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Date: **19th December 2022**

Rev: **0**

Client

**Henderson Homes
Narlin
Clumhunger Lane
Mere
WA16 6QG**

Site Address

**Land Adj Monet Lodge
Cavendish Road
West Didsbury
Manchester
M20 1JG**

Document Title

Drainage Condition Report

Project Title Drainage Condition Report – Monet Lodge, Didsbury, Manchester, M20 1JG
Project No 2751
Date 19th December 2022



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Revision History

Issue	Date	Status	Prepared By	Signature
O	19.12.22	First Issue	Lee Meadowcroft BSc(Hons) PgDip MScCHE CEng MStructE MICE IHBC	

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1.0 Introduction

- 1.1 In February 2022 a planning application was submitted to Manchester City Council for the erection of a pair of semi-detached dwellings together with associated works including landscaping and carparking.
- 1.2 Planning approval was granted in June 2022 (Ref: 133030/FO/2022) subject to a number of planning conditions, including one condition relating to the drainage of the development.
- 1.3 This report has been prepared to remove these drainage related planning conditions relevant to the application. The condition is number 5.

2.0 Drainage Strategy

2.1 Existing Drainage Layout

- 2.1.1 The United Utilities sewer records have been reviewed (refer to Figure 1 below) and confirms that there is a 450mm diameter combined sewer in Cavendish Road to the north of the site flowing in an easterly direction. There are no surface water sewers in close proximity that are accessible.

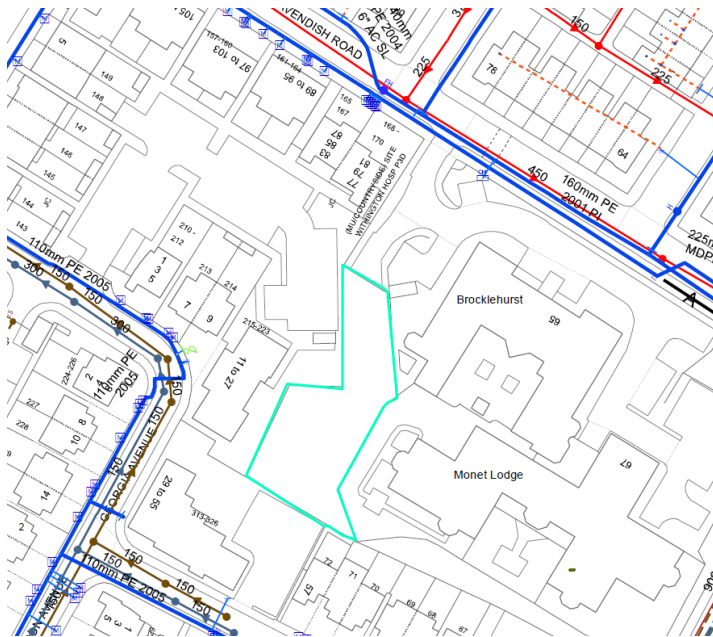


Figure 1 United Utilities Sewer Records

2.2 Existing Runoff

- 2.2.1 The current site can be classed as Greenfield. Figure 2 below defines the existing Greenfield runoff rates based on the respective rainfall intensities and an impermeable area of 0.075ha.

Existing Permeable Area (ha)	1yr Greenfield Rate	Qbar Greenfield Rate	30yr Greenfield Rate	100yr Greenfield Rate
0.075	0.1 l/s	0.2 l/s	0.3 l/s	0.3 l/s

Figure 2 Existing Greenfield Runoff Rates

2.3 Geology

2.3.1 A site specific Phase 2 intrusive investigation has been undertaken. This has identified shallow made ground over sands and gravels. In light of these findings, infiltration is deemed a suitable option to drain the site.

2.3.2 Site-specific BRE compliant soil percolation tests have been carried out at the site. The following test results were defined:

TP1 – 1.2×10^{-6} m/s

TP2 – 3.3×10^{-6} m/s

TP3 – 4.2×10^{-6} m/s

Based on these findings a rate of 3.3×10^{-6} m/s will be used in the design as this is the closest rate to the proposed infiltration device.

