1	71.760	Surcharged
SWMH11	FSR: 100 years: +45 %: 1440 mins: Winter	34.82 9	33.10 5	34.151	1.046	6.5	1.183	0.000	6.5	223.023	Surcharged
SWMH16	FSR: 100 years: +45 %: 15 mins: Winter	35.38 4	34.09 0	34.915	0.825	49.2	0.233	0.000	40.8	26.762	Surcharged
SWMH02	FSR: 100 years: +45 %: 15 mins: Winter	35.13 2	33.92 0	34.822	0.902	44.5	1.020	0.000	36.8	24.246	Surcharged
SWMH14	FSR: 100 years: +45 %: 15 mins: Winter	35.48 3	34.43 0	34.681	0.251	37.8	0.071	0.000	32.8	17.451	Surcharged
FC SWMH18	FSR: 100 years: +45 %: 1440 mins: Winter	35.06 4	31.74 0	34.152	2.412	2.5	2.728	0.000	1.8	214.993	Surcharged
SWMH03	FSR: 100 years: +45 %: 15 mins: Winter	34.99 8	33.61 0	34.651	1.041	36.8	1.177	0.000	39.3	24.269	Surcharged
UU 2310	FSR: 100 years: +45 %: 1440 mins: Winter	35.11 0	29.33 0	29.362	0.032	3.5	0.081	0.000	3.5	487.128	OK
UU 2404	FSR: 100 years: +45 %: 1440 mins: Winter	35.19 0	28.75 0	28.783	0.033	3.5	0.000	0.000	3.5	487.128	OK
COMMH34	FSR: 100 years: +45 %: 1440 mins: Winter	35.40 0	31.56 5	31.586	0.021	3.5	0.024	0.000	3.5	487.458	OK
SWMH12	FSR: 100 years: +45 %: 1440 mins: Winter	35.37 7	32.95 0	34.152	1.202	6.5	1.360	0.000	6.5	222.944	Surcharged
SWMH13	FSR: 100 years: +45 %: 1440 mins: Winter	35.37 7	32.92 5	34.152	1.227	6.5	1.388	0.000	6.5	220.873	Surcharged
COMMH32	FSR: 100 years: +45 %: 1440 mins: Winter	35.11 7	31.70 0	31.732	0.032	1.8	0.037	0.000	1.8	214.900	OK
FC SWMH29	FSR: 100 years: +45 %: 1440 mins: Winter	35.29 1	33.31 5	34.326	1.011	1.8	1.144	0.000	1.8	272.810	Surcharged
COMMH30	FSR: 100 years: +45 %: 1440 mins: Winter	35.28 9	33.01 5	33.048	0.033	1.8	0.037	0.000	1.8	272.732	OK

Trade City Sharston:		Date: 25/03/2026			
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FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank Unit 1	FSR: 2 years: +0 %: 1440 mins: Winter	32.154	32.154	0.399	0.399	7.0	175.315	0.000	0.000	1.0	150.813	73.453	OK
Tank Unit 2 and 3	FSR: 2 years: +0 %: 480 mins: Winter	33.579	33.579	0.217	0.217	13.8	121.410	0.000	0.000	1.7	83.727	78.303	OK
Porous Paving	FSR: 2 years: +0 %: 1440 mins: Winter	34.821	34.820	0.096	0.100	0.2	6.390	0.000	0.000	0.0	0.000	74.179	OK

Trade City Sharston:		Date: 25/03/2026			
		Designed by: NM	Checked by:		Approved By:
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FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank Unit 1	FSR: 30 years: +0 %: 1440 mins: Winter	32.544	32.544	0.789	0.789	12.2	346.696	0.000	0.000	1.1	158.795	47.502	OK
Tank Unit 2 and 3	FSR: 30 years: +0 %: 960 mins: Winter	33.816	33.816	0.454	0.454	14.5	253.854	0.000	0.000	1.7	173.722	54.634	OK
Porous Paving	FSR: 30 years: +0 %: 1440 mins: Winter	34.877	34.832	0.153	0.112	0.3	9.102	0.000	0.000	0.1	4.031	63.221	OK

