SCP

Transportation Planning : Infrastructure Design

Drainage Operations and Maintenance Manual

Residential Development

Cross Lane, Gorton

R and M Property

July 2024

Doc Ref: LC/230871/OMM REV B

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Document Revision Control

Revision	Date	Status	Prepared By	Approved By
A	26.06.2024	First Issue	LC	IA
B	26.07.2024	Second Issue	LC	IA

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1.0 INTRODUCTION

Background

1.1 SCP have prepared a Drainage Operation and Maintenance Manual for a 8-unit residential development, located off Cross Lane, Gorton. Particular reference is paid to the inspection, aftercare and maintenance of drainage features.

1.2 This report is based on current best practice guidance as outlined within the SuDS manual.

Scope of O & M Manual

1.3 This manual is intended to give an overview of the operation and maintenance for the range of drainage and external works features included with the design and in relation to typical details only.

1.4 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.

1.5 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.

2.0 DRAINAGE DESIGN PHILOSOPHY

2.1 The surface water network has been designed to accommodate the 1 in 100 year storm rainfall event plus an allowance for climate change.

2.2 As the flows are generally being attenuated on site and within SuDS features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as in Section 3.

2.3 The surface water and foul water drainage systems within the existing highway are intended to be offered for adoption under a S106 Agreement to the sewerage undertaker, United Utilities.

2.4 The drainage within the boundary of the development site is to remain private and will be maintained by a private maintenance company.

2.5 The surface water drainage will discharge into the existing United Utilities surface water sewer located on Cross Lane.

2.6 The foul water drainage system will discharge into the existing United Utilities combined sewer located on Cross Lane.

2.7 Attenuation in the form of an online cellular storage tank is to be used.

3.0 FOUL AND SURFACE WATER DRAINAGE

3.1 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.

3.2 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.

3.3 The surface water network is to be designed to accommodate from 1 in 100 year storm rainfall event plus an allowance for 45% climate change. As the flows are to be attenuated on site there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted in this section.

Components

3.4 The following components have been included within the drainage design for the development:

- Drainage Channels and Gullies
- Pipes
- Inspection, Manhole and Catchpit Chambers
- Attenuation Tank
- Flow Control Unit

3.5 A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

3.6 The maintenance of the drainage network will be the responsibility of a private maintenance company.

3.7 A copy of the final drainage layout is provided in Appendix A.

3.8 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

3.9 Some sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

3.10 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

3.11 During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris, leaves, litter etc.

3.12 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Drainage Channels and Gullies

Location and description

3.13 The locations of the gullies are indicated on the drainage drawing (SCP-230871-S106-0500-001-Rev D – S106 Drainage Layout (Cross Lane)), see Appendix A.

3.14 The features have been designed in accordance with all relevant standards, plus Statutory Bodies' and manufacturers requirements.

3.15 Gullies should be inspected and cleaned in accordance with the manufacturer's details.

3.16 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.

3.17 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Drainage Channels and Gullies Schedule

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near channel runs.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Remedial Action	Inspect gullies and rod through poorly performing gullies as initial remediation.	Monthly or as required

Pipes

Location and Description

3.18 The locations of the pipes are indicated on the drainage drawing (SCP-230871-S106-0500-001-Rev D – S106 Drainage Layout (Cross Lane)) provided in Appendix A.

3.19 The features have been designed in accordance with all relevant standards, plus Statutory Bodies' and manufacturers requirements.

3.20 Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed.

Operation

3.21 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.

3.22 These have been designed to be self-cleansing where possible for smaller diameter pipes and for larger diameters the risk is reduced due to the overall pipe size.

3.23 Access for maintenance will be provided through access chambers, manholes, rodding plates and rodding eyes.

Inspection and Maintenance Regime

3.24 Regular inspection and maintenance are important to identify areas which may have been obstructed/clogged and may not be drain correctly thus exposing the development to a greater level of flood risk. Maintenance responsibility for the pipes should be placed with the maintenance management contractor.