2.4 Hydrological Assessment

2.4.1 A review of the topographical survey, OS Maps and Environment Agency maps would indicate the closest watercourse to be located over 1.0 km to the south.

2.5 SuDS Hierarchal Approach

2.5.1 Based on the existing drainage configuration, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	Yes	Intrusive site investigations would indicate that the underlying ground is suitable for infiltration.
Connection to Watercourse	No	No watercourse in close proximity.
Connection to Surface Water Sewer	No	No surface water sewer in close proximity.
Connection to a Combined Sewer	No	Infiltration option takes precedent.

Figure 3 SuDS Hierarchal Approach

2.6 Surface Water Drainage Strategy

- 2.6.1 The SuDS assessment and hierarchal approach discussed in Figure 3 above has defined the overall SuDS strategy. The general principal of the surface water drainage strategy is to collect the runoff from the roof of the new residential units. The water will then be directed to a new below ground surface water drainage network that will outfall to a stone trench located beneath the new access road.
- 2.6.2 The access road, driveways and pathways will be constructed in permeable surfacing.
- 2.6.3 A detailed drainage GA drawing and calculations can be found in the Appendices. This indicates no flooding for both the 30-year and extreme 100 year + 40% climate change event.

2.7 Maintenance

- 2.7.1 The drainage network encompasses standard pipework, manholes and an infiltration trench. If the gullies at the base of the rainwater pipes are kept clear of leaves and detritus by regular inspection by the property owners then this should negate it passing into the network.
- 2.7.2 All management and maintenance of the drainage will be with a management company. This will involve general maintenance of the drainage network in accordance with best practice. All drainage will remain private and not be adopted by the local sewerage authority.
- 2.7.3 This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints. The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.
- 2.7.4 There are three types of maintenance activities associated with surface water drainage systems. The SuDS Manual, CIRIA C753, defines these as:
- Regular Maintenance – 'basic tasks undertaken on a frequent and predictable schedule' including vegetation management, litter and debris removal, and inspections.'
 - Occasional Maintenance – 'tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example.'
 - Remedial Maintenance – 'intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.'
- 2.7.5 Specific maintenance needs should be monitored and maintenance schedules adjusted to suit the location and condition of the drainage feature in question.
-

Operation and Maintenance Activity	SuDS Component		
	Piped Network / Inspection Chambers	Permeable Surfacing	Infiltration Trench
Regular Maintenance			
Inspection	■	■	■
Litter and debris removal	■	■	■
Grass cutting		■	■
Weed and invasive plant control		□	
Shrub management (including pruning)		□	□
Aquatic vegetation management		□	
Occasional Maintenance			
Sediment management ¹	■	■	■
Vegetation replacement			□
Remedial Maintenance			
Structure rehabilitation / repair	□	□	□
Infiltration surface reconditioning		■	
■ Will be required □ May be required ¹ Sediment should be collected and managed in pre-treatment systems, upstream of the main device.			

Figure 4 Extract from The SuDS Manual Table 32.1: Typical key SuDS components operation and maintenance activities

Piped Networks, Inspection, Manhole and Catchpit Chambers

- 2.7.6 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.
- 2.7.7 Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed.
- 2.7.8 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 2.7.9 Access for maintenance is provided through access chambers and manholes.

- 2.7.10 Regular inspection and maintenance are important to identify areas which may have been obstructed / clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any features that are not operating correctly. If required, take remedial action	Monthly for three months, then six monthly
	Debris removal from catchment surface / gratings (where may cause risks to performance)	Monthly (and after large storms)
	Remove sediment from trapped sumps, manholes and catchpits.	Annually or as required
Remedial Maintenance	Repair / rehabilitation of gratings, inlets and outlets	As required
Monitoring	Inspect / check all gratings, trapped sumps, manholes and catchpits to ensure that they are in good condition and operating as designed	Annually and after large storm events
Structure Rehabilitation / Repair	Regular Maintenance and Monitoring to identify if repair and / or replacement of features or pipework is required.	As required