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FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank Unit 1	FSR: 100 years: +0 %: 1440 mins: Winter	32.794	32.794	1.039	1.039	15.6	456.109	0.000	0.000	1.2	178.579	30.934	OK
Tank Unit 2 and 3	FSR: 100 years: +0 %: 1440 mins: Winter	33.985	33.985	0.623	0.623	13.4	348.088	0.000	0.000	1.7	245.122	37.793	OK
Porous Paving	FSR: 100 years: +0 %: 1440 mins: Winter	34.906	34.838	0.181	0.118	0.4	10.505	0.000	0.000	0.1	6.951	57.552	OK

Trade City Sharston:		Date: 25/03/2026		
		Designed by: NM	Checked by:	Approved By:
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FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank Unit 1	FSR: 100 years: +45 %: 1440 mins: Winter	34.152	34.152	2.397	2.397	22.7	659.710	0.000	0.000	2.5	218.013	0.103	OK
Tank Unit 2 and 3	FSR: 100 years: +45 %: 1440 mins: Winter	34.326	34.326	0.964	0.964	19.6	538.605	0.000	0.000	1.8	273.877	3.746	OK
Porous Paving	FSR: 100 years: +45 %: 960 mins: Winter	34.954	34.856	0.229	0.136	0.8	12.898	0.000	0.000	0.3	11.240	47.881	OK

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 7	SWMH0 4	35.480	34.387	0.114	4.461	0.5	0.05	9.6	OK
SW4.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 7	SWMH0 6	35.358	34.050	0.087	5.868	0.9	0.11	12.5	OK
SW8.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 9	SWMH2 0	35.438	34.409	0.077	2.744	0.6	0.23	5.8	OK
SW1.004	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 5	SWMH0 6	35.483	33.265	0.142	31.353	1.7	0.45	56.9	OK
SW5.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 0	SWMH1 1	34.829	33.305	0.149	17.456	1.1	0.5	37.2	OK
SW6.001	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 8	SWMH0 9	35.244	34.194	0.062	5.589	1.3	0.22	11.6	OK
Pipe (1)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 5	SWMH1 6	35.336	34.286	0.079	5.605	1.0	0.28	11.9	OK
SW1.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 1	SWMH0 2	35.103	34.054	0.082	4.327	0.7	0.22	9.1	OK
Pipe (5)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 4	SWMH0 5	35.483	34.483	0.106	4.934	0.8	0.27	10.5	OK
Pipe (10)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 3	SWMH2 6	35.614	34.189	0.098	9.072	0.9	0.11	17.6	OK
Pipe (4)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 2	SWMH0 3	35.132	34.005	0.070	6.826	1.3	0.27	13.9	OK
Pipe (12)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 3	SWMH0 4	34.998	33.665	0.126	6.815	0.6	0.14	13.5	OK
Pipe (13)	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	Porous Paving	SWMH0 3	35.224	34.742	0.027	0.000	0.0	0	0.0	OK
Pipe (14)	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	UU 2310	UU 2404	35.110	29.358	0.029	98.869	0.5	0	2.7	OK
SW1.008	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	COMMH 33	COMMH 34	35.471	31.685	0.022	37.014	0.5	0.02	1.0	OK
Pipe (15)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 1	SWMH2 0	35.428	34.377	0.091	5.274	0.7	0.25	10.6	OK
Pipe (16)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 5	SWMH2 6	35.557	34.553	0.088	3.853	0.6	0.1	8.1	OK
Pipe (17)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 7	SWMH2 6	35.556	34.252	0.086	2.557	0.4	0.08	5.2	OK
Pipe (18)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 2	SWMH2 3	35.614	34.568	0.068	4.575	0.9	0.2	9.4	OK