3.25 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Pipes Schedule

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly.
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

Inspection, Manhole and Catchpit Chambers

Location and Description

3.26 The locations of the inspection, manhole and catchpit chambers are as indicated on the drainage drawing (SCP-230871-S106-0500-001-Rev C – S106 Drainage Layout (Cross Lane)) within Appendix A.

3.27 The manholes within the existing highway, are to be offered for adoption under S106 Agreement to United Utilities. Following the 12-month maintenance period, the responsibility for the operation and maintenance of these will pass from the developer to the sewerage undertaker.

3.28 The features have been designed in accordance with all relevant standards, plus Statutory Bodies' and manufacturers requirements.

3.29 Inspection, manhole and catchpit chambers are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed.

3.30 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole.

Inspection and Maintenance Regime

3.31 Regular inspection and maintenance are important for the effective operation of the features. A regular inspection regime is very important to ensure the correct functionality of the surface water drainage network. Maintenance responsibility will be with United Utilities as part of the adopted drainage system.

3.32 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Chambers Schedule

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.
	Check penstocks and other mechanical devices (if present).	Half yearly.
	Inspect ventilation cowl (if present)	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
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually (or as required after heavy rainfall events)
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents.	As required.

Attenuation Tank

Location and Description

3.33 The location of the attenuation tank is as indicated on the drainage drawing (SCP-230871-S106-0500-001-Rev D – S106 Drainage Layout (Cross Lane)) within Appendix A.

3.34 The size of the attenuation tank is 30m^2 x 0.8m deep (24m^3). Two catchpit manholes have been designed at either end of the attenuation tank to allow for jetting through silt build up.

3.35 The features have been designed in accordance with all relevant standards, plus statutory Bodies' and manufacturers requirements.

3.36 Attenuation tanks are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally, different manufacturers may have different connection types and arrangements which will need to be taken into consideration.

Operation

3.37 The attenuation tank is to be the surface water storage feature to attenuate the discharge from the site up to and including the 1 in 100 year plus 45% climate change event.

3.38 Access for maintenance will be provided from the manhole chambers downstream of the tank.

Inspection And Maintenance Regime

3.39 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 correct functionality of the surface water drainage network.

3.40 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Lifetime Replacement

3.41 Geocellular tanks generally have a life expectancy of 50 years maximum. The tanks should therefore be replaced at their end of life expectancy of 50 years to ensure adequate attenuation storage is provided up to the 100 year lifetime expectancy of the development. The responsibility and cost of a replacement tank is to be included in the scope of works for the management and maintenance contract for the development.

Attenuation Tank Schedule

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.
	Check penstocks and other mechanical devices (if present).	Half yearly.
	Inspect ventilation cowl (if present)	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
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by	Monthly (and after large storms)

	silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets, overflows and vents.	As required

Flow Control Units

Location and Description

3.42 The location of the flow control unit is located in an open area to the western side of the development site, as indicated on drawing SCP-230871-S106-0500-001-Rev D – S106 Drainage Layout (Cross Lane), see Appendix A.

3.43 Details of the specification are as follows; flow control chamber diameter is 1350mm, with a depth of 1.518m from cover level to invert level. The flow control chamber as one incoming pipe with a diameter of 225mm, with one 150mm diameter pipe outgoing.

3.44 The orifice of the control unit is 75mm and is designed for a flow of 2.5l/s as indicated on drawing SCP-230871-S106-0500-040- Rev B – Flow Control Details (Sheet 1) within Appendix B.

3.45 The features have been designed in accordance with all relevant standards, plus Statutory Bodies' and manufacturers requirements.

Operation

3.46 The flow control unit is intended for downstream flow control and to restrict the discharge rate off the site.

3.47 The flow control unit will be a Hydro-Brake or similar approved and is a proprietary product; therefore, manufacturer's recommendations should also be taken into consideration.