Figure 5 Operation and Maintenance Requirements of Piped Networks and Inspection Chambers

Infiltration Trench

- 2.7.11 The infiltration trench is wrapped on the outside in a geotextile blanket and infilled with single sized stone. A perforated pipe is placed through the centre to allow water to pass through and infiltrate to the underlying sand.
- 2.7.12 Access for maintenance should be provided by an access chamber constructed as a catchpit, located at either end of the trench. Regular inspection and maintenance are important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular Maintenance\ Inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

Figure 6 Operation and Maintenance Requirements of Infiltration Trenches

Permeable Paving

- 2.7.13 Permeable paving provides a surface suitable for vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The surface itself is impervious to water, but the blocks are laid to provide void space through the surface to the sub-base. The water is temporarily stored within this sub-base before controlled discharge downstream.
- 2.7.14 Permeable surfaces, together with their associated substructures, are an efficient means of managing surface water runoff close to its source – intercepting runoff, reducing the volume and frequency of runoff, and providing a treatment medium. Treatment processes that occur within the surface structure, sub-base and geotextile layers include filtration, absorption, biodegradation and sedimentation.
- 2.7.15 Permeable paving should be inspected regularly, preferably during and after heavy rainfall to check effective operation and identify areas of ponding. Permeable paving needs to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. Evidence suggests that sweeping once per year should be sufficient to maintain an acceptable infiltration rate on most developments.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, or when required during autumn leaf fall
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48hours	Every 3 months, 48 hours after large storms.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Manage other weeds and vegetation and remove nuisance plants	Once a year, or when required
Remedial Actions	Repair erosion of any adjacent soft landscaping adjacent to the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Figure 7: Operation and Maintenance Requirements for Permeable Paving

3.0 Drainage Related Planning Condition and Responses

3.1 Planning Conditions

Each point of condition 5 is listed below in *italics* with the Brennan Consult response beneath in Blue.

Condition 5

Notwithstanding the approved plans and details, no development shall take place until surface water drainage scheme has been submitted to and approved in writing by the City Council as Local Planning Authority.

The scheme shall include:

1. *Results of ground investigation carried out under Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Proposal of the attenuation that is achieving half emptying time within 24 hours. If no ground investigations are possible or infiltration is not feasible on site, evidence of alternative surface water disposal routes is required.*

A site investigation includes soakaway testing has been undertaken at the location of the proposed infiltration trench. This has defined a rate of 3.3×10^{-6} m/s. Calculations have confirmed a half drain time of 585 minutes.

2. *Surface water drainage layout including discharge points, proposed attenuation (up to a 1 in 100 year including 40% climate change allowance) and proposed overland flow routes for extreme events which shall include a 5m easement for soakaways if infiltration is feasible.*

Refer to the drainage GA in Appendix A and the hydraulic calculations in Appendix B. This has confirmed no flooding for the 100yr + 40% peak storm event from the proposed infiltration trench. A 5m easement from the infiltration trench can be achieved.

3. *If infiltration is not feasible onsite, details of surface water attenuation that offers a reduction in surface water runoff rate to greenfield rates. Where the calculated rate is less than 5l/s, blockage risk shall be assessed and the discharge rate shall be no greater than 5 l/s.*

Infiltration is feasible.

4. *Hydraulic calculations to support the drainage proposal.*

Refer to Appendix B for the hydraulic calculations.

5. *Details of how the scheme shall be maintained and managed after completion including how future occupiers are to be advised of the presence and implications of any soakaways, porous surfaces and attenuation structures installed at the site.*