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Pipe (8)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 4	SWMH2 3	35.614	34.555	0.066	4.520	1.0	0.18	9.4	OK
Pipe (9)	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	COMMH 34	UU 2310	35.400	31.584	0.024	99.180	1.5	0.03	2.7	OK
Pipe (19)	FSR: 2 years: +0 %: 960 mins: Winter	Pipe	COMMH 31	COMMH 34	35.365	32.984	0.019	161.885	1.0	0.01	1.7	OK
SW11.000	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 8	Tank Unit 2 and 3	35.244	33.996	0.146	26.070	1.6	0.43	55.4	OK
Pipe (20)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 4	SWMH0 5	35.480	33.497	0.179	26.488	1.1	0.7	49.6	OK
Pipe (6)	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	Tank Unit 1	FC SWMH1 8	34.942	31.929	0.182	2.959	0.3	0.02	1.2	OK
Pipe (7)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 1	SWMH1 2	34.829	33.242	0.150	17.457	1.0	0.36	36.0	OK
Pipe (21)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 2	SWMH1 3	35.377	33.112	0.151	17.358	1.0	0.49	35.0	OK
Pipe (23)	FSR: 2 years: +0 %: 60 mins: Winter	Pipe	FC SWMH1 8	COMMH 32	35.064	31.972	0.025	5.770	0.5	0.06	1.0	Surcharged
Pipe (24)	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	COMMH 32	COMMH 33	35.117	31.725	0.025	37.064	0.4	0.02	1.0	OK
Pipe (11)	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	Tank Unit 2 and 3	FC SWMH2 9	35.327	33.574	0.236	62.700	0.2	0.02	1.7	OK
Pipe (25)	FSR: 2 years: +0 %: 360 mins: Winter	Pipe	FC SWMH2 9	COMMH 30	35.291	33.574	0.027	62.334	0.8	0.04	1.7	Surcharged
Pipe (26)	FSR: 2 years: +0 %: 480 mins: Winter	Pipe	COMMH 30	COMMH 31	35.289	33.047	0.026	83.338	0.7	0.04	1.7	OK
Pipe (2)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 6	SWMH0 4	35.384	34.162	0.134	7.566	0.6	0.23	15.4	OK
SW9.007	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 6	Tank Unit 2 and 3	35.557	33.680	0.123	16.776	1.1	0.32	30.1	OK
SW7.002	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH2 0	Tank Unit 2 and 3	35.432	34.010	0.099	10.154	1.1	0.36	19.1	OK
SW1.005	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 6	Tank Unit 1	35.352	33.120	0.113	37.195	2.4	0.16	68.0	OK
Pipe (22)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH1 3	Tank Unit 1	35.377	33.065	0.077	17.258	2.4	0.11	34.7	OK
Pipe	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	SWMH0 9	Tank Unit 1	34.913	33.820	0.044	5.581	2.1	0.08	11.2	OK

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FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH17	SWMH04	35.480	34.400	0.225	8.429	0.5	0.09	18.2	OK
SW4.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH07	SWMH06	35.358	34.069	0.127	11.098	1.0	0.21	23.7	OK
SW8.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH19	SWMH20	35.438	34.429	0.115	5.191	0.8	0.44	11.0	OK
SW1.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH05	SWMH06	35.483	33.351	0.216	59.403	2.0	0.85	106.9	OK
SW5.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH10	SWMH11	34.829	33.400	0.233	33.030	1.2	0.95	70.3	OK
SW6.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH08	SWMH09	35.244	34.227	0.087	10.574	1.5	0.42	22.1	OK
Pipe (1)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH15	SWMH16	35.336	34.324	0.115	10.608	1.1	0.53	22.6	OK
SW1.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH01	SWMH02	35.103	34.092	0.119	8.187	0.8	0.41	17.4	OK
Pipe (5)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH14	SWMH05	35.483	34.507	0.150	9.320	1.1	0.52	20.0	OK
Pipe (10)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH23	SWMH26	35.614	34.216	0.145	17.158	1.0	0.21	34.0	OK
Pipe (4)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH02	SWMH03	35.132	34.042	0.126	12.918	1.2	0.52	27.2	OK
Pipe (12)	FSR: 30 years: +0 %: 30 mins: Winter	Pipe	SWMH03	SWMH04	34.998	33.675	0.165	16.943	0.6	0.19	18.4	OK
Pipe (13)	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	Porous Paving	SWMH03	35.224	34.859	0.009	3.913	0.6	0	0.1	OK
Pipe (14)	FSR: 30 years: +0 %: 30 mins: Winter	Pipe	UU 2310	UU 2404	35.110	29.358	0.029	7.154	0.5	0	2.7	OK