Inspection and Maintenance Regime

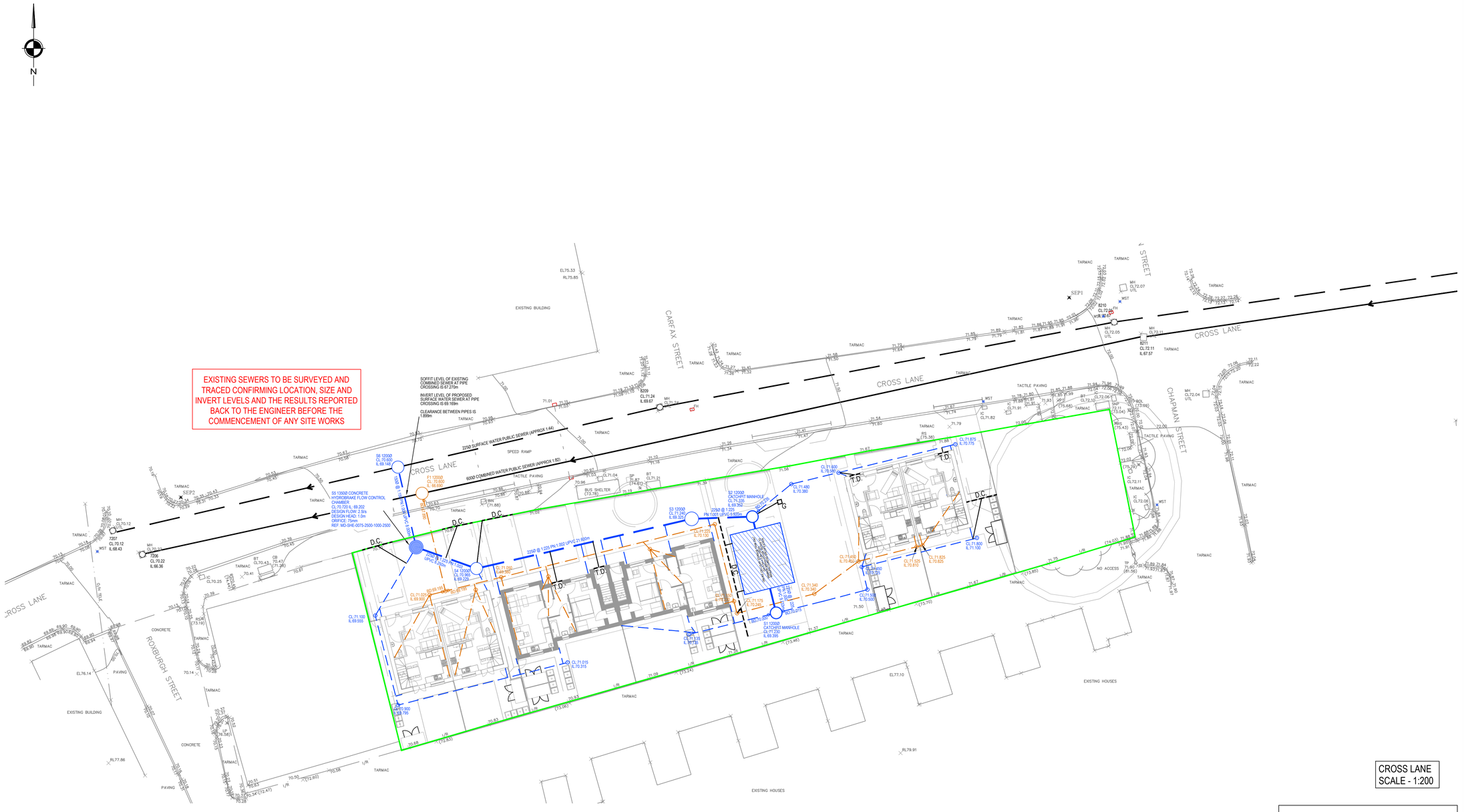
3.48 Access for maintenance will be provided by locating within a manhole chamber.