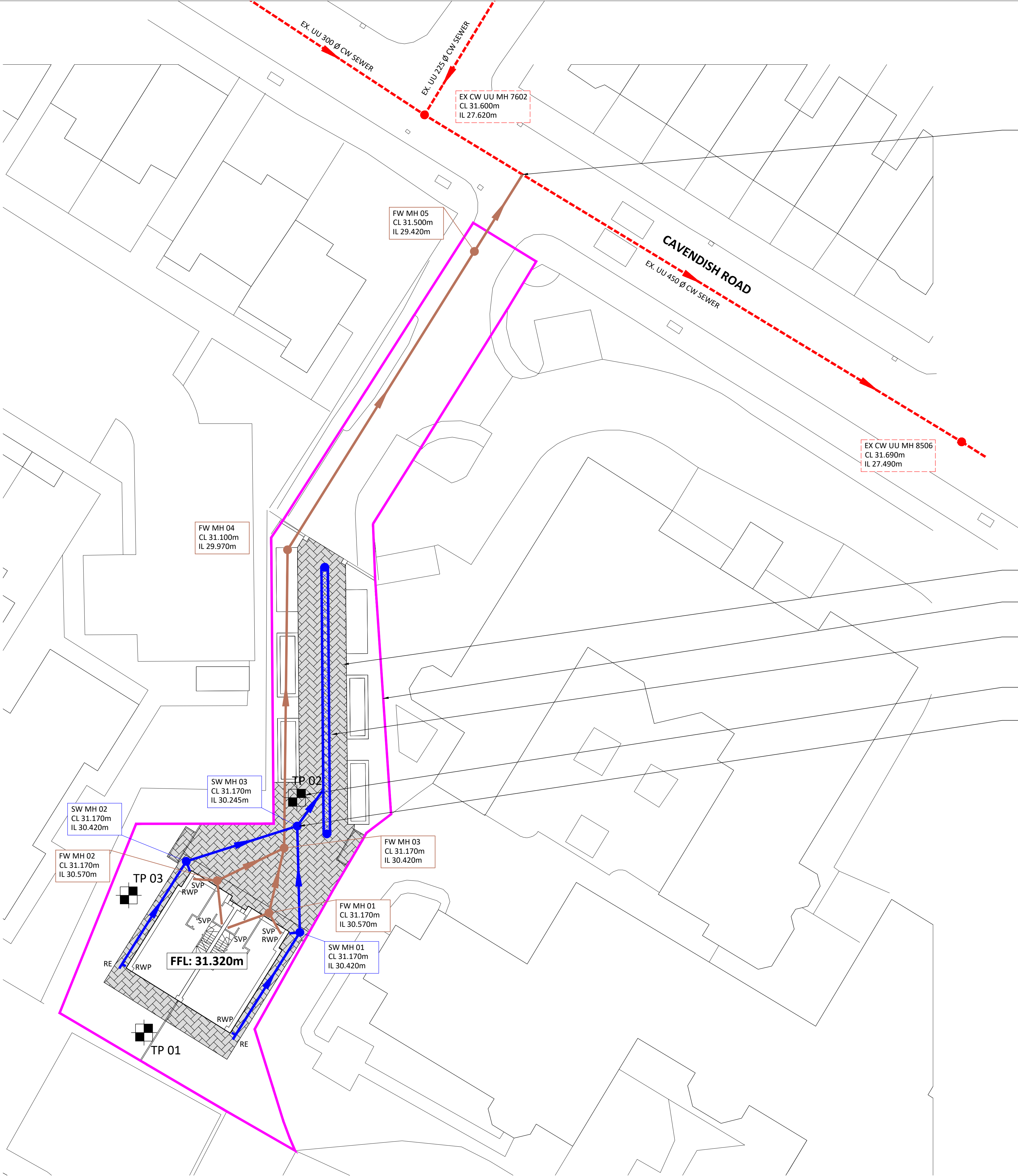
Refer to Section 2.7 for details on the proposed maintenance strategy.

Project Title Drainage Condition Report – Monet Lodge, Didsbury, Manchester, M20 1JG
Project No 2751
Date 19th December 2022



Appendix A – Brennan Consult Drawings

- 2751 100 – Drainage GA



PROPOSED DRAINAGE PLAN
SCALE 1:200

NEW FOUL CONNECTION TO 'UNITED UTILITIES' SEWER VIA SADDLE CONNECTION, SUBJECT TO AGREEMENT WITH 'UNITED UTILITIES'. INVERT LEVEL TO BE CHECK & CONFIRMED TO CONFIRM VIABILITY.