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SW1.008	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	COMMH 33	COMMH 34	35.471	31.685	0.022	157.874	0.5	0.02	1.1	OK
Pipe (15)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 1	SWMH2 0	35.428	34.410	0.135	9.969	0.8	0.48	20.3	OK
Pipe (16)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 5	SWMH2 6	35.557	34.570	0.130	7.287	0.6	0.18	15.4	OK
Pipe (17)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 7	SWMH2 6	35.556	34.269	0.128	4.830	0.4	0.16	10.0	OK
Pipe (18)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 2	SWMH2 3	35.614	34.598	0.097	8.645	1.1	0.38	17.9	OK
Pipe (8)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 4	SWMH2 3	35.614	34.583	0.093	8.545	1.2	0.34	17.9	OK
Pipe (9)	FSR: 30 years: +0 %: 120 mins: Winter	Pipe	COMMH 34	UU 2310	35.400	31.584	0.024	32.216	1.5	0.03	2.7	OK
Pipe (19)	FSR: 30 years: +0 %: 60 mins: Summer	Pipe	COMMH 31	COMMH 34	35.365	32.984	0.019	10.097	1.0	0.02	1.7	OK
SW11.000	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 8	Tank Unit 2 and 3	35.244	34.084	0.223	49.322	1.9	0.81	104.9	OK
Pipe (20)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH0 4	SWMH0 5	35.480	33.728	0.300	50.154	1.3	1.27	89.7	Surcharged
Pipe (6)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	Tank Unit 1	FC SWMH1 8	34.942	32.011	0.263	1.745	0.4	0.02	1.6	OK
Pipe (7)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH1 1	SWMH1 2	34.829	33.316	0.219	33.030	1.2	0.68	68.3	OK
Pipe (21)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH1 2	SWMH1 3	35.377	33.176	0.204	32.927	1.3	0.94	66.8	OK
Pipe (23)	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	FC SWMH1 8	COMMH 32	35.064	32.544	0.025	157.959	0.5	0.06	1.1	Surcharged
Pipe (24)	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	COMMH 32	COMMH 33	35.117	31.725	0.025	157.922	0.4	0.02	1.1	OK
Pipe (11)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	Tank Unit 2 and 3	FC SWMH2 9	35.327	33.538	0.199	2.604	0.4	0.02	2.1	OK
Pipe (25)	FSR: 30 years: +0 %: 60 mins: Summer	Pipe	FC SWMH2 9	COMMH 30	35.291	33.616	0.027	10.205	0.8	0.04	1.7	Surcharged

Trade City Sharston:		Date: 25/03/2026		
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Pipe (26)	FSR: 30 years: +0 %: 360 mins: Winter	Pipe	COMMH 30	COMMH 31	35.289	33.047	0.026	64.431	0.7	0.04	1.7	OK
Pipe (2)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH1 6	SWMH0 4	35.384	34.195	0.225	14.286	0.7	0.44	29.7	OK
SW9.007	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 6	Tank Unit 2 and 3	35.557	33.747	0.184	31.762	1.3	0.63	59.2	OK
SW7.002	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH2 0	Tank Unit 2 and 3	35.432	34.066	0.150	19.226	1.3	0.7	37.0	OK
SW1.005	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH0 6	Tank Unit 1	35.352	33.180	0.164	70.470	2.8	0.31	129.2	OK
Pipe (22)	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH1 3	Tank Unit 1	35.377	33.107	0.111	32.825	2.8	0.22	66.3	OK
Pipe	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	SWMH0 9	Tank Unit 1	34.913	33.838	0.061	10.563	2.4	0.15	21.5	OK