3.49 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 UU prior to any access.

Flow Control Schedule

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets 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 and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

Appendix A – Drainage Layout Drawing



NOTES

1. SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN. DISTANCES SHOULD NOT BE SCALED FROM THIS DRAWING.
2. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION GUIDANCE AND WHERE APPLICABLE UNITED UTILITIES DETAILS
3. THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE RATES SHALL INCLUDE FOR HAND DIG AROUND SERVICES WHERE NECESSARY. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES
5. THE OUTSIDES OF ALL SEWERS SHALL BE A MINIMUM OF 1.0m FROM KERB LINES AND THE OUTSIDE OF MANHOLES SHALL BE A MINIMUM OF 0.5m FROM KERB LINES
6. EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES
7. ONLY TRAINED PERSONNEL SHALL BE PERMITTED TO ENTER CONFINED SPACES
8. ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
9. ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
10. WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH-PERFORMANCE PIPE ASSOCIATION.
11. A CLASS S BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1m OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
12. SLAB LEVELS SHALL NOT BE VARIED WITHOUT REFERENCE TO THE ENGINEER FOR GUIDANCE
13. DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H. 110mm U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

	FOUL	S.W.
HEAD RUN	1 IN 40	1 IN 60
ELSEWHERE	1 IN 80	1 IN 100

14. ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED CLAY UNLESS NOTED OTHERWISE
15. MINIMUM COVER TO DRAINAGE SOFFIT LEVEL;

LANDSCAPING	TRAFFICKED AREAS	HIGHWAYS
0.600m	0.900m	1.200m

- CLASS 'S' BEDDING AND SURROUND TO BE USED WHERE MINIMUM COVER IS ACHIEVED.
- WHERE MINIMUM COVER IS NOT ACHIEVED CLASS 'Z' BEDDING AND SURROUND (CONCRETE ENCASEMENT) IS TO BE USED.

16. ALL PIPES TO BE 100Ø UNLESS NOTED
17. DRAINAGE CHANNELS ARE TO CONNECT DIRECTLY INTO ATTENUATION TANK
18. ALL INSPECTION CHAMBER SIZES TO BE 450Ø

ALL EXISTING SEWER LOCATIONS, INVERT LEVELS AND SIZES TO BE CONFIRMED BEFORE THE COMMENCEMENT OF ANY WORKS ON SITE

SUBJECT TO S106 APPROVAL

KEY

- PROPOSED S106 SURFACE WATER CONNECTION
- PROPOSED S106 FOUL WATER CONNECTION
- PRIVATE SURFACE WATER SEWER
- PRIVATE FLOW CONTROL CHAMBER
- PRIVATE FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER
- EXISTING SURFACE WATER SEWER
- PRIVATE ONLINE ATTENUATION STORAGE
- PRIVATE SURFACE WATER DRAIN AND PPIC
- PRIVATE SURFACE WATER RODDING EYE
- PRIVATE FOUL WATER RAIN AND PPIC
- PRIVATE SURFACE WATER GULLY AND CONNECTION
- PRIVATE DRAINAGE CHANNEL
- PRIVATE THRESHOLD DRAIN
- SITE BOUNDARY

REVISIONS

REV	DESCRIPTION	DATE	BY
A	FIRST ISSUE	11.04.24	KP
B	PIPE MATERIAL UPDATED AND SW RUN ON VAREY STREET PIPE DIAMETER INCREASED	21.05.24	LC
C	CROSS LANE PLOT FINISHED FLOOR, PLOT AND PRIVATE DRAINAGE LEVELS UPDATED	30.04.24	KP
D	PIPE CODE UPDATED FROM PN:1.005 TO PN:1.004	26.07.24	LC

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Office of Origin: Manchester Tel: 0161 832 4400
www.scptransport.co.uk - www.rskgroup.com