INDICATES EXTENT OF PERMEABLE PAVING.

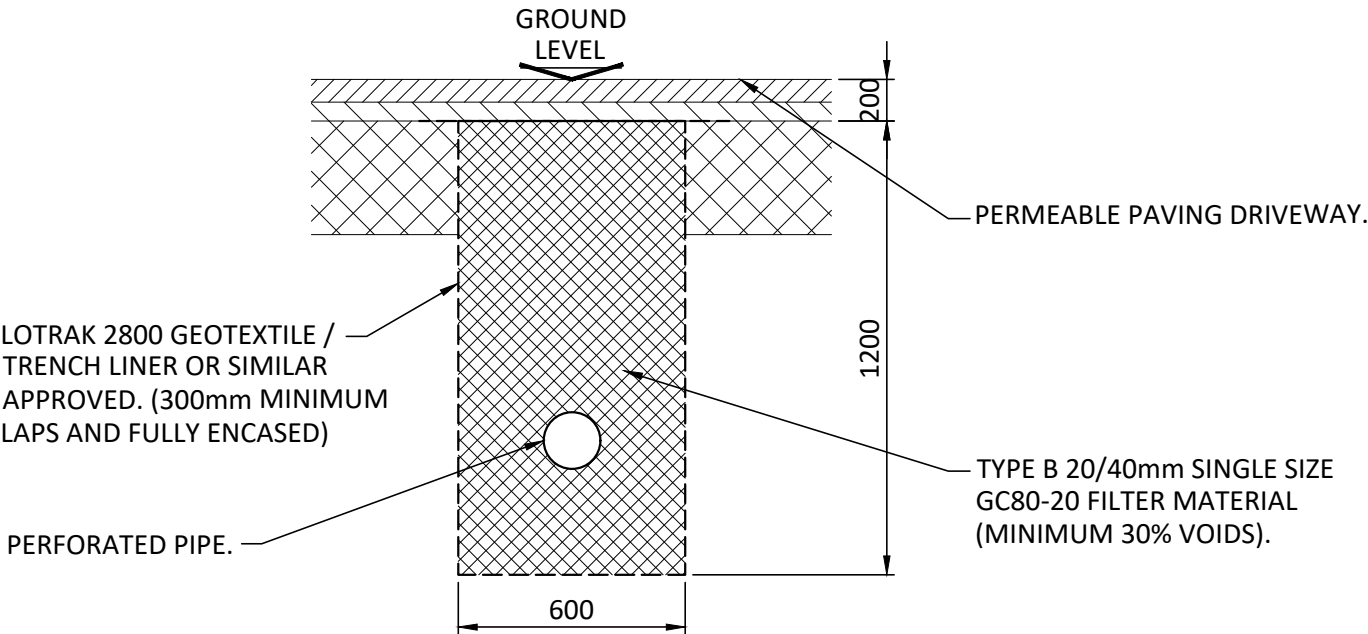
INDICATES SITE BOUNDARY, TBC BY ARCHITECT.

INDICATES 25 x 0.6 x 1.2m DEEP INFILTRATION TRENCH WITH 100mm PERFORATED PIPE & SINGLE SIZED STONE. PROVIDE CATCH PITS AT EACH END. INVERT LEVEL AT 29.970.

INDICATES SITE INVESTIGATION LOCATIONS, REFER TO 'GEOASSIST' REPORT.

INDICATES 'WAVIN' DOMESTIC SILT TRAP (6LB300) PRIOR TO INFILTRATION TRENCH, INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.

ALL EXTERNAL AREAS TO BE PERMEABLE PAVING OR SLOPE TO ADJACENT SOFT LANDSCAPE AREAS.