Trade City Sharston:	Date: 25/03/2026		
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Report Details: Type: Connections Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		





FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.001	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH17	SWMH04	35.480	34.406	0.225	10.894	0.6	0.12	23.5	OK
SW4.000	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH07	SWMH06	35.358	34.079	0.149	14.337	1.1	0.27	30.7	OK
SW8.000	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH19	SWMH20	35.438	34.440	0.140	6.701	0.8	0.56	14.2	OK
SW1.004	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH05	SWMH06	35.483	33.463	0.288	76.792	2.0	1.09	137.0	Surcharged
SW5.001	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH10	SWMH11	34.829	33.487	0.300	42.667	1.3	1.22	90.0	Surcharged
SW6.001	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH08	SWMH09	35.244	34.245	0.101	13.663	1.6	0.55	28.6	OK
Pipe (1)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH15	SWMH16	35.336	34.348	0.141	13.707	1.1	0.68	28.9	OK
SW1.000	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	SWMH01	SWMH02	35.103	34.107	0.134	9.444	0.9	0.51	21.3	OK
Pipe (5)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH14	SWMH05	35.483	34.521	0.150	12.037	1.5	0.67	25.9	OK
Pipe (10)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH23	SWMH26	35.614	34.229	0.174	22.173	1.0	0.27	44.2	OK
Pipe (4)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	SWMH02	SWMH03	35.132	34.057	0.225	14.895	1.2	0.54	28.2	OK
Pipe (12)	FSR: 100 years: +0 %: 30 mins: Winter	Pipe	SWMH03	SWMH04	34.998	33.763	0.225	22.095	0.6	0.25	23.9	OK
Pipe (13)	FSR: 100 years: +0 %: 360 mins: Winter	Pipe	Porous Paving	SWMH03	35.224	34.868	0.017	2.130	0.6	0	0.1	OK
Pipe (14)	FSR: 100 years: +0 %: 1440 mins: Winter	Pipe	UU 2310	UU 2404	35.110	29.358	0.029	421.303	0.5	0	2.7	OK

Trade City Sharston:		Date: 25/03/2026		
		Designed by: NM	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase		100 Barbirolli Square : Manchester United Kingdom M2 3PW		



SW1.008	FSR: 100 years: +0 %: 1440 mins: Winter	Pipe	COMMH 33	COMMH 34	35.471	31.687	0.023	177.389	0.6	0.03	1.2	OK
Pipe (15)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 1	SWMH2 0	35.428	34.428	0.164	12.874	0.8	0.62	26.3	OK
Pipe (16)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 5	SWMH2 6	35.557	34.579	0.156	9.408	0.7	0.24	20.0	OK
Pipe (17)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 7	SWMH2 6	35.556	34.277	0.154	6.237	0.4	0.21	12.9	OK
Pipe (18)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 2	SWMH2 3	35.614	34.615	0.112	11.165	1.2	0.49	23.2	OK
Pipe (8)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 4	SWMH2 3	35.614	34.598	0.108	11.041	1.2	0.44	23.2	OK
Pipe (9)	FSR: 100 years: +0 %: 1440 mins: Winter	Pipe	COMMH 34	UU 2310	35.400	31.584	0.024	421.620	1.5	0.03	2.7	OK
Pipe (19)	FSR: 100 years: +0 %: 30 mins: Summer	Pipe	COMMH 31	COMMH 34	35.365	32.984	0.019	4.839	1.1	0.02	1.7	OK
SW11.000	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 8	Tank Unit 2 and 3	35.244	34.236	0.300	63.736	1.9	1.03	134.0	Surcharged
Pipe (20)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH0 4	SWMH0 5	35.480	34.041	0.300	64.817	1.6	1.64	115.8	Surcharged
Pipe (6)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	Tank Unit 1	FC SWMH1 8	34.942	32.086	0.300	1.866	0.4	0.02	2.0	Surcharged
Pipe (7)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH1 1	SWMH1 2	34.829	33.370	0.266	42.667	1.3	0.87	87.7	OK
Pipe (21)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH1 2	SWMH1 3	35.377	33.218	0.236	42.564	1.4	1.21	86.0	OK
Pipe (23)	FSR: 100 years: +0 %: 1440 mins: Winter	Pipe	FC SWMH1 8	COMMH 32	35.064	32.794	0.027	177.481	0.6	0.07	1.2	Surcharged
Pipe (24)	FSR: 100 years: +0 %: 1440 mins: Winter	Pipe	COMMH 32	COMMH 33	35.117	31.727	0.027	177.441	0.4	0.03	1.2	OK
Pipe (11)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	Tank Unit 2 and 3	FC SWMH2 9	35.327	33.589	0.251	2.792	0.4	0.02	2.4	OK
Pipe (25)	FSR: 100 years: +0 %: 30 mins: Summer	Pipe	FC SWMH2 9	COMMH 30	35.291	33.629	0.027	4.947	0.8	0.04	1.7	Surcharged