Client Name: R & M PROPERTY GROUP LTD

Project Title: CROSS LANE GORTON

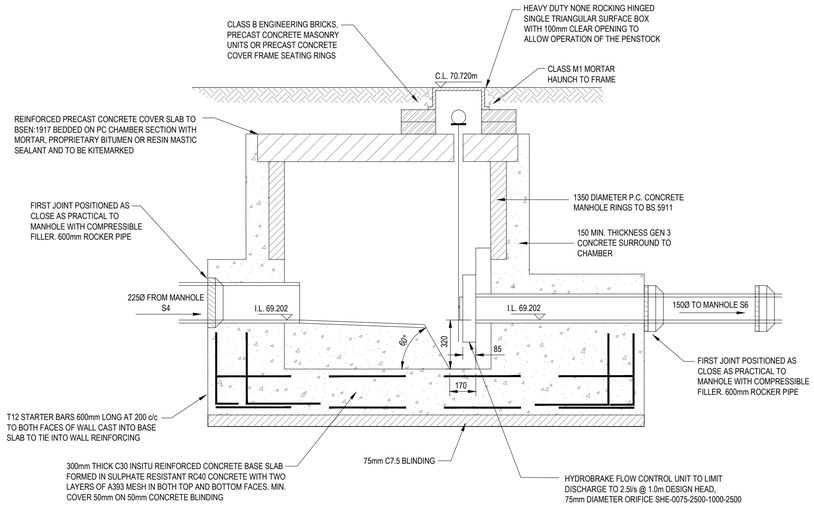
Drawing Title: S106 DRAINAGE LAYOUT

Date:	11.04.2024	Drawn By:	LC
Scale:	1:200 @ A1	Checked:	LR
Status:	DESIGN	Approved:	NMc

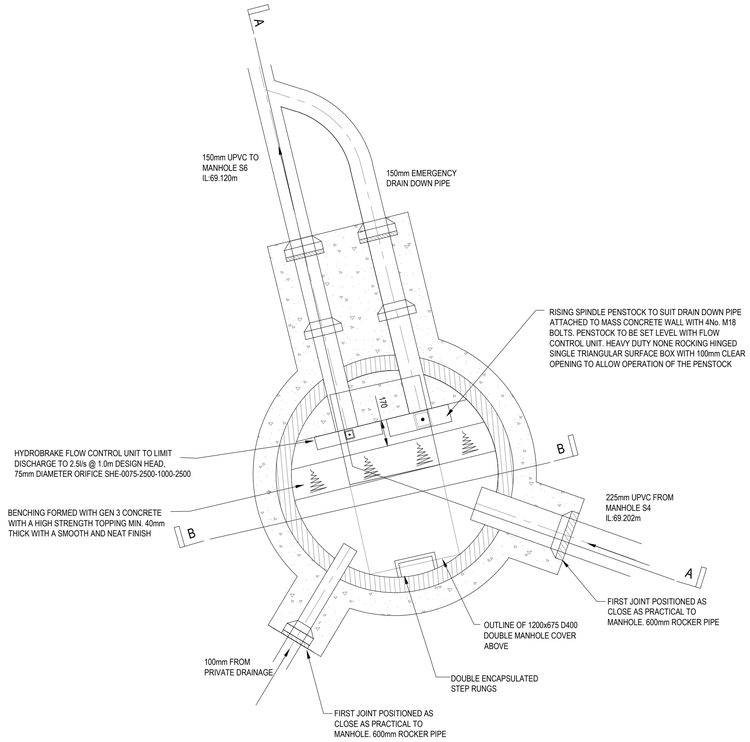
Drawing No.: SCP-230871-S106-0500-001 Rev.: D