TYPICAL INFILTRATION TRENCH DETAIL
SCALE 1:20

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DRAINAGE KEY	GENERAL NOTES
INDICATES EXISTING FW DRAINAGE	INDICATES NEW FW DRAINAGE
INDICATES EXISTING CW DRAINAGE	INDICATES NEW CW DRAINAGE
INDICATES EXISTING SW DRAINAGE	INDICATES NEW SW DRAINAGE
ALL NEW SURFACE AND FOUL WATER PIPES TO BE 100mm Ø UNO.	
ALL MANHOLES TO BE CONCRETE ENCASED PPIC'S, REFER TO DETAIL ON DRAWING 2751 - 101.	
ALL MANHOLE COVERS TO BE D400 LOAD RATING.	
CDM DESIGNER'S RISK ASSESSMENT	
BRENNANCONSULT ASSUME THAT THE CONTRACTOR IS COMPETENT IN MATTERS OF HEALTH & SAFETY AND IS AWARE OF ALL THE NORMAL RISKS ASSOCIATED WITH CONSTRUCTION OF THE TYPE SHOWN ON THIS DRAWING. REMAINING UNUSUAL RISKS ARE:-	
CONSTRUCTION	CHK'D.
1. POSSIBILITY OF UNCHARTED BURIED SERVICES. CONTRACTOR TO SURVEY AND SCAN FOR LOCATION OF ANY POSSIBLE BURIED SERVICES IN ADVANCE OF ANY FOUNDATION WORKS BEING UNDERTAKEN.	CB
MAINTENANCE / CLEANING	
NO UNUSUAL RISKS	CB
DECOMMISSIONING / DEMOLITION	
NO UNUSUAL RISKS	CB

1. ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN 752 AND BUILDING REGULATIONS APPROVED DOCUMENT H.
2. DETAILS OF EXISTING SEWERS SHALL BE CONFIRMED BY THE CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHOULD CHECK THE LEVELS OF ALL NEW OUT FALLS IN RELATION TO EXISTING SEWERS PRIOR TO ANY CONSTRUCTION TO ENSURE THE PROPOSED DESIGN CAN BE ACHIEVED.
3. THE CONTRACTOR SHALL ASCERTAIN THE DEPTHS, SIZES AND LOCATIONS OF ALL SERVICES TO BE CROSSED BEFORE EXCAVATION COMMENCES. ANY CONFLICT IN LEVELS BETWEEN NEW AND EXISTING SEWERS TO BE NOTIFIED TO THE ENGINEER.
4. ALL PIPES, CONNECTIONS, GULLIES, ACCESS FITTINGS, INSPECTION CHAMBERS, AND MANHOLES ARE TO COMPLY WITH THE BUILDING REGULATIONS.
5. PIPE BEDDING MATERIAL TO BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS, TAKING ACCOUNT OF THE DEPTH & LOADING IN RELATION TO THE PIPE STRENGTH, AND MODIFIED IF NECESSARY WHERE BELOW WATER LEVEL. BEDDING PROPOSALS ARE TO BE ISSUED FOR CONSIDERATION.
6. PIPES CONNECTED TO CHAMBERS ARE TO HAVE SOFFITS LEVEL U.N.O. PIPES 150mm IN DIAMETER OR SMALLER MAY BE LOWERED TO CENTRE LINES LEVEL.
7. ALL RWP CONNECTIONS TO BE 100mm DIAMETER U.N.O. LAID TO A FALL NO FLATTER THAN 1:40 AND WITH ROD ACCESS AT THE BASE.
8. ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS TO BE SOLID CLASS B ENGINEERING BRICK TO BS3921.
9. ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO BS5911 AND BE KITE MARKED.
10. ALL INSITU AND CONCRETE PRODUCTS SHALL COMPLY WITH CLASS D51 REQUIREMENTS FOR SULPHATE EXPOSURE IN ACCORDANCE WITH BRE SPECIAL DIGEST 1, CONCRETE IN AGGRESSIVE GROUND (2001) PART 1: TABLE 2.
11. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE EXISTING DRAINAGE SYSTEM.
12. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.
13. ALL RWP'S TO DISCHARGE BY DIRECT CONNECTION INTO RODDABLE ACCESS GULLY, WITH INTEGRAL TRAP.
14. ALL SVP'S & WWP'S POP UP'S TO CONSIST OF SLOW BENDS.