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Pipe (26)	FSR: 100 years: +0 %: 60 mins: Summer	Pipe	COMMH 30	COMMH 31	35.289	33.047	0.026	10.310	0.7	0.04	1.7	OK
Pipe (2)	FSR: 100 years: +0 %: 15 mins: Summer	Pipe	SWMH1 6	SWMH0 4	35.384	34.209	0.225	16.468	0.9	0.54	36.3	OK
SW9.007	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 6	Tank Unit 2 and 3	35.557	33.791	0.223	40.756	1.4	0.82	77.5	OK
SW7.002	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH2 0	Tank Unit 2 and 3	35.432	34.104	0.183	24.841	1.4	0.91	47.8	OK
SW1.005	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH0 6	Tank Unit 1	35.352	33.214	0.192	91.094	3.0	0.4	167.8	OK
Pipe (22)	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH1 3	Tank Unit 1	35.377	33.129	0.129	42.462	2.9	0.28	85.3	OK
Pipe	FSR: 100 years: +0 %: 15 mins: Winter	Pipe	SWMH0 9	Tank Unit 1	34.913	33.848	0.070	13.651	2.6	0.2	27.8	OK

Trade City Sharston:	Date: 25/03/2026		
	Designed by: NM	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	100 Barbirolli Square : Manchester United Kingdom M2 3PW		





FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH17	SWMH04	35.480	34.643	0.225	15.798	0.7	0.14	26.6	Surcharged
SW4.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH07	SWMH06	35.358	34.097	0.182	20.784	1.3	0.39	44.6	OK
SW8.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH19	SWMH20	35.438	34.497	0.150	9.712	1.0	0.72	18.3	OK
SW1.004	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH05	SWMH06	35.483	33.676	0.300	111.309	2.5	1.42	178.4	Surcharged
SW5.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH10	SWMH11	34.829	33.900	0.300	61.873	1.8	1.76	129.6	Surcharged
SW6.001	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH08	SWMH09	35.244	34.282	0.128	19.812	1.8	0.8	41.4	OK
Pipe (1)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH15	SWMH16	35.336	35.005	0.225	19.877	0.9	0.81	34.2	Surcharged
SW1.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH01	SWMH02	35.103	34.853	0.225	15.370	0.7	0.61	25.4	Flood Risk
Pipe (5)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH14	SWMH05	35.483	34.681	0.150	17.451	1.9	0.85	32.8	Surcharged
Pipe (10)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH23	SWMH26	35.614	34.253	0.259	32.174	1.0	0.4	64.7	OK
Pipe (4)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH02	SWMH03	35.132	34.822	0.225	24.246	1.3	0.71	36.8	Surcharged
Pipe (12)	FSR: 100 years: +45 %: 15 mins: Summer	Pipe	SWMH03	SWMH04	34.998	34.526	0.225	21.604	1.2	0.52	48.8	Surcharged
Pipe (13)	FSR: 100 years: +45 %: 240 mins: Winter	Pipe	Porous Paving	SWMH03	35.224	34.906	0.025	4.236	0.8	0	0.3	OK
Pipe (14)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	UU 2310	UU 2404	35.110	29.362	0.032	487.128	0.5	0	3.5	OK