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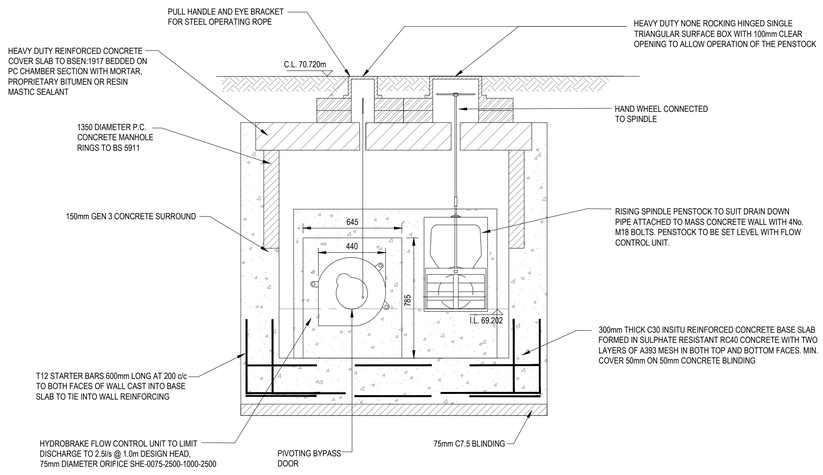
Appendix B – Flow Control Details



SECTION A-A



PLAN



SECTION B-B

MANHOLE REF	S5	
MANHOLE DIAMETER (mm)	1350	
COVER LEVEL (m)	70.720	
PIPE Ø (mm) | INVERT LEVEL (m)	225	69.202
	150	69.202
	-	-
	-	-
MANHOLE TYPE	FLOW CONTROL	
DEPTH TO SOFFIT (m)	1.293	
DEPTH TO CUT-OUT RECESS	N/A	
COVER SIZE (mm)	1200 x 685	
COVER DEPTH (mm)	150	
COVER SPEC	D400	
HOLE SIZE IN COVER SLAB	1200 x 685 E.O.	
LADDER OR DOUBLE STEPS?	DOUBLE STEPS	
SAFETY CHAIN	NO	
SAFETY RAILS	NO	
INVERT ACCESS STEPS	NO	
ROCKER PIPE LENGTH (mm)	600	
MINIMUM BENCHING WIDTH (mm)	600	
EASTING	388794.586	
NORTHING	396274.737	

ROCKER PIPES	
NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH (m)
150-600	0.600
601-750	1.000
OVER 750	1.250

AS PER 'TABLE E13' IN THE DESIGN AND CONSTRUCTION GUIDANCE

ALL LATERAL CONNECTIONS INTO ADOPTABLE MANHOLES WILL BE MADE AT SOFFIT LEVEL TO THE MAIN CHANNEL

ALL MANHOLE BENCHING TO BE TO THE DESIGN AND CONSTRUCTION GUIDANCE WITH MIN 450mm FROM EDGE OF STEPPING WITH AN ADDITIONAL MIN 225mm OPPOSITE SIDE OF PIPE

ROCKER PIPES TO BE INSTALLED TO ALL MANHOLES AS PER DESIGN AND CONSTRUCTION GUIDANCE REQUIREMENTS, *'SECTION E6.6 - RIGID PIPES AND JOINTS ADJACENT TO STRUCTURES'* AND *'TABLE 'E13'*

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	FOUL	S.W.
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18. ALL INSPECTION CHAMBER SIZES TO BE 450Ø

REVISIONS

REV	DESCRIPTION	DATE	BY
A	FIRST ISSUE	11.04.24	LC
B	PIPE MATERIAL UPDATED	21.05.24	LC

SCP
an RSK company
Office of Origin: Manchester Tel: 0161 832 4400
www.scptransport.co.uk - www.rskgroup.com

Client Name:
R & M PROPERTY GROUP LTD

Project Title:
CROSS LANE / VAREY STREET
GORTON

Drawing Title:
FLOW CONTROL DETAILS
CROSS LANE

Date: 11.04.2024	Drawn By: LC
Scale: 1:20 @ A1	Checked: LR
Status: DESIGN	Approved: NMc

Drawing No. SCP-230871-S106-0500-040 | Rev. B

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