DRAINAGE STRATEGY

1. THE FOUL DRAINAGE SHALL CONNECT INTO THE 450mm Ø PUBLIC COMBINED SEWER IN CAVENDISH ROAD.
2. THE SURFACE WATER SHALL BE DISPOSED WITH THE USE OF AN INFILTRATION TRENCH ON SITE AS PRELIMINARY TRIAL HOLES HAVE CONFIRMED THE GROUND CONDITIONS TO BE GRANULAR SANDS.

C	ISSUED TO DISCHARGE PLANNING CONDITIONS	WSS	20.12.22	CB
B	SITE BOUNDARY LINE UPDATED	WSS	22.02.22	CB
A	ISSUED FOR PLANNING	WSS	21.02.22	CB
O	PRELIMINARY ISSUE	WSS	18.01.22	CB
REV	REVISION DESCRIPTION	BY	DATE	CHECKED

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LAND AT CAVENDISH ROAD,
DIDSBURY, MANCHESTER, M20 1JG

NEW RESIDENTIAL DEVELOPMENT
PROPOSED DRAINAGE PLAN

Status PLANNING					
Project No. 2751	Series Code	Drawing No. 100	Revision C		
Scale 1:100	Size A1	Drawn JR	Date JAN 22	Checked CB	Passed CB

Appendix B – Hydraulic Calculations

- Proposed SW Network

Brennan Consult		Page 1
Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Monet Lodge, Didsbury Surface Water Network	
Date 14/12/2022 File Monet Lodge - SW Networ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.375	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.010	4-8	0.002

Total Area Contributing (ha) = 0.012

Total Pipe Volume (m³) = 0.448

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.000	0.150	80.0	0.003	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	10.000	0.175	57.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	12.000	0.150	80.0	0.003	4.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	10.000	0.175	57.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	3.000	0.050	60.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.23	30.570	0.003	0.0	0.0	0.0	0.86	6.8	0.4
1.001	50.00	4.40	30.420	0.006	0.0	0.0	0.0	1.02	8.0	0.8
2.000	50.00	4.23	30.570	0.003	0.0	0.0	0.0	0.86	6.8	0.4
2.001	50.00	4.40	30.420	0.006	0.0	0.0	0.0	1.02	8.0	0.8
1.002	50.00	4.45	30.245	0.012	0.0	0.0	0.0	1.00	7.8	1.6

Brennan Consult		Page 2
Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Monet Lodge, Didsbury Surface Water Network	
Date 14/12/2022 File Monet Lodge - SW Networ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.003	10.000	0.020	500.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	50.00	4.94	29.970	0.012	0.0	0.0	0.0	0.34	2.7	1.6

Brennan Consult		Page 3
Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Monet Lodge, Didsbury Surface Water Network	
Date 14/12/2022 File Monet Lodge - SW Networ...	Designed by paulg Checked by	
Innovyze	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE	31.170	30.570	0.500	Open Manhole	100
1.001	o	100	SW01	31.170	30.420	0.650	Open Manhole	450
2.000	o	100	RE	31.170	30.570	0.500	Open Manhole	100
2.001	o	100	SW02	31.170	30.420	0.650	Open Manhole	450
1.002	o	100	SW03	31.170	30.245	0.825	Open Manhole	450
1.003	o	100	TRENCH	31.170	29.970	1.100	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	12.000	80.0	SW01	31.170	30.420	0.650	Open Manhole	450
1.001	10.000	57.1	SW03	31.170	30.245	0.825	Open Manhole	450
2.000	12.000	80.0	SW02	31.170	30.420	0.650	Open Manhole	450
2.001	10.000	57.1	SW03	31.170	30.245	0.825	Open Manhole	450
1.002	3.000	60.0	TRENCH	31.170	30.195	0.875	Open Manhole	450
1.003	10.000	500.0	dummy	31.170	29.950	1.120	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.003	dummy	31.170	29.950	29.800	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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Innovyze	Network 2017.1.2	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.375		