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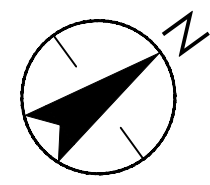
SW1.008	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	COMMH 33	COMMH 34	35.471	31.693	0.027	214.841	0.7	0.04	1.8	OK
Pipe (15)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 1	SWMH2 0	35.428	34.508	0.225	18.649	0.9	0.81	34.2	OK
Pipe (16)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 5	SWMH2 6	35.557	34.597	0.225	13.636	0.7	0.34	29.2	OK
Pipe (17)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 7	SWMH2 6	35.556	34.294	0.225	9.040	0.5	0.3	19.0	OK
Pipe (18)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 2	SWMH2 3	35.614	34.648	0.140	16.186	1.3	0.72	33.6	OK
Pipe (8)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 4	SWMH2 3	35.614	34.628	0.134	16.011	1.4	0.64	33.7	OK
Pipe (9)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	COMMH 34	UU 2310	35.400	31.586	0.027	487.458	1.7	0.04	3.5	OK
Pipe (19)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	COMMH 31	COMMH 34	35.365	32.985	0.021	272.683	1.1	0.02	1.8	OK
SW11.000	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 8	Tank Unit 2 and 3	35.244	34.507	0.300	92.412	2.8	1.51	197.1	Surcharged
Pipe (20)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH0 4	SWMH0 5	35.480	34.609	0.300	93.921	2.1	2.09	147.8	Surcharged
Pipe (6)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	Tank Unit 1	FC SWMH1 8	34.942	34.152	0.300	217.301	0.2	0.03	2.5	Surcharged
Pipe (7)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH1 1	SWMH1 2	34.829	33.694	0.300	61.871	1.8	1.25	126.3	Surcharged
Pipe (21)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH1 2	SWMH1 3	35.377	33.369	0.300	61.772	1.8	1.76	125.0	Surcharged
Pipe (23)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	FC SWMH1 8	COMMH 32	35.064	34.152	0.033	214.944	0.6	0.1	1.8	Surcharged
Pipe (24)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	COMMH 32	COMMH 33	35.117	31.732	0.032	214.900	0.5	0.04	1.8	OK
Pipe (11)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	Tank Unit 2 and 3	FC SWMH2 9	35.327	33.691	0.300	3.019	0.4	0.03	2.9	Surcharged
Pipe (25)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	FC SWMH2 9	COMMH 30	35.291	34.326	0.027	272.786	0.8	0.05	1.8	Surcharged

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Pipe (26)	FSR: 100 years: +45 %: 1440 mins: Winter	Pipe	COMMH 30	COMMH 31	35.289	33.048	0.026	272.732	0.7	0.04	1.8	OK
Pipe (2)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH1 6	SWMH0 4	35.384	34.915	0.225	26.762	1.0	0.61	40.8	Surcharged
SW9.007	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 6	Tank Unit 2 and 3	35.557	33.939	0.300	57.846	1.7	1.25	118.7	Surcharged
SW7.002	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH2 0	Tank Unit 2 and 3	35.432	34.240	0.225	36.039	1.7	1.3	68.3	Surcharged
SW1.005	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH0 6	Tank Unit 1	35.352	33.261	0.230	132.055	3.1	0.53	221.0	OK
Pipe (22)	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH1 3	Tank Unit 1	35.377	33.173	0.163	61.669	3.2	0.41	124.1	OK
Pipe	FSR: 100 years: +45 %: 15 mins: Winter	Pipe	SWMH0 9	Tank Unit 1	34.913	33.865	0.086	19.798	2.9	0.29	40.4	OK

Appendix J - Overland Flow Plan







Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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