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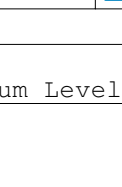
Online Controls for Storm

Pump Manhole: TRENCH, DS/PN: 1.003, Volume (m³): 0.2

Invert Level (m) 29.970

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	0.0000	1.800	0.0000	3.400	0.0000	5.000	0.0000
0.400	0.0000	2.000	0.0000	3.600	0.0000	5.200	0.0000
0.600	0.0000	2.200	0.0000	3.800	0.0000	5.400	0.0000
0.800	0.0000	2.400	0.0000	4.000	0.0000	5.600	0.0000
1.000	0.0000	2.600	0.0000	4.200	0.0000	5.800	0.0000
1.200	0.0000	2.800	0.0000	4.400	0.0000	6.000	0.0000
1.400	0.0000	3.000	0.0000	4.600	0.0000		
1.600	0.0000	3.200	0.0000	4.800	0.0000		

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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Monet Lodge, Didsbury Surface Water Network																					
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Innovyze		Network 2017.1.2																				
<u>Storage Structures for Storm</u> <u>Infiltration Trench Manhole: TRENCH, DS/PN: 1.003</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01190</td> <td>Trench Width (m)</td> <td>0.6</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.01190</td> <td>Trench Length (m)</td> <td>25.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>500.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.000</td> </tr> <tr> <td>Invert Level (m)</td> <td>29.970</td> <td>Cap Infiltration Depth (m)</td> <td>0.000</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01190	Trench Width (m)	0.6	Infiltration Coefficient Side (m/hr)	0.01190	Trench Length (m)	25.0	Safety Factor	2.0	Slope (1:X)	500.0	Porosity	0.30	Cap Volume Depth (m)	0.000	Invert Level (m)	29.970	Cap Infiltration Depth (m)	0.000
Infiltration Coefficient Base (m/hr)	0.01190	Trench Width (m)	0.6																			
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Invert Level (m)	29.970	Cap Infiltration Depth (m)	0.000																			
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.375
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	RE	360 Winter	30	+0%	100/30 Winter				30.623
1.001	SW01	360 Winter	30	+0%	30/120 Winter				30.623
2.000	RE	360 Winter	30	+0%	100/30 Winter				30.623
2.001	SW02	360 Winter	30	+0%	30/120 Winter				30.623
1.002	SW03	360 Winter	30	+0%	30/30 Summer				30.623
1.003	TRENCH	360 Winter	30	+0%	1/15 Summer				30.622

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	-0.047	0.000	0.02		0.1	OK	
1.001	SW01	0.103	0.000	0.04		0.3	SURCHARGED	
2.000	RE	-0.047	0.000	0.02		0.1	OK	
2.001	SW02	0.103	0.000	0.04		0.3	SURCHARGED	
1.002	SW03	0.278	0.000	0.07		0.5	SURCHARGED	
1.003	TRENCH	0.552	0.000	0.00		0.0	SURCHARGED	

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Innovyze		Network 2017.1.2	

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.375
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	RE	600 Winter	100	+40%	100/30 Winter				31.166
1.001	SW01	360 Winter	100	+40%	30/120 Winter				31.166
2.000	RE	600 Winter	100	+40%	100/30 Winter				31.166
2.001	SW02	360 Winter	100	+40%	30/120 Winter				31.166
1.002	SW03	480 Winter	100	+40%	30/30 Summer				31.165
1.003	TRENCH	480 Winter	100	+40%	1/15 Summer				31.165

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	RE	0.496	0.000	0.02		0.1	FLOOD RISK	
1.001	SW01	0.646	0.000	0.06		0.4	FLOOD RISK	
2.000	RE	0.496	0.000	0.02		0.1	FLOOD RISK	
2.001	SW02	0.646	0.000	0.06		0.4	FLOOD RISK	
1.002	SW03	0.820	0.000	0.10		0.7	FLOOD RISK	
1.003	TRENCH	1.095	0.000	0.00		0.0	FLOOD RISK	

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